Stayton Veterinary Hospital

PRELIMINARY STORMWATER REPORT

April 2nd, 2024
1308 N 1st Ave
Stayton, Oregon 97383

REGISTERED PROFESSIONAL
ENGINEER

80481PE

OREGON
DEC. 12, 2012
ANDREW T. RAPPE

RENEWAL DEC. 31, 2024

PREPARED BY:

UDELL ENGINEERING & LAND SURVEYING, LLC
63 EAST ASH ST.
LEBANON, OR 97355

Site Name: **Stayton Veterinary Hospital**

Property Location: **1308 N First Ave**
                                                              9S-01W-10AC
                                                              Lots 2400, 2500, 2600, 2700, and 2800.

Site Property Owner/Applicant: **Dark Horse Enterprise LLC**
                                                               C/O Dr. Michael Reynolds
                                                               1308 N 1st Ave
                                                               Stayton, OR 97383

Engineer: **Udell Engineering & Land Surveying, LLC**
                                                              63 East Ash St.
                                                              Lebanon, Oregon 97355
                                                              Andrew Rappé, PE
                                                              (541) 451-5125
                                                              andrew@udelleng.com

Contents

Udell Engineering & Land Surveying, LLC
Lebanon Or.

1.0 Purpose of Report

Udell Engineering and Land Surveying, LLC, abbreviated UELS, was consulted by the applicant, Dr. Michael Reynolds, to develop a preliminary Stormwater Report for the proposed development located at 1308 N 1st Avenue in Stayton, Oregon. The proposed development includes the expansion of the existing hospital building and parking lot across the full city lot. The applicant currently owns all 5 lots on the block and is in the process of consolidating the lots into one.

The purpose of this report is to demonstrate that the tentative improvements are capable of conforming with the City of Stayton post-construction stormwater management standards. UELS followed Division 6 of the City of Stayton Public Works Design Standards (Division 6) to provide water quality and water quantity for the proposed development.

2.0 Site Description

The project is currently located across 5 parcels on a 0.96 acre block between 1st Ave and 2nd Ave to the west and east, and E Pine St and E Hollister St to the north and south. The southern two lots consist of the existing veterinary hospital building and parking lot. The lots to the northwest consist of single family residences. The lot to the northeast is vacant, but was formerly a residence. A public alley running north and south through the block was vacated in 2023. The 5 parcels are proposed to be consolidated into one through a separate land use application.

Stormwater runoff from the site is shed to the surrounding right-of-way, with public stormdrain mains located in Pine, Hollister, and 1st Ave. The property is currently served by power, gas, sewer, and water. Service lines to the former residences will be removed and/or abandoned.

3.0 Proposed Stormwater Facility Improvements

Water quality treatment will be provided by an onsite water quality basin. The basin will infiltrate most of the incoming water underground. During extreme rain events, the basin will top an overflow inlet and discharge to the public storm drain system at the NE corner of N First and E Hollister. The system is designed to limit post-developed to pre-developed peak runoff rates for the 2, 5, 10, 50, and 100-year 24-hour storm events. Additionally, the post-developed 25-year storm event is limited to well below the 10-year pre-developed peak runoff rate.

4.0 Design Methodology and Calculations

4.1 Water Quality

For Water Quality sizing, UELS followed the City of Portland 2020 Stormwater Management Manual (PSWMM) as referenced by Division 6. The Water Quality basin is designed using the Performance Approach by incorporating the water quality storm event into the overall hydrology model as described in section 4.2.

4.2 Water Quantity

For water quantity (flow control) calculations, UELS used the Santa Barbara Urban Hydrograph method to build a hydrologic model using Hydrocad software Version 10.00-24: The software model for this project is comprised of 2 types of nodes: sub-catchments and ponds.

Sub-catchment nodes model the basin areas of land that receive rainfall during a storm. They generate runoff hydrographs based on several factors, including the runoff curve numbers, time of concentration, and design storms. For this model, UELS used curve numbers from the PSWMM into the software for the varying types of area with the contributing basin, pre-developed and post-

developed. For the post-construction basin, UELS used the software to calculate the time of concentration for the drainage basin. The 24hr design storm values used in the model were taken from Division 6 and are shown in Table 1 below.

In this hydrologic model, UELS used a pond node to model the stormwater management. The pond volume includes the above-ground basin area as well as the below-ground void spaces in the soil media filtration layer. Runoff that is not infiltrated into the groundwater table overflows into an overflow inlet. The inlet acts as a weir during large storm events and helps to limit the peak runoff flows.

The following table displays the input parameters that UELS used in the Hydrocad model. See the proposed Preliminary Development plans in Appendix A for details of the post-construction site.

Table 1, Input Parameters used for Hydrologic Analysis

Parameter	Value	Source
Curve Numbers	Varies	PSWMM
Rainfall Distribution	Type 1A	SCS/NRCS
Hydrologic Soil Group	B	NRCS Web-Soil Survey
Design Infiltration Rate*	3.7 in/hr	NRCS Web-Soil Survey
Water Quality, 24 hr Design Storm	1.61 in	Div. 6 Table 603.02.C.3
2yr., 24 hr Design Storm	2.50 in	Div. 6 Table 603.02.C.3
5yr., 24 hr Design Storm	3.00 in	Div. 6 Table 603.02.C.3
10yr., 24 hr Design Storm	3.50 in	Div. 6 Table 603.02.C.3
25yr., 24 hr Design Storm	4.00 in	Div. 6 Table 603.02.C.3
50yr., 24 hr Design Storm	4.50 in	Div. 6 Table 603.02.C.3
100yr., 24 hr Design Storm	4.60 in	Div. 6 Table 603.02.C.3

*The design infiltration rate is based on the saturated hydraulic conductivity as identified by NRCS and includes a factor of safety of 4.0. Prior to final engineering, in-situ infiltration tests will be performed on site.

The following table displays the results of the hydrologic calculations. See Appendices D & E for all input and output data from the Hydrocad model.

Table 3, Comparison Table of Pre-Development to Post Development Release Rates

Storm Event	Pre-Developed (cfs)	Post-Developed, w/o Flow Control (cfs)	Post-Developed, w/ Flow Control (cfs)	Peak Elevation (ft)	Storage Volume* (cf)
WQ Storm	0.009	0.267	0.000	456.03	188
2yr.-24hr	0.041	0.431	0.000	456.75	593
5yr.-24hr	0.089	0.522	0.000	457.04	912
10yr.-24hr	0.146	0.613	0.000	457.34	1,291
25yr.-24hr	0.208	0.704	0.095	457.53	1,568
50yr.-24hr	0.276	0.794	0.283	457.57	1,623
100yr.-24hr	0.290	0.812	0.335	457.58	1,635

*1,1776 cf provided

5.0 Conveyance System

Storm pipe sizing will be evaluated fully during final engineering using the Rational Method per City of Stayton Public Works standards.

6.0 Conclusion

UELS prepared this preliminary stormwater report for the proposed development to generally conform with the City of Stayton, Division 6 Stormwater Management design standards. The body of this report provides detailed parameters and design criteria that demonstrate conformance with the design standards. Based on the information within this report and the analysis provided, UELS believes that the stormwater management plan for the proposed development meets or exceeds City of Stayton Stormwater Management Public Works Design Standards.

APPENDIX A

## PRELIMINARY SITE DEVELOPMENT PLANS

PRELIMINARY SITE IMPROVEMENTS
STAYTON VETERINARY HOSPITAL
1308 NORTH 1ST STREET AVE
STAYTON, OREGON

SHEET INDEX

C100 - COVER SHEET
C101 - EXISTING CONDITIONS/DEMO PLAN
C102 - SITE PLAN
C200 - GRADING AND DRAINAGE PLAN
C300 - UTILITY PLAN

SHEET REVISIONS

PROPERTY

TAX MAP: 9S-01W-10AC
TAX LOTS: 2400, 2500, 2600, 2700, & 2800
TOTAL NET AREA: 0.96 ACRES

SITE ADDRESS:
1308, 1328, & 1336 N FIRST AVE
181 & 190 E HOLLISTER ST
STAYTON, OR 97383

APPLICANT/OWNER

DARK HORSE ENTERPRISE LLC
C/O MICHAEL REYNOLDS
1308 N 1ST AVENUE
STAYTON, OR 97383
(503) 769-7387

OREGON STATE MAP

PORTLAND
SALEM
CORVALLIS
Project Location
STAYTON
LEBANON
EUGENE
BEND
MEDFORD
KLAMATH FALLS
84
20
101
5
97

VICINITY MAP

SHAFF RD SE
FERN RIDGE RD SE
W REGIS ST
E CEDAR ST
SUBJECT PROPERTY
E PINE ST
E HOLLISTER ST
W LOCUST ST
N FIRST AVE
N 3RD AVE
N 2ND AVE
N 6TH AVE
E JEFFERSON ST
W WASHINGTON ST
E VIRGINIA ST
E BURNETT ST
N GARDNER AVE
N

NOT TO SCALE

DESIGN TEAM

CIVIL ENGINEER

UDELL ENGINEERING AND LAND SURVEYING, LLC
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JEFFERSON, OR 97352
(541) 936-0980
CONTACT: TRAVIS SHEFFIELD
TRAVIS@PUREENERGY.GROUP

PROJECT LEGENDS

EXISTING SYMBOL LEGEND

- EXISTING CONTROL POINT
- EXISTING GAS VALVE
- EXISTING WATER VALVE
- EXISTING WATER METER
- EXISTING FIRE HYDRANT
- EXISTING POWER POLE
- EXISTING 6' CYCLONE FENCE
- EXISTING 6' WOOD FENCE
- EXISTING SD LINE LOCATE
- EXISTING SS LINE LOCATE
- EXISTING WATER LINE LOCATE
- EXISTING PHONE LINE LOCATE
- EXISTING UNDERGROUND POWER LOCATE
- EXISTING OVERHEAD POWER
- EXISTING GAS LINE LOCATE
- EXISTING COMMUNICATION LINE LOCATE
- EXISTING CONTOUR ELEVATION

ABBREVIATIONS LEGEND

SS - SANITARY SEWER
SD - STORM DRAIN
MH - MANHOLE
CB - CATCH BASIN
CO - CLEAN OUT
PP - UTILITY POLE
IE - INVERT ELEVATION (FLOW LINE)
FF - FINISH FLOOR
R.O.W. - RIGHT-OF-WAY
FD - FOUND
CS - COUNTY SURVEY
IR - IRON ROD
R - RADIUS
BO - BLOWOFF
S.L. - STREET LIGHT
TC - TOP FACE OF CURB
BW - BACK OF WALK
CL - CENTERLINE
FH - FIRE HYDRANT
CI - CURB INLET
T.O.P. - TOP OF PIPE
FL - FLOW LINE
PUE - PUBLIC UTILITY EASEMENT
EX OR (E) - EXISTING
(P) - PROPOSED
PE - PLAIN END
FLGD OR FLG - FLANGED
MJ - MECHANICAL JOINT
D.I. - DUCTILE IRON
W/L - WATERLINE
TW - TOP OF WALL
SDAD - STORM DRAIN AREA DRAIN

GRADING LEGEND

S = 0.00% - SURFACE DRAIN DIRECTION
(E)P 000.00 - EXISTING TOP OF PAVEMENT ELEVATION
(E)TC 000.00 - EXISTING TOP OF CURB ELEVATION
(E)G 000.00 - EXISTING GROUND ELEVATION
P 000.00 - DESIGN TOP OF ASPHALT PAVEMENT ELEVATION
C 000.00 - DESIGN TOP OF CONCRETE PAVEMENT ELEVATION
W 000.00 - DESIGN TOP OF SIDEWALK ELEVATION
TC 000.00 - DESIGN TOP OF CURB ELEVATION
GR 000.00 - DESIGN TOP OF GRAVEL ELEVATION
GND 000.00 - DESIGN TOP OF GROUND ELEVATION
TW 000.00 - DESIGN TOP OF WALL ELEVATION

DESIGN SYMBOL LEGEND

- DESIGN WATER METER
- DESIGN CURB INLET
- DESIGN CATCH BASIN
- DESIGN DITCH INLET
- DESIGN SS MANHOLE
- DESIGN SD MANHOLE
- DESIGN WATER VALVE
- DESIGN FIRE HYDRANT

THIS MAP WAS PREPARED
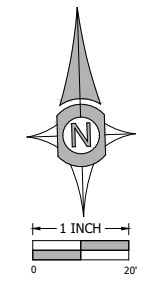FOR PLANNING PURPOSES
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FOR CONSTRUCTION.

COVER SHEET
STAYTON VETERINARY HOSPITAL
1308 N. FIRST AVE
STAYTON OR 97383

DATE: 04/02/24
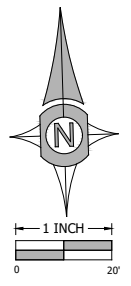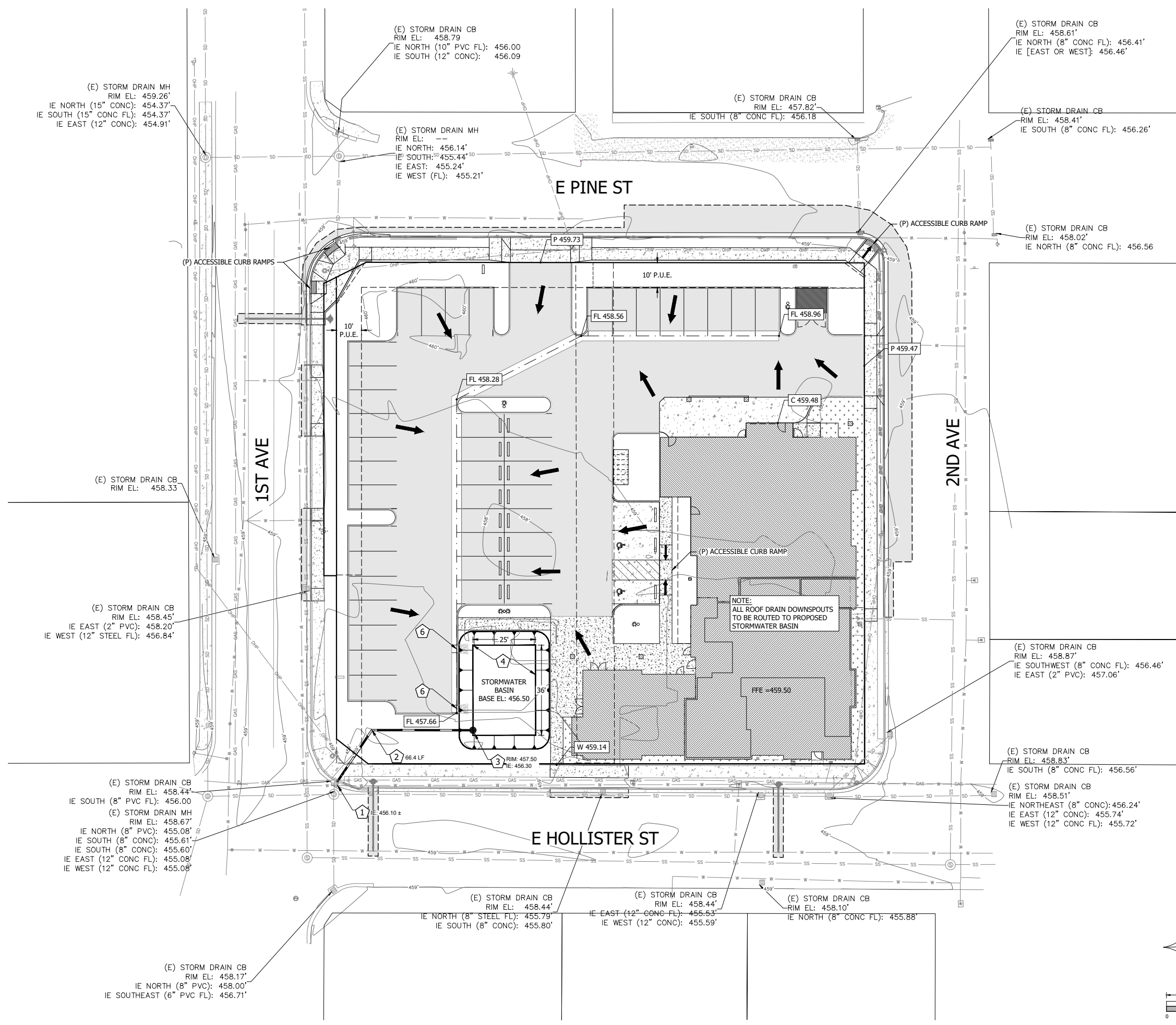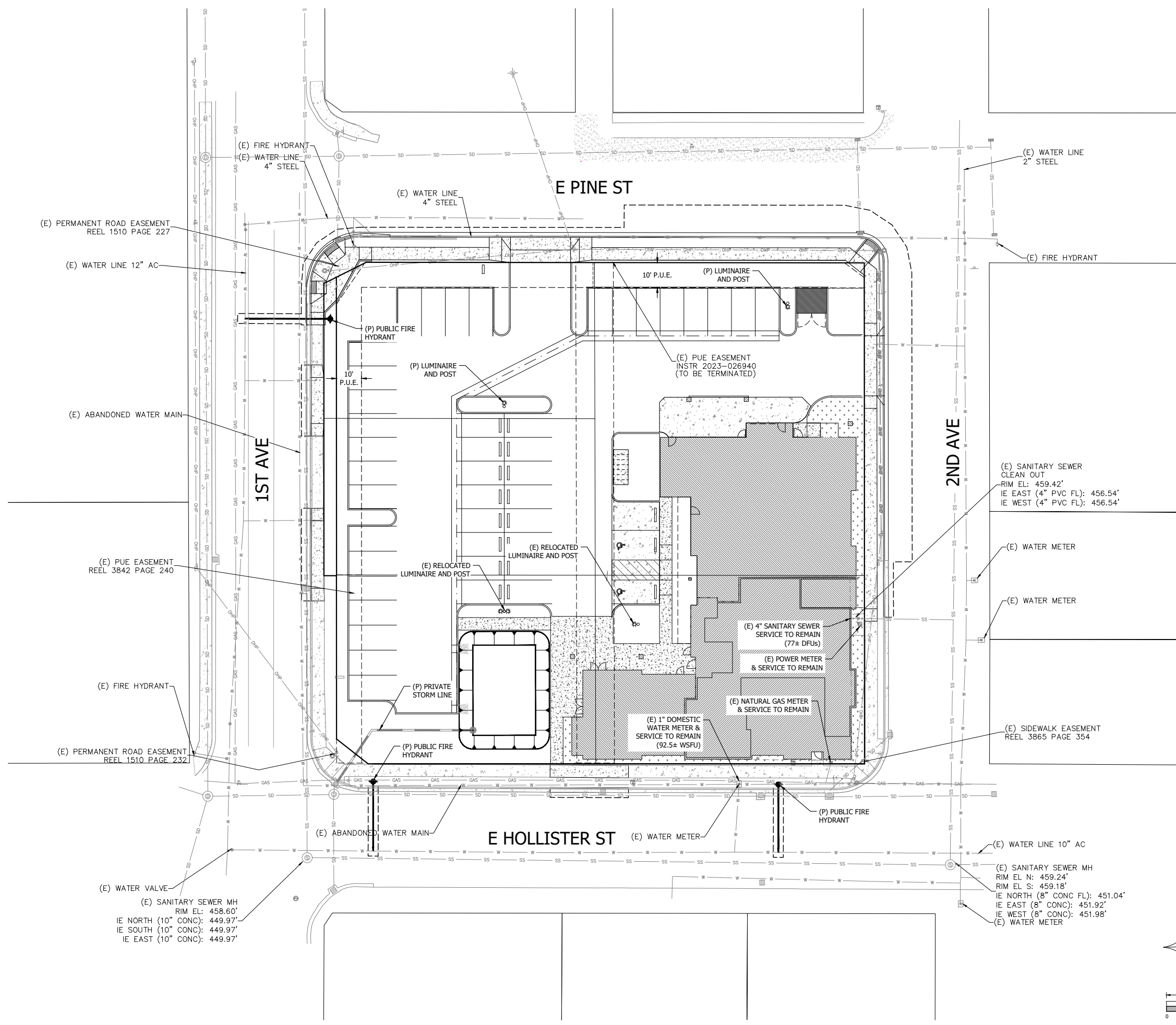PROJECT: 23-231 STAYTON VETERINARY HOSPITAL
DRAWN BY: ATR
CHECKED BY: BSV

