

Exhibit Q – Stormwater Calculations

PROJECT: 12424 NW Springville Road
 Portland, OR 97279

1N1 W15C – 00600 R96 1150770	54.49 acres
1N1 W16D – 02800 R96 1160130	22.27 acres
Total Area	76.81 acres

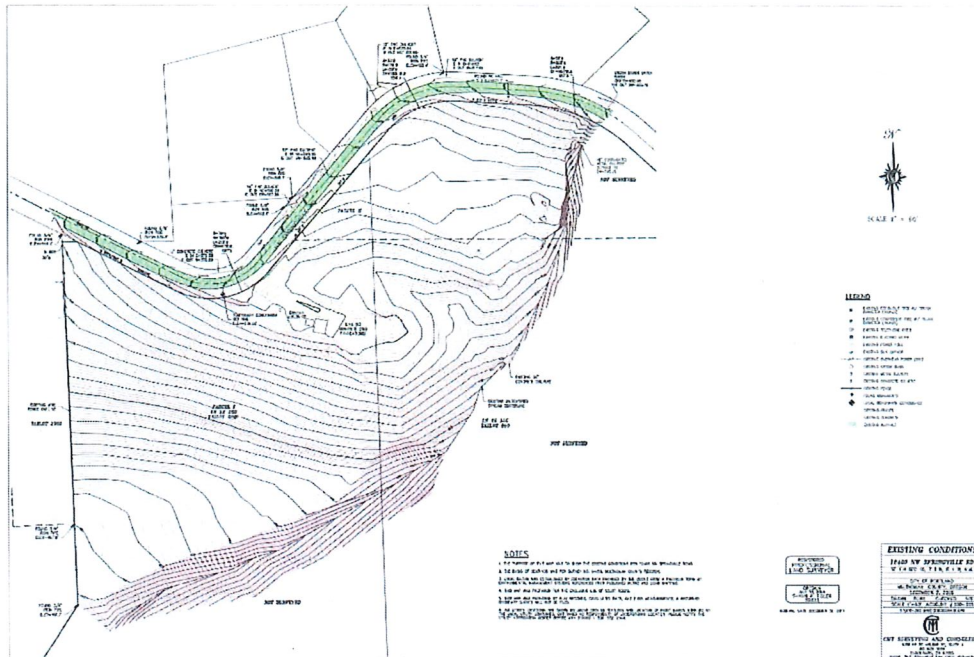


Proposed Action:

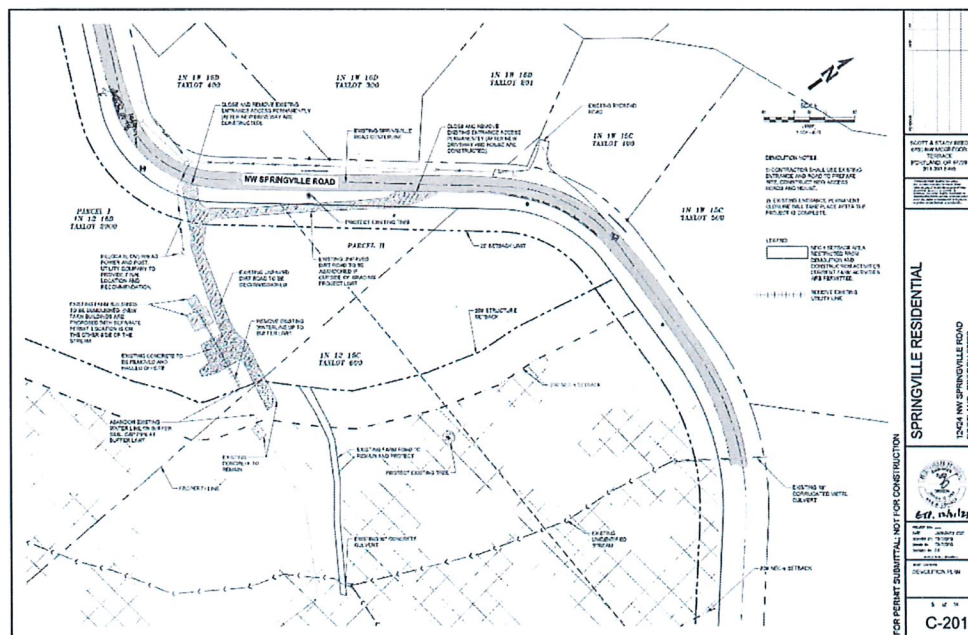
The landowner is proposing to build a new residential home on the property. The existing property consist of farmland that had 2 existing small structures (barns) in the proposed new residential home location (see figure above). There are also two relatively new structures on the southeastern portion of the property, across the small unnamed stream (see above figure). With the proposed action a Stormwater Drainage Control Certification is require per MCC 39.6235. The following report provides the calculations and assumptions for the proposed on-site drainage control system for the new residential home.

