
Drainage Report

212 Todd Road Development

Puyallup, WA 98371

Prepared for

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PROJECT ENGINEER'S CERTIFICATION

"I hereby state that this Drainage Report for the 212 Todd Rd. Development has been prepared by me or under my supervision and meets minimum standard of care and expertise which is usual and customary in this community for professional engineers. I understand that the City of Puyallup does not and will not assume liability for the sufficiency, suitability, or performance of drainage facilities prepared by me."



Justin Jones, PE



07-02-26

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Appendix A: Infiltration Report

PROJECT OVERVIEW AND MAPS

The 212 Todd Rd development is located along the south side of Todd Rd NE in Puyallup, WA and spans across lots 212 and 320 Todd Rd NE. The proposed project site consists of parcels 0420222008 and 0420222029, with a total project area of 1.83 ac (79,919 SF).

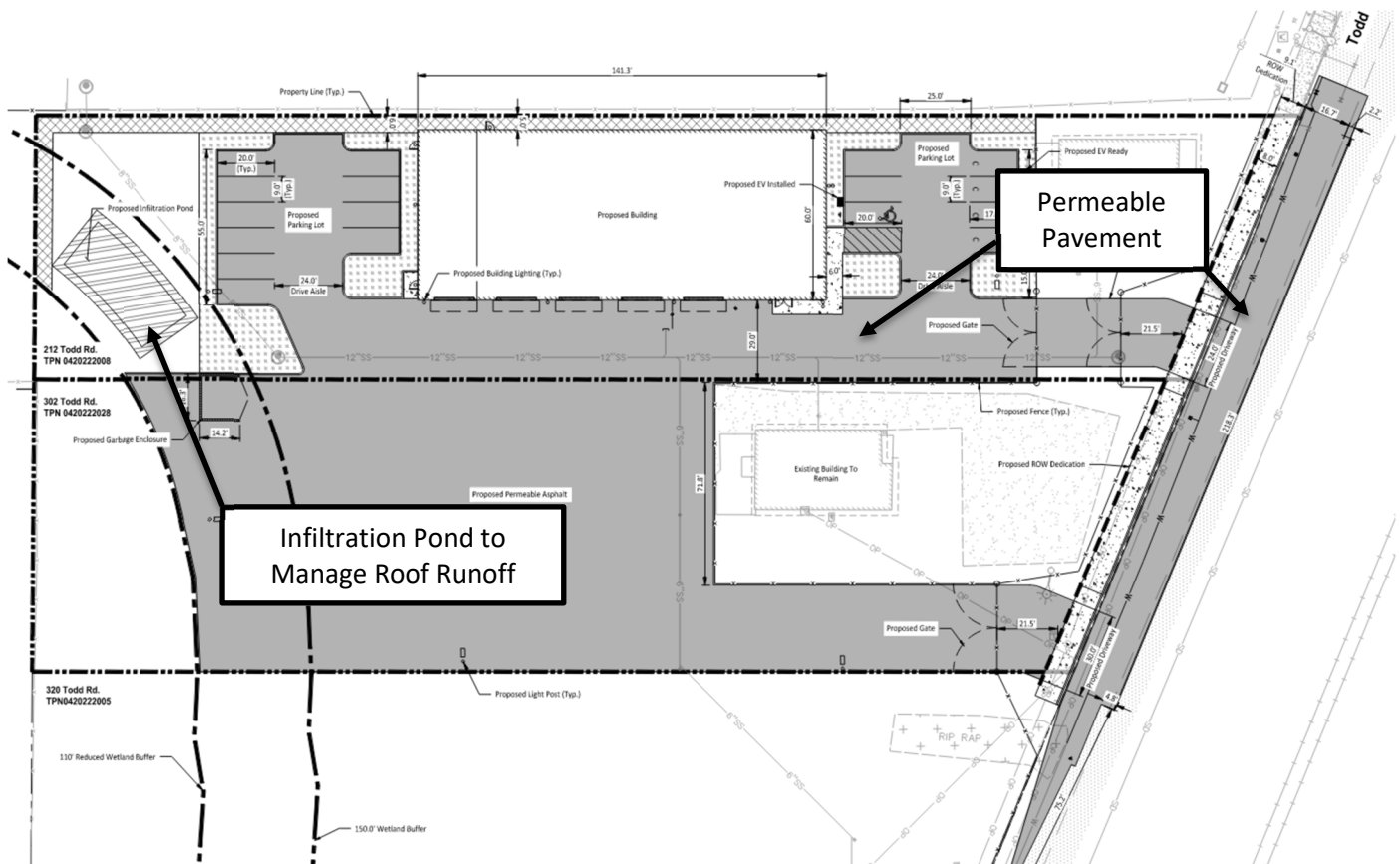


The project is a redevelopment project and includes the construction of a commercial building and parking lot. The project also triggers frontage improvements along NE Todd Rd. Frontage improvements consist of a new sidewalk, half-street improvements, and water main extension.

The stormwater approach for the 212 Todd Rd project is to infiltrate 100% of the runoff on-site, through the use of permeable pavement and a downspout infiltration pond.

The stormwater approach for the frontage improvement is to infiltrate 100% of the runoff on-site, through the use of permeable pavements.

See figure below for basin areas.



EXISTING CONDITIONS SUMMARY

The 212 Todd Rd project is located on two parcels with a total project area of 1.83 ac (79,919 SF). The site currently contains two single family residences, one garage, chain link fences surrounding the properties, water and sewer connections, and natural vegetation.

The project site is relatively flat. Stormwater that falls within the existing site fully infiltrates into native soil.

The project site also consists of a wetland to the southeast portion of the property.

The existing project site prior to development is approximately 92.5% impervious.

