

Technical Information Report

Town Place Hotel
Federal Way, WA

Prepared For:

HC FW, LLC
3926 Aurora Ave. North
Seattle, WA 98103

Prepared By:

SCJ Alliance
8730 Tallon Lane NE, Suite 200
Lacey, WA 98516
360-352-1465

RECEIVED

OCT 30 2019

CITY OF FEDERAL WAY
COMMUNITY DEVELOPMENT

September 2019



SCJ ALLIANCE
CONSULTING SERVICES

Technical Information Report

Project Information

Project: **Town Place Hotel**

Prepared for: **HC FW, LLC**
3926 Aurora Ave. North
Seattle, WA 98103
Contact Name: Han Kim
Contact Phone: 206-441-0266

Reviewing Agency

Jurisdiction: City of Federal Way

Project Representative

Prepared by: **SCJ Alliance**
8730 Tallon Lane NE, Suite 200
Lacey, WA 98516
360.352.1465
scjalliance.com

Contact: Tyrell Bradley, PE

Project Reference: **SCJ #3278.01**
Path: N:\Projects\3278 HC FW, LLC\3278.01 Town Place Hotel Federal
Way\Phase 02 - Construction Documents\Design\Storm\Technical
Information Report\2019-xxxx Stormwater Site Plan.docx

PROJECT ENGINEER'S CERTIFICATION

I hereby certify that this Technical Information Report (TIR) for the Town Place Hotel project has been prepared by me or under my supervision and meets the minimum standards of the City of Federal Way and normal standards of engineering practice. I hereby acknowledge and agree that the jurisdiction does not and will not assume liability for the sufficiency, suitability, or performance of drainage facilities designed by me.



09/27/2019

Prepared by: Mallory Dobbs, EIT
Mallory.Dobbs@scjalliance.com
(360) 352-1465

Date



09/27/2019

Approved by: Tyrell, Bradley, PE
Tyrell.Bradley@scjalliance.com
(360) 352-1465

Date

TABLE OF CONTENTS

- 1. Project Overview3**
- 2. Conditions and Requirements Summary3**
 - 2.1 Summary of Compliance On-Site 4
- 3. Offsite Analysis5**
 - 3.1 Level 1 Downstream Analysis..... 5
 - 3.1.1 Task 1. Study Area Definition and Maps..... 5
 - 3.1.2 Task 2. Resource Review..... 5
 - 3.1.3 Task 3. Field Inspection..... 5
 - 3.1.4 Task 4. Drainage System Description and Problem Descriptions 5
 - 3.1.5 Task 5. Mitigation of Existing or Potential Problems..... 5
- 4. Flow Control, Low Impact development (LID) and Water Quality Facility Analysis and Design6**
 - 4.1 Existing Site Hydrology (Part A)..... 6
 - 4.2 Developed Site Hydrology (Part B) 6
 - 4.3 Performance Standards (Part C)..... 7
 - 4.4 Flow Control System (Part D) 7
 - 4.5 Water Quality System (Part E)..... 7
- 5. Conveyance System Analysis and Design.....8**
- 6. Special Reports and Studies8**
 - 6.1.1 On-Site Soils Information 8
- 7. Other Permits.....8**
- 8. CSWPP Plan Analysis and Design.....8**
 - 8.1 Esc Plan Analysis and Design (Part A) 8
 - 8.2 SWPPS Plan Design (Part B)..... 9
- 9. Bond Quantities, Facility Summaries, and Declaration of Covenant9**
- 10. Operations and Maintenance Manual.....9**

LIST OF TABLES

- Table 1: Land Type Designations Existing vs. Proposed..... 7

LIST OF FIGURES

Figure 1: Existing Conditions (1990) Figure 2: Existing Conditions (2018)..... 6

LIST OF APPENDICES

- Appendix 1: Site Vicinity Map
- Appendix 2: Determination of Minimum Requirements Worksheet
- Appendix 3: Basin Map Exhibits
- Appendix 4: Preliminary Construction Plans
- Appendix 5: Special Reports
- Appendix 6: Operations and Maintenance Manual
- Appendix 7: Construction Stormwater Pollution Prevention Plan
- Appendix 8: FEMA Flood Insurance Map
- Appendix 9: Design Calculations and Computation
- Appendix 10: King County Surface Water Manual Worksheets
- Appendix 11: Declaration of Covenant



1. PROJECT OVERVIEW

The following report was prepared for the Town Place Hotel project in Federal Way, WA. This report was prepared to comply with the minimum technical standards and requirements that are set forth in the *2016 King County Surface Water Design Manual (KCSWDM)* and the 2017 City of Federal Way Addendum to The King County Surface Water Design Manual.

Project Proponent:	HC FW, LLC
Parcel Numbers:	2021049044
Total Parcel Area:	2.80 Acres
Current Zoning:	CE – Commercial Enterprise
Required Permits:	Grading, Utility, Paving, Building, etc.
Site Address:	34839 Pacific Hwy South
Section, Township, Range:	Section 20, Township 21 N, Range 4 E

The proposed Town Place Hotel is located on one parcel that contains 2.80 acres. The project is located to the south west of S 348th Street and Pacific Hwy South in Federal Way, WA. The proposed construction includes the 4-story hotel building, as well as associated parking lot, utilities, and stormwater improvements disturbing approximately 1.36 acres. Specifically, the proposed site improvements/construction activities for this project include the following:

- Site preparation, grading, and erosion control activities
- Construction of Town Place Hotel
- Construction of parking lot
- Construction/installation of on-site water quality and flow control facilities
- Extension of available utilities (i.e., water, sewer, etc.)

A site vicinity map of the proposed project location is enclosed herein as **Appendix 1**. A worksheet for determining the number of Minimum Requirements for this project per the KCSWDM has been prepared and enclosed herein as **Appendix 2**. Per Figure 1.1.2.A, the proposed project will require a Full Drainage Review.

2. CONDITIONS AND REQUIREMENTS SUMMARY

The proposed project improvements will result in more than 2,000 square feet of new impervious surface. In accordance with Section 1.1.2 of the KCSWDM, a Full Drainage Review is required for this project. As a result, Core Requirements 1-9 and Special Requirements 1-5 will need to be addressed. See below for the summary of compliance with these requirements.



2.1 SUMMARY OF COMPLIANCE ON-SITE

The stormwater design complies with the 9 core requirements and 5 special requirements as follows:

Core Requirement #1 – Discharge at the Natural Location – Currently, stormwater runoff within the parcel sheet flows to the center of the parcel and into an existing stream that runs through the parcel. After construction, the stormwater runoff from the proposed improvements will be collected, treated, detained and released into the stream at the predeveloped rates. A level spreader will be used at the outfall of the detention system to dissipate the water so that no erosion will occur in or near the stream. The areas to the west of the project will remain undisturbed throughout construction and will continue to follow the same drainage patterns.

Core Requirement #2 – Offsite Analysis – A Level 1 upstream and downstream analysis for this project has been completed and included in Section 3 of this TIR.

Core Requirement #3 – Flow Control Facilities – According to the City of Federal Way Flow Control Applications Map (see **Appendix 3**), the project is located within a Conservation Flow Control Area. There are no known drainage problems on the site or downstream from the site. Therefore, the flow control performance criteria requirement is to apply the historic site conditions Level 2 flow control standard which matches historic durations for 50% of the 2-year through 50-year peaks AND matches historic 2- and 10- year peaks. The historic site conditions are assumed to be forested. Flow control for the proposed project improvements will be provided by an underground detention facility and flow control release structure sized using the 2012 Western Washington Hydrology Model (WWHM), which is an approved continuous runoff model according to the KCSWDM.

Core Requirement #4 – Conveyance System – All on-site stormwater conveyance systems will be designed to route the 25-year peak flow event. A hydraulic analysis will be completed and provided in Section 5 of this report at the time of the civil permit submittal. Stormwater runoff release flows from the site are anticipated to remain the same after construction of the proposed improvements.

Core Requirement #5 – Construction Stormwater Pollution Prevention – A Construction Stormwater Pollution Prevention Plan (CSWPPP) will be prepared and include within the TIR at the time of the civil permit submittal which describes the 13 required elements. Further, an erosion control plan will be prepared and included as part of the engineering plan set. The contractor may need to amend and update these plans as part of development and/or management of the SWPPP. The contractor will be responsible for preparing the full SWPPP which shall comply with all of the required elements and the Washington Department of Ecology requirements for coverage under the NPDES Construction Stormwater General Permit.

Core Requirement #6 – Maintenance and Operations – All stormwater facilities will be located on the parcel and privately owned. A site-specific Operations and Maintenance Manual will be completed and included herein as **Appendix 6** at the time of the civil permit submittal.

Core Requirement #7 – Financial Guarantees and Liability– If required, the Owner will post a drainage facilities restoration and site stabilization financial guarantee.

Core Requirement #8 – Water Quality – According to the City of Federal Way Water Quality Applications Map (see **Appendix 3**), the project is located within an Enhanced Basic Water Quality Treatment Menu area. Per Section 1.2.8.1 of the KCSWDM, commercial land uses require the Enhanced Basic WQ menu. The proposed project will construct a hotel which is considered a commercial land use. Enhanced basic treatment will be provided for all of the target pollution-generating impervious surfaces by two Modular Wetland Systems.

Core Requirement #9 – Flow Control BMPs – The proposed project is on a site that is greater than 22,000 square feet, but is not a Large Rural Lot as defined in Section 1.2.9.2.3 of the KCSWDM, therefore, according to Section 1.2.9.2.2 of the KCSWDM the Large Lot BMP Requirements must be applied to this project.



Special Requirement #1 – Other Adopted Area-Specific Requirements – In addition to meeting the minimum requirements of the KCSWDM, this project will also comply with the 2017 City of Federal Way Addendum to the King County Surface Water Design Manual.

Special Requirement #2 – Flood Hazard Area Delineation – The proposed project is not located in or adjacent to a *flood hazard area*. This Special Requirement is not applicable.

Special Requirement #3 – Flood Protection Facilities – The proposed project does not rely on an existing flood protection facility. This Special Requirement is not applicable.

Special Requirement #4 – Source Control – Water quality source controls will be installed in accordance with the *King County Stormwater Pollution Prevention Manual*.

Special Requirement #5 – Oil Control – The expected average daily traffic (ADT) count will not be greater than 100 vehicles per 1,000 square feet of gross building area; oil control is not required.

3. OFFSITE ANALYSIS

3.1 LEVEL 1 DOWNSTREAM ANALYSIS

3.1.1 Task 1. Study Area Definition and Maps

The proposed project site does not appear to have any significant offsite run-on from the adjacent areas.

3.1.2 Task 2. Resource Review

According to the FEMA Flood Insurance Rate Map (FIRM) the project site is located within Zone X which is an area determined to be outside the 500-year floodplain. The project is not located within any basin plan areas or drainage and water quality problem areas.

3.1.3 Task 3. Field Inspection

There are no known flooding or conveyance problems located on or downstream from the project. The proposed project improvements will include the design of stormwater quality and quantity facilities and therefore it is anticipated at this time that the release flows from the project will remain the same or decrease.

3.1.4 Task 4. Drainage System Description and Problem Descriptions

Currently, stormwater runoff within the parcel sheet flows into the stream located on-site. It was observed that there are densely vegetated steep slopes down to the stream. These sloped vegetated areas are located within the 100' stream buffer and will remain undisturbed throughout the life of the project.

3.1.5 Task 5. Mitigation of Existing or Potential Problems

At this time, there are no known drainage problems on-site or downstream from the parcel. The proposed project will not alter the drainage patterns or increase stormwater runoff from the parcel. Stormwater runoff will be released at the predeveloped forested condition to meet core requirement #3. A flow spreader will disperse the stormwater runoff on the outside of the stream buffer.



4. FLOW CONTROL, LOW IMPACT DEVELOPMENT (LID) AND WATER QUALITY FACILITY ANALYSIS AND DESIGN

4.1 EXISTING SITE HYDROLOGY (PART A)

The subject site is +/- 2.80 acres in size. Topography within the property is generally flat throughout the site except for the side slopes of a stream that runs through the middle of the parcel. The site appears to have been cleared around 1990, with minimal to no on-site development. Today, the site remains undeveloped with trees and grassland. See the figures below.



Figure 1: Existing Conditions (1990)

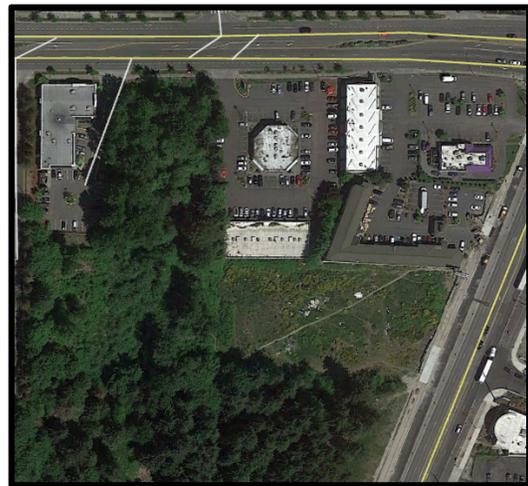


Figure 2: Existing Conditions (2018)

Currently, stormwater runoff within the project parcel sheet flows to the east and west and into the stream located near the center of the parcel. Although a portion of the site was cleared in the 90's, the vegetation adjacent to the stream has remained and matured. There are no known flow control or water quality facilities located on-site.

4.2 DEVELOPED SITE HYDROLOGY (PART B)

The proposed project follows the development requirements stated in the 2016 KCSWDM. Following Figure 1.1.2.A (See **Appendix 2**), this project classifies as a new development that requires a Full Drainage Review. The proposed project is not a single family residential or agricultural project and results in over 2,000 s.f. of new and/or replaced impervious surface. As part of the proposed project, stormwater runoff from the proposed improvements will be collected, treated, detained in an underground detention system and released at the predeveloped rates into a concrete flow spreader box. The stormwater system has been designed to meet Core Requirements #1-9 and Special Requirements #1-5. See **Appendix 4** for the proposed stormwater facility locations and details. Table 1: Land Type Designations Existing vs. Proposed below illustrates the existing and proposed impervious and pervious areas of the disturbed areas (See **Appendix 3** for the basin maps).



LAND TYPE DESIGNATIONS	AREA (ACRES)	% OF TOTAL AREA
Existing Areas	1.36	100
Impervious	0.00	0
Pervious	1.36	100
Proposed Areas	1.36	100
Roof	0.33	24.26
Asphalt	0.70	51.47
Sidewalk	0.09	6.62
Landscape	0.24	17.65

Table 1: Land Type Designations Existing vs. Proposed

4.3 PERFORMANCE STANDARDS (PART C)

The proposed project is on a site that is greater than 22,000 square feet but is not a Large Rural Lot as defined in Section 1.2.9.2.3 of the KCSWDM, therefore, according to Section 1.2.9.2.2 of the KCSWDM the Large Lot BMP Requirements must be applied to this project.

According to the City of Federal Way Water Quality Applications Map (see **Appendix 3**), the project is located within an Enhanced Basic Water Quality Treatment Menu area. Per Section 1.2.8.1 of the KCSWDM, commercial land uses require the Enhanced Basic WQ menu.

The conveyance system on-site will be entirely made up of new components and therefore must meet the requirements stated in Section 1.2.4.1 of the KCSWDM. The new pipe systems have been designed with sufficient capacity to convey and contain (at minimum) the 25-year peak flow, assuming developed conditions for onsite tributary areas.

4.4 FLOW CONTROL SYSTEM (PART D)

Flow control is required for the proposed development and will be provided through an underground detention system made up of Contech CMP pipes. The 2012 Western Washington Hydrology Model (WVHM) was used to size the flow control facilities so that they will meet Core Requirement #7. All of the stormwater runoff on-site will be collected, treated, and detained within the underground detention system. WVHM was used to size the detention system for the appropriate volume, and to provide the required release rates of the system. The required detention volume of the system is 26,650 c.f. The proposed system will consist of 60" Perforated CMP pipe so that the outer rock can be used as storage as well. The control structure will be constructed with three orifices, a 0.66" diameter orifice at the bottom of the facility, a 1" diameter orifice 3 feet from the bottom of the facility, and a 1.5" diameter orifice 4.7 feet from the bottom of the facility. The drainage plan with the detention and conveyance layouts has been included as **Appendix 4**. See **Appendix 9** for the WVHM report.

4.5 WATER QUALITY SYSTEM (PART E)

Enhanced treatment will be provided for the proposed development through Modular Wetland Systems. The Modular Wetland Systems will precede the detention system and therefore are required to treat the flow rate at or below which 91% of the runoff volume, as estimated by WVHM. At this stage in design, it is assumed that the stormwater runoff from the sidewalk areas will flow across the asphalt parking areas, and therefore were included in the treatment facility sizing. The Modular Wetland Systems are equipped with an internal bypass and therefore can be sized using the off-line water quality flow rates. See below for the treatment facility sizes. See **Appendix 3**



for the Treatment Basin Map exhibit. The drainage plan with the locations of the treatment facilities has been included as **Appendix 4**. See **Appendix 9** for the WWHM reports.

	TOTAL AREA (ACRES)	IMPERVIOUS AREA (ACRES)	PERVIOUS AREA (ACRES)	WATER QUALITY FLOW RATE (CFS)	TREATMENT SYSTEM SIZE
Basin 1	0.35	0.29	0.06	0.0262	4x4
Basin 2	0.54	0.47	0.07	0.0427	4x4

Table 2: Treatment Basin Summary

5. CONVEYANCE SYSTEM ANALYSIS AND DESIGN

All stormwater conveyance systems will be sized to convey the 24-hour 25-year storm within the pipe. All proposed stormwater pipes are a minimum of 12" at a minimum slope of 0.50%. A full backwater and flow capacity analysis will be completed and provided in this report at the time of the civil permit submittal.

6. SPECIAL REPORTS AND STUDIES

6.1.1 On-Site Soils Information

A geotechnical investigation was conducted by GeoResources in January 2008. Four test pits were conducted to depths of approximately 10 feet. The subsurface conditions encountered in the test pits were fairly uniform. The soils they observed in the test pits generally consist of 6 inches of topsoil overlying old fill and silty sand with gravel consistent with glacial till. In test pits TP-1, TP-3, and TP-4, they encountered loose to medium dense, moist fill consisting of silty sand with gravel and occasional topsoil and construction debris to depths ranging from 1 to 7.5 feet below surface grades. Groundwater seepage was not encountered in any of the excavated test pits. Infiltration testing was not conducted at this time. See **Appendix 5** for the geotechnical reports.

See **Appendix 5** for the existing conditions report that includes the stream and critical areas study. No other special reports or studies were required for this project.

7. OTHER PERMITS

Utility, paving, building, and grading permits may need to be secured prior to beginning construction activities. Coverage under Washington State Department of Ecology Phase II National Pollutant Discharge Elimination System Stormwater Permit will also need to be secured prior to beginning construction activities.

8. CSWPP PLAN ANALYSIS AND DESIGN

8.1 ESC PLAN ANALYSIS AND DESIGN (PART A)

A SWPPP will be prepared and attached herein as **Appendix 7** at the time of the civil permit submittal.



8.2 SWPPS PLAN DESIGN (PART B)

A SWPPP will be prepared and attached herein as **Appendix 7** at the time of the civil permit submittal.

9. BOND QUANTITIES, FACILITY SUMMARIES, AND DECLARATION OF COVENANT

A Bond Quantities Worksheet, facility summaries, and declaration of covenant(s) for privately maintained flow control facilities will be completed and enclosed herein as **Appendix 10** at the time of the civil permit submittal.

10. OPERATIONS AND MAINTENANCE MANUAL

The owner of the Town Place Hotel will be responsible in maintaining all stormwater facilities on-site. An operation and maintenance manual will be provided at the time of the civil permit submittal as **Appendix 6**.

END OF TECHNICAL INFORMATION REPORT



APPENDIX 1

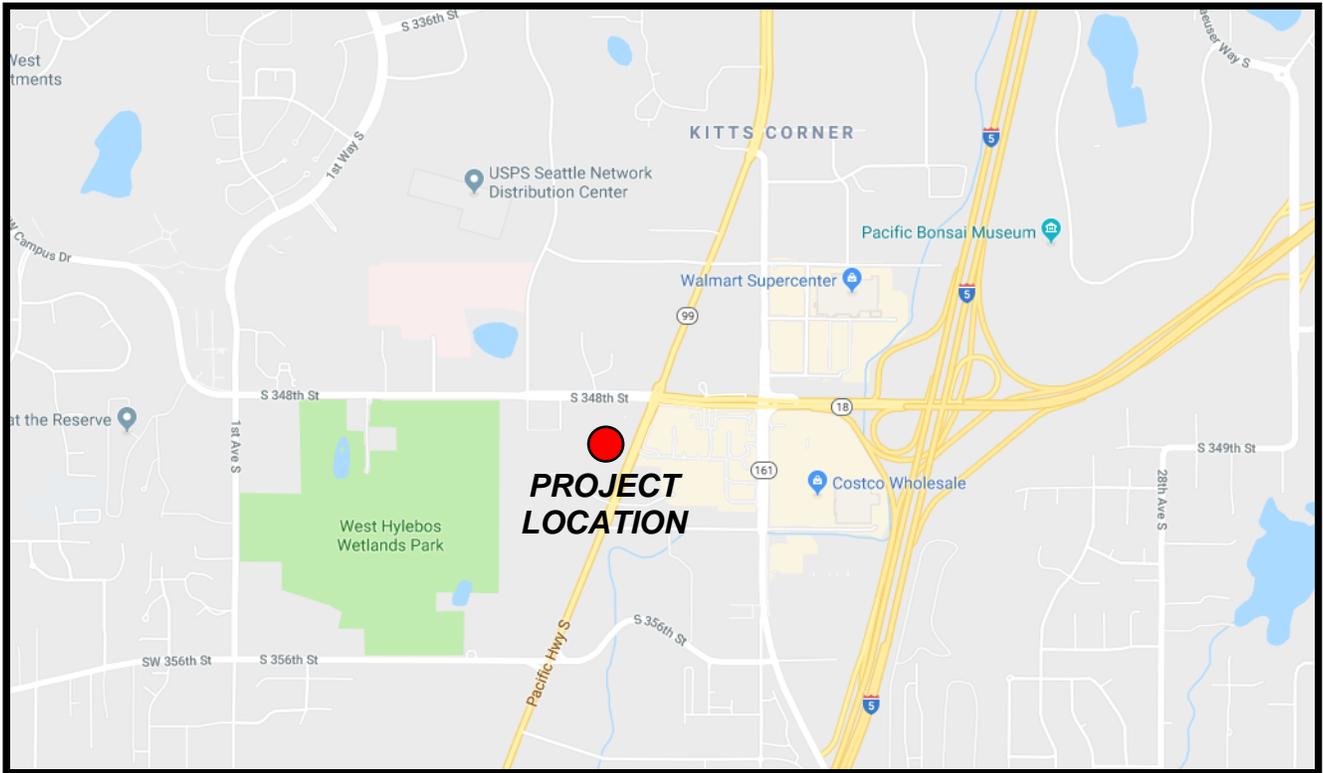
SITE VICINITY MAP





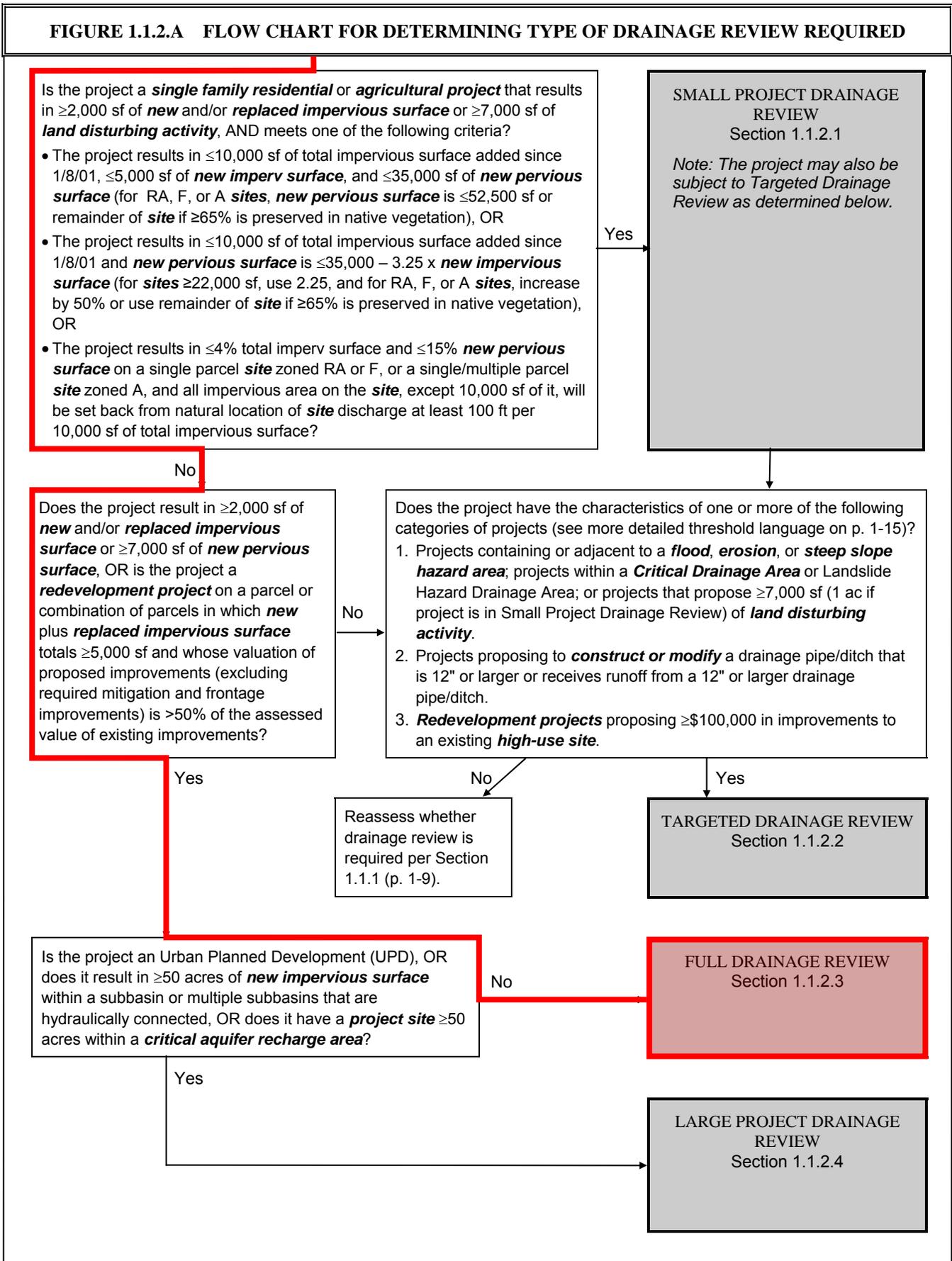
SCJ ALLIANCE

CONSULTING SERVICES



APPENDIX 2
DETERMINATION OF MINIMUM REQUIREMENTS WORKSHEET

FIGURE 1.1.2.A FLOW CHART FOR DETERMINING TYPE OF DRAINAGE REVIEW REQUIRED



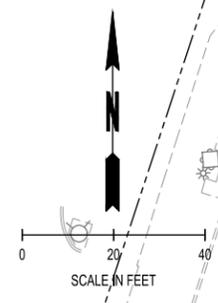
APPENDIX 3
BASIN MAP EXHIBITS

EXISTING BASIN AREAS:

IMPERVIOUS AREA: 0.00 ACRES

PERVIOUS AREA: 1.36 ACRES

TOTAL: 1.36 ACRES



Sep 24, 2019 11:13:26am - User: molly.dobbs
V:\PROJECTS\3278 TIC FW, LLC\3278.01 TOWN PLACE HOTEL FEDERAL WAY\CAD\EXHIBITS\STORMWATER\3278.01 EX. BASIN MAP.DWG

SCJ ALLIANCE
CONSULTING SERVICES
8730 TALLON LANE NE, SUITE 200, LACEY, WA 98516
P: 360.352.1465 F: 360.352.1509
SCJALLIANCE.COM

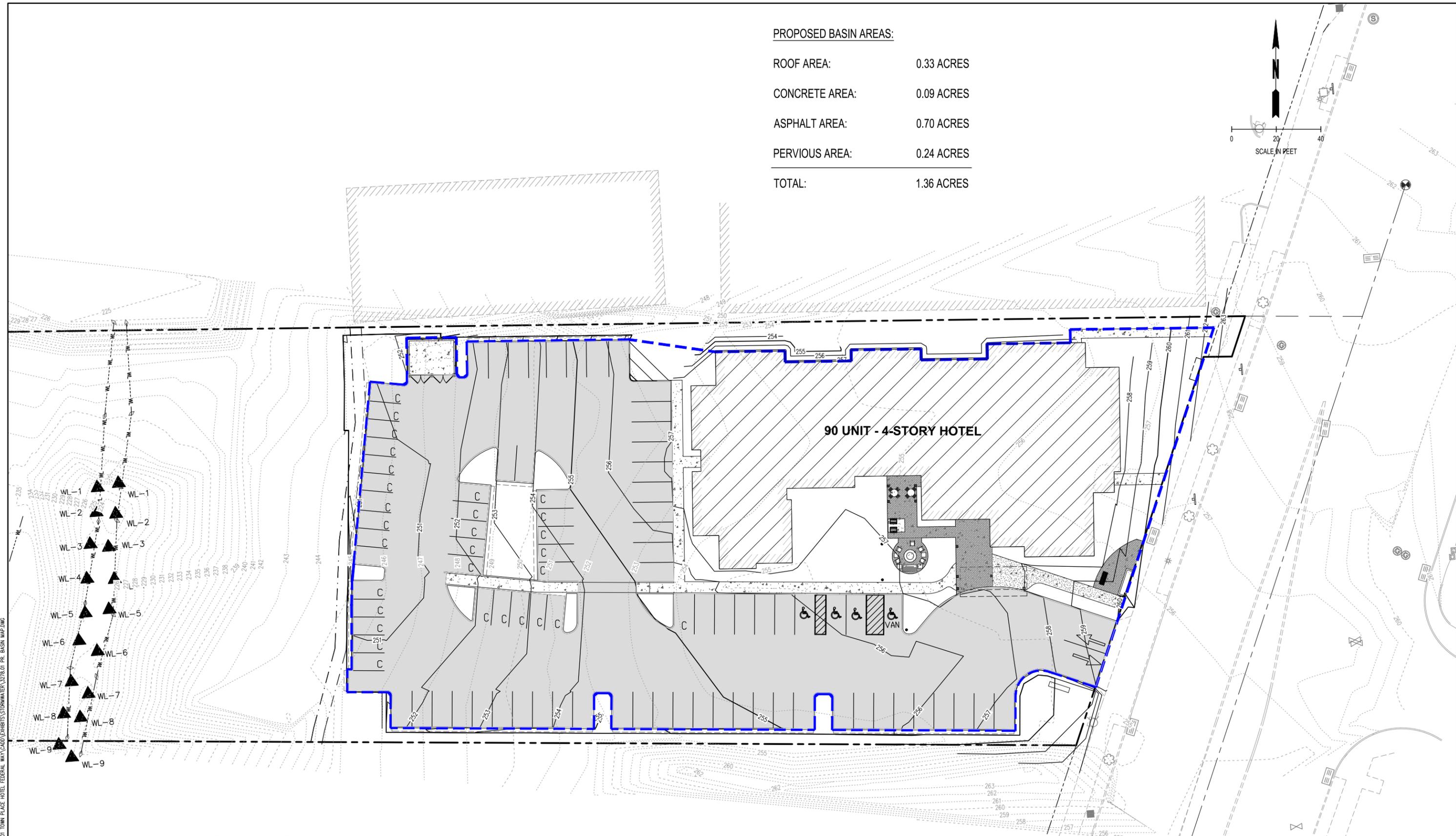
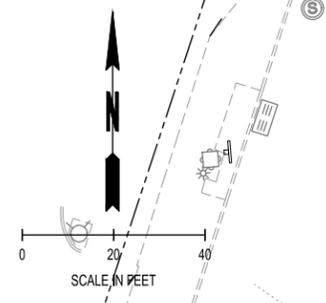
HORIZONTAL SCALE:	1"=20'
DATE:	SEPTEMBER, 2019
JOB No.:	3278.01
DRAWING FILE No.:	3278.01 Ex. Basin Map.dwg

EXISTING CONDITIONS MAP
TOWN PLACE HOTEL, FEDERAL WAY

EXHIBIT No.:	EX-01
SHEET No.:	1

PROPOSED BASIN AREAS:

ROOF AREA:	0.33 ACRES
CONCRETE AREA:	0.09 ACRES
ASPHALT AREA:	0.70 ACRES
PERVIOUS AREA:	0.24 ACRES
TOTAL:	1.36 ACRES



Sep 24, 2019 12:44:12pm - User: malloy.dobbs
 W:\PROJECTS\3278 Pr. Map\3278 Pr. Basin Map.dwg

SCJ ALLIANCE
CONSULTING SERVICES
8730 TALLON LANE NE, SUITE 200, LACEY, WA 98516
P: 360.352.1465 F: 360.352.1509
SCJALLIANCE.COM

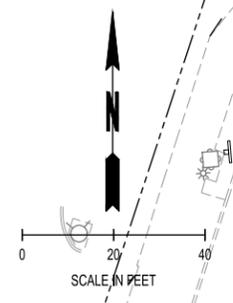
HORIZONTAL SCALE:	1"=20'
DATE:	SEPTEMBER, 2019
JOB No.:	3278.01
DRAWING FILE No.:	3278.01 Pr. Basin Map.dwg

PROPOSED CONDITIONS MAP
TOWN PLACE HOTEL, FEDERAL WAY

EXHIBIT No.:	EX-02
SHEET No.:	2

TREATMENT BASIN AREAS:

<u>BASIN 1:</u>	0.35 ACRES
IMPERVIOUS AREA:	0.29 ACRES
PERVIOUS AREA:	0.06 ACRES
<u>BASIN 2:</u>	0.54 ACRES
IMPERVIOUS AREA:	0.47 ACRES
PERVIOUS AREA:	0.07 ACRES



Sep 24, 2019 8:37:18am - User: molroy.dabb
 W:\PROJECTS\3278 Tr. Hotel, LLC\3278.01 TOWN PLACE HOTEL FEDERAL WAY\CADD\EXHIBITS\CUSTOMER\3278.01 Tr. Basin Map.dwg

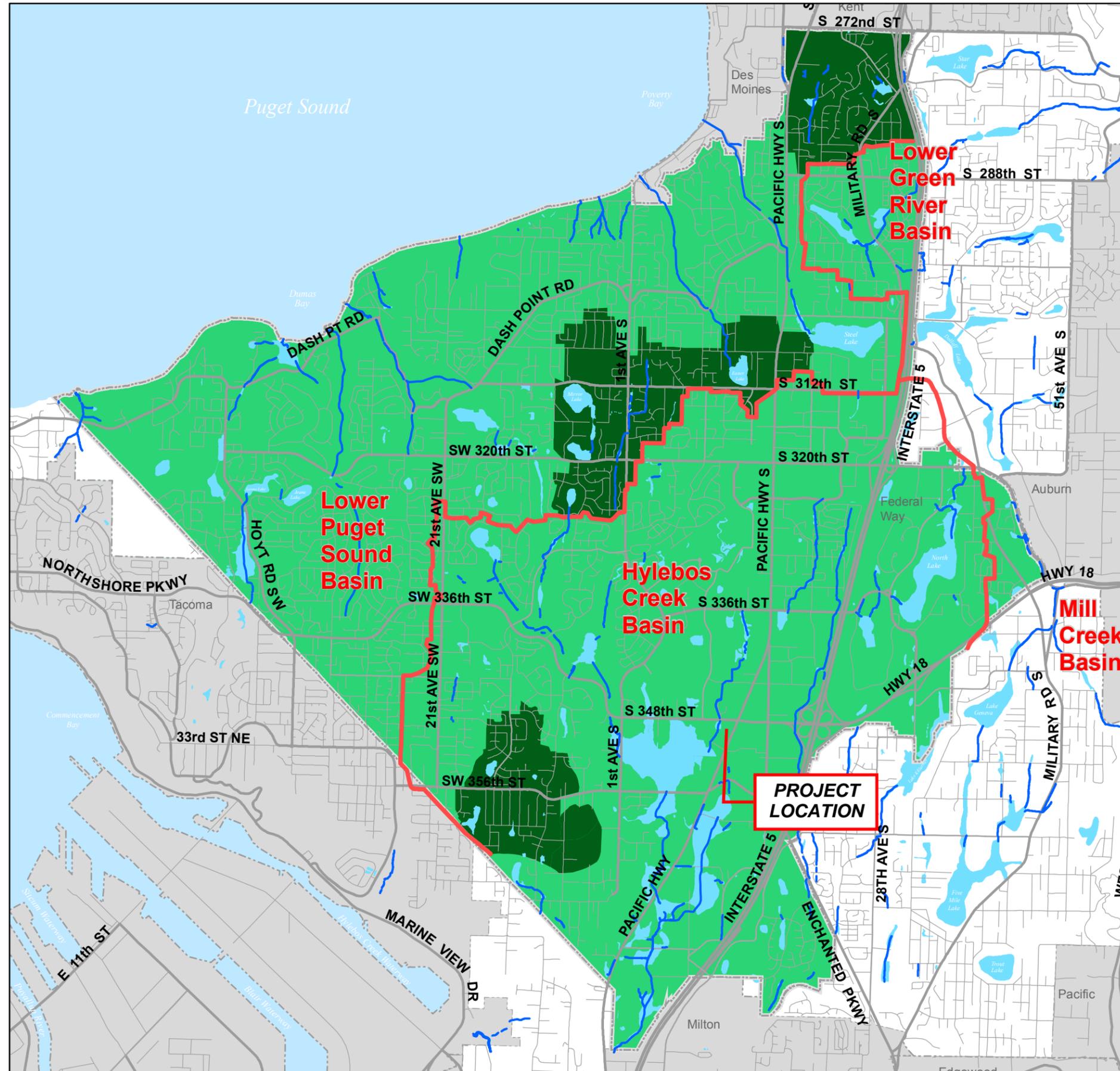
SCJ ALLIANCE
CONSULTING SERVICES
8730 TALLON LANE NE, SUITE 200, LACEY, WA 98516
P: 360.352.1465 F: 360.352.1509
SCJALLIANCE.COM

HORIZONTAL SCALE:	1"=20'
DATE:	SEPTEMBER, 2019
JOB No.:	3278.01
DRAWING FILE No.:	3278.01 Tr. Basin Map.dwg

TREATMENT BASIN MAP
TOWN PLACE HOTEL, FEDERAL WAY

EXHIBIT No.:	EX-03
SHEET No.:	3

City of Federal Way Flow Control Applications Map



Legend

- Drainage Basin Boundary
- Streams
- City Limits
- Lakes and Wetlands

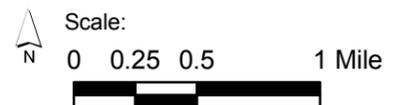
Flow Control

- Basic Flow Control Areas
- Conservation Flow Control Areas
- Flood Problem Flow Control Areas

Major Receiving Waters

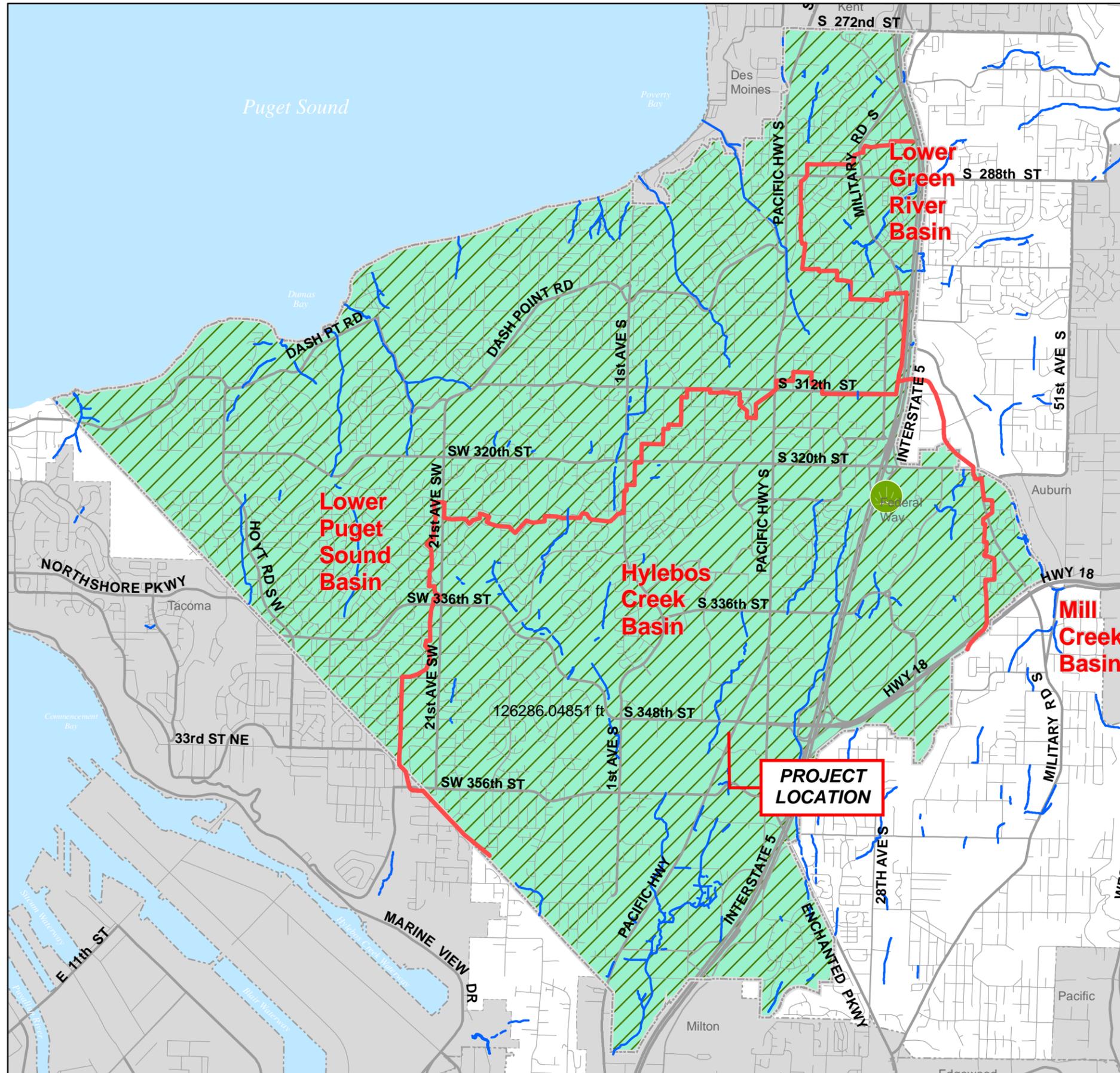
1. Puget Sound

Map Date: February, 2010
 SWM Division
 City of Federal Way
 33325 8th Ave S
 PO Box 9718
 Federal Way, WA 98063
 (253) 835-2700
www.cityoffederalway.com



This map is intended for use as a graphical representation only. The City of Federal Way makes no warranty as to its accuracy.