Assumptions:

WinTR-55 Small Watershed Hydrology computer modeling system was used. The following calculations were developed to analyze only the area of the proposed new residential. The area analyzed is shown below in Existing Topography and existing conditions:



Existing Topography



Existing Conditions

The following is a summary of the **existing area** analyzed including additional data:

WinTR-55 Main Window

File Options ProjectData GlobalData Run Help

WinTR-55 Small Watershed Hydrology

Project Identification Data

User: State:

Project: County:

Subtitle: Execution Date: 8/7/2022

Sub-areas are expressed in: Acres Square Miles

Dimensionless Unit Hydrograph:

Storm Data Source:

Rainfall Distribution Identifier:

Sub-area Entry and Summary

Sub-area Name	Sub-area Description	Sub-area Flows to Reach/Outlet	Area (ac)	Weighted CN	Tc (hr)
EXPas1	Existing Pasture Area	Outlet	15.03	79	0.100
EXBarns2	Existing Barns	Outlet	0.02	98	0.100
EXGravel3	Existing Gravel	Outlet	0.26	89	0.100

Project Area: 15.31 (ac)

EME Springville
Existing Conditions
Multnomah County, Oregon

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier Peak Flow and Peak Time (hr) by Rainfall Return Period 10-Yr (cfs) (hr)

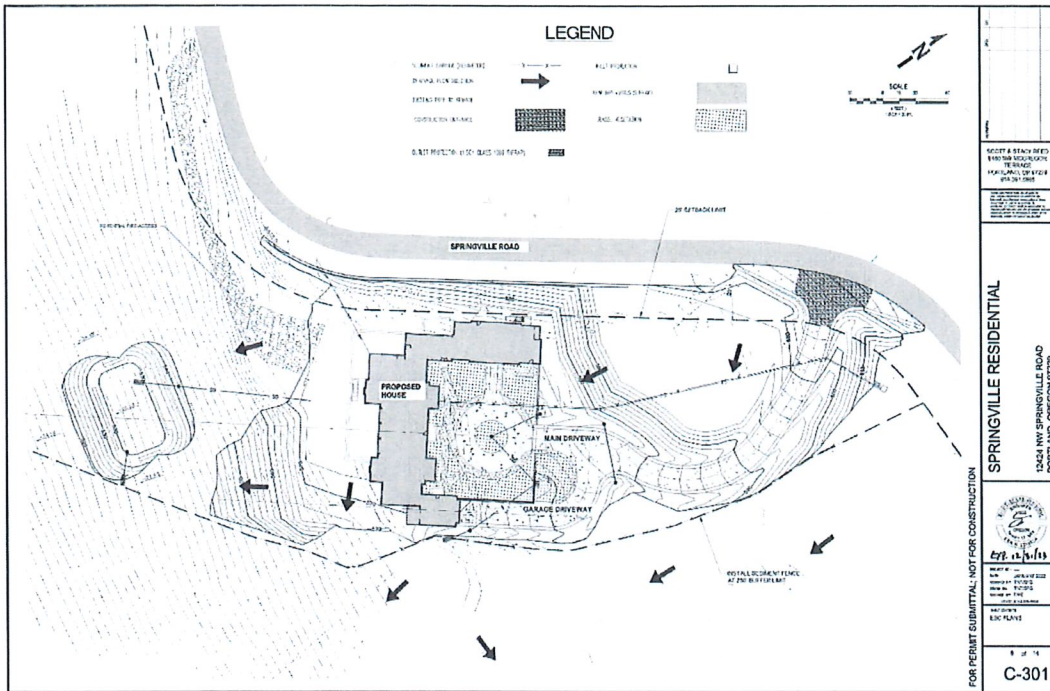
SUBAREAS

EXPas1	5.01	8.01
EXBarns2	.00	n/a
EXGravel3	0.15	7.93

REACHES

OUTLET	5.15	
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Future development with the proposed new resident can be shown in the



