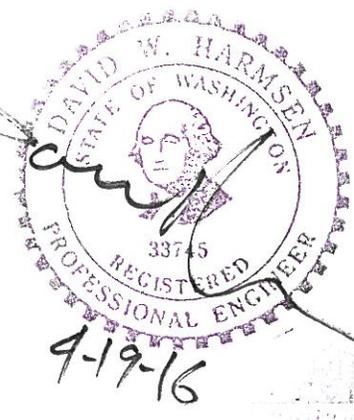


**CONCEPTUAL STORMWATER SITE PLAN  
FOR THE  
PRELIMINARY PLAT OF  
FOXBOROUGH  
MONROE, WASHINGTON**

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APRIL 19, 2016



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## PROJECT OVERVIEW

This Stormwater Site Plan has been prepared for the Preliminary Plat of Foxborough in Monroe, Washington. The project consists of 18 zero lot line lots spread over 4 buildings with a central site access drive. Currently, there is a single family home with outbuildings that will be removed from the site. The 2.4 acre site is located at 17417 West Main Street, see Figure 1: Vicinity Map.

## METHODOLOGY

The drainage design for the project has been prepared based on the requirements of the 2005 Department of Ecology Stormwater Management Manual (DOE Manual) as adopted by the City of Monroe. WWHM3 as provided by DOE has been used for determining basin runoff and for sizing of the stormwater facilities. Based on the flow charts in Figure 2.3 of the DOE Manual and the site parameters, the project is subject to Minimum Requirements 1-10.

The project site parameters are:

- The project is new development.
- The project will create 5,000 sf of new or replaced impervious area.
- The project will disturb more than 7,000 sf.
- The project does not convert  $\frac{3}{4}$  acre of pasture to lawn.
- The project does not convert 2.5 acres of forest to pasture.

## **MR 1: PREPARATION OF STORMWATER SITE PLANS**

### **DRAINAGE PLAN DESCRIPTION**

Stormwater runoff from roofs and paved areas will be collected and conveyed to a central infiltration trench located under the access drive.

### **WATER QUALITY MEASURES**

Following is a list of the proposed construction water quality BMPs. See MR 3: Water Pollution Source Control for more information. The proposed BMPs are as follows:

- BMP C103, High Visibility Fence
- BMP C105, Construction Entrance
- BMP C107, Construction Road/Parking Area Stabilization
- BMP C120, Temporary and Permanent Seeding
- BMP C121, Mulching
- BMP C123, Plastic Covering
- BMP C125, Topsoiling/Composting
- BMP C140, Dust Control
- BMP C220, Storm Inlet Protection
- Temporary Infiltration Pond

### **DETENTION SIZING**

Flow control will consist of an infiltration into the underlying soils using a pair of underground, infiltration trenches. As a result there will be no surface runoff from the site.

### **CONVEYANCE CALCULATIONS**

It is anticipated that pipe runs will be short and that conveyance will not be an issue.

### **STORMWATER TREATMENT BMP'S**

The roof runoff is considered clean and treatment is not required. The runoff from the new access drive will utilize cartridge filter treatment systems. See Minimum Requirement #6 for additional information.

### **PROTECTION OF WETLANDS**

There are no wetlands on or adjacent to the site.

### **OPERATIONS AND MAINTENANCE**

This will be provided with the permit documents after preliminary approval.

## EXISTING CONDITIONS SUMMARY

### DESCRIPTION

The site is located at 17417 West Main Street. There is currently a single family home with several outbuildings on the 0.97 acre site. The majority of the site is lawn with scattered trees. The topography of the site lies between 52 feet and 49 feet with the low area in the northeast. See Figure 2: Existing Site Map for more information.

### SOILS DESCRIPTION

GeoTest Services, Inc has performed soils exploration on the site and has documented the underlying soils in their report *Geotechnical Engineering Investigation – Monroe Townhouses*. In general, the soils are topsoil lying over sandy silt (alluvium) lying over very gravelly sand (glacial outwash). Infiltration testing of the underlying soils resulted in a recommended long-term infiltration rate of 3.7 inches per hour.

### EXISTING BASIN

The existing basin is the full site. As 100 percent infiltration is proposed, no existing basin calculations were performed.

## OFFSITE ANALYSIS & MITIGATION

No runoff is proposed to leave the site.

## UPSTREAM ANALYSIS

The site is bounded by West Main Street to the south, a plat to the north, Rodland's to the east and 174<sup>th</sup> Drive SE to the west. The plat to the north and Rodland's are lower than the site and do not contribute runoff. The curb along West Main Street blocks flow from the south. To the west, 174<sup>th</sup> Drive SE does flow onto the site.