City of Federal Way Water Quality Applications Map



Legend

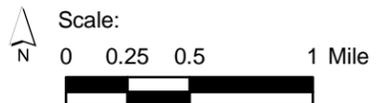
-  Drainage Basin Boundary
-  Streams
-  City Limits

Water Quality Treatment Area Types

-  Enhanced Basic Water Quality Treatment Menu Required*
-  Sensitive Lake
-  Identified Sphagnum Bog Wetlands

* High density single family, multi-family, commercial, and industrial uses, as well as most roads, are subject to Enhanced Basic Water Quality Treatment Requirements.

Map Date: November 2013
SWM Division
City of Federal Way
33325 8th Ave S.
Federal Way, WA. 98003
(253) 835 - 2700
www.cityoffederalway.com



This map is intended for use as a graphical representation only. The City of Federal Way makes no warranty as to its accuracy.

APPENDIX 4
PRELIMINARY CONSTRUCTION PLANS

APPENDIX 5
SPECIAL REPORTS

January 28, 2008

Mr. Dale Sweeney
5715 – 143rd Place SE
Bellevue, Washington 98006

Geotechnical Report
Proposed Hotel
34839 Pacific Highway South
Federal Way, Washington
Job Name: Sweeney,D.PacHwyS

INTRODUCTION

This report summarizes the results of our geotechnical engineering services for the proposed new hotel to be constructed at 34839 Pacific Highway South in Federal Way, Washington. The approximate location of the site is shown on Figure 1.

Our understanding of the project is based on our discussions with you, our review of the available project plans and our local experience with similar projects in the vicinity of the site. We were provided with a preliminary a site plan showing the planned building location and parking lot configuration. The plan indicates the project will consist of constructing a new 4-story hotel building in the approximate center of the site with parking areas provided along all sides. An access driveway will enter the site from Pacific Highway South at the sites' northeast corner and lead to a porte cochere over the main building entrance along the north side of the building. Site stormwater will discharge to a detention pipe located under the south parking lot. The site layout is shown on the Site Plan, Figure 2.

No topographic site plan was available at the time of our study. However, based on our observations at the time of our site visit, we expect cuts and fills up to 10 feet to achieve finish grades. Although specific design details are not available, we expect the structure will consist of typical spread footing foundations with slab-on-grade floors. Foundation loads should be in the range of 4 to 6 kips per foot for bearing walls and up 100 kips for isolated columns.

SCOPE

The purpose of our services is to evaluate the surface and subsurface conditions at the site as a basis for developing and providing geotechnical recommendations and design criteria for the proposed site development. Specifically, the scope of services for this project included the following:

1. Conducting a geologic reconnaissance of the site area.
2. Exploring the subsurface conditions at the site by monitoring the excavation of four track-hoe excavated test pits at selected locations across the site.

3. Addressing the appropriate geotechnical regulatory requirements for the proposed site development, including seismic hazards and liquefaction potential.
4. Providing geotechnical recommendations for site grading including site preparation, subgrade preparation, fill placement criteria, suitability of on-site soils for use as structural fill, temporary and permanent cut and fill slopes, and drainage and erosion control measures.
5. Providing recommendations and design criteria for foundation and floor slab support, including allowable bearing capacity, lateral soil pressures and estimates of settlement.
6. Providing recommendations for discharge of the site stormwater.
7. Providing recommendations and design criteria for parking lot pavements.
8. Providing recommendations for site drainage.

SITE CONDITIONS

Surface

The approximate 2.5-acre project site is located at 34839 Pacific Highway South in the city of Federal Way, Washington. The project site is bordered with undeveloped property to the south and west, a hotel to the north, and Pacific Highway South to the east. The site is currently developed with a small one-story commercial building in the northeast corner, a small one-story metal building in the approximate center of the site, and a few outbuildings at various locations along the east end of the site.

Surface grades at the site slope down to the west at surface inclinations ranging from 5 to 15 percent. Towards the western end of the site, surface grades increase to approximately 20 to 35 percent down to a wetland area along the western property line. The slope down to the wetland along the sites' western property line is approximately 20 feet tall.

The majority of the site is covered with either grass or gravel. The west end of the site is vegetated with various medium-sized coniferous and deciduous trees with moderately thick underbrush. No areas of erosion were apparent on the site slopes; no standing water was observed on the site at the time of our site work.

Soils

The United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS), formerly known as the Soil Conservation Service (SCS), for King County has mapped the site soils as consisting of Everett-Alderwood gravely sandy loam (EwC) soils that form on 6 to 15 percent slopes. According to the NRCS, the Everett-Alderwood soils at the site have a "moderate" potential for erosion when exposed. We observed no active erosion in the site area during our reconnaissance. Based on our observations, the site soils will have a low susceptibility to erosion, particularly where vegetation is established. An excerpt from the NRCS map is provided in Figure 3.

Geology

According to the *Geologic map of the Poverty Bay 7.5 Minute Quadrangle, Washington*, by Derek B. Booth, Howard H. Waldron, and Kathy G. Troost (2003), the site is underlain by Recessional outwash (Qvr). This soil unit is described as well stratified sand and gravel deposited by streams and rivers issuing from the front of the receding ice sheet. It is generally lightly oxidized and commonly very compact. In our opinion, based on the

soils observed in our test pits, the site soils would be better classified as glacial Till (Qvt). This soil unit is described as a compact mixture of sand, gravel, silt and clay. An excerpt from the USGS map is provided in Figure 4:

Subsurface Explorations

On November 2, 2007, a representative from our office was on site to explore subsurface conditions at the site by observing the excavation of 4 trackhoe test pits to a maximum depth of 10 feet below existing surface grades. The approximate test pit locations are shown on the Site Plan, Figure 2

Our representative continuously monitored the excavations, maintained logs of the subsurface conditions encountered in each test pit, obtained representative soil samples, and observed pertinent site features. The specific number, location, and depth of the explorations were selected by GeoResources personnel in the field. The soils encountered were visually classified in accordance with the Unified Soil Classification System (USCS) provided in Figure 5. The explorations performed as part of this evaluation indicate subsurface conditions at specific locations only and actual subsurface conditions can vary across the site. Furthermore, the nature and extent of any such variation would not become evident until additional explorations are performed or until construction activities have begun. The test pit logs are provided in Figure 5. Representative soil samples obtained from the test pits were placed in sealed containers and taken to a laboratory for possible further examination and testing.

Subsurface Conditions

The subsurface conditions encountered in the test pits were fairly uniform. The soils we observed in the test pits generally consist of 6 inches of topsoil overlying old fill and silty sand with gravel consistent with glacial till.

In Test Pits TP-1, TP-3 and TP-4, we encountered loose to medium dense, moist fill consisting of silty sand with gravel and occasional topsoil and construction debris to depths ranging from 1 to 7 ½ feet below surface grades. The fill was thicker towards the west end of the site. Underlying the fill in Test Pits TP-1, TP-3 and TP-4, and in Test Pit TP-2, we encountered medium dense to dense, moist silty sand with gravel consistent with glacial till.

We did not encounter groundwater seepage in any of the test pits excavated at the site. To the depths explored, we did not encounter mottled soils or other evidence suggesting a seasonal groundwater table develops at the site. However, based on the mapped stratigraphy of the area and the existence of fill over dense glacial till, we do anticipate a seasonal [perched groundwater table will develop under the site during the wet winter months (October through May). This water table will fluctuate seasonally due to precipitation, and future development both on and near the site.

GEOLOGIC HAZARDS

Erosion

Section 18-28 in the City of Federal Way municipal code defines erosion hazard areas as those areas having a "severe" or "very severe" erosion hazard due to natural agents such as wind, rain, splash, frost action or stream flow. The USDA NRCS has mapped the site soils as Everett-Alderwood soils having a "moderate" potential for erosion due to rainfall when exposed. Regardless of the erosion classification of the site, erosion and sediment control measures as required by the city of Federal Way will need to be in place prior to and during construction activity at the site.

Landslide

Section 18-28 in the City of Federal Way municipal code defines landslide hazard areas as those areas potentially subject to episodic downslope movement of a mass of soil or rock including but not limited to the following areas:

- a. Any area with a combination of:
 1. Slopes greater than 15 percent;
 2. Permeable sediment overlying a relatively impermeable sediment or bedrock;
 3. Springs or groundwater seeps.
- b. Any area which has shown movement during the Holocene epoch, from 10,000 years ago to the present, or which is underlain by mass wastage debris of that epoch.
- c. Areas potentially unstable as a result of rapid stream incision, stream bank erosion, and undercutting by wave action.
- d. Areas located in a canyon or on an active alluvial fan, presently or potentially subject to inundation by debris flows or catastrophic flooding.
- e. Areas that have a "severe" limitation for building site development because of slope conditions, according to the USDA SCS.
- f. Those areas mapped as Class U (Unstable), Uos (Unstable old slides), and Urs (unstable recent slides) by the Department of Ecology.
- g. Slopes having a gradient steeper than 80 percent subject to rock fall during seismic shaking.

No evidence of landslide activity, or significant erosion was observed at the site at the time of our site visit. We did observe slopes steeper than 15 percent but with no permeable sediment overlying relatively impermeable sediment or bedrock was observed, and no seepage. No planes of weakness or rockfall hazards were observed at the site. No other landslide hazard criteria were observed at the site or the immediate adjacent areas. Based on the above, it does not appear that the site has an active landslide hazard on or within 25 feet of the property.

Steep Slope

Section 18-28 in the City of Federal Way municipal code defines steep slope hazard areas as those areas with a slope of 40 percent or greater and with a vertical relief of 10 or more feet. Based on the topographic map provided to us and our observations during our site reconnaissance, the site does not have areas sloping greater than 40 percent with a vertical height of at least 10 feet, therefore the site is not classified as having steep slope hazard areas.

Seismic

The state of Washington has recently adopted the 2003 International Building Code (IBC). Based on the soil conditions encountered and the local geology, per chapter 16 of the 2003 (IBC) site class "C" should be used in structural design. This correlates to Soil Profile Type S_c in the 1997 Uniform Building Code (UBC). This is based on the inferred range of SPT (Standard Penetration Test) blow counts relative to trackhoe excavation progress and probing with a ½-inch diameter steel probe rod. The presence of glacially consolidated soil conditions were assumed to be representative for the site conditions beyond the depths explored.

Liquefaction is a phenomenon where there is a reduction or complete loss of soil strength due to an increase in water pressure. The increase in pore water pressure is induced by vibrations. Liquefaction mainly affects geologically recent deposits of loose, fine-grained sands that are below the groundwater table. Based on the medium dense

to dense and well-graded nature of the soils observed on the site, and the lack of an established water table to the depths explored, it is our opinion that there is no risk for liquefaction to occur at this site during an earthquake.

CONCLUSIONS AND RECOMMENDATIONS

General

Based on our study, it is our opinion soil and groundwater conditions are suitable for the proposed commercial development. The multi-story structure can be supported on conventional spread footings bearing on competent native soils or on structural fill placed above these native soils. Floor slabs and pavements can be similarly supported. The upper 1 to 7 ½ feet of old fill soils observed in Test Pits TP-1, TP-3 and TP-4 contain significant amounts of organics and trash debris and will not be suitable for support of structural elements, or for use as structural fill. Prior to construction, these unsuitable old fill soils should be removed from under new foundation and slab-on-grade areas and from under utility lines and structures. Grade should be restored with new structural fill. Parking lot pavements can be constructed on the native soils or the existing fill if the pavement section includes a drainage layer, and the exposed pavement subgrade can be compacted to a firm and non-yielding condition.

Detailed recommendations regarding these issues and other geotechnical design considerations are provided in the following sections of this report. These recommendations should be incorporated into the final design drawings and construction specifications.

Erosion and Sedimentation Control

The City of Federal Way Municipal code defines erosion hazard areas as those areas having a severe or very severe erosion hazard due to natural agents such as wind, rain, splash, frost action or stream flow. As previously discussed, the USDA NRCS has mapped the site soils as Everett-Alderwood soils having a "moderate" potential for erosion due to rainfall when exposed. We observed no active erosion on the site or on the slopes adjacent the site area during our reconnaissance. In our opinion, the potential for erosion is not a limiting factor in site development. Erosion hazards can be mitigated by applying Best Management Practices (BMPs) outlined in the Washington State Department of Ecology's (Ecology) *Stormwater Management Manual for the Puget Sound Basin*. Erosion protection measures, as required by the City of Federal Way, will need to be in place prior to starting grading activity on the site.

If the required erosion and sediment control BMPs are properly implemented and maintained, it is our opinion that the planned development will not increase the potential for erosion at the site or on adjacent properties. Similarly, it is our opinion that the planned development will not increase the potential for site instability resulting from erosion or added sediment transport to the watercourse along the west end of the property.

Site Preparation and Grading

To prepare the site for construction, all vegetation, organic surface soils, and other deleterious materials including any existing structures, foundations or abandoned utility lines should be stripped and removed from the site. Organic topsoil and the old fill containing organic and trash debris will not be suitable for use as structural fill, but may be used for limited depths in non-structural areas. Prior to construction, the existing fill containing topsoil and trash debris should be removed from under new foundation and

slab-on-grade areas and from under the site utility lines and utility structures. Stripping depths ranging from 1 to 7 ½ feet should be expected to remove these unsuitable soils.

Once clearing and stripping operations are complete, cut and fill operations can be initiated to establish desired grades. Prior to placing fill, all exposed surfaces should be proofrolled or probed to determine if any isolated soft and yielding areas are present. Proofrolling should also be performed in cut areas that will provide direct support for new construction. We recommend that a member of our staff evaluate the exposed subgrade conditions after removal of vegetation and topsoil stripping is completed and prior to placement of structural fill. If excessively yielding areas are observed and cannot be stabilized in place by compaction, the affected soils should be excavated and removed to firm bearing soil and grade restored with new structural fill. The depth and extent of overexcavation should be evaluated by our field representative at the time of construction.

Suitability of On-Site Materials as Fill

Our study indicates the native soils are currently in a moist condition and contain a relatively high percentage of fines (silt and clay-size particles), which will make them difficult to use as structural fill in wet weather conditions. The existing fill soils contain varying amounts of organic and construction debris, which will make them unsuitable for use as structural fill. Accordingly, the ability to use the native and fill soils from site excavations as structural fill will depend on their moisture content, organic and construction debris content, and the prevailing weather conditions when site grading activities take place.

If structural fill will be imported to the site and grading activities are planned during the wet winter months, or if they are initiated during the summer and extend into fall and winter, the owner should be prepared to import a wet weather structural fill. For this purpose, we recommend importing a wet weather structural fill as described in the “**Structural Fill**” Section of this report.

Structural Fill

All fill placed to establish finish grades and utility trench backfill should be placed as structural fill. The appropriate lift thickness will depend on the fill characteristics and compaction equipment used. We recommend that the appropriate lift thickness be evaluated by our field representative during construction. For planning purposes, we recommend a maximum loose-lift thickness of 12 inches. We recommend that our representative be present during site grading activities to observe the work and perform field density tests.

Fill should be compacted to at least 95 percent of the soils laboratory maximum dry density (MDD) as determined in accordance with ASTM D-1557 (Modified Proctor). The moisture content of the soil at the time of compaction should be within two percent of its optimum, as determined by this same ASTM standard.

The suitability of material for use as structural fill will depend on the gradation and moisture content of the soil. As the amount of fines (material passing the No. 200 sieve) increases, soil becomes increasingly sensitive to small changes in moisture content and compaction becomes more difficult to achieve. During wet weather, we recommend using a well-graded sand and gravel with less than 5 percent (by weight) passing the No. 200 sieve based on that fraction passing the 3/4-inch sieve. If prolonged dry weather prevails during the earthwork and foundation installation phase of construction, a slightly higher (up to 10 to 12 percent) fines content will be acceptable.

Material placed for structural fill should be free of debris, organic matter, trash and cobbles greater than 6 inches in diameter. The moisture content of the fill material should be adjusted as necessary for proper compaction.

Building Setback

Based on the soils encountered in the test pits, the mapped stratigraphy of the site, our site observations and our conclusion regarding site stability, it is our opinion that the site slopes do not constitute a landslide or steep slope hazard and therefore no geologic hazard area buffer is necessary. However, the City of Federal Way building department may require a building setback in accordance with IBC standard requirements. The IBC does require a building setback from slopes that are greater than 30 percent. According to the IBC, when the geotechnical report demonstrates that a reduced or eliminated setback, together with design and engineering solutions, will meet the intent of the chapter, such reduced or eliminated setback and design and engineering solutions may be permitted. Vegetation in the setback area may be enhanced, if approved/required by the City of Federal Way. Clearing, grading and filling within the setback area is allowed if it can be demonstrated that the existing vegetation will not be adversely impacted or that it can be mitigated (enhanced).

In our opinion, the foundations for the structure should be provided with at least a 15-foot setback from the site slopes with surface inclinations that exceed 30 percent in accordance with the 2003 International Building Code (IBC). Where necessary, the building setback for the house foundations may be measured horizontally from the lower outside edge of the footing to the face of the steep slope, in accordance with UBC/IBC. Where this 'Setback Modification' is utilized, the foundation elements should be extended vertically to meet the recommended setback criteria. This modification is based on the foundation elements extending to and being founded in the medium dense to dense native soils. Maintaining the prescribed setback in this manner provides the conventional foundation bearing prism beneath the footing.

Weathering, erosion and the resulting surficial sloughing and shallow land sliding are natural processes that affect steep slope areas. As noted, no evidence of surficial raveling or sloughing was observed at the site. To manage and reduce the potential for these natural processes, we recommend the following:

- No drainage of concentrated surface water or significant sheet flow onto or near the steep slope areas. Drainage from the roof area should be tightlined to flatter, lowland area beyond the toe of the steep slope.
- No fill should be placed within the setback area. Grading should be limited to providing surface grades that promote surface flows away from the slope crest to an approved point of collection for dispersal beyond the toe of the slope.
- No percolation of surface water within 20 feet of Building Setback or top of the steep slope.

Excavations

All excavations at the site associated with confined spaces, such as utility trenches and retaining walls, must be completed in accordance with local, state, or federal requirements. Based on current Washington State Safety and Health Administration (WSHA) regulations, the upper loose to medium dense fill and silty sand with gravel observed on the site would be classified as Type C soils. The deeper, dense silty sand with gravel at the site would be classified as Type A soils.

According to WSHA, for temporary excavations of less than 20 feet in depth, the side slopes in Type C soils should be laid back at a slope inclination of 1.5:1 (Horizontal:Vertical) or flatter from the toe to the crest of the slope. Side slopes in Type A soils can be laid back at a slope inclination of 0.75:1. All exposed slope faces should be covered with a durable reinforced plastic membrane during construction to prevent slope raveling and rutting during periods of precipitation. These guidelines assume that all surface loads are kept at a minimum distance of at least one half the depth of the cut away from the top of the slope and that significant seepage is not present on the slope face. Flatter cut slopes will be necessary where significant raveling or seepage occurs, or if construction materials will be stockpiled along the slope crest. If these safe temporary slope inclinations cannot be achieved due to property line constraints, shoring may be necessary.

This information is provided solely for the benefit of the owner and other design consultants, and should not be construed to imply that GeoResources assumes responsibility for job site safety. It is understood that job site safety is the sole responsibility of the project contractor.

Foundations

The structure can be supported on conventional spread footing foundations bearing on competent native soils or on new structural fills placed above these native soils. Foundation subgrades should be prepared as recommended in the "**Site Preparation**" section of this report. As previously discussed, the upper 1 to 7 ½ feet of old fill soils observed in Test Pits TP-1, TP-3 and TP-4 contain significant amounts of organics and construction debris and will not be suitable for support of foundation elements. Prior to construction, these unsuitable old fill soils should be removed from under new foundation areas and replaced with new structural fill. Alternatively, the foundations can be deepened to extend through the old fill to bear on the underlying undisturbed native soils observed at 1 to 7 ½ feet below surface grades.

Perimeter foundations exposed to the weather should bear at a minimum depth of 18 inches below final exterior grades for frost protection. Interior foundations can be constructed at any convenient depth below the floor slab. With footings founded as recommended, we recommend they be designed for an allowable soil bearing capacity of 2,500 pounds per square foot (psf) for combined dead and long-term live loads. The weight of the footing and any overlying backfill should be neglected. The allowable bearing value may be increased by one-third for short-term loads such as those induced by seismic events or wind loads. With the anticipated loads and this bearing stress applied, building settlements should be less than one-half inch total and one-quarter inch differential. All footing areas should be evaluated by a representative of GeoResources prior to placement of forms.

For designing foundations to resist lateral loads, a base friction coefficient of 0.40 can be used. Passive earth pressures acting on the sides of the footings can also be considered. We recommend calculating this lateral resistance using an equivalent fluid weight of 325 pounds per cubic foot (pcf). We recommend not including the upper 12 inches of soil in this computation because it can be affected by weather or disturbed by future grading activity. This value assumes the foundations will be constructed neat against competent native soil or backfilled with structural fill, as described in the "**Structural Fill**" section of this report. The values recommended include a safety factor of 1.5.

Site Retaining Walls

The magnitude of earth pressure development on below-grade walls, such as basement or retaining walls, will partly depend on the quality of the wall backfill. We recommend placing and compacting wall backfill as structural fill. Wall backfill below structurally loaded areas, such as pavements or floor slabs, should be compacted according to the specifications provided in the "**Structural Fill**" section of this report.

To guard against hydrostatic pressure development, drainage must be installed behind the wall. We recommend that wall drainage consist of a minimum 12 inches of clean sand and/or gravel with less than 3 percent fines placed against the back of the wall. In addition, a drainage collector system consisting of 4-inch perforated PVC pipe should be installed behind the wall to provide an outlet for any accumulated water. The drains should be provided with cleanouts at easily accessible locations. These cleanouts should be serviced at least once every year. The wall drainage material should be capped at the ground surface with 1-foot of relatively impermeable soil to prevent surface intrusion into the drainage zone.

With wall backfill placed and compacted as recommended and drainage properly installed, unrestrained walls can be designed for an active earth pressure equivalent to a fluid weighing 35 pcf. For restrained walls, we do not recommend using at rest earth pressures. For walls that will be restrained at the top, an additional uniform lateral pressure of 100 psf should be included. These values assume a horizontal backfill condition and that no other surcharge loading, such as traffic, sloping embankments, or adjacent buildings, will act on the wall. If such conditions exist, then the imposed surcharge loading must be included in the wall design. Friction at the base of the wall foundation and passive earth pressure will provide resistance to these lateral loads. Values for these parameters are provided in the "**Foundations**" section of this report.

Slab-On-Grade Floors

Slab-on-grade floors should be supported on subgrades prepared as recommended in the "**Site Preparation**" section of this report. As previously discussed, the upper 1 to 7 ½ feet of old fill soils observed in Test Pits TP-1, TP-3 and TP-4 contain significant amounts of organics and construction debris and will not be suitable for support of slab-on-grade floors. Prior to construction, these unsuitable old fill soils should be removed from under new slab-on-grade areas and replaced with new structural fill.

Immediately below the floor slab, we recommend placing a four-inch thick capillary break layer of clean, free-draining, coarse sand or fine gravel that has less than three percent passing the No. 200 sieve. This material will reduce the potential for upward capillary movement of water through the underlying soil and subsequent wetting of the floor slabs. The drainage material should be placed in one lift and compacted to a firm and unyielding condition.

The capillary break layer will not prevent moisture intrusion through the slab caused by water vapor transmission. Where moisture by vapor transmission is undesirable, such as covered floor areas, a common practice is to place a durable plastic membrane on the capillary break layer and then cover the membrane with a layer of clean sand or fine gravel to protect it from damage during construction, and aid in uniform curing of the concrete slab. It should be noted that if the sand or gravel layer overlying the membrane is saturated prior to pouring the slab, it will not assist in uniform curing of the slab, and may serve as a water supply for moisture transmission through the slab and affecting floor coverings. Therefore, in our opinion, covering the membrane with a layer of sand or gravel should be avoided if floor slab construction occurs during the wet winter months and the layer cannot be effectively drained.

Parking Lot Pavement

Parking lot pavement at the project site should be constructed on subgrades prepared as recommended in the “**Site Preparation**” section of this report. As previously discussed, the upper 1 to 7 ½ feet of old fill soils observed in Test Pits TP-1, TP-3 and TP-4 contain significant amounts of organics and trash debris. Prior to paving, these existing fill soils should be mechanically compacted to a firm and non-yield condition. Additionally, the pavement section should be provided with a drainage layer between the asphalt and the underlying compacted subgrade soils.

The thickness of the various components of the pavement depends on the subgrade soils and the traffic conditions to which the pavement will be subjected. We expect traffic to mainly consist of light passenger vehicles, with only occasional heavy service vehicles. Based on this information, and with a properly prepared and stable subgrade composed of on-site native granular soils, or compacted old fill soils, we recommend the following pavement section:

Options	Pavement Element	Thickness (inches)
Option 1	Asphalt Concrete (AC)	3
	Crushed Rock Base (CRB)	4
Option 2	Asphalt Concrete (AC)	2
	Asphalt Treated Base (ATB)	3
	Crushed Rock Base (CRB)	4

All paving materials should conform to the Washington State Department of Transportation (WSDOT) specifications for Class B asphalt concrete and CRB surfacing. Long-term pavement performance will depend on surface drainage. A poorly-drained pavement section will be subject to premature failure as a result of surface water infiltrating into the subgrade soils and reducing their supporting capability. To improve performance, we recommend surface drainage gradients of at least two percent. Some longitudinal and transverse cracking of the pavement surface should be expected over time. Regular maintenance should be planned to seal cracks when they occur.

Regardless of the relative compaction achieved, the subgrade must be firm and unyielding before paving. Proofrolling the subgrade with heavy construction equipment should be completed to verify this condition. We recommend compacting fill placed for pavement subgrades according to the recommendations provided in the “**Structural Fill**” section of this report.

Stormwater Detention Pipe

The site stormwater will discharge to a detention pipe located under the south parking lot. We understand the detention pipe will entail storage and a stormfilter for cleaning prior to discharge to the wetland located along the west end of the site. The detention pipe should be supported on a subgrade prepared as recommended in the “**Site Preparation**” section of this report. Accordingly, if the existing old fill containing organics

and construction debris is evident along the pipe subgrade, it should be removed and replaced with new structural fill.

We examined the existing soils underlying the site to determine if infiltration of the development stormwater was feasible. Due to the medium dense to dense, well-graded, and cemented nature of the native glacial till soils that underlie the site, it is our opinion that infiltration of the site stormwater is not feasible. It is also our opinion that the planned stormwater detention system will not increase the stability of the site slopes.

Utilities

We expect that underground utilities, such as sanitary sewer, storm, and water will consist of a series of pipes, vaults, manholes, and catch basins. The utility excavations should be performed in accordance with appropriate governmental guidelines. Utility pipes should be bedded and backfilled in accordance with American Public Works Association (APWA) specifications. The existing fill at the site containing organics and trash debris will not be suitable for support of the utility lines and structures. Prior to construction, these unsuitable old fill soils should be removed from under the utility lines and structures.

We anticipate that the on-site, non-organic soils will be suitable for use as structural backfill. If import soil is used as utility trench backfill, it should consist of a material meeting the wet weather fill recommendations provided in the "**Structural Fill**" section of this report. Controlled-density fill (CDF) is most often suitable for use as backfill in any weather condition and could be used as a convenient, but more expensive, alternative to granular backfill soil.

We recommend that utility backfill soils be compacted according to the recommendations provided in the "**Structural Fill**" section of this report. CDF backfill does not require compaction but should have a compressive strength commensurate with the application.

Drainage

All ground surfaces, pavements, and sidewalks should be sloped away from the structure. Surface water runoff should be controlled using a system of berms, drainage swales, and/or catchbasins, and conveyed to an approved point of controlled discharge. We recommend conventional roof and foundation drains be installed for all structures. The footing drains should be tightlined independent of the roof drains unless an adequate gradient will prevent backflow into the footing drains.

Surface water shall not be allowed to flow uncontrolled over the crest of the site slopes and embankments. Surface water should be directed away from the slope crests to a point of collection and controlled discharge. If constructed according to code, a dispersion trench would be considered a controlled discharge mechanism. If site grades do not allow for directing surface water away from the slopes, then the collected water should be tightlined down the slope face in a controlled manner.

LIMITATIONS

We have prepared this supplemental report for use by Dale Sweeney and members of their design team for use in the design and permitting portions of this project. This report and the data used in preparing this report should be provided to prospective contractors for bidding or estimating purposes only. Our report, conclusions and interpretations are based on data from others and limited site reconnaissance, and should not be construed as a warranty of the subsurface conditions.

Variations in subsurface conditions are possible between the explorations and may also occur with time. A contingency for unanticipated conditions should be included in the budget and schedule. Sufficient monitoring, testing and consultation should be provided by our firm during construction to confirm that the conditions encountered are consistent with those indicated by the explorations, to provide recommendations for design changes should the conditions revealed during the work differ from those anticipated, and to evaluate whether earthwork and foundation installation activities comply with contract plans and specifications.

When the project design is finalized, we recommend the design and specifications be reviewed by our firm to see that our recommendations have been interpreted and implemented as intended. If there are any changes in the loads, grades, locations, configurations or type of facilities to be constructed, the conclusions and recommendations presented in this report may not be fully applicable. If such changes are made, we should be given the opportunity to review our recommendations and provide written modifications or verifications, as appropriate.

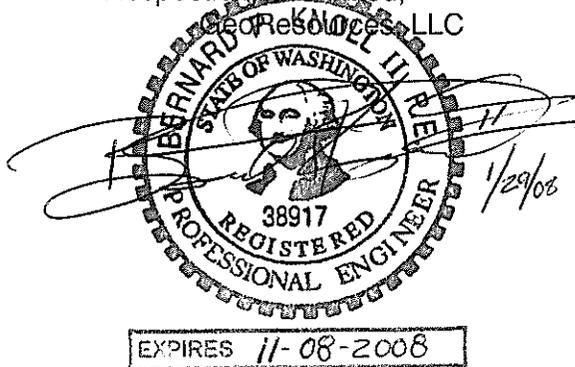
The scope of our services does not include services related to environmental remediation and construction safety precautions. Our recommendations are not intended to direct the contractor's methods, techniques, sequences or procedures, except as specifically described in our report for consideration in design.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in this area at the time this report was prepared. No other conditions, expressed or implied, should be understood.

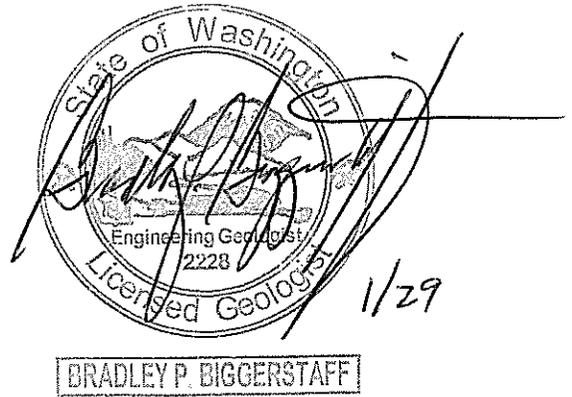


We appreciate the opportunity to be of continued service to you on this project. Please do not hesitate to call with any additional comments or questions.