The frontage condition currently consists of two travel lanes and no sidewalk. Existing runoff lateral flows off the roadway and infiltrates into neighboring vegetation.

PROPOSED CONDITIONS SUMMARY

The 212 Todd Rd project proposes the construction of an 8,655 SF commercial building, permeable asphalt parking lot, and fencing. The project also proposes frontage improvements containing concrete sidewalks, and permeable half street paving. On-site improvements include sewer and water connections, site lighting, and site grading. Frontage site improvements consist of water main extension and streetlights.

The proposed project will result in greater than 5,000 SF of new plus replaced hard surface; therefore, minimum requirements 1-9 will apply to this project.

The stormwater approach for the new and replaced hard surfaces on-site is to meet LID standards by infiltrating 100% of runoff on-site. Roof runoff will be captured and tightlined to an infiltration pond. New parking lot will be permeable pavement and will fully infiltrate runoff into native soil.

The stormwater approach for the frontage improvements is to meet LID standards by infiltrating 100% of runoff from new sidewalk and half-street paving via permeable pavement.

Landscaping on the site will infiltrate onsite, and will be consistent with BMP T5.13, Post-Construction Soil Quality and Depth.

Infiltration suitability was evaluated during the wet season (December 1st - April 1st) to determine infiltration rate and groundwater separation. Small PIT tests and groundwater monitoring were performed in accordance with the 2019 Stormwater Management Manual for Western Washington (DOE Manual) to determine infiltration feasibility. The infiltration rate was determined to be 1.17 in/hr (corrected). Infiltration Report has been provided in Appendix A. Groundwater has also been monitored and was determined to be 4.0' below existing grade of 50.5'. Based off known infiltration rate and groundwater levels, infiltration BMP's was deemed feasible on-site.

The proposed impervious areas will be 13.8% percent of the entire site. Below is a summary of the proposed surface coverage.

