



# CITY OF TUALATIN

## Community Development Department-Planning Division

### Land Use Application—Type II

**PROPOSAL NAME** River Ridge Addition

**PROPOSAL SUMMARY** (Brief description)

Planned parking lot and building pad for a future drive-through retail establishment.

**PROPERTY INFORMATION**

Location (address if available): 17915 SW Pacific Highway

Tax Map & Lot #(s): 2S115C, Tax Lot 2200 Planning District: CG

Total site size: ± 0.62 Acres  Developed  Undeveloped

Applicant's Consultant: AKS Engineering & Forestry, LLC - Chris Goodell  
Phone: (503) 563-6151, Email: ChrisG@aks-eng.com

**APPLICANT/CONTACT INFORMATION**

Applicant or Primary Contact Name: Mountain West Investment Corporation

Mailing Address: 201 Ferry Street SE, Suite 400

City/State: Salem, OR Zip: 97301

Phone: Please Contact Applicant's Consultant Email: Please Contact Applicant's Consultant

Applicant's Signature: *Robert F. Byers* Date: 2/6/2019

I hereby acknowledge that I have read this application and understand the requirements for approving and denying the application, that the information provided is correct, that I am the owner or authorized agent of the owner, and that plans submitted are in compliance with the City of Tualatin Development (TDC) and Municipal (TMC) Codes.

**PROPERTY OWNER/DEED HOLDER INFORMATION** (Attach list if more than one)

Name: Loretta Garcia Trust

Mailing Address: 17905 SW Pacific Highway

City/State: Tualatin, OR Zip: 97062

Phone: Please Contact Applicant's Consultant Email: Please Contact Applicant's Consultant

Property Owner Signature: *Daniel Garcia* Date: 2/6/2019

DocuSigned by:

*Daniel Garcia*

Power of attorney or letter of authorization required if application not signed by the property owner/deed holder.

**LAND USE APPLICATION TYPE**

- Architectural Review (AR)
- Historic Landmark (HIST)
- Interpretation (INT)
- Minor Variance (MVAR)
- Tree Removal (TCP)
- Other \_\_\_\_\_

FOR STAFF USE ONLY	
Case No.:	_____
Date Received:	_____
By:	_____
Fee Amount \$:	_____
Received by:	_____

<b>GENERAL INFORMATION</b>	
Site Address:	17915 SW Pacific Highway
Assessor's Map and Tax Lot #:	2S115C Tax Lot 2200
Planning District:	Commercial General (CG)
Parcel Size:	±0.61 Acres
Property Owner:	Loretta Garcia Trust
Applicant:	Mountain West Investment Corporation
Proposed Use:	Parking lot and drive-through retail establishment

<b>ARCHITECTURAL REVIEW DETAILS</b>	
Residential	<input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Industrial
Number of parking spaces:	36
Square footage of building(s):	± 1,200 square feet
Square footage of landscaping:	± 10,298 square feet
Square footage of paving:	± 16,493 square feet
Proposed density (for residential):	n/a

**For City Personnel to complete:**

Staff contact person:

**CITY OF TUALATIN FACT SHEET**

**General**

Proposed use: Parking lot and drive-through retail establishment					
Site area:	± 0.61	acres	Building footprint:	± 1,200	sq. ft.
Development area:	± 0.61	acres	Paved area:	± 16,493	sq. ft.
		± 26,572	Sq. ft.	Development area coverage:	%

**Parking**

Spaces required (see TDC 73.400) (example: warehouse @ 0.3/1000 GFA) Drive-Up @ 9.90 /1000 GFA = 15 Restaurant @ _____ /1000 GFA = _____ _____ @ _____ /1000 GFA = _____ Total parking required: _____ spaces ADA accessible = _____ Van pool = _____ Compact = (max. 35% allowed) = Loading berths = _____	Spaces provided: Total parking provided: 36 spaces Standard = 36 spaces ADA accessible = 2 spaces Van pool = n/a Compact = 10 spaces Loading berths = n/a
--	---

**Bicycles**

Covered spaces required: 3	Covered spaces provided: 3
----------------------------	----------------------------

**Landscaping**

Landscaping required: 15 % of dvpt. area Square feet	Landscaping provided: ± 38 % of dvpt. area Square feet
Landscaped parking island area required: %	Landscaped parking island area provided: %

**Trash and recycling facility**

Minimum standard method: ± 235 square feet
Other method: _____ square feet

**For commercial/industrial projects only**

Total building area: ± 1,200 sq. ft.	2 <sup>nd</sup> floor: n/a sq. ft.
Main floor: ± 1,200 sq. ft.	3 <sup>rd</sup> floor: n/a sq. ft.
Mezzanine: n/a sq. ft.	4 <sup>th</sup> floor: n/a sq. ft.

**For residential projects only**

Number of buildings: n/a	Total sq. ft. of buildings: n/a sq. ft.
Building stories: n/a	



Water supply modeling is necessary for larger projects to determine the impact of the project’s water demand on the water supply system. Water supply modeling will be performed by a consulting engineer based on the most recent version of the Tualatin Water System Master Plan.

Due to possible impacts to the water supply system, the following projects in Tualatin require hydraulic modeling based on the size and type of the project and projected water use for the finished project. The outcome of modeling could require offsite improvements to the water supply system in order to ensure that adequate water supply is available to serve the project and reduce impacts to the overall system.

**Hydraulic modeling of the water supply system is required for the following project type/sizes/demand:**

Project Type	Criteria	Permit Fee
<b>Commercial or Industrial Building</b>	Building floor area greater than 48,300 square feet <b>or</b> Anticipated daily water demand greater than 870 gallons per acre per day	\$ 300 per building
<b>Residential development</b>	More than 49 dwelling units	\$ 1,000
<b>Multi-family development</b>	More than 49 dwelling units <b>or</b> a combined building floor area greater than 48,300 square feet	\$ 300 per building

**Please complete this form and submit the form and required fee (if applicable) with your land-use application (architectural review, subdivision, etc.).**

Commercial or Industrial Development

- Building floor area 1,200 square feet
- Anticipated water demand (if known) Unknown gallons per day
- Described planned building use Drive-through retail establishment

Residential Development

- Number of dwelling units or single family home lots \_\_\_\_\_

Multi-Family Residential Development

- Number of dwelling units \_\_\_\_\_
- Building floor area (sum of all building) \_\_\_\_\_
- Number of multi-family buildings \_\_\_\_\_

**Permit fee required based on the information provided above \$ \_\_\_\_\_**

- If no fee is required, enter \$0.

NOTE: Water Supply Modeling does not replace the requirement for fire hydrant flow testing. Flow testing of fire hydrants will still be required to verify adequate fire flow of finished system



10295 Southwest Ridder Road Wilsonville, OR 97070  
o 503.570.0626 f 503.582.9307 republicservices.com

March 29, 2019

Mark Anderson  
Benner Stange Associates Architects, Inc.

Re: River Ridge Addition  
Pacific Highway W.  
Tualatin, OR 97062

Dear Mark

Thank you, for sending us the final site plans for this proposed development in Tualatin OR.

My Company: Republic Services of Clackamas and Washington Counties has the franchise agreement to service this area with the City of Tualatin. We will provide complete commercial waste removal and recycling services as needed on a weekly basis for this location

The trash and recycle enclosure design specifications and location sent 3/22/2019 will allow access for our trucks to safely service this commercial location.

Thank you Mark for your help and concerns for our services prior to this project being developed.

Sincerely,

A handwritten signature in black ink, appearing to read "Kelly Herrod". The signature is written in a cursive style with several loops and flourishes.

Kelly Herrod  
Operations Supervisor  
Republic Services Inc.





## Sensitive Area Pre-Screening Site Assessment

1. **Jurisdiction:** Washington County

2. **Property Information** (example 1S234AB01400)

Tax lot ID(s): 2S115C002200

Site Address: 17905-17915 SW Pacific Hwy

City, State, Zip: Tualatin, Oregon, 97062

Nearest Cross Street: SW 124th Ave

3. **Owner Information**

Name: Richard Berger

Company: Mountain West Investment Corp.

Address: 201 Ferry St., SE, Suite 400

City, State, Zip: Salem, Oregon, 97301

Phone/Fax: See Applicant

E-Mail: See Applicant

4. **Development Activity** (check *all* that apply)

- Addition to Single Family Residence (rooms, deck, garage)
- Lot Line Adjustment       Minor Land Partition
- Residential Condominium       Commercial Condominium
- Residential Subdivision       Commercial Subdivision
- Single Lot Commercial       Multi Lot Commercial

Other Commercial Parking Lot

5. **Applicant Information**

Name: Chuck Gregory, PE

Company: AKS Engineering & Forestry

Address: 12965 SW Herman Road, Suite 100

City, State, Zip: Tualatin, Oregon, 97062

Phone/Fax: 503-563-6151

E-Mail: chuckg@aks-eng.com

6. **Will the project involve any off-site work?**  Yes  No  Unknown

Location and description of off-site work 99W Frontage Sidewalk Improvements

7. **Additional comments or information that may be needed to understand your project** \_\_\_\_\_

This application does NOT replace Grading and Erosion Control Permits, Connection Permits, Building Permits, Site Development Permits, DEQ 1200-C Permit or other permits as issued by the Department of Environmental Quality, Department of State Lands and/or Department of the Army COE. All required permits and approvals must be obtained and completed under applicable local, state, and federal law.

By signing this form, the Owner or Owner's authorized agent or representative, acknowledges and agrees that employees of Clean Water Services have authority to enter the project site at all reasonable times for the purpose of inspecting project site conditions and gathering information related to the project site. I certify that I am familiar with the information contained in this document, and to the best of my knowledge and belief, this information is true, complete, and accurate.

Print/Type Name Chuck Gregory, PE Print/Type Title \_\_\_\_\_

**ONLINE SUBMITTAL**

Date 10/29/2018

### FOR DISTRICT USE ONLY

Sensitive areas potentially exist on site or within 200' of the site. **THE APPLICANT MUST PERFORM A SITE ASSESSMENT PRIOR TO ISSUANCE OF A SERVICE PROVIDER LETTER.** If Sensitive Areas exist on the site or within 200 feet on adjacent properties, a Natural Resources Assessment Report may also be required.

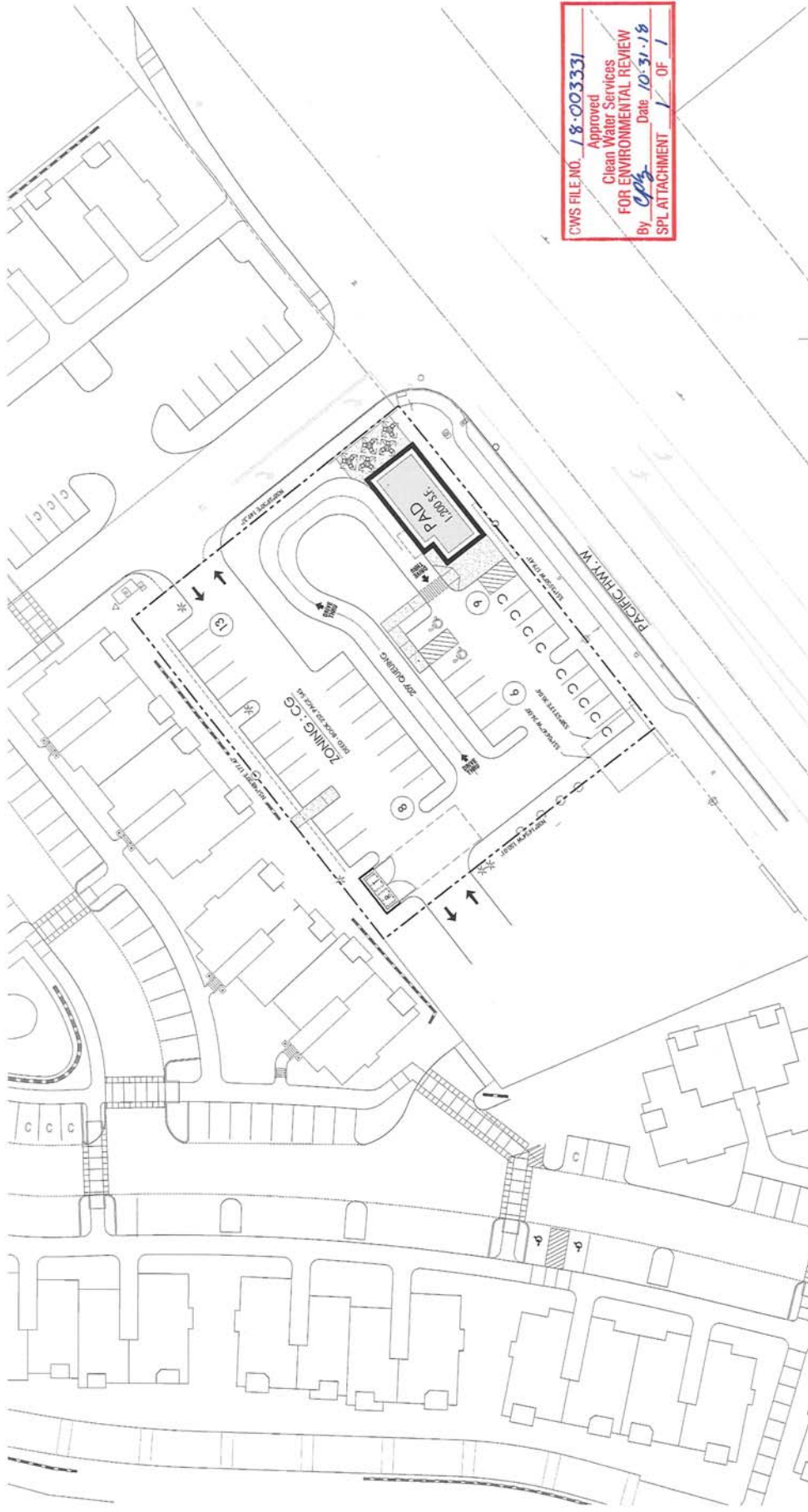
Based on review of the submitted materials and best available information Sensitive areas do not appear to exist on site or within 200' of the site. This Sensitive Area Pre-Screening Site Assessment does NOT eliminate the need to evaluate and protect water quality sensitive areas if they are subsequently discovered. This document will serve as your Service Provider letter as required by Resolution and Order 17-05, Section 3.02.1. All required permits and approvals must be obtained and completed under applicable local, State, and federal law.

Based on review of the submitted materials and best available information the above referenced project will not significantly impact the existing or potentially sensitive area(s) found near the site. This Sensitive Area Pre-Screening Site Assessment does NOT eliminate the need to evaluate and protect additional water quality sensitive areas if they are subsequently discovered. This document will serve as your Service Provider letter as required by Resolution and Order 07-20, Section 3.02.1. All required permits and approvals must be obtained and completed under applicable local, state and federal law.

This Service Provider Letter is not valid unless 1 CWS approved site plan(s) are attached.

The proposed activity does not meet the definition of development or the lot was platted after 9/9/95 ORS 92.040(2). NO SITE ASSESSMENT OR SERVICE PROVIDER LETTER IS REQUIRED.

Reviewed by Chuck Buchanan Date 10/31/18



CWS FILE NO. / 8-003331  
 Approved  
 Clean Water Services  
 FOR ENVIRONMENTAL REVIEW  
 By *[Signature]* Date 10-31-18  
 SPL ATTACHMENT / OF 1



**SITE PLAN**  
 SCALE: 1"=20'

October 24, 2018

**BENNER STANGE ASSOCIATES A/E ARCHITECTS, INC.**  
 800 N. WASHINGTON ST.  
 PORTLAND, OR 97214  
 FAX (503) 400-0035  
 bsaa@bennerstange.com



**SDI**

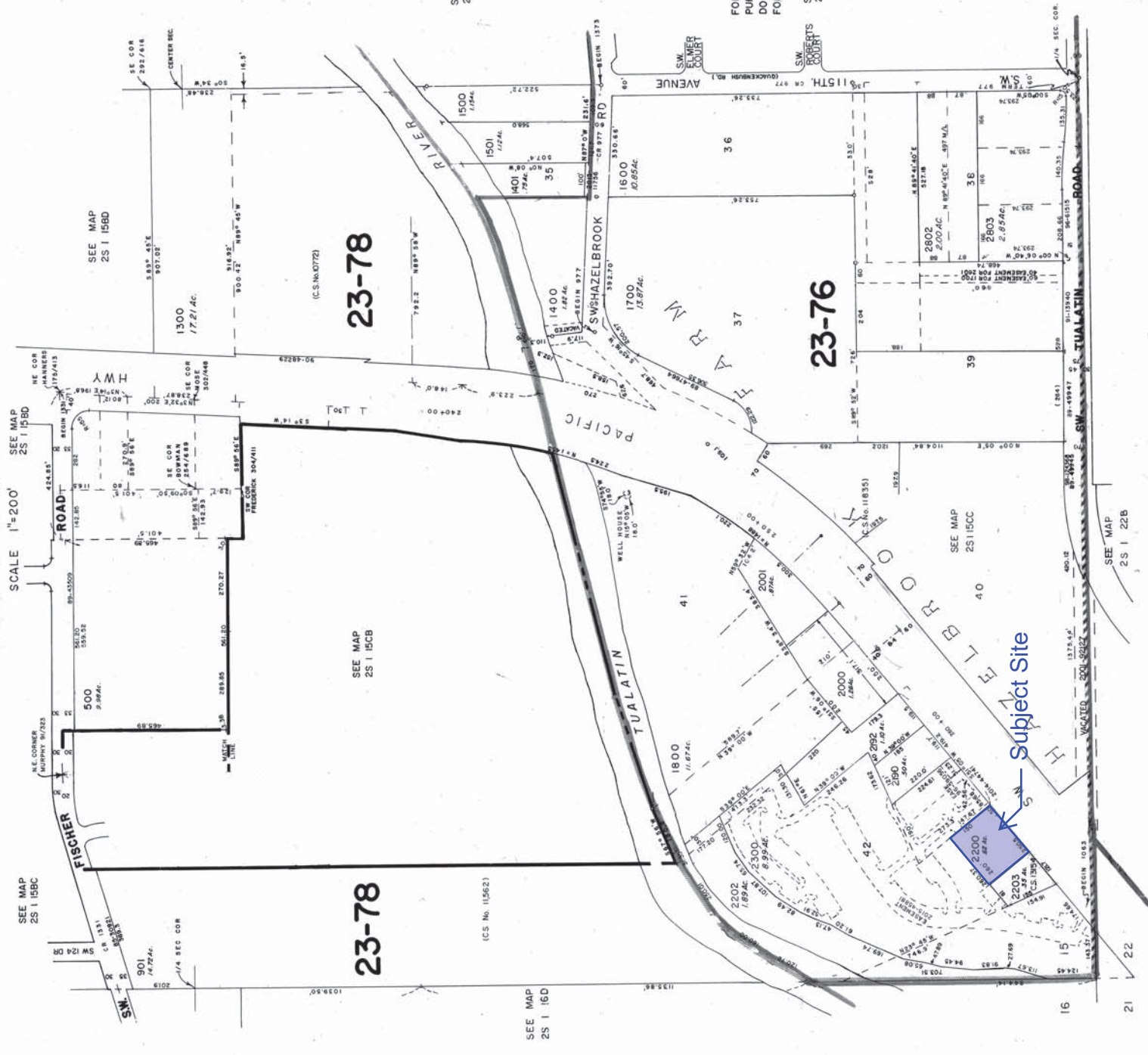
**MOUNTAIN WEST INVESTMENT CORPORATION**

**RIVERS RIDGE**  
 Pacific HWY 99 W | Tualatin, Oregon

© 2018 Benner Stange Associates, Inc. All rights reserved. CWS File No. 8-003331-18



CANCELLED TAX LOTS  
2700, 704, 702, 1026, 800,  
1000, 1701, 2000, 2001, 2800,  
1000, 1701, 2000, 2001, 2800,  
1000, 1701, 2000, 2001, 2800,  
1000, 1701, 2000, 2001, 2800,  
1000, 1701, 2000, 2001, 2800,  
299, 1002, 2400, 2400, 2500, 41,



FOR ASSESSMENT  
PURPOSES ONLY  
DO NOT RELY ON  
FOR ANY OTHER USE

SEE MAP  
2S I 15DC

SEE MAP  
2S I 15D

SEE MAP  
2S I 16D

SEE MAP  
2S I 22B

Subject Site



Customer Service  
 Phone: 503.219.1000  
 Email: [Ticor.Resource@TicorTitle.com](mailto:Ticor.Resource@TicorTitle.com)  
 Washington (OR)

**OWNERSHIP INFORMATION**

Owner(s) : **Garcia Loretta L**  
 CoOwner(s) :  
 Site Address : **17905 SW Pacific Hwy Tualatin 97062**  
 Mail Address : 17905 SW Pacific Hwy Tualatin Or 97062

Parcel Number : **R0523491**  
 Ref Parcel # : **2S115C0 02200**  
 T: 02S R: 01W S: 15 Q: SW QQ:  
 Telephone :

**PROPERTY DESCRIPTION**

Map Page Grid :  
 Census Tract : 320.01 Block: 1  
 Neighborhood : ZSHW  
 School District : Tigard  
 Subdivision/Plat :  
 Class Code : Single & Small Strip Store  
 Land Use : 2210 Com,Commercial Improved  
 Legal : ACRES .62, SEE ASSOCIATED  
 : ACCOUNT(S)  
 :

**ASSESSMENT AND TAX INFORMATION**

Mkt Land : \$271,350  
 Mkt Structure : \$122,780  
 Mkt Total : **\$394,130**  
 %Improved : 31  
 M50 Total : **\$187,280**  
 Levy Code : 02376  
 17-18 Taxes : \$3,128.15  
 Millage Rate : 16.7030

**PROPERTY CHARACTERISTICS**

Bedrooms :	Lot Acres : .62	Year Built :
Bathrooms :	Lot SqFt : 27,007	EffYearBlt :
HeatMethod :	BsmFin SF :	Floor Cover :
Pool :	BsmUnfinSF :	Foundation :
Appliances :	Bldg SqFt : 1,365	Roof Shape :
Dishwasher :	1stFlrSF : 1,365	Roof Matl :
Hood Fan :	UpperFlSF :	InteriorMat :
Deck :	Porch SqFt :	Paving Matl :
GarageType :	Attic SqFt :	Ext Finish :
Garage SF :	Deck SqFt :	Const Type :

**TRANSFER HISTORY**

Owner(s)	Date	Doc #	Price	Deed	Loan	Type
:Garcia Loretta L	:09/15/2003	155888	:	:	:	:
:	:	:	:	:	:	:
:	:	:	:	:	:	:
:	:	:	:	:	:	:
:	:	:	:	:	:	:
:	:	:	:	:	:	:

