

## DEVELOPMENT REVIEW APPLICATION

For Office Use Only			
STAFF CONTACT	PROJECT NO(S). <b>ELD-24-04</b>	PRE-APPLICATION NO.	
NON-REFUNDABLE FEE(S) <b>\$4,900</b>	REFUNDABLE DEPOSIT(S)	TOTAL	<b>\$4,900</b>

**Type of Review** (Please check all that apply):

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

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

<b>Site Location/Address:</b> 4194 Cornwall Street, West Linn, OR 97068	Assessor's Map No.: 21E36BA
	Tax Lot(s): 6500
	Total Land Area: 0.46 AC (20,037 SF)

**Brief Description of Proposal:** The client proposes to partition the property into three lots for middle housing, in accordance with the City of West Linn's land development requirements.

<b>Applicant Name*:</b> TPC PROPERTY LLC contact: JJ Portlock	Phone: (425) 829-1566
Address: PO BOX 521	Email: JPORTLOCK@THEPORTLOCKCO.COM
City State Zip: WEST LINN, OR 97068	

<b>Owner Name</b> (required): The Portlock Company	Phone:
Address: PO Box 521, West Linn OR 97068	Email:
City State Zip:	

<b>Consultant Name:</b> FIRWOOD DESIGN GROUP LLC contact: Carmen Nemes	Phone: (503) 668-3737
Address: 359 E HISTORIC COLUMBIA RIVER HWY	Email: CN@FIRWOODDESIGN.COM
City State Zip: TROUTDALE, OR 97060	

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

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



Applicant's signature

9/24/24  
Date



Owner's signature **(required)**

9/24/24  
Date

# Partition Application Narrative

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Project Name: **Cornwall 3 Lot Middle Housing**

Site Address: 4194 Cornwall Street, West Linn, OR.

Applicant: TPC PROPERTY LLC  
PO BOX 521  
West Linn, OR 97068

Contact: JJ Portlock  
(425) 829-1566  
[jportlock@theportlockco.com](mailto:jportlock@theportlockco.com)

Prepared By:



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## I. General Project Description

The project site is located at 4194 Cornwall Street, West Linn, OR (Parcel #21E36BA 065000), zoned R10. The current 0.459 acre lot features an existing residential structure and a detached garage. The existing house and garage will be removed, and the driveway will be improved. The site is relatively flat with slopes less than 5%, gently sloping towards the southeastern side. The remainder of the lot is landscaped with mature trees and a retaining landscape wall along the southern property line. A 20-foot access and utility easement is proposed to provide access to all three lots.

The property is currently connected to public utilities—including water, electricity, natural gas, and sewer services—available from Cornwall Street.

## II. Application Approval Requests

The client, TPC Property LLC, proposes to partition the parcel (Parcel #1S3E 36C TL 1400) at 4194 Cornwall Street into three parcels for single-family use. A new 14-foot wide, 135-foot long driveway is proposed to serve the first two lots, and it will continue as a 12-foot wide private driveway serving the third lot.

## III. Applicable Code Criteria

The subject property is zoned R-10, which permits triplex residential units as an outright use per CDC 11.030.1.b. This proposal includes three detached single units under the provisions of Section 2 of SB 458 for a middle housing land division. The applicable criteria are noted below in **bold** typeface with the applicant's responses in *italic* typeface.

### SB 458 Section 2:

**(1) As used in this section, "middle housing land division" means a partition or subdivision of a lot or parcel on which the development of middle housing is allowed under ORS 197.758 (2) or (3).**

**(2) A city or county shall approve a tentative plan for a middle housing land division if the application includes:**

**(a) A proposal for development of middle housing in compliance with the Oregon residential specialty code and land use regulations applicable to the original lot or parcel allowed under ORS 197.758 (5);**

*Response: The property is within the R-10 zoning designation and permits a triplex as outright use. The proposal includes a middle housing land division to create three lots, each with a detached single-family unit*

**(b) Separate utilities for each dwelling unit;**

*Response: A preliminary street and utility plan shows individual utilities for each lot.*

**(c) Proposed easements necessary for each dwelling unit on the plan for:**

**(A) Locating, accessing, replacing and servicing all utilities;**

**(B) Pedestrian access from each dwelling unit to a private or public road;**

**(C) Any common use areas or shared building elements;**

**(D) Any dedicated driveways or parking; and**

**(E) Any dedicated common area;**

*Response: A 20-foot shared access and utility easement is proposed, pedestrian access will be allowed via the private access easement. Each parcel has direct access to the shared driveway, with no common areas or shared building elements.*

**(d) Exactly one dwelling unit per resulting lot, except for common areas.**



*Response: The proposal includes one unit per lot, as shown in the submitted plans.*

**(e) Evidence demonstrating how buildings or structures on a resulting lot or parcel will comply with applicable building codes provisions relating to new property lines and, notwithstanding the creation of new lots or parcels, how structures or buildings located on the newly created lots or parcels will comply with the Oregon residential specialty code.**

*Response: Building setbacks are shown on the site plan. Existing structures will be removed before constructing the triplex units. A building permit will ensure compliance with the Oregon Residential Specialty Code.*

**(3) A city or county may add conditions to the approval of a tentative plan for a middle housing land division to:**

**(a) Prohibit the further division of the resulting lots or parcels.**

**(b) Require that a notation appear on the final plat indicating that the approval was given under this section.**

*Response: The applicant understands that conditions may be applied, including noting the approval on the final plat.*

**(4) In reviewing an application for a middle housing land division, a city or county:**

**(a) Shall apply the procedures under ORS 197.360 to 197.380.**

**(b) May require street frontage improvements where a resulting lot or parcel abuts the street consistent with land use regulations implementing ORS 197.758.**

**(c) May not subject an application to approval criteria except as provided in this section, including that a lot or parcel require driveways, vehicle access, parking or minimum or maximum street frontage.**

**(d) May not subject the application to procedures, ordinances or regulations adopted under ORS 92.044 or 92.046 that are inconsistent with this section or ORS 197.360 to 197.380.**

**(e) May allow the submission of an application for a middle housing land division at the same time as the submission of an application for building permits for the middle housing.**

**(f) May require the dedication of right of way if the original parcel did not previously provide a dedication.**

**(5) The type of middle housing developed on the original parcel is not altered by a middle housing land division.**

**(6) Notwithstanding ORS 197.312 (5), a city or county is not required to allow an accessory dwelling unit on a lot or parcel resulting from a middle housing land division.**

**(7) The tentative approval of a middle housing land division is void if and only if a final subdivision or partition plat is not approved within three years of the tentative approval. Nothing in this section or ORS 197.360 to 197.380 prohibits a city or county from requiring a final plat before issuing building permits.**

*Response: The applicant acknowledges the review process, including possible conditions and requirements and is aware that the application is void if the final plat is not approved within three years.*

## IV. Conclusion

This application narrative, along with the accompanying plans and supporting materials, demonstrates compliance with all applicable provisions of SB 458. The applicant respectfully requests approval of this application by the Planning Department.

## V. Items Submitted With The Application

- Clackamas County Assessor Map
- West Linn Zoning Map
- Preliminary Plan Set





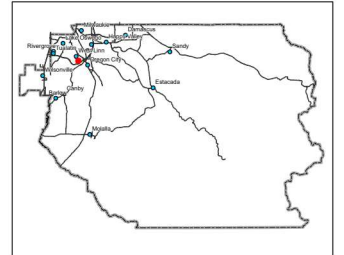
2 1E 36BA  
WEST LINN  
N.E. 1/4 N.W. 1/4 SEC. 36 T.2S. R.1E. W. M.  
CLACKAMAS COUNTY

1" = 100'  
D. L. C.  
JULIA ANN LEWIS NO. 54

Cancelled

- 5700
- 7200
- 6200
- 5400
- 5800
- 3800
- 4600
- 4200
- 5990
- 300
- 5600
- 3000
- 6300

- |                           |                         |
|---------------------------|-------------------------|
| — Parcel Boundary         | ○ Corner                |
| - - - Private Road ROW    | ○ Section Corner        |
| - - - Historical Boundary | — 1/16th Line           |
| - - - Railroad Centerline | — Govt Lot Line         |
| — Tax Code Lines          | — DLC Line              |
| — Map Index               | — Meander Line          |
| — Water Lines             | — PLS Section Line      |
| ○ Land Use Zoning         | — Historic Corridor 40' |
| — Plats                   | — Historic Corridor 20' |
| — Water                   |                         |



THIS MAP IS FOR ASSESSMENT  
PURPOSES ONLY

Print Date: 3/27/2024

2 1E 36BA  
WEST LINN



**Legend**

**Zoning**

- Single and Multi Family R-2.1
- Single and Multi Family R-3
- Single-Family R-4.5
- Single-Family R-5
- Single-Family R-7
- Single-Family R-10
- Single-Family R-15
- Single-Family R-20
- Single-Family R-40
- Mixed Use
- Neighborhood Commercial
- General Commercial
- Office Business Center
- Campus Industrial
- General Industrial

dissolved 0-5K

- Street Lights
- Stormwater Main
- PIPE
- OPEN DITCH
- Stormwater Lateral
- Stormwater Facility
- Water Main

0 0.06 0.11 Miles

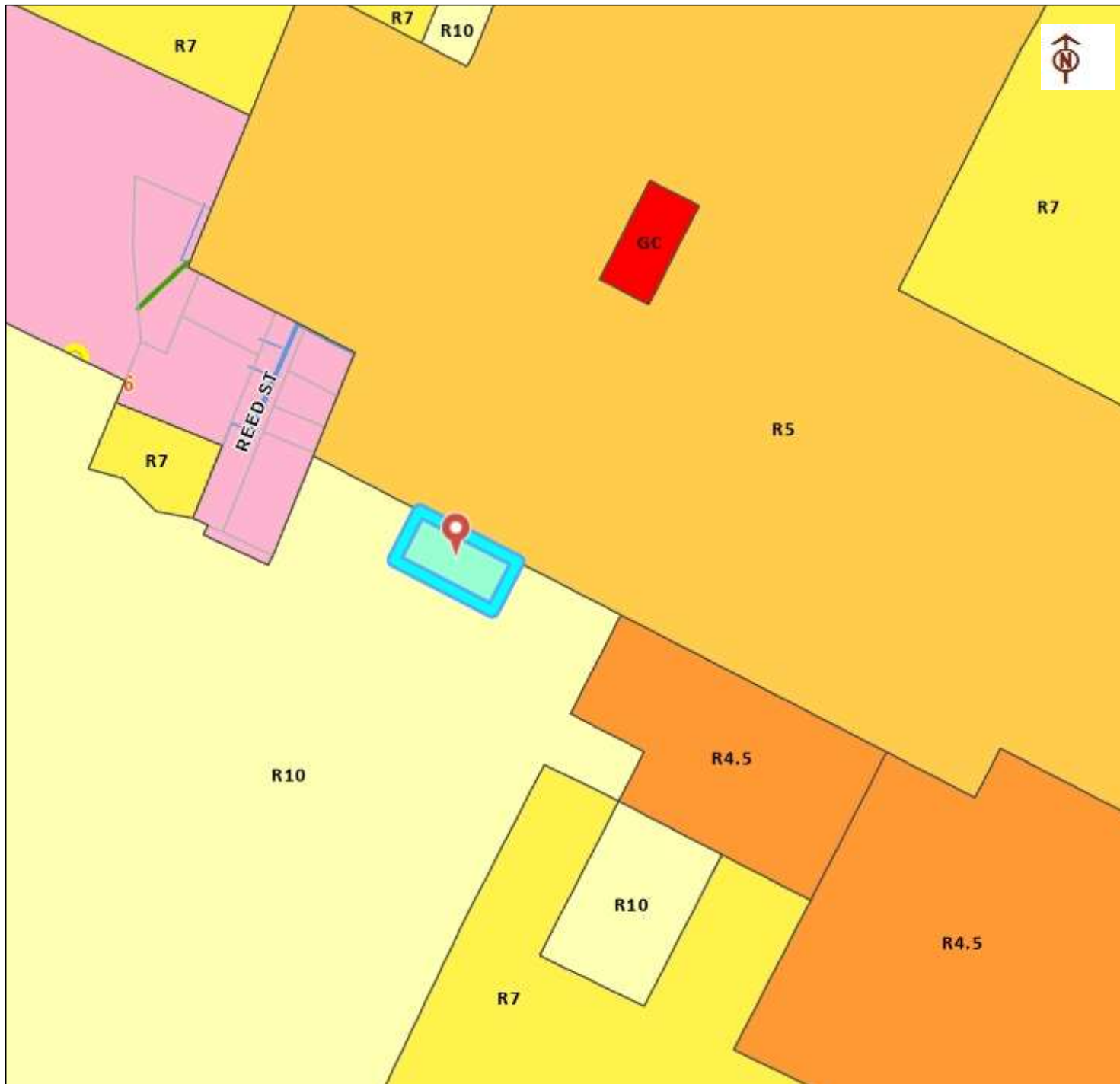


1: 4,514



**Notes**

This map was automatically generated using Geocortex Essentials.





# CORNWALL - 3 LOT PARTITION MIDDLE HOUSING - TAX LOT 21E36BA06500

## DEVELOPMENT ENGINEERING PLANS

LOCATED AT 4194 CORNWALL ST, CITY OF WEST LINN, OREGON 97068

**GENERAL NOTES:**

- ALL REFERENCES TO THE CITY OF WEST LINN STANDARDS REFER TO THE CURRENT PUBLIC WORKS STANDARD CONSTRUCTION SPECIFICATIONS.
- THE DESIGN ENGINEER WILL BE RESPONSIBLE FOR INSPECTION OF THE PROPOSED IMPROVEMENTS WITH OVERSIGHT FROM THE CITY OF WEST LINN.
- THE CONTRACTOR SHALL PROVIDE A WORK SCHEDULE TO THE ENGINEER AND CITY AND PROVIDE 24-HOUR NOTICE OF ANY TESTING REQUIRING WITNESSING BY THE CITY OR ENGINEER.
- ANY CHANGES TO THE PLANS MUST RECEIVE APPROVAL BY THE ENGINEER AND CITY IN WRITING BEFORE PROCEEDING WITH THE WORK.
- A PUBLIC IMPROVEMENT GUARANTEE AGREEMENT, A PRE-CONSTRUCTION MEETING, AND INSTALLATION OF THE EROSION CONTROL MEASURES, ARE ALL REQUIRED PRIOR TO BEGINNING CONSTRUCTION.
- A CITY AND ENGINEER REPRESENTATIVE MUST BE PRESENT FOR ALL TESTING, AND THE CITY SHALL BE FURNISHED A COPY OF ALL TEST RESULTS.
- CONTRACTOR SHALL VERIFY DEPTH AND LOCATION OF EXISTING UTILITIES AND POINTS OF CONNECTION PRIOR TO ORDERING MATERIALS. OTHER EXISTING UTILITIES MAY EXIST AND IF DISCREPANCIES ARE FOUND THE CONTRACTOR SHALL NOTIFY THE ENGINEER.
- THE CONTRACTOR SHALL ERECT AND MAINTAIN TRAFFIC CONTROL PER THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, PART VI. CONSTRUCTION AND MAINTENANCE, AND SUBMIT A TRAFFIC PLAN TO THE CITY PRIOR TO BEGINNING WORK. FOR TEMPORARY TRAFFIC CONTROL, REFER TO ODOT TEMPORARY TRAFFIC CONTROL MANUAL.
- OREGON LAW REQUIRES THAT THE RULES ADOPTED BY OREGON UTILITY NOTIFICATION CENTER BE FOLLOWED. THOSE RULES ARE SET FORTH IN OAR 952-001-0090. COPIES OF THE RULES ARE AVAILABLE BY CALLING THE CENTER OR ACCESSING VIA INTERNET AT WWW.CALLBEFOREYOU.DIG.ORG, PORTLAND METRO AREA 503-248-6699.

**STREET NOTES:**

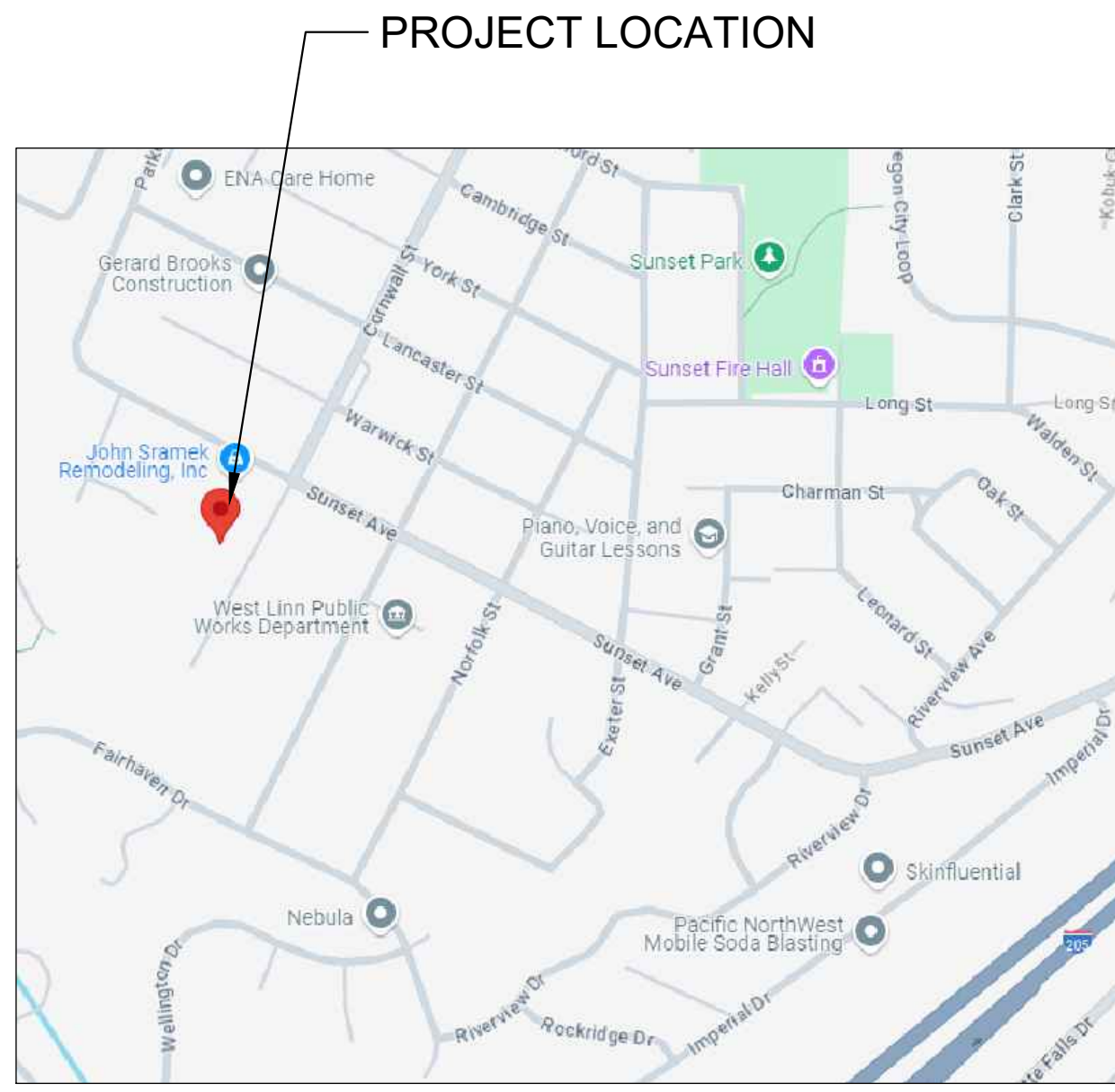
- ALL STREET SECTIONS TO BE CRUBBED AND GRADED TO A MINIMUM OF 8-INCHES BELOW THE SUBGRADE.
- THE STREET SUBGRADE SHALL CONFORM TO DIVISION 501 OF THE CITY OF WEST LINN STANDARD CONSTRUCTION SPECIFICATIONS. AREAS TO RECEIVE FILL ARE TO BE INSPECTED BY THE CITY OF WEST LINN PERSONNEL AND PROJECT GEOTECHNICAL PRIOR TO PLACEMENT OF FILL. THE PROJECT GEOTECHNICAL SHALL TEST FOR COMPACTION PER DIVISION 501.03.08 OF THE WEST LINN STANDARD CONSTRUCTION SPECIFICATIONS.
- AGGREGATE BASE ROCK SHALL CONFORM TO THE REQUIREMENTS OF DIVISION 205 OF THE WEST LINN STANDARD CONSTRUCTION SPECIFICATIONS. BASE COURSE IS 1 1/2" - 0" CRUSHED ROCK AND LEVELING COURSE IS 3/4" - 0" CRUSHED ROCK. THE CITY OF WEST LINN REQUIRES A PROOF ROLL WITH A LOADED 10-CUBIC YARD OR LARGEST USED (IE SUPER SOLO) DUMP TRUCK OF THE SUBGRADE PRIOR TO PLACEMENT OF THE BASE ROCK AND AT TOP OF ROCK JUST PRIOR TO PAVING.
- ASPHALT CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF WEST LINN STANDARD CONSTRUCTION SPECIFICATIONS, DIVISION 205. THE BASE LIFT SHALL BE CLASS "B" AC AND THE TOP LIFT SHALL BE CLASS "C" AC MEETING THE WEST LINN STANDARD CONSTRUCTION SPECIFICATIONS, DIVISION 505. THE TOP LIFT OF ASPHALT CONCRETE SHALL NOT BE PLACED PRIOR TO RECEIVING AUTHORIZATION FROM THE CITY OF WEST LINN.
- CURB AND GUTTER SHALL HAVE A COMPRESSIVE STRENGTH OF 3300 PSI, AND MAXIMUM AGGREGATE PER DIVISION 205 OF THE WEST LINN STANDARD CONSTRUCTION SPECIFICATIONS. A PROOF ROLL OF THE CURB LINES IS REQUIRED PRIOR TO CURB PLACEMENT. CONTRACTION JOINTS ARE TO BE INSTALLED AT 15-FOOT MAXIMUM. THE CONTRACTOR IS TO STAMP LOCATION OF SEWER AND WATER LINES CROSSING THE CURB LINE WITH AN "S" OR "W".

