CITY OF
MUKILTEO

REQUEST FOR COMMENTS

DATE: November 7, 2019

	Alderwood Water District – Mike Graves		Pilchuck Audubon Society (President)
	Burlington Northern Santa Fe Railway (Marvinique Hill)		Port of Everett (Laura Gurley)
	City of Edmonds (Rob Chave)	X	Puget Sound Clean Air Agency (SEPA Email / Air Resource Specialist)
	City of Everett (Allan Giffen)	X	Puget Sound Energy (Dom Amor)
	City of Everett (Steve Ingalsbe)		Puget Sound Regional Council
	City of Lynnwood (Todd Hall)		Seattle Dist. Corps of Engineers (Dept. Army-Reg. Branch)
	City of Mill Creek (Tom Rogers)	X	Snohomish Co. Airport/Paine Field (A. Rardin/R. Zulauf)
X	City of Mukilteo (Building Official)		Snohomish Co. Assessor's Office ***(Ordinances Only)***
X	City of Mukilteo (Fire Chief)		Snohomish Co. Conservation District
X	City of Mukilteo (Fire Marshal)	X	Snohomish Co. PW/ Environmental (Shannon Flemming)
X	City of Mukilteo (Engineering)		Snohomish Co. Marine Res. Comm. (Kathleen Herrmann)
X	City of Mukilteo (Com. Dev. Dir.)	X	Snohomish Co. Planning & Dev. Srvc. (Ryan Countryman)
X	City of Mukilteo (Police, Cheol Kang, Myron Travis)	X	Snohomish Co. PUD: Dist. Eng. Services (Mary Wicklund)
X	Comcast of Washington (Casey Brown, John Warrick)	X	Snohomish Health District (Bruce A. Straughn)
X	Community Transit (Kate Tourtellot)	X	Sound Transit Authority (Perry Weinberg)
	Dept. of Commerce (Growth Mgmt. Svcs Rev. Team)		South Snohomish Co. Fire Dist. (Kevin Zweber)
	Dept. of Natural Resources (James Taylor)	X	Tulalip Tribes – (Zachary Lamebull)
	Economic Alliance of Snohomish County	X	Tulalip Tribes – (Richard Young)
X	FAA/Air Traffic Division, ANM-0520 (Daniel Shoemaker)	X	United States Postal Service (Soon H. Kim)
	FEMA (John Graves)	X	Verizon Company of the NW, Inc. (Tim Rennick.)
	Island County MRC (Rex Porter) (*Shoreline Only)*	X	Washington Dept. of Ecology (Peg Plummer)
X	Master Builders King/Sno. Counties (Mike Pattison)	X	Washington Dept of Fish & Wildlife (Jamie Bails)
X	Mukilteo School District (Cindy Steigerwald)	X	WSDOT (Leah Bolotin)
X	Mukilteo School District (Josette Fisher)	X	WSDOT (Ramin Pazooki)
X	Mukilteo Water & Wastewater District (Jim Voetberg, Manager; Rick Matthews; Kendra Chapman)		WSDOT Ferries(Kevin Bartoy) (*Shoreline Only)*
	National Marine Fishery Service		WRIA 7 Water Resources
	Office of Archaeology & Historic Pres. (Allyson Brooks)		Other:
	Ogden, Murphy, Wallace (Daniel Kenny) ***(Ordinances Only)***		

FILE NO.: DA-2019-002 and BSP-2019-001 PROPONENT: Paula Townsell on behalf of Wild Sockeye LLC

PROJECT NAME: Harbour Pointe Townhomes Binding Site Plan and Amendment to Sector Plan and Development Agreement

PROJECT DESCRIPTION: This is a proposal to amend the existing Development Agreement and Sector 3 Plan (City of Mukilteo File No. PPR-2007-13, recorded under Snohomish County Auditor's File No. 200711290678) and for a new Binding Site Plan to change the allowed use from commercial to residential development. If approved, this would allow for the development of 32 townhouse-style condos on Lot 4A. There will be four (4) buildings, a community playground, a picnic area, and various pocket art parks. Eight (8) visitor parking spots are proposed to be scattered throughout the site. The site fronts on Harbour Place, which is an existing public roadway. Access to the site currently is available from a private joint use roadway shared with the Harbour Pointe Montessori School. A second entrance off Harbour Place is being proposed as the primary access for the proposed townhouse project.

FILE NO.: DA-2019-002 and BSP-2019-001 PROPONENT: Paula Townsell on behalf of Wild Sockeye LLC

PROJECT NAME: Harbour Pointe Townhomes Binding Site Plan and Amendment to Sector Plan and Development Agreement

ATTACHED IS:

X	Notice of Application	X	Traffic Impact Analysis Report
X	Environmental Checklist	X	Cost Benefit Analysis
X	Application	X	Impact Analysis Report
X	Narrative Statement(s)	X	Geotechnical Report dated February 8, 2019
X	Site Plan (Reduced)	X	Geotechnical Report dated March 22, 2019
X	Location Map	X	Geotechnical Report dated September 20, 2019
X	Targeted Drainage Report	X	Critical Areas Study
X	Binding Site Plan	X	Civil Plans

NOTE: _____

_____

****

Please review this project as it relates to your area of concern and return your comments with this cover sheet by, 4:30pm, Thursday, November 21, 2019 to Linda Ritter, Senior Planner, City of Mukilteo, 11930 Cyrus Way, Mukilteo, WA 98275.

Linda Ritter
Senior Planner

11/6/19
Date

****

RESPONSE SECTION:

_____ Comments Attached _____ No Comments

COMMENTS: _____

_____

_____ _____
Signature Date

_____
Company

DO YOU WANT A COPY OF OUR NOTICE OF DECISION YES __ NO __

CITY OF
MUKILTEO
11930 Cyrus Way
Mukilteo, WA 98275
(425) 263-8000

Notice of Application

Harbour Pointe Townhomes Binding Site Plan and Amendment to Sector Plan and Development Agreement 9900 Harbour Place

Paula Townsell, on behalf of **Wild Sockeye LLC,** applied for a Binding Site Plan, Development Agreement amendment, and amendment to the Sector 3 Harbour Pointe Master Plan with the City of Mukilteo on September 20, 2019. The application was determined complete on October 24, 2019. (File Nos. DA-2019-002 and BSP-2019-001)

Description of Proposal: This is a proposal to amend the existing Development Agreement and Sector 3 Plan (City of Mukilteo File No. PPR-2007-13, recorded under Snohomish County Auditor's File No. 200711290678) and for a new Binding Site Plan to change the allowed use from commercial to residential development. If approved, this would allow for the development of 32 townhouse-style condos on Lot 4A. There will be four (4) buildings, a community playground, a picnic area, and various pocket art parks. Eight (8) visitor parking spots are proposed to be scattered throughout the site. The site fronts on Harbour Place, which is an existing public roadway. Access to the site currently is available from a private joint use roadway shared with the Harbour Pointe Montessori School. A second entrance off Harbour Place is being proposed as the primary access for the proposed townhouse project.

Location of Proposal: 9900 Harbour Place, Mukilteo WA 98275; legally described as Sections 21 & 16 Township 28 Range 04 Quarter NE - PAR 4A OF ROS & AMEND BSP REC UND AFN 200508295173 BEING PTN LOT 4 HARBOUR POINTE BUSINESS CTR BIG GULCH CAMPUS BSP/ROS REC UND AFN 9312305007BEING PTN SE1/4 SE1/4 SEC 16 & NE1/4 NE1/4 SEC 21 ALL IN TWP 28 RGE 04

Environmental Documents Prepared for the Proposal:

- Environmental Checklist, prepared by Paris Beta LLC, dated September 19, 2019
- Traffic Impact Analysis Report, prepared by Gibson Traffic Consultants, Inc., dated August 2019
- Cost Benefit Analysis Report, prepared by Leland Consulting Group, dated September 10, 2019
- Impact Analysis Report, prepared by Brent Planning Solutions, LLC, dated October 2019
- Geotechnical Report, prepared by Associated Earth Science, Inc., dated February 8, 2019
- Geotechnical Report, prepared by Associated Earth Science, Inc., dated March 22, 2019
- Geotechnical Report, prepared by Associated Earth Science, Inc., dated September 20, 2019
- Critical Areas Study, prepared by Wetland Resources, dated September 6, 2019
- Targeted Drainage Report, prepared by Group Four, dated May 31, 2019 (revised August 13, 2019)

List of Required Permits:

- Sector Plan Amendment
- Development Agreement
- Binding Site Plan
- Any applicable State and Federal Permits

Applicable Policies and Requirements

The project will be reviewed for consistency with the following policies, standards and regulations:

- ☐ Possession Shores Master Plan
- ☒ Comprehensive Plan, Shoreline Master Plan
- ☒ International Building Code (2015 Edition)
- ☒ International Fire Code (2015 Edition)
- ☒ Sector Plan & Amendments
- ☒ Mukilteo Municipal Code
- ☒ City of Mukilteo Development Standards

Comment Period

This application and all supporting documents are available for public review at Mukilteo City Hall, 11930 Cyrus Way, Mukilteo WA 98275 (File Nos. DA-2019-002 and BSP-2019-001). The public is invited to submit written comments on the project to the Community Development Department at the above address **by 4:30 PM** on **Thursday, November 21, 2019**.

The City will not act on this application until the end of the 14-day public comment period. Upon completion of project review, the proposed application will be administratively approved, approved with conditions, or denied. You may request a copy of the final decision on the project by making a written request to the City contact person named below.

Public Hearing

A public hearing will be held on this proposal. The date of the public hearing has not yet been determined. You have the right to request notice of and to participate in the public hearing. If you want to receive notice of the hearing, you may make a written request to the City contact person named below.

Appeals

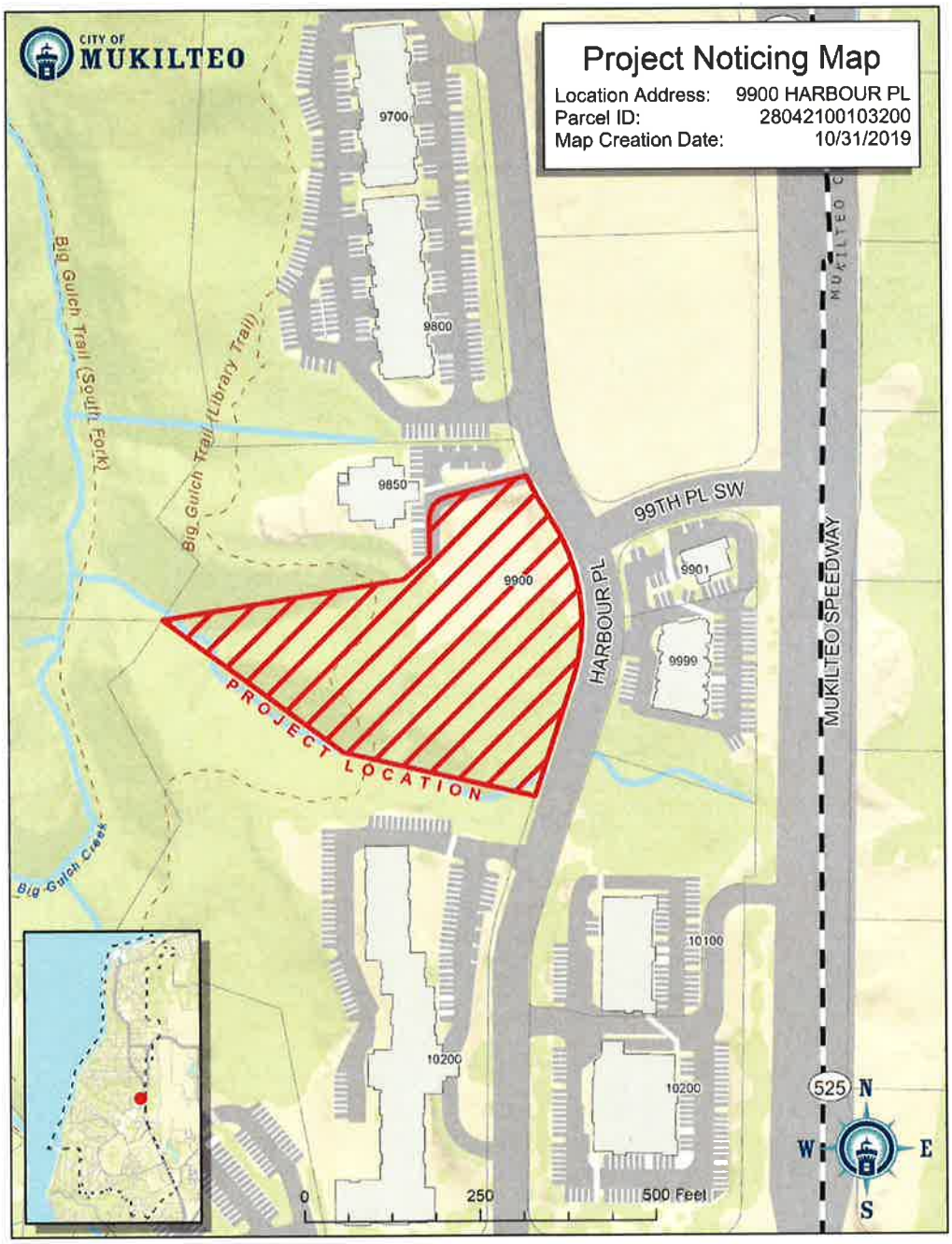
The final decision on this project is appealable to Superior Court. An appeal must be filed within 21 days after the final decision on the project is issued. Only parties of record may initiate an administrative appeal of a land use development permit application. Parties of record include the applicant, any person who testified at the open record hearing on the application (if a public hearing was held), and/or any person who submitted written comments concerning the application (excluding persons who have only signed petitions or mechanically produced form letters).

Staff Contact: Linda Ritter, Senior Planner (425) 263-8043

Email: lritter@mukilteowa.gov

Signature: Linda Ritter Date: 11/5/19

Linda Ritter, Senior Planner



Location Map

Date Issued: Thursday, November 7, 2019
Date Advertised: Thursday, November 7, 2019
End Comment Period: Thursday, November 21, 2019

pc: Applicant/Representative
Reviewing Agencies
Interested Parties
CDD Director
Permit Services Assistants (2)
Property File
Property Owners (300')

O:\Dev Review\2019\DEVELOPMENT AGREEMENT\DA-2019-002 Harbour Place and 99th Pl SW\Noticing\NOA\NOA.docx

RECEIVED
SEP 2 0 2019
CITY OF MUKILTEO

CITY OF MUKILTEO
11930 Cyrus Way Mukilteo, WA 98275
Fax (425) 212-2068

Land Use Permit Application

Date stamp
MPI-2019-002
DA-2019-002
BSP-2019-001

PPR # _____
SEPA # _____
Misc # _____

Applicant:	**Paris Beta LLC**	Owner:	**Wild Sockeye LLC**
Address:	**2225 94th Avenue NE**	Address:	**6308 Club House Lane**
	Clyde Hill, WA 98004		**Mukilteo, WA 98275**
Phone:	**(206) 928-5013**	Phone:	

Project Address: **Harbour Place at 99th Place SW**

Legal Description of Property: **Lot 4A, Amended BSP recorded under AFN 200508295173, Snohomish County, Washington**

Key Contact Person: **Ken Williams / Group Four** Phone: **425-408-1152**
Fax: **425-877-1341**
Lucy Chen / Basel Capital Phone: **206-890-5021**

Project Type:

- ☐ Commercial
- ☐ Multi-Family
- ☐ Industrial
- ☐ Shoreline* (JARPA)
- ☐ Conditional Use*
- ☐ Variance*
- ☐ Preliminary Subdivision*
- ☐ Final Subdivision*
- ☐ Preliminary Short Plat*
- ☐ Final Short Plat*
- ☐ Sector Plan Amendment
- ☐ Waterfront Development
- ☐ Single Family Residence
- ☐ Special Use Permit*
- ☐ Reasonable Use
- ☐ Lot Line Adjustment*
- ☐ Grading*
- ☒ **Binding Site Plan**
- ☐ Project Rezone
- ☒ Other, Specify: Major Sector Amend

* Need to fill out supplemental application form with project.

Project Resume:

Existing Use: **Vacant, Commercial**
Proposed Use: **Residential, Townhouse**
Total Site Area: **3.26 Acres**
Landscaping Area: **24,260 SF**
Building Foot Print Area: 25,560 SF
Water District: **Mukilteo Water & Wastewater**
Lot Coverage: 18%
Sewer District: **Mukilteo Water & Wastewater**
Parking Provided: **72 stalls**
# of Proposed Units: **32**
Building Height: **35-feet**
Comp Plan Designation: **Commercial-Mixed Use**
Gross Floor Area by Uses: _____
Zoning: **Planned Community Business South**

Pre-application Meeting Held: (Y/N; date) January 17, 2019; June 6, 2019

The information given is said to be true under the penalty of perjury by the laws of the State of Washington.

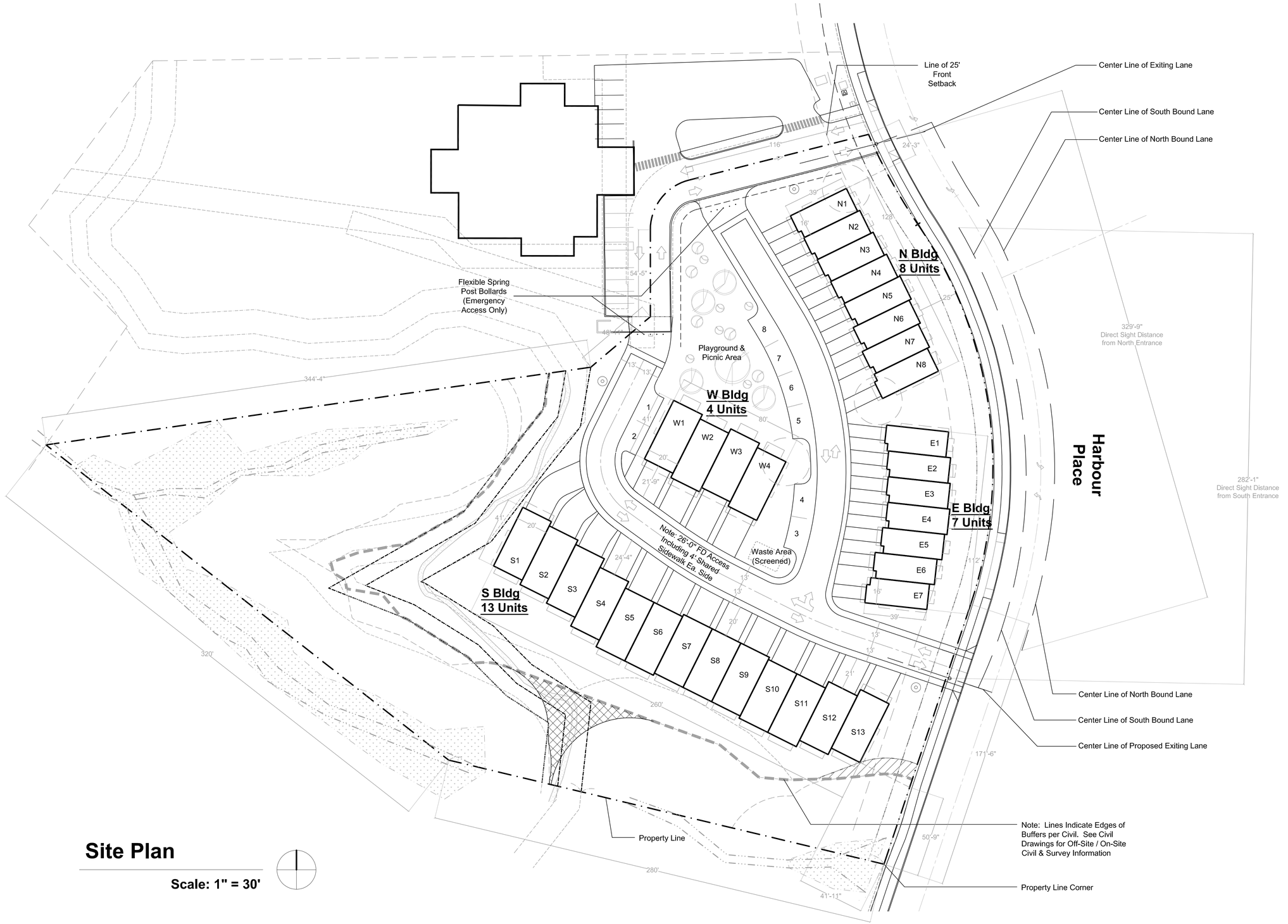
_____ 9. 20. 2019
Applicant/Authorized Agent Signature **Date**

_____ _____
Owners Signature **Date**

Harbour Pointe Townhomes: Project Narrative
September 20, 2019

Basel Harbour Pointe Townhomes is a 32-townhome style condo proposal situated on a 3.26 site located at the western terminus of the Harbour Place's short access road off Mukilteo Speedway in Mukilteo, WA. There are 4 buildings, a community playground and a picnic area, and various pocket art parks. The project proposes 8 visitor parking spots scattered throughout the site.

The site fronts on Harbour Place, which is an existing public roadway. Access to the site currently is available from a private, joint use roadway shared with the private pre-school (Harbour Pointe Montessori School). However, a proposed second driveway on Harbour Place would result in primary access private road for the proposed townhouse project.



