City of West Linn
Planning & Development • 22500 Salamo Rd #1000 • West Linn, Oregon 97068
Telephone 503.656-3535 • westlinnoregon.gov

DEVELOPMENT REVIEW APPLICATION

For Office Use Only		
STAFF CONTACT: Wyss	PROJECT NO(S): CUP-25-03/DR-25-03/VAR-25-02	PRE-APPLICATION NO.: PA-25-06
NON-REFUNDABLE FEE(S): $4,450	REFUNDABLE DEPOSIT(S): $9,000	TOTAL: $13,450

Type of Review (Please check all that apply):

- ☐ Annexation (ANX)
- ☐ Appeal (AP)
- ☐ CDC Amendment (CDC)
- ☐ Code Interpretation (MISC)
- ☑ Conditional Use (CUP)
- ☑ Design Review (DR)
- ☐ Tree Easement Vacation (MISC)
- ☐ Expediated Land Division (ELD)
- ☐ Extension of Approval (EXT)
- ☐ Final Plat (FP) Related File #_____
- ☐ Flood Management Area (FMA)
- ☐ Historic Review (HDR)
- ☐ Lot Line Adjustment (LLA)
- ☐ Minor Partition (MIP)
- ☐ Modification of Approval (MOD)
- ☐ Non-Conforming Lots, Uses & Structures
- ☐ Planned Unit Development (PUD)
- ☐ Street Vacation
- ☐ Subdivision (SUB)
- ☐ Temporary Uses (MISC)
- ☐ Time Extension (EXT)
- ☐ Right of Way Vacation (VAC)
- ☐ Variance (VAR)
- ☐ Water Resource Area Protection/Single Lot (WAP)
- ☐ Water Resource Area Protection/Wetland (WAP)
- ☐ Willamette & Tualatin River Greenway (WRG)
- ☐ Zone Change (ZC)

Pre-Application, Home Occupation, Sidewalk Use, Addressing, and Sign applications require different forms, available on the website.

Site Location/Address: 18850 Willamette Drive, West Linn, OR

Assessor's Map No.: 21E14DD

Tax Lot(s): 21E14DD06900

Total Land Area: 1.294 Acres, 56,378 sf

Brief Description of Proposal:

A 3,190 sf, One Story, 17'-8" high new automated car wash, with vacuum stations with associated parking stalls.
This building is replacing an existing McDonald's restaurant. The hours of operation are from 8:00 AM to 8:00 PM.
The building is Type VB Construction, and Occupancy Group B. Car maintenance facilities are allowed under a Conditional Use Permit from the City of West Linn.

Applicant Name*: Eric Li, TVA Architects
Address: 1750 SW Yamhill, Suite 150
City State Zip: Portland, OR 97205
Phone: 503.924.6321
Email: eeykelbosch@froelich-engineers.com

Owner Name (required): Chuck Kaady
Address: 2545 SW Spring Garden Street, Suite 200
City State Zip: Portland, OR, 97219
Phone: 503.924.6321
Email: eeykelbosch@froelich-engineers.com

Consultant Name: Evan Eykelbosch, Froelich Engineers
Address: 17700 SW Upper Boones Ferry Road, suite 115
City State Zip: Portland, OR 97224
Phone: 503.924.6321
Email: eeykelbosch@froelich-engineers.com

1. Application fees are non-refundable (excluding deposit). Applications with deposits will be billed monthly for time and materials above the initial deposit. ***The applicant is financially responsible for all application costs.**
2. All information provided with the application is considered a public record and subject to disclosure.
3. The owner/applicant or their representative should attend all public hearings related to the application.
4. A decision may be reversed on appeal. The decision will become effective once the appeal period has expired.
5. Submit this form, application narrative, and all supporting documents as a single PDF through the web page: https://westlinnoregon.gov/planning/submit-land-use-application.

The undersigned property owner authorizes the application and grants city staff the right of entry onto the property to review the application. The applicant and owner affirm that the information provided in this application is true and correct. Applications with deposits will be billed monthly for time and materials incurred above the initial deposit. The applicant agrees to pay additional billable charges.

Applicant's signature — Date: 07/23/2025

Owner's signature ***(required)*** — Date: 8-1-2025

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DEVELOPMENT REVIEW APPLICATION

For Office Use Only		
STAFF CONTACT	PROJECT NO(S).	PRE-APPLICATION NO.
NON-REFUNDABLE FEE(S)	REFUNDABLE DEPOSIT(S)	TOTAL

Type of Review (Please check all that apply):

- ☐ Annexation (ANX)
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- ☐ Final Plat (FP) Related File#_____
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- ☐ Minor Partition (MIP)
- ☐ Modification of Approval (MOD)
- ☐ Non-Conforming Lots, Uses & Structures
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- ☐ Subdivision (SUB)
- ☐ Temporary Uses (MISC)
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- ☐ Right of Way Vacation (VAC)
- ☑ Variance (VAR)
- ☐ Water Resource Area Protection/Single Lot (WAP)
- ☐ Water Resource Area Protection/Wetland (WAP)
- ☐ Willamette & Tualatin River Greenway (WRG)
- ☐ Zone Change (ZC)

Pre-Application, Home Occupation, Sidewalk Use, Addressing, and Sign applications require different forms, available on the website.

Site Location/Address:
18850 Willamette Drive, West Linn, OR, 97068

Assessor's Map No.: 21E14DD
Tax Lot(s): 21E14DD06900 Lots 40 & 41
Total Land Area: 1.294 Acres

Brief Description of Proposal:
This is an application for a Class II Variance, resulting from the findings of incompleteness in the Type II Land Use Review (PA-25-06) currently in for review with the City of West Linn. The applicant is requesting a Variance for section 55.100 6 e which stipulates 60% glazing on the primary street face and 30% glazing on secondary street facing.

Applicant Name*:	Eric Li, Senior Associate	Phone: 971.678.7578
Address:	TVA Architects	Email: ericl@tvaarchitects.com
City State Zip:	1750 SW Yamhill Street, Suite 150 Portland, OR 97205	
Owner Name (required):	Chuck Kaady	Phone: 503.246.7735
Address:	Kaady Car Washes	Email: CKaady@Kaady.com
City State Zip:	2545 SW Spring Garden Street, Suite 200 Portland, OR 97219	
Consultant Name:	Evan Eykelbosch	Phone: 503.924.6321
Address:	Froelich Engineering	Email: eeykelbosch@froelich-engineers.com
City State Zip:	17700 SW Upper Boones Ferry Rd. Suite 115 Portland, OR 97224	

1. Application fees are non-refundable (excluding deposit). Applications with deposits will be billed monthly for time and materials above the initial deposit. ***The applicant is financially responsible for all application costs.**
2. All information provided with the application is considered a public record and subject to disclosure.
3. The owner/applicant or their representative should attend all public hearings related to the application.
4. A decision may be reversed on appeal. The decision will become effective once the appeal period has expired.
5. Submit this form, application narrative, and all supporting documents as a single PDF through the web page: https://westlinnoregon.gov/planning/submit-land-use-application

The undersigned property owner authorizes the application and grants city staff the **right of entry** onto the property to review the application. The applicant and owner affirm that the information provided in this application is true and correct. Applications with deposits will be billed monthly for time and materials incurred above the initial deposit. The applicant agrees to pay additional billable charges.

Applicant's signature — 09/12/2025 Date

Owner's signature ***(required)*** — 9-13-2025 Date

DEVELOPMENT REVIEW CHECKLIST

The application form and supporting materials should be submitted electronically through https://westlinnoregon.gov/planning/submit-land-use-application **as one (1) .pdf file**. To create a single PDF file, go to Adobe Acrobat Free Merge PDF online tool. Other free Acrobat PDF tools like converting a file to PDF or reducing the file size are available on the Adobe website.

Supporting reports may be uploaded separately through this web form *if* the file size is too large. The separate submissions should be numbered (i.e., Submittal 1 of 2) and noted under transmittal contents. All plan set files MUST be flattened and reduced.

Submission requirement to upload through the web form:

- .pdf format.
- Individual file size no larger than 128 MB.
- Do not attach 'zip' files. Our server will reject all 'zip' files.
- Reduce and flatten all plan sets BEFORE uploading plan sets. The raster/vector settings should be optimized for printing.

A complete application must include the following:

- ☑ Development Review Application. Original signatures from all owners must be on the application form. **Do NOT use DocuSign.**
- ☑ A **project narrative** outlining the project's scope in detail, including the changes to the site, structure, landscaping, parking, land use, and lot consolidations.
- ☐ Complete written responses to identified approval criteria in the Community Development Code (CDC).
- ☐ A Service Provider Letter from Tualatin Valley Fire and Rescue - https://www.tvfr.com/399/Service-Provider-Permit Please contact Jason Arn at jason.arn@tvfr.com with any questions about TVF&R requirements.
- ☐ Vicinity Map showing the site within the City.
- ☐ Site Plan drawn to scale showing the:
    - Taxlot and address of the project,
    - Area of the site (acres or square feet),
    - Zoning and Neighborhood Association,
    - Location and dimensions of existing and proposed buildings, structures,
    - Location of existing and proposed on-site driveways and off-street parking,
    - Configuration and dimensions of all existing and proposed lots and tracts, including a proposed park, open space, and or drainage tracts or easements,
    - Location and width of existing and proposed easement for access, drainage, etc., and
    - Location of existing and proposed trees and other proposed landscaping.
    - Location of existing public and private utilities, easements, and 100-year floodplain,
    - Sensitive areas, including the location of on-site wetlands and riparian areas,
    - Location of existing off-site driveways across the street,
    - If applicable, internal circulation system, name, and location of existing and proposed roadways and roadway easements (private and public), and
    - Location and width of existing and proposed on-site pedestrian and bicycle facilities on-site.
- ☐ If applicable, a Utility Plan and Landscape plan, drawn to scale.
- ☐ If applicable, Building elevation drawings with exterior elevations for every side of each structure, height including building materials and floor levels, drawn to scale.
- ☐ If required, documentation of any required meeting with the respective City-recognized neighborhood association per CDC 99.038.
- ☐ Any other materials identified by city staff at the pre-application meeting.

For applications that the Planning Commission decides, the applicant or applicant's representative should present their proposal to the PC at the public hearing.

September 3, 2025

Chuck Kaady
2545 SW Spring Garden Street, Suite 200
Portland, OR 97205

SUBJECT: Conditional Use Permit and Class II Design Review Application for 18850 Willamette Drive (CUP-25-03/DR-25-03)

Chuck Kaady,
Your application submitted on August 4, 2025 has been deemed **incomplete.** The following items must be addressed:

1) CDC Chapter 55 Design Review (55.100(6)(E) – Commercial buildings must provide 60% windows or transparency at the pedestrian level. If 60% cannot be met a Class II Variance will be required.

2) CDC Chapter 75 Variances and Special Waivers - Address all applicable code sections in Chapter 75 regarding a request to reduce the required windows and transparency on commercial buildings. The fee for a Class II Variance is $3450 and must be paid at time of resubmittal.

3) CDC Chapter 99 Procedures for Decision Making: Quasi-Judicial (99.038)(A-E) – Address all applicable code criteria for 99.038(A-E).

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

Pursuant to ORS 227.178: If an application for a permit, limited land use decision or zone change is incomplete, the governing body or its designee shall notify the applicant in writing of exactly what information is missing within 30 days of receipt of the application and allow the applicant to submit the missing information. The application shall be deemed complete for the purpose of subsection (1) of this section upon receipt by the governing body or its designee of:

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

You have through February 24, 2026, to make the application complete by providing the information outlined above. On the 181st day after first being submitted, the application will be considered void if

the applicant has been notified of the missing information and has not submitted the information as requested above or a written notice responding to the above options.

Please contact me at 503-742-6062, or by email at cmyers@westlinnoregon.gov if you have any questions or comments.

Respectfully,

Chris Myers

Chris Myers
Associate Planner

Date:	September 12, 2025
Project Name:	Kaady Car Wash CUP-25-03/DR-25-03
Project No:	24041
Re:	Completeness Response Letter

Memo

To:	Chris Myers	Chuck Kaady
	Bob Thompson	
From:	Eric Li	

This is a response letter to the incompleteness letter received that was dated September 3, 2025, from the City of West Linn.

The following actions have been taken in response to the comments received.

1. **A Class II Variance has been applied for in response to the clause in Chapter 55.100(6)(E) that requires 60% glazing on the primary (Willamette Drive) face, and 30% on the secondary (Walling Way) Face.**
2. **The written narrative now includes, on page 9, the following justification for the variance:**

Class II VARIANCE 75.020

The proposed Car Wash does not comply with the window glazing requirements stipulated in 55.100 6 e, which requires 60 % transparency along the main elevation facing Willamette Drive, or the 30% transparency required along the secondary elevation facing Walling Way. The Applicant is submitting for a Class II Variance for the requirements of the glazing percentage required by 55.100 6 4.

During business hours, the exit elevation facing Willamette Drive will be open, providing a 12'-0" x 12'-0" opening that is fully "transparent". Along the Walling Way Driver's Side, there is 12% glazing provided to the employee workspaces (19'-8" glazing over 115'-0"). The Ticket Stations, which interact with the public, are 75% glazed (3 sides of each booth).

- The lack of the requisite glazing does not provide a life-safety or accessibility concern. The percentage of glazing is not a condition that conflicts with any requirements in the OSSC Code.

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phone: 503 220 0668 | www.tvaarchitects.com

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- The use of a masonry wall performs better as an acoustic buffer than a glazed opening, and acoustics was a primary concern of the Neighborhood Association. Windows adjacent to areas near fan dryers would increase the sound vibration from air blowers rather than dampen the noise, as the masonry walls will.
- Glazing into the wash bay on the passenger side is possible, but it does not achieve the required amount of glazing facing the public. Adding additional glazing would not enhance or provide any visual enhancement relative to the functions inside of the building. There are no people working inside the wash bay during operational hours, nobody needs to see out of the wash bay as the space is unoccupied.
- Glazing into the storage room on the South (Walling Way) side would interfere with the mounting of the filtration treatment equipment in the storage room, which requires and would not provide a notable benefit to be publicly seen.
- The requested variance does not affect the size, location, or topography of the building on the site. The code provision in 55.100 6 e is an aesthetic provision.
- The request for this variance does not create any conflicts with any other Community Development code standards.
- Nearby Precedents for non-compliance with this Code section (Whether or not they applied for a variance) include:
    - United Car Wash on 19303 Willamette Drive (Very Similar)
    - Walmart on 19133 Willamette Drive
    - Wells Fargo Bank on 19181 Willamette Drive
    - Soku Sushi and Noodle on 19171 Willamette Drive
    - Monte Gozales Family Dentistry on 18612 Willamette Drive
    - Burgerville on 18530 Willamette Drive

3. **Included in this Application, per the Procedures for Decision Making: Quasi-Jurisdictional of 99.038, Neighborhood Contact Required for Certain Applications:**

A. Purpose: The purpose of the neighborhood contact is to identify potential issues or conflicts regarding a proposed application so that they may be addressed before filing.
    a. Acknowledged. **This meeting was scheduled, held, and recorded in accordance with the requirements of 99.038.**
B. The applicant shall contact by letter all recognized neighborhood associations whose boundaries contain all or part of the site of the proposed development and all property owners within 500 feet of the site.
    a. A letter of notification was drafted to inform these neighbors of the scheduled meeting. These letters were mailed more than 20 days before the June 8 meeting. **This letter has been included as part of this Conditional Use application, see attached.**
    b. See the attached mailing list of neighbors, as determined by Chicago Title.
C. The letter shall be sent to the president of the neighborhood association and to one designee as submitted to the City by the Neighborhood Association. It shall be sent by regular mail to the other officers of the association and the property owners within 500 feet of the project.

a. The letter was sent by certified mail to NA President Michelle Goldberg, NA Vice President Tony Bracco, and to the Robinwood Station courtesy of Michelle Goldberg. **See the attached receipts for the certified mail.**
b. Please note that the email addresses listed for the Robinwood Neighborhood Association on the City of West Linn Website are not viable website addresses, which made contacting the officials very difficult. TVA had to attend the May Robinwood Neighborhood Association meeting to get on the next month's schedule, as repeated email requests to the City's identified email addresses were not returned, creating delays in the design team's ability to get on the Neighborhood Association meeting schedule. The NA Treasurer, Kevin Bryck, confirmed this issue. This information should be corrected for future applicants.

D. Two signs were posted on the building site, announcing the time, date, and location of the Neighborhood Association Meeting. One sign was placed along Willamette Drive, and one sign was placed next to the driveway entry on Walling Way. The signs were 30" x 42" and mounted on polycarbonate boards and were staked in place.
   a. **A .pdf of the sign has been provided as part of this CUP permit application.** Contact information for Chuck Kaady and Eric Li is included on both the sign and the notification letter.
   b. Photographs of the signage in place have been provided as part of this CUP application. **See sheets G1 and G1.1.**

E. The following documents have been attached to this application.
   a. **A copy of the certified letter with receipts from the USPS, dated 5/9/2025.**
   b. **An affidavit of the mailing for the letters of notification, dated 5/9/2025, which a notary public has stamped.**
   c. **A .pdf copy of the notification signage, announcing the date, time, and location of the Neighborhood Association Meeting.**
   d. **A copy of the meeting agenda and the meeting minutes provided by the Robinwood Neighborhood Association.**
   e. **As of 9/5/25, the Design Team has received (1) written comment in opposition to the proposed use, from Morgan McCarley, dated 5/20/2025. The email has been included in the application.**
   f. **An MP3 audio recording of the Neighborhood Association was provided to Chris Myers in the original application.**

The major points of concern from the audience were traffic, noise, and wetland issues.
The Applicant acknowledges the concerns of the neighborhood community and addresses these elements in this application narrative:

- Water Resource Area Protection Chapter 32
- Privacy and Noise 55.100D,
- Traffic 55.125

END COMPLETENESS RESPONSE

October 24, 2025

Chuck Kaady
2545 SW Spring Garden Street, Suite 200
Portland, OR 97205

SUBJECT: Conditional Use Permit and Class II Design Review Application for 18850 Willamette Drive (CUP-25-03/DR-25-03)

Chuck Kaady,
Your application resubmitted on September 19, 2025, has been deemed **incomplete.** The following items must be addressed:

1) The Engineering and Public Works Department has determined that a Traffic Impact Analysis (TIA) is warranted for the proposed project. Ensure the proposal is from a certified engineering firm.

2) The Planning Department requests a noise study from a licensed professional Acoustic Engineer to determine the level of noise produced by the proposed facility.

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

Pursuant to ORS 227.178: If an application for a permit, limited land use decision or zone change is incomplete, the governing body or its designee shall notify the applicant in writing of exactly what information is missing within 30 days of receipt of the application and allow the applicant to submit the missing information. The application shall be deemed complete for the purpose of subsection (1) of this section upon receipt by the governing body or its designee of:

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

You have through April 22, 2026, to make the application complete by providing the information outlined above. On the 181st day after first being submitted, the application will be considered void if the applicant has been notified of the missing information and has not submitted the information as requested above or a written notice responding to the above options.

Please contact me at 503-742-6062, or by email at cmyers@westlinnoregon.gov if you have any questions or comments.

Respectfully,

Chris Myers

Chris Myers
Associate Planner

Date:	January 8, 2026
Project Name:	Kaady Car Wash CUP-25-03/DR-25-03
Project No:	24041
Re:	Completeness Response Letter

Memo

To:	Darren Wyss	Chuck Kaady
	Bob Thompson	
From:	Eric Li	

This is a response letter to the second incompleteness letter received from the City of West Linn, dated October 24, 2025.

The following actions have been taken in response to the comments received.

1. A Traffic Impact Analysis was requested by the City of West Linn Engineering and Public Works Department.

   Ard Engineering was hired to provide an analysis of the site, and the full stamped and signed report has been added to this application. The engineer analyzed comparable facilities using a 2012 study of drive-through commercial facilities, including fast food restaurants, banks, coffee shops, pharmacies, and other car washes, including two Kaady Car Washes in the Portland Metro area. These two facilities are located at 1909 W Burnside St. in Portland and 9614 SW Tualatin Sherwood Road in Tualatin, OR, where Ard Engineering set up camera documentation of the traffic flow at those two sites.

   To summarize, this project is expected to generate 78 weekday evening peak-hour trips and 96 Saturday peak-hour trips. The calculated queue length is 7.4 vehicles, and the maximum length observed at any car wash was 10 vehicles. Our site has a capacity of 19 cars in the queue, which indicates that the facility will not provide any backup traffic onto Willamette Drive. This project has been determined not to result in increases in traffic or degradation of area roadways and intersections, as compared to either the prior use of the site or other uses permitted outright in the General Commercial Zone.

   The written narrative now includes, on page 9, the following justification for the variance:

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phone: 503 220 0668 | www.tvaarchitects.com

Robert Thompson, FAIA | Tim Wybenga, LEED AP | Pamela Saftler, AIA, IIDA | Mandy Butler, AIA, LEED AP, CSI CDT

2. The City of West Linn requested a noise study from a licensed professional Acoustic Engineer to determine the level of noise produced by the proposed facility.

   Tenor Acoustics was hired to provide an acoustic report. Tenor provided an assessment evaluating potential acoustical impacts by comparing predicted noise emissions from the proposed equipment against pertinent regulations established by the City of West Linn, Clackamas County, and the State of Oregon Department of Environmental Quality. The evaluation utilizes ambient sound level data obtained from the existing site as well as acoustic testing performed at three other Kaady Car Washes in the Portland area. The data was then used to create a software model that predicts noise from the proposed car wash to adjacent areas and properties. This report has been included in the Conditional Use/Design Review Application.

   Summarizing the findings, it was predicted that the initial proposal was compliant with codes and ordinances on the East, North, and South faces. These conditions indicated less than 55 dBA in noise-sensitive areas. The west-facing elevation, however, predicted non-compliant noise levels due to the mechanical blowers facing the residences on the west-facing slope, resulting in levels over 60 dBA at the residences on the west-facing slope to the west of the car wash.

   To mitigate this condition, TVA redesigned the car wash entry to provide an acoustic enclosure outside the west-facing exit, turning the exit to the north. (See Report Section 5.1) This eliminates the predicted noise impact on the sensitive residential areas to the west. This satisfies the Clackamas County Code and the Oregon Administrative Rules statistical noise levels for new commercial noise sources. The Modifications to the exit are shown on Site Plan A0.01 and Elevations A4.01, attached.

   Studies of the vacuum stations at the Tualatin/Sherwood Kaady Car Wash site predict that the blower sheds and vacuums do not cause any acoustic issues to any sensitive areas when applied to this project site.

END COMPLETENESS RESPONSE

Date:	Revised on January 8, 2025
Project Name:	Kaady Car Wash West Linn
Project No:	24041
Re:	Type II Design Review Application

CONDITIONAL USE AND TYPE II DESIGN REVIEW APPLICATION AND WRITTEN RESPONSES FOR 18550 Willamette Drive, Tax Lot 21E14DD06900 Per Chapters 55 and 60 of the City of West Linn Community Development Code

APPLICATION NARRATIVE

The Kaady Car Wash is a one-story, 3,190-sf building that is 17'-8" high and has 280 sf of auxiliary buildings (Ticket Booth and Vacuum Shed), for a total of 3,470 sf of leasable space. It is replacing a 3,948-sf McDonald's restaurant with drive-through service. The building type is considered an automobile cleansing facility per 2.a. in 19.060 Conditional Uses, which allows the use in this zone subject to the provisions of Chapter 60 of the CDC, Conditional Uses.

Kaady Car Wash is a locally owned franchise of automotive cleaning facilities that have used state-of-the-art car wash technology for the residents of the Portland Metropolitan area since 1977. Kaady Car Washes are better for the cars, the environment, and for all that cars go through. Business operations run daily from 8 AM to 8 PM. Similar facilities have recently been developed on West Burnside in Portland and along TV Highway in Hillsboro.

There are no public restroom facilities within the scope of this work. An accessible staff restroom is available for the use of car wash employees.

Building Construction Type and Occupancy:
The construction type is VB, and the occupancy group is B. The building is non-separated.
The Car Wash has an occupancy of 12, and each of the two ticket stations has an occupancy of 1.
The allowable area is 9,000 sf without sprinklers, per Table 504.3. COMPLIANT
The allowable building height is 40'-0" without sprinklers per Table 504.3. COMPLIANT

For Type VB Construction, Class B Occupancy, No Sprinklers:
OSSC Table 504.3 allowable building height is 40'-0" COMPLIANT
OSSC Table 504.4 allows for two allowable stories. COMPLIANT
OSSC Table 506.2 allowable area is 9,000 s.f. COMPLIANT

tva architects, inc.
1750 sw yamhill street | suite 150 | portland, oregon 97205
phone: 503 220 0668 | www.tvaarchitects.com

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A precedent for a car wash conditional use exists with the operation of United Car Wash, located at 19303 Willamette Drive, West Linn.

Existing Easement:

There is an existing Reciprocal Ingress and Egress Easement on the site, Document No 96-058137 amended by Document 98-051836, that provides access to the shopping mall on the lot adjacent to the north. This easement remains. The existing lot entries remain unchanged.

Existing landscaping and Planting:

None of the street trees on the site are documented or included in the City of West Linn Street Tree Inventory Map. One street tree located off Walling Way may need to be modified to accommodate the upgrade of the water service line, but the rest of the street trees are to remain. There is a masonry existing site retaining wall that is approximately 8'-0" on the east side of the lot that provides a visual and acoustic buffer to the adjacent residential zone. On the east side of the wall is a vegetated water treatment swale that we will keep, upgrade, and maintain. Interior lot landscaping will be demolished and replaced as shown on the site plan with City-compliant small trees.

Pre-Application Conference

TVA and Chuck Kaady met with Chris Myers with the City of West Linn Planning Department for a Pre-Application conference on March 8, 2025. See attached Summary Notes.

The key issues from the meeting were that:

1. The design team needed to meet with the Robinwood Neighborhood Association and to provide an audio recording of the meeting.
2. The applicant must have a TVF&R Provider Permit as part of the application
3. There is an existing ingress/egress easement on the property, which must be maintained unless legally changed with all property owners agreeing.

TVFR Provider Permit

A Tualatin Valley Fire and Rescue Provider Permit has been submitted and approved by TVFR, and is included as part of this application.

Historical Preservation:

This is not a historical condition subject to review from the Historic Review Board.

99.038 Neighborhood Contact Required for Certain Applications

TVA and Kaady Car Wash hosted a Robinwood Neighborhood Association meeting at the Robinwood Station Community Center on June 8, 2025, at 7:00 PM. Also in attendance were the Vice President, Tony Bracco, and the Secretary/Treasurer, Kevin Bryck. The Association President, Michelle Greenberg, was invited, but did not attend. Our presentation lasted about an hour, where we fielded questions and concerns from the community. A complete audio documentation of the event was taken and is submitted with this application.

Questions and concerns from this meeting included:

- Noise and acoustic performance of the building.
- The effects of on-site water drainage on the local water system.
- Traffic along Willamette Drive.
- Whether the addition of another car wash in the neighborhood is warranted.

The Design Team will address each of these items in this application.

Included in this Application, per the requirements of 99.038, Neighborhood Contact Required for Certain Applications:

A. Purpose: The purpose of the neighborhood contact is to identify potential issues or conflicts regarding a proposed application so that they may be addressed before filing.
    a. Acknowledged. This meeting was scheduled, held, and recorded in accordance with the requirements of 99.038.
B. The applicant shall contact by letter all recognized neighborhood associations whose boundaries contain all or part of the site of the proposed development and all property owners within 500 feet of the site.
    a. A letter of notification was drafted to inform these neighbors of the scheduled meeting. These letters were mailed more than 20 days before the June 8 meeting. This letter has been included as part of this Conditional Use application, see attached.
    b. See the attached mailing list of neighbors, as determined by Chicago Title.
C. The letter shall be sent to the president of the neighborhood association and to one designee as submitted to the City by the Neighborhood Association. It shall be sent by regular mail to the other officers of the association and the property owners within 500 feet.
    a. The letter was sent by certified mail to NA President Michelle Goldberg, NA Vice President Tony Bracco, and to the Robinwood Station courtesy of Michelle Goldberg. See the attached receipts for the certified mail.
    b. Please note that the email addresses listed for the Robinwood Neighborhood Association on the City of West Linn Website are not viable website addresses, which made contacting the officials very difficult. TVA had to attend the May Robinwood Neighborhood Association meeting to get on the next month's schedule, as repeated email requests to the City's identified email addresses were not returned, creating delays in the design team's ability to get on the Neighborhood Association meeting schedule. The NA Treasurer, Kevin Bryck, confirmed this issue. This information should be corrected for future applicants.
D. Two signs were posted on the building site, announcing the time, date, and location of the Neighborhood Association Meeting. One sign was placed along Willamette Drive,

and one sign was placed next to the driveway entry on Walling Way. The signs were 30" x 42" and mounted on polycarbonate boards and were staked in place.

a. A .pdf of the sign has been provided as part of this CUP permit application. Contact information for Chuck Kaady and Eric Li is included on both the sign and the notification letter.
b. Photographs of the signage in place have been provided as part of this CUP application. See sheets G1 and G1.1.

E. The following documents have been attached to this application.
   a. A copy of the certified letter with receipts from the USPS, dated 5/9/2025.
   b. An affidavit of the mailing for the letters of notification, dated 5/9/2025, which has been stamped by a notary public.
   c. A .pdf copy of the notification signage, announcing the date, time, and location of the Neighborhood Association Meeting.
   d. A copy of the meeting agenda and the meeting minutes provided by the Robinwood Neighborhood Association.
   e. As of 9/5/25, the Design Team has received (1) written comment in opposition to the proposed use, from Morgan McCarley, dated 5/20/2025. The email has been included in the application.
   f. An mp3 audio recording of the Neighborhood Association was provided to Chris Myers.

The major points of concern from the audience were traffic, noise, and wetland issues.
The Applicant acknowledges the concerns of the neighborhood community and addresses these elements in this application narrative:

- Water Resource Area Protection Chapter 32,
- Privacy and Noise 55.100D,
- Traffic 55.125

Design Documents:
The attached documents have been provided as part of this Conditional Use Application:
The required drawings have been provided in PDF format, in both full-size (30x42) and 11x17 formats. 55.070 Submittal Requirements require these Documents

- A site plan A0.01
- Building Elevations A4.01 and A4.02
- Grading Plan
- Site Utility Plan
- Photographs of the Existing McDonald's Site (with Neighborhood Notification Sign)
- Photographs of the Portland, West Burnside Kaady Car Wash, completed in 2024, which is the basis of the design for this project.
- Photographic proof of the acoustic testing of the Burnside Site.
- A Light Coverage Plan

CHAPTER 19 GENERAL COMMERCIAL (GC) ZONE REQUIREMENTS

19.020 PROCEDURES AND APPROVAL PROCESSES

- The approval of a conditional use is discretionary with the Planning Commission, the process and criteria for approval set forth in Chapter 60 of the City of West Linn Community Development Code.

19.060 CONDITIONAL USES

- Automotive and equipment cleaning uses are allowed as a conditional use. A Conditional Use Permit will be applied for under the requirements listed in Chapter 60 of the West Linn Community Development Plan. (See below for more information.)

19.070 DIMENSIONAL REQUIREMENTS

- Minimum front lot line length shall be 35 feet. COMPLIANT
- Minimum lot width shall be 50 feet. COMPLIANT
- Minimum lot depth shall not be less than 90 feet. COMPLIANT
- The maximum lot coverage shall be 50 percent. COMPLIANT
- Maximum building height shall be two and one-half stories or 35 feet for any structure located 50 feet or more from a low or medium-density residential zone. COMPLIANT
- For lot lines that abut an arterial, there shall be no minimum yard dimensions or minimum building setback area, and the maximum building line shall consist of landscaping or a combination of non-vehicular hardscape areas and landscaped areas. COMPLIANT

CHAPTER 32 WATER RESOURCE AREA PROTECTION

- Per the West Linn Water Resource Area Map, Fern Creek runs as an underground pipe segment below the property and is piped out at the west property line. Fern Creek, upon emerging on the other side of the property line becomes a significant riparian corridor.
- The projected water resource area of the riparian corridor on this property is where the stormwater treatment pond is. The water resource itself (Fern Creek) is outside of the property lines of this project.
- There is no construction in this area of the site. Per Table 32-1, stormwater treatment facilities are allowed in a Water Resource Area.
- There are no wetland conditions on this property identified in the Water Resource Inventory.

CHAPTER 42 CLEAR VISION AREA

- The Owner will trim and maintain the street tree canopy 8'-0" and below at the corner of Willamette Drive and Walling Way to provide the clear vision area 30'-0" from the

intersection as required per 42.020. There are to be no visual obstructions (walls, fences, or planting) provided at this intersection as part of this scope of work.

CHAPTER 44 FENCES

- No new fences are being provided in this cope of work.
- There is an existing CMU retaining wall on the east side of the east drive exit that will remain. This retaining wall is 6'-8" max. and does not abut a street. Most of this wall is 40" max above grade. This wall is not within a front yard setback area.

CHAPTER 46 OFF-STREET PARKING, LOADING, AND RESERVOIR AREAS

- The traffic flow reverses through the car wash, and vehicles can either exit back onto Willamette Drive or use the self-servicing vacuum spaces in a lot to the north of the car wash. The vacuum stalls are generously sized at 10'-0" wide x 18'-0" deep, and the total number of parking spaces is 17.
- Note that the vacuum stations are for active cleaning use and are not intended as medium or long-term parking spaces.
- Per the Off-Street Parking Requirements table 46.090, the maximum number of parking spaces is 5 per 1000 sf of leasable building, using "other commercial uses" as the Land Use criteria.
- 3.47 x 5 = 17.35 parking spaces maximum allowed. COMPLIANT
- The Reservoir Requirement for drive-in uses for mechanical car washes requires 3 spaces/washing unit, and 5 spaces for attendant ticket dispensing. This facility has a reservoir area of 6 cars from the car wash to the ticket station and 18 cars from the ticket station to the driveway entrance. ODOT has reviewed the site plan submitted for the Pre-Application Conference.
- The building does not exceed the threshold for Commercial Buildings at which a loading space berth is required. (10,000 sf). Per 46.130.
- All exterior lighting for this facility will be concealed or shielded for compliance with 46.150 Design Standard 13.
- This facility is compliant with the maximum allowable 12 parking spaces in a row as required by 46.150 Standard 19.
- One accessible parking space is required. One is provided.
- This facility is compliant with all of the conditions listed in 46.150 Design and Improvement Standards for non-residential parking.
- Two bicycle spaces are required or .33 spaces per 1000 gross sf (.33 x 4=1.32), whichever is greater, for auto-oriented services. Two are provided.
- This facility provides less than one-half acre of parking (7,548 sq. ft.), so it is not required to provide shade trees at the parking area.

CHAPTER 48 ACCESS, EGRESS, AND CIRCULATION

- This project is compliant with the conditions required in Chapter 48.

- A traffic impact analysis has not been requested by the City as a condition of the Pre-Application meeting. The State Department of Transportation is reviewing the Pre-Application documents.
- The two existing site access driveways remain, and no new driveways are being added. The driveway off of Willamette Drive (40'-0 wide) is both ingress and egress. The Owner is considering whether the driveway on Walling Way (37'-0" wide) will be used for Egress only or both ingress and egress. It was explained to the design team that it could be either condition.
- There is an existing reciprocal ingress and egress easement that is to remain along the west boundary of the site. See the Site Plan for additional easement information. Documents 96-058137 and 98-051836 are on record with the City of West Linn.
- A portion of the site utilizes one-way traffic to direct customers through the drive-through mechanical car wash. The vacuum station stalls are served by a two-way drive aisle. The Owner is considering utilizing the SW exit off of Walling way as an exit only driveway to control the traffic queue for the car wash.

CHAPTER 52 SIGNS

- Permanent monument signs and building-mounted signage are permitted on this property and will be submitted under a separate permit, conforming to 52.101 Signage Procedures and Approval Process to ensure compliance with Chapter 52 in full.
- Anticipated signage includes a building mounted sign and a pole mounted sign.

CHAPTER 54 LANDSCAPING

- All existing street trees along Willamette Drive and Walling Way are to be retained. The new drive access aisle follows the same profile as the existing curb line of the McDonald's site, protecting the existing root systems. The existing cedar trees along the east property line behind the masonry retaining wall remain. There are small existing deciduous trees (with a diameter of less than 12 inches at chest height) within parking islands and peninsulas that are being removed as part of this scope.
- One exception: There may be a need to remove or provide protection for a tree that has grown its root system around the existing water meter, which is being upsized for the car wash use.
- The existing street trees will be trimmed to conform to the Clear Vision Area requirements stated in Chapter 42.
- Per chapter 54.020, Parking lots with 10 to 20 parking spaces shall have a minimum of five percent of the interior devoted to landscaping. The perimeter landscaping is not to be included in this five percent. There shall be one shade tree planted for every eight parking spaces. For seventeen parking spaces, three trees are required, and four are proposed in this scope of work.
- Per the Pre-Application meeting review from the City of West Linn, the quantity of landscaping provided by the street trees as proposed in this site plan satisfies the criteria of Chapter 54

- The existing stormwater treatment containment pool and surrounding landscaping will be maintained, cleared of blackberries, and improved as necessary for water treatment and retention.

CHAPTER 55 DESIGN REVIEW

This project does not fall under any of the project types listed for CLASS I Design Review. Therefore, a new major commercial construction project is subject to a Class II Design Review. The project has executed the Pre-Application conference required by 55.030.

55.100 APPROVAL STANDARDS – CLASS II DESIGN REVIEW GENERAL/DISCRETIONARY

RELATIONSHIP TO THE NATURAL ENVIRONMENT

- No heritage trees are dedicated in the City of West Linn Street Tree Inventory Map on this site.
- The topography and natural drainage shall be preserved to the greatest degree possible. This project will utilize the existing stormwater treatment facility in the SW corner of the site, where the natural drainage of the site currently flows.
- There are no steep slopes on this site that are subject to slumping and sliding.

ARCHITECTURE

- The architectural character of this building is in character and scale with the other buildings in this neighborhood. A precedent for car washes exists nearby, with United Car Wash located at 19303 Willamette Dr. (approximately five blocks away). Drive-through businesses are common along Willamette Drive. Chevron, Starbucks, Burgerville, Castrol, and Wells Fargo all have drive-through operations along Willamette Dr. within five blocks of this site.
- The building that Kaady Car Wash will be replacing is a McDonald's drive-through restaurant, so the vehicular-oriented character has a precedent for this site.
- The size and shape of this building is consistent with the commercial buildings along Willamette Drive.
- Willamette Drive is an arterial highway (HWY 43) and does not support a pedestrian commercial environment. Walling Way is a local roadway that, due to previous right-of-way improvements, does not require additional frontage Improvements at the property location, according to the West Linn Department of Transportation.
- There are no public entrances to this facility. The public does not enter the building, except to run their cars through the wash. The main street and transit entrance proximity requirements do not apply.
- The car wash has been set back from the property lines, with the existing street trees and site retaining wall acting as an acoustic buffer to neighboring properties. These dimensions are to the property lines. Existing neighboring buildings are located at a minimum of 100 feet away.
    - South Buffer 71'-1"
    - West Buffer 54'-5"
    - North Buffer 53'-3"

    - East Buffer 113'-8"
- The mechanical equipment on top of the car wash has a 3'-8" high ribbed metal panel roof screen, masking HVAC equipment from view. See attached exterior elevations A4.01 and A4.02.We will be seeking an exception for the 60 percent glazing of the building due to its use as a car wash. There are windows provided for the Car Wash staff, but most of the building enclosure is for the car wash, for which windows are not needed.

Class II VARIANCE 75.020

The proposed Car Wash does not comply with the window glazing requirements stipulated in 55.100 6 e, which requires 60 % transparency along the main elevation facing Willamette Drive, or the 30% transparency required along the secondary elevation facing Walling Way. The Applicant is submitting for a Class II Variance for the requirements of the glazing percentage required by 55.100 6 4.

During business hours, the exit elevation facing Willamette Drive will be open, providing a 12'-0" x 12'-0" opening that is fully "transparent". Along the Walling Way Driver's Side, there is 12% glazing provided to the employee workspaces (19'-8" glazing over 115'-0"). The Ticket Stations, which interact with the public, are 75% glazed (3 sides of each booth).

- The lack of the requisite glazing does not provide a life-safety or accessibility concern. The percentage of glazing is not a condition that conflicts with any requirements in the OSSC Code.
- The use of a masonry wall performs better as an acoustic buffer than a glazed opening, and acoustics was a primary concern of the Neighborhood Association. Windows adjacent to areas near fan dryers would increase the sound vibration from air blowers rather than dampen the noise, as the masonry walls will.
- Glazing into the wash bay on the passenger side is possible, but it does not achieve the required amount of glazing facing the public. Adding additional glazing would not enhance or provide any visual enhancement relative to the functions inside of the building. There are no people working inside the wash bay during operational hours, nobody needs to see out of the wash bay as the space is unoccupied.
- Glazing into the storage room on the South (Walling Way) side would interfere with the mounting of the filtration treatment equipment in the storage room, which requires and would not provide a notable benefit to be publicly seen.
- The requested variance does not affect the size, location, or topography of the building on the site. The code provision in 55.100 6 e is an aesthetic provision.
- The request for this variance does not create any conflicts with any other Community Development code standards.
- Nearby Precedents for non-compliance with this Code section (Whether or not they applied for a variance) include:
    - United Car Wash on 19303 Willamette Drive (Very Similar)
    - Walmart on 19133 Willamette Drive
    - Wells Fargo Bank on 19181 Willamette Drive

- Soku Sushi and Noodle on 19171 Willamette Drive
- Monte Gozales Family Dentistry on 18612 Willamette Drive
- Burgerville on 18530 Willamette Drive

PRIVACY AND NOISE (55.100.D)

Applicable Sections:
3. Structures or on-site activity areas that generate noise, lights, or glare shall be buffered from adjoining residential uses in accordance with the standards in subsection C of this section, where applicable.
4. Businesses or activities that can reasonably be expected to generate noise in excess of the noise standards contained in West Linn Municipal Code Section 5.487 shall undertake and submit appropriate noise studies and mitigate as necessary to comply with the code. (See CDC 55.110(B)(11) and 55.120(M).) If the decision-making authority reasonably believes a proposed use may generate noise exceeding the standards specified in the municipal code, then the authority may require the applicant to supply professional noise studies from time to time during the user's first year of operation to monitor compliance with City standards and permit requirements."

Design response:

- West Linn Municipal Code 5.487 Sound Levels and Noise prohibits noise between 9:00 PM and 7:00 AM. Kaady Car Wash's daily operations begin at 8:00 AM and end at 8:00 PM, making the facility compliant.
- Chuck Kaady took decibel readings from the Burnside site, with cars going through the wash. These readings were taken at 8:00 AM on June 16.
    - 42 feet from car wash entry: 72 dB.
    - 50 feet from exit on the sidewalk on Burnside Street: 70db – 80 db
- This noise level is considered moderate, below the threshold for causing hearing damage. This noise is also intermittent and is a "whooshing" noise rather than a banging noise.
- The Willamette Drive site is 123 feet from the east property line (opposite the wash entry), and 67'-0" from the entry is an 8'-0" high CMU retaining wall buffer. The slope drops away from the site, and on the other side of the retaining wall is a thicket of mixed blackberry and wetland plantings.
- From the exit to the sidewalk along Willamette Drive, the exit is 61'-8" minimum. The sidewalk is 8'-4" wide, and Willamette Drive is 80'-0" before you hit the opposite sidewalk. The property on the opposite side of Willamette Drive is a commercial property. The nearest residential property to the west is at least 350' away from the exit of the car wash, and the commercial buildings in Lot 18825 provide an acoustic buffer. Moreover, Willamette Drive will provide a more constant and equivalent noise source (Louder for big trucks and motorcycles) than the car wash to the neighbors to the west.

- The distance offset from the car wash is considerably more than the acoustic readings that were taken from the new Burndside Kaady Car Wash, which is a new development, and is also using patented state-of-the-art equipment that has been designed to be quieter.

Per the Incompleteness letter received from the City of West Linn received on October 24, 2025, the Planning Department requested a noise study from a licensed professional Acoustic Engineer to determine the level of noise produced by the proposed facility.

Tenor Acoustics was hired to provide an acoustic report. Tenor provided an assessment evaluating potential acoustical impacts by comparing predicted noise emissions from the proposed equipment against pertinent regulations established by the City of West Linn, Clackamas County, and the State of Oregon Department of Environmental Quality. The evaluation utilizes ambient sound level data obtained from the existing site as well as acoustic testing performed at three other Kaady Car Washes in the Portland area. The data was then used to create a software model that predicts noise from the proposed car wash to adjacent areas and properties. This report has been included in the Conditional Use/Design Review Application.

To summarize the findings, it was predicted that the initial proposal was compliant with codes and ordinances on the East, North, and South faces. These conditions indicated less than 55 dBA in noise-sensitive areas. The west-facing elevation, however, predicted non-compliant levels of noise due to the facing of the mechanical blowers and the lack of intervening acoustical screens, and resulted in levels over 60 dBA at the residences on the uphill slope to the west of the car wash.

In order to mitigate this condition, TVA redesigned the entry of the car was to provide an acoustic enclosure outside the west facing exit of the car wash, turning the exit to the north. (See Report Section 5.1) This eliminates the predicted noise impact to the sensitive residential areas to the west. This satisfies the Clackamas County Code and the Oregon Administrative Rules statistical noise levels for new commercial noise sources. The Modifications to the exit are shown on Site Plan A0.01 and Elevations A4.01, attached.

Studies of the vacuum stations at the Tualatin/Sherwood Kaady Car Wash site predict that the blower sheds and vacuums do not cause any acoustic issues to any sensitive areas when applied to this project site.

TRAFFIC (55.125)

- Willamette Drive is classified as a major arterial.
    - ODOT controls this right-of-way.
    - Neighborhood Association members expressed concerns about the volume and speed of traffic along Willamette Drive. This project will not impact or modify the existing speed or volume of traffic along this major arterial.

- Walling Way is classified as a local roadway, with 50 feet of right-of-way along the frontage of our proposed development lot.
    - The City is not requesting any additional ROW to be dedicated across the property frontage.
    - Due to previous ROW improvements along Walling Way, the City will not require any additional frontage improvements at this location.

Section 55.125 states "Certain development proposals required that a **traffic impact analysis** (TIA) be provided which may result in modifications to the site plan or conditions of approval to address or minimize any adverse **impacts** created by the proposal. The purpose, applicability, and standards of this **analysis** are found in CDC 85.170(B)(2). (Ord. 1584, 2008; Ord. 1745 § 1 (Exh. A), 2023)"

CDC 85.170 (B)(2) requires a TIA (no dwellings) under the following considerations:

The development application involves one or more of the following actions:
(A) A change in zoning or a plan amendment designation; or (NO)
(B) Any proposed development or land use action that ODOT states may have operational or safety concerns along a State highway; and (NO)
(C) The development shall cause one or more of the following effects, which can be determined by field counts, site observation, traffic impact analysis or study, field measurements, crash history, Institute of Transportation Engineers Trip Generation manual, and information and studies provided by the local reviewing jurisdiction and/or ODOT: (NO)

(1) An increase in site traffic volume generation by 250 average daily trips (ADT) or more (or as required by the City Engineer); or (Not requested by the city)
(2) An increase in use of adjacent streets by vehicles exceeding the 20,000 pound gross vehicle weights by 10 vehicles or more per day; or (NO)
(3) The location of the access driveway does not meet minimum intersection sight distance requirements, or is located where vehicles entering or leaving the property are restricted, or such vehicles queue or hesitate on the State highway, creating a safety hazard; or (NO)
(4) The location of the access driveway does not meet the access spacing standard of the roadway on which the driveway is located; or (NO)
(5) A change in internal traffic patterns that may cause safety problems, such as backup onto the highway or traffic crashes in the approach area. (Not with the modified queue reservoir configuration… ODOT)

Per the Incompleteness Letter on October 24, 2025, a Traffic Impact Analysis was requested by the City of West Linn Engineering and Public Works Department.

Ard Engineering was hired to provide an analysis of the site, and the full stamped and signed report has been added to this application. The engineer analyzed comparable facilities using a 2012 study of drive-through commercial facilities, including fast food restaurants, banks, coffee shops, pharmacies, and other car washes, including two Kaady Car Washes in the Portland

Metro area. These two facilities are located on 1909 W Burnside St. in Portland, and 9614 SW Tualatin Sherwood Road in Tualatin, OR, where Ard Engineering set up a camera documentation of the traffic flow of those two sites.

To summarize the report, this project is expected to generate 78 weekday evening peak-hour trips and 96 Saturday peak-hour trips. The calculated queue length is 7.4 vehicles, and the maximum length observed at any car wash was 10 vehicles. Our site has a capacity of 19 cars in the queue, which indicates that the facility will not provide any backup traffic onto Willamette Drive. This project has been determined not to result in increases in traffic or degradation of area roadways and intersections, as compared to either the prior use of the site or other uses permitted outright in the General Commercial Zone.

CHAPTER 60: CONDITIONAL USE

Per Section 19.060, Automotive and Equipment Cleaning facilities are considered a conditional use. A Conditional Use Permit application has been submitted, and the associated Neighborhood Association Meeting was held on Tuesday, June 10, at the Robinwood Neighborhood Association Community Center. A recording of this meeting has been provided for the Conditional Use requirements.

The conditional use application includes a written narrative and a site plan describing the conditions stipulated in 60.070 Approval Standards and Conditions. This submittal includes information described in this application pursuant to Chapters 52 through 55 and section 92.010 of the Community Development Code.

The site is nominally level and mostly flat, with sufficient area and dimensions adequate to the proposed use. This is a commercial property within a General Commercial zone. (GC)
This site does not involve the removal or alteration of a historic resource.

SUITABILITY OF PUBLIC FACILITIES PER 60.070 APPROVAL STANDARDS

This proposed project meets the requirements of the Public Facilities standards, per review with the City Engineers through the Pre-Application conference from March 6, 2025.

SANITARY SEWER

- The Existing 8" sanitary main currently running along the partial frontages of the property of Walling Way, and the 8" main in the vicinity are large enough to handle the capacity from our development.
- As-built data shows that the McDonald's property utilizes a 4" sanitary lateral on Walling Way.
- A new 6" sanitary lateral is shown and will be provided if warranted

DOMESTIC WATER

- The existing 6" domestic water main that runs across the frontages of the property on Walling Way currently serves a 1.5" meter.

- Our project proposes an upgrade to a 2" water meter for Car Wash needs. The city's water main can serve this new meter. This will require Systems Development Charges, which will be paid prior to the issuance of a Site Development Permit.
- A 2" RPBA will be provided to protect the water system.

STORMWATER

- An existing water quality vault and retention pond currently serve this site and the adjacent strip mall. Due to the age of this system, it is likely does not meet current stormwater management requirements. Therefore, the project will be providing a new water quality treatment manhole and a below-grade detention system. Discharge from the flow control structure will tie into the exiting site stormwater system, including the stormwater retention pond.
    - The design team acknowledges that the City of West Linn is currently in the process of adopting a new stormwater management manual.

END OF LAND USE / CONDITIONAL USE NARRATIVE

Eric Li, Senior Associate, TVA Architects

CITY OF WEST LINN
PRE-APPLICATION CONFERENCE MEETING
SUMMARY NOTES
March 6, 2025

SUBJECT: Proposed Car Wash.

FILE: PA-25-06

APPLICANTS PRESENT: Chuck Kaady, Eric Li

STAFF PRESENT: Chris Myers, Associate Planner

PUBLIC PRESENT:

These pre-application summary notes have been prepared for the applicant to identify applicable code sections and critical issues for the proposed application and summarize the application process and fees. Pre-Application summary notes are based on preliminary information and may not include all considerations. Contact the assigned planner for additional information regarding the process, approval criteria, submittal requirements, questions, and clarifications. Pre-Application Conference summary notes are valid for eighteen months from the meeting date. Once a complete application is submitted, the final decision can take 6-10 months.*

SITE INFORMATION:

Site Address:	18850 Willamette Drive
Tax Lot No.:	21E14DD06900
Site Area:	1.294 Acres
Neighborhood:	Robinwood NA
Comp. Plan:	Commercial
Zoning:	General Commercial
Zoning Overlays:	Riparian Corridor, Habitat Conservation Area

PROJECT DESCRIPTION:

The applicant proposes a Conditional Use Permit and a Class II Design Review for the construction of a car wash.

APPLICABLE COMMUNITY DEVELOPMENT CODE SECTIONS:

Approval standards and criteria in effect when an application is *received* will be applied to the proposed development. The following Community Development Code (CDC) Chapters apply to this proposal:

- Chapter 2: Definitions
- Chapter 19: General Commercial
  - 19.020 Procedures and Approval Process
  - 19.030 Permitted Uses
  - 19.060 Conditional Uses
  - 19.080 Dimensional Requirements, Conditional U
- Chapter 32: Water Resource Area Protection
  - 32.010 Purpose
  - 32.020 Applicability
- Chapter 42: Clear Vision Areas
  - 42.020 Clear Vision Areas Required
  - 42.040 Computation; Street and Accessway 24 Feet or More in Width
- Chapter 46: Off-Street Parking, Loading, and Reservoir Areas
  - 46.020 Applicability and General Provisions
  - 46.030 Submittal Requirements
  - 46.070 Maximum Distance Allowed Between Parking Area and Use

    - 46.090 Computation of Required Parking Spaces (Maximum)
    - 46.110 Reservoir Areas Required for Drive-in Uses (car wash is listed)
    - 46.150 Design and Improvement Standards
- Chapter 48: Access, Egress, and Circulation
    - 48.020 Applicability and General Provisions
    - 48.025 Access Control
    - 48.040 Minimum Vehicle Requirements for Non-Residential Uses
    - 48.050 One-Way Vehicular Access Points
    - 48.080 Bicycle and Pedestrian Circulation
- Chapter 52: Signs
    - 52.300 Permanent Sign Design Standards
- Chapter 54 Landscaping
    - 54.050 Protection of Street Trees
- Chapter 55: Design Review
    - 55.020 Classes of Design Review (Class II)
    - 55.070 Submittal Requirements
    - 55.100 Approval Standards – Class II Design Review – General Discretionary
    - 55.110 Site Analysis
    - 55.120 Site Plan
    - 55.125 Transportation Analysis
    - 55.140 Architectural Drawings
    - 55.150 Landscape Plan
- Chapter 60: Conditional Uses
    - 60.030 Administration and Approval Process
    - 60.070 Approval Standards and Conditions
    - 60.080 Site Plan and Map
- Chapter 99: Procedures for Decision Making: Quasi-Judicial
    - 99.030 Application Process
    - 99.038 Neighborhood Contact Required (Yes, CUP requires NA meeting)
    - 99.060 Approval Authority (Planning Commission)

KEY ISSUES & CONSIDERATIONS

Staff has identified the following development issues, design considerations, or procedural issues that you should be aware of as you prepare your formal application for submittal. The identification of these issues or considerations here does not preclude the future identification of additional issues or considerations:

1. Applicant must attend NA meeting AND provide an audio recording as part of the application.
2. Applicant must have a TVF&R Provider Permit as part of the application.
3. There is an existing ingress/egress easement on the property which must be maintained unless legally changed with all property owners agreeing (1998).

RESPONSE TO APPLICANT QUESTIONS:

Links to previous Design Review projects:
https://westlinnoregon.gov/projects/completed?term_node_tid_depth=All&field_project_type_tid=40&keys=

Master Fee Schedule:
https://westlinnoregon.gov/sites/default/files/fileattachments/finance/page/7989/mfc_-_fy_2025_effective_july_1_2024_clean_adopted_08.08.24_-_minor_wlrr_updates.pdf

A storm water report will be needed at the time of Development Review.

ENGINEERING:
The Engineering department comments are attached. For further details, contact Clark Ide at 503-722-3437 or Cide@westlinnoregon.gov.

BUILDING:
For building code and ADA questions, contact Adam Bernert at abernert@westlinnoregon.gov or 503-742-6054 or Alisha Bloomfield at abloomfield@westlinnoregon.gov or 503-742-6053.

TUALATIN VALLEY FIRE & RESCUE:
A Service Provider Permit must be provided with this application - https://www.tvfr.com/399/Service-Provider-Permit. Contact Jason Arn at jason.arn@tvfr.com or 503-259-1510 with any questions.

TREES:
For information on the tree requirements for this proposal, contact the Mike Perkins, City Arborist at mperkins@westlinnoregon.gov or 503-722-4728.

PROCESS:
A Conditional Use Permit and a Class II Design Review are a Planning Commission Decision. A public hearing is required. Once the application is declared complete, staff will review the application, send a 20-day public comment notice, and post a notice sign on the property. When the public comment period closes. A final decision can take 6-10 months.

There is a 14-day appeal period after the decision. If the decision is not appealed, the applicant may proceed with the development.

NEIGHBORHOOD MEETING:
A neighborhood meeting is required for a Conditional Use Permit and a Class II Design Review

HOW TO SUBMIT AN APPLICATION:
Submit a complete application in a single PDF document through the Submit a Land Use Application web portal. A complete application should include:

1. A development application;
2. Application materials identified in the Development Review Checklist.

COMPLIANCE NARRATIVE:
Written responses supported by substantial evidence must address all applicable approval standards and criteria. Written materials must explain how and why the proposed application will meet each applicable approval criteria. "Not Applicable" is not an acceptable response to the approval criteria.

Submittal requirements may be waived, but the applicant must first identify the specific submittal requirement and request, in writing, that the Planning Manager waive the requirement. The applicant must identify the specific grounds for the waiver. The Planning Manager will respond with a written determination about the waiver request before applying.

APPLICATION FEES & DEPOSITS:
The Planning Division Fee Schedule can be found on our website: https://westlinnoregon.gov/finance/current-fee-schedule

- Deposit for a CUP = $4500
  = $500 Inspection fee
- Deposit Class II Design Review = $4500

= $500

Applications with deposits will be billed monthly for time and materials. Please provide the name and address of the party responsible for the final invoice in your application.

Timelines:

Once the application and payment are received, the City has 30 days to determine if the application is complete. If the application is incomplete, the applicant has 180 days to complete it or provide written notice to staff that no other information will be provided. Once complete, the City has 120 days from the completeness determination to make a final decision on the application. Typical land use applications can take 6 months from beginning to end.

*** DISCLAIMER:** *These pre-application notes have been prepared per CDC Section 99.030.B.7. The information provided is an overview of the proposal considerations and requirements. Staff responses are based on limited material presented at the pre-application conference. New issues and requirements can emerge as the application is developed. Failure to provide information does not constitute a waiver of the applicable standards or requirements. The applicant has the burden of proof to demonstrate that all approval criteria have been satisfied. These notes do not constitute an endorsement of the proposed application or assure project approval.*

Pre-app Comments

Project Number: PA-25-06
Class 2 Commercial Design Review: 18850 Willamette Drive

Engineering Contact:

Jameson Lumpkin
jlumpkin@westlinnoregon.gov
Telephone: (503) 722-4739

Project Description: Proposed Car Wash

Pre-application meeting date: March 6, 2025

The comments provided below are based upon material provided as part of the pre-application packet and are intended to identify potential design challenges associated with the development. Comments are not intended to be exhaustive and do not preclude the engineering department from making additional comments as part of the formal land use application process.