This title information has been furnished, without charge, in conformance with the guidelines approved by the State of Oregon Insurance Commissioner. The Insurance Division cautions intermediaries that this service is designed to benefit the ultimate insureds. Indiscriminate use only benefiting intermediaries will not be permitted. Said services may be discontinued. No liability is assumed for any errors in this report. Information is deemed reliable but not guaranteed



# TICOR TITLE™

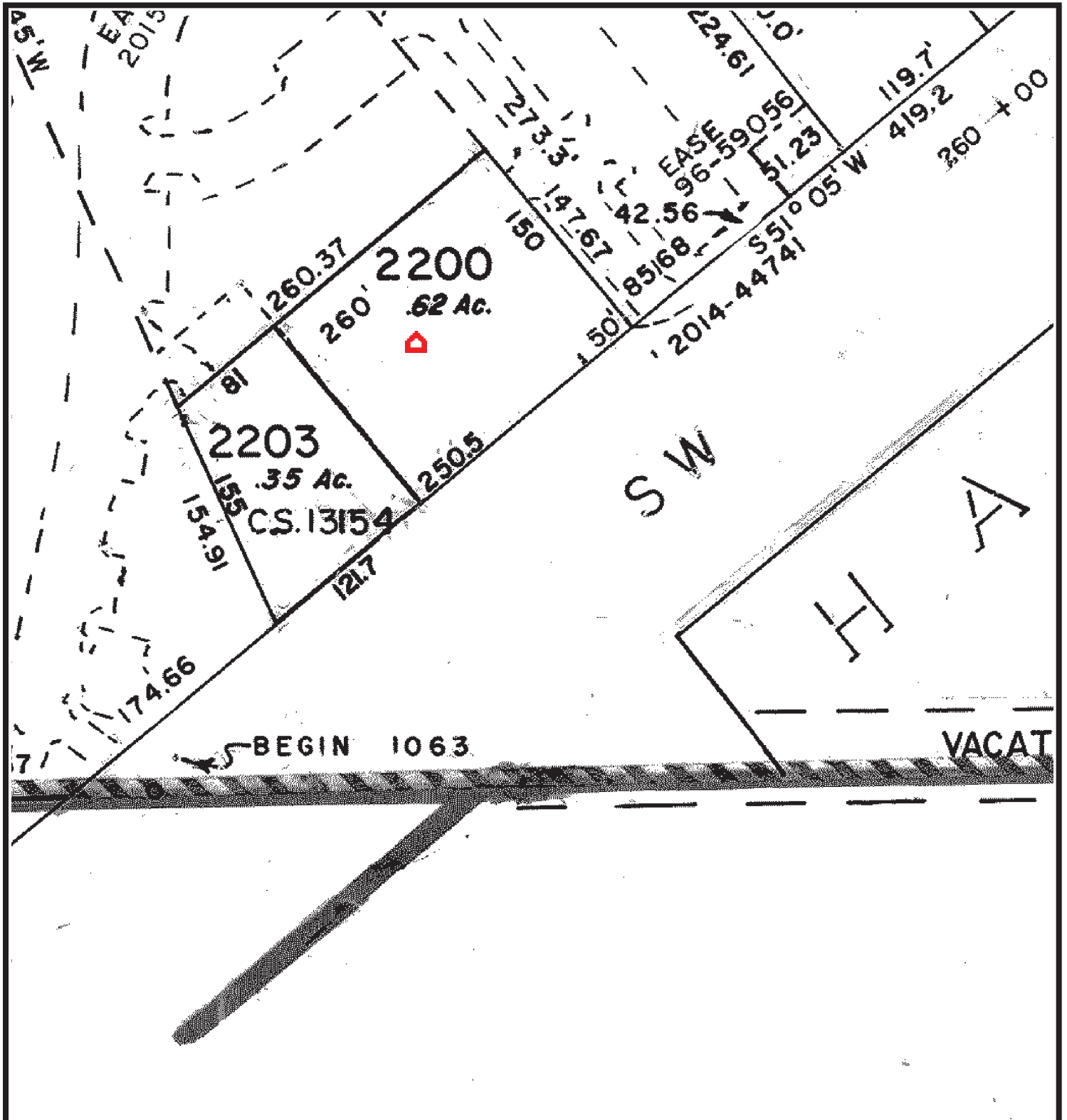
The RIGHT choice...*your* choice!

Customer Service  
Phone: 503.219.1000  
Email: [Ticor.Resource@TicorTitle.com](mailto:Ticor.Resource@TicorTitle.com)



Parcel # : R2163085

Ref Parcel Number : 2S115C0 02200



This map is made solely for assisting in locating said premises. The company assumes no liability for variations, if any, in dimensions and location ascertained by an actual survey.



## PRELIMINARY REPORT

In response to the application for a policy of title insurance referenced herein Tigor Title Company of Oregon hereby reports that it is prepared to issue, or cause to be issued, as of the specified date, a policy or policies of title insurance describing the land and the estate or interest hereinafter set forth, insuring against loss which may be sustained by reason of any defect, lien or encumbrance not shown or referred to as an exception herein or not excluded from coverage pursuant to the printed Schedules, Conditions and Stipulations or Conditions of said policy forms.

The printed Exceptions and Exclusions from the coverage of said policy or policies are set forth in Exhibit One. The policy to be issued may contain an arbitration clause. When the Amount of Insurance is less than that set forth in the arbitration clause, all arbitrable matters shall be arbitrated at the option of either the Company or the Insured as the exclusive remedy of the parties. Copies of the policy forms should be read. They are available from the office which issued this report.

This report (and any supplements or amendments hereto) is issued solely for the purpose of facilitating the issuance of a policy of title insurance and no liability is assumed hereby.

The policy(s) of title insurance to be issued hereunder will be policy(s) of Chicago Title Insurance Company, a/an Florida corporation.

**Please read the exceptions shown or referred to herein and the Exceptions and Exclusions set forth in Exhibit One of this report carefully. The Exceptions and Exclusions are meant to provide you with notice of matters which are not covered under the terms of the title insurance policy and should be carefully considered.**

**It is important to note that this preliminary report is not a written representation as to the condition of title and may not list all liens, defects and encumbrances affecting title to the land.**

This preliminary report is for the exclusive use of the parties to the contemplated transaction, and the Company does not have any liability to any third parties nor any liability until the full premium is paid and a policy is issued. Until all necessary documents are placed of record, the Company reserves the right to amend or supplement this preliminary report.

*Countersigned*

A handwritten signature in black ink that reads 'Maggie Metcalf'. The signature is written in a cursive style. Below the signature is a horizontal line.



111 SW Columbia St., Ste 1000, Portland, OR 97201  
(503)242-1210 FAX (503)242-0770

## PRELIMINARY REPORT

**TITLE OFFICER:** Mark Davison

**ORDER NO.:** 36261803170

**TO:** Ticor Title Company of Oregon  
Lori Neva  
315 Commercial Street SE, Suite 150  
Salem, OR 97301

**OWNER/SELLER:** The Loretta Garcia Estate

**BUYER/BORROWER:** Mountain West Investment Corporation

**PROPERTY ADDRESS:** 17905 SW Pacific Highway, Tualatin, OR 97062

**EFFECTIVE DATE:** June 12, 2018, 08:00 AM

1. THE POLICY AND ENDORSEMENTS TO BE ISSUED AND THE RELATED CHARGES ARE:

	<u>AMOUNT</u>	<u>PREMIUM</u>
ALTA Owner's Policy 2006 Owner's Standard	\$ 640,066.00	\$ 1,562.00
Government Lien Search		\$ 25.00

2. THE ESTATE OR INTEREST IN THE LAND HEREINAFTER DESCRIBED OR REFERRED TO COVERED BY THIS REPORT IS:

A Fee

3. TITLE TO SAID ESTATE OR INTEREST AT THE DATE HEREOF IS VESTED IN:

Heirs and/or Devisees of Loretta L. Garcia, deceased

4. THE LAND REFERRED TO IN THIS REPORT IS SITUATED IN THE CITY OF TUALATIN, COUNTY OF WASHINGTON, STATE OF OREGON, AND IS DESCRIBED AS FOLLOWS:

SEE EXHIBIT "A" ATTACHED HERETO AND MADE A PART HEREOF



**EXHIBIT "A"**  
Legal Description

A part of Lot 42, HAZELBROOK FARM, in the City of Tualatin, County of Washington and State of Oregon, lying Westerly of the tract conveyed to Angelo Ed Garcia, et ux, by deed recorded in Book 252, Page 545, described as follows:

Beginning at an iron pipe on the Northwestern right of way line of Westside Pacific (State) Highway, which iron pipe bears North 89°52' East, 143.4 feet and North 51°48' East, 175.0 feet from the Southwest corner of Lot 42, is also the Southwest corner of Section 15, Township 2 South, Range 1 West of the Willamette Meridian; thence North 51°48' East along the Northwestern line of said highway, 250.5 feet; thence North 51°5' along said highway, 50.7 feet to an angle corner of said premises; thence North 39°00' West along the line of said premises, 150 feet; thence Southwesterly parallel with the Northwestern line of said highway, 260 feet, more or less, to the Westerly line thereof; thence South 23°45' East, 160 feet, more or less, to the place of beginning.

EXCEPTING THEREFROM the following:

Beginning at an iron pipe on the Northwestern right of way line of the Westside Pacific (State) Highway, which iron pipe bears North 89° 52' East, a distance of 143.4 feet and North 51°48' East, a distance of 175.0 feet from the Southwest corner of Lot 42, and which corner is also the Southwest corner of Section 15, Township 2 South, Range 1 West of the Willamette Meridian; thence from the described place of beginning, North 51°48' East along the Northwestern line of said highway, a distance of 121.7 feet; thence North 38°12' West, a distance of 150 feet; thence South 51°48' West, a distance of 81 feet, more or less, to the West line of said Garcia tract; thence South 23°45' East, a distance of 155 feet, more or less to the place of beginning.

AND FURTHER EXCEPTING THEREFROM that portion conveyed to the State of Oregon, by and through its State Highway Commission, by deed recorded July 6, 1953, in Book 345, Page 464.

**AS OF THE DATE OF THIS REPORT, ITEMS TO BE CONSIDERED AND EXCEPTIONS TO COVERAGE IN ADDITION TO THE PRINTED EXCEPTIONS AND EXCLUSIONS IN THE POLICY FORM WOULD BE AS FOLLOWS:**

**GENERAL EXCEPTIONS:**

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the Public Records.
2. Any facts, rights, interests or claims, which are not shown by the Public Records but which could be ascertained by an inspection of the Land or by making inquiry of persons in possession thereof.
3. Easements, or claims of easement, which are not shown by the Public Records; reservations or exceptions in patents or in Acts authorizing the issuance thereof; water rights, claims or title to water.
4. Any encroachment (of existing improvements located on the Land onto adjoining land or of existing improvements located on adjoining land onto the subject Land), encumbrance, violation, variation or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the subject Land.
5. Any lien or right to a lien for services, labor, material, equipment rental or workers compensation heretofore or hereafter furnished, imposed by law and not shown by the Public Records.

**SPECIFIC ITEMS AND EXCEPTIONS:**

6. Unpaid Property Taxes with partial payment are as follows:

Fiscal Year: 2015-2016  
Original Amount: \$2,862.20  
Unpaid Balance: \$2,851.57, plus interest, if any

Unpaid Property Taxes are as follows:

Fiscal Year: 2016-2017  
Amount: \$2,982.70, plus interest, if any

Unpaid Property Taxes are as follows:

Fiscal Year: 2017-2018  
Amount: \$3,128.15, plus interest, if any  
Levy Code: 023.76  
Account No.: R523491  
Map No.: 2S115C-02200

Prior to close of escrow, please contact the Tax Collector's Office to confirm all amounts owing, including current fiscal year taxes, supplemental taxes, escaped assessments and any delinquencies.

The Land has 3 years delinquent taxes and is subject to foreclosure action as provided under Oregon Revised Statutes. Upon the expiration of the statutory redemption period, the property shall be deeded to the county by the tax collector.

7. Property taxes, which are a lien not yet due and payable, including any assessments collected with taxes to be levied for the fiscal year 2018-2019.

Tax Identification No.: R523491

8. City Liens, if any, in favor of the City of Tualatin. None found as of June 18, 2018.

9. Rights of the public to any portion of the Land lying within the area commonly known as streets, roads and highways.

10. Limited access to and from the Land as set forth in Deed shown below, which provides that there shall be no right of easement or right of access to, from or across the State Highway other than as expressly provided for in said Deed:

Grantor: Angelo Ed Garcia also known as Angelo E. Garcia and Loretta L. Garcia  
Grantee: State of Oregon, by and through its State Highway Commission  
Recording Date: July 6, 1953  
Recording No.: Book 346 Page 464

Amendment(s)/Modification(s) of said covenants, conditions and restrictions

Recording Date: August 8, 1958  
Recording No: Book 407 Page 626

11. Easement(s) for the purpose(s) shown below and rights incidental thereto, as granted in a document:

Granted to: City of Tualatin  
Purpose: Vehicle detector loop  
Recording Date: June 11, 1993  
Recording No: 93046003

12. A deed of trust to secure an indebtedness in the amount shown below,

Amount: \$110,000.00  
Dated: September 9, 2003  
Trustor/Grantor: Loretta L Garcia  
Trustee: Pacific Northwest Title  
Beneficiary: Sterling Savings Bank  
Loan No.: 700755249  
Recording Date: September 15, 2003  
Recording No.: 2003-155889

13. A deed of trust to secure an indebtedness in the amount shown below,

Amount: \$86,000.00  
Dated: July 14, 2008  
Trustor/Grantor: Daniel Garcia Executor of the Loretta Garcia Estate  
Trustee: Pacific Northwest Title of Oregon, Inc.  
Beneficiary: Stan Smith  
Loan No.: None shown  
Recording Date: October 10, 2008  
Recording No.: 2008-084824

14. Construction, Access and Maintenance Easement Agreement including the terms and provisions thereof

Executed by: MWIC Tualatin, LLC, Reza Lankarani and Farah Pakseresht, as tenants by the entirety, Roamer's Rest R.V. Park, LLC, Sean P. Casey, Estate of Loretta L. Garcia and Robert Osborne  
Recording Date: December 9, 2014  
Recording No.: 2014-078678

Amendment(s)/Modification(s) of said agreement

Recording Date: June 11, 2015  
Recording No: 2015-045880

15. Due probate and administration of the estate shown below. Personal representative appointed in said estate will be authorized to execute the forthcoming conveyance when the following requirement(s) has been met:

Requirement: Review of the case file is required, please contact your Title Officer prior to closing.  
Estate of: Loretta L Garcia, deceased  
Court: Circuit  
Probate No. C080355PE  
Personal Representative: Daniel R. Garcia  
Attorney for Estate: Valerie Ingram Kirkendall

16. If requested to issue an extended coverage ALTA loan policy, the following matters must be addressed:

- a) The rights of tenants holding under unrecorded leases or tenancies
- b) Matters disclosed by a statement as to parties in possession and as to any construction, alterations or repairs to the Land within the last 75 days. The Company must be notified in the event that any funds are to be used for construction, alterations or repairs.
- c) Any facts which would be disclosed by an accurate survey of the Land

**ADDITIONAL REQUIREMENTS/NOTES:**

- A. In addition to the standard policy exceptions, the exceptions enumerated above shall appear on the final 2006 ALTA Policy unless removed prior to issuance.
- B. Furnish recording instructions with the documents to be recorded in this transaction. Said instructions must address each requirement made herein, list any endorsements to be issued with the policy and specify the recording order of any documents furnished.

The Company reserves the right to add additional items or make further requirements after review of the requested instructions prior to recording the documents or issuing any requested endorsement.

The Company also reserves the right to charge any applicable additional fees for any endorsement requested.

C. The Company will require the following documents for review prior to the issuance of any title insurance predicated upon a conveyance or encumbrance by the corporation named below:

Name of Corporation: Mountain West Investment Corporation

- a) A Copy of the corporation By-laws and Articles of Incorporation
- b) An original or certified copy of a resolution authorizing the transaction contemplated herein
- c) If the Articles and/or By-laws require approval by a 'parent' organization, a copy of the Articles and By-laws of the parent
- d) A current dated certificate of good standing from the proper governmental authority of the state in which the entity was created

The Company reserves the right to add additional items or make further requirements after review of the requested documentation.

D. Note: There are NO conveyances affecting said Land recorded within 24 months of the date of this report.

E. Note: There are no matters against the party(ies) shown below which would appear as exceptions to coverage in a title insurance product:

Parties: Mountain West Investment Corporation, an Oregon corporation

F. Notice: Please be aware that due to the conflict between federal and state laws concerning the cultivation, distribution, manufacture or sale of marijuana, the Company is not able to close or insure any transaction involving Land that is associated with these activities.

G. Note: No utility search has been made or will be made for water, sewer or storm drainage charges unless the City/Service District claims them as liens (i.e. foreclosable) and reflects them on its lien docket as of the date of closing. Buyers should check with the appropriate city bureau or water service district and obtain a billing cutoff. Such charges must be adjusted outside of escrow.

H. Note: Effective January 1, 2008, Oregon law (ORS 314.258) mandates withholding of Oregon income taxes from sellers who do not continue to be Oregon residents or qualify for an exemption. Please contact your Escrow Closer for further information.

I. Washington County imposes a transfer tax of \$1.00 per \$1,000 (or fraction thereof) of the selling price in a real estate transfer, unless the county approves an exemption application. Exemption criteria and applications are available at the county's website, see: <http://www.co.washington.or.us/AssessmentTaxation/Recording/TransferTaxExemption/index.cfm>.

J. Recording Charge (Per Document) is the following:

County	First Page	Each Additional Page
Multnomah	\$82.00	\$5.00
Washington	\$81.00	\$5.00
Clackamas	\$93.00	\$5.00
Yamhill	\$81.00	\$5.00

Note: When possible the company will record electronically. An additional charge of \$5.00 applies to each document that is recorded electronically.



- K. THE FOLLOWING NOTICE IS REQUIRED BY STATE LAW: YOU WILL BE REVIEWING, APPROVING AND SIGNING IMPORTANT DOCUMENTS AT CLOSING. LEGAL CONSEQUENCES FOLLOW FROM THE SELECTION AND USE OF THESE DOCUMENTS. YOU MAY CONSULT AN ATTORNEY ABOUT THESE DOCUMENTS. YOU SHOULD CONSULT AN ATTORNEY IF YOU HAVE QUESTIONS OR CONCERNS ABOUT THE TRANSACTION OR ABOUT THE DOCUMENTS. IF YOU WISH TO REVIEW TRANSACTION DOCUMENTS THAT YOU HAVE NOT SEEN, PLEASE CONTACT THE ESCROW AGENT.
- L. Note: This map/plat is being furnished as an aid in locating the herein described Land in relation to adjoining streets, natural boundaries and other land. Except to the extent a policy of title insurance is expressly modified by endorsement, if any, the Company does not insure dimensions, distances or acreage shown thereon.

# *RIVER RIDGE ADDITION*

## *Tualatin, Oregon*

### Preliminary Stormwater Report

**Date:** April 10, 2019

**Client:** Mountain West Investment Corporation  
201 Ferry Street SE, Suite 400  
Salem, OR 97301

**Engineering Firm:** AKS Engineering & Forestry, LLC.  
12965 SW Herman Road, Suite 100  
Tualatin, OR 97062

**Engineering Contact:** Chuck Gregory, P.E. – Associate  
ChuckG@aks-eng.com

**AKS Job Number:** 6892



12965 SW Herman Road, Suite 100  
Tualatin, OR 97062  
P: (503) 563-6151  
www.aks-eng.com



RENEWS: JUNE 30, 20\_\_

---

## Table of Contents

<b>1.0</b>	<b>Purpose of Report .....</b>	<b>1</b>
<b>2.0</b>	<b>Project Location/Description .....</b>	<b>1</b>
2.1	LOCATION.....	1
2.2	EXISTING SITE .....	1
2.3	PROJECT SUMMARY .....	1
<b>3.0</b>	<b>Regulatory Design Criteria .....</b>	<b>2</b>
3.1	CITY OF TUALATIN PRE-APPLICATION COMMENTS .....	2
3.2	STORMWATER QUANTITY .....	2
3.3	STORMWATER QUALITY.....	2
<b>4.0</b>	<b>Design Methodology .....</b>	<b>3</b>
<b>5.0</b>	<b>Design Parameters .....</b>	<b>3</b>
5.1	DESIGN STORMS – CONVEYANCE SIZING.....	3
<b>6.0</b>	<b>Stormwater Analyses .....</b>	<b>3</b>
6.1	STORMWATER CONVEYANCE DESIGN AND CONDUIT SIZING .....	3
6.2	STORMWATER QUALITY.....	3
<b>7.0</b>	<b>Downstream Analysis .....</b>	<b>4</b>
<b>8.0</b>	<b>Conclusions .....</b>	<b>4</b>

## Tables

<b>Table 6-1: On-Site Water Quality Summary .....</b>	<b>3</b>
<b>Table 8-1: 25-Year Flow Rate Summary Table.....</b>	<b>4</b>

## Appendices

<b>APPENDIX A: VICINITY MAP</b>	
<b>APPENDIX B: PRE-DEVELOPMENT CATCHMENT MAP</b>	
<b>APPENDIX C: POST-DEVELOPMENT CATCHMENT MAP</b>	
<b>APPENDIX D: PRE-DEVELOPED HYDROCAD CALCULATIONS</b>	
<b>APPENDIX E: POST-DEVELOPED HYDROCAD CALCULATIONS</b>	
<b>APPENDIX F: USDA NRCS SOIL RESOURCE REPORT</b>	
<b>APPENDIX G: TECHNICAL RELEASE 55 RUNOFF CURVE NUMBERS</b>	
<b>APPENDIX H: PUBLIC STORM SEWER MAP</b>	
<b>APPENDIX I: INFILTRATION TEST REPORT</b>	

---

---

# **Preliminary Stormwater Report**

## **RIVER RIDGE ADDITION TUALATIN, OR**

### **1.0 Purpose of Report**

The purpose of this report is to analyze the effects of the proposed developments on the existing stormwater conveyance system and to document the criteria, methodology, and informational sources by which the proposed stormwater system has been designed.

### **2.0 Project Location/Description**

#### **2.1 LOCATION**

The proposed development is positioned on the north side of Pacific Highway West (OR99W) (SW Pacific Highway), located near the intersection of SW 124<sup>th</sup> Avenue and Pacific Highway West in Tualatin, Oregon.

Tax Lot 2200, Washington County Tax Map 2S 1 15C  
Area: 0.61 acres

#### **2.2 EXISTING SITE**

The project site is currently developed with a small strip building of commercial businesses, a single-family home, and other outbuilding structures. There is one driveway which provides access to Pacific Highway West. There is an existing curb tight sidewalk along the Pacific Highway West frontage.