Respectfully submitted,
Bernard P. Knoll II, PE



Bernard P. Knoll II, PE
Senior Engineer

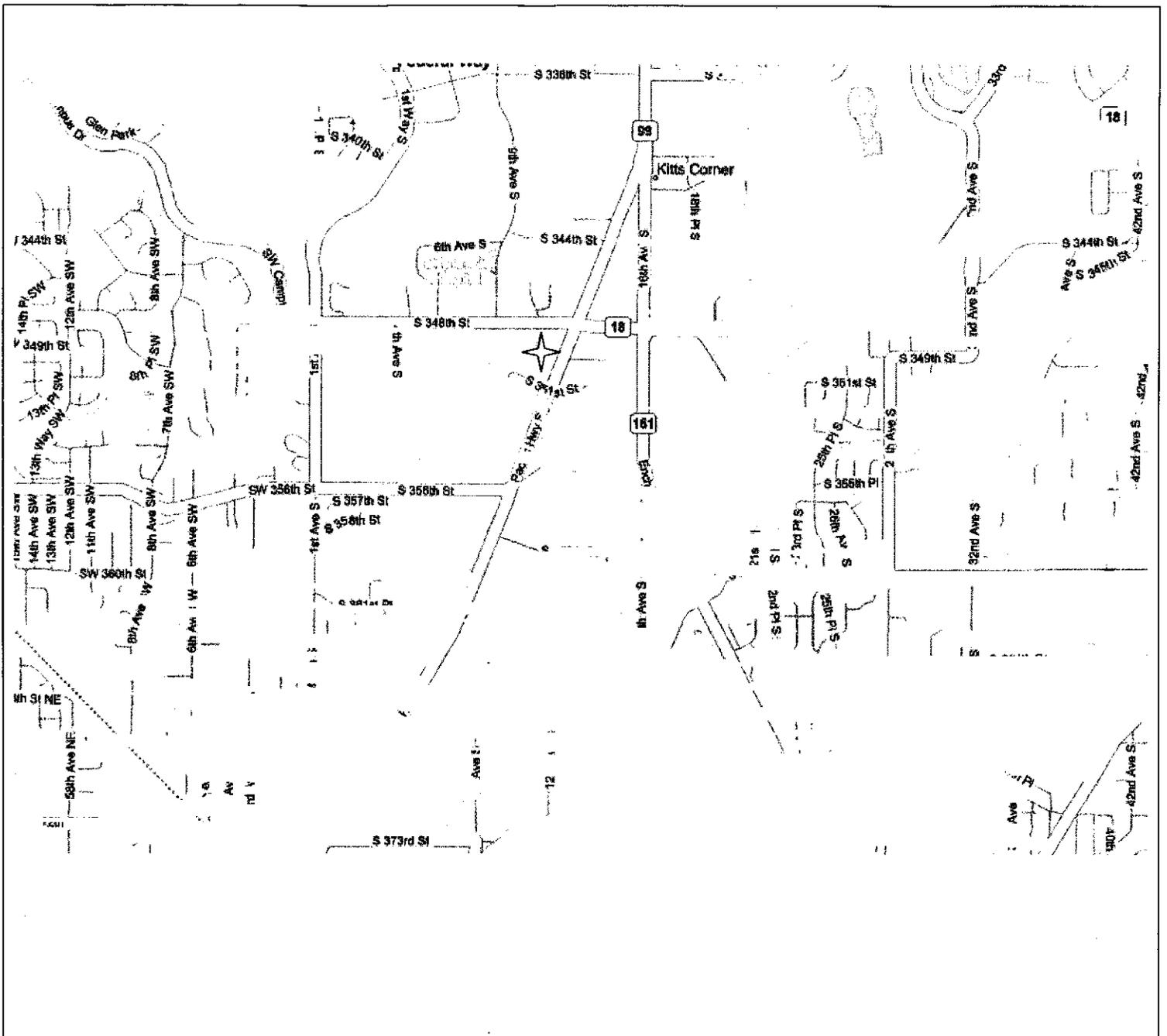


Brad P. Biggerstaff, LEG
Principal

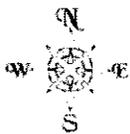
BPK:BPB:bpk

Document ID: Sweeney,D.PacificHighwayS.GR

- Attachments:
- Figure 1 – Site Vicinity Map
 - Figure 2 – Site Plan
 - Figure 3 – USDA NRCS Soils Map
 - Figure 4 – USGS Map
 - Figure 5 – Unified Soil Classification System (USCS)
 - Figure 6 – Test Pit Logs



Approximate Site Location



GeoResources, LLC

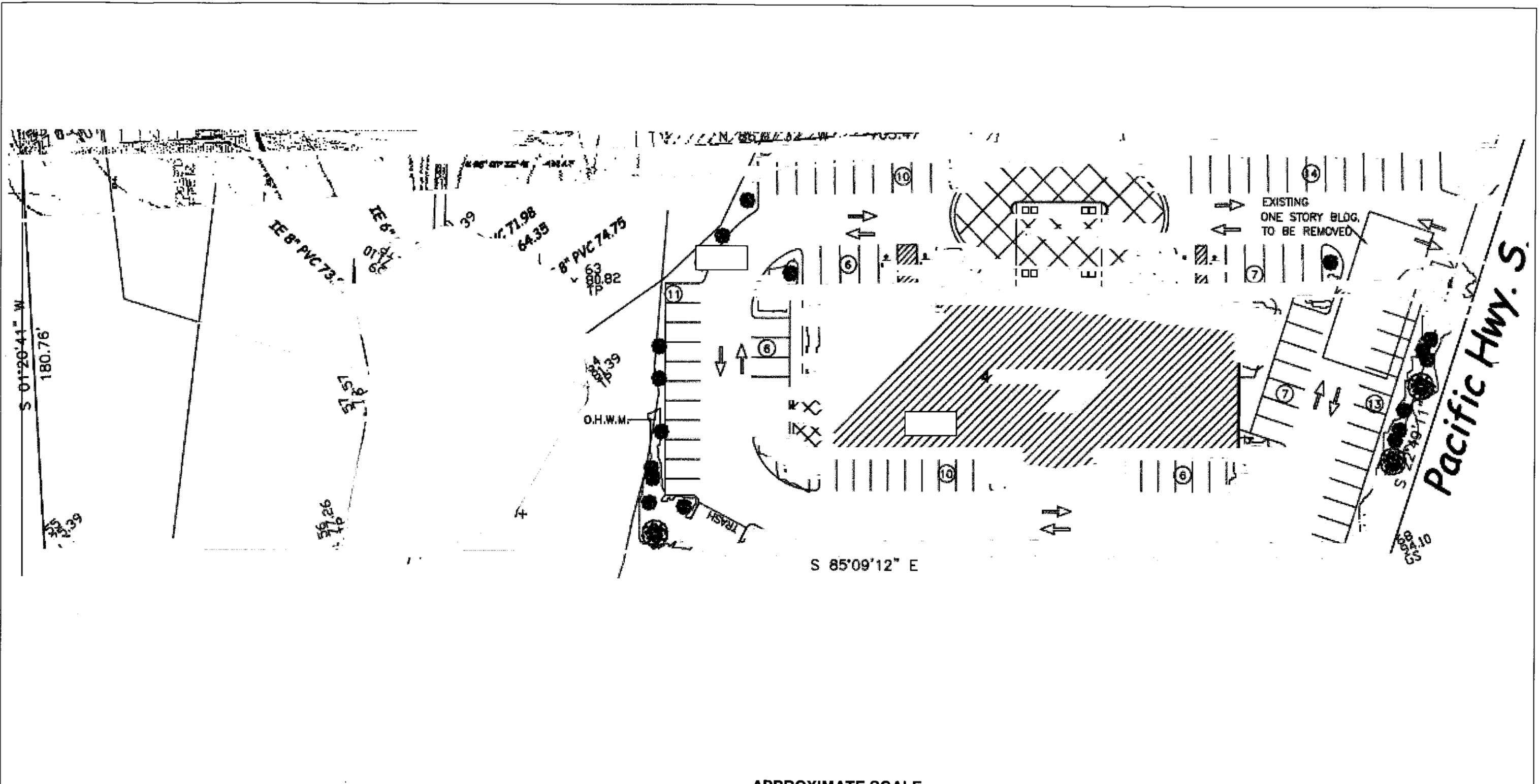
5007 Pacific Highway East, Suite 20
 Fife, Washington 98424
 Phone: 253-896-1011
 Fax: 253-896-2633

Site Vicinity Map 34839 Pacific Highway South Federal Way, Washington

Job #: Sweeney,D.PacificHwyS

January 2008

Figure 1



Site plan provided by TNT Engineering.

APPROXIMATE SCALE
1" = 30'

- APPROXIMATE TEST PIT LOCATION
- APPROXIMATE LOCATION OF SLOPES > 40%
- APPROXIMATE LOCATION OF SLOPES > 15 - 39%



GeoResources, LLC

5007 Pacific Highway East, Suite 20
 Fife, Washington 98424
 Ph: 253-896-1011 Fax: 253-896-2633

Site Plan
34839 Pacific Highway South
Federal Way, Washington

Job #: Sweeney,D.PacificHwyS

January 2008

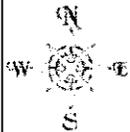
Figure 2

h

:

Approximate S Location

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
EWC		2.4	100.0%
Totals for Area of Interest (AOI)		2.4	100.0%



GeoResources, LLC

5007 Pacific Highway East, Suite 20
Fife, Washington 98424
Phone: 253-896-1011
Fax: 253-896-2633

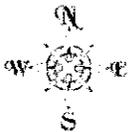
USDA NRCS Map 34839 Pacific Highway South Federal Way, Washington

Job #: Sweeney,D.PacificHwyS

January 2008

Figure 3

Approximate Site Location



GeoResources, LLC

5007 Pacific Highway East, Suite 20
Fife, Washington 98424
Phone: 253-896-1011
Fax: 253-896-2633

USGS Map
34839 Pacific Highway South
Federal Way, Washington

Job #: Sweeney,D.PacificHwyS

January 2008

Figure 4

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GROUP SYMBOL	GROUP NAME
COARSE GRAINED SOILS More than 50% Retained on No. 200 Sieve	GRAVEL More than 50% Of Coarse Fraction Retained on No. 4 Sieve	CLEAN GRAVEL	GW	WELL-GRADED GRAVEL, FINE TO COARSE GRAVEL
			GP	POORLY-GRADED GRAVEL
		GRAVEL WITH FINES	GM	SILTY GRAVEL
			GC	CLAYEY GRAVEL
	SAND More than 50% Of Coarse Fraction Passes No. 4 Sieve	CLEAN SAND	SW	WELL-GRADED SAND, FINE TO COARSE SAND
			SP	POORLY-GRADED SAND
		SAND WITH FINES	SM	SILTY SAND
			SC	CLAYEY SAND
FINE GRAINED SOILS More than 50% Passes No. 200 Sieve	SILT AND CLAY Liquid Limit Less than 50	INORGANIC	ML	SILT
			CL	CLAY
		ORGANIC	OL	ORGANIC SILT, ORGANIC CLAY
	SILT AND CLAY Liquid Limit 50 or more	INORGANIC	MH	SILT OF HIGH PLASTICITY, ELASTIC SILT
			CH	CLAY OF HIGH PLASTICITY, FAT CLAY
			ORGANIC	OH
HIGHLY ORGANIC SOILS			PT	PEAT

NOTES:

1. Field classification is based on visual examination of soil in general accordance with ASTM D2488-90.
2. Soil classification using laboratory tests is based on ASTM D2487-90.
3. Description of soil density or consistency are based on interpretation of blow count data, visual appearance of soils, and or test data.

SOIL MOISTURE MODIFIERS:

- Dry- Absence of moisture, dry to the touch
- Moist- Damp, but no visible water
- Wet- Visible free water or saturated, usually soil is obtained from below water table

<p>GeoResources, LLC 5007 Pacific Highway East, Suite 20 Fife, Washington 98424 Phone: 253-896-1011 Fax: 253-896-2633</p>	<p>Unified Soil Classification System (USCS) 34839 Pacific Highway South Federal Way, Washington</p>			
	<table style="width: 100%; border: none;"> <tr> <td style="border: none;">Job #: Sweeney,D.PacificHwys</td> <td style="border: none;">January 2008</td> <td style="border: none;">Figure 5</td> </tr> </table>	Job #: Sweeney,D.PacificHwys	January 2008	Figure 5
Job #: Sweeney,D.PacificHwys	January 2008	Figure 5		

Test Pit TP-1

Location: See Site Plan

Depth (ft.)	Soil Type	Description
0.0 - 4.0	-	(3 inches grass roots and TOPSOIL) FILL: Gray and brown silty sand with gravel and cobbles, loose to medium dense, moist. (Fill was organic-laced from 3 to 4 feet.)
4.0 - 6.5	SM	Brownish-orange silty SAND with gravel, slightly cemented, medium dense, moist. (Weathered Glacial Till)
6.5 - 8.0	SM	Gray silty SAND with gravel, moderately cemented, dense. (Glacial Till)

Terminated at 8 feet below the ground surface.
No caving observed.
No groundwater observed.

Test Pit TP-2

Location: See Site Plan

Depth (ft.)	Soil Type	Description
0.0 - 3.5	SM	(2 inches grass roots and TOPSOIL) Gray silty SAND with gravel, moderately cemented, dense. (Glacial Till)

Terminated at 3 ½ feet below the ground surface.
No caving observed.
No groundwater observed.

Test Pit TP-3

Location: See Site Plan

Depth (ft.)	Soil Type	Description
0.0 - 7.5	-	(4 inches grass roots and TOPSOIL) FILL: Gray and brown silty sand with gravel and cobbles, loose to medium dense, moist to wet. (Fill was organic-laced with construction debris and a strong organic odor from 5 to 7 ½ feet.)
7.5 - 9.0	SM	Brownish-orange silty SAND with gravel, slightly cemented, medium dense, moist. (Weathered Glacial Till)
9.0 - 10.0	SM	Gray silty SAND with gravel, moderately cemented, dense. (Glacial Till)

Terminated at 10 feet below the ground surface.
No caving observed.
No groundwater observed.

Test Pit TP-4

Location: See Site Plan

Depth (ft.)	Soil Type	Description
0.0 - 1.0	-	(2 inches grass roots and TOPSOIL) FILL: Brown silty sand with gravel loose to medium dense, moist.
1.0 - 4.0	SM	Brownish-orange silty SAND with gravel, slightly cemented, medium dense, moist. (Weathered Glacial Till)
4.0 - 6.0	SM	Gray silty SAND with gravel, moderately cemented, dense. (Glacial Till)

Terminated at 6 feet below the ground surface.
No caving observed.
No groundwater observed.

GeoResources, LLC

5007 Pacific Highway East, Suite 20
Fife, Washington 98424
Phone: 253-896-1011
Fax: 253-896-2633

Test Pit Logs 34839 Pacific Highway South Federal Way, Washington

Job # : Sweeney,D.PacificHwys

January 2008

Figure 6

EXISTING CONDITIONS REPORT

HOTEL CONCEPTS FEDERAL WAY, WASHINGTON

Prepared For:
HOTEL CONCEPTS
Seattle, Washington

Prepared By:
TALASAEA CONSULTANTS, INC.
Woodinville, Washington

April 2018

Existing Conditions Report

Hotel Concepts Federal Way, Washington

Prepared For:

Alfred Kim
Hotel Concepts
3926 Aurora Avenue North
Seattle, Washington 98103

Prepared By:

Talasaesa Consultants, Inc.
150250 Bear Creek Road NE
Woodinville, Washington 98077
(425) 861-7550

April 2018

EXECUTIVE SUMMARY

PROJECT NAME: Hotel Concepts Site

PROJECT LOCATION: The address for the Site is 34839 Pacific Highway South in the City of Federal Way, Washington. The project includes King County Tax Parcel number 202104-9044. The Public Land Survey System location of the Site is Section 20, Township 21 North, Range 4 East, Willamette Meridian.

CLIENT: Alfred Kim, Hotel Concepts

PROJECT STAFF: Bill Shiels, Principal; Jennifer Marriott, Senior Ecologist; and Kristen Numata, Ecologist.

FIELD SURVEY: Site evaluations were performed on 1 and 6 February 2018.

DETERMINATION: One stream (a tributary to West Hylebos Creek) was identified on-site, and one wetland (Wetland A) was observed off-site to the north. West Hylebos Creek is classified as a Type F stream, which requires a 100-foot setback per Federal Way Revised Code (FWRC). Wetland A rated as a Category III with a habitat score of 5, which requires a 105-foot standard buffer.

VEGETATION: The Site is undeveloped, and is dominated by invasive species from lack of maintenance. The majority of the stream buffer is forested with deciduous tree species such as red alder and black cottonwood.

PREVIOUS MITIGATION: As part of a previously permitted development, a 72" culvert on the north side of the property was removed and the 100-foot buffer for West Hylebos Creek was enhanced. Native species identified to be planted within the mitigation area included Douglas fir, western red cedar, willows, pacific ninebark, and snowberry.

TABLE OF CONTENTS

Executive Summary	i
Table of Contents	ii
List of Figures and Appendices	iii
Chapter 1. Introduction	1
1.1 Purpose of Report	1
1.2 Statement of Accuracy	1
1.3 Qualifications	1
Chapter 2. Property Description	2
2.1 Property Location	2
2.2 Existing Site Development.....	2
Chapter 3. Methodology	2
3.1 Background Data Reviewed	2
3.2 Field Investigation	3
3.2.1 Wetland Determinations	3
3.2.2 Ordinary High Water Mark Determinations.....	3
Chapter 4. Results.....	3
4.1 Analysis of Existing Information.....	4
4.1.1 Natural Resources Conservation Service.....	4
4.1.2 National Wetlands Inventory.....	4
4.1.3 King County GIS Database	4
4.1.4 City of Federal Way Public Records Request.....	4
4.2 Analysis of Existing Conditions.....	4
4.2.1 Streams	4
4.2.2 Wetlands	5
4.2.3 Other Features	5
Chapter 5. Regulatory Review.....	5
5.1 City of Federal Way Zoning Code	5
Chapter 6. Summary	6
Chapter 7. References	7

LIST OF FIGURES

Figure 1 – Vicinity Map and Driving Directions

Figure 2 – NRCS Soils Map

Figure 3 – National Wetlands Inventory Map

Figure 4 – Existing Conditions Map

Figures occur at the end of the report.

APPENDICES

Appendix A: Documentation of Permanent Easement, dated 3 November 2009

Appendix B: Raedeke Associates *Wetland & Stream Assessment*, dated 30 January 2008

Appendix C: 2009 Site Development Plans, prepared by TRT Engineering, Inc.

Appendix D: Wetland Rating Form, *Washington State Department of Ecology Wetland Rating System for Western Washington* (2014), Talasaea Consultants, 2018

CHAPTER 1. INTRODUCTION

1.1 Purpose of Report

This report is the result of an existing conditions study for the property located at 34839 Pacific Highway South in Federal Way, Washington (referred to hereinafter as the “Site”) (Figure 1).

This report has been prepared to comply with the requirements of Federal Way Revised Code (FWRC) Chapter 19.145.080 – Critical area report to summarize the existing conditions of the Site. No site development impacts or mitigation are included within this report.

This report will provide and describe the following information:

- General property description;
- Methodology for critical areas investigation;
- Results of critical areas background review and field investigation;
- Existing site conditions; and
- Regulatory review.

1.2 Statement of Accuracy

Stream and wetland characterizations and ratings were conducted by trained professionals at Talasaea Consultants, Inc., and adhered to the protocols, guidelines, and generally accepted industry standards available at the time the work was performed. The conclusions in this report are based on the results of analyses performed by Talasaea Consultants and represent our best professional judgment. To that extent and within the limitation of project scope and budget, we believe the information provided herein is accurate and true to the best of our knowledge. Talasaea does not warrant any assumptions or conclusions not expressly made in this report, or based on information or analyses other than what is included herein.

1.3 Qualifications

Field investigations and evaluations were conducted by Bill Shiels, Principal; Jennifer Marriott, PWS, Senior Ecologist; and Kristen Numata, Ecologist. Bill Shiels has a Bachelor's Degree in Biology from Central Washington University and a Master's Degree in Biological Oceanography from the University of Alaska. He has over 40 years of experience in wetland delineations and mitigations. Jennifer Marriott has a Bachelor's Degree and a Master's Degree in Biology from University of Central Florida, and a second Master's Degree in Soil and Environmental Science from the University of Florida. She has over 13 years of experience in wetland delineations and environmental permitting. Kristen Numata has a Bachelor's Degree in Biology and Environmental Science from Santa Clara University.

CHAPTER 2. PROPERTY DESCRIPTION

2.1 Property Location

The property is located along Pacific Highway (SR-99), and includes King County Tax Parcel number 202104-9044. The Site is approximately 2.8 acres in size. The Public Land Survey System location of the Site is Section 20, Township 21 North, Range 4 East, Willamette Meridian.

The topography of the Site is sloping downhill from east to west. The Site is bound by Pacific Highway to the east, development to the north and immediately west, and West Hylebos Wetlands Park farther to the west. The parcels to the south are not developed.

2.2 Existing Site Development

The Site is not currently developed, although there have been previously submitted plans to develop the property. Several informal pedestrian trails traverse the Site that appear regularly used, and evidence of homeless camps occur across the Site. The majority of the Site is dominated by a variety of grasses and Scot's broom (*Cytisus scoparius*) except for a shrub- and young tree-dominated buffer around the stream.

CHAPTER 3. METHODOLOGY

The critical areas analysis of the Site involved a two-part effort. The first part consisted of a preliminary assessment of the Site and the immediate surrounding area using published environmental information. This information includes:

- 1) Wetland and soils information from resource agencies;
- 2) Critical Areas information from King County and the City of Federal Way;
- 3) Orthophotography and LIDAR imagery; and,
- 4) Relevant studies completed or ongoing near the Site.

The second part consisted of site investigations where direct observations and measurements of existing environmental conditions were made. Observations included plant communities, soils, hydrology, and stream conditions. This information was used to help characterize the site and define the limits of critical areas onsite and offsite for regulatory purposes (see **Section 3.2 – Field Investigation** below).

3.1 Background Data Reviewed

Background information from the following sources was reviewed prior to field investigations:

- US Fish and Wildlife Service (USFWS), Wetlands Online Mapper (National Wetlands Inventory) (U.S. Fish and Wildlife Service, 2018) (www.wetlandsfws.er.usgs.gov/wtlnds/launch.html);
- Natural Resources Conservation Service, Web Soil Survey (Natural Resources Conservation Service, 2018) (www.websoilsurvey.nrcs.usda.gov/app/);
- King County GIS Database (King County, 2018);
- Washington Department of Fish and Wildlife Priority Habitat and Species (PHS) Mapper;

- Orthophotography from USDA's National Agricultural Imagery Program (NAIP 2018), Earth Explorer (USGS), and Google Earth; and
- Information obtained from the City of Federal Way via Public Records Requests (2018).

3.2 Field Investigation

Talasaesa Consultants evaluated the Site on 1 and 6 February 2018.

3.2.1 Wetland Determinations

Site investigation utilized the routine approach described in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountain, Valleys, and Coast Regions* (U.S. Army Corps of Engineers, 2010) to evaluate the Site for potential wetlands.

Plant species were identified according to the taxonomy of Hitchcock and Cronquist (Hitchcock, *et al.* 1973). Taxonomic names were updated and plant wetland status was assigned according to *North American Digital Flora: National Wetland Plant List, Version 2.4.0* (Lichvar, *et al.* 2016). Wetland classes were determined with the U.S. Fish and Wildlife Service's system of wetland classification (Cowardin, *et al.* 1979). Vegetation was considered hydrophytic if greater than 50% of the dominant plant species had a wetland indicator status of facultative or wetter (i.e., facultative, facultative wetland, or obligate wetland).

Wetland hydrology was determined based on the presence of hydrologic indicators listed in the Corps' Regional Supplement. These indicators are separated into Primary Indicators and Secondary Indicators. To confirm the presence of wetland hydrology, one Primary Indicator or two Secondary Indicators must be demonstrated. Indicators of wetland hydrology may include, but are not necessarily limited to: drainage patterns, drift lines, sediment deposition, watermarks, stream gauge data and flood predictions, historical records, visual observation of saturated soils, and visual observation of inundation.

Soils on the site were considered hydric if one or more of the hydric soil indicators listed in the Corps' Regional Supplement were present. Indicators include presence of organic soils, reduced, depleted, or gleyed soils, or redoximorphic features in association with reduced soils.

3.2.2 Ordinary High Water Mark Determinations

The ordinary high water mark was determined using the current methodology as described in *Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State* (Anderson, *et al.* 2016).

CHAPTER 4. RESULTS

This section describes the results of our in-house research and field investigations. For the purpose of this report, the term "vicinity" describes an area within 300 feet of the Site.

4.1 Analysis of Existing Information

The following sources provided information on site conditions based on data compiled from resource agencies and local government.

4.1.1 Natural Resources Conservation Service

The NRCS maps two soil types on the Site: Norma sandy loam and Everett-Alderwood gravelly sandy loam, 6-15% slopes (**Figure 2**).

4.1.2 National Wetlands Inventory

The National Wetlands Inventory (NWI) maps one wetland on-site and one wetland off-site to the north (**Figure 3**). The mapped on-site wetland is a Palustrine Scrub-Shrub, seasonally flooded (PSSC) wetland. The wetland mapped north of the Site is mapped as a Palustrine Forested, seasonally flooded (PFOC) wetland. A large wetland complex is mapped south and west of the Site that overlaps the West Hylebos Wetland Park, which is mapped as a Palustrine Forested, temporarily flooded (PFOA) wetland with pockets of mapped PSSC wetlands. No streams are mapped on the Site by the NWI.

4.1.3 King County GIS Database

King County identifies one stream that bisects the site. No wetlands were identified on, or in the vicinity of, the Site.

4.1.4 City of Federal Way Public Records Request

The stream bisecting the Site is labeled as West Hylebos Creek. However, other sources identify the on-site stream as a tributary to West Hylebos Creek and not the main stem of this stream. According to documents acquired from the City of Federal Way, a permanent easement for surface water facilities (approximately 51,998 sf) is located in the western half of the property. The easement is associated with the on-site stream and includes the 100-foot standard buffer associated with the stream. Effectively, the Site from the eastern limits of the 100-foot stream buffer to the western property boundary are contained within the above-referenced easement (**Appendix A**).

4.2 Analysis of Existing Conditions

The Site is generally heavily disturbed and is dominated by a variety of grasses, Scot's broom, and Himalayan blackberry. There is an abundance of debris on the Site from homeless activity.

4.2.1 Streams

One stream (likely a tributary to West Hylebos Creek) was identified within the western half of the property (**Figure 4**). The stream enters the Site from the north and continues off property to the south before co-mingling with Hylebos Creek to the southwest. Short, steep slopes are located on either side of the stream channel as this stretch of the stream is highly channelized. The streambed was a mix of round rocks and silt. Riffles and pool complexes were observed off-site to the south, though none occurred within the Site.

As outlined in the Raedeke Associates *Wetland & Stream Assessment*, dated 30 January 2008, a large 72" culvert was removed from the north end of the property as

part of the previously permitted project (**Appendix B**). The 100-foot stream buffer was enhanced with native species such as Douglas fir (*Pseudotsuga menziesii*), western red cedar (*Thuja plicata*), willows (*Salix* sp.), pacific ninebark (*Physocarpus capitatus*), and snowberry (*Symphoricarpos albus*). While the development associated with this mitigation was never completed, portions of the development plan were completed, including the stream mitigation and the construction of temporary stormwater facilities that were then left in place.

4.2.2 Wetlands

One wetland (Wetland A) was observed off-site to the north. Wetland A is dominated by black cottonwood (*Populus balsamifera*), red alder (*Alnus rubra*), and salmonberry (*Rubus spectabilis*). Hydrology for Wetland A is provided by precipitation, interception of surface and groundwater, and overbank flooding from the stream. Soils were not evaluated within Wetland A because this feature occurs off-site. Wetland A appears to be limited to a small area in proximity to the stream that is a combination of riverine and depressional wetland.

Conditions were evaluated immediately adjacent to the Site in more detail to determine whether the buffer for Wetland A would extend onto the Site. The current extent of Wetland A was estimated based on field observations and aerial imagery. Wetland A is much smaller under current conditions than it was during the last round of critical area assessments done by Raedeke in 2008, which we believe to be a result of the culvert removal done as part of the previously permitted mitigation activities. While it seems difficult to think a 72" culvert caused a backwater effect, field conditions reflect an area that previously held higher levels of water than what was currently observed. The culvert removal is the most obvious detail that has changed since 2008. Water is able to move freely through the stream channel without any blockages and hindrances. The Stream is down-cut through the Site and the immediate areas north of the Site, such that stream-driven hydrology has little opportunity to extend up the slope.

4.2.3 Other Features

Two man-made features occur east of the stream, and are presumed to have been constructed to handle stormwater, though no outlets were found associated with either feature. Both are clearly constructed features with steep, defined side slopes that are currently vegetated. The eastern feature, located immediately outside of the stream buffer, coincides with the proposed temporary sediment pond that was identified on the previously-permitted plans (**Appendix C**). The western feature, located immediately within the stream buffer from the temporary sediment pond, is square in shape and of an unknown origin. It appears to have been constructed around the same time as the temporary sediment trap/pond, but is not reflected on any of the permitted drawings found to date. These features do not meet the definition of a regulated wetland.

CHAPTER 5. REGULATORY REVIEW

5.1 City of Federal Way Zoning Code

Wetlands and other critical areas in Federal Way are regulated under the Federal Way Revised Code (FWRC) 19.145. Wetlands have been rated using the *Washington State*

Wetland Rating System for Western Washington (Ecology Publication # 14-06-029). Wetland rating datasheets are provided in **Appendix D**.

Due to its connection to Hylebos Creek, the on-site stream is considered a Type F stream. Fish-bearing streams within Federal Way have a standard 100-foot buffer according to FWRC 19.14.270.

Wetland A was preliminarily rated as a Category III wetland with a Habitat Score of 5 based on best professional judgment, and a combination of limited field and extensive office evaluations. Category III wetlands with a Habitat Score of 5 require a 105-foot standard buffer according to FWRC 19.145.420.

The large wetland complex to the southwest was not identified or verified in the field. Assuming the NWI-identified boundary is close to the actual wetland boundary, the approximate edge of this wetland is more than 150-feet from the edge of the Site, and more than 400 feet from the eastern edge of the on-site stream buffer. Therefore, this off-site wetland, assuming the largest wetland buffers, would not extend a buffer onto the Site that would extend beyond the existing on-site critical areas. Therefore, no additional fieldwork was conducted to attempt to rate this large wetland complex.

CHAPTER 6. SUMMARY

The Site is an approximately 2.8 acre parcel located in Federal Way, Washington. One stream (either the main stem of West Hylebos Creek or a tributary to West Hylebos Creek) and one wetland (Wetland A) were identified on, or in the vicinity of, the Site. The standard buffer for a fish-bearing stream is 100 feet. The stream continues off-site and connects to Hylebos Creek downstream approximately 2,500 feet from the Site. Category III wetlands with a Habitat Score of 5 require a 105-foot standard buffer, which does not extend a buffer for Wetland A onto the Site. A permanent easement exists on the Site that includes the lands from the eastern limits of the 100-foot stream buffer to the western property boundary. No additional critical areas constraints exist on this property beyond those already documented with the City of Federal Way.

CHAPTER 7. REFERENCES

- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Fish and Wildlife Service, Department of the Interior. FWSOBS-70/31.
- Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*. Technical Report Y-87-1, US Army Engineer Waterways Experiment Station, Vicksburg, Miss.
- Federal Way Revised Code. Chapter 19.145 Environmentally Critical Areas (FWRC, 2017).
- Hitchcock, C.L., and A. Cronquist. 1973. *Flora of the Pacific Northwest*. University of Washington Press. 730 pp.
- Hruby, T. 2014. *Washington State Wetland Rating System for Western Washington. 2014 Update*. Washington State Department of Ecology Publication # 14-06-029.
- Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. *The National Wetland Plant List*. 2016 wetland ratings. Phytoneuron 2016-30: 1-17. Published 28 April 2016. ISSN 2153 733X
- Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at <http://websoilsurvey.nrcs.usda.gov/>. Accessed [2018].
- U.S. Army Corps of Engineers. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region. Wetland Regulatory Assistance Program. ERDC/EL TR-10-3
- U.S. Fish and Wildlife Service. 1989. *National Wetlands Inventory Map, Poverty Bay Quadrangle*.
- Washington State Department of Ecology. March 1997. *Washington State Wetland Identification and Delineation Manual*.
- Washington State Department of Ecology. *Water Quality Assessment and 303(d) List*. 2016. www.ecy.wa.gov/programs/wq/303d (accessed 2018).
- Washington State Department of Fish and Wildlife [Map Online], Olympia (WA): SalmonScape [2018]. URL: <<http://wdfw.wa.gov/mapping/salmonscape/index.html>>
- Washington State Department of Fish and Wildlife. 2016. *Priority Habitats and Species Database* [online], Olympia, WA. [Accessed 2018]. <www.wdfw.wa.gov/mapping/phs/>

FIGURES

Figure 1 – Vicinity Map and Driving Directions

Figure 2 – NRCS Soils Map

Figure 3 – National Wetlands Inventory Map

Figure 4 – Existing Conditions Map

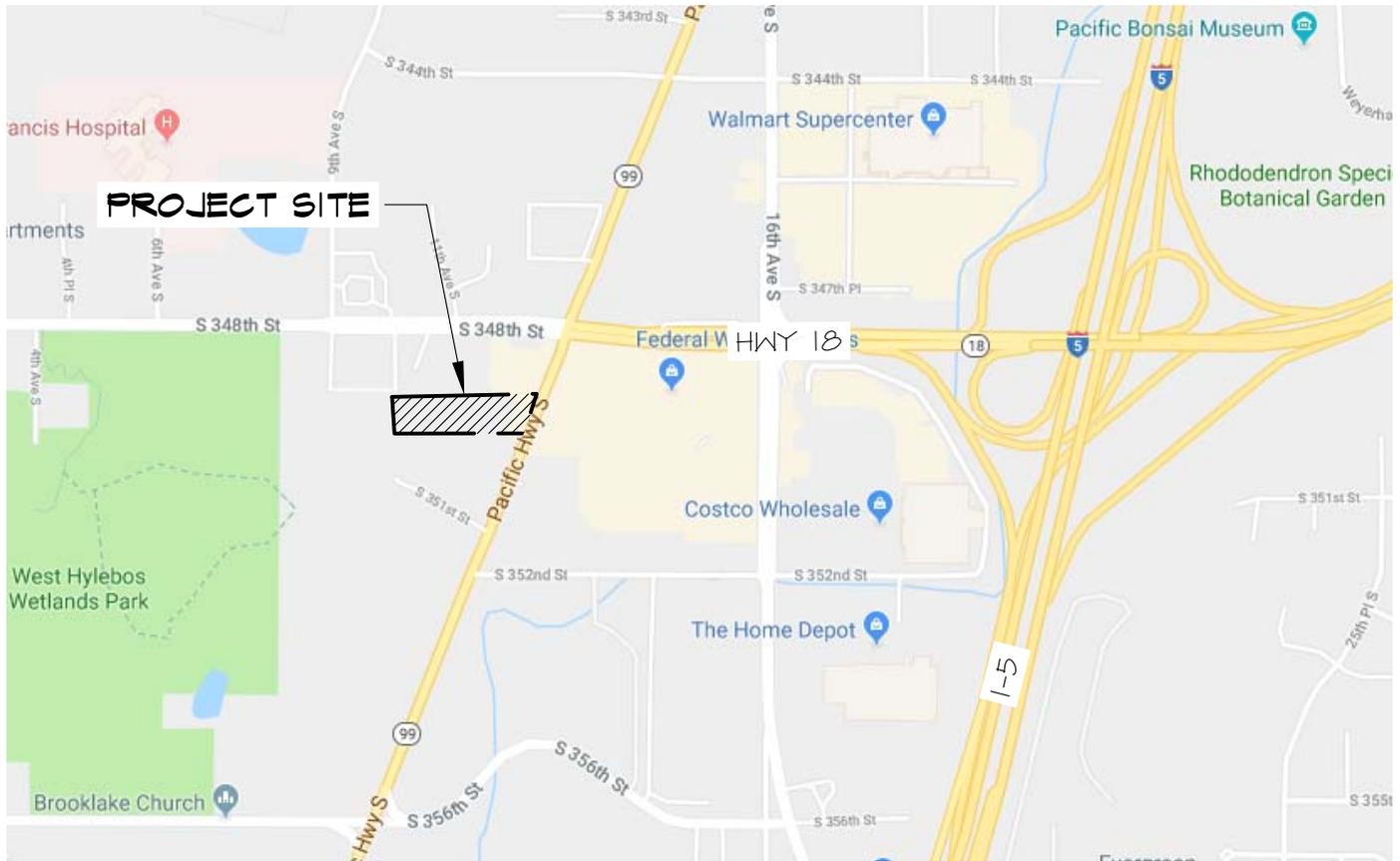
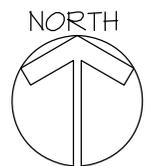


IMAGE SOURCE: GOOGLE MAPS, WWW.MAPS.GOOGLE.COM (ACCESSED 20 MARCH 2018)

DRIVING DIRECTIONS:

FROM I-5, SOUTH OF HWY 18:

1. FROM I-5 TAKE EXIT 142B FOR HWY 18
2. MERGE ONTO WA-18 TOWARD S 348TH ST. CONTINUE FOR 0.9 MILES.
3. USE THE 2ND FROM THE LEFT LANE TO TURN LEFT ONTO PACIFIC HIGHWAY SOUTH. CONTINUE FOR 340 FEET.
4. DESTINATION WILL BE ON THE RIGHT.



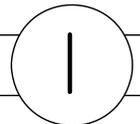
TALASAEA
CONSULTANTS, INC.

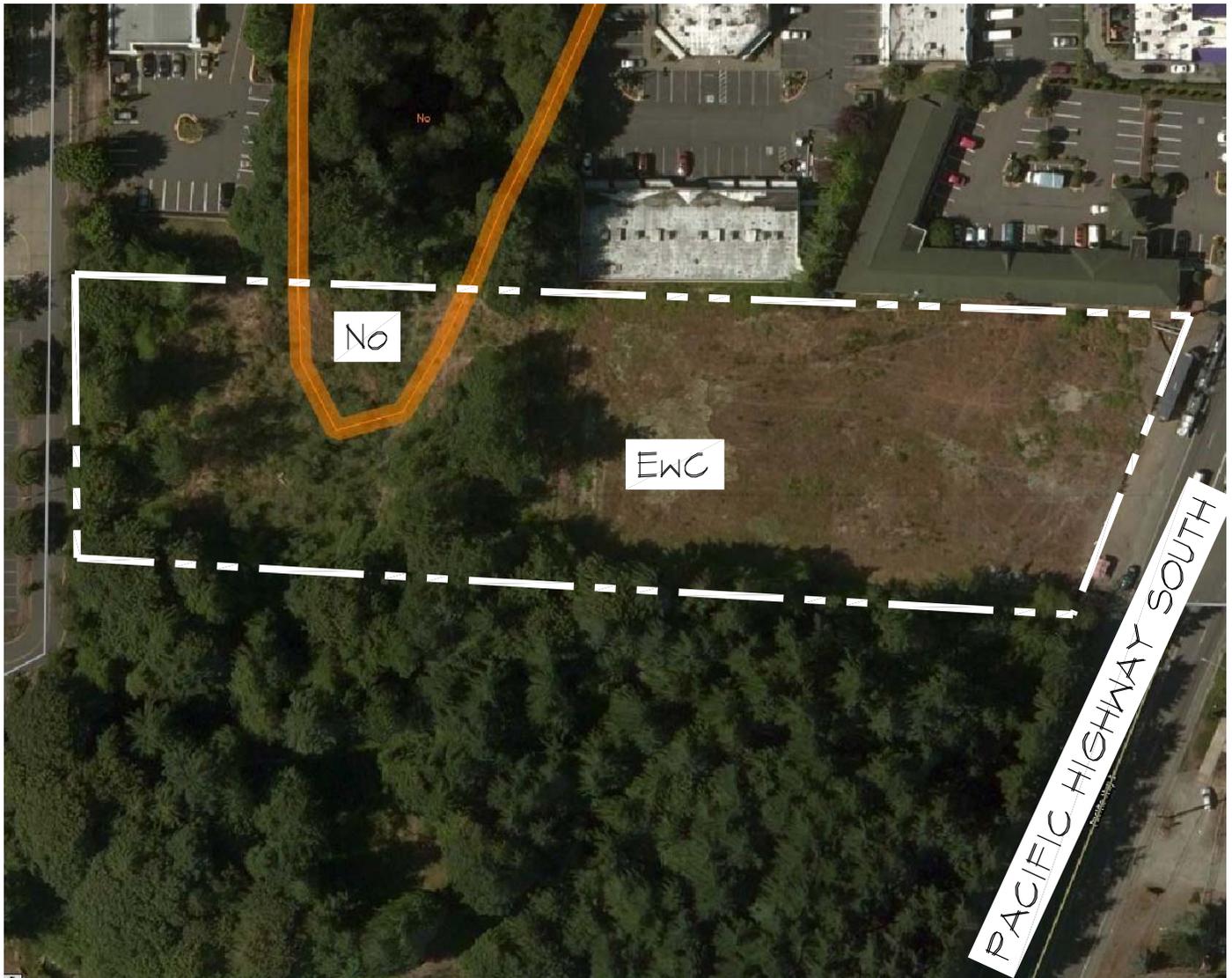
Resource & Environmental Planning
15020 Bear Creek Road Northeast
Woodinville, Washington 98077
Bus (425)861-7550 - Fax (425)861-7549

FIGURE #1

VICINITY MAP & DRIVING DIRECTIONS
HOTEL CONCEPTS
FEDERAL WAY, WASHINGTON

DESIGN	DRAWN	PROJECT
	KM	1719
SCALE		
NTS		
DATE		
4-5-2018		
REVISED		

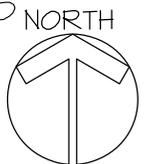




LEGEND

TYPE	DESCRIPTION, SLOPES
No	NORMA SANDY LOAM.
EWC	EVERETT-ALDERWOOD GRAVELLY SANDY LOAMS, 6-15 PERCENT SLOPES.