Site Plan

Scale: 1" = 30'

Lemons Architecture PLLC
98 Yesler Way
Seattle, WA 98104
206.306.5952
LemonsArchitecture.com

10848 REGISTERED ARCHITECT
JONATHAN LEMONS
STATE OF WASHINGTON

DATE
2019.09.19

ISSUE
Major Sector Amendment Phase

Site Plan
Harbour Pointe Community
1000 Harbour Place
Mukilteo, WA 98275

©Lemons Architecture PLLC 2019 - Drawings subject to non-disclosure agreement & copyrights

JOB NUMBER:

A1.0

DATE PLOTTED: 9/18/2019 10:18:17 AM UPDATED: 9/18/2019 10:09:38 AM by Dougr
LOGIN: Doug Rouse

DECLARATION OF OWNERSHIP

WE THE UNDERSIGNED DEPOSE AND STATE THAT WE ARE OWNERS OF THE LAND DESCRIBED HEREIN, DO HEREBY DECLARE THAT WE HAVE NO OBJECTION TO THE PROPOSED LAND USE ACTION AND THAT THERE ARE NO OTHER PERSON/PERSONS HAVING AN INTEREST IN THIS PROPERTY.

_____

_____

_____

ACKNOWLEDGMENT

STATE OF WASHINGTON }
COUNTY OF SNOHOMISH } SS

I CERTIFY THAT I KNOW OR HAVE SATISFACTORY EVIDENCE THAT _____ IS THE PERSON WHO APPEARED BEFORE ME, AND SAID PERSON ACKNOWLEDGED THAT HE SIGNED THIS INSTRUMENT, ON OATH STATED THAT HE WAS AUTHORIZED TO EXECUTE THE INSTRUMENT AND ACKNOWLEDGED IT AS THE _____, TO BE THE FREE AND VOLUNTARY ACT OF SUCH PARTY FOR THE USES AND PURPOSES MENTIONED IN THE INSTRUMENT.

DATED _____

SIGNATURE OF
NOTARY PUBLIC _____
(PRINT NAME) _____

NOTARY PUBLIC IN AND FOR THE STATE OF WASHINGTON
RESIDING AT _____

MY APPOINTMENT EXPIRES _____

APPROVALS

THIS RECORD OF SURVEY IS FILED UNDER THE PROVISIONS OF RCW 58.17.040(4) AND CHAPTER 16.14 OF THE MUKILTEO MUNICIPAL CODE FILE NO. _____ CONTAINS THE APPROVED AMENDED SITE PLAN FOR THE LAND DEPICTED HEREON AND SHOULD BE REVIEWED PRIOR TO APPLICATION FOR A DEVELOPMENT PERMIT.

EXAMINED AND APPROVED THIS _____ DAY OF _____, 2019.

_____
PLANNING DIRECTOR

_____
PUBLIC WORKS DIRECTOR

TREASURER'S CERTIFICATE

I HEREBY CERTIFY THAT ALL STATE AND COUNTY TAXES HERETOFORE LEVIED AGAINST THE PROPERTY DESCRIBED HEREIN, ACCORDING TO THE BOOKS AND RECORDS OF MY OFFICE, HAVE BEEN FULLY PAID AND DISCHARGED, INCLUDING _____TAXES.

_____ BY:_____
TREASURER, SNOHOMISH COUNTY DEPUTY COUNTY TREASURER

RESTRICTIONS

1. THIS SITE IS SUBJECT TO EXCEPTIONS AND RESERVATIONS CONTAINED IN DEED FROM THE STATE OF WASHINGTON RECORDED UNDER SNOHOMISH COUNTY RECORDING NO. 1036445.

2. THIS SITE IS SUBJECT TO PROVISIONS OF "POSSESSION SHORES AGREEMENT" RECORDED UNDER SNOHOMISH COUNTY RECORDING NO'S. 7808310138, 7808310139 AND 7808310140.

3. THE SITE IS THIS SITE IS SUBJECT TO RESERVATIONS CONTAINED IN DEED RECORDED UNDER SNOHOMISH COUNTY RECORDING NO. 7811300199 AND AMENDED AND/OR MODIFIED BY DOCUMENT RECORDED UNDER SNOHOMISH COUNTY RECORDING NO. 9105290198.

4. THIS SITE IS SUBJECT TO THE TERMS AND CONDITIONS OF DOCUMENT EXECUTED BY MUKILTEO WATER DISTRICT, RECORDED UNDER SNOHOMISH COUNTY RECORDING NO'S. 8005220052 AND 8005220053.

5. THIS SITE IS SUBJECT TO CONDITIONS CONTAINED IN DEED TO THE STATE OF WASHINGTON, RECORDED UNDER SNOHOMISH COUNTY RECORDING NO. 8510240171.

6. THIS SITE IS SUBJECT TO TERMS AND CONDITIONS CONTAINED IN AGREEMENT, RECORDED UNDER SNOHOMISH COUNTY RECORDING NO. 8804010200.

7. THIS SITE IS SUBJECT TO TERMS AND CONDITIONS CONTAINED IN AGREEMENT, RECORDED UNDER SNOHOMISH COUNTY RECORDING NO. 88009020115.

8. THIS SITE IS SUBJECT TO COVENANTS, CONDITIONS, RESTRICTIONS, EASEMENTS AND LIABILITY FOR ASSESSMENTS OF HARBOUR POINT OFFICE, BUSINESS AND INDUSTRIAL PARKS, RECORDED UNDER SNOHOMISH COUNTY RECORDING NO. 8903080274 AND AMENDED AND/OR MODIFIED BY DOCUMENT RECORDED UNDER SNOHOMISH COUNTY RECORDING NO. 9102280535.

9. THIS SITE IS SUBJECT TO COVENANTS, CONDITIONS, RESTRICTIONS, EASEMENTS AND LIABILITY FOR ASSESSMENTS OF HARBOUR POINT MAINTENANCE ASSOCIATION, RECORDED UNDER SNOHOMISH COUNTY RECORDING NO. 8903080275 AND AMENDED AND/OR MODIFIED BY DOCUMENT RECORDED UNDER SNOHOMISH COUNTY RECORDING NO. 9102280534.

10. THIS SITE IS SUBJECT TO THE TERMS AND CONDITIONS OF AGREEMENT BETWEEN THE CITY OF MUKILTEO AND HARBOUR POINTE LIMITED PARTNERSHIP REGARDING CONCOMITANT ANNEXATION, RECORDED UNDER SNOHOMISH COUNTY RECORDING NO. 9204160131 AND MODIFIED BY AMENDMENT RECORDED UNDER SNOHOMISH COUNTY RECORDING NO. 9306010018.

11. THIS SITE IS SUBJECT TO AN EASEMENT FOR DRAINAGE AS DELINEATED AND/OR DEDICATED BY BINDING SITE PLAN RECORDED UNDER SNOHOMISH COUNTY RECORDING NO. 9312305007.

12. THIS SITE IS SUBJECT TO COVENANTS, CONDITIONS, RESTRICTIONS, AND EASEMENTS CONTAINED IN BINDING SITE PLAN RECORDED UNDER SNOHOMISH COUNTY RECORDING NO. 9312305007, AND AFFIDAVIT OF STREET NAME CHANGE RECORDED UNDER SNOHOMISH COUNTY RECORDING NO. 9902180080.

13. THIS SITE IS SUBJECT TO THE TERMS AND CONDITIONS TO AN EASEMENT TO THE CITY OF MUKILTEO FOR AN OUTDOOR RECREATIONAL TRAIL FOR PUBLIC USE, RECORDED UNDER SNOHOMISH COUNTY RECORDING NO. 9609120420.

14. THIS SITE IS SUBJECT TO COVENANTS, CONDITIONS, RESTRICTIONS, DEDICATIONS, AGREEMENTS, EASEMENTS, MAINTENANCE PROVISIONS AND NOTES, AS CONTAINED IN CITY OF MUKILTEO BOUNDARY LINE ADJUSTMENT NUMBER BLA 99-10, RECORDED UNDER SNOHOMISH COUNTY RECORDING NO. 199910060039, SURVEY OF BOUNDARY LINE ADJUSTMENT FOR HARBOUR POINTE LIMITED PARTNERSHIP RECORDED UNDER SNOHOMISH COUNTY RECORDING NO. 199910065001, AND AFFIDAVIT OF CORRECTION OF BOUNDARY LINE ADJUSTMENT RECORDED UNDER SNOHOMISH COUNTY RECORDING NO. 199911020558.

15. THIS SITE IS SUBJECT TO TERMS AND CONDITIONS OF THAT CERTAIN "DISTRIBUTION EASEMENT" TO PUBLIC UTILITY DISTRICT NO. 1 OF SNOHOMISH COUNTY AND GTE NORTHWEST INCORPORATED FOR ELECTRIC DISTRIBUTION LINE FACILITIES, RECORDED UNDER SNOHOMISH COUNTY RECORDING NO. 200001250312, AND MODIFIED BY THAT CERTAIN DISTRIBUTION EASEMENT-MODIFIED", RECORDED UNDER SNOHOMISH COUNTY RECORDING NO. 200006210350.

16. THIS SITE IS SUBJECT TO THE TERMS AND CONDITIONS OF THAT CERTAIN "EASEMENT" TO MUKILTEO WATER DISTRICT FOR WATER AND RELATED APPURTENANCES, RECORDED UNDER SNOHOMISH COUNTY RECORDING NO. 200005260855.

17. THIS SITE IS SUBJECT TO THE TERMS AND CONDITIONS OF THAT CERTAIN "MUKILTEO TOWN SQUARE DEVELOPMENT AGREEMENT", RECORDED UNDER SNOHOMISH COUNTY RECORDING NO. 200212200087.

18. ALL DEVELOPMENT AND USE OF THE LAND DESCRIBED HEREIN SHALL BE IN ACCORDANCE WITH THIS BINDING SITE PLAN, AS IT MAY BE AMENDED WITH THE APPROVAL OF THE CITY OF MUKILTEO, AND IN ACCORDANCE WITH SUCH OTHER GOVERNMENTAL PERMITS, APPROVALS, REGULATIONS, REQUIREMENTS, AND RESTRICTIONS THAT MAY BE IMPOSED UPON SUCH LAND AND THE DEVELOPMENT AND USE THEREOF. THIS BINDING SITE PLAN SHALL BE BINDING UPON ALL NOW OR HEREAFTER HAVING ANY INTEREST IN THE LAND DESCRIBED HEREIN.

LEGAL DESCRIPTION

PER EXHIBIT A, CHICAGO TITLE COMPANY OF WASHINGTON COMMITMENT NO. 500078930, PRINTED 12-20-2018 @ 12:58 PM.

PARCEL 4A OF RECORD OF SURVEY AND AMENDED BINDING SITE PLAN RECORDED UNDER AUDITOR'S FILE NO. 200508295173, RECORDS OF SNOHOMISH COUNTY, WASHINGTON, BEING A PORTION OF LOT 4, HARBOUR POINTE BUSINESS CENTER BIG GULCH CAMPUS BINDING SITE PLAN/RECORD OF SURVEY RECORDED UNDER AUDITOR'S FILE NO. 9312305007, BEING A PORTION OF THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 16, AND THE NORTHEAST QUARTER OF THE NORTHEAST QUARTER OF SECTION 21, ALL IN THE TOWNSHIP 28 NORTH, RANGE 4 EAST OF THE WILLAMETTE MERIDIAN.

SE1/4, SE1/4, SECTION 16 & NE1/4,
NE1/4 SECTION 21, T28N, R4E, W.M.
CITY OF MUKILTEO
SNOHOMISH COUNTY, WASHINGTON

RECORDING CERTIFICATE

FILED FOR RECORD BY GROUP FOUR, INC.
THIS _____ DAY OF_____ 20_____ A.D., AT_____
MINUTES PAST _____ O'CLOCK _____ M; AND RECORDED IN VOLUME _____OF SURVEYS ON PAGE _____
RECORDS OF _____ COUNTY, WASHINGTON

_____ _____
AUDITOR DEPUTY AUDITOR

DANIEL K. ROUSE
STATE OF WASHINGTON
30450
REGISTERED
PROFESSIONAL LAND SURVEYOR
9/18/2019

SURVEYOR'S CERTIFICATE

THIS MAP CORRECTLY REPRESENTS A SURVEY MADE BY ME OR UNDER MY DIRECTION IN CONFORMANCE WITH THE REQUIREMENTS OF THE SURVEY RECORDING ACT, AT THE REQUEST OF _____
THIS _____ DAY OF _____ 20_____

_____ **L.S. NO.** _____
REGISTERED LAND SURVEYOR

SHEET: 1 of 2

DATE: 9/18/19

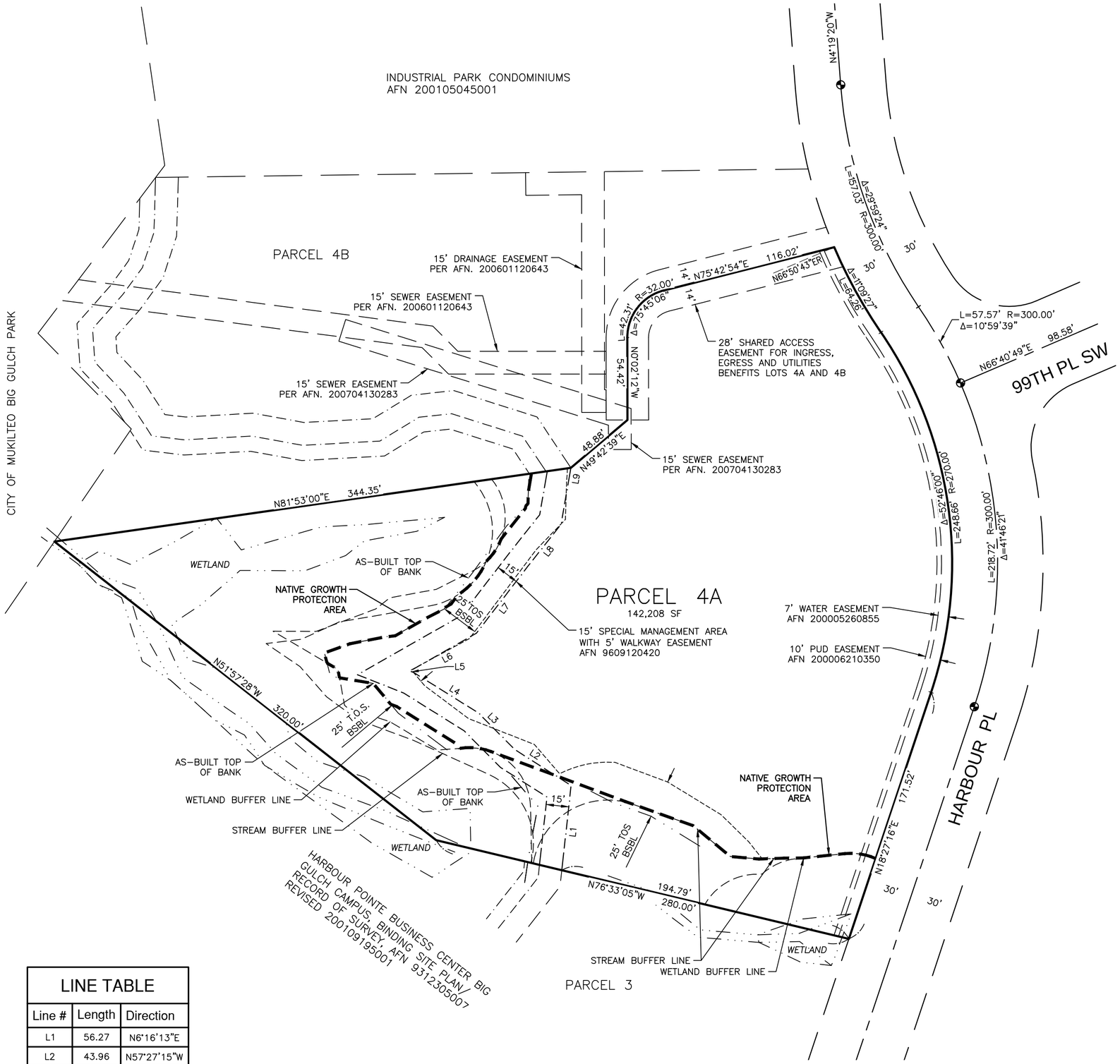
18-4523

GROUP FOUR Inc.
Land Surveying // Civil Engineering
Land Use Planning // Project Management
P.O. BOX 1059 / 1901 VERNON ROAD SUITE "A", LAKE STEVENS, WA 98258
(425)408-1152 * FAX(425)877-1341 * www.GRP4.com

RECORD OF SURVEY/
BINDING SITE PLAN-ALTERATION
HARBOUR POINTE TOWNHOUSES
CITY OF MUKILTEO, SNOHOMISH COUNTY, WASHINGTON

FILENAME: P:\Projects\2018\18-4523\dwg\Survey\18-4523 BSP ALT.dwg

DATE PLOTTED: 9/18/2019 11:10:50 AM UPDATED: 9/18/2019 10:09:38 AM by Dougr
LOGIN: Doug Rouge



BASIS OF BEARINGS

PER RECORD OF SURVEY AND AMENDED BINDING SITE PLAN RECORDED UNDER AFN. 200508295173.

FOUND STANDARD SNOHOMISH COUNTY MONUMENT IN CASE

SURVEY NOTES

1. EQUIPMENT USED: GEOMAX CR2 TOTAL STATION (2" DIRECT READING THEODOLITE WITH E.D.M.)

2. PRECISION OF CONTROL TRAVERSE IS AT A HIGHER LEVEL THAN MINIMUM STANDARDS REQUIRED BY WAC, 332-130-090.

3. MONUMENTS VISITED JANUARY 2019.

EASEMENT PROVISIONS

A 28 FOOT WIDE SHARED ACCESS EASEMENT, AS SHOWN HEREON, IS HEREBY RESERVED FOR AND GRANTED TO THE OWNERS OF LOTS 4A AND 4B FOR THE PURPOSE OF INGRESS, EGRESS AND UTILITIES.

MAINTENANCE PROVISIONS

MAINTENANCE, REPAIR, AND/OR RECONSTRUCTION OF ANY DRIVEWAY IMPROVEMENTS, LANDSCAPING, AND /OR UTILITY SYSTEMS LOCATED UNDER AND UPON THE 28 FOOT SHARED ACCESS EASEMENT, AS SHOWN HEREON, EXCEPT FOR SUCH UTILITY SYSTEMS THAT ARE MAINTAINED BY THOSE PUBLIC PURVEYORS PROVIDING SERVICE TO LOTS 4A AND 4B, SHALL BE THE EQUAL RESPONSIBILITY OF AND THE COSTS OF SAID MAINTENANCE, REPAIR, AND/OR RECONSTRUCTION SHALL BE BORNE EQUALLY BY THE OWNERS, THEIR HEIRS, SUCCESSORS, AND ASSIGNS OF SAID LOTS.

LINE TABLE		
Line #	Length	Direction
L1	56.27	N6°16'13"E
L2	43.96	N57°27'15"W
L3	34.21	N44°51'27"W
L4	50.23	N57°59'12"W
L5	2.83	N68°25'26"W
L6	50.51	N60°23'27"E
L7	56.10	N37°32'43"E
L8	34.94	N38°21'02"E
L9	37.86	N9°52'25"E

DANIEL K. ROUGE STATE OF WASHINGTON 30450 REGISTERED PROFESSIONAL LAND SURVEYOR
9/18/2019

SE1/4, SE1/4, SECTION 16 & NE1/4, NE1/4 SECTION 21, T28N, R4E, W.M.
CITY OF MUKILTEO
SNOHOMISH COUNTY, WASHINGTON

SHEET: 2 of 2

DATE: 9/18/19

18-4523

GROUP FOUR Inc.
Land Surveying // Civil Engineering
Land Use Planning // Project Management
P.O. BOX 1059 / 1901 VERNON ROAD SUITE "A", LAKE STEVENS, WA 98258
(425)408-1152 * FAX(425)877-1341 * www.GRP4.com

RECORD OF SURVEY/
BINDING SITE PLAN-ALTERATION

HARBOUR POINTE TOWNHOUSES

CITY OF MUKILTEO, SNOHOMISH COUNTY, WASHINGTON

FILENAME: P:\Projects\2018\18-4523\Civil\Survey\18-4523 BSP ALT.dwg

SE 1/4, SE 1/4 SEC. 16 ,TWP. 28 N ,RGE. 4 E ,W.M.

DATUM: NAVD88

BENCH: FOUND WSDOT BRASS DISK SET IN CONC AT EAST POINT OF TRAFFIC ISLAND ON HARBOUR POINT BLVD AND HWY 525. WSDOT ID: 1774, WGS DESIGNATION GP31525–75 ELEV=527.61'

BASIS OF BEARINGS:

PER RECORD OF SURVEY AND AMENDED BINDING SITE PLAN RECORDED UNDER AFN. 200508295173.

SURVEY NOTES:

SURVEY NOTES:
EQUIPMENT USED: GEOMAX CR2 TOTAL STATION
(2" DIRECT READING THEODOLITE WITH E.D.M.)