## DOWNSTREAM ANALYSIS

No runoff is proposed to leave the site.

## PROPOSED CONDITIONS SUMMARY

The site will be sub-divided into 18 zero-lot line lots consisting of 4 multi-unit buildings, two 6-unit buildings to the east and two 3-unit buildings to the west. An access will be extended north from West Main Street and then tee to provide access between the units to east and west. See Figure 3: Developed Conditions.

## **MR 2: CONSTRUCTION STORMWATER POLLUTION PREVENTION (SWPP)**

This SWPPP Narrative has been prepared as part of the preliminary plat and is conceptual in nature. The project proposes less than 1 acre of land disturbing activities and will not require a Department of Ecology Construction Stormwater General Permit.

The construction site has the following characteristics:

Disturbed Area: Approximately 0.9 ac.  
Soil Type: Pastik silt loam.  
(Runoff is slow and the hazard of water erosion is slight)  
Average slope: 0.5-2% on the flatter areas.  
Critical Areas: None.

### **1. CONSTRUCTION STORMWATER POLLUTION PREVENTION ELEMENTS**

A Construction Stormwater Management Plan will be prepared that addresses the 12 Required Elements summarized below:

#### **Element #1: Mark Clearing Limits**

The construction plans delineate the limits of the clearing for the site. These will be located in the field prior to clearing taking place.

#### **Element #2: Establish Construction Access**

Construction access will be taken from the existing access to West Main Street. A stabilized construction entrance will be installed at that location.

#### **Element #3: Control Flow Rates**

Temporary infiltration ponds will be constructed by the contractor to allow construction runoff to infiltrate.

#### **Element #4: Install Sediment Controls**

Sediment controls and their installation will be delineated on the construction documents in the future.

#### **Element #5: Stabilize Soils**

In planting areas the exposed soils will be stabilized per the Landscape Plan prepared for the project. In paved areas the soils will be stabilized by the placement of the rock base course. Temporary stockpiles will be mulched, seeded or covered with plastic.

#### **Element #6: Protect Slopes**

The site is flat and will not require slope protection.

**Element #7: Protect Drain Inlets**

The storm drains along West Main Street will be protected with filter inserts.

**Element #8: Stabilize Channels and Outlets**

No channels or outfalls are proposed.

**Element #9: Control of Pollutants**

All pollutants, including waste materials and demolition debris, that occur onsite shall be handled and disposed of in a manner that does not cause contamination of stormwater. Good housekeeping and preventative measures will be taken to ensure that the site will be kept clean, well organized, and free of debris.

**Element #10: Control De-Watering**

No dewatering is expected as no excavation to the water table is anticipated.

**Element #11: Maintain BMPs**

Notes for the maintenance of erosion control facilities will be included on the construction plans.

**Element #12: Manage the Project**

The project will be subject to seasonal work limitations, site inspection and monitoring as required by the City of Monroe. Erosion control monitoring and supervision will be managed by the contractor.

**Element #13: Protect Low Impact Development**

This will be addressed on the final construction documents after preliminary plat.

### **MR 3: WATER POLLUTION SOURCE CONTROL**

#### PERMANENT SOURCE CONTROL BMPs

Being a residential development source control will consist of maintained garbage facilities, maintenance of the storm drain system, and pavement sweeping.

### **MR 4: PRESERVATION OF NATURAL DRAINAGE**

Infiltration of the storm water runoff from the developed site is proposed. This matches the existing conditions where there is essentially no surface discharge from the site. As such there is no downstream drainage that will be impacted by the discharge of surface water from the proposed development. By allowing the runoff to continue to infiltrate, the natural drainage will be preserved.

### **MR 5: ON-SITE STORMWATER MANAGEMENT**

The project proposed 100 percent infiltration of runoff, meeting the requirements of MR 5.

### **MR 6: RUNOFF TREATMENT**

With more than 5,000 sf of pollution generating impervious surface the site requires runoff treatment. Storm water treatment of the parking lot runoff will be accomplished through the use of catch basin cartridge filter treatment systems by Contech Stormwater Solutions. The system is approved for stand alone general use by the Department of Ecology and is sized to treat the 6-month developed stormwater runoff rate while safely conveying larger stormwater events to the infiltration facility. A system will be placed on each end of the proposed infiltration facility.

The basin tributary to the filter catchbasins is 0.32 ac with a treatment flow rate of 0.06 cfs. Initial calculations indicate a need for 6 cartridges.

## **MR 7: FLOW CONTROL**

The site has been sized as a single basin. Paved areas will be graded to drain to the catchbasin filters and then into infiltration trenches while roof drains will be directly connected to the infiltration trenches.