SOURCE: SOIL SURVEY STAFF, NATURAL RESOURCES CONSERVATION SERVICE, UNITED STATES DEPARTMENT OF AGRICULTURE, WEB SOIL SURVEY. AVAILABLE ONLINE AT <http://websoilsurvey.nrcs.usda.gov/>. ACCESSED (3/20/2018).



TALASAEA
CONSULTANTS, INC.

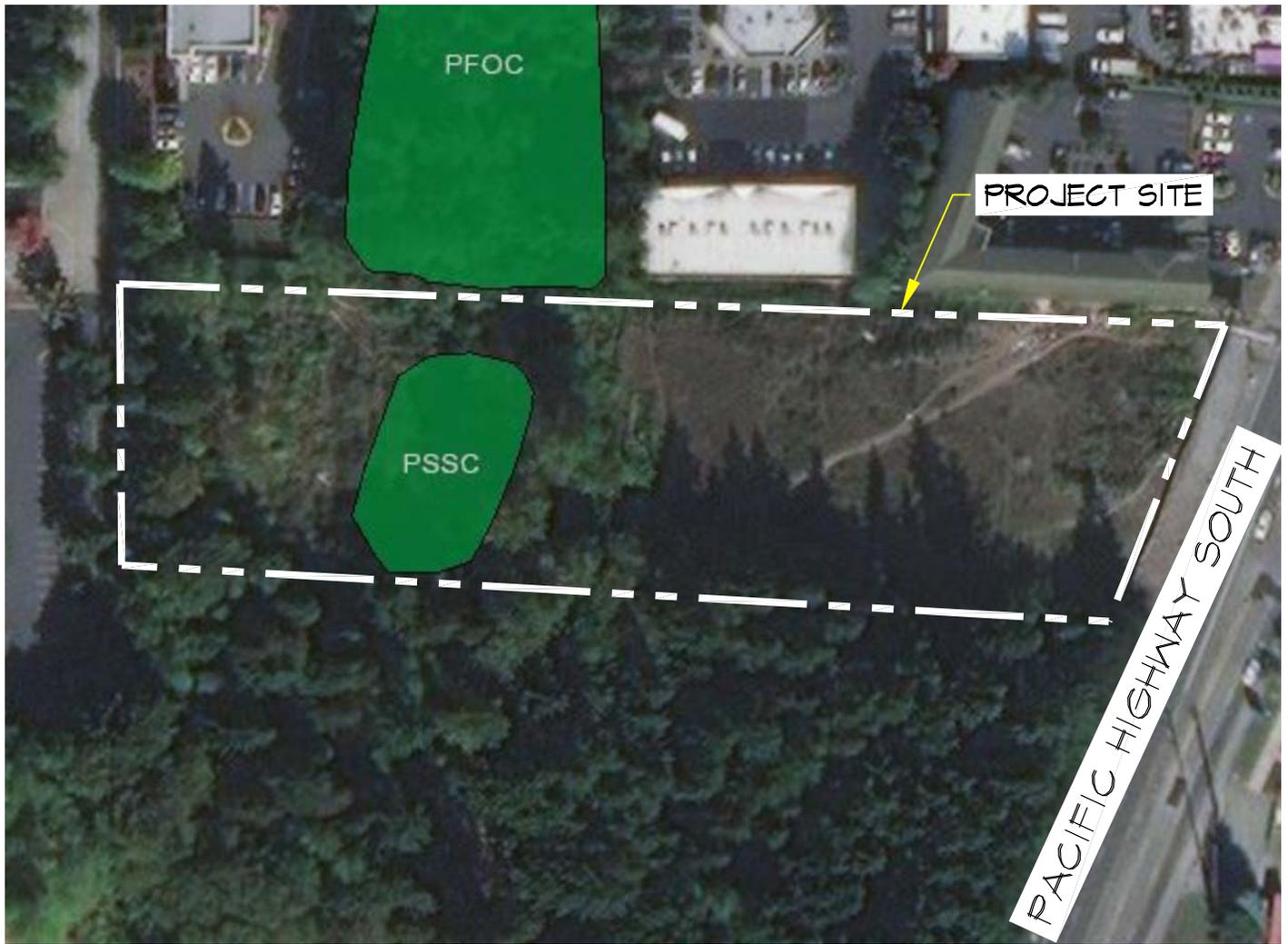
Resource & Environmental Planning
15020 Bear Creek Road Northeast
Woodinville, Washington 98077
Bus (425)861-7550 - Fax (425)861-7549

FIGURE #2

NRCS SOILS MAP
HOTEL CONCEPTS
FEDERAL WAY, WASHINGTON

DESIGN	DRAWN	PROJECT
	KM	1719
SCALE		
NTS		
DATE		
4-5-2018		
REVISED		

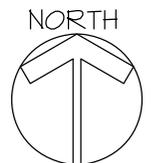
2



LEGEND

TYPE	DESCRIPTION
PFOC	PALUSTRINE FORESTED, SEASONALLY FLOODED WETLAND.
PSSC	PALUSTRINE SCRUB-SHRUB, SEASONALLY FLOODED WETLAND.

SOURCE: U.S. FISH AND WILDLIFE SERVICE, (MARCH 2018). NATIONAL WETLANDS INVENTORY WEBSITE, U.S. DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE, WASHINGTON D.C.
<http://www.fws.gov/wetlands/data/wetland-codes.html>



TALASAEA
CONSULTANTS, INC.

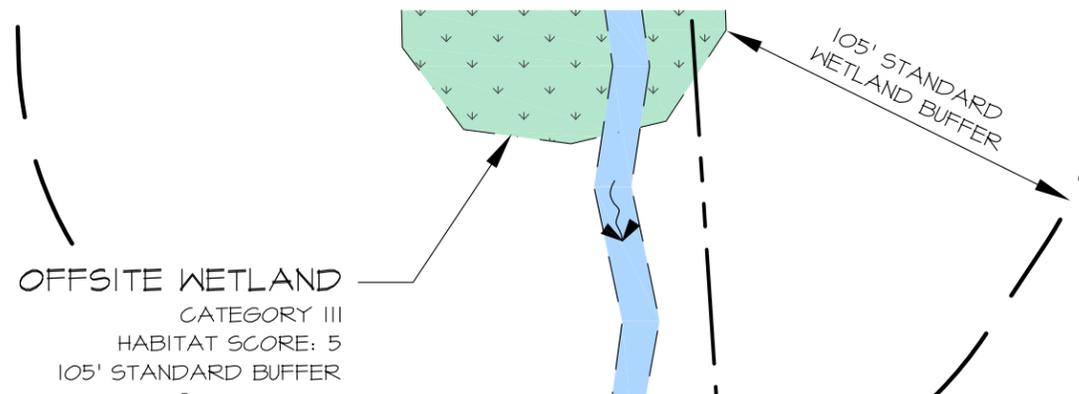
Resource & Environmental Planning
 15020 Bear Creek Road Northeast
 Woodinville, Washington 98077
 Bus (425)861-7550 - Fax (425)861-7549

FIGURE #3

NATIONAL WETLAND INVENTORY
 HOTEL CONCEPTS
 FEDERAL WAY, WASHINGTON

DESIGN	DRAWN	PROJECT
	KM	1719
SCALE		
NTS		
DATE		
4-5-2018		
REVISED		

3



OFFSITE WETLAND
 CATEGORY III
 HABITAT SCORE: 5
 105' STANDARD BUFFER

105' STANDARD
 WETLAND BUFFER

PROJECT SITE
 APN: 2021049044

WEST HYLEBOS CREEK
 TYPE F
 100' STANDARD BUFFER

100' STANDARD
 STREAM BUFFER

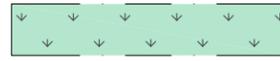
EXISTING SEDIMENT
 TRAP

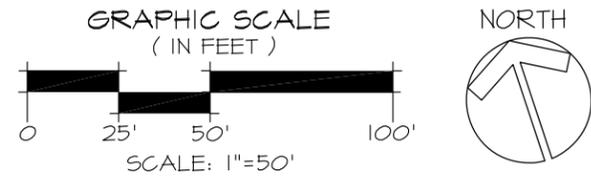
100' STANDARD
 STREAM BUFFER

EXISTING
 NON-WETLAND
 DEPRESSION

PACIFIC HIGHWAY S

PLAN LEGEND

-  PROPERTY LINE (NOT SURVEYED)
-  APPROXIMATED WETLAND BOUNDARY (NOT SURVEYED)
-  WETLAND BUFFER
-  STREAM FLOW (NOT SURVEYED)
-  STREAM BUFFER



TALASAEA
CONSULTANTS, INC.
 Resource & Environmental Planning
 15020 Bear Creek Road Northeast
 Woodinville, Washington 98077
 Bus (425)861-7550 - Fax (425)861-7549

FIGURE #4
 EXISTING CONDITIONS
 HOTEL CONCEPTS
 FEDERAL WAY, WASHINGTON

DESIGN JM	DRAWN KM	PROJECT 1719
SCALE AS SHOWN		
DATE 4-5-2018		
REVISED		

4

Z:\DRAWING\1700-1799-1799\TAL1719\Plans\TAL-xxxx FIGURES.dwg

APPENDIX A

**DOCUMENTATION OF PERMANENT EASEMENT,
DATED 3 NOVEMBER 2009**

Recording Requested By:
Fife Motel, Inc., Faruq Ramzanalli, Alfred Kim, and Spiradex

When Recorded Mail To:
City of Federal Way
Attn: Fei Fang, P.E./Public Works Dept.
33325 8th Ave S
PO Box 9718
Federal Way, WA 98063-9718



20091103001181

CITY OF FEDERAL WAY
PAGE-001 OF 010
11/03/2009 13:46
KING COUNTY, WA

71.00

PERMANENT EASEMENT FOR SURFACE WATER FACILITIES

Grantor (s): Fife Motel, Inc., a Washington corporation, Faruq Ramzanalli, a married person, Alfred Kim, a single person, and Spiradex, Inc., a Washington corporation
Grantee (s): CITY OF FEDERAL WAY, a Washington municipal corporation

Property Legal Description (abbreviated): Ptn. NE ¼ of SW ¼ of SE ¼, Section 20, Township 21 N, Range 4 E, W.M. Complete Legal Description indicated below.

Easement Legal Description: Entire Legal Description on Exhibit B and B-1.

Assessor's Tax Parcel ID#(s): 202104 9044

For and in consideration of One Dollars (\$1.00) and other valuable consideration, the receipt of which is hereby acknowledged, Fife Motel, Inc., a Washington corporation, Faruq Ramzanalli, a married person, Alfred Kim, a single person, and Spiradex, Inc., a Washington corporation, ("Grantor") grants, conveys and warrants to the CITY OF FEDERAL WAY, a Washington municipal corporation ("Grantee"), for the purposes hereinafter set forth a permanent easement under, across and over certain real property (the "Property") located in Federal Way, Washington, legally described as follows:

Legal description of property attached hereto as Exhibit "A" and incorporated herein by reference.

Except as may be otherwise set forth herein, Grantee's rights shall be exercised upon that portion of the Property ("Easement") legally described as follows:

Legal Description of Permanent Surface Water Facilities Easement attached hereto as Exhibit "B" and as depicted on Exhibit "B-1" and incorporated herein by this reference.

1. Purpose. Grantee and its agents, designees and/or assigns shall have the right, without prior notice to Grantor, at such times as deemed necessary by Grantee, to enter upon the Property to inspect, design, construct, reconstruct, operate, maintain, repair, and replace stream habitat restoration measures within the Easement, including but not limited to, removing the existing culvert, re-grading stream bank slope, re-aligning stream channel, stream stabilization measures, fish habitat improvements, and riparian habitat improvements ("Facilities"). The Facilities are more specifically described in the Construction Plans and

EXCISE TAX NOT REQUIRED

King Co Records
By , Deputy


Tiffany Frank

Documents, entitled West Hylebos Creek Headwaters Restoration Project. Following the initial construction of the Facilities, Grantee may from time to time construct such additional facilities as it may require. Further expansion of the Facilities will require additional approval by the Grantor. It shall be the Grantee's responsibility to maintain the Facilities following the construction.

2. Access. Grantee shall have the right of access to the Easement over and across the Property to enable Grantee to exercise its rights hereunder by utilizing the existing open space on the Property or by any other method mutually agreeable to Grantor and Grantee. Upon future development of the Property, Grantee shall have the right of access to the Easement over and across the Property by utilizing paved driveway and/or parking space. Grantor shall ensure that future development of the Property will allow for Grantee's access to the Easement.

3. Grantor's Use of Easement. This Easement shall be exclusive to Grantee; provided, however, Grantor reserves the right to use the Easement for any purpose not inconsistent with Grantee's rights provided: further, that Grantor shall not construct or maintain any buildings or other structures on the Easement, that Grantor shall not perform grading or other form of construction activity on the Property, which would alter the functioning of the Facilities.

4. Indemnification.

4.1 Grantee Indemnification. Grantee agrees to indemnify, defend, and hold Grantor, its employees, and agents, harmless from any and all claims, demands, losses, actions and liabilities (including costs and all attorney fees) to or by any and all persons or entities, including, without limitation, their respective agents, licensees, or representatives, arising from, resulting from, or connected with this Easement, to the extent caused by the negligent acts, errors, or omissions of the Grantee, its employees, agents, representatives or licensees.

4.2 Grantor Indemnification. Grantor agrees to indemnify, defend, and hold Grantee, its elected officials, officers, employees, agents, and volunteers harmless from any and all claims, demands, losses, actions and liabilities (including costs and all attorney fees) to or by any and all persons or entities, including, without limitation, their respective agents, licensees, or representatives, arising from, resulting from, or connected with this Easement, to the extent caused by the negligent acts, errors, or omissions of the Grantor, its employees, agents, representatives or licensees.

5. Successors and Assigns. The rights and obligations of the parties shall inure to the benefit of and be binding upon their respective successors in interest, heirs and assigns.

DATED THIS 28th day of Aug, 2009.

GRANTOR

ALFRED KIM

By: _____

Signature

708 S 283th Ln
Address

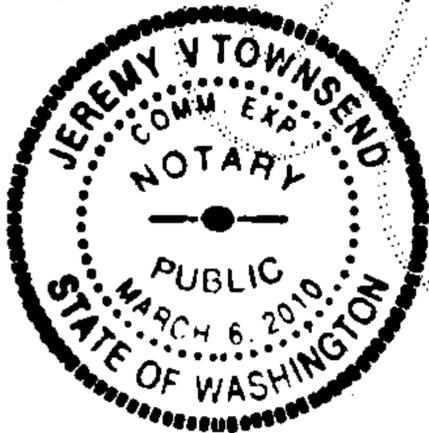
Federal Way, WA 98003
City/State/Zip

253-327-0269
Phone

STATE OF WASHINGTON)
) ss.
COUNTY OF King)

On this day personally appeared before me, Alfred Kim, a single person, to me known to be the individual described in and who executed the foregoing instrument, and on oath swore that he/she/they executed the foregoing instrument as his/her/their free and voluntary act and deed for the uses and purposes therein mentioned.

GIVEN my hand and official seal this 28th day of August, 2009.



Jeremy V. Townsend
(typed/printed name of notary)

Notary Public in and for the State of Washington.
My commission expires 03/06/2010.

DATED THIS 10 day of September, 2009.

GRANTEE

CITY OF FEDERAL WAY

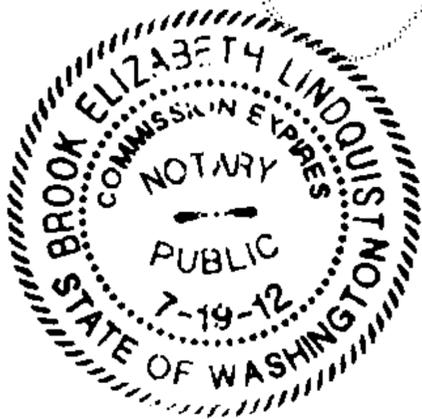
By: 
Brian J. Wilson, Interim City Manager
PO Box 9718
Federal Way, WA 98063-9718

APPROVED AS TO FORM:


Patricia A. Richardson, City Attorney

STATE OF WASHINGTON)
) ss.
COUNTY OF KING)

On this day personally appeared before me Brian J. Wilson, to me known to be the Interim City Manager, of the City of Federal Way, that executed the foregoing instrument, and acknowledged the said instrument to be the free and voluntary act and deed of said corporation, for the uses and purposes therein mentioned, and on oath stated that he was authorized to execute said instrument and that the seal affixed, if any, is the corporate seal of said corporation.




Brook Elizabeth Lindquist
(typed/printed name of notary)
Notary Public in and for the State of Washington.
My commission expires 7-19-12

Exhibit "A"
Property Legal Description

That portion of the northeast quarter of the southwest quarter of the southeast quarter of section 20, township 21 north, range 4 east, Willamette meridian, in King County, Washington, described as follows:

Commencing at the southwest corner of the northeast quarter of the southwest quarter of the southeast quarter of said section 20;

Thence north 00 21'53" east along the west line of said subdivision 326.50 feet to the true point of beginning;

Thence south 87 26'19" east 704.31 feet to the westerly margin of pacific highway south;

Thence south 21 50'33" west along said westerly margin 204.82 feet;

Thence north 86 07'16" west 629.93 feet to the west line of said subdivision;

Thence north 00 21'53" east along said west line 179.10 feet to the true point of beginning.

Exhibit "B"
Easement Legal Description

The western portion of the hereinafter described parcel "A" lying west of a line described as follows:

100 feet east from the centerline of the West Hylebos Creek. The creek centerline is defined as the center between the two ordinary high water marks on each side of the West Hylebos Creek.

Containing 51,998 square feet, more or less.

Parcel "A"

That portion of the northeast quarter of the southwest quarter of the southeast quarter of section 20, township 21 north, range 4 east, Willamette meridian, in King County, Washington, described as follows:

Commencing at the southwest corner of the northeast quarter of the southwest quarter of the southeast quarter of said section 20;

Thence north 00 21'53" east along the west line of said subdivision 326.50 feet to the true point of beginning;

Thence south 87 26'19" east 704.31 feet to the westerly margin of pacific highway south;

Thence south 21 50'33" west along said westerly margin 204.82 feet;

Thence north 86 07'16" west 629.93 feet to the west line of said subdivision;

Thence north 00 21'53" east along said west line 179.10 feet to the true point of beginning.



PACIFIC HIGHWAY

PARCEL
2021049045

PARCEL
2021049042

PARCEL A
2021049044

PARCEL
2021049027

PERMANENT EASEMENT
= 51,998 SF±

WEST HYLEBDS
CREEK CENTERLINE

PARCEL
2021049140

100' BUFFER

186.91'

180.76'

PARCEL
2021049028



EXHIBIT B-1
PERMANENT EASEMENT FOR SURFACE WATER FACILITIES

APPENDIX B

**RAEDEKE ASSOCIATES *WETLAND & STREAM ASSESSMENT*,
DATED 30 JANUARY 2008**

WETLAND & STREAM ASSESSMENT

**Holiday Inn Express
Federal Way, Washington**

January 30, 2008

RAEDEKE ASSOCIATES, INC.

RECEIVED

JAN 31 2008

**CITY OF FEDERAL WAY
CDS**



Report To: Mr. Dale Sweeney
Sweeney Designs
5715 143rd PI SE
Bellevue, WA 98006

Title: Wetland and Stream Assessment for the
Holiday Inn Express site
City of Federal Way, Washington

Project Number: 2007-025-001

Prepared By: RAEDEKE ASSOCIATES, INC.
5711 Northeast 63rd Street
Seattle, Washington 98115
(206) 525-8122

Date: January 30, 2008

RECEIVED
JAN 31 2008
CITY OF FEDERAL WAY
CDS



Project Manager:

Lisa Danielski, B.A., WPIT
Wetland Biologist/Botanist

Current Project Personnel:

Emmett Pritchard, B.S.
Principal/Wetland Ecologist

Richard W. Lundquist, M.S.
Vice President/Wildlife Biologist

Emily Podolak, M.L.A.
Landscape Designer

Duane Dietz, B.A., A.S.L.A.
Landscape Architect

Gail W. Livingstone, B.S.L.A.
Natural Resource Planner & Editor

Kurt Richardson, Jr., B.A.
Biological Technician

Submitted by:

Handwritten signature of Lisa Danielski in cursive script.

Signature

Printed name Lisa Danielski in a simple sans-serif font.

Printed Name

Handwritten date 1-30-08 in a simple sans-serif font.

Date

TABLE OF CONTENTS

	Page
LIST OF FIGURES	v
LIST OF TABLES	v
1.0 INTRODUCTION	1
1.1 Statement of Purpose	1
1.2 Study Area	1
1.3 Project History	1
2.0 METHODS	2
2.1 Background Review	2
2.2 Field Sampling Procedures and Data Analysis	2
3.0 EXISTING CONDITIONS	3
3.1 Results of Background Investigation	3
3.2 General Study Area Description	3
3.3 Stream Description	3
3.4 Off-Site Wetland Description	4
3.5 Upland Descriptions	5
4.0 WETLAND FUNCTIONAL ASSESSMENT	6
4.1 Surface Water Control	6
4.2 Wildlife Habitat	6
4.3 Pollution and Erosion Control	7
4.4 Groundwater Exchange	7
4.5 Open Space & Aesthetic Contrast	7
4.6 Recreational, Educational, and Cultural Functions and Values	7
5.0 REGULATORY CONSIDERATIONS	8
5.1 Federal Clean Water Act (U.S. Army Corps of Engineers)	8
5.2 City of Federal Way	8
6.0 IMPACTS	11
6.1 Direct Impacts	11
6.2 Indirect Stream and Wetland Impacts	11
6.3 Stream and Wetland Buffer Impacts	14

7.0 MITIGATION	18
7.1 Avoidance of Impacts	18
7.2 Minimization of Impacts.....	18
7.3 Compensatory Mitigation	18
8.0 LIMITATIONS	20
9.0 LITERATURE CITED	21
FIGURES AND TABLES	24
APPENDIX A:.....	A-1
Wright Federal Way Stream Delineation (Raedeke Associates, Inc. 2006).....	A-1

LIST OF FIGURES

Figure		Page
1.	Vicinity map.....	25
2	Aerial photo of project site.....	26
3.	USFWS NWI map	27
4.	USDA SCS map.....	28
5.	WDNR forest practice activity map.....	29
6.	City of Federal Way stream ratings map.....	30
7a, b.	Existing conditions.....	31
8.	Proposed site plan	32

LIST OF TABLES

Table		Page
1.	List of aerial photographs used in the study.....	34
2.	List of WDNR stream types.....	35

1.0 INTRODUCTION

1.1 STATEMENT OF PURPOSE

This report is for the Holiday Inn Express site in the City of Federal Way, Washington (Figure 1). The primary objectives of this report are to: (1) provide information on previously identified wetlands located on property adjoining the Holiday Inn Express site, (2) evaluate direct and indirect impacts of the proposed development to the on-site stream (delineated under a previous study) and off-site wetland, as well as their associated buffers, and (3) discuss mitigation measures to avoid, reduce, or compensate for those impacts. This report supplements the Stream Delineation letter prepared by Raedeke Associates, Inc. (Raedeke Associates, Inc. 2006; see Appendix A of this report) for the purposes of City of Federal Way SEPA review of the proposed project.

1.2 STUDY AREA

The Holiday Inn Express project site consists of approximately 2.85 acres located in the southeast portion of Section 20, Township 21 North, Range 4 East W.M., in the City of Federal Way, Washington. Specifically, the site is located along the west side of Pacific Highway South and south of S 348th Street. The parcel we investigated is identified as King County Tax parcel #2021049044.

1.3 PROJECT HISTORY

The Holiday Inn Express site was initially investigated by Raedeke Associates, Inc. on May 31, 2006 for the previous owner to identify potential streams and wetlands on the site. During this investigation, Raedeke Associates, Inc. delineated the Ordinary High Water Mark (OHWM) of one stream in the west corner of the site, and found no wetlands on the project site (Raedeke Associates, Inc. 2006; Appendix A).

The City of Federal Way requires that information be provided regarding any wetlands on or within 200 feet of the subject property, as described in Section 22-1356 of the City of Federal Way (2005) Critical Areas code. One wetland previously investigated by Raedeke Associates, Inc. in 1987 and 1988 is located adjacent to the north property boundary of the project site (Raedeke Associates, Inc. 1988, 1992). As part of the development on the adjoining property, a wetland and buffer enhancement plan was implemented in the mid-1990's, and concluded in 1998 (Raedeke Associates, Inc. 1988, 1998).

2.0 METHODS

2.1 BACKGROUND REVIEW

In preparation for our investigation, we reviewed Raedeke Associates, Inc. (2006) stream delineation for previously-compiled information regarding inventoried wetlands, soils, and streams. We reviewed the Washington Department of Fish and Wildlife (WDFW 2003) SalmonScape for additional information regarding the presence of fish species within the vicinity of the project area. We also reviewed Raedeke Associates, Inc.'s (1988, 1992) reports regarding the wetland on the adjoining property.

2.2 FIELD SAMPLING PROCEDURES AND DATA ANALYSIS

2.2.1 On-Site Wetland and Stream Investigation

Methodologies used to investigate the Holiday Inn Express site are discussed in Raedeke Associates, Inc. (2006; see Appendix A of this report).

2.3.2 Off-Site Wetland Investigation

The off-site wetland to the north of the project site was originally delineated by Raedeke Associates, Inc. (1998) using the U.S. Army Corps of Engineers (COE) Wetlands Delineation Manual (Environmental Laboratory 1987). For this current study, the adjoining property owner to the north of the project site would not grant Raedeke Associates, Inc. permission to access the site to investigate the previously-delineated wetland. Therefore our July 23, 2007 investigation of the wetland on the adjoining parcel to the north was limited to visually observing the wetland from the north property boundary of the Holiday Inn Express site.

3.0 EXISTING CONDITIONS

3.1 RESULTS OF BACKGROUND INVESTIGATION

3.1.1 Wetlands and Streams

As described in the Raedeke Associates, Inc. (2006) Stream Delineation letter, no wetlands were identified on the property. The wetland on the adjoining parcel to the north is depicted on the USFWS NWI (1987, 2007) map (Figure 3) and City of Federal Way (2005c) Stream Ratings map (Figure 6). The stream in the west portion of the site is depicted as a "Major Stream" on the City of Federal Way (2005) Stream Ratings map; StreamNet (2006), SalmonScape (2003) and the WDFW (2002) PHS maps do not depict the presence of any salmonid species in the reach of stream located on the project site. Please refer Figures 3 through 6 of this report and Raedeke Associates, Inc. (2006; Appendix A) for a complete description of the results of our inventory review.

3.2 GENERAL STUDY AREA DESCRIPTION

As described in Raedeke Associates, Inc. (2006), the Holiday Inn Express site is within the Hylebos Creek drainage basin of the Puyallup River Watershed (King County 2007). In 1986, King County (1986) issued a mitigated determination of non-significance to allow placement of fill on the Holiday Inn Express site, per King County Grading Permit #C9000374.

King County (1986) identified an unnamed tributary to Hylebos Creek, hereafter called Stream 1, which is located in the west portion of the site (Figure 7a). Two steep slopes are located on either side of Stream 1, which are primarily vegetated with deciduous trees and shrubs. The property to the east of the steep ravine is primarily grassland that lies on a gentle west-facing slope. The west portion of the site is relatively flat.

Surrounding land use includes commercial buildings adjacent along most of the north and west property boundaries, and Pacific Highway South along the east property boundary. Undeveloped coniferous forest borders the south property line.

3.3 STREAM DESCRIPTION

Raedeke Associates, Inc. (2006) identified and flagged the on-site portion of the OHWM of Stream 1 in May 2006. Figure 7a depicts the OHWM of the on-site stream, as surveyed by professional surveyors at Sadler/Barnard & Associates, Inc. Stream 1 originates off-site to the north of the Holiday Inn Express property, flowing south through a 72-inch corrugated metal culvert that was installed at the north end of the project site as part of the fill placement in the mid-1980's. Stream 1 flows off-site to the south. The

stream substrate has cobbles generally less than three inches in diameter, and minimal sediment deposition was evident.

3.4 OFF-SITE WETLAND DESCRIPTION

During our July 23, 2007 investigation of the off-site wetland, we observed “edge of wetland” survey stakes that generally corresponded to the wetland boundary depicted on a survey map provided to Sweeney Designs by the City of Federal Way (Figures 7a and 7b). The south wetland boundary appears to follow the toe of a steep slope. Based on visual observations of existing vegetation, topography, and evidence of inundation, the staked wetland edge appeared to accurately reflect the current wetland boundary.

Raedeke Associates, Inc. (1988) indicated that the off-site wetland is 0.53 acres in size. According to Raedeke Associates, Inc., a majority of the off-site wetland visible from the Holiday Inn Express site consisted of black cottonwood (*Populus balsamifera* ssp. *Trichocarpa*, FAC) and red alder (*Alnus rubra*), trees along the edge of the wetland, as well as Pacific willow (*Salix lucida* ssp. *Lasiandra*, FACW+) trees, Sitka willows (*Salix sitchensis*, FACW), redosier dogwood (*Cornus sericea*, FACW), and twinberry honeysuckle (*Lonicera involucrata*, FAC+) towards the center of the wetland.

At the time of our July 23, 2007 site visit, some standing water was visible in the center of the wetland; however, we could not confirm the inundation depth. Water from the off-site wetland discharges south into the stream on the Holiday Inn Express site via a 72-inch-wide metal culvert (Figure 7a). According to Raedeke Associates, Inc. (1988), soils within the wetland consist of silt loams, gravelly sand, and some organic soils.

Raedeke Associates, Inc. (1988) designated a small area of the west-central portion of the wetland as “palustrine, open water – seasonally flooded.” Raedeke Associates, Inc. (1992) subsequently revised the USFWS (Cowardin et al. 1992) classification of the wetland to a palustrine, scrub-shrub, broad-leaved deciduous (PSS1) wetland. Based on relatively recent aerial photos of the off-site wetland (King County 2007; Figure 2) and based on visual observations of the wetland on July 23, 2007, we did not observe any portion of the wetland that had less than 30% canopy cover by shrub, tree, or emergent species rooted in the wetland. Thus, the off-site wetland consists of at least 30% cover by deciduous tree species and thus would be classified as a palustrine, forested, broad-leaved deciduous (PFO1) wetland per the USFWS (Cowardin et al. 1992) classification system. This corresponds with the USFWS (2007) designation of the wetland as a palustrine, forested, seasonally flooded (PFOC) wetland on their NWI map (Figure 3).

3.5 UPLAND DESCRIPTIONS

Please refer to Raedeke Associates, Inc. (2006; Appendix A) for a complete description of the uplands located on the Holiday Inn Express site. Upland vegetation immediately south of the wetland boundary mainly consists of Himalayan blackberry (*Rubus armeniacus*, FACU). Because we were not able to access the property to the north, we were unable to sample soils within the uplands adjoining the wetland.

4.0 WETLAND FUNCTIONAL ASSESSMENT

Per Section 22-1357 of the City of Federal Way (2005) Critical Areas code, the City requires an evaluation and assessment of existing or potential functions and values of wetlands on or within 200 feet of the project site. Because Raedeke Associates, Inc. was not granted access to the adjoining property to the north of the Holiday Inn Express site, the following discussion is based upon the functional assessment provided in Section 5.2 of Raedeke Associates, Inc. (1992), as updated with available background information and visual observations from our July 23, 2007 site visit. Raedeke Associates, Inc.'s (1992) assessment of functions and values of the off-site wetland discussed surface water control, wildlife habitat, pollution and erosion control, groundwater exchange, open space and aesthetic contrast, and recreational, educational and cultural opportunities.

4.1 SURFACE WATER CONTROL

Raedeke Associates, Inc. (1992) concluded that the off-site wetland contributes to flood control and water storage based on the presence of silt loam soils to store and release water, as well as the presence of dense vegetation to slow surface water flows. The basic configuration of the wetland appears to be relatively unchanged since 1987, indicating the wetland generally has maintained its capacity to store floodwaters. We observed dense scrub-shrub vegetation in the south portion of the wetland during our July 23, 2007 site visit, and thus the wetland continues to attenuate flood flows.

4.2 WILDLIFE HABITAT

Raedeke Associates, Inc. (1992) indicated that the off-site wetland provided limited food, cover, and breeding opportunities for some small mammal, bird, reptile, and amphibian species. At the time of their investigation, the forested stratum of the wetland had not developed. Currently, a deciduous forest canopy covers most of the wetland, which has increased the structural complexity of the wetland and increased the input of woody debris and leaf litter. As in 1992, the wetland is protected by a relatively undisturbed 25-foot-wide buffer; however, the wetland is still isolated from other habitats due to the presence of surrounding development.

Raedeke Associates, Inc. (1992) concluded that the wetland does not support a fish population due to the seasonal nature of the stream and lack of appropriate habitat. Current inventories of salmonid use in streams (WDFW 2002, 2003, WDNR 2007, StreamNet 2006) indicate that salmonid species are not present in the reach of stream on the Holiday Inn Express site.

4.3 POLLUTION AND EROSION CONTROL

The Raedeke Associates, Inc. (1992) report indicated the off-site wetland provided pollution and erosion control functions through the presence of an emergent vegetation community and open water. These communities have mainly developed into scrub-shrub vegetation. Assuming the general configuration of the wetland has not changed, it is still able to store water to allow sediments and pollutants to settle out of the water column. The presence of more thin-stemmed emergent or woody vegetation also means the wetland has at least the same, and likely more, capacity to trap sediments. If organic soils are still present in the off-site wetland, then the wetland also has the capacity to adsorb any heavy metal compounds that may enter the wetland.

4.4 GROUNDWATER EXCHANGE

The potential of the off-site wetland to provide groundwater discharge and recharge is relatively low because of its small size and the topographic location of the wetland, which precludes groundwater discharge back into surrounding uplands (Raedeke Associates, Inc. 1992). Since the overall size and position of the wetland has not substantially changed, the wetland likely still provides minimal groundwater discharge and recharge.

4.5 OPEN SPACE & AESTHETIC CONTRAST

The off-site wetland provides a small patch of open space that subsequently provides a distinct contrast to surrounding urbanized lands. Enhancement of the wetland and wetland buffer with native shrub and tree species has increased the structural complexity and plant species diversity in the wetland, thus increasing its overall aesthetic value.

4.6 RECREATIONAL, EDUCATIONAL, AND CULTURAL FUNCTIONS AND VALUES

At the time Raedeke Associates, Inc. (1992) prepared the functional assessment for the off-site wetland, the wetland was located on private property and did not contain species of interest or special habitat features that would warrant recreational, cultural, educational or scientific value. The wetland is still located on private, difficult-to-access land, and thus is unlikely to have the above-mentioned values.

5.0 REGULATORY CONSIDERATIONS

Wetlands and streams are protected by Section 404 of the Federal Clean Water Act and other state and local policies and ordinances including the City of Federal Way (2007) Critical Areas Code. Regulatory considerations pertinent to wetlands identified within the study area are discussed below, but this discussion should not be considered comprehensive. Additional information may be obtained from agencies with jurisdictional responsibility for, or interest in, the site. A brief review of the U.S. Army Corps of Engineers (COE) regulations and City of Federal Way policy relative to wetlands and streams is presented below.

5.1 FEDERAL CLEAN WATER ACT (U.S. ARMY CORPS OF ENGINEERS)

Federal law (Section 404 of the Clean Water Act) generally discourages the discharge of dredged or fill material into the nation's waters, including most wetlands, without a permit from the COE. The COE makes the final determination as to whether an area meets the definition of a wetland as defined by the federal government (Federal Register 1986:41251), and thus, if it is under their jurisdiction.

We should caution that the placement of fill within wetlands or other Waters of the U.S. without authorization from the COE is not advised, as the COE makes the final determination as to whether any permits would be required for any proposed alteration. As the COE makes the final determination regarding permitting under their jurisdiction, we recommend requesting a jurisdictional determination from the COE prior to any construction activities, if any modification of wetlands is proposed. A jurisdictional determination would also provide evaluation and confirmation of our wetland delineation by the COE.

5.2 CITY OF FEDERAL WAY

5.2.1 Streams

Ratings and Standard Buffers

Currently the City of Federal Way (2007) regulates streams under Article I – “In General” (definitions) and Article XIV – “Critical Areas.” Under these regulations, streams are rated as Major or Minor streams, with Major Streams being “any stream, and the tributaries to any stream, which contains, or supports, or under normal circumstances contains or supports, resident or migratory fish.” The standard setback for a major stream is 100 feet outward of the OHWM of the stream.

Based on the results of our initial background review and field investigation in 2006 (Raedeke Associates, Inc. 2006), Stream 1 has been rated as a “Major Stream” (City of

Federal Way 2005a). Stream 1 likely received this rating because it is a tributary to West Hylebos Creek, which has documented anadromous and resident fish presence (WDFW 2002, Streamnet 2006). Portions of Stream 1 outside of the on-site culvert would receive a standard 100-foot-wide setback as measured perpendicular from the OHWM. The City of Federal Way (2007) does not apply stream setbacks to any segment of a stream that is presently within, and will remain within, a culvert.

Development Standards and Mitigation Options

Intrusions into stream buffers are subject to the conditions in Sections 22-1312 and 22-1313 in Article XIV of the City of Federal Way's (2007) Critical Areas Code. Depending on the proposed intrusion, the activity may be subject to Process III or IV review, as detailed in Articles VI and VII of the City of Federal Way's (2007) Critical Areas Code.

5.2.2 Wetlands

Ratings and Standard Buffers

The City of Federal Way (2007) also regulates streams under Article I – “In General” (definitions) and Article XIV – “Critical Areas.” Under these regulations, wetlands are regulated as Category I, II or III wetlands. Category I wetlands meet one of the following criteria: (1) they contain the presence of species or documented habitat recognized by state or federal agencies as endangered, threatened or potentially extirpated plant, fish or animal species; (2) they contain the presence of plant associations of infrequent occurrence, irreplaceable ecological functions, or exceptional local significance including but not limited to estuarine systems, peat bogs and fens, mature forested wetlands, groundwater exchange areas, significant habitat or unique educational sites; or (3) they have three or more wetland classes, one of which is open water.

Category II wetlands are greater than 2,500 square feet in area, do not exhibit the characteristics of Category I wetlands, and meet one of the following criteria: (1) they are contiguous with water bodies or tributaries to water bodies which under normal circumstances contain or support a fish population, including streams where flow is intermittent; (2) are greater than one acre in size in its entirety; or (3) are less than or equal to one acre in size in its entirety and have two or more wetland classes, with neither class dominated by non-native invasive species. Category III wetlands are greater than 2,500 square feet in area and do not exhibit those characteristics of Category I or II wetlands.