Stormwater drains to the ODOT right-of-way and the River Ridge Apartment site (Tax Lot 2300).

#### **2.3 PROJECT SUMMARY**

As part of the proposed project, the existing structures and installations will be removed and a new parking lot, commercial building, and drive-through will be constructed. Additional on-site improvements include construction of a garbage and recycling enclosure, walkways, and seating areas. Off-site improvements include the removal of the existing driveway to Pacific Highway West and construction of a new driveway to the River Ridge Apartments' shared driveway, a new separated sidewalk along Pacific Highway West, as well as connecting walkways to the public sidewalk.

Shallow infiltration testing was performed to evaluate the feasibility of impervious area reduction. With a measured infiltration rate of 7 inches per hour, porous asphalt pavement has been chosen to manage on-site stormwater. Infiltration test results are included in the Appendices. Stormwater management for the parking area and drive-through will be provided with the construction of porous asphalt pavement. The roof runoff from the new building will drain to the existing catch basin at the northeasterly corner of the site, as there is no other available public stormwater conveyance system along the project frontage or other property boundaries.

With the removal of multiple structures and all impervious parking areas, the peak post-developed flow rate from the project site will be less than the existing peak flow rate. Both the flow rate discharged to adjacent properties and the ODOT right-of-way will be decreased as a result of this development.

---

A separate stormwater report will be prepared to document the downstream system to treat the new roof runoff utilizing the existing ODOT infrastructure. It should be reiterated that this treatment flow rate is less than that currently being conveyed and treated.

### **3.0 Regulatory Design Criteria**

#### **3.1 CITY OF TUALATIN PRE-APPLICATION COMMENTS**

Per the pre-application notes, dated October 09, 2018, the following applicable stormwater criteria have been addressed:

*Stormwater treatment to CWS standards and detention per ODOT standards. Pervious pavement allowed.*

#### **3.2 STORMWATER QUANTITY**

Per the pre-application notes, stormwater flow control shall meet ODOT standards. The following criteria have been copied from ODOT's *Stormwater Management Program – Flow Control Design Storm*:

*Projects may be excluded from water quantity design storm performance standards when the following occurs:*

- *Projects discharge into major water bodies, such as mainstem rivers and large lakes and reservoirs;*
- *Projects in local jurisdictions have more conservative discharge thresholds; and*
- *The uncontrolled peak post-construction runoff rate from the new impervious surface area is less than 0.5 cubic feet per second during the 10-year, 24-hour storm event.*

As shown in the appendices, all stormwater from the site discharges to the Tualatin River. In addition, the uncontrolled peak post-construction runoff rate from new impervious surface areas is less than 0.5 cubic feet per second during the 10-year, 24-hour storm event. Therefore, the project is excluded from the water quantity design storm performance standards.

#### **3.3 STORMWATER QUALITY**

Per Clean Water Services (CWS) *Design and Construction Standards – R&O 17-05* (April 2017):

##### *4.05.1 General*

*Owners of new development and other activities which create or modify 1,000 square feet or greater of impervious surfaces, or increase the amount of stormwater runoff or pollution leaving the site, are required to implement or fund permanent water quality approaches to reduce contaminants entering the storm and surface water system.*

##### *4.05.2 Criteria for Requiring Implementation of a Water Quality Approach*

*a. A water quality approach shall be implemented on-site unless, in the judgment of the District or City, any of the following conditions exist:*

- 1. Due to topography, soils or other site conditions, implementation of an on-site approach is impractical, ineffective or results in the inefficient use of District or City resources for long-term operations and maintenance; or*
- 2. There is a more efficient and effective regional approach within the subbasin that was designed to incorporate the development, or there is an approach in the subbasin which is demonstrated to have the capacity to treat the site.*



*b. If construction or implementation of a water quality approach is not required as a result of meeting any condition outlined in Section 4.05.2 (a) (1)-(2), the Owner of the development shall pay a Fee-In-Lieu of construction or implementation of Water Quality Approaches in accordance with District Rates and Charges.*

#### **4.0 Design Methodology**

The Santa Barbara Urban Hydrograph (SBUH) Method has been used to analyze stormwater runoff from the site. This method utilizes the SCS Type 1A 24-hour design storm. HydroCAD computer software version 10.00-18 aided in the analysis.

#### **5.0 Design Parameters**

##### **5.1 DESIGN STORMS – CONVEYANCE SIZING**

Stormwater mains, inlets, and laterals for the site are placed at locations that adequately collect and control the stormwater for the site. The stormwater pipes are sized using Manning’s equation based on peak flows for the 25-year storm event.

#### **6.0 Stormwater Analyses**

##### **6.1 STORMWATER CONVEYANCE DESIGN AND CONDUIT SIZING**

Runoff from the parking areas and drive aisles will permeate through the porous asphalt. Runoff that does not infiltrate will surface flow from the low point at the new driveway approach to the River Ridge Apartments site, similarly to the pre-developed condition. Roof drains have been designed to convey flows from the 25-year storm event. No other piping or collection/conveyance structures are proposed.

##### **6.2 STORMWATER QUALITY**

Porous asphalt pavement has been selected for all parking areas and drive aisles, and therefore these areas are excluded from the water quality summary. A seating area to the northeast of the new building and a walkway to the River Ridge Apartment site will shed to adjacent landscape, acting similarly to a vegetated filter strip. A small area of impervious surfaces, including the trash enclosure and the seating area to the southwest of the new building, will shed directly to the porous asphalt pavement. Because the uncollected impervious area is less than the 1,000 square feet threshold, the intent of R&O 17-05 Section 4.05.1 is met, and additional water quality approaches are not proposed. The on-site water quality treatment is summarized in the table below:

<b>Proposed Improvement</b>	<b>Treatment Methodology</b>	<b>Area (ft<sup>2</sup>)</b>
New Building	ODOT WQ Median Swale	±1,200
Concrete Walkway, Seating Area	Sheds to Landscape	±469
Trash Enclosure, Concrete Seating Area	Untreated - Unable to be Collected	±805
	<b>TOTAL</b>	<b>±2,579</b>

## 7.0 Downstream Analysis

Per Clean Water Services' (CWS) *Design and Construction (R&O 07-05)*, Section 2.04.2 Initial Plan Submittal Requirements:

### 2.04.2.m.3 Review of Downstream System:

- A. For each development constructing new impervious surface of greater than 5,280 square feet, or collecting and discharging greater than 5,280 square feet of impervious area, except for the construction of a detached single family dwelling or duplex, the design Engineer shall perform a capacity and condition analysis of existing downstream storm facilities and conveyance elements receiving flow from the proposed development.
- B. The analysis shall extend downstream to a point in the drainage system where the additional flow from the proposed development site constitutes 10 percent or less of the total tributary drainage flow.
- C. Where the additional flow from the proposed development drops to less than 10 percent of the total tributary drainage flow, then the analysis will continue for the lesser of:
  - i. One-quarter (1/4) of a mile; or
  - ii. Until the additional flow constitutes less than 5 percent of the total tributary drainage flow.
- D. When the downstream analysis does not continue for at least one-quarter (1/4) mile, the design engineer shall provide a stamped Certification of Investigation that states the design Engineer has visually investigated the downstream system for at least one-quarter (1/4) mile downstream and is aware of no observable downstream impacts to structures.

The proposed development neither creates nor collects greater than 5,280 sf of impervious area. Furthermore, as discussed previously, this project will result in an overall reduction in impervious area. As such, there will be a reduction in stormwater runoff. Therefore, a capacity and condition analysis is not required.

## 8.0 Conclusions

The proposed development meets all stormwater standards outlined by the City of Tualatin, Clean Water Services, and ODOT. Without an available public storm main, stormwater management is achieved with the construction of porous asphalt pavement. Where porous surfacing is not feasible, water quality is provided through sheet flow across adjacent landscaping. Additionally, the flow rate discharged to adjacent properties and the ODOT right-of-way will be decreased as a result of this development.

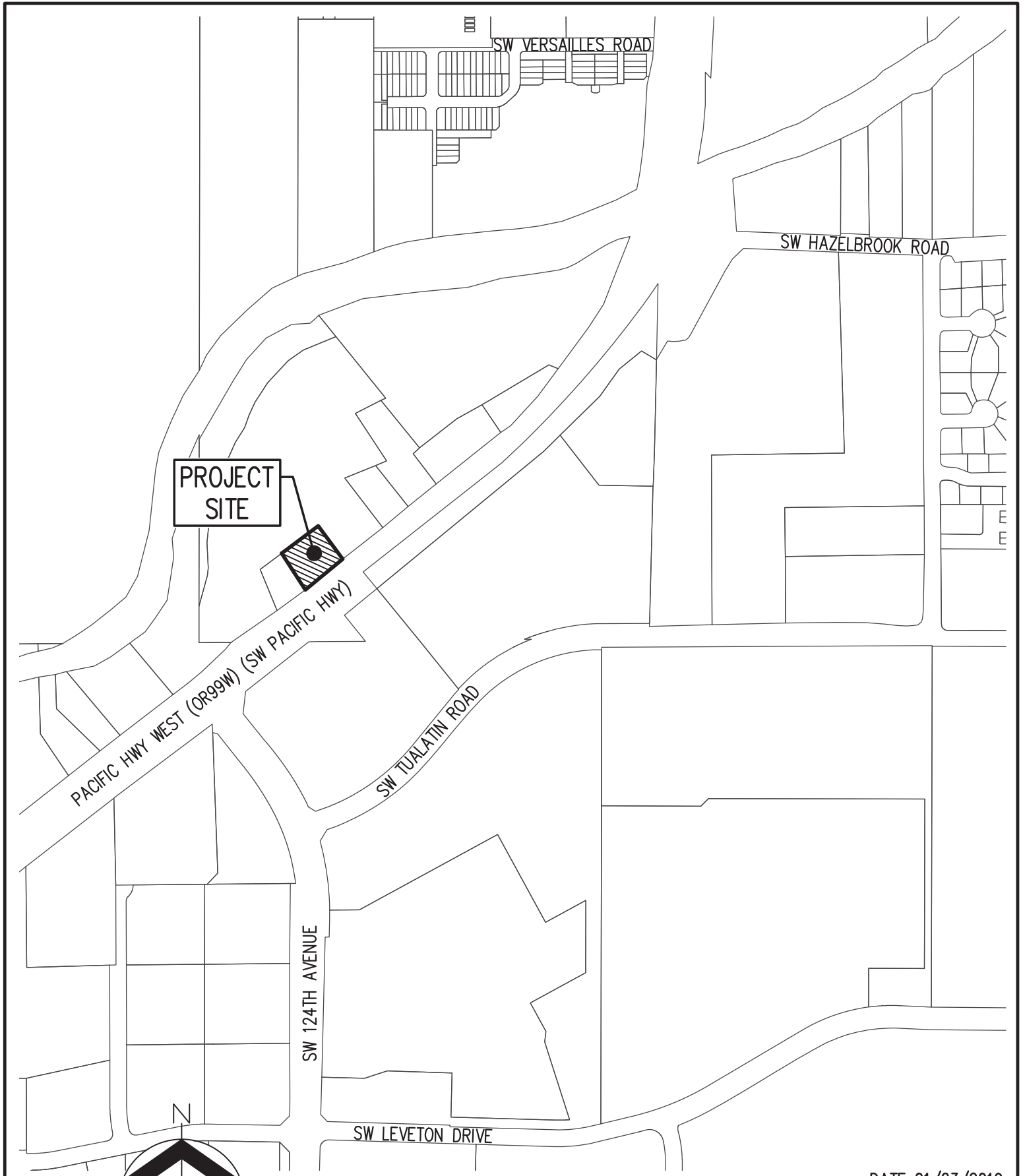
**Table 8-1: 25-Year Flow Rate Summary Table**

Sub-basin	Pre-Developed Flow Rate (cfs)	Post-Developed Flow Rate (cfs)	Difference (cfs)
Drains to Private Property	0.20	0.14*	-0.05
Drains to ODOT R/W	0.13	0.07	-0.06

\*In the stormwater analysis, porous asphalt pavement is assigned a curve number associated with landscaping, and therefore does not represent full infiltration. Based on the measured in-situ infiltration rate, full infiltration is feasible.

## **Appendix A: Vicinity Map**

---



DATE: 01/23/2019

**VICINITY MAP**

AKS ENGINEERING & FORESTRY, LLC  
 12965 SW HERMAN RD, STE 100  
 TUALATIN, OR 97062  
 P: 503.563.6151 F: 503.563.6152 aks-eng.com



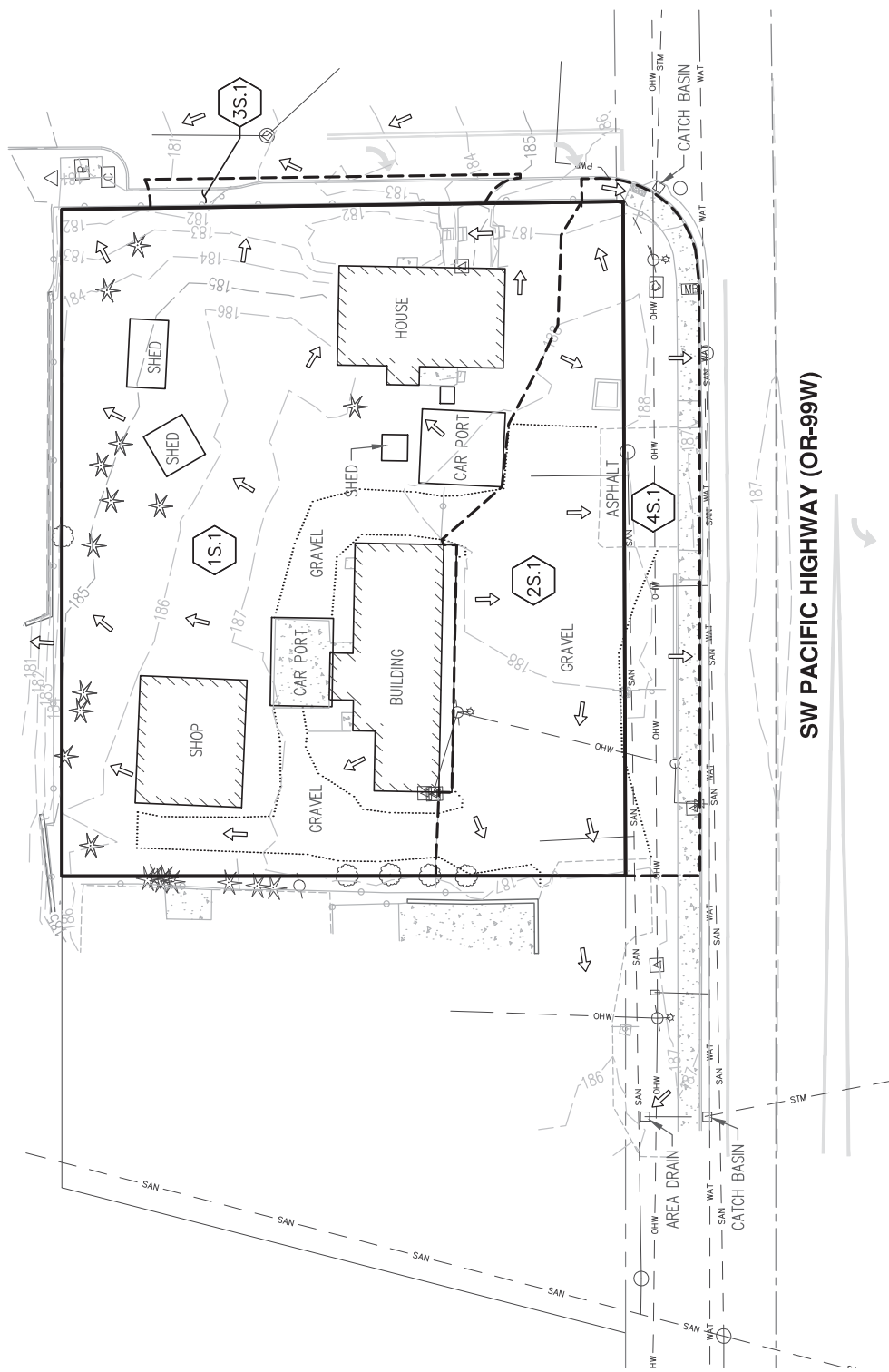
EXHIBIT  
**A**

DRWN: WJD  
 CHKD: CEG  
 AKS JOB:  
 6892

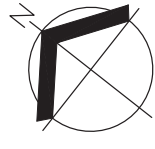
## **Appendix B: Pre-Development Catchment Map**

---





- 1S.1 ON-SITE, DRAINS TO PRIVATE PROPERTY
- 2S.1 ON-SITE, DRAINS TO ODOT R/W
- 3S.1 OFF-SITE, DRAINS TO PRIVATE PROPERTY
- 4S.1 OFF-SITE, DRAINS TO ODOT R/W
- ⇨ PRE-DEVELOPED SURFACE FLOW ARROW



SCALE: 1" = 30 FEET



DATE: 04/10/2019

PRE-DEVELOPMENT CATCHMENT MAP

EXHIBIT

RIVER RIDGE ADDITION

AKS ENGINEERING & FORESTRY, LLC  
 12965 SW HERMAN RD, STE 100  
 TUALATIN, OR 97062  
 P: 503.563.6151 F: 503.563.6152 aks-eng.com

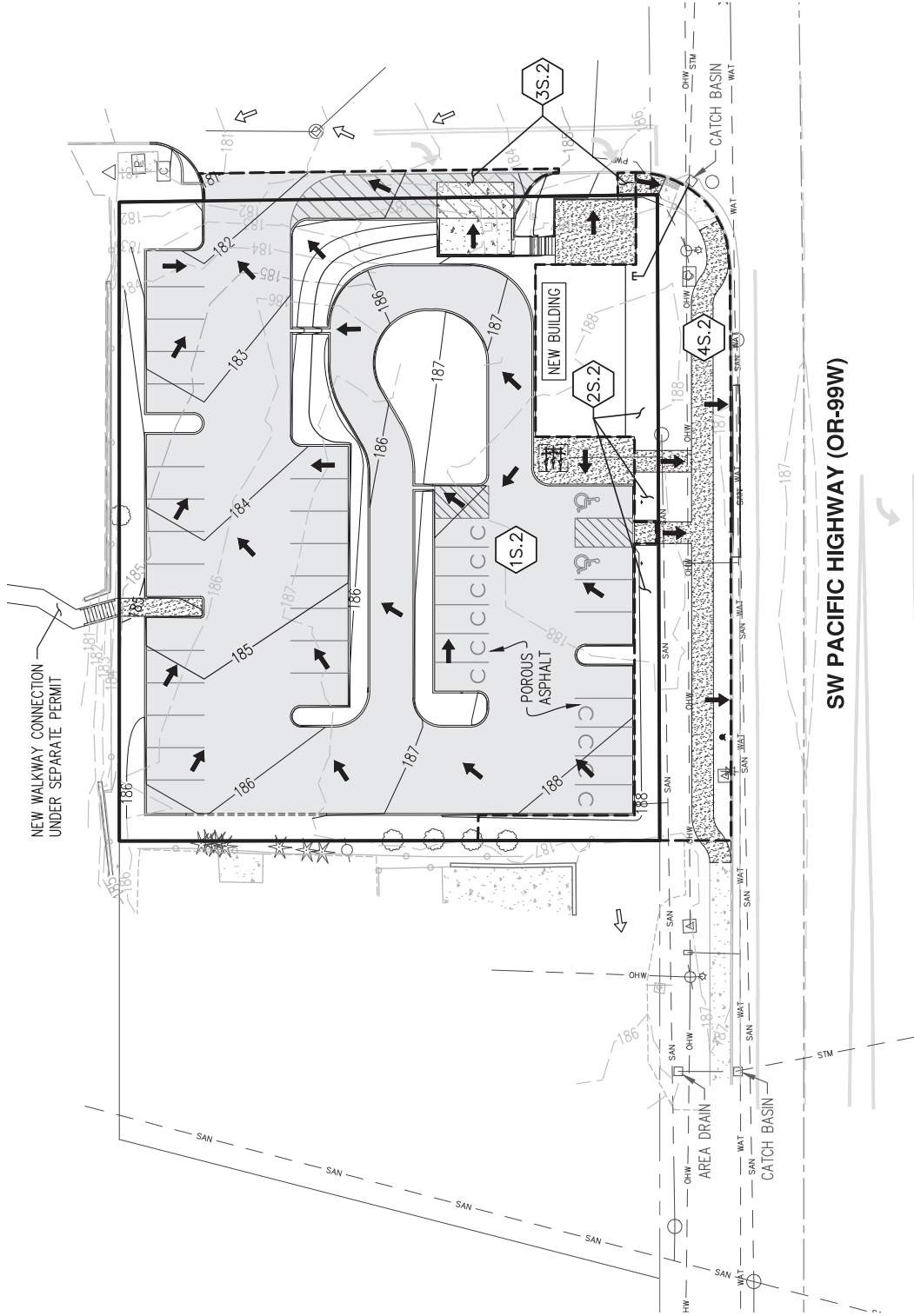
B

DRWN: WJD  
 CHKD: CEG  
 AKS JOB:  
 6892

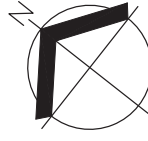


## **Appendix C: Post-Development Catchment Map**

---



- 1S.2 ON-SITE, DRAINS TO PRIVATE PROPERTY
- 2S.2 ON-SITE, DRAINS TO ODOT R/W
- 3S.2 OFF-SITE, DRAINS TO PRIVATE PROPERTY
- 4S.2 OFF-SITE, DRAINS TO ODOT R/W
- ↑ POST-DEVELOPED SURFACE FLOW ARROW



SCALE: 1" = 30 FEET



DATE: 04/10/2019

EXHIBIT

POST-DEVELOPMENT CATCHMENT MAP

RIVER RIDGE ADDITION

AKS ENGINEERING & FORESTRY, LLC

12965 SW HERMAN RD, STE 100

TUALATIN, OR 97062

P: 503.563.6151 F: 503.563.6152 aks-eng.com

DRWN: WJD

CHKD: CEG

AKS JOB:

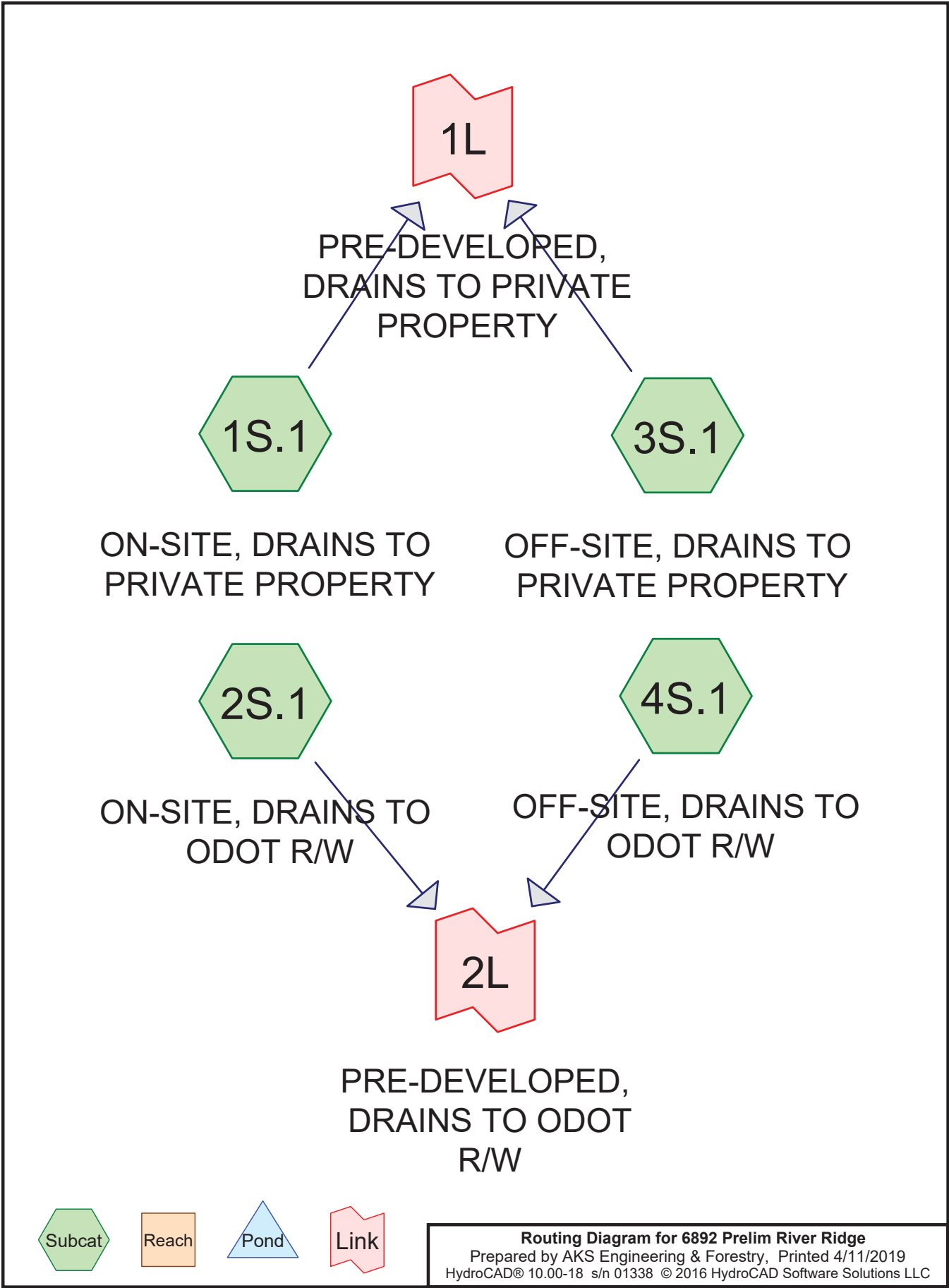
6892

C



## **Appendix D: Pre-Developed HydroCAD Calculations**

---



**6892 Prelim River Ridge**

Prepared by AKS Engineering & Forestry

HydroCAD® 10.00-18 s/n 01338 © 2016 HydroCAD Software Solutions LLC

Type IA 24-hr 10-Year Storm Rainfall=3.45"

Printed 4/11/2019

Page 2

**Summary for Subcatchment 1S.1: ON-SITE, DRAINS TO PRIVATE PROPERTY**

Runoff = 0.15 cfs @ 7.99 hrs, Volume= 2,082 cf, Depth> 1.23"

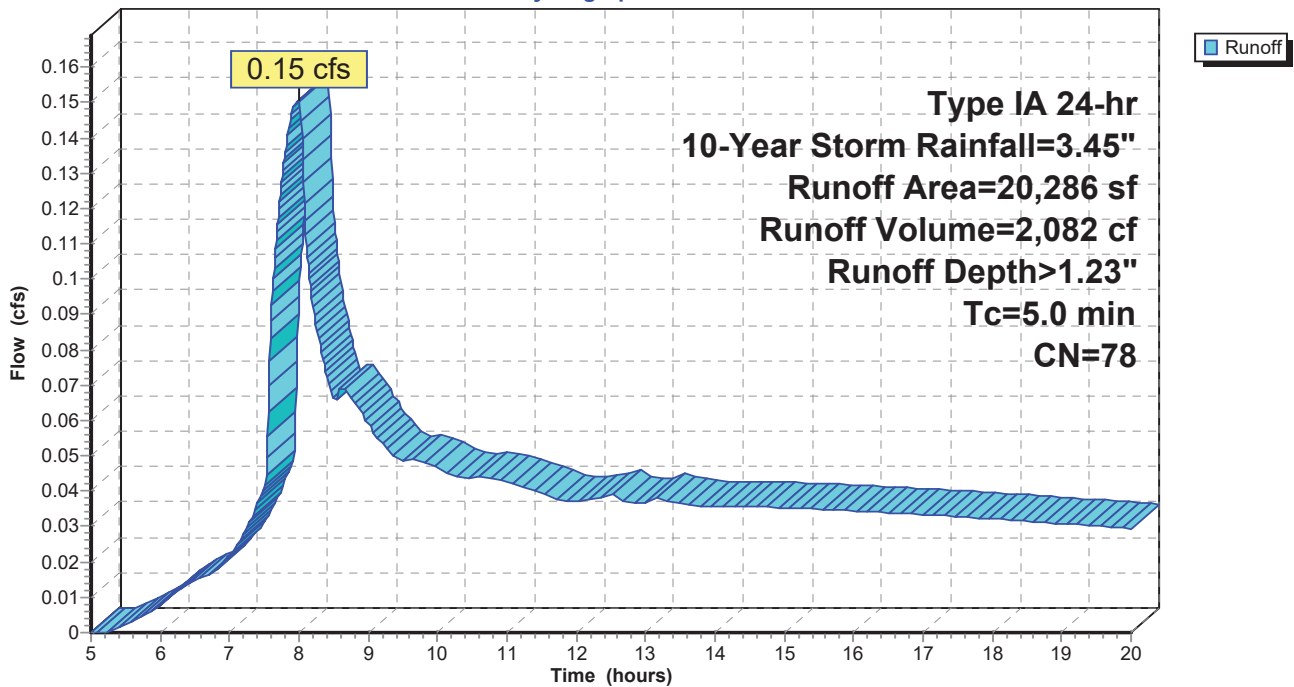
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs  
Type IA 24-hr 10-Year Storm Rainfall=3.45"

	Area (sf)	CN	Description
*	5,138	98	Structures
*	134	98	Concrete
*	1,988	89	Gravel
*	13,026	69	Landscape
	20,286	78	Weighted Average
	15,014		74.01% Pervious Area
	5,272		25.99% Impervious Area

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

**Subcatchment 1S.1: ON-SITE, DRAINS TO PRIVATE PROPERTY**

Hydrograph





**6892 Prelim River Ridge**

Prepared by AKS Engineering & Forestry

HydroCAD® 10.00-18 s/n 01338 © 2016 HydroCAD Software Solutions LLC

Type IA 24-hr 10-Year Storm Rainfall=3.45"

Printed 4/11/2019

Page 3

**Summary for Subcatchment 2S.1: ON-SITE, DRAINS TO ODOT R/W**

Runoff = 0.07 cfs @ 7.94 hrs, Volume= 907 cf, Depth> 1.69"

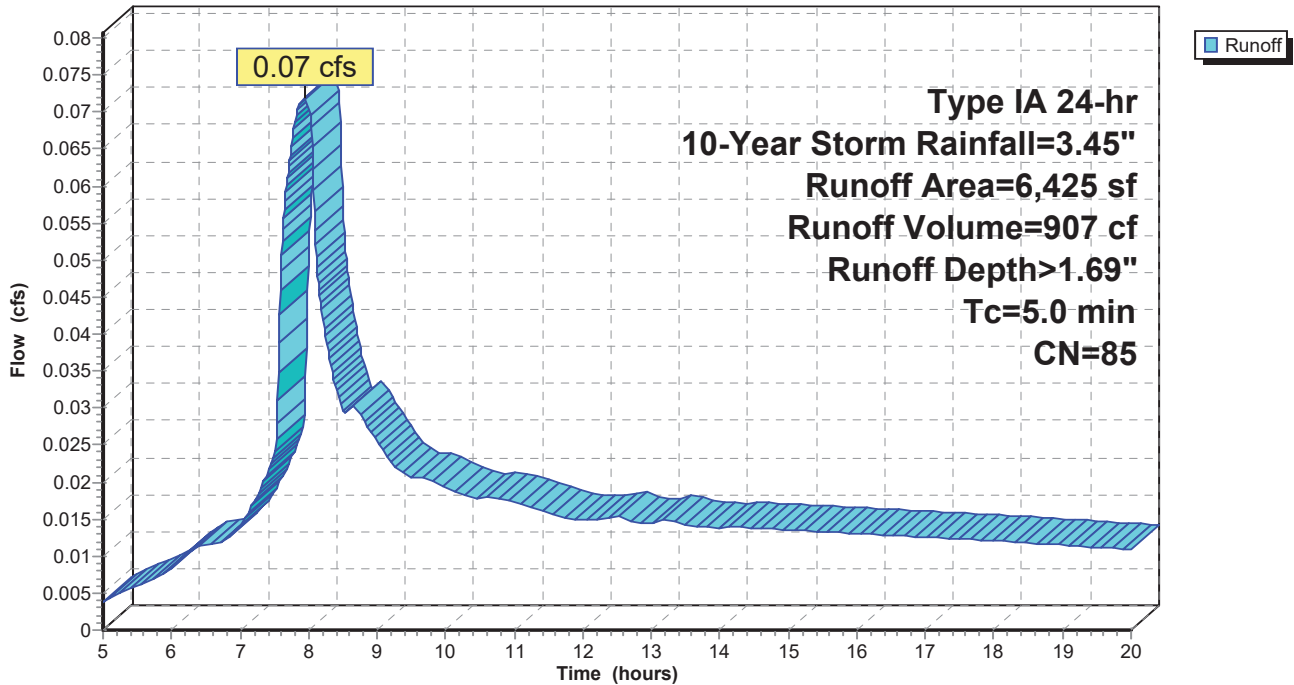
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs  
Type IA 24-hr 10-Year Storm Rainfall=3.45"

	Area (sf)	CN	Description
*	278	98	Asphalt
*	4,832	89	Gravel
*	1,315	69	Landscape
	6,425	85	Weighted Average
	6,147		95.67% Pervious Area
	278		4.33% Impervious Area

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

**Subcatchment 2S.1: ON-SITE, DRAINS TO ODOT R/W**

Hydrograph



**Summary for Subcatchment 3S.1: OFF-SITE, DRAINS TO PRIVATE PROPERTY**

Runoff = 0.00 cfs @ 8.01 hrs, Volume= 62 cf, Depth> 1.06"

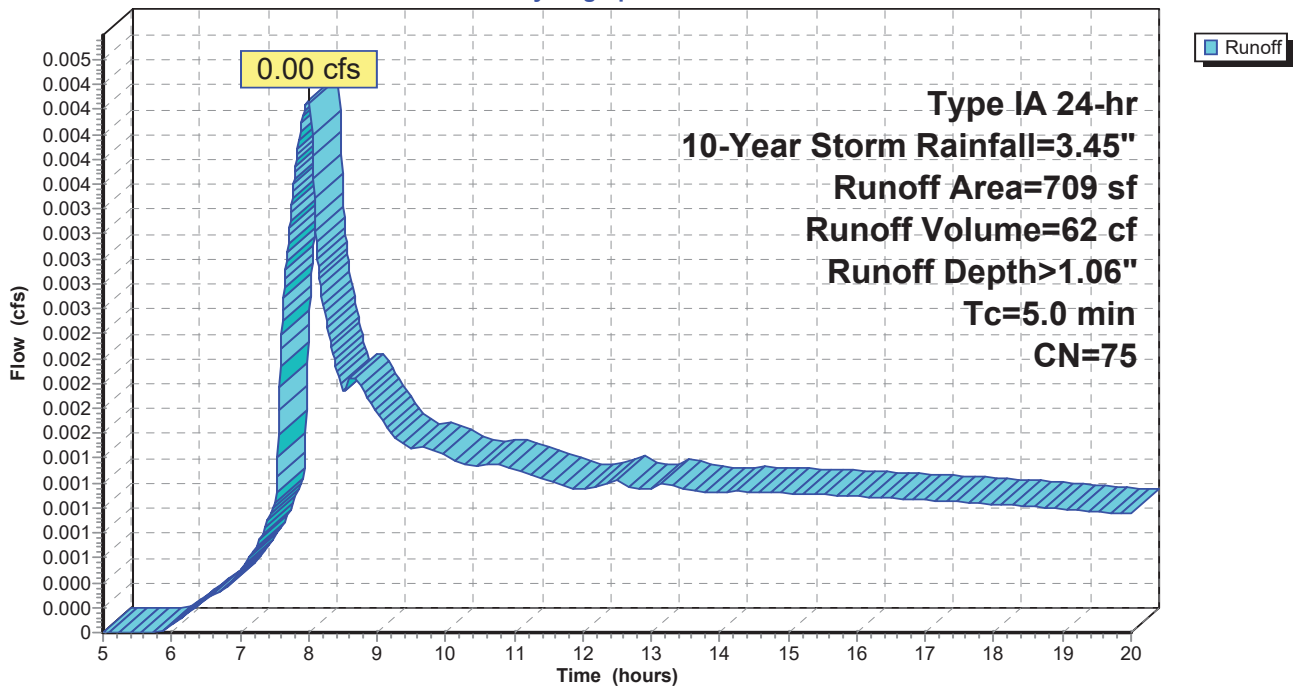
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs  
 Type IA 24-hr 10-Year Storm Rainfall=3.45"

	Area (sf)	CN	Description
*	135	98	Asphalt
*	574	69	Landscape
	709	75	Weighted Average
	574		80.96% Pervious Area
	135		19.04% Impervious Area

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

**Subcatchment 3S.1: OFF-SITE, DRAINS TO PRIVATE PROPERTY**

Hydrograph



**6892 Prelim River Ridge**

Prepared by AKS Engineering & Forestry

HydroCAD® 10.00-18 s/n 01338 © 2016 HydroCAD Software Solutions LLC

Type IA 24-hr 10-Year Storm Rainfall=3.45"

Printed 4/11/2019

Page 5

**Summary for Subcatchment 4S.1: OFF-SITE, DRAINS TO ODOT R/W**

Runoff = 0.04 cfs @ 7.95 hrs, Volume= 472 cf, Depth> 1.56"

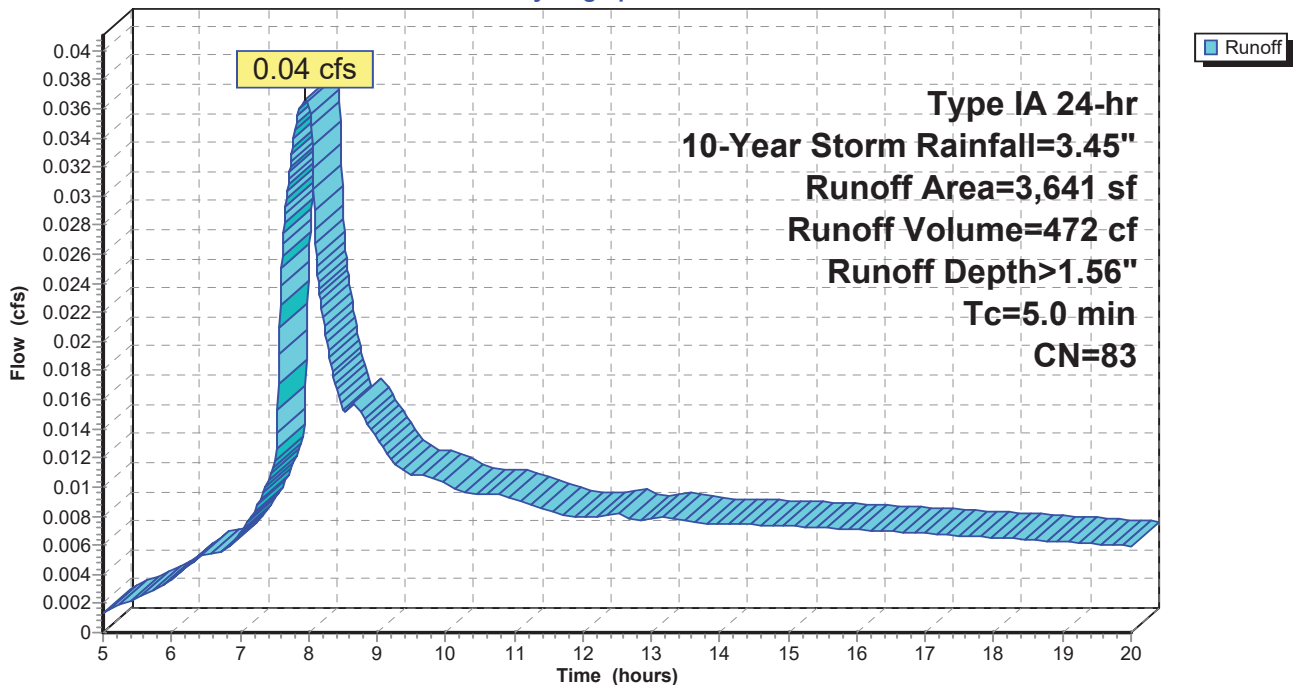
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs  
Type IA 24-hr 10-Year Storm Rainfall=3.45"

	Area (sf)	CN	Description
*	483	98	Asphalt
*	1,104	98	Sidewalk
*	185	89	Gravel
*	1,869	69	Landscape
			<hr/>
	3,641	83	Weighted Average
	2,054		56.41% Pervious Area
	1,587		43.59% Impervious Area

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

**Subcatchment 4S.1: OFF-SITE, DRAINS TO ODOT R/W**

Hydrograph

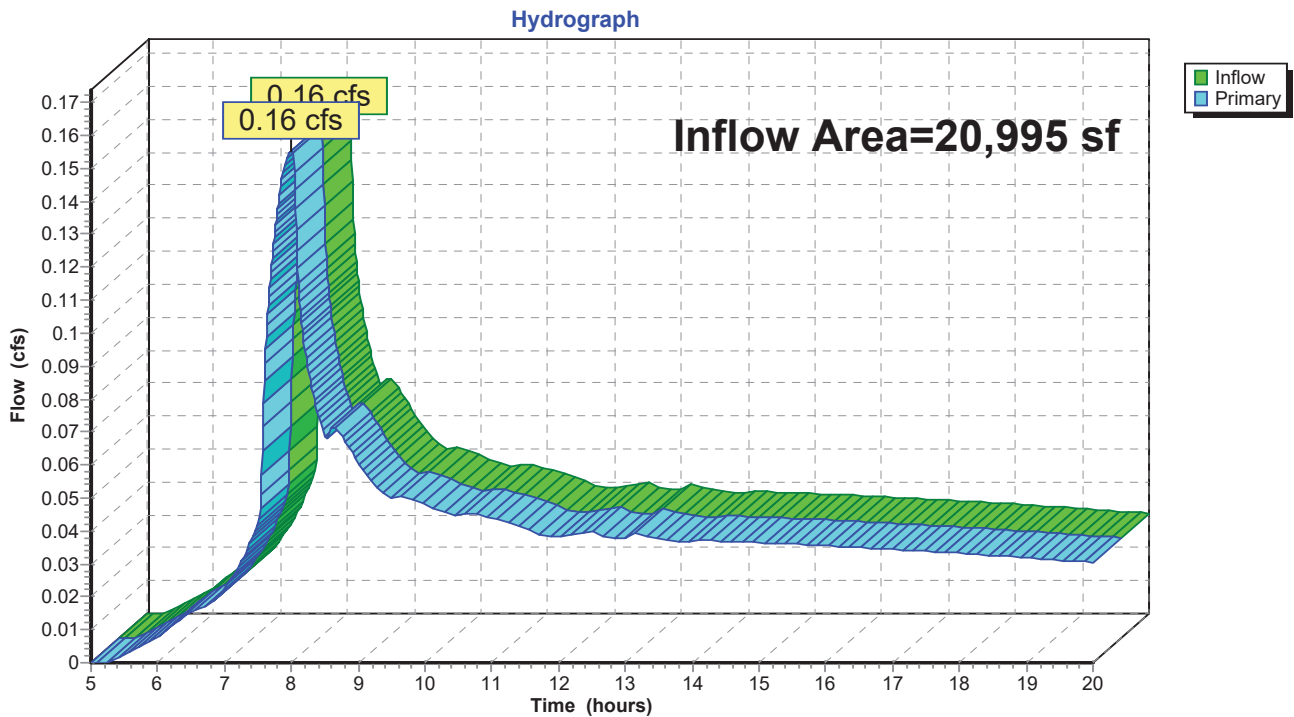


### Summary for Link 1L: PRE-DEVELOPED, DRAINS TO PRIVATE PROPERTY

Inflow Area = 20,995 sf, 25.75% Impervious, Inflow Depth > 1.23" for 10-Year Storm event  
Inflow = 0.16 cfs @ 7.99 hrs, Volume= 2,144 cf  
Primary = 0.16 cfs @ 7.99 hrs, Volume= 2,144 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs

### Link 1L: PRE-DEVELOPED, DRAINS TO PRIVATE PROPERTY



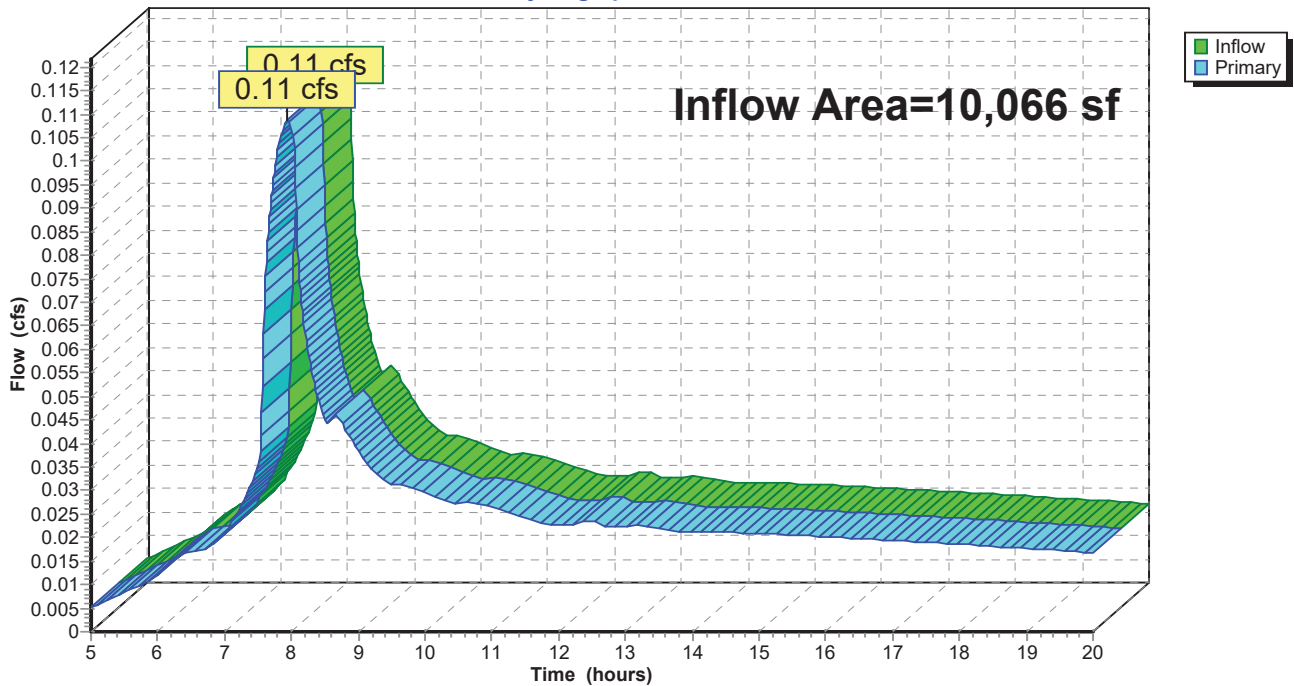
Summary for Link 2L: PRE-DEVELOPED, DRAINS TO ODOT R/W

Inflow Area = 10,066 sf, 18.53% Impervious, Inflow Depth > 1.64" for 10-Year Storm event  
Inflow = 0.11 cfs @ 7.95 hrs, Volume= 1,379 cf  
Primary = 0.11 cfs @ 7.95 hrs, Volume= 1,379 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs

Link 2L: PRE-DEVELOPED, DRAINS TO ODOT R/W

Hydrograph



**6892 Prelim River Ridge**

Prepared by AKS Engineering & Forestry

HydroCAD® 10.00-18 s/n 01338 © 2016 HydroCAD Software Solutions LLC

Type IA 24-hr 25-Year Storm Rainfall=3.90"

Printed 4/11/2019

Page 8

**Summary for Subcatchment 1S.1: ON-SITE, DRAINS TO PRIVATE PROPERTY**

Runoff = 0.19 cfs @ 7.97 hrs, Volume= 2,598 cf, Depth> 1.54"

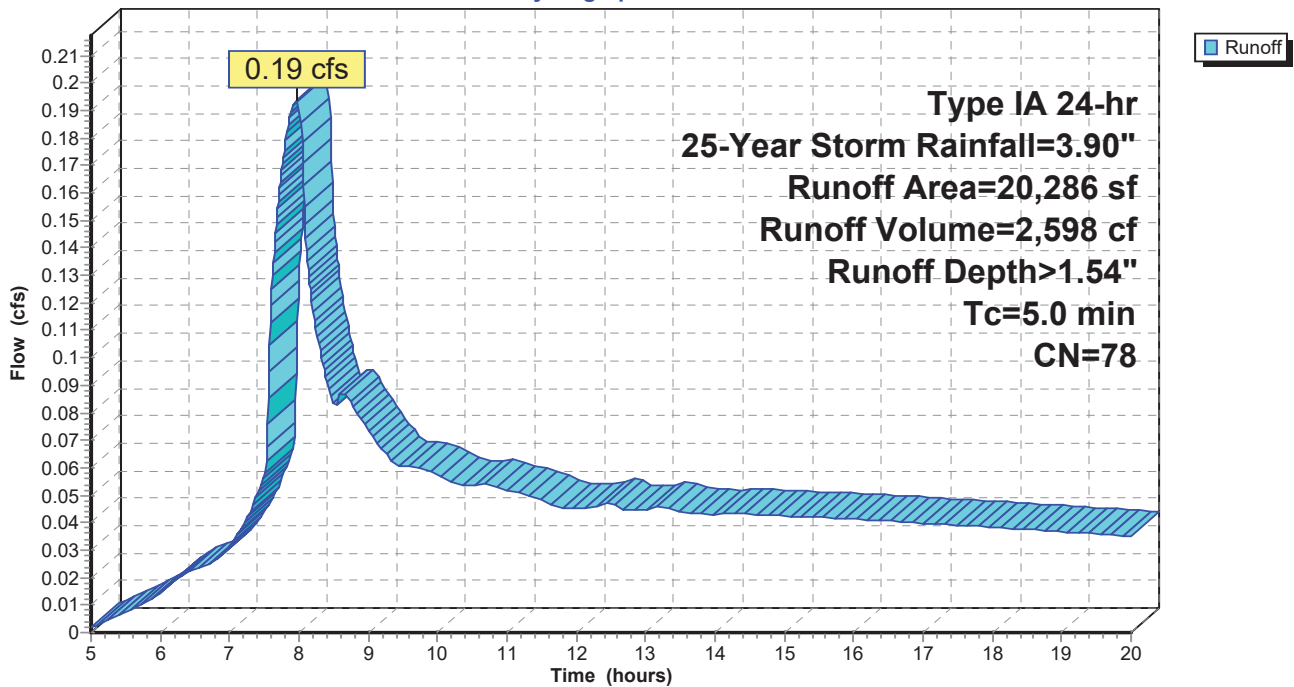
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs  
Type IA 24-hr 25-Year Storm Rainfall=3.90"

	Area (sf)	CN	Description
*	5,138	98	Structures
*	134	98	Concrete
*	1,988	89	Gravel
*	13,026	69	Landscape
<hr/>			
	20,286	78	Weighted Average
	15,014		74.01% Pervious Area
	5,272		25.99% Impervious Area

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

**Subcatchment 1S.1: ON-SITE, DRAINS TO PRIVATE PROPERTY**

Hydrograph



**6892 Prelim River Ridge**

Prepared by AKS Engineering & Forestry

HydroCAD® 10.00-18 s/n 01338 © 2016 HydroCAD Software Solutions LLC

Type IA 24-hr 25-Year Storm Rainfall=3.90"

Printed 4/11/2019

Page 9

**Summary for Subcatchment 2S.1: ON-SITE, DRAINS TO ODOT R/W**

Runoff = 0.09 cfs @ 7.93 hrs, Volume= 1,088 cf, Depth> 2.03"

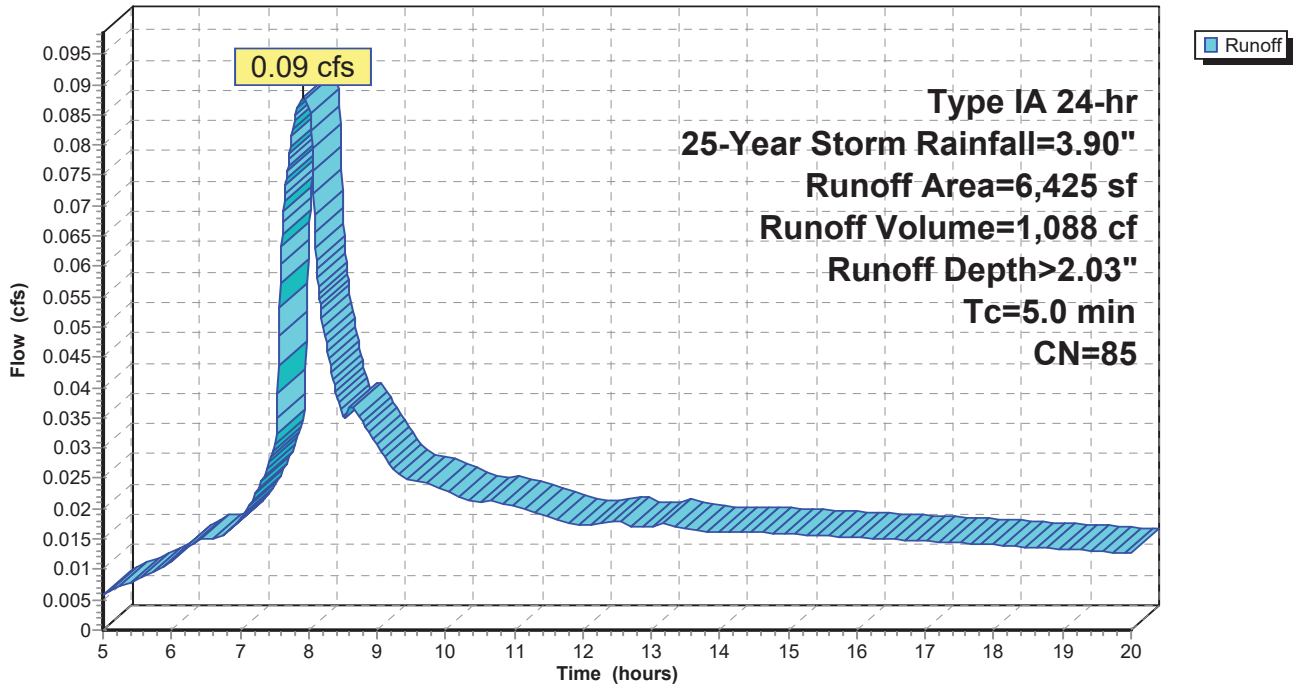
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs  
Type IA 24-hr 25-Year Storm Rainfall=3.90"

	Area (sf)	CN	Description
*	278	98	Asphalt
*	4,832	89	Gravel
*	1,315	69	Landscape
	6,425	85	Weighted Average
	6,147		95.67% Pervious Area
	278		4.33% Impervious Area

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

**Subcatchment 2S.1: ON-SITE, DRAINS TO ODOT R/W**

Hydrograph





**Summary for Subcatchment 3S.1: OFF-SITE, DRAINS TO PRIVATE PROPERTY**

Runoff = 0.01 cfs @ 8.00 hrs, Volume= 79 cf, Depth> 1.34"

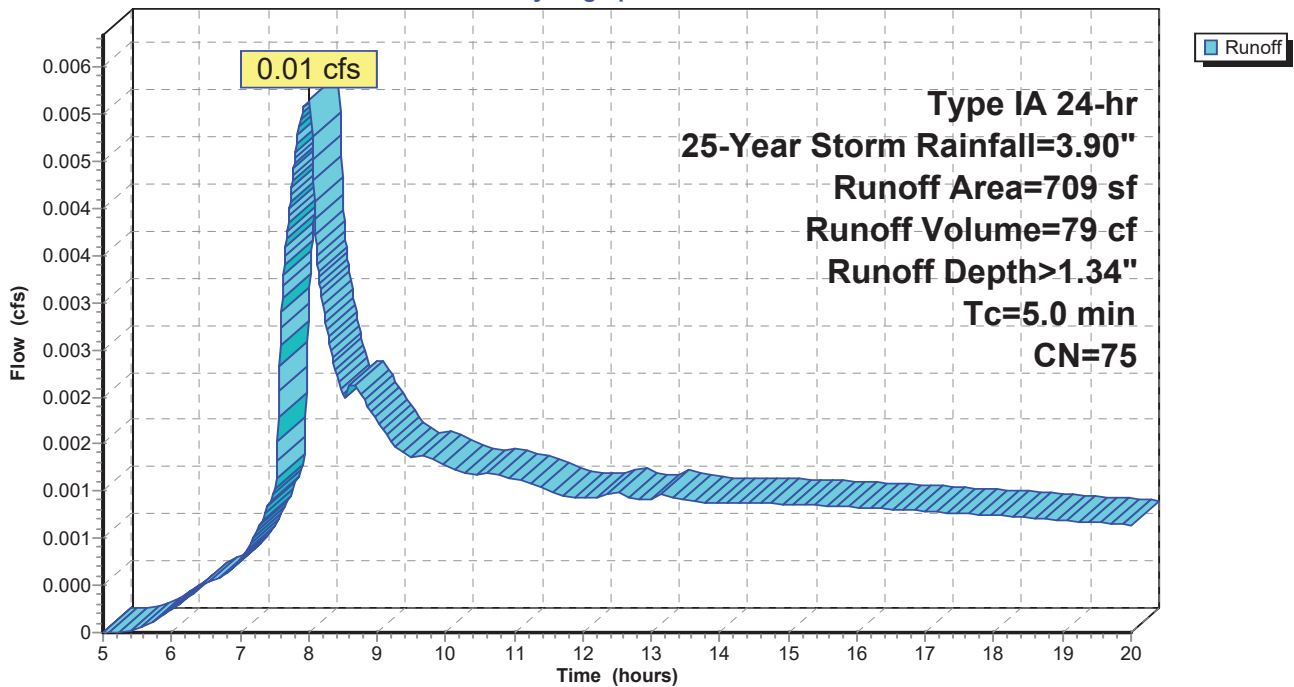
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs  
 Type IA 24-hr 25-Year Storm Rainfall=3.90"

	Area (sf)	CN	Description
*	135	98	Asphalt
*	574	69	Landscape
	709	75	Weighted Average
	574		80.96% Pervious Area
	135		19.04% Impervious Area

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

**Subcatchment 3S.1: OFF-SITE, DRAINS TO PRIVATE PROPERTY**

Hydrograph



**6892 Prelim River Ridge**

Prepared by AKS Engineering & Forestry

HydroCAD® 10.00-18 s/n 01338 © 2016 HydroCAD Software Solutions LLC

Type IA 24-hr 25-Year Storm Rainfall=3.90"

Printed 4/11/2019

Page 11

**Summary for Subcatchment 4S.1: OFF-SITE, DRAINS TO ODOT R/W**

Runoff = 0.05 cfs @ 7.94 hrs, Volume= 573 cf, Depth> 1.89"

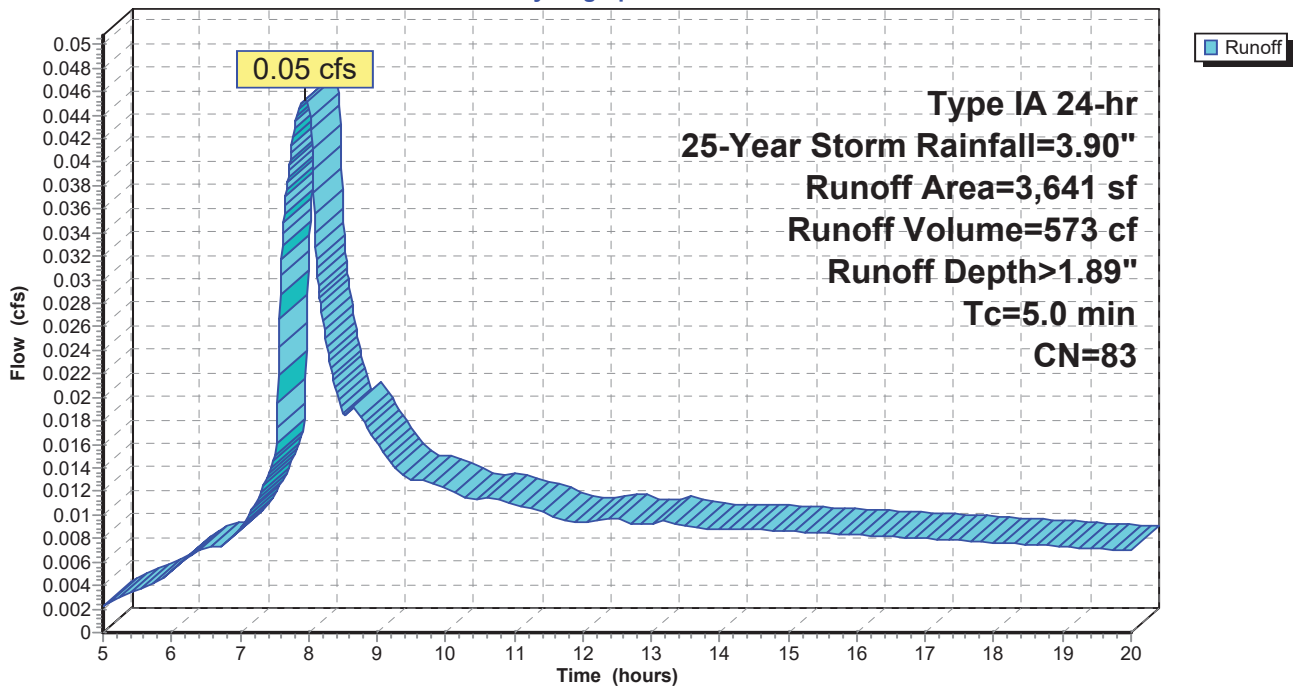
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs  
Type IA 24-hr 25-Year Storm Rainfall=3.90"

	Area (sf)	CN	Description
*	483	98	Asphalt
*	1,104	98	Sidewalk
*	185	89	Gravel
*	1,869	69	Landscape
<hr/>			
	3,641	83	Weighted Average
	2,054		56.41% Pervious Area
	1,587		43.59% Impervious Area

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

**Subcatchment 4S.1: OFF-SITE, DRAINS TO ODOT R/W**

Hydrograph

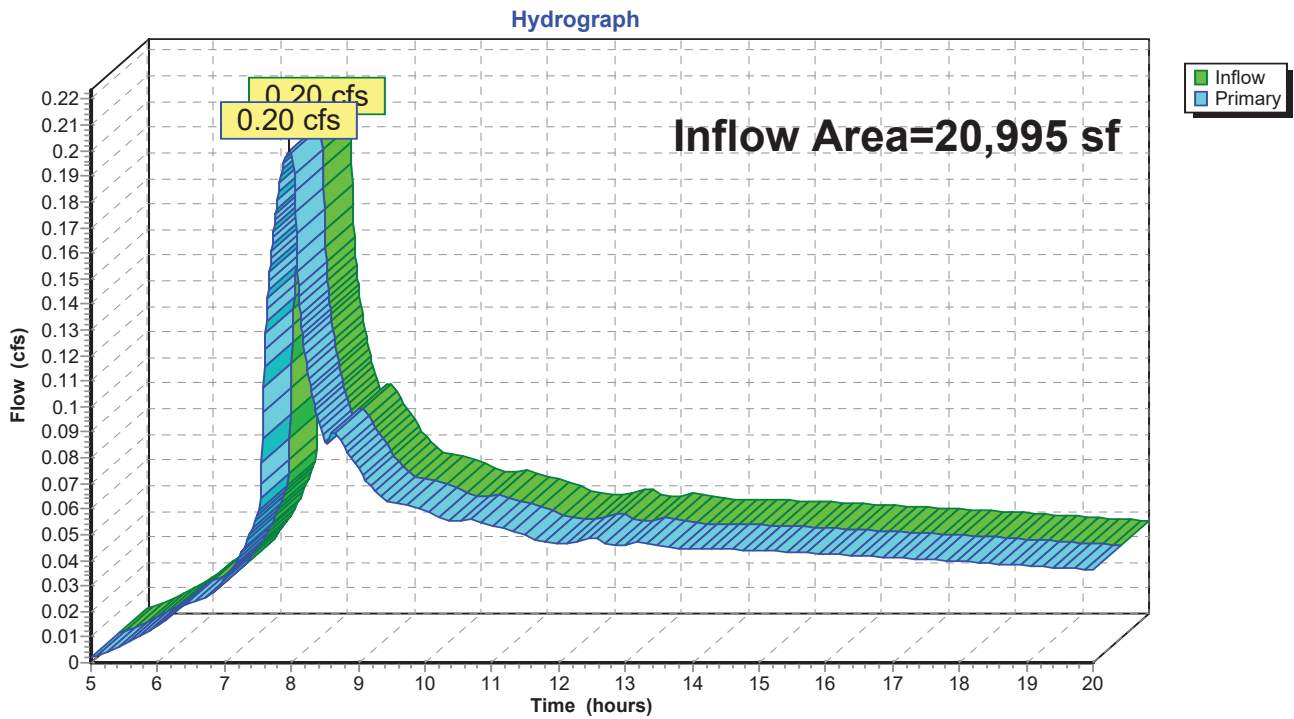


### Summary for Link 1L: PRE-DEVELOPED, DRAINS TO PRIVATE PROPERTY

Inflow Area = 20,995 sf, 25.75% Impervious, Inflow Depth > 1.53" for 25-Year Storm event  
Inflow = 0.20 cfs @ 7.97 hrs, Volume= 2,677 cf  
Primary = 0.20 cfs @ 7.97 hrs, Volume= 2,677 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs

### Link 1L: PRE-DEVELOPED, DRAINS TO PRIVATE PROPERTY

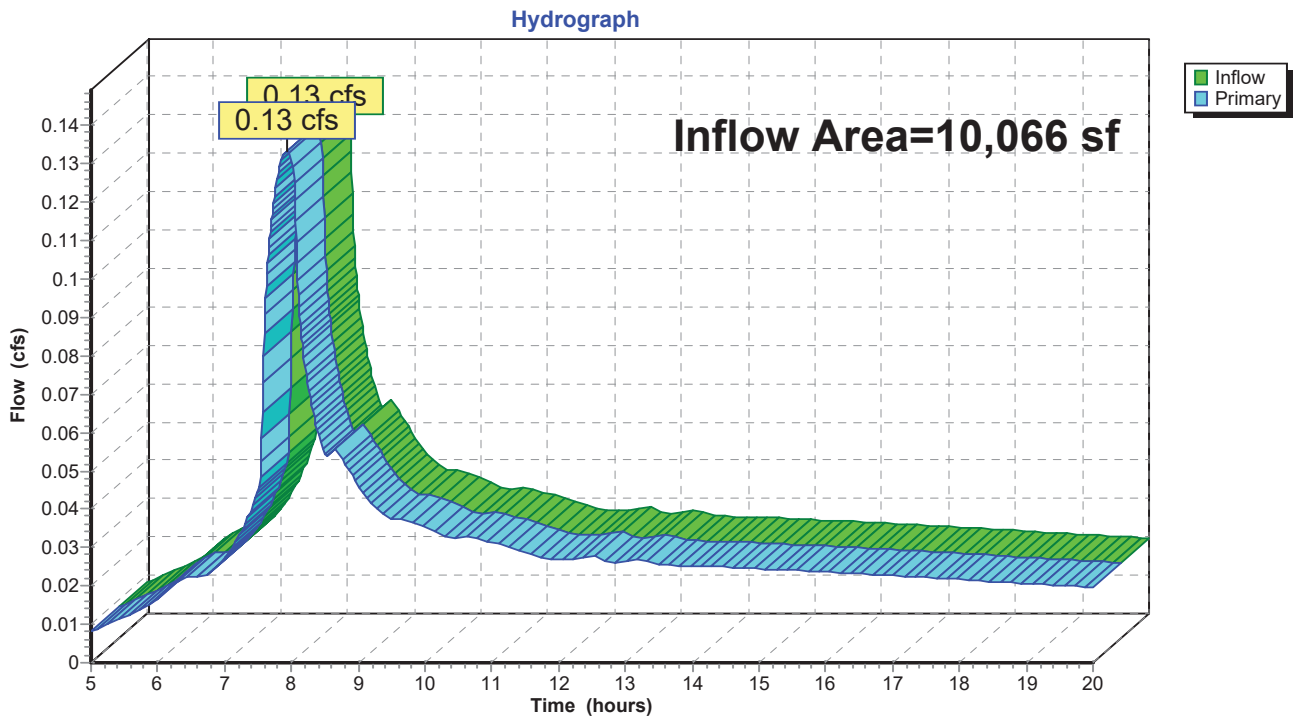


**Summary for Link 2L: PRE-DEVELOPED, DRAINS TO ODOT R/W**

Inflow Area = 10,066 sf, 18.53% Impervious, Inflow Depth > 1.98" for 25-Year Storm event  
Inflow = 0.13 cfs @ 7.94 hrs, Volume= 1,661 cf  
Primary = 0.13 cfs @ 7.94 hrs, Volume= 1,661 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs

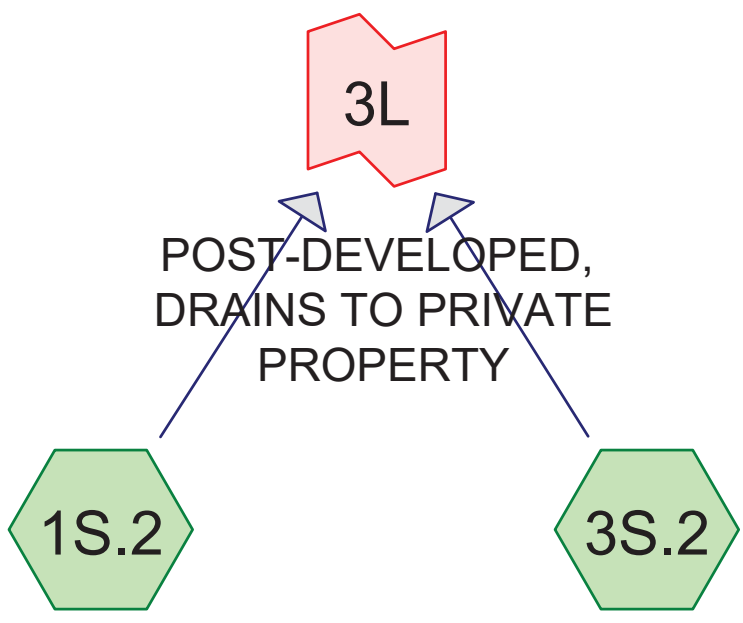
**Link 2L: PRE-DEVELOPED, DRAINS TO ODOT R/W**



## **Appendix E: Post-Developed HydroCAD Calculations**

---

---



ON-SITE, DRAINS TO PRIVATE PROPERTY

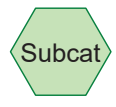
OFF-SITE, DRAINS TO PRIVATE PROPERTY



ON-SITE, DRAINS TO ODOT R/W

OFF-SITE, DRAINS TO ODOT R/W

POST-DEVELOPED, DRAINS TO ODOT R/W



**6892 Prelim River Ridge**

Type IA 24-hr 10-Year Storm Rainfall=3.45"

Prepared by AKS Engineering & Forestry

Printed 4/11/2019

HydroCAD® 10.00-18 s/n 01338 © 2016 HydroCAD Software Solutions LLC

Page 2

**Summary for Subcatchment 1S.2: ON-SITE, DRAINS TO PRIVATE PROPERTY**

Runoff = 0.09 cfs @ 8.02 hrs, Volume= 1,585 cf, Depth> 0.79"

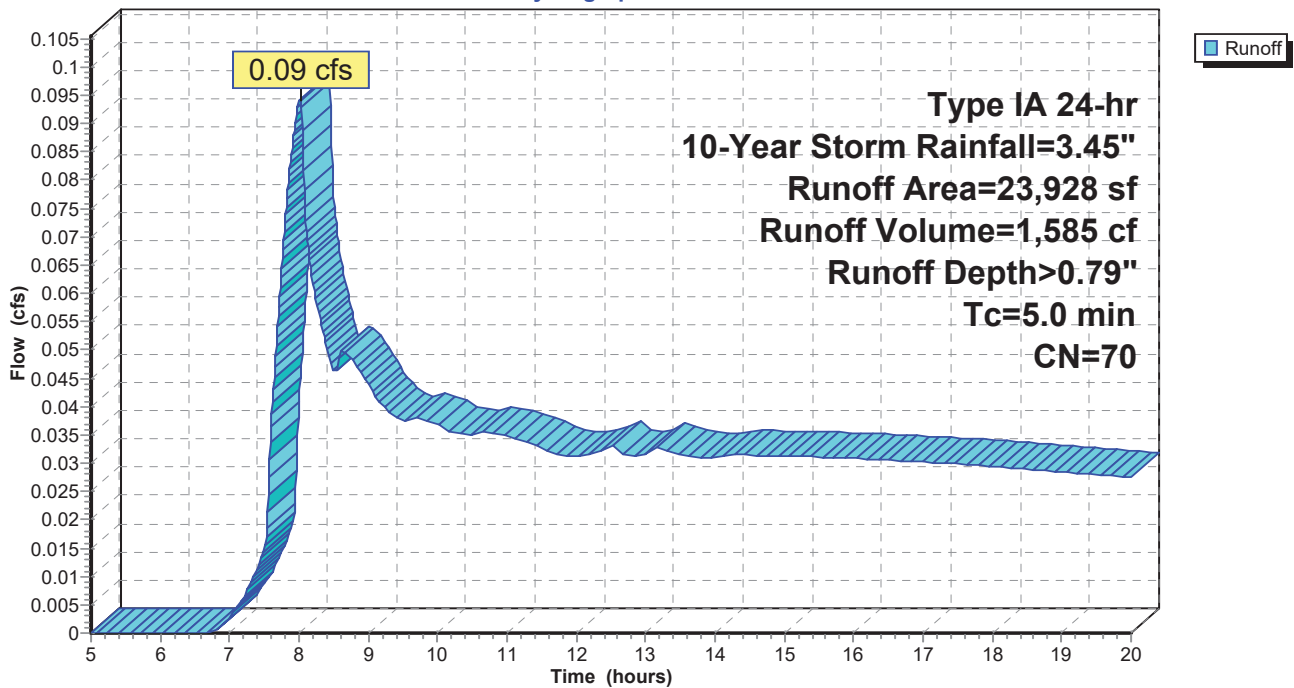
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs  
Type IA 24-hr 10-Year Storm Rainfall=3.45"

	Area (sf)	CN	Description
*	16,890	69	Porous Asphalt - treat like landscape
*	1,167	98	Concrete
*	5,871	69	Landscape
	23,928	70	Weighted Average
	22,761		95.12% Pervious Area
	1,167		4.88% Impervious Area

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

**Subcatchment 1S.2: ON-SITE, DRAINS TO PRIVATE PROPERTY**

Hydrograph





**6892 Prelim River Ridge**

Prepared by AKS Engineering & Forestry

HydroCAD® 10.00-18 s/n 01338 © 2016 HydroCAD Software Solutions LLC

Type IA 24-hr 10-Year Storm Rainfall=3.45"

Printed 4/11/2019

Page 3

**Summary for Subcatchment 2S.2: ON-SITE, DRAINS TO ODOT R/W**

Runoff = 0.03 cfs @ 7.96 hrs, Volume= 345 cf, Depth> 1.49"

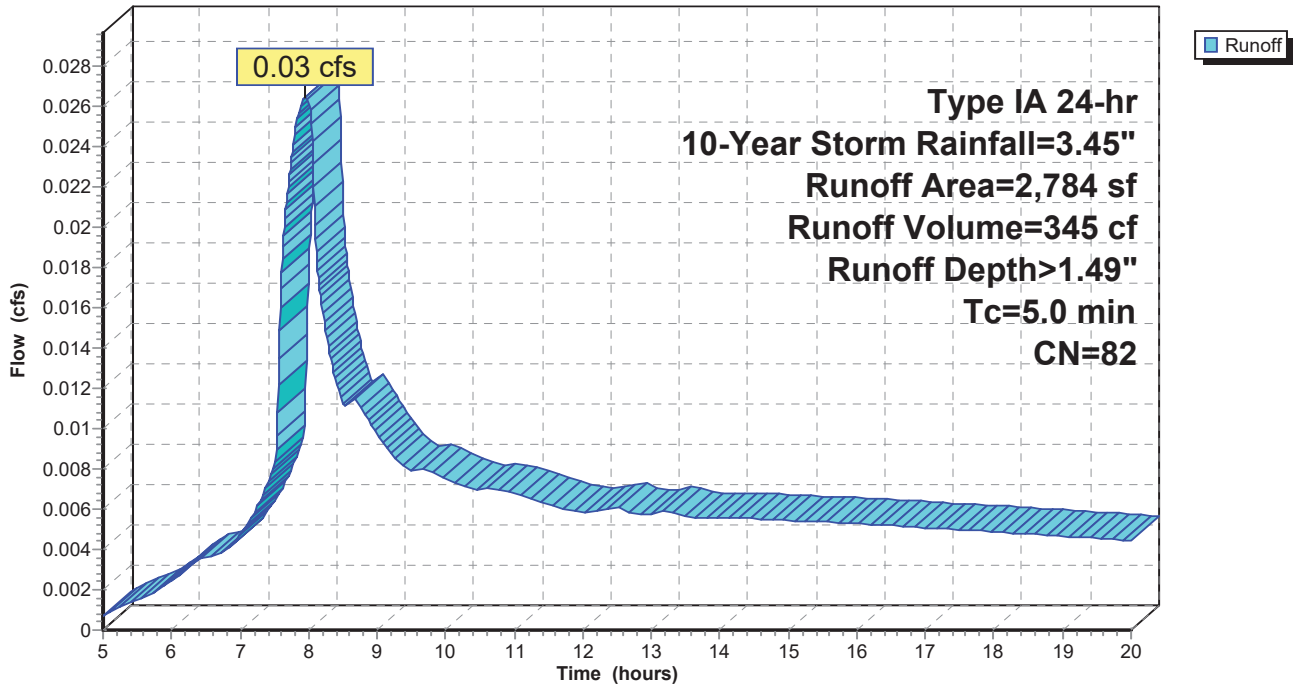
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs  
Type IA 24-hr 10-Year Storm Rainfall=3.45"

	Area (sf)	CN	Description
*	1,200	98	New Building
*	36	98	Concrete
*	1,548	69	Landscape
	2,784	82	Weighted Average
	1,548		55.60% Pervious Area
	1,236		44.40% Impervious Area

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

**Subcatchment 2S.2: ON-SITE, DRAINS TO ODOT R/W**

Hydrograph



**Summary for Subcatchment 3S.2: OFF-SITE, DRAINS TO PRIVATE PROPERTY**

Runoff = 0.00 cfs @ 8.01 hrs, Volume= 62 cf, Depth> 1.00"

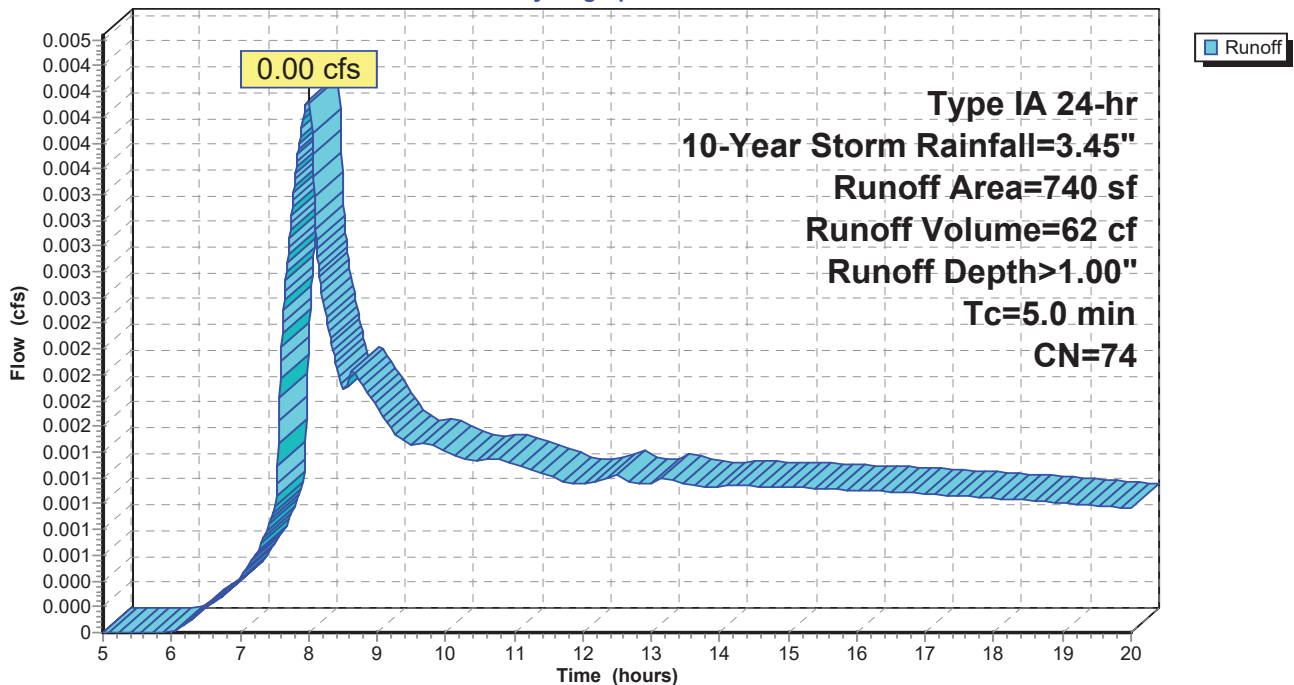
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs  
 Type IA 24-hr 10-Year Storm Rainfall=3.45"

	Area (sf)	CN	Description
*	621	69	Porous Asphalt - treat like landscape
*	119	98	Concrete
	740	74	Weighted Average
	621		83.92% Pervious Area
	119		16.08% Impervious Area

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

**Subcatchment 3S.2: OFF-SITE, DRAINS TO PRIVATE PROPERTY**

Hydrograph



**Summary for Subcatchment 4S.2: OFF-SITE, DRAINS TO ODOT R/W**

Runoff = 0.03 cfs @ 7.98 hrs, Volume= 389 cf, Depth> 1.29"

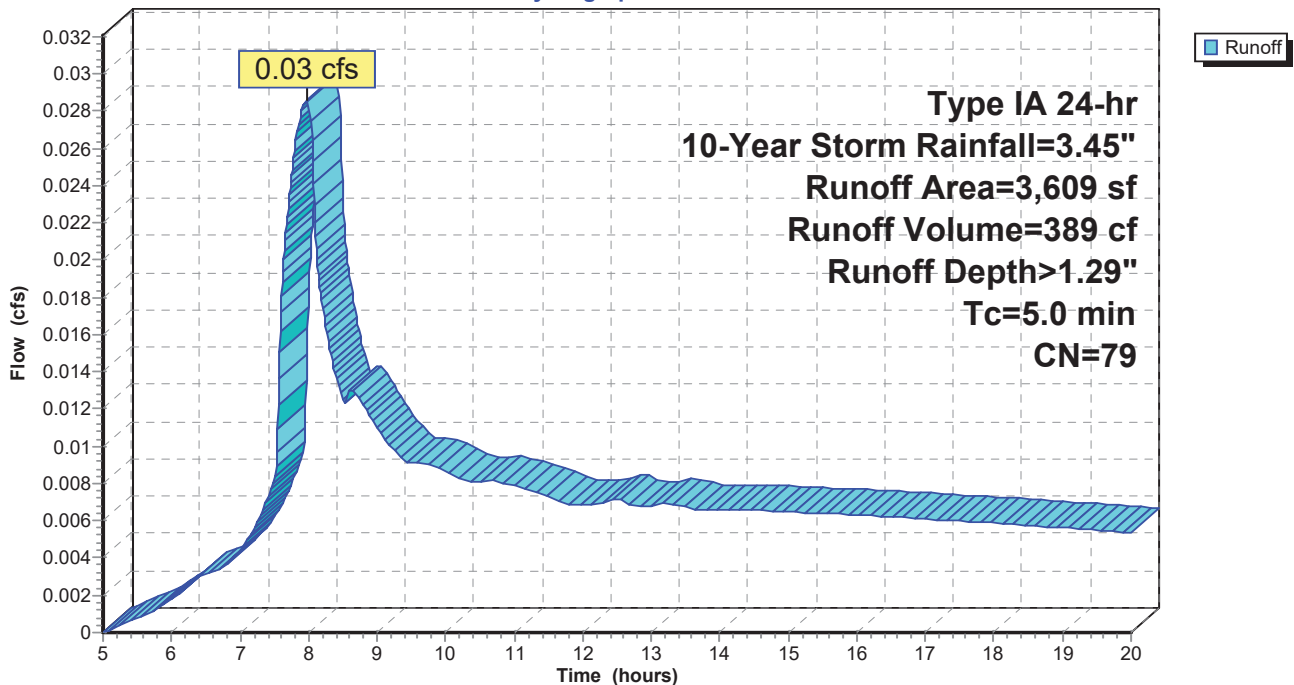
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs  
 Type IA 24-hr 10-Year Storm Rainfall=3.45"

	Area (sf)	CN	Description
*	1,276	98	New & Existing Sidewalk
*	2,333	69	Landscape
	3,609	79	Weighted Average
	2,333		64.64% Pervious Area
	1,276		35.36% Impervious Area

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

**Subcatchment 4S.2: OFF-SITE, DRAINS TO ODOT R/W**

Hydrograph

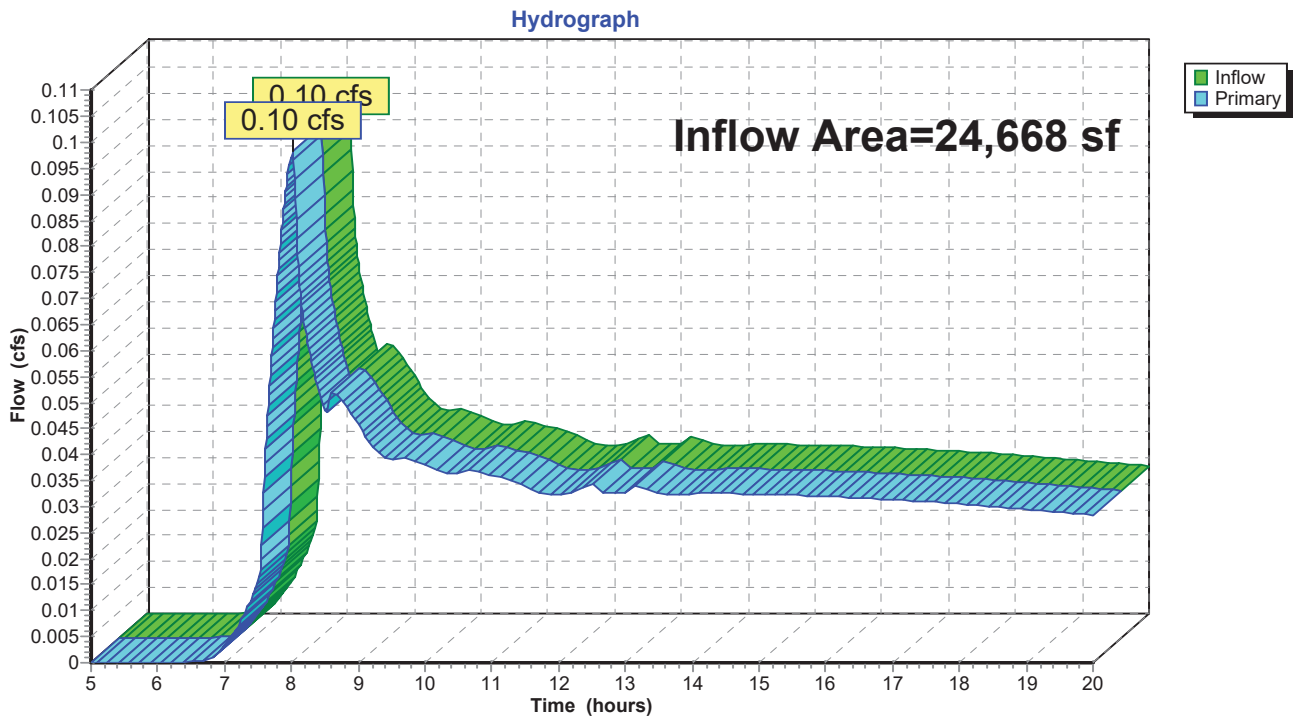


### Summary for Link 3L: POST-DEVELOPED, DRAINS TO PRIVATE PROPERTY

Inflow Area = 24,668 sf, 5.21% Impervious, Inflow Depth > 0.80" for 10-Year Storm event  
Inflow = 0.10 cfs @ 8.02 hrs, Volume= 1,646 cf  
Primary = 0.10 cfs @ 8.02 hrs, Volume= 1,646 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs

### Link 3L: POST-DEVELOPED, DRAINS TO PRIVATE PROPERTY

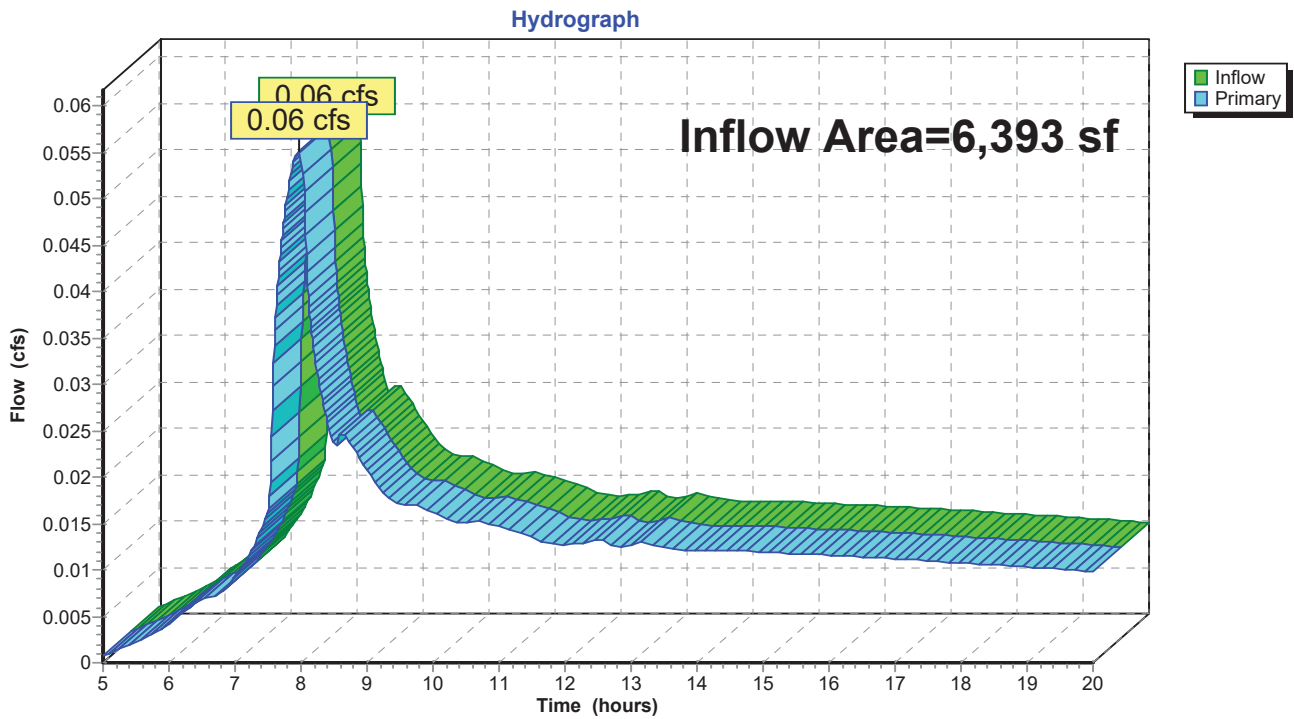


### Summary for Link 4L: POST-DEVELOPED, DRAINS TO ODOT R/W

Inflow Area = 6,393 sf, 39.29% Impervious, Inflow Depth > 1.38" for 10-Year Storm event  
Inflow = 0.06 cfs @ 7.97 hrs, Volume= 734 cf  
Primary = 0.06 cfs @ 7.97 hrs, Volume= 734 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs

### Link 4L: POST-DEVELOPED, DRAINS TO ODOT R/W



**6892 Prelim River Ridge**

Prepared by AKS Engineering & Forestry

HydroCAD® 10.00-18 s/n 01338 © 2016 HydroCAD Software Solutions LLC

Type IA 24-hr 25-Year Storm Rainfall=3.90"

Printed 4/11/2019

Page 8

**Summary for Subcatchment 1S.2: ON-SITE, DRAINS TO PRIVATE PROPERTY**

Runoff = 0.13 cfs @ 8.01 hrs, Volume= 2,075 cf, Depth> 1.04"

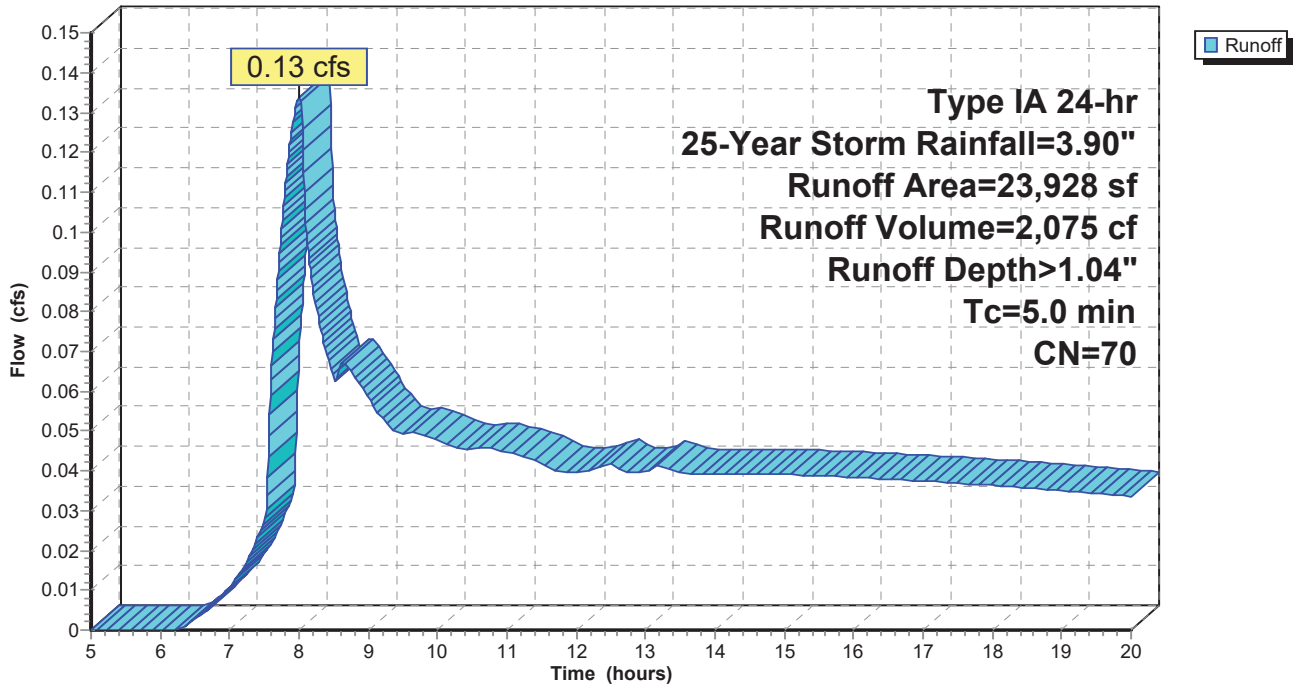
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs  
Type IA 24-hr 25-Year Storm Rainfall=3.90"

	Area (sf)	CN	Description
*	16,890	69	Porous Asphalt - treat like landscape
*	1,167	98	Concrete
*	5,871	69	Landscape
	23,928	70	Weighted Average
	22,761		95.12% Pervious Area
	1,167		4.88% Impervious Area

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

**Subcatchment 1S.2: ON-SITE, DRAINS TO PRIVATE PROPERTY**

Hydrograph



**6892 Prelim River Ridge**

Prepared by AKS Engineering & Forestry

HydroCAD® 10.00-18 s/n 01338 © 2016 HydroCAD Software Solutions LLC

Type IA 24-hr 25-Year Storm Rainfall=3.90"

Printed 4/11/2019

Page 9

**Summary for Subcatchment 2S.2: ON-SITE, DRAINS TO ODOT R/W**

Runoff = 0.03 cfs @ 7.95 hrs, Volume= 421 cf, Depth> 1.82"

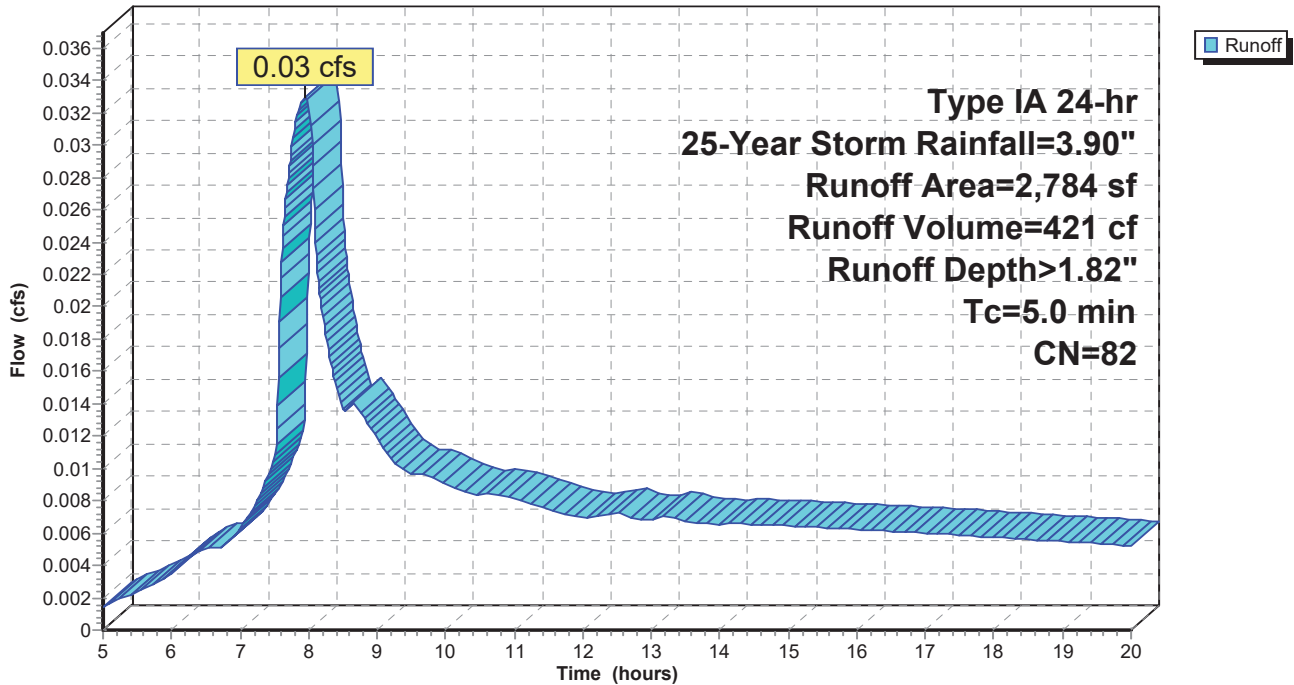
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs  
Type IA 24-hr 25-Year Storm Rainfall=3.90"

	Area (sf)	CN	Description
*	1,200	98	New Building
*	36	98	Concrete
*	1,548	69	Landscape
	2,784	82	Weighted Average
	1,548		55.60% Pervious Area
	1,236		44.40% Impervious Area

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

**Subcatchment 2S.2: ON-SITE, DRAINS TO ODOT R/W**

Hydrograph





**Summary for Subcatchment 3S.2: OFF-SITE, DRAINS TO PRIVATE PROPERTY**

Runoff = 0.01 cfs @ 8.00 hrs, Volume= 79 cf, Depth> 1.28"

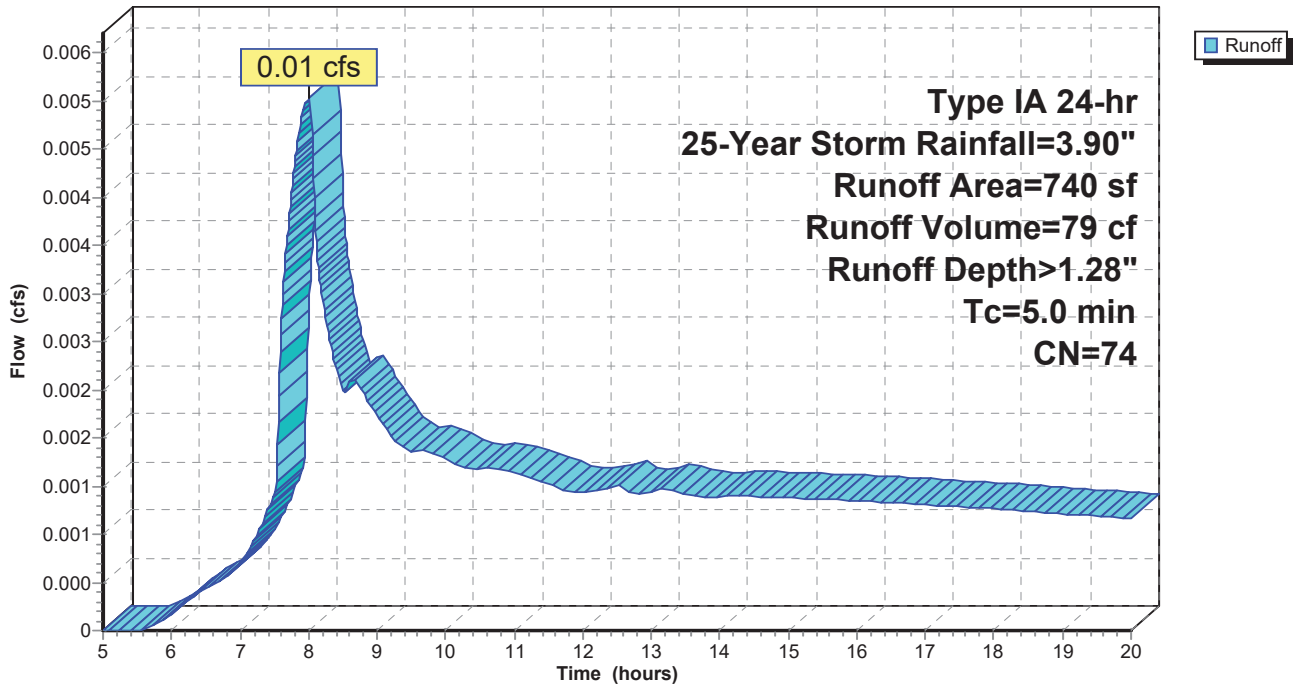
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs  
 Type IA 24-hr 25-Year Storm Rainfall=3.90"

	Area (sf)	CN	Description
*	621	69	Porous Asphalt - treat like landscape
*	119	98	Concrete
	740	74	Weighted Average
	621		83.92% Pervious Area
	119		16.08% Impervious Area

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

**Subcatchment 3S.2: OFF-SITE, DRAINS TO PRIVATE PROPERTY**

Hydrograph



**Summary for Subcatchment 4S.2: OFF-SITE, DRAINS TO ODOT R/W**

Runoff = 0.04 cfs @ 7.97 hrs, Volume= 483 cf, Depth> 1.61"

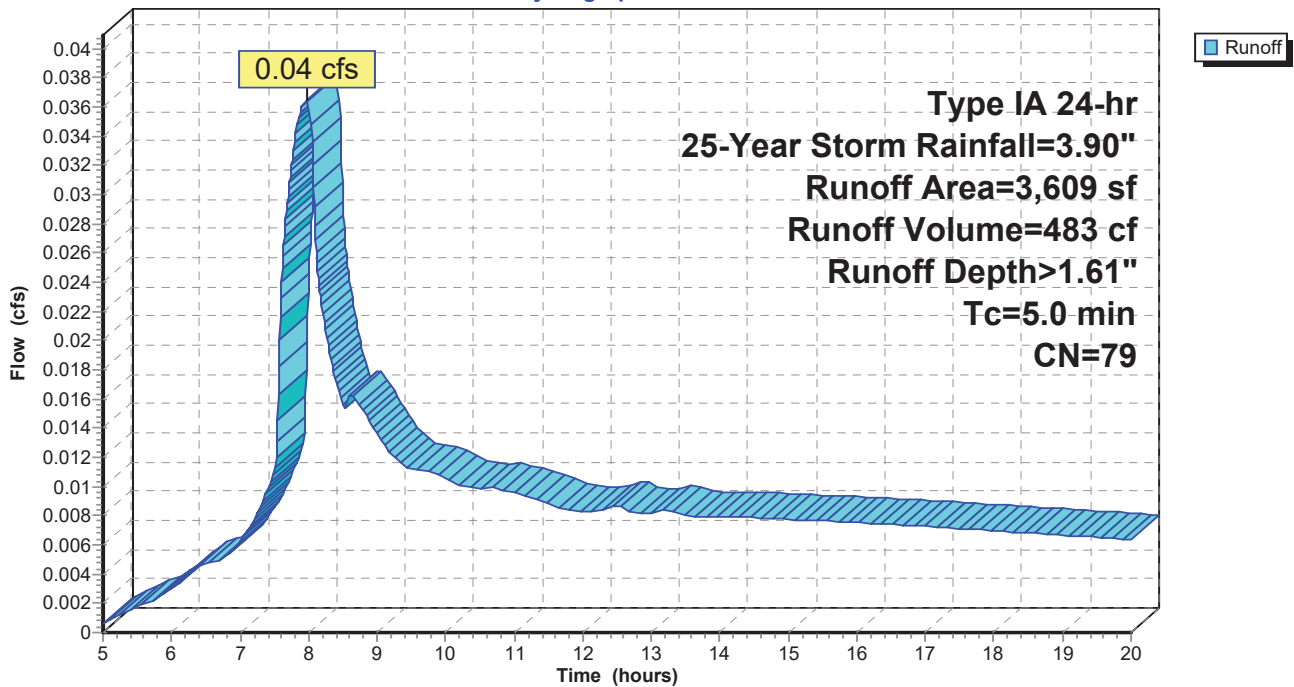
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs  
 Type IA 24-hr 25-Year Storm Rainfall=3.90"

	Area (sf)	CN	Description
*	1,276	98	New & Existing Sidewalk
*	2,333	69	Landscape
	3,609	79	Weighted Average
	2,333		64.64% Pervious Area
	1,276		35.36% Impervious Area

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

**Subcatchment 4S.2: OFF-SITE, DRAINS TO ODOT R/W**

Hydrograph

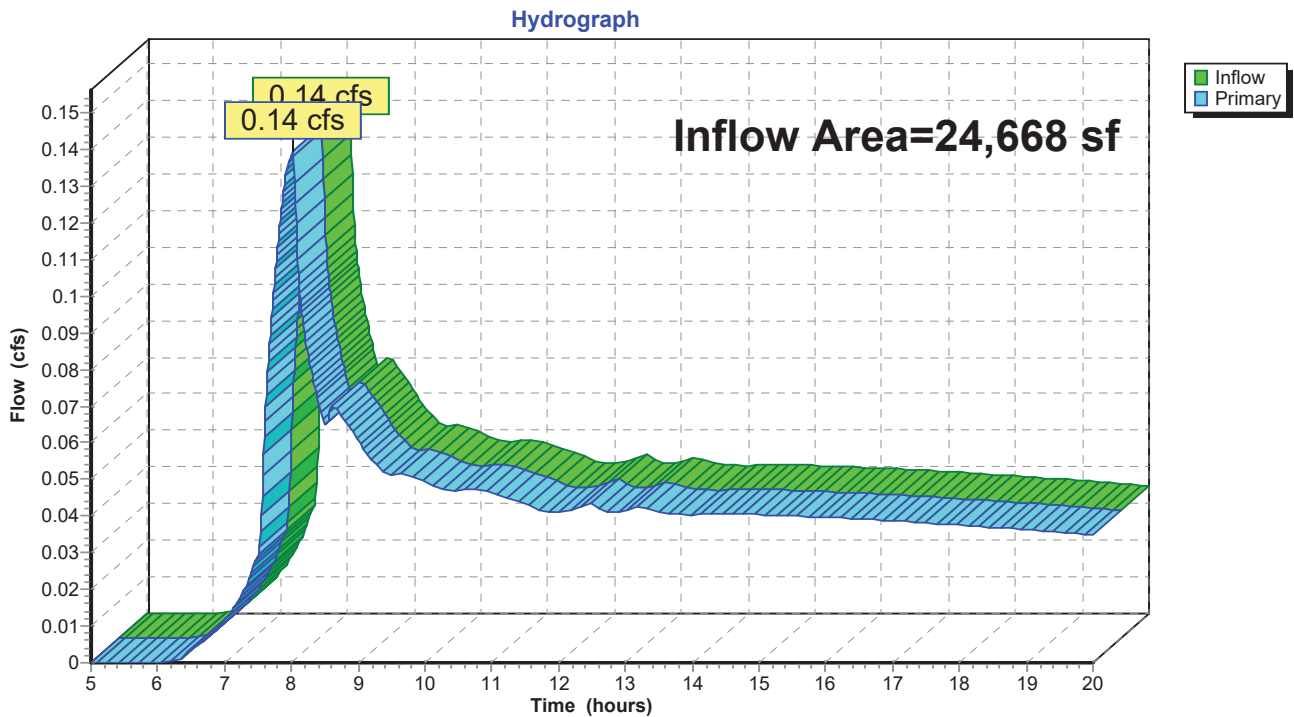


### Summary for Link 3L: POST-DEVELOPED, DRAINS TO PRIVATE PROPERTY

Inflow Area = 24,668 sf, 5.21% Impervious, Inflow Depth > 1.05" for 25-Year Storm event  
Inflow = 0.14 cfs @ 8.01 hrs, Volume= 2,153 cf  
Primary = 0.14 cfs @ 8.01 hrs, Volume= 2,153 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs

### Link 3L: POST-DEVELOPED, DRAINS TO PRIVATE PROPERTY



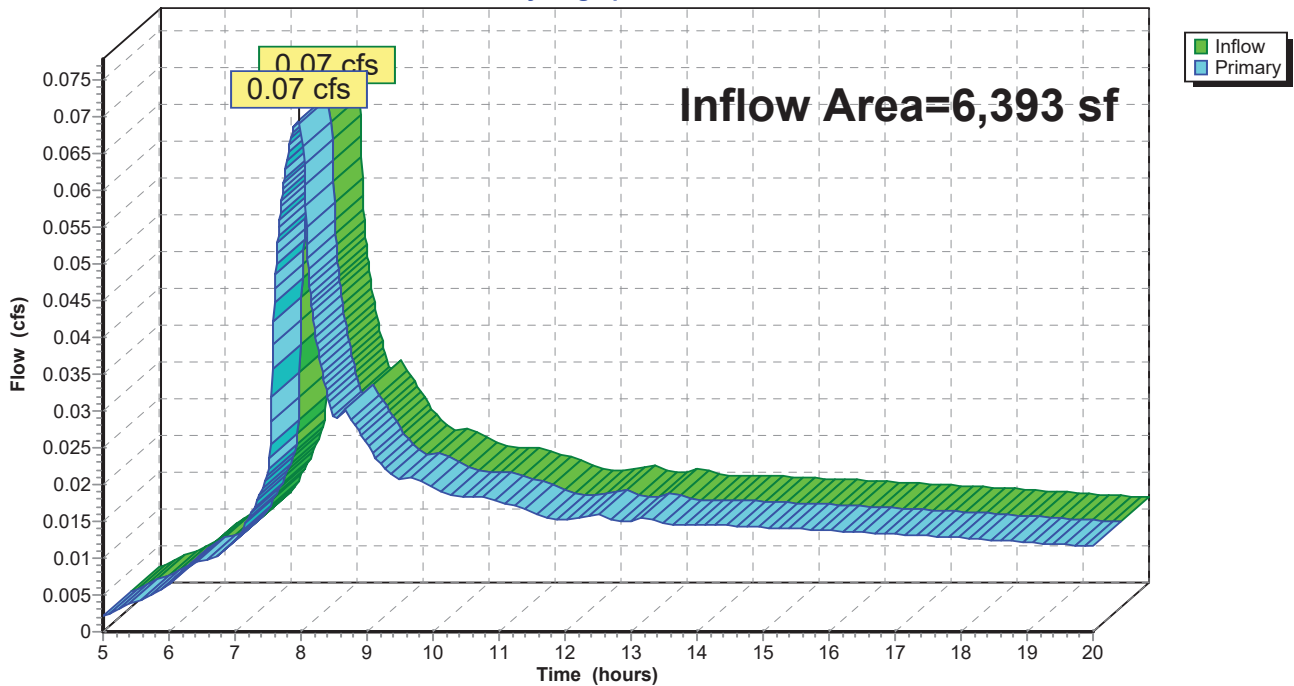
**Summary for Link 4L: POST-DEVELOPED, DRAINS TO ODOT R/W**

Inflow Area = 6,393 sf, 39.29% Impervious, Inflow Depth > 1.70" for 25-Year Storm event  
Inflow = 0.07 cfs @ 7.96 hrs, Volume= 904 cf  
Primary = 0.07 cfs @ 7.96 hrs, Volume= 904 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs

**Link 4L: POST-DEVELOPED, DRAINS TO ODOT R/W**

Hydrograph



## **Appendix F: USDA NRCS Soil Resource Report**

---

# Custom Soil Resource Report for Washington County, Oregon



# Preface

---

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist ([http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2\\_053951](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951)).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.