The basin is 0.90 acres in area and consists of 0.70 acres of impervious surface and 0.20 acres of pervious landscaping. Two infiltration trenches will be installed to avoid the existing water main that runs north-south through the site. For preliminary purposes, the trench has been sized as a single unit.

The trench has the following characteristics:

Length:	276 feet
Width:	10 feet
Depth:	3 feet
Design Rate:	3.7 in/hr
Percent Infiltrated:	100%

See attached WWHM3 screen captures in Appendix A.

## **MR 8: WETLANDS PROTECTION**

There are no wetlands or other critical areas on or near the site.

## **MR 9: BASIN/WATERSHED PLANNING**

The City of Monroe does not have any specific drainage basin or watershed requirements.

## **MR 10: OPERATION AND MAINTENANCE**

A full operations and Maintenance Manual will accompany the final drainage report.

## FIGURES



**FIGURE 1: VICINITY MAP**



**FIGURE 2: EXISTING CONDITIONS**

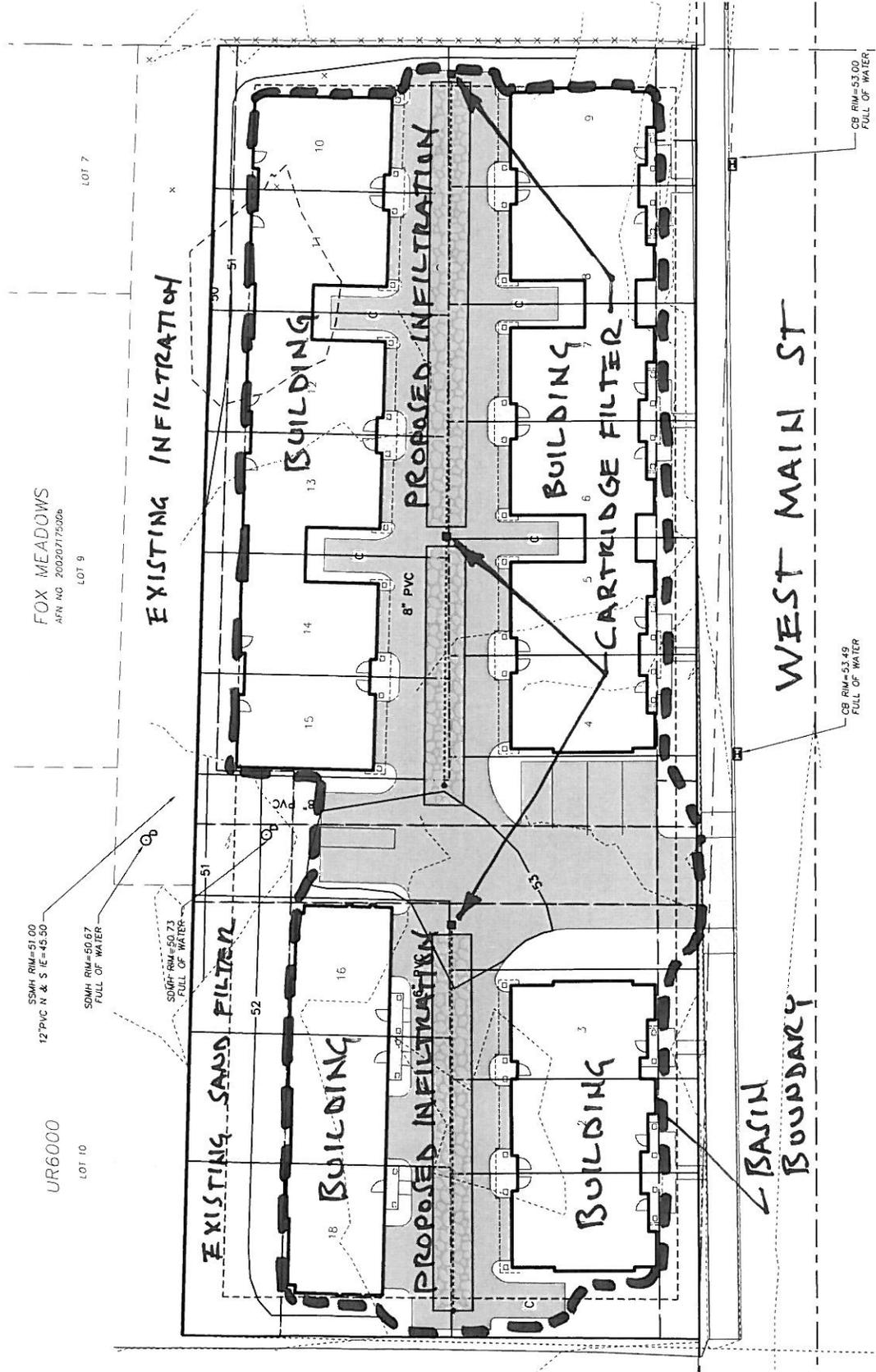
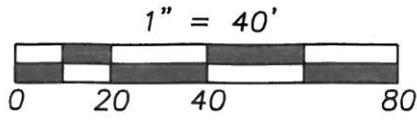