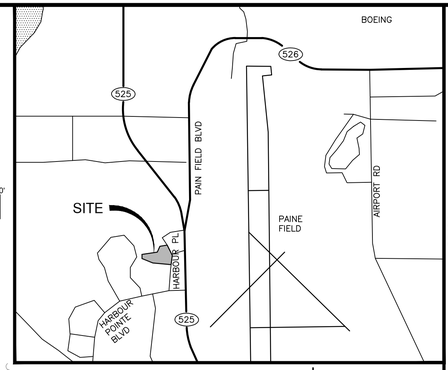
PRECISION OF CONTROL TRAVERSE IS AT A HIGHER LEVEL THAN MINIMUM STANDARDS REQUIRED BY WAC, 332–130–090.

LEGAL DESCRIPTION:

PER EXHIBIT A, CHICAGO TITLE COMPANY OF WASHINGTON COMMITMENT NO. 500078930, PRINTED 12–20–2018 @ 12:58 PM.

PARCEL 4A OF RECORD OF SURVEY AND AMENDED BINDING SITE PLAN RECORDED UNDER AUDITOR'S FILE NO. 200508295173, RECORDS OF SNOHOMISH COUNTY, WASHINGTON, BEING A PORTION OF LOT 4, HARBOUR POINTE BUSINESS CENTER BIG GULCH CAMPUS BINDING SITE PLAN/RECORD OF SURVEY RECORDED UNDER AUDITOR'S FILE NO. 9312305007, BEING A PORTION OF THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 16, AND THE NORTHEAST QUARTER OF THE NORTHEAST QUARTER OF SECTION 21, ALL IN THE TOWNSHIP 28 NORTH, RANGE 4 EAST OF THE WILLAMETTE MERIDIAN.

SCALE: 1" = 30'
CONTOUR INTERVAL = 2'
30' 0 30' 60'



VICINITY MAP
SCALE 1" = 2,000'

PROJECT INFORMATION

APPLICANT	PARIS BETA LLC 2225 94TH AVE NE CLYDE HILL, WA. 98004 PHONE: (206) 928–5013 PROJECT MGR: LUCY CHEN
OWNER	WILD SOCKEYE LLC 6308 CLUB HOUSE LANE MUKILTEO, WA. 98275
SURVEYOR/ENGINEER	GROUP FOUR, INC. P.O. BOX 1059 LAKE STEVENS, WA. 98258 PHONE: (425) 408–1152 PROJ. MGR.: KEN WILLIAMS
ARCHITECT	LEMONS ARCHITECTURE 98 YESLER WAY SEATTLE, WA. 98104 PHONE: (206) 306–5952 PROJ. MGR.: JONATHAN LEMONS
TRAFFIC CONSULTANT	GIBSON TRAFFIC CONSULTANTS 2813 ROCKAFELLER AVE, #B EVERETT, WA. PHONE: (425) 339–8266
GEOTECHNICAL ENGINEER	ASSOCIATED EARTH SCIENCES 911 5TH AVENUE KIRKLAND, WA. 98033 PHONE: (425) 827–7701 CONTACT: NICKI SHOBERT
WETLAND BIOLOGIST	WETLAND RESOURCES 9505 19TH AVE SE, #106 EVERETT, WA. 98208 PHONE: (425) 337–3174 CONTACT: JEFF MALLAHAN
ZONING	PLANNED COMMUNITY BUSINESS–SOUTH (PCB–S)
ACREAGE	3.26 AC (142,208 SF)
UNITS	32
WATER SOURCE/PURVEYOR	MUKILTEO WATER AND WASTEWATER
SEWER METHOD/OPERATOR	MUKILTEO WATER AND WASTEWATER
FIRE DISTRICT	MUKILTEO FIRE DISTFICT
SCHOOL DISTRICT	MUKILTEO SCHOOL DISTRICT NO. 6
TAX ACCOUNT NUMBER	*2804210010.3200*
CUT	*1,000 CY*
FILL	*1,100 CY*
IMPERVIOUS SURFACE	50,624 SF (35.6%)

NO.	REVISION	DATE	BY
1	REVISIONS PER REVIEW	08/12/2019	CSJ
2	REVISIONS PER CLIENT	08/22/2019	CSJ

DATE:	05/09/2019
DRAWN:	CAD
DESIGNED:	KRW
CHECKED:	KRW
APPROVED:	KRW

ANN GREENAWAY LEMONS — REGISTERED PROFESSIONAL ARCHITECT — STATE OF WASHINGTON — 08/12/2019

GROUP FOUR Inc.
Land Surveying || Land Use Planning || Civil Engineering
Land Surveying || Land Use Planning || Project Management
P.O. BOX 1059 / 1901 VERNON ROAD SUITE "A", LAKE STEVENS, WA 98258
(425)408-1152 FAX#(425)977-1341 www.GRP4.com

PARIS BETA LLC
HARBOUR POINTE TOWNHOMES
PRELIMINARY DRAINAGE AND UTILITY PLAN
CITY OF MUKILTEO WASHINGTON

SHEET	OF
P1	4

18-4523

LEGEND

EXISTING	PROPOSED	
		CONCRETE
		ASPHALT PAVEMENT
		BUILDING
500		EXISTING MAJOR CONTOURS
475		EXISTING MINOR CONTOURS
	500	DESIGN MAJOR CONTOURS
	475	DESIGN MINOR CONTOURS
		RIGHT–OF–WAY
		EASEMENT LINE
		CENTERLINE
		BOUNDARY SET–BACK LINE (BSBL)
		EDGE OF PAVEMENT (EOP)
		STORM CLEANOUT
		AREA DRAIN, NYLOPLAST OR EQUIV.
		6" DEEP SHALLOW SWALE
	SD	STORM DRAIN LINE
SS		SANITARY SEWER LINE
		SEWER CLEANOUT
		SEWER STUB
W		WATER LINE
		WATER/IRRIGATION METER
		ROCK WALL
		CATCH BASIN (CB) TYPE 1/1L

SE 1/4, SE 1/4 SEC. 16 ,TWP. 28 N ,RGE. 4 E ,W.M.

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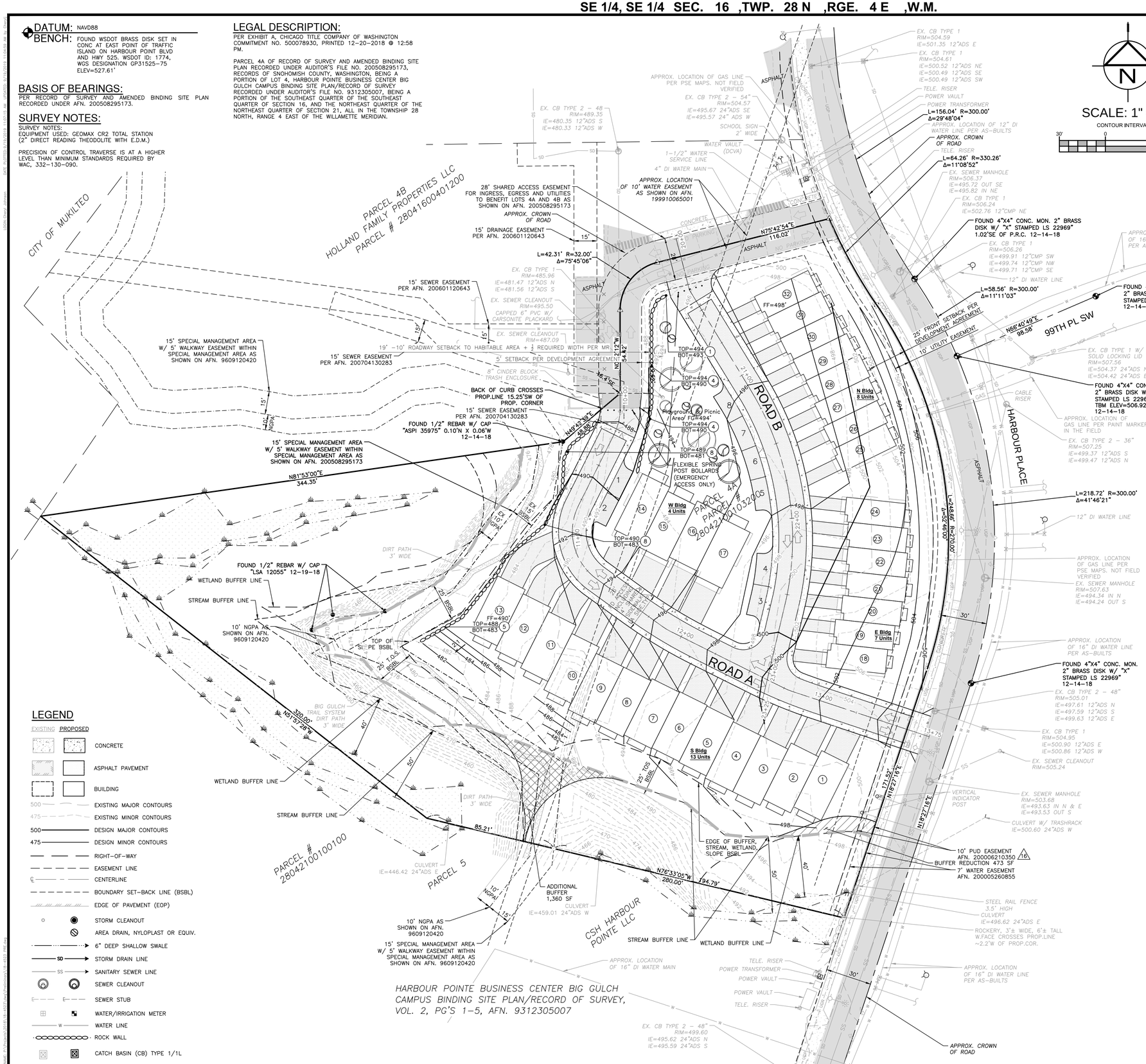

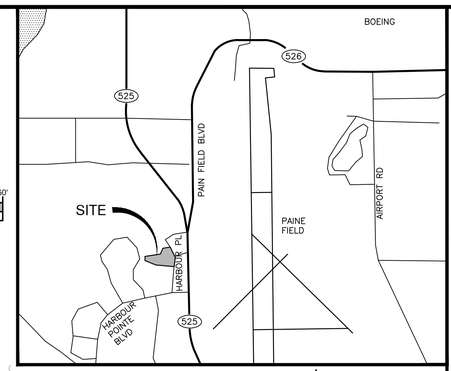

VICINITY MAP
SCALE 1" = 2,000'

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SCHOOL DISTRICT	MUKILTEO SCHOOL DISTRICT NO. 6
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CUT	*1,000 CY*
FILL	*1,100 CY*
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1	REVISIONS PER REVIEW	08/12/2019	CSJ
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DATE:	05/09/2019
DRAWN:	CAD
DESIGNED:	KRW
CHECKED:	KRW
APPROVED:	KRW

ANN GRENEMAN GIBSON 36559 REGISTERED PROFESSIONAL ENGINEER STATE OF WASHINGTON
08/12/2019

GROUP FOUR Inc.
Land Surveying // Land Use Planning // Civil Engineering // Project Management
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PARIS BETA LLC
HARBOUR POINTE TOWNHOMES
PRELIMINARY GRADING PLAN
CITY OF MUKILTEO WASHINGTON

SHEET	OF
P2	4

18-4523

P:\Projects\2018\18-4523\dwg\Preliminary\18-4523 PRE.dwg | Layout: p2 GRAD
PLOTTED: 8/22/2019 2:57:31 PM BY: Christopher Jones
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IMAGES:

LEGEND

EXISTING PROPOSED

- CONCRETE
- ASPHALT PAVEMENT
- BUILDING
- 500 EXISTING MAJOR CONTOURS
- 475 EXISTING MINOR CONTOURS
- 500 DESIGN MAJOR CONTOURS
- 475 DESIGN MINOR CONTOURS
- RIGHT-OF-WAY
- EASEMENT LINE
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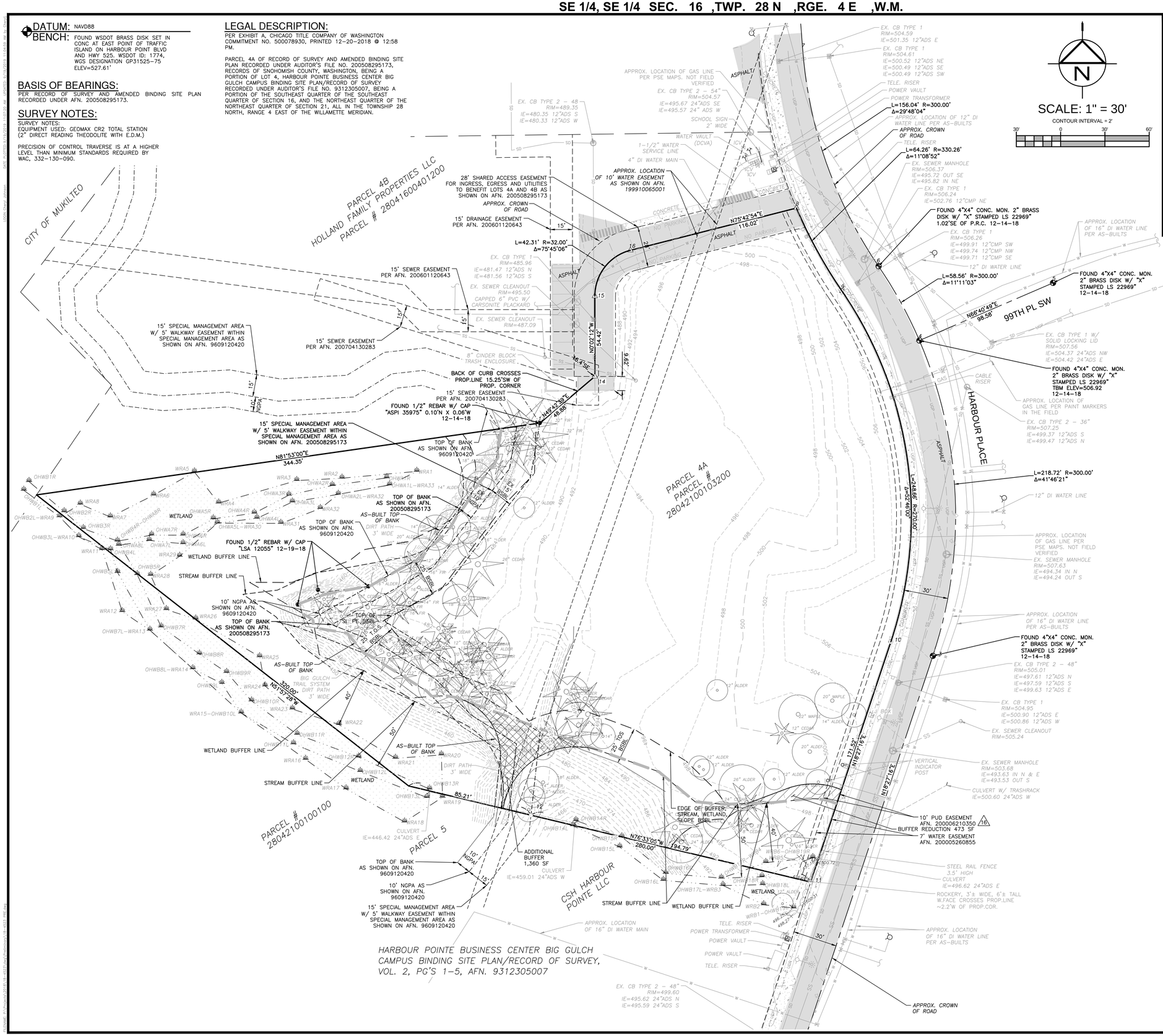

VICINITY MAP

SCALE 1" = 2,000'

NO.	REVISION	DATE	BY
1	REVISIONS PER REVIEW	08/12/2019	CSJ

DATE:	05/09/2019
DRAWN:	CSJ
DESIGNED:	KRW
CHECKED:	KRW
APPROVED:	KRW

ANN GREENHAW — 36830 — REGISTERED PROFESSIONAL ENGINEER — STATE OF WASHINGTON — 05/12/2019

PROJECT INFORMATION

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PARIS BETA LLC
HARBOUR POINTE TOWNHOMES
CRITICAL AREAS
CITY OF MUKILTEO WASHINGTON

SHEET	OF
P3	4

18-4523

D:\Projects\2018\18-4523\dwg\Preliminary\18-4523 PRE.dwg | Layout: p3 Critical Areas
PLOTTED: 5/9/2019 2:10:12 PM BY: Christopher Johnson
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IMAGES:
I:\Projects\2018\18-4523\dwg\Preliminary\18-4523 PRE.dwg

SE 1/4, SE 1/4 SEC. 16 ,TWP. 28 N ,RGE. 4 E ,W.M.

PROJECT INFORMATION:

SITE ADDRESS: NOT AVAILABLE.

FEMA FLOOD ZONE: ZONE X PER FLOOD INSURANCE RATE MAP NUMBER 53061C1020 E, DATE: NOVEMBER 8, 1999, PANEL 1020 OF 1575

SITE AREA: 142,208 SF (3.26 AC)

NOTE:
NO EVIDENCE OF RECENT EARTH MOVING WORK, BUILDING CONSTRUCTION OR BUILDING ADDITIONS OBSERVED DURING THE TIME OF THIS SURVEY.

NO EVIDENCE OF STREET OR SIDEWALK CONSTRUCTION OR REPAIRS OBSERVED DURING THE TIME OF THIS SURVEY.

ALL CURB IS VERTICAL CURB UNLESS NOTED OTHERWISE.

ALL UNDERGROUND POWER LINE LOCATIONS ARE APPROXIMATE PER P.S.E. MAPS. NOT FIELD VERIFIED. UNDERGROUND AND/OR OVERHEAD COMMUNICATIONS LINES, TELEPHONE LINES, FIBER OPTIC LINES WERE NOT OBSERVED AT THE TIME OF THIS SURVEY.

LEGAL DESCRIPTION:

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DATUM: NAVD88

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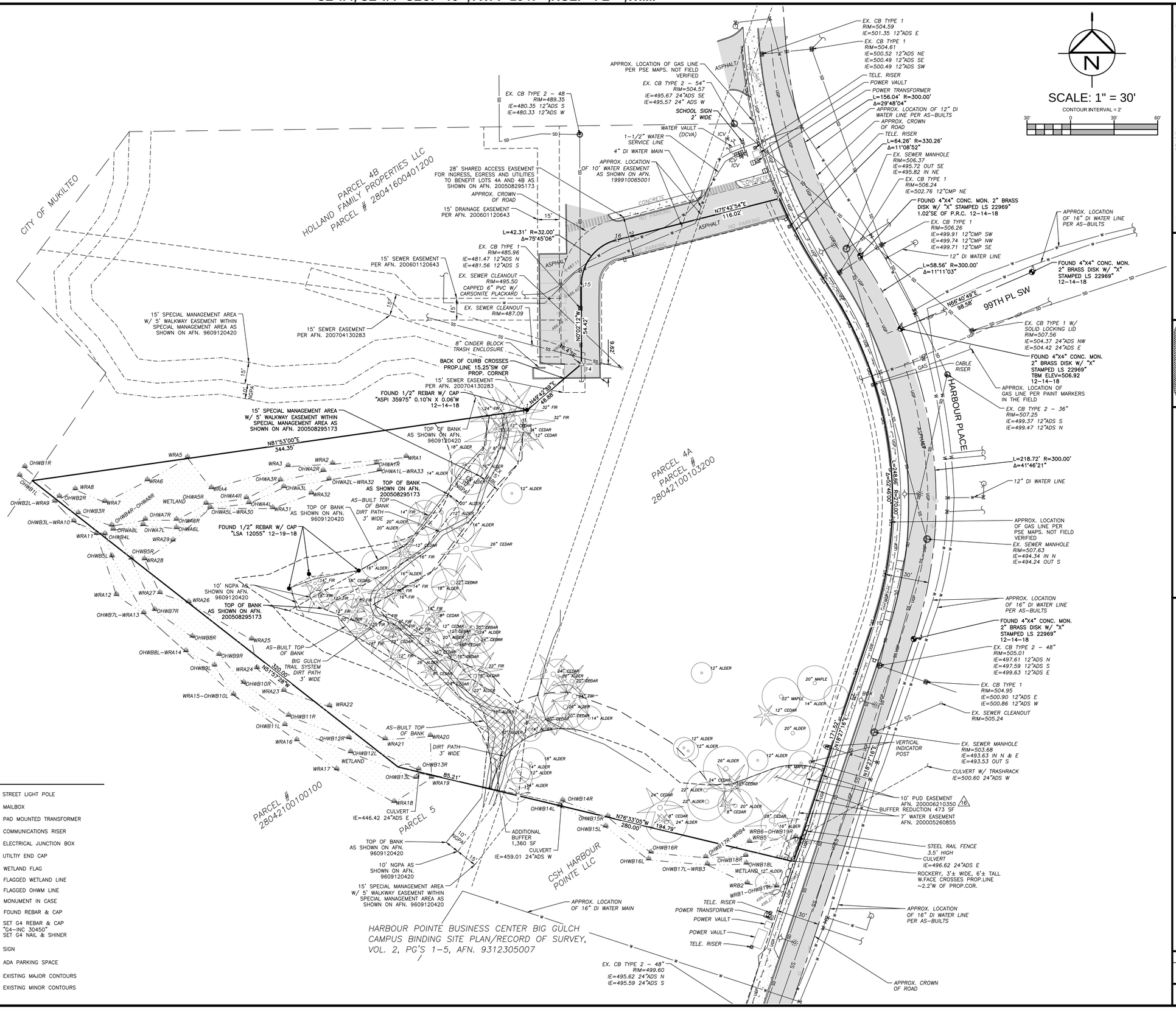
(2" DIRECT READING THEODOLITE WITH E.D.M.)