TRANSPORTATION
Minimum Requirements:

- Willamette Drive
  - Willamette Drive is classified as a major arterial.
  - Oregon Department of Transportation (ODOT) controls this Right of Way.
- Walling Way
  - Walling Way is classified as a local roadway.
  - Walling Way has approx. 50 feet of ROW along the frontage of the proposed development lot. The City would not request any additional ROW be dedicated across the property frontage.
  - Due to previous ROW improvements to Walling Way, the City will require no additional frontage Improvements at the property location.

SANITARY SEWER
Minimum Required Improvement:

- Existing 8” mains currently run along the patrial frontages of the property on Walling Way. The 8” mains in the vicinity are large enough to handle the capacity from the proposed development.
- As-built data shows current commercial property utilizes 4” sanitary lateral on Walling Way.

DOMESTIC WATER
Minimum Required Improvement:

- Existing 6” DI water mains currently run along the frontages of the property on Walling Way
  - Existing property utilizes meter from this main.
- Building code will dictate the required meter size for this proposed development. Current meter size is 1.5”
- Developer inquired about upgrade to a 2” meter. City main has the capacity to serve this 2” meter upgrade.

CITY OF West Linn	**Pre-app Comments** **Project Number: PA-25-06** **Class 2 Commercial Design Review: 18850 Willamette Drive**	**Engineering Contact:** Jameson Lumpkin jlumpkin@westlinnoregon.gov Telephone: (503) 722-4739

SURFACE WATER (STORM SEWER)
Minimum Required Improvement:

- Onsite run-off generated from new impervious areas of greater than 1000 square feet must be captured, treated, detained and conveyed to the nearest public stormwater system in accordance with the *Portland Stormwater Management Manual,* the Uniform Plumbing Code, and *City of West Linn Public Works Standards*.
- Preferred stormwater management would be to capture, treat, and infiltrate on site. If infiltration is not feasible, conveyance to the City system would be required.
- All Stormwater facilities must be designed and accepted by a licensed engineer.
- Current property shows a stormwater facility on site. This facility may be used for this proposed development but a licensed engineer must prove the facility meets current stormwater requirements.

OTHER

- City is currently in the process of adopting a new stormwater management manual. If site development plans are submitted after this adoption, the new requirements will be enforced.
- Any required improvements shall be constructed to meet current City of West Linn Design Standards.
- Any required work in the ROW shall be constructed, inspected and accepted by the City.
- Development shall pay all applicable System Development Charges (SDC) fees prior to issuance of Site Development permit.
- The proposed development will disturb less than 5 acre, therefore a West Linn Erosion Control Permit Application, as outlined in Section 2.0065 of the *City of West Linn Public Works Standards,* will be required prior to the commencement of construction.

ROBINWOOD NEIGHBORHOOD ASSOCIATION

June Meeting Agenda

7:00 pm, June 8th, 2025. Robinwood Station

Zoom meeting:

https://us05web.zoom.us/j/83286322408?pwd=GCoY3SrlCqejtO8FUXBO5810tzMYk1.1

Meeting ID: 832 8632 2408 *Passcode:* jb4ywY

1. Call to Order. Introduction of new attendees.

2. Agenda Approval. May Minutes Approval

3. Treasurer's Report

4. Presentation from Eric Li from TVA Architects: New Kaady carwash to be constructed at former McDonalds location on Walling and 43 requires a zoning variance.

6. Presentation about Restoration Project at 3955 Cedaroak Dr.

7. Announcements, City and Community Events

8. Old Business

- Budget Committee update.
- Ole Olsen regarding Kenthorpe infill project.
- Formation of the "Robinwood Good Neighbor Committee"

9. New Business

- Picnic Committee volunteers sought for planning August 23rd event.
- Replacement of RNA President pending

10. Adjournment

ROBINWOOD NEIGHBORHOOD ASSOCIATION MINUTES
June 10th 2025 Meeting

Meeting Called to Order by Tony Bracco at 7:07 pm.

Guests and new attendees: Eric Li with TVA Architects

Agenda Review: Agenda approved.

May Minutes Approval: Approved by acclamation.

Treasurer's Report: No expenditures, current balance is $3594.80

TVA Architects, Eric Li: Working on the new carwash at former McDonalds location on Walling and 43. Landscaping remain same except one tree removal. Building lower than existing play area. 17 foot building height plus 4 feet of mechanical on top. Conditional use permit and design review required due to automotive related business not allowed in General Comm; zone. Conditional uses are discretionary based upon conditions required by Planning Staff.

Questions regarding creeks and sensitive riparian areas. Creek runs in pipe under site. Not changing hardscape so no increased surface water runoff created. 2 to 3 minutes cycle with no public use inside, only at vac stations outside. Water is 41 and there is a catchment from McD on the southwest corner which is over grown with berries. Water reused and recylcled and settled in containment tanks. 30 gallons used per car. Effluent collected in tanks in the building and periodically disposed.

Attendants on site. Two vacuum pumps enclosed inside building masonry walls central system. Operating hours 8am to 8pm 7 days. Cars enter from east with dryer blowers facing OR43. New blowers are much quieter. Blowers 70dB at 50 feet so less than traffic noise. Check 19th & Burnside location for same installation. Currently in phase 2 of 5 step permitting process.

Questions about traffic counts and potential for sound baffling structures.
18 total back in parking spaces, 15 for vacuums with 3 for employees.

Motion for Ad Hoc committee to bring forth a motion for the July meeting.

Update on Trillium Restoration by Dillon Wells: Ongoing, no new info.

Announcements, City & Community Events:
Community Garden Plant Sale - Free tomatoes still available in the Garden.
Blood Drive at Station, Saturday July 8th. No Open Mic Night in June.
Family Fun Day this Saturday with Bounce House, Crafts, Movies, Pizza, Slushies.

Old Business:
No Budget Committee update.
Good Neighbor Code Enforcement Committee needs more volunteers and a plan.
Ole Olsen on Kenthorpe infill project. 4399 Kenthorpe Way 4-lot expedited land division.
Since original 1936 survey was not recorded, property cannot be legally re-platted.
Trillium Creek property naming? Proposed names include 'Trillium Crossing' and 'Trillium Preserve.'

New Business: Yard /Garage Sale Weekend second Saturday in August.

Adjourn 8:42 **Attendance:** 45 with 0 virtual

Michelle Goldberg, President
Tony Bracco, Vice President
Kevin Bryck, Secretary/Treasurer
Dawn Meaney, Ambassador
Joe Fustolo, Member at Large

AFFIDAVIT OF MAILING

STATE OF OREGON
COUNTY OF MULTNOMAH

I, Eric Li, being duty sworn, depose and say that on 05/09/ 2025, I caused to have mailed to Michelle Goldberg, the President of the Robinwood Neighborhood Association, and to a designated recipient of the Neighborhood Associations' request, a notice of a mailing to discuss a proposed development at 18850 Willamette Drive, West Linn, Oregon, 97068. A copy of which has been attached hereto and made a part hereof.

Chicago Title has provided a list of all neighbors within 500 feet of the proposed work, and each of these property owners is receiving a notification of a pending meeting by United States Post. See attached list of neighborhood recipients.

I further state that said notices were enclosed in envelopes plainly addressed to said persons and were deposited on the date indicated above in the United States Post Office with postage prepaid, therein.

This MAY 9, 2025

Signed

Eric Li, Senior Associate
TVA Architects

Subscribed and sworn in, or affirmed before me this 9 day of May 2025

Notary Public for the State of Oregon

My Commission Expires Aug 16 2027

OFFICIAL STAMP
CORY JOE TOWNSEND
NOTARY PUBLIC - OREGON
COMMISSION NO. 1039934
MY COMMISSION EXPIRES AUGUST 16, 2027

tva architects, inc.
1750 sw yamhill street | suite 150 | portland, oregon 97205
phone: 503 220 0668 | www.tvaarchitects.com

Robert Thompson, FAIA | Tim Wyberga, LEED AP | Pamela Sattler, AIA, IIDA | Mandy Butler, AIA, LEED AP, CSI CDT

Eric Li

From: Morgan McCarley <morgan_mccarley@yahoo.com>
Sent: Tuesday, May 20, 2025 2:23 PM
To: ckaady@kaady.com; Eric Li
Subject: Proposed Kaady Carwash in West Linn

Chuck,

I'm a West linn resident concerned with a proposed plan to build a carwash within a 3 mile radius of 2 existing carwashes. I currently use the Kaady carwash in Lake Oswego, because I don't like the carwash across Hidden Springs from Walmart (leaves a film on my cars). I intend on continuing to use the Lake O Kaady car wash even if one is built closer to my home in West Linn. Frankly, I don't want it there, so I will not support the new location, if built and I will encourage others to do the same. Are there any alternatives to this plan or is this, for sure, happening?

Thanks,

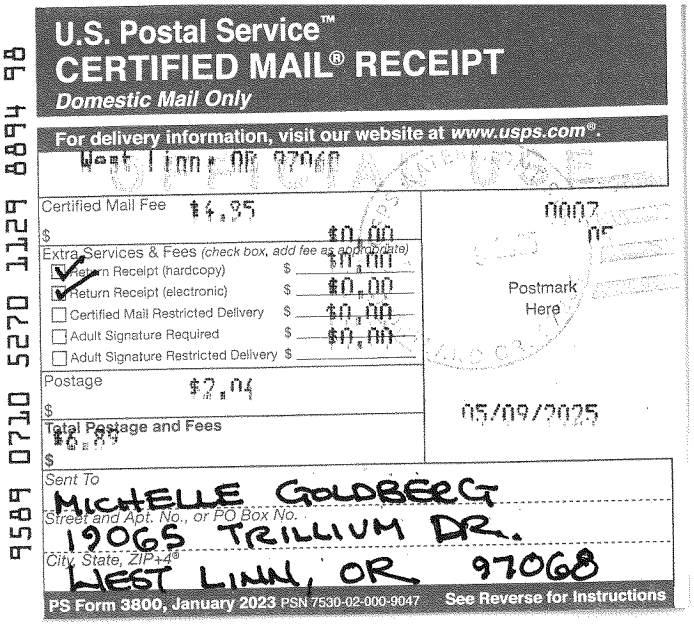
Morgan McCarley
916-715-1369

NOTIFICATION OF PROPOSED DEVELOPMENT FOR CONDITIONAL USE PERMIT

18850 WILLAMETTE DRIVE
WEST LINN, OREGON 97068

The proposal is for the removal of the existing McDonald's drive-through restaurant, to be replaced with a new Kaady Car Wash. A neighborhood meeting has been scheduled to take place at the Robinwood Station Community Center, 37068 Cedar Oak Drive, at 7:00 PM on Tuesday, June 10. The public is invited to attend to discuss the proposal with the Applicant and Designer of the proposed project.

For additional information about this development you may contact:
Chuck Kaady, Developer: 503.793.1100, ckaady@kaady.com
Eric Li, Project Architect, TVA Architects: 971.678.7578, ericl@tvaarchitects.com



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WEST LINN, OR 97068

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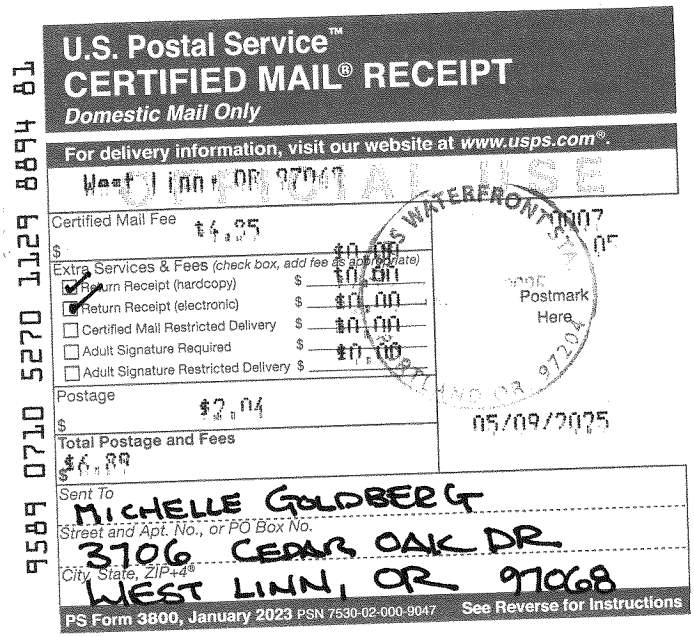

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WEST LINN, OR 97068

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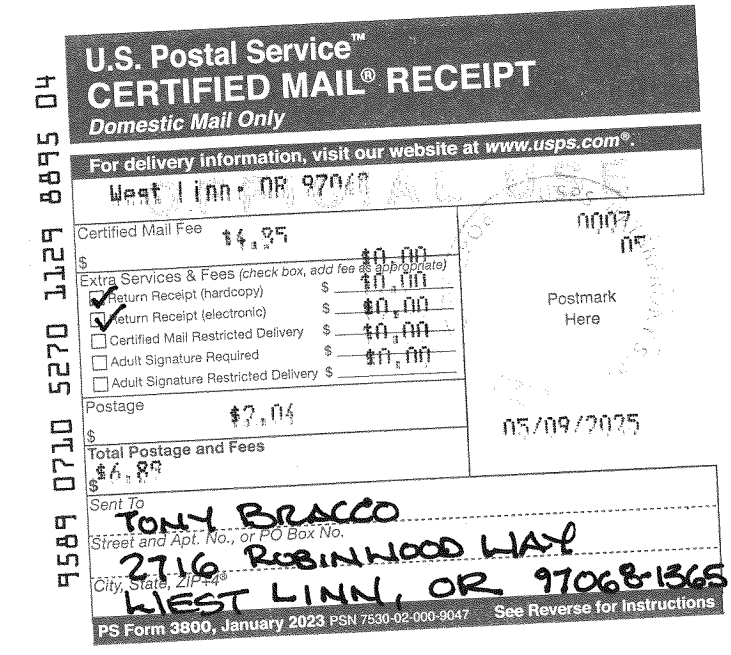

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TONY BRACCO
Street and Apt. No., or PO Box No.
2716 ROBINHOOD WAY
City, State, ZIP+4®
WEST LINN, OR 97068-1365

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David Sims
3499 Walling Way
West Linn, OR 97068-1544

21E13CC05500
Brent & Sarah Hunsberger
3536 Walling Way
West Linn, OR 97068-1546

21E13CC05600
Nancy Rowinski
3424 Walling Way
West Linn, OR 97068-1535

21E13CC05700
Roxanna Khosravi
19625 Old River Dr
West Linn, OR 97068-1639

21E14DC07501
Scott Hillson
19461 View Dr
West Linn, OR 97068-1339

21E14DC07600
Edward & Janet Gerbasi
19489 View Dr
West Linn, OR 97068-1339

21E14DC07601
Eleanor Jones
19477 View Dr
West Linn, OR 97068-1339

21E14DC07700
Rickey Hug & Billie Janette
1152 Troon Rd
Lake Oswego, OR 97034

21E14DC08000 & 08001
David & Karen Clary
19535 View Dr
West Linn, OR 97068-1341

21E14DC08100
Overlook Dc LLC
18676 Willamette Dr
West Linn, OR 97068-1718

21E14DD01500
Zack & Monica Lorts
2245 Snead Dr
Lake Havasu City, AZ 86406-7667

21E14DD01908
Forrest Faubion
18527 Rose Ct
West Linn, OR 97068-1131

21E14DD01909
Andrew Chitty & Aniko Becsei
3275 Fairview Way
West Linn, OR 97068-1549

21E14DD01912
Robert Nevarez
18534 Rose Ct
West Linn, OR 97068-1129

21E14DD02200
David & Judy Robison
18490 Vista Ct
West Linn, OR 97068-1141

21E14DD02300
Alice Seeger
18530 Vista Ct
West Linn, OR 97068-1130

21E14DD02400
Brian Kavanagh
5360 S Boston St
Greenwood Village, CO 80111-3409

21E14DD02500
Nicholas Sumerfelt
3171 Fairview Way
West Linn, OR 97068-1517

21E14DD02600
Barbara Weber
18525 Vista Ct
West Linn, OR 97068-1132

21E14DD03000
Morgan McCarley
18485 Vista Ct
West Linn, OR 97068-1143

21E14DD03100
Dc Willamette Drive LLC
2327 Stickney Point Rd
Sarasota, FL 34231-4016

21E14DD03300
Chung Park
6457 McDuff Ct
Lake Oswego, OR 97035-8048

21E14DD03600
Liu Gong LLC
9520 SW Beaverton Hillsdale Hwy
Beaverton, OR 97005-3309

21E14DD05000
18675 Willamette Drive LLC
Pmb 305 2050 Beavercreek Rd Ste 101
Oregon City, OR 97045

21E14DD05100
Mirko Munetic
2128 Club House Dr
West Linn, OR 97068

21E14DD05200
Raymond & Rufina Louthan
412 N Division St
Pinehurst, ID 83850-8726

21E14DD05201
Angelica Villarreal
19590 View Dr
West Linn, OR 97068-1338

21E14DD05300 & 06300
Will Earhart II
18745 Willamette Dr
West Linn, OR 97068-1701

21E14DD05400
Judith Espino & Manuel Ortiz
19586 View Dr
West Linn, OR 97068-1338

21E14DD05500
Brian & Stephanie Schutzler
21640 S Sweetbriar Cir
West Linn, OR 97068-9228

21E14DD05600
Ann Bias
19512 View Dr
West Linn, OR 97068-1338

21E14DD05601
John & Mary Bartlett
19482 View Dr
West Linn, OR 97068-1336

21E14DD05602
Kathy Fisher
19500 View Dr
West Linn, OR 97068-1338

21E14DD05800
Elizabeth Zlatnick
19464 View Dr
West Linn, OR 97068-1336

21E14DD05900
William Adams
19426 View Dr
West Linn, OR 97068-1336

21E14DD06000
Daniel Mercer
19422 View Dr
West Linn, OR 97068-1336

21E14DD06100 & 06200
M5 Willamette LLC
5441 S MacAdam Ave Ste 208
Portland, OR 97239-3822

21E14DD06400
Thomas Irey
2151 Marylhurst Dr
West Linn, OR 97068-1417

21E14DD06500
Donald Bailey
6330 Haverhill Ct
West Linn, OR 97068-4900

21E14DD06600-06700
Berrey Investment LLC
25999 SW Canyon Creek Rd Ste E
Wilsonville, OR 97070

21E14DD06800
Berrey Investment LLC
110 N Carpenter St Dept 027
Chicago, IL 60607

21E14DD07000
Jody & Chrstina Forlenza
3315 Walling Way
West Linn, OR 97068-1539

21E14DD07100
Joseph Sewell
18747 Rose Way
West Linn, OR 97068-1532

21E14DD07200
Carolyn & Larry Ullman
18705 Rose Way
West Linn, OR 97068-1532

21E14DD07300
Richard & Victoria Hunt
18655 Rose Way
West Linn, OR 97068-1545

21E14DD07400
Terry & Sandra Bottemiller
3204 Fairview Way
West Linn, OR 97068-1519

21E14DD07500
Dennis & Jeanne Eisele
3220 Fairview Way
West Linn, OR 97068-1519

21E14DD07600
Melissa Dugan
3262 Fairview Way
West Linn, OR 97068-1519

21E14DD07601
Diane Finnigan
18625 Rose Way
West Linn, OR 97068-1545

21E14DD07700
Jason Johnsen & Kari Dee
3477 Walling Way
West Linn, OR 97068-1544

21E14DD07800
Shane & Michelle Winder
18718 Rose Way
West Linn, OR 97068-1534

21E14DD08000
Randy Karnes
18652 Rose Way
West Linn, OR 97068-1543

21E14DD08300
R & Cs LLC
4283 Terra Vista Ct
West Linn, OR 97068-1655

21E14DD08400
Holly Shannon
3344 Fairview Way
West Linn, OR 97068-1551

21E14DD08401
Wade & C Gefre
PO Box 243
West Linn, OR 97068

21E23AA00100
Noel Lee
19679 Old River Rd
West Linn, OR 97068-1639

21E23AA00200
Lisa Stanton
39710 Wendling Rd
Marcola, OR 97454-9105

21E23AA00601
Cedar Linn LLC
1539 NW 19th Ave
Portland, OR 97209-1702

21E23AA00700 & 01700
Douglas Seely
1780 SW Advance
West Linn, OR 97068-9677

21E23AA01100
Marilyn Frankel & Carol Pulvermacher
3364 Walling Way
West Linn, OR 97068-1555

21E23AA01200
Durward & Yvonne Bennett
3320 Walling Way
West Linn, OR 97068-1555

21E23AA01300
William Schroeter
PO Box 256
Marylhurst, OR 97036

21E23AA01400
West Linn Investors LLC
6830 SW Windemere Loop
Portland, OR 97225-6161

21E23AA01700
Douglas Seely
1780 SW Advance
West Linn, OR 97068-9677

21E23AA01800
Gerardo & Gail Bezmertney
19042 Walling Cir
West Linn, OR 97068-1716

21E23AA01801
Wen Zhao & Sui Yin
85 Laurel St
Lake Oswego, OR 97034-4938

21E23AA02000
Yandy Roman
18976 Walling Cir
West Linn, OR 97068-1714

21E23AA02100
Daniela Lucescu & Ryan Pacurar
18950 Walling Cir
West Linn, OR 97068-1714

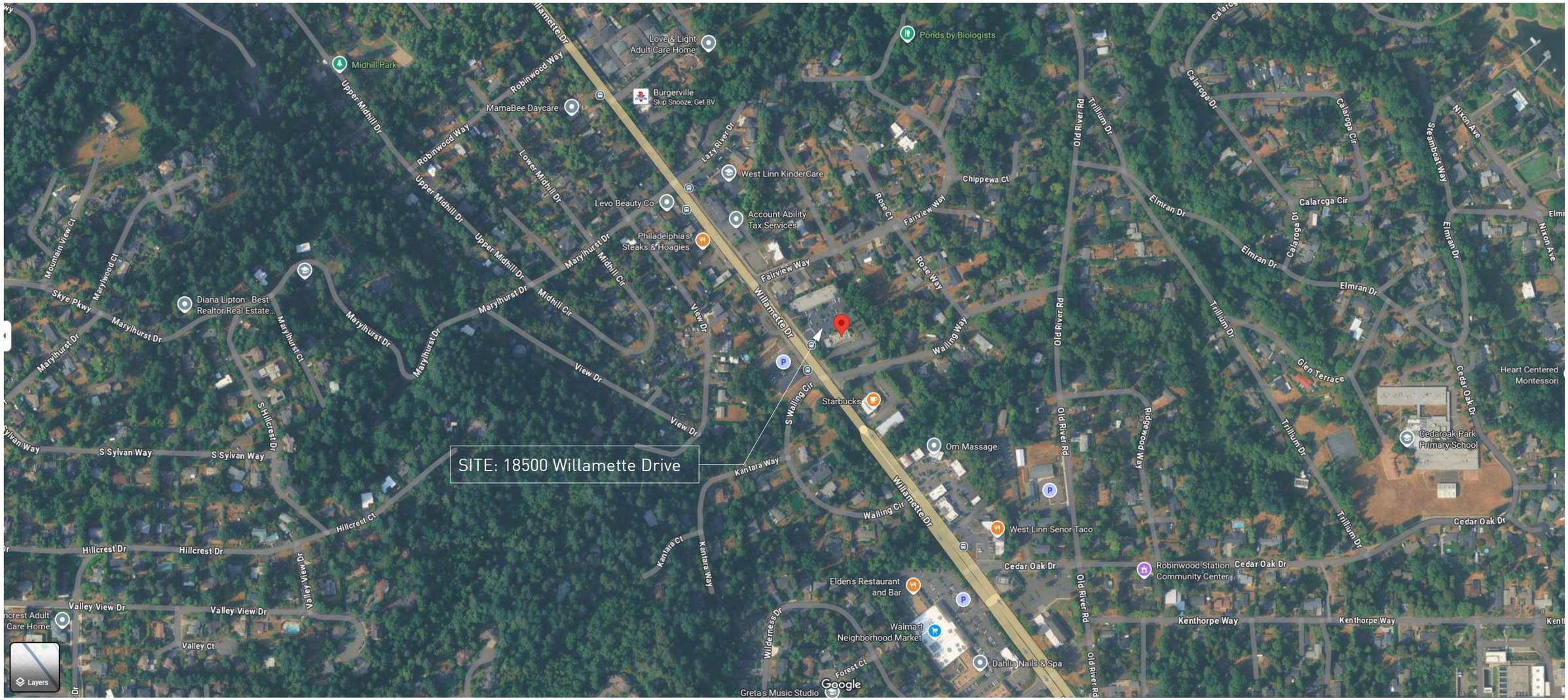
21E23AA02200
Tzer Cheng & Chien Ju
18902 Walling Cir
West Linn, OR 97068-1714

21E23AA02300
Jason & Hannah Harper
1309 N Maple St
Canby, OR 97013-2324

21E23AA02400
Douglas Pullin
18891 Walling Cir
West Linn, OR 97068-1717

21E23AA02500
Mark & Tracie Krellwitz
18909 Walling Cir
West Linn, OR 97068-1706

21E23AB00100
Wei An
19412 View Dr
West Linn, OR 97068-1336



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1750 SW Yamhill Street | suite 150 | portland, oregon 97205
phone: 503 220 0668 | www.tvaarchitects.com

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G0
VICINITY MAP

07/22/25

KAADY CAR WASH
18850 WILLAMETTE DRIVE, WEST LINN, OREGON 97068

tva architects inc.
1750 SW Yamhill Street | suite 150 | portland, oregon 97205
phone: 503 220 0668 | www.tvaarchitects.com

G1

EXISTING McDONALD'S SITE PHOTO - WILLAMETTE DRIVE

07/23/25

KAADY CAR WASH

18850 WILLAMETTE DRIVE, WEST LINN, OREGON 97068

tva architects inc.
1750 SW Yamhill Street | suite 150 | portland, oregon 97205
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G1.1

EXISTING McDONALD'S SITE PHOTO - WALLING WAY

07/23/25

KAADY CAR WASH

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G2

EXISTING McDONALD'S SITE PHOTO

07/23/25

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G3

BURNSIDE KAADY PRECEDENT PHOTO

07/23/25

KAADY CAR WASH

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G4

EXISTING BURNSIDE KAADY PRECEDENT

07/23/25

KAADY CAR WASH

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G5

EXISTING BURNSIDE KAADY PRECEDENT PHOTOS

07/23/25

KAADY CAR WASH

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Decibel readings taken at 50'-0" from the car wash exit: 72 db to 80 db (Including background noise from Burnside) SHOWN
Decibel readings taken at 42 feet from the car wash entry on the north side: 72 db

These readings put the noise levels within the "medium" noise range, the equivalent of busy street traffic, which is a background noise source in both the Burnside location and the Willamette Drive location. Note that the distance from the entrance at the Willamette Drive conditions is an additional 50'-0" minimally, with an 8'-0" min. high CMU buffering wall on the east side, and Willamette Drive, and a commercial propoerty on the west side.

The business operations fall between 8:00 AM and 8:00 PM, which is within noise tolerance levels of the West Linn Noise Code.

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G6

ACOUSTIC DECIBEL TESTING PHOTOS

07/23/25

KAADY CAR WASH

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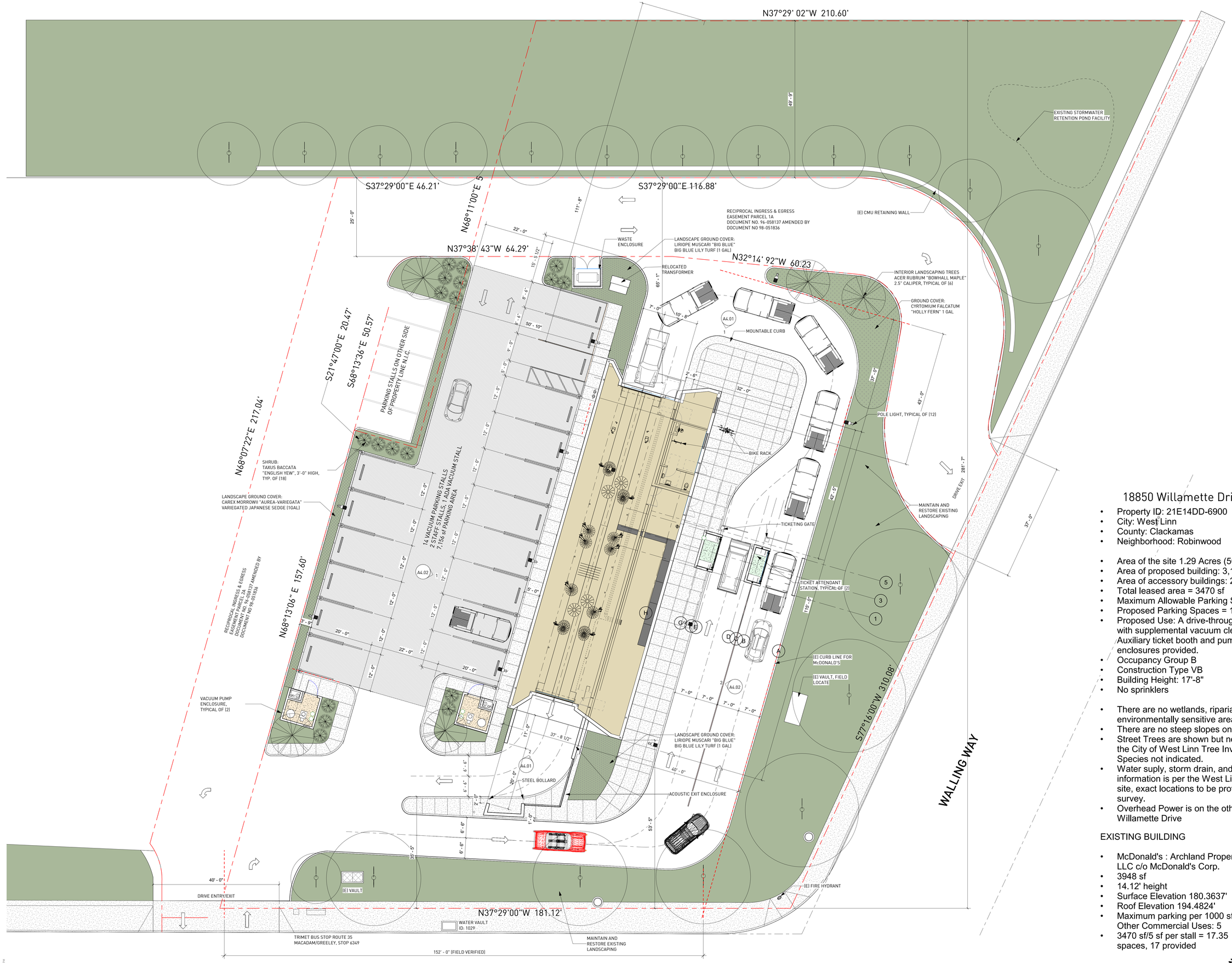

1 SITE PLAN
3/32" = 1'-0"

tva

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NOT FOR CONSTRUCTION

KAADY CAR WASH

18850 WILLAMETTE DRIVE, WEST LINN, OREGON 97068

18850 Willamette Drive

- Property ID: 21E14DD-6900
- City: West Linn
- County: Clackamas
- Neighborhood: Robinwood

- Area of the site 1.29 Acres (56,378 sf)
- Area of proposed building: 3,190 sf
- Area of accessory buildings: 280 sf
- Total leased area = 3470 sf
- Maximum Allowable Parking Spaces = 17
- Proposed Parking Spaces = 17
- Proposed Use: A drive-through car wash with supplemental vacuum cleaning stations. Auxiliary ticket booth and pumphouse enclosures provided.
- Occupancy Group B
- Construction Type VB
- Building Height: 17'-8"
- No sprinklers

- There are no wetlands, riparian, or environmentally sensitive areas on site.
- There are no steep slopes on site.
- Street Trees are shown but not identified on the City of West Linn Tree Inventory Map. Species not indicated.
- Water suply, storm drain, and sanitary sewer information is per the West Linn City Maps site, exact locations to be provided by survey.
- Overhead Power is on the other side of Willamette Drive

EXISTING BUILDING

- McDonald's : Archland Property LLC c/o McDonald's Corp.
- 3948 sf
- 14.12' height
- Surface Elevation 180.3637'
- Roof Elevation 194.4824'
- Maximum parking per 1000 sf for Other Commercial Uses: 5
- 3470 sf/5 sf per stall = 17.35 spaces, 17 provided

△ Revisions

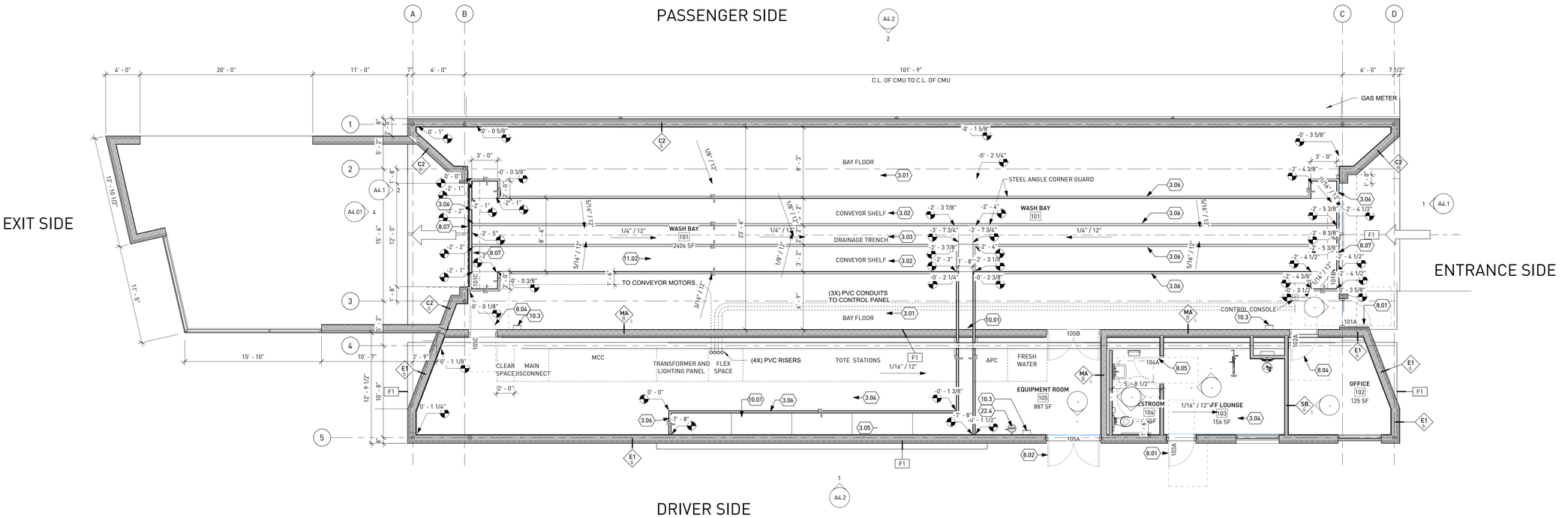
CONDITIONAL USE PERMIT

OVERALL SITE PLAN

Project # 22005

A0.01

Date: 7.23.2025



1 FLOOR PLAN

3/16" = 1'-0"

GENERAL NOTES

1. SITE INFORMATION SHOWN FOR REFERENCE ONLY. SEE SITE PLANS.
2. SEE 0 SERIES SHEETS FOR CODE COMPLIANCE INFORMATION.
3. ALL DIMENSIONS ARE TO FACE OF FINISH, CENTERLINE OF COLUMN, OR GRID LINE, UNO, EXTERIOR DIMENSIONS ARE TO FACE OF FINISH, DIMENSIONS INDICATED AS "CLR MIN" ARE TO FACE OF FINISH
4. ALL DOOR OPENINGS PERPENDICULAR TO A WALL ARE 5" TO THE WALL UNO
5. SEE G1.XX FOR TYPICAL WALL TYPES, OTHER ASSEMBLY TYPES, STEEL COLUMN FIRE PROTECTION, UNO.
6. SEE EXTERIOR ELEVATIONS FOR WINDOW TYPES NOT SHOWN HERE.
7. DOOR CLEARANCES ARE SHOWN DASHED AND ARE FOR REFERENCE ONLY .
8. PROVIDE SOLID FRT BLOCKING AT ALL GRAB BARS AND WHERE INDICATED ON INTERIOR ELEVATIONS.
9. THE WASH BAY SLAB AND CONVEYOR SHELF SLAB RUN PARALLEL TO EACH OTHER, 25" APART VERTICALLY. SEE STRUCTURAL FOR POUR SEQUENCE.
10. THE WASH BAY SLAB AND OFFICE SLAB RUN PARALLEL TO AND FLUSH WITH EACH OTHER. THE WASH BAY SLAB IS 8" THICK, AND THE OFFICE BAY SLAB IS 4" THICK. SEE STRUCTURAL. THE WASH BAY SLAB ALSO HAS A CROSS SLOPE THAT DRAINS TO THE CONVEYOR/DRAINAGE TRENCH, WHILE THE OFFICE SLAB DOES NOT HAVE A CROSS SLOPE.
11. ELECTRICAL AND PLUMBING CONDUITS ARE SHOWN FOR REFERENCE ONLY. SEE ELECTRICAL AND PLUMBING DRAWINGS FOR EXACT LOCATIONS AND ADDITIONAL INFORMATION.
12. SINCE SITE CONDITIONS WILL VARY, THE DIRECTIONAL INFORMATION IS DESCRIBED BY FUNCTION: ENTRANCE, EXIT, DRIVER'S SIDE, AND PASSENGER'S SIDE. CARDINAL DIRECTIONS WILL BE REFERENCED ON SITE PLANS AND CIVIL DOCUMENTS.
13. CAR WASH EQUIPMENT IS SHOWN FOR REFERENCE ONLY EXACT COMPONENTS TO BE OWNER FURNISHED AND LOCATED.

KEYNOTES

SHOWN THUS ⬡

NOTE: ONLY KEYNOTES APPROPRIATE TO THIS SHEET ARE SHOWN IN THIS KEYNOTE LEGEND. GC TO VERIFY ANY DISCREPANCY IN KEYNOTING.

3.01	8" POURED-IN-PLACE CONCRETE WASH BAY SLAB. SEE STRUCTURAL FOR REINFORCING. HARD TROWEL FINISH. SLOPE 1" OVER 20'-0" FROM ENTRANCE TO EXIT. [100'-0"]. COUNTER-SLOPE TO DRAIN TO CONVEYOR SHELF. PROVIDE MASTERPOLYHEED 980 MID-RANGE WATER-REDUCING CONCRETE ADMIXTURE AND FINISH WITH W.R. MEADOWS SEAL CURE-25 CONCRETE CURING AND SEALING COMPOUND.
3.02	8" POURED-IN-PLACE CONCRETE CONVEYOR SHELF SLAB. SEE STRUCTURAL FOR REINFORCING. HARD TROWEL FINISH. SLOPE IS PARALLEL TO WASH BAY SLAB. COUNTER SLOPE TO DRAINAGE TRENCH. PROVIDE MASTERPOLYHEED 980 MID-RANGE WATER-REDUCING CONCRETE ADMIXTURE. FINISH WITH W.R. MEADOWS SEAL CURE-25 CONCRETE CURING AND SEALING COMPOUND. COORDINATE INSTALLATION OF CONVEYOR SYSTEM WITH OWNER. PROVIDE STEEL ANGLES FOR OWNER PROVIDED FIBERGLASS TRENCH GRATING.
3.03	6" POURED-IN-PLACE CONCRETE DRAINAGE TRENCH SLAB. SEE STRUCTURAL FOR REINFORCING. HARD TROWEL FINISH SMOOTH. PROVIDE MASTERPOLYHEED 980 WATER-REDUCING ADMIXTURE. FINISH WITH W.R. MEADOWS SEAL CURE-25 CONCRETE CURING AND SEALING COMPOUND. SLOPE TOWARDS CROSS-TRENCH, SEE PLAN FOR SLOPE . COORDINATE APPLICATION OF OWNER PROVIDED TRENCH COVER PLATING.
3.04	4" POURED-IN-PLACE CONCRETE OFFICE SLAB. SEE STRUCTURAL FOR REINFORCING. SLOPE PARALLEL TO MATCH BAY FLOOR SLAB. NO CROSS SLOPE. HARD TROWEL SMOOTH FINISH. PROVIDE MASTERPOLYHEED 980 MID-RANGE WATER-REDUCING CONCRETE ADMIXTURE. FINISH WITH W.R. MEADOWS SEAL CURE-25 CONCRETE CURING AND SEALING COMPOUND.
3.05	FILTRATION PIT: 6" POURED-IN-PLACE CONCRETE SLAB ON GRADE, WITH 6" THICK CONCRETE BAFFLE PARTITIONS STAGGERED AS INDICATED ON DRAWINGS. HARD TROWEL FINISH. PROVIDE MASTERPOLYHEED 980 MID-RANGE WATER-REDUCING CONCRETE ADMIXTURE. FINISH WITH W.R. MEADOWS SEAL CURE-25 CONCRETE CURING AND SEALING COMPOUND.
3.06	L3X3X1/4" EMBEDDED ANGLE WITH 3/8" DIA. X 3" SHEAR ANCHORS @ 16" O.C.
8.01	GLAZED ALUMINUM STOREFRONT ENTRY 3'-0" X 8'-0": KAWNEER 350T STANDARD MEDIUM THERMAL SWING DOOR ENTRANCE. 3 1/2" ALUMINUM STILES AND TOP RAIL, 6 1/2" BOTTOM RAIL. GUARDIAN SNX 62/27 LOW-E TEMPERED GLASS LITES, U .28 MAX, SHGC .26 MAX. DOOR HARDWARE: BUTT HINGES (4EA): IVES 5BB1HW 4.5 X 4.5 NRP 630 BRUSHED STAINLESS FINISH, EXIT DEVICE: FALCON F-25-R-L-NL-LAT RIM DEVICE, CLOSER: LCN 4020 CUSH SURFACE MOUNTED CLOSER. THRESHOLD: PEMKO 171 SERIES COMMERCIAL FLAT THRESHOLD 5" WIDE. GASKET: ZERO 488SBK PSA. DOOR SWEEP ZERO 8198AA RAIN DRIP WITH NYLON BRUSH.
8.02	GLAZED ALUMINUM PAIRED STOREFRONT ENTRY 6'-0" X 8'-0": KAWNEER 350T STANDARD MEDIUM THERMAL SWING DOOR ENTRANCE. 3 1/2" ALUMINUM STILES AND TOP RAIL, 6 1/2" BOTTOM RAIL. GUARDIAN SNX 62/27 LOW-E TEMPERED GLASS LITES, U .28 MAX, SHGC .26 MAX. DOOR HARDWARE: BUTT HINGES (8EA): IVES 5BB1HW 4.5 X 4.5 NRP 630 BRUSHED STAINLESS FINISH, EXIT DEVICE (2EA): FALCON F-25-C-L-NL-LAT CONCEALED VERTICAL ROD DEVICE, CLOSER (2EA): LCN 4020 CUSH SURFACE MOUNTED CLOSER. THRESHOLD: PEMKO 171 SERIES COMMERCIAL FLAT THRESHOLD 5" WIDE. GASKET: ZERO 488SBK PSA. DOOR SWEEP ZERO 8198AA RAIN DRIP WITH NYLON BRUSH.
8.04	HOLLOW METAL OFFICE DOOR WITH HOLLOW METAL FRAME 3'-0" X 8'-0", PAINT WHITE. HARDWARE: BUTT HINGES (4EA): IVES 5BB1HW 4.5 X 4.5 NRP 630 BRUSHED STAINLESS FINISH, OFFICE LOCKSET: FALCON T-521-CP6-LAT. CLOSER: LCN 4110 SURFACE MOUNT. GASKET: ZERO 488SBK PSA.
8.05	HOLLOW METAL RESTROOM DOOR IN HOLLOW METAL FRAME 3'-0" X 8'-0", PAINT WHITE. HARDWARE: BUTT HINGES (4EA): IVES 5BB1HW 4.5 X 4.5 NRP 630 BRUSHED STAINLESS FINISH, BATHROOM PRIVACY LOCKSET WITH OCCUPANCY INDICATOR: FALCON H2171-610-LAT. CLOSER: LCN 4020 SURFACE MOUNT (PUSH SIDE)
8.07	OVERHEAD COILING DOOR: COOKSON MODEL ESD10 MOTORIZED ROLLING SERVICE DOOR. 20 GAUGE PAINTED GALVANIZED STEEL, PAINT WHITE. 12'-0" WIDE X 9'-0" HIGH.
10.01	OWNER FURNISHED 1 1/2" THICK FIBERGLASS TRENCH GRATE. SET ON L2X2X1/8" CONTINUOUS STEEL ANGLES.
10.3	FIRE EXTINGUISHER AND FEC: FIRE EXTINGUISHER: POTTER ROEMER 3010 (OR FIRE MARSHAL APPROVED ALTERNATE) MULTIPURPOSE DRY-CHEMICAL TIYPE IN STEEL CONTAINER: UL RATED 4A:60BC, 10 LB NOMINCAL CPACITY WITH MONAMMONIUM PHOSPHATE BASED DRY CHEMICAL IN ENAMELED STEEL CONTAINER. CABINET: POTTER ROEMER MODEL 7024 SURFACE MOUNTED GALVANNEALED STEEL WITH RECOATABLE WHITE POLYESTER FINISH. ROLLED RADIUS WITH GLASS PANEL DOOR.
11.02	CAR WASH EQUIPMENT PROVIDED BY OWNER, SHOWN FOR REFERENCE ONLY. FINAL LOCATION OF EQUIPMENT TO BE DETERMINED BY OWNER.
22.4	EYE WASH STATION: BRADLEY MODEL S19224BPT HALO EYEWASH WITH STAINLESSS STEEL BOWL, TAILPIECE & P-TRAP. COMPLIES WITH ANSI/ISEA STANDARD Z358.1. BARRIER FREE DESIGN. MINIMUM FLOW .4 GPM AT 30 PSI.

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NOT FOR CONSTRUCTION

KAADY CAR WASH

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△ Revisions

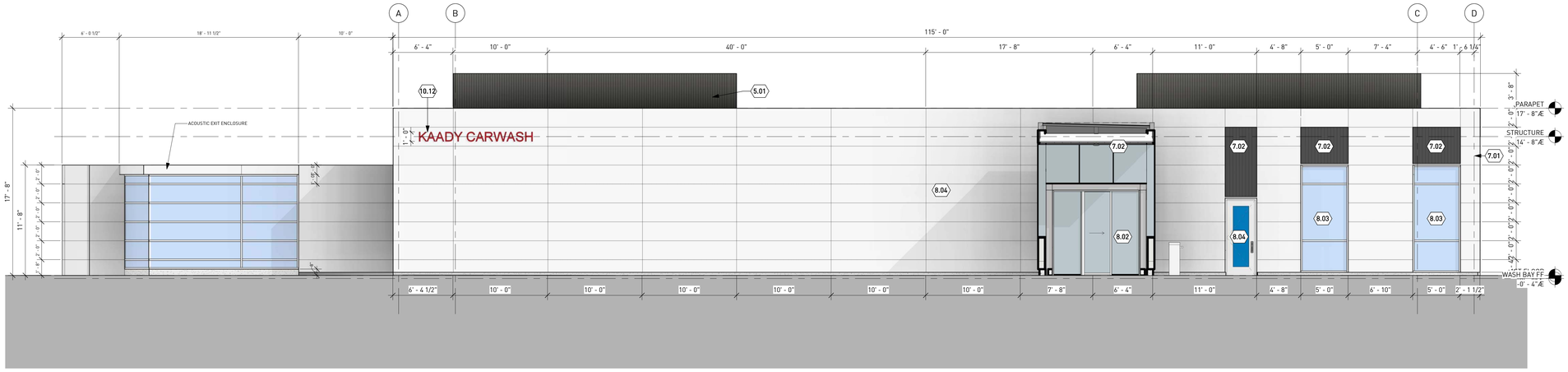
CONDITIONAL USE PERMIT

FLOOR PLAN LEVEL 01

Project # 22005

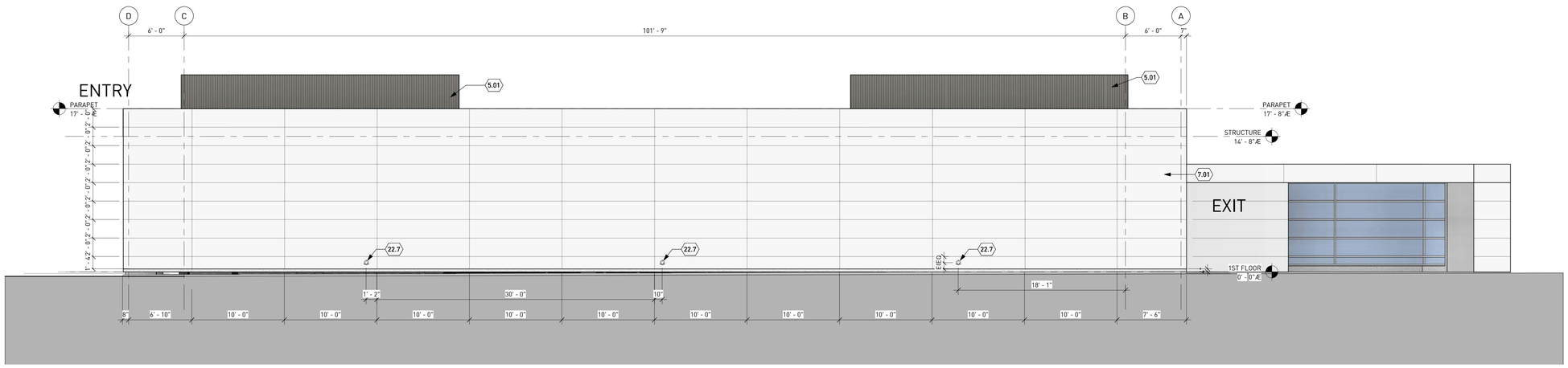
A1.00

Date: 7.23.25



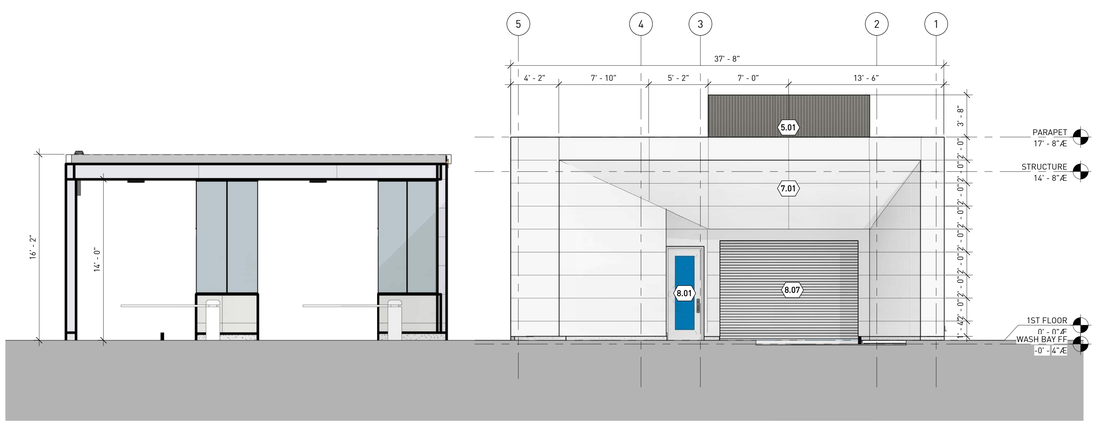
1 DRIVER'S SIDE ELEVATION (SOUTH)

3/16" = 1'-0"



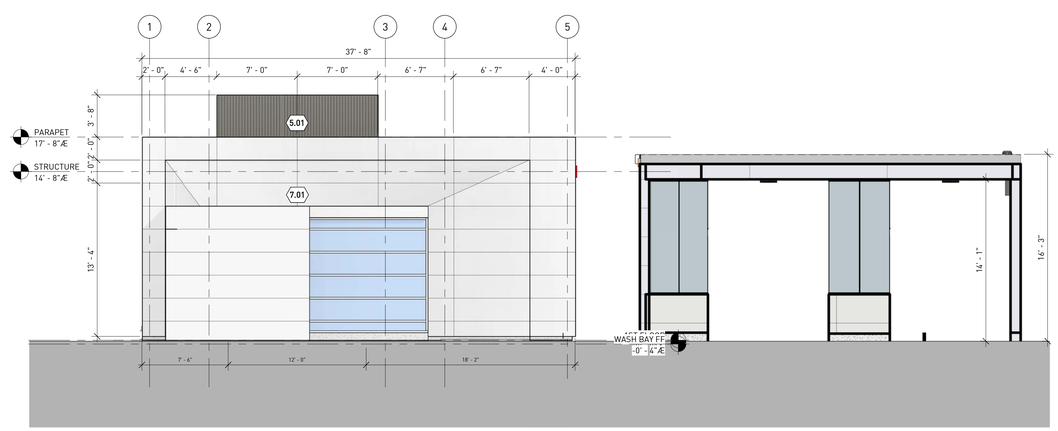
2 PASSENGER'S SIDE ELEVATION (NORTH)

3/16" = 1'-0"



3 ENTRANCE ELEVATION

3/16" = 1'-0"



4 EXIT ELEVATION

3/16" = 1'-0"

GENERAL NOTES

1. PAINT ALL NON-NOTED MISCELLANEOUS ITEMS TO MATCH ADJACENT REFERENCE FINISH COLOR UNO.
2. LOUVER COLOR TO BE COORDINATED / SELECTED WITH SUBMITTALS.
3. SEE FLOOR PLAN FOR DOOR AND WINDOW TAGS,TYP.
4. WINDOW TYPES NOT SHOWN ON FLOOR PLANS ARE SHOWN ON THESE ELEVATIONS.
5. SEE EXTERIOR COMPOSITE SHEETS FOR EXTERIOR FINISHES AND GLAZING.
6. SEE WALL SECTIONS FOR ADDITIONAL ELEVATED AREAS.
7. ALIGN CENTERLINE OF PANEL JOINTS ON SOFFITS AND PROJECTING FRAME ELEMENTS WITH CENTERLINE OF PANEL JOINTS ON WALLS, TYP.

KEYNOTES

SHOWN THUS ⬡

NOTE: ONLY KEYNOTES APPROPRIATE TO THIS SHEET ARE SHOWN IN THIS KEYNOTE LEGEND. GC TO VERIFY ANY DISCREPANCY IN KEYNOTING.