**STORM SEWER NOTES:**

- RIBBED PVC ASTM 794 OR DUCTILE IRON CONFORMING TO ASTM C 151, CLASS 52, WITH RUBBER JOINTS REQUIRED.
- GUTTER INLETS SHALL BE POURED IN PLACE CONCRETE WITH A MINIMUM COMPRESSIVE STRENGTH OF 3300 PSI. FRAMES SHALL BE FABRICATED OF STRUCTURAL STEEL, ASTM A-3733.
- MANHOLE BASES MAY BE POURED IN PLACE CONCRETE WITH A MINIMUM COMPRESSIVE STRENGTH OF 3300 PSI OR PRECAST. MANHOLE RISERS AND TOPS SHALL BE PRECAST WITH MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI. TOPS SHALL BE ECCENTRIC CONES EXCEPT WHERE THERE IS INSUFFICIENT HEADROOM REQUIRES A FLAT TOP. THE INTERIOR DIMENSIONS NOTED ON THE PLANS ARE MINIMUMS, AND SOME OR ALL OF THE MANHOLES MAY BE REQUIRED TO BE OVERSIZED. THE CONTRACTOR SHALL VERIFY WITH THE MANHOLE MANUFACTURER FOR THE ACTUAL SIZE OF MANHOLE NEEDED FOR TYPE AND SIZE OF PIPE TO BE USED. INVERTS SHALL BE CONSTRUCTED SO AS TO PROVIDE A SMOOTH FLOW AND PIPES SHALL BE CONNECTED TO THE MANHOLE BY MEANS OF A FLEXIBLE CONNECTION AND SHALL HAVE A SHEAR JOINT LOCATED 18-INCHES OUTSIDE THE MANHOLE.
- MANHOLES LOCATED IN EASEMENTS REQUIRE A TAMPER PROOF FRAME AND COVER AND SET 12-INCHES ABOVE FINISHED GRADE IN UNPAVED AREAS.
- GRANULAR BACKFILL (3/4" - 0") IS TO BE COMPACTED TO 95% OF MAXIMUM DRY DENSITY PER AASHTO T-180 TEST METHOD AND NATIVE MATERIAL SHALL BE COMPACTED TO 95% OF IN-PLACE DRY DENSITY OF SURROUNDING SOIL.
- A VIDEO INSPECTION IN ACCORDANCE WITH DIVISION 601.03.11 PER THE WEST LINN STANDARD CONSTRUCTION SPECIFICATIONS IS REQUIRED. ALL TESTS SHALL BE WITNESSED BY THE ENGINEER AND A REPRESENTATIVE OF THE CITY.
- A PLUMBING PERMIT IS REQUIRED FOR ALL STORM DRAINS BEYOND THE FIRST CLEANOUT.

**SANITARY SEWER NOTES:**

- PIPE SHALL BE PVC SEWER PIPE CONFORMING TO ASTM D-3034 SDR 35, MINIMUM STIFFNESS SHALL BE 46 PSI AND JOINT TYPE SHALL BE ELASTOMERIC GASKET CONFORMING TO ASTM D-3212.
- MANHOLE BASE MAY BE POURED IN PLACE CONCRETE WITH A MINIMUM COMPRESSIVE STRENGTH OF 3300 PSI OR PRECAST. MANHOLE RISERS AND TOPS SHALL BE PRECAST WITH MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI. TOPS SHALL BE ECCENTRIC CONES EXCEPT WHERE THERE IS INSUFFICIENT HEADROOM REQUIRES A FLAT TOP. INVERTS SHALL BE CONSTRUCTED TO PROVIDE A SMOOTH FLOW WITH THE CHANNEL BEING ABLE TO PAS A 6" X 36" CYLINDER INTO THE PIPES. PVC PIPE SHALL BE CONNECTED TO THE MANHOLE BY MEANS OF A FLEXIBLE CONNECTION AND SHALL HAVE A SHEAR JOINT LOCATED 18-INCHES OUTSIDE THE MANHOLE. CEMENT GROUT FOR CONNECTING PVC SEWER PIPE WILL NOT BE PERMITTED.
- ALL MANHOLES LOCATED IN EASEMENT AREAS WILL HAVE TAMPER PROOF FRAMES AND COVERS WITH THE COVER SET 12-INCHES ABOVE FINISH GRADE IN UNPAVED AREAS.
- GRANULAR BACKFILL (3/4" - 0") IS TO BE COMPACTED TO 95% OF MAXIMUM DRY DENSITY PER AASHTO T-180 TEST METHOD AND NATIVE MATERIAL SHALL BE COMPACTED TO 95% OF IN-PLACE DRY DENSITY OF SURROUNDING SOIL. EXCAVATION, BEDDING, AND BACKFILL SHALL BE IN CONFORMANCE WITH DIVISION 204 OF THE WEST LINN STANDARD CONSTRUCTION SPECIFICATIONS. BACKFILL WITHIN NEW AND EXISTING STREETS SHALL BE CLASS B.
- PVC SERVICE LATERALS SHALL BE 4-INCH CONFORMING TO THE SAME MATERIALS AS THE MAINLINE SEWERS. SERVICE LATERALS SHALL BE INSTALLED TO A POINT BEYOND THE UTILITY EASEMENT AS SHOWN ON THE PLAN. THE SERVICE LATERALS SHALL BE PLUGGED WITH THE LOCATION MARKED WITH A 2X4 PAINTED GREEN.
- SANITARY SEWER PIPE, INCLUDING SERVICE LATERALS, SHALL BE TESTED IN ACCORDANCE WITH WEST LINN STANDARD CONSTRUCTION SPECIFICATIONS DIVISION 301.03.09 AND MANHOLES SHALL BE VACUUM TESTED IN ACCORDANCE WITH DIVISION 302.03.07. TESTS SHALL BE WITNESSED BY THE ENGINEER AND THE CITY OF WEST LINN. CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE TESTING AND PROVIDING PASSING TESTS PRIOR TO CONNECTION TO THE EXISTING SYSTEM.
- A PLUMBING PERMIT FROM THE CITY IS REQUIRED FOR SANITARY SEWER LATERALS BEYOND THE FIRST CLEANOUT.
- ALL MATERIALS, INSTALLATION, TESTING, AND INSPECTIONS TO BE IN STRICT ACCORDANCE WITH THE CITY OF WEST LINN PUBLIC WORKS STANDARDS AND THE DEQ.



**PROPOSED LEGEND**

PROPOSED MAJOR CONTOUR	—————
PROPOSED MINOR CONTOUR	-----
PROPOSED SIGHT LINE	- - - - -
PROPOSED ROAD CENTER LINE	- · - · -
PROPOSED SAWCUT LINE	- · - · -
PROPOSED GRAVEL	▨ ▨ ▨ ▨ ▨
PROPOSED FILTER STRIP	▨ ▨ ▨ ▨ ▨
PROPOSED EARTHEN SHOULDER	▨ ▨ ▨ ▨ ▨
PROPOSED AC	▨ ▨ ▨ ▨ ▨
PROPOSED CULVERT	— · — · — · — · —
PROPOSED UNDERGROUND POWER	— · — · — · — · —

SHEET INDEX	
SHEET NUMBER	SHEET TITLE
1	COVER SHEET
2	EXISTING CONDITIONS & DEMO PLAN
3	SITE PLAN
4	GRADING STORM & ESC PLAN
5	PRELIMINARY UTILITY PLAN
6	PRELIMINARY PLAT
7	DETAILS
8	DETAILS

**PROJECT CIVIL ENGINEER**

KELLI GROVER, PE  
 FIRWOOD DESIGN GROUP, LLC  
 359 E. HISTORIC COLUMBIA RIVER HWY  
 TROUTDALE, OR 97060  
 PHONE (503) 668-3737

**PROJECT CONTRACTOR**

THE PORTLOCK COMPANY LLC  
 4194 CORNWALL ST  
 WEST LINN, OR  
 CCB#  
 PROJECT CONTACT - JJ PORTLOCK  
 JPORTLOCK@THEPORTLOCKCO.COM  
 PHONE (425) 829-1566

**PROJECT SURVEYOR**

CMT SURVEYING AND CONSULTING  
 20330 SE HIGHWAY 212  
 DAMASCUS, OR 97089  
 PHONE (503) 850-4672

**PROJECT OWNER**

CHRISTMAN, EARL & JENNIFER  
 14495 S BLUE VISTA DR.  
 OREGON CITY, 97045

**NATIVE DESCRIPTION:**

TAX LOT 21E36BA06500  
 N.E. ¼ N.W. ¼ SEC. 36 T.2S. R.1E. W.M.  
 CITY OF WEST LINN, CLACKAMAS COUNTY, OREGON

**WATER NOTES:**

- WATER MAINS SHALL BE DUCTILE IRON PIPE CONFORMING TO AWWA C151, CLASS 52. PIPE IS TO HAVE CEMENT MORTAR LINING AND BITUMINOUS SEAL COAT CONFORMING TO AWWA C104. JOINTS ARE TO BE PUSH-ON RUBBER GASKETED JOINTS UNLESS OTHERWISE NOTED ON THE PLANS. PIPE FITTINGS ARE TO BE THE SAME MATERIAL AND CLASS AS THE PIPE AND OF DOMESTIC ORIGIN.
- WATER MAINS TO HAVE A MINIMUM COVER OF 36-INCHES.
- ALL TEES, BENDS (HORIZONTAL AND VERTICAL), OR SIGNIFICANT CHANGES IN DIRECTION IN ALIGNMENT SHALL BE RESTRAINED WITH FIELD LOCK GASKETS AND MEGA LUG FITTINGS (SEE SPEC 4.0014).
- GRANULAR BACKFILL (3/4" - 0") IS TO BE COMPACTED TO 95% OF MAXIMUM DRY DENSITY PER AASHTO T-180 TEST METHOD AND NATIVE MATERIAL SHALL BE COMPACTED TO 95% OF IN-PLACE DRY DENSITY OF SURROUNDING SOIL. EXCAVATION, BEDDING, AND BACKFILL SHALL BE IN CONFORMANCE WITH DIVISION 204 OF THE WEST LINN STANDARD CONSTRUCTION SPECIFICATIONS. BACKFILL WITHIN NEW AND EXISTING STREETS SHALL BE CLASS B.
- SERVICES SHALL BE 1-INCH TYPE K COPPER. CORPORATION STOPS SHALL BE MUELLER B-25008 OR APPROVED EQUAL. ANGLE STOPS SHALL BE MUELLER B-24258 OR APPROVED EQUAL. METER BOXES SHALL BE DFW PLASTICS MODEL DFW846WBC OR APPROVED EQUAL. METER BOXES ARE TO BE INSTALLED 2 1/2" FROM THE CURB IN PLANTER STRIPS OR BEHIND SIDEWALK. METER BOX LOCATION TO BE DETERMINED IN THE FIELD.
- ALL WATER LINES SHALL BE PRESSURE TESTED AND BIOLOGICALLY TESTED BEFORE CONNECTION TO THE CITY WATER SYSTEM. CHLORINATION SHALL BE PER DIVISION 403.13 OF THE CITY OF WEST LINN CONSTRUCTION SPECIFICATIONS. PRESSURE TESTING SHALL BE IN ACCORDANCE WITH THE CITY OF WEST LINN STANDARD CONSTRUCTION SPECIFICATIONS, DIVISION 403.14. TEST PRESSURE WILL BE 180 PSI OR 1.5 TIMES THE NORMAL WORKING PRESSURE, WHICHEVER IS HIGHER.
- CONNECTION OF THE NEW PIPE SYSTEMS WILL NOT BE MADE UNTIL ALL TESTS ARE MADE AND ACCEPTED BY THE CITY OF WEST LINN.
- A PLUMBING PERMIT IS REQUIRED FOR EXTENSIONS OF WATERLINES BEYOND THE METER.
- ALL MATERIALS, INSTALLATION, AND TESTS TO BE IN STRICT ACCORDANCE WITH THE CITY OF WEST LINN PUBLIC WORKS STANDARD CONSTRUCTION SPECIFICATIONS DIVISION 204, AND THE OREGON STATE HEALTH DIVISION ADMINISTRATION RULES, CHAPTER 333.
- ALL SURPLUS APPURTENANCES SHALL BE RETURNED TO THE CITY OF WEST LINN WATER DEPARTMENT.
- SERVICES TO BE INSTALLED BY WEST LINN STAFF. METERS TO BE PLACED IN PLANTER STRIP OR BACK OF SIDEWALK (NOT IN CONCRETE).

**PROJECT DATUM**

THE BASIS OF BEARINGS WAS PER SURVEY NO. 2014-039, CLACKAMAS COUNTY RECORDS.

**NOTICE TO EXCAVATORS:**

ATTENTION: OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0001 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES BY CALLING THE CENTER. (NOTE: THE TELEPHONE NUMBER FOR THE OREGON UTILITY NOTIFICATION CENTER IS (503)-232-1987).

**POTENTIAL UNDERGROUND FACILITY OWNERS**



CALL THE OREGON ONE-CALL CENTER  
 1-800-332-2344 OR 811

**EMERGENCY TELEPHONE NUMBERS**

PGE	503-464-7777
NW NATURAL GAS	503-220-2415
CLACKAMAS COUNTY	503-742-4400
COMCAST CABLE	503-617-1212
VERIZON	800-837-4966



EXPIRES: 06/30/25  
 SIGNATURE DATE:

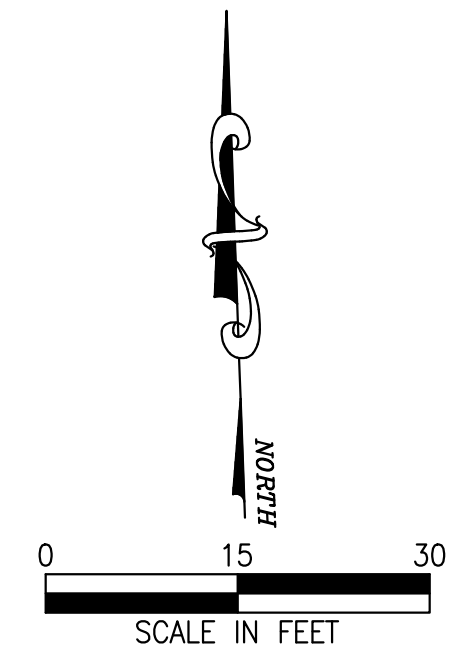
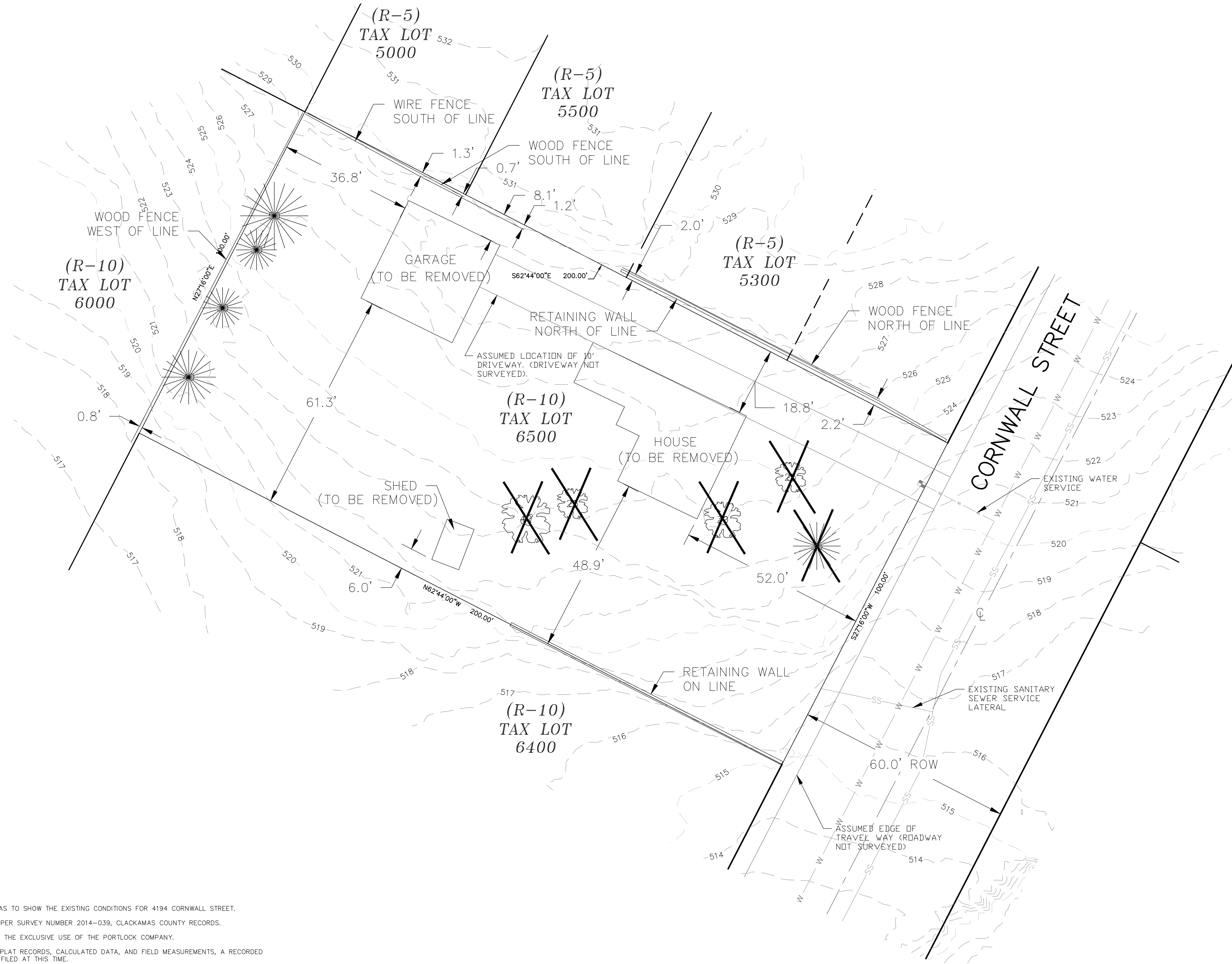
DRAWN: JRF	DESIGNED: CMN	CHECKED: KAG	
SCALE: AS SHOWN	SEPTEMBER 2024		
PROJECT NO. E24-030			
DATE:	NO.	REVISION	

**FIRWOOD DESIGN GROUP**  
 Reliable Engineering Solutions  
 359 EAST HISTORIC COLUMBIA RIVER HIGHWAY  
 TROUTDALE, OREGON 97060  
 (503) 668-3737

**TPC PROPERTY LLC**  
 PO BOX 521  
 West Linn, OR 97068

**COVER SHEET**  
 DEVELOPMENT ENGINEERING PLANS





- LEGEND**
- EXISTING DECIDUOUS TREE W/ TRUNK DIAMETER (INCHES)(CL=CLUSTER)
  - EXISTING CONIFEROUS TREE W/ TRUNK DIAMETER (INCHES)(CL=CLUSTER)
  - EXISTING POWER POLE
  - EXISTING FENCE
  - EXISTING DECIDUOUS TREE TO BE REMOVED
  - EXISTING CONIFEROUS TREE TO BE REMOVED
  - CENTER OF ROW
  - MAJOR CONTOUR (EX. 5')
  - MINOR CONTOUR (EX. 1')

REGISTERED  
PROFESSIONAL  
LAND SURVEYOR

OREGON  
SEPTEMBER 11, 2018  
DAVID ROEGER  
86811

EXPIRES DECEMBER 31, 2024

**NOTES**

1. THE PURPOSE OF THIS MAP WAS TO SHOW THE EXISTING CONDITIONS FOR 4194 CORNWALL STREET.
2. THE BASIS OF BEARINGS WAS PER SURVEY NUMBER 2014-039, CLACKAMAS COUNTY RECORDS.
3. THIS MAP WAS PREPARED FOR THE EXCLUSIVE USE OF THE PORTLOCK COMPANY.
4. THIS MAP WAS PREPARED BY PLAT RECORDS, CALCULATED DATA, AND FIELD MEASUREMENTS, A RECORDED BOUNDARY SURVEY WILL NOT BE FILED AT THIS TIME.