PRECISION OF CONTROL TRAVERSE IS AT A HIGHER LEVEL THAN MINIMUM STANDARDS REQUIRED BY WAC, 332-130-090.

SURVEY LEGEND

- CATCH BASIN (CB) TYPE 1
- CATCH BASIN (CB) TYPE 2
- STORM DRAIN CULVERT
- SD — STORM DRAIN LINE
- SS — SANITARY SEWER LINE
- SEWER CLEANOUT
- SEWER MANHOLE (SSMH)
- FIRE DEPT CONNECTION
- FIRE HYDRANT
- WATER METER
- WATER VALVE
- W — WATER LINE
- ICV — IRRIGATION CONTROL VALVE
- GAS — GAS LINE
- GAS VALVE
- STREET LIGHT POLE
- MAILBOX
- PAD MOUNTED TRANSFORMER
- COMMUNICATIONS RISER
- ELECTRICAL JUNCTION BOX
- UTILTIY END CAP
- WETLAND FLAG
- FLAGGED WETLAND LINE
- FLAGGED OHWM LINE
- MONUMENT IN CASE
- FOUND REBAR & CAP
- SET G4 REBAR & CAP "G4-INC 30450"
- SET G4 NAIL & SHINER
- SIGN
- ADA PARKING SPACE
- 500 — EXISTING MAJOR CONTOURS
- 475 — EXISTING MINOR CONTOURS



NO.	REVISION	DATE	BY
1	REVISIONS PER REVIEW	08/12/2019	CSJ

DATE:	05/09/2019				
DRAWN:	CSJ				
DESIGNED:	KRW				
CHECKED:	KRW				
APPROVED:	KRW				

DANIEL K. ROUPP — REGISTERED PROFESSIONAL LAND SURVEYOR — STATE OF WASHINGTON — 08/12/2019

G4 GROUP FOUR Inc.
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PARIS BETA LLC

HARBOUR POINTE TOWNHOMES
BOUNDARY AND TOPOGRAPHY MAP

CITY OF MUKILTEO — WASHINGTON

SHEET	OF
P4	4

18-4523

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SEP 20 2019
CITY OF MUKILTEO

CITY OF
MUKILTEO

ENVIRONMENTAL CHECKLIST

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

***Instructions for applicants*:**

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals:

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. Background

1. Name of proposed project, if applicable: **HARBOUR POINTE TOWNHOUSES**

2. Name of applicant: **PARIS BETA LLC**

3. Address and phone number of applicant and contact person:

Applicant: **George Li**
2225 94th Avenue NE
Clyde Hill, WA 98004
(206) 890 5021
lucychen@baselcg.com

Contact: **Group Four Inc., Attn: Ken Williams**
P.O. Box 1059
Lake Stevens, WA 98258
(425) 408-1152
kenw@grp4.com

4. Date checklist prepared: **September 19, 2019**

5. Agency requesting checklist: **City of Mukilteo Planning & Community Development**

6. Proposed timing or schedule (including phasing, if applicable):

Construction would start in the Winter of 2019, subject to receipt of all necessary development approvals and building permits.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain. **No**

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

The following reports and information for this proposal are incorporated by reference and have been submitted to the City of Mukilteo under the submittal for the proposal.

Pre-Application Meeting Summary (June 6, 2019) ..... City of Mukilteo
Stormwater Technical Information Report (September 2019) ..... Group Four, Inc.
Subsurface Exploration, Geologic Hazard, and
Preliminary Geotechnical Engineering Report (Feb. 8, 2019) ..... Associated Earth Sciences Inc.
Additional Subsurface Explorations (Letter-Report Mar. 22, 2019) ..... Associated Earth Sciences Inc.
Critical Areas Report (September 6, 2019) ..... Wetland Resources Inc.
Traffic Impact Analysis (August 2019) ..... Gibson Traffic Consultants Inc.
Preliminary Site Plan (September 2019) ..... Lemons Architecture
Preliminary Civil Plans (September 2019) ..... Group Four, Inc.
Sector 3 Development Agreement (Amendment, September 2019) ..... Stephens & Klinge LLP

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain. **None**

10. List any government approvals or permits that will be needed for your proposal, if known.

The following permits/approvals have been identified as possible permits for this proposal:

SEPA Determination/Compliance ..... City of Mukilteo
Development Agreement Approval ..... City of Mukilteo
Sector Plan Amendment Approval ..... City of Mukilteo
Binding Site Plan Approval ..... City of Mukilteo
Application for Alternate Material, Design, or Method of Construction (Deviation) ..... City of Mukilteo
Clearing and Grading Permit ..... City of Mukilteo
Stormwater Review and Approval ..... City of Mukilteo
Sanitary Sewer & Water Plan ..... City of Mukilteo
Right-of-Way Use Permit ..... City of Mukilteo
Commercial Building Permit/Mechanical/Electrical/Plumbing ..... City of Mukilteo
National Pollutant Discharge Elimination System (NPDES) ..... Washington Department of Ecology
Electrical Permit Review ..... Washington State Dept. of Labor & Industries
Utility Extensions ..... Various Area Utility Providers

Other permits may be identified during the review and permitting process. Information in this SEPA Checklist is based on the referenced material as well as information on the project from the applicant, consultants and research items.

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

The proposal is for a 32-unit attached, single-family, residential townhouse development on an undeveloped 3.26-acre site. The applicant has submitted detailed reports and plans, held community meetings with neighbors, and had two pre-application meetings with the City of Mukilteo, in preparation of a responsive townhouse development proposal for the subject site. A Major Sector Amendment is required to amend the existing Sector 3 Development Agreement to allow proposal.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

The site is located on the west side of Harbour Place at 99th Place SW, within the city limits of the City of Mukilteo (City), in the northeast quarter of Section 21 and the southeast quarter of Section 16, Township 28 N., Range 4 E., W.M. (Snohomish County Tax Account No. 28042100103200) The location is further depicted on Figure 1 – Vicinity Map, Figure 2 – Project Area Parcel Map and Figure 3 – Site Plan.

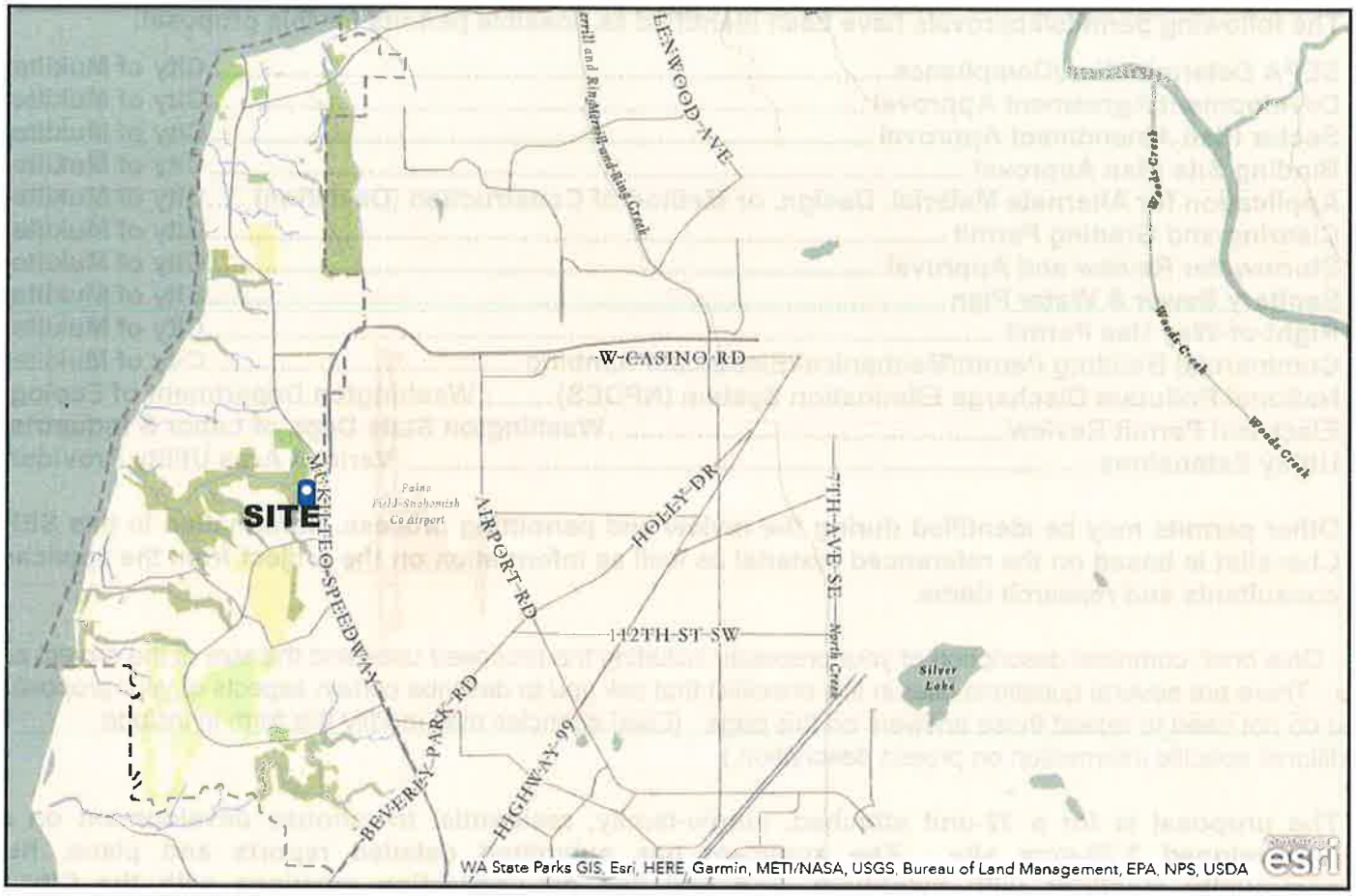

Figure 1 – Vicinity Map

Figure 2 – Project Area Parcel Map

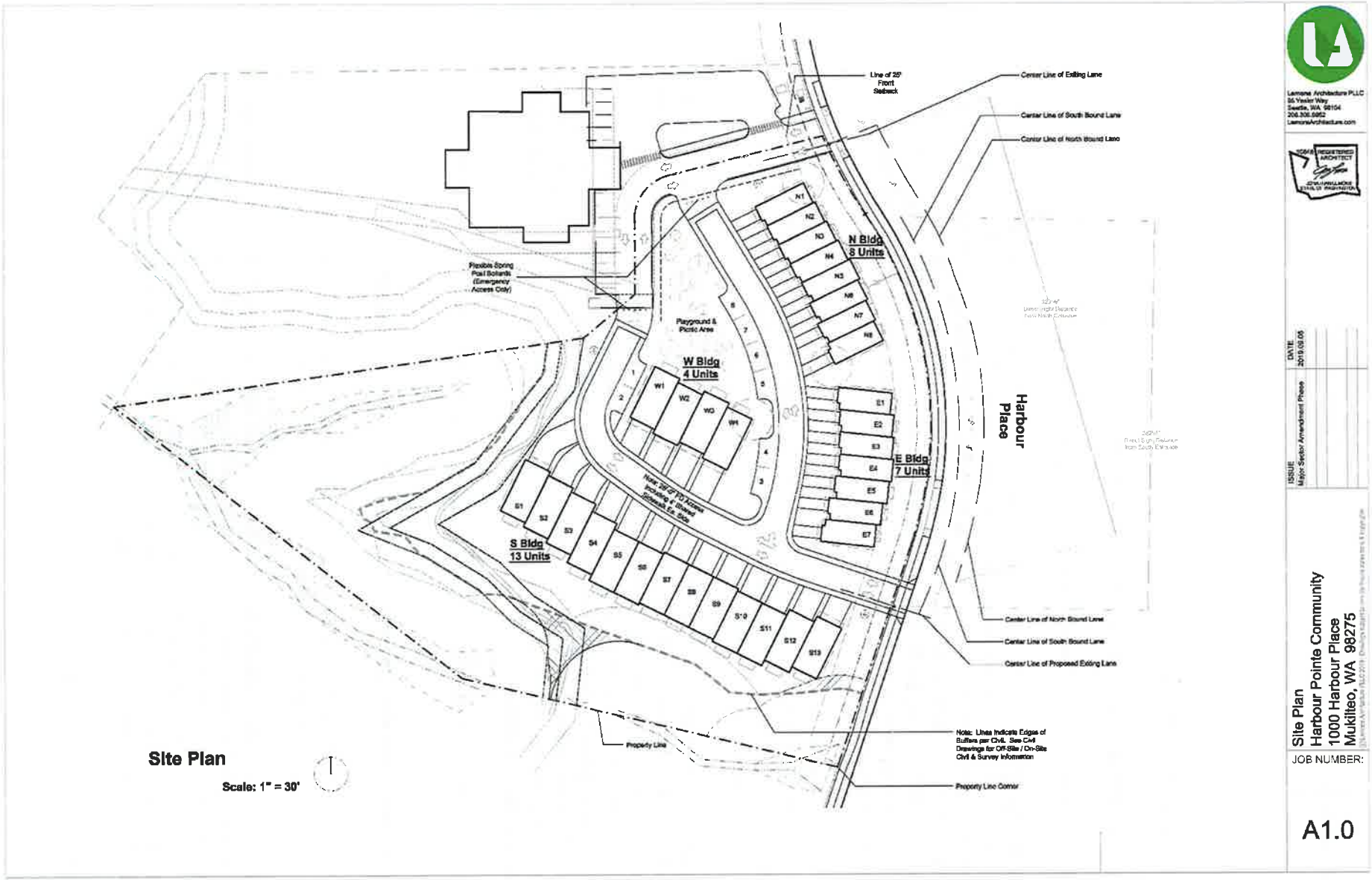

Figure 3 – Site Plan

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site:

(circle one): Flat, **rolling**, hilly, steep slopes, mountainous, other _____

b. What is the steepest slope on the site (approximate percent slope)?

The on-site topography consists of a gentle slope, becoming sharply steep with a westerly aspect. Given the topography of the site, general surface water patterns flow to the western property boundary, which borders Big Gulch (containing the South Fork of Big Gulch Creek and associated wetlands). The steepest slope on-site is approximately 40%. (Refer to the submitted preliminary civil plans for additional detail.) The project would meet all City code requirements for critical area setbacks, including steep slopes.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

A geotechnical report was completed for the proposal. Subsurface conditions at the project site were inferred from the field explorations accomplished for this report, visual reconnaissance of the site, and review of selected applicable geologic literature. The on-site soils are mapped as gravelly sandy loam (Alderwood with 0 to 8% slopes and Everett very gravelly sandy loam with 15 to 30% slopes), according to the Natural Resources Conservation Service Soil Survey of Snohomish County and confirmed in on-site investigations. (Refer to the submitted geotechnical report and Critical Areas Report for additional detail.)

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

Yes; refer to the submitted geotechnical report for additional detail.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

Roads and building sites would be cleared, graded and compacted as necessary to achieve proper grading transition, drainage and structural stability. Approximately 1,000 cubic yards of material will be cut, and approximately 1,100 cubic yards will be used for fill. Fill material will be from cut material, excess cut material will be exported off-site. (For additional details refer to the submitted preliminary civil plans, which include grading and drainage.)

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

The potential for on-site erosion would increase in the short-term where soils are exposed during site preparation and construction.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

Approximately 35.6% of the site would be covered with impervious surfaces upon project completion.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

During construction a Temporary Erosion and Sediment Controls (TESC) would be submitted and implemented using best management practices (BMPs). A preliminary SWPPP (Stormwater Pollution Prevention Plan) has been prepared for the proposal. The preliminary SWPPP is based on the 2014 DOE Surface Water Management Manual requirements. Erosion control measures typically include silt fences, hay bales, and catch basin protection, and rock armoring, as necessary to minimize the impacts of erosion on off-site areas and on-site systems.

An NPDES permit from the Washington State Department of Ecology would be required for the project because it would disturb over one acre of land area.

2. Air

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

The Puget Sound Clean Air Agency, in connection with the Washington State Department of Ecology (DOE), conducts air quality monitoring at numerous sites around Puget Sound (including Lynnwood and Marysville; stations located nearest the subject site). According to the 2017 Air Quality Data Summary (the most recent available), over the last two decades, many pollutant levels have declined, and air quality has improved. Achieving significant reductions in particulate matter is a top priority of the Agency. All Snohomish County monitoring areas are in attainment with the standards for fine particle levels, which pose the greatest air quality challenge in our jurisdiction. Of the six criteria air pollutants monitored in the Puget Sound area, PM2.5 is associated with the most serious health effects.

Site preparation and construction would result in temporary localized increases in pollutant emissions from activities and equipment. Dust from excavation and grading could contribute to ambient concentrations of suspended particulate matter. Emissions related to construction would be short-term and should not generate any significant air quality impacts. It is anticipated that these impacts would be minimal.

Long-term impacts would result from increased traffic to the site, resulting in a slight increase in carbon monoxide levels. Domestically produced pollutants would be generated after the residential structures are occupied. These impacts are not expected to be significant.

Once the project is completed, the primary emissions sources would be from the existing surrounding uses and vehicles on the road system. The type and levels of

those emissions would not be significant and would not produce significant greenhouse gas (GHG) emissions.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

Emissions from vehicles traveling on roads adjacent to the site may affect the development.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

The Washington State Clean Air Act requires the use of all known, available, and reasonable means of controlling air pollution, including dust. Construction impacts would not be significant and the potential for soils to be carried off the site by exiting trucks could be controlled with the construction of a gravel entrance. Additionally, equipment used for site preparation would be serviced and maintained in good operation condition to lessen impacts from this source, and water would also be used for dust control when necessary. Long-term air quality impacts would be those of a single-family residential townhouse development and are not expected to exceed regulated amounts.

3. Water

a. Surface Water:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

The South Fork of Big Gulch Creek lies just west of the site and an unnamed tributary, with associated wetlands, flows along the south property line of the site.

Two wetlands (Wetlands A and B) and two streams (Streams A and B) were identified on the subject property. Pursuant to MMC, critical areas, wetlands, and fish and wildlife habitat conservation areas were assessed adjacent to the subject site, that may project regulated buffers onto the property. The South Fork of Big Gulch Creek is located approximately 100 feet west of the subject property. No additional off-site features were identified. (Refer to the Critical Area Study for additional detail.)

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

Clearing, grading, and building construction would take place adjacent to the stream and associated wetlands, subject to buffers and land-disturbing restrictions pursuant to City code. (Refer to the Critical Area Study for additional detail.)

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

None is proposed with the project.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

No; there would be no withdrawals or diversions to surface water.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

No; the proposal is not within a 100-year floodplain.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

Waste materials would not be discharged to surface waters as a result of the project. Discharges of petroleum products and other substances related to automobiles from the roads could result from the surface flow of storm water. Implementation of the drainage plan would minimize this occurrence by including water quality treatment with the storm water drainage facilities.

b. Ground Water:

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.

Construction-related groundwater impacts are not anticipated. No groundwater would be withdrawn as a part of the proposal. Public water is provided by Mukilteo Water & Wastewater District.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

No waste material would be discharged into the ground as a part of the proposal. Sewer service would be provided to the site by Mukilteo Water & Wastewater District (MWWD).

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

The source of runoff is from stormwater runoff. Surface water runoff from impervious surfaces shall be directed to storm drainage conveyance and detention systems and released into existing surface water conveyance systems (i.e. pipes, ditches etc.), as described in the submitted drainage report. Detailed drainage plans would be approved by City, in accordance with the drainage code.

2) Could waste materials enter ground or surface waters? If so, generally describe.

Oil, grease, and other pollutants from the additional paved areas could potentially enter the ground or downstream surface waters through surface water runoff. Construction of the detention system, control structures, and water quality features of the detailed drainage plan would provide adequate downstream protection.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.

Drainage patterns would not be altered or otherwise affected by the proposal.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:

Surface runoff during construction and after development would be controlled by the drainage system according to approved drainage and temporary erosion control plans. Best management practices (BMPs) would be incorporated into the grading activity. A Temporary Erosion and Sedimentation Control plan (TESC) would be put in place and would incorporate erosion control measures. To the extent possible the disturbed area of the project site would be limited to minimize erosion potential. Operation and maintenance activities, and storage and disposal at the construction site would be conducted to minimize the potential for contamination of stormwater runoff. Enhanced water quality treatment is incorporated into the design.

Drainage detention and controlled release would limit erosion impacts, and primary treatment in the form of dead storage and filtration would settle sediments. The location and design of permanent storm drainage facilities would match existing drainage patterns and runoff rates in compliance with City regulations.