5.01	HSS 4X4 ROOF SCREEN FRAME, SEE STRUCTURAL. RIBBED METAL PANEL CLADDING, METAL SALES T10-A.
7.01	SMOOTH METAL PANEL SMP-1, COMPOSITE METAL PANEL, ALPOLIC, ALUCOBOND, REYNOBOND OR APPROVED. .020 INCH THICK ALUMINUM SHEET WITH ORGANIC COATING FINISH WITH A LOW-DENSITY POLYEHTYLENE CORE. COLOR: WHITE, ROUT AND RETURN FABRICATION FOR 1" NOMINAL PANEL DEPTH. PROVIDE BACKER ROD AND SILICONE SEALANT FOR 1/2" VERTICAL AND HORIZONTAL JOINTS.
7.02	RIBBED METAL PANEL RMP-1; METAL SALES T10-A, 22 GAUGE BOXED RIB METAL PANEL. MOUNT TO FURRING CHANNEL AND FLUSH OUT WITH ADJACENT SMOOTH METAL PANEL SMP-1. COLOR: GREY
8.01	GLAZED ALUMINUM STOREFRONT ENTRY 3'-0" X 8'-0"; KAWNEER 350T STANDARD MEDIUM THERMAL SWING DOOR ENTRANCE. 3 1/2" ALUMINUM STILES AND TOP RAIL, 6 1/2" BOTTOM RAIL. GUARDIAN SNX 62/27 LOW-E TEMPERED GLASS LITES, U .28 MAX, SHGC .24 MAX. DOOR HARDWARE: BUTT HINGES (4EA): IVES 5BB1HW 4.5 X 4.5 NRP 630 BRUSHED STAINLESS FINISH, EXIT DEVICE: FALCON F-25-R-L-NL-LAT RIM DEVICE, CLOSER: LCN 4020 CUSH SURFACE MOUNTED CLOSER. THRESHOLD: PEMKO 171 SERIES COMMERCIAL FLAT THRESHOLD 5" WIDE. GASKET: ZERO 488SBK PSA. DOOR SWEEP ZERO 8198AA RAIN DRIP WITH NYLON BRUSH.
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8.03	GLAZED ALUMINUM STOREFRONT; BASIS OF DESIGN: KAWNEER 451T THERMALLY BROKEN 4 1/2" ALUMINUM STOREFRONT. 1" INSULATED GLAZING UNITS, GUARDIAN SNX 62/27 U=.28, SHGC=.26. COLOR: WHITE
8.04	HOLLOW METAL OFFICE DOOR WITH HOLLOW METAL FRAME 3'-0" X 8'-0", PAINT WHITE. HARDWARE: BUTT HINGES (4EA): IVES 5BB1HW 4.5 X 4.5 NRP 630 BRUSHED STAINLESS FINISH, OFFICE LOCKSET: FALCON T-521-CP6-LAT. CLOSER: LCN 4110 SURFACE MOUNT. GASKET: ZERO 488SBK PSA.
8.07	OVERHEAD COILING DOOR: COOKSON MODEL ESD10 MOTORIZED ROLLING SERVICE DOOR. 20 GAUGE PAINTED GALVANIZED STEEL, PAINT WHITE, 12'-0" WIDE X 9'-0" HIGH.
10.12	OWNER FURNISHED, OWNER INSTALLED BUILDING SIGNAGE
22.7	3" OVERFLOW NOZZLE WITH FLAPPER. ZURN ZF 199 OR APPROVED

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△ Revisions

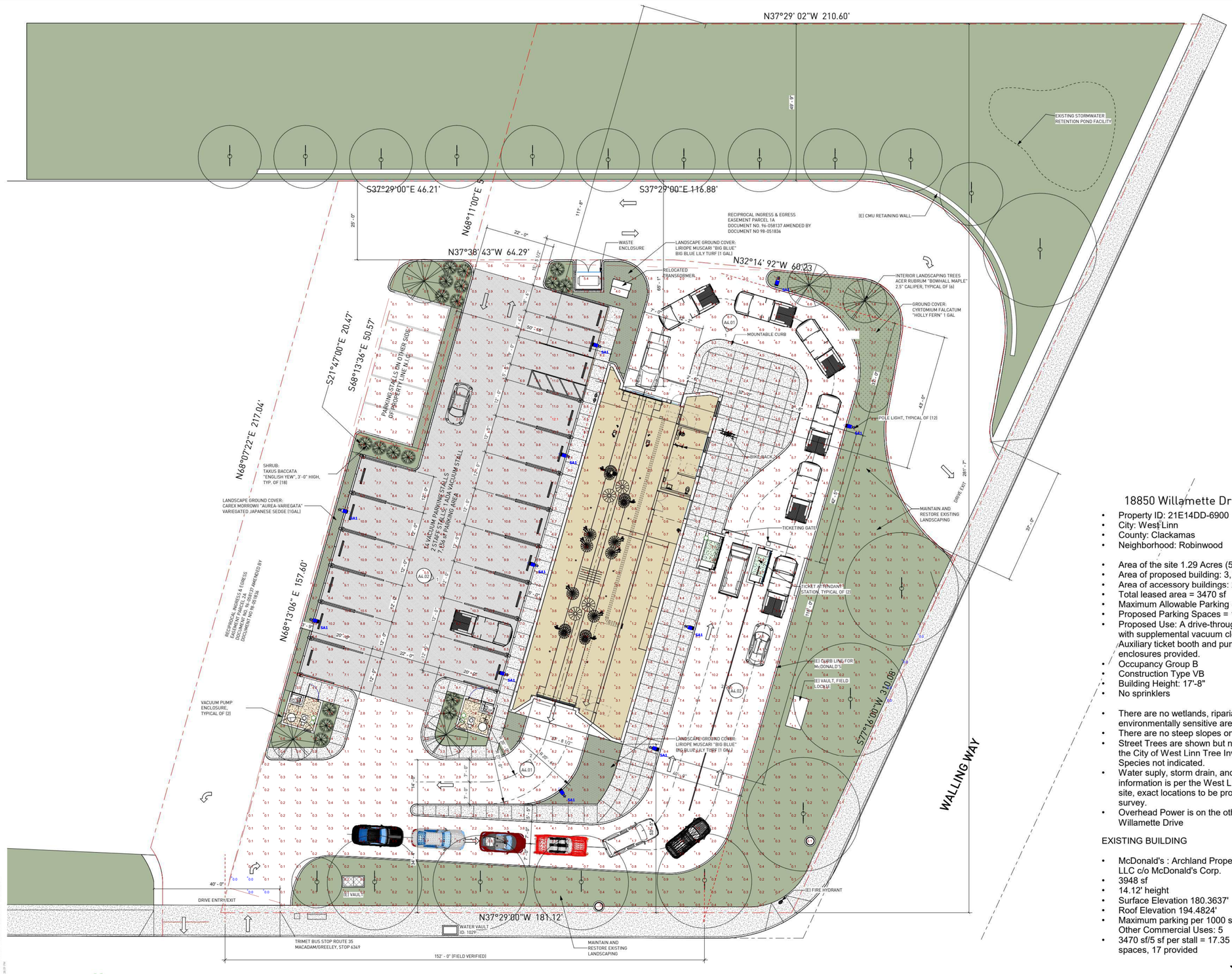
CONDITIONAL USE PERMIT

EXTERIOR ELEVATIONS

Project # 22005

A4.01

Date: 7.23.25



1 SITE PLAN
3/32" = 1'-0"

Plan View
Scale - 1" = 12ft

Schedule

Symbol	Label	Image	QTY	Catalog Number	Description	Lamp	Number Lamps	Lumens per Lamp	LLF	Wattage	Polar Plot
	SA1		11	ESX1 LED P2 40K R3	ESX LED Area Luminaire Size 1 P2 Lumen Package 4000K CCT Type R3 Distribution		1	13917	0.9	97.59	Max: 7840cd

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Δ Revisions

CONDITIONAL USE PERMIT

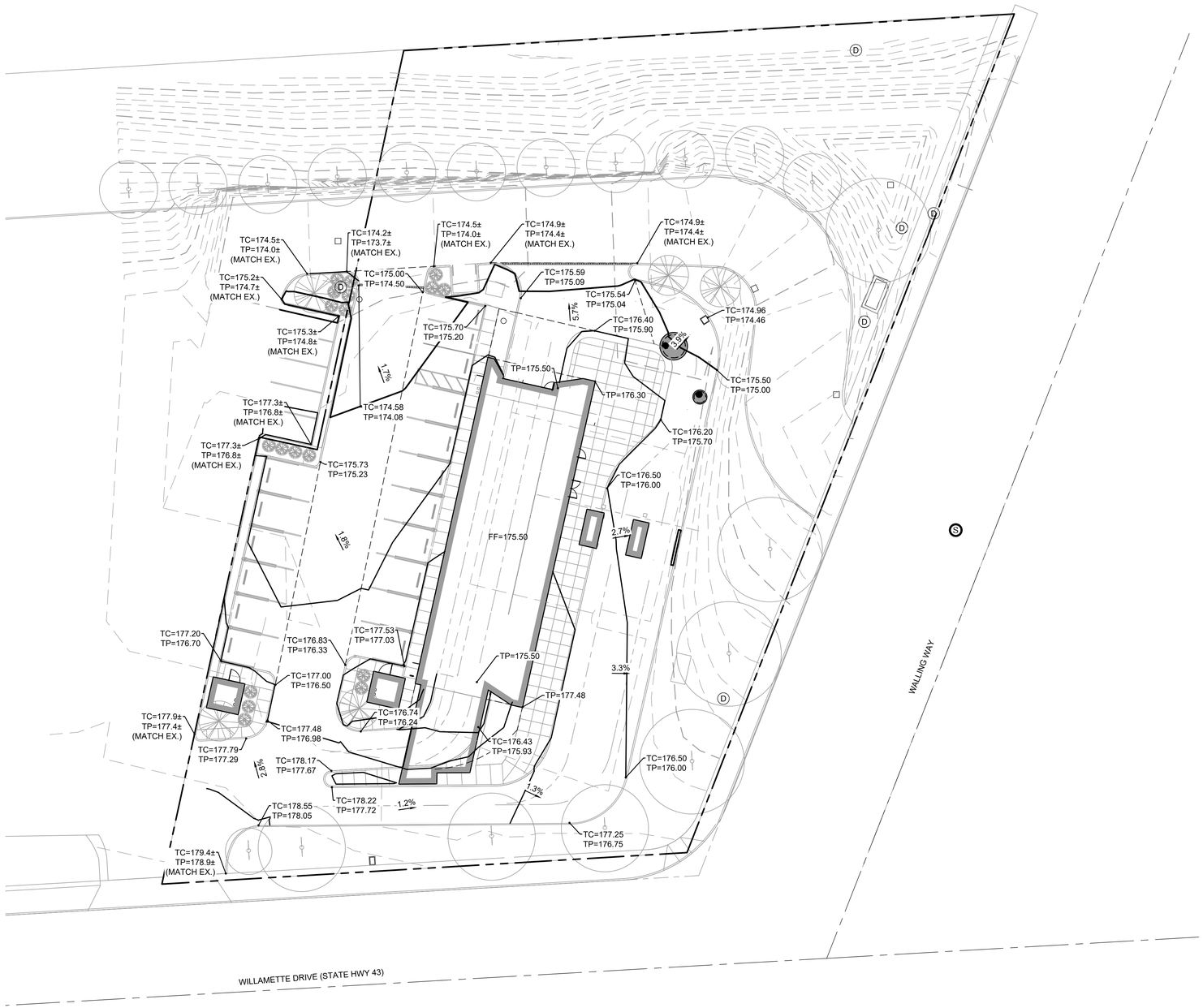
OVERALL SITE PLAN

Project # 22005

A0.01

Date: 7.23.2025

Designer
Date 07/25/2025
Scale Not to Scale
Drawing No.
Summary



SHEET NOTES

1. SLOPES PROVIDED ON SLOPE ARROW ARE FOR REFERENCE ONLY.
2. LANDINGS ON ACCESSIBLE ROUTES SHALL NOT EXCEED 1.5% IN ANY DIRECTION.
3. ALL ACCESSIBLE ROUTES SHALL COMPLY WITH CURRENT ADA ACCESSIBILITY GUIDELINES FOR BUILDING AND FACILITIES (ADAAG).
4. ALL WALKWAYS FROM ACCESSIBLE UNITS ARE DESIGNED TO NOT REQUIRE HANDRAILS. THEREFORE, RAMPS WITH SLOPES STEEPER THAN 5.0% AND LESS THAN 8.33% SHALL NOT EXCEED 0.5' RISE OR 6.0' LENGTH.
5. TOP OF CONCRETE OUTSIDE DOOR = FF ELEV. MINUS 0.02' SLOPE LANDING 1.5% AWAY FROM BLDG.

KEY NOTES

1 XXXXXXXXXX

GRADING LABEL LEGEND

CALLOUT	DESCRIPTION
X.X% →	GRADING SLOPE AND DIRECTION (DOWNHILL)

XX.XX XX
- SPOT ELEVATION
- DESCRIPTION LISTED BELOW. NO DESCRIPTION MEANS TP OR TG

BOS	BOTTOM OF SWALE
BOW	BACK OF WALK
BS	BOTTOM OF STEP
BW	BOTTOM OF WALL
EG	EXISTING GRADE
FF	FINISHED FLOOR
FL	FLOW LINE
G	GUTTER
HP	HIGH POINT
LP	LOW POINT
RIM	RIM OF STRUCTURE
TC	TOP OF CURB
TG	TOP OF GROUND
TP	TOP OF PAVEMENT
TS	TOP OF STEP
TW	TOP WALL

SHEET LEGEND

- DRAINAGE FLOW DIRECTION
- GRADE BREAK
- 49 EX. CONTOUR MINOR
- 50 EX. CONTOUR MAJOR
- 49 CONTOUR MINOR (FG)
- 50 CONTOUR MAJOR (FG)
- CONVEYANCE SWALE

SCALE 1 INCH = 20 FEET
20 0 20 40

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FROELICH ENGINEERS
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REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 31, 2001
TIMOTHY ANDREW FOX-KELBOSCH
RENEWS: 12/31/

KAADY CAR WASH
WEST LINN, OREGON

Revisions

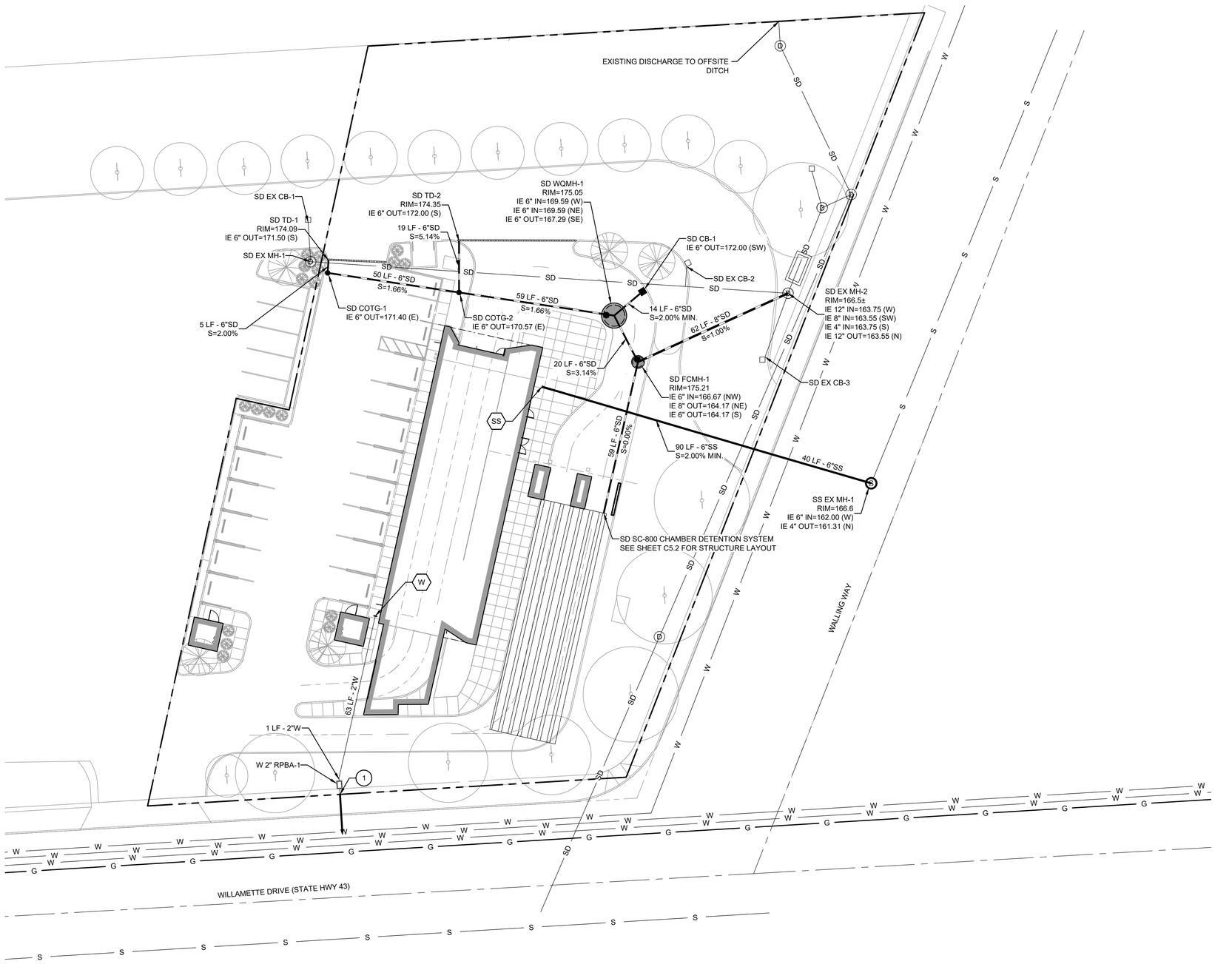
LAND-USE SET

GRADING PLAN

Project # 22005

C3.0

Date: 7.9.2025



SHEET NOTES

1. PIPE BEDDING AND BACKFILL FOR ALL UTILITIES SHALL BE DONE PER DETAIL X/C5.X.
2. STRUCTURES LOCATIONS ARE BASED ON CENTER OF STRUCTURE.
3. INSTALL TRUST BLOCK ON FIRE AND WATER LINES PER DETAIL X & X/CX.X.

KEY NOTES

1 COORDINATE WATER SERVICE POINT OF CONNECTION TO EXISTING X" LATERAL WITH CITY OF WEST LINN.

2 FIELD VERIFY LOCATION AND IE OF EXISTING XX" XXXXX LATERAL PRIOR TO CONSTRUCTION.

3 IRRIGATION BACKFLOW ASSEMBLY VAULT, SEE LANDSCAPE PLANS.

UTILITY LABEL LEGEND

STRUCTURE LABEL

UTILITY TYPE (SD=STORM DRAINAGE, S=SANITARY SEWER, W=WATER, FP=FIRE PROTECTION)
STRUCTURE TYPE CALLOUT
ID NUMBER (WHERE APPLICABLE)

XX XX-XX
X+XX.X RT X.X'
RIM=
IE IN = XX.X
IE OUT = XX.X

LOCATION (WHERE APPLICABLE)
STRUCTURE INFO (WHERE APPLICABLE)

PIPE LABEL

UTILITY LENGTH
UTILITY SIZE
UTILITY TYPE

XXLF - XX" XX

S=X.XX%

SLOPE (WHERE APPLICABLE)

STRUCTURE TYPE

CALLOUT	DESCRIPTION	DETAIL REF.
BEND	BEND, USE FITTING IF APPLICABLE	
BWV	BACKWATER VALVE	
CB	TRAPPED CATCH BASIN	
CO	CLEANOUT TO GRADE	
CONN	CONNECTION	
DW	DRYWELL	
FCMH	FLOW CONTROL MANHOLE	
FD	FOUNDATION DRAINAGE POINT OF CONN.	
FH	FIRE HYDRANT	
GV	GATE VALVE	
OF	OUTFALL	
OV	OVERFLOW INLET	
SDMH	48" DIA. STORM DRAIN MH	
TD	TRENCH DRAIN	
TEE	TEE CONNECTION	
WYE	WYE CONNECTION	
WQMH	WATER QUALITY MANHOLE	

SHEET LEGEND

SS CONNECT TO WASTE LINE. SEE PLUMBING PLANS FOR CONTINUATION. SIZE AS NOTED.

RD CONNECT TO STORM DRAIN/ROOF DRAIN. SEE PLUMBING PLANS FOR CONTINUATION. SIZE AND IE AS NOTED.

W CONNECT TO COLD WATER SYSTEM. SEE PLUMBING PLANS FOR CONTINUATION. SIZE AS NOTED.

II UTILITY CROSSING. PROVIDE 12" MIN. CLEARANCE, U.N.O.

SCALE 1 INCH = 20 FEET
20 0 20 40

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REGISTERED PROFESSIONAL ENGINEER
83693PE
OREGON
JULY 31, 1970
TIMOTHY ANTHONY FYKELBOSCH
RENEWS 12/31/

KAADY CAR WASH
WEST LINN, OREGON

Δ Revisions

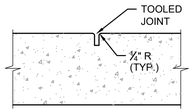
LAND-USE SET

UTILITY PLAN

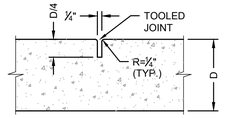
Project # 22005

C4.0

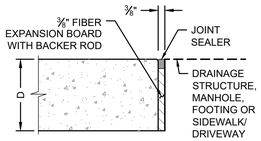
Date: 7.9.2025



SCORE JOINT



CONTRACTION JOINT



EXPANSION / ISOLATION JOINT

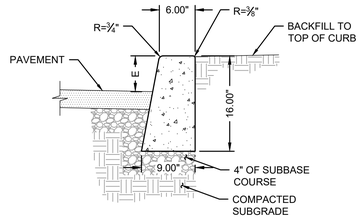
JOINT INTERVALS TABLE

TYPE	SPACING	OR AT …
SCORE	5' TYP	LOCATIONS SHOWN ON PLANS
CONTRACTION	15' MAX	END OF RAMPS AND DRIVEWAYS
EXPANSION/ ISOLATION	200' *	POINTS OF TANGENCY AND AT ENDS OF EACH DRIVEWAY OR OTHER FIXED OBJECTS

* MONOLITHIC CURB AND SIDEWALK SHALL BE 45' MAX

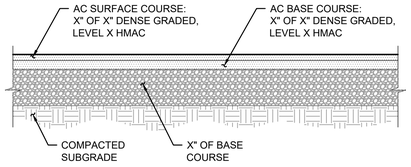
NOTES:
1. CONTRACTION JOINTS MAY BE USED IN PLACE OF SCORE JOINTS.
2. CONSTRUCTION COLD JOINTS MAY BE USED IN PLACE OF CONTRACTION JOINTS.
3. PROVIDE MEDIUM BROOM FINISH WITH NO TOOL MARKS.

X SIDEWALK JOINTS
SCALE: NTS

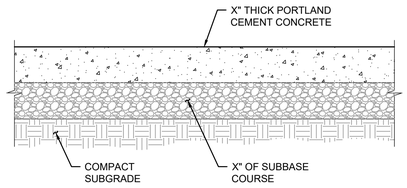


NOTES:
1. CURB EXPOSURE 'E' = 6", TYP. VARY AS SHOWN ON PLANS OR AS DIRECTED.
2. CONSTRUCT CONTRACTION JOINTS AT 15' MAX. SPACING AND AT RAMPS. CONSTRUCT EXPANSION JOINTS AT 200' MAX SPACING AT POINTS OF TANGENCY AND AT ENDS OF EACH DRIVEWAY.
3. TOPS OF ALL CURBS SHALL SLOPE TOWARD THE ROADWAY AT 2% UNLESS OTHERWISE SHOWN OR AS DIRECTED.
4. DIMENSIONS ARE NOMINAL AND MAY VARY TO CONFORM WITH CURB MACHINE AS APPROVED BY THE ENGINEER.

X STANDARD CONCRETE CURB
SCALE: NTS

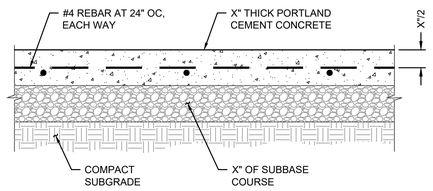


X ASPHALT PAVEMENT SECTION
SCALE: NTS



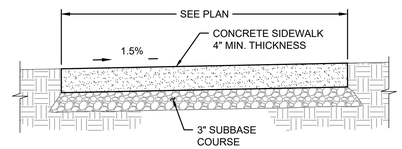
NOTES:
1. - CONSTRUCT CONTRACTION JOINTS AT 15' MAX. SPACING AND AT RAMPS.
   - CONSTRUCT EXPANSION JOINTS AT 200' MAX. SPACING AT POINTS OF TANGENCY AND AT ENDS OF EACH DRIVEWAY.
2. PROVIDE MEDIUM TO COARSE BROOM FINISH.

X CONCRETE PAVEMENT SECTION
SCALE: NTS



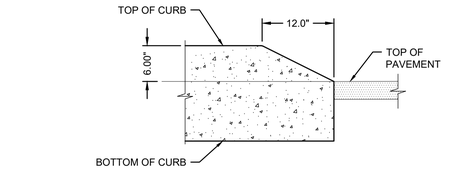
NOTES:
1. JOINTS:
   - CONSTRUCT CONTRACTION JOINTS AT 15' MAX. SPACING AND AT RAMPS.
   - CONSTRUCT EXPANSION JOINTS AT 200' MAX. SPACING AT POINTS OF TANGENCY AND AT ENDS OF EACH DRIVEWAY.
2. PROVIDE MEDIUM TO COARSE BROOM FINISH.

X REINFORCED CONCRETE PAVEMENT SECTION
SCALE: NTS

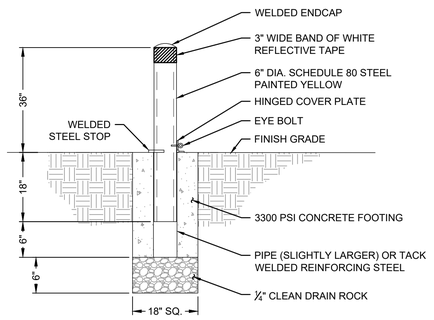


NOTES:
1. CONSTRUCT CONTRACTION JOINTS AT 15' MAX. SPACING AND AT RAMPS. CONSTRUCT EXPANSION JOINTS AT 200' MAX SPACING, AT POINTS OF TANGENCY AND AT ENDS OF EACH DRIVEWAY, UNLESS NOTED OTHERWISE.

X CONCRETE SIDEWALK
SCALE: NTS

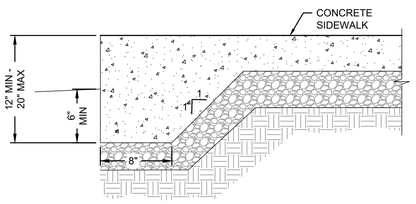


X CONCRETE CURB ENDING
SCALE: NTS

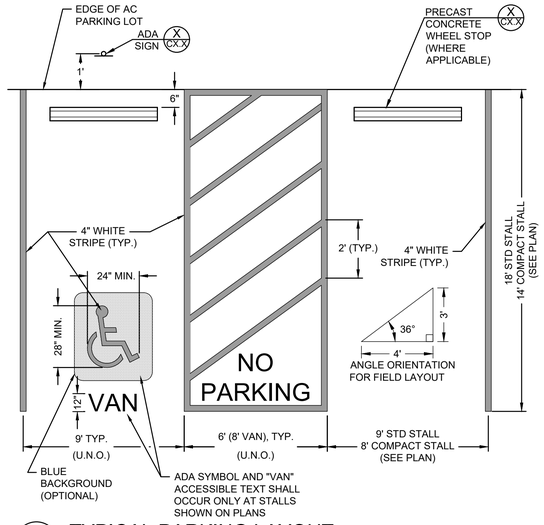


SECTION

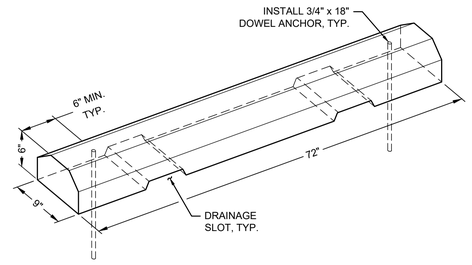
X REMOVABLE PIPE BOLLARD
SCALE: NTS



X THICKENED CONCRETE EDGE
SCALE: NTS



X TYPICAL PARKING LAYOUT
SCALE: NTS



NOTES:
1. DIMENSIONS ARE NOMINAL AND MAY VARY TO CONFORM TO MANUFACTURER'S PRODUCTS APPROVED BY ENGINEER.

X PRECAST CONCRETE WHEEL STOP
SCALE: NTS

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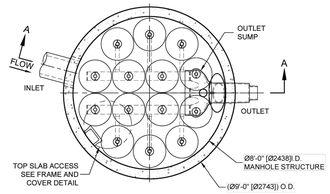
DETAILS

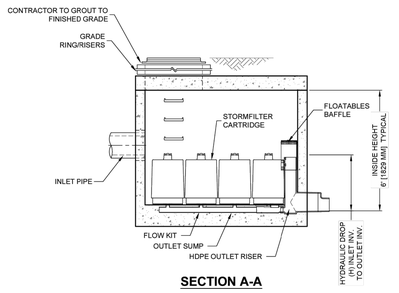
Project # 22005

C5.0

Date: 7.9.2025



PLAN VIEW
STANDARD OUTLET RISER
FLOWKIT: 43A



SECTION A-A

The Stormwater Management StormFilter®

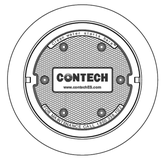
STORMFILTER DESIGN NOTES

STORMFILTER TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE SELECTION AND THE NUMBER OF CARTRIDGES. THE STANDARD MANHOLE STYLE IS SHOWN WITH THE MAXIMUM NUMBER OF CARTRIDGES (14). VOLUME SYSTEM IS ALSO AVAILABLE WITH MAXIMUM 14 CARTRIDGES. Ø8'-0" [2438 mm] MANHOLE STORMFILTER PEAK HYDRAULIC CAPACITY IS 1.8 CFS [51 L/s]. IF THE SITE CONDITIONS EXCEED 1.8 CFS [51 L/s] AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

CARTRIDGE SELECTION

CARTRIDGE HEIGHT	27" [686 mm]		18" [458 mm]			LOW DROP	
RECOMMENDED HYDRAULIC DROP (H)	3.05' [930 mm]		2.3' [700 mm]			1.8' [550 mm]	
SPECIFIC FLOW RATE (gpm/sf) [L/s/m²]	2 [1.30]	1.67* [1.08]	1 [0.65]	2 [1.30]	1.67* [1.08]	1 [0.65]	2 [1.30]	1.67* [1.08]	1 [0.65]
CARTRIDGE FLOW RATE (gpm) [L/s]	22.5 [1.42]	18.79 [1.19]	11.25 [0.71]	15 [0.95]	12.53 [0.79]	7.5 [0.44]	10 [0.63]	8.35 [0.54]	5 [0.32]

* 1.67 gpm/sf [1.08 L/s/m²] SPECIFIC FLOW RATE IS APPROVED WITH PHOSPHOSORB® (PSORB) MEDIA ONLY



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

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	*
WATER QUALITY FLOW RATE (cfs) [L/s]	*
PEAK FLOW RATE (cfs) [L/s]	*
RETURN PERIOD OF PEAK FLOW (yrs)	*
CARTRIDGE HEIGHT (SEE TABLE ABOVE)	*
NUMBER OF CARTRIDGES REQUIRED	*
CARTRIDGE FLOW RATE	*
MEDIA TYPE (PERLITE, ZPG, PSORB)	*

PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE #1	*	*	*
INLET PIPE #2	*	*	*
OUTLET PIPE	*	*	*
RIM ELEVATION			*

ANTI-FLOTATION BALLAST	WIDTH	HEIGHT
	*	*

NOTES/SPECIAL REQUIREMENTS:

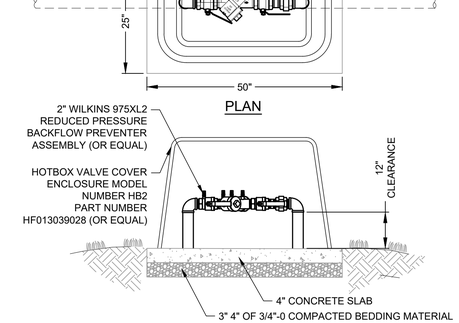
* PER ENGINEER OF RECORD

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR SITE SPECIFIC DRAWINGS WITH DETAILED VAULT DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
4. STORMFILTER WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS-20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 5' [1524 mm] AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
6. FILTER CARTRIDGES SHALL BE MEDIA-FILLED, PASSIVE, SIPHON ACTUATED, RADIAL FLOW, AND SELF CLEANING. RADIAL MEDIA DEPTH SHALL BE 7-INCHES [178 mm]. FILTER MEDIA CONTACT TIME SHALL BE AT LEAST 38 SECONDS.
7. SPECIFIC FLOW RATE IS EQUAL TO THE FILTER TREATMENT CAPACITY (gpm) [L/s] DIVIDED BY THE FILTER CONTACT SURFACE AREA (sq ft)[m^2].
8. STORMFILTER STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STORMFILTER STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET PIPE(S).
E. CONTRACTOR TO PROVIDE AND INSTALL CONNECTOR TO THE OUTLET RISER STUB. STORMFILTER EQUIPPED WITH A DUAL DIAMETER HDPE OUTLET STUB AND SAND COLLAR. IF OUTLET PIPE IS LARGER THAN 8 INCHES [200 mm], CONTRACTOR TO REMOVE THE 8 INCH [200 mm] OUTLET STUB AT MOLDED-IN CUT LINE. COUPLING BY FERNCO OR EQUAL AND PROVIDED BY CONTRACTOR.
F. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.

CONTECH ENGINEERED SOLUTIONS LLC
www.contechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

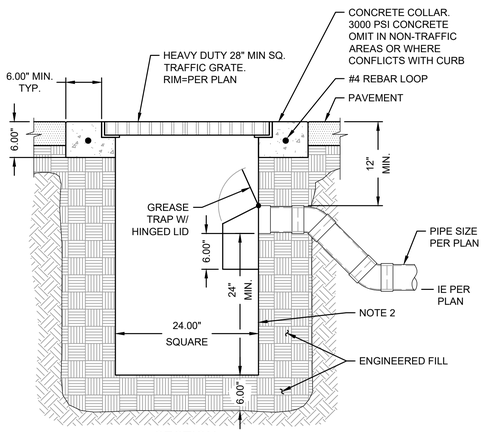
SFMH96
STORMFILTER
STANDARD DETAIL



NOTE:
ELEVATION

1. HOTBOX ENCLOSURE SHALL BE INSULATED AND HEATED. COORDINATE WITH ELECTRICAL PLANS FOR CONNECTION.
2. RPBA SHALL BE ACCESSIBLE BY VERTICALLY LIFTING OFF ENCLOSURE. CONTRACTOR TO VERIFY ACCESSIBILITY PRIOR TO CONSTRUCTION.

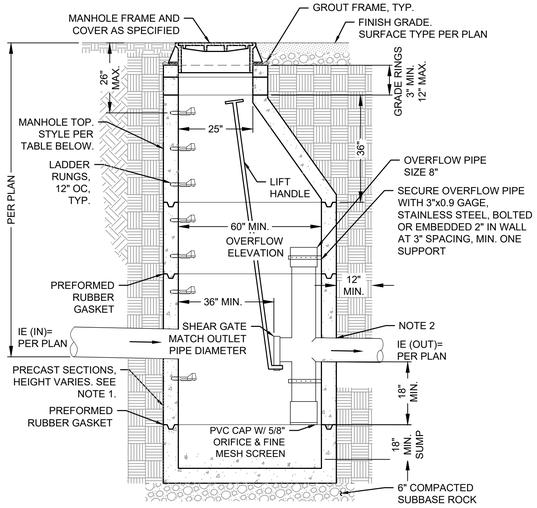
10 REDUCED PRESSURE BACKFLOW ASSEMBLY
SCALE: NTS



SECTION

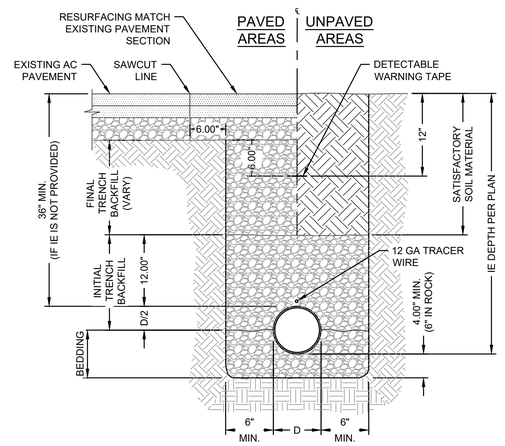
NOTES:
1. CONTRACTOR TO WIDEN EXCAVATION AS REQUIRED TO OBTAIN COMPACTION WITH CONTRACTORS COMPACTION EQUIPMENT.
2. 1/4" STEEL PLATE, BITUMINOUS COATED. AS MANUFACTURED BY GIBSON STEEL BASINS OR APPROVED EQUAL.

X TRAPPED CATCH BASIN
SCALE: NTS

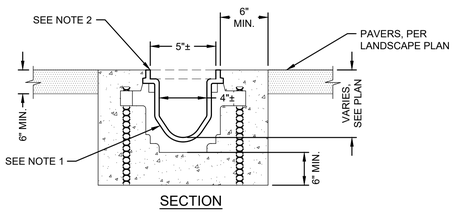


NOTES:
1. ALL PRECAST SECTIONS SHALL CONFORM TO REQUIREMENTS OF ASTM C-478.
2. ALL CONNECTING PIPES SHALL HAVE FLEXIBLE, GASKETED AND UNRESTRAINED JOINT WITHIN 18" OF MANHOLE VAULT. PIPE SIZES NOTED ON PLANS. PIPE CONNECTION TO MANHOLES SHALL HAVE KOR-N-SEAL BOOT OR APPROVED EQUAL.
3. ORIFICE AND OVERFLOW ELEVATIONS ARE RELATIVE TO IE (OUT)

6 FLOW CONTROL MANHOLE
SCALE: NTS



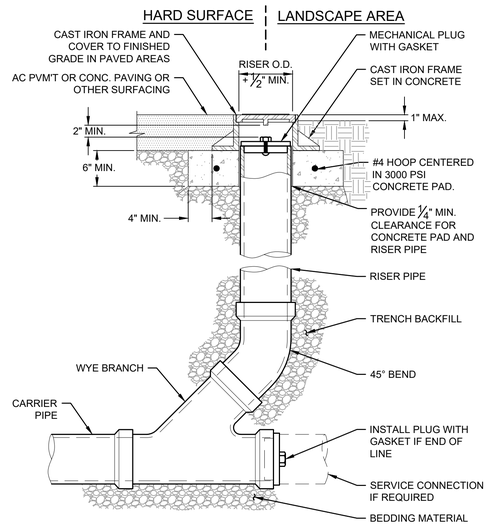
X TYPICAL PIPE BEDDING AND BACKFILL
SCALE: NTS



SECTION

NOTES:
1. TRENCH DRAIN SHALL BE PRE-SLOPED 4" WIDE ZURN OR ACO TRENCH DRAIN OR APPROVED EQUAL.
2. TRENCH DRAINS GRATE SHALL BE LOCKABLE HEAVY DUTY TRENCH GRATE - CLASS C.
3. TRENCH SYSTEM SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.

X TRENCH DRAIN - 4 INCH WIDE
SCALE: NTS



NOTES:
1. CAST IRON FRAME AND COVER SHALL MEET H-20 LOAD REQUIREMENT.
2. FOR CARRIER PIPE SIZE 6"Ø AND LESS, PROVIDE RISER PIPE SIZE TO MATCH CARRIER PIPE.
3. FOR CARRIER PIPE SIZE 8"Ø AND LARGER, RISER PIPE SHALL BE 6"Ø.
4. RISER PIPE MATERIAL TO MATCH CARRIER PIPE MATERIAL.

X STANDARD CLEANOUT (COTG)
SCALE: NTS

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REGISTERED PROFESSIONAL ENGINEER 83693PE OREGON JULY 14, 2015 PRELIMINARY NOT FOR CONSTRUCTION

RENEWS: 12/31/

KAADY CAR WASH
WEST LINN, OREGON

Revisions

LAND-USE SET

DETAILS

Project # 22005

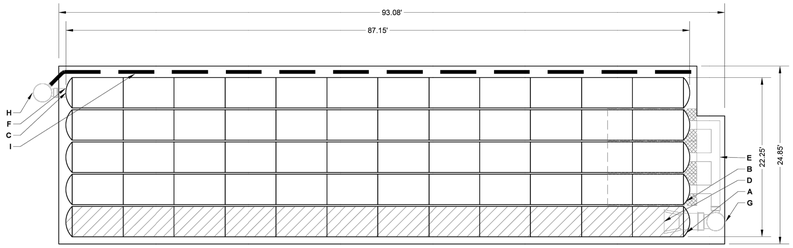
C5.1

Date: 7.9.2025

PROPOSED LAYOUT		PROPOSED ELEVATIONS	
60	STORMTECH SC-800 CHAMBERS	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	111.75
10	STORMTECH SC-800 END CAPS	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	105.75
6	STONE ABOVE (in)	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	104.25
6	STONE BELOW (in)	MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	104.25
40	STONE VOID	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	104.25
5272	INSTALLED SYSTEM VOLUME (CF) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)	TOP OF STONE:	111.75
		TOP OF SC-800 CHAMBER:	103.25
		12" x 12" TOP MANIFOLD INVERT:	111.75
		24" ISOLATOR ROW PLUS INVERT:	103.88
2286	SYSTEM AREA (SF)	12" BOTTOM CONNECTION INVERT:	103.63
235.9	SYSTEM PERIMETER (ft)	BOTTOM OF SC-800 CHAMBER:	100.50
423	THERMOPLASTIC LINER (SY) (20% OVERAGE)	UNDERDRAIN INVERT:	100.50
		BOTTOM OF STONE:	100.00

*INVERT ABOVE BASE OF CHAMBER

PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
PREFABRICATED EZ END CAP	A	24" BOTTOM PREFABRICATED EZ END CAP. PART#: SC800ECEZ / TYP OF ALL 24" BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	2.30"	
PRE-CORED END CAP	B	12" TOP PRE-CORED END CAP. PART#: SC800EPE12TPC / TYP OF ALL 12" TOP CONNECTIONS	14.40"	
PRE-CORED END CAP	C	12" BOTTOM PRE-CORED END CAP. PART#: SC800EPE12BPC / TYP OF ALL 12" BOTTOM CONNECTIONS	1.60"	
FLAMP	D	INSTALL FLAMP ON 24" ACCESS PIPE / PART#: SC80024RAMP		
MANIFOLD	E	12" x 12" TOP MANIFOLD, ADS N-12	14.40"	
PIPE CONNECTION	F	12" BOTTOM CONNECTION	1.60"	
NYLOPLAST (INLET W/ ISO PLUS ROW)	G	30" DIAMETER (24.00" SUMP MIN)		5.9 CFS IN
NYLOPLAST (OUTLET)	H	30" DIAMETER (DESIGN BY ENGINEER)		2.0 CFS OUT
UNDERDRAIN	I	8" ADS N-12 DUAL WALL PERFORATED HDPE UNDERDRAIN		



ISOLATOR ROW PLUS (SEE DETAIL)

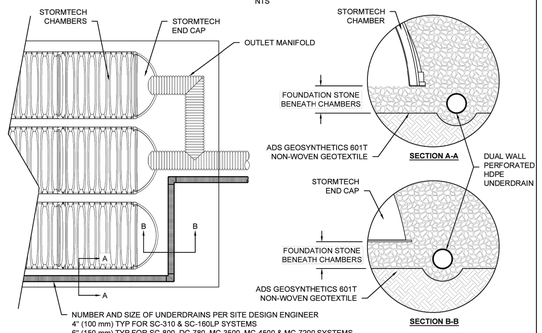
PLACE MINIMUM 12.50' OF ADSPLUS825 WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS

THERMOPLASTIC LINER (SEE TECH NOTE #6.50 PROVIDED BY OTHERS / DESIGN BY OTHERS)

THERMOPLASTIC LINER (SEE TECH NOTE #6.50 PROVIDED BY OTHERS / DESIGN BY OTHERS)

NOTES
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- **NOT FOR CONSTRUCTION**: THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT & THE REQUIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.

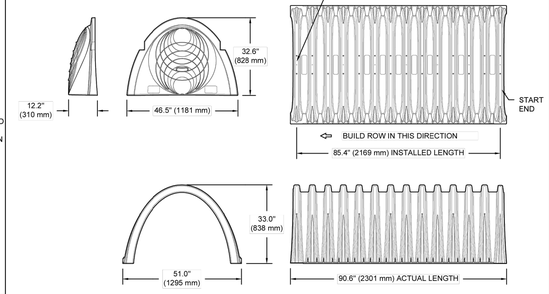
UNDERDRAIN DETAIL
NTS



4 UNDERDRAIN DETAIL

SPACE INTENTIONALLY LEFT BLANK

SC-800 TECHNICAL SPECIFICATION
NTS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	51.0" X 33.0" X 85.4"	(1295 mm X 838 mm X 2169 mm)
CHAMBER STORAGE	50.6 CUBIC FEET	(1.43 m³)
MINIMUM INSTALLED STORAGE*	78.4 CUBIC FEET	(2.22 m³)
WEIGHT	81.8 lbs.	(37.1 kg)

NOMINAL END CAP SPECIFICATIONS

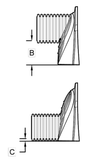
SIZE (W X H X INSTALLED LENGTH)	46.5" X 32.6" X 10.5"	(1181 mm X 828 mm X 267 mm)
END CAP STORAGE	3.4 CUBIC FEET	(0.09 m³)
MINIMUM INSTALLED STORAGE**	14.7 CUBIC FEET	(0.42 m³)
WEIGHT	15.7 lbs.	(7.1 kg)

* ASSUMES 6" (150 mm) STONE ABOVE, BELOW, AND BETWEEN CHAMBERS, 3" (75 mm) BETWEEN CHAMBERS
**ASSUMES 6" (150 mm) STONE ABOVE AND BELOW END CAPS, 3" (150 mm) BETWEEN ROWS, 12" (300 mm) BEYOND END CAPS

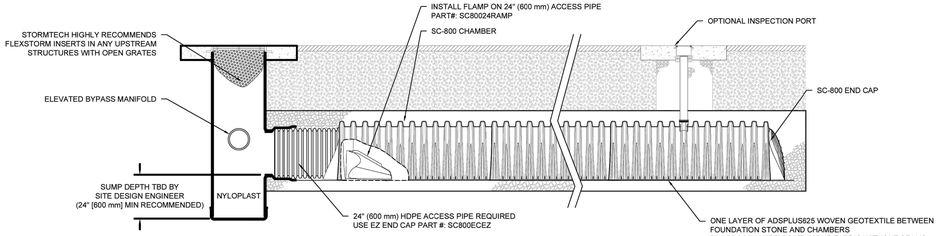
PRE-CORED HOLES AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "BPC"
PRE-CORED HOLES AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "TPC"

PART #	STUB	B	C
SC800EPE06TPC	6" (150 mm)	21.4" (544 mm)	---
SC800EPE06BPC		---	0.9" (23 mm)
SC800EPE08TPC	8" (200 mm)	19.2" (488 mm)	---
SC800EPE08BPC		---	1.0" (25 mm)
SC800EPE10TPC	10" (250 mm)	17.0" (432 mm)	---
SC800EPE10BPC		---	1.2" (30 mm)
SC800EPE12TPC	12" (300 mm)	14.4" (366 mm)	---
SC800EPE12BPC		---	1.6" (41 mm)
SC800EPE15TPC	15" (375 mm)	11.3" (287 mm)	---
SC800EPE15BPC		---	1.7" (43 mm)
SC800EPE18TPC	18" (450 mm)	8.0" (203 mm)	---
SC800EPE18BPC		---	2.0" (51 mm)
SC800EPE24BPC	24" (600 mm)	---	2.3" (58 mm)
SC800EPE	NONE	SOLID END CAP	

NOTE: ALL DIMENSIONS ARE NOMINAL



2 SC-800 TECHNICAL SPECIFICATION



SC-800 ISOLATOR ROW PLUS DETAIL
NTS

3 SC-800 ISOLATOR ROW PLUS DETAIL

SPACE INTENTIONALLY LEFT BLANK

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45° (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

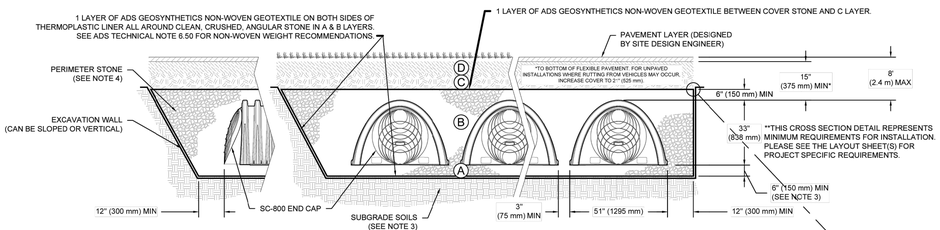
NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

ACCEPTABLE FILL MATERIALS: STORMTECH SC-800 CHAMBER SYSTEMS

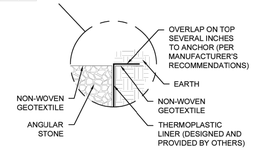
	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 15" (375 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[4] A-1, A-2-4, A-3 OR AASHTO M43[4] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE[5]	AASHTO M43[4] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE[5]	AASHTO M43[4] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.
5. WHERE RECYCLED CONCRETE AGGREGATE IS USED IN LAYERS 'A' OR 'B' THE MATERIAL SHOULD ALSO MEET THE ACCEPTABILITY CRITERIA OUTLINED IN TECHNICAL NOTE 6.20 "RECYCLED CONCRETE STRUCTURAL BACKFILL".



NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-800 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS. REFERENCE STORMTECH DESIGN MANUAL FOR BEARING CAPACITY GUIDANCE.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 750 LBS/FT/%. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.



THERMOPLASTIC LINER DETAIL

1 SC-800 CROSS SECTION DETAIL

DATE: 07/25/2025
DRAWN: CC
PROJECT #:
CHECKED: N/A
REV:
NOT TO SCALE

25-C007 KAADY
WEST LINN, OR, USA

StormTech® Chamber System

4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

SHEET 1 OF 1

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REGISTERED PROFESSIONAL ENGINEER
83693PE
OREGON
JULY 31, 2015
PRELIMINARY NOT FOR CONSTRUCTION
RENEWS: 12/31

KAADY CAR WASH
WEST LINN, OREGON

Revisions

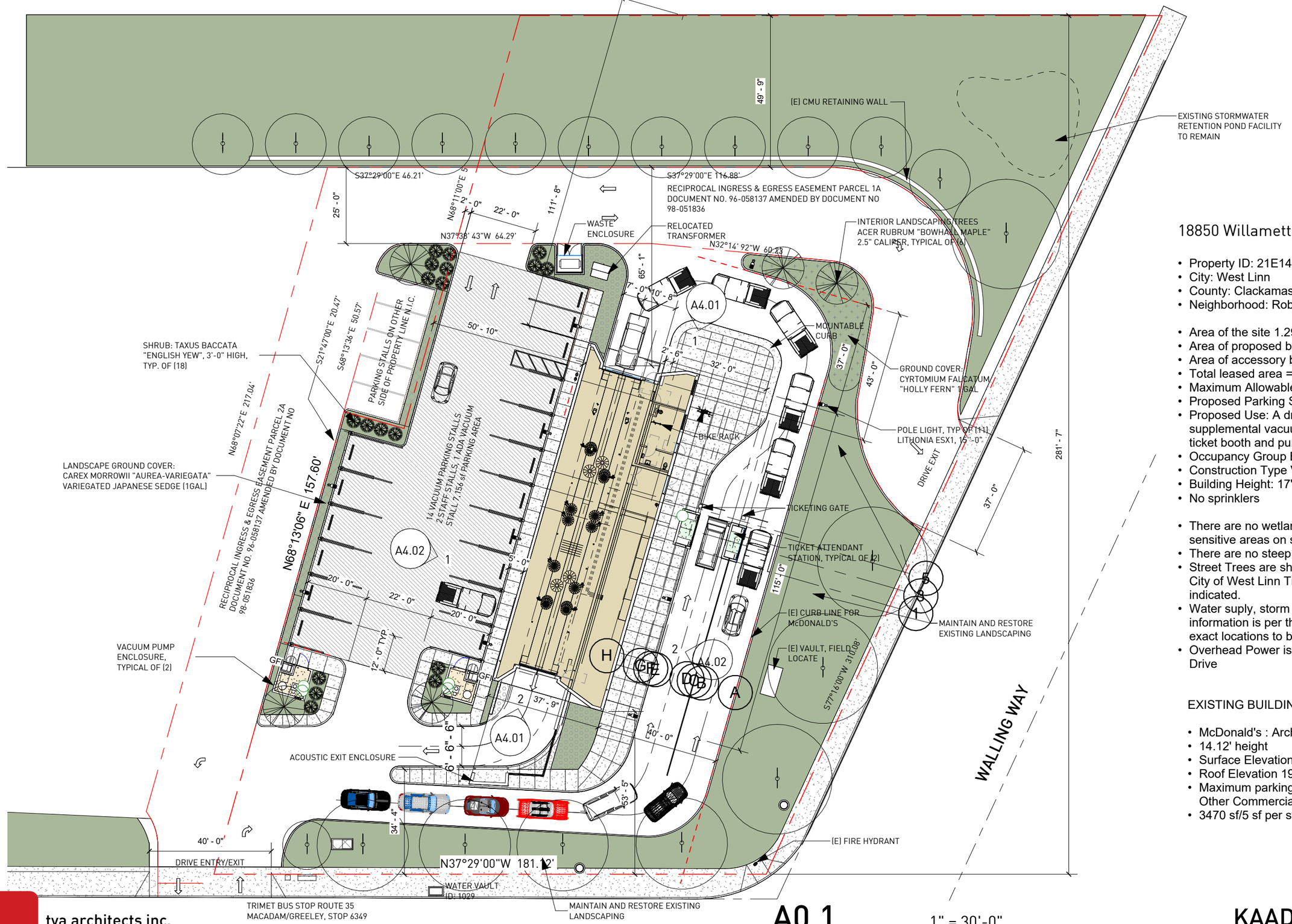
LAND-USE SET

DETAILS

Project # 22005

C5.2

Date: 7.9.2025



18850 Willamette Drive

- Property ID: 21E14DD-6900
- City: West Linn
- County: Clackamas
- Neighborhood: Robinwood

- Area of the site 1.29 Acres (56,378 sf)
- Area of proposed building: 3,190 sf
- Area of accessory buildings: 280 sf
- Total leased area = 3470 sf
- Maximum Allowable Parking Spaces = 17
- Proposed Parking Spaces = 17
- Proposed Use: A drive-through car wash with supplemental vacuum cleaning stations. Auxiliary ticket booth and pumphouse enclosures provided.
- Occupancy Group B
- Construction Type VB
- Building Height: 17'-8"
- No sprinklers

- There are no wetlands, riparian, or environmentally sensitive areas on site.
- There are no steep slopes on site.
- Street Trees are shown but not identified on the City of West Linn Tree Inventory Map. Species not indicated.
- Water suply, storm drain, and sanitary sewer information is per the West Linn City Maps site, exact locations to be provided by survey.
- Overhead Power is on the other side of Willamette Drive

EXISTING BUILDING

- McDonald's : Archland Property LLC 3948 sf
- 14.12' height
- Surface Elevation 180.3637'
- Roof Elevation 194.4824'
- Maximum parking per 1000 sf for Other Commercial Uses: 5
- 3470 sf/5 sf per stall = 17.35 spaces, 17 provided

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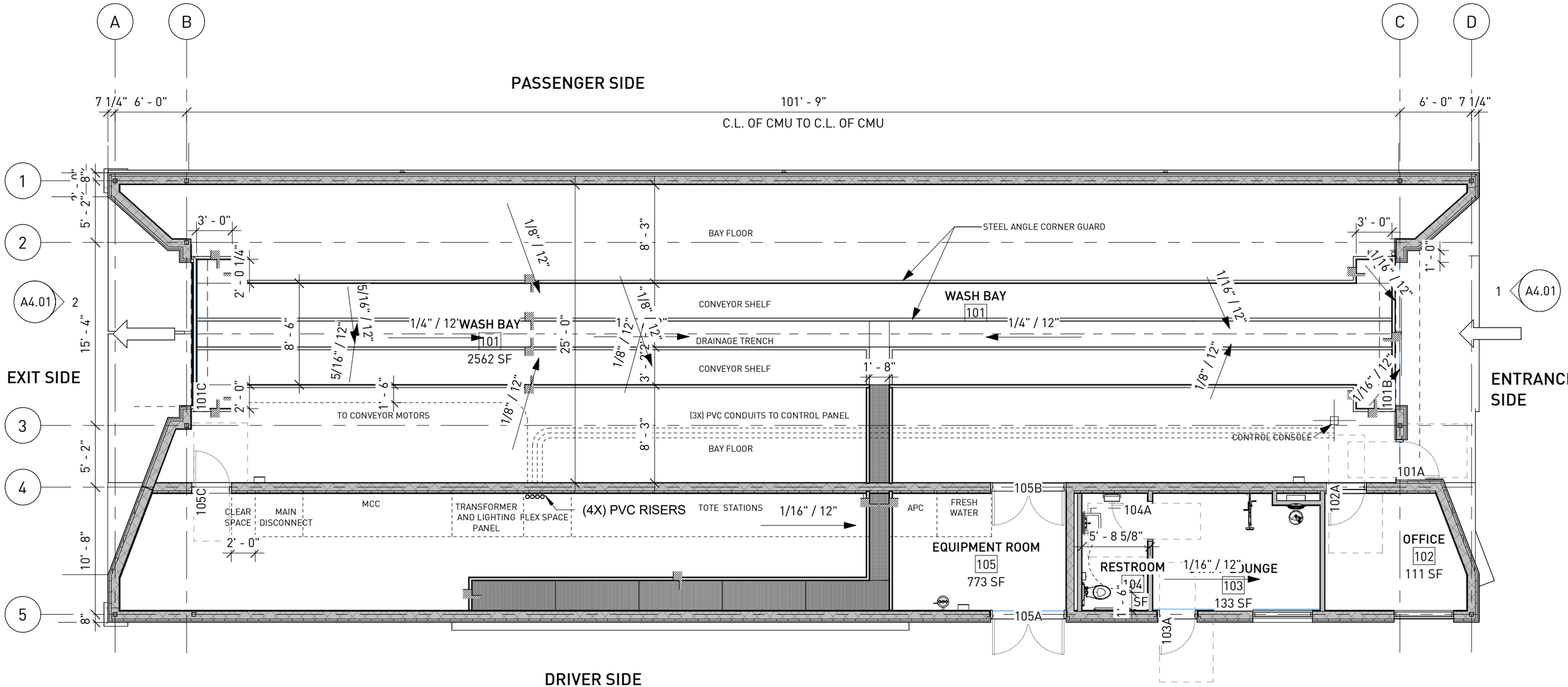
A0.1
SITE PLAN

1" = 30'-0"

07/22/25

KAADY CAR WASH

18850 WILLAMETTE DRIVE, WEST LINN, OREGON 97068



DRIVER SIDE

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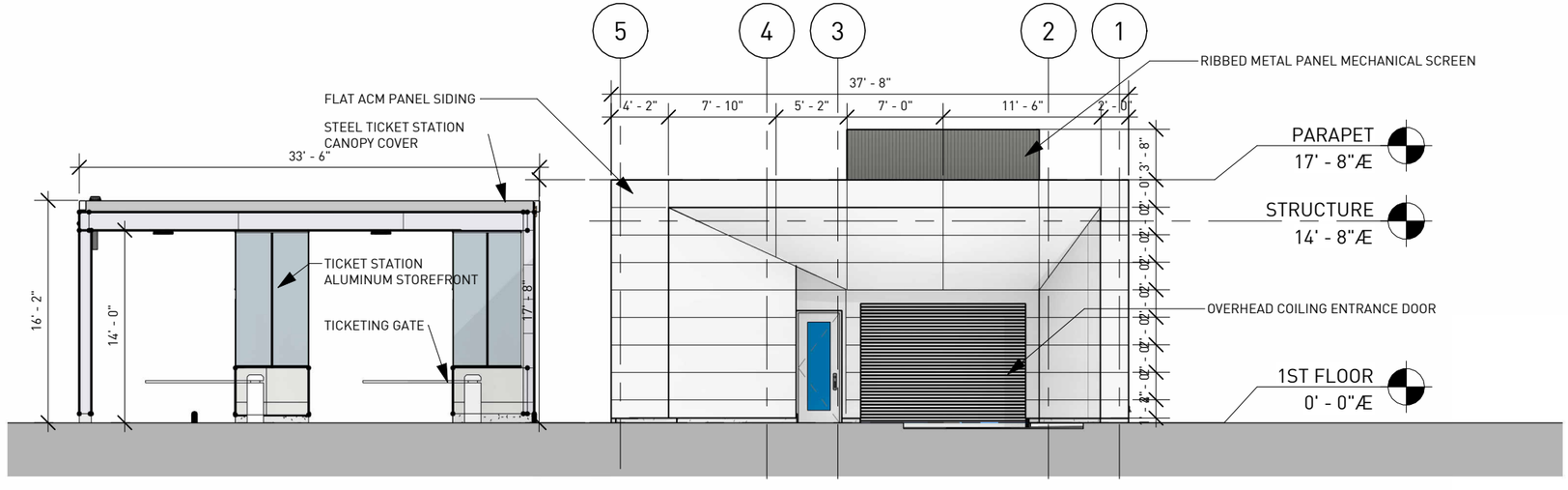
A1
FLOOR PLAN

1/8" = 1'-0"
07/23/25

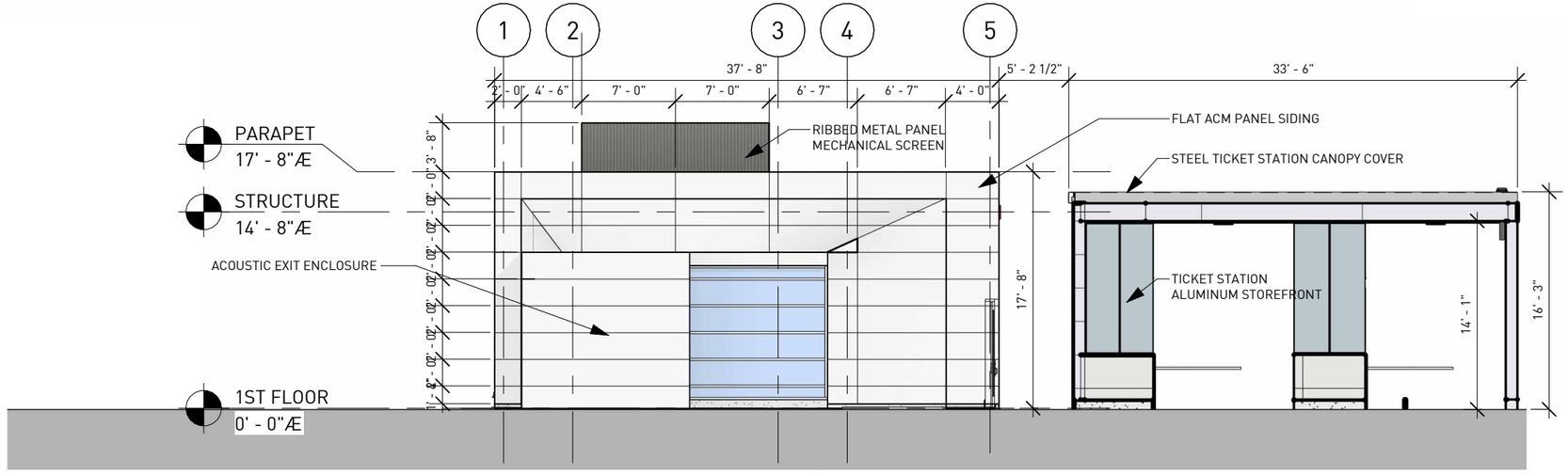
KAADY CAR WASH

18850 WILLAMETTE DRIVE, WEST LINN, OREGON 97068



1 ENTRANCE ELEVATION 1/8"

3/32" = 1'-0"