PLAN REVISIONS | DATE

Sheet
C100

SCALE: SEE BARSCALE

E PINE ST

E HOLLISTER ST

1ST AVE

2ND AVE

TREE LEGEND

- EXISTING DECIDUOUS TREE TO REMAIN
- EXISTING EVERGREEN TREE TO REMAIN
- ⊗ EXISTING TREE TO BE REMOVED

DEMOLITION NOTES
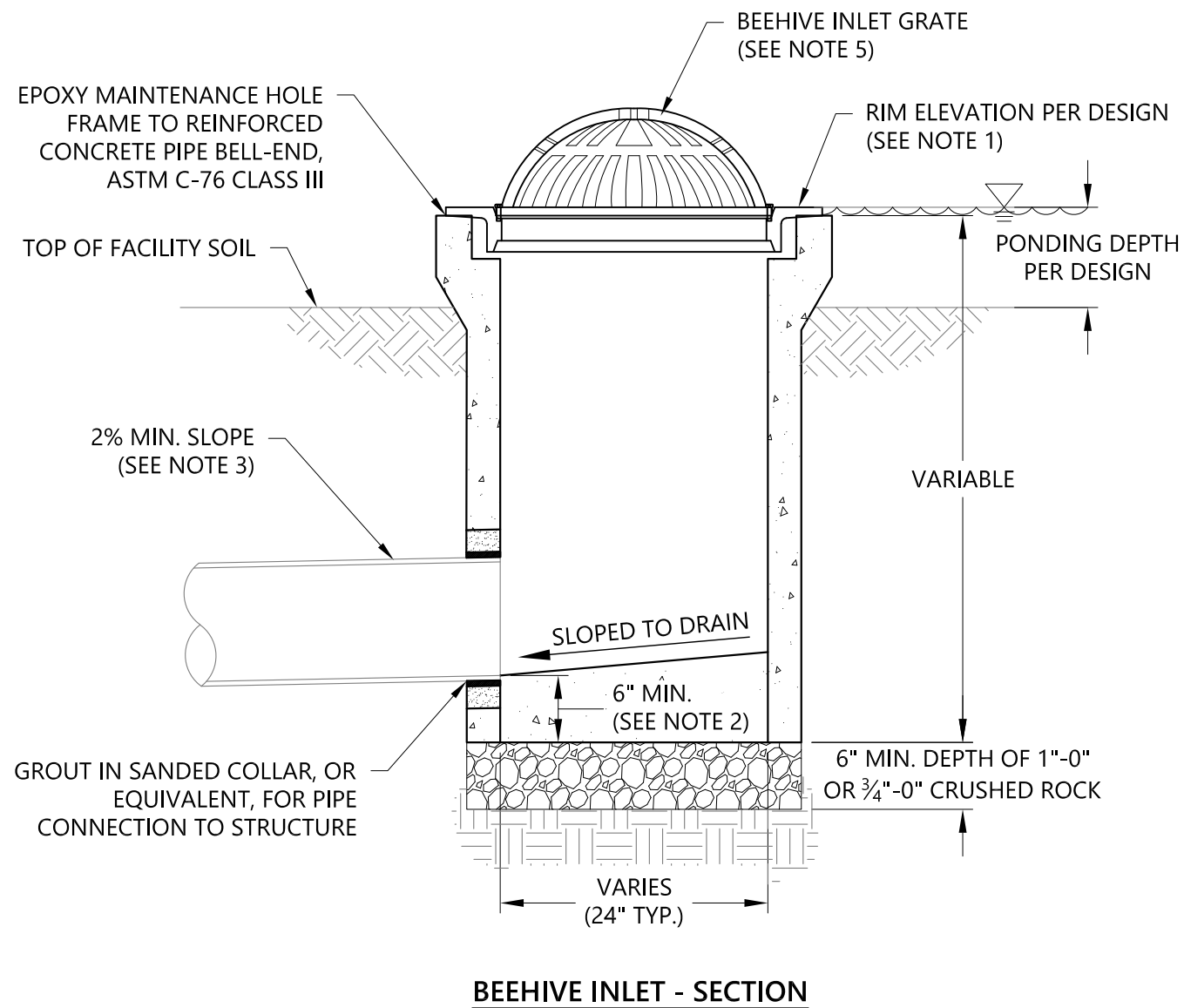
1	EXISTING DRIVEWAY ACCESS TO BE REMOVED.
2	EXISTING PAVEMENT TO BE SAWCUT AND REMOVED.
3	EXISTING CURB TO BE REMOVED.
4	EXISTING SIDEWALK TO BE REMOVED.
5	EXISTING GRAVEL TO BE REMOVED
6	EXISTING STORM DRAIN CATCH BASIN AND PIPE TO BE REMOVED
7	EXISTING CONCRETE TO BE REMOVED
8	EXISTING OVERHEAD UTILITY LINES TO BE REMOVED
9	EXISTING UTILITY POLE TO BE REMOVED
10	EXISTING WATER METER TO BE REMOVED
11	EXISTING MONUMENT SIGN TO BE RELOCATED
12	EXISTING LIGHT POLE AND BASE TO BE RELOCATED
13	EXISTING MAILBOXES TO BE REMOVED

PROJECT VERTICAL DATUM -- NAVD 88

ALL ELEVATIONS ARE SHOWN ON THE VERTICAL DATUM OF NAVD 88. ELEVATIONS LABELED FOR EXISTING UTILITIES AND STRUCTURES ARE BASED FROM COLLECTION OF SURVEY DATA BY UDELL ENGINEERING AND LAND SURVEYING, LLC.

THE LOCATION AND DESCRIPTIONS OF EXISTING UTILITIES SHOWN ON THE DRAWINGS ARE COMPILED FROM AVAILABLE RECORDS AND/OR FIELD SURVEYS. THE ENGINEER OR UTILITY COMPANIES DO NOT GUARANTEE THE ACCURACY OR THE COMPLETENESS OF SUCH RECORDS. CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION.

ATTENTION: OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES BY CALLING THE CENTER AT (503) 232-1987.

THIS MAP WAS PREPARED FOR PLANNING PURPOSES ONLY. NOT TO BE USED FOR CONSTRUCTION.

PLAN REVISIONS	DATE

Sheet C102

SCALE: SEE BARSCALE

1 INCH
0   20'

Map labels / annotations

(E) SIGN "N FIRST AVE" "E PINE ST" "STOP"

BERTOLI, EVELYN MAP NO. 091W10AC TAX LOT 02300

BAXTER, JAMES C II MAP NO. 091W10AC TAX LOT 02900

(E) SIGN "STOP"

WILCO FARMERS MAP NO. 091W10BD TAX LOT 01700

(E) PERMANENT ROAD EASEMENT REEL 1510 PAGE 227

(E) SIGN "SCHOOL XING"

(E) 5" VERTICAL PVC

(E) 5" VERTICAL PVC

(E) SIGN "STOP"

(E) UTILITY POLE TO BE PRESERVED

RICHMAN, TRACIE & LYNN MAP NO. 091W10AC TAX LOT 03700

(E) PUE EASEMENT INSTR 2023-026940 (TO BE TERMINATED)

MAP NO. 091W10AC TAX LOT 2400

MAP NO. 091W10AC TAX LOT 2800

MAP NO. 091W10AC TAX LOT 2500

(E) PROPERTY LINE TO BE REMOVED PER SEPARATE APPLICATION

GETTY LEASING INC C/O ELENA LOKIS ESQ MAP NO. 091W10BD TAX LOT 01800

(E) PUE EASEMENT REEL 3842 PAGE 240

SETTGAST, CAITLIN MAP NO. 091W10AC TAX LOT 03800

(E) PROPERTY LINE TO BE REMOVED PER SEPARATE APPLICATION

(E) ARBORVITAE CL 4' WIDE

(E) SIGN "VAN ACCESSIBLE"

FF EL = 459.59

MAP NO. 091W10AC TAX LOT 2600

MAP NO. 091W10AC TAX LOT 2700 (E) VETERINARY HOSPITAL 1308 N 1ST AVE

(E) MONUMENT SIGN "STAYTON VETERINARY HOSPITAL"

CROWTHER, JEFF & REBECCA MAP NO. 091W10AC TAX LOT 03900

(E) SIGN "STOP"

(E) SIGN "N FIRST AVE" "E HOLLISTER ST" "STOP"

(E) SIDEWALK EASEMENT REEL 3865 PAGE 354

(E) PERMANENT ROAD EASEMENT REEL 1510 PAGE 232

(E) PHONE MH

JUNGWIRTH, JEANETTE MAP NO. 091W10AC TAX LOT 09500

PARRISH, ROBERT & SHARRON MAP NO. 091W10AC TAX LOT 09400

SANCHEZ, LENARD & GLORIA MAP NO. 091W10AC TAX LOT 09200

13' DWY
20' DWY
24' DWY
22' DWY
17' DWY
23' DWY

START 2 3 4
END 2 3 4

N

E PINE ST

60' R/W

(E) PERMANENT ROAD EASEMENT REEL 1510 PAGE 227
(P) ACCESSIBLE CURB RAMP
(P) SIGHT VISION CLEARANCE (10'x10')
(E) RELOCATED MONUMENT SIGN
(P) 24.0' DRIVEWAY
(P) SIGHT VISION CLEARANCE (10'x10')
(P) ACCESSIBLE CURB RAMP
(P) SIDEWALK EASEMENT
(P) ACCESSIBLE CURB RAMP
(P) SIDEWALK EASEMENT
(P) ASPHALT CONCRETE PAVEMENT
(P) SIDEWALK, CURB & GUTTER, AND PAVEMENT
(P) SIGHT VISION CLEARANCE (10'x10')
(P) 48" VALLEY GUTTER
(P) SIGHT-OBSCURED TRASH ENCLOSURE
(P) 24.0' DRIVEWAY
(P) STANDARD CURB
(E) PUE EASEMENT INSTR 2023-026940 24' (TO BE TERMINATED)
(P) SIDEWALK, CURB & GUTTER, AND PAVEMENT PATCH
(P) SIGHT VISION CLEARANCE (10'x10')
60' R/W
(E) RIGHT-OF-WAY
(P) 48" VALLEY GUTTER
(P) ASPHALT CONCRETE PAVEMENT
(P) TRUCK BAY W/CONCRETE PAVEMENT
(P) 5' RIGHT-OF-WAY DEDICATION
(P) BICYCLE PARKING (7 SPACES)
(P) SIDEWALK
(P) BUILDING EXPANSION
50' R/W
(P) SIDEWALK, CURB & GUTTER, AND PAVEMENT PATCH
(P) CONCRETE PAVEMENT
(P) VAN ACCESSIBLE PARKING STALL
(E) PUE EASEMENT REEL 3842 PAGE 240
(P) ACCESSIBLE PARKING STALL
(P) STANDARD CURB
(P) SIDEWALK, CURB & GUTTER, AND PAVEMENT PATCH
(E) MONUMENT SIGN
(P) STORMWATER BASIN
(E) BUILDING AREA TO REMAIN
(P) BUILDING EXPANSION
(E) SIDEWALK EASEMENT REEL 3865 PAGE 354
(E) PERMANENT ROAD EASEMENT REEL 1510 PAGE 232
(P) SIDEWALK
(E) CURB RAMP
(P) SIDEWALK, CURB & GUTTER, AND PAVEMENT PATCH
(E) CURB RAMP

E HOLLISTER ST   60' R/W

1ST AVE
2ND AVE

VEHICLE PARKING SUMMARY		
FLOOR AREA	REQUIRED	SPACES PROVIDED
11,488 SF	40 SPACES (3.5/1000SF)	43 STANDARD, 10'x19' 1 ACCESSIBLE, 9'x19' 1 VAN ACCESSIBLE, 10'x18' (W/AISLE) 45 SPACES TOTAL
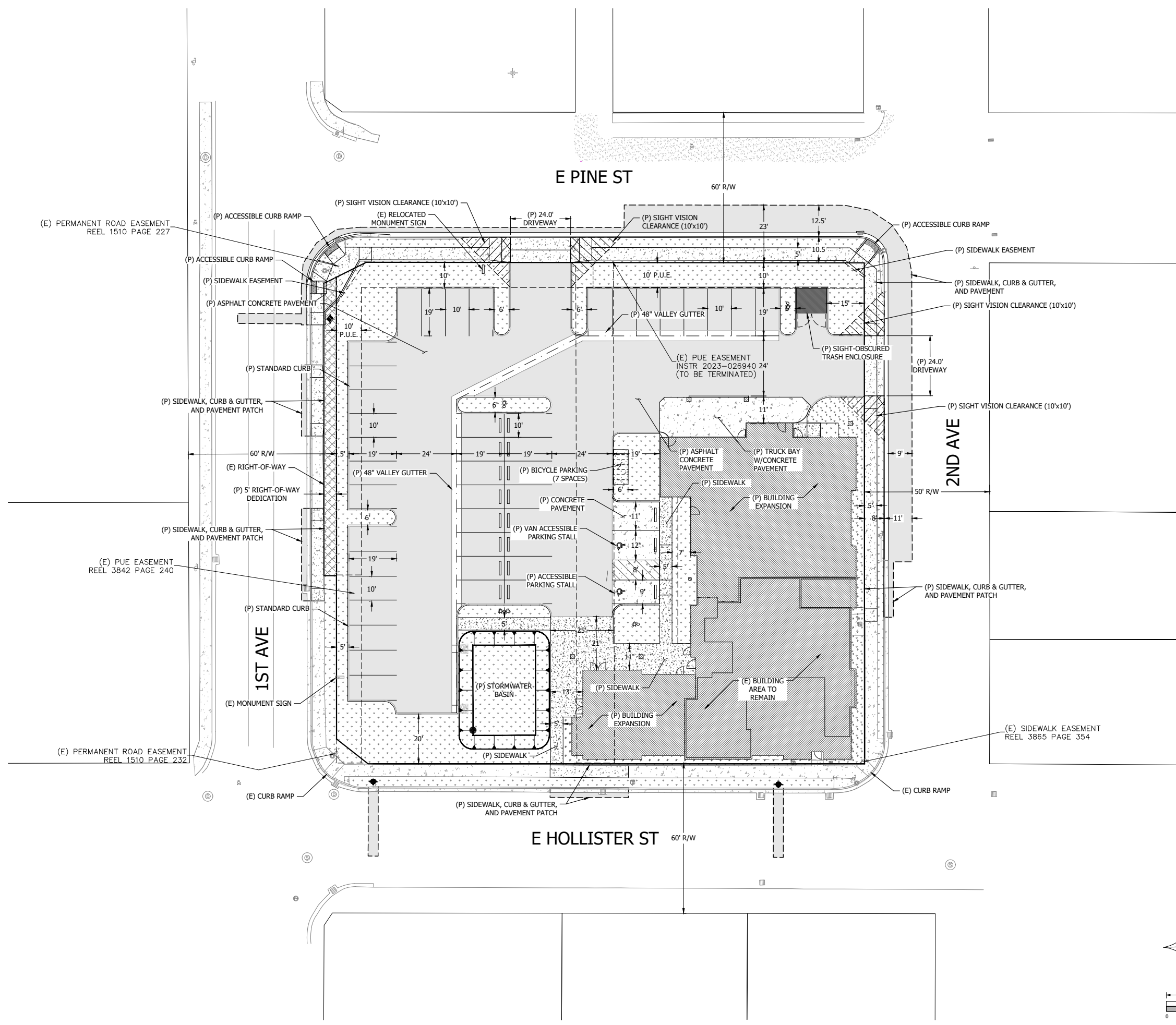
CLIENT:
STAYTON VETERINARY HOSPITAL
C/O MICHAEL REYNOLDS
1308 NORTH FIRST AVENUE
STAYTON, OR 97383
(503) 769-7387

UDELL ENGINEERING
AND
LAND SURVEYING, LLC
63 EAST ASH ST.,
LEBANON, OREGON 97355
(541) 451-5125 PH.
(541) 451-1366 FAX

PRELIMINARY SITE PLAN
STAYTON VETERINARY HOSPITAL
1308 N. FIRST AVE
STAYTON OR 97383

DATE: 04/02/24
PROJECT: 23-231 STAYTON VETERINARY HOSPITAL
DRAWN BY: ATR
CHECKED BY: JISV

THIS MAP WAS PREPARED FOR PLANNING PURPOSES ONLY. NOT TO BE USED FOR CONSTRUCTION.