Based on our background review of available inventories (WDFW 2002, 2003, StreamNet 2006, WDNR 2007) and previous reports (Raedeke Associates, Inc. 1988, 1992), the off-site wetland to the north of the Holiday Inn Express site does not contain documented habitat for sensitive species or infrequent or irreplaceable plant associations or ecosystems. The off-site wetland now only consists of one wetland class (palustrine forested) as would be defined in the USFWS (Cowardin et al. 1992) classification system;

the open water component documented in Raedeke Associates, Inc. (1988) no longer is present in the wetland.

Thus, the off-site wetland would be a Category II wetland under the City of Federal Way (2007) Critical Areas code since it is contiguous with a tributary to a stream that contains or supports a fish population (West Hylebos Creek). Therefore, the off-site wetland would receive a standard 100-foot-wide buffer measured from the edge of the wetland boundary (Figures 7a, 7b).

Development Standards and Mitigation Options

Development in wetlands or wetland buffers are subject to the conditions in Sections 22-1358 and 22-1359 in Article XIV of the City of Federal Way's (2007) Critical Areas Code. Proposed activities may be subject to Process III or IV review, as detailed in Articles VI and VII of the City of Federal Way's (2007) Critical Areas Code.

6.0 IMPACTS

This discussion of project impacts to on-site streams and buffers, as well as off-site wetlands, is based on the site plan prepared by TRT Engineering and received in our offices on January 7, 2008, as well as discussions with TRT Engineering regarding specific design elements of the Holiday Inn Express development. The proposed development involves the construction of a 4-story hotel, which would have a footprint totaling 13,213 square feet, and associated parking and access.

6.1 DIRECT IMPACTS

6.1.1 Stream Impacts

The proposed development would result in no direct impacts to Stream 1 (Figure 8). The stream would be retained in its current state, as open space along with the required 100-foot buffer.

6.1.3 Wetland Impacts

The proposed development on the Holiday Inn Express site would result in no direct impacts to the off-site wetland located north of the project site (Figure 8). The proposed development would also retain the required 100-foot wetland buffer as open space.

6.2 INDIRECT STREAM AND WETLAND IMPACTS

Several environmental processes occur at a site-wide and watershed-wide scale that can indirectly affect the structural characteristics of aquatic resources, and thus affect – negatively or positively - the water quality, hydrologic, and habitat functions provided by such aquatic resources (Stanley et al. 2005, Sheldon et al. 2005).

Unless properly mitigated, the removal of forested and other vegetation, the removal and compaction of topsoil, the construction of impervious surfaces, and alterations in overland flow drainage patterns may decrease groundwater recharge, reduce the downward movement of subsurface flow, and/or result in increased surface runoff flows (Stanley et al. 2005, Sheldon et al. 2005). Soil disturbance, vegetation removal, and runoff from streets, roads, and trails may also increase the delivery of sediments and pollutants to aquatic resources. Cumulatively, alterations to vegetation and soil may have a wide range of impacts on the functions wetlands provide, and thus should be evaluated on a case-by-case basis. Below is a discussion of potential indirect impacts to Stream 1 and the off-site wetland from the proposed Holiday Inn Express development.

6.2.1 Indirect Stream Impacts

Hydrologic Impacts

Removal of existing vegetation and soil compaction as well as construction of impervious surfaces for the proposed Holiday Inn Express development may alter the timing and release of surface water and interflow that reaches the on-site stream from the east portion of the site. However, most of the development would occur on grassland, which does not provide the optimum stormwater runoff reduction that dense forest and scrub-shrub vegetation would provide (King County Department of Natural Resources and Parks 2005). The remainder of the site where development is proposed consists of existing buildings and asphalt (see Figure 7a).

The proposed stormwater management design for the development would route surface water runoff from impervious surfaces to a stormwater vault in the south-central portion of the site (Figure 8). The City of Federal Way (2005) requires new site developments to comply with the King County (1998) Surface Water Design Manual. The City of Federal Way (2005a) Flow Control Application Map indicates that Level 1 flow control, per the King County (1998) Surface Water Design Manual, is required for the project site. Stormwater from the proposed vault would discharge into the east edge of Stream 1 via an energy-dissipating flow spreader. The stormwater vault and dispersal facility have been designed to provide Level 1 flow control (Mr. Tim Turner, TRT Engineering pers. comm. January 8, 2008).

Level 1 flow control requires matching the developed peak discharge rates to the pre-development discharge rates for 2- and 10-year return periods. Pre-development and post-development (vault-detained) peak flows on the Holiday Inn Express site were calculated by TRT Engineering (2008) using HydroCAD® 8.00. The HydroCAD® 8.00 model calculated that peak discharge on the site during the 2-year storm event would be 0.14 cubic feet per second (cfs) after development and detention, which matches peak discharge under existing conditions. Post-development and detention discharge rates during the ten-year storm event would be 0.29 cfs, which would be slightly lower than pre-development discharge (0.30 cfs).

Therefore, the proposed surface water detention and dispersal likely would minimize changes to the amount and timing of water that reaches Stream 1 from the east portion of the site during high-precipitation events. Furthermore, restoration and retention of 100% of the standard 100-foot-wide stream buffer on the east side of the stream will ensure that surface and subsurface flows continue to reach Stream 1 during normal precipitation events.

There is no proposed development on the portion of the site that is west of Stream 1. Therefore, there should not be any changes in surface and subsurface discharge into Stream 1 from the west side of the site due to the proposed development.

Water Quality Impacts

As discussed in Section 6.1.2, the stormwater treatment vault has been designed to meet the requirements of the City of Federal Way (2005b). If the on-site stormwater quality control structures fail during high-precipitation events, the on-site stream could be affected by indirect water quality impacts. Any runoff from streets, roads, and other impervious surfaces that is not routed to the stormwater detention/treatment facility could also increase the contaminant loading to the on-site stream. However, on-site runoff from impervious surfaces would be directed to the stormwater facility for treatment prior to discharge to the stream.

Overall, implementation of the proposed water quality treatment facilities and temporary erosion and sediment control (TESC) measures as required by the City of Federal Way (2005b) would minimize water quality impacts to the on-site stream.

6.2.2 Indirect Wetland Impacts

As mentioned above, the proposed Holiday Inn Express development would alter the existing conditions of portions of uplands on the eastern portion of the site, and thus alter existing surface and subsurface flows. However, based on the existing topography on the site, most of the surface and subsurface water on the east portion of the site generally flows west and southwest, away from the off-site wetland (Figure 7a). At the most, under current conditions, the north one-third of the site potentially contributes surface and subsurface flows to the off-site wetland. Thus, a majority of the proposed development should result in minimal changes to surface and subsurface flows that reach the off-site wetland.

Deposition of sediment into the wetland by wind or water can result in a loss of stormwater storage capacity and can affect habitat conditions, thus altering vegetation communities and wildlife use of the wetlands. However, the proper installation and maintenance of the proposed stormwater treatment facility and implementation of (TESC) measures as required by the City of Federal Way (2005) would minimize water quality impacts to the off-site wetland during construction. No runoff from developed (impervious) surfaces would be discharged to the wetland, thus it is unlikely there would be any long-term water quality impacts to the wetland.

The proposed development would remove most of the pasture and grassland on the east portion of the site, thus resulting in an unavoidable loss of habitat for some types of wildlife. Except for the temporary disturbance associated with the installation of the sewer line, there will be no disturbance to the connectivity of the off-site wetland and buffer with the on-site stream or riparian corridor that extends off-site to the south. In addition, stormwater controls are expected to maintain surface water discharge peak flow

rates at pre-development levels. Therefore, it is expected that there will be minimal changes to the vegetative characteristics of the wetland that support wildlife habitat.

Grading and construction activities associated with the proposed development, as well as increased levels of human activity on-site, would also result in increased short- and long-term disturbance to wildlife species using the retained habitat areas. This would further reduce the suitability of the on-site habitats to some wildlife species (Penland 1984). Some species adapted to urban environments and fringes, including many non-native plant and animal species, may find suitable habitat on-site and become established and/or increase in numbers. Those species less adapted to urban environments, however, would be expected to decrease in numbers.

6.3 STREAM AND WETLAND BUFFER IMPACTS

6.3.1 Stream Buffer Impacts

The proposed construction of a 12-inch-diameter stormwater pipe would require excavating an approximately 3-foot-wide trench through the 100-foot-wide buffer of Stream 1, would result in up to 1,151 square feet of temporary disturbance to the buffer due to construction activities (Figure 8). Disturbed portions of the buffer would be restored with native vegetation upon completion of the stormwater pipe installation (See Section 7.3).

The proposed construction likely will likely be construed as an “other intrusion” per Section 22-1312(c) of the City of Federal Way (2007) Critical Areas Code. Thus, the proposed work would be subject to a Process IV review, which requires a Hearing Examiner’s decision and compliance with the conditions set forth Article VII of the City of Federal Way (2007) Code. The development will also be subject to the conditions of Sections 22-1312(c) and 22-1313 of the City of Federal Way (2007) Critical Areas Code. These development standards are discussed below, as well proposed project design elements to comply with these requirements.

Stream Buffer- “Other Intrusion” Development Standards

The proposed construction of the stormwater outfall pipe would be subject to the following conditions per Section 22-1312(c) of the City of Federal Way (2007) Critical Areas Code, which requires that:

1. **The intrusion will not adversely affect water quality:** The proposed construction of the stormwater pipeline would implement temporary erosion and sediment control (TESC) measures as required by the City of Federal Way (2005) to minimize water quality impacts to the on-site stream during pond outfall construction. The project engineer has designed the stormwater detention/treatment vault and pond outfall to

meet the water quality standards in the King County (1998) Surface Water Design Manual (SWDM), as required by the City of Federal Way (2005b; Mr. Tim Turner, TRT Engineering pers. comm. January 7, 2008). Furthermore, the detention and treatment facility will incorporate additional water quality design features into the vault design per King County's (1998) "Resource Stream Protection Menu."

Replanting of the buffer with native vegetation after sewer line construction is completed will restore water quality protection functions to the stream buffer.

2. **The intrusion will not adversely affect the existing quality of wildlife habitat within the stream or setback area:** Vegetation in the proposed stormwater pipe location consists mainly of grassland in the east portion of the buffer and deciduous trees and shrubs in the west portion of the buffer. Clearing and excavation will result in temporary disturbance to the vegetation cover within this area; however, restoration with native woody vegetation will restore structure and diversity, and thus wildlife habitat function, to the buffer.
3. **The intrusion will not adversely affect drainage or stormwater retention capabilities:** The proposed stormwater pipe location would cross a steep slope that does not provide substantial stormwater retention capabilities. The final "footprint" would not result in a considerable change to the existing topography of the stream buffer, and the temporarily disturbed area will be revegetated. Thus it is unlikely the proposed intrusion will affect drainage patterns within the buffer.
4. **The intrusion will not lead to unstable earth conditions nor create erosion hazards:** As mentioned under condition #1, TESC measures as required by the City of Federal Way (2005b) will be implemented during and after construction. The stormwater outfall to the creek would include an energy-dissipating flow spreader designed per King County (1998) standards, and peak flow rates through the outfall pipe will be attenuated by the detention system (Turner 2008). Revegetation will stabilize soils in the disturbed portion of stream buffer. Therefore, the proposed pipe and outfall construction likely will not lead to unstable earth conditions or erosion hazards.
5. **The intrusion will not be materially detrimental to any other property in the area of the subject property nor to the city as a whole, including the loss of significant open space:** The stormwater pipe and outfall design and construction would comply with all applicable Federal Way laws and would occur in a portion of the site that does not adjoin any existing businesses, residences, or other facilities; therefore, the pond outfall construction likely would not be materially detrimental to any other property in the area or the city as a whole. Soils and vegetation within the buffer that would be temporarily disturbed would subsequently be restored to

conditions comparable to pre-development conditions; thus there will be no permanent loss to open space.

6. **The intrusion is necessary for reasonable development of the subject property:** The locations of the stormwater pipe and outfall are necessary because on-site disposal is not feasible due to unsuitable soils on the site for infiltration (Turner 2008).

Additional Requirements for Land Surface Modification

Per Section 22-1313 of the City of Federal Way (2007) Critical Areas Code, the proposed stream buffer intrusion will also need to meet the following design requirements:

1. **All fill material used must be nondissolving and nondecomposing. The proposed fill material must not contain organic or inorganic material that would be detrimental to water quality or the existing habitat:** The stormwater pipe construction would use soils excavated within the buffer as trench backfill. Crushed rock bedding placed below the pipe would comply with the bedding materials requirements in the King County (1998) SWDM.
2. **The applicant may deposit dredge spoils on the subject property only if part of an approved development on the subject property:** The proposed development would not involve the removal of earth or other materials from a body of water, watercourse, or wetland.
3. **The applicant shall stabilize all areas left exposed after land surface modification with native vegetation normally associated with the stream or setback area:** The stream buffer that will be temporarily disturbed by the stormwater pipe construction will be restored with native vegetation typical of stream buffer vegetation in the area (see Section 7.3).

6.3.2 Wetland Buffer Impacts

The proposed construction of a 6-inch-diameter sanitary sewer line would connect into an existing sewer line that runs north-south through the central portion of the site. This construction would require excavating an approximately 3-foot-wide trench through the on-site portion of the 100-foot-wide wetland buffer, resulting in up to 916 square feet of temporary disturbance (Figure 8). The area of disturbance would be restored after construction of the sewer line is complete (See Section 7.3).

The proposed development in the wetland buffer likely will be considered a “buffer modification” per Section 22-1359(f) of the City of Federal Way (2007) Critical Areas Code, and be subject to a Process IV review. Development requirements under Section 22-1359 of the City of Federal Way (2007) Critical Areas Code include:

1. **The modification will not adversely affect water quality:** As described in Section 6.1.2, TESC measures as required by the City of Federal Way (2005) will be implemented during development. Replanting with native vegetation will restore water quality protection functions to the wetland buffer.
2. **The modification will not adversely affect the existing quality of the wetland's or buffer's wildlife habitat:** The existing wetland buffer where the proposed sewer line would be constructed mainly consists of grassland and invasive Himalayan blackberry. Revegetation of the wetland buffer with native woody vegetation will likely increase the structure and diversity of the wetland buffer, thus improving wildlife habitat within the area of disturbance.
3. **The modification will not adversely affect drainage or stormwater retention capabilities:** The sewer line location lies on a relatively gentle slope that does not provide substantial stormwater retention capabilities. The final footprint of the sewer line would not result in a substantial change to the existing topography of the wetland buffer, and the temporarily disturbed area will be revegetated. Thus it is unlikely the proposed intrusion will affect drainage patterns within the buffer.
4. **The modification will not lead to unstable earth conditions nor create erosion hazards:** Construction of the sewer line will implement TESC measures as required by the City of Federal Way (2005b). Revegetation will stabilize soils in the disturbed portion of wetland buffer.
5. **The modification will not be materially detrimental to any other property in the area of the subject property nor to the city as a whole, including the loss of open space.** The sewer line design and construction would comply with all applicable Federal Way regulations and would occur in a portion of the site that does not adjoin any existing businesses, residences, or other facilities; therefore, the sewer line construction likely would not be materially detrimental to any other property in the area or the city as a whole. Soils and vegetation within the buffer that would be temporarily disturbed would subsequently be restored to conditions comparable to pre-development conditions; thus there will be no permanent loss to open space.

7.0 MITIGATION

Mitigation has been defined by the State Environmental Policy Act (SEPA) (WAC 197-11-768; cf. Cooper 1987), and more recently in a Memorandum of Agreement between the Environmental Protection Agency and the U.S. Army Corps of Engineers (Memorandum 1989). In order of desirability, mitigation may include:

1. Avoidance - avoiding impacts by not taking action or parts of an action;
2. Minimization - minimizing impacts by limiting the degree or magnitude of the action and its implementation;
3. Compensatory Mitigation - which may involve:
 - a) repairing, rehabilitating, or restoring the affected environment;
 - b) replacing or creating substitute resources or environments;
 - c) mitigation banking.

The proposed site plan incorporates mitigating measures that would avoid, minimize, and/or mitigated for impacts to on-site sensitive areas and buffers.

7.1 AVOIDANCE OF IMPACTS

As noted previously, direct impacts (i.e., fill or excavation) to the off-site wetland or on-site portion of Stream 1 on the Holiday Inn Express site would not occur under the proposed site plan. The proposed site plan would also result in no disturbance to at least 95% of the on-site portion of the standard 100-foot buffer for the wetland and Stream 1.

7.2 MINIMIZATION OF IMPACTS

Measures to minimize temporary disturbances to the wetland and stream buffers on the project site are discussed in Sections 6.1 and 6.2.

7.3 COMPENSATORY MITIGATION

The installation of stormwater and sewer lines will result in up to 1,151 square feet and 916 square feet of temporary impacts to the on-site stream and wetland buffers, respectively (Figure 8). The proposed buffer restoration plan would restore equal or greater functions to portions of the on-site stream and wetland buffers that will be temporarily impacted by installation of sewer and water lines for the development. This goal would be accomplished by replanting the temporarily disturbed portions of stream

and wetland buffers with native, shallow-rooted woody vegetation. Species would be selected based on those native woody species currently found in uplands adjoining the wetland and stream, as well as those appropriate to hydrologic conditions provided and which are in compliance with applicable regulations regarding utility line construction and maintenance.

Concurrent with the preparation of detailed engineering plans for final approval, full conceptual and final buffer restoration plans would be developed based upon available site plan information. The conceptual buffer restoration plan would present: (1) proposed design features and their locations, (2) mitigation goals and objectives, (3) monitoring plan outline, (4) evaluation criteria and performance standards, and (5) discussion of contingency plans and bonding.

Upon approval of the conceptual buffer restoration plan, a final planting plan and construction specifications would be prepared in conjunction with a landscape architect. The final planting plan would specify such items as: (1) plant species, quantities, and sizes, (2) planting locations, (3) general notes, (4) planting details, (5) construction timing, (6) protection of existing vegetation, (7) source of plant material, (8) soil amendments, (9) watering, and (10) maintenance. Specific plantings (consisting of native species, subject to availability) for the mitigation area would be developed in coordination with the City of Federal Way.

The compensatory buffer restoration plans would include a systematic monitoring program to assess the success of the effort (Cooper 1987). The monitoring program would include construction, compliance, and long-term monitoring. The results of the monitoring would be used to develop any needed modifications or alterations of the mitigation site in subsequent years. The purposes of the monitoring program would be to: (1) document the physical and biological characteristics and wetland community development within the mitigation area; and (2) assure that the mitigation goals and objectives have been met and comply with permit specifications. Performance standards of success (for use in monitoring), as well as contingency plans, would also be developed in coordination with the City of Federal Way.

8.0 LIMITATIONS

We have prepared this report for the exclusive use of Sweeney Designs, and their consultants. No other person or agency may rely upon the information, analysis, or conclusions contained herein without permission from Sweeney Designs.

The determination of ecological system classifications, functions, values, and boundaries is an inexact science, and different individuals and agencies may reach different conclusions. With regard to wetlands, the final determination of their boundaries for regulatory purposes is the responsibility of the various agencies that regulate development activities in wetlands. We cannot guarantee the outcome of such determinations. Therefore, the conclusions of this report should be reviewed by the appropriate regulatory agencies.

We warrant that the work performed conforms to standards generally accepted in our field, and was prepared substantially in accordance with then-current technical guidelines and criteria. The conclusions of this report represent the results of our analysis of the information provided by the project proponent and their consultants, together with information gathered in the course of the study. No other warranty, expressed or implied, is made.

9.0 LITERATURE CITED

- Cooper, J.W. 1987. An overview of estuarine habitat mitigation projects in Washington State. *Northwest Environmental Journal* 3(1):112-127.
- Cowardin L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1992. Classification of wetlands and deepwater habitats of the United States. USDI Fish and Wildlife Service Publication. FWS/OBS-79/31. 131 pp.
- Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1, US Army Engineers Waterways Experiment Station, Vicksburg, Mississippi. 100 pp.
- Federal Interagency Committee for Wetland Delineation. 1989. Federal Manual for Identifying and Delineating Jurisdictional Wetlands. U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, and U.S.D.A. Soil Conservation Service, Washington, D.C. Cooperative technical publication. 76 pp. plus appendices.
- Federal Way, City of. 2005a. Flow control applications map. March 2005.
<http://www.cityoffederalway.com/folders/home/businesseconomicdevelopment/citymaps/environmentalmaps/flowcontrol.pdf>
- Federal Way, City of. 2005b. Storm Drainage. Chapter 4 in City of Federal Way Public Works Development Standards. February 2005.
<http://www.cityoffederalway.com/folders/home/yourcityservices/streettraffic/developmentstandards/Chapter%20-%20Storm%20Drainage.pdf>
- Federal Way, City of. 2005c. Stream ratings map.
<http://www.cityoffederalway.com/GetFile.aspx?id=10443>. January 2005.
- Federal Way, City of. 2007. Federal Way City Code. Current through Ordinance 07-559, passed July 3, 2007.
- King County. 1986. Mitigated determination of non-significance for File #2752-60, proponent: Robert L. Wright. March 11, 1986.
- King County. 2007. GIS interactive map center (iMAP), King County, Washington.
http://www.metrokc.gov/gis/iMAP_main.htm#. Accessed August 13, 2007.
- King County Department of Natural Resources. 1998. King County, Washington surface water design manual. September 1998.

- King County Department of Natural Resources and Parks. 2005. King County, Washington surface water design manual. January 24, 2005.
- Memorandum. 1989. Memorandum of Agreement between the U.S. Environmental Protection Agency and the Department of Army Concerning the Determination of Mitigation under the Clean Water Act, Section 404 B1 Guidelines. Effective 7 November 1989.
- Penland, S. 1984. Avian response to a gradient of urbanization. PhD. Dissertation, University of Washington, Seattle, Washington. 407 pp.
- Raedeke Associates, Inc. 1988. Wetland assessment and enhancement report for the Starkovich Property, King County, Washington. August 18, 1988 report to Yellowstone Investment Company, Federal Way, Washington.
- Raedeke Associates, Inc. 1992. Updated wetland assessment of the Brooklake Village property, Federal Way, Washington. August 13, 1992 report to Yellowstone Investment Company, Federal Way, Washington.
- Raedeke Associates, Inc. 1998. Brooklake Village mitigation monitoring – Final wetland buffer mitigation monitoring report. November 5, 1998 report to Yellowstone Investment Company, Federal Way, Washington.
- Raedeke Associates, Inc. 2006. Wright Federal Way - stream delineation and wetland reconnaissance. July 7, 2006 letter to Mr. Bob Wright, Federal Way, Washington.
- Sheldon, D., T. Hruby, P. Johnson, K. Harper, A. McMillan, T. Granger, S. Stanley, and E. Stockdale. 2005. Wetlands in Washington State – Volume 1: A Synthesis of the Science. Washington State Department of Ecology. Publication #05-06-006. Olympia, Wa. March 2005.
- Snyder, D., P. Gale, and R. Pringle. 1973. Soil Survey of King County area, Washington. U.S.D.A. Soil Conservation Service. 100 pp.
- Stanley, S., J. Brown, and S. Grigsby. 2005. Protecting Aquatic Ecosystems: A Guide for Puget Sound Planners to Understand Watershed Processes. Washington State Department of Ecology. Publication #05-06-027. Olympia, Wa. December 2005.
- StreamNet. 2006. Pacific NW interactive mapper.
<http://map.streamnet.org/snetmapper/viewer.htm>. Accessed May 31, 2006.
- TRT Engineering. 2008. Drainage diagram for Pacific. January 2, 2008.

Turner, T. 2007. "Re: Federal Way" Email to Ms. Lisa Danielski. December 28, 2007.

Turner, T. 2008. "Re: Federal Way" Email to Ms. Lisa Danielski. January 8, 2008.

U.S. Fish and Wildlife Service National Wetlands Inventory. 2007. Online Mapper.
<http://wetlandsfws.er.usgs.gov/NWI/index.html>. Accessed 2007.

Washington Department of Fish and Wildlife. 2003. SalmonScape.
<http://wdfw.wa.gov/mapping/salmonscape/index.html>.

Washington Department of Fish and Wildlife. 2002. Priority habitats and species maps and reports in the vicinity of Township 26 North, Range 4 East, Section 28. April 19, 2002. Habitat Program, Olympia, Washington.

Washington State Department of Natural Resources. 2007. Forest Practices Activity Map for Section 20 Township 18 North, Range 2 East, W.M.
<http://www3.wadnr.gov/dnrapp5/website/fpars.viewer.htm>. Accessed August 13, 2007.

FIGURES AND TABLES

Graphics on Server\2007\2007-025 Holiday Inn Express\001\Fig 1 Vicinity Map.pdf. rai#2007-025-001 - Wetland and Stream Assessment 01/08

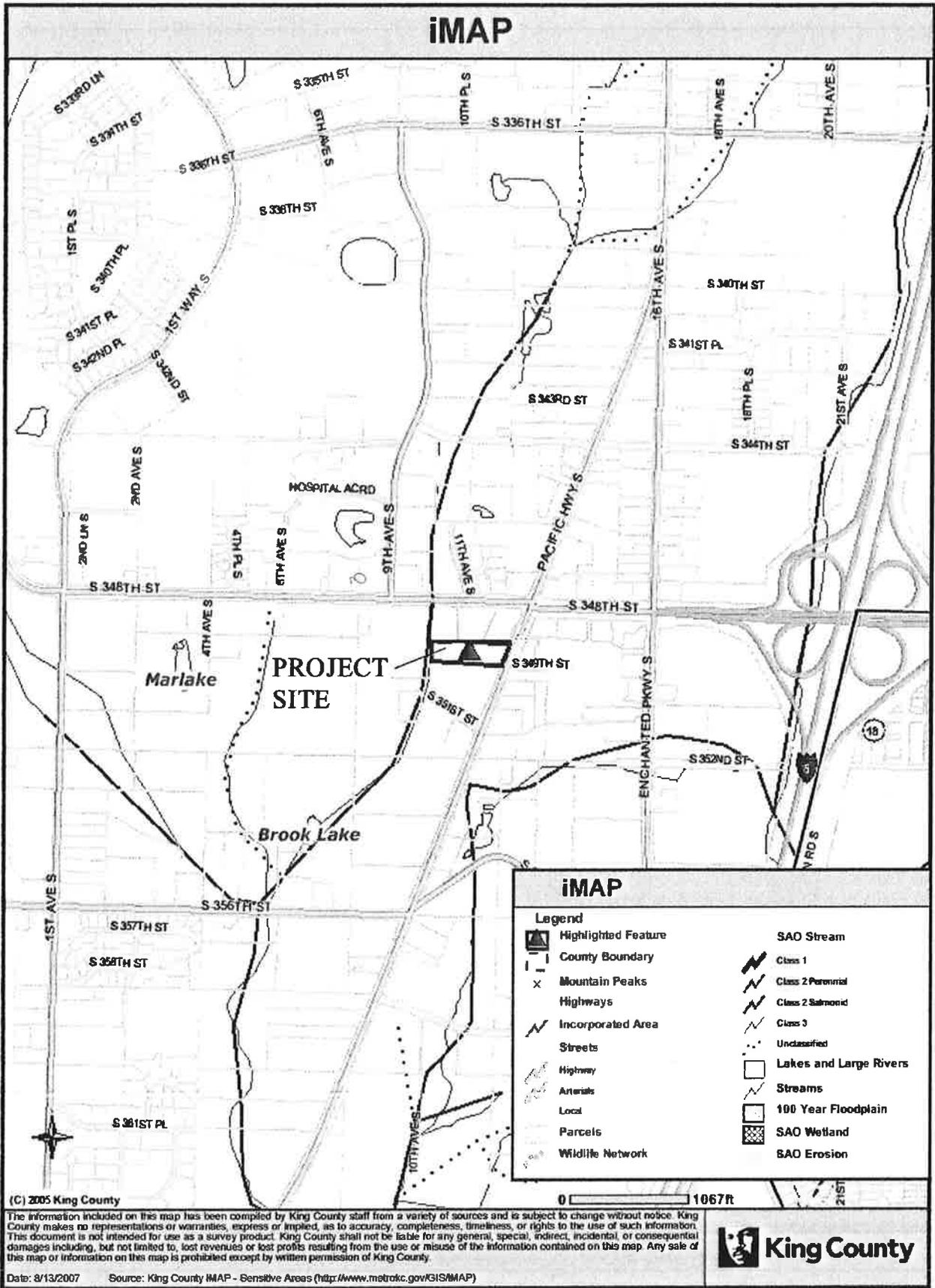


Figure 1. King County (2007) iMap showing general location of the project.

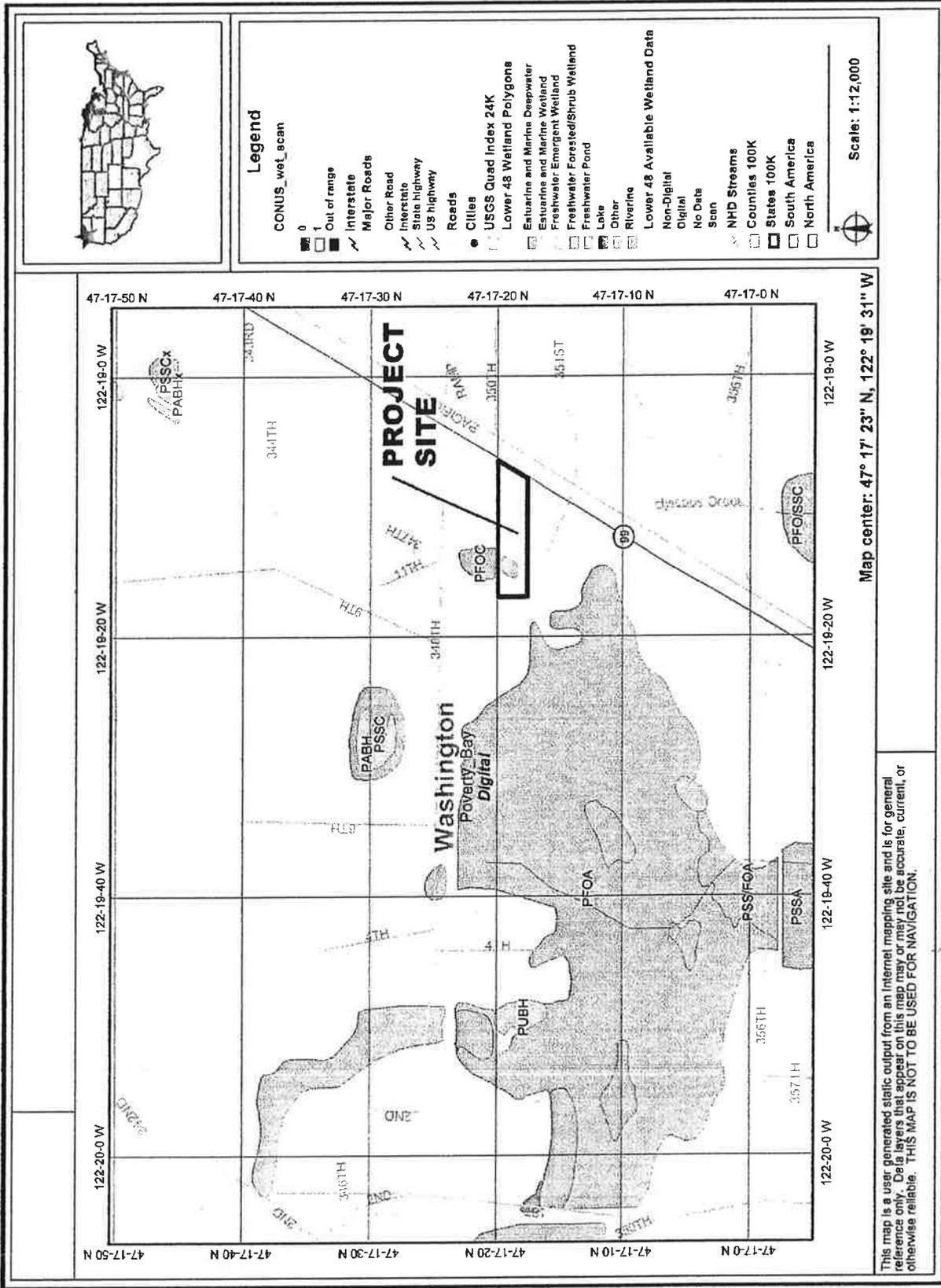
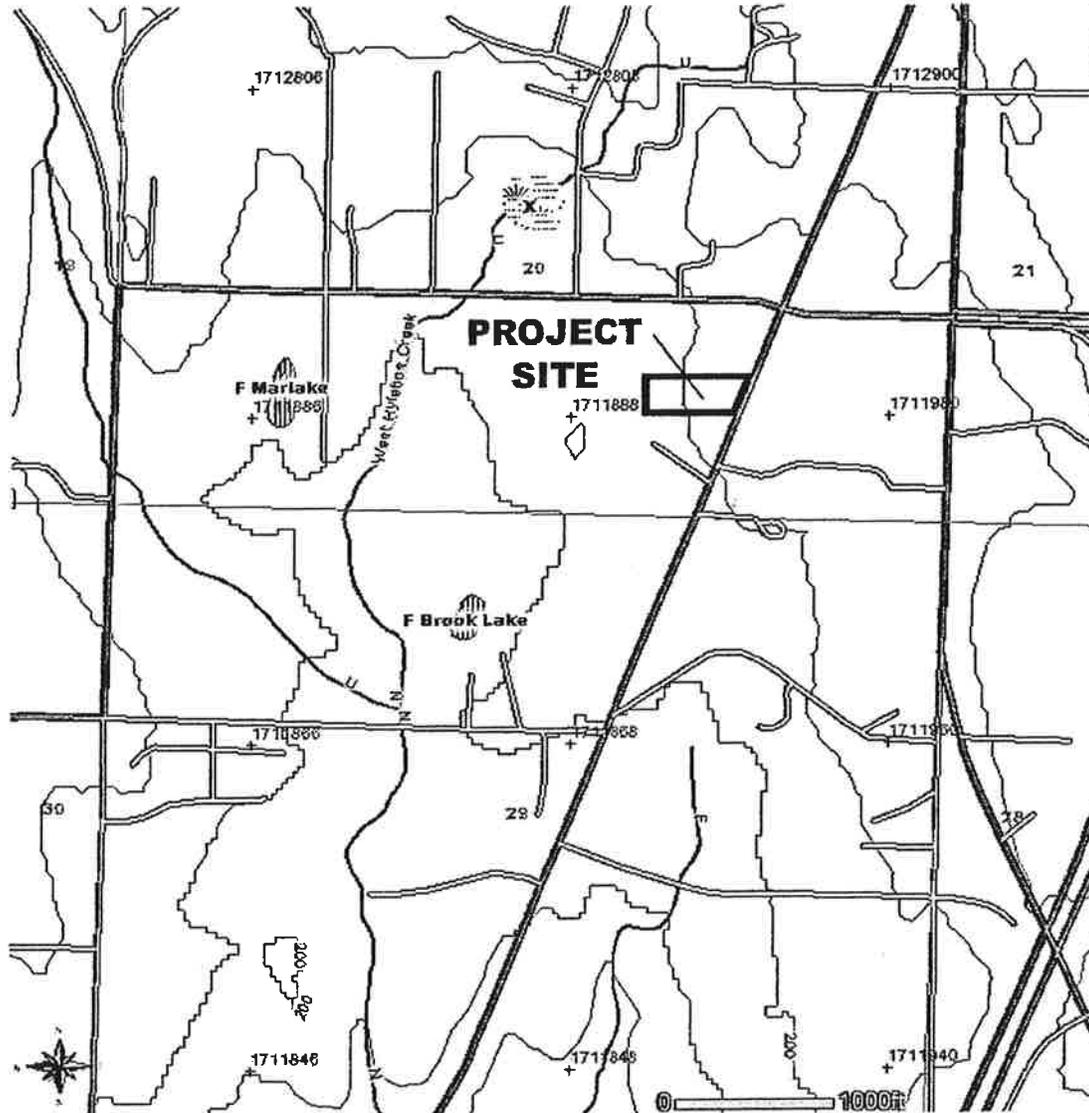


Figure 3. U.S. Fish and Wildlife National Wetland Inventory (2007) online wetland mapper for the project area.

FOREST PRACTICE ACTIVITY MAP

TOWNSHIP 21 NORTH HALF 0, RANGE 4 EAST (W.M.) HALF 0, SECTION 20

Application # _____



Please use the legend from the FPA Instruction or provide a list of symbols used.

Monday, August 13, 2007 9:27:41 AM
NAD 83
Contour Interval: 40 Feet

Graphics on Server\2007\2007-025 Holiday Inn Express\001\Figure 5 WDNr.pdf R.A.I#2007-025-001 Wetland & Stream Assessment 01/08

[HTTP://WWW3.WADNR.GOV](http://www3.wadnr.gov)

Figure 5. Washington Department of Natural Resources (2007) Forest Practice Activity Map for the project area.