2 EXIT ELEVATION 1/8"

3/32" = 1'-0"

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A4.1

EXTERIOR ELEVATIONS

3/32" = 1'-0"

1/08/2026

KAADY CAR WASH

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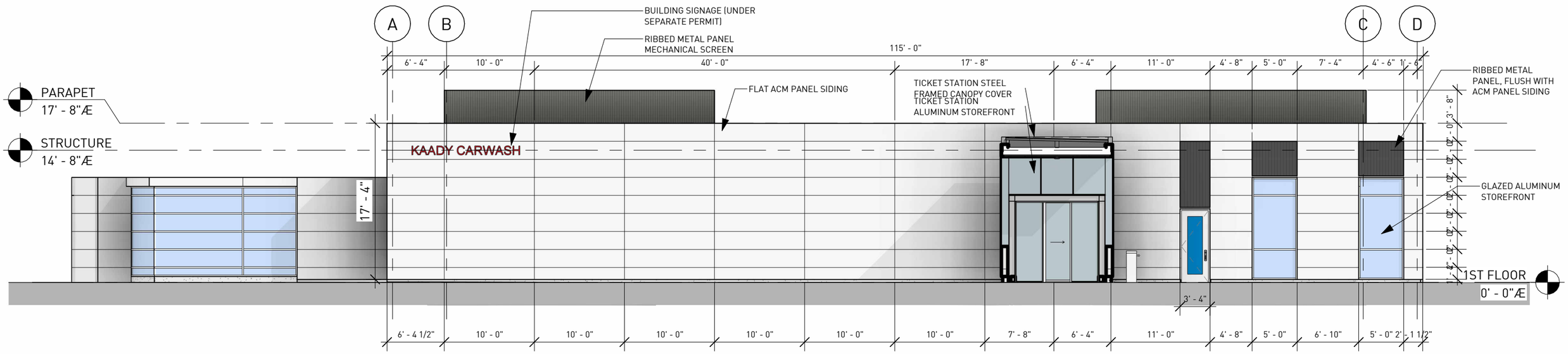
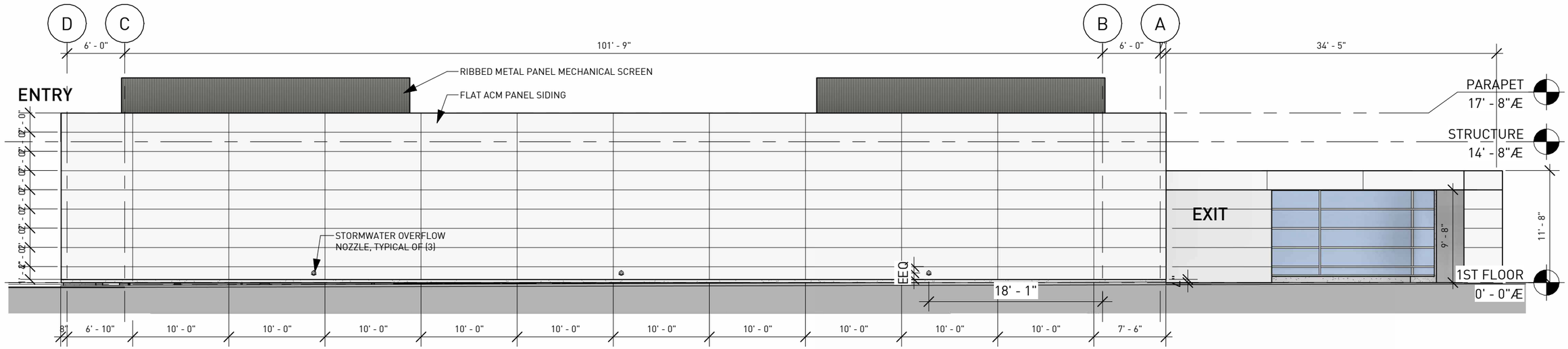


1 DRIVER'S SIDE ELEVATION

3/32" = 1'-0"



2 PASSENGER'S SIDE ELEVATION

3/32" = 1'-0"

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A4.2

EXTERIOR ELEVATIONS

3/32" = 1'-0"

01/08/2026

KAADY CAR WASH

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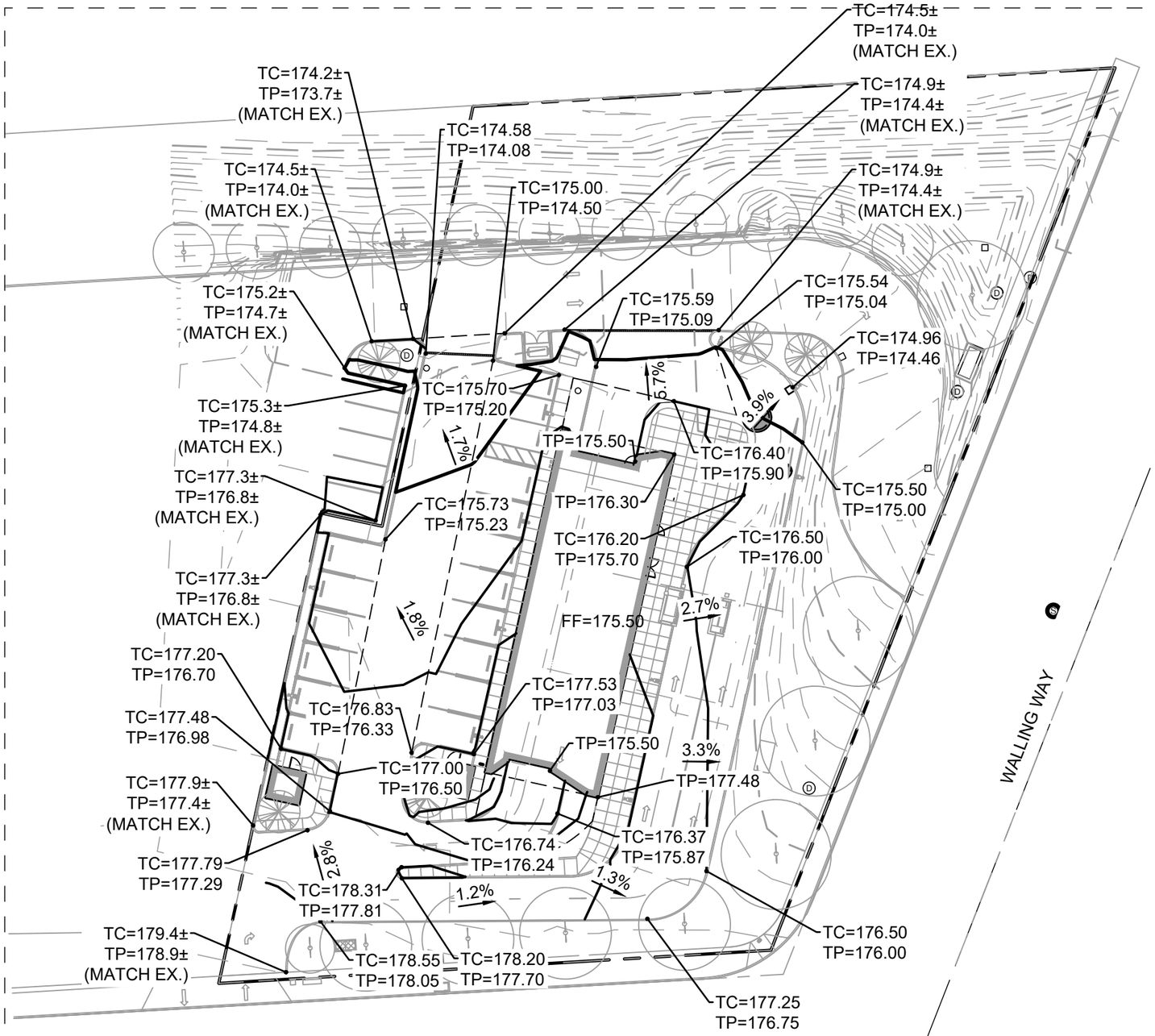

SHEET NOTES &

1. SLOPES PROVIDED ON SLOPE ARROW ARE FOR REFERENCE ONLY.
2. LANDINGS ON ACCESSIBLE ROUTES SHALL NOT EXCEED 1.5% IN ANY DIRECTION.
3. ALL ACCESSIBLE ROUTES SHALL COMPLY WITH CURRENT ADA ACCESSIBILITY GUIDELINES FOR BUILDING AND FACILITIES (ADAAG).
4. ALL WALKWAYS FROM ACCESSIBLE UNITS ARE DESIGNED TO NOT REQUIRE HANDRAILS. THEREFORE, RAMPS WITH SLOPES STEEPER THAN 5.0% AND LESS THAN 8.33% SHALL NOT EXCEED 0.5' RISE OR 6.0' LENGTH.
5. TOP OF CONCRETE OUTSIDE DOOR = FF ELEV. MINUS 0.02' SLOPE LANDING 1.5% AWAY FROM BLDG.

LABEL LEGEND

CALLOUT	DESCRIPTION
X.X% →	GRADING SLOPE AND DIRECTION (DOWNHILL)

SPOT ELEVATION — XX.XX XX — DESCRIPTION LISTED BELOW. NO DESCRIPTION MEANS TP OR TG

BOS	BOTTOM OF SWALE
BOW	BACK OF WALK
BS	BOTTOM OF STEP
BW	BOTTOM OF WALL
EG	EXISTING GRADE
FF	FINISHED FLOOR
FL	FLOW LINE
G	GUTTER
HP	HIGH POINT
LP	LOW POINT
RIM	RIM OF STRUCTURE
TC	TOP OF CURB
TG	TOP OF GROUND
TP	TOP OF PAVEMENT
TS	TOP OF STEP
TW	TOP WALL

GRADE BREAK

49 EX. CONTOUR MINOR

50 EX. CONTOUR MAJOR

49 CONTOUR MINOR (FG)

50 CONTOUR MAJOR (FG)

N

SCALE 1 INCH = 40 FEET

40 0 40 80

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Plotted: 7/31/25 at 4:15pm By: atomlinson

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C3.0 GRADING PLAN

KAADY CAR WASH - WEST LINN

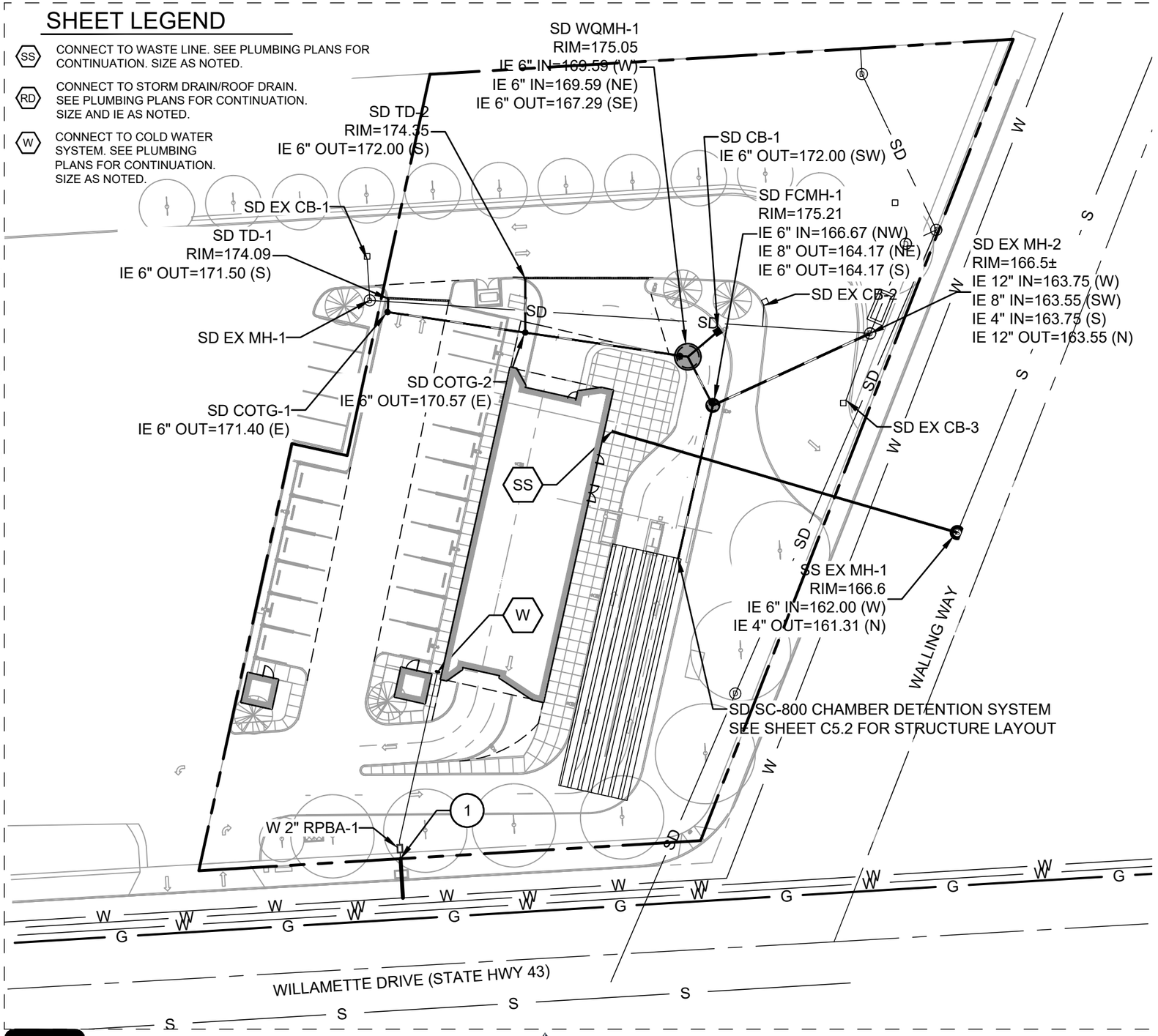
18850 WILLAMETTE DRIVE WEST LINN, OR

SHEET LEGEND

SS — CONNECT TO WASTE LINE. SEE PLUMBING PLANS FOR CONTINUATION. SIZE AS NOTED.

RD — CONNECT TO STORM DRAIN/ROOF DRAIN. SEE PLUMBING PLANS FOR CONTINUATION. SIZE AND IE AS NOTED.

W — CONNECT TO COLD WATER SYSTEM. SEE PLUMBING PLANS FOR CONTINUATION. SIZE AS NOTED.



SHEET NOTES

1. PIPE BEDDING AND BACKFILL FOR ALL UTILITIES SHALL BE DONE PER DETAIL X/C5.X.
2. STRUCTURES LOCATIONS ARE BASED ON CENTER OF STRUCTURE.
3. INSTALL TRUST BLOCK ON FIRE AND WATER LINES PER DETAIL X & X/CX.X.

KEY NOTES

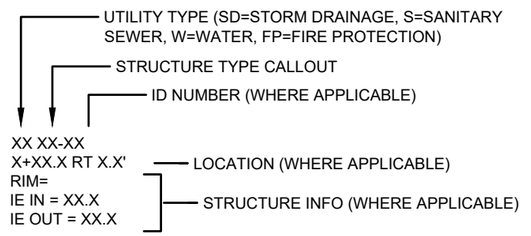
1 COORDINATE WATER SERVICE POINT OF CONNECTION TO EXISTING X" LATERAL WITH CITY OF WEST LINN.

2 FIELD VERIFY LOCATION AND IE OF EXISTING XX" XXXXX LATERAL PRIOR TO CONSTRUCTION.

3 IRRIGATION BACKFLOW ASSEMBLY VAULT, SEE LANDSCAPE PLANS.

UTILITY LABEL LEGEND

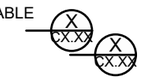
STRUCTURE LABEL



STRUCTURE TYPE

CALLOUT	DESCRIPTION
BEND	BEND, USE FITTING IF APPLICABLE
BWV	BACKWATER VALVE
CB	TRAPPED CATCH BASIN
CO	CLEANOUT TO GRADE
CONN	CONNECTION
DW	DRYWELL
FCMH	FLOW CONTROL MANHOLE
FD	FOUNDATION DRAINAGE POINT OF CONN.
FH	FIRE HYDRANT
GV	GATE VALVE
OF	OUTFALL
OV	OVERFLOW INLET
SDMH	48" DIA. STORM DRAIN MH
TD	TRENCH DRAIN
TEE	TEE CONNECTION
WYE	WYE CONNECTION
WQMH	WATER QUALITY MANHOLE

DETAIL REF.



N

SCALE 1 INCH = 40 FEET

40 0 40 80

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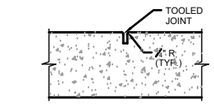
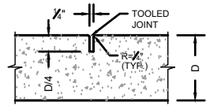
C4.0 UTILITY PLAN

KAADY CAR WASH - WEST LINN

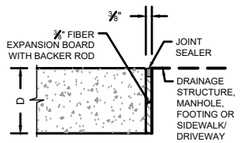
18850 WILLAMETTE DRIVE WEST LINN, OR



SCORE JOINT



CONTRACTION JOINT



EXPANSION / ISOLATION JOINT

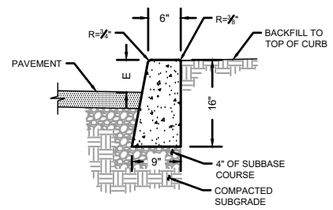
JOINT INTERVALS TABLE

TYPE	SPACING	OR AT …
SCORE	5' TYP	LOCATIONS SHOWN ON PLANS
CONTRACTION	15' MAX	END OF RAMPS AND DRIVEWAYS
EXPANSION/ ISOLATION	200' *	POINTS OF TANGENCY AND AT ENDS OF EACH DRIVEWAY OR OTHER FIXED OBJECTS

* MONOLITHIC CURB AND SIDEWALK SHALL BE 45' MAX

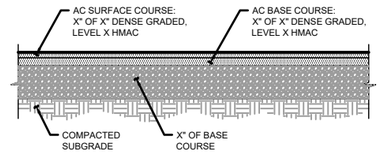
NOTES:
1. CONTRACTION JOINTS MAY BE USED IN PLACE OF SCORE JOINTS.
2. CONSTRUCTION COLD JOINTS MAY BE USED IN PLACE OF CONTRACTION JOINTS.
3. PROVIDE MEDIUM BROOM FINISH WITH NO TOOL MARKS.

X SIDEWALK JOINTS
SCALE: NTS

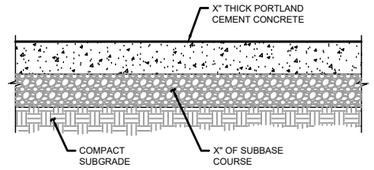


NOTES:
1. CURB EXPOSURE 'E' = 6", TYP. VARY AS SHOWN ON PLANS OR AS DIRECTED.
2. CONSTRUCT CONTRACTION JOINTS AT 15' MAX. SPACING AND AT RAMPS. CONSTRUCT EXPANSION JOINTS AT 200' MAX SPACING AT POINTS OF TANGENCY AND AT ENDS OF EACH DRIVEWAY.
3. TOPS OF ALL CURBS SHALL SLOPE TOWARD THE ROADWAY AT 2% UNLESS OTHERWISE SHOWN OR AS DIRECTED.
4. DIMENSIONS ARE NOMINAL AND MAY VARY TO CONFORM WITH CURB MACHINE AS APPROVED BY THE ENGINEER.

X STANDARD CONCRETE CURB
SCALE: NTS

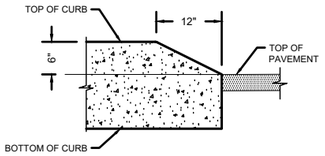


X ASPHALT PAVEMENT SECTION
SCALE: NTS

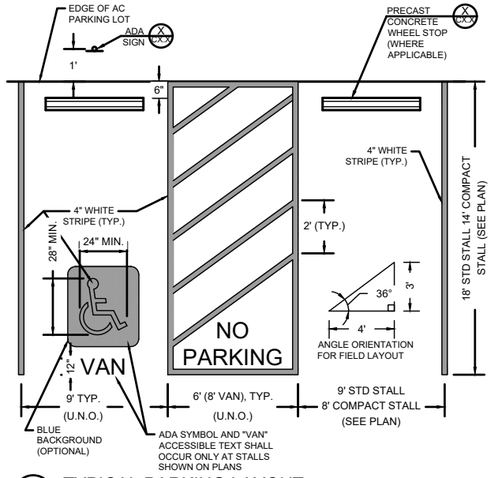


NOTES:
1. - CONSTRUCT CONTRACTION JOINTS AT 15' MAX. SPACING AND AT RAMPS.
   - CONSTRUCT EXPANSION JOINTS AT 200' MAX. SPACING AT POINTS OF TANGENCY AND AT ENDS OF EACH DRIVEWAY.
2. PROVIDE MEDIUM TO COARSE BROOM FINISH.

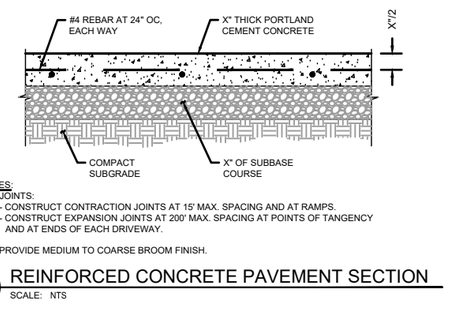
X CONCRETE PAVEMENT SECTION
SCALE: NTS



X CONCRETE CURB ENDING
SCALE: NTS

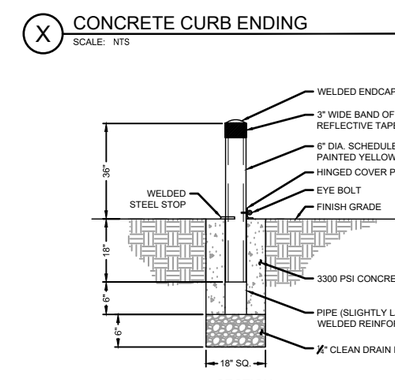


X TYPICAL PARKING LAYOUT
SCALE: NTS



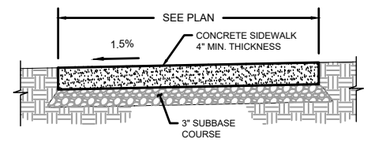
NOTES:
1. JOINTS:
   - CONSTRUCT CONTRACTION JOINTS AT 15' MAX. SPACING AND AT RAMPS.
   - CONSTRUCT EXPANSION JOINTS AT 200' MAX. SPACING AT POINTS OF TANGENCY AND AT ENDS OF EACH DRIVEWAY.
2. PROVIDE MEDIUM TO COARSE BROOM FINISH.

X REINFORCED CONCRETE PAVEMENT SECTION
SCALE: NTS



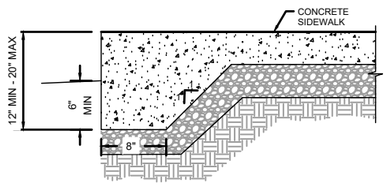
SECTION

X REMOVABLE PIPE BOLLARD
SCALE: NTS

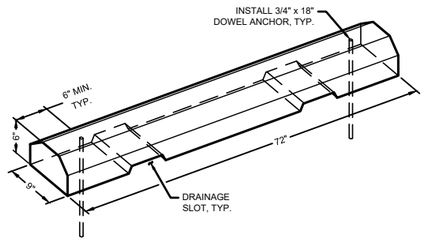


NOTES:
1. CONSTRUCT CONTRACTION JOINTS AT 15' MAX. SPACING AND AT RAMPS. CONSTRUCT EXPANSION JOINTS AT 200' MAX SPACING, AT POINTS OF TANGENCY AND AT ENDS OF EACH DRIVEWAY, UNLESS NOTED OTHERWISE.

X CONCRETE SIDEWALK
SCALE: NTS



X THICKENED CONCRETE EDGE
SCALE: NTS



NOTES:
1. DIMENSIONS ARE NOMINAL AND MAY VARY TO CONFORM TO MANUFACTURER'S PRODUCTS APPROVED BY ENGINEER.

X PRECAST CONCRETE WHEEL STOP
SCALE: NTS

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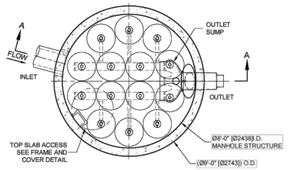
File: P:\2025\25-c007 (kaady car wash - west linn)\300 civil design documents - froelich\302 CAD\PLOT\25-C007_C5.0-DETL.dwg TAB:C5.0 (11x17)

11X17TB

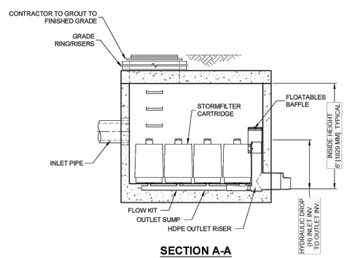
C5.0 DETAILS

KAADY CAR WASH - WEST LINN

18850 WILLAMETTE DRIVE WEST LINN, OR



PLAN VIEW
STANDARD OUTLET RISER
FLOWKIT: 43A



SECTION A-A

The Stormwater Management StormFilter®
THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING U.S. PATENTS: 5,322,629; 5,324,215; 5,707,527; 5,893,971; 6,027,639; 6,649,048; RELATED FOREIGN PATENTS, OR OTHER PATENTS PENDING.

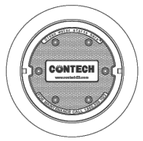
STORMFILTER DESIGN NOTES

STORMFILTER TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE SELECTION AND THE NUMBER OF CARTRIDGES. THE STANDARD MANHOLE STYLE IS SHOWN WITH THE MAXIMUM NUMBER OF CARTRIDGES (14). VOLUME SYSTEM IS ALSO AVAILABLE WITH MAXIMUM 14 CARTRIDGES. Ø8'-0" [2438 mm] MANHOLE STORMFILTER PEAK HYDRAULIC CAPACITY IS 1.8 CFS [51 L/s]. IF THE SITE CONDITIONS EXCEED 1.8 CFS [51 L/s] AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

CARTRIDGE SELECTION

CARTRIDGE HEIGHT	27" (686 mm)		18" (458 mm)		LOW DROP			
RECOMMENDED HYDRAULIC DROP (hl)	3.05' [930 mm]		2.3' [700 mm]		1.8' [550 mm]			
SPECIFIC FLOW RATE (gpm/sf) [L/s/m²]	2 [1.30]	1.67* [1.08]	1 [0.65]	2 [1.30]	1.67* [1.08]	1 [0.65]	2 [1.30]	1.67* [1.08]	1 [0.65]
CARTRIDGE FLOW RATE (gpm) [L/s]	22.5 [1.42]	18.79 [1.19]	11.25 [0.71]	15 [0.95]	12.53 [0.79]	7.5 [0.44]	10 [0.63]	8.35 [0.54]	5 [0.32]

* 1.67 gpm/sf [1.08 L/s/m²] SPECIFIC FLOW RATE IS APPROVED WITH PHOSPHOSORB® (PSORB) MEDIA ONLY



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

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	*
WATER QUALITY FLOW RATE (cfs) [L/s]	*
PEAK FLOW RATE (cfs) [L/s]	*
RETURN PERIOD OF PEAK FLOW (yrs)	*
CARTRIDGE HEIGHT (SEE TABLE ABOVE)	*
NUMBER OF CARTRIDGES REQUIRED	*
CARTRIDGE FLOW RATE	*
MEDIA TYPE (PERLITE, ZPG, PSORB)	*

PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE #1	*	*	*
INLET PIPE #2	*	*	*
OUTLET PIPE	*	*	*

RIM ELEVATION	*

ANTI-FLOTATION BALLAST	WIDTH	HEIGHT
	*	*

NOTES/SPECIAL REQUIREMENTS:

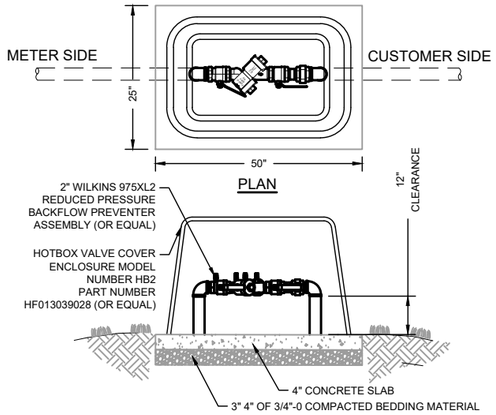
* PER ENGINEER OF RECORD

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR SITE SPECIFIC DRAWINGS WITH DETAILED VAULT DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
4. STORMFILTER WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS-20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 5' [1524 mm] AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
6. FILTER CARTRIDGES SHALL BE MEDIA-FILLED, PASSIVE, SIPHON ACTUATED, RADIAL FLOW, AND SELF CLEANING. RADIAL MEDIA DEPTH SHALL BE 7-INCHES [178 mm]. FILTER MEDIA CONTACT TIME SHALL BE AT LEAST 38 SECONDS.
7. SPECIFIC FLOW RATE IS EQUAL TO THE FILTER TREATMENT CAPACITY (gpm) [L/s] DIVIDED BY THE FILTER CONTACT SURFACE AREA (sq ft)[m²].
8. STORMFILTER STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STORMFILTER STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET PIPE(S).
E. CONTRACTOR TO PROVIDE AND INSTALL CONNECTOR TO THE OUTLET RISER STUB. STORMFILTER EQUIPPED WITH A DUAL DIAMETER HDPE OUTLET STUB AND SAND COLLAR. IF OUTLET PIPE IS LARGER THAN 8 INCHES [200 mm], CONTRACTOR TO REMOVE THE 8 INCH [200 mm] OUTLET STUB AT MOLDED-IN CUT LINE. COUPLING BY FERNCO OR EQUAL AND PROVIDED BY CONTRACTOR.
F. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.

CONTECH ENGINEERED SOLUTIONS LLC
www.contechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

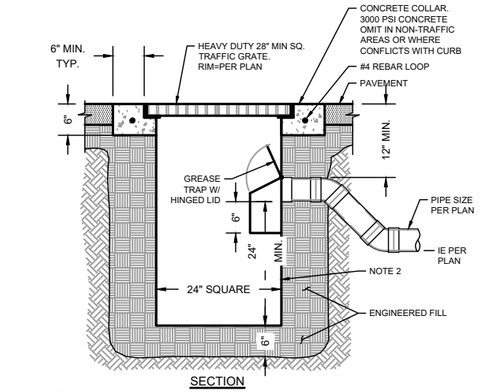
SFMH96
STORMFILTER
STANDARD DETAIL



NOTE:
ELEVATION

1. HOTBOX ENCLOSURE SHALL BE INSULATED AND HEATED. COORDINATE WITH ELECTRICAL PLANS FOR CONNECTION.
2. RPBA SHALL BE ACCESSIBLE BY VERTICALLY LIFTING OFF ENCLOSURE. CONTRACTOR TO VERIFY ACCESSIBILITY PRIOR TO CONSTRUCTION.

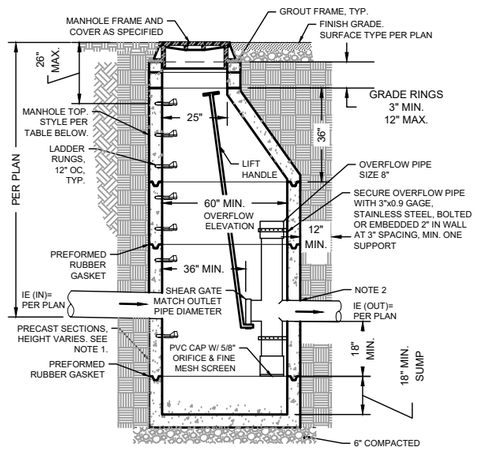
10 REDUCED PRESSURE BACKFLOW ASSEMBLY
SCALE: NTS



SECTION

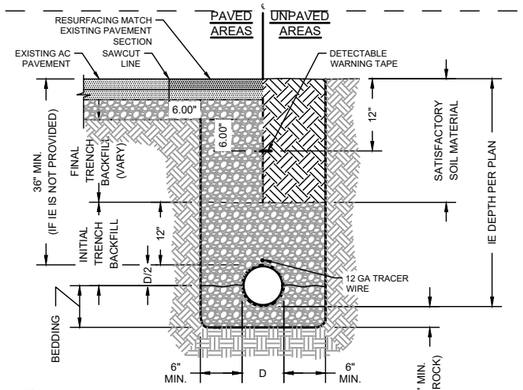
NOTES:
1. CONTRACTOR TO WIDEN EXCAVATION AS REQUIRED TO OBTAIN COMPACTION WITH CONTRACTORS COMPACTION EQUIPMENT.
2. 1/4" STEEL PLATE, BITUMINOUS COATED. AS MANUFACTURED BY GIBSON STEEL BASINS OR APPROVED EQUAL.

X TRAPPED CATCH BASIN
SCALE: NTS

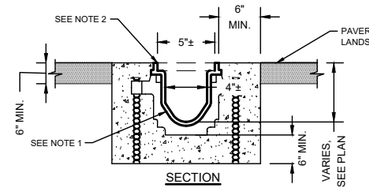


NOTES:
1. ALL PRECAST SECTIONS SHALL CONFORM TO REQUIREMENTS OF ASTM C-478.
2. ALL CONNECTING PIPES SHALL HAVE FLEXIBLE, GASKETED AND UNRESTRAINED JOINT WITHIN 18" OF MANHOLE VAULT. PIPE SIZES NOTED ON PLANS. PIPE CONNECTION TO MANHOLES SHALL HAVE KOR-N-SEAL BOOT OR APPROVED EQUAL.
3. ORIFICE AND OVERFLOW ELEVATIONS ARE RELATIVE TO IE (OUT)

6 FLOW CONTROL MANHOLE
SCALE: NTS



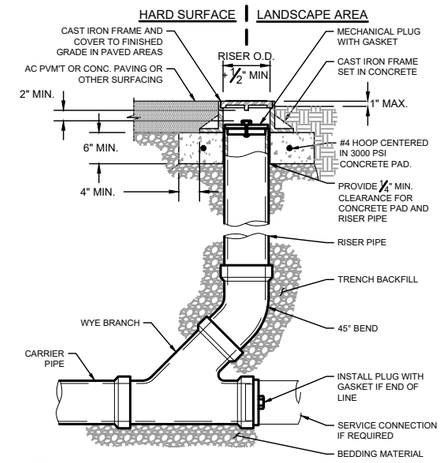
X TYPICAL PIPE BEDDING AND BACKFILL
SCALE: NTS



SECTION

NOTES:
1. TRENCH DRAIN SHALL BE PRE-SLOPED 4" WIDE ZURN OR ACO TRENCH DRAIN OR APPROVED EQUAL.
2. TRENCH DRAINS GRATE SHALL BE LOCKABLE HEAVY DUTY TRENCH GRATE - CLASS C.
3. TRENCH SYSTEM SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.

X TRENCH DRAIN - 4 INCH WIDE
SCALE: NTS



NOTES:
1. CAST IRON FRAME AND COVER SHALL MEET H-20 LOAD REQUIREMENT.
2. FOR CARRIER PIPE SIZE 6"Ø AND LESS, PROVIDE RISER PIPE SIZE TO MATCH CARRIER PIPE.
3. FOR CARRIER PIPE SIZE 8"Ø AND LARGER, RISER PIPE SHALL BE 6"Ø.
4. RISER PIPE MATERIAL TO MATCH CARRIER PIPE MATERIAL.

X STANDARD CLEANOUT (COTG)
SCALE: NTS

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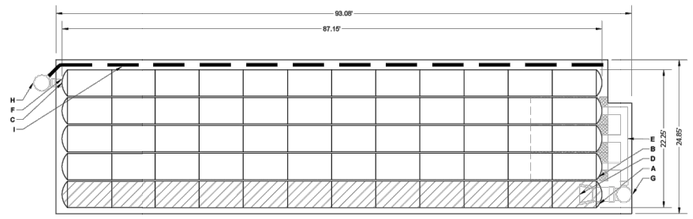
C5.1 DETAILS

KAADY CAR WASH - WEST LINN
18850 WILLAMETTE DRIVE WEST LINN, OR

PROPOSED LAYOUT		PROPOSED ELEVATIONS	
60	STORMTECH SC-800 CHAMBERS	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	111.2
10	STORMTECH SC-800 END CAPS	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	103.0
6	STONE ABOVE (in)	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	104.0
6	STONE BELOW (in)	MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	104.0
40	STONE VOID	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	103.7
5272	INSTALLED SYSTEM VOLUME (CF) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)	TOP OF STONE:	103.2
		TOP OF SC-800 CHAMBER:	103.2
		12" x 12" TOP MANIFOLD INVERT:	103.0
		24" ISOLATOR ROW PLUS INVERT:	103.0
2286	SYSTEM AREA (SF)	12" BOTTOM CONNECTION INVERT:	103.0
235.9	SYSTEM PERIMETER (ft)	BOTTOM OF SC-800 CHAMBER:	100.0
423	THERMOPLASTIC LINER (SY) (20% OVERAGE)	UNDERDRAIN INVERT:	100.0
		BOTTOM OF STONE:	100.0

*INVERT ABOVE BASE OF CHAMBER

PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
PREFABRICATED EZ END CAP	A	24" BOTTOM PREFABRICATED EZ END CAP, PART#: SC800ECEZ / TYP OF ALL 24" BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	2.30"	
PRE-CORED END CAP	B	12" TOP PRE-CORED END CAP, PART#: SC800EPE12TPC / TYP OF ALL 12" TOP CONNECTIONS	14.40"	
PRE-CORED END CAP	C	12" BOTTOM PRE-CORED END CAP, PART#: SC800EPE12BPC/ TYP OF ALL 12" BOTTOM CONNECTIONS	1.60"	
FLAMP	D	INSTALL FLAMP ON 24" ACCESS PIPE / PART#: SC80024RAMP		
MANIFOLD	E	12" x 12" TOP MANIFOLD, ADS N-12	14.40"	
PIPE CONNECTION	F	12" BOTTOM CONNECTION	1.60"	
NYLOPLAST (INLET W/ ISO PLUS ROW)	G	30" DIAMETER (24.00" SUMP MIN)		5.9 CFS IN
NYLOPLAST (OUTLET)	H	30" DIAMETER (DESIGN BY ENGINEER)		2.0 CFS OUT
UNDERDRAIN	I	8" ADS N-12 DUAL WALL PERFORATED HDPE UNDERDRAIN		



ISOLATOR ROW PLUS (SEE DETAIL)

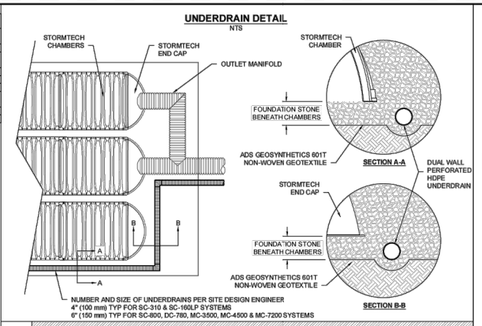
PLACE MINIMUM 12.5SY OF ADSPLUS625 WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS

THERMOPLASTIC LINER (SEE TECH NOTE #6.50 PROVIDED BY OTHERS / DESIGN BY OTHERS)

NOTES
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- **NOT FOR CONSTRUCTION:** THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT & THE REQUIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.

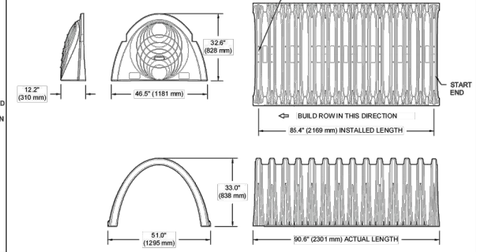
SPACE INTENTIONALLY LEFT BLANK

UNDERDRAIN DETAIL
NTS



4 UNDERDRAIN DETAIL

SC-800 TECHNICAL SPECIFICATION
NTS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	51.0" X 33.0" X 85.4"	(1295 mm X 839 mm X 2169 mm)
CHAMBER STORAGE	50.6 CUBIC FEET	(1.43 m³)
MINIMUM INSTALLED STORAGE*	78.4 CUBIC FEET	(2.22 m³)
WEIGHT	81.8 lbs.	(37.1 kg)

NOMINAL END CAP SPECIFICATIONS

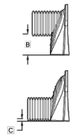
SIZE (W X H X INSTALLED LENGTH)	46.5" X 32.6" X 10.5"	(1181 mm X 828 mm X 267 mm)
END CAP STORAGE	3.4 CUBIC FEET	(0.09 m³)
MINIMUM INSTALLED STORAGE**	14.7 CUBIC FEET	(0.42 m³)
WEIGHT	15.7 lbs.	(7.1 kg)

* ASSUMES 6" (150 mm) STONE ABOVE, BELOW, AND BETWEEN CHAMBERS, 3" (75 mm) BETWEEN CHAMBERS
**ASSUMES 6" (150 mm) STONE ABOVE AND BELOW END CAPS, 3" (150 mm) BETWEEN ROWS, 12" (300 mm) BEYOND END CAPS

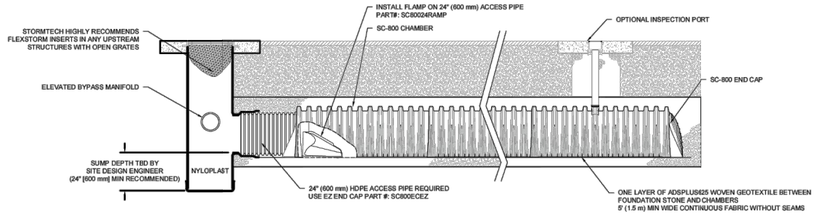
PRE-CORED HOLES AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "BPC"
PRE-CORED HOLES AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "TPC"

PART #	STUB	B	C
SC800EPE06TPC	6" (150 mm)	21.4" (544 mm)	---
SC800EPE06BPC		---	0.9" (23 mm)
SC800EPE08TPC	8" (200 mm)	19.2" (488 mm)	---
SC800EPE08BPC		---	1.0" (25 mm)
SC800EPE10TPC	10" (250 mm)	17.0" (432 mm)	---
SC800EPE10BPC		---	1.2" (30 mm)
SC800EPE12TPC	12" (300 mm)	14.4" (366 mm)	---
SC800EPE12BPC		---	1.6" (41 mm)
SC800EPE15TPC	15" (375 mm)	11.3" (287 mm)	---
SC800EPE15BPC		---	1.7" (43 mm)
SC800EPE18TPC	18" (450 mm)	8.0" (203 mm)	---
SC800EPE18BPC		---	2.0" (51 mm)
SC800EPE24BPC	24" (600 mm)	---	2.3" (59 mm)
SC800EPE	NONE	SOLID END CAP	

NOTE: ALL DIMENSIONS ARE NOMINAL



2 SC-800 TECHNICAL SPECIFICATION



SC-800 ISOLATOR ROW PLUS DETAIL
NTS

3 SC-800 ISOLATOR ROW PLUS DETAIL

SPACE INTENTIONALLY LEFT BLANK

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45° (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

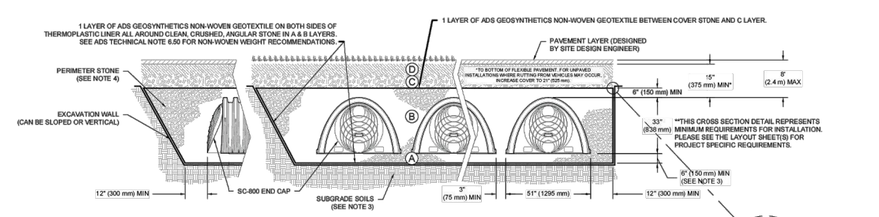
NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

ACCEPTABLE FILL MATERIALS: STORMTECH SC-800 CHAMBER SYSTEMS

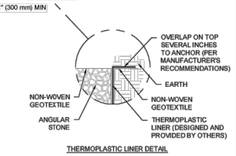
	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE (B' LAYER) TO 18" (375 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[4] A-1, A-2-4, A-3 OR AASHTO M43[4] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE[5]	AASHTO M43[4] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE[5]	AASHTO M43[4] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.
5. WHERE RECYCLED CONCRETE AGGREGATE IS USED IN LAYERS 'A' OR 'B' THE MATERIAL SHOULD ALSO MEET THE ACCEPTABILITY CRITERIA OUTLINED IN TECHNICAL NOTE 6.20 "RECYCLED CONCRETE STRUCTURAL BACKFILL".



NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-800 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS. REFERENCE STORMTECH DESIGN MANUAL FOR BEARING CAPACITY GUIDANCE.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 750 LBS/FT/%, AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.



THERMOPLASTIC LINER DETAIL

1 SC-800 CROSS SECTION DETAIL

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DRAWN: CC | DATE: 07/25/2025
CHECKED: N/A | PROJECT #: 25-C007 KAADY
REV: | NOT TO SCALE
WEST LINN, OR, USA

StormTech® Chamber System

4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

SHEET 1 OF 1

tva architects inc.
920 sw sixth avenue | suite 1500 | portland, oregon 97204
phone: 503 220 0668 | www.tvaarchitects.com

Plotted: 7/31/25 at 4:16pm By: atomlinson

FROELICH ENGINEERS
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Portland, OR | Bend, OR | Denver, CO
froelich-engineers.com | FE# ####

C5.2 DETAILS

KAADY CAR WASH - WEST LINN
18850 WILLAMETTE DRIVE WEST LINN, OR

FIRE CODE / LAND USE / BUILDING REVIEW APPLICATION

Tualatin Valley Fire & Rescue

North Operating Center
11945 SW 70th Avenue
Tigard, OR 97223
Phone: 503-649-8577

South Operating Center
8445 SW Elligsen Rd
Wilsonville, OR 97070
Phone: 503-649-8577

REV 6-30-20

Project Information

Applicant Name: Eric Li, TVA Architects

Address:1750 SW Yamhill Street, Suite 150, Portland, Oregon 97205

Phone:971-678-7578

Email: ericl@tvaarchitects.com

Site Address: 18850 Willamette Drive

City: West Linn

Map & Tax Lot #: 21E14DD-6900

Business Name: Kaady Car Wash

Land Use/Building Jurisdiction: General Commercial

Land Use/ Building Permit #PA-25-06 (This is a Pre-App#. Pending CU Submission for permit number.)

Choose from: Beaverton, Tigard, Newberg, Tualatin, North Plains, West Linn, Wilsonville, Sherwood, Rivergrove, Durham, King City, Washington County, Clackamas County, Multnomah County, Yamhill County

Project Description

Demolition of an existing McDonald's restaurant. Providing a new drive-through mechanized car wash and associated vacuum parking stalls.

The building is Type VB construction, one story, 3,1900 sf, 17'-8" high. Drive access is available on all four sides of the building. The building is not sprinklered, but its interior is constantly wet due to the nature of the building.

Permit/Review Type (check one):

☒ Land Use / Building Review - Service Provider Permit

☐ Emergency Radio Responder Coverage Install/Test

☐ LPG Tank (Greater than 2,000 gallons)

☐ Flammable or Combustible Liquid Tank Installation (Greater than 1,000 gallons)

* Exception: Underground Storage Tanks (UST) are deferred to DEQ for regulation.

☐ Explosives Blasting (Blasting plan is required)

☐ Exterior Toxic, Pyrophoric or Corrosive Gas Installation (in excess of 810 cu.ft.)

☐ Tents or Temporary Membrane Structures (in excess of 10,000 square feet)

☐ Temporary Haunted House or similar

☐ OLCC Cannabis Extraction License Review

☐ Ceremonial Fire or Bonfire (For gathering, ceremony or other assembly)

For Fire Marshal's Office Use Only

TVFR Permit # 2025-0113

Permit Type: SPP - West Linn

Submittal Date: 7-5-25

Assigned To: DFM Arn

Due Date: NA

Fees Due: Ø

Fees Paid: Ø

Approval/Inspection Conditions

(For Fire Marshal's Office Use Only)

This section is for application approval only

0430 7-8-25

Fire Marshal or Designee Date

Conditions: See approved fire service plans.

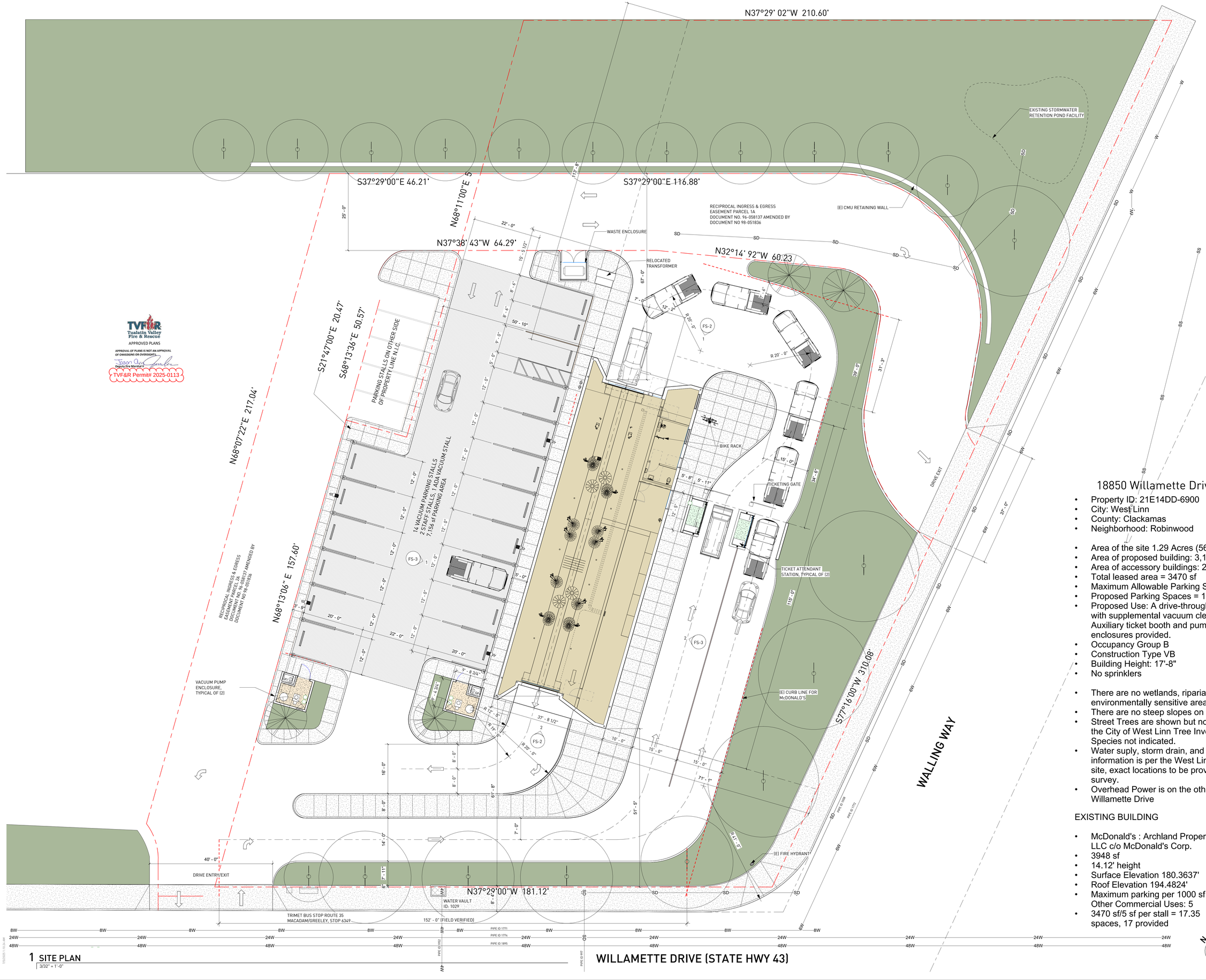
See Attached Conditions: ☐ Yes ☒ No

Site Inspection Required: ☐ Yes ☒ No

This section used when site inspection is required

Inspection Comments:

Final TVFR Approval Signature & Emp ID Date



TVF&R
Tualatin Valley Fire & Rescue

APPROVED PLANS

APPROVAL OF PLANS IS NOT AN APPROVAL OF OMISSIONS OR OVERSIGHTS.

Deputy Fire Marshal II

TVF&R Permit# 2025-0113

1 SITE PLAN
3/32" = 1'-0"

tva architects inc.
1750 sw yamhill st. suite 150
portland, oregon 97205
phone: 503 220 0668
www.tvaarchitects.com

NOT FOR CONSTRUCTION

KAADY CAR WASH

18850 WILLAMETTE DRIVE, WEST LINN, OREGON 97068

18850 Willamette Drive

- Property ID: 21E14DD-6900
- City: West Linn
- County: Clackamas
- Neighborhood: Robinwood

- Area of the site 1.29 Acres (56,378 sf)
- Area of proposed building: 3,190 sf
- Area of accessory buildings: 280 sf
- Total leased area = 3470 sf
- Maximum Allowable Parking Spaces = 17
- Proposed Parking Spaces = 17
- Proposed Use: A drive-through car wash with supplemental vacuum cleaning stations. Auxiliary ticket booth and pumphouse enclosures provided.
- Occupancy Group B
- Construction Type VB
- Building Height: 17'-8"
- No sprinklers

- There are no wetlands, riparian, or environmentally sensitive areas on site.
- There are no steep slopes on site.
- Street Trees are shown but not identified on the City of West Linn Tree Inventory Map. Species not indicated.
- Water suply, storm drain, and sanitary sewer information is per the West Linn City Maps site, exact locations to be provided by survey.
- Overhead Power is on the other side of Willamette Drive

EXISTING BUILDING

- McDonald's : Archland Property LLC c/o McDonald's Corp.
- 3948 sf
- 14.12' height
- Surface Elevation 180.3637'
- Roof Elevation 194.4824'
- Maximum parking per 1000 sf for Other Commercial Uses: 5
- 3470 sf/5 sf per stall = 17.35 spaces, 17 provided

△ Revisions

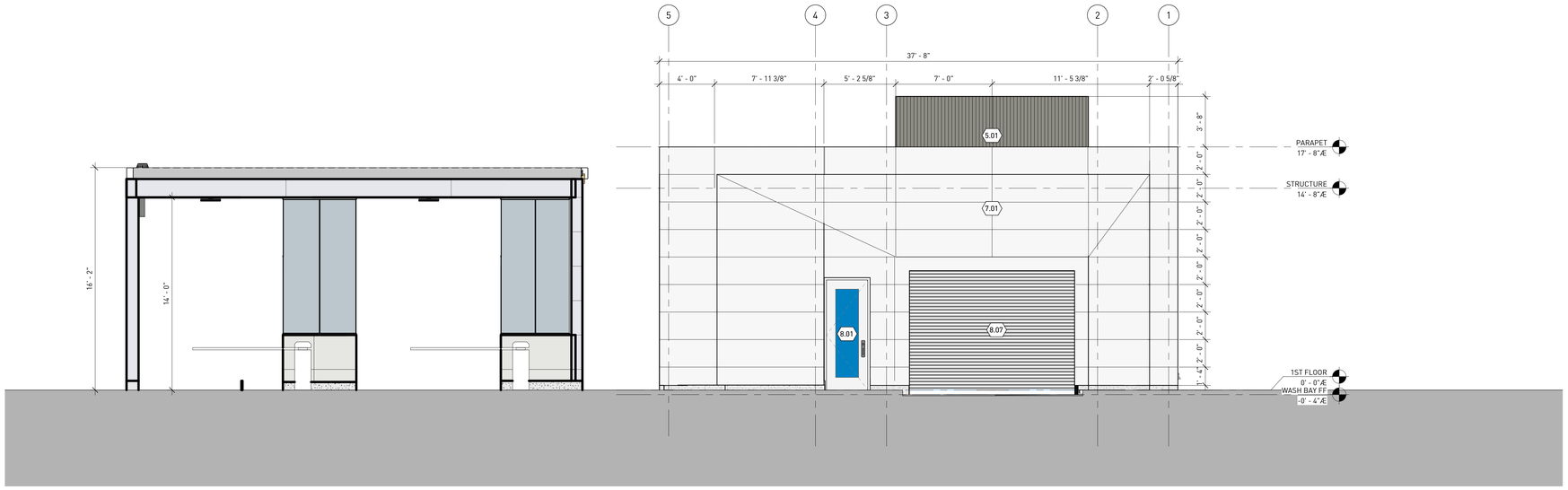
FIRE SERVICE PERMIT

OVERALL SITE PLAN

Project # 22005

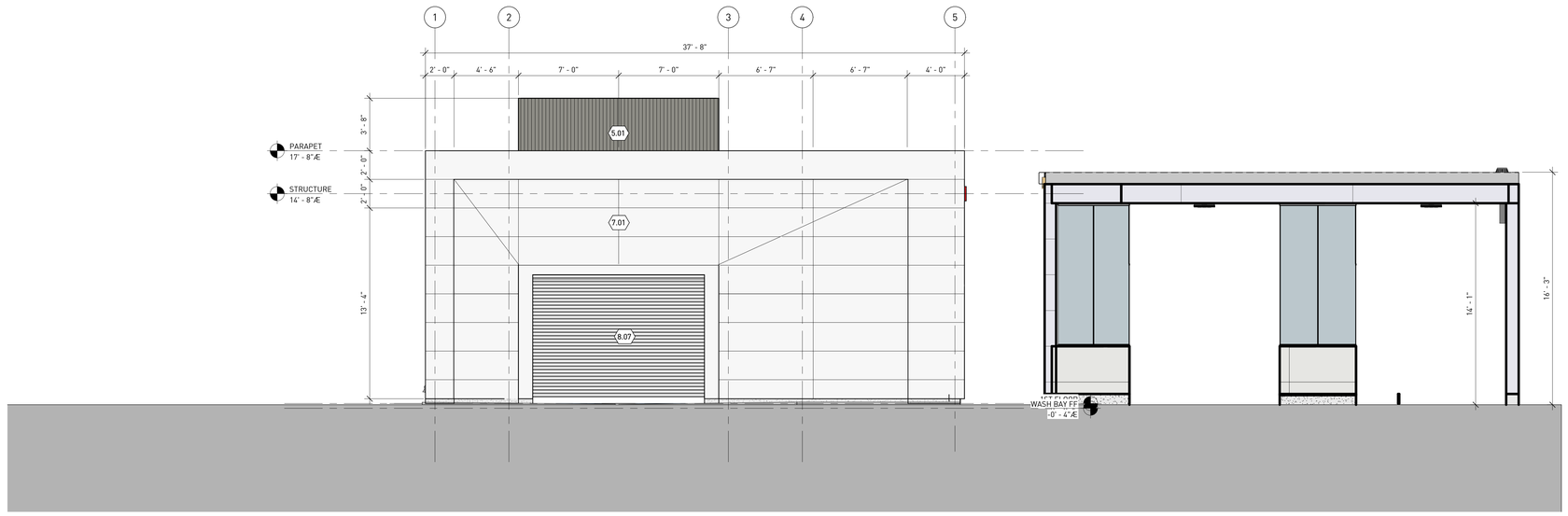
FS-1

Date: 2.7.2024



1 ENTRANCE ELEVATION

1/4" = 1'-0"



2 EXIT ELEVATION

1/4" = 1'-0"

GENERAL NOTES

1. PAINT ALL NON-NOTED MISCELLANEOUS ITEMS TO MATCH ADJACENT REFERENCE FINISH COLOR UNO.
2. LOUVER COLOR TO BE COORDINATED / SELECTED WITH SUBMITTALS.
3. SEE FLOOR PLAN FOR DOOR AND WINDOW TAGS,TYP.
4. WINDOW TYPES NOT SHOWN ON FLOOR PLANS ARE SHOWN ON THESE ELEVATIONS.
5. SEE WALL SECTIONS FOR ADDITIONAL ELEVATED AREAS.