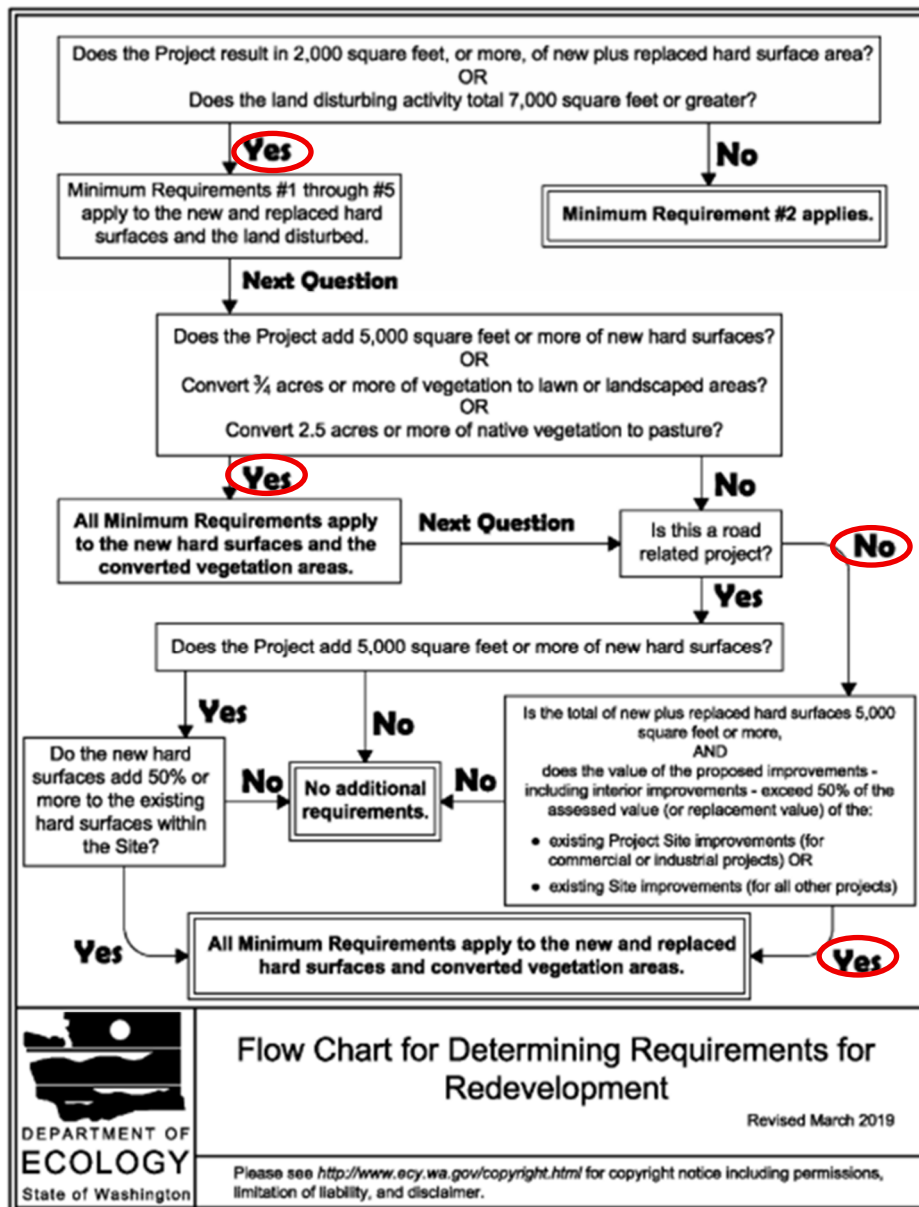
LOT COVERAGE

Description ^a	Onsite	Offsite	Total
Existing Conditions			
Total Project Area ^b (ft ²)	79775	4885	84660
Existing hard surface (ft ²)	4622	4885	51107
Existing vegetation area (ft ²)	33553	0	33553
Proposed Conditions			
Total Project Area ^b (ft ²)	77982	6678	84660
Amount of new hard surface (ft ²)	8894	1793	10687
Amount of new pollution generating hard surface (PGHS) ^c (ft ²)	13446	0	13466
Amount of replaced hard surface (ft ²)	0	0	0
Amount of replaced PGHS ^d (ft ²)	32626	3199	44394
Amount of new plus replaced hard surface (ft ²)	8894	1793	13466
Amount of new + replaced PGHS (ft ²)	54641	3199	57840
Amount of existing hard surfaces converted to vegetation (ft ²)	2985	0	2985
Amount of Land Disturbed (ft ²)	58654	7011	65665
Vegetation to Lawn/Landscaped (acres)	20	0	20
Native Vegetation to Pasture (acres)	0	0	0
Existing hard surface to remain unaltered (ft ²)	7405	0	7405
Existing vegetation area to remain unaltered (ft ²)	8671	0	8671

SUMMARY OF MINIMUM REQUIREMENTS

The 2019 DOE Stormwater Management Manual for Western Washington (DOE Manual) describes the minimum requirements for a redevelopment project. Using the flowcharts below, all minimum requirements apply to the new and replaced hard surfaces and converted vegetation areas for the 212 Todd Rd project site.