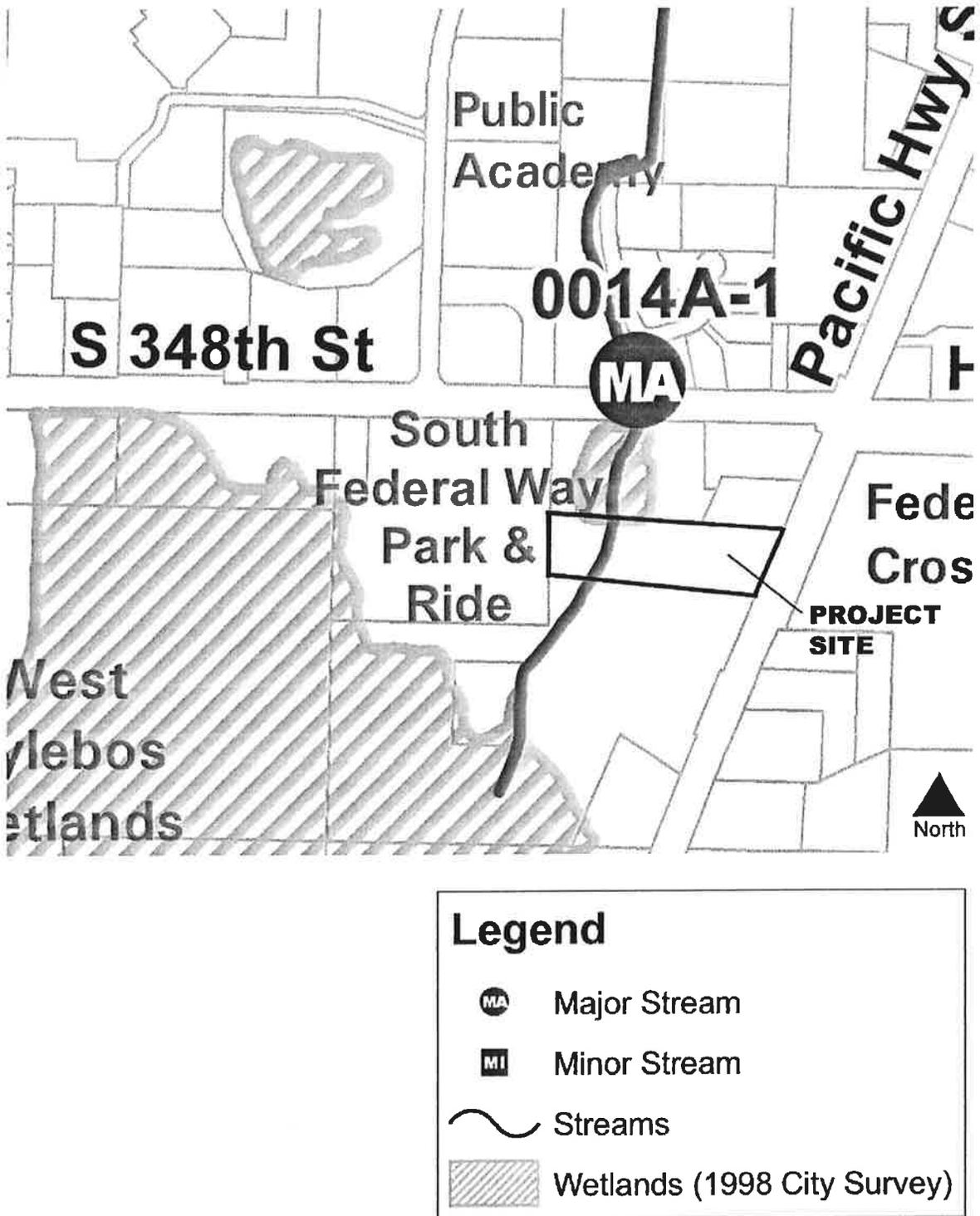
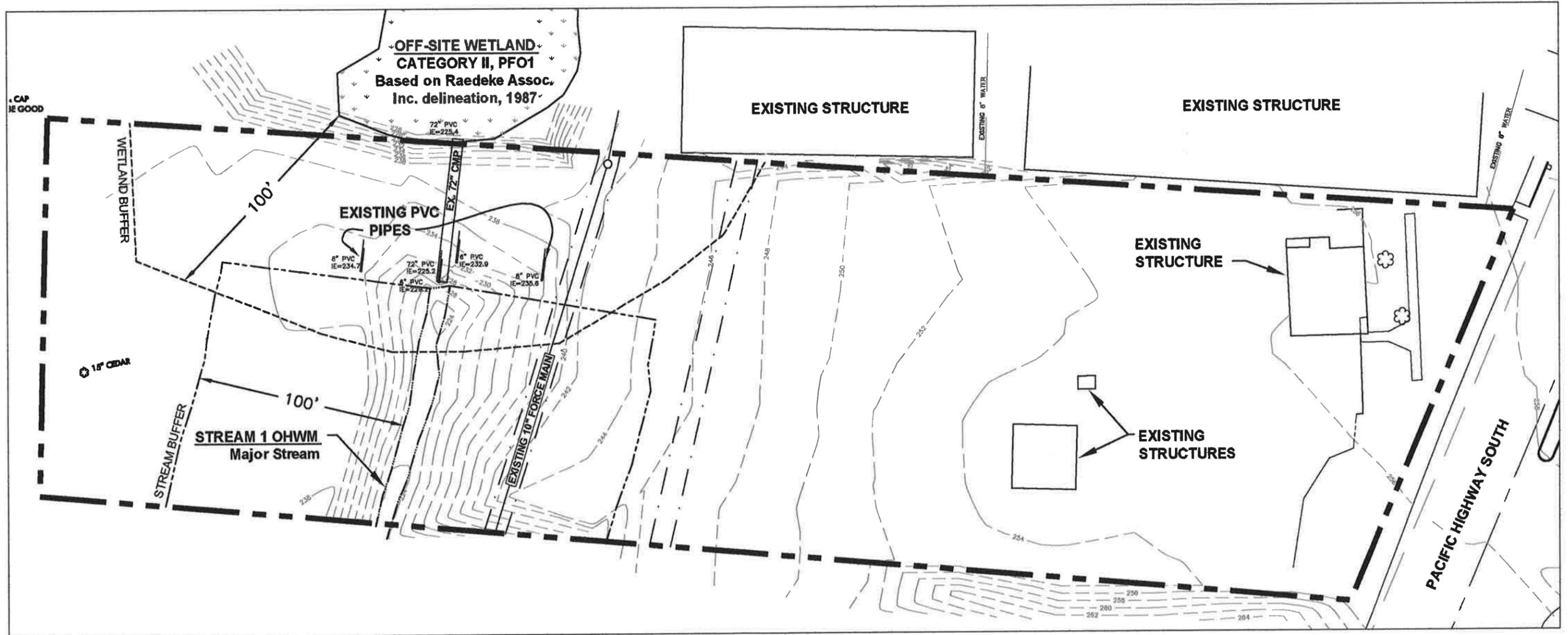


Figure 6. City of Federal Way (2005c) Stream Ratings Map for the project area.

SWEENEY DESIGNS
HOLIDAY INN EXPRESS

CITY OF FEDERAL WAY

EXISTING CONDITIONS



KEY	
	PROJECT BOUNDARY
	OFF-SITE WETLAND DELINEATED BY RAEDEKE ASSOCIATES, INC., 1987
	STREAM ORDINARY HIGH WATER MARK (OHWM)
	EXISTING CONTOURS
	EXISTING EASEMENTS
	CITY OF FEDERAL WAY 100' STANDARD WETLAND BUFFER
	CITY OF FEDERAL WAY 100' STANDARD STREAM BUFFER



RA
 RAEDEKE ASSOCIATES, INC.
 5711 NORTHEAST 63RD ST. SEATTLE, WA 98115
 (206) 525-8122 FAX: (206) 526-2880

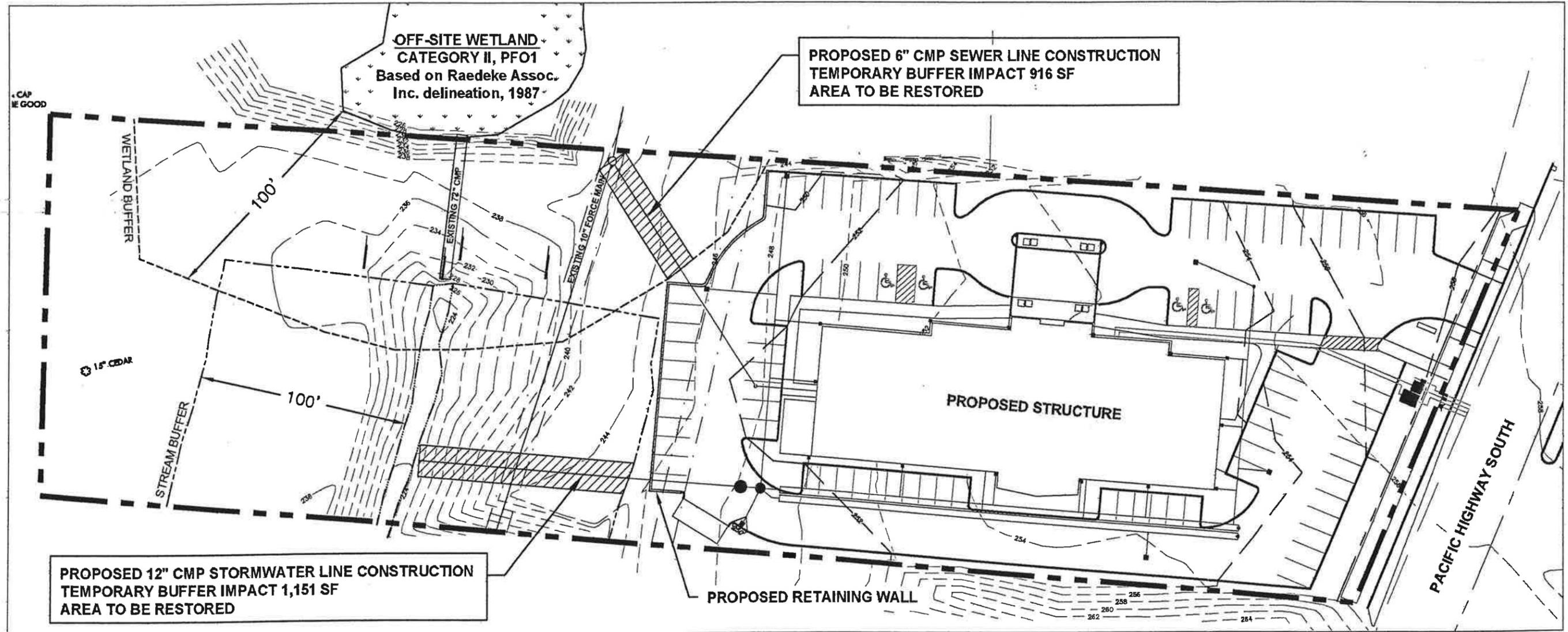
RAEDEKE PROJECT #:2007-025-001
DATE: 01/14/2008
DRAWN BY: DAD and ELP
Base information: from TRT Associates, files FEDERAL BASE.dwg and FEDERAL SITE.dwg received on 01/09/08 and from Sadler / Barnard & Assoc. Inc, file 2005078.02.dwg received on 05/09/07.

Graphics on Server\2007\2007-025 Holiday Inn Express\001\Figure 7a Existing Conditions.dwg RAI#2007-025-001 Wetland and Stream Assessment 01/08

SWEENEY DESIGNS
HOLIDAY INN EXPRESS

CITY OF FEDERAL WAY

PROPOSED SITE PLAN



KEY			
	PROJECT BOUNDARY		EXISTING EASEMENTS
	OFF-SITE WETLAND DELINEATED BY RAEDEKE ASSOCIATES, INC., 1987		CITY OF FEDERAL WAY 100' STANDARD WETLAND BUFFER
	STREAM ORDINARY HIGH WATER MARK (OHWM)		CITY OF FEDERAL WAY 100' STANDARD STREAM BUFFER
	EXISTING CONTOURS		TEMPORARY BUFFER IMPACTS (APPROX. 480 SF)
	PROPOSED GRADING		TOTAL AREA TO BE RESTORED



RA
 RAEDEKE ASSOCIATES, INC.
 5711 NORTHEAST 63RD ST. SEATTLE, WA 98115
 (206) 525-8122 FAX: (206) 526-2880

RAEDEKE PROJECT #2007-025-001
DATE: 01/14/2008
DRAWN BY: DAD and ELP
Base information: from TRT Associates, files FEDERAL BASE.dwg and FEDERAL SITE.dwg received on 01/09/06 and from Sadler / Barnard & Assoc. Inc, file 2005078.02.dwg received on 05/09/07.

File Name: T:\2007\2007-025 Holiday Inn Express\001\Figure 8 Proposed Site Plan.dwg RA#2007-025-001 Wetland and Stream Assessment 01/08

Table 1. List of aerial photographs used in the study.

Agency	Date	Type ¹	Scale
Wash. Dept. Natural Resources	1970	B&W	1"=1,000'
Wash. Dept. Natural Resources (SP 85)	1985	B&W	1"=1,000'
Wash. Dept. Natural Resources (SP 89)	1989	B&W	1"=1,000'
Wash. Dept. Natural Resources (NW 95 series)	1995	B&W	1"=1,000'
Wash. Dept. Natural Resources (NW 01 series)	2001	Color	1"=1,000'

¹ B&W = black and white photograph
 Enlg. = enlargement

Table 2. Summary of definitions of water types found on Washington Department of Natural Resources Forest Practice Base Maps (See Washington State Forest Practices Board [2004] for complete definitions).

-
- “Type F Water”** means segments of natural waters other than Type S Waters, which are within the bankfull widths of defined channels and periodically inundated areas of their associated wetlands, or within lakes, ponds, or impoundments having a surface area of 0.5 acre or greater at seasonal low water and which in any case contain fish habitat or are described by one of the following four categories:
- (a) Waters, which are diverted for domestic use by more than 10 residential or camping units or by a public accommodation facility licensed to serve more than 10 persons, where such diversion is determined by the department to be a valid appropriation of water and the only practical water source for such users. Such waters shall be considered to be Type F Water upstream from the point of such diversion for 1,500 feet or until the drainage area is reduced by 50 percent, whichever is less;
 - (b) Waters, which are diverted for use by federal, state, tribal or private fish hatcheries. Such waters shall be considered Type F Water upstream from the point of diversion for 1,500 feet, including tributaries if highly significant for protection of downstream water quality. The department may allow additional harvest beyond the requirements of Type F Water designation provided the department determines after a landowner-requested on-site assessment by the department of fish and wildlife, department of ecology, the affected tribes and interested parties that:
 - (i) The management practices proposed by the landowner will adequately protect water quality for the fish hatchery; and
 - (ii) Such additional harvest meets the requirements of the water type designation that would apply in the absence of the hatchery;
 - (c) Waters, which are within a federal, state, local, or private campground having more than 10 camping units: Provided, That the water shall not be considered to enter a campground until it reaches the boundary of the park lands available for public use and comes within 100 feet of a camping unit, trail or other park improvement;
 - (d) Riverine ponds, wall-based channels, and other channel features that are used by fish for off-channel habitat. These areas are critical to the maintenance of optimum survival of fish. This habitat shall be identified based on the following criteria:
 - (i) The site must be connected to a fish habitat stream and accessible during some period of the year; and
 - (ii) The off-channel water must be accessible to fish.

Table 2. Continued

“Type Np Water” means all segments of natural waters within the bankfull width of defined channels that are perennial nonfish habitat streams. Perennial streams are waters that do not go dry any time of a year of normal rainfall. However, for the purpose of water typing, Type Np Waters include the intermittent dry portions of the perennial channel below the uppermost point of perennial flow. If the uppermost point of perennial flow cannot be identified with simple, nontechnical observations (see board manual, section 23), then Type Np Waters begin at a point along the channel where the contributing basin area is:

- (a) At least 13 acres in the Western Washington coastal zone (which corresponds to the Sitka spruce zone defined in Franklin and Dyrness, 1973);
- (b) At least 52 acres in other locations in Western Washington;
- (c) At least 300 acres in Eastern Washington.

“Type Ns Water” means all segments of natural waters within the bankfull width of the defined channels that are not Type S, F, or Np Waters. These are seasonal, nonfish habitat streams in which surface flow is not present for at least some portion of a year of normal rainfall and are not located downstream from any stream reach that is a Type Np Water. Ns Waters must be physically connected by an above-ground channel system to Type S, F, or Np Waters.

For purposes of this section:

- (a) “Residential unit” means a home, apartment, residential condominium unit or mobile home, serving as the principal place of residence.
- (b) “Camping unit” means an area intended and used for:
 - (i) Overnight camping or picnicking by the public containing at least a fireplace, picnic table and access to water and sanitary facilities; or
 - (ii) A permanent home or condominium unit or mobile home not qualifying as a “residential unit” because of part time occupancy.
- (c) “Public accommodation facility” means a business establishment open to and licensed to serve the public, such as a restaurant, tavern, motel or hotel.
- (d) “Natural waters” only excludes water conveyance systems which are artificially constructed and actively maintained for irrigation.
- (e) “Seasonal low flow” and “seasonal low water” mean the conditions of the 7-day, 2-year low water situation, as measured or estimated by accepted hydrologic techniques recognized by the department.

Table 2. Continued

- (f) "Channel width and gradient" means a measurement over a representative section of at least 500 linear feet with at least 10 evenly spaced measurement points along the normal stream channel but excluding unusually wide areas of negligible gradient such as marshy or swampy areas, beaver ponds and impoundments. Channel gradient may be determined utilizing stream profiles plotted from United States geological survey topographic maps (see board manual section 23).
- (g) "Intermittent streams" means those segments of streams that normally go dry.
- (h) "Fish habitat" means habitat which is used by any fish at any life stage at any time of the year, including potential habitat likely to be used by fish which could be recovered by restoration or management and includes off-channel habitat.

APPENDIX A:

Wright Federal Way Stream Delineation (Raedeke Associates, Inc. 2006)



July 7, 2006

Mr. Bob Wright
36200 16th Ave. South
Federal Way, WA 98003

RE: Wright Federal Way
Stream Delineation and Wetland Reconnaissance
R.A.I. Project #2006-045-001

Dear Mr. Wright:

At your request, this letter summarizes the results of our investigation of the Wright Federal Way property. The project site consists of approximately 2.85 acres located in the southeast portion of Section 20, Township 21 North, Range 4 East W.M., in the City of Federal Way, Washington. Specifically, the site is located along the west side Pacific Highway South and south of S 348th Street, as described to us by you on April 18, 2006 and depicted on King County's (2006) iMAP parcel viewer. The parcel we investigated is identified as King County Tax parcel #2021049044.

The primary objective of our investigation was to examine the property to identify and delineate areas that could be defined and classified as regulatory wetlands or streams. We visited the site on May 31, 2006 to investigate the soil, vegetation, and hydrologic conditions of the property in order to determine the approximate locations of wetlands and/or streams. We also collected general descriptions of vegetation, soil, and hydrologic conditions in representative areas to document our observations.

This letter is not intended to constitute a full wetland and stream delineation report. Nor does it include a discussion of potential project impacts to wetlands, streams, and wildlife habitat, or a discussion of potential mitigation measures for project impacts to sensitive areas. Ultimately, the City of Federal Way may require a full wetland and stream assessment report in order to complete its review of a development application for the site.

DEFINITIONS AND METHODOLOGIES

Wetlands and streams are protected by federal law, as well as by state and local regulations. Federal law (Section 404 of the Clean Water Act) generally prohibits the discharge of dredged or fill material into the nation's waters, including wetlands, without a permit from the U.S. Army Corps of Engineers (COE 2002). The COE makes the final determination as to whether an area meets the definition of a wetland, if it is under their jurisdiction, and whether any permits are required for any proposed alterations.

Wetlands

We based our wetland investigation upon the guidelines of the COE Wetlands Delineation Manual (Environmental Laboratory 1987), as revised in the Washington State Wetlands Identification and Delineation Manual published by the Washington Department of Ecology (WDOE 1997). The WDOE wetland manual is required by state law for all local jurisdictions (including the City of Federal Way), is consistent with the 1987 COE wetland delineation manual with respect to wetland identification and delineation, and incorporates subsequent amendments and clarifications provided by the COE (1991a, 1991b, 1992, 1994). A wetland is defined as an area "inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (Federal Register 1986:41251).

As outlined in the COE Wetlands Delineation Manual (Environmental Laboratory 1987) and WDOE (1997) Washington State Wetlands Identification and Delineation Manual, wetlands are distinguished by three diagnostic characteristics: hydrophytic vegetation (wetland plants), hydric soil (wetland soil), and wetland hydrology.

Hydrophytic vegetation is present when "more than 50 percent of the dominant species are OBL, FACW, or FAC on lists of plants species that occur in wetlands" (Environmental Laboratory 1987:19). Under the WDOE (1997) methodology, dominant plant species provide at least 20% areal cover. Plants are rated, from highest to lowest probability of occurrence in wetlands, as obligate (OBL), facultative wetland (FACW), facultative (FAC), facultative upland (FACU) (Reed 1988, 1993). Those plant species not listed by Reed (1988, 1993) are rated UPL by default (Federal Interagency Committee for Wetland Delineation 1989).

Soils are specifically examined for hydric indicators immediately below the A horizon or 10 inches, whichever is shallower. Hydric soil indicators include, but are not limited to: (1) gley conditions, (2) mottling in a low chroma matrix, (3) histic (organic) soils, and (4) saturated or inundated conditions. Soil colors were determined using Munsell Color (2000).

In order for an area to have wetland hydrology according to the 1987 and 1997 manuals, soils must be saturated within a major portion of the vegetation rooting zone (usually within 12 inches of the surface) for at least 5% of the growing season (Environmental Laboratory 1987, U.S. Army Corps of Engineers 1991b, 1992).

Streams

The City of Federal Way (2005) defines a stream as "a course or route, formed by nature, including those which have been modified by humans, and generally consisting of a channel with a bed, banks or sides throughout substantially all its length, along which surface waters naturally and normally flow in draining from higher to lower elevations."

A stream need not contain water year-round to meet this definition. The City of Federal Way (2005) stream definition does not include artificially-created watercourses, irrigation ditches or stormwater facilities, unless the watercourse is used by anadromous or resident fish or constructed from a stream that naturally occurred prior to construction.

The City of Federal Way measures buffers for regulated streams from the ordinary high water mark (OHWM) of a stream, as defined in Section 22-1 of the City of Federal Way (2005) Code.

BACKGROUND RESEARCH

In preparation for our investigation, we collected and analyzed available background information for the project area. We reviewed maps and information from the U.S. Fish and Wildlife (USFWS 1987) National Wetlands Inventory (NWI) map, the USDA Soils Conservation Service (SCS) Soil Survey (Snyder et al. 1973), the Washington Department of Natural Resources (WDNR 2006) Forest Practices Base Map, and the City of Federal Way GIS Division (2005b) Surface Water Map, and the StreamNet (2006) Pacific NW interactive mapper. After completion of our site visit, we also reviewed the Washington Department of Fish and Wildlife (WDFW 2002) Priority Habitats and Species (PHS) map for the project area and the City of Federal Way GIS Division (2005a) Stream Ratings Map.

The USFWS (1987) NWI map, Poverty Bay Quadrangle, does not depict any wetlands on the Wright property. A palustrine, scrub-shrub, seasonally flooded (PSSC) and palustrine, aquatic bed, permanently flooded (PABH) wetland complex is depicted adjacent to the northwest corner of the site. Approximately 1,000 feet southwest of the project site, the NWI maps a large PSSC, palustrine, forested, temporarily flooded (PFOA), palustrine, open water, permanently flooded (POWH) wetland complex.

The SCS (Snyder et al. 1973) soils survey for King County maps soils on a majority of the project site as Everett-Alderwood gravelly sandy loams, 6 to 15 percent slopes (Map Symbol EwC). The Everett soil series is a somewhat excessively drained soil formed on very gravelly glacial outwash. This soil series is not classified as hydric (Federal Register 1995). The western portion of the site is mapped as Norma sandy loam (Map Symbol No), which is a poorly drained hydric soil found in basins of glaciated uplands and stream bottoms. Soil series boundaries are mapped from aerial photographs with limited field verification. Thus, the location and extent of the boundaries between mapping units may be approximate for a given parcel of land within the survey area.

The WDNR (2006) Forest Practice Activity Map does not show any streams or water bodies on or immediately adjacent to the Wright property. The map depicts West Hylebos Creek as a Type N (non-fish bearing) stream west of the project site and Brook Lake as a Type F (fish-bearing) water body to the southwest of the project site.

The City of Federal Way GIS Division (2005b) Surface Water Map depicts a stream feature in the west portion of the project site, which connects to the West Hylebos Creek wetland complex to the southwest of the project site. A wetland is mapped in the parcel north of the site, which generally corresponds to the wetland depicted on the USFWS (1987) NWI map.

The StreamNet (2006) interactive mapper does not show any streams with anadromous or resident fish use on the Wright property. The Streamnet (2006) interactive mapper indicates winter steelhead and Coho salmon migration within the northern reach of the West Hylebos Creek.

The WDFW (2004) PHS map does not show any priority species or habitat occurrence on the project site. The Hylebos Creek wetland is mapped to the southwest of the project site as a priority habitat, and Coho salmon presence is depicted within West Hylebos Creek.

The City of Federal Way GIS Division (2005a) Stream Ratings Map depicts a stream feature in the west portion of the project site that corresponds in location to the stream shown on the City of Federal Way GIS Division (2005) Surface Water Map. The stream is rated as a "Major Stream."

FIELD SAMPLING PROCEDURES

Wetlands

We examined vegetation, soils, and hydrology in representative areas of the property on May 31, 2006. Plant communities were inventoried, classified, and described primarily by field inspection and by examining photos or existing mappings. In addition to identifying dominant plant species, we used the Braun-Blanquet cover-abundance method (Mueller-Dombois and Ellenberg 1974) as an objective way to describe homogenous vegetation "cover types." General vegetation patterns were noted; scientific nomenclature of plant species generally follows Hitchcock and Cronquist (1976), as updated by Polar and MacKinnon (1994), Guard (1995), and Cooke (1997).

We sampled soils at locations that corresponded with vegetation sampling areas and potential wetland areas. Numerous holes were dug to investigate soil textures and general moisture and water table conditions. We excavated soil pits to 18 inches below the surface, where feasible, in representative areas of the site in order to describe soil profiles. Colors of the soils were determined using a Munsell Soil Color Chart (Munsell Color 2000).

We examined representative areas of the project site for indicators of wetland hydrology. Positive indicators of wetland hydrology include direct observation of inundation or soil

saturation, as well as indirect evidence such as driftlines, watermarks, surface encrustations, and drainage patterns.

Streams

We searched the property for naturally-occurring watercourses that appeared to meet the City of Federal Way's (2005) definition for streams. We determined the OHWM of on-site stream segments using indicators outlined in the WDOE (1994) Shoreline Administrators Manual, which include: (1) a clear vegetation mark; (2) wetland/upland edge; (3) elevation; (4) a combination of changes in vegetation, elevation, and landward limit of drift deposition; (5) soil surface changes from algae or sediment deposition to areas where soils show no sign of depositional processes; and/or (6) soil profile changes from wetter conditions (low chroma, high soil organic matter, and lack of mottling) to drier conditions (higher chroma, less organic matter, or brighter mottles).

We placed pink-and-black striped flagging along the ordinary high water mark of on-site streams. A sketch map depicting the stream delineation was provided to you on May 31, 2006.

PROPERTY DESCRIPTION AND LAND USE HISTORY

The Wright property is within the Hylebos Creek drainage basin of the Puyallup River Watershed (King County 2006). In 1986, King County (1986) issued a mitigated determination of non-significance to allow placement of fill on the Wright property, per King County Grading Permit #C9000374. King County (1986) identified an unnamed tributary to Hylebos Creek was located on the site.

The unnamed tributary to Hylebos Creek, hereafter called Stream 1, is located in the west portion of the site. Two steep ravines are located on either side of Stream 1. The remainder of the property lies on a gentle west-facing slope that ranges in elevation from 260 feet on the east side of the property to 240 feet on the west side of the property (King County iMAP 2006). A majority of the site consists of grassland, while the ravine is vegetated with deciduous trees and shrubs.

Surrounding land use includes commercial buildings adjacent along most of the north and west property boundaries, and Pacific Highway South along the east property boundary. Undeveloped forest borders the south property line.

EXISTING CONDITIONS

The following sections provide further discussion of the vegetation, soil, and hydrologic conditions of the property, based on our field investigations. We identified one stream (Stream 1) and no wetlands on the Wright property.

Stream 1

Stream 1 originates off-site to the north of the Wright property, flowing south through a 72-inch corrugated metal culvert that was installed at the north end of the project site as part of the fill placement in the mid-1980's; a fill berm is located on top of the culvert. The average bankfull width of the on-site stream channel is 10 feet. The north side of Stream 1 is at least 3 feet deep. The stream substrate has cobbles generally less than three inches in diameter, and minimal sediment deposition was evident. At the time of our site visit, the excavated portion of Stream 1 had over three feet of standing water, while no flowing water was present in the stream at the south end of the site. We observed from the south property line that the stream continues off-site to the south; we did not walk the streambed off-site to the south. Fringing vegetation on the steep slopes of the ravine primarily consists of red alder (*Alnus rubra*, FAC) and black cottonwood (*Populus balsamifera*, FAC), Himalayan blackberry (*Rubus discolor*, FACU), and salmonberry (*Rubus spectabilis*, FAC+).

An excavated area that appears to be less than 2,500 square feet in size is located adjacent to the east ravine slope's top-of-bank. A perforated pipe was installed in the north portion of the excavated area, apparently to drain surface water into Stream 1 via a culvert that outlets near the top of the east ravine slope. Vegetation consists mainly of Sitka willow (*Salix sitchensis*, FACW), Pacific willow (*Salix lucida*, FACW+), and reed canarygrass (*Phalaris arundinacea*, FACW). Soils were very compacted in this area and could not be excavated below 12 inches. The soil profile consisted of brown (7.5YR 5/2) gravelly sandy loam with yellowish brown (10YR 5/6) mottles that were many, medium, and prominent. No soil saturation or groundwater was present during our May 31, 2006 site visit; there was some evidence of ponding (i.e., sediment-stained leaves) localized to small pockets within the bottom of the excavated area.

Upland Descriptions

Vegetation in the upland area west of Stream 1 was dominated by red fescue (*Festuca rubra*, FAC+). Non-dominant plant species in this area included black cottonwood and big-leaf maple (*Acer macrophyllum*, FACU) saplings and young trees, Scotch broom (*Cytisus scoparius*, UPL) seedlings, Himalayan blackberry; common velvetgrass (*Holcus lanatus*, FAC), oxeye daisy (*Chrysanthemum leucanthemum*, UPL), English plantain (*Plantago lanceolata*, FAC), brome (*Bromus* spp., FAC+/FACU-), and bentgrass (*Agrostis* spp. FACW/FAC), among others. Soils were also very compacted in this area; the upper 12 inches of the soil profile consisted of brown (7.5YR 5/2) gravelly sandy loam with strong brown (7.5 YR 4/6) mottles that were few, fine, and prominent. No primary or secondary indicators of hydrology were present during our May 31, 2006 site visit.

The east side of the Wright property is a field whose dominant plant species were black medic (*Medicago lupulina*, FAC) and bluegrass (*Poa* spp., no WIS). Other non-dominant species included sheep sorrel (*Rumex acetosella*, FACU+), hairy cat's ear (*Hypochaeris*

radicata, FACU), brome, bedstraw (*Galium* spp., no WIS), common velvetgrass, English plantain, and white clover (*Trifolium repens*, FAC), among others. Soils were too rocky and compacted in this area to be sampled; we did not see any primary or secondary indicators of wetland hydrology during our May 31, 2006 site visit.

SUMMARY DETERMINATION AND CLASSIFICATION

Based on our field reconnaissance on May 31, 2006 site visit, we identified one stream on the Wright property.

Currently the Federal Way (2005) City Code regulates streams under Chapter 22 - Zoning. Under these regulations, streams are classified as either major or minor streams. The City of Federal Way (2005) defines a major stream as "any stream, and tributaries to any stream, which contains or supports, or under normal circumstances contains or supports resident or migratory fish." If a natural blockage is present that precludes upstream movement of fish, then only the stream segment downstream of the blockage is considered a major stream. The standard setback for a major stream is 100 feet outward of the OHWM of the stream. The City Federal Way (2005) defines a minor stream as "any stream that does not meet the definition of 'major stream.'" The standard setback for a minor stream is 50 feet outward of the stream's OHWM. Stream setbacks do not apply to any segment of a stream that is within a culvert (City Federal Way 2005).

Based on our background review and field investigation, Stream 1 has been rated as a "Major Stream (City of Federal Way GIS Division 2005a)." Stream 1 likely received this rating because it is a tributary to West Hylebos Creek, which has documented anadromous and resident fish presence (WDFW 2002, Streamnet 2006). Portions of Stream 1 outside of the on-site culvert would receive a standard 100-foot-wide setback.

At the time of our site visit, no portion of the Wright property had indicators for all three wetland criteria to be considered a wetland according to the WDOE (1997) manual. The site may need to be re-investigated earlier in the growing season (i.e., the beginning of March) to confirm presence or absence of wetland hydrology on the project site.

The excavated area at the top of the east ravine slope had some strong indicators of hydrophytic vegetation and hydric soils. If sufficient hydrology is present earlier in the growing season, it may be considered a wetland. However, the excavated area appears to be less than 2,500 square feet in size, and thus likely would not be considered a regulated wetland by the City of Federal Way (2005).

We caution that our determinations should be considered preliminary, and the City of Federal Way has the final authority to determine wetland and stream ratings and required buffers. The City would determine the specific conditions of approval of any proposed future activities in the context of a specific development proposal. The COE also regulates wetlands and streams as waters of the U.S. under Section 404 of the Clean Water Act, and

Mr. Bob Wright
July 7, 2006
Page 8

WDOE regulates wetlands under the state Water Pollution Control Act (90.48 RCW) and Shoreline Management Act (90.58 RCW).

LIMITATIONS

We have prepared this report for the exclusive use of Mr. Bob Wright and his consultants. No other person or agency may rely upon the information, analysis, or conclusions contained herein without permission from Mr. Wright.

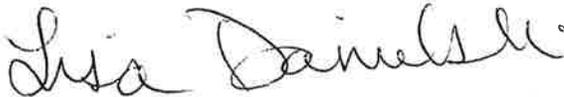
The determination of ecological system classifications, functions, values, and boundaries is an inexact science, and different individuals and agencies may reach different conclusions. With regard to wetlands and streams, the final determination of their boundaries for regulatory purposes is the responsibility of the various resource agencies that regulate development activities in wetlands and streams. We cannot guarantee the outcome of such agency determinations. Therefore, the conclusions of this report should be reviewed by the appropriate regulatory agencies prior to any detailed site planning or construction activities.

We warrant that the work performed conforms to standards generally accepted in our field, and was prepared substantially in accordance with then-current technical guidelines and criteria. The conclusions of this report represent the results of our analysis of the information provided by the project proponents and their consultants, together with information gathered in the course of this study. No other warranty, expressed or implied, is made.

Thank you for this opportunity to work with you. We hope this information is useful. If you have any questions, we are available at (206) 525-8122.

Respectfully submitted,

RAEDEKE ASSOCIATES, INC.

A handwritten signature in cursive script that reads "Lisa Danielski".

Lisa Danielski, B.A.
Wetland Biologist/Botanist

LITERATURE CITED

- Cooke, S. 1997. A field guide to common wetland plants of Western Washington and Northwestern Oregon. Seattle Audubon Society. Seattle, Washington. 417 pp.
- Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1, US Army Engineers Waterways Experiment Station, Vicksburg, Mississippi. 100 pp.
- Federal Interagency Committee for Wetland Delineation. 1989. Federal manual for identifying and delineating jurisdictional wetlands. U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, and U.S.D.A. Soil Conservation Service, Washington, D.C. Cooperative technical publication. 76 pp.
- Federal Register. 1986. 40 CFR Parts 320 through 330: Regulatory programs of the Corps of Engineers; final rule. Volume 51, No. 219, pp. 41206-41260, U.S. Government Printing Office, Washington, D.C.
- Federal Register. 1995. Soil Conservation Service: changes in hydric soils of the United States. Volume 59, No. 133, pp. 35680-35695. July 13, 1994. U.S. Government Printing Office, Washington, D.C. Revised December 15, 1995.
- Federal Way, City of. 2005. Federal Way City Code. Current through Ordinance 05-514, passed Dec. 20, 2005.
- Federal Way, City of, GIS Division. 2005a. City of Federal Way stream ratings map. <http://www.cityoffederalway.com/GetFile.aspx?id=10443>. January 2005.
- Federal Way, City of, GIS Division. 2005b. City of Federal Way surface water map. <http://www.cityoffederalway.com/GetFile.aspx?id=6746>. May 31, 2005.
- Guard, B.J. 1995. Wetland Plants of Oregon and Washington. Lone Pine Publishing, Renton, Washington. 239 pp.
- Hitchcock, C., and A. Cronquist. 1976. Flora of the Pacific Northwest. Univ. of Washington Press, Seattle, Washington. 730 pp.
- King County. 1986. Mitigated determination of non-significance for File #2752-60, proponent: Robert L. Wright. March 11, 1986.
- King County Department of Natural Resources and Parks. 2002. Final Report, East Hylebos Creek 2001 Monitoring Program. July 2002.
- Mueller-Dombois, D. and H. Ellenberg. 1974. Aims and methods of vegetation ecology. John Wiley and Sons, New York. 547 pp.

- Munsell Color. 2000. Munsell soil color charts. GretagMacbeth, New Windsor, NY.
- Pojar, J., and A. MacKinnon. 1994. Plants of the Pacific Northwest Coast, Washington, Oregon, British Columbia, and Alaska. B.C. Ministry of Forests; B.C. Forest Service; Research Program. 528 pp.
- Reed, P.B., Jr. 1988. National list of plant species that occur in wetlands: Northwest (Region 9). U.S.D.I. Fish and Wildlife Service. Biological Report 88 (26.9). 89 pp.
- Reed, P.B., Jr. 1993. 1993 Supplement to list of plant species that occur in wetlands: Northwest (Region 9). U.S.D.I. Fish and Wildlife Service. Supplement to Biological Report 88 (26.9) May 1988.
- Snyder, D., P. Gale, and R. Pringle. 1973. Soil Survey of King County area, Washington. U.S.D.A. Soil Conservation Service. 100 pp.
- StreamNet. 2006. Pacific NW interactive mapper.
<http://map.streamnet.org/snetmapper/viewer.htm>. Accessed May 31, 2006.
- U.S. Army Corps of Engineers. 1991a. Special notice. Subject: Use of the 1987 wetland delineation manual. U.S. Army Corps of Engineers, Seattle District. August 30, 1991.
- U.S. Army Corps of Engineers. 1991b. Memorandum. Subject: Questions and answers on the 1987 manual. U.S. Army Corps of Engineers, Washington D.C. October 7, 1991. 7 pp. including cover letter by John P. Studt, Chief, Regulatory Branch.
- U.S. Army Corps of Engineers. 1992. Memorandum. Subject: Clarification and interpretation of the 1987 methodology. U.S. Army Corps of Engineers, Washington D.C., March 26, 1992. 4 pp. Arthur E. Williams, Major General, U.S.A. Directorate of Civil Works.
- U.S. Army Corps of Engineers. 1994. Public Notice. Subject: Washington regional guidance on the 1987 wetland delineation manual. May 23, 1994, Seattle District. 8 pp.
- U.S. Army Corps of Engineers. 2002. Final regional conditions, 401 water quality certification conditions, Coastal Zone management consistency responses, for Nationwide permits for the Seattle District Corps of Engineers for the State of Washington. July 23, 2002. Special Public Notice. Seattle District. 132 pp.
- U.S.D.A. Soil Conservation Service. 1991. Hydric soils of the United States: In cooperation with the National Technical Committee for Hydric Soils. U.S.D.A. Miscellaneous Publication Number 1491.

Mr. Bob Wright
July 7, 2006
Page 11

U.S. Fish and Wildlife Service National Wetlands Inventory. 1987. Poverty Bay, 7.5-minute quadrangle.

Washington Department of Ecology. 1994. Shoreline Administrators Manual Vol. 1: Shoreline Management Guidebook, 2nd Ed. Publication No. 93-104a. January 1994.