KEYNOTES

SHOWN THUS ⬡

NOTE: ONLY KEYNOTES APPROPRIATE TO THIS SHEET ARE SHOWN IN THIS KEYNOTE LEGEND. GC TO VERIFY ANY DISCREPANCY IN KEYNOTING.

5.01	HSS 4X4 ROOF SCREEN FRAME, SEE STRUCTURAL. RIBBED METAL PANEL CLADDING, METAL SALES T10-A.
7.01	SMOOTH METAL PANEL SMP-1, COMPOSITE METAL PANEL, ALPOLIC, ALUCOBOND, REYNOBOND OR APPROVED. .020 INCH THICK ALUMINUM SHEET WITH ORGANIC COATING FINISH WITH A LOW-DENSITY POLYEHTYLENE CORE. COLOR: WHITE. ROUT AND RETURN FABRICATION FOR 1" NOMINAL PANEL DEPTH. PROVIDE BACKER ROD AND SILICONE SEALANT FOR 1/2" VERTICAL AND HORIZONTAL JOINTS.
8.01	GLAZED ALUMINUM STOREFRONT ENTRY 3'-0" X 8'-0": KAWNEER 350T STANDARD MEDIUM THERMAL SWING DOOR ENTRANCE. 3 1/2" ALUMINUM STILES AND TOP RAIL, 6 1/2" BOTTOM RAIL. GUARDIAN SNX 62/27 LOW-E TEMPERED GLASS LITES, U .28 MAX, SHGC .26 MAX. DOOR HARDWARE: BUTT HINGES (4EA): IVES 5BB1HW 4.5 X 4.5 NRP 630 BRUSHED STAINLESS FINISH, EXIT DEVICE: FALCON F-25-R-L-NL-LAT RIM DEVICE, CLOSER: LCN 4020 CUSH SURFACE MOUNTED CLOSER. THRESHOLD: PEMKO 171 SERIES COMMERCIAL FLAT THRESHOLD 5" WIDE. GASKET: ZERO 488SBK PSA. DOOR SWEEP ZERO 8198AA RAIN DRIP WITH NYLON BRUSH.
8.07	OVERHEAD COILING DOOR: COOKSON MODEL ESD10 MOTORIZED ROLLING SERVICE DOOR. 20 GAUGE PAINTED GALVANIZED STEEL, PAINT WHITE. 12'-0" WIDE X 9'-0" HIGH.

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NOT FOR CONSTRUCTION

KAADY CAR WASH

18850 WILLAMETTE DRIVE, WEST LINN, OREGON 97068

△ Revisions

FIRE SERVICE PERMIT

EXTERIOR ELEVATIONS

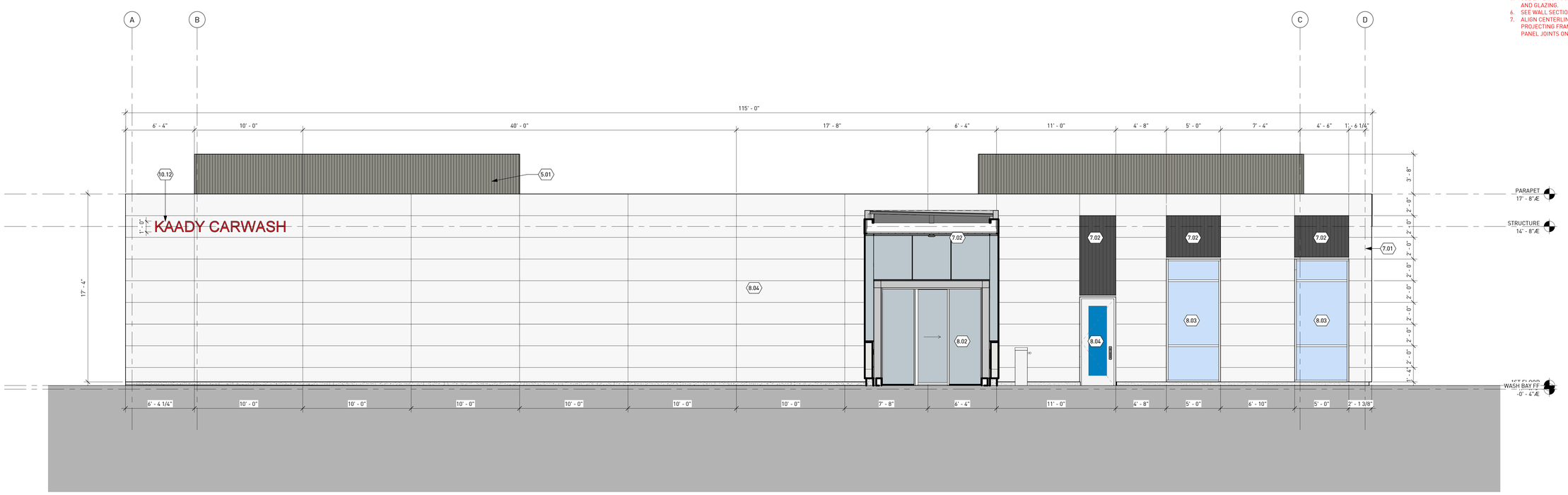
Project # 22005

FS-2

Date: 2.7.2024

GENERAL NOTES

1. PAINT ALL NON-NOTED MISCELLANEOUS ITEMS TO MATCH ADJACENT REFERENCE FINISH COLOR UNO.
2. LOUVER COLOR TO BE COORDINATED / SELECTED WITH SUBMITTALS.
3. SEE FLOOR PLAN FOR DOOR AND WINDOW TAGS,TYP.
4. WINDOW TYPES NOT SHOWN ON FLOOR PLANS ARE SHOWN ON THESE ELEVATIONS.
5. SEE EXTERIOR COMPOSITE SHEETS FOR EXTERIOR FINISHES AND GLAZING.
6. SEE WALL SECTIONS FOR ADDITIONAL ELEVATED AREAS.
7. ALIGN CENTERLINE OF PANEL JOINTS ON SOFFITS AND PROJECTING FRAME ELEMENTS WITH CENTERLINE OF PANEL JOINTS ON WALLS, TYP.



1 DRIVER'S SIDE ELEVATION (SOUTH)

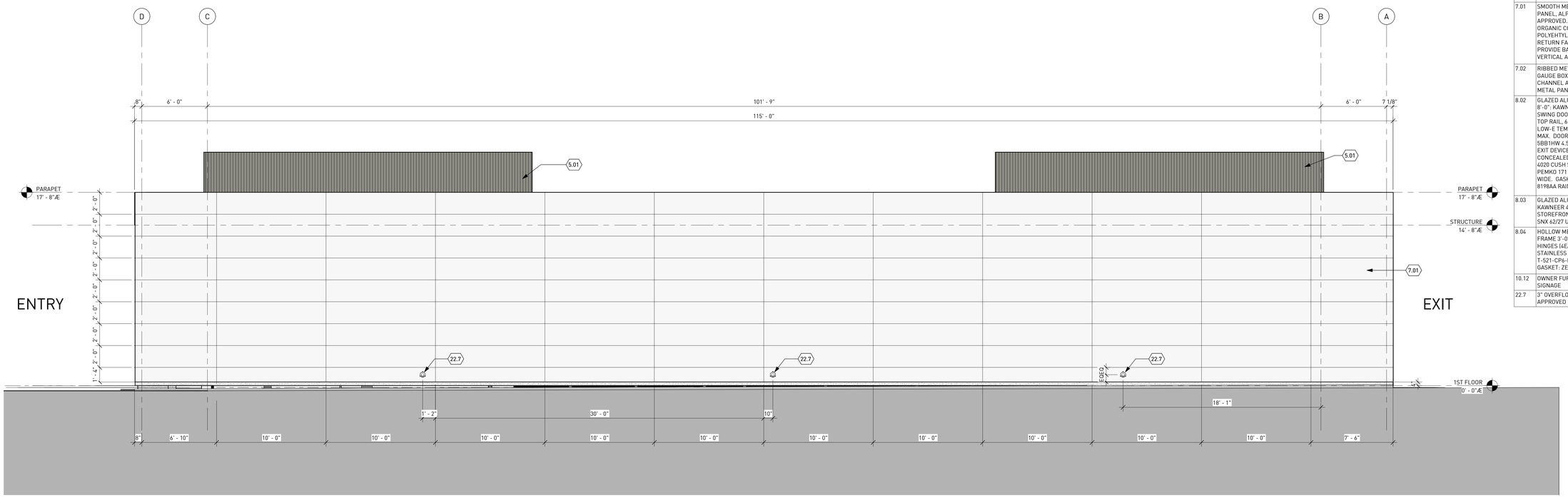
1/4" = 1'-0"

KEYNOTES

SHOWN THUS ⬡

NOTE: ONLY KEYNOTES APPROPRIATE TO THIS SHEET ARE SHOWN IN THIS KEYNOTE LEGEND. GC TO VERIFY ANY DISCREPANCY IN KEYNOTING.

5.01	HSS 4X4 ROOF SCREEN FRAME, SEE STRUCTURAL. RIBBED METAL PANEL CLADDING, METAL SALES T10-A.
7.01	SMOOTH METAL PANEL SMP-1, COMPOSITE METAL PANEL, ALPOLIC, ALUCOBOND, REYNOBOND OR APPROVED. .020 INCH THICK ALUMINUM SHEET WITH ORGANIC COATING FINISH WITH A LOW-DENSITY POLYEHTYLENE CORE. COLOR: WHITE. ROUT AND RETURN FABRICATION FOR 1" NOMINAL PANEL DEPTH. PROVIDE BACKER ROD AND SILICONE SEALANT FOR 1/2" VERTICAL AND HORIZONTAL JOINTS.
7.02	RIBBED METAL PANEL RMP-1: METAL SALES T10-A, 22 GAUGE BOXED RIB METAL PANEL. MOUNT TO FURRING CHANNEL AND FLUSH OUT WITH ADJACENT SMOOTH METAL PANEL SMP-1. COLOR: GREY
8.02	GLAZED ALUMINUM PAIRED STOREFRONT ENTRY 6'-0" X 8'-0": KAWNEER 350T STANDARD MEDIUM THERMAL SWING DOOR ENTRANCE. 3 1/2" ALUMINUM STILES AND TOP RAIL, 6 1/2" BOTTOM RAIL. GUARDIAN SNX 62/27 LOW-E TEMPERED GLASS LITES, U .28 MAX, SHGC .26 MAX. DOOR HARDWARE: BUTT HINGES (8EA): IVES 5BB1HW 4.5 X 4.5 NRP 630 BRUSHED STAINLESS FINISH, EXIT DEVICE (2EA): FALCON F-25-C-L-NL-LAT CONCEALED VERTICAL ROD DEVICE. CLOSER (2EA): LCN 4020 CUSH SURFACE MOUNTED CLOSER. THRESHOLD: PEMKO 171 SERIES COMMERCIAL FLAT THRESHOLD 5" WIDE. GASKET: ZERO 4885BK PSA. DOOR SWEEP ZERO 8198AA RAIN DRIP WITH NYLON BRUSH.
8.03	GLAZED ALUMINUM STOREFRONT: BASIS OF DESIGN: KAWNEER 451T THERMALLY BROKEN 4 1/2" ALUMINUM STOREFRONT. 1" INSULATED GLAZING UNITS, GUARDIAN SNX 62/27 U=.28, SHGC=.26. COLOR: WHITE
8.04	HOLLOW METAL OFFICE DOOR WITH HOLLOW METAL FRAME 3'-0" X 8'-0", PAINT WHITE. HARDWARE: BUTT HINGES (4EA): IVES 5BB1HW 4.5 X 4.5 NRP 630 BRUSHED STAINLESS FINISH, OFFICE LOCKSET: FALCON T-521-CP6-LAT. CLOSER: LCN 4110 SURFACE MOUNT. GASKET: ZERO 4885BK PSA.
10.12	OWNER FURNISHED, OWNER INSTALLED BUILDING SIGNAGE
22.7	3" OVERFLOW NOZZLE WITH FLAPPER. ZURN ZF 199 OR APPROVED



2 PASSENGER'S SIDE ELEVATION (NORTH)

1/4" = 1'-0"

tva architects inc.
1750 sw yamhill st. suite 150
portland, oregon 97205
phone: 503 220 0668
www.tvaarchitects.com

NOT FOR CONSTRUCTION

KAADY CAR WASH

18850 WILLAMETTE DRIVE, WEST LINN, OREGON 97068

△ Revisions

FIRE SERVICE PERMIT

EXTERIOR ELEVATIONS

Project # 22005

FS-3

Date: 2.7.2024

FROELICH
ENGINEERS

(Land Use) Stormwater Management Report

Kaady Car Wash – West Linn

18850 Willamette Dr
West Linn, OR 97068

Prepared by: Evan Eykelbosch, PE, and Ben Ullmann, PE
Froelich Engineers
17700 SW Upper Boones Ferry Rd, Suite 115
Portland, OR 97224
Froelich Project Number: 25-C007
Date: 8/1/2025

Contents

I. Project Overview and Description

This stormwater report has been prepared in accordance with the City of West Linn's Stormwater Management Manual (WLSWMM) to support the Building Permit application for the proposed project improvements.

Kaady Car Wash – West Linn is a site redevelopment project to convert an existing fast food site. The site is located on tax lot 6900 in the Clackamas County tax map 21E14DD. The existing development will be removed and a new automatic drive thru car wash, with a queuing line and vacuum equipped parking stalls will be constructed. There are no expected frontage improvements to be required with this on-site work.

Existing Conditions

Onsite
This site is located at 18850 Willamette Dr. West Linn, Oregon (See Appendix A: Vicinity Map) and is zoned for General Commercial use (GC). The existing site is approximately 1.30 acres and currently consists of a non-operational McDonalds drive-thru and parking lot. The topography of the majority of the site is a north to south sloping topography with a perpendicular running retaining wall along the north side of the drive aisle. The slope increases significantly beyond the retaining wall. The site is accessible by driveway on Willamette Drive and a driveway along Walling Way. The existing soil is classified as Cascade silt loam with 8 to 15 percent slopes based on a Soil Resource Report for the NRCS with a **Group C** type soil (See Appendix D: Soil Resource Report). Stormwater from the existing site is collected in a series of catch basins and is conveyed into an on-site water quality vault and detention pond. Runoff is managed through a flow control structure and then discharged into the stormwater main in Walling Way. The stormwater is then conveyed into Fern Creek which then outfalls to the Willamette River. The site is within the Willamette River watershed.

'Table 1A: Predeveloped Catchment Basins' provides the predeveloped basin characteristics for the various catchment areas under the predeveloped conditions.

Proposed Conditions

Onsite
The proposed development will construct water quality, water quantity, and storm water detention facilities to meet the requirements in WLSWMM. The onsite development will collect and manage stormwater through trench drains, roof drains, and a catch basin. The captured runoff is then conveyed through a water quality manhole and then piped into a buried detention structure. The proposed stormwater system will tie into the existing stormwater manhole and discharge to the same location.

'Table 1B: Proposed Catchment Basins' provides the proposed basin characteristics for the various catchment areas under the proposed conditions.

A proposed condition Basin Map is provided in Appendix B: Basin Maps and Areas.

II. Methodology

The WLSWMM requires that all new construction resulting in at least 10,000 square feet of impervious area created or replaced to comply with stormwater requirements. Infiltration on site is not feasible due to existing soil conditions and steep slope conditions.

The water quality requirements consist of providing stormwater treatment for the water quality event of 1 inch per 24-hour period for a time of concentration of 10 minutes for the impervious area. This is roughly 80% of the average annual rainfall for the City of West Linn.

The flow control requirements consist of limiting the 2-year, 10-year, and 25-year post development peak flows to their respective pre-development peak. Predeveloped flows are based on a grassland/forested topography with a time of concentration of 5 minutes.

A summary of the stormwater treatment requirements facilities is provided in ‘Table 2: Catchment and Facility Table’ and a summary of the flow rate results is provided in ‘Table 3: Pre- vs Post-Construction Stormwater Flow Rate Table.’

The conveyance calculations were designed for the 25-year storm event (3.9 in/24-hr). See Appendix H: Conveyance Calculations for conveyance sizing calculations.

III. Analysis

The analysis for the onsite stormwater system design is based on Santa Barbara Urban Hydrograph (SBUH) Method using a NRCS Type 1A rainfall distribution for a 24-hour storm. The system was designed using HydroCAD software.

The proprietary water quality manhole design is based on water quality flow of 1 inch per 24-hour storm event, using HydroCAD software (See Appendix F: Water Quality Calculations).

The detention facility design is based on the 2-year, 10-year, and 25-year storm events, using HydroCAD. The WLSSMM requires that detention systems be designed with concrete detention pipes unless the use of such pipe is not practical. Due to the footprint size of using concrete pipes, the project was required to explore the use of an alternative product. The proposed system is currently shown using the ADS SC-800 Chamber Detention system. An analysis of a concrete pipe detention system with a similar depth was considered, and an exhibit for the use of the concrete pipe is provided. (See Appendix G: Water Quantity Calculations.)

Conveyance calculations are based on the Manning Formula for uniform pipe flow (See Appendix I: Stormwater Conveyance Calculations). The peak runoff event can be conveyed by an 6-inch pipe with a minimum slope of 1.50% and an 8-inch pipe with a minimum slope of 1.00%.

Table 1A: Predeveloped Catchment Basins

Predeveloped

Basin	Area				Total	
	Pervious		Impervious			
	sf	ac	sf	ac	sf	ac
Basin A	31,100	0.714	0	0.000	31,100	0.714

Table 1B: Proposed Catchment Basins

Proposed

Basin	Area				Total		Flow Q (25-YR)
	Pervious		Impervious				
	sf	ac	sf	ac	sf	ac	cfs
Basin A	314	0.007	30,786	0.707	31,100	0.714	0.65

Table 2: Catchment and Facility table

Catchment/ Facility ID	Drainage Source	Area Managed (sf)	Ownership (private/ public)	Facility Type	Facility Size
WQMH72”-1	Basin A	30,786	Private	Water Quality Manhole	96” Dia Manhole with (9) 18” StormFilters
ADS SC-800 Detention System	Basin A	31,100	Private	Underground Detention Chambers	25.3’x89.3’x3.8’ (60) ADS SC-800 Chambers

Table 3: Pre- vs Post-Construction Stormwater Flow Rate Table

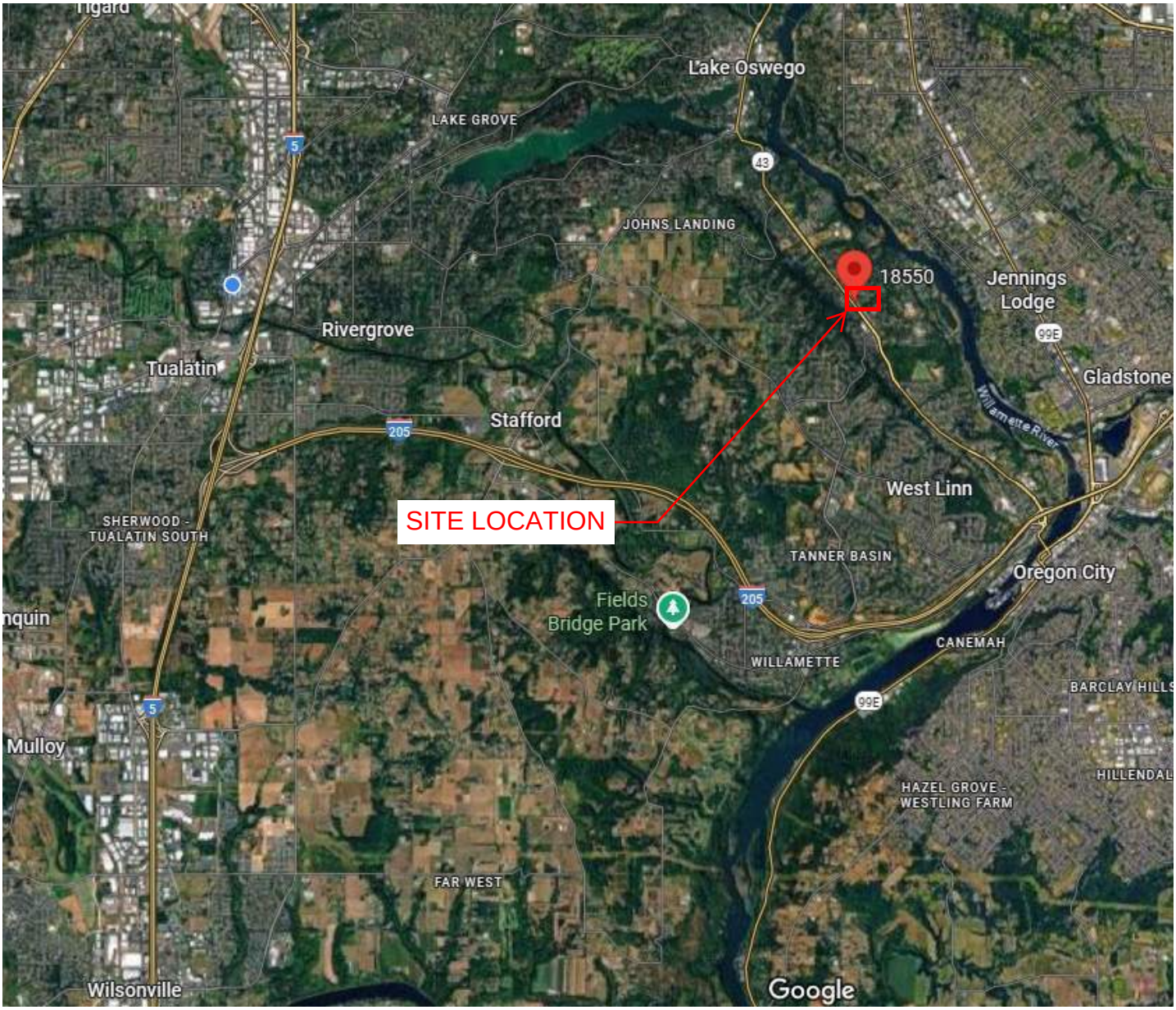
Catchment/ Facility ID	Peak Flow Rate (cfs) for a 24-hour storm					
	2-year		10-year		25-year	
	Pre	Post	Pre	Post	Pre	Post
Basin A	0.02	0.02	0.11	0.09	0.15	0.12

IV. Engineering Conclusion

Based on the requirements of the City of West Linn, all facilities and conveyance components have enough capacity to manage the runoff from the required storm event and should be approved as designed.

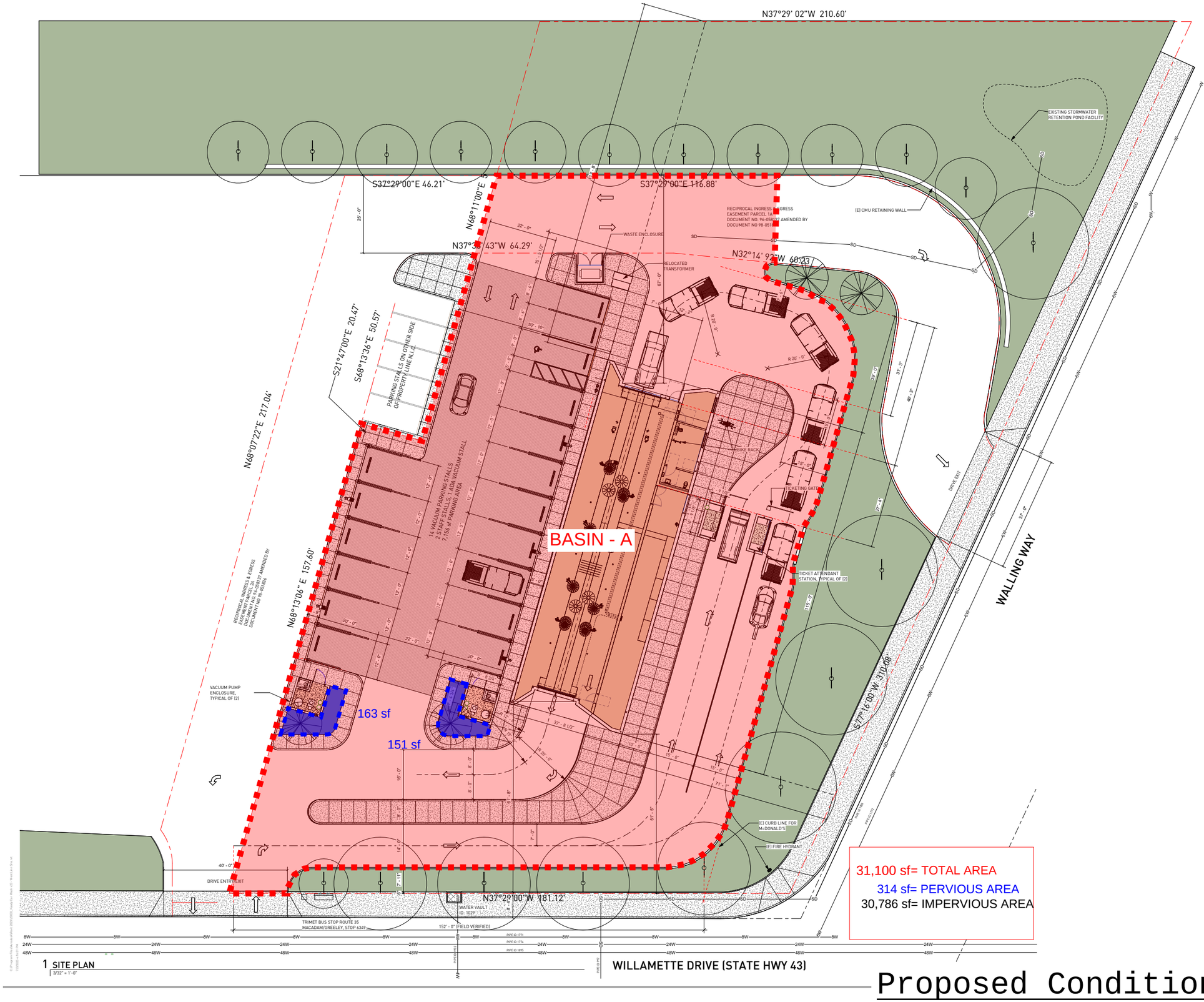
V. Appendices

Appendix A: Vicinity Map



Appendix B: Basin Maps and Areas

Proposed Conditions Basin Map



Appendix C: Assumptions

Santa Barbara Unit Hydrograph (SBUH) Assumptions:
(used for Water Quality, Flow Control, Conveyance)

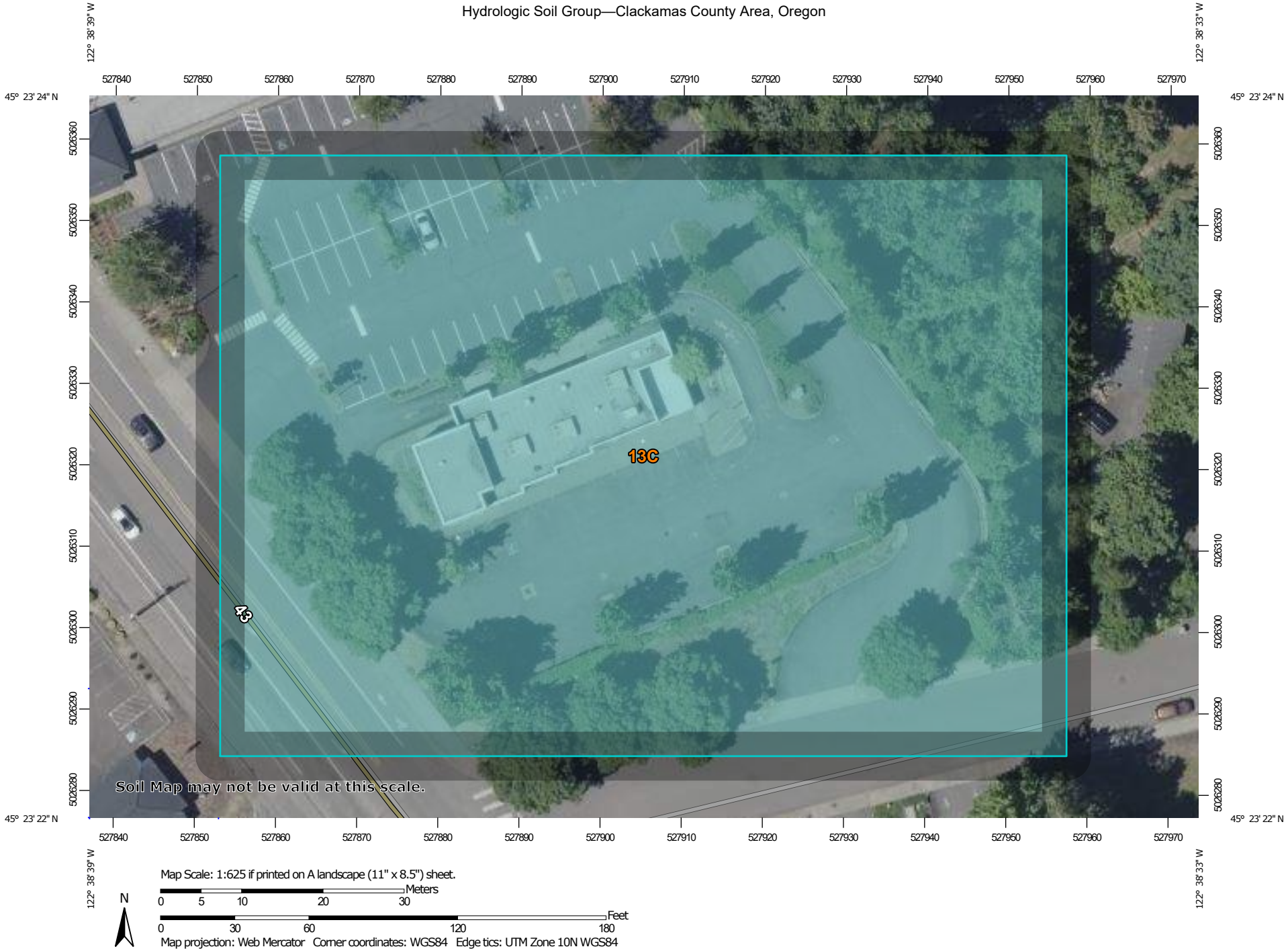
Storm Events:

Water Quality (WQ) Storm Event* =	**1.00***	in/24-hours per West Linn Design Standards 5/25
2-year Storm Event =	**2.50**	in/24-hours per West Linn Design Standards 5/25
10-year Storm Event =	**3.45**	in/24-hours per West Linn Design Standards 5/25
25-year Storm Event =	**3.90**	in/24-hours per West Linn Design Standards 5/25
		*80% of Average Annual Runoff for West Linn
Time of Concentration	**10.0**	minutes
Roughness Coefficient	**0.013**	

Curve Number Assumptions:

NRSC Soil Group =	**C**	
Impervious Area =	**98**	per West Linn Design Standards 5/25
Existing Pervious Area =	**86**	per West Linn Design Standards 5/25
Proposed Pervious Area =	**74**	per West Linn Design Standards 5/25
Pre-development Area =	**70**	per West Linn Design Standards 5/25

Appendix D: Soil Resource Report



Map Scale: 1:625 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 5 10 20 30

Feet
0 30 60 120 180

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

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Clackamas County Area, Oregon
Survey Area Data: Version 21, Aug 30, 2024

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

Date(s) aerial images were photographed: Mar 1, 2024—Jul 1, 2024

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
13C	Cascade silt loam, 8 to 15 percent slopes	C	1.9	100.0%
Totals for Area of Interest			**1.9**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

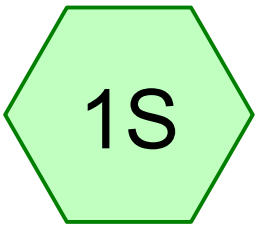
Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

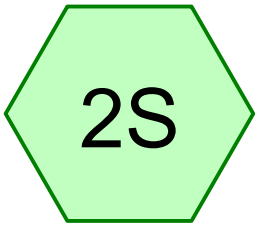
Appendix E: Geotechnical Report

To be provided in final stormwater report

Appendix F: Water Quality Calculations



Total Site (PreDev)



Total Site (PostDev)

Subcat Reach Pond Link

Routing Diagram for 25-C007 Kaady Car Wash
Prepared by Froelich Engineers, Printed 7/23/2025

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Total Site (PreDev) Runoff Area=31,100 sf 0.00% Impervious Runoff Depth=0.00"
Tc=10.0 min CN=70/0 Runoff=0.00 cfs 0.000 af

Subcatchment2S: Total Site (PostDev) Runoff Area=31,100 sf 98.99% Impervious Runoff Depth=0.78"
Tc=5.0 min CN=74/98 Runoff=0.14 cfs 0.047 af

water quality flow

Summary for Subcatchment 1S: Total Site (PreDev)

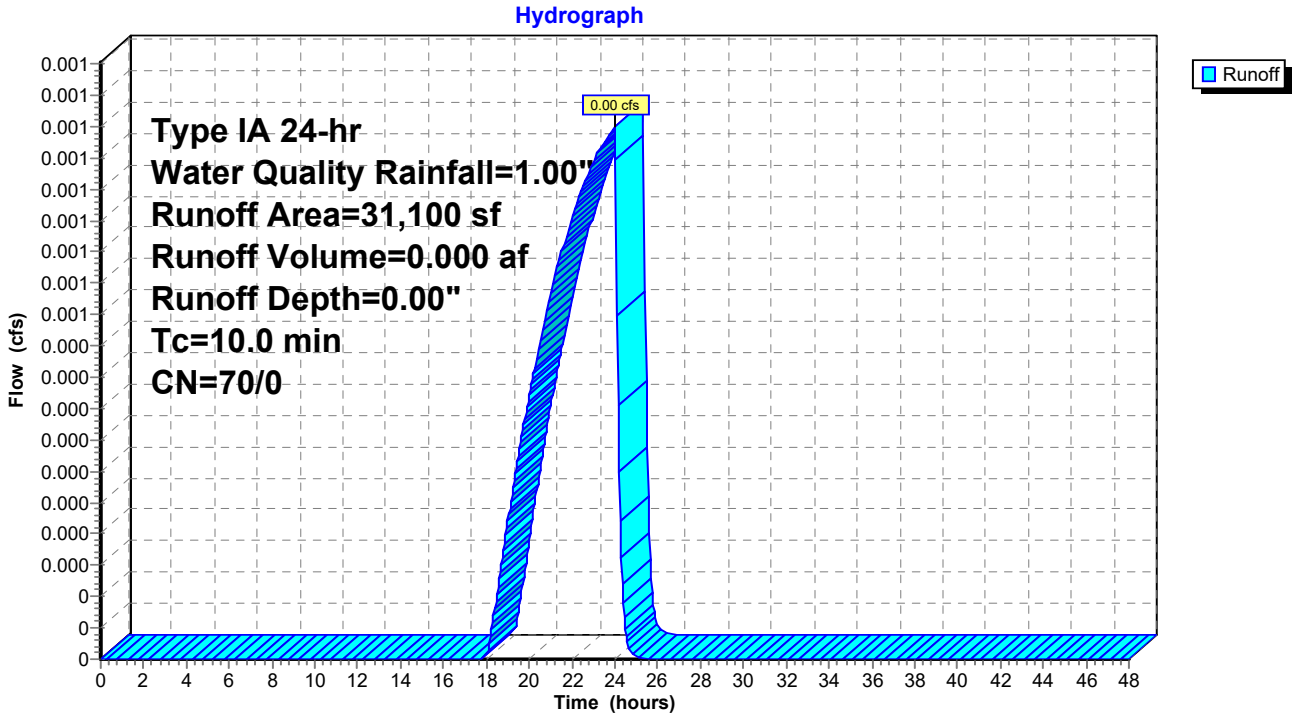
Runoff = 0.00 cfs @ 24.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type IA 24-hr Water Quality Rainfall=1.00"

	Area (sf)	CN	Description
*	31,100	70	
	31,100	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment 1S: Total Site (PreDev)



Summary for Subcatchment 2S: Total Site (PostDev)

[49] Hint: Tc<2dt may require smaller dt

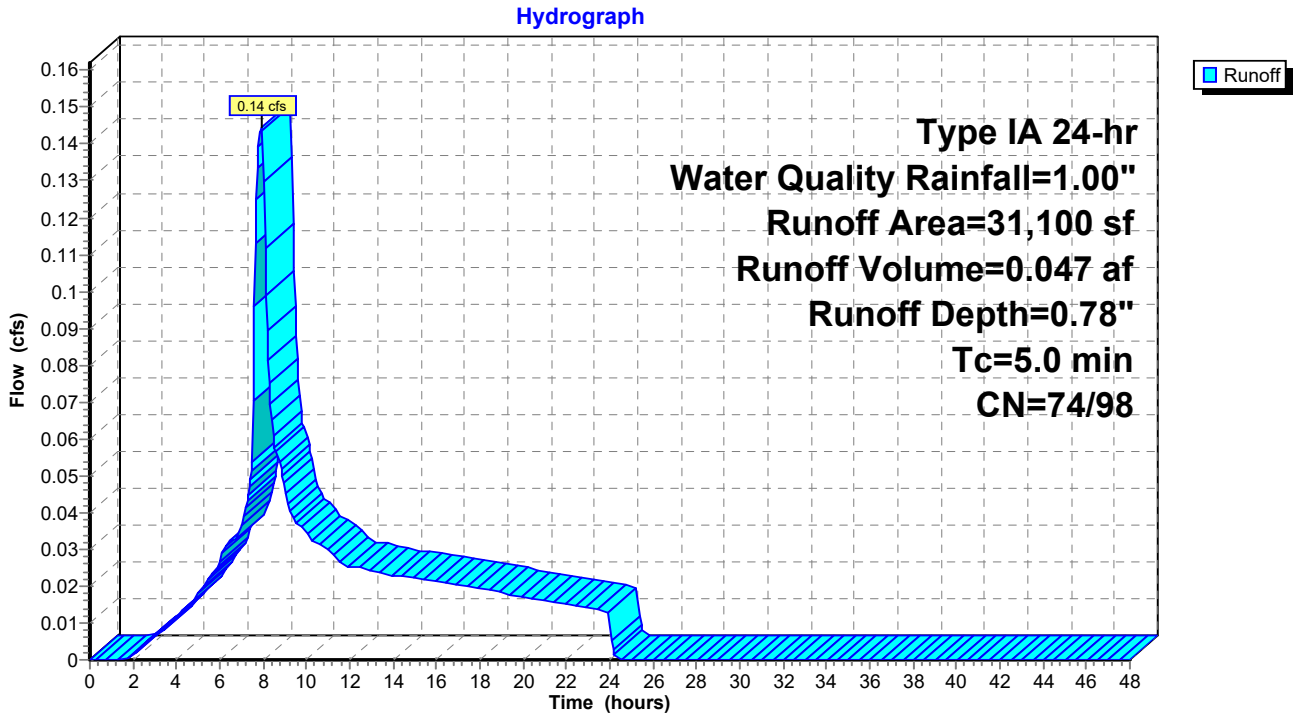
Runoff = 0.14 cfs @ 7.92 hrs, Volume= 0.047 af, Depth= 0.78"
Routed to Pond 3P : Det SC-800

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type IA 24-hr Water Quality Rainfall=1.00"

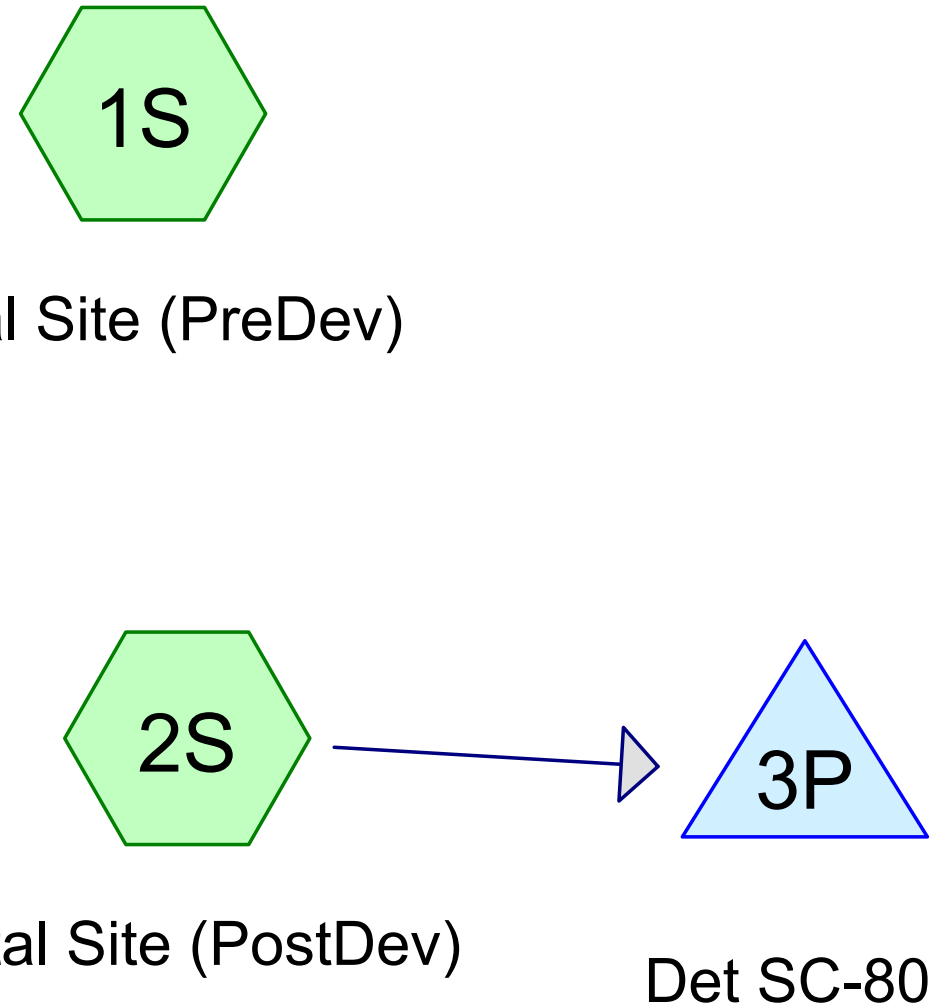
	Area (sf)	CN	Description
*	30,786	98	
*	314	74	
	31,100	98	Weighted Average
	314	74	1.01% Pervious Area
	30,786	98	98.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 2S: Total Site (PostDev)



Appendix G: Water Quantity Calculations



Subcat Reach Pond Link

Routing Diagram for 25-C007 Kaady Car Wash
Prepared by Froelich Engineers, Printed 7/29/2025

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	Type IA 24-hr		Default	24.00	1	2.50	2
2	10-Year	Type IA 24-hr		Default	24.00	1	3.45	2
3	25-Year	Type IA 24-hr		Default	24.00	1	3.90	2

predev flowrate

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Total Site (PreDev) Runoff Area=31,100 sf 0.00% Impervious Runoff Depth=0.46"
Tc=10.0 min CN=70/0 Runoff=0.02 cfs 0.027 af

Subcatchment2S: Total Site (PostDev) Runoff Area=31,100 sf 98.99% Impervious Runoff Depth=2.25"
Tc=5.0 min CN=74/98 Runoff=0.41 cfs 0.134 af

Pond 3P: Det SC-800 Peak Elev=103.24' Storage=0.109 af Inflow=0.41 cfs 0.134 af
Outflow=0.02 cfs 0.057 af

Total Runoff Area = 1.428 ac Runoff Volume = 0.161 af Average Runoff Depth = 1.35"
50.50% Pervious = 0.721 ac 49.50% Impervious = 0.707 ac

Summary for Subcatchment 1S: Total Site (PreDev)

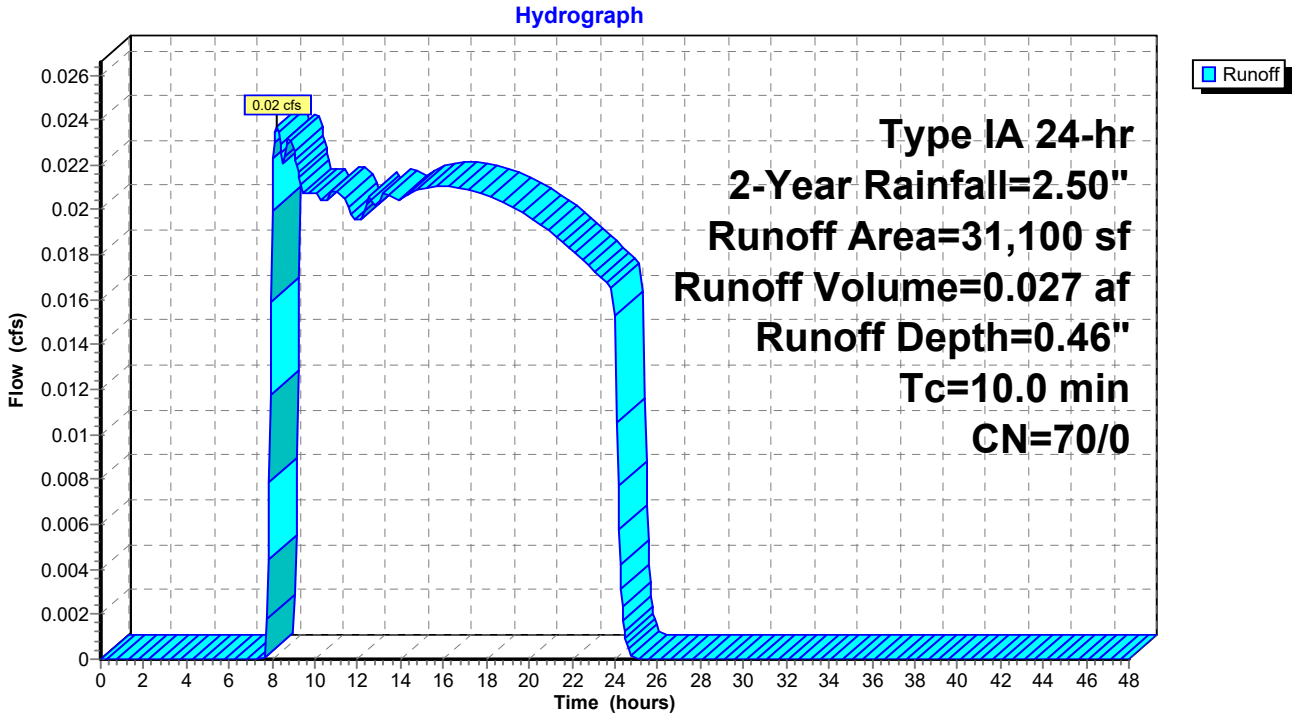
Runoff = 0.02 cfs @ 8.23 hrs, Volume= 0.027 af, Depth= 0.46"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-Year Rainfall=2.50"

	Area (sf)	CN	Description
*	31,100	70	
	31,100	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment 1S: Total Site (PreDev)



Summary for Subcatchment 2S: Total Site (PostDev)

[49] Hint: Tc<2dt may require smaller dt

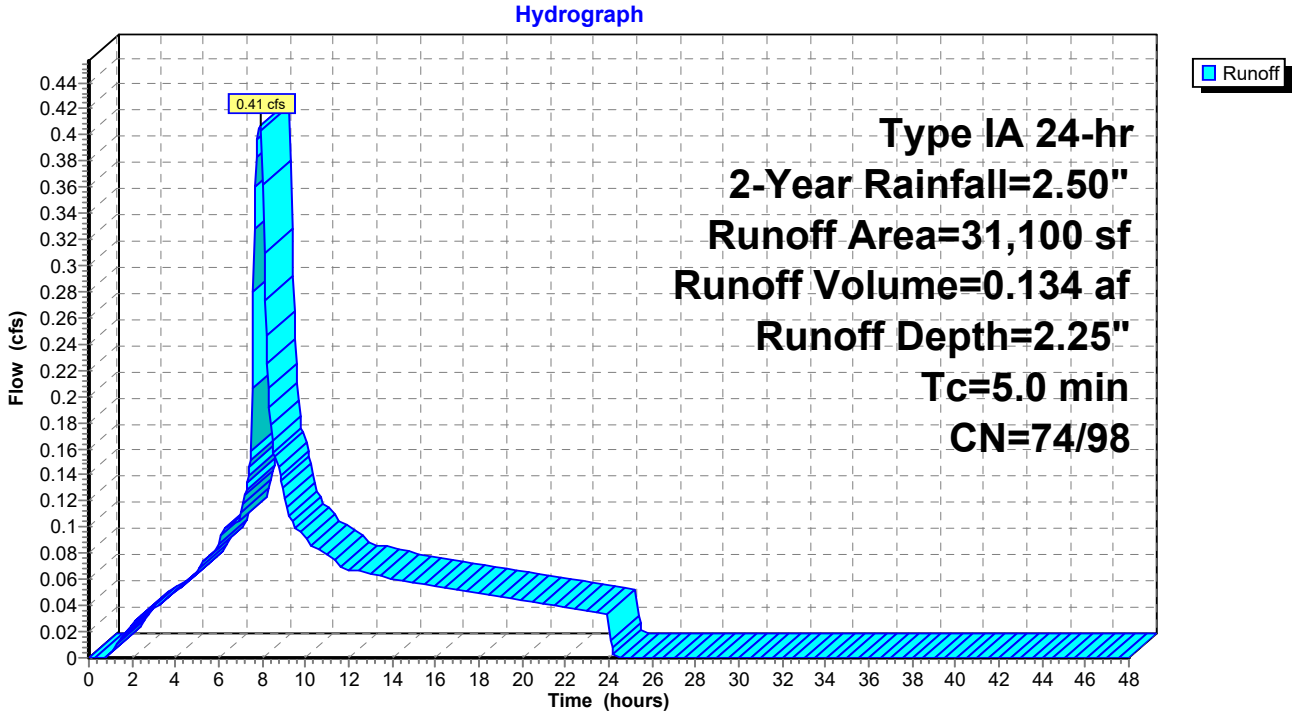
Runoff = 0.41 cfs @ 7.90 hrs, Volume= 0.134 af, Depth= 2.25"
Routed to Pond 3P : Det SC-800

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-Year Rainfall=2.50"

	Area (sf)	CN	Description
*	30,786	98	
*	314	74	
	31,100	98	Weighted Average
	314	74	1.01% Pervious Area
	30,786	98	98.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 2S: Total Site (PostDev)



Summary for Pond 3P: Det SC-800

Inflow Area = 0.714 ac, 98.99% Impervious, Inflow Depth = 2.25" for 2-Year event
Inflow = 0.41 cfs @ 7.90 hrs, Volume= 0.134 af
Outflow = 0.02 cfs @ 24.08 hrs, Volume= 0.057 af, Atten= 95%, Lag= 971.0 min
Primary = 0.02 cfs @ 24.08 hrs, Volume= 0.057 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 103.24' @ 24.08 hrs Surf.Area= 0.052 ac Storage= 0.109 af

Plug-Flow detention time= 1,215.7 min calculated for 0.057 af (43% of inflow)
Center-of-Mass det. time= 930.2 min (1,604.6 - 674.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	100.00'	0.049 af	**25.25'W x 89.17'L x 3.75'H Field A** 0.194 af Overall - 0.070 af Embedded = 0.123 af x 40.0% Voids
#2A	100.50'	0.070 af	**ADS_StormTech SC-800 +Cap** x 60 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 60 Chambers in 5 Rows Cap Storage= 3.4 cf x 2 x 5 rows = 34.2 cf
		0.120 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**0.625" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	103.65'	**8.000" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.02 cfs @ 24.08 hrs HW=103.24' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.02 cfs @ 8.63 fps)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 3P: Det SC-800 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-800 +Cap (ADS StormTech®SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 5 rows = 34.2 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

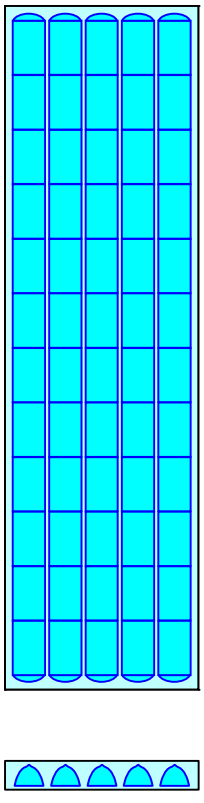
12 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 87.17' Row Length +12.0" End Stone x 2 = 89.17' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Stone Base + 33.0" Chamber Height + 6.0" Stone Cover = 3.75' Field Height

60 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 5 Rows = 3,069.7 cf Chamber Storage

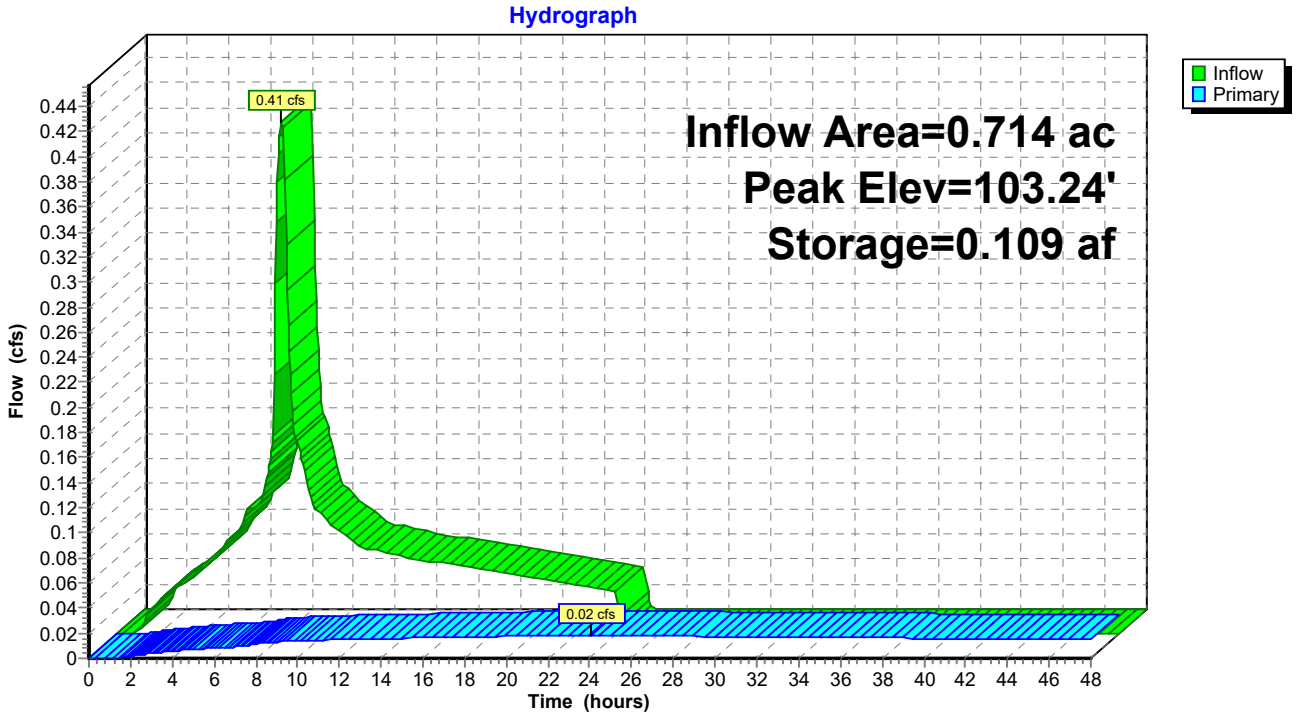
8,443.0 cf Field - 3,069.7 cf Chambers = 5,373.2 cf Stone x 40.0% Voids = 2,149.3 cf Stone Storage

Chamber Storage + Stone Storage = 5,219.0 cf = 0.120 af
Overall Storage Efficiency = 61.8%
Overall System Size = 89.17' x 25.25' x 3.75'

60 Chambers
312.7 cy Field
199.0 cy Stone



Pond 3P: Det SC-800



predev flowrate

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Total Site (PreDev) Runoff Area=31,100 sf 0.00% Impervious Runoff Depth=0.98"
Tc=10.0 min CN=70/0 Runoff=0.11 cfs 0.058 af

Subcatchment2S: Total Site (PostDev) Runoff Area=31,100 sf 98.99% Impervious Runoff Depth=3.20"
Tc=5.0 min CN=74/98 Runoff=0.57 cfs 0.190 af

Pond 3P: Det SC-800 Peak Elev=103.69' Storage=0.119 af Inflow=0.57 cfs 0.190 af
Outflow=0.09 cfs 0.106 af

Total Runoff Area = 1.428 ac Runoff Volume = 0.248 af Average Runoff Depth = 2.09"
50.50% Pervious = 0.721 ac 49.50% Impervious = 0.707 ac

Summary for Subcatchment 1S: Total Site (PreDev)

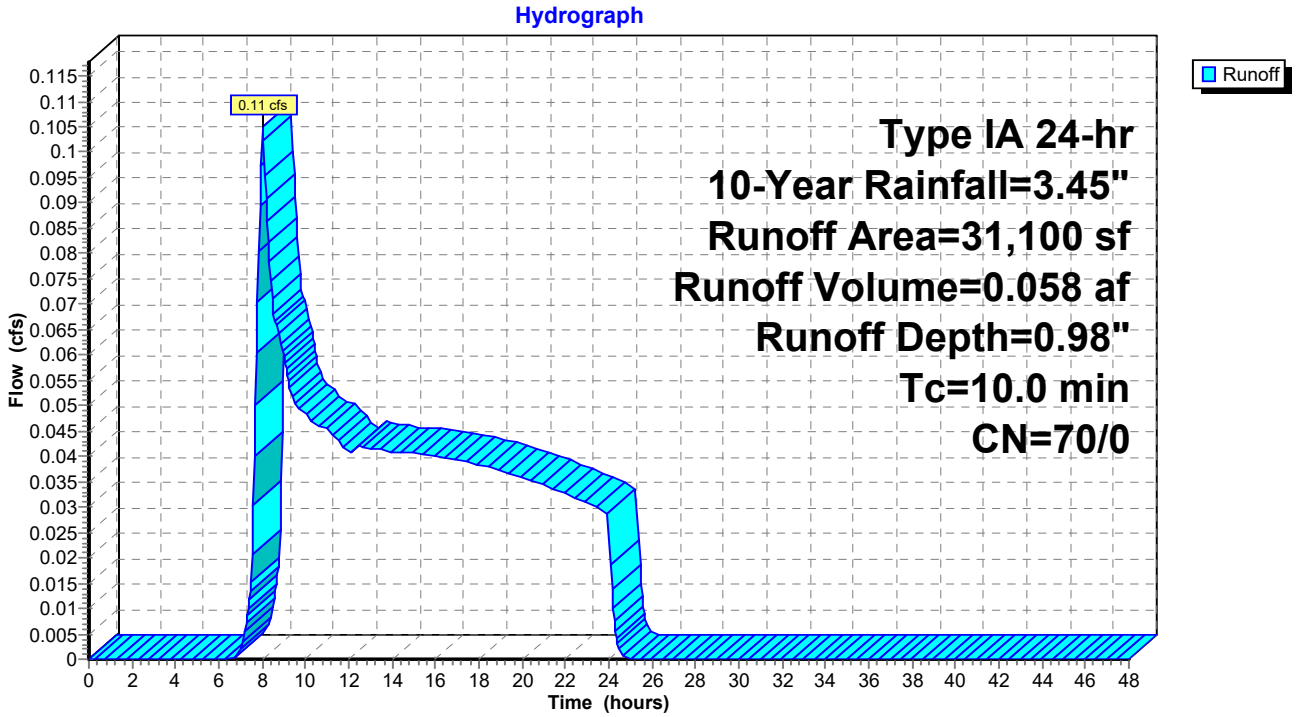
Runoff = 0.11 cfs @ 8.03 hrs, Volume= 0.058 af, Depth= 0.98"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-Year Rainfall=3.45"