PLAN REVISIONS	DATE

Sheet C102

SCALE: SEE BARSCALE

1 INCH
0   20'

N

E PINE ST

1ST AVE

2ND AVE

E HOLLISTER ST

(E) STORM DRAIN CB
RIM EL: 458.79
IE NORTH (10" PVC FL): 456.00
IE SOUTH (12" CONC): 456.09

(E) STORM DRAIN CB
RIM EL: 458.61'
IE NORTH (8" CONC FL): 456.41'
IE [EAST OR WEST]: 456.46'

(E) STORM DRAIN CB
RIM EL: 457.82'
IE SOUTH (8" CONC FL): 456.18

(E) STORM DRAIN CB
RIM EL: 458.41'
IE SOUTH (8" CONC FL): 456.26'

(E) STORM DRAIN MH
RIM EL: 459.26'
IE NORTH (15" CONC): 454.37'
IE SOUTH (15" CONC FL): 454.37'
IE EAST (12" CONC): 454.91'

(E) STORM DRAIN MH
RIM EL: --
IE NORTH: 456.14'
IE SOUTH: 455.44'
IE EAST: 455.24'
IE WEST (FL): 455.21'

(E) STORM DRAIN CB
RIM EL: 458.02'
IE NORTH (8" CONC FL): 456.56

(P) ACCESSIBLE CURB RAMP

(P) ACCESSIBLE CURB RAMPS

10' P.U.E.

10' P.U.E.

P 459.73

FL 458.56

FL 458.96

FL 458.28

P 459.47

C 459.48

(E) STORM DRAIN CB
RIM EL: 458.33

(E) STORM DRAIN CB
RIM EL: 458.45'
IE EAST (2" PVC): 458.20'
IE WEST (12" STEEL FL): 456.84'

(P) ACCESSIBLE CURB RAMP

NOTE:
ALL ROOF DRAIN DOWNSPOUTS
TO BE ROUTED TO PROPOSED
STORMWATER BASIN

(E) STORM DRAIN CB
RIM EL: 458.87'
IE SOUTHWEST (8" CONC FL): 456.46'
IE EAST (2" PVC): 457.06'

6

6

25'

4

STORMWATER
BASIN
BASE EL: 456.50

36'

FFE =459.50

FL 457.66

W 459.14

2   66.4 LF

3   RIM: 457.50
IE: 456.30

(E) STORM DRAIN CB
RIM EL: 458.83'
IE SOUTH (8" CONC FL): 456.56'

(E) STORM DRAIN CB
RIM EL: 458.44'
IE SOUTH (8" PVC FL): 456.00

(E) STORM DRAIN MH
RIM EL: 458.67'
IE NORTH (8" PVC): 455.08'
IE SOUTH (8" CONC): 455.61'
IE SOUTH (8" CONC): 455.60'
IE EAST (12" CONC FL): 455.08'
IE WEST (12" CONC FL): 455.08'

1   IE 456.10 ±

(E) STORM DRAIN CB
RIM EL: 458.51'
IE NORTHEAST (8" CONC): 456.24'
IE EAST (12" CONC): 455.74'
IE WEST (12" CONC FL): 455.72'

(E) STORM DRAIN CB
RIM EL: 458.17'
IE NORTH (8" PVC): 458.00'
IE SOUTHEAST (6" PVC FL): 456.71'

(E) STORM DRAIN CB
RIM EL: 458.44'
IE NORTH (8" STEEL FL): 455.79'
IE SOUTH (8" CONC): 455.80'

(E) STORM DRAIN CB
RIM EL: 458.44'
IE EAST (12" CONC FL): 455.53'
IE WEST (12" CONC): 455.59'

(E) STORM DRAIN CB
RIM EL: 458.10'
IE NORTH (8" CONC FL): 455.88'

GRADING LEGEND

362 — EXISTING SURFACE CONTOUR ELEVATION
362 — DESIGN SURFACE CONTOUR ELEVATION
→ — EXISTING SURFACE DRAIN DIRECTION
➜ — DESIGN SURFACE DRAIN DIRECTION

(E)P 000.00	EXISTING TOP OF PAVEMENT ELEVATION
(E)TC 000.00	EXISTING TOP OF CURB ELEVATION
(E)G 000.00	EXISTING GROUND ELEVATION
P 000.00	DESIGN TOP OF ASPHALT PAVE ELEVATION
C 000.00	DESIGN TOP OF CONCRETE PAVE ELEVATION
W 000.00	DESIGN TOP OF SIDEWALK ELEVATION
TC 000.00	DESIGN TOP OF CURB ELEVATION
GR 000.00	DESIGN TOP OF GRAVEL ELEVATION
GND 000.00	DESIGN TOP OF GROUND ELEVATION

STORM DRAIN NOTES

1   PROPOSED CONNECTION TO EXISTING PUBLIC STORM DRAIN CATCH BASIN, IE = 456.10±

2   PROPOSED PRIVATE STORM DRAIN PIPE - SIZE TO BE DETERMINED WITH BUILDING PERMIT SUBMITTAL.

3   PROPOSED PRIVATE BEEHIVE OVERFLOW INLET

4   PROPOSED UNLINED STORMWATER BASIN WITH 12" AMENDED SOIL LAYER.

5   PROPOSED CURB OPENING WITH SPLASH PAD AND ROCK BLANKET

THIS MAP WAS PREPARED
FOR PLANNING PURPOSES
ONLY. NOT TO BE USED
FOR CONSTRUCTION.

PLAN REVISIONS   DATE

Sheet C200

SCALE: SEE BARSCALE

1 INCH
0   20'

N

E PINE ST

2ND AVE

1ST AVE

E HOLLISTER ST

(E) PERMANENT ROAD EASEMENT
REEL 1510 PAGE 227

(E) WATER LINE 12" AC

(E) ABANDONED WATER MAIN

(E) PUE EASEMENT
REEL 3842 PAGE 240

(E) PERMANENT ROAD EASEMENT
REEL 1510 PAGE 232

(E) WATER VALVE

(E) SANITARY SEWER MH
RIM EL: 458.60'
IE NORTH (10" CONC): 449.97'
IE SOUTH (10" CONC): 449.97'
IE EAST (10" CONC): 449.97'

(E) FIRE HYDRANT

(E) FIRE HYDRANT
(E) WATER LINE
4" STEEL

(E) WATER LINE
4" STEEL

(E) WATER LINE
4" STEEL

(E) WATER LINE
2" STEEL

(E) FIRE HYDRANT

10' P.U.E.

(P) LUMINAIRE
AND POST

(E) PUE EASEMENT
INSTR 2023-026940
(TO BE TERMINATED)

(P) PUBLIC FIRE
HYDRANT

10'
P.U.E.

(P) LUMINAIRE
AND POST

(E) SANITARY SEWER
CLEAN OUT
RIM EL: 459.42'
IE EAST (4" PVC FL): 456.54'
IE WEST (4" PVC FL): 456.54'

(E) WATER METER

(E) RELOCATED
LUMINAIRE AND POST

(E) RELOCATED
LUMINAIRE AND POST

(E) WATER METER

(E) 4" SANITARY SEWER
SERVICE TO REMAIN
(77± DFUs)

(E) POWER METER
& SERVICE TO REMAIN

(P) PRIVATE
STORM LINE

(E) NATURAL GAS METER
& SERVICE TO REMAIN

(E) 1" DOMESTIC
WATER METER &
SERVICE TO REMAIN
(92.5± WSFU)

(E) SIDEWALK EASEMENT
REEL 3865 PAGE 354

(P) PUBLIC FIRE
HYDRANT

(P) PUBLIC FIRE
HYDRANT

(E) ABANDONED WATER MAIN

(E) WATER METER

(E) WATER LINE 10" AC

(E) SANITARY SEWER MH
RIM EL N: 459.24'
RIM EL S: 459.18'
IE NORTH (8" CONC FL): 451.04'
IE EAST (8" CONC): 451.92'
IE WEST (8" CONC): 451.98'
(E) WATER METER

THIS MAP WAS PREPARED
FOR PLANNING PURPOSES
ONLY. NOT TO BE USED
FOR CONSTRUCTION.

PLAN REVISIONS   DATE

Sheet C400

SCALE: SEE BARSCALE

1 INCH
0   20'

NOTES:

1. SET BEEHIVE RIM ELEVATION AT: CURB AND GUTTER FLOW LINE (FL) ELEVATION, 2" BELOW LOWEST SIDEWALK ELEVATION, OR 2" BELOW LOWEST TOP OF CURB ELEVATION. USE WHICHEVER IS LOWEST.

2. CONSTRUCT CONCRETE BASE SLOPED TO DRAIN. CONCRETE BASE SHOULD HAVE A MINIMUM THICKNESS OF 6" AT DRAIN PIPE INVERT.

3. IF CONNECTING TO A COMBINATION SEWER MAINTENANCE HOLE INSTALLATION OF A SWING-CHECK TYPE BACKWATER VALVE OR APPROVED EQUAL IS REQUIRED TO PREVENT ODOR EMISSIONS. INSTALL PER MANUFACTURER'S RECOMMENDATION.

4. IF BEEHIVE INLET IS LOCATED IN A LINED FACILITY, THEN ATTACH LINER TO STRUCTURE USING STAINLESS STEEL SHEAR BANDS.

5. INSTALL OLYMPIC FOUNDRY INC. MH25 BEEHIVE GRATE WITH MH30 24x4 REVERSIBLE RING, OR APPROVED EQUAL.

   5.1. CAST IRON ASTM A48 CL30
   5.2. 276 OPEN SQUARE INCHES
   5.3. BOLT GRATE TO FRAME IN 2 PLACES WITH $\frac{3}{8}$" SS HEX BOLT. COUNTER SINK NOT REQUIRED.
   5.4. BOLTS TO HAVE ANTI-SEIZE THREAD LUBRICANT APPLIED AT INSTALLATION.

BEEHIVE INLET GRATE (SEE NOTE 5)

RIM ELEVATION PER DESIGN (SEE NOTE 1)

EPOXY MAINTENANCE HOLE FRAME TO REINFORCED CONCRETE PIPE BELL-END, ASTM C-76 CLASS III

TOP OF FACILITY SOIL

PONDING DEPTH PER DESIGN

2% MIN. SLOPE (SEE NOTE 3)

VARIABLE

SLOPED TO DRAIN

6" MIN. (SEE NOTE 2)

6" MIN. DEPTH OF 1"-0" OR $\frac{3}{4}$"-0" CRUSHED ROCK

GROUT IN SANDED COLLAR, OR EQUIVALENT, FOR PIPE CONNECTION TO STRUCTURE

VARIES (24" TYP.)

BEEHIVE INLET - SECTION

Bureau of Environmental Services
CITY OF PORTLAND, OREGON

Chief Engineer

STANDARD DRAWING Title

BEEHIVE INLET

Effective Date: 07-31-20

Calc. Book No.: N/A

Baseline Report Date: N/A

Standard Drawing No.

P-309

VARIES PER PAC

3:1 MAX. SIDE SLOPES (TYP.)

PER PAC

FOR PARKING LOTS USE TIRE STOPS OR CURB CUTS WITH 12" OPENINGS FOR PASSAGE OF STORMWATER

2"

PONDING PER PAC, 18" MAX.

12" MAX.

BLENDED SOIL

EXISTING SUBGRADE
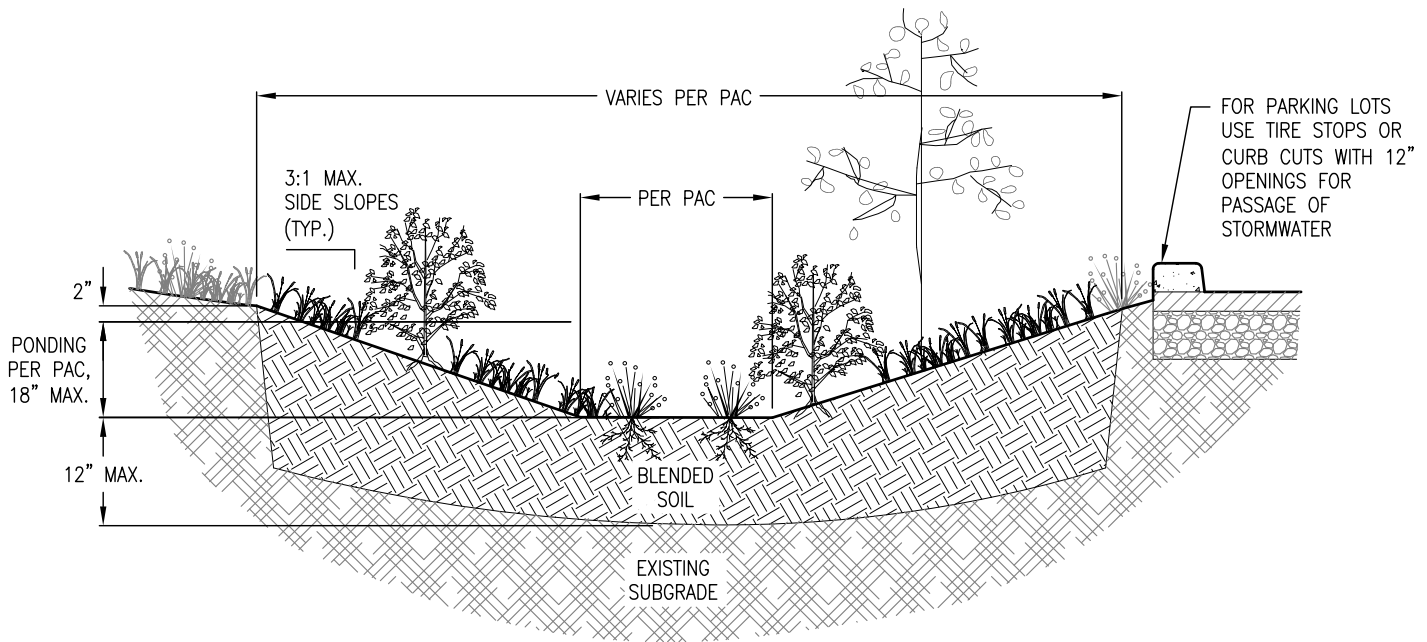
1. Detail intended as an example. Detail must match PAC assumptions and/or design report.

2. Setbacks: 5' from property lines except next to right-of-way; 10' from building foundations.

3. Rock Gallery/Storage Layer, as required: Size per the PAC. Construct rock galleries of $\frac{3}{4}$" washed drain rock overlain by a 3-4" filter layer of $\frac{1}{4}$" No.10 washed angular aggregate. Alternative configurations and materials such as cellular storage systems, drainage mats, and non-standard aggregates may be used under the Performance Approach, with BES approval.

4. Overflow: Overflow elevation must allow for 2" of freeboard, minimum. Protect from debris and sediment with strainer or grate.

5. Blended Soil: Use BES standard soil blend for stormwater facilities (SWMM Section 6.3) unless otherwise approved. Install minimum of 12" on native soil. Install minimum of 24" if there's a drainage layer or storage layer below the imported soil.

6. Vegetation: Refer to plant list in SWMM Section 3.5. Minimum container size is 1 gal. Number of plantings per 100sf of facility area:
   - Zone A (wet): 80 herbaceous plants OR 72 herbaceous plants and 4 small shrubs.
   - Zone B (moderate to dry): 7 large or small shrubs AND 70 groundcover plants.

   The delineation between Zone A and B shall be either at the outlet elevation or the check dam elevation, whichever is lowest. If project area is over 200sf consider adding a tree.

7. Entrance Erosion Control: Install river rock, flagstone, or similar to dissipate the energy of incoming water at entrances and ends of downspout extensions.

8. Check Dams: Spacing per the PAC. Check dam ends must be keyed into the native soil a minimum of 12".

9. Inspections: Call BDS IVR Inspection Line, (503) 823-7000, request 487. 3 inspections required.

CONSTRUCTION REQUIREMENTS

Mark the location of future facilities, and fence or cover facility locations after excavation. Do not allow vehicular traffic, foot traffic, material storage, or heavy equipment within 10 feet of the infiltration area except as needed to excavate, grade, and construct the facility. Do not allow entry of runoff or sediment during construction.

- DRAWING NOT TO SCALE -

PRESUMPTIVE AND PERFORMANCE DESIGN APPROACH

Bureau of Environmental Services

STORMWATER MANAGEMENT TYPICAL DETAILS FOR PRIVATE PROPERTY

BASIN WITHOUT UNDERDRAIN

SW-240

9-8-20

APPENDIX B

RAINFALL DATA

A.3.2 Santa Barbara Urban Hydrograph Method

The Santa Barbara Urban Hydrograph (SBUH) method was developed by the Santa Barbara County Flood Control and Water Conservation District to determine a runoff hydrograph for an urbanized area. The SBUH method is the method approved by the City for determining runoff for volume-based facilities and rate-volume-based facilities. The SBUH method depends on several variables: the contributing area, the time of concentration (t_c), the runoff curve numbers (CN), and the design storm.

Contributing Area

The contributing area is the area that drains to the stormwater facility. The contributing area must be quantified in order to evaluate the resulting site runoff.

Time of Concentration

The time of concentration, t_c, for a stormwater facility is the time for the runoff from the entire contributing area to reach the stormwater facility. The t_c is derived by calculating the overland flow time and the channelized flow time. The t_c depends on several factors, including ground slope, ground roughness, and distance of flow.

In the SBUH method, the minimum t_c that can be used is half the time step. Since the City's hyetograph uses 10-minute time steps, the minimum t_c that can be used with the City's hyetograph is 5 minutes. To calculate t_c, refer to BES's SDFDM. If the minimum calculated t_c is less than 5 minutes, use a t_c of 5 minutes.