DATE:	NO.	REVISION	DRAWN: JRF	DESIGNED: CMN	CHECKED: KAG
			SCALE: AS SHOWN	SEPTEMBER 2024	
			PROJECT NO. E24-030		

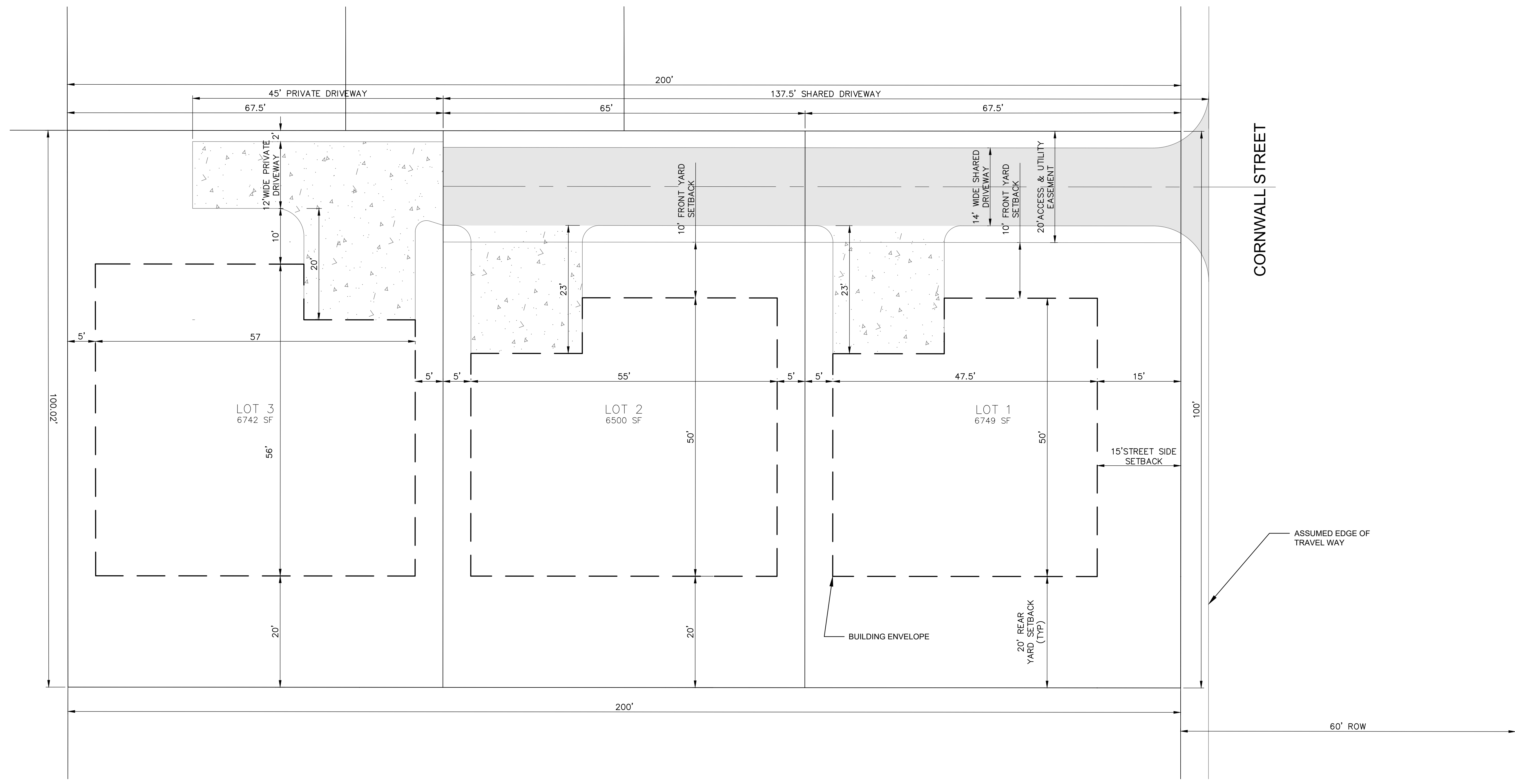
**FIRWOOD** DESIGN GROUP  
Reliable Engineering Solutions  
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(503) 668-3737

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PO BOX 521  
West Linn, OR 97068

EXISTING CONDITIONS & DEMO PLAN  
DEVELOPMENT ENGINEERING PLANS

# CORNWALL - 3 LOT PARTITION MIDDLE HOUSING DEVELOPMENT ENGINEERING PLANS

LOCATED AT 4194 CORNWALL STREET, WEST LINN, OREGON 97068  
TAX LOT: 21E36BA LOT NO.: 6500 ZONED R-10

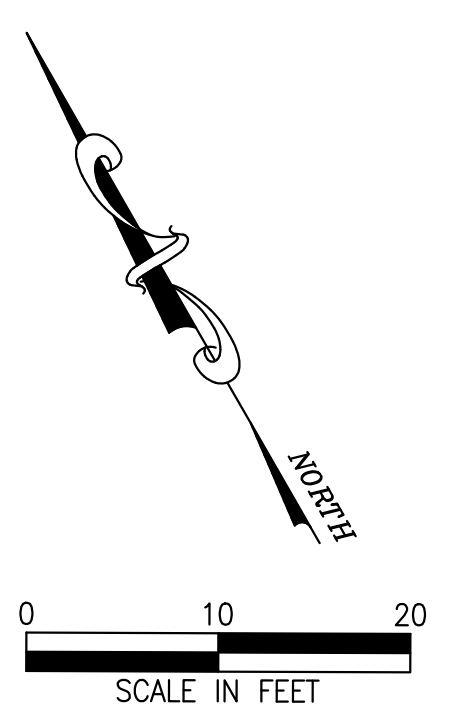


**SITE DATA**

SITE AREA : 0.46 AC  
CURRENT ZONING : R-10  
TAX LOT: 6500  
PROPOSED NO OF LOTS: 3

**SETBACKS:**

FRONT SETBACK: 20'  
STREET SETBACK: 15'  
INTERIOR SIDE SETBACK: 5'  
REAR SETBACK : 20'



DATE:	NO.	REVISION

DRAWN: JRF	DESIGNED: CMN	CHECKED: KAG
SCALE: AS SHOWN	SEPTEMBER 2024	
PROJECT NO. E24-030		


**FIRWOOD** DESIGN GROUP  
 Reliable Engineering Solutions

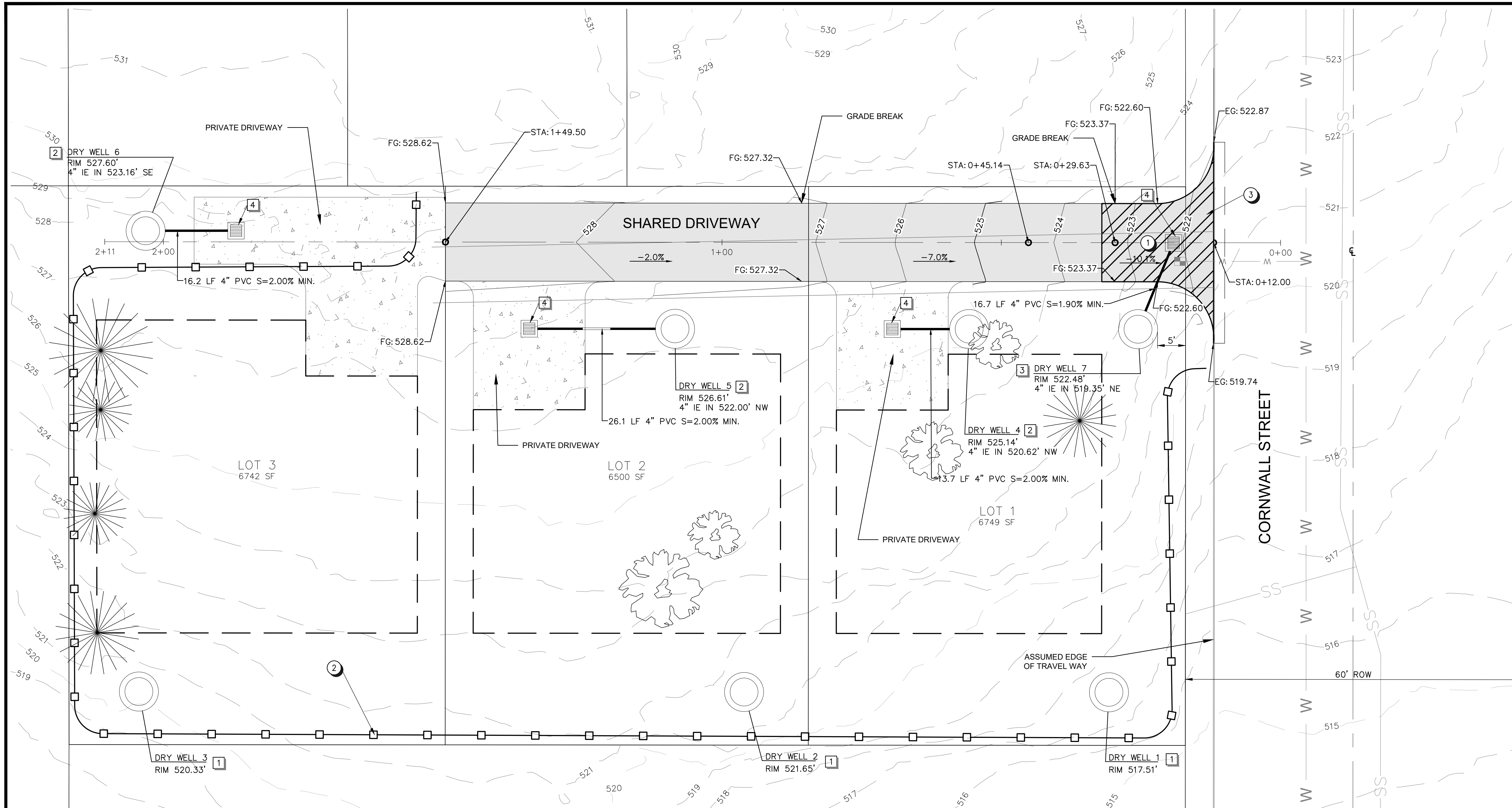
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 (503) 668-3737

**TPC PROPERTY LLC**  
 PO BOX 521  
 West Linn, OR 97068

**SITE PLAN**  
**DEVELOPMENT ENGINEERING PLANS**

3  
8





- GENERAL NOTES**
1. FILL PLACEMENT AND COMPACTION REQUIREMENTS SHALL BE PER THE GEOTECHNICAL ENGINEER'S RECOMMENDATIONS.
  2. STRIPPING DEPTH SHALL BE PER THE GEOTECHNICAL ENGINEER'S RECOMMENDATIONS.
  3. STRIPPINGS SHALL BE STOCKPILED ON SITE AND DISTRIBUTED OVER GRADED AREAS NOT RECEIVING A HARDCAPE SURFACE (MAXIMUM 1' DEPTH)
  4. THE SCOPE OF THE GRADING PERMIT IS INTENDED TO COVER THE DRIVEWAY ONLY

- GRADING LEGEND**
- 2.0% SLOPE ARROW (PR)
  - EG EXISTING GRADE
  - FG FINISH GRADE
  - 100 MAJOR CONTOUR (PR, 5')
  - 101 MINOR CONTOUR (PR, 1')
  - 100 MAJOR CONTOUR (EX, 5')
  - 105 MINOR CONTOUR (EX, 1')

NOTE: TOPOGRAPHY DATA SOURCED FROM DOGAMI LIDAR WEB SERVICE. NO ONSITE SURVEY WAS CONDUCTED FOR THIS DESIGN. ACTUAL ELEVATIONS MAY DIFFER.

- STORMWATER NOTES**
- 1 PROPOSED DRYWELL TO SERVE ROOF DRAINS PER DETAIL ON SHEET 7.
  - 2 PROPOSED DRYWELL TO SERVE PRIVATE DRIVEWAY. SEE DETAIL ON SHEET 7.
  - 3 PROPOSED DRYWELL TO SERVE SHARED DRIVEWAY. SEE DETAIL ON SHEET 7.
  - 4 PROPOSED LYNCH CATCH BASIN PER DETAIL ON SHEET 8.

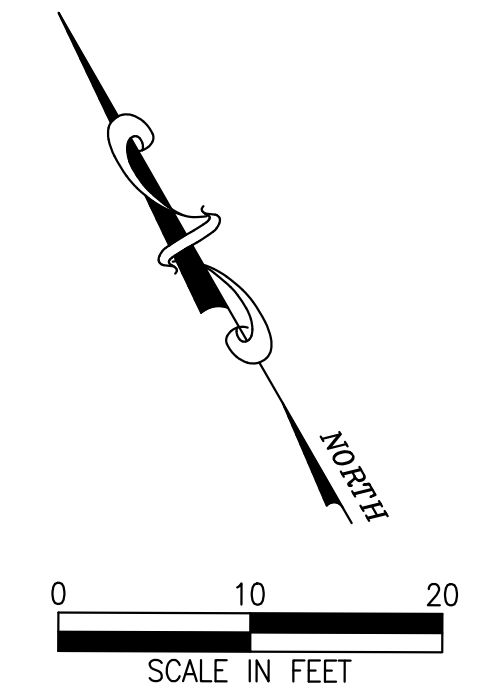
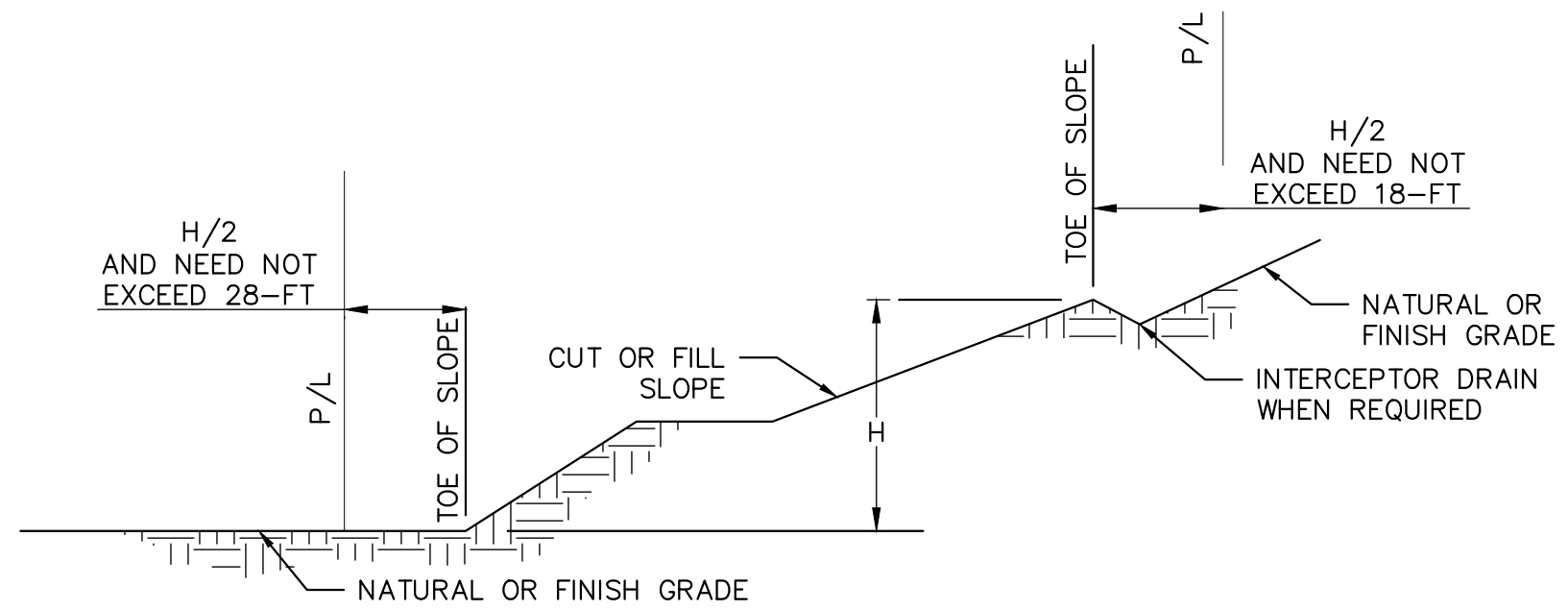
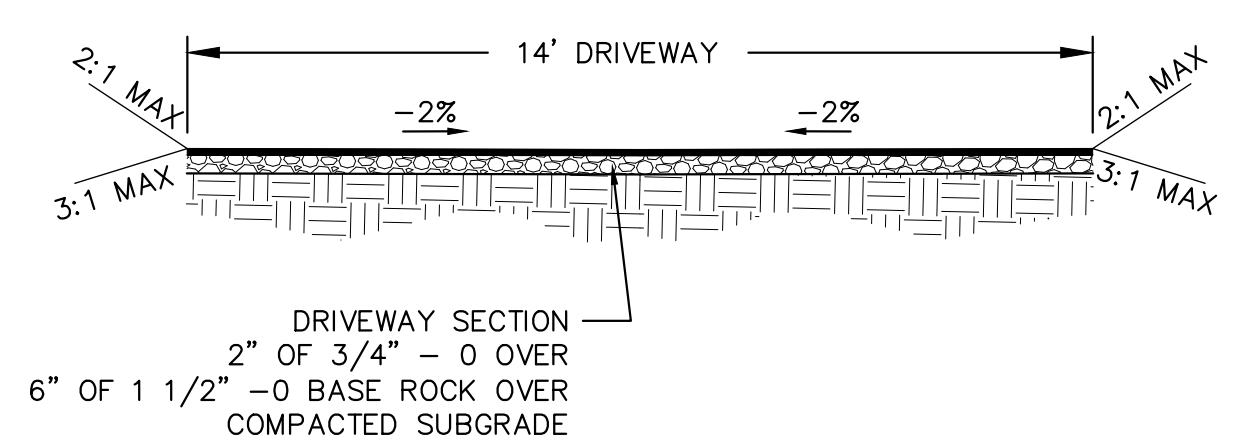
**ESTIMATED GRADING QUANTITIES**

NOTE: 2:1 MAX CUT SLOPE AND 3:1 MAX FILL SLOPE TO EXIST GROUND. CUT/FILL QUANTITIES REPRESENT GRADING NECESSARY FOR NEW SHARED DRIVEWAY.

CUT: 3.97 CY (DOES NOT ACCOUNT FOR ADDITIONAL TRENCH SPOILS)  
 FILL: 28.29 CY  
 NET: 24.32 (FILL)

TOTAL AREA OF DISTURBANCE = 3,020 SF (0.06 ACRES)

NOTE: ALL ON-SITE STORMWATER LINES TO BE INSTALLED PER THE OREGON SPECIALTY PLUMBING CODE AND INSTALLED BY A LICENSED PLUMBING PROFESSIONAL.



**GRADING AND EROSION CONTROL KEY NOTES**

- 1 PROPOSED 14' WIDE A.C. DRIVEWAY APPROACH FROM CORNWALL STREET PER DETAIL ON SHEET 7.
- 2 PROPOSED SEDIMENT FENCE. INSTALL ON THE DOWNHILL SIDE OF PROPOSED GRADING ACTIVITIES. INSPECTION IS REQUIRED AFTER SEDIMENT FENCE IS INSTALLED. SEE ESC NOTES AND DETAIL ON SHEET 7.
- 3 INSTALL CONSTRUCTION ENTRANCE PER DETAIL ON SHEET 7.