	Area (sf)	CN	Description
*	31,100	70	
	31,100	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment 1S: Total Site (PreDev)



Summary for Subcatchment 2S: Total Site (PostDev)

[49] Hint: Tc<2dt may require smaller dt

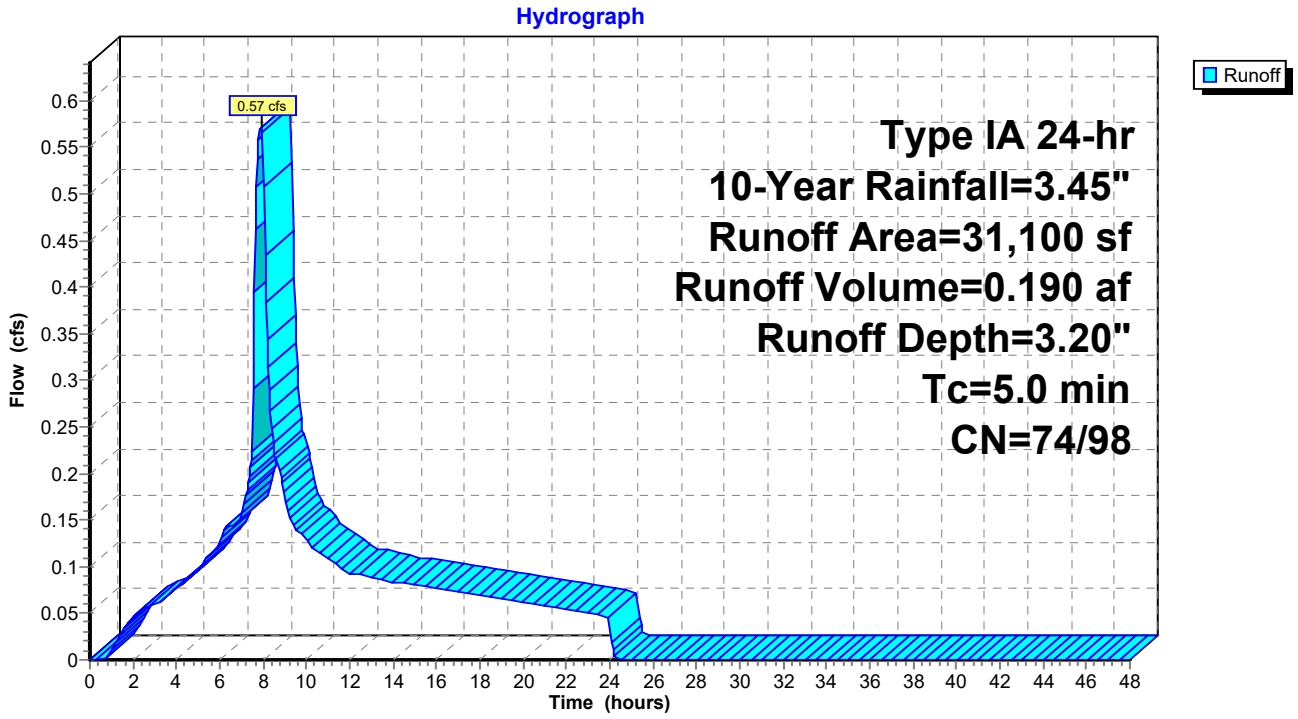
Runoff = 0.57 cfs @ 7.90 hrs, Volume= 0.190 af, Depth= 3.20"
Routed to Pond 3P : Det SC-800

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-Year Rainfall=3.45"

	Area (sf)	CN	Description
*	30,786	98	
*	314	74	
	31,100	98	Weighted Average
	314	74	1.01% Pervious Area
	30,786	98	98.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 2S: Total Site (PostDev)



Summary for Pond 3P: Det SC-800

Inflow Area = 0.714 ac, 98.99% Impervious, Inflow Depth = 3.20" for 10-Year event
Inflow = 0.57 cfs @ 7.90 hrs, Volume= 0.190 af
Outflow = 0.09 cfs @ 13.62 hrs, Volume= 0.106 af, Atten= 85%, Lag= 343.6 min
Primary = 0.09 cfs @ 13.62 hrs, Volume= 0.106 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 103.69' @ 13.62 hrs Surf.Area= 0.052 ac Storage= 0.119 af

Plug-Flow detention time= 945.2 min calculated for 0.106 af (56% of inflow)
Center-of-Mass det. time= 700.6 min (1,365.7 - 665.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	100.00'	0.049 af	**25.25'W x 89.17'L x 3.75'H Field A** 0.194 af Overall - 0.070 af Embedded = 0.123 af x 40.0% Voids
#2A	100.50'	0.070 af	**ADS_StormTech SC-800 +Cap** x 60 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 60 Chambers in 5 Rows Cap Storage= 3.4 cf x 2 x 5 rows = 34.2 cf
		0.120 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**0.625" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	103.65'	**8.000" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.08 cfs @ 13.62 hrs HW=103.69' (Free Discharge)
1=Orifice/Grate (Orifice Controls 0.02 cfs @ 9.22 fps)
2=Orifice/Grate (Weir Controls 0.06 cfs @ 0.68 fps)

Pond 3P: Det SC-800 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-800 +Cap (ADS StormTech®SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 5 rows = 34.2 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

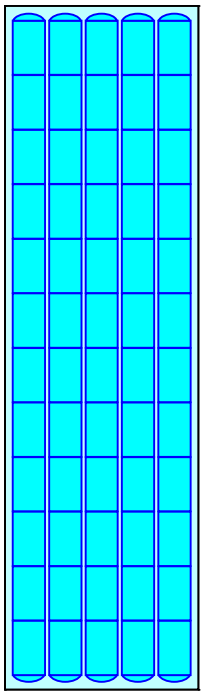
12 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 87.17' Row Length +12.0" End Stone x 2 = 89.17' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Stone Base + 33.0" Chamber Height + 6.0" Stone Cover = 3.75' Field Height

60 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 5 Rows = 3,069.7 cf Chamber Storage

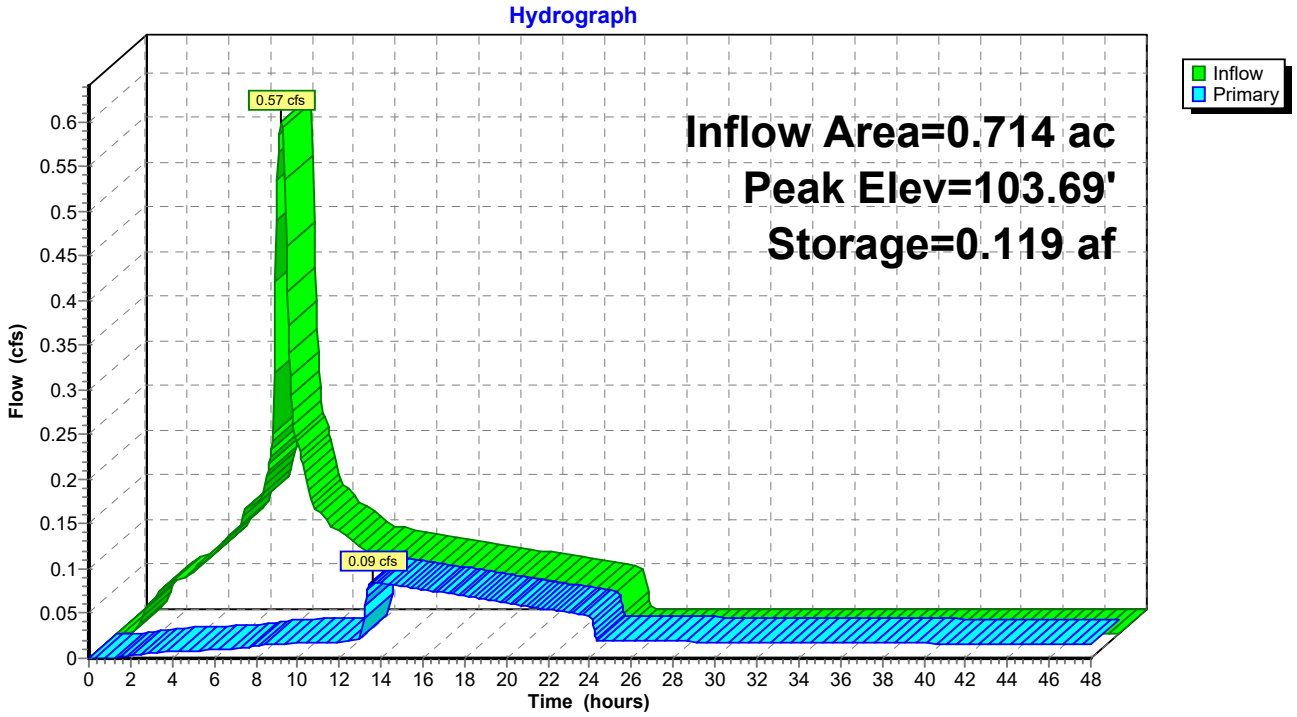
8,443.0 cf Field - 3,069.7 cf Chambers = 5,373.2 cf Stone x 40.0% Voids = 2,149.3 cf Stone Storage

Chamber Storage + Stone Storage = 5,219.0 cf = 0.120 af
Overall Storage Efficiency = 61.8%
Overall System Size = 89.17' x 25.25' x 3.75'

60 Chambers
312.7 cy Field
199.0 cy Stone



Pond 3P: Det SC-800



predev flowrate

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Total Site (PreDev) Runoff Area=31,100 sf 0.00% Impervious Runoff Depth=1.26"
Tc=10.0 min CN=70/0 Runoff=0.15 cfs 0.075 af

Subcatchment2S: Total Site (PostDev) Runoff Area=31,100 sf 98.99% Impervious Runoff Depth=3.64"
Tc=5.0 min CN=74/98 Runoff=0.65 cfs 0.217 af

Pond 3P: Det SC-800 Peak Elev=103.71' Storage=0.119 af Inflow=0.65 cfs 0.217 af
Outflow=0.12 cfs 0.133 af

Total Runoff Area = 1.428 ac Runoff Volume = 0.292 af Average Runoff Depth = 2.45"
50.50% Pervious = 0.721 ac 49.50% Impervious = 0.707 ac

Peak flowrate for conveyance

Summary for Subcatchment 1S: Total Site (PreDev)

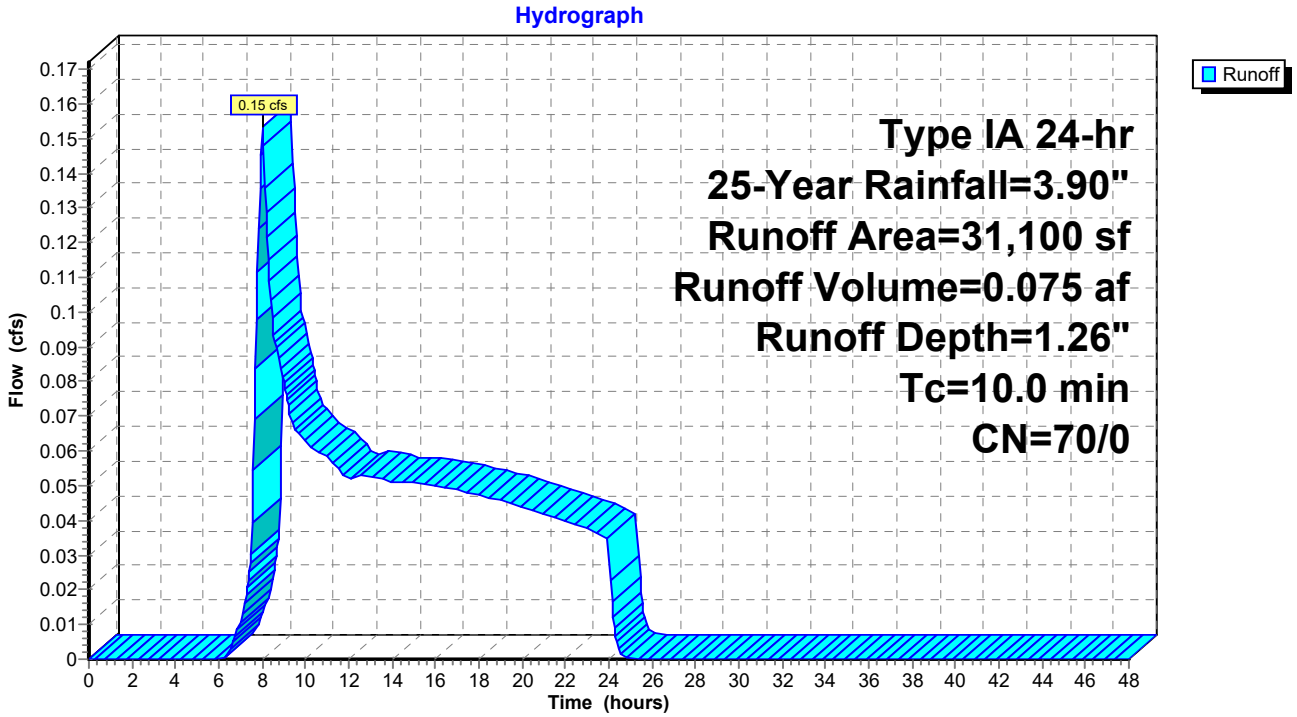
Runoff = 0.15 cfs @ 8.02 hrs, Volume= 0.075 af, Depth= 1.26"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-Year Rainfall=3.90"

	Area (sf)	CN	Description
*	31,100	70	
	31,100	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment 1S: Total Site (PreDev)



Summary for Subcatchment 2S: Total Site (PostDev)

[49] Hint: Tc<2dt may require smaller dt

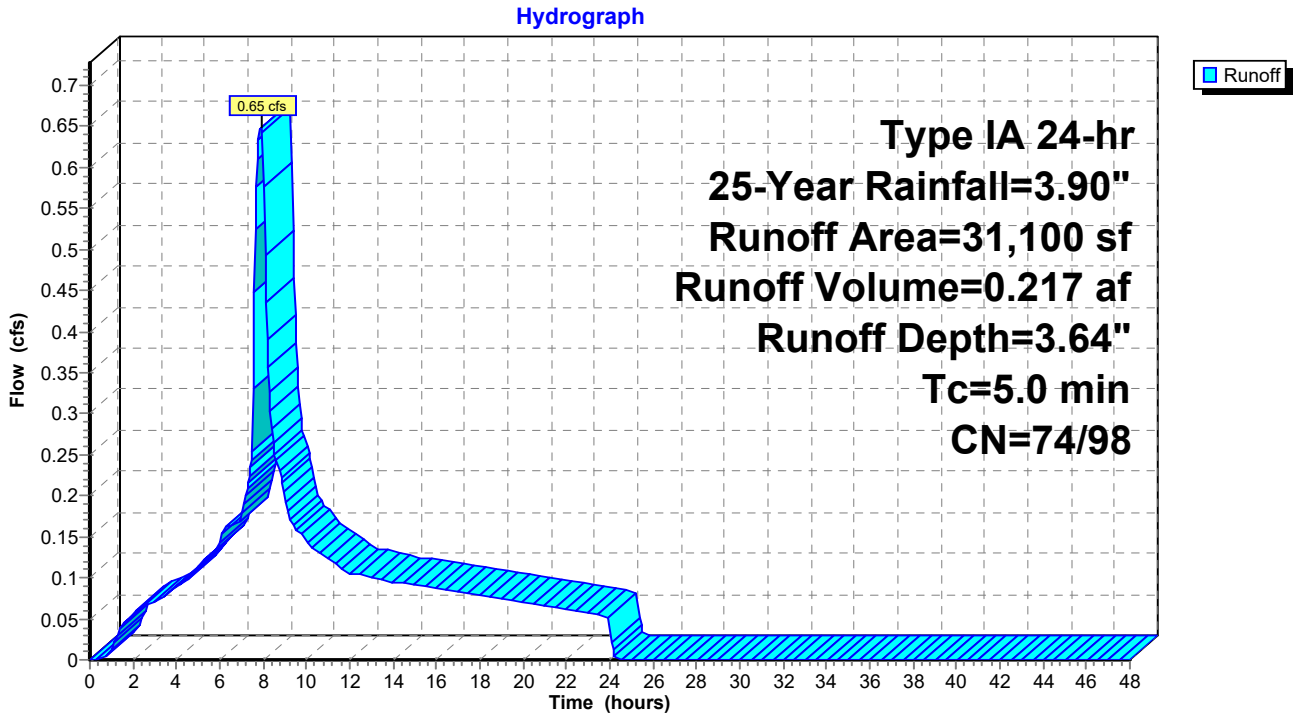
Runoff = 0.65 cfs @ 7.90 hrs, Volume= 0.217 af, Depth= 3.64"
Routed to Pond 3P : Det SC-800

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-Year Rainfall=3.90"

	Area (sf)	CN	Description
*	30,786	98	
*	314	74	
	31,100	98	Weighted Average
	314	74	1.01% Pervious Area
	30,786	98	98.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 2S: Total Site (PostDev)



Summary for Pond 3P: Det SC-800

Inflow Area = 0.714 ac, 98.99% Impervious, Inflow Depth = 3.64" for 25-Year event
Inflow = 0.65 cfs @ 7.90 hrs, Volume= 0.217 af
Outflow = 0.12 cfs @ 11.21 hrs, Volume= 0.133 af, Atten= 82%, Lag= 198.8 min
Primary = 0.12 cfs @ 11.21 hrs, Volume= 0.133 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 103.71' @ 11.21 hrs Surf.Area= 0.052 ac Storage= 0.119 af

Plug-Flow detention time= 819.7 min calculated for 0.133 af (61% of inflow)
Center-of-Mass det. time= 595.3 min (1,257.4 - 662.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	100.00'	0.049 af	**25.25'W x 89.17'L x 3.75'H Field A** 0.194 af Overall - 0.070 af Embedded = 0.123 af x 40.0% Voids
#2A	100.50'	0.070 af	**ADS_StormTech SC-800 +Cap** x 60 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 60 Chambers in 5 Rows Cap Storage= 3.4 cf x 2 x 5 rows = 34.2 cf
		0.120 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**0.625" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	103.65'	**8.000" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.12 cfs @ 11.21 hrs HW=103.71' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.02 cfs @ 9.24 fps)
└**2=Orifice/Grate** (Weir Controls 0.10 cfs @ 0.80 fps)

Pond 3P: Det SC-800 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-800 +Cap (ADS StormTech®SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 5 rows = 34.2 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

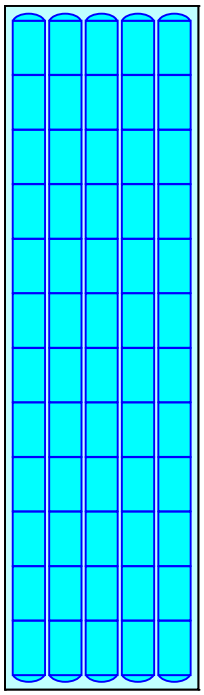
12 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 87.17' Row Length +12.0" End Stone x 2 = 89.17' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Stone Base + 33.0" Chamber Height + 6.0" Stone Cover = 3.75' Field Height

60 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 5 Rows = 3,069.7 cf Chamber Storage

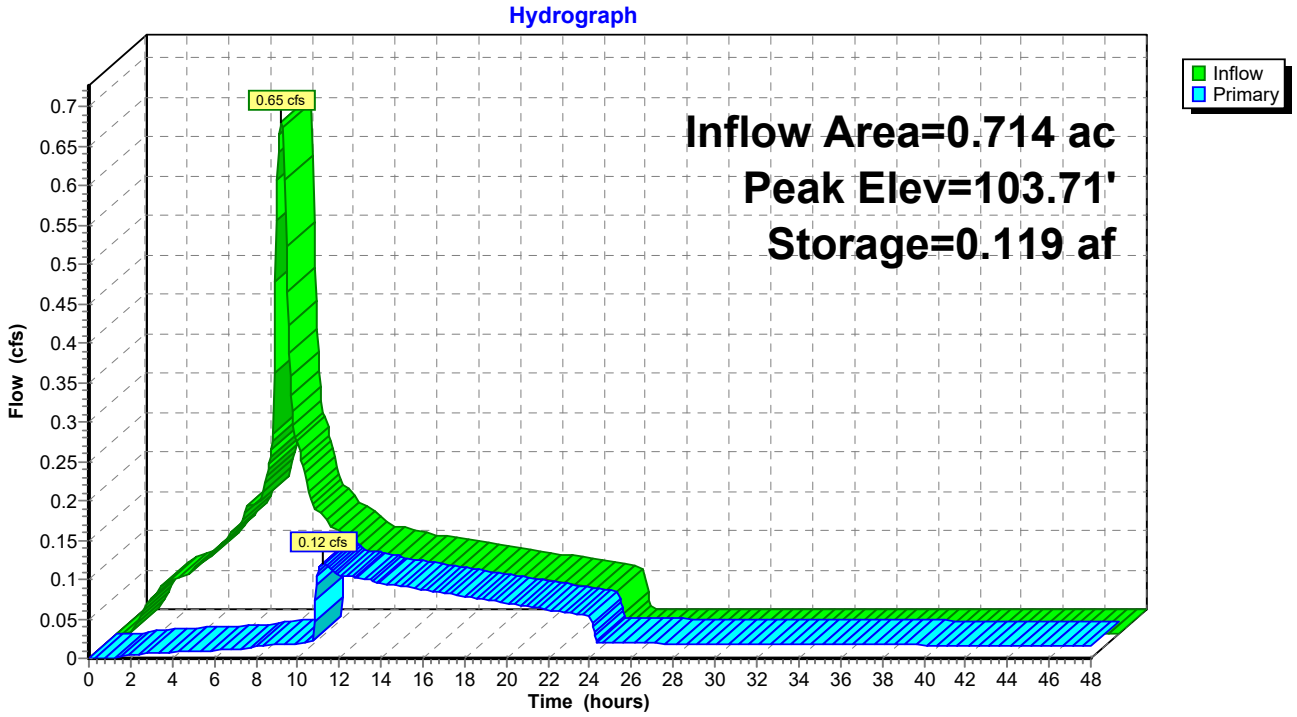
8,443.0 cf Field - 3,069.7 cf Chambers = 5,373.2 cf Stone x 40.0% Voids = 2,149.3 cf Stone Storage

Chamber Storage + Stone Storage = 5,219.0 cf = 0.120 af
Overall Storage Efficiency = 61.8%
Overall System Size = 89.17' x 25.25' x 3.75'

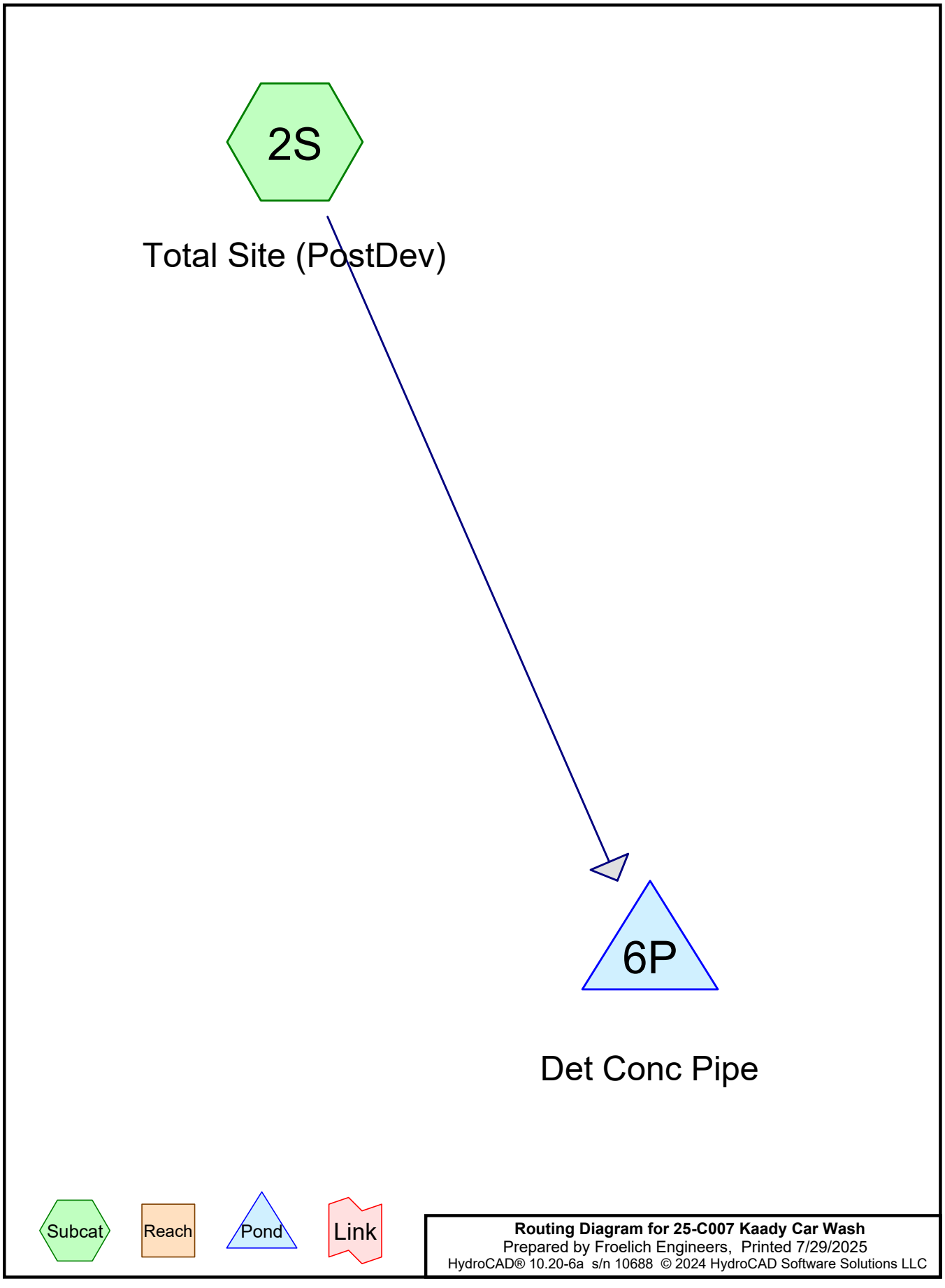
60 Chambers
312.7 cy Field
199.0 cy Stone



Pond 3P: Det SC-800



CONCRETE DETENTION PIPE ANALYSIS



Routing Diagram for 25-C007 Kaady Car Wash
Prepared by Froelich Engineers, Printed 7/29/2025

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	Type IA 24-hr		Default	24.00	1	2.50	2
2	10-Year	Type IA 24-hr		Default	24.00	1	3.45	2
3	25-Year	Type IA 24-hr		Default	24.00	1	3.90	2

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment2S: Total Site (PostDev) Runoff Area=31,100 sf 98.99% Impervious Runoff Depth=2.25"
Tc=5.0 min CN=74/98 Runoff=0.41 cfs 0.134 af

Pond 6P: Det Conc Pipe Peak Elev=102.63' Storage=0.105 af Inflow=0.41 cfs 0.134 af
Outflow=0.02 cfs 0.066 af

Total Runoff Area = 0.714 ac Runoff Volume = 0.134 af Average Runoff Depth = 2.25"
1.01% Pervious = 0.007 ac 98.99% Impervious = 0.707 ac

Summary for Subcatchment 2S: Total Site (PostDev)

[49] Hint: Tc<2dt may require smaller dt

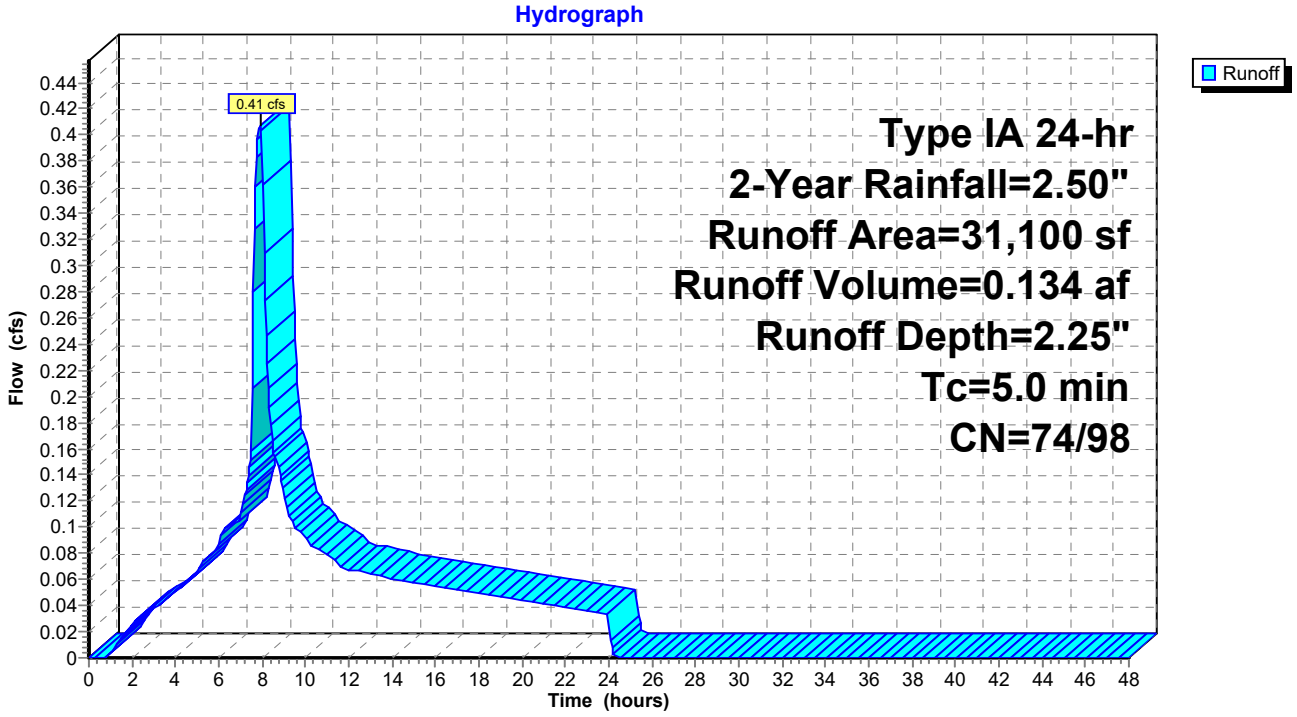
Runoff = 0.41 cfs @ 7.90 hrs, Volume= 0.134 af, Depth= 2.25"
Routed to Pond 6P : Det Conc Pipe

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-Year Rainfall=2.50"

	Area (sf)	CN	Description
*	30,786	98	
*	314	74	
	31,100	98	Weighted Average
	314	74	1.01% Pervious Area
	30,786	98	98.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 2S: Total Site (PostDev)



Summary for Pond 6P: Det Conc Pipe

Inflow Area = 0.714 ac, 98.99% Impervious, Inflow Depth = 2.25" for 2-Year event
Inflow = 0.41 cfs @ 7.90 hrs, Volume= 0.134 af
Outflow = 0.02 cfs @ 24.07 hrs, Volume= 0.066 af, Atten= 95%, Lag= 970.2 min
Primary = 0.02 cfs @ 24.07 hrs, Volume= 0.066 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 102.63' @ 24.07 hrs Surf.Area= 0.065 ac Storage= 0.105 af

Plug-Flow detention time= 1,181.4 min calculated for 0.066 af (49% of inflow)
Center-of-Mass det. time= 915.5 min (1,590.0 - 674.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	100.00'	0.028 af	**22.00'W x 129.00'L x 3.08'H Field A** 0.201 af Overall - 0.132 af Embedded = 0.069 af x 40.0% Voids
#2A	100.00'	0.087 af	**RCP Round 30** x 96 Inside #1 Inside= 30.0"W x 30.0"H => 4.91 sf x 8.00'L = 39.3 cf Outside= 37.0"W x 37.0"H => 7.46 sf x 8.00'L = 59.7 cf 96 Chambers in 6 Rows
		0.114 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**0.700" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	102.90'	**8.000" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.02 cfs @ 24.07 hrs HW=102.63' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.02 cfs @ 7.76 fps)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 6P: Det Conc Pipe - Chamber Wizard Field A

Chamber Model = RCP Round 30 (Round Reinforced Concrete Pipe)
Inside= 30.0"W x 30.0"H => 4.91 sf x 8.00'L = 39.3 cf
Outside= 37.0"W x 37.0"H => 7.46 sf x 8.00'L = 59.7 cf

37.0" Wide + 6.0" Spacing = 43.0" C-C Row Spacing

16 Chambers/Row x 8.00' Long = 128.00' Row Length +6.0" End Stone x 2 = 129.00' Base Length
6 Rows x 37.0" Wide + 6.0" Spacing x 5 + 6.0" Side Stone x 2 = 22.00' Base Width
37.0" Chamber Height = 3.08' Field Height

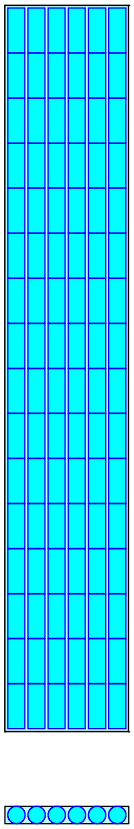
96 Chambers x 39.3 cf = 3,769.9 cf Chamber Storage
96 Chambers x 59.7 cf = 5,732.0 cf Displacement

8,750.5 cf Field - 5,732.0 cf Chambers = 3,018.5 cf Stone x 40.0% Voids = 1,207.4 cf Stone Storage

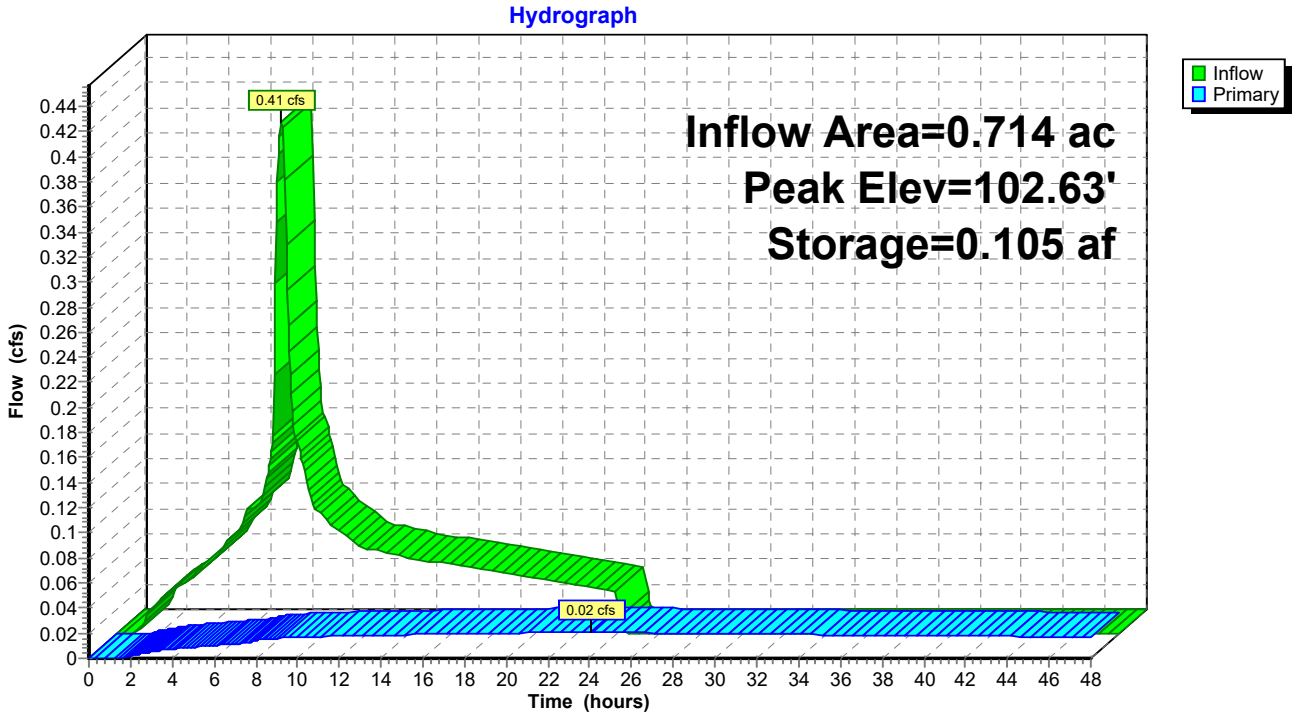
Chamber Storage + Stone Storage = 4,977.3 cf = 0.114 af
Overall Storage Efficiency = 56.9%
Overall System Size = 129.00' x 22.00' x 3.08'

OVERALL SIZE

96 Chambers
324.1 cy Field
111.8 cy Stone



Pond 6P: Det Conc Pipe



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment2S: Total Site (PostDev) Runoff Area=31,100 sf 98.99% Impervious Runoff Depth=3.20"
Tc=5.0 min CN=74/98 Runoff=0.57 cfs 0.190 af

Pond 6P: Det Conc Pipe Peak Elev=102.95' Storage=0.111 af Inflow=0.57 cfs 0.190 af
Outflow=0.09 cfs 0.117 af

Total Runoff Area = 0.714 ac Runoff Volume = 0.190 af Average Runoff Depth = 3.20"
1.01% Pervious = 0.007 ac 98.99% Impervious = 0.707 ac

Summary for Subcatchment 2S: Total Site (PostDev)

[49] Hint: Tc<2dt may require smaller dt

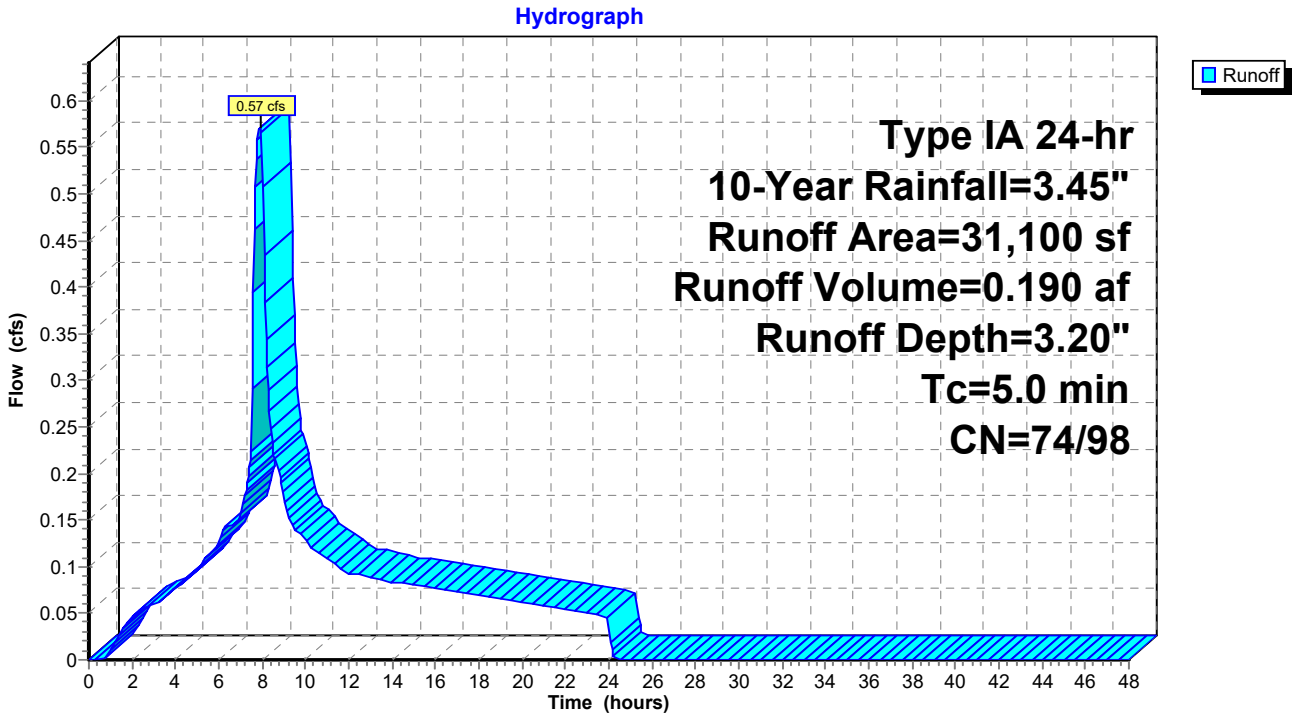
Runoff = 0.57 cfs @ 7.90 hrs, Volume= 0.190 af, Depth= 3.20"
Routed to Pond 6P : Det Conc Pipe

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-Year Rainfall=3.45"

	Area (sf)	CN	Description
*	30,786	98	
*	314	74	
	31,100	98	Weighted Average
	314	74	1.01% Pervious Area
	30,786	98	98.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 2S: Total Site (PostDev)



Summary for Pond 6P: Det Conc Pipe

Inflow Area = 0.714 ac, 98.99% Impervious, Inflow Depth = 3.20" for 10-Year event
Inflow = 0.57 cfs @ 7.90 hrs, Volume= 0.190 af
Outflow = 0.09 cfs @ 12.65 hrs, Volume= 0.117 af, Atten= 84%, Lag= 285.2 min
Primary = 0.09 cfs @ 12.65 hrs, Volume= 0.117 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 102.95' @ 12.65 hrs Surf.Area= 0.065 ac Storage= 0.111 af

Plug-Flow detention time= 908.7 min calculated for 0.117 af (62% of inflow)
Center-of-Mass det. time= 684.7 min (1,349.8 - 665.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	100.00'	0.028 af	**22.00'W x 129.00'L x 3.08'H Field A** 0.201 af Overall - 0.132 af Embedded = 0.069 af x 40.0% Voids
#2A	100.00'	0.087 af	**RCP Round 30** x 96 Inside #1 Inside= 30.0"W x 30.0"H => 4.91 sf x 8.00'L = 39.3 cf Outside= 37.0"W x 37.0"H => 7.46 sf x 8.00'L = 59.7 cf 96 Chambers in 6 Rows
		0.114 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**0.700" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	102.90'	**8.000" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.09 cfs @ 12.65 hrs HW=102.95' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.02 cfs @ 8.22 fps)
└**2=Orifice/Grate** (Weir Controls 0.07 cfs @ 0.70 fps)

Pond 6P: Det Conc Pipe - Chamber Wizard Field A

Chamber Model = RCP Round 30 (Round Reinforced Concrete Pipe)
Inside= 30.0"W x 30.0"H => 4.91 sf x 8.00'L = 39.3 cf
Outside= 37.0"W x 37.0"H => 7.46 sf x 8.00'L = 59.7 cf

37.0" Wide + 6.0" Spacing = 43.0" C-C Row Spacing

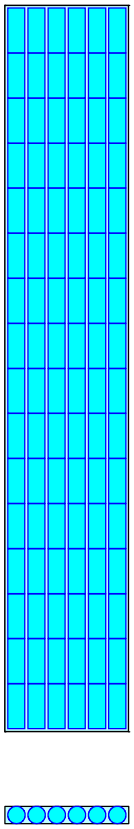
16 Chambers/Row x 8.00' Long = 128.00' Row Length +6.0" End Stone x 2 = 129.00' Base Length
6 Rows x 37.0" Wide + 6.0" Spacing x 5 + 6.0" Side Stone x 2 = 22.00' Base Width
37.0" Chamber Height = 3.08' Field Height

96 Chambers x 39.3 cf = 3,769.9 cf Chamber Storage
96 Chambers x 59.7 cf = 5,732.0 cf Displacement

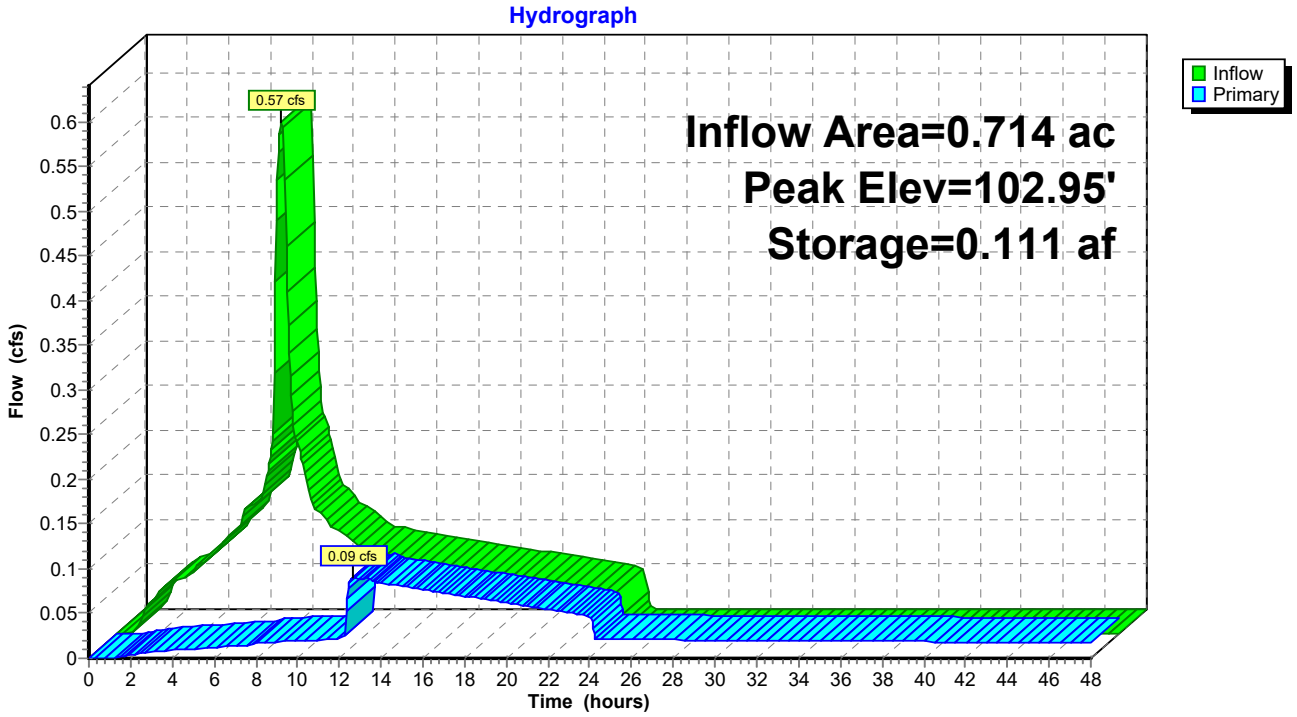
8,750.5 cf Field - 5,732.0 cf Chambers = 3,018.5 cf Stone x 40.0% Voids = 1,207.4 cf Stone Storage

Chamber Storage + Stone Storage = 4,977.3 cf = 0.114 af
Overall Storage Efficiency = 56.9%
Overall System Size = 129.00' x 22.00' x 3.08'

96 Chambers
324.1 cy Field
111.8 cy Stone



Pond 6P: Det Conc Pipe



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment2S: Total Site (PostDev) Runoff Area=31,100 sf 98.99% Impervious Runoff Depth=3.64"
Tc=5.0 min CN=74/98 Runoff=0.65 cfs 0.217 af

Pond 6P: Det Conc Pipe Peak Elev=102.96' Storage=0.112 af Inflow=0.65 cfs 0.217 af
Outflow=0.13 cfs 0.144 af

Total Runoff Area = 0.714 ac Runoff Volume = 0.217 af Average Runoff Depth = 3.64"
1.01% Pervious = 0.007 ac 98.99% Impervious = 0.707 ac

Summary for Subcatchment 2S: Total Site (PostDev)

[49] Hint: Tc<2dt may require smaller dt

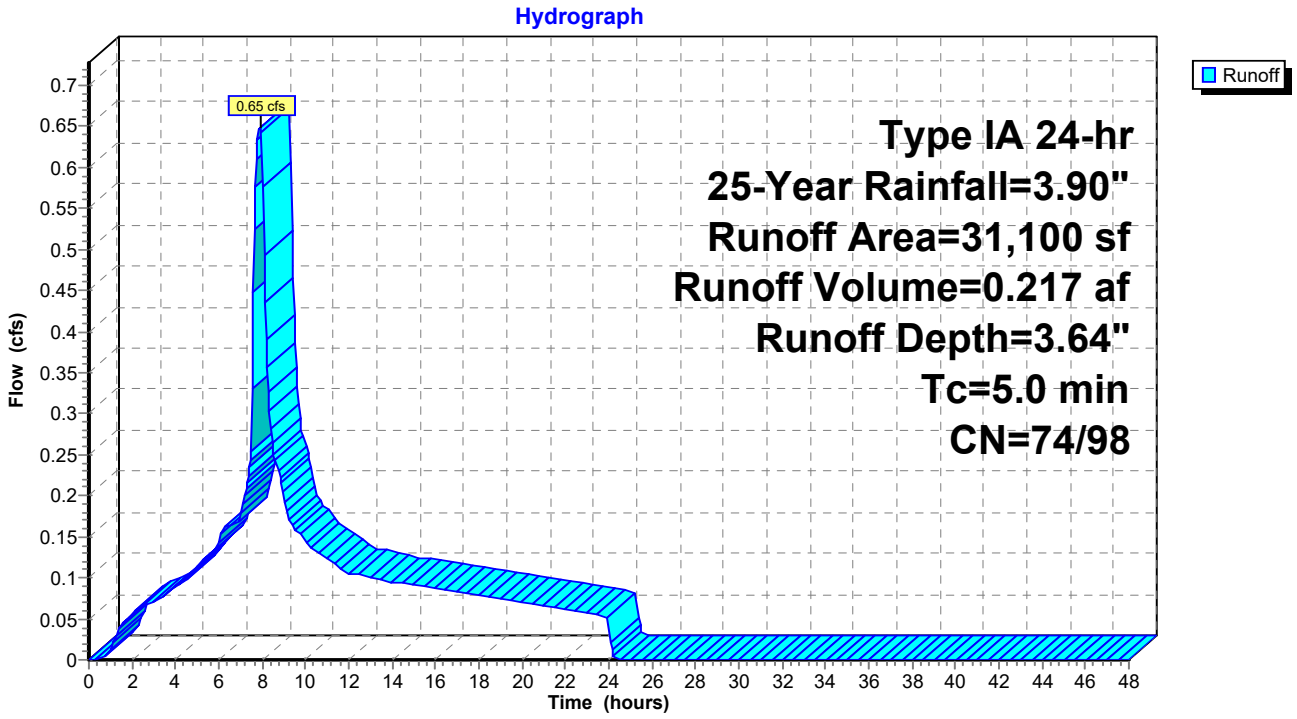
Runoff = 0.65 cfs @ 7.90 hrs, Volume= 0.217 af, Depth= 3.64"
Routed to Pond 6P : Det Conc Pipe

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-Year Rainfall=3.90"

	Area (sf)	CN	Description
*	30,786	98	
*	314	74	
	31,100	98	Weighted Average
	314	74	1.01% Pervious Area
	30,786	98	98.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 2S: Total Site (PostDev)



Summary for Pond 6P: Det Conc Pipe

Inflow Area = 0.714 ac, 98.99% Impervious, Inflow Depth = 3.64" for 25-Year event
Inflow = 0.65 cfs @ 7.90 hrs, Volume= 0.217 af
Outflow = 0.13 cfs @ 10.69 hrs, Volume= 0.144 af, Atten= 80%, Lag= 167.5 min
Primary = 0.13 cfs @ 10.69 hrs, Volume= 0.144 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 102.96' @ 10.69 hrs Surf.Area= 0.065 ac Storage= 0.112 af

Plug-Flow detention time= 789.5 min calculated for 0.144 af (66% of inflow)
Center-of-Mass det. time= 585.3 min (1,247.4 - 662.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	100.00'	0.028 af	**22.00'W x 129.00'L x 3.08'H Field A** 0.201 af Overall - 0.132 af Embedded = 0.069 af x 40.0% Voids
#2A	100.00'	0.087 af	**RCP Round 30** x 96 Inside #1 Inside= 30.0"W x 30.0"H => 4.91 sf x 8.00'L = 39.3 cf Outside= 37.0"W x 37.0"H => 7.46 sf x 8.00'L = 59.7 cf 96 Chambers in 6 Rows
		0.114 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**0.700" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	102.90'	**8.000" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.13 cfs @ 10.69 hrs HW=102.96' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 0.02 cfs @ 8.25 fps)
└—**2=Orifice/Grate** (Weir Controls 0.11 cfs @ 0.82 fps)

Pond 6P: Det Conc Pipe - Chamber Wizard Field A

Chamber Model = RCP Round 30 (Round Reinforced Concrete Pipe)
Inside= 30.0"W x 30.0"H => 4.91 sf x 8.00'L = 39.3 cf
Outside= 37.0"W x 37.0"H => 7.46 sf x 8.00'L = 59.7 cf

37.0" Wide + 6.0" Spacing = 43.0" C-C Row Spacing

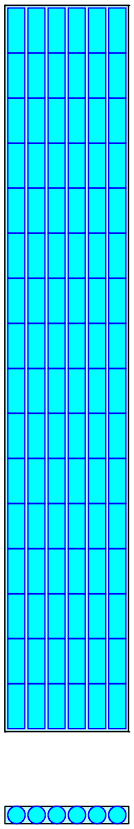
16 Chambers/Row x 8.00' Long = 128.00' Row Length +6.0" End Stone x 2 = 129.00' Base Length
6 Rows x 37.0" Wide + 6.0" Spacing x 5 + 6.0" Side Stone x 2 = 22.00' Base Width
37.0" Chamber Height = 3.08' Field Height

96 Chambers x 39.3 cf = 3,769.9 cf Chamber Storage
96 Chambers x 59.7 cf = 5,732.0 cf Displacement

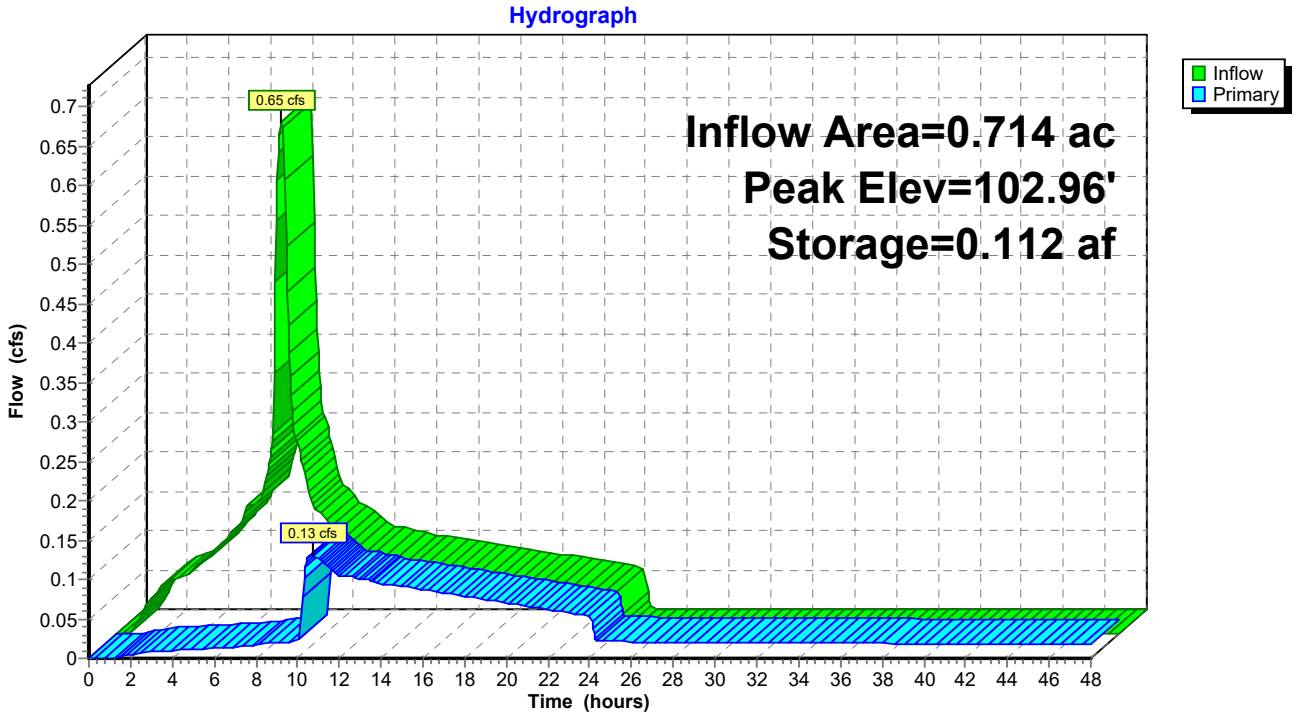
8,750.5 cf Field - 5,732.0 cf Chambers = 3,018.5 cf Stone x 40.0% Voids = 1,207.4 cf Stone Storage

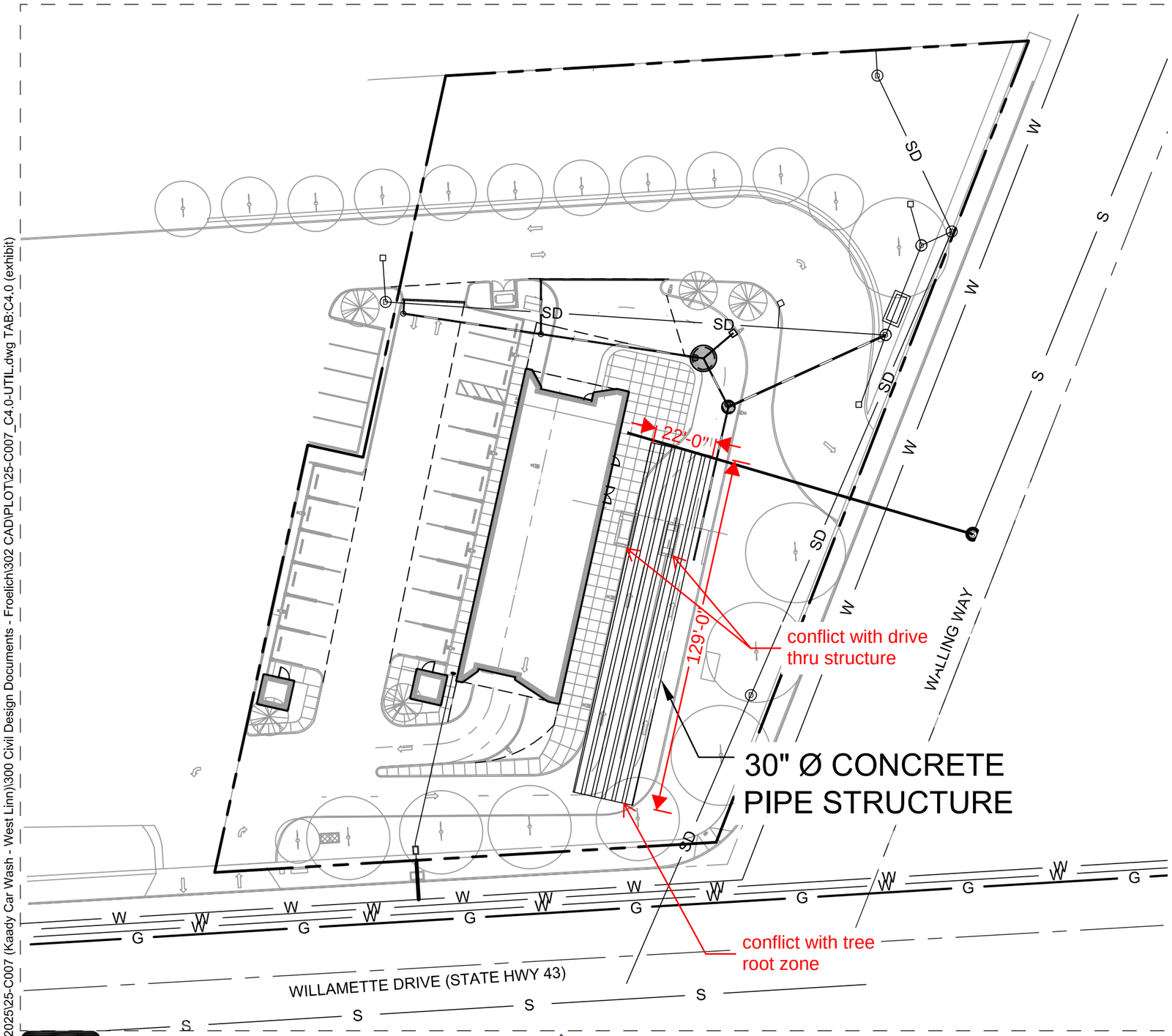
Chamber Storage + Stone Storage = 4,977.3 cf = 0.114 af
Overall Storage Efficiency = 56.9%
Overall System Size = 129.00' x 22.00' x 3.08'

96 Chambers
324.1 cy Field
111.8 cy Stone



Pond 6P: Det Conc Pipe





SCALE 1 INCH = 40 FEET

40 0 40 80

File: P:\2025\25-C007 (Kaady Car Wash - West Linn)\300 Civil Design Documents - Froelich\302 CAD\PLOT\25-C007_C4.0-UTIL.dwg TAB:C4.0 (exhibit)

11X17B

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Plotted: 7/31/25 at 4:08pm By: atomlinson

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froelich-engineers.com | FE# ####

APPENDIX G EXHIBIT
UTILITY PLAN

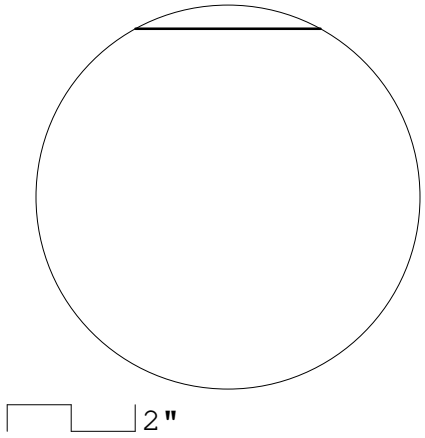
KAADY CAR WASH - WEST LINN

18850 WILLAMETTE DRIVE WEST LINN, OR

Appendix H: Stormwater Conveyance Calculations

Project 25-C007
Kaady Car Wash

GRAVITY PIPE FLOW (Chezy-Manning)
6-inch Pipe @ 1.5%

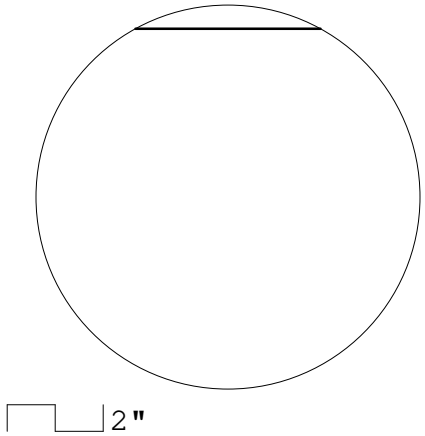


diameter = 6.0"
slope = 1.50%
material: ABS, PVC
Manning's n = 0.013
depth of flow = 93.82% of diameter (max)

wetted perimeter = 1.32'
area = 0.19 s.f.
hydraulic radius = 0.14'
velocity = 3.87 fps
flow = 0.74 cfs

Project 25-C007
Kaady Car Wash

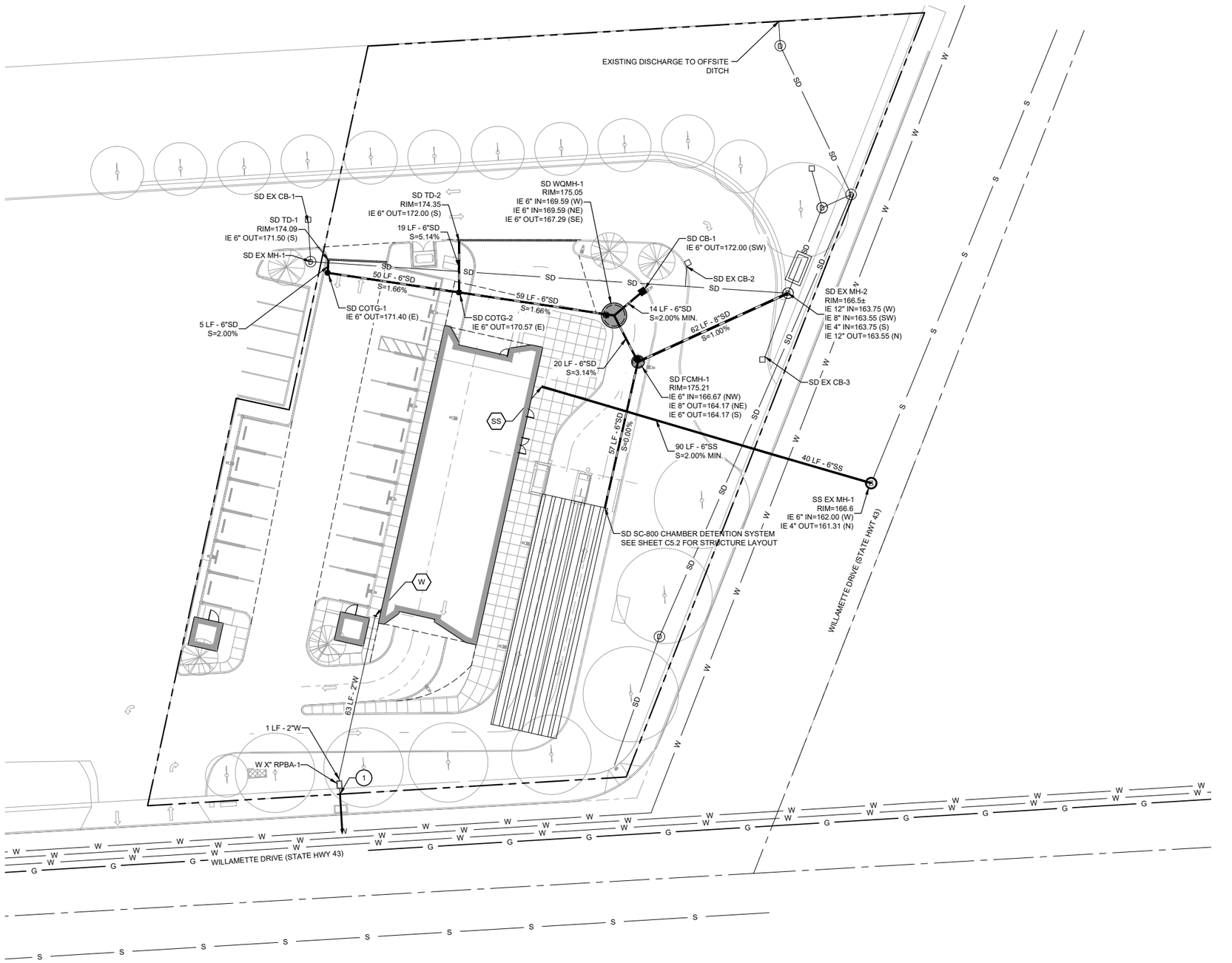
GRAVITY PIPE FLOW (Chezy-Manning)
8-inch Pipe @ 1.0%



diameter = 8.0"
slope = 1.00%
material: ABS, PVC
Manning's n = 0.013
depth of flow = 93.82% of diameter (max)

wetted perimeter = 1.76'
area = 0.34 s.f.
hydraulic radius = 0.19'
velocity = 3.83 fps
flow = 1.30 cfs

Appendix I: Utility Plan / Details



SHEET NOTES

1. PIPE BEDDING AND BACKFILL FOR ALL UTILITIES SHALL BE DONE PER DETAIL X/C5.X.
2. STRUCTURES LOCATIONS ARE BASED ON CENTER OF STRUCTURE.
3. INSTALL TRUST BLOCK ON FIRE AND WATER LINES PER DETAIL X & X/CX.X.