Curve Numbers

Curve numbers (CNs) were originally developed by the NRCS to translate rainfall into runoff. The higher the CN, the more runoff for a given rainfall depth. The CN changes with development; pre-development CNs in the City have been correlated to the site's soil group and post-development CNs depend upon the post-development surface (the ecoroof curve number correlates to the well-draining soils typically used for ecoroofs). The CNs shown in Table A-8 should typically be used. The SDFDM provides post-development CNs for other surfaces.

Table A-8. Curve Numbers

Development Status	Area Description		Curve Number
Pre-development	Soil Group	A	65
		B	72
		C	79
		D	81
		Unidentified	81
Post-development	Impervious area		98
	Ecoroof		61

APPENDIX C

SOIL DATA

Soil Map may not be valid at this scale.

Map Scale: 1:514 if printed on A landscape (11" x 8.5") sheet.

Meters
0   5   10   20   30

Feet
0   20   40   80   120

N

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

USDA   **Natural Resources**
       Conservation Service

Web Soil Survey
National Cooperative Soil Survey

3/7/2024
Page 1 of 4

MAP LEGEND

MAP INFORMATION
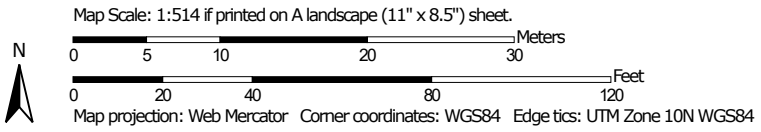
Area of Interest (AOI)
☐ Area of Interest (AOI)

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

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: Marion County Area, Oregon
Survey Area Data: Version 21, Sep 8, 2023

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

Date(s) aerial images were photographed: May 28, 2020—May 29, 2020

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.

USDA   **Natural Resources
Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

3/7/2024
Page 2 of 4

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
St	Sifton gravelly loam	B	1.0	100.0%
Totals for Area of Interest			**1.0**	**100.0%**

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

USDA **Natural Resources**
     Conservation Service

Web Soil Survey
National Cooperative Soil Survey

3/7/2024
Page 4 of 4

Soil Map may not be valid at this scale.

Map Scale: 1:514 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0   5   10   20   30

Feet
0   20   40   80   120

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

USDA   **Natural Resources
Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

3/7/2024
Page 1 of 3
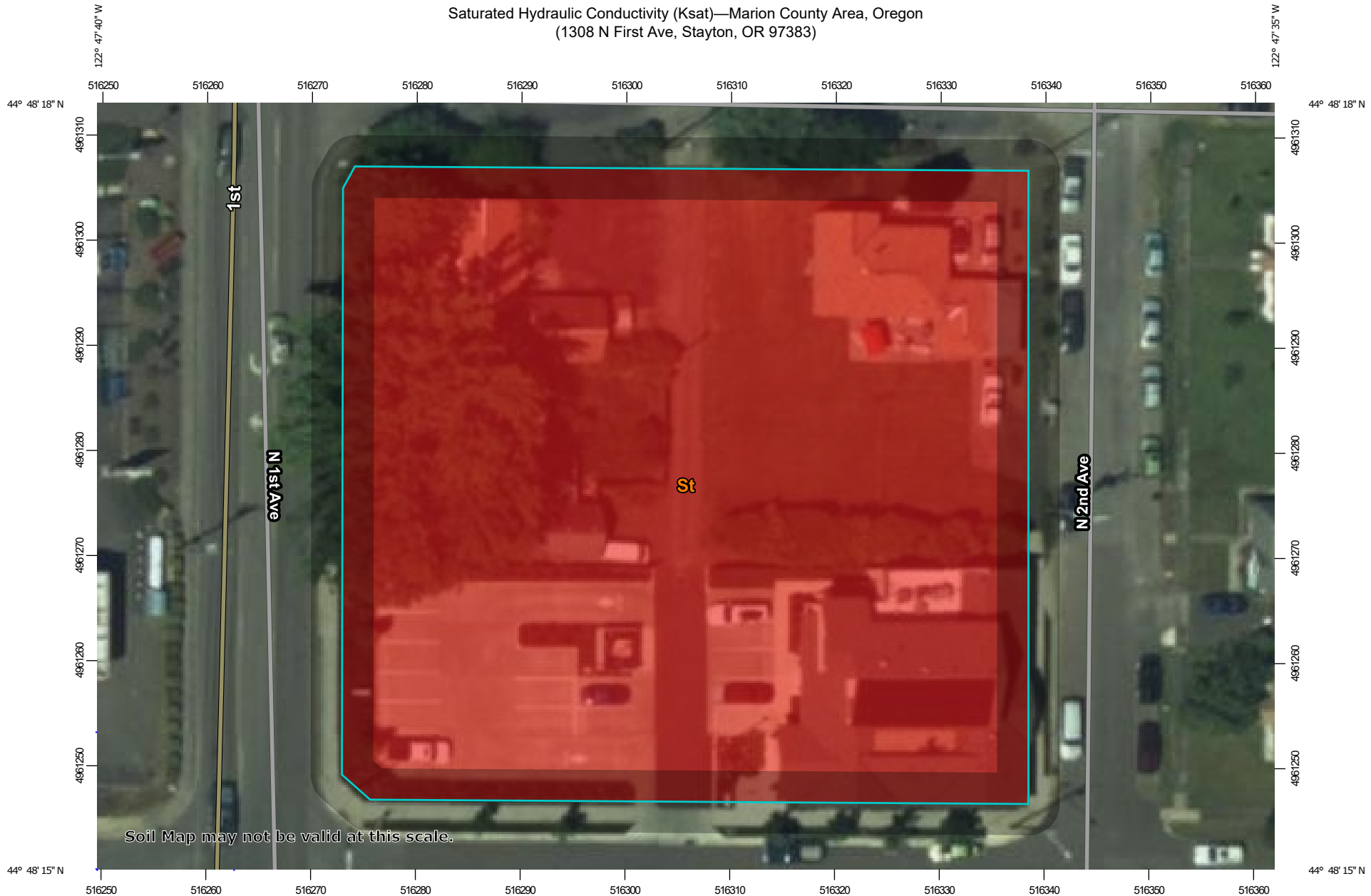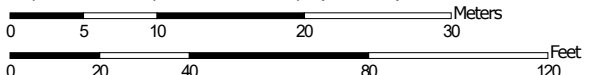
MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

= 104.9341

Not rated or not available

Soil Rating Lines

= 104.9341

Not rated or not available

Soil Rating Points

= 104.9341

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: Marion County Area, Oregon
Survey Area Data: Version 21, Sep 8, 2023

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

Date(s) aerial images were photographed: May 28, 2020—May 29, 2020

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
St	Sifton gravelly loam	104.9341 = 14.7 in/hr	1.0	100.0%
Totals for Area of Interest		With FS = 4.0, 3.7 in/hr	**1.0**	**100.0%**

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: 0

Bottom Depth: 36

Units of Measure: Inches

APPENDIX D

PRE-DEVELOPMENT HYDROCAD MODEL

3S

Pre-Dev

23-231 Stayton Vet Hospital_Pre
Prepared by Udell Engineering & Land Surveying
HydroCAD® 10.00-26 s/n 05283 © 2020 HydroCAD Software Solutions LLC

23-231 Stayton Veterinary Hospital
Type IA 24-hr WQ Storm Rainfall=1.61"
Printed 3/20/2024
Page 2
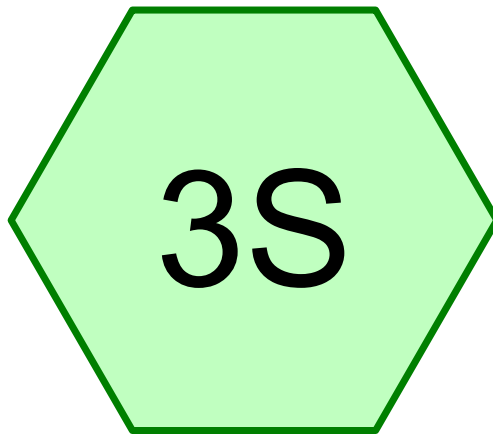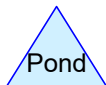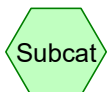
Summary for Subcatchment 3S: Pre-Dev

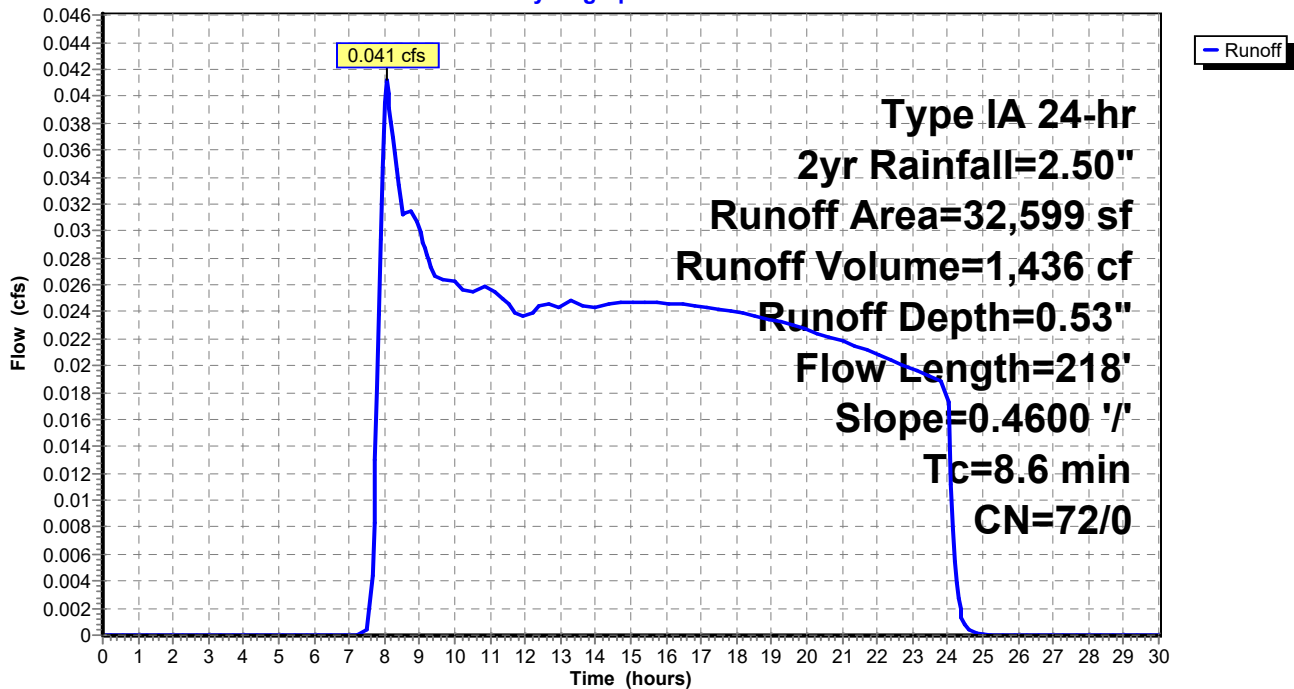Runoff   =   0.009 cfs @   18.62 hrs, Volume=   399 cf, Depth= 0.15"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr WQ Storm Rainfall=1.61"

	Area (sf)	CN	Description
*	32,599	72	
	32,599	72	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	218	0.4600	0.42		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.50"

Subcatchment 3S: Pre-Dev

Hydrograph

23-231 Stayton Vet Hospital_Pre
Prepared by Udell Engineering & Land Surveying
HydroCAD® 10.00-26 s/n 05283 © 2020 HydroCAD Software Solutions LLC

23-231 Stayton Veterinary Hospital
Type IA 24-hr 2yr Rainfall=2.50"
Printed 3/20/2024
Page 3

Summary for Subcatchment 3S: Pre-Dev

Runoff   =   0.041 cfs @   8.06 hrs, Volume=   1,436 cf, Depth= 0.53"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2yr Rainfall=2.50"

	Area (sf)	CN	Description
*	32,599	72	
	32,599	72	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	218	0.4600	0.42		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.50"

Subcatchment 3S: Pre-Dev

Hydrograph

Type IA 24-hr
2yr Rainfall=2.50"
Runoff Area=32,599 sf
Runoff Volume=1,436 cf
Runoff Depth=0.53"
Flow Length=218'
Slope=0.4600 '/'
Tc=8.6 min
CN=72/0

23-231 Stayton Vet Hospital_Pre
Prepared by Udell Engineering & Land Surveying
HydroCAD® 10.00-26 s/n 05283 © 2020 HydroCAD Software Solutions LLC

23-231 Stayton Veterinary Hospital
Type IA 24-hr 5yr Rainfall=3.00"
Printed 3/20/2024
Page 4

Summary for Subcatchment 3S: Pre-Dev

Runoff   =   0.089 cfs @   8.02 hrs, Volume=   2,195 cf, Depth= 0.81"
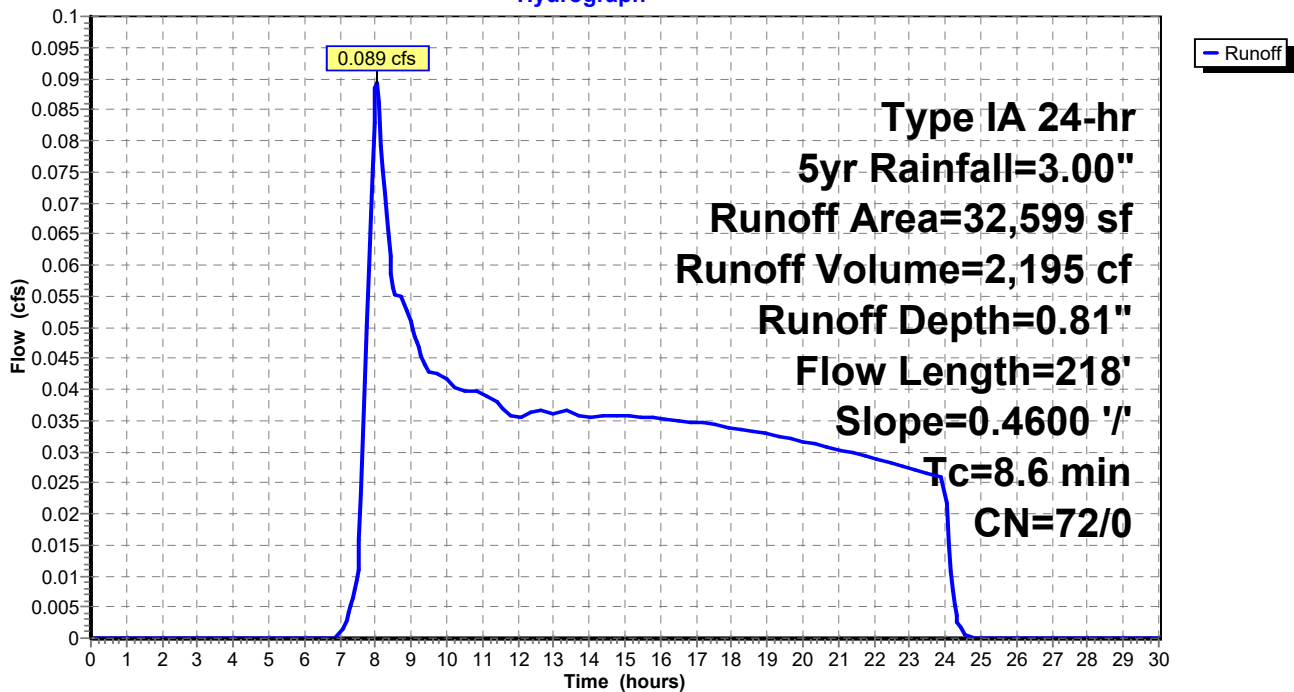
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 5yr Rainfall=3.00"

Area (sf)	CN	Description
* 32,599	72	
32,599	72	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	218	0.4600	0.42		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.50"

Subcatchment 3S: Pre-Dev

Hydrograph

Type IA 24-hr
5yr Rainfall=3.00"
Runoff Area=32,599 sf
Runoff Volume=2,195 cf
Runoff Depth=0.81"
Flow Length=218'
Slope=0.4600 '/'
Tc=8.6 min
CN=72/0

23-231 Stayton Vet Hospital_Pre
Prepared by Udell Engineering & Land Surveying
HydroCAD® 10.00-26 s/n 05283 © 2020 HydroCAD Software Solutions LLC

23-231 Stayton Veterinary Hospital
Type IA 24-hr 10yr Rainfall=3.50"
Printed 3/20/2024
Page 5

