

**STORMWATER DRAINAGE REPORT FOR
REECE OFFICE & SCALE HOUSE
ARLINGTON, WASHINGTON**

APRIL 8, 2021



4/8/21



CONSTRUCTION DRAWING REVIEW ACKNOWLEDGMENT

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DRAINAGE INFORMATION SUMMARY FORM

Project Name: REECE OFFICE & SCALE HOUSE
 Project Total Area: 1.75 acres
 Number of Lots: 1

SUMMARY TABLE

Drainage Basin Information	Individual Basin Designation
	A
Area of Impact (acres)	0.84
Existing condition Area (ac)	0.84
Pervious Area (ac)	0.84
Impervious Area (ac)	0.00
Proposed Condition Area (ac)	0.84
Pervious Area (ac)	0.08
Impervious Area (ac)	0.76
Non-pollution Generating (ac)	0.18
Pollution Generating (ac)	0.58
Predeveloped Runoff Rates	
Q (cfs) 2 year	0.0007
10 year	0.003
100 year	0.013
Post-developed Runoff Rates	
Q (cfs) 2 year	0.00
10 year	0.00
100 year	0.00
Offsite Upstream Area	0
Type of Storage Proposed	Infiltration Trench
Approximate Storage Volume (cf)	1,600
Type of Treatment	Filtterra
Low Impact Development	BMP T5.13

MR 1: STORMWATER SITE PLAN REPORT

PROJECT OVERVIEW & EXECUTIVE SUMMARY

DRAINAGE PLAN DESCRIPTION

This Drainage Report has been prepared for the Reece Office & Scale House project on their property in Arlington WA. The 13.86-acre site is located at 5802 Cemetery Road, Arlington, see Figure 1: Vicinity Map. Currently the site is used as a construction materials storage and aggregate sorting facility. There are also several buildings and parking areas on the site. The site is bounded by Cemetery Road to the north, the property to the west is also owned by Reece, and industrial developments to the east and south. The applicant is proposing to construct a new 2 story office building with associated parking and a scale house building see Figures 3A and 3B.

METHODOLOGY

The drainage calculations for the site have been prepared based on the requirements of the 2012 DOE Manual as adopted by the City of Arlington. Based on the proposed new plus replaced impervious area of more than 5,000 sf, the site is required to comply with Minimum Requirements 1-9 of the DOE Manual. WWHM2012 by DOE has been used for runoff calculations.

DRAINAGE BASIN

The site is being development consists of 2 areas. First is the Office Basin consisting of the new office building and associated parking. This basin also includes rebuilding the site access as a roadway extension from Cemetery Road. The Scale House Basin consists of the new scale house.

DRAINAGE SYSTEM SKETCH

Refer to Figure 3: Developed Conditions for a graphic representation of the proposed drainage system.

DOWNSTREAM ANALYSIS

See Downstream Analysis on page 4 of this report.

UPSTREAM ANALYSIS

See Upstream Analysis on page 4 of this report.

CONVEYANCE CALCULATIONS

Conveyance calculations will be prepared for the project prior to final construction approval.

WATER QUALITY

With more than 1 acre of disturbance a DOE A Storm Water Pollution Prevention Plan (SWPPP) has been prepared for this project. A copy is included with the building permit submittal package. The plan includes several of the following erosion control Best Management Practices:

BMP C105, Construction Entrance
BMP C120, Temporary & Permanent Seeding,
BMP C121, Mulching,
BMP C123, Plastic Covering,
BMP C125, Top soiling,
BMP C220, Storm Drain Inlet Protection
BMP C233, Silt Fence.

OPERATIONS AND MAINTENANCE

An Operations and Maintenance Manual is provided under separate cover.

RUNOFF TREATMENT BMP'S

With more than 5,000 sf of new/replaced impervious surface subject to vehicular traffic the project meets the threshold for requiring runoff treatment BMPs. A Filterra bioretention filtration system by Contech is proposed to treat the parking area and access runoff, see MR 6 for more information.

STREAM BANK EROSION CONTROL BMP'S

The proposed impervious surface is more than 10,000 sf therefore flow control is required. The following Flow Control BMPs are used on this site. See MRs 5 and 7 for more information.

Infiltration Trench,
BMP T5.13, Soil Quality and Depth.

EXISTING CONDITIONS SUMMARY

DESCRIPTION

Currently the site is used as a construction materials storage and aggregate sorting facility, see Figure 2 Existing Site. There are also several buildings and parking areas on the site. An existing infiltration pond that serves the site is located on the adjacent property to the southwest of the work areas. A storm collection and conveyance system consisting of catch basins and pipe routes existing site runoff to this pond. The site slopes gently to the south for about 440 feet from Cemetery Road at elevation 123 to a low of about 110. This is where the existing storm catch basins collect the site runoff. The ground then rises to about elevation 115 at the south property line. There are no wetlands, stream, steep slopes or other critical areas on the site.