4. Plants

a. Check the types of vegetation found on the site:

_X_ deciduous tree: **alder**, maple, aspen, other
_X_ evergreen tree: **fir**, **cedar**, pine, other
_X_ **shrubs**
_X_ **grass**
___ pasture
___ crop or grain
___ Orchards, vineyards or other permanent crops.
_X_ **wet soil plants**: cattail, buttercup, bullrush, skunk cabbage, other:
___ water plants: water lily, eelgrass, milfoil, other
___ other types of vegetation

Refer to the Critical Areas Report for additional detail.

b. What kind and amount of vegetation will be removed or altered?

Dominant on-site vegetation is represented by managed lawn grasses and small stands of black cottonwood and red alder saplings. On the southwestern portion of

the site a mature forested area exists containing Douglas fir, Big leaf maple, and Western red cedar. Existing native vegetation (trees, shrubs, groundcover, and grass) would be cleared at the time of development, subject to clearing restrictions associated with required buffers. (Refer to the Critical Areas Report and geotechnical report.)

c. List threatened and endangered species known to be on or near the site.

According to the Washington State Department of Fisheries and Wildlife's Priority Habitats and Species on the Web database, there were no threatened or endangered vegetation species identified on or known to exist on or adjacent to the proposal site.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

All cleared areas, exclusive of buildings and parking, would be landscaped upon completion of the project. Hydro-seeding may possibly occur on barren areas, per City requirements. Landscaping requirements would be provided consistent with City code requirements.

e. List all noxious weeds and invasive species known to be on or near the site.

Himalayan Blackberry, Reed Canarygrass, and Scotch broom are found on-site.

5. Animals

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site.

Examples include:

birds: hawk, **heron**, **eagle**, **songbirds**, other: **crow, robin, sparrow**
mammals: deer, bear, elk, beaver, other: **squirrels, rodents**
fish: bass, salmon, trout, herring, shellfish, other: **Coho, Resident Coastal Cutthroat**

The majority of the site is adjacent to significant human disturbance. No mammalian species were directly observed and on-site wildlife habitat is limited to small mammal and avian species. Species expected to occur within the area include gray squirrels (*Sciurus* spp.) and raccoon (*Procyon lotor*). Avian species likely to use the area include: American Crow (*Corvus brachyrhynchos),* American Robin (*Turdus migratorius*), Steller's Jay (*Cyanocitta stelleri*), Black-capped Chickadee (*Poecile atricapilla)*, Dark-eyed Junco (*Junco hyemalis*), northern flicker (*Colaptes auratus*), and Song Sparrow (*Melospiza melodia*).

A diverse wildlife component is expected within the greater Big Gulch riparian corridor. (Refer to the Critical Areas Report for additional detail.)

b. List any threatened and endangered species known to be on or near the site.

According to the Washington State Department of Fisheries and Wildlife's Priority Habitats and Species on the Web database, the nearby stream in Big Gulch is mapped as containing Coho and Resident Coastal Cutthroat

(*see inset map*). There is also a mapped aquatic habitat associated with Big Gulch located south of Harbour Pointe Blvd.

c. Is the site part of a migration route? If so, explain.

The project site is located along the Pacific Flyway, which includes Alaska, Arizona, California, Idaho, Nevada, Oregon, Utah, Washington, and those portions of Colorado, Montana, New Mexico, and Wyoming west of the Continental Divide. This is one of three major migratory routes in North America. The Pacific Flyway stretches 4,000 miles north-to-south and 1,000 miles east-to-west, from the Arctic to the west coast of Mexico and the Rocky Mountains to the Pacific Ocean. Every year, migratory birds travel some or all of this distance both in spring and in fall, following food sources, heading to breeding grounds, or travelling to overwintering sites. There is no evidence that the project area of the site is of any specific value to migrating birds.

d. Proposed measures to preserve or enhance wildlife, if any:

The wetlands, streams, and associated buffers would remain undisturbed, which provides habitat for wildlife. The landscaping provided (or replaced) would meet or exceed City code requirements, which includes consistency with the Development Agreement (sections 2.3 Critical/Sensitive Area Standards and 2.4.2 Open Space) and could provide limited habitat for on-site species more tolerant of urban activity. The Sector 3 Development Agreement standards for landscaping, trail, and NGPA would all be satisfied with the proposal.

e. List any invasive animal species known to be on or near the site.

It is likely that within the area there are rodents, mice, feral cats, etc. present on portions of the site; however, no specific species have been observed or documented on the subject site.

6. Energy and Natural Resources

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

Electricity would be used for lighting and heating, and natural gas would be used for heating.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

The project would not adversely impact the surrounding potential uses of solar energy and would be consistent with City development code and regulations.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

The requirements of the international building and city of Mukilteo codes would be satisfied in the construction of the residential buildings, and energy conserving materials would be utilized wherever possible throughout the construction process.

7. Environmental Health

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

There are certain opportunities for hazards during construction. These are limited by the requirements for the general contractor and subcontractors that would be doing the work. All State and federal requirements for construction safety would be met. The completed project is not anticipated to generate any environmental hazards.

1) Describe any known or possible contamination at the site from present or past uses.

There are no known contaminants on the site, which is undeveloped.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

There are no known hazardous conditions on or underground at the site.

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.

There are no hazardous materials or toxic chemicals that would be used as part of the building, parking lot or landscaping on-going maintenance after development. Petroleum fuel and machine operating products would be used and/or stored on the site during construction. After construction, it is likely that fertilizers and pesticides, would be used for landscaping maintenance.

4) Describe special emergency services that might be required.

No special emergency services are anticipated to be required.

5) Proposed measures to reduce or control environmental health hazards, if any:

During construction the project site would adhere to the contractor's spill prevention, control, and countermeasures plan and program.

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

Traffic on existing roads near the site would be audible from the property as would some activities at the nearby airport.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Temporary noise impacts would result from the use of construction equipment during daylight hours, generated by heavy equipment, hand tools and the transporting of construction equipment. At 200 feet from the area of construction, LEQ would be at approximately the following levels:

Activity	LEQ (in decibels)
clearing	**71-72**
excavation	**59-77**
foundations	**65**
building construction	**60-72**
finishing	**62-77**

Long-term impacts would be those associated with the increase in site users and additional traffic, the increase in noise would be typical of single-family residences.

3) Proposed measures to reduce or control noise impacts, if any:

Construction activities are subject to the Washington State and City of Mukilteo noise ordinances (8.18 MMC – Noise Control and 9.46 Public Nuisance), which includes limitations on the hours of construction activity noise.

Single-family use by residents is expected to generate typical residential noises, also subject to local noise ordinances.

8. Land and Shoreline Use

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.

The site is currently vacant, as it is an undeveloped parcel. Property to the south is developed with a senior assisted living complex. Property to the north is developed with a private pre-school facility. Properties to the east, across Harbour Place, are developed with commercial buildings for retail, food, and service businesses. Properties to the west are developed as single-family residential subdivisions, with associated permanent open space tracts adjacent to the site. Big Gulch Park lies to the west of the site.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?

There is no history of the site having been utilized for farming or working forest lands.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:

No, the site is within the city limits of Mukilteo and located near Paine Field, a regional airport.

c. Describe any structures on the site.

There are no structures on the site as it is undeveloped with only a private, joint use roadway shared with the private pre-school at the northern portion of the property.

d. Will any structures be demolished? If so, what?

No structures would be demolished. There is an existing paved shared private driveway to the undeveloped parcel currently on the site.

e. What is the current zoning classification of the site?

As shown on the City of Mukilteo Zoning Map (*see inset map*), the site is zoned Planned Community Business South (PCB-S). A Major Sector Amendment is proposed for the site. In the PCB-S zone, the City allows townhomes if authorized by a development agreement approved by the City Council (MMC Table 17.16.040, Note 9).

f. What is the current comprehensive plan designation of the site?

As shown on the City of Mukilteo Comprehensive Plan Land Use Designation Map (*see inset map*), the site is designated as Commercial – Mixed Use. The site is located within the City's Harbour Pointe Neighborhood Planning Area.

g. If applicable, what is the current shoreline master program designation of the site?

N/A; the site is not designated within the shoreline master program.

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.

The stream with associated wetlands and the steep slopes present on, and adjacent to, the site are all considered to be critical areas according to City code (17.52 MMC). (Refer to Critical Area Report and geotechnical report for additional details.)

i. Approximately how many people would reside or work in the completed project?

Based upon a 32-unit development, there would be approximately 86 residents as a result of the proposal (2.7 residents x 32 units = 86 residents).

j. Approximately how many people would the completed project displace?

None; the site is undeveloped.

k. Proposed measures to avoid or reduce displacement impacts, if any:

N/A; the site is undeveloped.

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

The proposed development of townhouses is subject to impact mitigation fees for schools, parks and traffic. (Refer to the Cost Benefit Analysis prepared for the proposal.)

Compatibility of the proposal is measured by consistency with the adopted comprehensive plan, zoning code, and environmental review. The proposal has been designed to provide this consistency with zoning, grading, building, critical areas, landscaping, storm and surface water, and other regulations adopted by the City. The project would meet or exceed the standards of all applicable City land use codes and regulations. Extensive reports have been prepared and submitted with this application to address the consistency with codes and regulations.

The proposal would further the goals and policies of the adopted City Comprehensive Plan as it is consistent with the following elements:

Land Use

LU2: Development regulations and standards that improve the quality of life of Mukilteo residents and promote the city's single-family residential character should be adopted.

LU9: The City shall manage and regulate development in critical areas and the shoreline to allow reasonable and appropriate uses in those areas while protecting them against adverse effects and shall regularly evaluate these regulations and programs to ensure they continue to use the best available science to protect environmentally sensitive areas from negative impacts associated with development.

LU13: New development and redevelopment, both in Mukilteo and at Snohomish County/Paine Field Airport, should be complementary to each other and should support general aviation and the aerospace industry over all other airport uses.

Housing

HO2: Housing policies, programs, and regulations designed to support and promote sustainability and which minimize the impact on environmentally sensitive areas should be developed.

HO5: A wide variety of housing options should be encouraged in the city's residential and mixed use zoning districts to meet demands for housing, including affordable housing.

Transportation

TR2: Future development shall be required to pay its proportionate share of the cost to increase the City's transportation system's ability to handle the additional traffic generated by the development.

TR9: Pedestrian and bicycle facilities, streetscape standards, and traffic calming methods should be installed to improve connectivity between parks, retail centers, schools, and regional transportation nodes and to promote a pedestrian and bicycle friendly environment.

m. Proposed measures to ensure the proposal is compatible with nearby agricultural and forest lands of long-term commercial significance, if any:

There are no nearby agricultural or forest lands of long-term commercial significance; therefore, no measures are needed.

9. Housing

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

The proposal is for development of 32 middle-income townhouse units.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

None; the site is undeveloped.

c. Proposed measures to reduce or control housing impacts, if any:

Application of City development regulations, including impact mitigation measures, would serve to reduce housing impacts. The proposed development of townhouses is subject to impact mitigation fees for schools, parks and traffic, as detailed within this SEPA Checklist. (Refer to the Cost Benefit Analysis prepared for the proposal.)

10. Aesthetics

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

Structures would comply with the City zoning code for height limits. The tallest structure on-site would be approximately 34'6", which is in compliance with the code maximum of 35' for the townhomes. It is anticipated that the height would be within 3 feet of the maximum allowed; therefore, a Mean Ground and building height worksheet will need to be prepared and stamped by a land surveyor.

Exterior materials would be principally cementitious cladding with accent siding.

b. What views in the immediate vicinity would be altered or obstructed?

No surrounding views would be obstructed; however, development of the site would alter the view of the site.

c. Proposed measures to reduce or control aesthetic impacts, if any:

Retention of existing vegetation and re-vegetation with landscaping of the building sites would serve to reduce impacts.

11. Light and Glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

Light and glare would be produced by exterior and interior residential lighting during evening hours and vehicle headlights traveling to and from the site.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

Light from the finished project would not interfere with views or cause hazards. Exterior lighting would be typical of a residential neighborhood, and would actually promote safety at the site.

c. What existing off-site sources of light or glare may affect your proposal?

The primary off-site source of light and glare would be from the existing residential area lighting, and vehicles traveling along the area roadways. Existing off-site sources of light and glare should not affect the subject proposal.

d. Proposed measures to reduce or control light and glare impacts, if any:

All exterior building lighting would be directed downward and shielded to minimize glare on the nearest properties.

12. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?

City parks and trails, a golf course, playgrounds at school facilities, and boating and water-related activities are all available in the project area. Also, an existing walking trail is located on the site as part of an existing City trail system, which includes Big Gulch Park and 92nd Street Park.

b. Would the proposed project displace any existing recreational uses? If so, describe.

The site is currently an undeveloped privately-owned parcel.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

The project would be subject to park impact mitigation requirements, pursuant to City code (3.105 MMC).

13. Historic and cultural preservation

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers located on or near the site? If so, specifically describe.

The site is undeveloped, therefore it does not contain any buildings or structures. There are no adjacent properties mapped as containing historic buildings or structures according to the Washington State Department of Archaeology and Historic Preservation's (DAHP's) online mapping system (WISAARD).

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

None known; research was conducted with the DAHP for the site and immediate area. DAHP has two levels of secure access – the first allows access to the Project module for historic property inventory data entry and was reviewed. The second level includes access to Washington State's vast collection of archaeological site inventory data and cultural resources reports. It is restricted to primarily archaeologists and was not within the scope of this SEPA Checklist.

No documented findings were indicated on the subject site and limited mapped historic structures are within this area of Mukilteo.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

Potential impacts to cultural and historic resources have not been identified during previous the development of this site (entrance driveway) and adjacent properties, so no further assessment has been initiated.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

If evidence of any on-site historic, archeological, scientific or cultural significance were found during site activity, construction would be halted in that area and the State Historical Preservation Officer would be notified. At that time, the appropriate persons would be notified of the exact nature and extent of the resource so that measures could be taken to secure it.

14. Transportation

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

The site fronts on Harbour Place, which is an existing public roadway. Access to the site is currently available from a private, joint use roadway shared with the private pre-school (Harbour Pointe Montessori School). A proposed second driveway on Harbour Place would result in private road for the proposed townhouse project.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

Local and commuter transit service runs along SR 525 and along Harbour Pointe Blvd. The nearest stop is located south of the site at the intersection of SR 525 and Harbour Pointe Blvd.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate?

The project provides 72 spaces in total, including 47 in-unit stalls, 17 stalls in private driveways, and 8 designated guest parking stalls. No parking would be eliminated as the site is currently undeveloped.

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

No new public road, street, pedestrian, bicycle or state transportation facility improvements would be required as a result of the proposal.

Private access to the site would be via a full access driveway approximately 330 feet south of the existing Montessori school access. The existing shared access would continue to serve the school and is proposed as an emergency access to the north side of the new development. The emergency accesses would be controlled with flexible spring post bollards.

A deviation from City standards, to AASHTO standards, for intersection sight distance is a part of the development proposal.

e. Describe the existing condition of the proposed access road, including width of easement, width of pavement or roadway, curbs, gutters, and/or sidewalks.

Harbour Place is fully improved to the City standard, including approximately 36-feet of asphalt pavement with concrete curb and gutter, as well as sidewalks on both sides. Site access is proposed directly from Harbour Place via a looped private road for the proposed townhouse project, as detailed within the submitted application packet, Site Plan and the Traffic Impact Analysis.

f. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

While other means of transportation (such as water, rail and air) are available within the region, the residential project would not use other means of transportation.

g. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

Trip generation information is provided in the traffic study prepared by Gibson Traffic Consultants, which was submitted as a part of the proposal application packet. (Refer

to Traffic Impact Analysis for additional detail.) According to the report, the project trip generation is as follows:

Table 1: Trip Generation Summary

Basel Mukilteo Townhomes		Average Daily Trips			AM Peak-Hour Trips			PM Peak-Hour Trips		
		Inbound	Outbound	Total	Inbound	Outbound	Total	Inbound	Outbound	Total
ITE LUC 220, Multi-Family (Low-Rise), 32 Units	Generation Rate	7.32 Trips Per Unit			0.46 Trips Per Unit			0.56 Trips Per Unit		
	Splits	50%	50%	100%	23%	77%	100%	63%	37%	100%
	Trips	117	117	234	3.39	11.33	14.72	11.29	6.63	17.92
NEW TRIPS		117	117	234	3.39	11.33	14.72	11.29	6.63	17.92

New PM peak hour trips generated by the proposal would be subject to traffic impact mitigation fees.

h. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

The proposal would not interfere with the movement of agricultural and forest products on the road system.

i. Proposed measures to reduce or control transportation impacts, if any:

The project would be subject to the City traffic impact mitigation requirements of (3.107 MMC), which provides for traffic mitigation to both the City and Snohomish County.

The interlocal agreement between Snohomish County (County) and the City of Mukilteo (City) allows the County to request traffic mitigation fees from any new developments in the City. The development is not anticipated to impact County roadways and therefore no mitigation fees to be paid to the County.

The City assesses traffic impact fees based on $1,875 per new PM peak-hour trip. The development would generate 17.92 new PM peak-hour trips and therefore is obligated to pay a traffic mitigation fee of $33,600.00 to the City.

15. Public Services

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

There would be an increase in the level of public services needed as a result of the proposal; however, it is not anticipated to be significant. (Refer to the Cost Benefit Analysis for additional detail.)

b. Proposed measures to reduce or control direct impacts on public services, if any.

The proposal would generate new tax and use revenue, as detailed in the Cost Benefit Analysis, and would be subject to the impact mitigation requirements of City code.

The proposal would be subject to the City impact mitigation requirements, which include schools (3.100 MMC) and parks of (3.105 MMC), which serves to reduce or control impacts for those services.

Adherence to the City development standards and regulations reduces or controls direct impacts to other public services. Adequate access to the development (including circulation for emergency vehicles, clearly identified building(s) and addresses, and adequate fire flow), are examples of the proposed measures to minimize direct impacts of the proposal on public services.

16. Utilities

a. Circle utilities currently available at the site: **electricity**, **natural gas**, **water**, **refuse service**, **telephone**, **sanitary sewer**, septic system, other: **cable television**

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

Electricity – Snohomish County PUD No. 1
Gas – Puget Sound Energy
Water – Mukilteo Water & Wastewater District
Refuse – Waste Management NW
Telephone – Verizon Northwest
Sanitary sewer – Mukilteo Water & Wastewater District
Cable television – Comcast

These utilities would all be extended into the site from existing facilities located in Harbour Place and from adjacent properties. Utility providers have been consulted throughout the preliminary process to ensure availability of adequate services. The actual extension of utilities and provision of public services would be coordinated through the planning/building phase.

C. Signature

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: _____

Name of signee George Li

Position and Agency/Organization President, Paris Beta LLC

Date Submitted: September 20, 2019

CRITICAL AREA STUDY

FOR

SNOHOMISH COUNTY PARCEL NO. 28042100103200

MUKILTEO, WA

Wetland Resources, Inc. Project #18321

Prepared By
Wetland Resources, Inc.
9505 19th Avenue SE, Suite 106
Everett, WA 98208
(425) 337-3174

Prepared For
Paris Beta LLC
Attn: Lucy Chen
925 80th Ave. NE
Medina, WA 98039

September 6, 2019

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1.0 INTRODUCTION

Wetland Resources, Inc (WRI) completed a site investigation on December 24, 2018 to delineate jurisdictional wetlands and streams on and in the vicinity of the subject property located directly west of the intersection of Harbour Pl and SR-525 in Mukilteo, Washington, for future development activities, as required by the City of Mukilteo's Municipal Code (MMC) At the time of our site investigation, the weather was overcast.

The 3.26-acre subject property is further located as a portion of Section 16, Township 28N, Range 04E, W.M. The property is generally triangular in shape with a small portion extending north. The tax identification number for the subject site is 28042100103200. The intent of this document is to characterize all identified critical areas and buffers on and in the vicinity of the subject property.

Figure 1 Aerial view of the subject property.

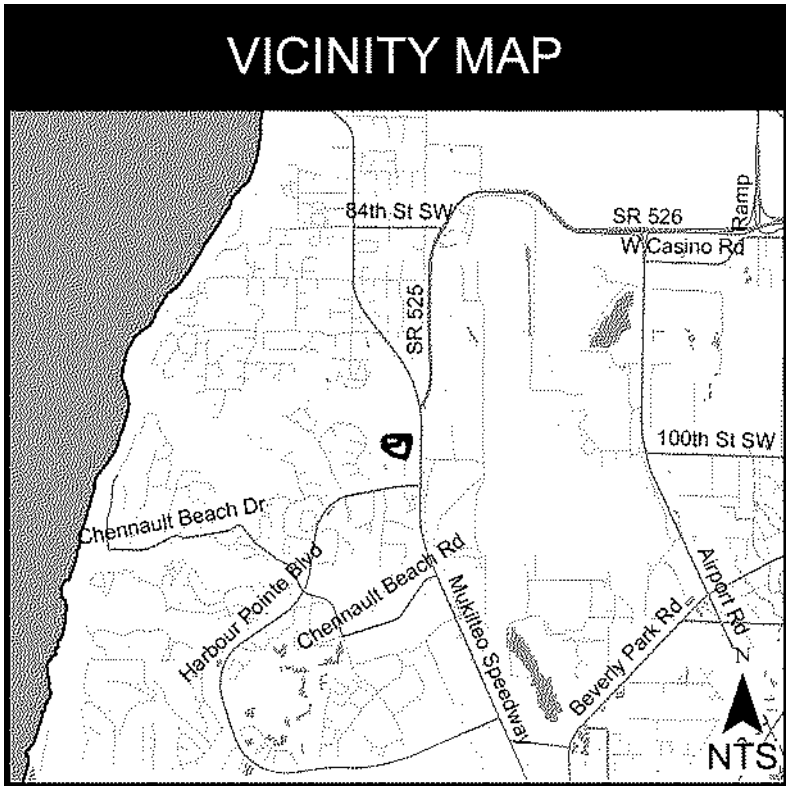

Figure 2 Vicinity Map of the subject property.