Future Conditions

The following is a summary of the **future area** analyzed including additional data:

WinTR-55 Main Window

File Options ProjectData GlobalData Run Help

WinTR-55 Small Watershed Hydrology

Project Identification Data

User: EME State: Oregon

Project: Springville County: Multnomah

Subtitle: Future Conditions Execution Date: 8/7/2022

Sub-areas are expressed in: Acres

Dimensionless Unit Hydrograph: standard

Storm Data Source: User-provided custom storm data

Rainfall Distribution Identifier: Type IA

Sub-area Name	Sub-area Description	Sub-area Flows to Reach/Outlet	Area (ac)	Weighted CN	Tc (hr)
House1	House & Porch	Outlet	0.38	98	0.100
GravelBW2	Drive Way & walkway	Outlet	0.46	89	0.100
Remain Pas	Remaining Pasture	Outlet	14.65	79	0.100

Project Area: 15.49 (ac)

Springville
Future Conditions
Multnomah County, Oregon

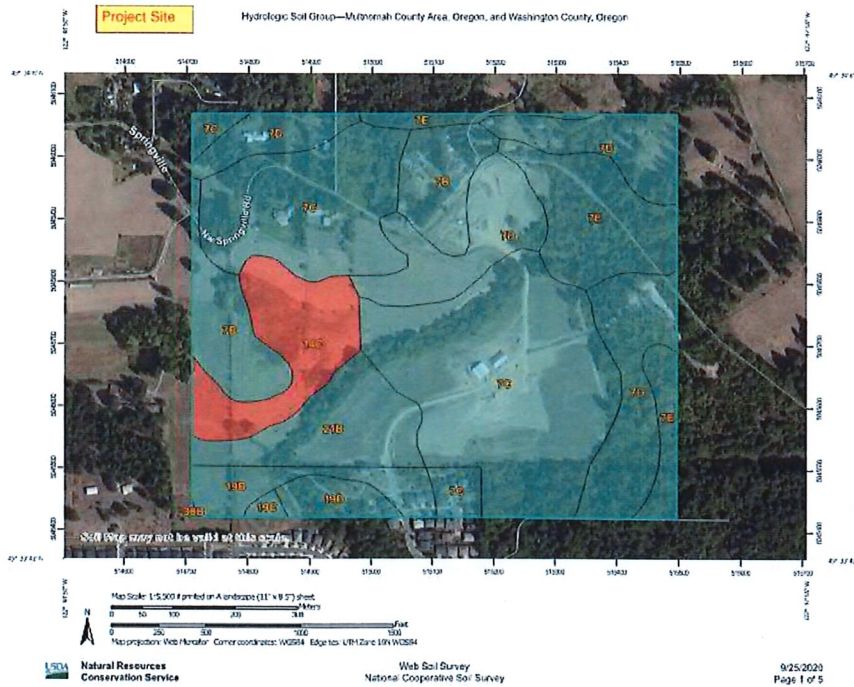
Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 10-Yr (cfs) (hr)
SUBAREAS	
House1	0.30 7.84
GravelDW2	0.27 7.93
Remain Pas	4.88 8.01
REACHES	
OUTLET	5.44

The following Rainfall Depths were used for the calculations:

Recurrence Interval (years)	24-Hour Rainfall Depth (inches)
2	2.4
5	2.9
10	3.4
25	3.8
100	4.7

The Hydraulic Soil Group were assumed to be:



Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
7B	Cascade silt loam, 3 to 8 percent slopes	C	11.7	0.2%
7C	Cascade silt loam, 8 to 15 percent slopes	C	45.7	36.1%
7D	Cascade silt loam, 15 to 30 percent slopes	C	26.9	21.2%
7E	Cascade silt loam, 30 to 60 percent slopes	C	13.9	11.0%
14C	Doona silt loam, 3 to 12 percent slopes	D	10.0	7.9%
21B	Hevelia silt loam, 3 to 8 percent slopes	C	9.1	7.2%
Subtotals for Soil Survey Area			117.3	92.5%
Totals for Area of Interest			126.8	100.0%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
7C	Cascade silt loam, 7 to 12 percent slopes	C	1.6	1.3%
19B	Hevelia silt loam, 2 to 7 percent slopes	C	4.8	3.8%
19C	Hevelia silt loam, 7 to 12 percent slopes	C	0.5	0.4%
19D	Hevelia silt loam, 12 to 20 percent slopes	C	2.6	2.1%
36B	Saum silt loam, 2 to 7 percent slopes	C	0.0	0.0%
Subtotals for Soil Survey Area			9.5	7.5%
Totals for Area of Interest			126.8	100.0%