Figure I-3.2: Flow Chart for Determining Requirements for Redevelopment



MINIMUM REQUIREMENT 1: PREPARATION OF STORMWATER SITE PLANS

Stormwater Site Plan drawings are submitted with this Permit.

MINIMUM REQUIREMENT 2: CONSTRUCTION STORMWATER POLLUTION PREVENTION

A Temporary Erosion and Sediment Control Plan has been prepared. Construction Stormwater Pollution Prevention measures may include: storm drain inlet protection; construction entrance; silt fence and vegetative filtration. See "Temporary Erosion & Sediment Control Plan" in Site Drawings.

MINIMUM REQUIREMENT 3: SOURCE CONTROL OF POLLUTION

Source control BMPs will be implemented to minimize stormwater contamination and help comply with the Department of Ecology Manual. BMPs for the project may include:

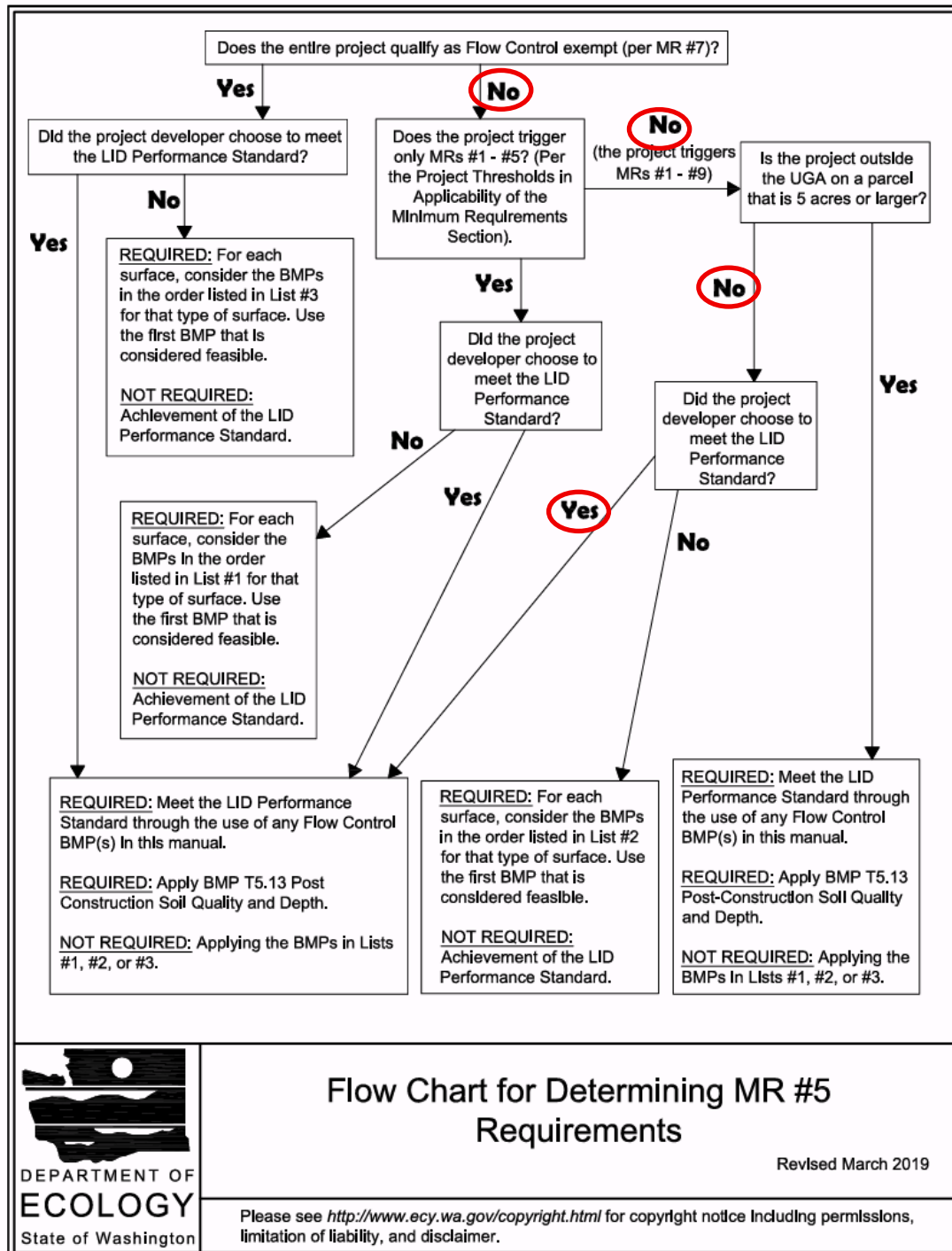
- *BMP410, BMP417, BMP454 and BMP457: Inspect and clean treatment BMPs, conveyance systems, and catch basins as needed, and determine necessary O & M Improvements.*
- *BMP453: A Pollution Prevention Team will be formed to implement and maintain all BMPs and treatment for the site.*
- *BMP455: Spill prevention will be implemented.*
- *BMP456: Employees will be trained to identify pollutant sources, understand pollutant control measures, spill prevention and response, emergency response procedures, and handling practices that are environmentally acceptable.*
- *BMP458: Required records will be kept on site.*
- *BMP431: Parking lot stormwater will be treated to account for vehicle washing in drive aisle and driveways.*
- *BMP421: Vehicles and Equipment will be washed and runoff will be discharged to approved wastewater treatment system.*