KEY NOTES

1 COORDINATE WATER SERVICE POINT OF CONNECTION TO EXISTING X" LATERAL WITH CITY OF WEST LINN.

2 FIELD VERIFY LOCATION AND IE OF EXISTING XX" XXXXX LATERAL PRIOR TO CONSTRUCTION.

3 IRRIGATION BACKFLOW ASSEMBLY VAULT, SEE LANDSCAPE PLANS.

UTILITY LABEL LEGEND

STRUCTURE LABEL

UTILITY TYPE (SD=STORM DRAINAGE, S=SANITARY SEWER, W=WATER, FP=FIRE PROTECTION)
STRUCTURE TYPE CALLOUT
ID NUMBER (WHERE APPLICABLE)

XX XX-XX
X+XX.X RT X.X'
RIM=
IE IN = XX.X
IE OUT = XX.X

LOCATION (WHERE APPLICABLE)
STRUCTURE INFO (WHERE APPLICABLE)

PIPE LABEL

UTILITY LENGTH
UTILITY SIZE
UTILITY TYPE

XXLF - XX" XX

S=X.XX%
SLOPE (WHERE APPLICABLE)

STRUCTURE TYPE

CALLOUT	DESCRIPTION	DETAIL REF.
BEND	BEND, USE FITTING IF APPLICABLE	X/XXX
BWV	BACKWATER VALVE	
CB	TRAPPED CATCH BASIN	
CO	CLEANOUT TO GRADE	
CONN	CONNECTION	
DW	DRYWELL	
FCMH	FLOW CONTROL MANHOLE	
FD	FOUNDATION DRAINAGE POINT OF CONN.	
FH	FIRE HYDRANT	
GV	GATE VALVE	
OF	OUTFALL	
OV	OVERFLOW INLET	
SDMH	48" DIA. STORM DRAIN MH	
TD	TRENCH DRAIN	
TEE	TEE CONNECTION	
WYE	WYE CONNECTION	
WQMH	WATER QUALITY MANHOLE	

SHEET LEGEND

(SS) CONNECT TO WASTE LINE. SEE PLUMBING PLANS FOR CONTINUATION. SIZE AS NOTED. — X/XXX

(RD) CONNECT TO STORM DRAIN/ROOF DRAIN. SEE PLUMBING PLANS FOR CONTINUATION. SIZE AND IE AS NOTED.

(W) CONNECT TO COLD WATER SYSTEM. SEE PLUMBING PLANS FOR CONTINUATION. SIZE AS NOTED.

(!!) UTILITY CROSSING. PROVIDE 12" MIN. CLEARANCE, U.N.O.

SCALE 1 INCH = 20 FEET
20 0 20 40

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RENEWS: 12/31/

KAADY CAR WASH

WEST LINN, OREGON

Revisions

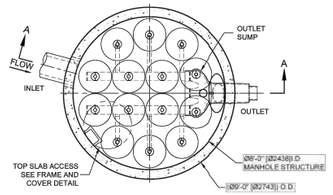
CONSTRUCTION SET

UTILITY PLAN

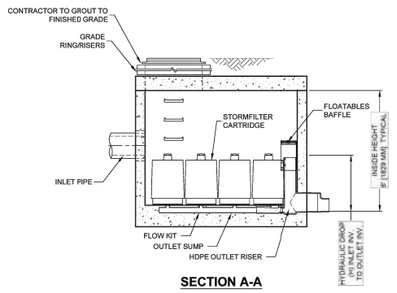
Project # 22005

C4.0

Date: 7.9.2025



PLAN VIEW
STANDARD OUTLET RISER
FLOWKIT: 43A



SECTION A-A

The Stormwater Management StormFilter®

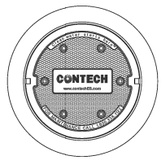
STORMFILTER DESIGN NOTES

STORMFILTER TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE SELECTION AND THE NUMBER OF CARTRIDGES. THE STANDARD MANHOLE STYLE IS SHOWN WITH THE MAXIMUM NUMBER OF CARTRIDGES (14). VOLUME SYSTEM IS ALSO AVAILABLE WITH MAXIMUM 14 CARTRIDGES. Ø8'-0" [2438 mm] MANHOLE STORMFILTER PEAK HYDRAULIC CAPACITY IS 1.8 CFS [51 L/s] . IF THE SITE CONDITIONS EXCEED 1.8 CFS [51 L/s] AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

CARTRIDGE SELECTION

CARTRIDGE HEIGHT	27" [686 mm]	18" [458 mm]		LOW DROP		
RECOMMENDED HYDRAULIC DROP (H)	3.09' [930 mm]	2.3' [700 mm]		1.8' [550 mm]		
SPECIFIC FLOW RATE (gpm/sf) [L/s/m²]	2 [1.30] 1.67' [1.08] 1 [0.65]	2 [1.30]	1.67' [1.08] 1 [0.65]	2 [1.30]	1.67' [1.08]	1 [0.65]
CARTRIDGE FLOW RATE (gpm) [L/s]	22.5 [1.42] 18.79 [1.19] 11.25 [0.71]	15 [0.95]	12.53 [0.79] 7.5 [0.44]	10 [0.63]	8.35 [0.54]	5 [0.32]

* 1.67 gpm/sf [1.08 L/s/m²] SPECIFIC FLOW RATE IS APPROVED WITH PHOSPHOSORB® (PSORB) MEDIA ONLY



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

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	*
WATER QUALITY FLOW RATE (cfs) [L/s]	*
PEAK FLOW RATE (cfs) [L/s]	*
RETURN PERIOD OF PEAK FLOW (yrs)	*
CARTRIDGE HEIGHT (SEE TABLE ABOVE)	*
NUMBER OF CARTRIDGES REQUIRED	*
CARTRIDGE FLOW RATE	*
MEDIA TYPE (PERLITE, ZPG, PSORB)	*

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

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR SITE SPECIFIC DRAWINGS WITH DETAILED VAULT DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
4. STORMFILTER WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS-20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 5' [1524 mm] AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
6. FILTER CARTRIDGES SHALL BE MEDIA-FILLED, PASSIVE, SIPHON ACTUATED, RADIAL FLOW, AND SELF CLEANING. RADIAL MEDIA DEPTH SHALL BE 7-INCHES [178 mm]. FILTER MEDIA CONTACT TIME SHALL BE AT LEAST 38 SECONDS.
7. SPECIFIC FLOW RATE IS EQUAL TO THE FILTER TREATMENT CAPACITY (gpm) [L/s] DIVIDED BY THE FILTER CONTACT SURFACE AREA (sq ft) [m²].
8. STORMFILTER STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STORMFILTER STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL AND GROUT INLET PIPE(S).
E. CONTRACTOR TO PROVIDE AND INSTALL CONNECTOR TO THE OUTLET RISER STUB. STORMFILTER EQUIPPED WITH A DUAL DIAMETER HDPE OUTLET STUB AND SAND COLLAR. IF OUTLET PIPE IS LARGER THAN 8 INCHES [200 mm], CONTRACTOR TO REMOVE THE 8 INCH [200 mm] OUTLET STUB AT MOLDED-IN CUT LINE. COUPLING BY FERNCO OR EQUAL AND PROVIDED BY CONTRACTOR.
F. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.

CONTECH
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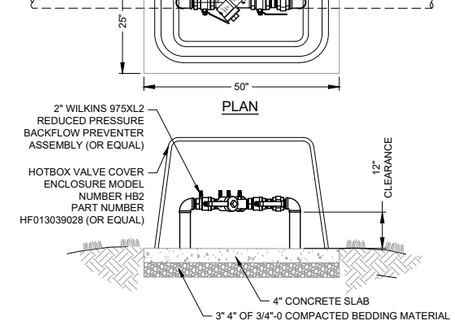
SFMH96
STORMFILTER
STANDARD DETAIL

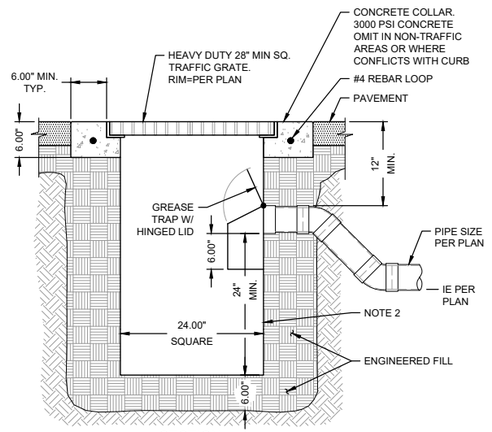


NOTE:

ELEVATION

1. HOTBOX ENCLOSURE SHALL BE INSULATED AND HEATED. COORDINATE WITH ELECTRICAL PLANS FOR CONNECTION.
2. RPBA SHALL BE ACCESSIBLE BY VERTICALLY LIFTING OFF ENCLOSURE. CONTRACTOR TO VERIFY ACCESSIBILITY PRIOR TO CONSTRUCTION.

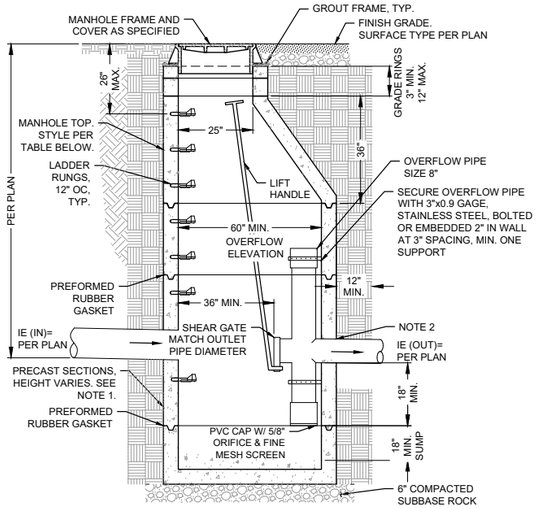
10 REDUCED PRESSURE BACKFLOW ASSEMBLY
SCALE: NTS



SECTION

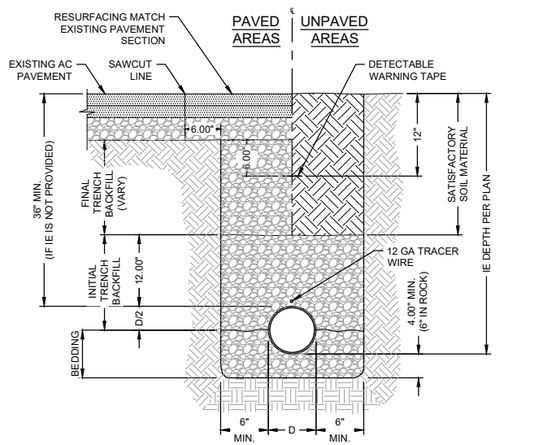
NOTES:
1. CONTRACTOR TO WIDEN EXCAVATION AS REQUIRED TO OBTAIN COMPACTION WITH CONTRACTORS COMPACTION EQUIPMENT.
2. 1/4" STEEL PLATE, BITUMINOUS COATED. AS MANUFACTURED BY GIBSON STEEL BASINS OR APPROVED EQUAL.

X TRAPPED CATCH BASIN
SCALE: NTS

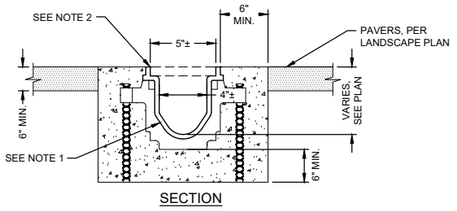


NOTES:
1. ALL PRECAST SECTIONS SHALL CONFORM TO REQUIREMENTS OF ASTM C-478.
2. ALL CONNECTING PIPES SHALL HAVE FLEXIBLE, GASKETED AND UNRESTRAINED JOINT WITHIN 18" OF MANHOLE VAULT. PIPE SIZES NOTED ON PLANS. PIPE CONNECTION TO MANHOLES SHALL HAVE KOR-N-SEAL BOOT OR APPROVED EQUAL.
3. ORIFICE AND OVERFLOW ELEVATIONS ARE RELATIVE TO IE (OUT)

6 FLOW CONTROL MANHOLE
SCALE: NTS



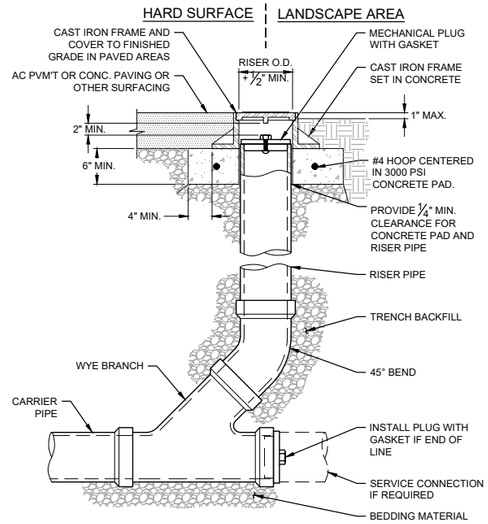
X TYPICAL PIPE BEDDING AND BACKFILL
SCALE: NTS



SECTION

NOTES:
1. TRENCH DRAIN SHALL BE PRE-SLOPED 4" WIDE ZURN OR ACO TRENCH DRAIN OR APPROVED EQUAL.
2. TRENCH DRAINS GRATE SHALL BE LOCKABLE HEAVY DUTY TRENCH GRATE - CLASS C.
3. TRENCH SYSTEM SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.

X TRENCH DRAIN - 4 INCH WIDE
SCALE: NTS



NOTES:
1. CAST IRON FRAME AND COVER SHALL MEET H-20 LOAD REQUIREMENT.
2. FOR CARRIER PIPE SIZE 6"Ø AND LESS, PROVIDE RISER PIPE SIZE TO MATCH CARRIER PIPE.
3. FOR CARRIER PIPE SIZE 8"Ø AND LARGER, RISER PIPE SHALL BE 6"Ø.
4. RISER PIPE MATERIAL TO MATCH CARRIER PIPE MATERIAL.

X STANDARD CLEANOUT (COTG)
SCALE: NTS

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RYAN M. KELBOSCH

KAADY CAR WASH
WEST LINN, OREGON

Revisions

CONSTRUCTION SET

DETAILS

Project # 22005

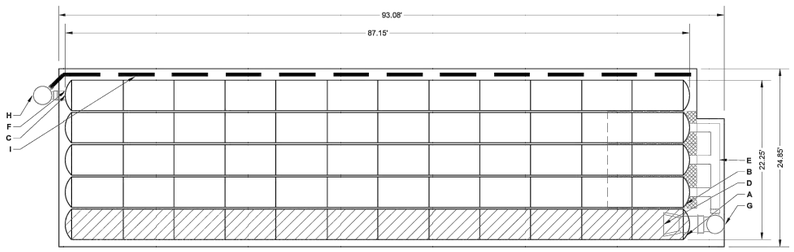
C5.1

Date: 7.9.2025

PROPOSED LAYOUT		PROPOSED ELEVATIONS	
60	STORMTECH SC-800 CHAMBERS	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	111.25
10	STORMTECH SC-800 END CAPS	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	105.50
8	STONE ABOVE (in)	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	104.83
6	STONE BELOW (in)	MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	104.50
40	STONE VOID	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	104.50
5272	INSTALLED SYSTEM VOLUME (CF) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)	TOP OF STONE:	111.75
		TOP OF SC-800 CHAMBER:	103.25
		12" x 12" TOP MANIFOLD INVERT:	103.75
		24" ISOLATOR ROW PLUS INVERT:	103.69
2288	SYSTEM AREA (SF)	12" BOTTOM CONNECTION INVERT:	103.63
235.9	SYSTEM PERIMETER (ft)	BOTTOM OF SC-800 CHAMBER:	103.50
423	THERMOPLASTIC LINER (SY) (20% OVERAGE)	UNDERDRAIN INVERT:	100.50
		BOTTOM OF STONE:	100.00

*INVERT ABOVE BASE OF CHAMBER

PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
PREFABRICATED EZ END CAP	A	24" BOTTOM PREFABRICATED EZ END CAP, PART#: SC800ECEZ / TYP OF ALL 24" BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	2.30"	
PRE-CORED END CAP	B	12" TOP PRE-CORED END CAP, PART#: SC800EPE12TPC / TYP OF ALL 12" TOP CONNECTIONS	14.40"	
PRE-CORED END CAP	C	12" BOTTOM PRE-CORED END CAP, PART#: SC800EPE12BPC / TYP OF ALL 12" BOTTOM CONNECTIONS	1.60"	
FLAMP	D	INSTALL FLAMP ON 24" ACCESS PIPE / PART#: SC80024RAMP		
MANIFOLD	E	12" x 12" TDP MANIFOLD, ADS N-12	14.40"	
PIPE CONNECTION	F	12" BOTTOM CONNECTION	1.60"	
NYLOPLAST (INLET W/ ISO PLUS ROW)	G	30" DIAMETER (24.00" SUMP MIN)		5.9 CFS IN
NYLOPLAST (OUTLET)	H	30" DIAMETER (DESIGN BY ENGINEER)		2.8 CFS OUT
UNDERDRAIN	I	6" ADS N-12 DUAL WALL PERFORATED HDPE UNDERDRAIN		



ISOLATOR ROW PLUS (SEE DETAIL)

PLACE MINIMUM 12.50' OF ADSPLUS825 WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS

THERMOPLASTIC LINER (SEE TECH NOTE #6.50 PROVIDED BY OTHERS / DESIGN BY OTHERS)

NOTES
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- **NOT FOR CONSTRUCTION**: THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT & THE REQUIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.

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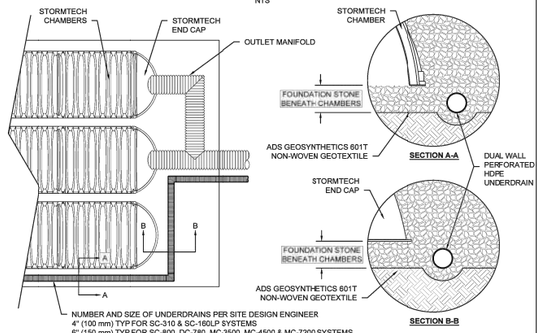
UNDERDRAIN DETAIL

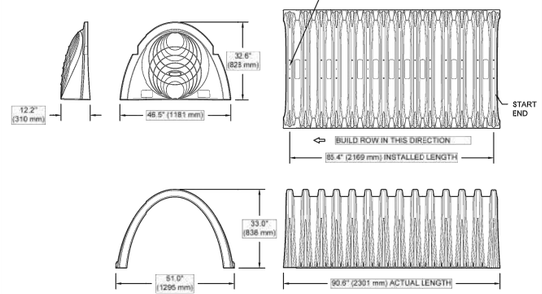
NTS



4 UNDERDRAIN DETAIL

SC-800 TECHNICAL SPECIFICATION

NTS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	51.0" X 33.0" X 85.4"	(1295 mm X 838 mm X 2169 mm)
CHAMBER STORAGE	50.6 CUBIC FEET	(1.43 m³)
MINIMUM INSTALLED STORAGE*	78.4 CUBIC FEET	(2.22 m³)
WEIGHT	81.8 lbs.	(37.1 kg)

NOMINAL END CAP SPECIFICATIONS

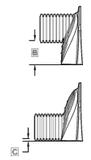
SIZE (W X H X INSTALLED LENGTH)	46.5" X 32.6" X 10.5"	(1181 mm X 828 mm X 267 mm)
END CAP STORAGE	3.4 CUBIC FEET	(0.09 m³)
MINIMUM INSTALLED STORAGE**	14.7 CUBIC FEET	(0.42 m³)
WEIGHT	15.7 lbs.	(7.1 kg)

* ASSUMES 6" (150 mm) STONE ABOVE, BELOW, AND BETWEEN CHAMBERS, 3" (75 mm) BETWEEN CHAMBERS
**ASSUMES 6" (150 mm) STONE ABOVE AND BELOW END CAPS, 3" (150 mm) BETWEEN ROWS, 12" (300 mm) BEYOND END CAPS

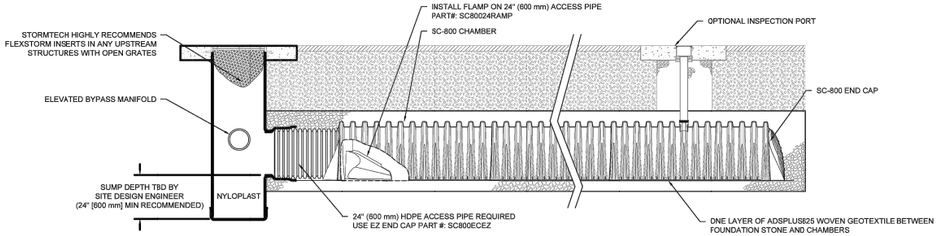
PRE-CORED HOLES AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "BPC"
PRE-CORED HOLES AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "TPC"

PART #	STUB	B	C
SC800EPE06TPC	6" (150 mm)	21.4" (544 mm)	---
SC800EPE06BPC		---	0.9" (23 mm)
SC800EPE08TPC	8" (200 mm)	19.2" (488 mm)	---
SC800EPE08BPC		---	1.0" (25 mm)
SC800EPE10TPC	10" (250 mm)	17.0" (432 mm)	---
SC800EPE10BPC		---	1.2" (30 mm)
SC800EPE12TPC	12" (300 mm)	14.4" (366 mm)	---
SC800EPE12BPC		---	1.6" (41 mm)
SC800EPE15TPC	15" (375 mm)	11.3" (287 mm)	---
SC800EPE15BPC		---	1.7" (43 mm)
SC800EPE18TPC	18" (450 mm)	8.0" (203 mm)	---
SC800EPE18BPC		---	2.0" (51 mm)
SC800EPE24BPC	24" (600 mm)	---	2.3" (58 mm)
SC800EPE	NONE	SOLID END CAP	

NOTE: ALL DIMENSIONS ARE NOMINAL



2 SC-800 TECHNICAL SPECIFICATION



SC-800 ISOLATOR ROW PLUS DETAIL
NTS

3 SC-800 ISOLATOR ROW PLUS DETAIL

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INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45° (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

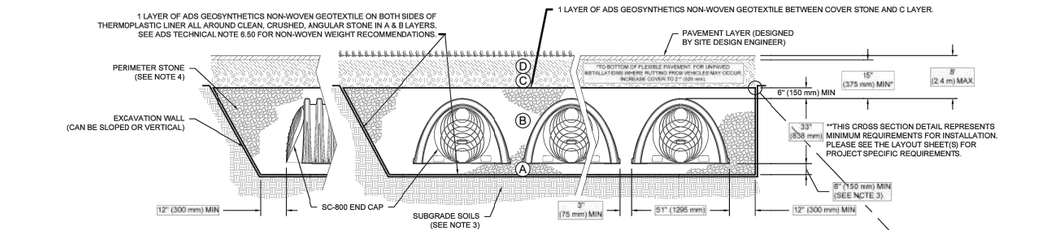
NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

ACCEPTABLE FILL MATERIALS: STORMTECH SC-800 CHAMBER SYSTEMS

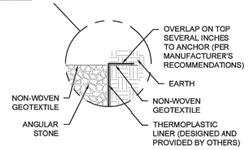
	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 15" (375 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[4] A-1, A-2-4, A-3 OR AASHTO M43[4] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE[5]	AASHTO M43[4] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE[5]	AASHTO M43[4] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.
5. WHERE RECYCLED CONCRETE AGGREGATE IS USED IN LAYERS 'A' OR 'B' THE MATERIAL SHOULD ALSO MEET THE ACCEPTABILITY CRITERIA OUTLINED IN TECHNICAL NOTE 6.20 "RECYCLED CONCRETE STRUCTURAL BACKFILL".



NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-800 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS. REFERENCE STORMTECH DESIGN MANUAL FOR BEARING CAPACITY GUIDANCE.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 750 LBS/FT/% AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.



THERMOPLASTIC LINER DETAIL

1 SC-800 CROSS SECTION DETAIL

DRAWN: CC | DATE: 07/25/2025
CHECKED: N/A | PROJECT #:
REV: | NOT TO SCALE

25-C007 KAADY
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OREGON
PRELIMINARY NOT FOR CONSTRUCTION
RENEWS: 12/31

KAADY CAR WASH
WEST LINN, OREGON

Revisions

CONSTRUCTION SET
DETAILS

Project # 22005

C5.2

Date: 7.9.2025

Appendix J: Operations and Maintenance Plan

to be provided in final stormwater report

Elevating acoustical design.

WEST LINN – KAADY CAR WASH

ENVIRONMENTAL NOISE IMPACT STUDY

Submitted to:

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Portland, OR 97219

TVA Architects
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Portland, OR 97205

Prepared by:

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Seattle, WA 98104

December 28, 2025

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TABLE OF CONTENTS

1 Executive Summary

This report is a summary of the environmental noise impact assessment for the proposed Kaady Car Wash located at 18850 Willamette Drive in West Linn, Oregon. This facility, a one-story, 3,190 square foot automatic drive-through car wash with supplemental vacuum cleaning stations, is proposed for a site previously occupied by a McDonald's drive-through restaurant.

As required by the West Linn Community Development Code (CDC), this assessment evaluates potential acoustical impacts by comparing predicted noise emissions from the proposed equipment against pertinent regulations established by the City of West Linn, Clackamas County, and the State of Oregon Department of Environmental Quality (DEQ).

The evaluation utilizes ambient sound level data obtained from the existing site as well as acoustic testing performed at three other Kaady Car Washes in the Portland area. This data was then used to create a software model that predicts noise from the proposed car wash to adjacent areas and properties.

2 Noise Code

2.1 West Linn Municipal Code (WLMC Section 5.487)

The WLMC Section 5.487 explicitly finds that low and moderate ambient noise levels are a significant City amenity and establishes standards to protect the livability, health, comfort, and welfare of its residents.

2.1.1 General Prohibition and Factors

WLMC 5.487 generally prohibits any unreasonably loud, disturbing, or raucous noise, or any noise that unreasonably annoys, disturbs, or endangers the comfort, repose, health, safety, or peace of reasonable persons of ordinary sensitivity.
Factors considered in judging whether a sound is unreasonably loud, disturbing, and unnecessary include:

1. The proximity of the sound to sleeping facilities, whether residential or commercial.
2. The land use, nature, and zoning of the area where the sound emanates and where it is received or perceived.
3. The time of day or night the sound occurs.
4. The duration of the sound.
5. Whether the sound is recurrent, intermittent, or constant.

2.1.2 Prohibited Hours

The operation of the proposed car wash, running from 8:00 AM to 8:00 PM, falls entirely within the permissible hours for general operational noise in West Linn, which prohibits unreasonably loud and raucous noise between 9:00 PM and 7:00 AM.

2.2 Clackamas County Noise Control (Chapter 6.05)

Clackamas County Code 6.05.010 declares a policy to protect the health, safety, welfare, peace, and quiet of its citizens from excessive sound. The County Code declares sound exceeding specific decibel levels at the property line to be a per se violation:

- 7:00 a.m. and 10:00 p.m.: Sound exceeding 60 dBA.
- 10:00 p.m. and 7:00 a.m. the following day: Sound exceeding 50 dBA.

However, the County Code section 6.05.060(F) specifies that sounds caused by industrial or commercial organizations or workers during their normal operations are generally exempted from the provisions of Chapter 6.05. Furthermore, industrial or commercial sound sources that are subject to noise regulation by the State of Oregon Department of Environmental Quality (DEQ) are listed separately in the definitions. Since the proposed Kaady Car Wash is a commercial operation subject to DEQ rules (OAR 340-035-0035), the State and City regulations are generally considered the primary jurisdictional noise standards.

Measurements taken to enforce Chapter 6.05 standards require a sound level meter meeting Type I or Type II meter requirements as specified in ANSI Standard 1.4-1971, with personnel trained in its use.

2.3 Oregon Administrative Rules (OAR 340-035)

Oregon Administrative Rules (OAR), Department of Environmental Quality (DEQ), Chapter 340, Division 35: Noise Control Regulations dictate overall noise guidelines, while OAR 340-035-0035: Noise Control Regulations for Industry and Commerce more specifically applies to the West Linn car wash site. The proposed car wash facility falls under the classification of a "New Industrial or Commercial Noise Source" per OAR 340-035-0015: Definitions. Because the site was previously utilized commercially (McDonald's drive-through restaurant), the appropriate reference criteria are generally found under the standards for new noise sources located on previously used sites, as defined by 340-035-0035.

Noise levels from industrial or commercial sources are measured at an appropriate measurement point on Noise Sensitive Property. Noise Sensitive Property includes real property normally used for sleeping, or normally used as schools, churches, hospitals, or public libraries. Measurement procedures must conform to the guidelines set forth in the Sound Measurement Procedures Manual (NPCS-1).

2.3.1 New Industrial and Commercial Noise Source Standards

The allowable statistical noise levels for new industrial and commercial noise sources, applicable in any one hour, are detailed below:

OAR 340-035-0035
Table 8
New Industrial and Commercial Noise Source Standards
Allowable Statistical Noise Levels in Any One Hour

7:00 a.m. – 10:00 p.m.	10:00 p.m. – 7:00 a.m.
L_{50} – 55 dBA	L_{50} – 50 dBA
L_{10} – 60 dBA	L_{10} – 55 dBA
L_{1} – 75 dBA	L_{1} – 60 dBA

Note: L50 is the noise level equaled or exceeded 50% of the time, L10 is exceeded 10% of the time (or 6 minutes in any hour), and L1 is exceeded 1% of the time (or 36 seconds in any hour).

3 Environmental Noise Site Assessment

3.1 Proposed Site

The site at 18550 Willamette Dr is a General Commercial (GC) / Mixed-Use Commercial & Residential parcel situated on a topographic bench along the east side of Highway 43. The site is characterized by a relatively flat paved surface that terminates at a Concrete Masonry Unit (CMU) wall and a distinct grade break on the eastern boundary, where the terrain slopes steeply downward toward the Willamette River. The CMU wall stands approximately 6 feet tall and serves as the primary acoustic boundary on the site.

To the east and southeast lie the residential properties of Walling Way and Rose Way. These lots are terraced significantly below the commercial grade, placing the residential rooftops and backyards well below the elevation of the parking lot. Notably, the slope and residential lots are covered in dense, mature vegetation and tree canopy, which largely visually screens the CMU wall from the residents below.

. Surrounding properties and areas are zoned as follows:

- **West (across roadway):** Highway 43 and properties immediately west are zoned GC (commercial) with the properties further west up the slope being designated for Low-Medium Density Residential (R-10 or R-8.5).
- **East (shared property line with CMU wall):** The zoning shifts to Low-Medium Density Residential (R-10/R-15). This boundary is critical for noise ordinances, as it directly borders a noise-sensitive residential zone.
- **North/South:** Commercial/Office strips designated GC.

Figure 1 below shows the general layout of the existing site, while Figure 3 shows the zoning.

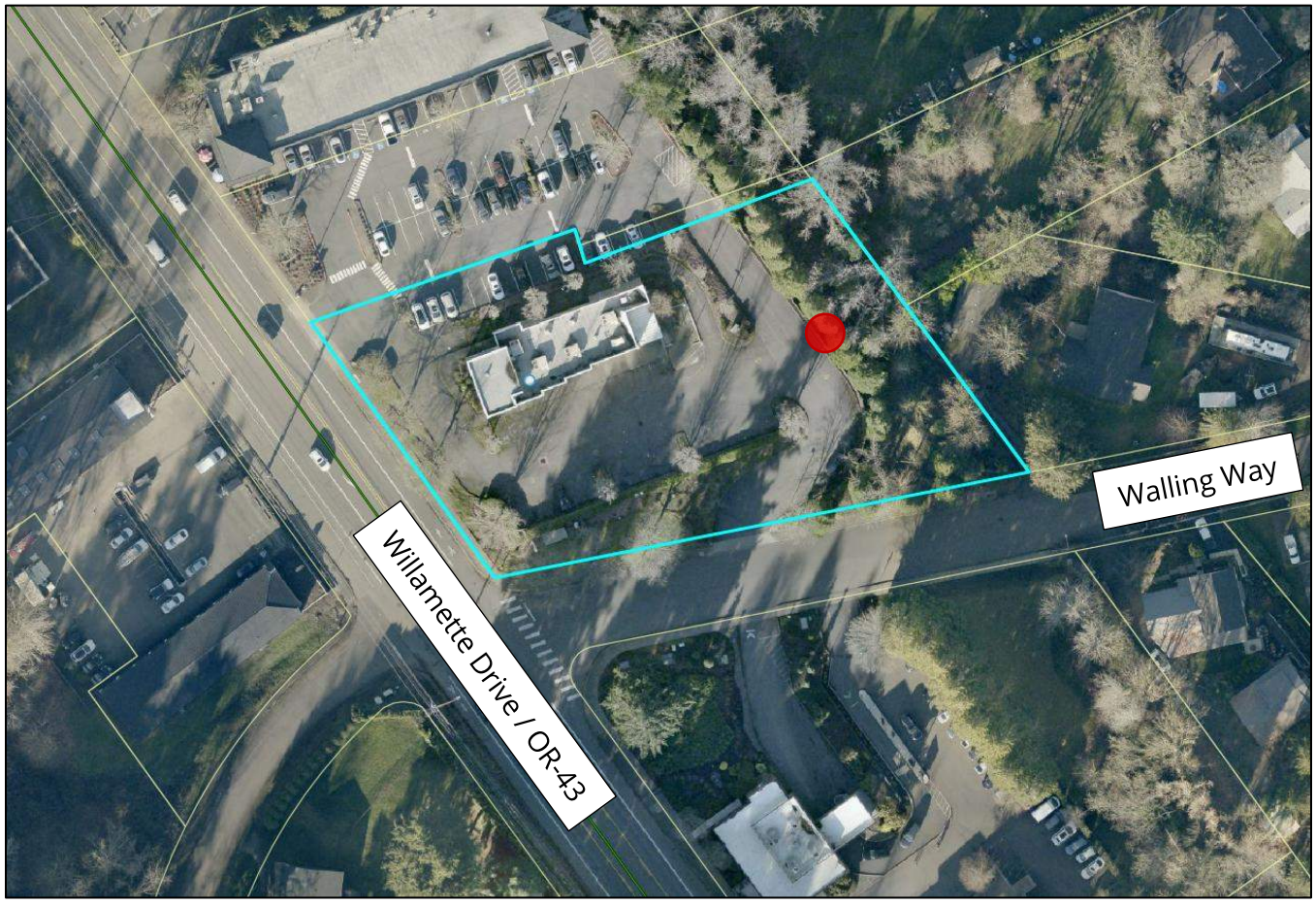


Figure 1: Existing Site and Neighboring Area Layout

Site boundaries

Ambient sound monitoring location

Figure 2: Zoning Boundaries and Types

Mixed-Use Commercial / Residential (GC)

Low-Medium Density Residential

From a noise impact standpoint, the CMU wall with the existing topography provides the primary noise reduction from the site to the residential neighbors. The construction of the wall uses high-mass (CMU) and is continuous which blocks the direct line-of-sight between noise sources on the lot and from the west (such as automobile traffic on Highway 43) and the lower-elevation residences. This creates an acoustical shadow immediately behind the wall, preventing direct sound transmission, so that the primary sound energy is diffracted over the barrier based on the source – path – receiver geometry.

While the dense vegetation provides a visual buffer, its acoustic impact is much more limited in comparison to the CMU wall. The effectiveness of vegetation as a barrier is based on the year-round thickness and the overall depth of the foliage the sound energy travels through. In general, it takes more than 100 feet of thick vegetation to reduce sound energy by 15% (~3 dB). The sound reduction of the existing vegetation was not considered in this acoustical impact study due to the limited thickness.

3.2 Ambient Noise Assessment

An environmental noise monitor was deployed on the site of the proposed future car wash tunnel entrance on Monday, November 3, 2025, during daytime business hours (8:00 am - 3:25 pm) above the eastern CMU wall dividing the existing site parking lot from residential properties. The approximate location is shown in Figure 2. Measurements were used to calibrate the ambient traffic noise in the environmental computer noise impact model. The hourly average sound level ranged from 56 to 62 dBA; the primary noise sources were vehicle traffic on Willamette Drive to the west / southwest and Walling Way to the south / southeast. The loudest hourly increment (62 dBA) occurred from 1:00 pm to 2:00 pm.

Additional ambient sound readings were also taken that morning on Walling Way to better understand existing conditions in the residential area to the east of the site. The measurements were taken from the site's south parking lot exit onto Walling and east to the intersection with Rose Way. The sound levels ranged from 57 to 44 dBA as distance from Willamette Drive (the primary noise generator) increased.

Project site looking north

Noise Monitoring location near ladder

Handheld measurements of Highway 43

4 Environmental Noise Impact

4.1 Noise Emission from Proposed Equipment

Our 3D computer model of the sound emission and analysis used sound data from measurements at existing Kaady Car Washes and Sonny's Car Washes in Phoenix, Arizona. The measured sound data is shown in the table below.

Measured Equipment and Sources	Sound Pressure Level, Leq (dBA)
Centrifugal Blowers *Source: Kaady, W Burnside St, Portland*	79 dBA @ 36-feet from tunnel exit
Wash Systems (no blowers) *Source: Kaady, W Burnside St, Portland*	68 dBA @ 27-feet from tunnel entrance
Centrifugal Vacuum Producer *Source: Kaady, SE 70th Ave, Tualatin*	68 dBA @ 5-feet from equipment room louver
Vacuum Hoses & Debris Traps *Source: Sonny's Car Wash, Phoenix*	75 dBA @ 2-ft
Cars and Trucks idling in line *Source: Sonny's Car Wash, Phoenix*	< 55 dBA @ 30-feet

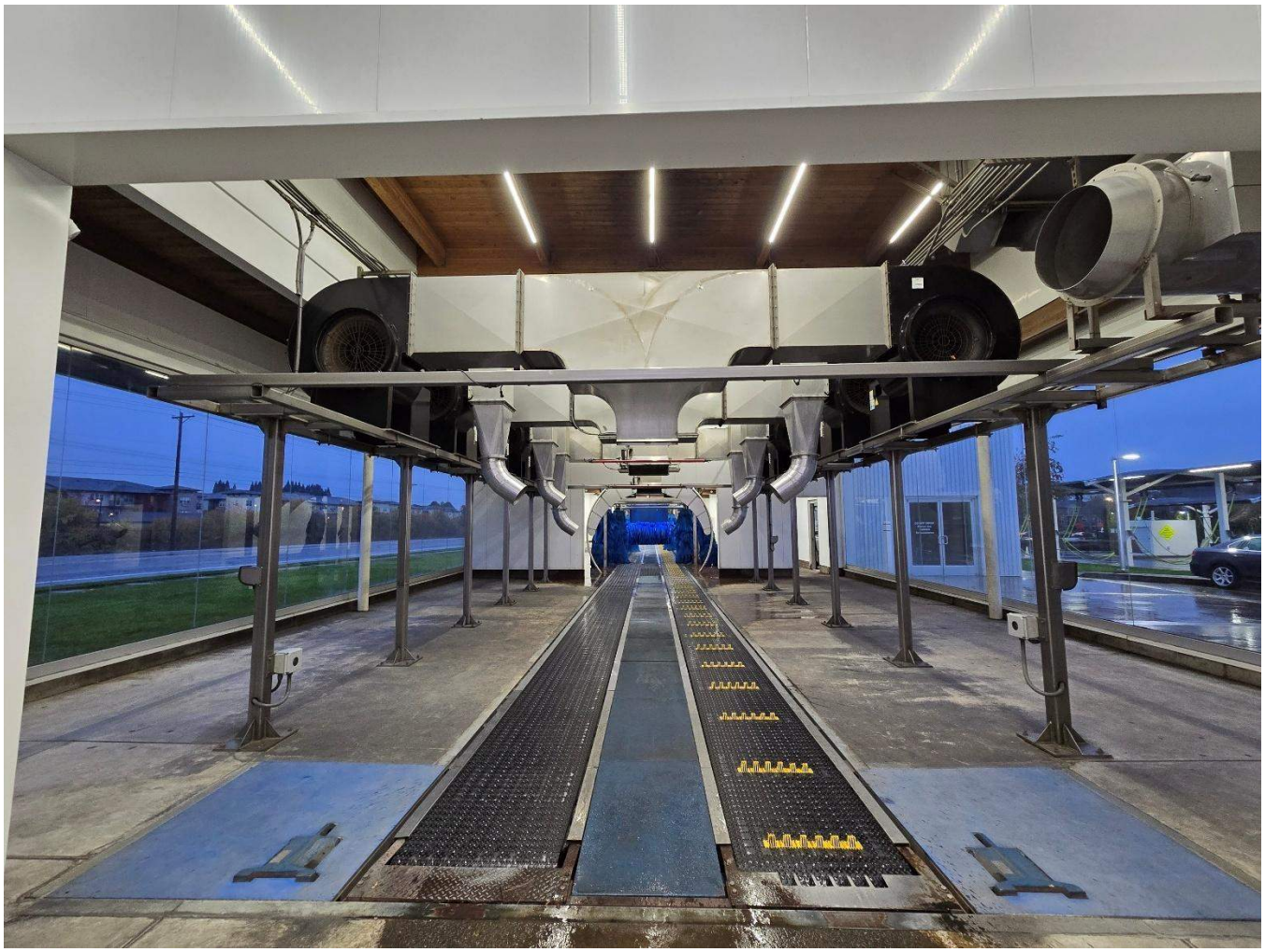
Pictures from testing of comparable Kaady Car Wash systems to integrate into 3D topographical noise impact computer model.

End of Tunnel at Tualatin

Blower equipment at Tualatin

Vacuum Collector Doghouse

Vacuum Collector at Hillsboro



Tunnel at Hillsboro

4.2 Computer Noise Impact Model and Prediction

Noise from the car wash was modeled using the DataKustik CadnaA noise prediction software and predicted to all adjacent property lines. The predicted car wash noise levels are compared to the predicted daytime average ambient noise levels due to traffic at each of these receiver locations; calibrated from on-site environmental noise monitoring. The modeled noise sources include the entrance and exit of the car wash with blowers inside the tunnel, (2) vacuum producer units, and vacuums at each parking stall.

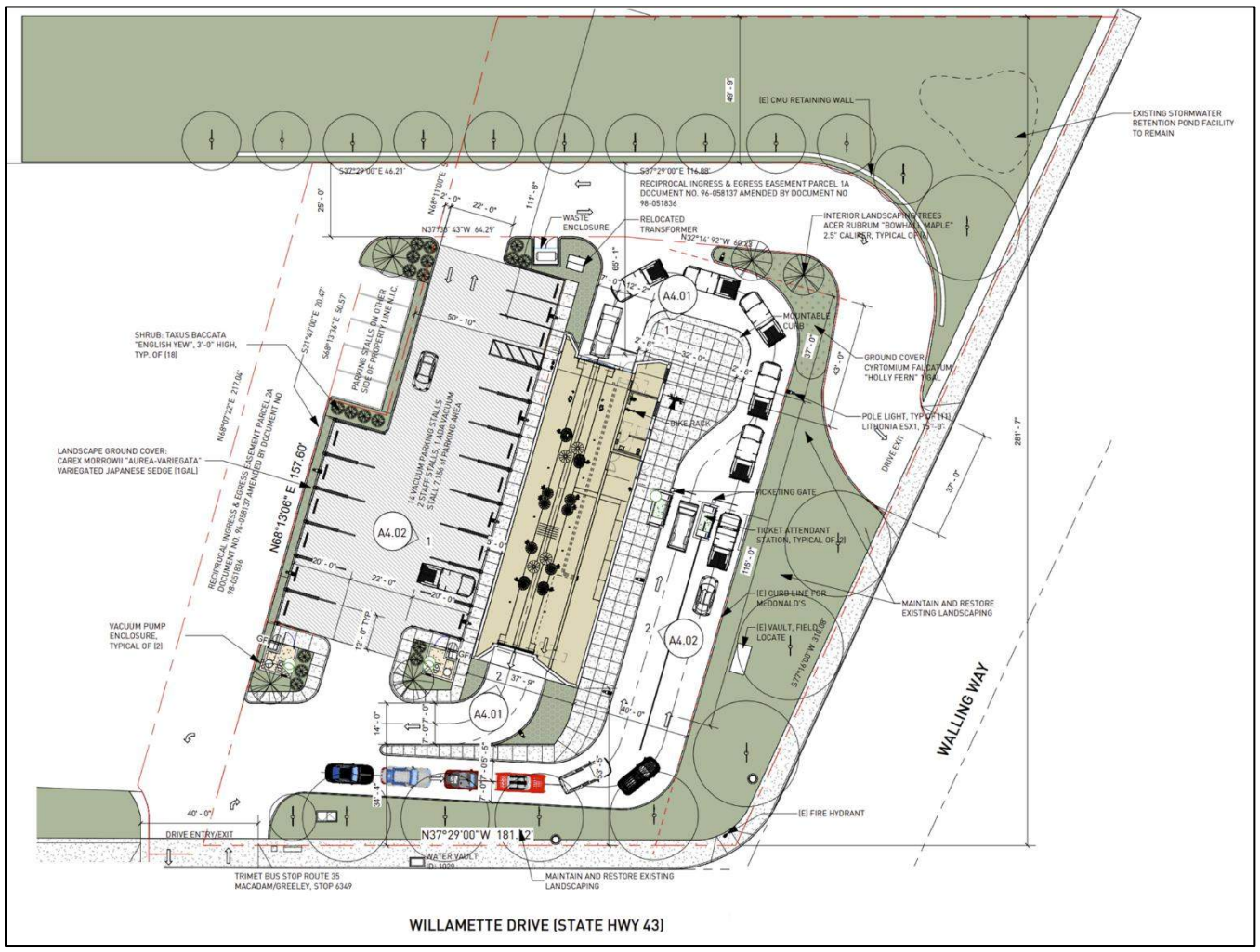


Figure 3: Proposed Car Wash Site Plan

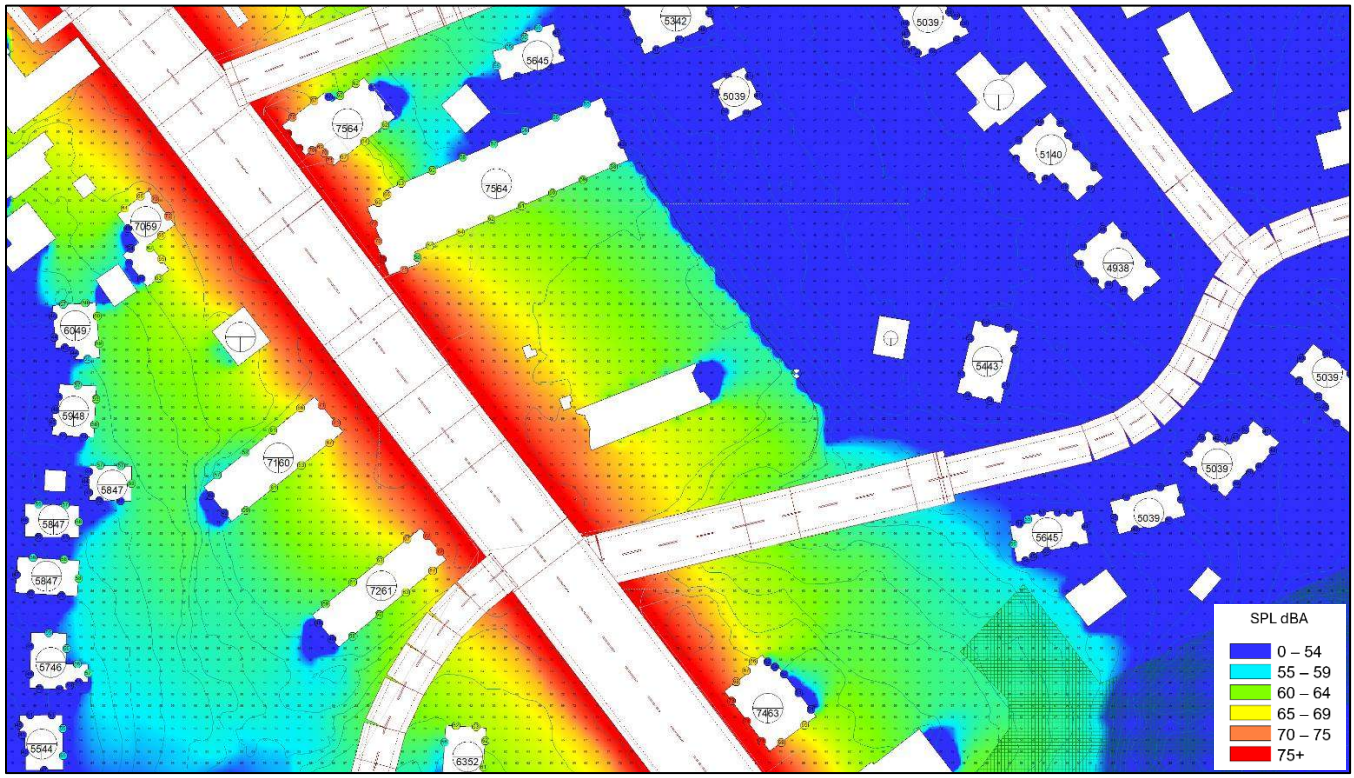


Figure 4: Traffic Noise Impact at Proposed Car Wash Site (Car Wash OFF)

Figure 4 shows predicted traffic noise impact at the site location. The traffic noise was modeled using traffic data from the Oregon Traffic Monitoring System and calibrated with the daytime sound level measurements taken on the east boundary of the site. Traffic noise was modeled for Willamette Drive / Highway 43, but not for the residential street Walling Way. The predicted noise is color mapped to coded (**red** depicts sound levels greater than 75 dBA, **blue** depicts sound levels less than 54 dBA). Noise is predicted to be around 70 dBA at the exit to the car wash site from traffic from Willamette Drive / Highway 43 before operating the car wash equipment.