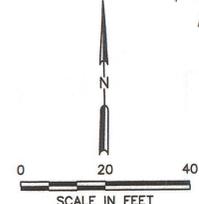
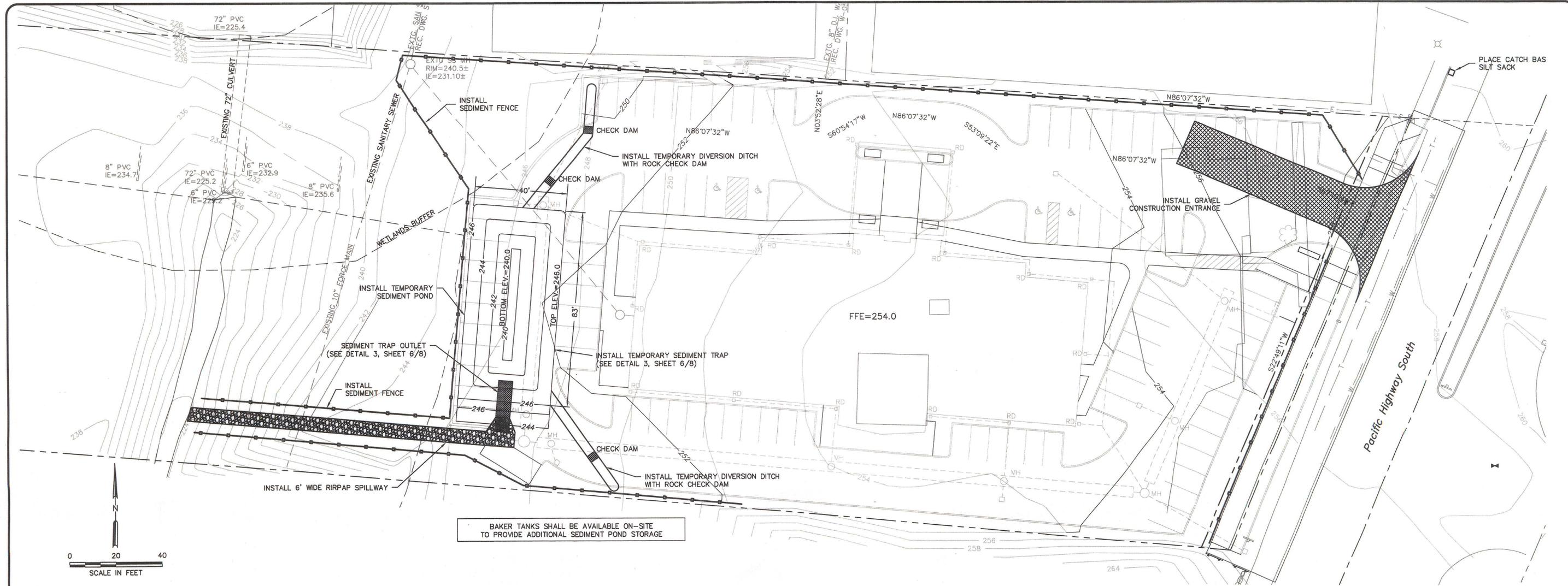
Washington Department of Ecology. 1997. Washington state wetland identification and delineation manual. March 1997. Publication No. 96-94. 88 pp. plus appendices.

Washington Department of Fish and Wildlife. 2002. Priority habitats and species maps and reports in the vicinity of Township 26 North, Range 4 East, Section 28. April 19, 2004. Habitat Program, Olympia, Washington.

Washington State Department of Natural Resources. 2006. Forest Practices Activity Map for Section 20 Township 18 North, Range 2 East, W.M.
<http://www3.wadnr.gov/dnrapp5/website/fpars.viewer.htm>. Accessed May 31, 2006.

APPENDIX C

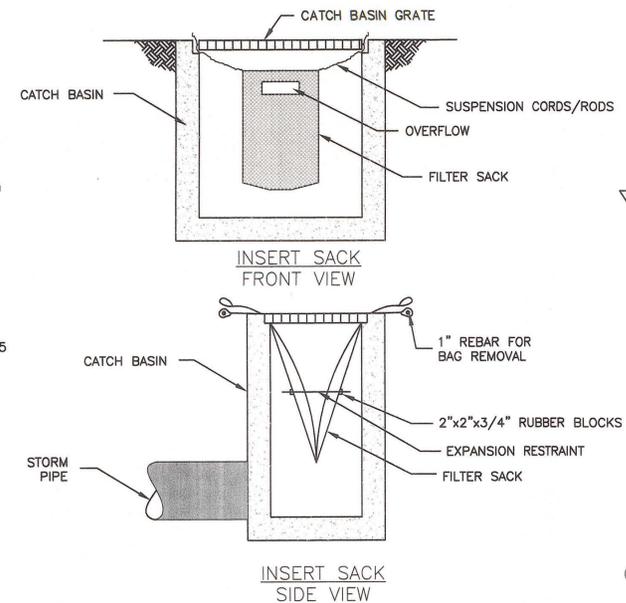
2009 SITE DEVELOPMENT PLANS, PREPARED BY TRT ENGINEERING, INC.



Erosion/Sedimentation Control Notes:

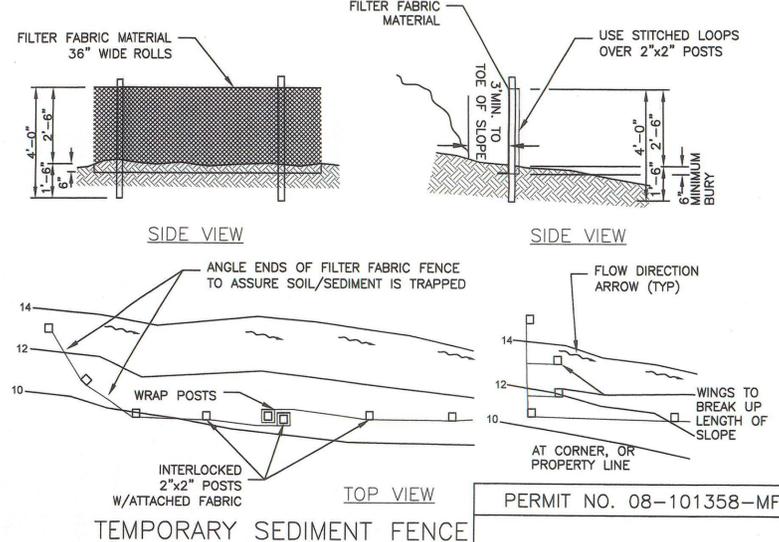
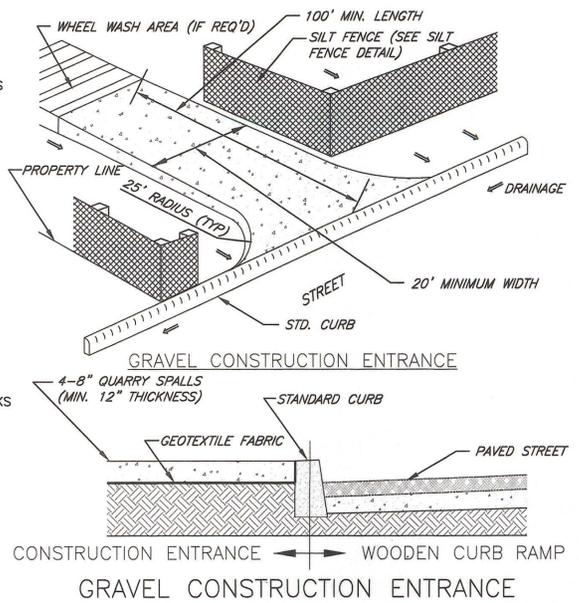
- Approval of this Erosion/Sedimentation Control (ESC) plan does not constitute an approval of permanent road or drainage design (i.e. size and location of roads, pipes, restrictors, channels, retention facilities, utilities, etc.).
- The implementation of these ESC plans and the construction, maintenance, replacement, and upgrading of these ESC facilities is the responsibility of the applicant/contractor until all construction is approved.
- The boundaries of the clearing limits shown on this plan shall be clearly flagged in the field prior to construction. During the construction period, no disturbance beyond the flagged clearing limits shall be permitted. The flagging shall be maintained by the applicant/contractor for the duration of construction.
- The ESC facilities shown on this plan must be constructed in conjunction with all clearing and grading activities, and in such a manner as to insure that sediment laden water does not enter the drainage system or violate applicable water standards.
- The ESC facilities shown on this plan are the minimum requirements for anticipated site conditions. During the construction period, these ESC facilities shall be upgraded (i.e. additional sumps, relocation of ditches and silt fences, etc.) as needed for unexpected storm events.
- The ESC facilities shall be inspected daily by the applicant/contractor and maintained as necessary to ensure their continued functioning.
- Any area stripped of vegetation, including roadway embankments, where no further work is anticipated or a period of 15 days, shall be immediately stabilized with the approved ESC methods (i.e. seeding, mulching, netting, erosion blankets, etc.).
- Any area needing ESC measures, not requiring immediate attention, shall be addressed within 15 days.
- The ESC facilities on inactive sites shall be inspected and maintained a minimum of once a month or within the 48 hours following a storm event.
- At no time shall more than one foot of sediment be allowed to accumulate within a catch basin. All catch basins and conveyance lines shall be cleaned prior to paving. The cleaning operation shall not flush sediment-laden water into the downstream system.
- Stabilized construction entrances and wash pads shall be installed at the beginning of construction and maintained for the duration of the project. Additional measures may be required to insure that all paved areas are kept clean for the duration of the project.
- During the time period of October 1 through April 30, all project disturbed areas greater than 5,000 square feet, that are left unworked for more than 12 hours, shall be covered by one of the following cover measures: mulch, sod, or plastic covering. Wet season requirements as described in Appendix D, Section D.5.2 of KCSWDM.
- Any permanent retention/detention facility used as a temporary settling basin shall be modified with the necessary erosion control measures and shall provide adequate storage capacity. If the permanent facility is to function ultimately as an infiltration or dispersion system, the facility shall not be used as a temporary settling basin. No underground detention tanks or vaults shall be used as a temporary settling basin.
- Where seeding for temporary erosion control is required, fast germinating grasses shall be applied at an appropriate rate (i.e., annual or perennial rye applied at approximately 80 pounds per acre).
- Where straw mulch for temporary erosion control is required, it shall be applied at a minimum thickness of two inches.
- Management practices providing significant tree protection shall be provided per Section 22-1568 (c) (6) (a-g) of FWCC.

BAKER TANKS SHALL BE AVAILABLE ON-SITE TO PROVIDE ADDITIONAL SEDIMENT POND STORAGE



NOTE: RECESSED CURB INLET MUST BE BLOCKED WHEN USING FILTER FABRIC INLET SACKS. SIZE OF FILTER FABRIC INLET SACK TO BE DETERMINED BY MANUFACTURER.

FILTER FABRIC INLET PROTECTION



PERMIT NO. 08-101358-MF
 APPROVED: *Kan Miller*
 DATE: 1/21/10
 FEDERAL EROSION 1/14/10



REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY
1	MAY 2009		TRT	TRT		

TRT ENGINEERING, INC.
 2636 S.E. MARKET STREET
 PORTLAND, OREGON 97214
 PHONE (503) 235-7592
 FAX (503) 235-7593

HOLIDAY INN EXPRESS
 34839 PACIFIC HIGHWAY SOUTH
 FEDERAL WAY, WASHINGTON
 EROSION CONTROL PLAN

DRAWING NO.
3/8
 PROJECT NO.

APPENDIX D

WETLAND RATING FORM, *WASHINGTON STATE DEPARTMENT OF ECOLOGY WETLAND RATING SYSTEM FOR WESTERN WASHINGTON* (2014), TALASAEA CONSULTANTS, 2018

Wetland name or number A

**Not Field Verified * Preliminary **

RATING SUMMARY – Western Washington

Name of wetland (or ID #): A (off-site) TAL-1719 Date of site visit: 2/1/18
 Rated by KN/JMM Trained by Ecology? Yes ___ No Date of training 3/16; 5/15

HGM Class used for rating Depressional Wetland has multiple HGM classes? ___ Y ___ N

NOTE: Form is not complete without the figures requested (figures can be combined).
 Source of base aerial photo/map _____

OVERALL WETLAND CATEGORY III (based on functions ___ or special characteristics ___)

1. Category of wetland based on FUNCTIONS

- ___ Category I – Total score = 23 - 27
- ___ Category II – Total score = 20 - 22
- Category III – Total score = 16 - 19
- ___ Category IV – Total score = 9 - 15

FUNCTION	Improving Water Quality			Hydrologic			Habitat			
<i>Circle the appropriate ratings</i>										
Site Potential	H	<u>M</u>	L	H	M	<u>L</u>	H	M	<u>L</u>	
Landscape Potential	H	<u>M</u>	L	<u>H</u>	M	L	H	M	<u>L</u>	
Value	<u>H</u>	M	L	H	<u>M</u>	L	<u>H</u>	M	L	TOTAL
Score Based on Ratings	<u>7</u>			<u>6</u>			<u>5</u>			<u>18</u>

Score for each function based on three ratings (order of ratings is not important)

9 = H,H,H
 8 = H,H,M
 7 = H,H,L
 7 = H,M,M
 6 = H,M,L
 6 = M,M,M
 5 = H,L,L
 5 = M,M,L
 4 = M,L,L
 3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY			
Estuarine	I	II		
Wetland of High Conservation Value	I			
Bog	I			
Mature Forest	I			
Old Growth Forest	I			
Coastal Lagoon	I	II		
Interdunal	I	II	III	IV
None of the above				

Wetland name or number A

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (<i>can be added to map of hydroperiods</i>)	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland (<i>can be added to another figure</i>)	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland (<i>can be added to another figure</i>)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream (<i>can be added to another figure</i>)	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland (<i>can be added to another figure</i>)	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of dense trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of dense, rigid trees, shrubs, and herbaceous plants (<i>can be added to figure above</i>)	S 4.1	
Boundary of 150 ft buffer (<i>can be added to another figure</i>)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

NO – go to 2

YES – the wetland class is **Tidal Fringe** – go to 1.1

- 1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

NO – **Saltwater Tidal Fringe (Estuarine)**

YES – **Freshwater Tidal Fringe**

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

NO – go to 3

YES – The wetland class is **Flats**

*If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.*

3. Does the entire wetland unit **meet all** of the following criteria?

___ The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size;

___ At least 30% of the open water area is deeper than 6.6 ft (2 m).

NO – go to 4

YES – The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?

___ The wetland is on a slope (*slope can be very gradual*),

___ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks,

___ The water leaves the wetland **without being impounded**.

NO – go to 5

YES – The wetland class is **Slope**

NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

5. Does the entire wetland unit **meet all** of the following criteria?

___ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,

___ The overbank flooding occurs at least once every 2 years.

Wetland name or number A

NO – go to 6

YES – The wetland class is **Riverine**

NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland.*

NO – go to 7

YES – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

NO – go to 8

YES – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. **GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide).** Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

*If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.*

Wetland name or number A

DEPRESSIONAL AND FLATS WETLANDS
Water Quality Functions - Indicators that the site functions to improve water quality

D 1.0. Does the site have the potential to improve water quality?		
D 1.1. Characteristics of surface water outflows from the wetland:		
Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). points = 3		1
Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2		
Wetland has an <u>unconstricted</u> , or slightly constricted, surface outlet that is permanently flowing points = 1		
Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1		
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions). Yes = 4 No = 0		0
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes):		
Wetland has persistent, ungrazed, plants > 95% of area points = 5		3
Wetland has persistent, ungrazed, plants > 1/2 of area points = 3		
Wetland has persistent, ungrazed plants > 1/10 of area points = 1		
Wetland has persistent, ungrazed plants < 1/10 of area points = 0		
D 1.4. Characteristics of seasonal ponding or inundation:		
<i>This is the area that is ponded for at least 2 months. See description in manual.</i>		
Area seasonally ponded is > 1/2 total area of wetland points = 4		4
Area seasonally ponded is > 1/4 total area of wetland points = 2		
Area seasonally ponded is < 1/4 total area of wetland points = 0		
Total for D 1	Add the points in the boxes above	8

Rating of Site Potential If score is: 12-16 = H X 6-11 = M 0-5 = L Record the rating on the first page

D 2.0. Does the landscape have the potential to support the water quality function of the site?		
D 2.1. Does the wetland unit receive stormwater discharges?	Yes = 1 No = 0	1
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants?	Yes = 1 No = 0	1
D 2.3. Are there septic systems within 250 ft of the wetland?	Yes = 1 No = 0	0
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3?		0
Source _____	Yes = 1 No = 0	0
Total for D 2	Add the points in the boxes above	2

Rating of Landscape Potential If score is: 3 or 4 = H X 1 or 2 = M 0 = L Record the rating on the first page

D 3.0. Is the water quality improvement provided by the site valuable to society?		
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list?	Yes = 1 No = 0	1
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list?	Yes = 1 No = 0	1
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (answer YES if there is a TMDL for the basin in which the unit is found)?	Yes = 2 No = 0	2
Total for D 3	Add the points in the boxes above	4

Rating of Value If score is: X 2-4 = H 1 = M 0 = L Record the rating on the first page

Wetland name or number A

DEPRESSIONAL AND FLATS WETLANDS
Hydrologic Functions - Indicators that the site functions to reduce flooding and stream degradation

D 4.0. Does the site have the potential to reduce flooding and erosion?		
D 4.1. Characteristics of surface water outflows from the wetland:		
Wetland is a depression or flat depression with no surface water leaving it (no outlet)	points = 4	0
Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet	points = 2	
Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch	points = 1	
Wetland has an <u>unconstricted</u> , or slightly constricted, surface outlet that is permanently flowing	points = 0	
D 4.2. Depth of storage during wet periods: Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part.		
Marks of ponding are 3 ft or more above the surface or bottom of outlet	points = 7	3
Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet	points = 5	
Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet	points = 3	
The wetland is a "headwater" wetland	points = 3	
Wetland is flat but has small depressions on the surface that trap water	points = 1	
Marks of ponding less than 0.5 ft (6 in)	points = 0	
D 4.3. Contribution of the wetland to storage in the watershed: Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.		
The area of the basin is less than 10 times the area of the unit	points = 5	0
The area of the basin is 10 to 100 times the area of the unit	points = 3	
The area of the basin is more than 100 times the area of the unit	points = 0	
Entire wetland is in the Flats class	points = 5	
Total for D 4	Add the points in the boxes above	3

Rating of Site Potential If score is: 12-16 = H 6-11 = M X 0-5 = L Record the rating on the first page

D 5.0. Does the landscape have the potential to support hydrologic functions of the site?		
D 5.1. Does the wetland receive stormwater discharges?	Yes = 1 No = 0	1
D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff?	Yes = 1 No = 0	1
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at >1 residence/ac, urban, commercial, agriculture, etc.)?	Yes = 1 No = 0	1
Total for D 5	Add the points in the boxes above	3

Rating of Landscape Potential If score is: X 3 = H 1 or 2 = M 0 = L Record the rating on the first page

D 6.0. Are the hydrologic functions provided by the site valuable to society?		
D 6.1. The unit is in a landscape that has flooding problems. Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met.		
The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds):		1
• Flooding occurs in a sub-basin that is immediately down-gradient of unit.	points = 2	
• Surface flooding problems are in a sub-basin farther down-gradient.	points = 1	
Flooding from groundwater is an issue in the sub-basin.	points = 1	
The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. Explain why _____	points = 0	
There are no problems with flooding downstream of the wetland.	points = 0	
D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan?	Yes = 2 No = 0	0
Total for D 6	Add the points in the boxes above	1

Rating of Value If score is: 2-4 = H X 1 = M 0 = L Record the rating on the first page

Wetland name or number A

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

H 1.1. Structure of plant community: *Indicators are Cowardin classes and strata within the Forested class. Check the Cowardin plant classes in the wetland. Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.*

- Aquatic bed 4 structures or more: points = 4
 - Emergent 3 structures: points = 2
 - Scrub-shrub (areas where shrubs have > 30% cover) 2 structures: points = 1
 - Forested (areas where trees have > 30% cover) 1 structure: points = 0
- If the unit has a Forested class, check if:*
- The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon

1

H 1.2. Hydroperiods

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (*see text for descriptions of hydroperiods*).

- Permanently flooded or inundated 4 or more types present: points = 3
- Seasonally flooded or inundated 3 types present: points = 2
- Occasionally flooded or inundated 2 types present: points = 1
- Saturated only 1 type present: points = 0
- Permanently flowing stream or river in, or adjacent to, the wetland
- Seasonally flowing stream in, or adjacent to, the wetland
- Lake Fringe wetland** **2 points**
- Freshwater tidal wetland** **2 points**

1

H 1.3. Richness of plant species

Count the number of plant species in the wetland that cover at least 10 ft².

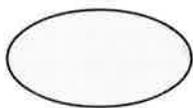
Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle

- If you counted: > 19 species points = 2
- 5 - 19 species points = 1
- < 5 species points = 0

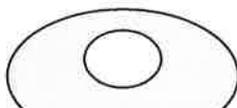
1

H 1.4. Interspersion of habitats

Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always high.*



None = 0 points



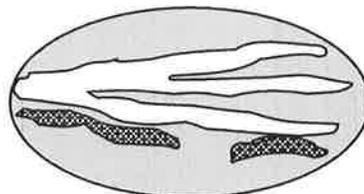
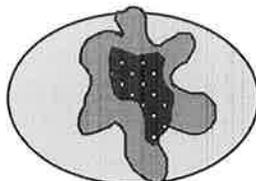
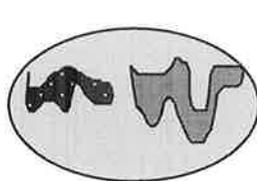
Low = 1 point



Moderate = 2 points

1

All three diagrams in this row are **HIGH** = 3points



Wetland name or number A

4

<p>H 1.5. Special habitat features:</p> <p>Check the habitat features that are present in the wetland. <i>The number of checks is the number of points.</i></p> <p><input checked="" type="checkbox"/> Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long).</p> <p><input type="checkbox"/> Standing snags (dbh > 4 in) within the wetland</p> <p><input type="checkbox"/> Undercut banks are present for at least 6.6 ft (2 m) and/or overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m)</p> <p><input type="checkbox"/> Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (<i>cut shrubs or trees that have not yet weathered where wood is exposed</i>)</p> <p><input type="checkbox"/> At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (<i>structures for egg-laying by amphibians</i>)</p> <p><input checked="" type="checkbox"/> Invasive plants cover less than 25% of the wetland area in every stratum of plants (<i>see H 1.1 for list of strata</i>)</p>	<p>2</p>
<p>Total for H 1</p>	<p>Add the points in the boxes above</p> <p style="text-align: center;">6</p>

Rating of Site Potential If score is: 15-18 = H 7-14 = M X 0-6 = L *Record the rating on the first page*

<p>H 2.0. Does the landscape have the potential to support the habitat functions of the site?</p>	
<p>H 2.1. Accessible habitat (include <i>only habitat that directly abuts wetland unit</i>).</p> <p><i>Calculate:</i> % undisturbed habitat ___ + [(% moderate and low intensity land uses)/2] ___ = ___%</p> <p>If total accessible habitat is:</p> <p>> 1/3 (33.3%) of 1 km Polygon points = 3</p> <p>20-33% of 1 km Polygon points = 2</p> <p>10-19% of 1 km Polygon points = 1</p> <p>< 10% of 1 km Polygon points = 0</p>	<p>1</p>
<p>H 2.2. Undisturbed habitat in 1 km Polygon around the wetland.</p> <p><i>Calculate:</i> % undisturbed habitat ___ + [(% moderate and low intensity land uses)/2] ___ = ___%</p> <p>Undisturbed habitat > 50% of Polygon points = 3</p> <p>Undisturbed habitat 10-50% and in 1-3 patches points = 2</p> <p>Undisturbed habitat 10-50% and > 3 patches points = 1</p> <p>Undisturbed habitat < 10% of 1 km Polygon points = 0</p>	<p>1</p>
<p>H 2.3. Land use intensity in 1 km Polygon: If</p> <p>> 50% of 1 km Polygon is high intensity land use points = (- 2)</p> <p>≤ 50% of 1 km Polygon is high intensity points = 0</p>	<p>-2</p>
<p>Total for H 2</p>	<p>Add the points in the boxes above</p> <p style="text-align: center;">0</p>

Rating of Landscape Potential If score is: 4-6 = H 1-3 = M X < 1 = L *Record the rating on the first page*

<p>H 3.0. Is the habitat provided by the site valuable to society?</p>	
<p>H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? <i>Choose only the highest score that applies to the wetland being rated.</i></p> <p>Site meets ANY of the following criteria: points = 2</p> <p><input checked="" type="checkbox"/> It has 3 or more priority habitats within 100 m (see next page)</p> <p><input type="checkbox"/> It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists)</p> <p><input type="checkbox"/> It is mapped as a location for an individual WDFW priority species</p> <p><input type="checkbox"/> It is a Wetland of High Conservation Value as determined by the Department of Natural Resources</p> <p><input type="checkbox"/> It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan</p> <p>Site has 1 or 2 priority habitats (listed on next page) within 100 m points = 1</p> <p>Site does not meet any of the criteria above points = 0</p>	<p>2</p>

Rating of Value If score is: X 2 = H 1 = M 0 = L *Record the rating on the first page*

Wetland name or number A

WDFW Priority Habitats

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. <http://wdfw.wa.gov/publications/00165/wdfw00165.pdf> or access the list from here: <http://wdfw.wa.gov/conservation/phs/list/>)

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit: **NOTE:** This question is independent of the land use between the wetland unit and the priority habitat.

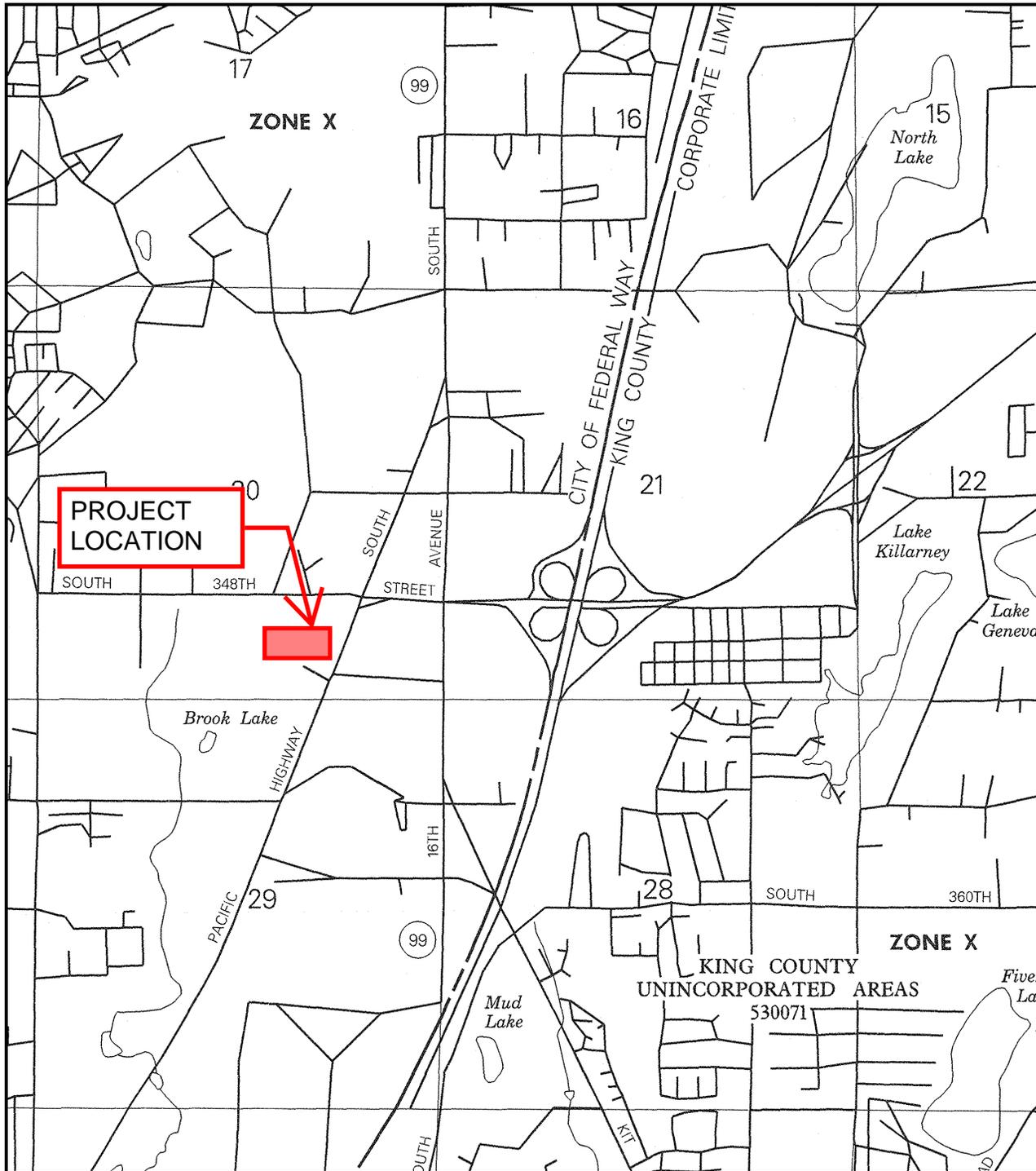
- **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).
- **Biodiversity Areas and Corridors:** Areas of habitat that are relatively important to various species of native fish and wildlife (full descriptions in WDFW PHS report).
- **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.
- **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.
- **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (full descriptions in WDFW PHS report p. 158 – see web link above).
- ✓ **Riparian:** The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (full descriptions in WDFW PHS report p. 161 – see web link above).
- ✓ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- **Nearshore:** Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page).
- **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.
- **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- ✓ **Presumed Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

APPENDIX 6
OPERATIONS AND MAINTENANCE MANUAL
(NOT INCLUDED AT THIS TIME)

APPENDIX 7
CONSTRUCTION STORMWATER POLLUTION PREVENTION PLAN
(NOT INCLUDED AT THIS TIME)

APPENDIX 8
FEMA FLOOD INSURANCE MAP



levees from 100-year flood.

OTHER AREAS

- ZONE X** Areas determined to be outside 500-year floodplain.
- ZONE D** Areas in which flood hazards are undetermined.

NATIONAL FLOOD INSURANCE PROGRAM

**FIRM
FLOOD INSURANCE RATE MAP**

**KING COUNTY,
WASHINGTON AND
INCORPORATED AREAS**

PANEL 1250 OF 1725
(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
FEDERAL WAY, CITY OF	530322	1250	F
KING COUNTY UNINCORPORATED AREAS	530071	1250	F
PACIFIC CITY OF	530086	1250	F

**MAP NUMBER
53033C1250 F**

**MAP REVISED:
MAY 16, 1995**



Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

APPENDIX 9
DESIGN CALCULATIONS AND COMPUTATIONS

WWHM2012
PROJECT REPORT
DETENTION

General Model Information

Project Name: 3278.01 Town Place Hotel Detention
Site Name:
Site Address:
City:
Report Date: 9/13/2019
Gage: Seatac
Data Start: 1948/10/01
Data End: 2009/09/30
Timestep: 15 Minute
Precip Scale: 1.000
Version Date: 2018/10/10
Version: 4.2.16

POC Thresholds

Low Flow Threshold for POC1: 50 Percent of the 2 Year
High Flow Threshold for POC1: 50 Year

Landuse Basin Data

Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use C, Forest, Flat	acre 1.36
Pervious Total	1.36
Impervious Land Use	acre
Impervious Total	0
Basin Total	1.36

Element Flows To:
Surface Interflow Groundwater

DRAFT

Mitigated Land Use

Basin 1

Bypass: No

GroundWater: No

Pervious Land Use acre
C, Lawn, Flat 0.24

Pervious Total 0.24

Impervious Land Use acre
ROOF TOPS FLAT 0.33
SIDEWALKS FLAT 0.09
PARKING FLAT 0.7

Impervious Total 1.12

Basin Total 1.36

Element Flows To:

Surface	Interflow	Groundwater
Vault 1	Vault 1	

DRAFT

Mitigated Routing

Vault 1

Width: 57 ft.
Length: 85 ft.
Depth: 6.5 ft.
Discharge Structure
Riser Height: 5.5 ft.
Riser Diameter: 18 in.
Orifice 1 Diameter: 0.66 in. Elevation:0 ft.
Orifice 2 Diameter: 1 in. Elevation:3 ft.
Orifice 3 Diameter: 1.5 in. Elevation:4.7 ft.
Element Flows To:
Outlet 1 Outlet 2

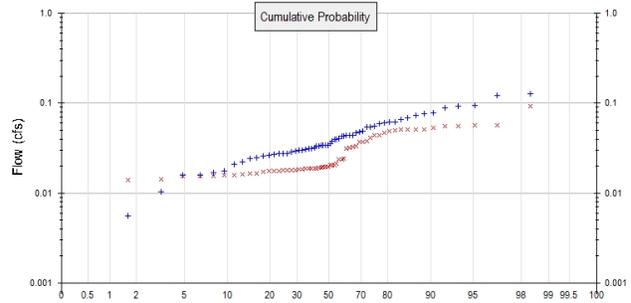
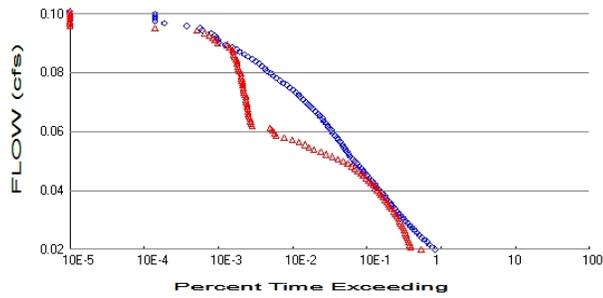
Vault Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.111	0.000	0.000	0.000
0.0722	0.111	0.008	0.003	0.000
0.1444	0.111	0.016	0.004	0.000
0.2167	0.111	0.024	0.005	0.000
0.2889	0.111	0.032	0.006	0.000
0.3611	0.111	0.040	0.007	0.000
0.4333	0.111	0.048	0.007	0.000
0.5056	0.111	0.056	0.008	0.000
0.5778	0.111	0.064	0.009	0.000
0.6500	0.111	0.072	0.009	0.000
0.7222	0.111	0.080	0.010	0.000
0.7944	0.111	0.088	0.010	0.000
0.8667	0.111	0.096	0.011	0.000
0.9389	0.111	0.104	0.011	0.000
1.0111	0.111	0.112	0.011	0.000
1.0833	0.111	0.120	0.012	0.000
1.1556	0.111	0.128	0.012	0.000
1.2278	0.111	0.136	0.013	0.000
1.3000	0.111	0.144	0.013	0.000
1.3722	0.111	0.152	0.013	0.000
1.4444	0.111	0.160	0.014	0.000
1.5167	0.111	0.168	0.014	0.000
1.5889	0.111	0.176	0.014	0.000
1.6611	0.111	0.184	0.015	0.000
1.7333	0.111	0.192	0.015	0.000
1.8056	0.111	0.200	0.015	0.000
1.8778	0.111	0.208	0.016	0.000
1.9500	0.111	0.216	0.016	0.000
2.0222	0.111	0.224	0.016	0.000
2.0944	0.111	0.233	0.017	0.000
2.1667	0.111	0.241	0.017	0.000
2.2389	0.111	0.249	0.017	0.000
2.3111	0.111	0.257	0.018	0.000
2.3833	0.111	0.265	0.018	0.000
2.4556	0.111	0.273	0.018	0.000
2.5278	0.111	0.281	0.018	0.000
2.6000	0.111	0.289	0.019	0.000
2.6722	0.111	0.297	0.019	0.000

2.7444	0.111	0.305	0.019	0.000
2.8167	0.111	0.313	0.019	0.000
2.8889	0.111	0.321	0.020	0.000
2.9611	0.111	0.329	0.020	0.000
3.0333	0.111	0.337	0.025	0.000
3.1056	0.111	0.345	0.029	0.000
3.1778	0.111	0.353	0.032	0.000
3.2500	0.111	0.361	0.034	0.000
3.3222	0.111	0.369	0.036	0.000
3.3944	0.111	0.377	0.038	0.000
3.4667	0.111	0.385	0.040	0.000
3.5389	0.111	0.393	0.042	0.000
3.6111	0.111	0.401	0.043	0.000
3.6833	0.111	0.409	0.045	0.000
3.7556	0.111	0.417	0.046	0.000
3.8278	0.111	0.425	0.047	0.000
3.9000	0.111	0.433	0.049	0.000
3.9722	0.111	0.441	0.050	0.000
4.0444	0.111	0.449	0.051	0.000
4.1167	0.111	0.457	0.052	0.000
4.1889	0.111	0.465	0.053	0.000
4.2611	0.111	0.473	0.054	0.000
4.3333	0.111	0.482	0.055	0.000
4.4056	0.111	0.490	0.057	0.000
4.4778	0.111	0.498	0.058	0.000
4.5500	0.111	0.506	0.059	0.000
4.6222	0.111	0.514	0.060	0.000
4.6944	0.111	0.522	0.060	0.000
4.7667	0.111	0.530	0.077	0.000
4.8389	0.111	0.538	0.085	0.000
4.9111	0.111	0.546	0.091	0.000
4.9833	0.111	0.554	0.097	0.000
5.0556	0.111	0.562	0.101	0.000
5.1278	0.111	0.570	0.106	0.000
5.2000	0.111	0.578	0.110	0.000
5.2722	0.111	0.586	0.114	0.000
5.3444	0.111	0.594	0.117	0.000
5.4167	0.111	0.602	0.121	0.000
5.4889	0.111	0.610	0.124	0.000
5.5611	0.111	0.618	0.368	0.000
5.6333	0.111	0.626	0.902	0.000
5.7056	0.111	0.634	1.595	0.000
5.7778	0.111	0.642	2.385	0.000
5.8500	0.111	0.650	3.212	0.000
5.9222	0.111	0.658	4.014	0.000
5.9944	0.111	0.666	4.734	0.000
6.0667	0.111	0.674	5.326	0.000
6.1389	0.111	0.682	5.771	0.000
6.2111	0.111	0.690	6.087	0.000
6.2833	0.111	0.698	6.427	0.000
6.3556	0.111	0.706	6.713	0.000
6.4278	0.111	0.714	6.986	0.000
6.5000	0.111	0.723	7.249	0.000
6.5722	0.111	0.731	7.503	0.000
6.6444	0.000	0.000	7.748	0.000

Analysis Results

POC 1



+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1

Total Pervious Area: 1.36
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1

Total Pervious Area: 0.24
Total Impervious Area: 1.12

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	0.039985
5 year	0.062798
10 year	0.075727
25 year	0.089423
50 year	0.097899
100 year	0.105108

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	0.024668
5 year	0.038304
10 year	0.049389
25 year	0.065997
50 year	0.080432
100 year	0.096786

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	Predeveloped	Mitigated
1949	0.039	0.017
1950	0.049	0.024
1951	0.088	0.057
1952	0.028	0.015
1953	0.022	0.020
1954	0.034	0.018
1955	0.055	0.018
1956	0.044	0.044
1957	0.035	0.018
1958	0.040	0.020