MINIMUM REQUIREMENT 4: PRESERVATION OF NATURAL DRAINAGE SYSTEMS AND OUTFALLS

Natural drainage patterns will be maintained and discharges from the project site will occur at natural locations. The proposed discharge of the site's runoff will not cause significant adverse impact to downstream receiving waters and downgradient properties.

MINIMUM REQUIREMENT 5: ONSITE STORMWATER MANAGEMENT

Per figure 1 of the DOE Manual, this project is required to either meet the LID performance standards or consider BMPs in List #3 for each type of surface. This project will meet LID performance standards.



Permeable pavement and downspout infiltration were selected to manage runoff for this project. Runoff will fully infiltrate into native soil in order to meet LID standards.

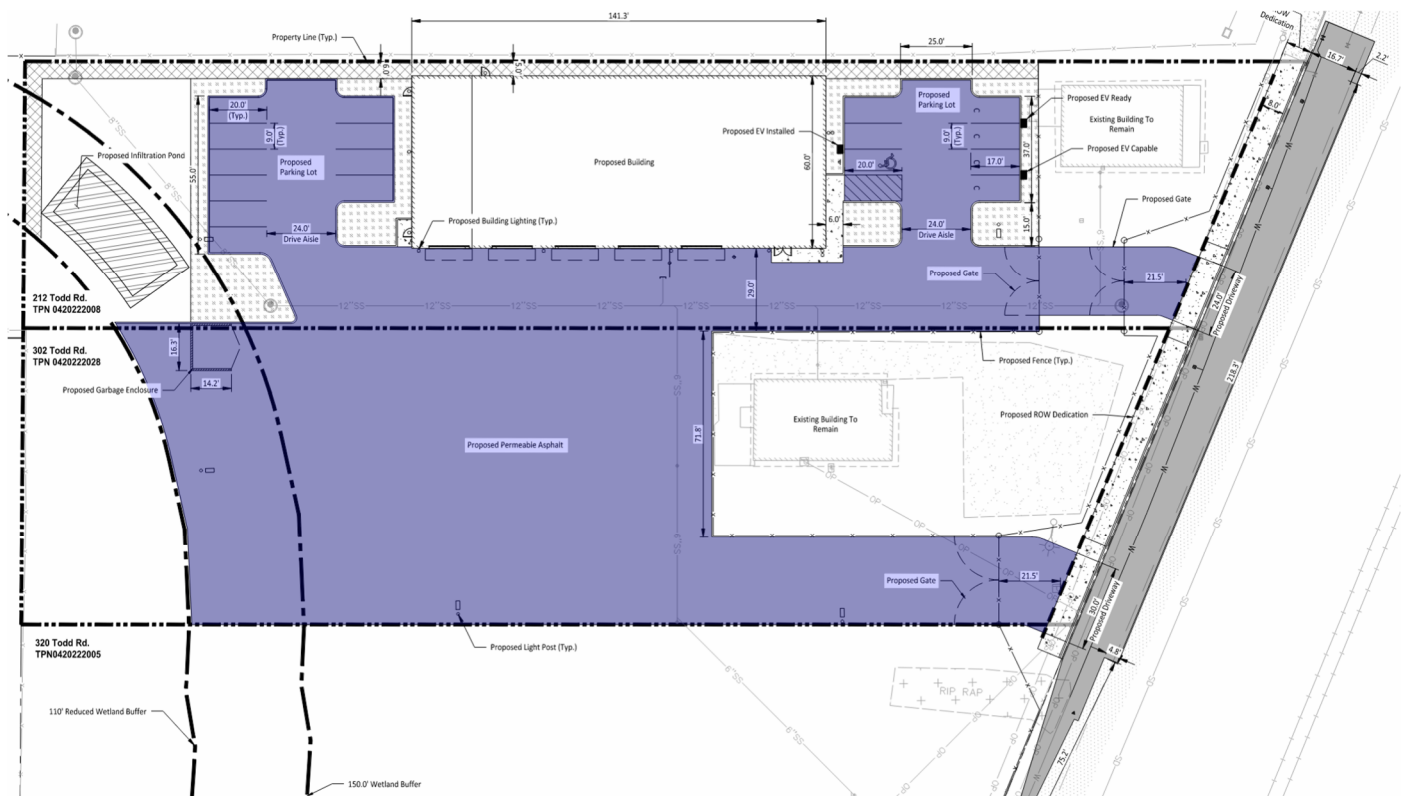
On-site runoff from the roof will be routed to the infiltration pond sized to infiltrate 100% of the roof runoff. On-site parking lot runoff will fully infiltrate into the native soils below through the use of permeable pavement.