FIGURE 3: DEVELOPED SITE

**APPENDIX A**  
**WWHM3 SCREEN SHOTS**

**Basin 1 Mitigated**

Subbasin Name:   Designate as Bypass for POC:

Flows To: Surface:  Interflow:  Groundwater:

Area in Basin  Show Only Selected

Available Pervious		Available Impervious	
<input type="checkbox"/> A/B, Forest, Flat	0	<input checked="" type="checkbox"/> ROADS/FLAT	7
<input type="checkbox"/> A/B, Forest, Mod	0	<input type="checkbox"/> ROADS/MOD	0
<input type="checkbox"/> A/B, Forest, Steep	0	<input type="checkbox"/> ROADS/STEEP	0
<input type="checkbox"/> A/B, Pasture, Flat	0	<input checked="" type="checkbox"/> ROOF TOPS/FLAT	0
<input type="checkbox"/> A/B, Pasture, Mod	0	<input type="checkbox"/> DRIVEWAYS/FLAT	0
<input type="checkbox"/> A/B, Pasture, Steep	0	<input type="checkbox"/> DRIVEWAYS/MOD	0
<input type="checkbox"/> A/B, Lawn, Flat	0	<input type="checkbox"/> DRIVEWAYS/STEEP	0
<input type="checkbox"/> A/B, Lawn, Mod	0	<input type="checkbox"/> SIDEWALKS/FLAT	0
<input type="checkbox"/> A/B, Lawn, Steep	0	<input type="checkbox"/> SIDEWALKS/MOD	0
<input type="checkbox"/> C, Forest, Flat	0	<input type="checkbox"/> SIDEWALKS/STEEP	0
<input type="checkbox"/> C, Forest, Mod	0	<input type="checkbox"/> PARKING/FLAT	0
<input type="checkbox"/> C, Forest, Steep	0	<input type="checkbox"/> PARKING/MOD	0
<input type="checkbox"/> C, Pasture, Flat	0	<input type="checkbox"/> PARKING/STEEP	0
<input type="checkbox"/> C, Pasture, Mod	0	<input type="checkbox"/> POND	0
<input type="checkbox"/> C, Pasture, Steep	0		
<input checked="" type="checkbox"/> C, Lawn, Flat	2		
<input type="checkbox"/> C, Lawn, Mod	0		
<input type="checkbox"/> C, Lawn, Steep	0		

Pervious Total:  Acres      Impervious Total:  Acres

Basin Total:  Acres

### DEVELOPED BASIN INPUT

**Gravel Trench Bed 1 Mitigated**

Facility Name:

Outlet 1:       Outlet 2:       Outlet 3:

Downstream Connection:

Facility Type:   Quick Trench

Precipitation Applied to Facility

Evaporation Applied to Facility

Facility Bottom Elevation (ft):

**Facility Dimensions**

Trench Length:

Trench Bottom Width:

Effective Total Depth:

Bottom slope of Trench:

Left Side Slope:

Right Side Slope:

**Outlet Structure**

Riser Height (ft):

Riser Diameter (in):

Riser Type:

Notch Type:

Orifice Number	Diameter (In)	Height (Ft)	QMax (cfs)
1	<input type="text" value="0"/>	<input type="text" value="0"/>	0
2	<input type="text" value="0"/>	<input type="text" value="0"/>	0
3	<input type="text" value="0"/>	<input type="text" value="0"/>	0

**Material Layers for**

Layer 1 Thickness (ft):

Layer 1 porosity:

Layer 2 Thickness (ft):

Layer 2 porosity:

Layer 3 Thickness (ft):

Layer 3 porosity:

**Infiltration**  YES

Measured Infiltration Rate (in/hr):

Infiltration Reduction Factor:

Use Wetted Surface Area (sidewalls):

Total Volume Infiltrated (acre-ft):

Total Volume Through Riser (acre-ft):

Trench Volume at Riser Head (acre-ft):

Pond Increment:

**Show Pond Table**  Open Table

Total Volume Through Facility (acre-ft):

Percent Infiltrated:

### INFILTRATION FACILITY SIZING

**APPENDIX B**  
**GEOTECHNICAL REPORT**