1.1 SITE DESCRIPTION

Access to the subject site is via Harbour Pl, on its western side. The subject site is currently undeveloped, while surrounding land use is a mix of single and multi-family residential and commercial development. Dominant on-site vegetation is represented by managed lawn grasses and small stands of black cottonwood and red alder saplings. On the southwestern portion of the site a mature forested area exists containing Douglas fir, Big leaf maple, and Western red cedar.

Topography consists of a gentle slope, becoming sharply steep with a westerly aspect. Given the topography of the site, general surface water patterns flow to the western property boundary, which borders Big Gulch. On-site soils are mapped as Alderwood gravelly sandy loam, 0 to 8 percent slopes, and Everett very gravelly sandy loam, 15 to 30 percent slopes. Soils found during the investigation are similar to the above mapped series.

Two wetlands (Wetlands A and B) and two streams (Streams A and B) were identified on the subject property. Pursuant to MMC, critical areas, wetlands, and fish and wildlife habitat conservation areas were assessed adjacent to the subject site, that may project regulated buffers onto the property. The South Fork of Big Gulch Creek is located approximately 100 feet west of the subject property. No additional off-site features were identified.

The City of Mukilteo provides regulatory guidance on wetland classification within the City's jurisdiction, *Wetlands shall be classified as Category I, II, III or IV using the 2014 Washington State Department of Ecology's Wetland Rating System for Western Washington, Publication No. 04-06-025, or as amended hereafter. Identification of wetlands and delineation of their boundaries pursuant to this chapter shall be done in accordance with the approved federal wetland delineation manual and applicable regional supplements. All areas within the city meeting the wetland designation criteria in that procedure are hereby designated critical areas and are subject to the provisions of this chapter.* Pursuant to MMC 17.52B.090, Wetland A is classified as a Category IV wetland, with a habitat score of 5. Wetland B is classified as a Category IV wetland, with a habitat score of 5. All Category IV wetlands in the City of Mukilteo receive standard 40-foot protective buffers. Pursuant to MMC 17.52C.080, Both Stream A and B are classified as a Type-5 streams. All Type-5 streams in the City of Mukilteo receive standard 50-foot protective buffers.

1.2 PROJECT DESCRIPTION

Paris Beta LLC, hereafter referred to as the applicant, is proposing the construction of a 4-building 32-unit, multi-family residential development and associated infrastructure. To accommodate for this development the applicant is proposing minor buffer averaging, pursuant to MMC 17.52C.090 & 17.52B.100. The buffer adjacent to Building-S (lot-1) will be reduced by 473 square feet. This portion of the buffer will be reduced by an average of 10-feet, with a minimum buffer of width of 40 feet. The proposed reduction plan is thereby less impactful than the maximum 17.5-ft reduction allowed. The area proposed for the buffer reduction is currently dominated by Himalayan blackberry with no significant trees. As such, reducing this area would have the least impact in terms of buffer function, and will not adversely impact the functions and values of the subject wetland. This proposed mitigation will not reduce the total area of buffer on the subject property. As compensatory mitigation, 1,360 square feet of additional buffer (a 2.9:1 mitigation ratio) will be provided between the two distinct wetland and stream areas, creating contiguous protected buffer along the southern property line. This buffer addition area will help to establish a connected riparian and wetland corridor. An open canopy of big leaf maple and red alder currently dominates the area proposed for additional buffer.

The applicant is offering a buffer averaging plan that provides an additional 337 square feet of buffer protected in perpetuity. The averaging plan summarized below provides an increase to wetland and stream functions and values by increasing the total buffer area, and by providing a connected corridor, which will maintain quantity, density, and structural diversity of the native plant assemblage within the on-site buffer, thereby improving attenuation of floodflow, biofiltration function, and the quality of wildlife habitat provided.

Table 1 Summary of Proposed Actions

Action	Impact Area	Compensatory Mitigation	Mitigation to Impact Ratio
Buffer Reduction	473 square feet	1,360 square feet of Buffer Addition	2.9:1

1.3 WETLAND CLASSIFICATION

1.3.1 Cowardin System Classification

According to the Cowardin System, as described in Classification of Wetlands and Deepwater Habitats of the United States, Cowardin, et al. 1979, the classification for the on-site wetlands and streams are as follows:

Wetland A: Palustrine, Scrub-Shrub, Broad-leaved Deciduous, Seasonally Flooded

Wetland B: Palustrine, Forested, Broad-leaved Deciduous, Seasonally Flooded

Stream A: Riverine, Intermittent, Streambed, Cobble-gravel

Stream B: Riverine, Intermittent, Streambed, Cobble-gravel

1.3.2 City of Mukilteo Classifications

As required by MMC 17.52B.090, the subject wetlands were classified using the *Washington State Department of Ecology (DOE) Wetland Rating System for Western Washington: 2014 Update.*

Wetland A - Category IV: Wetland A received a total score of 14 on the DOE *Wetland Rating Form for Western Washington 2014 Update,* with a score for habitat functions of 5. In Mukilteo, wetlands that receive scores between 9 and 15 points are classified as Category IV wetlands. Category IV wetlands in Mukilteo receive standard buffers of 40 feet.

Wetland B - Category IV: Wetland B received a total score of 14 on the DOE *Wetland Rating Form for Western Washington 2014 Update,* with a score for habitat functions of 5. In Mukilteo, wetlands that receive scores between 9 and 15 points are classified as Category IV wetlands. Category IV wetlands in Mukilteo receive standard buffers of 40 feet.

As required by MMC 17.52C.080, Streams shall be classified according to the stream type system as provided in WAC 222-16-031, Interim water typing system.

Stream A - Type-5: Pursuant to MMC 17B.52C.080, Stream B meets the parameters necessary for classification as a Type 5 stream. Under MMC 17B.52C.090, Type 5 streams receive 50-foot protective buffers.

Stream B - Type-5: Pursuant to MMC 17B.52C.080, Stream B meets the parameters necessary for classification as a Type 5 stream. Under MMC 17B.52C.090, Type 5 streams receive 50-foot protective buffers.

2.0 CRITICAL AREAS DETERMINATION

2.1 PUBLICLY AVAILABLE DATA

Prior to conducting the site investigation, public resource information was reviewed to gather background information on the subject property and the surrounding area in regards to wetlands, streams, and other critical areas. These sources included the following:

- *USDA/NRCS Web Soil Survey* shows two soil units on-site: Alderwood gravelly sandy loam, 0 to 8 percent slopes, and Everett very gravelly sandy loam, 15 to 30 percent slopes. A more detailed soil description is provided in the "2.2 Field Determination Methodology" section below.
- *USFWS National Wetlands Inventory (NWI)* identifies no wetlands on or in the immediate vicinity of the subject property. The nearest mapped feature is Big Gulch Creek, located approximately 100 feet to the west.
- *Snohomish County PDS Map Portal* shows no environmentally sensitive on-site. The closest is Big Gulch Creek, a Type-3 stream, which is located approximately 100 feet west of the subject site. Additionally, PDS models two wetlands; one is along Big Gulch Creek, and the second is approximately 500 feet south of the subject property. Wetland conditions in this location was not confirmed.
- *DNR FPARS ARCIMS Mapping Application* confirms the presence of the Type-3 stream to the west, and confirms its identity as Big Gulch Creek.
- *WDFW Priority Habitat and Species (PHS) Interactive Map* further confirms the presence of the Type-3 stream to the west and the wetland to the south. Additionally, maps coho and resident cutthroat trout within Big Gulch Creek.
- *StreamNET Interactive Mapping System* confirms the presence of the fish-bearing stream, Big Gulch Creek, to the west. The segment of the stream that is closest to the subject property is recorded as containing coho salmon.

2.2 FIELD DETERMINATION METHODOLOGY

Wetland conditions where present, were evaluated using routine methodology described in the *Corps of Engineers Wetlands Delineation Manual* (*Final Report*; January 1987), except where superseded by *2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)*, (referred as 2010 Regional Supplement). The following criteria descriptions were used in the boundary determination: examination of the site for hydrophytic vegetation (species present and percent cover), examination of the site for hydric soils, and determining the presence of wetland hydrology.

2.2.1 Vegetation Criteria

The 2010 Regional Supplement defines hydrophytic vegetation as "assemblage of macrophytes that occurs in areas where inundation or soil saturation is either permanent or of sufficient

frequency and duration to influence plant occurrence." Field indicators were used to determine whether the vegetation meets the definition for hydrophytic vegetation.

2.2.2 Soils Criteria and Mapped Description

The 2010 Regional Supplement defines hydric soils as "soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part." Field indicators were used to determine whether a given soil meets the definition for hydric soils.

The soils underlying the project area are mapped in the *Natural Resources Conservation Service Web Soil Survey* as follows: Alderwood gravelly sandy loam, 0 to 8 percent slopes, and Everett very gravelly sandy loam, 15 to 30 percent slopes. The following soil descriptions are excerpts from the official soils descriptions found on the NRCS website:

(http://soils.usda.gov/technical/classification/osd/index.html).

Alderwood gravelly sandy loam, 0 to 8 percent slopes. Alderwood gravelly sandy loam is described as rolling with irregularly shaped areas ranging from 10 to about 600 acres in size. The A horizon ranges form very dark brown to dark brown. The B horizon is dark brown, grayish brown, and dark yellowish brown. Permeability is moderately rapid in the surface layer and subsoil and very slow in the substratum. Available water capacity is described as low. Included within this soil unit are the poorly drained Norma, Bellingham, Seattle, Tukwila, Shalcar soils, and Alderwood soils that have slopes more gentle or steeper than 6 to 15 percent. Included soil units make up no more than 30 percent of the total acreage.

Everett gravelly sandy loam, 15 to 30 percent slopes. Everett gravelly sandy loam is described as very deep, somewhat excessively drained soil on terraces and outwash plains. It formed in glacial outwash. Typically, the surface layer, where mixed to a depth of about 6 inches, is dark brown gravelly sandy loam. The subsoil is dark brown very gravelly sandy loam about 12 inches thick. Included in this unit are small areas of Alderwood soils on till plains, Indianola soils on terraces and outwash plains, and Ragnar soils on outwash plains. Included areas make up about 15 percent of the total acreage. Permeability of this Everett soil is rapid. Available water capacity is low.

2.2.3 Hydrology Criteria

As stated in the 2010 Regional Supplement, the "term wetland hydrology encompasses all hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface for a sufficient duration during the growing season." It also explains "areas with evident characteristics of wetland hydrology are those where the presence of water has an overriding influence on characteristics of vegetation and soils due to anaerobic and chemically reducing conditions, respectively."

Additionally, the *US Army Corps of Engineers 1987 Wetland Delineation Manual* states that "areas which are seasonally inundated and/or saturated to the surface for a consecutive number of days ≥12.5

percent of the growing season are wetlands, provided the soil and vegetation parameters are met. Areas inundated or saturated between 5 and 12.5 percent of the growing season in most years may or may not be wetlands. Areas saturated to the surface for less than 5 percent of the growing season are non-wetlands." Field indicators were used to determine whether wetland hydrology parameters were met on this site.

2.3 BOUNDARY DETERMINATION

2.3.1 Wetland A

HGM Classification: Slope
City of Mukilteo Classification: Category IV
City of Mukilteo Buffer: 40-feet

Wetland A is irregular in shape and located partially on-site in the western region. It is associated with hillside seeps, which serve as the primary sources of hydrology, eventually focusing flow within Streams A & B. Dominant vegetation within Wetland A consists of western red cedar (*Thuja plicata*; FAC), red alder (*Alnus rubra*; FAC), big-leaf maple (*Acer macrophyllum*; FACU), salmonberry (*Rubus spectabilis*; FAC), devilsclub (*Oplopanax horridus*; FAC), and piggyback plant (*Tolmeia menziesii*; FAC). The soils underlying the wetland are typically a Munsell color of very dark brown (10YR 2/2) and a sandy loam texture to 3 inches. From 3 to 12 inches below the soil surface, soils are a grayish brown (2.5Y 5/2) with dark yellowish brown (10YR 3/6) redoximorphic features and a sandy loam texture. These soils meet hydric soil indicator Depleted Matrix (F3). The soils were saturated from 0 to 6 inches, with a water table observed at 6 inches below the soil surface during our December 2018 site visit.

2.3.2 Wetland B

HGM Classification: Slope
City of Mukilteo Classification: Category IV
City of Mukilteo Buffer: 40-feet

Wetland B is small slope wetland located partially on-site in the southeast region of the subject property. Dominant vegetation within Wetland B consists of western red cedar (*Thuja plicata*; FAC), red alder (*Alnus rubra*; FAC), salmonberry (*Rubus spectabilis*; FAC), Himalayan blackberry (*Rubus armeniacus*; FAC), and piggyback plant (*Tolmeia menziesii*; FAC). The soils underlying the wetland are typically a Munsell color of very dark brown (10YR 2/2) and a sandy loam texture to 8 inches. From 8 to 15 inches below the soil surface, soils are a dark brown (10YR 3/3) and a sandy loam texture. The soils were saturated from 0 to 2 inches, with a water table observed at 2 inches below the soil surface during our December 2018 site visit.

2.3.3 Stream A

City of Mukilteo Classification: Type 5
City of Mukilteo Buffer: 50-feet

Stream A is an intermittent feature that originates in the northern portion of Wetland A. It is a tributary to Stream B, flowing northeast to southwest until the two meet in the western region of the subject property. Though Stream A flows to Stream B (a tributary to Big Gulch Creek, which

has documented fish presence) and has an average channel width of 5.2-feet, WRI's analysis shows that multiple segments of Stream A are on slopes of more than 20 percent. According to WDFW's *Fish Passage Barrier and Surface Water Diversion Screening and Prioritization Manual*, stream gradients over 20 percent constitute a fish passage barrier. Thus, according to MMC 17B.52C.080, Stream B meets the parameters necessary for classification as a Type 5 stream. Under MMC 17B.52C.090, Type 5 streams receive 50-foot protective buffers.

2.3.4 Stream B

City of Mukilteo Classification: Type 5
City of Mukilteo Buffer: 50-feet

Stream B is an intermittent feature that originates in the southern region of the subject property, where it flows through Wetland B, southeast to northwest, until its confluence with Stream A. It is a tributary to the South Fork of Big Gulch Creek (which has documented fish presence). While it has an average channel width of 6.6-feet, WRI's analysis shows that multiple segments of Stream B are on slopes of more than 20 percent. According to WDFW's *Fish Passage Barrier and Surface Water Diversion Screening and Prioritization Manual*, stream gradients over 20 percent constitute a fish passage barrier. Thus, according to MMC 17B.52C.080, Stream B meets the parameters necessary for classification as a Type 5 stream. Under MMC 17B.52C.090, Type 5 streams receive 50-foot protective buffers.

2.3.5 Non-Wetland

Vegetation across the site consists primarily of two distinct assemblages (pasture and forest areas). The "pasture area" on the northeast portion of the site is comprised largely of managed pasture grasses, and small sapling stands. This area was historically cleared and graded and is primarily comprised of primary invaders. Dominant vegetation in this area, consists of black cottonwood (*Populus trichocarpa*; FAC), red alder (*Alnus rubra; FAC*), reed canarygrass (*Phalaris arundinacea*; FACW), (*Juncus effusus*; FACW), creeping buttercup (*Ranunculus repens*; FAC). velvet grass (*Holcus lanatus*; FACU), bluegrass (*Poa annua*; FAC), white clover (*Trifolium repens*; FAC), dandylion (*Traxicum officianle*; FACU), bracken fern (*Pteridium aquilinum*; FACU), and Himalayan blackberry (*Rubus armeniacus,* FAC). Soils in this area were typically a very dark brown (10YR 3/1) and a texture of silt loam, from 0-3 inches below the surface. From 3 to at least 12 inches below the surface, soils were a dark brown (10YR 4/3) with 10% yellowish red (5Y 4/6) redoximorphic features and a silty clay loam texture. Soils were saturated at a depth of 11 inches during the October 2018 site visit. At 12 inches there are large deposits of cobble and gravel material which resulted in refusal. Redoximorphic features in this area appear to be relic in nature, as diffuse boundaries were not observable. Significant compaction and the absence of topsoil appear to indicate that this area has had significant disturbance resultant of past clearing and grading.

The second vegetation assemblage is that of mature "forested area" associated with the Big Gulch corridor, on the southeastern portion of the site. Dominant vegetation in includes big leaf maple (*Acer macrophyllum;* FACU), Douglas fir (*Pseudotsuga menziesii* FACU), and western red cedar (*Thuja plicata;* FAC) overstory; and a complex understory comprised of vine maple (*Acer circinatum;* FAC), beaked hazelnut (*Corylus cornuta;* FACU), Osoberry (*Oemleria cerasiformis;* FACU), western sword fern (*Polystichum munitum;* FACU), Oregon grape (*Mahonia nervosa;* FACU), salal (*Gaultheria shallon;*

FACU), evergreen blackberry (*Rubus ursinus;* FACU), red huckleberry (*Vaccinium parvifolium;* FACU), stinging nettle (*Urtica dioica;* FAC), and Pacific bleeding heart (*Dicentra Formosa;* FACU). Soils in these areas were generally very dark grayish brown (10YR 3/2) from 0 to 5 inches below the soil surface. From 5 to 8 inches below the soil surface, soils were generally a dark brown (10YR 3/3) and a sandy loam texture. From 8 to 16 inches below the soil surface, soils were generally a dark yellowish brown (10YR 3/4), and a sandy loam texture. These soil characteristics are not consistent with any of the hydric soil indicators listed in the 2010 Regional Supplement. No saturation or presence of a high water table was observed in the non-wetland areas, and vegetation communities are not hydrophytic.

2.3.6 Area of concern

An isolated area, located on the western portion of the "pasture area" described above, meets the wetland criteria for hydric soils, and is comprised generally of primary invaders typical of disturbed sites. However, as stated in the soils description for the "pasture area," this area of concern appears to be resultant of past clearing and grading, and not formed from shallow ground water. Historic aerial imagery obtained from Environmental Data Resources, and the City of Mukilteo Historic Aerial database, provides evidence that this area was cleared and graded for the creation of Harbour Pl and the surrounding commercial and residential property development in 1996. Photos show that the area of concern had historically contained upland species, as evidenced by the historical presence of Douglas firs (a FACU species, unable to persist in wet conditions) from 1947 to at least 1995, further supported by the surrounding mature Douglas fir forest observed on-site. An aerial from 1996 shows the extent of clearing and grading associated with installation Harbour Pl and its surrounding development. Appendix D includes the full range of historical photos obtained from Environmental Data Resources.

Additional clearing activities were completed in 2006 during the construction of the Harbour Point Montessori School. The subject site was once again disturbed during this time, and housed construction materials and an access road. No critical areas were identified on-site or immediately adjacent during the construction of the school. According to MMC 17.08.020 wetlands are *those areas that are inundated or saturated by surface or ground water at a frequency and duration to support, and that under normal circumstances do support, a prevalence of vegetation adapted for life in saturated soil conditions.* MMC states that wetlands do not include *those artificial wetlands intentionally created from nonwetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway.* WRI concludes that the feature was a byproduct of the removal of topsoil resultant of the historical disturbance (clearing and grading for Harbour Pl, and continued grading activities) on the subject property, which exposed relic glacial material and not active hydric soils. Therefore, it does not meet the definition of a wetland according to MMC. As such, this area is not regulated.