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			SCALE: AS SHOWN	SEPTEMBER 2024	
			PROJECT NO. E24-030		

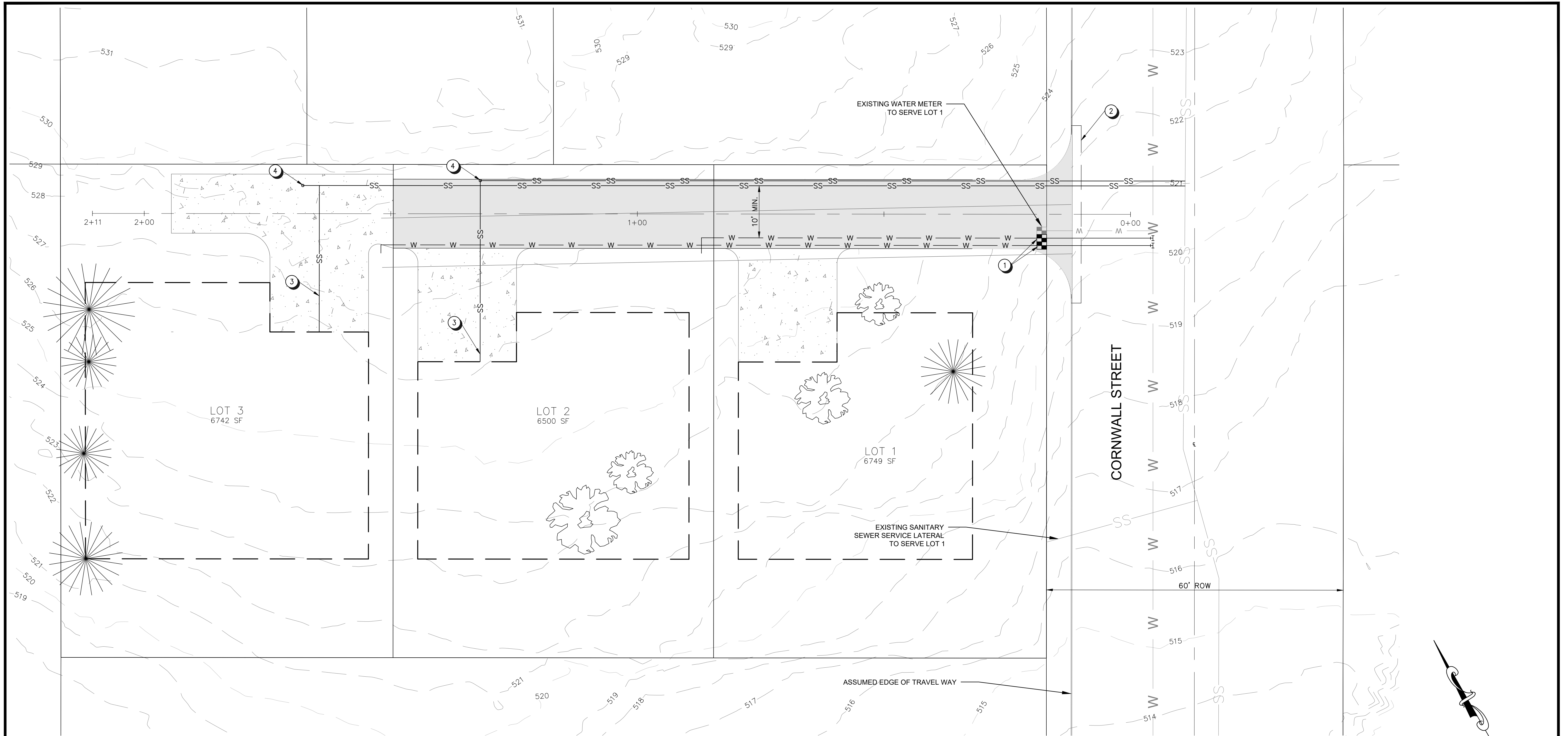
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 Reliable Engineering Solutions

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 PO BOX 521  
 West Linn, OR 97068

**GRADING STORM & ESC PLAN**  
 DEVELOPMENT ENGINEERING PLANS





**GENERAL NOTES**

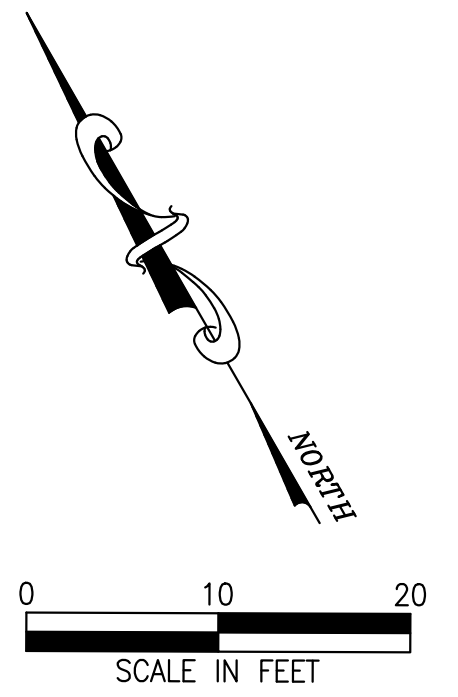
1. LOCATION OF WATER & SEWER MAINS WAS OBTAINED FROM CITY OF WEST LINN GIS. NO ONSITE SURVEY WAS CONDUCTED TO LOCATE UTILITIES. CONTRACTOR TO VERIFY LOCATION OF EXISTING UTILITIES.
2. SANITARY SEWER SERVICE LATERALS SHALL BE 4-INCH AND CONFORM TO THE SAME MATERIALS AS THE MAINLINE SEWERS.

**KEY NOTES**

- 1 PROPOSED 1-INCH WATER SERVICE PER DETAIL ON SHEET 8.
- 2 PROPOSED SAWCUT LINE MIN. 6" FROM EDGE OF EXISTING A.C. SAWCUT LINE TO BE APPROVED PRIOR TO BEGINNING WORK
- 3 PROPOSED 4-INCH SANITARY SEWER SERVICE LATERAL.
- 4 PROPOSED SANITARY SEWER CLEANOUT PER DETAIL ON SHEET 8.

**LEGEND**

- WATER METER
- CLEANOUT
- PROPOSED WATER LINE
- EXISTING WATER LINE
- PROPOSED SANITARY SEWER
- EXISTING SANITARY SEWER



DATE:	NO.	REVISION

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SCALE: AS SHOWN	SEPTEMBER 2024	
PROJECT NO. E24-030		

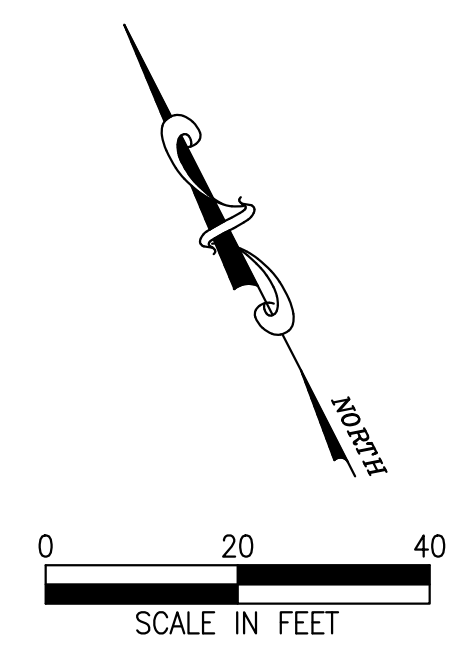
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**TPC PROPERTY LLC**  
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 West Linn, OR 97068

**PRELIMINARY UTILITY PLAN**  
**DEVELOPMENT ENGINEERING PLANS**

**5**  
**8**

EXPIRES: 06/30/25  
SIGNATURE DATE:



EXPIRES: 06/30/25  
SIGNATURE DATE:

DATE:	NO.	REVISION	DRAWN: JRF	DESIGNED: CMN	CHECKED: KAG
			SCALE: AS SHOWN	SEPTEMBER 2024	
			PROJECT NO. E24-030		

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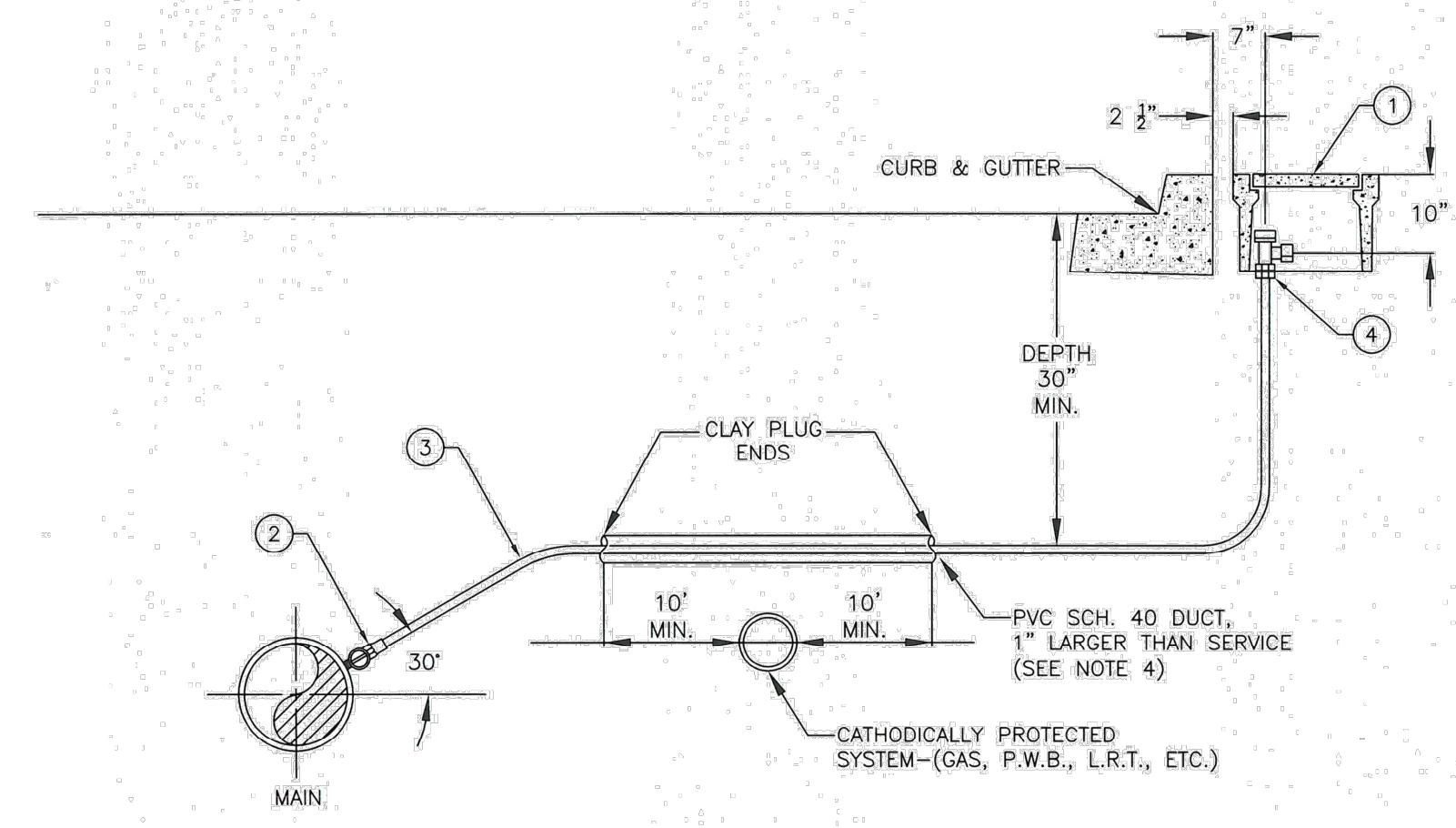
**PRELIMINARY PLAT**  
**DEVELOPMENT ENGINEERING PLANS**

**6**  
**8**









**MATERIALS:**

- METER BOX: DFW PLASTICS MODEL DFW486WBC4, OR APPROVED EQUAL
- CORPORATION STOP: MUELLER 1" B-25008 300 PSI BALL TYPE CORP. OR APPROVED EQUAL
- COPPER TUBING: 1" SEAMLESS SOFT TEMPER, TYPE "K", COMPLYING WITH ASTM B-88
- ANGLE STOP: MUELLER 1" B-24258 FULL PORT 300 PSI BALL VALVE NO. LEAD ANGLE STOP, OR APPROVED EQUAL

**NOTE:**

- MACHINE DRILL OR TAP, HAND DRILLING IS NOT ALLOWED.
- BACKFILL WITHIN PIPE AND STRUCTURE ZONE WITH 3/4" - 0" AGGREGATE BASE. COMPACT TO 95% MAX DENSITY AS DETERMINED BY AASHTO T-180.
- WHEN AN ACTIVE CATHODIC PROTECTED SYSTEM IS ENCOUNTERED, SCH. 40 PVC SHALL BE INSTALLED AS SHOWN WITH CLAY PLUG.
- METER BOX SHALL BE CENTERED OVER THE COMPLETED METER ASSEMBLY.
- SERVICE TAPS INTO MAIN SHOULD HAVE 18" MIN. SEPARATION ON CENTER.
- ANGLE METER STOPS SHALL BE 18" FROM ALL PROPERTY LINES AND NOT WITHIN A DRIVEWAY APPROACH.
- METERS SHALL BE LOCATED BEHIND SIDEWALKS OR PLACED IN PLANTER STRIPS. BOXES THAT HAVE TO BE PLACED IN SIDEWALKS NEED TO BE APPROVED BY THE CITY ENGINEER.

Standard Drawing No. WL-RD274  
 Effective Date: 08/07/19  
 City Engineer: [Signature]  
 Title: 1-INCH WATER SERVICE  
 City of West Linn  
 Public Works Department - Standard Drawings  
 1000 N. Main Street, West Linn, OR 97146  
 Phone: 503-732-5500  
 Fax: 503-732-5500  
 Note: The selection and use of this drawing is subject to the terms and conditions of the contract and the specifications of the project. It is the responsibility of the user to ensure that the drawing is used in accordance with the intended purpose and that all necessary permits and approvals are obtained before construction begins.

**GRATING**  
 BIKE PROOF, HEAVY DUTY TRAFFIC GRATE SUPPORTS AASHTO H20 LOADS

**NOTES:**  
 BOX FABRICATED FROM 10 GA. MATERIAL

**PLAN VIEW**  
 29" SQUARE  
 24" SQUARE  
 OUTLET

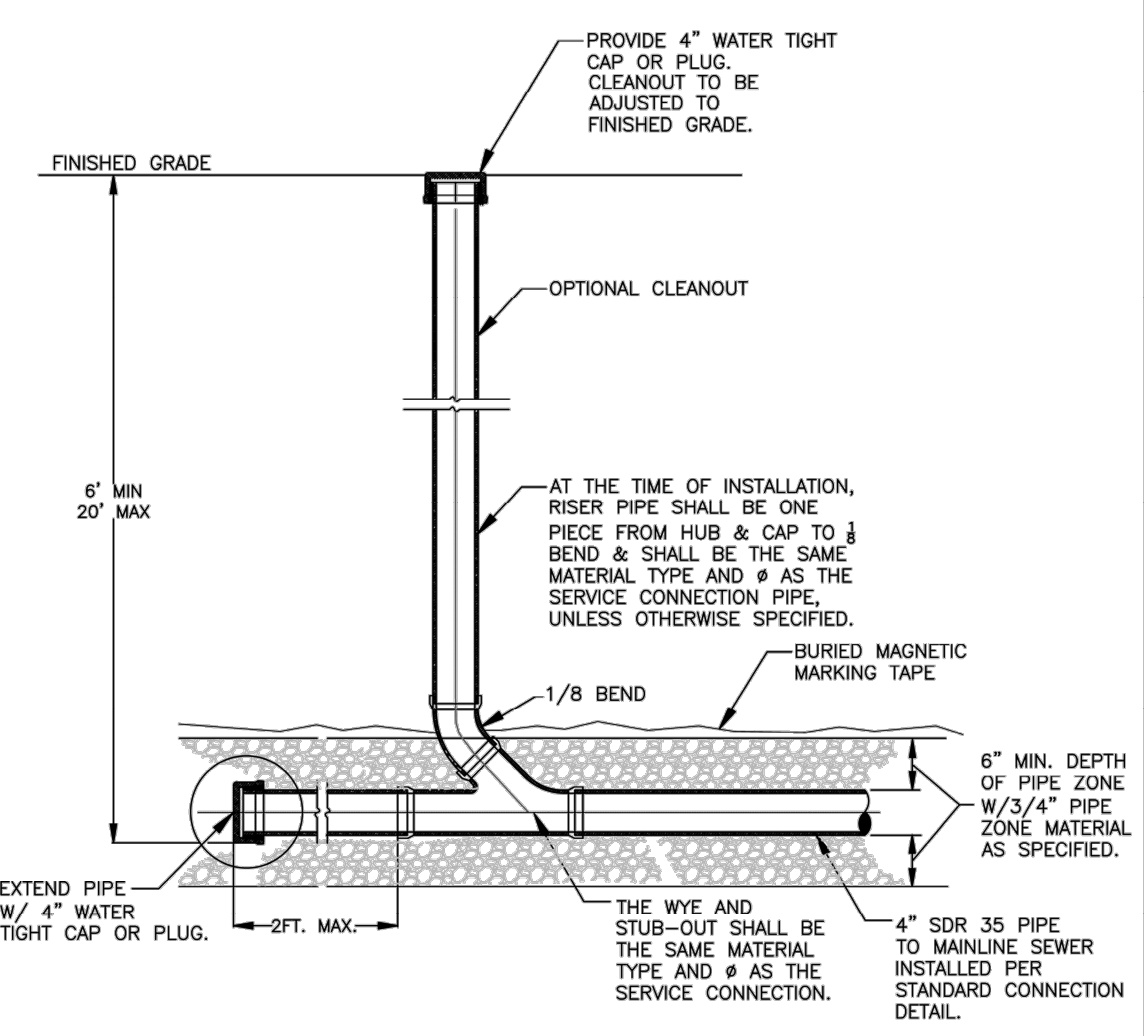
**SIDE VIEW**  
 29" SQUARE  
 30"  
 24" SQUARE  
 22" MIN.  
 6"  
 OUTLET  
 SEDIMENT TRAP W/ HINGED LID

**ISOMETRIC SECTION**  
 L2x2x1/8 FRAME

STATE APPROVED - ASPHALT DIPPED

24" SQUARE - 4"Ø OR 6"Ø OUTLET	DWG #
STORM WATER CATCH BASIN	<b>S1</b>
MODEL: GCB10-30HB-4&6	SCALE: NONE
DATE: 11/19/2020	

**Gibson Steel Basins, Inc.**  
 1040 Arrowsmith St. Eugene, Or. 97402  
 (541) 484-7200 or (800) 574-8096  
 Visit us at: www.gibsonsteelbasins.com  
 Email us at: sales@gibsonsteelbasins.com  
 EST. 1996 CCB 150089



- ALL PIPE AND FITTINGS SHALL BE ASTM D-3034, SDR 35.
- ON LOTS WITH EXISTING HOMES, CONTRACTOR SHALL INSTALL APPROVED HUBS AND CAPS FLUSH WITH FINISHED GRADE.
- CLEANOUTS SHALL NOT BE CONSTRUCTED SO THE CLEANOUTS CAP WILL END UP IN SIDEWALKS, STEPS OR DRIVEWAYS.

**STANDARD CLEANOUT**



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			SCALE: AS SHOWN	SEPTEMBER 2024	
			PROJECT NO. E24-030		

**FIRWOOD** DESIGN GROUP  
 Reliable Engineering Solutions  
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 TROUTDALE, OREGON 97060  
 (503) 668-3737

**TPC PROPERTY LLC**  
 PO BOX 521  
 West Linn, OR 97068

**DETAILS**  
 DEVELOPMENT ENGINEERING PLANS

8/8

---

Preliminary Stormwater Report  
**Cornwall 3 Lot Middle Housing**  
City of West Linn, OR

*September 2024*

FDG Project No. E24-030



Prepared By:



**FIRWOOD** DESIGN GROUP

359 E. Historic Columbia River Highway Troutdale, OR 97060 503.668.3737 firwooddesign.com

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Table of Contents

I	EXISTING CONDITIONS .....	1
II	PROPOSED IMPROVEMENTS AND DESIGN PARAMETERS .....	2
III	FLOW CONTROL ANALYSIS.....	2
V	WATER QUALITY.....	3
VII	DOWN STREAM ANALYSIS.....	3
VIII	CONCLUSION .....	4

APPENDICES:

- Appendix A: Stormwater and Grading Plan
- Appendix B: HydroCAD Output
- Appendix C: NRCS Soil Report
- Appendix D: Infiltration Test Report



I      **EXISTING CONDITIONS**

---

The project site is located at 4194 Cornwall Street, West Linn, OR (Parcel #21E36BA 065000), and is zoned R10. The current 0.49 acres lot features an existing residential structure and a detached garage. The site is relatively flat, with slopes less than 5%, gently sloping towards the southern side. The remainder of the lot is landscaped with mature trees and a retaining landscape wall along the southern property line. The site's soils are classified as "Saum Silt Loam" and fall within hydrological soil group C, with slopes ranging from 3 to 8 percent. See Figure 1 for details.