Summary for Subcatchment 3S: Pre-Dev

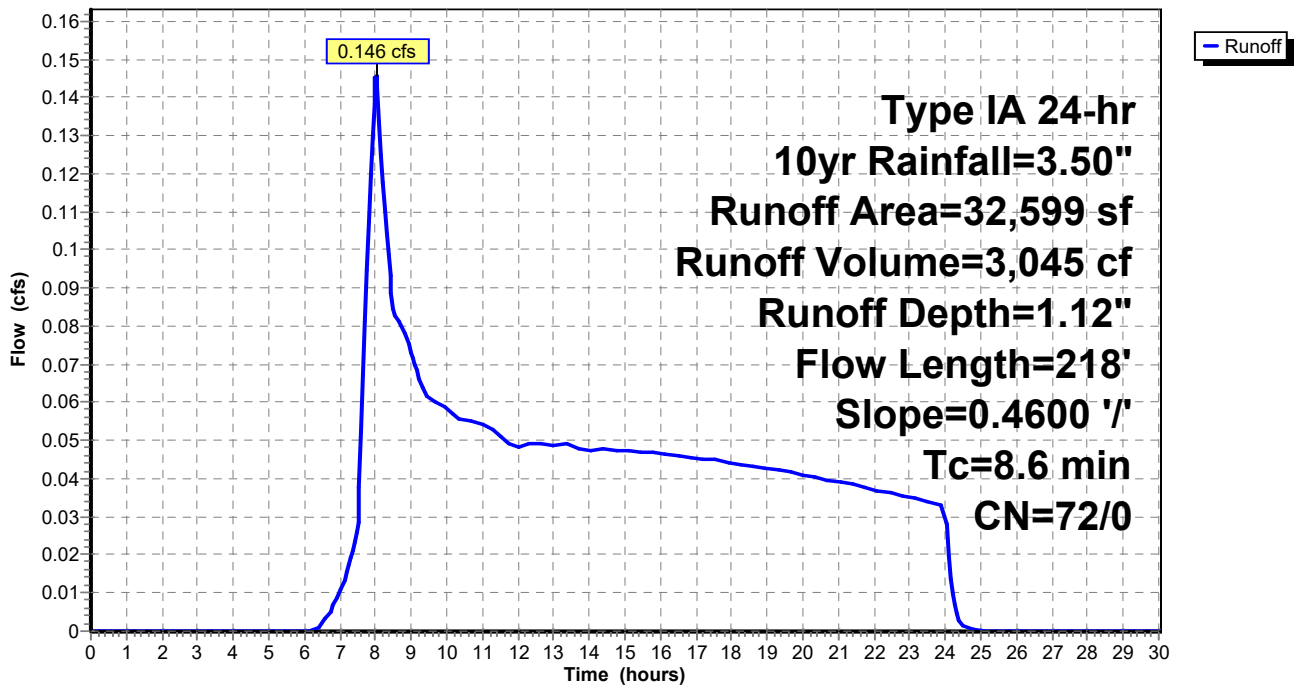Runoff   =   0.146 cfs @   8.01 hrs, Volume=   3,045 cf, Depth= 1.12"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10yr Rainfall=3.50"

	Area (sf)	CN	Description
*	32,599	72	
	32,599	72	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	218	0.4600	0.42		**Sheet Flow,**
					Grass: Dense n= 0.240 P2= 2.50"

Subcatchment 3S: Pre-Dev

Hydrograph

Type IA 24-hr
10yr Rainfall=3.50"
Runoff Area=32,599 sf
Runoff Volume=3,045 cf
Runoff Depth=1.12"
Flow Length=218'
Slope=0.4600 '/'
Tc=8.6 min
CN=72/0

23-231 Stayton Vet Hospital_Pre
Prepared by Udell Engineering & Land Surveying
HydroCAD® 10.00-26 s/n 05283 © 2020 HydroCAD Software Solutions LLC

23-231 Stayton Veterinary Hospital
Type IA 24-hr 25yr Rainfall=4.00"
Printed 3/20/2024
Page 6

Summary for Subcatchment 3S: Pre-Dev

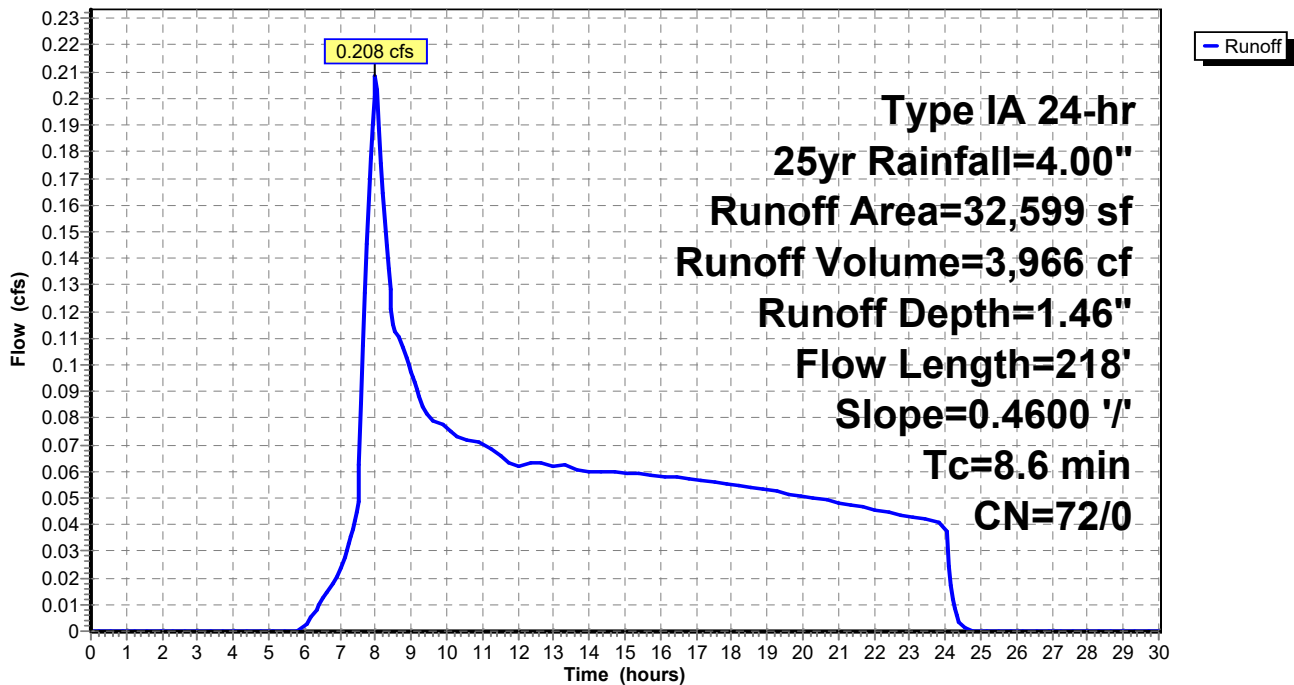Runoff   =   0.208 cfs @   8.01 hrs, Volume=   3,966 cf, Depth= 1.46"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25yr Rainfall=4.00"

	Area (sf)	CN	Description
*	32,599	72	
	32,599	72	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	218	0.4600	0.42		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.50"

Subcatchment 3S: Pre-Dev

Hydrograph

Type IA 24-hr
25yr Rainfall=4.00"
Runoff Area=32,599 sf
Runoff Volume=3,966 cf
Runoff Depth=1.46"
Flow Length=218'
Slope=0.4600 '/'
Tc=8.6 min
CN=72/0

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Type IA 24-hr 50yr Rainfall=4.50"
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Summary for Subcatchment 3S: Pre-Dev

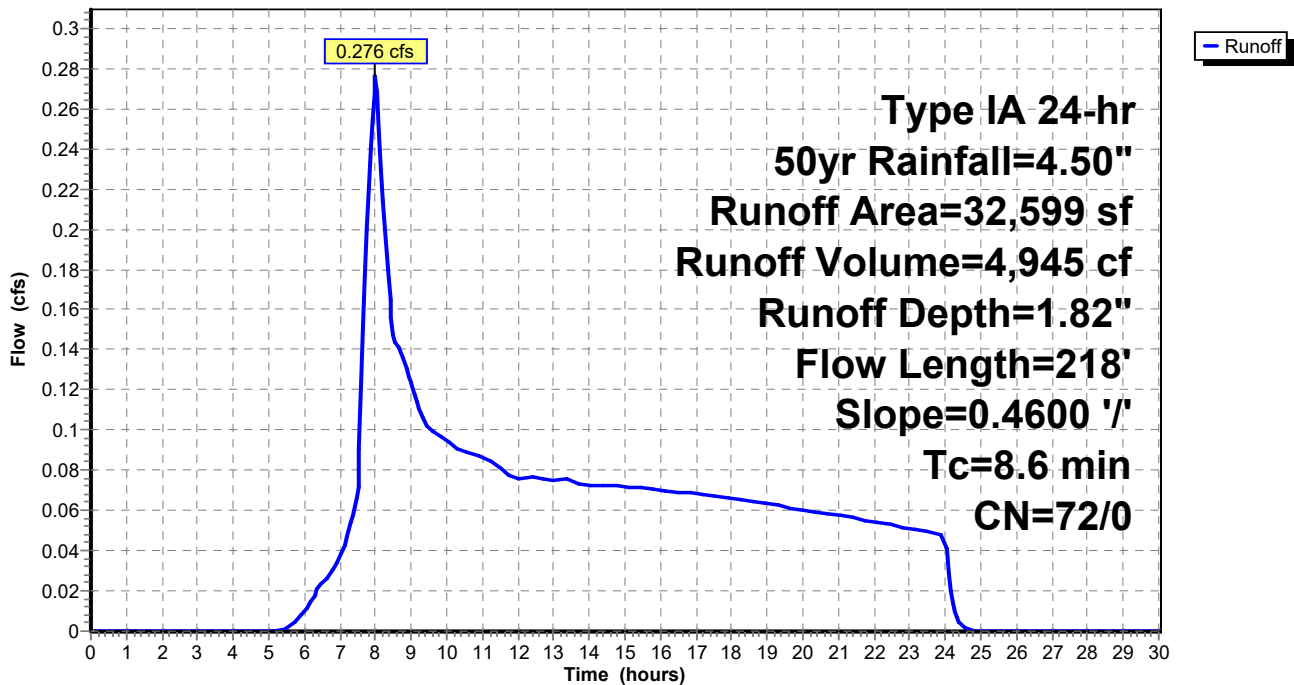Runoff   =   0.276 cfs @   8.00 hrs, Volume=   4,945 cf, Depth= 1.82"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50yr Rainfall=4.50"

Area (sf)	CN	Description
* 32,599	72	
32,599	72	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	218	0.4600	0.42		**Sheet Flow,**
					Grass: Dense n= 0.240 P2= 2.50"

Subcatchment 3S: Pre-Dev

Hydrograph

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Type IA 24-hr 100yr Rainfall=4.60"
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Summary for Subcatchment 3S: Pre-Dev

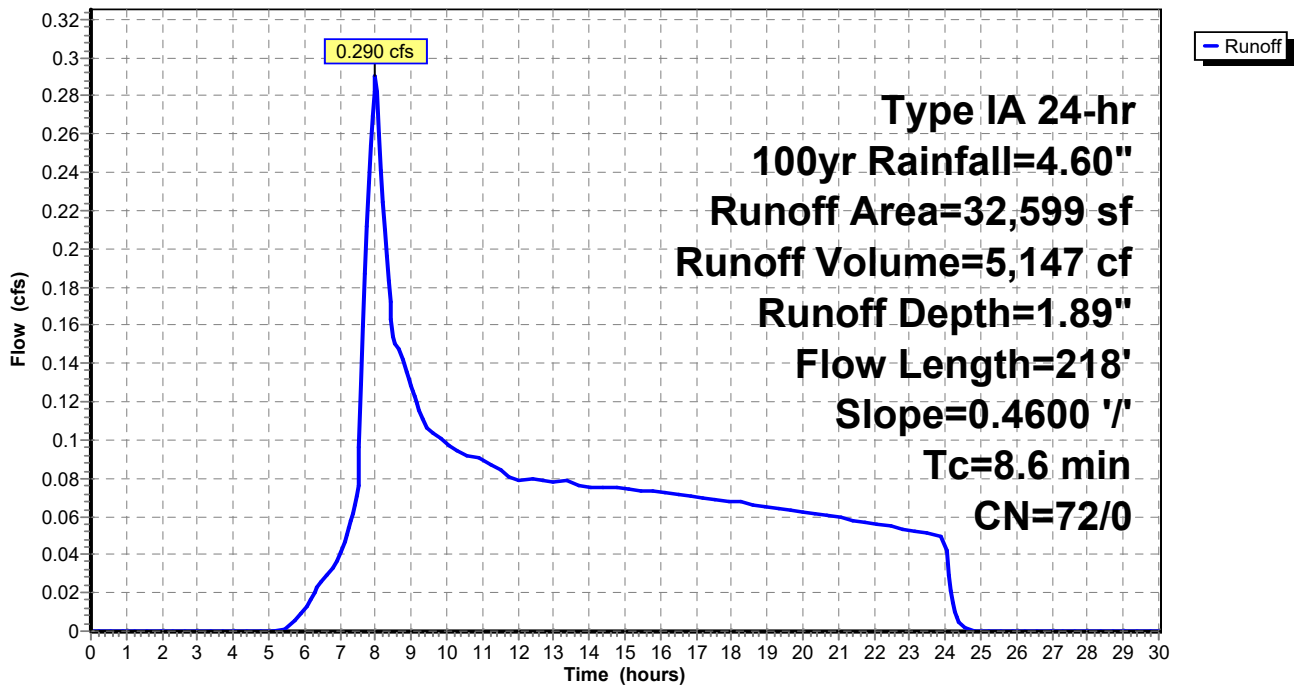Runoff   =   0.290 cfs @   8.00 hrs, Volume=   5,147 cf, Depth= 1.89"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100yr Rainfall=4.60"

Area (sf)	CN	Description
* 32,599	72	
32,599	72	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	218	0.4600	0.42		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.50"

Subcatchment 3S: Pre-Dev

Hydrograph

Type IA 24-hr
100yr Rainfall=4.60"
Runoff Area=32,599 sf
Runoff Volume=5,147 cf
Runoff Depth=1.89"
Flow Length=218'
Slope=0.4600 '/'
Tc=8.6 min
CN=72/0

APPENDIX E
POST-DEVELOPMENT HYDROCAD MODEL
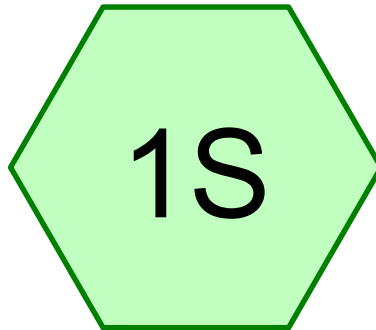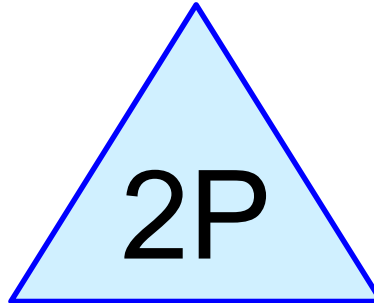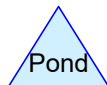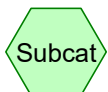
1S

Basin 1

2P

Stormwater Basin

Subcat   Reach   Pond   Link

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Type IA 24-hr 2yr Rainfall=2.50"
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Page 2

Summary for Subcatchment 1S: Basin 1

Runoff   =   0.431 cfs @   7.90 hrs, Volume=   6,169 cf, Depth= 2.27"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2yr Rainfall=2.50"

	Area (sf)	CN	Description
*	32,599	98	Pavement and Roofs
	32,599	98	100.00% Impervious Area

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

Subcatchment 1S: Basin 1

Hydrograph

Type IA 24-hr
2yr Rainfall=2.50"
Runoff Area=32,599 sf
Runoff Volume=6,169 cf
Runoff Depth=2.27"
Tc=5.0 min
CN=0/98
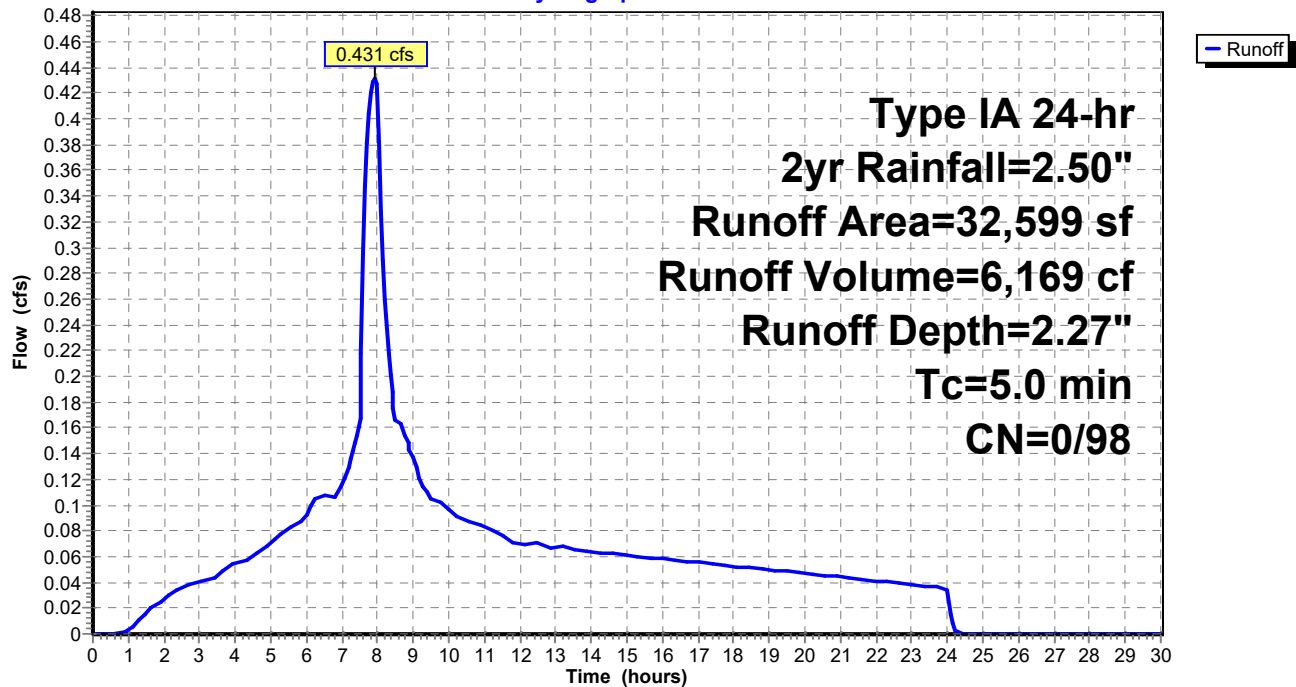
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Type IA 24-hr 2yr Rainfall=2.50"
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Page 3

Summary for Pond 2P: Stormwater Basin

Inflow Area =   32,599 sf, 100.00% Impervious, Inflow Depth = 2.27"   for 2yr event
Inflow   =   0.431 cfs @   7.90 hrs, Volume=   6,169 cf
Outflow   =   0.152 cfs @   7.40 hrs, Volume=   6,169 cf, Atten= 65%, Lag= 0.0 min
Discarded =   0.152 cfs @   7.40 hrs, Volume=   6,169 cf
Primary   =   0.000 cfs @   0.00 hrs, Volume=   0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 456.75' @ 8.80 hrs   Surf.Area= 1,776 sf   Storage= 593 cf