The proposed stormwater control structure (Basin1):

Structure Data
✖

Structure Name: Clear Delete Rename

Pond Surface Area

@ spillway crest acres

(optional) feet above spillway acres

Discharge Description

Spillway Type: Pipe Weir

Diameter(in):

Trial #1	Trial #2	Trial #3
<input type="text" value="6"/>	<input type="text" value="8"/>	<input type="text" value="10"/>

Height (ft)
 Pipe invert to spillway

Accept

Plot

Cancel

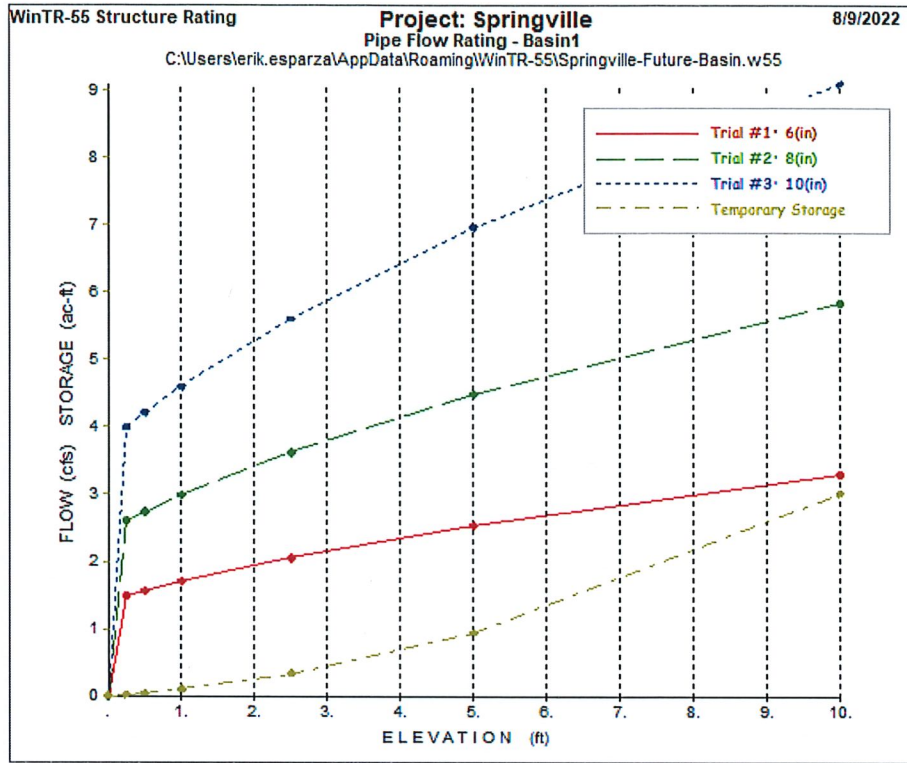
Help

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--- Orifice flow assumed ---

Pipe Flow Rating - Basin1

Stage (ft)	Diameter1 6(in)		Diameter2 8(in)		Diameter3 10(in)		Temporary Storage (ac-ft)
	Pipe Head (ft)	Flow cfs	Pipe Head (ft)	Flow cfs	Pipe Head (ft)	Flow cfs	
0.00	2.250	0.000	2.167	0.000	2.083	0.000	0.00
0.25	2.500	1.490	2.417	2.605	2.333	3.999	0.02
0.50	2.750	1.563	2.667	2.736	2.583	4.208	0.04
1.00	3.250	1.699	3.167	2.982	3.083	4.597	0.10
2.50	4.750	2.054	4.667	3.620	4.583	5.605	0.33
5.00	7.250	2.538	7.167	4.485	7.083	6.968	0.94
10.00	12.250	3.299	12.167	5.844	12.083	9.100	3.01



Recommendations

Based on the above calculations, the proposed stormwater structure will convey no more than the existing conditions flows at 10-year/24-hour storm event. Therefore, the proposed future residential areas will have not impact to the existing drainage basin.