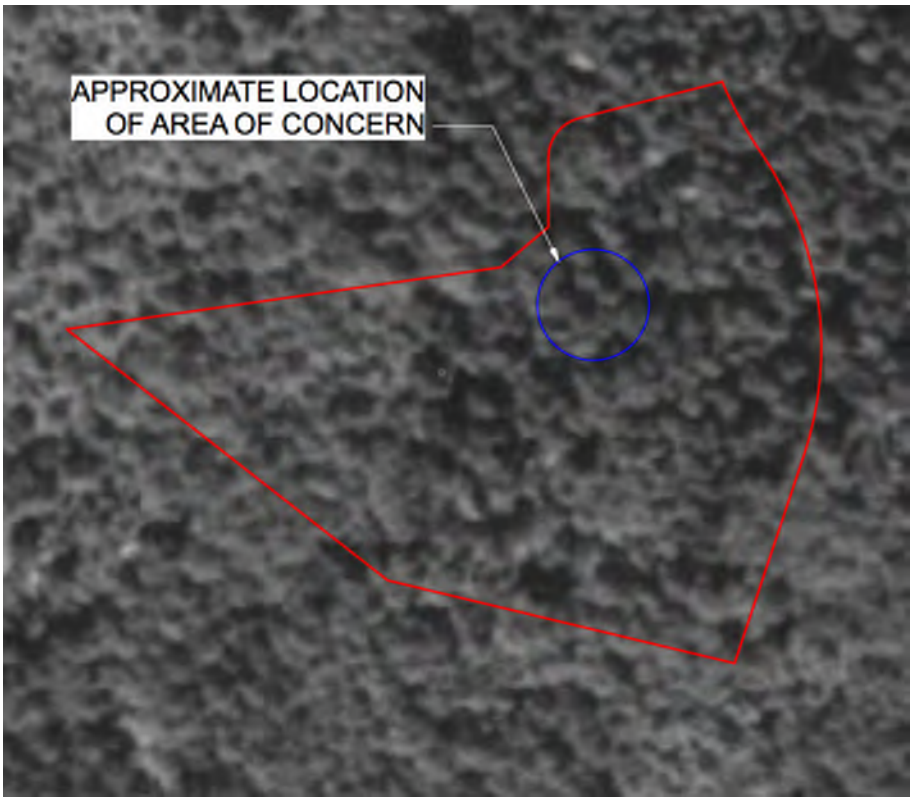

Figure 3 Historic aerial view of the subject property from 1947.

Figure 4 Historic aerial view of the subject property from 1996, post clearing for Harbour Pl.

Figure 5 Historic aerial view of the subject property from 2002, after Harbour Pl development area completed.

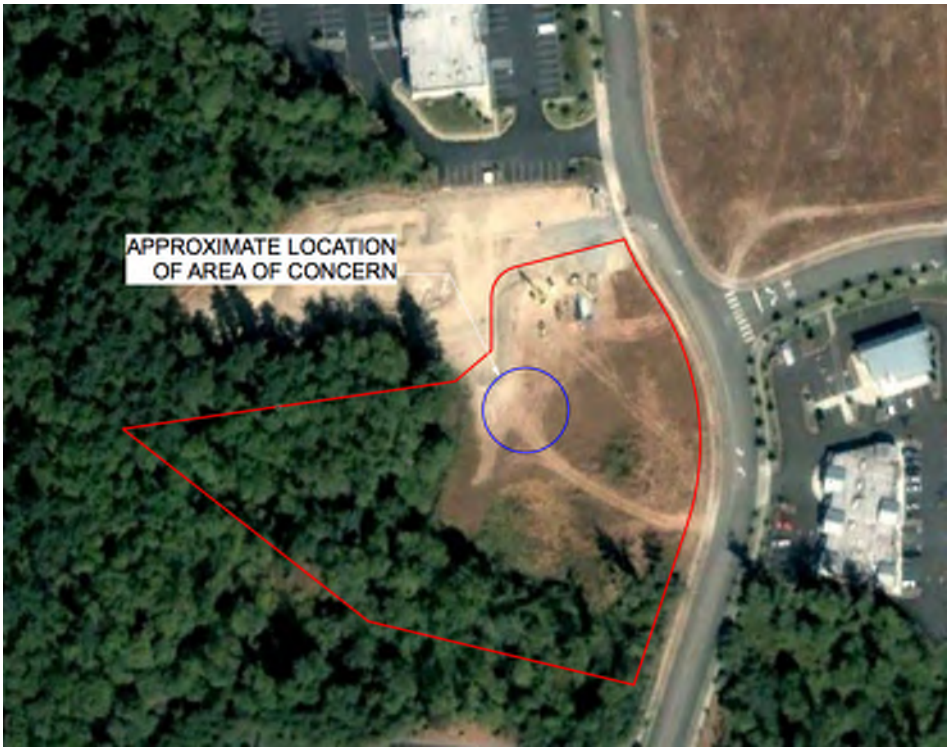

Figure 6 Historic aerial view of the subject property from 2006, during school construction on the property to the north.

3.0 WETLAND FUNCTIONS AND VALUES ASSESSMENT

Pursuant to requirements set forth in MMC 17.52B.140 critical areas reports shall assess the impacts of any alteration proposed for a critical area or buffer. The following assessment is intended to compare the current and post-development functions and values provided by Wetland A and B, as well as Stream A and B in the vicinity of the project area.

3.1 METHODOLOGY

The methodology for this functions and values assessment is based on professional opinion developed through past field analyses and interpretation. This assessment pertains specifically to the on-site wetland system, but is typical for assessments of similar systems common to Western Washington.

3.2 FUNCTIONAL COMPONENTS

Wetlands in Western Washington perform a variety of ecosystem functions. Included among the most important functions provided by wetlands are stormwater control, water quality improvement, fish and wildlife habitat, aesthetic value, recreational opportunities and education. The most commonly assessed functions and their descriptions are listed below.

Streams provide both hydrologic and habitat connections throughout the Western Washington Region. Many channels serve as rearing grounds for a variety of fish species, including salmonids. Many wildlife species make use of the resources provided by riparian ecosystems.

3.2.1 Hydrologic Functions

Wetlands often function as natural water storage areas during periods of precipitation and flooding. By storing water that otherwise might be channeled into open flow systems, wetlands can attenuate or modify potentially damaging effects of storm events, reducing erosion and peak flows to downstream systems. Additionally, the soils underlying wetlands are often less permeable, providing long-term storage of stormwater or floodflow and controlling baseflows of downstream systems. Stormwater storage capacity and floodflow attenuation are generally a function of the size of the wetland and their topographic characteristics.

3.2.2 Water Quality

Surface water quality improvement is another evaluated function. Surface runoff during periods of precipitation increases the potential for sediments and pollutants to enter surface water. Wetlands improve water quality by acting as filters as water passes through them, trapping sediments and pollutants from surface water. Ponded areas within depressional wetlands also allow sediments to drop out of suspension, thereby increasing water quality. As development increases, the potential for polluted water to reach wetlands and streams also increases. Unnaturally high inputs of pollutants, which are often found in urbanized areas, along with the size of the wetlands and the vegetation structure within them are the main limiting factors of this function.

3.2.3 Wildlife Habitat

Wetlands have potential to provide diverse habitat for aquatic, terrestrial, and avian species for nesting, rearing, resting, cover, and foraging. Wildlife species are commonly dependent upon a variety of intermingled habitat types, including wetlands, adjacent uplands, large bodies of water,

and movement corridors between them. Human intrusion, including development within and adjacent to wetlands, and impacts to movement corridors are the most limiting factors for wildlife habitat functions.

3.3 VALUE ASSESSMENT

3.3.1 Wetland A & B

Hydrologic Function

Wetlands A and B are located on slopes eventually becoming very steep. Vegetation in the wetlands are limited to sparse scrub-shrub understories with some limited tree coverage. Streams A and B flow through both wetlands which limit the wetland's ability to attenuate stormwater. These streams act as unconstricted permanently flowing outlets. In general, wetlands with unconstricted outlets store less amounts of water than depressional wetlands with restricted or no outlets. This wetland collects and temporarily stores precipitation as well as runoff from the surrounding area during storm events. Additionally, Wetlands A and B have limited cover of rigid plants that could reduce the velocity of surface flows during these events. The geomorphic position of Wetlands A and B is such that it they cannot provide much function for water storage. Based on their geomorphic position, and ability to attenuate surface water flows, Wetlands A and B provide a low value for this function.

Water Quality

These wetlands provides some water quality benefits as water moves through the system. However as these wetlands are located on steep slopes with limited depressional areas, the residence time is low. Depressional wetlands improve water quality by allowing sediment to settle out of the sequestered stormwater due to the reduction in flow velocity. This sediment is often ionically bonded to pollutants such as phosphorous. Wetlands A and B do not have the ability to effectively provide a water quality function as they don't contribute much in the way of live water storage. Additionally, the location of the wetlands in an urban area and, the presence of dense, uncut, herbaceous vegetation allow this wetland to perform a moderate bio-filtration function. Subsequently, residence time and vegetation allow the wetland to provide a low to moderate value of Water Quality function.

Wildlife Habitat

Wetlands A and B have some potential to perform a wildlife habitat function. The wetlands have moderate structural complexity. There is moderate species diversity, and two hydroperiods. The wetland contains vegetation, which provides resources such as food, water, thermal cover and hiding cover in close proximity, which wildlife species need to thrive. High intensity land uses including roads and residential development surrounding the subject property disturb the continuity of the corridor. The disturbed nature of the corridor and relative isolation of the wetland limits the ability to provide a high value for this function. Therefore, this wetland provides a low to moderate value for this function.

3.3.2 Streams A and B

Streams A and B are narrow drainage channels that outflow from managed stormwater structures, eventually outflowing to Big Gulch Creek. The channel width and gradient do not meet the

parameters of a fish-bearing stream, and the substrate does not provide appropriate cover for juvenile salmonids. Stochastic high velocity flow events exhibited by intermittent stream systems, do not provide appropriate access to food and water for terrestrial wildlife, and persistent instream habitat for fish species. Additionally, a significant drop in elevation (>20%) was observed. This drop in elevation creates a physical barrier to fish use. Overall, Streams A and B provides only low levels of habitat, water quality, and hydrologic functions.

3.4 POST-DEVELOPMENT FUNCTIONS AND VALUES

The additional buffer area and buffer averaging will provide an added barrier between the surrounding development and the on-site wetland and stream area, thereby increasing protection. Establishing a contiguous riparian corridor to be protected in perpetuity, will greatly increase the functions and values on-site. The existing vegetation and underlying soils will absorb and control excess runoff that enters the wetland area. The existing woody species within the additional buffer areas will help to maintain water quality improvement functions on this site by slowing overland flows and allowing sediments to settle before entering the watercourse. Excess nutrients and pollutants associated with pesticides, fertilizers, and septic systems would be absorbed or filtered out by the existing species within the newly designated buffer areas. Additionally, mitigation (1,360 square feet of buffer addition) at a 2.9:1 ratio more than compensate for the minor (473 square feet) buffer reduction proposed.

3.4.1 Conclusion

Based on these anticipated conditions, it is expected that this proposal will sufficiently replace and improve the functions and values offered by this site.

3.5 NATIVE GROWTH PROTECTION AREAS AND BUFFERS

In the City of Mukilteo, regulated streams, wetlands and their buffers are designated collectively as Native Growth Protection Areas (NGPAs). All Native Growth Protection Areas shall be shown on the development site plans or final plat maps, and shall be noted as follows, per MMC 17.52.035:

> *Any area in which development is prohibited by these critical areas regulations shall be set aside in a native growth protection area. NGPAs shall be placed in a separate tract on which development is prohibited, protected by execution of an easement, dedicated to a conservation organization or land trust, or similarly preserved through a permanent protective mechanism acceptable to the city. The location and limitation associated with the critical area and its buffer shall be shown on the face of the deed, site plan, or plat applicable to the property and shall be recorded with the Snohomish County assessor's office.*
>
> *B. Native growth protection areas and buffers shall not be used for storage or deposit of construction debris or material, or deposit of vegetative spoils.*
>
> *C. All native growth protection areas shall be shown on the development site plans or final plat maps, and shall be noted as follows:*

There shall be no clearing, excavation, or fill within a native growth protection area shown on the face of this site plan/plat, with the exception of required utility installation, removal of dangerous trees, thinning of woodlands for the benefit of the woodlands as determined by a certified landscape architect or arborist, and removal of obstructions on drainage courses, or as allowed under Section 17.52A.070, Vegetation management on steep slopes.

D. A temporary sign shall be placed at the boundary of all native growth protection areas during periods of construction, clearing, grading, or excavation on adjacent property. The sign shall describe the limitations of on-site disturbance and development within the native growth protection area. A permanent sign shall be placed at the boundary of all native growth protection areas describing the limitation on development. NGPA signs shall be spaced fifty feet on center along the periphery of the critical area.

3.5.1 NGPA Signage

Signs designating the presence of the NGPA shall be posted along the NGPA boundary. Signs shall be placed at approximately 50-foot intervals around the perimeter of the NGPA. An example of Type 1 sign language is as follows:

NATIVE GROWTH PROTECTION AREA
THIS WETLAND AND UPLAND BUFFER ARE PROTECTED TO
PROVIDE WILDLIFE HABITAT AND MAINTAIN WATER QUALITY.
PLEASE DO NOT DISTURB THIS VALUABLE RESOURCE.
*SEE RECORDED PLAT FOR RESTRICTIONS

The signs shall be constructed of aluminum or similar durable material. They shall be secured to 4" x 4" x 7' (min.) pressure treated posts buried a minimum of two feet in quick setting concrete.

4.0 WILDLIFE

The subject site provides low to moderate habitat functions. Although a portion of the property contains mature forest, the majority of the property including those forested areas is adjacent to significant human disturbance. Therefore, the onsite wildlife habitat is limited to small mammal and avian species. No mammalian species were detected during our on-site investigation in 2016, although several species, including gray squirrels (*Sciurus* spp.) and raccoon (*Procyon lotor*), are expected to occur within the area. Avian activity was not strongly detected. However, given the habitat available nearby, it is expected that the following avian species use the area: American Crow (*Corvus brachyrhynchos),* American Robin (*Turdus migratorius*), Steller's Jay (*Cyanocitta stelleri*), Black-capped Chickadee (*Poecile atricapilla)*, Dark-eyed Junco (*Junco hyemalis*), northern flicker (*Colaptes auratus*), and Song Sparrow (*Melospiza melodia*). A diverse wildlife component is expected however, within the greater Big Gulch riparian corridor. These lists are not meant to be all-inclusive and may omit species that currently utilize or could utilize the site.

5.0 USE OF THIS REPORT

This Critical Areas Study is supplied to Paris Beta LLC as a means of determining on-site critical area conditions, and providing appropriate mitigation for on-site buffer impacts, as required by City of Mukilteo during the permitting process. This report is based largely on readily observable conditions and, to a lesser extent, on readily ascertainable conditions. No attempt has been made to determine hidden or concealed conditions.

The laws applicable to critical areas are subject to varying interpretations and may be changed at any time by the courts or legislative bodies. This report is intended to provide information deemed relevant in the applicant's attempt to comply with the laws now in effect.

The work for this report has conformed to the standard of care employed by wetland ecologists. No other representation or warranty is made concerning the work or this report, and any implied representation or warranty is disclaimed.

Wetland Resources, Inc.

Jeff Mallahan
Senior Wetland Ecologist

6.0 REFERENCES

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APPENDIX A:
WETLAND DETERMINATION DATA FORMS

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Paris Beta - Harbour Pl | City/County: Mukilteo/Snohomish | Sampling Date: 12/24/2018

Applicant/Owner: Paris Beta LLC | State: WA | Sampling Point: S1

Investigator(s): N. Pedersen | Section, Township, Range: S16/21, T28N, R4E, W.M.

Landform (hillslope, terrace, etc.): Hillslope | Local relief (concave, convex, none): concave | Slope (%): ~5%

Subregion (LRR): LRR-A | Lat: 47.908 | Long: -122.295 | Datum: NAD83

Soil Map Unit Name: Alderwood gravelly sandy loam, 0 to 8 percent slopes | NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑ No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☑ No ☐	
Wetland Hydrology Present?	Yes ☑ No ☐	

Remarks:

Within Wetland B

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m^2)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	60	Y	FAC
2. Thuja plicata	40	Y	FAC
3.			
4.			
	100	= Total Cover	
Sapling/Shrub Stratum (Plot size: 3m^2)			
1. Rubus armeniacus	30	Y	FAC
2. Rubus spectabilis	10	Y	FAC
3. Rubus ursinus	Trace	N	FACU
4.			
5.			
	40	= Total Cover	
Herb Stratum (Plot size: 1m^2)			
1. Tolmeia menziesii	60	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	60	= Total Cover	
Woody Vine Stratum (Plot size: 3m^2)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 40

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	0 (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☑ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: S1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2/2	100					Sandy Loam	
8-15	10YR 3/3	100					Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

BPJ

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☑ No ☐ Depth (inches): 2"+

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): 0-2"

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Paris Beta - Harbour Pl City/County: Mukilteo/Snohomish Sampling Date: 12/24/2018

Applicant/Owner: Paris Beta LLC State: WA Sampling Point: S2

Investigator(s): N. Pedersen Section, Township, Range: S16/21, T28N, R4E, W.M

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): LRR A Lat: 47.908 Long: -122.295 Datum: NAD83

Soil Map Unit Name: Alderwood gravelly sandy loam, 0 to 8 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑ No ☐	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐ No ☑	
Wetland Hydrology Present?	Yes ☐ No ☑	

Remarks:

Site has been historically filled and graded. Site conditions are new normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m^2)	Absolute % Cover	Dominant Species?	Indicator Status
1. Thuja plicata	60	Y	FAC
2. Alnus rubra	40	Y	FAC
3.			
4.			
	100	= Total Cover	
Sapling/Shrub Stratum (Plot size: 3m^2)			
1. Rubus armeniacus	30	Y	FAC
2. Rubus ursinus	5	N	FACU
3. Rubus spectabilis	Trace		FAC
4.			
5.			
	35	= Total Cover	
Herb Stratum (Plot size: 1m^2)			
1. Dicentra formosa	5	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	5	= Total Cover	
Woody Vine Stratum (Plot size: 3m^2)			
1. none			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 95

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	0 (A)		0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☑ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

Non-wetland site is a storage yard with a gravel/dirt pad. No vegetation present at the time of investigation

SOIL

Sampling Point: S2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/2	100					Sandy loam	Dry
6-15	10YR 3/3	100					Sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☑

Remarks:

Redox does not appear to be formed in place and is a function of the source material.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☑

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Paris Beta - Harbour Pl - Wetland A City/County: Mukilteo/Snohomish Sampling Date: 12/24/2018

Applicant/Owner: Paris Beta LLC State: WA Sampling Point: S3

Investigator(s): N. Pedersen Section, Township, Range: S16/21, T28N, R4E, W.M.

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): concave Slope (%): ~20%

Subregion (LRR): LRR-A Lat: 47.908 Long: -122.295 Datum: NAD83

Soil Map Unit Name: Everett very gravelly sandy loam, 15 to 30 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑ No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☑ No ☐	
Wetland Hydrology Present?	Yes ☑ No ☐	

Remarks:

Within Wetland B

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m^2)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	40	Y	FAC
2. Thuja plicata	20	Y	FAC
3. Acer macrophyllum (rooted out)	20	Y	FACU
4.			
	80	= Total Cover	
Sapling/Shrub Stratum (Plot size: 3m^2)			
1. Rubus spectabilis	40	Y	FAC
2. Oplopanax horridus	20	Y	FAC
3.			
4.			
5.			
	60	= Total Cover	
Herb Stratum (Plot size: 1m^2)			
1. Tolmeia menziesii	30	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	30	= Total Cover	
Woody Vine Stratum (Plot size: 3m^2)			
1. none			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 70

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	0 (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☑ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: S3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 2/2	100					Sandy Loam	
3-12	2.5Y 5/2	90	10YR 3/6	10	C	M	Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☑ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☑ No ☐ Depth (inches): 6"

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): 0-6"

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Paris Beta - Harbour Pl City/County: Mukilteo/Snohomish Sampling Date: 12/24/2018

Applicant/Owner: Paris Beta LLC State: WA Sampling Point: S4

Investigator(s): N. Pedersen Section, Township, Range: S16/21, T28N, R4E, W.M.