*Figure 1: 4194 Cornwall Street, West Linn, OR 97068*

## II PROPOSED IMPROVEMENTS AND DESIGN PARAMETERS

---

The client proposes to partition the parcel into three parcels for single-family use. A new 14-foot wide, 130-foot long driveway is proposed to serve the first two lots, continuing as a 12-foot wide private driveway serving the third lot. The project will include the construction of utility services (water, sewer) to connect to existing mains on Cornwall Street. Stormwater improvements will include Lynch Style Catch Basin to capture driveway surface runoff for treatment, and drywells to fully infiltrate the Stormwater runoff from the catch basins and roof runoff directly without treatment; individual drywells are proposed for each private driveway and each private roof area runoff. See Stormwater and Grading Plan.

The design parameters applied are consistent with the City of West Linn Public Works Standards Section 2 and the current edition of the City of Portland Stormwater Management Manual.

Rapid Soil Solutions conducted a geotechnical infiltration test meeting the City standard and determined that the site soils are conducive to on-site infiltration. Below is a summary of the findings. A copy of the full report is included in the appendices.

Location	Depth (ft)	Rate (in/hr.)
HA#1	3.5	6.375
HA#1	3.5	125

The design storms, as required by the City of West Linn and City of Portland design and construction standards, are as follows:

Recurrence Interval (years)	Total Precipitation Depth (In)
WQ	1.2
2	2.4
10	3.4
25	3.8

## III FLOW CONTROL ANALYSIS

---

The Santa Barbara Urban Hydrography method (via HydroCAD) was used to create the basin hydrographs and estimate the peak flows for the 10-year design storms. For detailed data and calculations, please see the Hydrocad Output.

A curve number of 98 was assigned to all impervious surfaces, and a minimum time of concentration of 6 minutes was applied to all drainage basin areas.

The drywells were sized using the 10-year design storm per City standards.



The average infiltration rate derived from these tests is 3.812 inches per hour. For our stormwater design, we applied a safety factor of 2, resulting in an adjusted infiltration rate of 1.906 inches per hour. This rate was used in our stormwater calculations for the proposed drywells and planters. For the complete geotechnical report, please see Infiltration Test report attached.

The drywells were modeled assuming a 12-inch rock band surrounding the drywell with a 40% void ratio.

These basin areas and planter designs are discussed further in the next section. The following table summarizes the drywell design for the 10 year storm events.

Drywell	ID	Basin Area (sf)	Design Depth (ft)	Post Construction Storm Event	Peak Inflow (cfs)	Peak Elevation	Peak Storage (cf)
1	Shared Driveway	2,245	10'	10-year	0.04	12.17'	184
2	Lot 1 Private Driveway	930	5.5'	10-year	0.02	5.32'	64
3	Lot 1 Roof Area	2,175	9.5'	10-year	0.04	9.44'	178
4	Lot 2 Private Driveway	930	5.5'	10-year	0.02	5.32'	64
5	Lot 2 Roof Area	2,550	11.5'	10-year	0.05	11.26'	212
6	Lot 3 Private Driveway	960	6'	10-year	0.02	5.52'	67
7	Lot 3 Roof Area	3,016	14'	10-year	0.05	13.52'	255

The results of the analysis for full infiltration of the 10-year storm illustrate that a 36 inch and 48 -inch diameter with the specified design depth will be adequate, as the peak elevation does not exceed these depths during the maximum storm event.

## **V WATER QUALITY**

---

Water quality treatment for all pollution generating surfaces is provided by Lynch style Catch basins as approved per Table 3-7 in the City of Portland Stormwater Management manual. Roof runoff is not required to be treated and will directly discharge into the proposed drywell systems.

## **VII DOWN STREAM ANALYSIS**

---

No downstream analysis is required as the site is 100% infiltrated on site per city of Portland Stormwater standards.

## VIII CONCLUSION

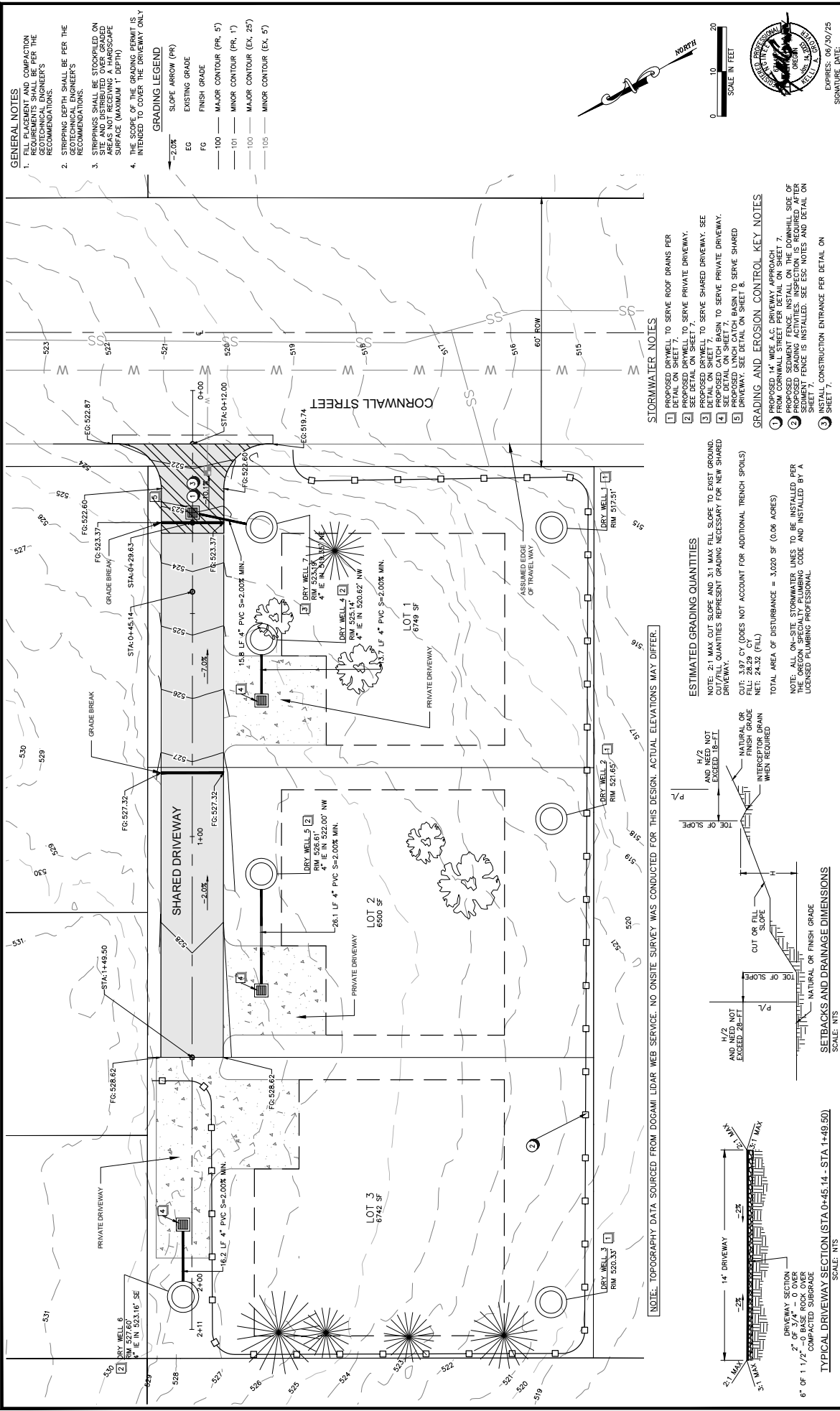
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The project site demonstrates favorable infiltration characteristics, enabling effective on-site stormwater management. The proposed stormwater management plan for the new improvements is summarized as follows: Stormwater from the proposed shared and private driveway areas will be treated by the proposed Lynch style catch basins.

Stormwater will be managed on-site through 100% infiltration for the 10-year design storm. The proposed stormwater management meets the City of West Linn Public Works standards.

## APPENDIX A

---



- GENERAL NOTES**
1. ALL MATERIALS AND CONSTRUCTION REQUIREMENTS SHALL BE PER THE GEOLOGICAL ENGINEER'S RECOMMENDATIONS.
  2. STRIPPING DEPTH SHALL BE PER THE GEOTECHNICAL ENGINEER'S RECOMMENDATIONS.
  3. STREPPINGS SHALL BE STOCKPILED ON SITE AND DISTRIBUTED OVER GRADED AREAS NOT RECEIVING A HARDCAPE SURFACE (MAXIMUM 1' DEPTH).
  4. THE SCOPE OF THE GRADING PERMIT IS INTENDED TO COVER THE DRIVEWAY ONLY.

- GRADING LEGEND**
- 2.0% SLOPE (ARROW (PR))
  - EG EXISTING GRADE
  - FG FINISH GRADE
  - 100 MAJOR CONTOUR (PR. 5')
  - 101 MINOR CONTOUR (PR. 1')
  - 100 MAJOR CONTOUR (EX. 25')
  - 105 MINOR CONTOUR (EX. 5')



- STORMWATER NOTES**
1. PROPOSED DRYWELL TO SERVE ROOF DRAINS PER DETAIL ON SHEET 7.
  2. PROPOSED DRYWELL TO SERVE PRIVATE DRIVEWAY. SEE DETAIL ON SHEET 7.
  3. PROPOSED DRYWELL TO SERVE SHARED DRIVEWAY. SEE DETAIL ON SHEET 7.
  4. PROPOSED CATCH BASIN TO SERVE PRIVATE DRIVEWAY. SEE DETAIL ON SHEET 7.
  5. PROPOSED CATCH BASIN TO SERVE SHARED DRIVEWAY. SEE DETAIL ON SHEET 8.
- GRADING AND EROSION CONTROL KEY NOTES**
1. PROPOSED 14" WIDE A.C. DRIVEWAY APPROACH PER DETAIL ON SHEET 7.
  2. PROPOSED SEAMANT FENCE TO BE INSTALLED ON THE DOWNHILL SIDE OF DRIVEWAY. SEE DETAIL ON SHEET 7.
  3. PROPOSED GRADING ACTIVITIES IS REQUIRED AFTER SEAMANT FENCE IS INSTALLED. SEE ESC NOTES AND DETAIL ON SHEET 7.
  4. INSTALL CONSTRUCTION ENTRANCE PER DETAIL ON SHEET 7.

**ESTIMATED GRADING QUANTITIES**

NOTE: 2:1 MAX CUT SLOPE AND 3:1 MAX FILL SLOPE TO EXIST GROUND.

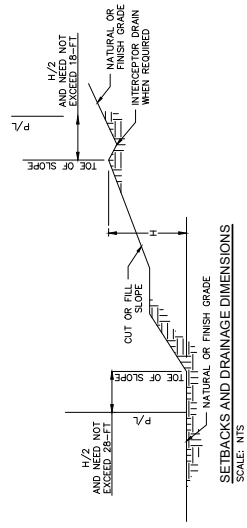
CUT/FILL QUANTITIES REPRESENT GRADING NECESSARY FOR NEW SHARED DRIVEWAY.

CUT: 3.97 CY (DOES NOT ACCOUNT FOR ADDITIONAL TRENCH SPOILS)

FILL: 28.29 CY

TOTAL AREA OF DISTURBANCE = 3,020 SF (0.06 ACRES)

NOTE: ALL ON-SITE STORMWATER LINES TO BE INSTALLED PER REGIONAL SPECIFICATIONS AND AS INSTALLED BY A LICENSED PLUMBING PROFESSIONAL.



NOTE: TOPOGRAPHY DATA SOURCED FROM DOGAMI LIDAR. WEB SERVICE. NO ONSITE SURVEY WAS CONDUCTED FOR THIS DESIGN. ACTUAL ELEVATIONS MAY DIFFER.

**TYPICAL DRIVEWAY SECTION (STA 0+45.14 - STA 1+49.50)**

SCALE: NTS

DRIVEWAY SECTION

- 2" OF 3/4" - 0 OVER
- 6" OF 1 1/2" COMPACTED SUBGRADE

<p>DATE: NO. REVISION</p>		<p>PROJECT NO. E24-030</p>		<p>DESIGNED: CMJ   CHECKED: MAG</p>		<p>SEPTEMBER 2024</p>	
<p>SCALE: AS SHOWN</p>		<p>391 EAST HAYDEN COLUMBIA RIVER HIGHWAY TILLAMOOK, OREGON 97140 (503) 968-2977</p>		<p><b>FIRWOOD</b> DESIGN GROUP Reliable Engineering Solutions</p>		<p>TPC PROPERTY LLC PO BOX 521 West Linn, OR 97068</p>	
<p>GRADING STORM &amp; ESC PLAN</p>		<p>DEVELOPMENT ENGINEERING PLANS</p>		<p>8</p>		<p>EXPIRES: 06/30/25</p>	

## APPENDIX B

---



Shared Driveway



Drywell SD



Private Driveway Lot 1



Drywell PV 1



Lot 1 Roof Area



Drywell RA 1



Private Driveway Lot 2



Drywell PV 2



Lot 2 Roof Area



Drywell RA 2



Private Driveway Lot 3



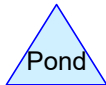
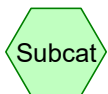
Drywell PV 3



Lot 3 Roof Area



Drywell RA 3



**Routing Diagram for Hydrocad Report**

Prepared by Firwood Design Group, Printed 9/15/2024

HydroCAD® 10.10-7a s/n 04664 © 2021 HydroCAD Software Solutions LLC

# Hydrocad Report

Prepared by Firwood Design Group

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Printed 9/15/2024

Page 2

## Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	10 Year	Type IA 24-hr		Default	24.00	1	3.40	2

# Hydrocad Report

Prepared by Firwood Design Group

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Printed 9/15/2024

Page 3

## Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
2,245	98	Asphalt (1B)
7,741	98	Building Roof Area (1A, 9S, 12S)
2,820	98	Concrete (3S, 6S, 10S)
<b>12,806</b>	<b>98</b>	<b>TOTAL AREA</b>



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## Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
0	HSG C	
0	HSG D	
12,806	Other	1A, 1B, 3S, 6S, 9S, 10S, 12S
<b>12,806</b>		<b>TOTAL AREA</b>

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## Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Subcatch Numbers
0	0	0	0	2,245	2,245	Asphalt	
0	0	0	0	7,741	7,741	Building Roof Area	
0	0	0	0	2,820	2,820	Concrete	
<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>12,806</b>	<b>12,806</b>	<b>TOTAL AREA</b>	

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Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points

Runoff by SBUH method, Split Pervious/Imperv.

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>Subcatchment 1A: Lot 1 Roof Area</b>	Runoff Area=2,175 sf 100.00% Impervious Runoff Depth=3.17" Tc=6.0 min CN=0/98 Runoff=0.04 cfs 574 cf
<b>Subcatchment 1B: Shared Driveway</b>	Runoff Area=2,245 sf 100.00% Impervious Runoff Depth=3.17" Tc=6.0 min CN=0/98 Runoff=0.04 cfs 592 cf
<b>Subcatchment 3S: Private Driveway Lot 1</b>	Runoff Area=930 sf 100.00% Impervious Runoff Depth=3.17" Tc=6.0 min CN=0/98 Runoff=0.02 cfs 245 cf
<b>Subcatchment 6S: Private Driveway Lot 2</b>	Runoff Area=930 sf 100.00% Impervious Runoff Depth=3.17" Tc=6.0 min CN=0/98 Runoff=0.02 cfs 245 cf
<b>Subcatchment 9S: Lot 2 Roof Area</b>	Runoff Area=2,550 sf 100.00% Impervious Runoff Depth=3.17" Tc=6.0 min CN=0/98 Runoff=0.05 cfs 673 cf
<b>Subcatchment 10S: Private Driveway Lot 3</b>	Runoff Area=960 sf 100.00% Impervious Runoff Depth=3.17" Tc=6.0 min CN=0/98 Runoff=0.02 cfs 253 cf
<b>Subcatchment 12S: Lot 3 Roof Area</b>	Runoff Area=3,016 sf 100.00% Impervious Runoff Depth=3.17" Tc=6.0 min CN=0/98 Runoff=0.05 cfs 796 cf
<b>Pond 20P: Drywell PV 1</b>	Peak Elev=5.32' Storage=64 cf Inflow=0.02 cfs 245 cf Outflow=0.00 cfs 245 cf
<b>Pond 21P: Drywell SD</b>	Peak Elev=9.78' Storage=184 cf Inflow=0.04 cfs 592 cf Outflow=0.01 cfs 592 cf
<b>Pond 25P: Drywell RA 1</b>	Peak Elev=9.44' Storage=178 cf Inflow=0.04 cfs 574 cf Outflow=0.01 cfs 574 cf
<b>Pond 26P: Drywell PV 2</b>	Peak Elev=5.32' Storage=64 cf Inflow=0.02 cfs 245 cf Outflow=0.00 cfs 245 cf
<b>Pond 28P: Drywell RA 2</b>	Peak Elev=11.26' Storage=212 cf Inflow=0.05 cfs 673 cf Outflow=0.01 cfs 673 cf
<b>Pond 29P: Drywell PV 3</b>	Peak Elev=5.52' Storage=67 cf Inflow=0.02 cfs 253 cf Outflow=0.00 cfs 253 cf
<b>Pond 30P: Drywell RA 3</b>	Peak Elev=13.52' Storage=255 cf Inflow=0.05 cfs 796 cf Outflow=0.01 cfs 796 cf

**Total Runoff Area = 12,806 sf Runoff Volume = 3,379 cf Average Runoff Depth = 3.17"**  
**0.00% Pervious = 0 sf 100.00% Impervious = 12,806 sf**

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## Summary for Subcatchment 1A: Lot 1 Roof Area

Runoff = 0.04 cfs @ 7.90 hrs, Volume= 574 cf, Depth= 3.17"

Routed to Pond 25P : Drywell RA 1

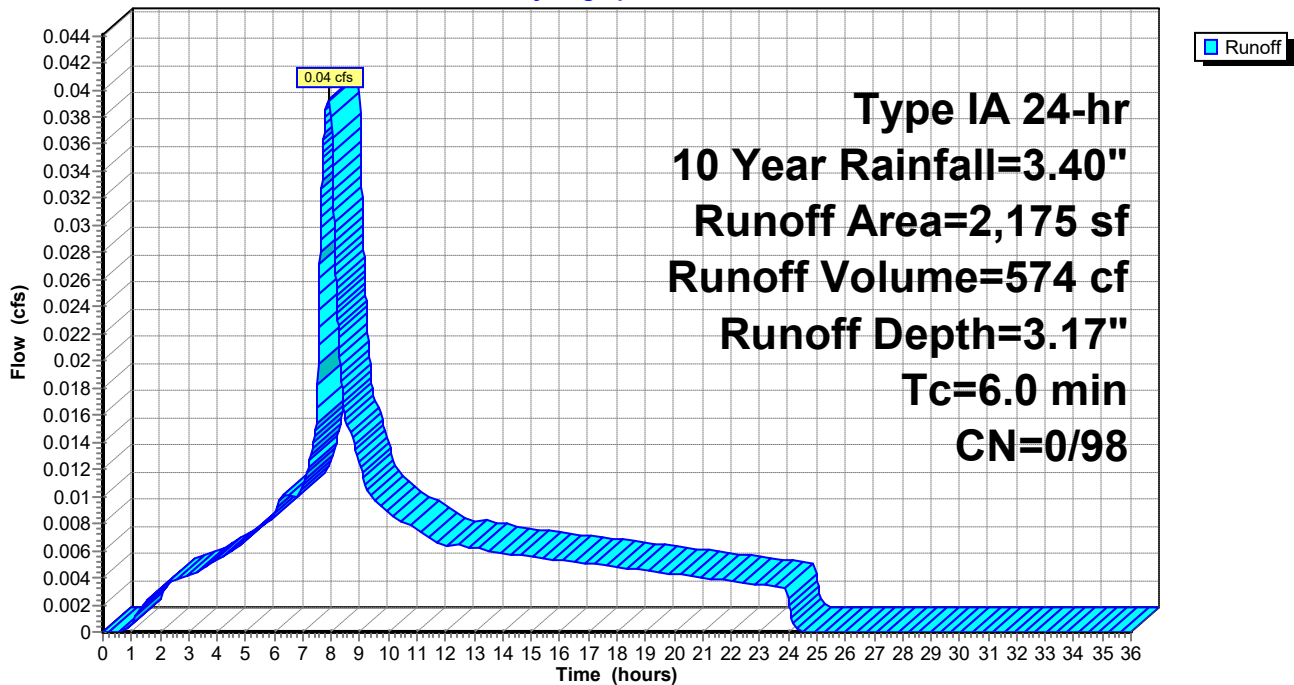
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.01 hrs  
Type IA 24-hr 10 Year Rainfall=3.40"