# Contents

---

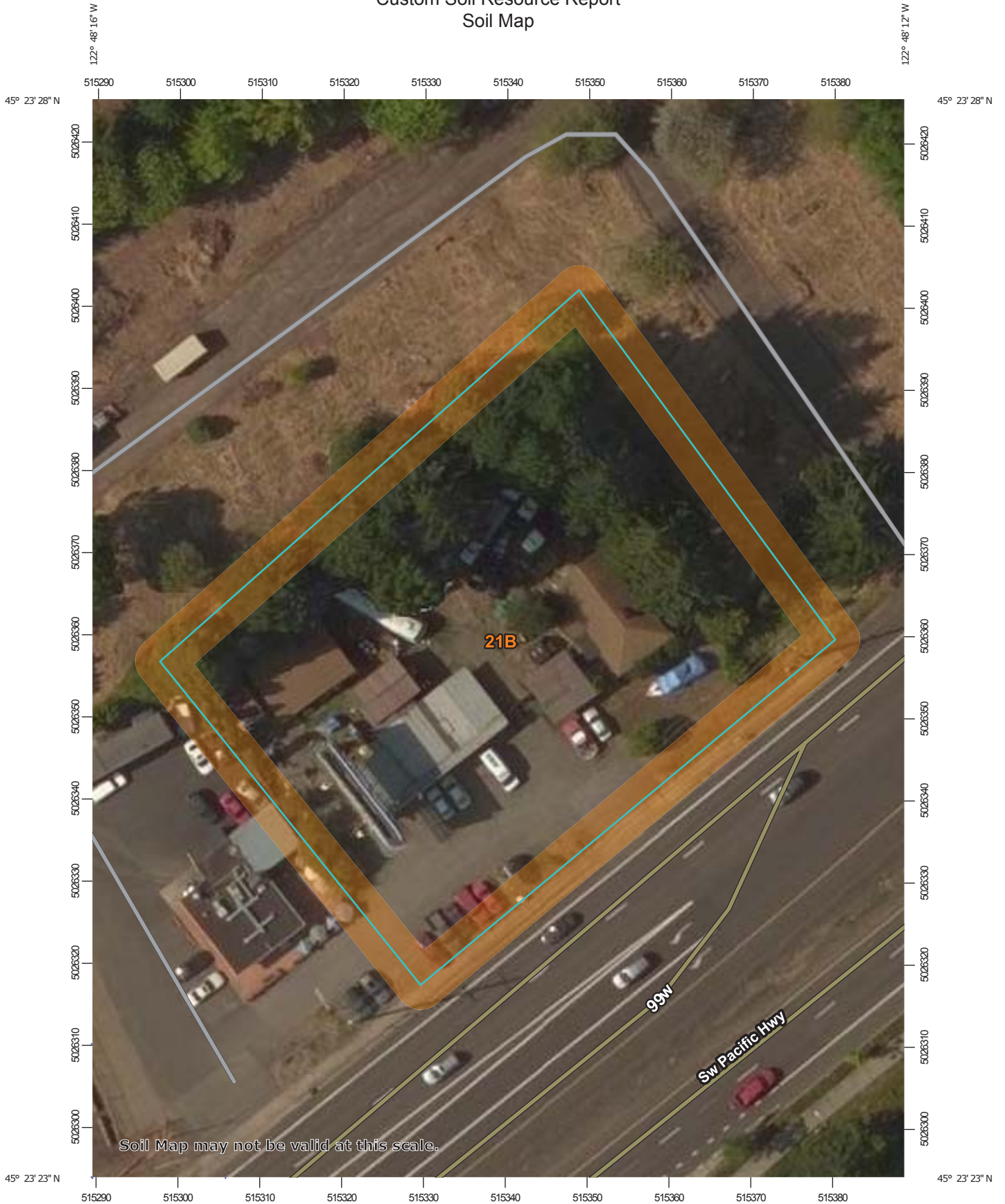
<b>Preface</b> .....	2
<b>Soil Map</b> .....	5
Soil Map.....	6
Legend.....	7
Map Unit Legend.....	8
Map Unit Descriptions.....	8
Washington County, Oregon.....	10
21B—Hillsboro loam, 3 to 7 percent slopes.....	10
<b>Soil Information for All Uses</b> .....	11
Soil Properties and Qualities.....	11
Soil Qualities and Features.....	11
Hydrologic Soil Group.....	11

# Soil Map

---

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

# Custom Soil Resource Report Soil Map



Map Scale: 1:639 if printed on A portrait (8.5" x 11") sheet.

0 5 10 20 30 Meters

0 30 60 120 180 Feet

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 Map Unit Polygons
  -  Soil Map Unit Lines
  -  Soil Map Unit Points
- Special Point Features**
  -  Blowout
  -  Borrow Pit
  -  Clay Spot
  -  Closed Depression
  -  Gravel Pit
  -  Gravelly Spot
  -  Landfill
  -  Lava Flow
  -  Marsh or swamp
  -  Mine or Quarry
  -  Miscellaneous Water
  -  Perennial Water
  -  Rock Outcrop
  -  Saline Spot
  -  Sandy Spot
  -  Severely Eroded Spot
  -  Sinkhole
  -  Slide or Slip
  -  Sodic Spot
- Water Features**
  -  Streams and Canals
- Transportation**
  -  Rails
  -  Interstate Highways
  -  US Routes
  -  Major Roads
  -  Local Roads
- Background**
  -  Aerial Photography
- Other Features**
  -  Spoil Area
  -  Stony Spot
  -  Very Stony Spot
  -  Wet Spot
  -  Other
  -  Special Line Features

## 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: Washington County, Oregon  
 Survey Area Data: Version 15, Sep 19, 2017

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

Date(s) aerial images were photographed: Aug 3, 2014—Aug 23, 2014

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

## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
21B	Hillsboro loam, 3 to 7 percent slopes	0.9	100.0%
<b>Totals for Area of Interest</b>		<b>0.9</b>	<b>100.0%</b>

## Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

## Custom Soil Resource Report

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

## Washington County, Oregon

### 21B—Hillsboro loam, 3 to 7 percent slopes

#### Map Unit Setting

*National map unit symbol:* 21y6  
*Elevation:* 160 to 240 feet  
*Mean annual precipitation:* 40 to 50 inches  
*Mean annual air temperature:* 52 to 54 degrees F  
*Frost-free period:* 165 to 210 days  
*Farmland classification:* All areas are prime farmland

#### Map Unit Composition

*Hillsboro and similar soils:* 90 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Hillsboro

##### Setting

*Landform:* Terraces  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Silty and loamy old alluvium

##### Typical profile

*H1 - 0 to 15 inches:* loam  
*H2 - 15 to 48 inches:* loam  
*H3 - 48 to 57 inches:* fine sandy loam  
*H4 - 57 to 81 inches:* fine sand

##### Properties and qualities

*Slope:* 3 to 7 percent  
*Depth to restrictive feature:* More than 80 inches  
*Natural drainage class:* Well drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.57 to 1.98 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water storage in profile:* High (about 10.6 inches)

##### Interpretive groups

*Land capability classification (irrigated):* 2e  
*Land capability classification (nonirrigated):* 2e  
*Hydrologic Soil Group:* B  
*Hydric soil rating:* No



# Soil Information for All Uses

---

## Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

## Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

## Hydrologic Soil Group

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.



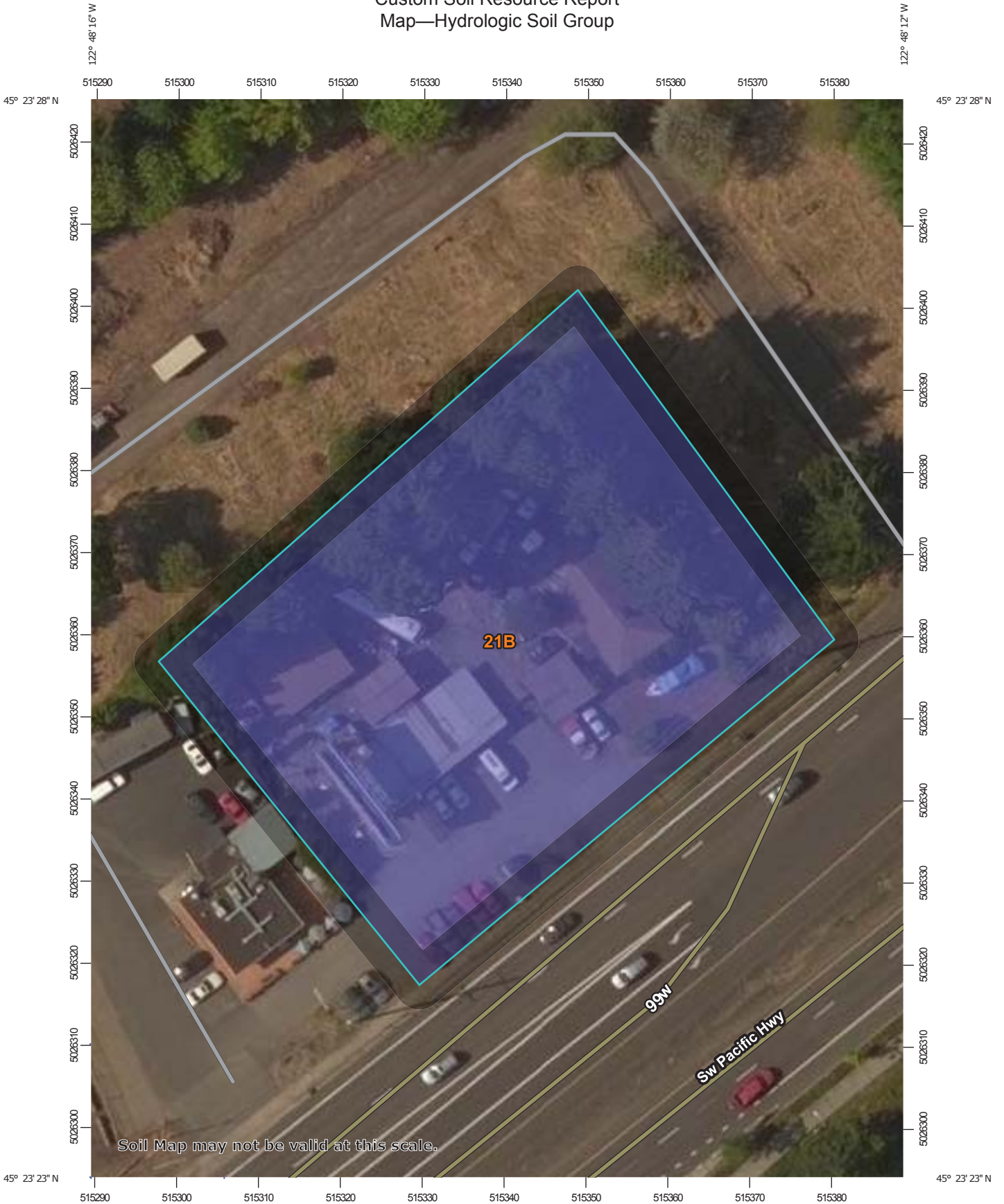
## Custom Soil Resource Report

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.

# Custom Soil Resource Report Map—Hydrologic Soil Group



Soil Map may not be valid at this scale.

Map Scale: 1:639 if printed on A portrait (8.5" x 11") sheet.

0 5 10 20 30 Meters

0 30 60 120 180 Feet

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

**Water Features**

	Streams and Canals
--	--------------------

**Transportation**

	Rails
	Interstate Highways
	US Routes
	Major Roads
	Local Roads

**Background**

	Aerial Photography
--	--------------------

**Soil Rating Points**

	A
	A/D
	B
	B/D
	C
	C/D
	D
	Not rated or not available

## 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: Washington County, Oregon  
 Survey Area Data: Version 15, Sep 19, 2017

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

Date(s) aerial images were photographed: Aug 3, 2014—Aug 23, 2014

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

**Table—Hydrologic Soil Group**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
21B	Hillsboro loam, 3 to 7 percent slopes	B	0.9	100.0%
<b>Totals for Area of Interest</b>			<b>0.9</b>	<b>100.0%</b>

**Rating Options—Hydrologic Soil Group**

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff:* None Specified

*Tie-break Rule:* Higher

## **Appendix G: Technical Release 55 Runoff Curve Numbers**

---

**Table 2-2a** Runoff curve numbers for urban areas <sup>1/</sup>

Cover description	Average percent impervious area <sup>2/</sup>	Curve numbers for hydrologic soil group			
		A	B	C	D
<b>Fully developed urban areas (vegetation established)</b>					
Open space (lawns, parks, golf courses, cemeteries, etc.) <sup>3/</sup> :					
Poor condition (grass cover < 50%) .....		68	79	86	89
Fair condition (grass cover 50% to 75%) .....		49	63	79	84
Good condition (grass cover > 75%) .....		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way) .....		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way) .....		98	98	98	98
Paved; open ditches (including right-of-way) .....		83	89	92	93
Gravel (including right-of-way) .....		76	85	89	91
Dirt (including right-of-way) .....		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) <sup>4/</sup> .....		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders) .....		96	96	96	96
Urban districts:					
Commercial and business .....	85	89	92	94	95
Industrial .....	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses) .....	65	77	85	90	92
1/4 acre .....	38	61	75	83	87
1/3 acre .....	30	57	72	81	86
1/2 acre .....	25	54	70	80	85
1 acre .....	20	51	68	79	84
2 acres .....	12	46	65	77	82

**Developing urban areas**

Newly graded areas  
(pervious areas only, no vegetation) <sup>5/</sup> .....

	77	86	91	94
--	----	----	----	----

Idle lands (CN's are determined using cover types  
similar to those in table 2-2c).

<sup>1/</sup> Average runoff condition, and  $I_a = 0.2S$ .

<sup>2/</sup> The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

<sup>3/</sup> CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

<sup>4/</sup> Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

<sup>5/</sup> Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

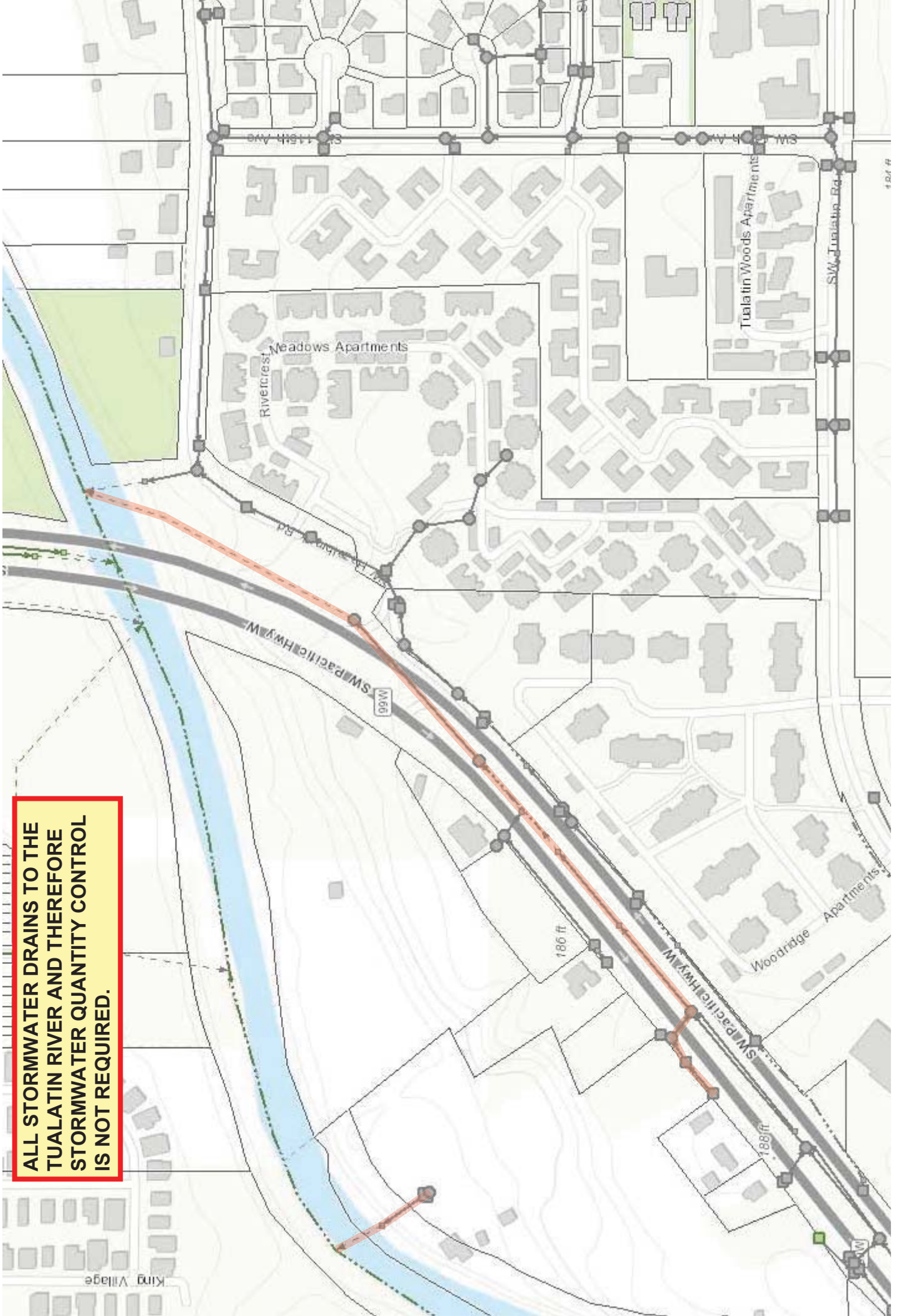
## **Appendix H: Public Storm Sewer Map**

---

---



**ALL STORMWATER DRAINS TO THE TUALATIN RIVER AND THEREFORE STORMWATER QUANTITY CONTROL IS NOT REQUIRED.**





## **Appendix I: Infiltration Test Report**

---

---

## ***Tualatin Retail Center Project***

December 29<sup>th</sup>, 2018



### ***Infiltration Testing and Analysis***

While on site, we conducted three (2) field infiltration tests as requested by the site design Engineer.

The two excavations were performed on site using a 4-inch diameter hand auger. The holes were excavated to a depth of more than 3 feet.

The soils in the excavations were a Sandy Loam material .

The field infiltration testing was performed in general conformance with the EPA Falling Head Method. Specifically, water was discharged into the test holes and allowed to penetrate the exposed subgrade soils at depth within the excavations. The water level was adjusted over a two (2) hour period and allowed to achieve a saturated subgrade soil condition. At the end of the saturation period, water was added to the test holes and the time and rate at which the water level dropped was monitored and recorded. The water level changes were monitored until a consistent infiltration rate was observed and repeated.

Based on the results of this testing, we have found that the silty loam material possesses an ultimate infiltration rate of about 7.7 inches per hour (in/hr.). This should provide a reasonable infiltration rate for the disposal of surface water runoff from the proposed pervious surface material within the limits of the proposed hard surface areas.

**Tualatin Retail Center Project**

*Infiltration Test*

Test No.1

December 29th, 2018

Time (min)	Time Difference (min)	Water Level (feet)	Infiltration (feet)	Infiltration (inches)	Infiltration Rate In/Min	Infiltration Rate In/hr	Cumulative Infiltration (inches)
0		1.2					
4	4	1.26	0.06	0.72	0.18	10.8	0.72
8	4	1.3	0.04	0.48	0.12	7.2	1.2
12	4	1.34	0.04	0.48	0.12	7.2	1.68
16	4	1.38	0.04	0.48	0.12	7.2	2.16
20	4	1.42	0.04	0.48	0.12	7.2	2.64
30	10	1.51	0.09	1.08	0.108	6.48	3.72
40	10	1.6	0.09	1.08	0.108	6.48	4.8
50	10	1.68	0.08	0.96	0.096	5.76	5.76
60	10	1.76	0.08	0.96	0.096	5.76	6.72
70	10						
80	10		0	0	0	0	0
90	10		0	0	0	0	0
100	10		0	0	0	0	0
120	20		0	0	0	0	0

Average Rate 6.72

Design Rate 3 in/hr

**24 Hour Design Rate 72 in**

*Site material is a Sandy Loam, depth of excavation 40 inches*

**Tualatin Retail Center Project**

*Infiltration Test*

Test No. 2

December 29th, 2018

Time (min)	Time Difference (min)	Water Level (feet)	Infiltration (feet)	Infiltration (inches)	Infiltration Rate In/Min	Infiltration Rate In/hr	Cumulative Infiltration (inches)
0		1.2					
4	4	1.28	0.08	0.96	0.24	14.4	0.96
8	4	1.34	0.06	0.72	0.18	10.8	1.68
12	4	1.4	0.06	0.72	0.18	10.8	2.4
16	4	1.45	0.05	0.6	0.15	9	3
20	4	1.5	0.05	0.6	0.15	9	3.6
30	10	1.62	0.12	1.44	0.144	8.64	5.04
40	10	1.72	0.1	1.2	0.12	7.2	6.24
50	10	1.83	0.11	1.32	0.132	7.92	7.56
60	10	1.94	0.11	1.32	0.132	7.92	8.88
70	10						
80	10		0	0	0	0	0
90	10		0	0	0	0	0
100	10		0	0	0	0	0
120	20		0	0	0	0	0

Average Rate

8.88

Design Rate

4.44 in/hr

**24 Hour Design Rate**

**106.56 in**

*Site material is a Sandy Loam, depth of excavation 44 inches*