Plug-Flow detention time= 15.8 min calculated for 6,158 cf (100% of inflow)
Center-of-Mass det. time= 15.8 min (689.6 - 673.8)

Volume	Invert	Avail.Storage	Storage Description
#1	455.50'	0 cf	**37.00'W x 48.00'L x 2.17'H Overall Footprint**
			3,854 cf Overall - 3,197 cf Embedded = 657 cf x 0.0% Voids
#2	455.50'	355 cf	**37.00'W x 48.00'L x 1.00'H Soil Media**Inside #1
			1,776 cf Overall x 20.0% Voids
#3	456.50'	1,421 cf	**25.00'W x 36.00'L x 1.17'H WQ Basin Z=4.0**Inside #1
		1,776 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	455.50'	**3.700 in/hr Infiltration over Surface area**
#2	Primary	457.50'	**24.0000" Horiz. Beehive Overflow X 0.75** C= 0.600
			Limited to weir flow at low heads

Discarded OutFlow Max=0.152 cfs @ 7.40 hrs HW=455.52'   (Free Discharge)
└─**1=Infiltration** (Exfiltration Controls 0.152 cfs)

Primary OutFlow Max=0.000 cfs @ 0.00 hrs HW=455.50'   (Free Discharge)
└─**2=Beehive Overflow** (Controls 0.000 cfs)

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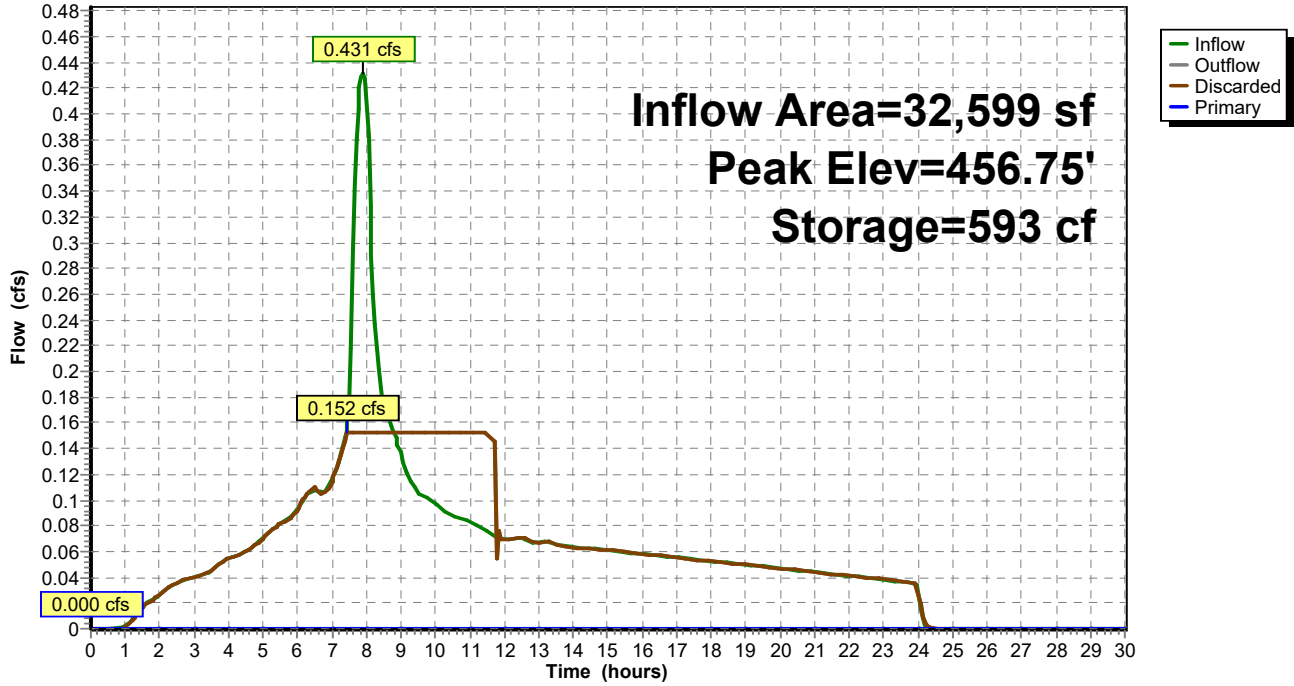23-231 Stayton Veterinary Hospital
Type IA 24-hr 2yr Rainfall=2.50"
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Page 4

Pond 2P: Stormwater Basin

Hydrograph

Inflow Area=32,599 sf
Peak Elev=456.75'
Storage=593 cf

Legend:
— Inflow
— Outflow
— Discarded
— Primary

0.431 cfs
0.152 cfs
0.000 cfs

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Type IA 24-hr 5yr Rainfall=3.00"
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Summary for Subcatchment 1S: Basin 1

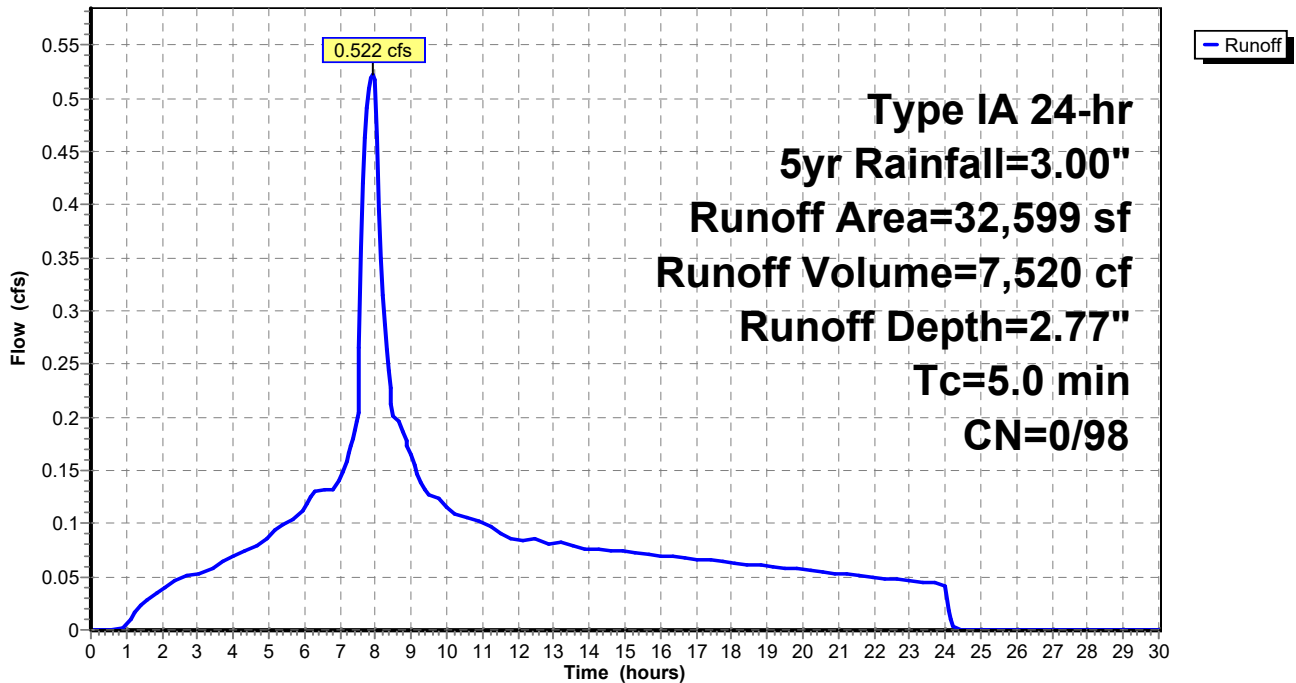Runoff   =   0.522 cfs @   7.90 hrs, Volume=   7,520 cf, Depth= 2.77"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 5yr Rainfall=3.00"

	Area (sf)	CN	Description
*	32,599	98	Pavement and Roofs
	32,599	98	100.00% Impervious Area

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

Subcatchment 1S: Basin 1

Hydrograph

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Type IA 24-hr 5yr Rainfall=3.00"
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Summary for Pond 2P: Stormwater Basin

Inflow Area =		32,599 sf,100.00% Impervious,	Inflow Depth = 2.77"	for 5yr event		
Inflow	=	0.522 cfs @ 7.90 hrs,	Volume=	7,520 cf		
Outflow	=	0.152 cfs @ 7.15 hrs,	Volume=	7,520 cf,	Atten= 71%,	Lag= 0.0 min
Discarded	=	0.152 cfs @ 7.15 hrs,	Volume=	7,520 cf		
Primary	=	0.000 cfs @ 0.00 hrs,	Volume=	0 cf		

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 457.04' @ 9.11 hrs   Surf.Area= 1,776 sf   Storage= 912 cf

Plug-Flow detention time= 29.2 min calculated for 7,508 cf (100% of inflow)
Center-of-Mass det. time= 29.1 min (697.4 - 668.2)

Volume	Invert	Avail.Storage	Storage Description
#1	455.50'	0 cf	**37.00'W x 48.00'L x 2.17'H Overall Footprint**
			3,854 cf Overall - 3,197 cf Embedded = 657 cf x 0.0% Voids
#2	455.50'	355 cf	**37.00'W x 48.00'L x 1.00'H Soil Media**Inside #1
			1,776 cf Overall x 20.0% Voids
#3	456.50'	1,421 cf	**25.00'W x 36.00'L x 1.17'H WQ Basin Z=4.0**Inside #1
		1,776 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	455.50'	**3.700 in/hr Infiltration over Surface area**
#2	Primary	457.50'	**24.0000" Horiz. Beehive Overflow X 0.75** C= 0.600
			Limited to weir flow at low heads

Discarded OutFlow Max=0.152 cfs @ 7.15 hrs HW=455.52' (Free Discharge)
└─**1=Infiltration** (Exfiltration Controls 0.152 cfs)

Primary OutFlow Max=0.000 cfs @ 0.00 hrs HW=455.50' (Free Discharge)
└─**2=Beehive Overflow** (Controls 0.000 cfs)

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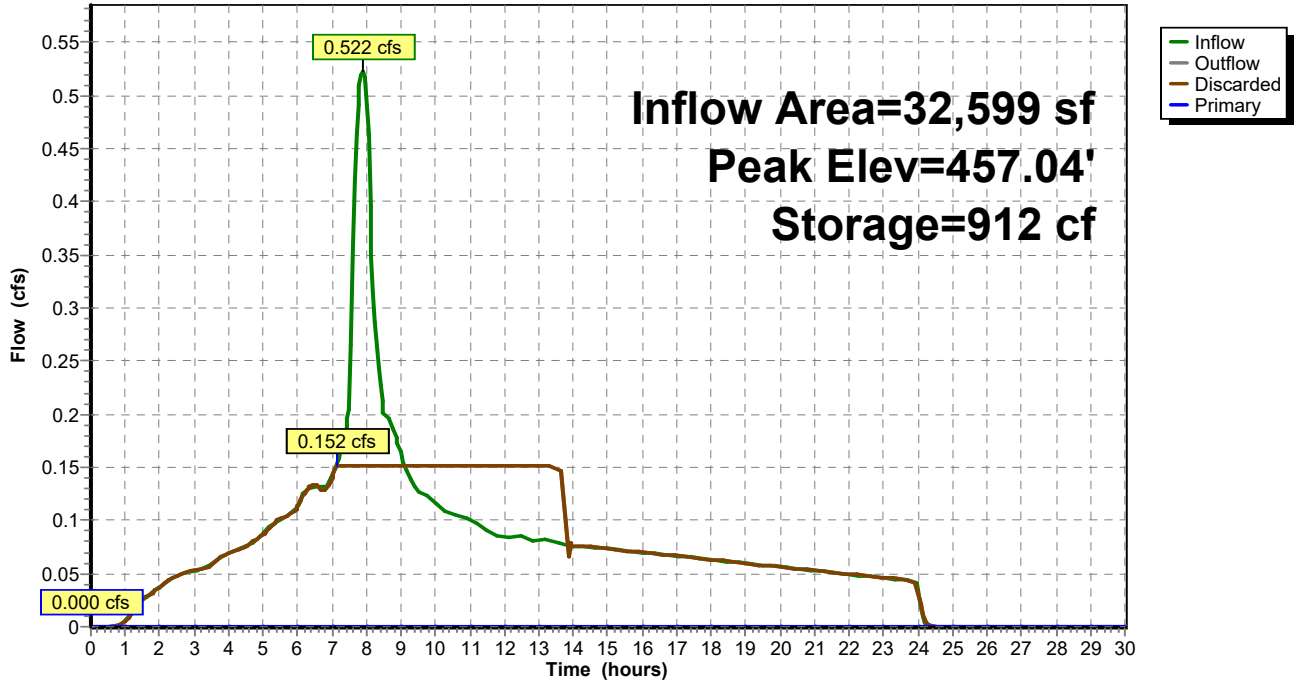
23-231 Stayton Veterinary Hospital
Type IA 24-hr 5yr Rainfall=3.00"
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Page 7

Pond 2P: Stormwater Basin

Hydrograph

Inflow Area=32,599 sf
Peak Elev=457.04'
Storage=912 cf

Legend:
- Inflow
- Outflow
- Discarded
- Primary

0.522 cfs
0.152 cfs
0.000 cfs

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Type IA 24-hr 10yr Rainfall=3.50"
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Summary for Subcatchment 1S: Basin 1

Runoff   =   0.613 cfs @   7.90 hrs, Volume=   8,874 cf, Depth= 3.27"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10yr Rainfall=3.50"

	Area (sf)	CN	Description
*	32,599	98	Pavement and Roofs
	32,599	98	100.00% Impervious Area

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

Subcatchment 1S: Basin 1

Hydrograph

Type IA 24-hr
10yr Rainfall=3.50"
Runoff Area=32,599 sf
Runoff Volume=8,874 cf
Runoff Depth=3.27"
Tc=5.0 min
CN=0/98
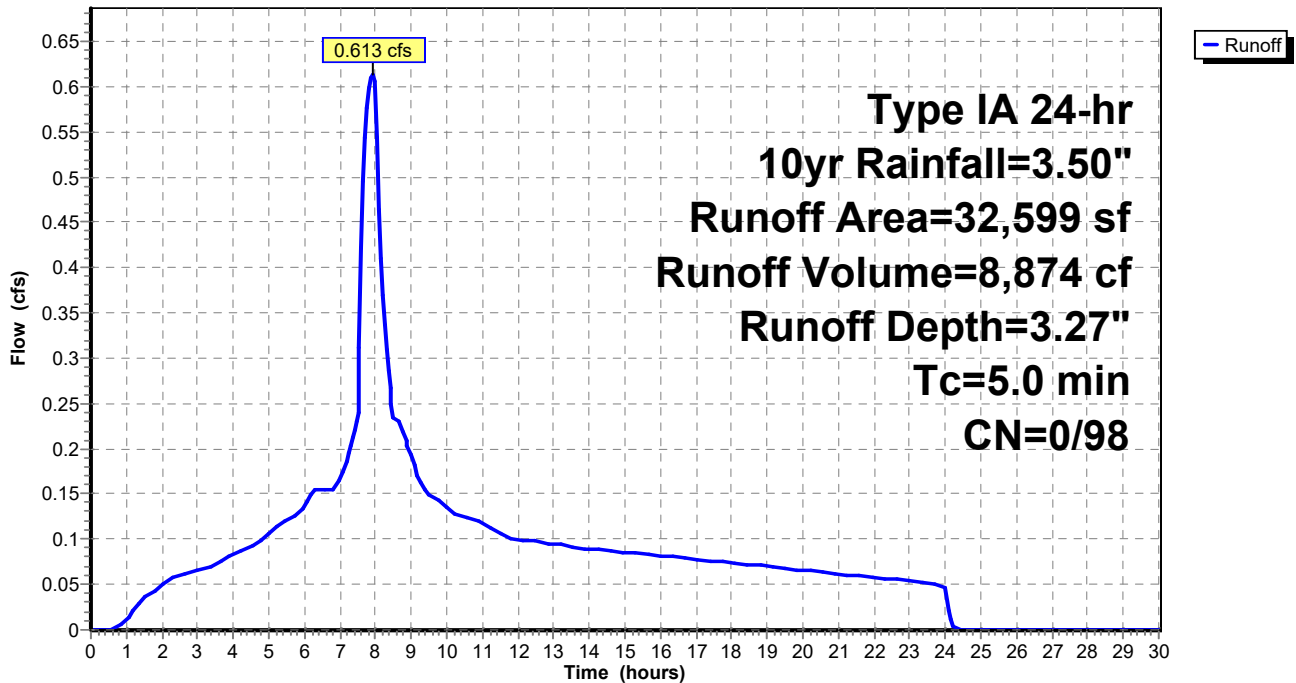
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Type IA 24-hr 10yr Rainfall=3.50"
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Summary for Pond 2P: Stormwater Basin

Inflow Area =   32,599 sf,100.00% Impervious, Inflow Depth = 3.27"   for 10yr event
Inflow   =   0.613 cfs @   7.90 hrs, Volume=   8,874 cf
Outflow   =   0.152 cfs @   6.30 hrs, Volume=   8,874 cf, Atten= 75%, Lag= 0.0 min
Discarded =   0.152 cfs @   6.30 hrs, Volume=   8,874 cf
Primary   =   0.000 cfs @   0.00 hrs, Volume=   0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 457.34' @ 9.42 hrs   Surf.Area= 1,776 sf   Storage= 1,291 cf

Plug-Flow detention time= 50.2 min calculated for 8,859 cf (100% of inflow)
Center-of-Mass det. time= 50.1 min (714.1 - 664.0)

Volume	Invert	Avail.Storage	Storage Description
#1	455.50'	0 cf	**37.00'W x 48.00'L x 2.17'H Overall Footprint**
			3,854 cf Overall - 3,197 cf Embedded = 657 cf x 0.0% Voids
#2	455.50'	355 cf	**37.00'W x 48.00'L x 1.00'H Soil Media**Inside #1
			1,776 cf Overall x 20.0% Voids
#3	456.50'	1,421 cf	**25.00'W x 36.00'L x 1.17'H WQ Basin Z=4.0**Inside #1
		1,776 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	455.50'	**3.700 in/hr Infiltration over Surface area**
#2	Primary	457.50'	**24.0000" Horiz. Beehive Overflow X 0.75** C= 0.600
			Limited to weir flow at low heads