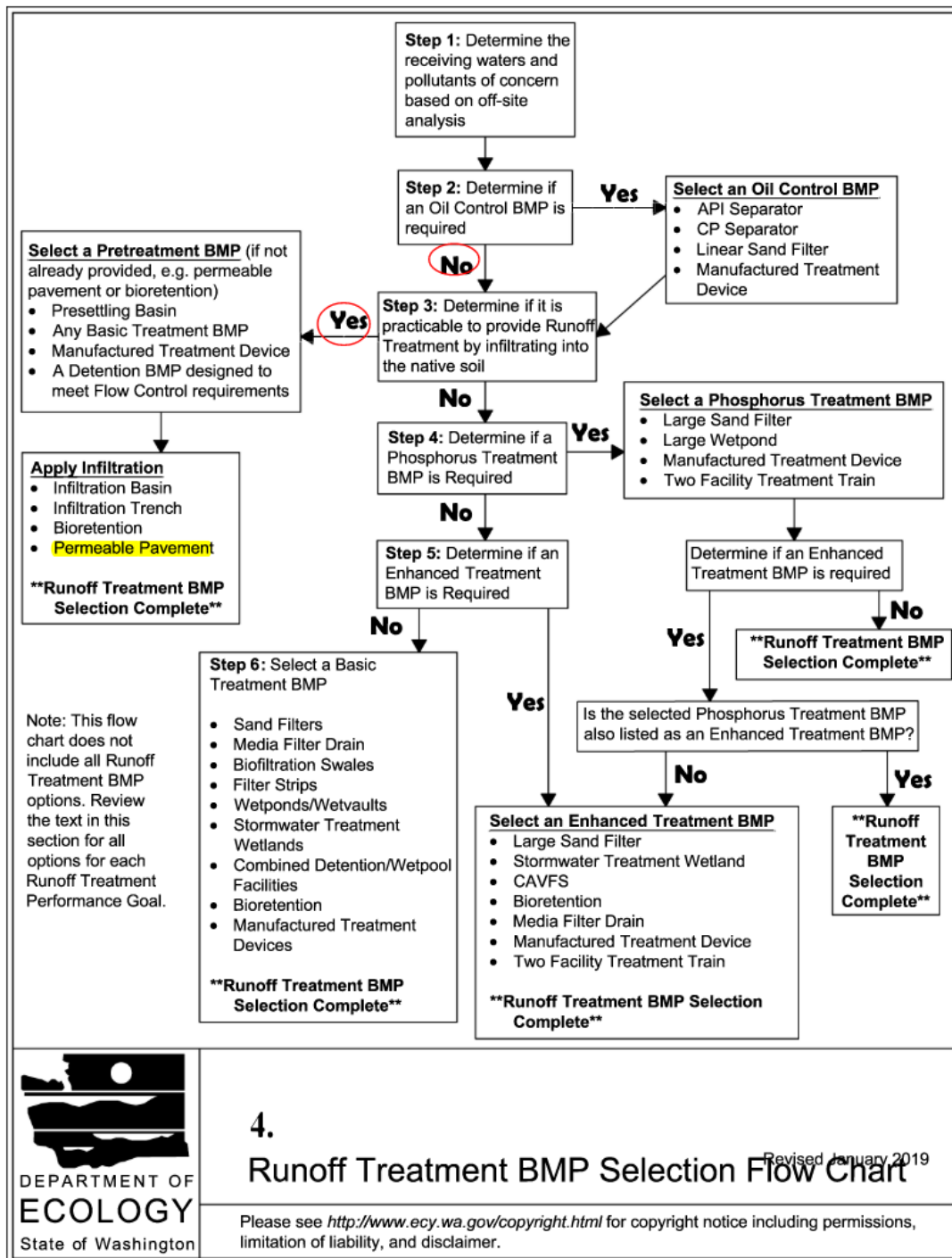
Frontage improvement runoff will be managed via permeable pavement. Half-street paving will consist of permeable asphalt to collect and infiltrate 100% of runoff into native soils. Frontage sidewalks will consist of standard concrete and lateral flow onto the permeable asphalt on the road and infiltrate 100% into native soil.