1959	0.034	0.017
1960	0.060	0.049
1961	0.034	0.033
1962	0.021	0.016
1963	0.029	0.019
1964	0.038	0.031
1965	0.027	0.037
1966	0.026	0.019
1967	0.054	0.024
1968	0.034	0.019
1969	0.033	0.018
1970	0.027	0.020
1971	0.029	0.019
1972	0.066	0.051
1973	0.030	0.037
1974	0.032	0.019
1975	0.044	0.017
1976	0.032	0.019
1977	0.004	0.016
1978	0.028	0.020
1979	0.017	0.014
1980	0.062	0.052
1981	0.025	0.019
1982	0.048	0.045
1983	0.043	0.019
1984	0.026	0.016
1985	0.016	0.017
1986	0.069	0.024
1987	0.061	0.047
1988	0.024	0.018
1989	0.016	0.016
1990	0.128	0.050
1991	0.077	0.051
1992	0.030	0.020
1993	0.031	0.016
1994	0.010	0.014
1995	0.044	0.033
1996	0.094	0.055
1997	0.078	0.056
1998	0.018	0.016
1999	0.073	0.051
2000	0.031	0.021
2001	0.006	0.013
2002	0.034	0.032
2003	0.043	0.018
2004	0.056	0.057
2005	0.040	0.018
2006	0.047	0.042
2007	0.095	0.093
2008	0.123	0.053
2009	0.060	0.038

DRAFT

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.1282	0.0933
2	0.1227	0.0574
3	0.0951	0.0573

4	0.0937	0.0559
5	0.0881	0.0554
6	0.0783	0.0528
7	0.0772	0.0516
8	0.0734	0.0509
9	0.0693	0.0507
10	0.0656	0.0507
11	0.0621	0.0498
12	0.0613	0.0491
13	0.0603	0.0468
14	0.0595	0.0445
15	0.0560	0.0437
16	0.0550	0.0416
17	0.0544	0.0378
18	0.0490	0.0374
19	0.0478	0.0370
20	0.0473	0.0333
21	0.0445	0.0327
22	0.0438	0.0317
23	0.0437	0.0313
24	0.0432	0.0241
25	0.0428	0.0239
26	0.0401	0.0237
27	0.0398	0.0214
28	0.0393	0.0203
29	0.0378	0.0203
30	0.0353	0.0203
31	0.0345	0.0197
32	0.0341	0.0196
33	0.0339	0.0195
34	0.0339	0.0194
35	0.0336	0.0190
36	0.0332	0.0190
37	0.0323	0.0189
38	0.0317	0.0189
39	0.0310	0.0187
40	0.0309	0.0186
41	0.0298	0.0184
42	0.0298	0.0183
43	0.0293	0.0181
44	0.0287	0.0181
45	0.0278	0.0181
46	0.0277	0.0178
47	0.0274	0.0177
48	0.0270	0.0174
49	0.0264	0.0174
50	0.0260	0.0171
51	0.0248	0.0165
52	0.0242	0.0164
53	0.0224	0.0161
54	0.0209	0.0159
55	0.0177	0.0157
56	0.0168	0.0156
57	0.0158	0.0156
58	0.0157	0.0154
59	0.0104	0.0144
60	0.0055	0.0140
61	0.0038	0.0132

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0200	17554	11499	65	Pass
0.0208	16174	8350	51	Pass
0.0216	14972	8104	54	Pass
0.0224	13854	7882	56	Pass
0.0231	12810	7653	59	Pass
0.0239	11813	7428	62	Pass
0.0247	10900	7253	66	Pass
0.0255	10119	7078	69	Pass
0.0263	9390	6847	72	Pass
0.0271	8733	6648	76	Pass
0.0279	8145	6419	78	Pass
0.0286	7599	6186	81	Pass
0.0294	7060	5976	84	Pass
0.0302	6590	5711	86	Pass
0.0310	6149	5416	88	Pass
0.0318	5781	5131	88	Pass
0.0326	5431	4883	89	Pass
0.0334	5097	4588	90	Pass
0.0342	4808	4374	90	Pass
0.0349	4524	4169	92	Pass
0.0357	4252	3968	93	Pass
0.0365	4017	3722	92	Pass
0.0373	3784	3510	92	Pass
0.0381	3546	3328	93	Pass
0.0389	3339	3161	94	Pass
0.0397	3138	2984	95	Pass
0.0405	2952	2774	93	Pass
0.0412	2787	2622	94	Pass
0.0420	2599	2434	93	Pass
0.0428	2447	2233	91	Pass
0.0436	2304	2071	89	Pass
0.0444	2162	1911	88	Pass
0.0452	2026	1778	87	Pass
0.0460	1898	1608	84	Pass
0.0467	1790	1470	82	Pass
0.0475	1688	1331	78	Pass
0.0483	1584	1177	74	Pass
0.0491	1483	1018	68	Pass
0.0499	1380	875	63	Pass
0.0507	1292	737	57	Pass
0.0515	1221	604	49	Pass
0.0523	1155	512	44	Pass
0.0530	1098	413	37	Pass
0.0538	1048	357	34	Pass
0.0546	997	315	31	Pass
0.0554	930	261	28	Pass
0.0562	883	212	24	Pass
0.0570	837	164	19	Pass
0.0578	789	128	16	Pass
0.0586	743	121	16	Pass
0.0593	713	114	15	Pass
0.0601	668	106	15	Pass
0.0609	630	61	9	Pass

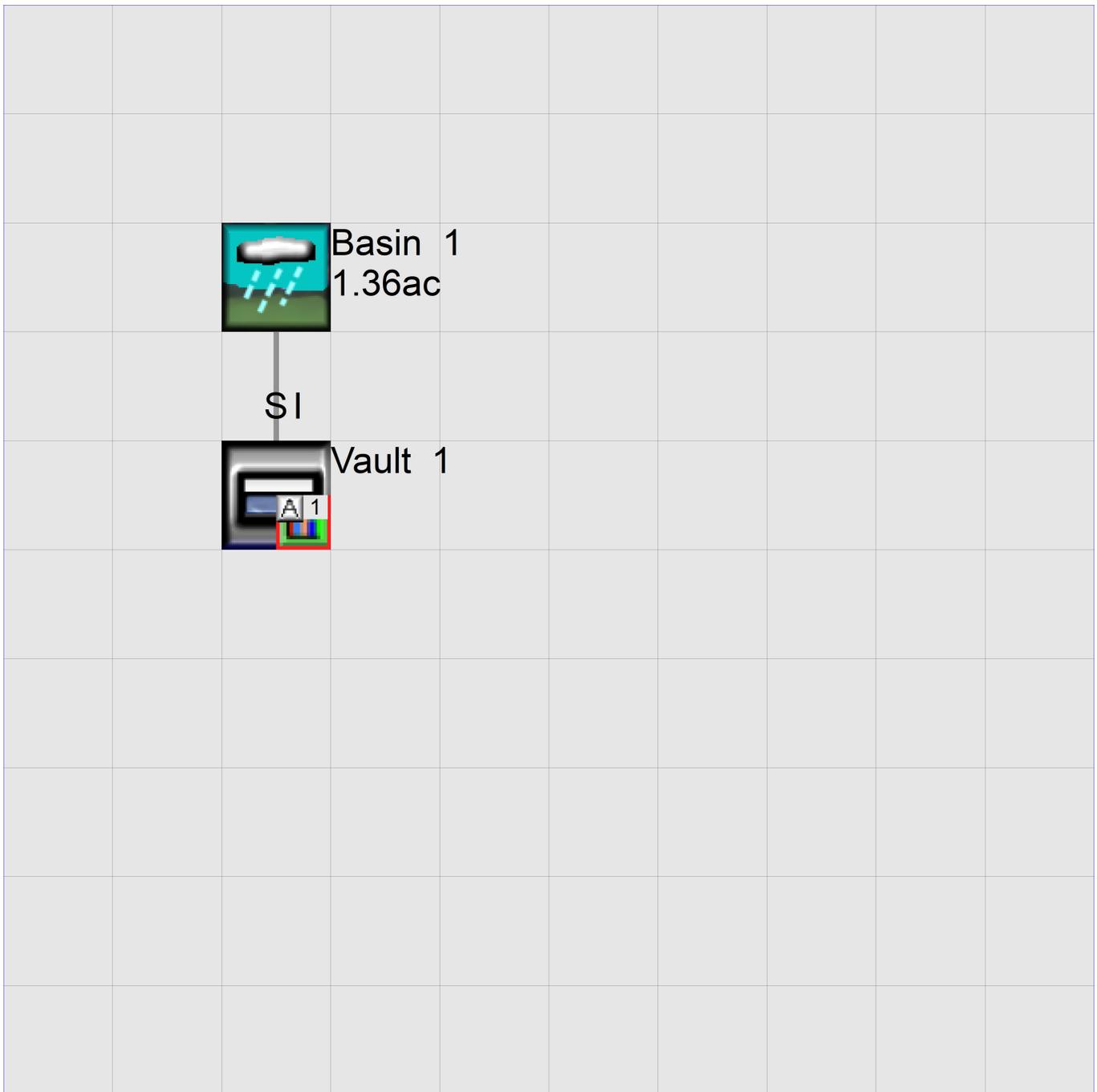
0.0617	595	59	9	Pass
0.0625	565	58	10	Pass
0.0633	539	57	10	Pass
0.0641	496	55	11	Pass
0.0648	473	54	11	Pass
0.0656	434	54	12	Pass
0.0664	399	53	13	Pass
0.0672	366	52	14	Pass
0.0680	348	52	14	Pass
0.0688	323	51	15	Pass
0.0696	296	50	16	Pass
0.0704	272	50	18	Pass
0.0711	256	49	19	Pass
0.0719	235	47	20	Pass
0.0727	217	46	21	Pass
0.0735	195	46	23	Pass
0.0743	180	45	25	Pass
0.0751	158	45	28	Pass
0.0759	145	44	30	Pass
0.0767	129	44	34	Pass
0.0774	119	43	36	Pass
0.0782	109	43	39	Pass
0.0790	97	41	42	Pass
0.0798	91	40	43	Pass
0.0806	82	39	47	Pass
0.0814	76	38	50	Pass
0.0822	68	38	55	Pass
0.0829	61	37	60	Pass
0.0837	54	35	64	Pass
0.0845	48	34	70	Pass
0.0853	41	34	82	Pass
0.0861	38	33	86	Pass
0.0869	33	30	90	Pass
0.0877	27	28	103	Pass
0.0885	22	21	95	Pass
0.0892	21	19	90	Pass
0.0900	20	18	90	Pass
0.0908	19	16	84	Pass
0.0916	17	14	82	Pass
0.0924	13	11	84	Pass
0.0932	12	3	25	Pass
0.0940	8	0	0	Pass
0.0948	4	0	0	Pass
0.0955	3	0	0	Pass
0.0963	3	0	0	Pass
0.0971	3	0	0	Pass
0.0979	3	0	0	Pass

Appendix
Predeveloped Schematic



Basin 1
1.36ac

Mitigated Schematic



Disclaimer

Legal Notice

This program and accompanying documentation are provided 'as-is' without warranty of any kind. The entire risk regarding the performance and results of this program is assumed by End User. Clear Creek Solutions Inc. and the governmental licensee or sublicensees disclaim all warranties, either expressed or implied, including but not limited to implied warranties of program and accompanying documentation. In no event shall Clear Creek Solutions Inc. be liable for any damages whatsoever (including without limitation to damages for loss of business profits, loss of business information, business interruption, and the like) arising out of the use of, or inability to use this program even if Clear Creek Solutions Inc. or their authorized representatives have been advised of the possibility of such damages. Software Copyright © by : Clear Creek Solutions, Inc. 2005-2019; All Rights Reserved.

Clear Creek Solutions, Inc.
6200 Capitol Blvd. Ste F
Olympia, WA. 98501
Toll Free 1(866)943-0304
Local (360)943-0304

www.clearcreeksolutions.com

DRAFT

WWHM2012
PROJECT REPORT
TREATMENT
BASIN 1

General Model Information

Project Name: 3278.01 Town Place Hotel Treatment
Site Name:
Site Address:
City:
Report Date: 9/13/2019
Gage: Seatac
Data Start: 1948/10/01
Data End: 2009/09/30
Timestep: 15 Minute
Precip Scale: 1.000
Version Date: 2018/10/10
Version: 4.2.16

POC Thresholds

Low Flow Threshold for POC1: 50 Percent of the 2 Year
High Flow Threshold for POC1: 50 Year

Landuse Basin Data

Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use C, Forest, Flat	acre 0.35
Pervious Total	0.35
Impervious Land Use	acre
Impervious Total	0
Basin Total	0.35

Element Flows To:
Surface Interflow Groundwater

DRAFT

Mitigated Land Use

Basin 1

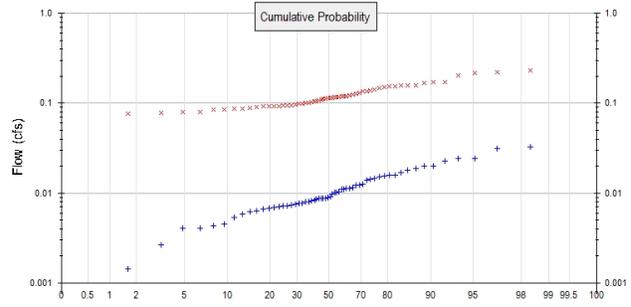
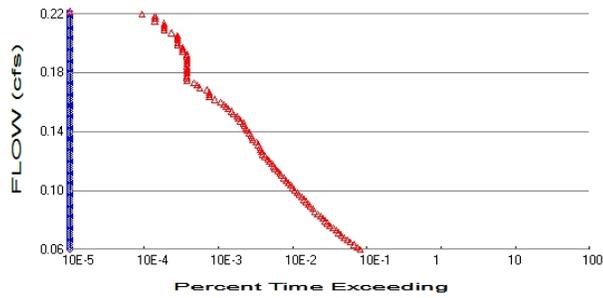
Bypass:	No
GroundWater:	No
Pervious Land Use C, Lawn, Flat	acre 0.06
Pervious Total	0.06
Impervious Land Use PARKING FLAT	acre 0.29
Impervious Total	0.29
Basin Total	0.35

Element Flows To:
Surface Interflow Groundwater

DRAFT

Analysis Results

POC 1



+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1

Total Pervious Area: 0.35
 Total Impervious Area: 0

Mitigated Landuse Totals for POC #1

Total Pervious Area: 0.06
 Total Impervious Area: 0.29

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	0.01029
5 year	0.016161
10 year	0.019489
25 year	0.023013
50 year	0.025195
100 year	0.02705

Flow Frequency Return Periods for Mitigated. POC #1

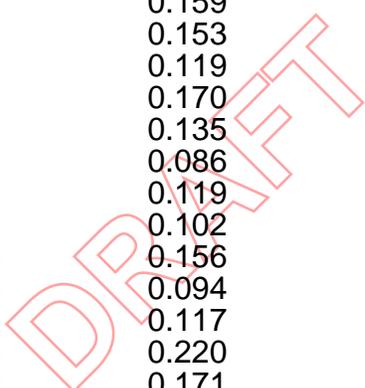
Return Period	Flow(cfs)
2 year	0.114402
5 year	0.14586
10 year	0.167388
25 year	0.195471
50 year	0.217072
100 year	0.239283

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	Predeveloped	Mitigated
1949	0.010	0.152
1950	0.013	0.156
1951	0.023	0.095
1952	0.007	0.080
1953	0.006	0.087
1954	0.009	0.093
1955	0.014	0.105
1956	0.011	0.103
1957	0.009	0.120
1958	0.010	0.094

1959	0.009	0.094
1960	0.015	0.098
1961	0.009	0.101
1962	0.005	0.086
1963	0.007	0.098
1964	0.010	0.093
1965	0.007	0.124
1966	0.007	0.081
1967	0.014	0.139
1968	0.009	0.159
1969	0.009	0.113
1970	0.007	0.107
1971	0.008	0.127
1972	0.017	0.136
1973	0.008	0.077
1974	0.008	0.117
1975	0.011	0.129
1976	0.008	0.091
1977	0.001	0.094
1978	0.007	0.116
1979	0.004	0.159
1980	0.016	0.153
1981	0.006	0.119
1982	0.012	0.170
1983	0.011	0.135
1984	0.007	0.086
1985	0.004	0.119
1986	0.018	0.102
1987	0.016	0.156
1988	0.006	0.094
1989	0.004	0.117
1990	0.033	0.220
1991	0.020	0.171
1992	0.008	0.086
1993	0.008	0.073
1994	0.003	0.078
1995	0.011	0.105
1996	0.024	0.116
1997	0.020	0.112
1998	0.005	0.109
1999	0.019	0.231
2000	0.008	0.114
2001	0.001	0.121
2002	0.009	0.149
2003	0.011	0.116
2004	0.014	0.216
2005	0.010	0.099
2006	0.012	0.088
2007	0.024	0.203
2008	0.032	0.168
2009	0.016	0.143



Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.0330	0.2315
2	0.0316	0.2196
3	0.0245	0.2157

4	0.0241	0.2025
5	0.0227	0.1715
6	0.0202	0.1704
7	0.0199	0.1684
8	0.0189	0.1588
9	0.0178	0.1585
10	0.0169	0.1561
11	0.0160	0.1561
12	0.0158	0.1533
13	0.0155	0.1519
14	0.0153	0.1491
15	0.0144	0.1431
16	0.0141	0.1395
17	0.0140	0.1364
18	0.0126	0.1348
19	0.0123	0.1292
20	0.0122	0.1274
21	0.0114	0.1237
22	0.0113	0.1212
23	0.0113	0.1195
24	0.0111	0.1190
25	0.0110	0.1190
26	0.0103	0.1174
27	0.0102	0.1170
28	0.0101	0.1163
29	0.0097	0.1159
30	0.0091	0.1155
31	0.0089	0.1137
32	0.0088	0.1126
33	0.0087	0.1117
34	0.0087	0.1093
35	0.0086	0.1067
36	0.0085	0.1052
37	0.0083	0.1047
38	0.0081	0.1033
39	0.0080	0.1015
40	0.0080	0.1014
41	0.0077	0.0988
42	0.0077	0.0982
43	0.0075	0.0977
44	0.0074	0.0947
45	0.0072	0.0941
46	0.0071	0.0940
47	0.0070	0.0937
48	0.0070	0.0935
49	0.0068	0.0931
50	0.0067	0.0929
51	0.0064	0.0909
52	0.0062	0.0881
53	0.0058	0.0867
54	0.0054	0.0865
55	0.0046	0.0860
56	0.0043	0.0857
57	0.0041	0.0805
58	0.0040	0.0802
59	0.0027	0.0781
60	0.0014	0.0768
61	0.0010	0.0731

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume: 0.0375 acre-feet

On-line facility target flow: 0.0466 cfs.

Adjusted for 15 min: 0.0466 cfs.

Off-line facility target flow: 0.0262 cfs.

Adjusted for 15 min: 0.0262 cfs.

DRAFT

Appendix
Predeveloped Schematic



Basin 1
0.35ac

Mitigated Schematic



Basin 1
0.35ac

Disclaimer

Legal Notice

This program and accompanying documentation are provided 'as-is' without warranty of any kind. The entire risk regarding the performance and results of this program is assumed by End User. Clear Creek Solutions Inc. and the governmental licensee or sublicensees disclaim all warranties, either expressed or implied, including but not limited to implied warranties of program and accompanying documentation. In no event shall Clear Creek Solutions Inc. be liable for any damages whatsoever (including without limitation to damages for loss of business profits, loss of business information, business interruption, and the like) arising out of the use of, or inability to use this program even if Clear Creek Solutions Inc. or their authorized representatives have been advised of the possibility of such damages. Software Copyright © by : Clear Creek Solutions, Inc. 2005-2019; All Rights Reserved.

Clear Creek Solutions, Inc.
6200 Capitol Blvd. Ste F
Olympia, WA. 98501
Toll Free 1(866)943-0304
Local (360)943-0304

www.clearcreeksolutions.com

DRAFT

WWHM2012
PROJECT REPORT
TREATMENT
BASIN 2

General Model Information

Project Name: 3278.01 Town Place Hotel Treatment
Site Name:
Site Address:
City:
Report Date: 9/13/2019
Gage: Seatac
Data Start: 1948/10/01
Data End: 2009/09/30
Timestep: 15 Minute
Precip Scale: 1.000
Version Date: 2018/10/10
Version: 4.2.16

POC Thresholds

Low Flow Threshold for POC1: 50 Percent of the 2 Year
High Flow Threshold for POC1: 50 Year

Landuse Basin Data

Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use C, Forest, Flat	acre 0.54
Pervious Total	0.54
Impervious Land Use	acre
Impervious Total	0
Basin Total	0.54

Element Flows To:
Surface Interflow Groundwater

DRAFT

Mitigated Land Use

Basin 1

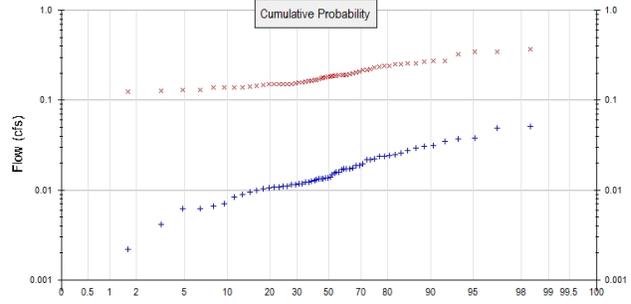
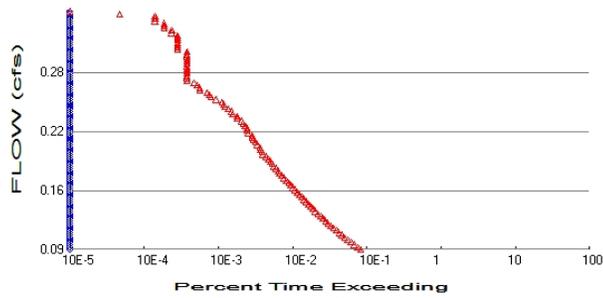
Bypass:	No
GroundWater:	No
Pervious Land Use C, Lawn, Flat	acre 0.07
Pervious Total	0.07
Impervious Land Use PARKING FLAT	acre 0.47
Impervious Total	0.47
Basin Total	0.54

Element Flows To:
Surface Interflow Groundwater

DRAFT

Analysis Results

POC 1



+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1

Total Pervious Area: 0.54
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1

Total Pervious Area: 0.07
Total Impervious Area: 0.47

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	0.015876
5 year	0.024935
10 year	0.030068
25 year	0.035506
50 year	0.038872
100 year	0.041734

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	0.183682
5 year	0.233559
10 year	0.267621
25 year	0.311981
50 year	0.346054
100 year	0.38105

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	Predeveloped	Mitigated
1949	0.016	0.242
1950	0.019	0.252
1951	0.035	0.151
1952	0.011	0.130
1953	0.009	0.140
1954	0.014	0.149
1955	0.022	0.168
1956	0.017	0.166
1957	0.014	0.191
1958	0.016	0.151

1959	0.014	0.152
1960	0.024	0.156
1961	0.013	0.162
1962	0.008	0.139
1963	0.011	0.157
1964	0.015	0.150
1965	0.011	0.198
1966	0.010	0.130
1967	0.022	0.224
1968	0.013	0.255
1969	0.013	0.180
1970	0.011	0.171
1971	0.012	0.204
1972	0.026	0.217
1973	0.012	0.124
1974	0.013	0.188
1975	0.017	0.209
1976	0.013	0.145
1977	0.001	0.153
1978	0.011	0.187
1979	0.007	0.256
1980	0.025	0.243
1981	0.010	0.191
1982	0.019	0.273
1983	0.017	0.217
1984	0.010	0.139
1985	0.006	0.191
1986	0.028	0.164
1987	0.024	0.252
1988	0.010	0.152
1989	0.006	0.190
1990	0.051	0.346
1991	0.031	0.272
1992	0.012	0.138
1993	0.012	0.118
1994	0.004	0.127
1995	0.018	0.169
1996	0.037	0.185
1997	0.031	0.178
1998	0.007	0.176
1999	0.029	0.370
2000	0.012	0.182
2001	0.002	0.196
2002	0.013	0.238
2003	0.017	0.185
2004	0.022	0.345
2005	0.016	0.158
2006	0.019	0.140
2007	0.038	0.323
2008	0.049	0.267
2009	0.024	0.232

DRAFT

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.0509	0.3698
2	0.0487	0.3456
3	0.0378	0.3449

4	0.0372	0.3234
5	0.0350	0.2728
6	0.0311	0.2715
7	0.0306	0.2667
8	0.0292	0.2565
9	0.0275	0.2550
10	0.0260	0.2524
11	0.0247	0.2521
12	0.0243	0.2429
13	0.0239	0.2422
14	0.0236	0.2376
15	0.0222	0.2318
16	0.0218	0.2241
17	0.0216	0.2174
18	0.0194	0.2167
19	0.0190	0.2093
20	0.0188	0.2044
21	0.0177	0.1976
22	0.0174	0.1960
23	0.0174	0.1913
24	0.0172	0.1912
25	0.0170	0.1911
26	0.0159	0.1896
27	0.0158	0.1879
28	0.0156	0.1870
29	0.0150	0.1851
30	0.0140	0.1846
31	0.0137	0.1822
32	0.0135	0.1798
33	0.0135	0.1784
34	0.0135	0.1762
35	0.0133	0.1713
36	0.0132	0.1692
37	0.0128	0.1684
38	0.0126	0.1660
39	0.0123	0.1638
40	0.0123	0.1624
41	0.0118	0.1579
42	0.0118	0.1573
43	0.0116	0.1557
44	0.0114	0.1525
45	0.0110	0.1518
46	0.0110	0.1516
47	0.0109	0.1513
48	0.0107	0.1511
49	0.0105	0.1503
50	0.0103	0.1495
51	0.0099	0.1454
52	0.0096	0.1404
53	0.0089	0.1401
54	0.0083	0.1389
55	0.0070	0.1388
56	0.0067	0.1375
57	0.0063	0.1297
58	0.0062	0.1295
59	0.0041	0.1265
60	0.0022	0.1245
61	0.0015	0.1178

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume: 0.0599 acre-feet

On-line facility target flow: 0.0756 cfs.

Adjusted for 15 min: 0.0756 cfs.

Off-line facility target flow: 0.0427 cfs.

Adjusted for 15 min: 0.0427 cfs.

DRAFT

Appendix
Predeveloped Schematic



Basin 1
0.54ac

Mitigated Schematic



Basin 1
0.54ac

Disclaimer

Legal Notice

This program and accompanying documentation are provided 'as-is' without warranty of any kind. The entire risk regarding the performance and results of this program is assumed by End User. Clear Creek Solutions Inc. and the governmental licensee or sublicensees disclaim all warranties, either expressed or implied, including but not limited to implied warranties of program and accompanying documentation. In no event shall Clear Creek Solutions Inc. be liable for any damages whatsoever (including without limitation to damages for loss of business profits, loss of business information, business interruption, and the like) arising out of the use of, or inability to use this program even if Clear Creek Solutions Inc. or their authorized representatives have been advised of the possibility of such damages. Software Copyright © by : Clear Creek Solutions, Inc. 2005-2019; All Rights Reserved.

Clear Creek Solutions, Inc.
6200 Capitol Blvd. Ste F
Olympia, WA. 98501
Toll Free 1(866)943-0304
Local (360)943-0304

www.clearcreeksolutions.com

DRAFT

APPENDIX 10
KING COUNTY SURFACE WATER MANUAL WORKSHEETS

TECHNICAL INFORMATION REPORT (TIR) WORKSHEET

Part 1 PROJECT OWNER AND PROJECT ENGINEER	
Project Owner	HC FW, LLC
Phone	
Address	3926 Aurora Ave. N Seattle, WA 98103
Project Engineer	Tyrell Bradley, PE
Company	SCJ Alliance
Phone	(360) 352 - 1465

Part 2 PROJECT LOCATION AND DESCRIPTION	
Project Name	Town Place Hotel
DDES Permit #	
Location Township	21 N
Range	4 E
Section	20
Site Address	34839 Pacific Hwy S Federal Way, WA 38003

Part 3 TYPE OF PERMIT APPLICATION	
<input type="checkbox"/> Landuse Services Subdivision / Short Subd. / UPD	
<input checked="" type="checkbox"/> Building Services M/F / Commerical / SFR	
<input checked="" type="checkbox"/> Clearing and Grading	
<input type="checkbox"/> Right-of-Way Use	
<input type="checkbox"/> Other	

Part 4 OTHER REVIEWS AND PERMITS	
<input type="checkbox"/> DFW HPA	<input type="checkbox"/> Shoreline Management
<input type="checkbox"/> COE 404	<input type="checkbox"/> Structural Rockery/Vault/_____
<input type="checkbox"/> DOE Dam Safety	<input type="checkbox"/> ESA Section 7
<input type="checkbox"/> FEMA Floodplain	
<input type="checkbox"/> COE Wetlands	
<input type="checkbox"/> Other _____	

Part 5 PLAN AND REPORT INFORMATION			
Technical Information Report		Site Improvement Plan (Engr. Plans)	
Type of Drainage Review (circle one):	<input checked="" type="radio"/> Full / Targeted / Large Site	Type (circle one):	<input checked="" type="radio"/> Full / Modified / Small Site
Date (include revision dates):	09/25/2019	Date (include revision dates):	09/25/2019
Date of Final:		Date of Final:	

Part 6 ADJUSTMENT APPROVALS	
Type (circle one):	Standard / Complex / Preapplication / Experimental / Blanket
Description: (include conditions in TIR Section 2)	

Date of Approval: _____	

TECHNICAL INFORMATION REPORT (TIR) WORKSHEET

Part 7 MONITORING REQUIREMENTS	
Monitoring Required: Yes / No	Describe: _____ _____ _____
Start Date: _____	
Completion Date: _____	

Part 8 SITE COMMUNITY AND DRAINAGE BASIN
Community Plan : _____
Special District Overlays: _____
Drainage Basin: <u>Duwamish River</u>
Stormwater Requirements: Core Requirements #1-8, Special Requirements #1-5 _____

Part 9 ONSITE AND ADJACENT SENSITIVE AREAS	
<input checked="" type="checkbox"/> River/Stream <u>On-site stream</u>	<input type="checkbox"/> Steep Slope _____
<input type="checkbox"/> Lake _____	<input type="checkbox"/> Erosion Hazard _____
<input type="checkbox"/> Wetlands _____	<input type="checkbox"/> Landslide Hazard _____
<input type="checkbox"/> Closed Depression _____	<input type="checkbox"/> Coal Mine Hazard _____
<input type="checkbox"/> Floodplain _____	<input type="checkbox"/> Seismic Hazard _____
<input type="checkbox"/> Other _____	<input type="checkbox"/> Habitat Protection _____
_____	<input type="checkbox"/> _____

Part 10 SOILS		
Soil Type	Slopes	Erosion Potential
<u>Everett-Alderwood</u>	<u>6 to 15 percent</u>	_____
<u>gravelly sandy loams</u>	_____	_____
_____	_____	_____
_____	_____	_____
<input type="checkbox"/> High Groundwater Table (within 5 feet)	<input type="checkbox"/> Sole Source Aquifer	
<input type="checkbox"/> Other _____	<input type="checkbox"/> Seeps/Springs	
<input type="checkbox"/> Additional Sheets Attached		

TECHNICAL INFORMATION REPORT (TIR) WORKSHEET

Part 11 DRAINAGE DESIGN LIMITATIONS	
REFERENCE	LIMITATION / SITE CONSTRAINT
<input type="checkbox"/> Core 2 – Offsite Analysis	_____
<input type="checkbox"/> Sensitive/Critical Areas	_____
<input type="checkbox"/> SEPA	_____
<input type="checkbox"/> Other	_____
<input type="checkbox"/> _____	_____
<input type="checkbox"/> Additional Sheets Attached	

Part 12 TIR SUMMARY SHEET (provide one TIR Summary Sheet per Threshold Discharge Area)	
Threshold Discharge Area: (name or description)	On-site stormwater improvements to drain to on-site stream
Core Requirements (all 8 apply)	
Discharge at Natural Location	Number of Natural Discharge Locations: 1
Offsite Analysis	Level: ① / 2 / 3 dated: _____
Flow Control (incl. facility summary sheet)	Level: 1 / ② / 3 or Exemption Number _____ Small Site BMPs _____
Conveyance System	Spill containment located at: _____
Erosion and Sediment Control	ESC Site Supervisor: Contact Phone: After Hours Phone:
Maintenance and Operation	Responsibility: Private / Public If Private, Maintenance Log Required: Yes / No
Financial Guarantees and Liability	Provided: Yes / No
Water Quality (include facility summary sheet)	Type: Basic / Sens. Lake / Enhanced Basicm / Bog or Exemption No. _____ Landscape Management Plan: Yes / No
Special Requirements (as applicable)	
Area Specific Drainage Requirements	Type: CDA / SDO / MDP / BP / LMP / Shared Fac. / None Name: _____
Floodplain/Floodway Delineation	Type: Major / Minor / Exemption / None 100-year Base Flood Elevation (or range): _____ Datum:
Flood Protection Facilities	Describe:
Source Control (comm./industrial landuse)	Describe landuse: Describe any structural controls:

TECHNICAL INFORMATION REPORT (TIR) WORKSHEET

Oil Control	High-use Site: Yes / No Treatment BMP: _____ Maintenance Agreement: Yes / No with whom? _____
Other Drainage Structures	
Describe:	

Part 13 EROSION AND SEDIMENT CONTROL REQUIREMENTS	
<p style="text-align: center;">MINIMUM ESC REQUIREMENTS DURING CONSTRUCTION</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Clearing Limits <input checked="" type="checkbox"/> Cover Measures <input checked="" type="checkbox"/> Perimeter Protection <input type="checkbox"/> Traffic Area Stabilization <input type="checkbox"/> Sediment Retention <input type="checkbox"/> Surface Water Collection <input type="checkbox"/> Dewatering Control <input checked="" type="checkbox"/> Dust Control <input checked="" type="checkbox"/> Flow Control 	<p style="text-align: center;">MINIMUM ESC REQUIREMENTS AFTER CONSTRUCTION</p> <ul style="list-style-type: none"> <input type="checkbox"/> Stabilize Exposed Surfaces <input type="checkbox"/> Remove and Restore Temporary ESC Facilities <input type="checkbox"/> Clean and Remove All Silt and Debris, Ensure Operation of Permanent Facilities <input type="checkbox"/> Flag Limits of SAO and open space preservation areas <input type="checkbox"/> Other _____

Part 14 STORMWATER FACILITY DESCRIPTIONS (Note: Include Facility Summary and Sketch)			
Flow Control	Type/Description	Water Quality	Type/Description
<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Detention <input type="checkbox"/> Infiltration <input type="checkbox"/> Regional Facility <input type="checkbox"/> Shared Facility <input type="checkbox"/> Flow Control BMPs <input type="checkbox"/> Other 	<p>Pipes/Vault</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Biofiltration <input type="checkbox"/> Wetpool <input type="checkbox"/> Media Filtration <input type="checkbox"/> Oil Control <input type="checkbox"/> Spill Control <input type="checkbox"/> Flow Control BMPs <input checked="" type="checkbox"/> Other 	<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>Modular Wetland Systems</p>

TECHNICAL INFORMATION REPORT (TIR) WORKSHEET

Part 15 EASEMENTS/TRACTS	Part 16 STRUCTURAL ANALYSIS
<input type="checkbox"/> Drainage Easement <input type="checkbox"/> Covenant <input type="checkbox"/> Native Growth Protection Covenant <input type="checkbox"/> Tract <input type="checkbox"/> Other	<input type="checkbox"/> Cast in Place Vault <input type="checkbox"/> Retaining Wall <input type="checkbox"/> Rockery > 4' High <input type="checkbox"/> Structural on Steep Slope <input type="checkbox"/> Other

Part 17 SIGNATURE OF PROFESSIONAL ENGINEER
<p>I, or a civil engineer under my supervision, have visited the site. Actual site conditions as observed were incorporated into this worksheet and the attached Technical Information Report. To the best of my knowledge the information provided here is accurate.</p> <hr/> <p style="text-align: center;"><i>Signed/Date</i></p>

STORMWATER FACILITY SUMMARY SHEET

DDES Permit

Number 1

(provide one Stormwater Facility Summary Sheet per *Natural Discharge Location*)

Overview:

Project Name

Town Place Hotel, Federal Way

Date 09/25/2019

Downstream Drainage Basins

Major Basin Name Hylebos Creek Basin

Immediate Basin Name Hylebos Creek Basin

Flow Control:

Flow Control Facility Name/Number 1

Facility

Location Western edge of parking lot

If none,

Flow control provided in regional/shared facility (give location) _____

No flow control required _____ Exemption number _____

General Facility Information:

Type/Number of detention facilities: Type/Number of infiltration facilities:

_____ ponds

_____ ponds

1 vaults

_____ tanks

_____ tanks

_____ trenches

Control Structure Location

West edge of parking lot

Type of Control Structure Type 2 - 54 in. catch basin Number of Orifices/Restrictions

3

Size of Orifice/Restriction:

No. 1 0.66 in.

No. 2 1 in.

No. 3 1.5 in.

No. 4 _____

Flow Control Performance Standard Level 2

Live Storage Volume 26,650 C.F. Depth 5.5 ft. Volume Factor of Safety _____

Number of Acres Served 1.36

Number of Lots 1

Dam Safety Regulations (Washington State Department of Ecology)

Reservoir Volume above natural grade _____

Depth of Reservoir above natural grade _____

Facility Summary Sheet Sketch

All detention, infiltration and water quality facilities must include a detailed sketch.
(11"x17" reduced size plan sheets may be used)

See Appendix 4: Preliminary Construction Plans

Water Quality:

Type/Number of water quality facilities/BMPs:

_____ biofiltration swale (regular/wet/ or continuous inflow large)	_____ sand filter (basic or large)
_____ combined detention/wetpond (wetpond portion basic or large)	_____ sand filter, linear (basic or large)
_____ combined detention/wetvault	_____ sand filter vault (basic or large)
_____ filter strip	_____ sand bed depth _____ (inches)
_____ flow dispersion	_____ stormwater wetland
_____ farm management plan	_____ 2 storm filter Bioclean: Modular Wetland Systems
_____ landscape management plan	_____ wetpond (basic or large)
_____ oil/water separator above	_____ wetvault
(baffle or coalescing plate)	_____ Is facility Lined?
Liner? _____	If so, what marker is used
_____ catch basin inserts: Manufacturer _____	
_____ pre-settling pond	
_____ pre-settling structure: Manufacturer _____	
_____ high flow bypass structure (e.g., flow-splitter catch basin)	
_____ source controls	

Design Information

Water Quality design flow 0.0262 cfs and 0.0427 cfs

Water Quality treated volume (sandfilter) _____

Water Quality storage volume (wetpool) _____

Facility Summary Sheet Sketch

All detention, infiltration and water quality facilities must include a detailed sketch.
(11"x17" reduced size plan sheets may be used)

See Appendix 4: Preliminary Construction Plans

APPENDIX 11
DECLARATION OF COVENANT
(NOT INCLUDED AT THIS TIME)