Discarded OutFlow Max=0.152 cfs @ 6.30 hrs HW=455.52'   (Free Discharge)
└─**1=Infiltration** (Exfiltration Controls 0.152 cfs)

Primary OutFlow Max=0.000 cfs @ 0.00 hrs HW=455.50'   (Free Discharge)
└─**2=Beehive Overflow** (Controls 0.000 cfs)

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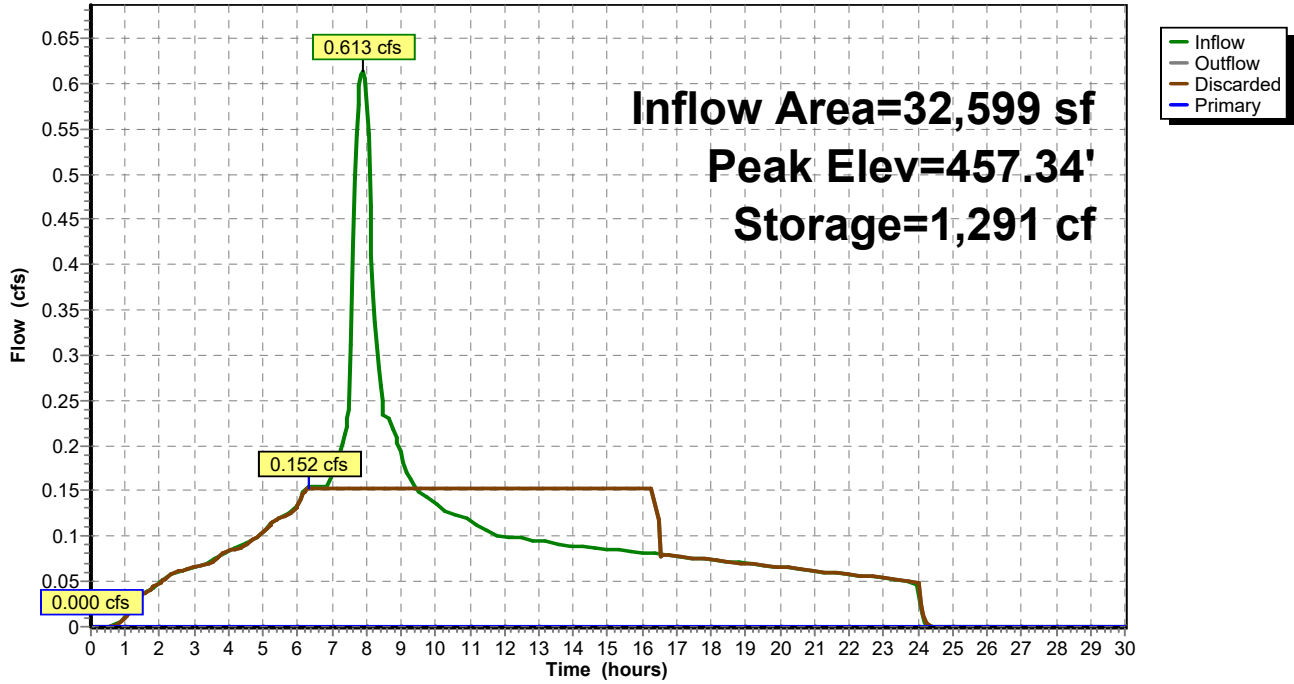HydroCAD® 10.00-26 s/n 05283 © 2020 HydroCAD Software Solutions LLC

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Type IA 24-hr 10yr Rainfall=3.50"
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Pond 2P: Stormwater Basin

Hydrograph

Inflow Area=32,599 sf
Peak Elev=457.34'
Storage=1,291 cf

Legend:
- Inflow
- Outflow
- Discarded
- Primary

Peak annotations: 0.613 cfs, 0.152 cfs, 0.000 cfs

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Type IA 24-hr 25yr Rainfall=4.00"
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Summary for Subcatchment 1S: Basin 1

Runoff   =   0.704 cfs @   7.90 hrs, Volume=   10,228 cf, Depth= 3.77"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25yr Rainfall=4.00"

	Area (sf)	CN	Description
*	32,599	98	Pavement and Roofs
	32,599	98	100.00% Impervious Area

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

Subcatchment 1S: Basin 1

Hydrograph

Type IA 24-hr
25yr Rainfall=4.00"
Runoff Area=32,599 sf
Runoff Volume=10,228 cf
Runoff Depth=3.77"
Tc=5.0 min
CN=0/98
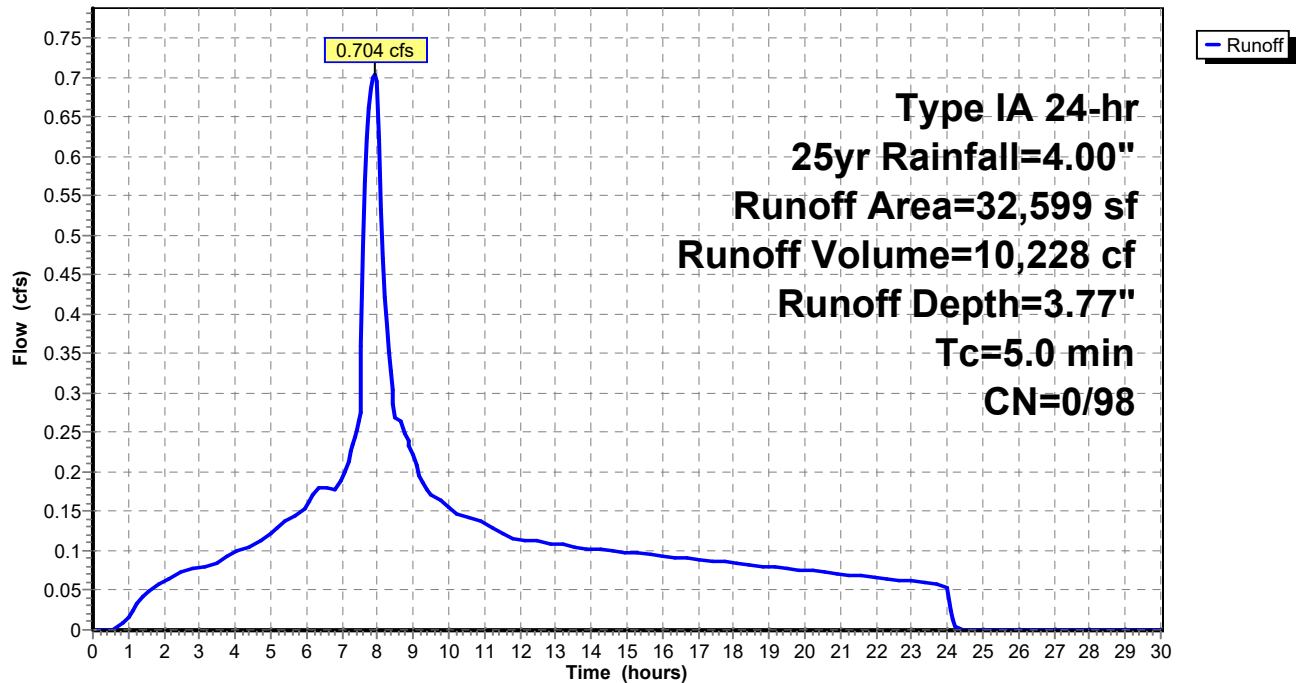
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Summary for Pond 2P: Stormwater Basin

Inflow Area =		32,599 sf,	100.00% Impervious,	Inflow Depth = 3.77"	for 25yr event	
Inflow	=	0.704 cfs @	7.90 hrs,	Volume=	10,228 cf	
Outflow	=	0.247 cfs @	8.80 hrs,	Volume=	10,228 cf,	Atten= 65%, Lag= 54.4 min
Discarded	=	0.152 cfs @	5.95 hrs,	Volume=	9,970 cf	
Primary	=	0.095 cfs @	8.80 hrs,	Volume=	258 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 457.53' @ 8.80 hrs   Surf.Area= 1,776 sf   Storage= 1,568 cf

Plug-Flow detention time= 68.5 min calculated for 10,211 cf (100% of inflow)
Center-of-Mass det. time= 68.4 min (729.2 - 660.7)

Volume	Invert	Avail.Storage	Storage Description
#1	455.50'	0 cf	**37.00'W x 48.00'L x 2.17'H Overall Footprint**
			3,854 cf Overall - 3,197 cf Embedded = 657 cf x 0.0% Voids
#2	455.50'	355 cf	**37.00'W x 48.00'L x 1.00'H Soil Media**Inside #1
			1,776 cf Overall x 20.0% Voids
#3	456.50'	1,421 cf	**25.00'W x 36.00'L x 1.17'H WQ Basin Z=4.0**Inside #1
		1,776 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	455.50'	**3.700 in/hr Infiltration over Surface area**
#2	Primary	457.50'	**24.0000" Horiz. Beehive Overflow X 0.75** C= 0.600
			Limited to weir flow at low heads

Discarded OutFlow Max=0.152 cfs @ 5.95 hrs HW=455.52'   (Free Discharge)
└—**1=Infiltration** (Exfiltration Controls 0.152 cfs)

Primary OutFlow Max=0.091 cfs @ 8.80 hrs HW=457.53'   (Free Discharge)
└—**2=Beehive Overflow** (Weir Controls 0.091 cfs @ 0.44 fps)

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Type IA 24-hr 25yr Rainfall=4.00"

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Pond 2P: Stormwater Basin

Hydrograph

Inflow Area=32,599 sf
Peak Elev=457.53'
Storage=1,568 cf

Legend:
- Inflow
- Outflow
- Discarded
- Primary

Flow (cfs) vs Time (hours)

Labeled peaks: 0.704 cfs, 0.247 cfs, 0.152 cfs, 0.095 cfs

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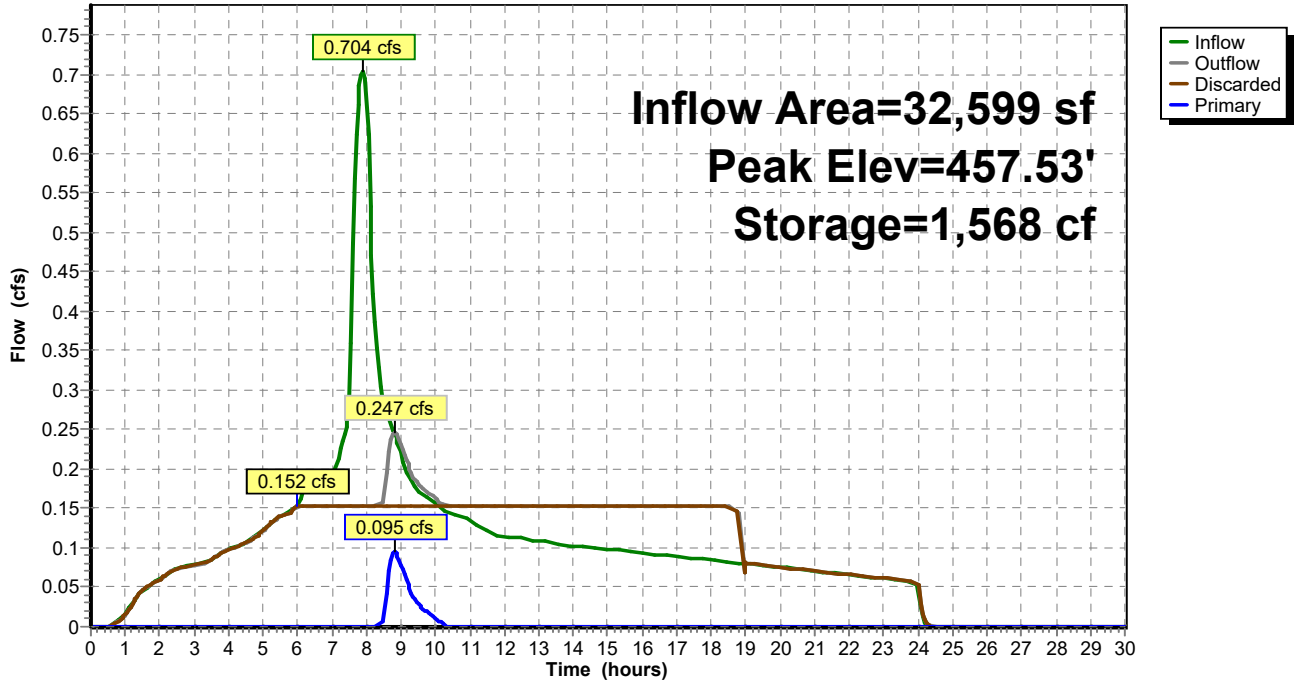HydroCAD® 10.00-26 s/n 05283 © 2020 HydroCAD Software Solutions LLC

23-231 Stayton Veterinary Hospital
Type IA 24-hr 50yr Rainfall=4.50"
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Summary for Subcatchment 1S: Basin 1

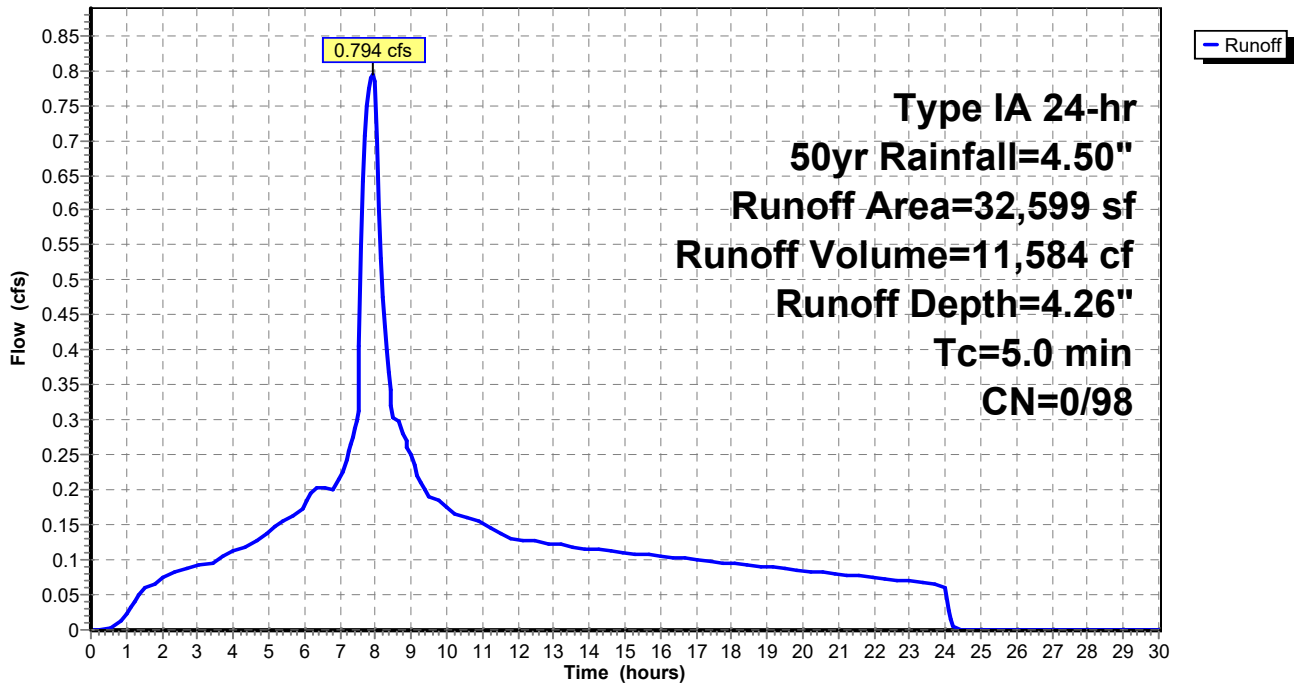Runoff   =   0.794 cfs @   7.90 hrs, Volume=   11,584 cf, Depth= 4.26"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50yr Rainfall=4.50"

	Area (sf)	CN	Description
*	32,599	98	Pavement and Roofs
	32,599	98	100.00% Impervious Area

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

Subcatchment 1S: Basin 1

Hydrograph

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Type IA 24-hr 50yr Rainfall=4.50"
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Summary for Pond 2P: Stormwater Basin

Inflow Area =   32,599 sf, 100.00% Impervious, Inflow Depth = 4.26"   for 50yr event
Inflow   =   0.794 cfs @   7.90 hrs, Volume=   11,584 cf
Outflow   =   0.435 cfs @   8.26 hrs, Volume=   11,584 cf, Atten= 45%, Lag= 21.9 min
Discarded =   0.152 cfs @   5.30 hrs, Volume=   10,753 cf
Primary   =   0.283 cfs @   8.26 hrs, Volume=   830 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 457.57' @ 8.26 hrs   Surf.Area= 1,776 sf   Storage= 1,623 cf

Plug-Flow detention time= 73.5 min calculated for 11,564 cf (100% of inflow)
Center-of-Mass det. time= 73.4 min (731.5 - 658.1)

Volume	Invert	Avail.Storage	Storage Description
#1	455.50'	0 cf	**37.00'W x 48.00'L x 2.17'H Overall Footprint**
			3,854 cf Overall - 3,197 cf Embedded = 657 cf x 0.0% Voids
#2	455.50'	355 cf	**37.00'W x 48.00'L x 1.00'H Soil Media**Inside #1
			1,776 cf Overall x 20.0% Voids
#3	456.50'	1,421 cf	**25.00'W x 36.00'L x 1.17'H WQ Basin Z=4.0**Inside #1
		1,776 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	455.50'	**3.700 in/hr Infiltration over Surface area**
#2	Primary	457.50'	**24.0000" Horiz. Beehive Overflow X 0.75** C= 0.600
			Limited to weir flow at low heads

Discarded OutFlow Max=0.152 cfs @ 5.30 hrs HW=455.52'   (Free Discharge)
└─**1=Infiltration** (Exfiltration Controls 0.152 cfs)