Area (sf)	CN	Description
* 2,175	98	Building Roof Area
2,175		100.00% Impervious Area

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

## Subcatchment 1A: Lot 1 Roof Area

Hydrograph



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## Summary for Subcatchment 1B: Shared Driveway

Runoff = 0.04 cfs @ 7.90 hrs, Volume= 592 cf, Depth= 3.17"

Routed to Pond 21P : Drywell SD

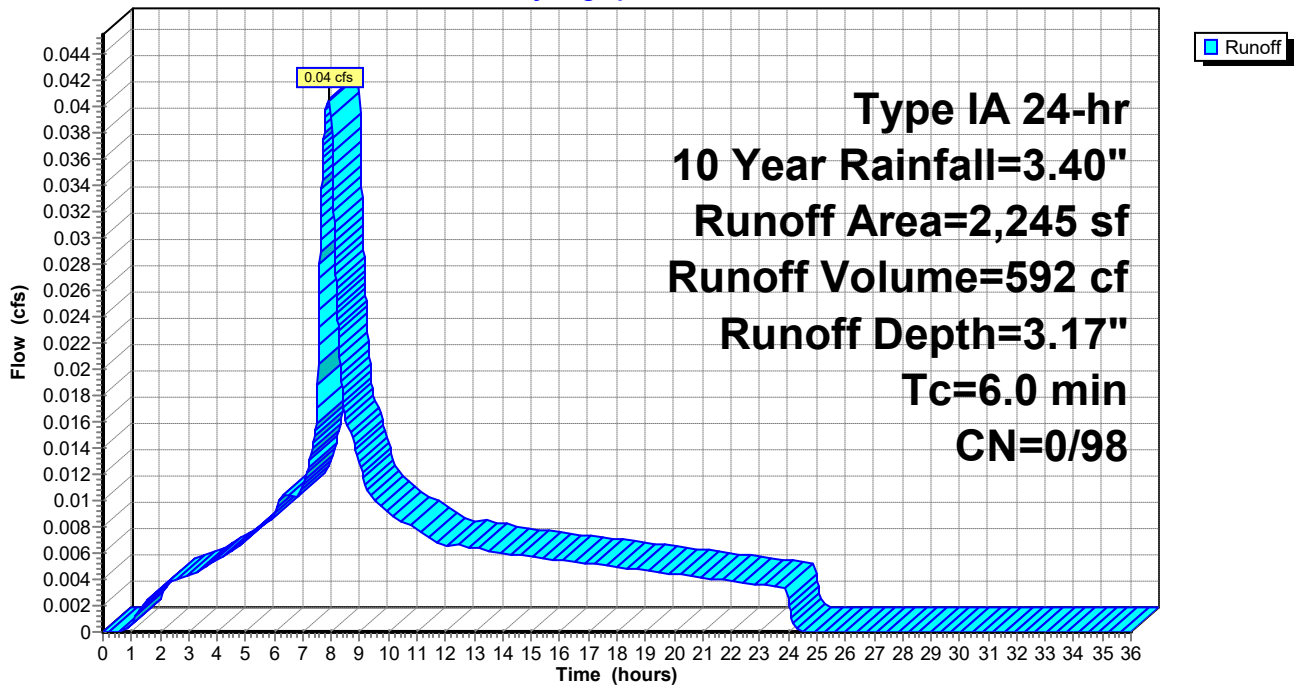
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.01 hrs  
Type IA 24-hr 10 Year Rainfall=3.40"

Area (sf)	CN	Description
* 2,245	98	Asphalt
2,245		100.00% Impervious Area

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

## Subcatchment 1B: Shared Driveway

Hydrograph



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## Summary for Subcatchment 3S: Private Driveway Lot 1

Runoff = 0.02 cfs @ 7.90 hrs, Volume= 245 cf, Depth= 3.17"

Routed to Pond 20P : Drywell PV 1

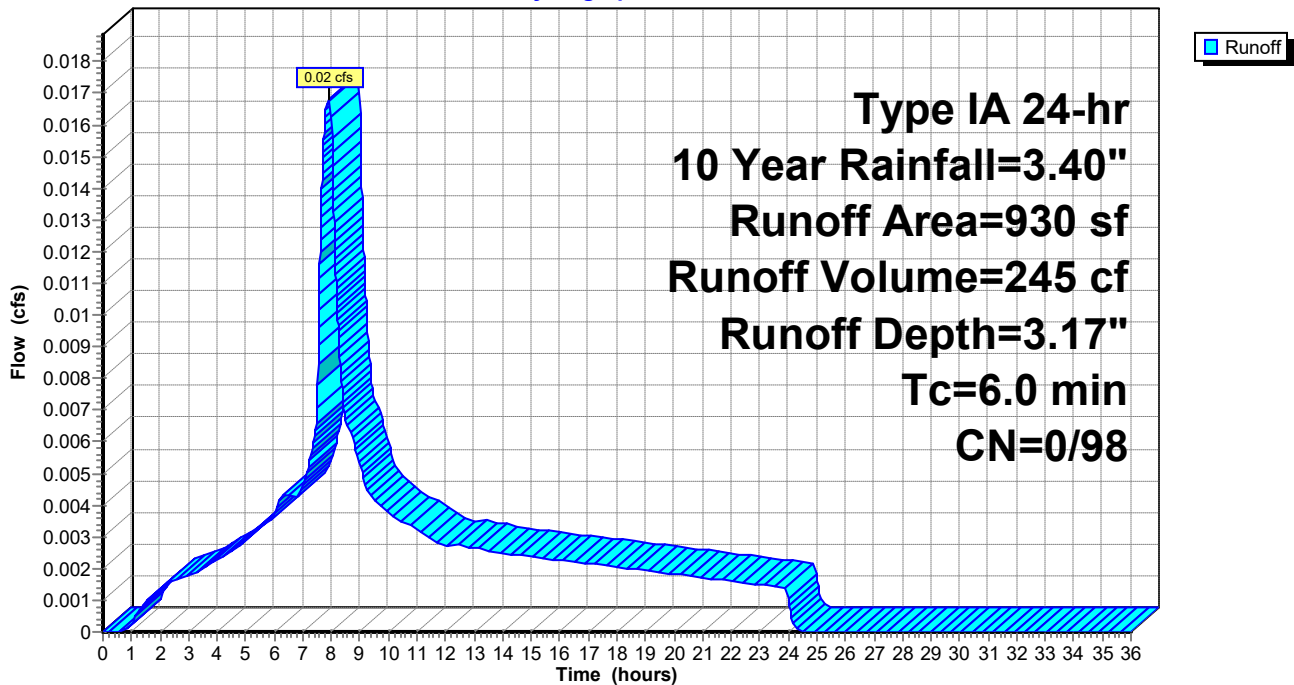
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.01 hrs  
Type IA 24-hr 10 Year Rainfall=3.40"

Area (sf)	CN	Description
* 930	98	Concrete
930		100.00% Impervious Area

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

## Subcatchment 3S: Private Driveway Lot 1

Hydrograph



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## Summary for Subcatchment 6S: Private Driveway Lot 2

Runoff = 0.02 cfs @ 7.90 hrs, Volume= 245 cf, Depth= 3.17"  
Routed to Pond 26P : Drywell PV 2

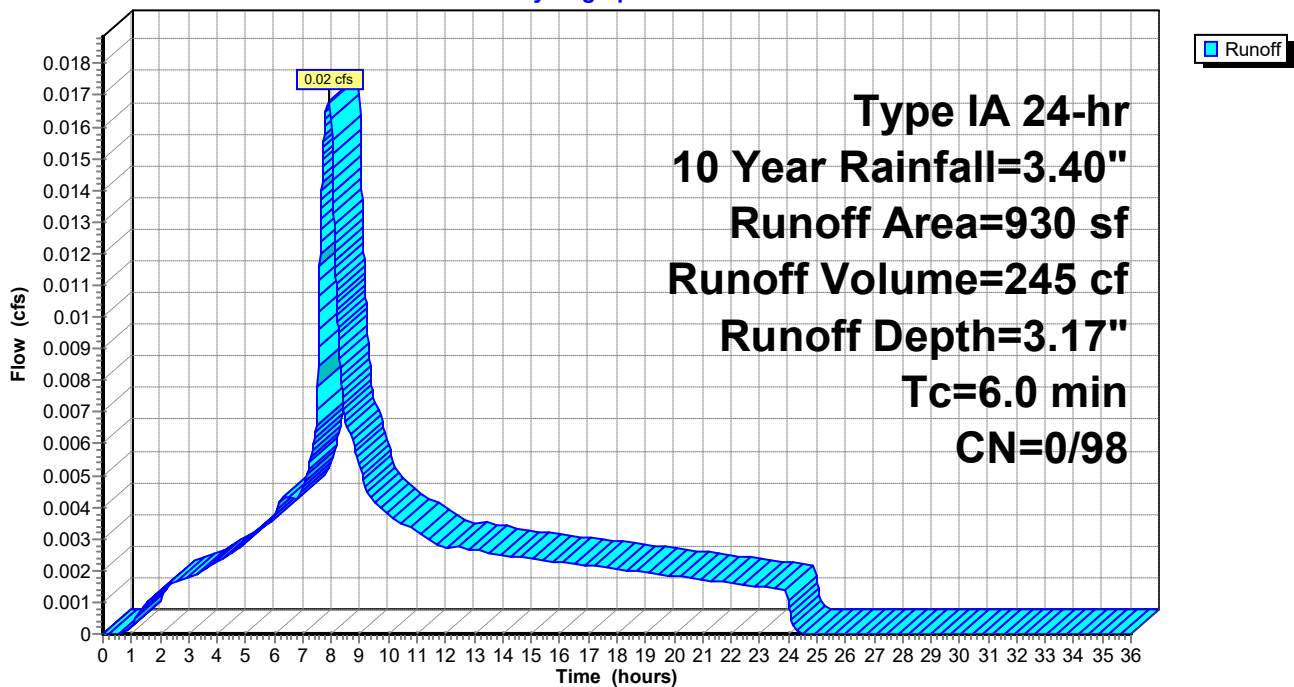
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.01 hrs  
Type IA 24-hr 10 Year Rainfall=3.40"

Area (sf)	CN	Description
* 930	98	Concrete
930		100.00% Impervious Area

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

## Subcatchment 6S: Private Driveway Lot 2

Hydrograph



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Type IA 24-hr 10 Year Rainfall=3.40"

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## Summary for Subcatchment 9S: Lot 2 Roof Area

Runoff = 0.05 cfs @ 7.90 hrs, Volume= 673 cf, Depth= 3.17"  
Routed to Pond 28P : Drywell RA 2

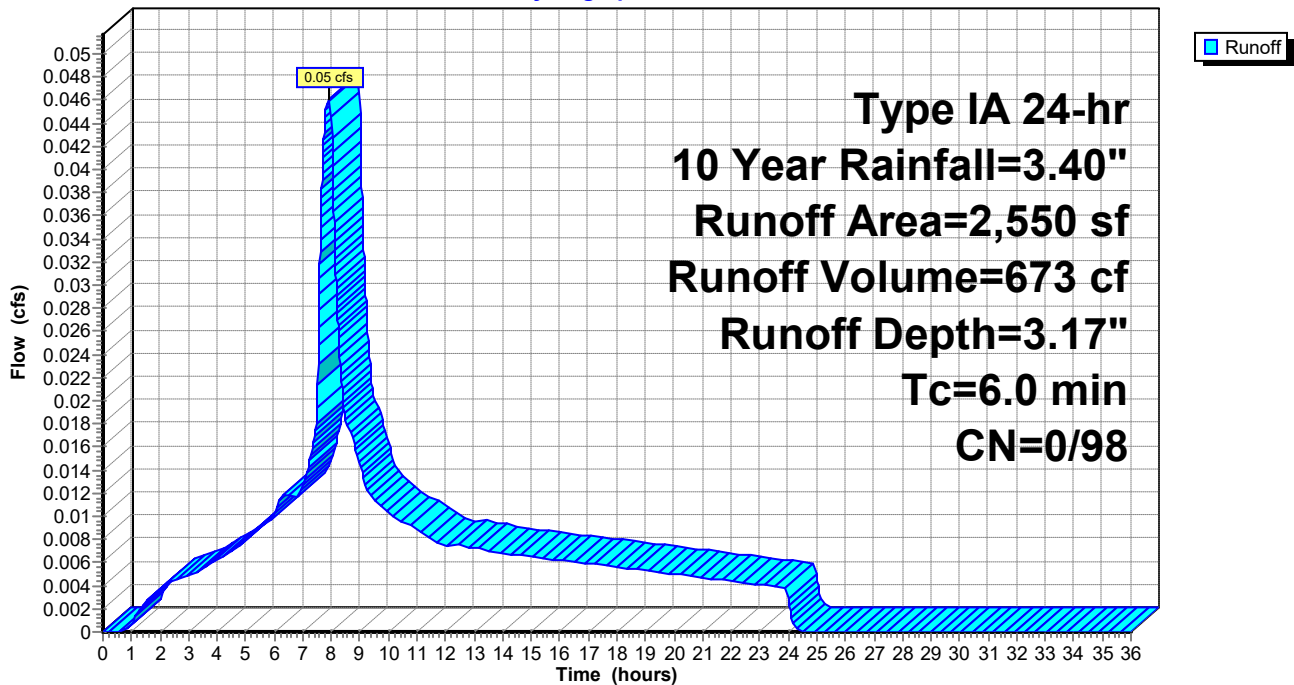
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.01 hrs  
Type IA 24-hr 10 Year Rainfall=3.40"

Area (sf)	CN	Description
* 2,550	98	Building Roof Area
2,550		100.00% Impervious Area

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

## Subcatchment 9S: Lot 2 Roof Area

Hydrograph





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Type IA 24-hr 10 Year Rainfall=3.40"

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## Summary for Subcatchment 10S: Private Driveway Lot 3

Runoff = 0.02 cfs @ 7.90 hrs, Volume= 253 cf, Depth= 3.17"  
Routed to Pond 29P : Drywell PV 3

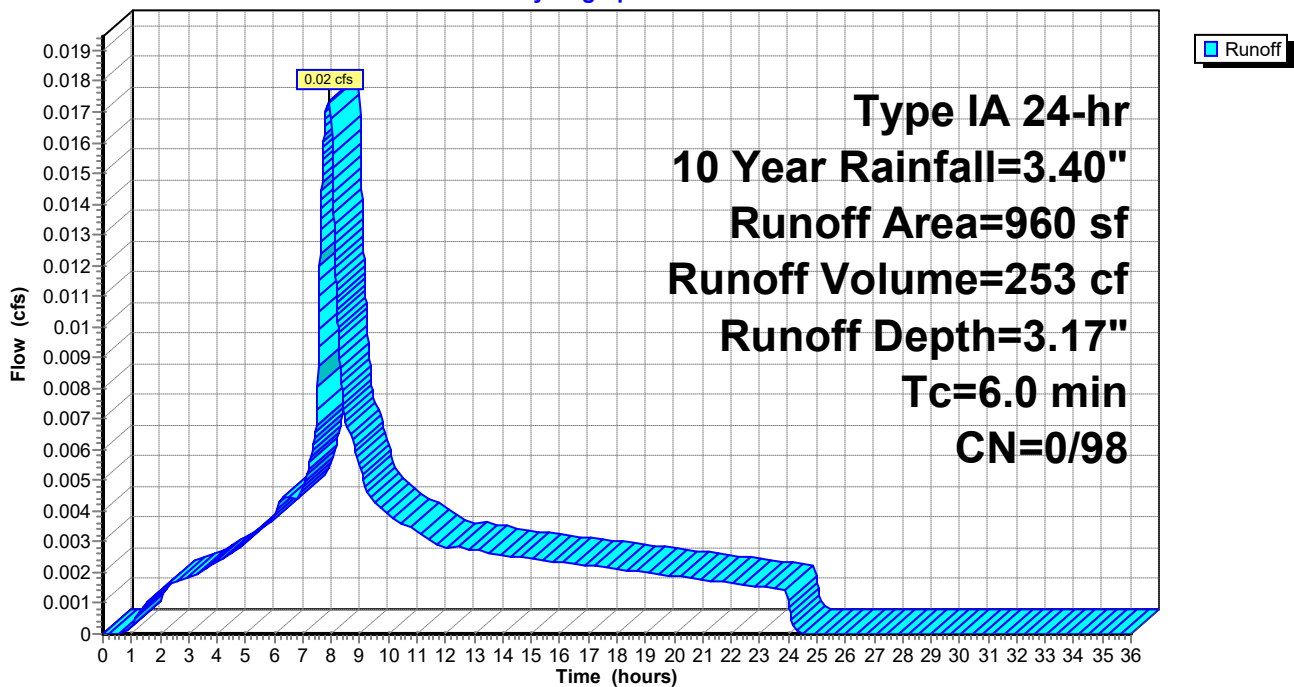
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.01 hrs  
Type IA 24-hr 10 Year Rainfall=3.40"

Area (sf)	CN	Description
* 960	98	Concrete
960		100.00% Impervious Area

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

## Subcatchment 10S: Private Driveway Lot 3

Hydrograph



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Type IA 24-hr 10 Year Rainfall=3.40"

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## Summary for Subcatchment 12S: Lot 3 Roof Area

Runoff = 0.05 cfs @ 7.90 hrs, Volume= 796 cf, Depth= 3.17"  
Routed to Pond 30P : Drywell RA 3

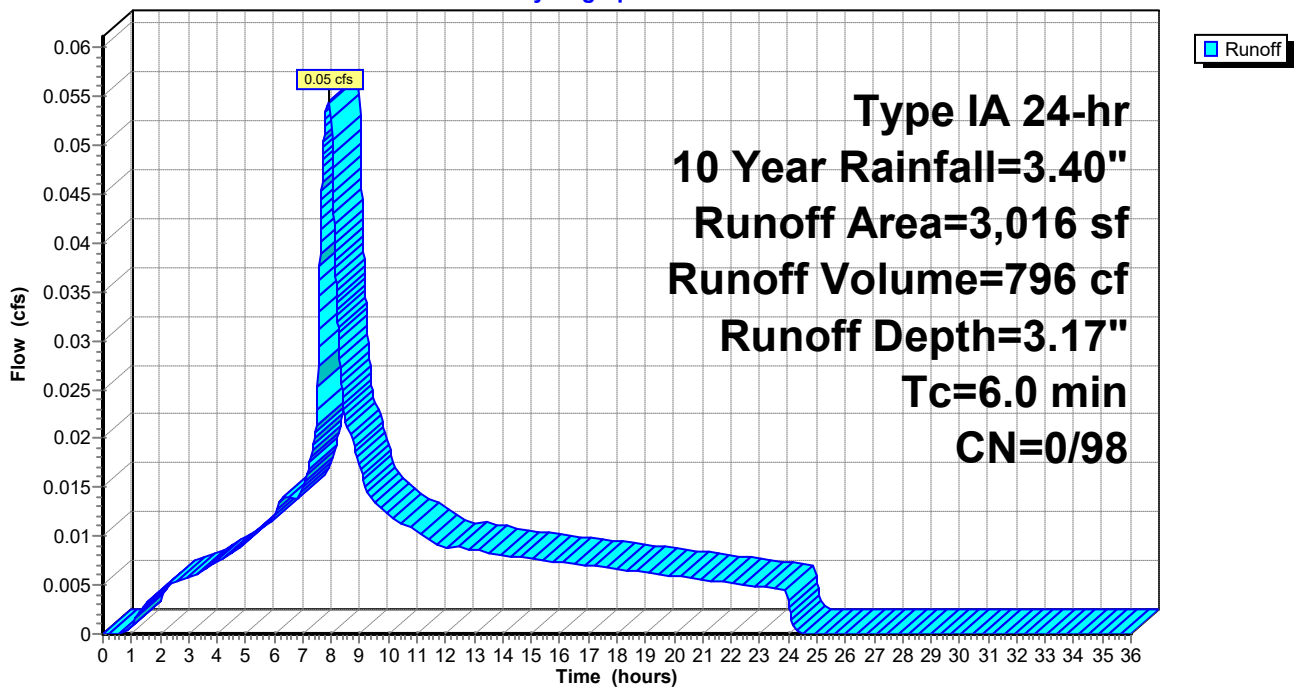
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.01 hrs  
Type IA 24-hr 10 Year Rainfall=3.40"