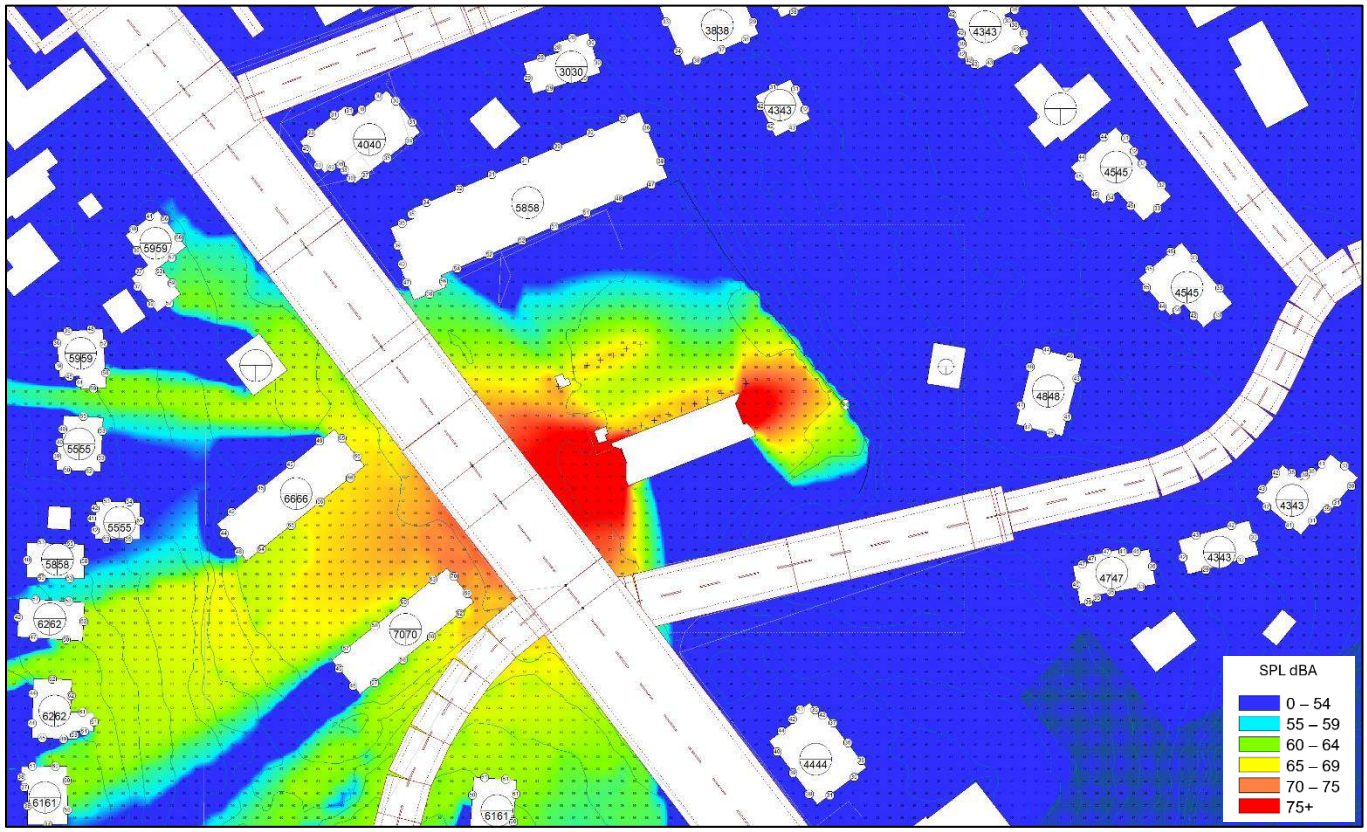


Figure 5: Predicted Noise Impact from Car Wash Activities (not including traffic noise)

Figure 5 shows the predicted sound impact from the car wash system (including blowers) and enclosed vacuum collectors, excluding traffic noise. This noise impact model assumes sound levels coming from the tunnel are comparable to those measured at the existing Kaady Car Wash locations used as reference and include the continuous operation of two (2) vacuum producers and fifteen (15) vacuum hoses running simultaneously.

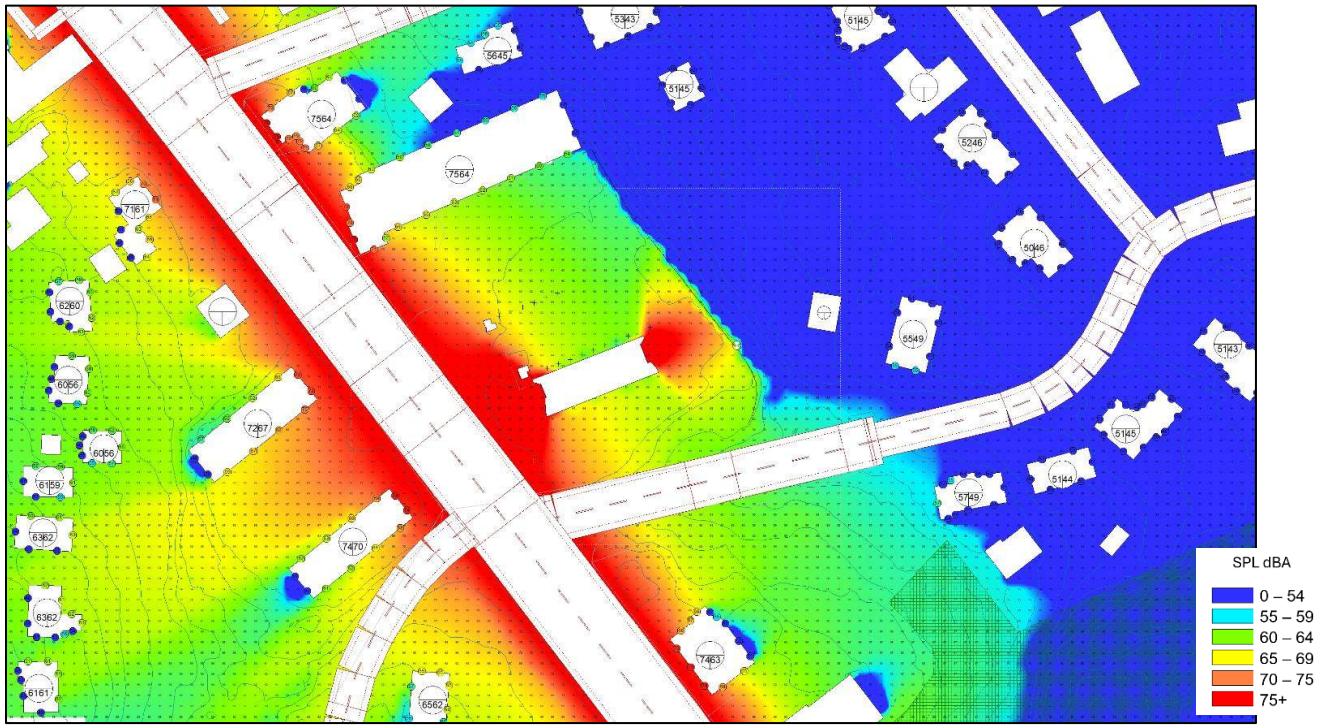


Figure 6: Predicted Noise Impact from Car Wash Activities, Including Traffic Noise

Figure 6 shows the combined predicted noise impact of car wash activities and traffic noise. This noise impact model sums the car wash operations with daytime traffic noise.

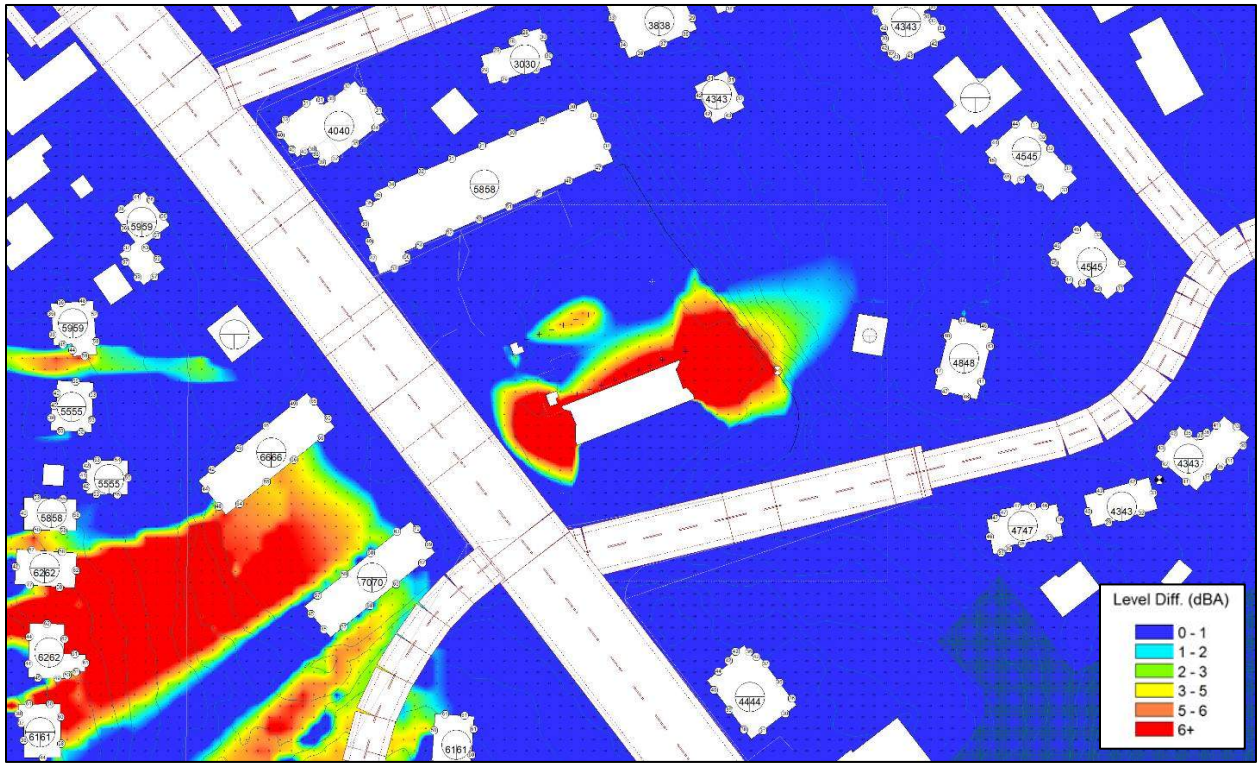


Figure 7: Predicted Noise Level Difference with addition of Car Wash to existing Traffic noise

Figure 7 shows the predicted overall change in noise with the addition of the car wash to the existing traffic noise. The yellow, orange, and red colors on the map represent decibel level increases of 3 to more than 6 dB, which might be perceptible to these property owners and users when the car wash systems are operating at 100%.

The following sections summarize the predicted noise impact to the surrounding noise-sensitive communities.

4.2.1 North, Northwest, South, and Southeast - General Commercial Zones

The noise impact model predicts that the sound level at the nearest commercial properties around the proposed car wash will be equal to or less than traffic noise based on the traffic volumes and the planned orientation of the car wash tunnel. As noted in Figure 5, the noise impact to the nearest commercial buildings is not predicted to exceed 60 dBA and Figure 7 notes that the noise impact is not predicted to increase the noise level above existing traffic noise.

4.2.2 East / Northeast Residential Zone

The noise impact model predicts that the sound level at the nearest residential properties to the east, northeast, and southeast are predicted to be less than 55 dBA, as shown in Figure 5, which meets the OAR 340-035-0035 limit of 55 dBA (L_{50}) to noise-sensitive properties. Figure 7 shows that the blowers might increase the noise by 3 dBA or less in the rear yard of 3315 Walling Way; this means the blower noise might be barely audible above traffic noise, but should not be a significant impact. Pre-construction ambient levels in this area were modeled in the 48–52 dBA range. The inclusion of the car wash brings the cumulative levels to approximately 50–54 dBA within the backyard; this meets the OAR noise code limit without additional remediation.

4.2.3 West / Southwest Commercial and Residential Zones

The noise impact model predicts that the sound level at the nearest commercial properties will not exceed traffic noise.

The noise impact model predicts that the sound level at the nearest residential properties to the west up the hill could exceed 60 dBA and the ambient sound level by up to 5 dBA. The predicted noise impact from the car wash blowers is estimated to be 60–63 dBA, which exceeds the Clackamas County daytime limit and OAR L_{10} (10% of an hour) limit of 60 dBA. This is an estimated 20% to 25% increase in sound over traffic, and may be perceived as a noticeable impact when windows are open or within east-facing outdoor spaces.

A primary driver to the west compared to the east is the topography and lack of visible and acoustical screens; the terrain elevation increases to the west (note topographic lines toward the lower left of the figures), the residential properties have a direct line of sight into the car wash tunnel exit. The geometry associated with this topography is such that a barrier at the exit of the car wash would not provide enough noise reduction, and the existing foliage provides effective noise reduction. The shape of the buildings on the west side of Willamette Drive does not provide any noise reduction to these residences.

5 Noise Control Options

The following noise control options have been engineered to reduce the noise impact to meet the Clackamas County Code 60 dBA (during daytime hours 7:00am to 10:00pm) and Oregon Administrative Rules statistical noise levels for new commercial noise sources.

5.1 Redesigned Tunnel Exit

To address the noise impact to the residences to the west up the hill, an enclosed turn to the west end of the car wash tunnel was engineered. The following is the proposed coordinated design by TVA Architects.

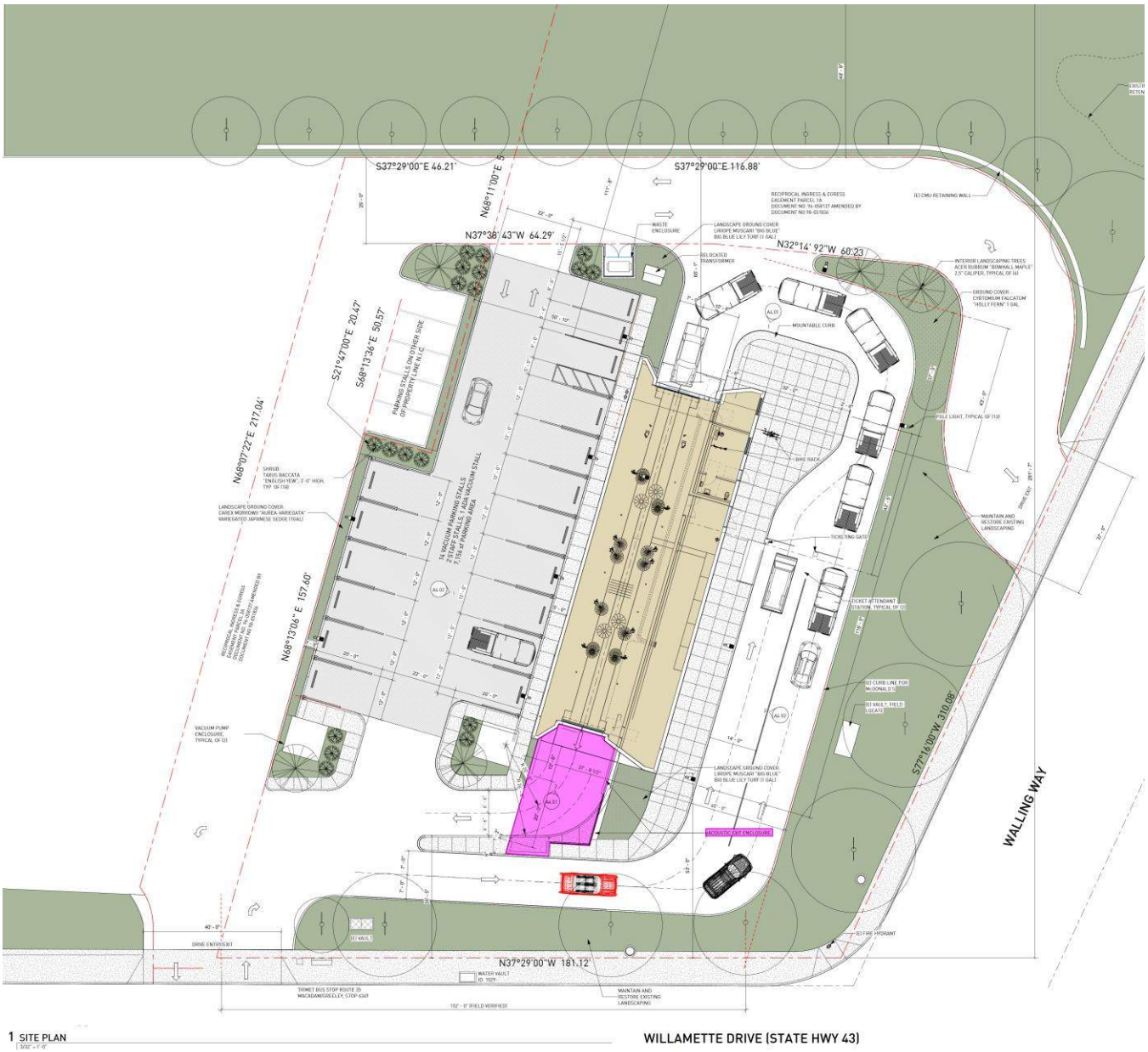


Figure 8: Updated Site Plan

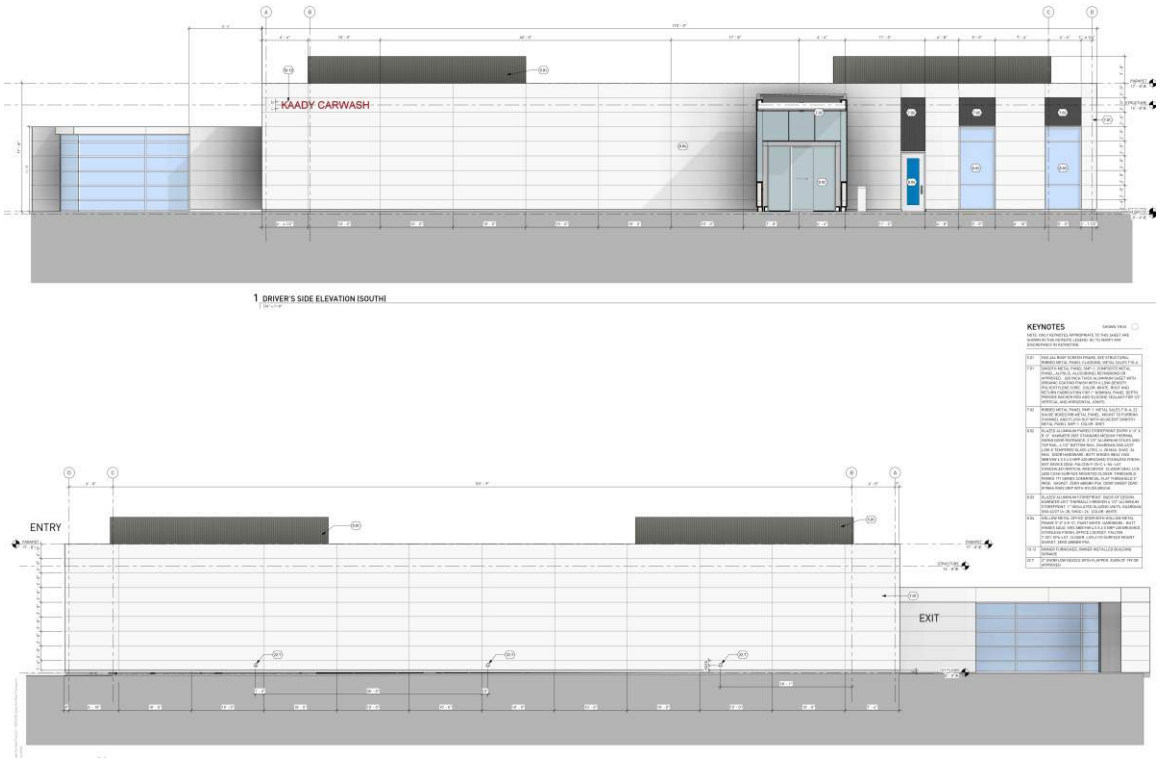


Figure 9: Exterior Elevation Drawings (TVA Architects)

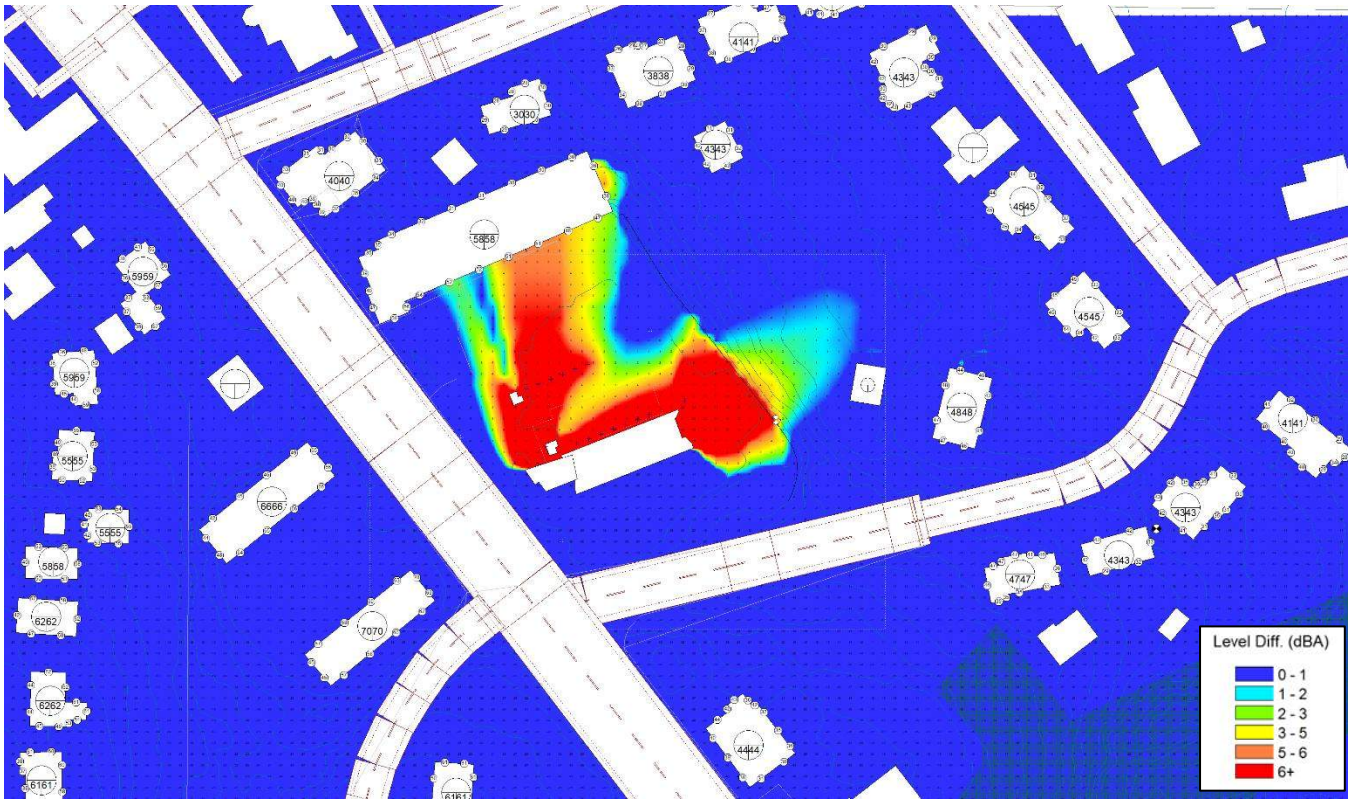


Figure 10: Predicted Noise Level Increase with Tunnel Exit Modification

Figure 10, shows that the extension reduces the noise to be equal to or less than traffic noise to the western residences.

5.2 Alternative Tunnel Blowers

This option was modeled, but is not planned.

No Noise Impact at West Residences (1 dBA or less of increase above traffic noise without altering the tunnel design)

1) Install a blower system inside the tunnel that does not exceed a total sound pressure level of 69 dBA at 30-feet.
    a. Suggested System: International Drying Corporation Stealth Predator Dryer System (80 HP), 69 dBA at 30-feet

Meets Clackamas County Code (60 dBA) and Oregon Administrative Rules (55 dBA)

2) Install a blower system inside the tunnel that does not exceed a total sound pressure level of 75 dBA at 30-feet or silencer package that reduces the noise by 6 dBA for the current basis of design system.
    a. Suggested System: International Drying Corporation Stealth Predator Dryer System (120 HP), 72 dBA at 30-feet

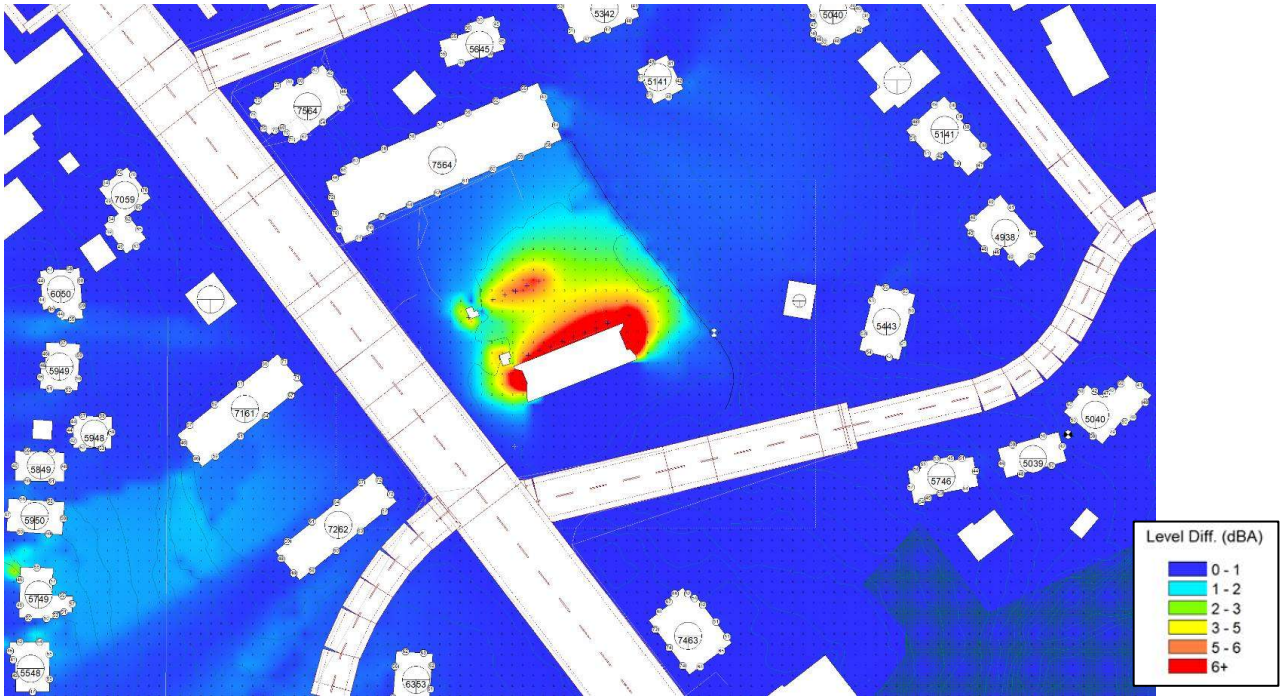


Figure 11: Predicted Noise Level Increase from International Dryer Corp Stealth Predator 80HP Dryer

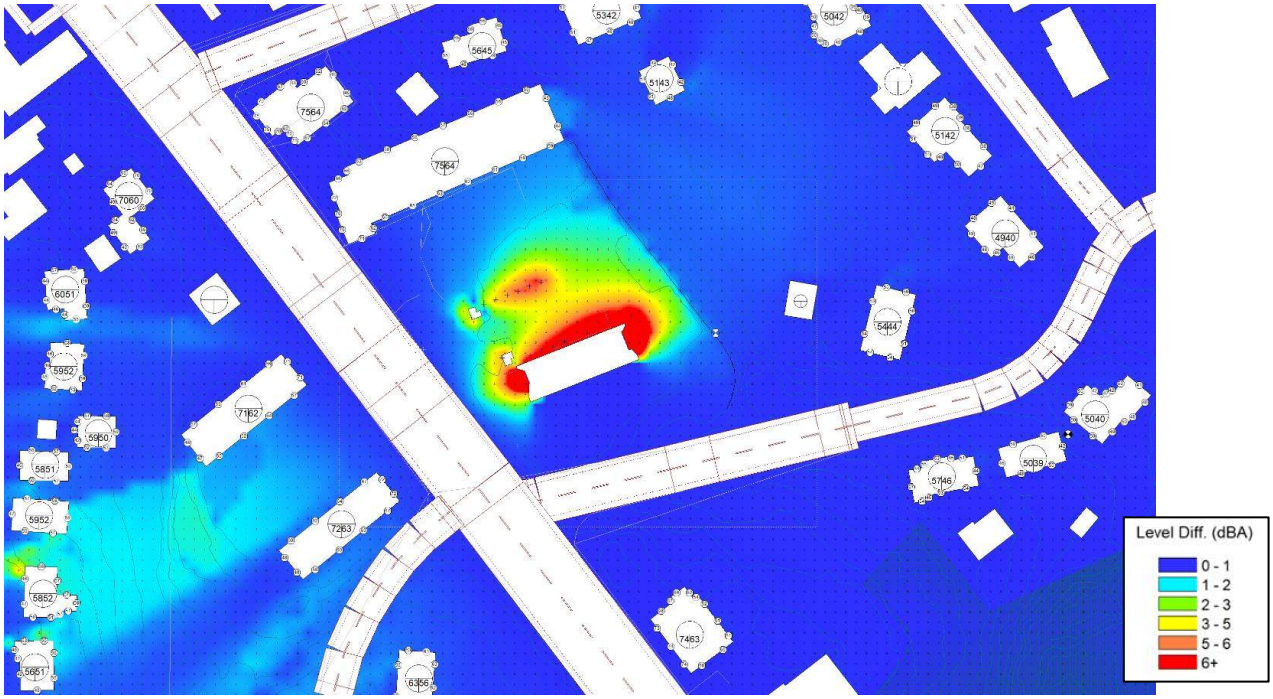


Figure 12: Predicted Noise Level Difference from International Dryer Corp Stealth Predator 120HP Dryer system

Figure 13 shows the predicted noise impact with International Dryer Corporation's Stealth Predator 120HP dryer system. The proposed system meets the noise code at all adjacent properties and is predicted to not exceed 54 dBA at the western residential property lines.

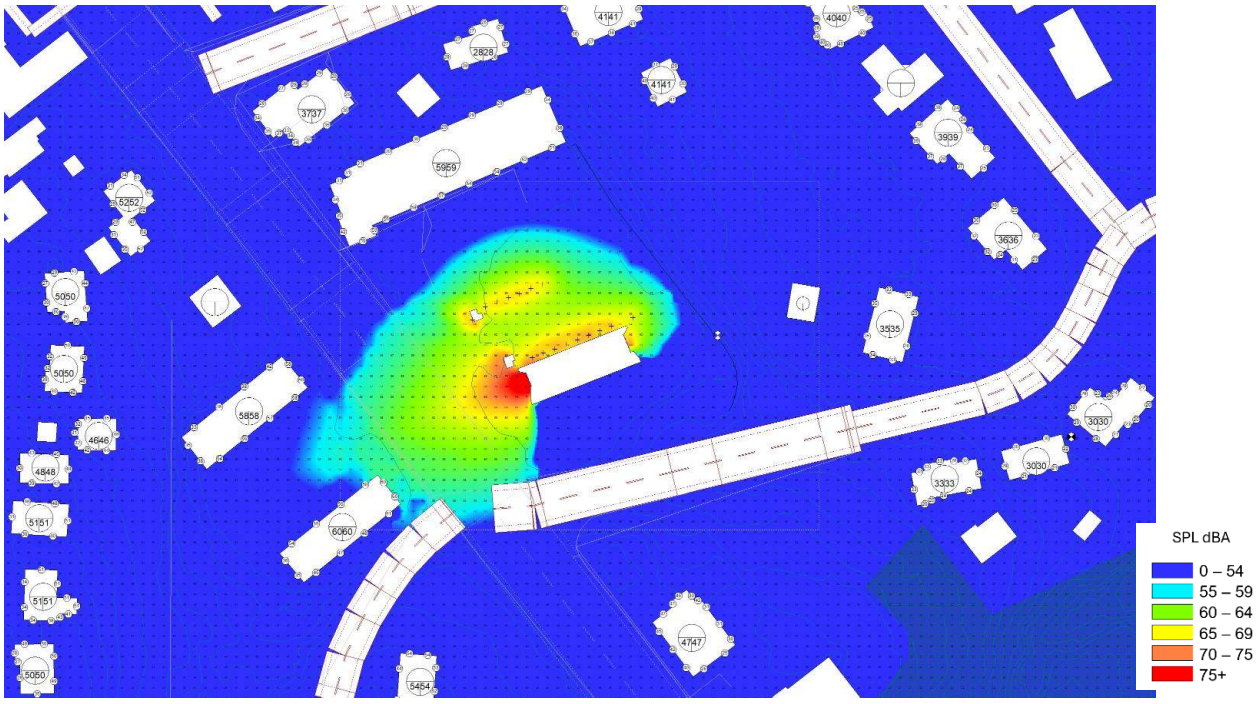


Figure 13: Predicted Noise Impact with International Dryer Corp Stealth Predator 120HP Dryer system

With the level of background noise associated with traffic from Willamette Drive / Highway 43 it is not feasible to measure the independent contributing sound from the car wash without stopping traffic. This means the measured sound level at the nearest property lines will always be a combination of traffic noise and the car wash activity noise (e.g., 52 dBA, traffic + 53 dBA, car wash = 56 dBA measured).

Please contact us with any questions or additional coordination.

All the best,

DREW LODAREK
ACOUSTICAL CONSULTANT

GRANT SCHEFFNER
STAFF CONSULTANT

ERIK MILLER-KLEIN, PE, INCE BD. CERT.
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OREGON
DECEMBER 31, 2019
ERIK T MILLER-KLEIN

RENEWAL DATE: 12/31/2026

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21370 SW Langer Farms Pkwy
Suite 142, Sherwood, OR 97140

November 25, 2025

REGISTERED PROFESSIONAL ENGINEER
54983PE
JULY 10, 2002
MICHAEL T. ARD
RENEWS: 12/31/2027

Chris Myers, Associate Planner
City of West Linn
22500 Salamo Road
West Linn, OR 97068

RE: 18850 Willamette Drive Car Wash: Transportation Impact Analysis Letter

Dear Mr. Myers,

This letter is written to provide information related to the transportation impacts of a proposed car wash facility at 18850 Willamette Drive in West Linn, Oregon. The purpose of this analysis is to provide information about the proposed use, make comparisons to the prior use of the site, examine expected queue lengths within the site, and provide information related to compatibility of the proposed conditional use with the surrounding environment.

Project and Location Description

The subject property is a 1.29-acre site that was previously home to a 3,948 square foot fast food restaurant with a drive-through window. However, the restaurant is no longer operational and the site has been unoccupied for several years. The property takes access via two driveways with one on Willamette Drive (OR Highway 43) and the other on Walling Way. These access driveways serve the Cedar Oaks Shopping Center, which includes the Backyard Burger Company, Kartcade, Smile Linn Dental clinic, Melani Studios Tattooing, Body&Brain Yoga/Tai Chi studio, and Umai Teriyaki restaurant.

Under the current proposal, the building that housed the prior restaurant will be removed, and an automated car wash facility will be constructed on the site. The car wash building will have a gross floor area of 3,190 square feet and will be centered within the site. A parking area will be provided on the north side of the building, with two staff parking spaces, 14 vacuum parking stalls, and one ADA vacuum parking stall. The ticketing and entry queue area will be at the south side of the site. Drivers will typically enter via the driveway on Willamette Drive and immediately turn right to enter the car wash queue. The entry splits into two lanes, each of which feeds into a ticket attendant station. The site layout provides a total of 300 feet of storage space for queueing vehicles between the ticket attendant stations and the site access, which is sufficient space for approximately 13 vehicles without queues extending into the site access driveway on Willamette Drive. Six additional vehicles can queue in the 140 feet between the ticketing stations and the car wash entrance, providing a total queue storage of 19 vehicles entering the car wash tunnel.

A site access and circulation diagram depicting the locations of the site access driveways, the proposed car wash tunnel, the parking area, and the queueing area is provided in Figure 1 below.

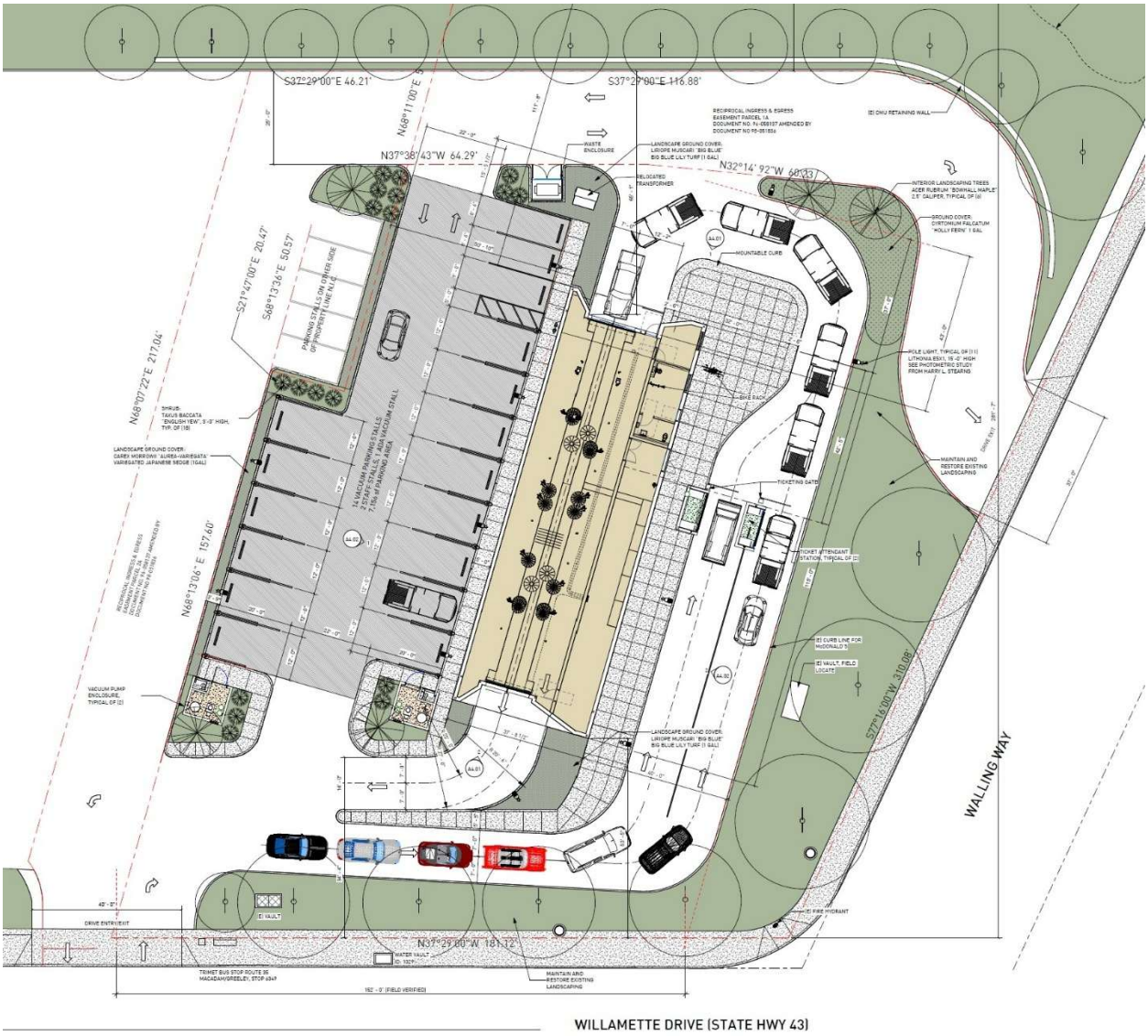

Figure 1: Site Access and Circulation Diagram

Willamette Drive (Oregon Hwy. 43) is classified by the City of West Linn as a Major Arterial roadway. It is also classified by the Oregon Department of Transportation as a Statewide Highway. It has one through lane in each direction in the immediate site vicinity, with turn lanes added at intersections. It has a posted speed limit of 35 mph. Sidewalks and bike lanes are in place on both sides of the roadway.

Walling Way is classified by the City of West Linn as a Local Street. It has a two-lane cross-section with one through lane in each direction and a posted speed limit of 25 mph. Existing sidewalks are in place on both sides of the roadway.

Trip Generation

To estimate the number of trips generated by the proposed use, data from the *ITE Trip Generation Manual, 11th Edition*, published by the Institute of Transportation Engineers was used. The data referenced was for land use code 948, Automated Car Wash. The ITE manual contains trip projections based on either the gross floor area of the facility and the number of car wash tunnels. A comparison of the two metrics revealed that using the number of car wash tunnels (i.e., one) results in a higher trip projection for the weekday evening peak hour, while using the gross floor area (i.e., 3,190 square feet) results in a higher trip projection for the Saturday peak hour. To maintain a conservative analysis, the higher trip generation estimates were used for both analysis periods.

Based on the calculations, the proposed car wash would be projected to generate 78 trips during the weekday evening peak hour and 96 trips during the Saturday peak hour. A summary of the trip generation calculations is provided in Table 1 below. Detailed trip generation calculation worksheets are also included in the attached technical appendix.

Table 1 - Trip Generation: Automated Car Wash

	PM Peak Hour			Saturday Peak Hour		
	In	Out	Total	In	Out	Total
3,190 sf or 1 tunnel	39	39	78	48	48	96

Since the proposed conditional may result in a change in operation as compared to the uses that are outright permitted within the site, one purpose of the trip generation estimate is to quantify how the trip generation characteristics of the site will change if the site is used for an automated car wash rather than other uses that are permitted outright within the underlying zone.

Uses permitted outright in the General Commercial (GC) zone include restaurants, general retail services, medical and dental offices, convenience stores, indoor recreation facilities, and community centers. Of the permitted uses, the highest traffic volumes would be generated by a convenience store or a fast-food restaurant with a drive-through window.

Re-occupancy of the existing 3,948 square-foot fast-food restaurant with a drive-through window would be projected to generate 130 trips during the weekday evening peak hour, and 218 Saturday peak hour trips. The comparison to this outright permitted land use shows that the proposed car wash would generate 47

percent fewer site trips during the evening peak hour and 60 percent fewer Saturday peak hour trips than a fast-food restaurant on the site (which also uses a drive-through window).

Alternatively, redevelopment of the site with a 3,000 square foot convenience store would be projected to generate 147 trips during the weekday evening peak hour, and 238 Saturday peak hour trips. The proposed car wash facility would generate 47 percent fewer weekday evening peak hour trips and 60 percent fewer Saturday peak hour trips than a 3,000 square foot convenience store within the site.

Based on the above comparisons, the proposed car wash facility is projected to have transportation impacts well below the levels associated with other outright permitted uses in the General Commercial zone. Notably, since the existing fast food restaurant with drive-through window on the site could be re-occupied, approval of the proposed car wash facility also represents a decrease in trip generation as compared to a use that is permitted without going through a land use approval process.

Queuing Analysis

Since the proposed car wash use requires on-site queuing, it is also appropriate to evaluate whether there is sufficient space to accommodate lines of vehicles waiting to enter the car wash tunnel. The potential site queues were analyzed using a review of prior studies of car wash facilities, direct observation of comparable Kaady Car Wash sites in the Portland Metro area, and using a mathematical model based on peak-hour service demands in conjunction with actual service times, assuming arrival of individual vehicles occurs at random times within the peak hour.

A search for prior studies yielded a 2012 study of various drive-through queues for facilities including banks, car washes, coffee shops, fast food restaurants, and pharmacies prepared by Mike Spack, PE in Minnesota. That study collected data for 6 car wash facilities, with a total of 12 days of observations. The study reported the maximum queues observed over the course of each examined day. The average maximum queue length was 4.42 vehicles, with a standard deviation of 2.31 vehicles. From the study, a high estimate of the maximum queue (85^{th} percentile) was 6.2 vehicles. The longest queue ever observed during the study was 10 vehicles. Notably, these observed car wash queue lengths were less than those reported for fast food restaurants. Fast food restaurants experienced average maximum queues of 8.5 vehicles, an 85^{th} percentile of 12 vehicles, and a maximum observed queue of 13 vehicles.

For local data, cameras were installed to observe one mid-week day and one weekend day at two Kaady Car Wash sites in the Portland metro area. The selected sites were at 9614 SW Tualatin Sherwood Road in Tualatin, Oregon and at 1909 W Burnside Street in Portland, Oregon. However, since there was rain during part of the weekend observations at the Tualatin Sherwood Road site, a second weekend of data was collected at that location. The maximum queue observed during a midweek day was 4 vehicles at the location in Tualatin (the maximum mid-week queue at the Burnside site was 2 vehicles). During weekend

operation, the maximum observed queue was also 4 vehicles at the location in Tualatin (the maximum weekend queue at the Burnside location was 3 vehicles).

The mathematical queuing model used was a Poisson distribution queuing model that used designated hourly arrival rates and service times to calculate the projected queue length. In order to provide for a very conservative analysis, the arrival rate used for the calculations was based on the highest trip generation data point contained in the ITE Trip Generation manual rather than the average trip generation rate. This trip rate was 37.75 trips per thousand square feet during the Saturday peak hour, which equates to 120 trips for the 3,190 square foot car wash, with half entering and half exiting the site (i.e., 60 vehicles arriving and 60 vehicles departing during the peak hour.) Additionally, the service rate was conservatively assumed to be 40 seconds per vehicle. Actual observation of car wash operations at the two Kaady Car Wash sites showed service times of as little as 30 seconds between vehicles when queues were present. Based on the calculations, the projected 95th percentile queue length for the very high estimated arrival rate was 7.4 vehicles.

Overall, the calculated queue length for the proposed car wash was 7.4 vehicles, and the maximum queue length observed at any car wash location among the data sets was 10 vehicles.

The proposed site plan provides sufficient space for 19 vehicles to queue prior to entering the wash tunnel.

Based on the analysis and the proposed site plan, the projected vehicle queues waiting to enter the car wash tunnel can safely be accommodated within the project site. Since the car wash queues are not projected to extend to the driveway, they will not impede the movement of vehicles entering and exiting the Cedar Oaks Shopping Center and are not projected to impact operation of either Willamette Drive or Walling Way.

CONCLUSIONS

Based on the transportation analysis, approval of the proposed automated car wash facility at 18850 Willamette Drive in West Linn, Oregon will not result in increases in traffic or degradation of operation of area roadways and intersections as compared to either the prior use of the site or other uses which are permitted outright in the General Commercial zone. Since the existing fast food restaurant with drive-through window on the site could be re-occupied, approval of the proposed car wash facility also represents a decrease in trip generation as compared to a use that is permitted without going through a land use approval process.

Based on the queuing analysis, the proposed site plan includes adequate space to accommodate the projected maximum queues without interfering with operation of the site access driveways or the adjacent public streets.

No additional travel demand, circulation, or queueing mitigation measures are recommended in conjunction with implementation of the proposed site plan for this conditional use.

If you have any questions regarding this analysis or if you need any further assistance, please don't hesitate to contact me.

Sincerely,

Michael Ard, PE
Principal Engineer

CONCLUSIONS

Based on the transportation analysis, approval of the proposed automated car wash facility at 18850 Willamette Drive in West Linn, Oregon will not result in increases in traffic or degradation of operation of area roadways and intersections as compared to either the prior use of the site or other uses which are permitted outright in the General Commercial zone. Since the existing fast food restaurant with drive-through window on the site could be re-occupied, approval of the proposed car wash facility also represents a decrease in trip generation as compared to a use that is permitted without going through a land use approval process.

Based on the queuing analysis, the proposed site plan includes adequate space to accommodate the projected maximum queues without interfering with operation of the site access driveways or the adjacent public streets.

No additional travel demand, circulation, or queueing mitigation measures are recommended in conjunction with implementation of the proposed site plan for this conditional use.

If you have any questions regarding this analysis or if you need any further assistance, please don't hesitate to contact me.

Sincerely,

Michael Ard, PE
Principal Engineer

Trip Generation Calculation Worksheet

Land Use Description: Automated Car Wash
ITE Land Use Code: 948
Independent Variable: Gross Floor Area
Quantity: 3.19 Thousand Square Feet

Summary of ITE Trip Generation Data

PM Peak Hour of Adjacent Street Traffic
Trip Rate: 14.20 trips per ksf
Directional Distribution: 50% Entering 50% Exiting

Saturday Peak Hour of Generator
Trip Rate: 30.40 trips per ksf
Directional Distribution: 50% Entering 50% Exiting

Site Trip Generation Calculations

3.19 ksf Automated Car Wash

	Entering	Exiting	Total
PM Peak Hour	23	23	46
Saturday Hour	48	48	96

Data Source: *Trip Generation Manual, 11th Edition* , Institute of Transportation Engineers, 2021

Trip Generation Calculation Worksheet

Land Use Description: Automated Car Wash
ITE Land Use Code: 948
Independent Variable: Car Wash Tunnels
Quantity: 1 Car Wash Tunnel

Summary of ITE Trip Generation Data

PM Peak Hour of Adjacent Street Traffic
Trip Rate: 77.50 trips per car wash tunnel
Directional Distribution: 50% Entering 50% Exiting

Saturday Peak Hour of Generator
Trip Rate: 41.00 trips per car wash tunnel
Directional Distribution: 50% Entering 50% Exiting

Site Trip Generation Calculations

1 Car Wash Tunnel

	Entering	Exiting	Total
PM Peak Hour	39	39	78
Saturday Hour	21	21	42

Data Source: *Trip Generation Manual, 11th Edition* , Institute of Transportation Engineers, 2021

Trip Generation Calculation Worksheet

Land Use Description: Fast-Food Restaurant with Drive-Through
ITE Land Use Code: 934
Independent Variable: Gross Floor Area
Quantity: 3.948 Thousand Square Feet

Summary of ITE Trip Generation Data

AM Peak Hour of Adjacent Street Traffic
Trip Rate: 44.61 trips per ksf
Directional Distribution: 51% Entering 49% Exiting

PM Peak Hour of Adjacent Street Traffic
Trip Rate: 33.03 trips per ksf
Directional Distribution: 52% Entering 48% Exiting

Total Weekday Traffic
Trip Rate: 467.48 trips per ksf
Directional Distribution: 50% Entering 50% Exiting

Saturday Peak Hour
Trip Rate: 55.25 trips per ksf
Directional Distribution: 51% Entering 50% Exiting

Site Trip Generation Calculations

3.9 ksf Fast-Food Restaurant w/ Drive Thru

	Entering	Exiting	Total
AM Peak Hour	90	86	176
PM Peak Hour	68	62	130
Weekday	923	923	1846
Saturday Peak	111	107	218

Data Source: *Trip Generation Manual, 11th Edition* , Institute of Transportation Engineers, 2021

Trip Generation Calculation Worksheet

Land Use Description: Convenience Store
ITE Land Use Code: 851
Independent Variable: Gross Floor Area
Quantity: 3.00 Thousand Square Feet

Summary of ITE Trip Generation Data

AM Peak Hour of Adjacent Street Traffic
Trip Rate: 62.54 trips per ksf
Directional Distribution: 50% Entering 50% Exiting

PM Peak Hour of Adjacent Street Traffic
Trip Rate: 49.11 trips per ksf
Directional Distribution: 51% Entering 49% Exiting

Total Weekday Traffic
Trip Rate: 762.28 trips per ksf
Directional Distribution: 50% Entering 50% Exiting

Saturday Peak Hour Traffic
Trip Rate: 79.12 trips per ksf
Directional Distribution: 50% Entering 50% Exiting

Site Trip Generation Calculations

3.00 ksf Convenience Store

	Entering	Exiting	Total
AM Peak Hour	94	94	188
PM Peak Hour	75	72	147
Weekday	1143	1143	2286
Saturday Peak	119	119	238

Data Source: *Trip Generation Manual, 11th Edition* , Institute of Transportation Engineers, 2021

The data for Kansas banks was collected between 4:30pm and 6:00pm. While many of the maximum queues for the data collected in Minnesota were between these times, maximum queues occurred between 8:30am and 5:30pm so it is possible that some of the Kansas data does not capture the actual maximum queues for the day.

The number of available lanes at banks, not including the ATM lane, ranged from two to seven lanes (though the most open at one time was five lanes). Even though plenty of lanes were available, cars often stacked at the lane closest to the building, thus additional lanes may not result in shorter queues. With an 85th percentile maximum queue of eight vehicles, the data suggests that banks with drive-through lanes should be able to accommodate 160 feet of vehicle stacking.

3.2 Car Washes

Data collection was done at six car washes with drive-through services (including one full-service car wash) in February 2012. Twelve days of data were collected. The car washes were located in the cities of Falcon Heights, Hopkins, Minneapolis, Roseville and St. Louis Park, MN. Five of the six car washes (excluding the full-service car wash) were located at gas stations. Only the vehicles waiting in line were counted; vehicles being washed were not added to the queue.

Table 3.2 – Drive-Through Car Wash Maximum Queue Statistics

Number of Data Points	**12**
Average Maximum Queue (Vehicles)	**4.42**
Standard Deviation (Vehicles)	**2.31**
Coefficient of Variation	**52%**
Range (Vehicles)	**1 to 10**
85th Percentile (Vehicles)	**6.20**
33rd Percentile (Vehicles)	**3.00**

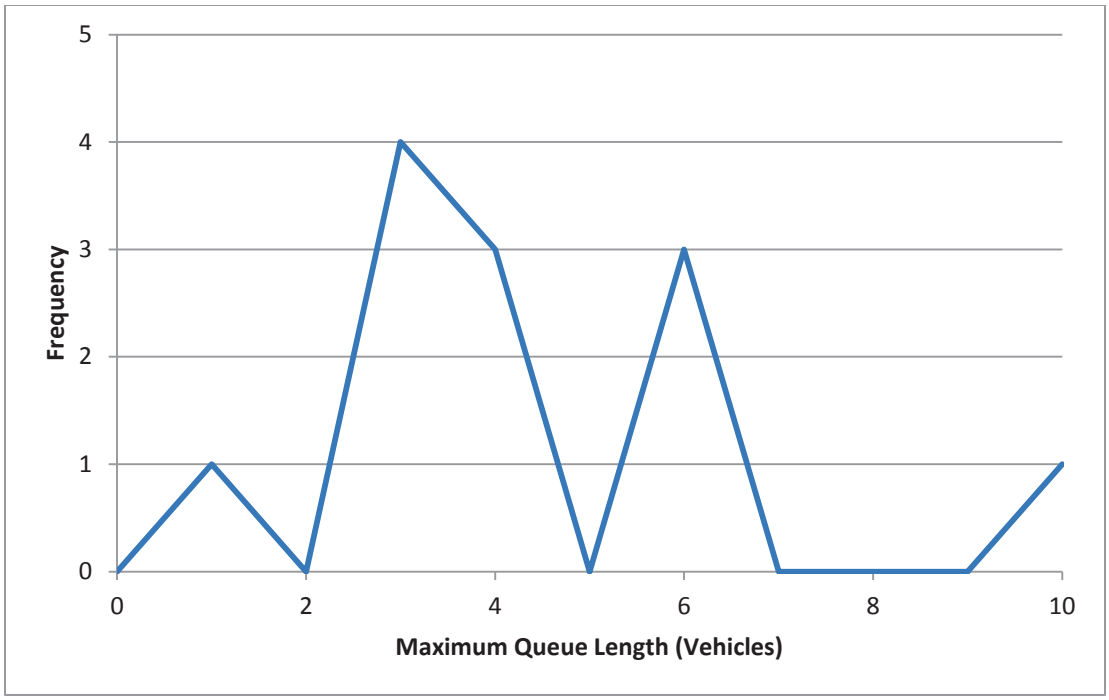

Figure 3.2 – Drive-Through Car Wash Maximum Queue Frequency

Two of the car washes had two lanes while the other four were one lane car washes. The full-service car wash had two lanes and also produced the highest maximum queue of 10 vehicles. The maximum queues for car washes were spread throughout the afternoon from 12:30pm to 8:30pm. With an 85th percentile maximum queue of more than six vehicles, the data suggests that car washes with drive-through lanes should be able to accommodate 140 feet of vehicle stacking throughout the day.

3.3 Coffee Shops

Data collection was done at six coffee shops with drive-through services in November 2010, August 2011 and February 2012. Fourteen days of data were collected. The coffee shops were located in the cities of Edina, Hopkins, Minneapolis, Roseville and St. Louis Park, MN. Vehicles being served were counted as being in the queue. Twelve days of data from the Kansas City, Kansas area is also included.

Table 3.3 – Drive-Through Coffee Shop Maximum Queue Statistics

	Minnesota Data	Minnesota + Kansas Data
Number of Data Points	14	26
Average Maximum Queue (Vehicles)	11.00	10.23
Standard Deviation (Vehicles)	2.25	2.76
Coefficient of Variation	20%	27%
Range (Vehicles)	7 to 16	3 to 16
85th Percentile (Vehicles)	13.50	13.00
33rd Percentile (Vehicles)	10.00	9.91

Queuing Video Observations - Burnside Washman 11/18/2025 (Tuesday)

Time	Patrons	Max Queue
8:00 AM	14	1
9:00 AM	16	1
10:00 AM	19	2
11:00 AM	17	2
12:00 PM	8	1
1:00 PM	21	2
2:00 PM	13	2
3:00 PM	19	2
4:00 PM	7	1
5:00 PM	14	2
6:00 PM	6	2
7:00 PM	3	1

Queuing Video Observations - Burnside Washman 11/22/2025 (Saturday)

Time	Patrons	Max Queue
8:00 AM	8	1
9:00 AM	20	3
10:00 AM	21	2
11:00 AM	14	2
12:00 PM	14	2
1:00 PM	19	3
2:00 PM	21	2
3:00 PM	20	2
4:00 PM	15	3
5:00 PM	4	1
6:00 PM	5	1
7:00 PM	7	1

Queuing Video Observations - Tualatin Sherwood Rd Washman 11/15/2025-11/16/2025 (Sat/Sun)

Time	Patrons	Max Queue	Notes
11/15/025			
1:00 PM	43	4	
2:00 PM	21	3	
3:00 PM	28	3	
4:00 PM	18	2	
5:00 PM	5	1	
6:00 PM	8	2	
7:00 PM	3	1	
11/16/2025			
8:00 AM	3	1	Rain
9:00 AM	2	1	Rain
10:00 AM	3	1	Rain
11:00 AM	2	1	Rain
12:00 PM	14	2	Rain

Queuing Video Observations - Tualatin Sherwood Rd Washman 11/18/2025 (Tuesday)

Time	Patrons	Max Queue
8:00 AM	16	2
9:00 AM	13	2
10:00 AM	13	3
11:00 AM	15	2
12:00 PM	29	4
1:00 PM	19	4
2:00 PM	30	4
3:00 PM	28	3
4:00 PM	17	3
5:00 PM	11	2
6:00 PM	3	1
7:00 PM	3	1
Total	**197**	

Queuing Video Observations - Tualatin Sherwood Rd Washman 11/22/2025 (Saturday)

Time	Patrons	Max Queue
8:00 AM	11	2
9:00 AM	12	2
10:00 AM	14	3
11:00 AM	19	3
12:00 PM	28	3
1:00 PM	18	2
2:00 PM	16	2
3:00 PM	12	3
4:00 PM	7	2
5:00 PM	7	1
6:00 PM	8	1
7:00 PM	3	1

18850 Willamette Drive Car Wash

Queue Calculation Worksheet (Assumes Poisson Distrubution of Arrivals)

Average Arrival Rate (λ)	60	veh/hour
Service Time	40	seconds/vehicle
Service Rate (μ)	90	veh/hour

Utilization (ρ)

= (λ)/(μ) 0.666667

Average Queue Length*

= (ρ^2)/(1-ρ) 1.3 vehicles

95th Percentile Queue*

= (log .05) / log (ρ) 7.4 vehicles

*The queue length calculations reflect a high estimate of Saturday peak demand.
Typical queue lengths are projected to be less than those calculated here.