Proposed landscaping runoff will be mitigated using BMP T5.13 Post-Construction Soil Quality and Depth.

MINIMUM REQUIREMENT 6: RUNOFF TREATMENT

The 2019 DOE Storm Manual states that any project with a pollution generating threshold discharge area greater than 5,000 SF shall be required to utilize runoff treatment BMPs. The project exceeds the threshold and will construct permeable pavement with a treatment layer to treat all runoff from pollution generating impervious surface areas on site. See below for Pollution Generating areas highlighted in blue.





4.

Runoff Treatment BMP Selection Flow Chart

Revised January 2019

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MINIMUM REQUIREMENT 7: FLOW CONTROL

Per 2019 DOE Manual, Flow Control BMPs are required if the site TDA meets any of the following thresholds:

- TDAs that have a total of 10,000 SF or more of effective impervious surfaces, or
- TDAs that convert 3/4 acres or more of native vegetation, pasture, scrub/shrub, or unmaintained non-native vegetation to lawn or landscape, or convert 2.5 acres or more of native vegetation to pasture, and from which there is a surface discharge in a natural or man-made conveyance system from the TDA, or
- TDAs that through a combination of effective hard surfaces and converted vegetation areas cause a 0.15 cubic feet per second (cfs) or greater increase in the 100-year flow frequency as estimated using an approved continuous simulation model and 15-minute time step.

Effective impervious surfaces can be defined as those impervious surfaces that are connected via sheet flow or discrete conveyance to a drainage system. Impervious surfaces are considered ineffective if approved runoff modeling methods indicate that the entire runoff file is infiltrated.

The 212 Todd Rd. project is proposing to infiltrate 100% of runoff file using a downspout infiltration pond and permeable pavements; therefore, all proposed impervious areas are deemed ineffective. Since the project is not proposing any effective impervious, TDA Thresholds stated above are not triggered and Flow Control BMPs are not required.

MINIMUM REQUIREMENT 8: WETLAND PROTECTION

Minimum Requirement 8, Wetland Protection, applies only to TDAs whose stormwater discharges into a wetland, either directly or indirectly through a conveyance system. The 212 Todd Rd development will not discharge stormwater into a wetland and thus is not subject to the wetland protection standards outlined in Minimum Requirement 8.

MINIMUM REQUIREMENT 9: OPERATION AND MAINTENANCE

An Operations & Maintenance manual for all new stormwater BMPs installed with the project will be provided in a future Civil Permit submittal.