Area (sf)	CN	Description
* 3,016	98	Building Roof Area
3,016		100.00% Impervious Area

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

## Subcatchment 12S: Lot 3 Roof Area

Hydrograph



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Type IA 24-hr 10 Year Rainfall=3.40"

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## Summary for Pond 20P: Drywell PV 1

Inflow Area = 930 sf, 100.00% Impervious, Inflow Depth = 3.17" for 10 Year event  
 Inflow = 0.02 cfs @ 7.90 hrs, Volume= 245 cf  
 Outflow = 0.00 cfs @ 9.25 hrs, Volume= 245 cf, Atten= 73%, Lag= 81.0 min  
 Discarded = 0.00 cfs @ 9.25 hrs, Volume= 245 cf

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 2  
 Peak Elev= 5.32' @ 9.25 hrs Surf.Area= 20 sf Storage= 64 cf

Plug-Flow detention time= 191.7 min calculated for 245 cf (100% of inflow)  
 Center-of-Mass det. time= 191.8 min ( 856.3 - 664.6 )

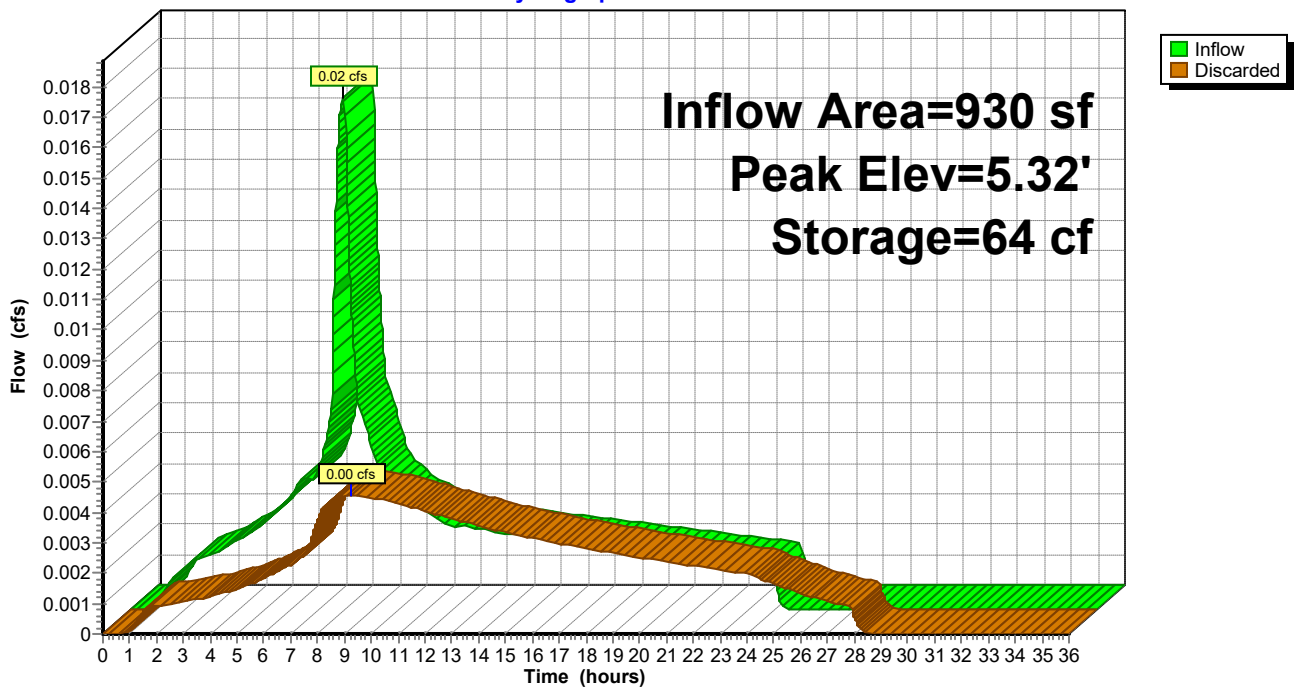
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	28 cf	<b>5.00'D x 5.50'H Vertical Cone/Cylinder</b> 108 cf Overall - 39 cf Embedded = 69 cf x 40.0% Voids
#2	0.00'	39 cf	<b>3.00'D x 5.50'H Vertical Cone/Cylinder</b> Inside #1
		67 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	<b>1.906 in/hr Exfiltration over Wetted area</b>

**Discarded OutFlow** Max=0.00 cfs @ 9.25 hrs HW=5.32' (Free Discharge)  
 ↑1=Exfiltration (Exfiltration Controls 0.00 cfs)

## Pond 20P: Drywell PV 1

Hydrograph



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Type IA 24-hr 10 Year Rainfall=3.40"

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## Summary for Pond 21P: Drywell SD

Inflow Area = 2,245 sf, 100.00% Impervious, Inflow Depth = 3.17" for 10 Year event  
 Inflow = 0.04 cfs @ 7.90 hrs, Volume= 592 cf  
 Outflow = 0.01 cfs @ 9.88 hrs, Volume= 592 cf, Atten= 77%, Lag= 119.3 min  
 Discarded = 0.01 cfs @ 9.88 hrs, Volume= 592 cf

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 2  
 Peak Elev= 9.78' @ 9.88 hrs Surf.Area= 28 sf Storage= 184 cf

Plug-Flow detention time= 286.8 min calculated for 592 cf (100% of inflow)  
 Center-of-Mass det. time= 286.9 min ( 951.5 - 664.6 )

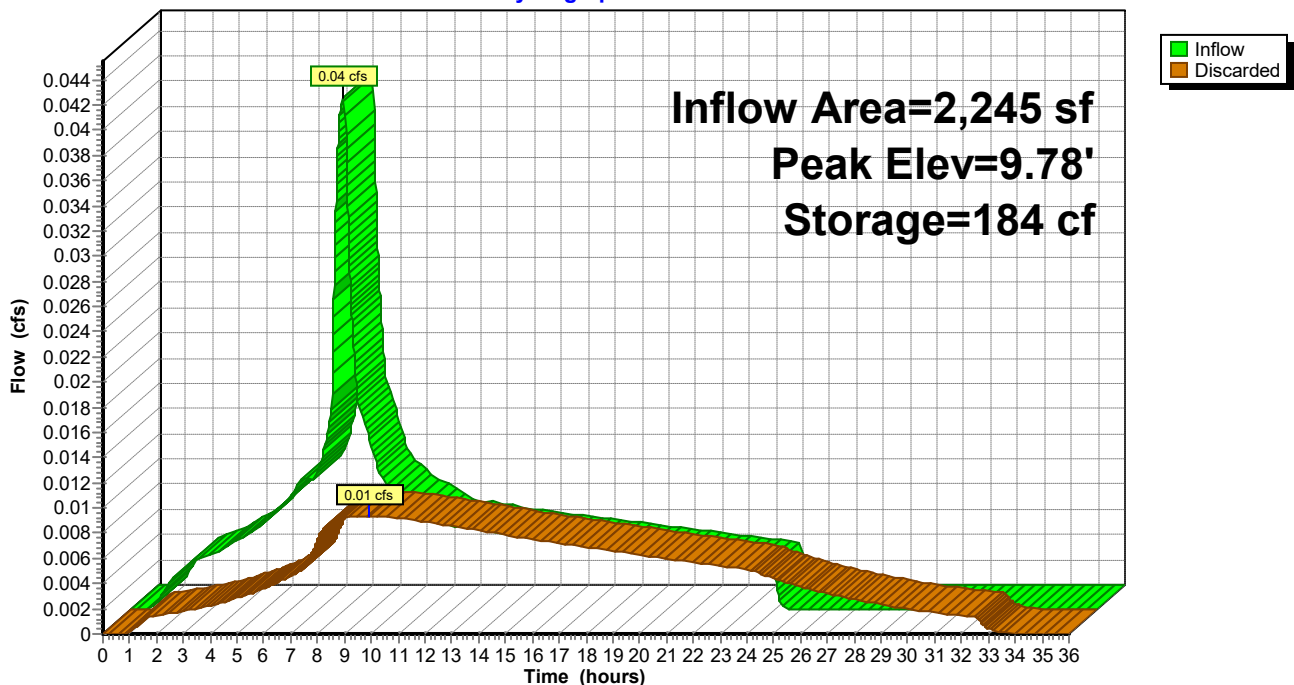
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	63 cf	<b>6.00'D x 10.00'H Vertical Cone/Cylinder</b> 283 cf Overall - 126 cf Embedded = 157 cf x 40.0% Voids
#2	0.00'	126 cf	<b>4.00'D x 10.00'H Vertical Cone/Cylinder</b> Inside #1
		188 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	<b>1.906 in/hr Exfiltration over Wetted area</b>

**Discarded OutFlow** Max=0.01 cfs @ 9.88 hrs HW=9.78' (Free Discharge)  
 ↑1=Exfiltration (Exfiltration Controls 0.01 cfs)

## Pond 21P: Drywell SD

Hydrograph



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## Summary for Pond 25P: Drywell RA 1

Inflow Area = 2,175 sf, 100.00% Impervious, Inflow Depth = 3.17" for 10 Year event  
 Inflow = 0.04 cfs @ 7.90 hrs, Volume= 574 cf  
 Outflow = 0.01 cfs @ 9.88 hrs, Volume= 574 cf, Atten= 77%, Lag= 119.0 min  
 Discarded = 0.01 cfs @ 9.88 hrs, Volume= 574 cf

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 2  
 Peak Elev= 9.44' @ 9.88 hrs Surf.Area= 28 sf Storage= 178 cf

Plug-Flow detention time= 284.6 min calculated for 574 cf (100% of inflow)  
 Center-of-Mass det. time= 284.6 min ( 949.2 - 664.6 )

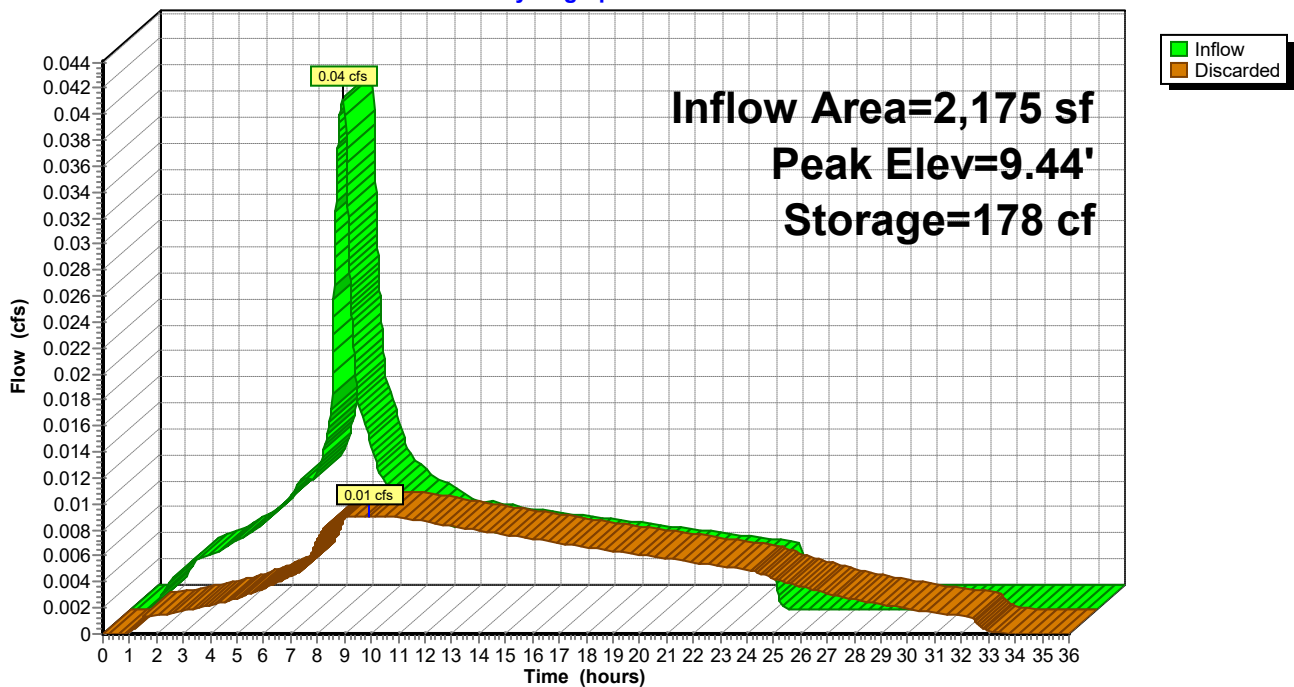
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	60 cf	<b>6.00'D x 9.50'H Vertical Cone/Cylinder</b> 269 cf Overall - 119 cf Embedded = 149 cf x 40.0% Voids
#2	0.00'	119 cf	<b>4.00'D x 9.50'H Vertical Cone/Cylinder</b> Inside #1
		179 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	<b>1.906 in/hr Exfiltration over Wetted area</b>

**Discarded OutFlow** Max=0.01 cfs @ 9.88 hrs HW=9.44' (Free Discharge)  
 ↑1=Exfiltration (Exfiltration Controls 0.01 cfs)

## Pond 25P: Drywell RA 1

Hydrograph



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## Summary for Pond 26P: Drywell PV 2

Inflow Area = 930 sf, 100.00% Impervious, Inflow Depth = 3.17" for 10 Year event  
 Inflow = 0.02 cfs @ 7.90 hrs, Volume= 245 cf  
 Outflow = 0.00 cfs @ 9.25 hrs, Volume= 245 cf, Atten= 73%, Lag= 81.0 min  
 Discarded = 0.00 cfs @ 9.25 hrs, Volume= 245 cf

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 2  
 Peak Elev= 5.32' @ 9.25 hrs Surf.Area= 20 sf Storage= 64 cf

Plug-Flow detention time= 191.7 min calculated for 245 cf (100% of inflow)  
 Center-of-Mass det. time= 191.8 min ( 856.3 - 664.6 )

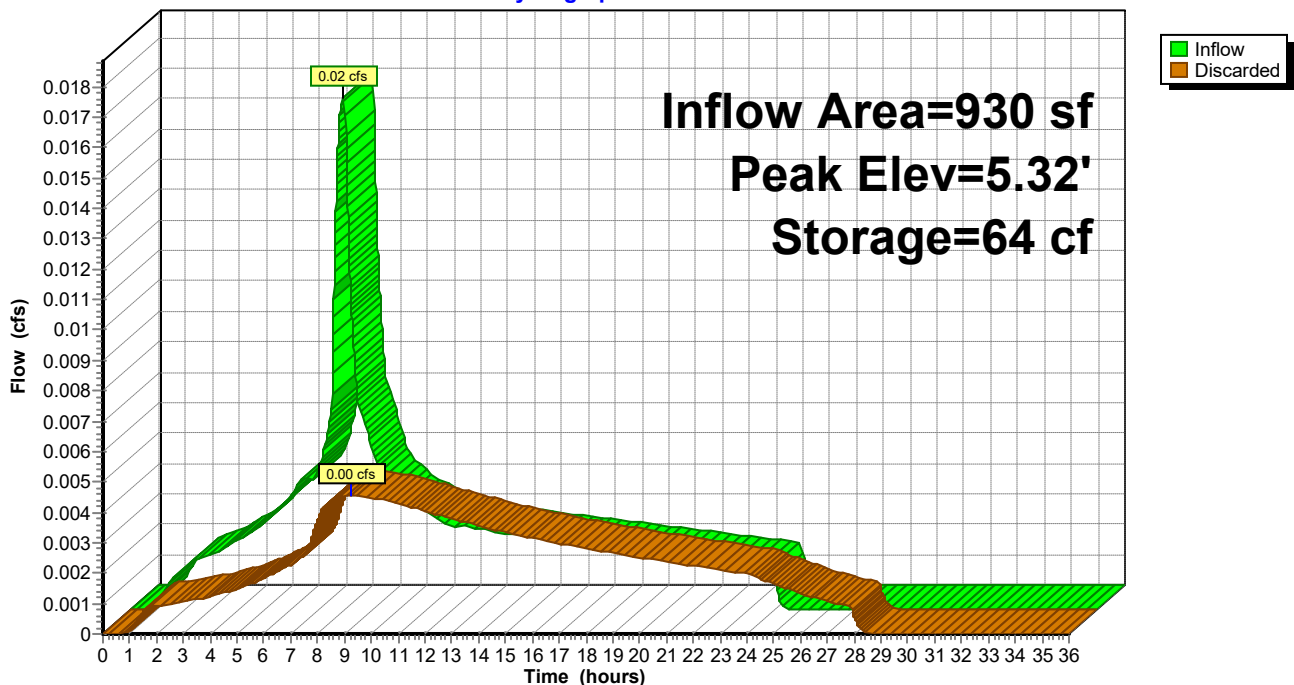
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	28 cf	<b>5.00'D x 5.50'H Vertical Cone/Cylinder</b> 108 cf Overall - 39 cf Embedded = 69 cf x 40.0% Voids
#2	0.00'	39 cf	<b>3.00'D x 5.50'H Vertical Cone/Cylinder</b> Inside #1
		67 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	<b>1.906 in/hr Exfiltration over Wetted area</b>

**Discarded OutFlow** Max=0.00 cfs @ 9.25 hrs HW=5.32' (Free Discharge)  
 ↑1=Exfiltration (Exfiltration Controls 0.00 cfs)

## Pond 26P: Drywell PV 2

Hydrograph



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## Summary for Pond 28P: Drywell RA 2

Inflow Area = 2,550 sf, 100.00% Impervious, Inflow Depth = 3.17" for 10 Year event  
 Inflow = 0.05 cfs @ 7.90 hrs, Volume= 673 cf  
 Outflow = 0.01 cfs @ 9.90 hrs, Volume= 673 cf, Atten= 77%, Lag= 120.4 min  
 Discarded = 0.01 cfs @ 9.90 hrs, Volume= 673 cf

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 2  
 Peak Elev= 11.26' @ 9.90 hrs Surf.Area= 28 sf Storage= 212 cf

Plug-Flow detention time= 295.7 min calculated for 673 cf (100% of inflow)  
 Center-of-Mass det. time= 295.7 min ( 960.3 - 664.6 )

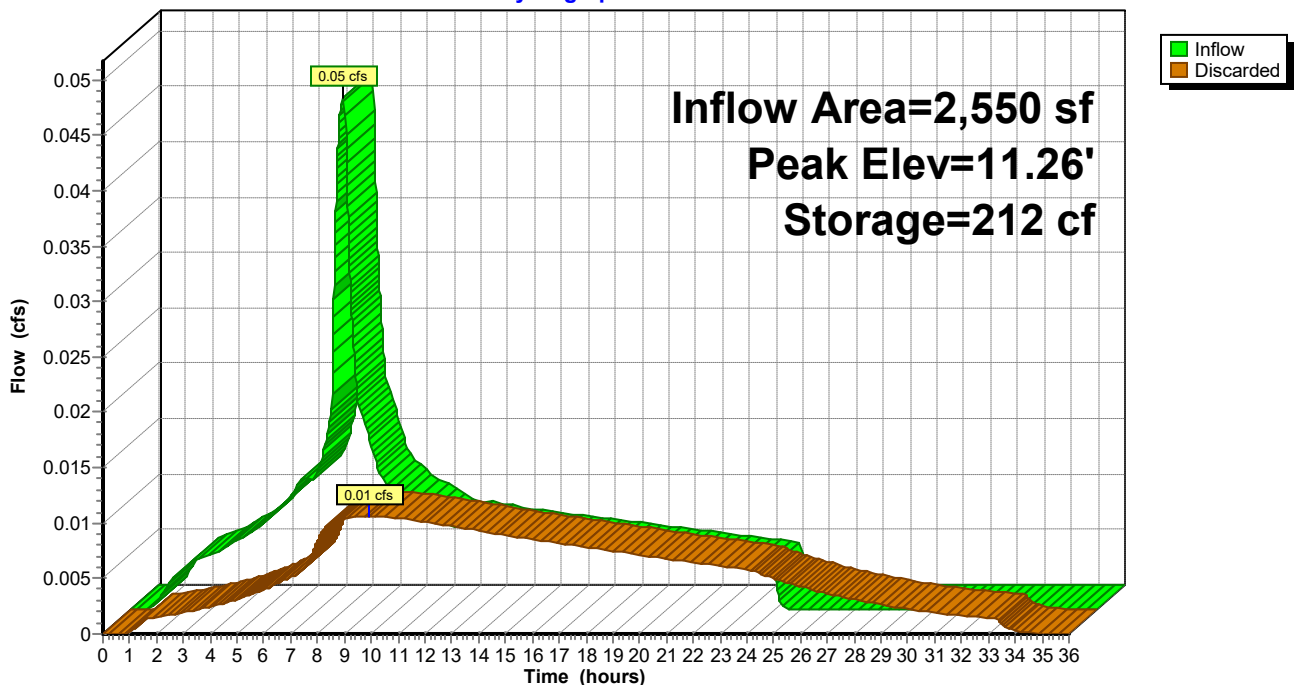
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	72 cf	<b>6.00'D x 11.50'H Vertical Cone/Cylinder</b> 325 cf Overall - 145 cf Embedded = 181 cf x 40.0% Voids
#2	0.00'	145 cf	<b>4.00'D x 11.50'H Vertical Cone/Cylinder</b> Inside #1
		217 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	<b>1.906 in/hr Exfiltration over Wetted area</b>