Primary OutFlow Max=0.278 cfs @ 8.26 hrs HW=457.57'   (Free Discharge)
└─**2=Beehive Overflow** (Weir Controls 0.278 cfs @ 0.64 fps)

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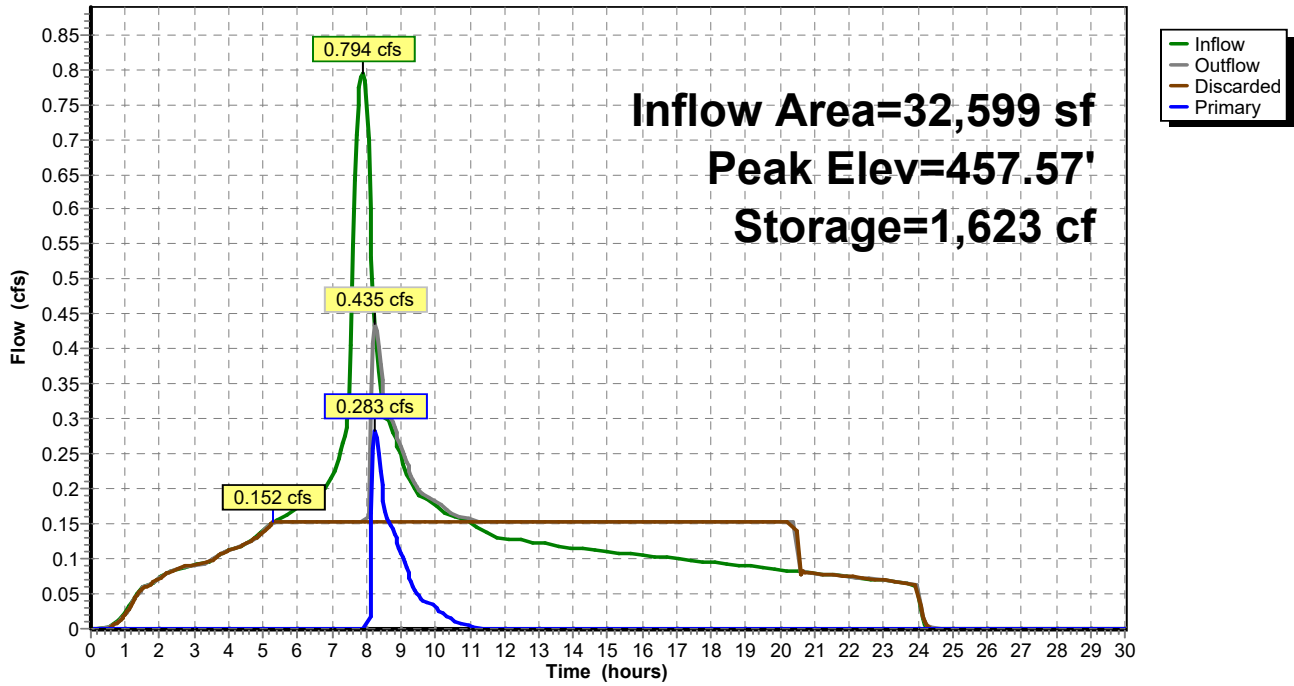HydroCAD® 10.00-26 s/n 05283 © 2020 HydroCAD Software Solutions LLC

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Type IA 24-hr 50yr Rainfall=4.50"
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Pond 2P: Stormwater Basin

Hydrograph

Inflow Area=32,599 sf
Peak Elev=457.57'
Storage=1,623 cf

Legend:
- Inflow
- Outflow
- Discarded
- Primary

Data labels: 0.794 cfs, 0.435 cfs, 0.283 cfs, 0.152 cfs

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Type IA 24-hr 100yr Rainfall=4.60"
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Summary for Subcatchment 1S: Basin 1

Runoff   =   0.812 cfs @   7.90 hrs, Volume=   11,855 cf, Depth= 4.36"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100yr Rainfall=4.60"

	Area (sf)	CN	Description
*	32,599	98	Pavement and Roofs
	32,599	98	100.00% Impervious Area

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

Subcatchment 1S: Basin 1

Hydrograph

Type IA 24-hr
100yr Rainfall=4.60"
Runoff Area=32,599 sf
Runoff Volume=11,855 cf
Runoff Depth=4.36"
Tc=5.0 min
CN=0/98
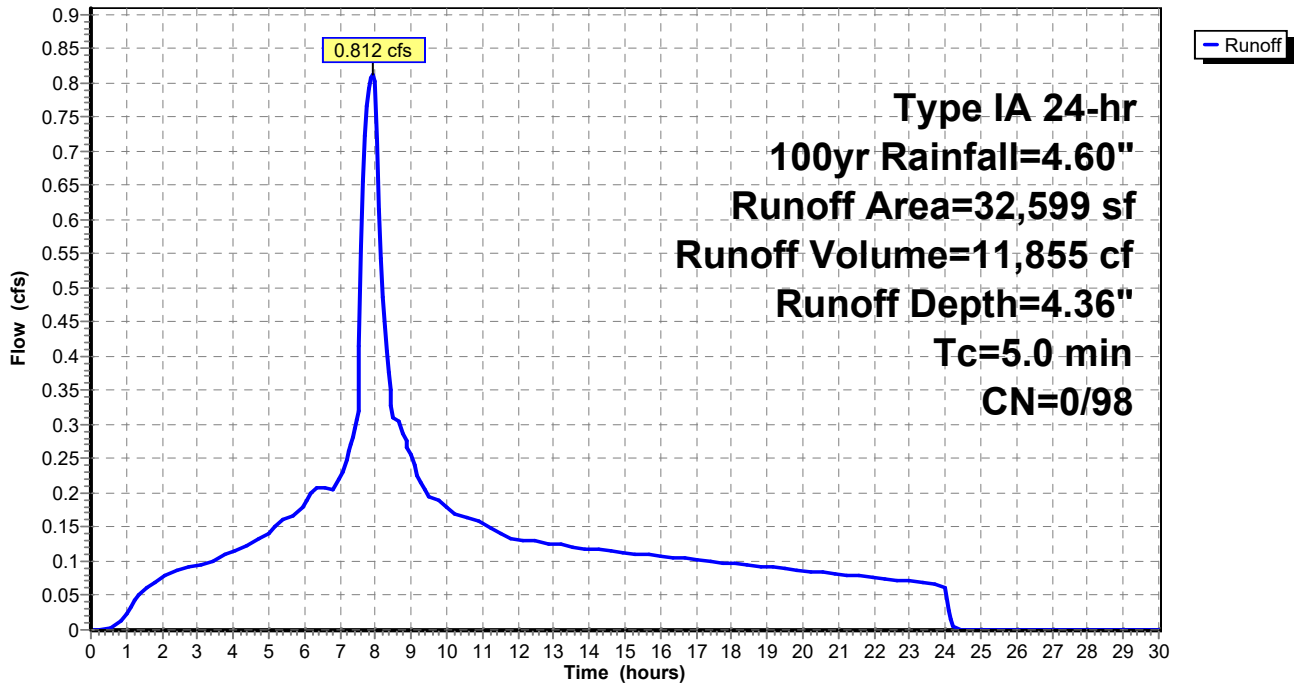
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Type IA 24-hr 100yr Rainfall=4.60"
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Summary for Pond 2P: Stormwater Basin

Inflow Area =   32,599 sf,100.00% Impervious, Inflow Depth = 4.36"   for 100yr event
Inflow   =   0.812 cfs @   7.90 hrs, Volume=   11,855 cf
Outflow   =   0.487 cfs @   8.21 hrs, Volume=   11,855 cf, Atten= 40%, Lag= 19.1 min
Discarded =   0.152 cfs @   5.25 hrs, Volume=   10,898 cf
Primary   =   0.335 cfs @   8.21 hrs, Volume=   956 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 457.58' @ 8.21 hrs   Surf.Area= 1,776 sf   Storage= 1,635 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 74.4 min (732.0 - 657.6)

Volume	Invert	Avail.Storage	Storage Description
#1	455.50'	0 cf	**37.00'W x 48.00'L x 2.17'H Overall Footprint**
			3,854 cf Overall - 3,197 cf Embedded = 657 cf x 0.0% Voids
#2	455.50'	355 cf	**37.00'W x 48.00'L x 1.00'H Soil Media**Inside #1
			1,776 cf Overall x 20.0% Voids
#3	456.50'	1,421 cf	**25.00'W x 36.00'L x 1.17'H WQ Basin Z=4.0**Inside #1
		1,776 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	455.50'	**3.700 in/hr Infiltration over Surface area**
#2	Primary	457.50'	**24.0000" Horiz. Beehive Overflow X 0.75** C= 0.600
			Limited to weir flow at low heads

Discarded OutFlow Max=0.152 cfs @ 5.25 hrs HW=455.52'   (Free Discharge)
└─**1=Infiltration** (Exfiltration Controls 0.152 cfs)

Primary OutFlow Max=0.329 cfs @ 8.21 hrs HW=457.58'   (Free Discharge)
└─**2=Beehive Overflow** (Weir Controls 0.329 cfs @ 0.68 fps)

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Type IA 24-hr 100yr Rainfall=4.60"
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Pond 2P: Stormwater Basin

Hydrograph

Inflow Area=32,599 sf
Peak Elev=457.58'
Storage=1,635 cf

Legend: Inflow, Outflow, Discarded, Primary

Peak labels: 0.812 cfs, 0.487 cfs, 0.335 cfs, 0.152 cfs

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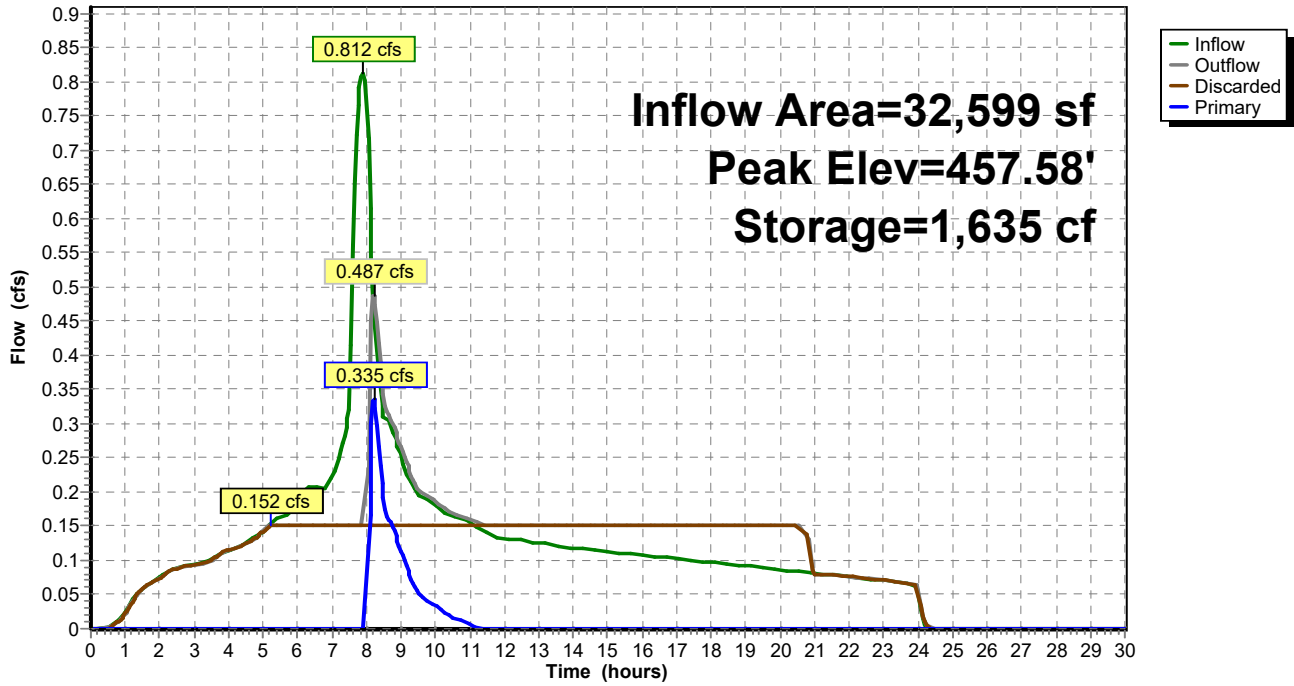HydroCAD® 10.00-26 s/n 05283 © 2020 HydroCAD Software Solutions LLC

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Type IA 24-hr WQ Storm Rainfall=1.61"
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Summary for Subcatchment 1S: Basin 1

Runoff   =   0.267 cfs @   7.91 hrs, Volume=   3,772 cf, Depth= 1.39"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr WQ Storm Rainfall=1.61"

	Area (sf)	CN	Description
*	32,599	98	Pavement and Roofs
	32,599	98	100.00% Impervious Area

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

Subcatchment 1S: Basin 1

Hydrograph

Type IA 24-hr
WQ Storm Rainfall=1.61"
Runoff Area=32,599 sf
Runoff Volume=3,772 cf
Runoff Depth=1.39"
Tc=5.0 min
CN=0/98
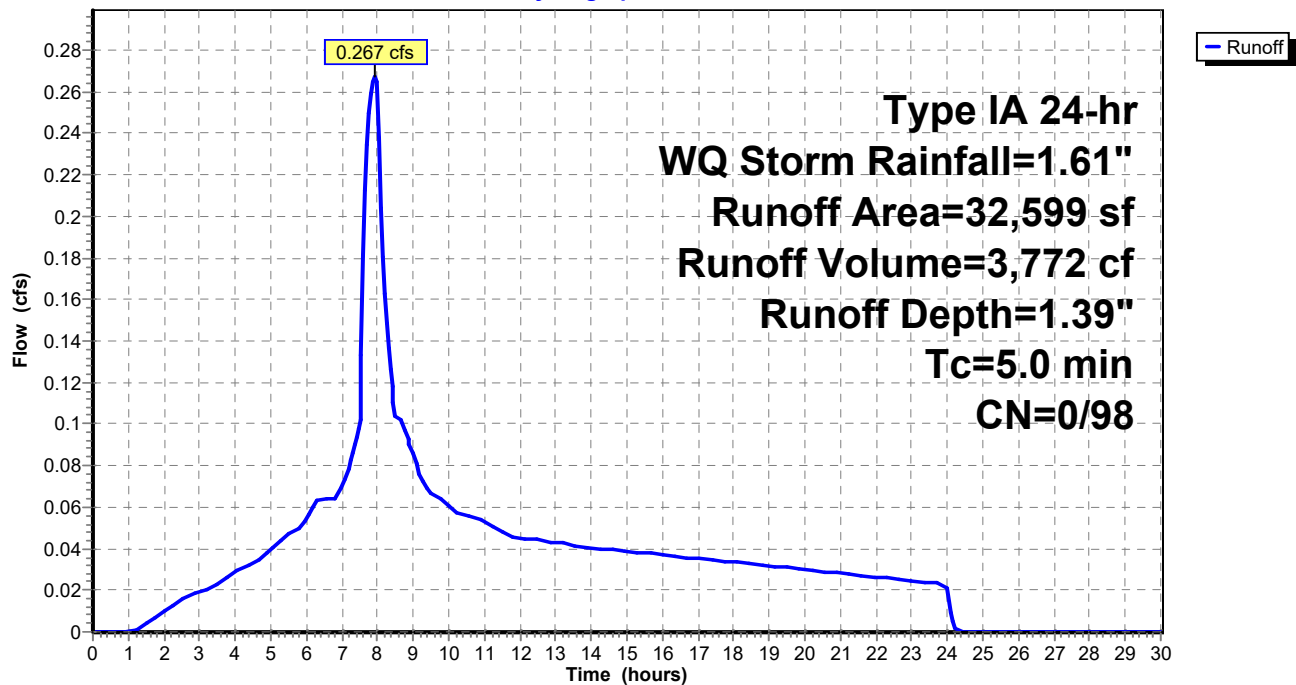
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Type IA 24-hr WQ Storm Rainfall=1.61"
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Summary for Pond 2P: Stormwater Basin

Inflow Area =   32,599 sf, 100.00% Impervious, Inflow Depth = 1.39"   for WQ Storm event
Inflow   =   0.267 cfs @   7.91 hrs, Volume=   3,772 cf
Outflow   =   0.152 cfs @   7.60 hrs, Volume=   3,772 cf, Atten= 43%, Lag= 0.0 min
Discarded =   0.152 cfs @   7.60 hrs, Volume=   3,772 cf
Primary   =   0.000 cfs @   0.00 hrs, Volume=   0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 456.03' @ 8.24 hrs   Surf.Area= 1,776 sf   Storage= 188 cf

Plug-Flow detention time= 3.5 min calculated for 3,766 cf (100% of inflow)
Center-of-Mass det. time= 3.5 min (693.9 - 690.3)

Volume	Invert	Avail.Storage	Storage Description
#1	455.50'	0 cf	**37.00'W x 48.00'L x 2.17'H Overall Footprint**
			3,854 cf Overall - 3,197 cf Embedded = 657 cf x 0.0% Voids
#2	455.50'	355 cf	**37.00'W x 48.00'L x 1.00'H Soil Media** Inside #1
			1,776 cf Overall x 20.0% Voids
#3	456.50'	1,421 cf	**25.00'W x 36.00'L x 1.17'H WQ Basin Z=4.0** Inside #1
		1,776 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	455.50'	**3.700 in/hr Infiltration over Surface area**
#2	Primary	457.50'	**24.0000" Horiz. Beehive Overflow X 0.75** C= 0.600
			Limited to weir flow at low heads

Discarded OutFlow Max=0.152 cfs @ 7.60 hrs HW=455.53'   (Free Discharge)
  ⌐**1=Infiltration** (Exfiltration Controls 0.152 cfs)

Primary OutFlow Max=0.000 cfs @ 0.00 hrs HW=455.50'   (Free Discharge)
  ⌐**2=Beehive Overflow** (Controls 0.000 cfs)

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Pond 2P: Stormwater Basin

Hydrograph

Inflow Area=32,599 sf
Peak Elev=456.03'
Storage=188 cf

Legend:
- Inflow
- Outflow
- Discarded
- Primary

0.267 cfs
0.152 cfs
0.000 cfs