APPENDIX A

JMJ

Location:

302 Todd Rd

Project Location:	302 Todd Rd				Initial Meter: 1055.93 (Gallons)			
Date of Test:	4/21/2026							
Test Pit Dimensions:		Width (feet)	5.5	Length (feet)	5	Depth (inches)	10	
Presoak:	4/20/2026	2:40 PM Start						
Infiltration Test:	4/21/2026	11:12 AM Start						
		Water Column Maintained (inches):	7					
		Gallons Per Inch:	17.14					
	Time	Time(Minutes)	Volume (gallons)	Flow Rate (GPM)			Flow (Gallons)	Infiltration Rate (in/hr)
				Meter Start	Meter End	Flow (Gallons)		
	11:12 AM	0		1257.6	1276.7	19.1	19.1	
	11:27 AM	15		1276.7	1293.3	16.6	35.7	
	11:43 AM	30		1293.3	1313.1	19.8	55.5	
	11:50 AM	45		1313.1	1330.2	17.1	72.6	
	12:05 PM	60		1330.2	1330.2	0.0	72.6	
							Average Infiltration Rate	4.2

Drawdown Test (Sensor): JMJ 01						
Sensor Name:		JMJ 01 (CRS451V Sensors from Campbell Scientific)				
Time (Decimal Hours)	Measurem ent (Min)	Time Stamp	Record #	Reading (PSI)	Level (in)	
0.00	0	12:25 PM	5	0.5320883	14.75	
0.08	5	12:30 PM	6	0.5229041	14.49	
0.17	10	12:35 PM	7	0.5131617	14.22	
0.25	15	12:40 PM	8	0.504065	13.97	
0.33	20	12:45 PM	9	0.4951537	13.73	
0.42	25	12:50 PM	10	0.4862988	13.48	
0.50	30	12:55 PM	11	0.4778761	13.25	
0.58	35	1:00 PM	12	0.4691962	13.01	
0.67	40	1:05 PM	13	0.4606642	12.77	
0.75	45	1:10 PM	14	0.4520603	12.53	
0.83	50	1:15 PM	15	0.4440258	12.31	
0.92	55	1:20 PM	16	0.4358605	12.08	
1.00	60	1:25 PM	17	0.4281615	11.87	
1.08	65	1:30 PM	18	0.4202019	11.65	
1.17	70	1:35 PM	19	0.4123648	11.43	
1.25	75	1:40 PM	20	0.4048234	11.22	
1.33	80	1:45 PM	21	0.3970506	11.01	
1.42	85	1:50 PM	22	0.3898104	10.81	
1.50	90	1:55 PM	23	0.3823557	10.60	
1.58	95	2:00 PM	24	0.3751524	10.40	
1.67	100	2:05 PM	25	0.3683088	10.21	
1.75	105	2:10 PM	26	0.3614292	10.02	
1.83	110	2:15 PM	27	0.3551305	9.84	
1.92	115	2:20 PM	28	0.3487671	9.67	
2.00	120	2:25 PM	29	0.3423133	9.49	
2.08	125	2:30 PM	30	0.3359099	9.31	
					Average Infiltration Rate:	2.61
					Factor of Safety:	0.45

APPENDIX B

PRODUCT



CRS451V

Stainless-Steel Vented Stand-Alone Pressure Transducer



Pressure Transducer Combined with a Recorder

High resolution and accuracy

Overview

The CRS451V consists of a submersible water-level and water-temperature sensor with its own time clock and memory to store the collected data—in a compact stainless-steel case. This data logging capability frees users to place the sensor in remote sites and let it collect data for long periods. HydroSci software is included and elegantly supports test setup, data

retrieval, and data display. Long battery life and rugged construction mean you can trust the CRS451V to collect important data. Low cost and ease of use make it a good choice in a variety of applications. The CRS456V is the same as this, but with a titanium case.

Benefits and Features

- › Sensors and data-collection features in one instrument case
- › Rugged stainless-steel case protects piezoresistive sensor
- › Quality construction ensures product reliability
- › Fully temperature-compensated
- › Fast scan rate
- › Large data-storage capacity
- › Long battery life
- › Easy-to-use software

Detailed Description

The CRS451V has several pressure range options.

HydroSci software is available for [download](#). This software simplifies the process of configuring the CRS451V. Users can

configure the CRS451V to monitor surface water, ground water, or a standard pump test.

HydroSci software will display the data in tabular or graphical formats.

Specifications

Venting

Vented

Measurement Time

< 1.0 s