**Discarded OutFlow** Max=0.01 cfs @ 9.90 hrs HW=11.26' (Free Discharge)  
 ↑1=Exfiltration (Exfiltration Controls 0.01 cfs)

## Pond 28P: Drywell RA 2

Hydrograph



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## Summary for Pond 29P: Drywell PV 3

Inflow Area = 960 sf, 100.00% Impervious, Inflow Depth = 3.17" for 10 Year event  
 Inflow = 0.02 cfs @ 7.90 hrs, Volume= 253 cf  
 Outflow = 0.00 cfs @ 9.25 hrs, Volume= 253 cf, Atten= 73%, Lag= 81.2 min  
 Discarded = 0.00 cfs @ 9.25 hrs, Volume= 253 cf

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 2  
 Peak Elev= 5.52' @ 9.25 hrs Surf.Area= 20 sf Storage= 67 cf

Plug-Flow detention time= 194.3 min calculated for 253 cf (100% of inflow)  
 Center-of-Mass det. time= 194.3 min ( 858.9 - 664.6 )

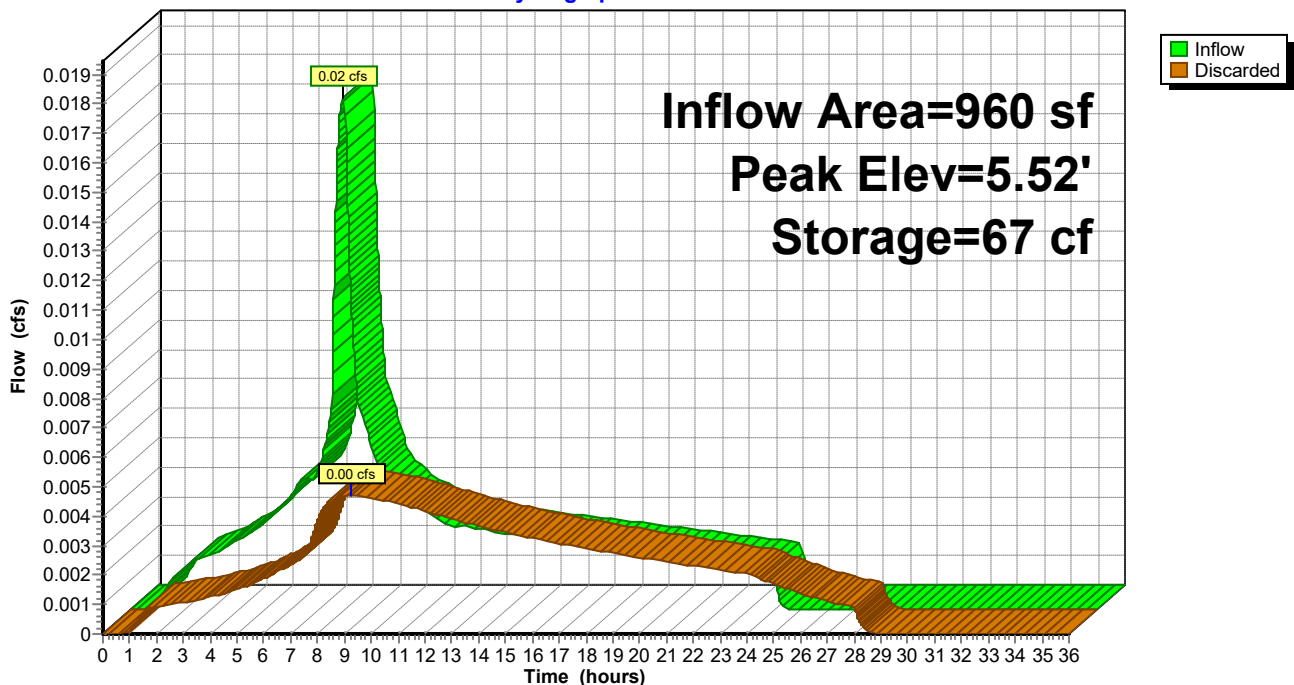
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	30 cf	<b>5.00'D x 6.00'H Vertical Cone/Cylinder</b> 118 cf Overall - 42 cf Embedded = 75 cf x 40.0% Voids
#2	0.00'	42 cf	<b>3.00'D x 6.00'H Vertical Cone/Cylinder</b> Inside #1
		73 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	<b>1.906 in/hr Exfiltration over Wetted area</b>

**Discarded OutFlow** Max=0.00 cfs @ 9.25 hrs HW=5.52' (Free Discharge)  
 ↑1=Exfiltration (Exfiltration Controls 0.00 cfs)

## Pond 29P: Drywell PV 3

Hydrograph





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## Summary for Pond 30P: Drywell RA 3

Inflow Area = 3,016 sf, 100.00% Impervious, Inflow Depth = 3.17" for 10 Year event  
 Inflow = 0.05 cfs @ 7.90 hrs, Volume= 796 cf  
 Outflow = 0.01 cfs @ 9.92 hrs, Volume= 796 cf, Atten= 77%, Lag= 121.7 min  
 Discarded = 0.01 cfs @ 9.92 hrs, Volume= 796 cf

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 2  
 Peak Elev= 13.52' @ 9.92 hrs Surf.Area= 28 sf Storage= 255 cf

Plug-Flow detention time= 306.1 min calculated for 796 cf (100% of inflow)  
 Center-of-Mass det. time= 306.0 min ( 970.6 - 664.6 )

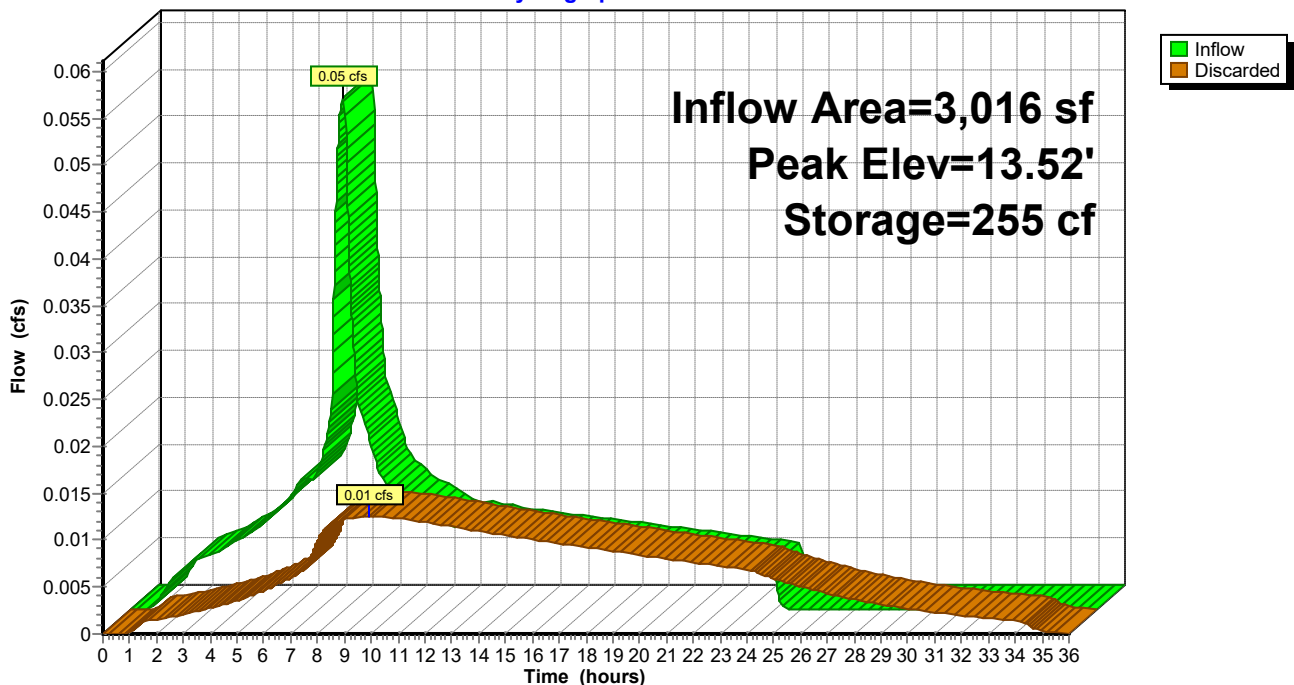
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	88 cf	<b>6.00'D x 14.00'H Vertical Cone/Cylinder</b> 396 cf Overall - 176 cf Embedded = 220 cf x 40.0% Voids
#2	0.00'	176 cf	<b>4.00'D x 14.00'H Vertical Cone/Cylinder</b> Inside #1
		264 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	<b>1.906 in/hr Exfiltration over Wetted area</b>

**Discarded OutFlow** Max=0.01 cfs @ 9.92 hrs HW=13.52' (Free Discharge)  
 ↑1=Exfiltration (Exfiltration Controls 0.01 cfs)

## Pond 30P: Drywell RA 3

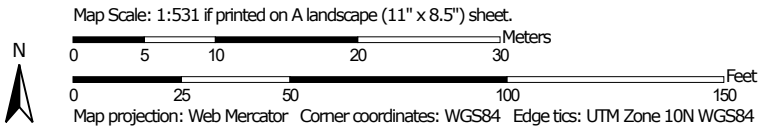
Hydrograph



## APPENDIX C


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Soil Map—Clackamas County Area, Oregon  
(Cornwall Soil Map)




## 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



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

### Water Features



Streams and Canals

### Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

### Background



Aerial Photography

## MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Clackamas County Area, Oregon

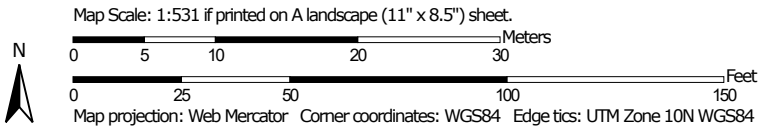
Survey Area Data: Version 20, Sep 7, 2023

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

Date(s) aerial images were photographed: Sep 26, 2022—Oct 11, 2022


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

Hydrologic Soil Group—Clackamas County Area, Oregon  
(Cornwall Soil Map)



## MAP LEGEND

### Area of Interest (AOI)









 Area of Interest (AOI)

### Soils

#### Soil Rating Polygons





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

#### Soil Rating Lines


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

#### Soil Rating Points






 A  
 A/D  
 B  
 B/D

 C  
 C/D  
 D  
 Not rated or not available


### Water Features

 Streams and Canals

### Transportation

 Rails  
 Interstate Highways  
 US Routes  
 Major Roads  
 Local Roads

### Background

 Aerial Photography

## MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Clackamas County Area, Oregon  
 Survey Area Data: Version 20, Sep 7, 2023

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

Date(s) aerial images were photographed: Sep 26, 2022—Oct 11, 2022

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

## Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
78B	Saum silt loam, 3 to 8 percent slopes	C	0.6	100.0%
<b>Totals for Area of Interest</b>			<b>0.6</b>	<b>100.0%</b>

### Description

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

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

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

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

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

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

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

### Rating Options

*Aggregation Method: Dominant Condition*

*Component Percent Cutoff: None Specified*

*Tie-break Rule:* Higher



Saturated Hydraulic Conductivity (Ksat)—Clackamas County Area, Oregon  
(Cornwall Soil Map)



Map Scale: 1:531 if printed on A landscape (11" x 8.5") sheet.




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

 = 9.0000


 Not rated or not available


#### Soil Rating Lines

 = 9.0000

 Not rated or not available

#### Soil Rating Points

 = 9.0000

 Not rated or not available

### Water Features

 Streams and Canals


### Transportation

 Rails


 Interstate Highways

 US Routes

 Major Roads

 Local Roads

### Background

 Aerial Photography

## MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Clackamas County Area, Oregon  
Survey Area Data: Version 20, Sep 7, 2023

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

Date(s) aerial images were photographed: Sep 26, 2022—Oct 11, 2022

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.

## Saturated Hydraulic Conductivity (Ksat)

Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
78B	Saum silt loam, 3 to 8 percent slopes	9.0000	0.6	100.0%
<b>Totals for Area of Interest</b>			<b>0.6</b>	<b>100.0%</b>

### Description

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity is considered in the design of soil drainage systems and septic tank absorption fields.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

The numeric Ksat values have been grouped according to standard Ksat class limits.

### Rating Options

*Units of Measure:* micrometers per second

*Aggregation Method:* Dominant Component

*Component Percent Cutoff:* None Specified

*Tie-break Rule:* Fastest

*Interpret Nulls as Zero:* No

*Layer Options (Horizon Aggregation Method):* Depth Range (Weighted Average)

*Top Depth:* 36

*Bottom Depth:* 60

*Units of Measure:* Centimeters

## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
78B	Saum silt loam, 3 to 8 percent slopes	0.6	100.0%
<b>Totals for Area of Interest</b>		<b>0.6</b>	<b>100.0%</b>



JJ Portlock  
425-829-1566  
jportlock@theportlockco.com

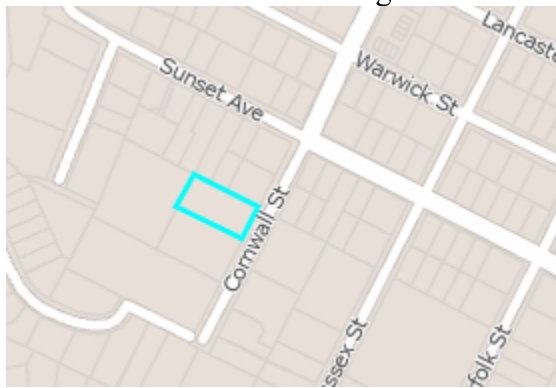
26 June 2024

Re: infiltration testing at 4194 Cornwall Street, West Linn OR

Dear Mr. Portlock,

**Field Investigation:**

Rapid Soil Solutions (RSS) has performed a two (2) infiltration tests. Figure 1 shows the project site location. The site has a gentle 5% slope to the rear where testing took place. Soils found on site match those in by DOGMI, RSS found fine- grained flood deposits. Testing was performed for future storm water drainage.



**Infiltration Testing & Conclusion:**

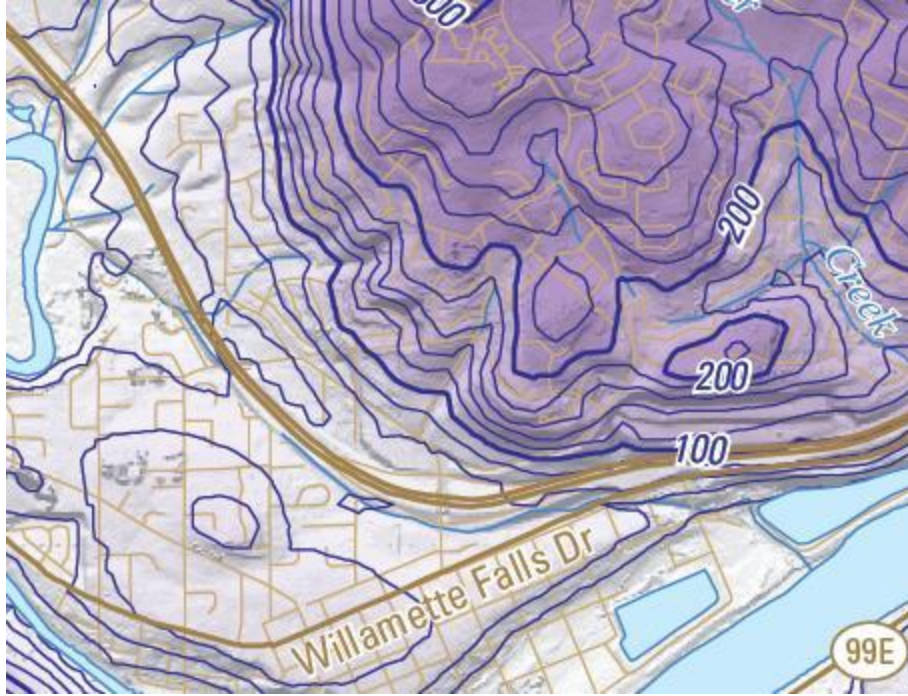
A summary of the test results is shown below. The attached sheets along with the soils and locations of the tests.

Location	Depth (ft)	Rate (in/hr.)
HA#1	3.5	6.375
HA#1	3.5	125

**Depth to Ground Water**

RSS was unable to excavate an addition hole to look for water at a depth of 10ft due to rock layer. No water loving vegetation was noted at the site. USGS has water mapped greater than 80ft below the surface.





USGS 5059 plate

The analysis, conclusions and recommendations contained in this report are based on site conditions as they existed at the time of explorations. Any questions regarding this report please contact me at the below number or email.

Sincerely,



EXPIRES:  
12/31/2024

Mia Mahedy, PE GE.

## Rapid Soil Solutions Infiltration Test Results



**4194 CORNWALL ST**  
WEST LINN



### Preliminary Information

<b>Location:</b>	4194 Cornwall St, West Linn, OR.	<b>Performed By:</b> (Supervised by Mia Mahedy, PE, GE)	Rick Sands
<b>Date &amp; Time:</b>	6-24-24, 9:45 am	<b>Instrument Used:</b>	3 inch hand auger
<b>Weather:</b>	68, sunny	<b>Depth:</b>	3.5 ft

### HA # 1

0-2	Dry, coarse, tan, silty clay, medium stiffness		
2-3.5	Dry to damp, tan, coarse, silty clay, medium stiff to stiff		
<b>Time</b>	<b>Measurement (inches)</b>	<b>Level Refilled To (inches)</b>	<b>Rate (inches/hour)</b>
10:25	13 5/8		
10:45	9.5		
11:05	7		
11:25	5.25	13 3/8	
11:45	10.25		
12:05	7.75		
12:25	6.25	13.5	
12:45	10.75		
1:05	9		
1:25	7 1/8		
<b>Site Infiltration Rate (inches/hour)</b>			<b>6.375 in/hr.</b>



## Rapid Soil Solutions Infiltration Test Results



**4194 CORNWALL ST**  
WEST LINN



### Preliminary Information

<b>Location:</b>	4194 Cornwall St, West Linn, OR.	<b>Performed By:</b> (Supervised by Mia Mahedy, PE, GE)	Rick Sands
<b>Date &amp; Time:</b>	6-24-24, 9:45 am	<b>Instrument Used:</b>	3-inch hand auger
<b>Weather:</b>	68, sunny	<b>Depth:</b>	3.5 ft

### HA # 2

0-2	Dry, coarse, tan, silty clay, medium stiffness		
2-3.5	Dry to damp, tan, coarse, silty clay, medium stiff to stiff		
<b>Time</b>	<b>Measurement (inches)</b>	<b>Level Refilled To (inches)</b>	<b>Rate (inches/hour)</b>
10:25	12 7/8		
10:45	11.5		
11:05	10.75		
11:25	10 3/8	13.25	
11:45	12.75		
12:05	12 1/8		
12:25	11.75	13 1/8	
12:45	12.5		
1:05	12.25		
1:25	11 7/8		
<b>Site Infiltration Rate (inches/hour)</b>			<b>1.25in/hr.</b>