The site is bounded by Cemetery Road to the north, the property to the west is also owned by Reece and contains additional storage areas and the infiltration pond, and industrial developments lay to the east and south.

EXISTING OFFICE BASIN

In the current condition the 0.84 acre basin has the following areas:

Forest	0.84 ac
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The existing site flow frequency runoff rates are:

2 year	0.0009 cfs
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10 year	0.003 cfs
100 year	0.013 cfs

See WWHM2012 report in Appendix B.

SOILS DESCRIPTION

According to the Natural Resources Conservation Service Web Soil Survey Map the soils on-site are classified as Everett Gravelly Sandy Loam. This very deep, somewhat excessively drained soil is found on terraces and outwash plains and is formed in glacial outwash. Typically, the surface layer is dark brown gravelly sandy loam about 6 inches thick. The subsoil is dark brown very gravelly sandy loam about 12 inches thick. The upper part of the substratum is brown very gravelly loamy sand about 5 inches thick. The lower part to a depth of 60 inches or more is dark brown extremely gravelly sand. The DOE Manual defines Everett soil as a hydrologic group A soil. The NRCS Web Soil Survey map is included in Appendix A.

Geotest has prepared a geotechnical study for the site titled *Geotechnical Evaluation Report - Construction Office and Scale Relocation* dated November 25, 2020. The report documented their subsurface findings and provided design recommendations. They evaluated the underlying soils for infiltration and recommended a design infiltration rate of 10"/hr. See their report for more information.

UPSTREAM ANALYSIS

There is no significant upstream area that flows onto the site. To the north lays Cemetery Road with roadside ditches that prevent runoff from entering the site. To the east are industrial sites with their own storm systems. To the south is the Arlington Airport and to the west is other property owned by Reece.

DOWNSTREAM ANALYSIS

Runoff from the site is collected and flows to an onsite storm system and then to the infiltration pond located on the adjacent property to the west. Runoff from the scale house will be dispersed and flow to the existing storm system and infiltration pond. The proposed office building and parking lot runoff will be collected, treated and infiltrated in a new infiltration trench. As such there is no surface flow discharge from the site.

MR 2: SWPPP NARRATIVE

This proposed project will result in greater than 1 acre of disturbed are and will require a Department of Ecology Construction Stormwater General Permit. A Full SWPPP Narrative using the DOE template is provided under separate cover

MR 3: WATER POLLUTION SOURCE CONTROL

CONSTRUCTION STORMWATER BMPs

A Stormwater Pollution Prevention Plan, SWPPP, is part of the construction drawings prepared for the project, and specifies many of the following erosion control Best Management Practices:

- BMP C102, Buffer Zones
- 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, Top soiling/Composting
- BMP C130, Surface Roughening
- BMP C140, Dust Control
- BMP C150, Materials on Hand
- BMP C153, Material Storage
- BMP C160, Certified Erosion and Sediment Control Lead
- BMP C200, Interceptor Dike and Swale
- BMP C207, Check Dams
- BMP C209, Outlet Protection
- BMP C220, Storm Inlet Protection
- BMP C233, Silt Fence

PERMANENT SOURCE CONTROL BMPs

The site is subject to ongoing Source Control BMPs as part of the current site operations DOE NPDES permitting. No additional BMPs will be required as a result of the proposed site improvements. Typical BMPs associated with an office building are:

- Stormwater system maintenance
- Vegetation Management
- Street Sweeping
- Maintenance of dumpsters

MR 4: PRESERVATION OF NATURAL DRAINAGE

Runoff from the site sheet flows to the central lower area of the site, where several catch basins collect runoff and convey it to an existing infiltration pond located on the adjacent property to the west. In the developed condition runoff from the Office Basin will be collected, treated and infiltrated in a new trench located under the proposed parking lot. Runoff from the Scale Building basin will be brought to splash blocks and then flow to the existing storm system. With infiltration being the existing and proposed methods of controlling stormwater runoff the existing drainage will be preserved. Note that with implementation of the new infiltration facility that the total amount of runoff flowing to the existing infiltration pond will be reduced somewhat.

MR 5: ON-SITE STORMWATER MANAGEMENT

As the site is located in the City of Arlington and will be required to meet MR #1-9, it can achieve MR 5 requirement either through the use of List #2 or by meeting the Low Impact Development Performance Standard. With infiltration of the site runoff, the site meets the Low Impact Development Performance Standard.

Runoff from the different site areas will be managed as follows:

LAWN AND LANDSCAPED AREAS:

BMP T5.13 Post Construction Soil Quality and Depth will be implemented on disturbed and landscaped areas. It is expected that most disturbed soil will be covered with new impervious. Select site topsoil or imported topsoil will be used for those small areas where pervious surfaces need restoration.

ROOF AREAS:

Item #1: Full Dispersion or Downspout Full Infiltration

The site is underlain by sands and gravels. As such the roof runoff will be collected and infiltrated in the trench to be located under the southwest corner of the parking lot.

PAVEMENT AREAS:

Item #1: Full Dispersion or Full Infiltration

The site is underlain by sands and gravels. As such the parking lot runoff will be collected, treated and infiltrated in the trench to be located under the southwest corner of the parking lot.

MR 6: RUNOFF TREATMENT

With more than 5,000 sf of pollution generating impervious surface the site requires runoff treatment.

Oil Control: The site does not meet the threshold of 100 vehicles per day/1,000 sf of building area.

Phosphorous Control: We have reviewed the 303d listing and there are no water bodies listed in the local area. There is no City requirement for Phosphorous Control.

Enhanced Treatment: Enhanced treatment is required when a commercial site discharges directly to fresh waters or conveyance systems tributary to fresh waters designated for aquatic life use or that have an existing aquatic life use. Enhanced treatment will be required.

OFFICE BASIN TREATMENT FACILITY

The Filterra Treatment System has been chosen to meet the runoff treatment requirements for the site runoff. The system has Department of Ecology GULD approval for enhanced treatment.

FILTERRA OPERATION

Stormwater runoff enters the Filterra bioretention system from SDCB #4 then filters through a specially designed bioretention filter media mixture contained in a landscaped concrete container. The filter media captures and immobilizes pollutants; those pollutants are then decomposed, volatilized and incorporated into the biomass of the Filterra system's micro/macro fauna and flora. Stormwater runoff flows through the media and into an underdrain system at the bottom of the container, where the treated water is discharged.

FILTERRA SIZING

Treatment facility has been performed using WWHM2012 with the parameters based on Contech's approved media, see output in Appendix B. The facility will be located near the southwest corner of the parking lot and will drain to the infiltration trench. The required Filterra filter bed size, required runoff treatment percentage and actual runoff treatment percentage are listed below. See WWHM2012 report for sizing calculations in Appendix B.

Filterra Size, feet	6'x4'
Required Treatment	91%
Percent Treated	96.0%

MR 7: FLOW CONTROL

The site redevelopment will result in more than 10,000 sf of new and new or replaced impervious surface and will require construction of a flow control facility.

OFFICE BASIN FLOW CONTROL FACILITY

In the developed condition, the basin has the following land uses and areas.

Landscaping	0.08 ac
Asphalt	0.58 ac
Concrete	0.07 ac
Roof	0.11 ac

An infiltration trench will be used to provide flow control. The trench will be located under the southwest corner of the parking area receive flow from the Filterra treatment facility. The infiltration trench will have the following parameters:

Trench Parameters

Length:	80 feet
Width:	20 feet
Depth:	2.5 feet
Infiltration Rate:	10 inch/hour
% Infiltrated:	100%

For drainage basin input parameters and flow frequency calculations, input parameters and flow duration analysis see WWHM2012 report in Appendix B.

GROUNDWATER

The geotechnical report includes several soil logs to a depth of about 8 feet. No groundwater was noted in the soil logs. The geotechnical report, see page 6, goes on to reference Department of Ecology and other information showing the regional groundwater is 60-70 feet below the ground surface. The bottom of the proposed infiltration trench is elevation 112 and the existing ground at that location is about 117. This provides about 3 feet of separation from the bottom of the trench to the limits of the onsite excavations and likely more than 50 feet to groundwater.

SCALE BUILDING BASIN

The area to contain the scale building and access loop is currently fully impervious and currently flows to existing catch basins, then to an infiltration pond to the northwest. The scale house building is only 820 sf and it is proposed that splash blocks be used to disperse runoff to the adjacent gravel area. Runoff from the paving of the existing access loop will continue to sheet flow to the existing catch basins and infiltration pond.

MR 8: WETLANDS PROTECTION

There are no known wetlands, streams or other critical areas on the site.

MR 9: OPERATION AND MAINTENANCE

The specific requirements for the ongoing operation and maintenance of the proposed storm water systems is detailed in a separate Operation and Maintenance Manual submitted with the construction drawings, under separate cover.