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): concave Slope (%): ~20%

Subregion (LRR): LRR-A Lat: 47.908 Long: -122.295 Datum: NAD83

Soil Map Unit Name: Everett very gravelly sandy loam, 15 to 30 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑ No ☐	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐ No ☑	
Wetland Hydrology Present?	Yes ☐ No ☑	

Remarks:

Within Wetland B

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m^2)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	30	Y	FAC
2. Thuja plicata	30	Y	FAC
3. Acer macrophyllum	30	Y	FACU
4.			
	90	= Total Cover	
Sapling/Shrub Stratum (Plot size: 3m^2)			
1. Rubus spectabilis	25	Y	FAC
2. Polystichum munitum	25	Y	FACU
3.			
4.			
5.			
	50	= Total Cover	
Herb Stratum (Plot size: 1m^2)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
		= Total Cover	
Woody Vine Stratum (Plot size: 3m^2)			
1. none			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 100

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	0
FACW species	x 2 =	0
FAC species	x 3 =	0
FACU species	x 4 =	0
UPL species	x 5 =	0
Column Totals: 0 (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☑ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: S4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	2.5 Y 4/3	100					Sandy Loam	Dry

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☑

Remarks:

BPJ

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☑

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX B:
DEPARTMENT OF ECOLOGY WETLAND RATING FORMS

Wetland name or number **WLA**

RATING SUMMARY – Western Washington

Name of wetland (or ID #): 18321 - WETLAND A Date of site visit: 12/24/18

Rated by JM, TA Trained by Ecology? ✔ Yes ___No Date of training 3/2015

HGM Class used for rating RIVERINE 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 SNOHOMISH COUNTY

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			TOTAL
	Circle the appropriate ratings									
Site Potential	H	[M]	L	H	[M]	L	H	M	[L]	
Landscape Potential	[H]	M	L	[H]	M	L	H	M	[L]	
Value	H	M	[L]	H	[M]	L	[H]	M	L	
Score Based on Ratings	**6**			**7**			**5**			**18**

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 **WLA**

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 (*can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	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 *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	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 *(can be added to another figure)*	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 (*can be added to figure above)*	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	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	

Wetland name or number **WLA**

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 **WLA**

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 **WLA**

RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

R 1.0. Does the site have the potential to improve water quality?		
R 1.1. Area of surface depressions within the Riverine wetland that can trap sediments during a flooding event: ☐ Depressions cover > $^3/_4$ area of wetland — points = 8 ☐ Depressions cover > ½ area of wetland — points = 4 ☐ Depressions present but cover < ½ area of wetland — points = 2 ☑ No depressions present — points = 0		**0**
R 1.2. Structure of plants in the wetland (areas with >90% cover at person height, **not** Cowardin classes) ☐ Trees or shrubs > $^2/_3$ area of the wetland — points = 8 ☑ Trees or shrubs > $^1/_3$ area of the wetland — points = 6 ☐ Herbaceous plants (> 6 in high) > $^2/_3$ area of the wetland — points = 6 ☐ Herbaceous plants (> 6 in high) > $^1/_3$ area of the wetland — points = 3 ☐ Trees, shrubs, and ungrazed herbaceous < $^1/_3$ area of the wetland — points = 0		**6**
Total for R 1	Add the points in the boxes above	**6**

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

R 2.0. Does the landscape have the potential to support the water quality function of the site?		
R 2.1. Is the wetland within an incorporated city or within its UGA?	Yes = 2 No = 0	**2**
R 2.2. Does the contributing basin to the wetland include a UGA or incorporated area?	Yes = 1 No = 0	**1**
R 2.3. Does at least 10% of the contributing basin contain tilled fields, pastures, or forests that have been clearcut within the last 5 years?	Yes = 1 No = 0	**0**
R 2.4. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants?	Yes = 1 No = 0	**1**
R 2.5. Are there other sources of pollutants coming into the wetland that are not listed in questions R 2.1-R 2.4 Other sources _____	Yes = 1 No = 0	**1**
Total for R 2	Add the points in the boxes above	**5**

Rating of Landscape Potential If score is: ✔ **3-6 = H** ___**1 or 2 = M** ___**0 = L** *Record the rating on the first page*

R 3.0. Is the water quality improvement provided by the site valuable to society?		
R 3.1. Is the wetland along a stream or river that is on the 303(d) list or on a tributary that drains to one within 1 mi?	Yes = 1 No = 0	**0**
R 3.2. Is the wetland along a stream or river that has TMDL limits for nutrients, toxics, or pathogens?	Yes = 1 No = 0	**0**
R 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 drainage in which the unit is found*)	Yes = 2 No = 0	**0**
Total for R 3	Add the points in the boxes above	**0**

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

Wetland name or number **WLA**

RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS

Hydrologic Functions - Indicators that site functions to reduce flooding and stream erosion

R 4.0. Does the site have the potential to reduce flooding and erosion?

R 4.1. Characteristics of the overbank storage the wetland provides: *Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of wetland)/(average width of stream between banks).* ☐ If the ratio is more than 20	points = 9	**2**
☐ If the ratio is 10-20	points = 6	
☐ If the ratio is 5-<10	points = 4	
☑ If the ratio is 1-<5	points = 2	
☐ If the ratio is < 1	points = 1	
R 4.2. Characteristics of plants that slow down water velocities during floods: *Treat large woody debris as forest or shrub. Choose the points appropriate for the best description (polygons need to have >90% cover at person height. These are NOT Cowardin classes).* ☑ Forest or shrub for > 1/3 area OR emergent plants > 2/3 area	points = 7	**7**
☐ Forest or shrub for > 1/10 area OR emergent plants > 1/3 area	points = 4	
☐ Plants do not meet above criteria	points = 0	
Total for R 4	Add the points in the boxes above	**9**

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

R 5.0. Does the landscape have the potential to support the hydrologic functions of the site?

R 5.1. Is the stream or river adjacent to the wetland downcut?	Yes = 0 [No = 1]	**1**
R 5.2. Does the up-gradient watershed include a UGA or incorporated area?	[Yes = 1] No = 0	**1**
R 5.3. Is the up-gradient stream or river controlled by dams?	Yes = 0 [No = 1]	**1**
Total for R 5	Add the points in the boxes above	**3**

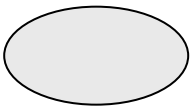
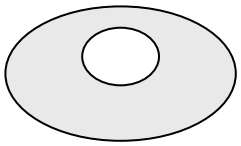
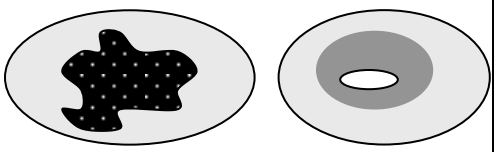
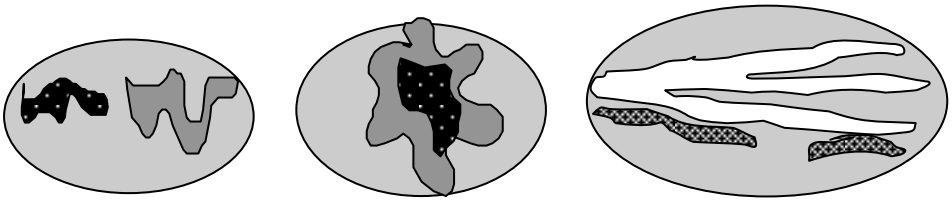
Rating of Landscape Potential If score is: ✔ **3 = H** ___ **1 or 2 = M** ___ **0 = L** *Record the rating on the first page*

R 6.0. Are the hydrologic functions provided by the site valuable to society?

R 6.1. Distance to the nearest areas downstream that have flooding problems? *Choose the description that best fits the site*. ☐ The sub-basin immediately down-gradient of the wetland has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds)	points = 2	**1**
☑ Surface flooding problems are in a sub-basin farther down-gradient	points = 1	
☐ No flooding problems anywhere downstream	points = 0	
R 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 R 6	Add the points in the boxes above	**1**

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

Wetland name or number **WLA**

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 ft^2. *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 All three diagrams in this row are **HIGH** = 3points 	**0**

Wetland name or number **WLA**

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. *The number of checks is the number of points.* ✔ Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long). ___ Standing snags (dbh > 4 in) within the wetland ___ 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) ___ 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 *(cut shrubs or trees that have not yet weathered where wood is exposed)* ___ At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)* ___ Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*)	**1**
Total for H 1 Add the points in the boxes above	**4**

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

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* % undisturbed habitat 9 + [(% moderate and low intensity land uses)/2] 3 = 12 % If total accessible habitat is: ☐ > 1/3 (33.3%) of 1 km Polygon points = 3 ☐ 20-33% of 1 km Polygon points = 2 ✔ 10-19% of 1 km Polygon points = 1 ☐ < 10% of 1 km Polygon points = 0	**1**
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. *Calculate:* % undisturbed habitat 26 + [(% moderate and low intensity land uses)/2] 4 = 30 % ☐ Undisturbed habitat > 50% of Polygon points = 3 ☐ Undisturbed habitat 10-50% and in 1-3 patches points = 2 ✔ Undisturbed habitat 10-50% and > 3 patches points = 1 ☐ Undisturbed habitat < 10% of 1 km Polygon points = 0	**1**
H 2.3. Land use intensity in 1 km Polygon: If ✔ > 50% of 1 km Polygon is high intensity land use points = (- 2) ☐ ≤ 50% of 1 km Polygon is high intensity points = 0	**-2**
Total for H 2 Add the points in the boxes above	**0**

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

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: points = 2 ✔ It has 3 or more priority habitats within 100 m (see next page) ☐ It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) ☐ It is mapped as a location for an individual WDFW priority species ☐ It is a Wetland of High Conservation Value as determined by the Department of Natural Resources ☐ 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 ☐ Site has 1 or 2 priority habitats (listed on next page) within 100 m points = 1 ☐ Site does not meet any of the criteria above points = 0	**2**

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

Wetland name or number **WLA**

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.

☑ **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.

Wetland name or number **WLA**

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt Yes –Go to **SC 1.1** No= **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = **Category I** No - Go to **SC 1.2**	**Cat. I**
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are *Spartina*, see page 25) ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes **–** Go to **SC 2.2** No **–** Go to **SC 2.3** SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes **= Category I** No **= Not a WHCV** SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes **– Contact WNHP/WDNR and go to SC 2.4** No **= Not a WHCV** SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? Yes **= Category I** No **= Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? Yes – Go to **SC 3.3** No – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 3.3** No = **Is not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = **Is a Category I bog** No – Go to **SC 3.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = **Is a Category I bog** No **= Is not a bog**	**Cat. I**

Wetland name or number **WLA**

SC 4.0. Forested Wetlands

Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? ***If you answer YES you will still need to rate the wetland based on its functions.***

☐ **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more.

☐ **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm).

Yes **= Category I** | No **= Not a forested wetland for this section**

Cat. I

SC 5.0. Wetlands in Coastal Lagoons

Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?

☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks

☐ The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)*

Cat. I

Yes – Go to **SC 5.1** | No = **Not a wetland in a coastal lagoon**

SC 5.1. Does the wetland meet all of the following three conditions?

☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100).

☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland.

☐ The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2)

Cat. II

Yes = **Category I** No = **Category II**

SC 6.0. Interdunal Wetlands

Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer yes you will still need to rate the wetland based on its habitat functions.***

In practical terms that means the following geographic areas:

☐ Long Beach Peninsula: Lands west of SR 103

☐ Grayland-Westport: Lands west of SR 105

☐ Ocean Shores-Copalis: Lands west of SR 115 and SR 109

Cat I

Yes – Go to **SC 6.1** | No = **not an interdunal wetland for rating**

SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)?

Cat. II

Yes = **Category I** No – Go to **SC 6.2**

SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger?

Yes = **Category II** No – Go to **SC 6.3**

Cat. III

SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac?

Yes = **Category III** No = **Category IV**

Cat. IV

Category of wetland based on Special Characteristics

If you answered No for all types, enter "Not Applicable" on Summary Form

N/A

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PARIS BETA - HARBOUR PL

WETLAND RATING FIGURE 1- WETLAND A

LEGEND

- FORESTED VEGETATION
- SEASONALLY FLOODED
- 150' FROM WL BOUNDARY
- PERENNIAL STREAM

Scale 1" = 100'

0 50 100 150 200

Wetland Resources, Inc.

Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance

9505 19th Avenue S.E. Suite 106 Everett,Washington 98208

Phone: (425) 337-3174

Fax: (425) 337-3045

Email: mailbox@wetlandresources .com

WETLAND RATING

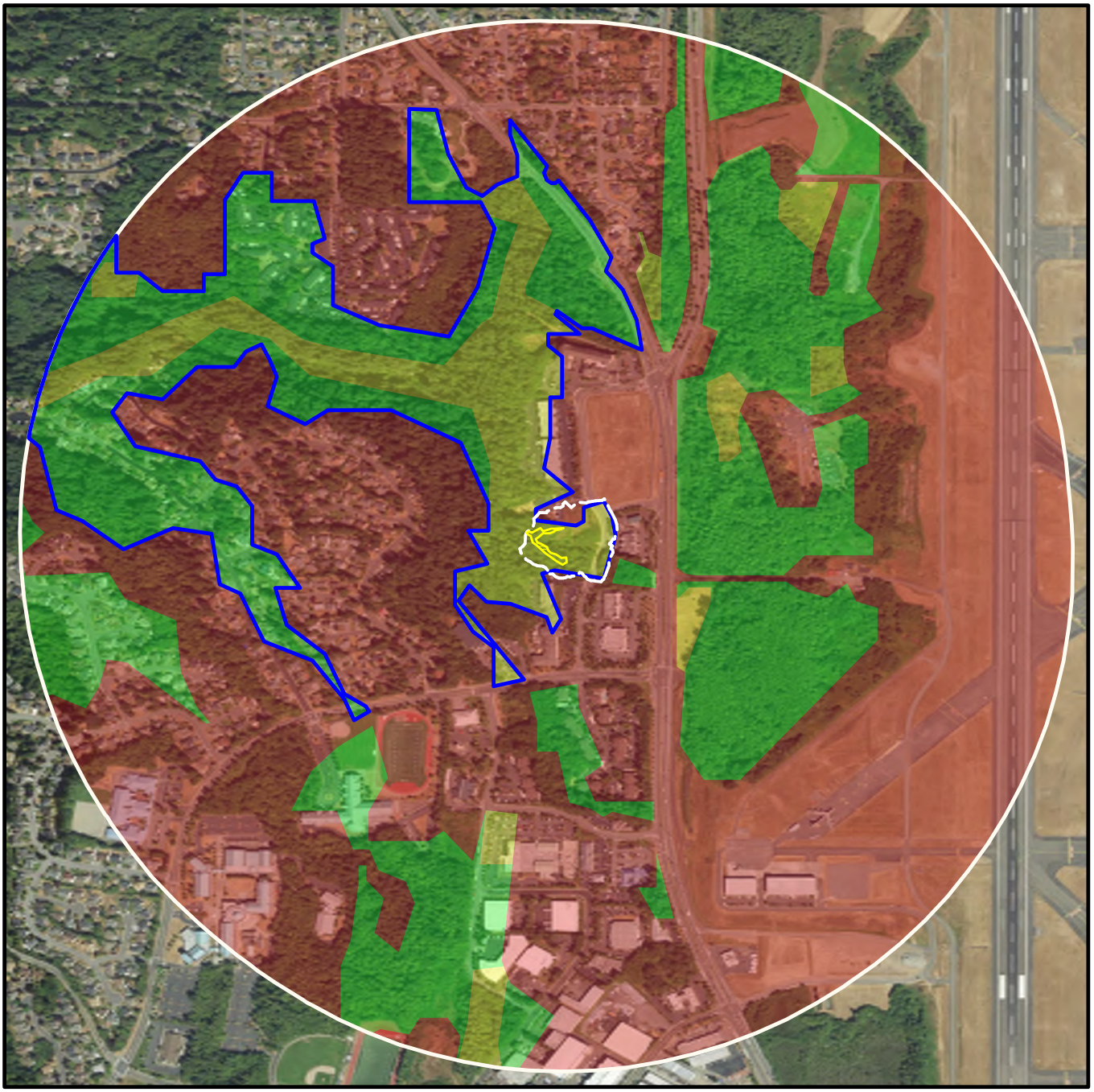
Wetland A

Paris Beta, LLC
Attn: Susan Tang
925 80th Ave NE
Medina, WA 98039

Figure A-1
WRI Job # 18321
Rated by: TA

PARIS BETA - HARBOUR PL

WETLAND RATING FIGURE 2- WETLAND A



LEGEND

- RELATIVELY UNDISTURBED
- LOW/MOD. INTENSITY
- HIGH INTENSITY
- ACCESSIBLE HABITAT
- WETLAND
- 1 KM FROM WETLAND
- CONTRIBUTING BASIN

Scale 1" = 1,000'

0 1,000 2,000

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9505 19th Avenue S.E. Suite 106 Everett, Washington 98208

Phone: (425) 337-3174

Fax: (425) 337-3045

Email: mailbox@wetlandresources .com

WETLAND RATING

Wetland A

Paris Beta, LLC
Attn: Susan Tang
925 80th Ave NE
Medina, WA 98039

Figure A-2
WRI Job # 18321
Rated by: TA

PARIS BETA - HARBOUR PL

WETLAND RATING FIGURE 3- WETLAND A

LEGEND

WETLAND

AQUATIC RESOURCES ON THE 303(d) LIST

Scale 1" = 1,000'

0 1,000 2,000

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9505 19th Avenue S.E. Suite 106 Everett, Washington 98208

Phone: (425) 337-3174

Fax: (425) 337-3045

Email: mailbox@wetlandresources .com

WETLAND RATING

Wetland A

Paris Beta, LLC
Attn: Susan Tang
925 80th Ave NE
Medina, WA 98039

Figure A-3
WRI Job # 18321
Rated by: TA

PARIS BETA - HARBOUR PL

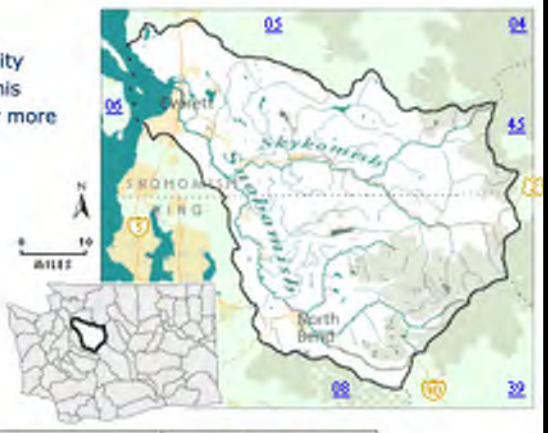
WETLAND RATING FIGURE 4- WETLAND A

WRIA 7: Snohomish

The following table lists overview information and links to specific water quality improvement projects (including total maximum daily loads, or TMDLs) for this water resource inventory area (WRIA). Please use links (where available) for more information on a project.

Counties

- King
- Snohomish



Waterbody Name	Pollutant(s)	Status**	TMDL Lead
Lake Loma	Total Phosphorus	Straight to implementation project under development	Tricia Shoblom 425-649-7288
Snohomish River	French Creek / Pilchuck River • Dissolved Oxygen • Temperature	Under development	Ralph Svrjcek 425-649-7165
	Dioxin	EPA approved	Ralph Svrjcek 425-649-7165
	Estuary • Ammonia • BOD	EPA approved	Ralph Svrjcek 425-649-7165
	Tributaries • Fecal Coliform Tributaries: • Allen Creek • Quilceda Creek • French Creek • Woods Creek • Pilchuck River • Marshlands (Wood Creek) {2}	EPA approved	Ralph Svrjcek 425-649-7165
	Snoqualmie River • Ammonia-N • BOD (5-day) • Fecal Coliform Temperature	EPA approved EPA approved Has an implementation plan	Ralph Svrjcek 425-649-7165

** ***Status*** *will be listed as one of the following: Approved by EPA, Under Development or Implementation*

Wetland Resources, Inc.
Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance
9505 19th Avenue S.E. Suite 106 Everett, Washington 98208
Phone: (425) 337-3174
Fax: (425) 337-3045
Email: mailbox@wetlandresources .com

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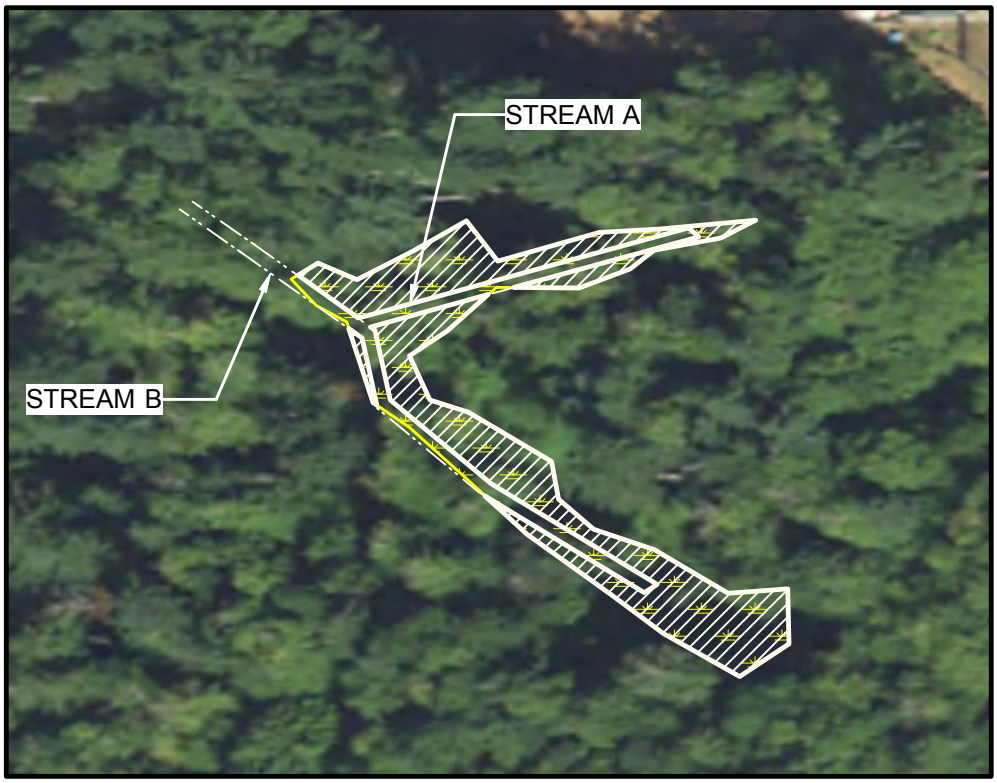
Figure A-4
WRI Job # 18321
Rated by: TA

PARIS BETA - HARBOUR PL

WETLAND RATING FIGURE 5- WETLAND A



AVERAGE WIDTH OF STREAMS A & B = 6.73'
AVERAGE WIDTH OF WETLAND A = 28.75'

Scale 1" = 100'

0 50 100 150 200

LEGEND

WETLAND

FOREST OR SCRUB-SHRUB

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WETLAND RATING
Wetland A

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Figure A-5
WRI Job # 18321
Rated by: TA

Wetland name or number **WLB**

RATING SUMMARY – Western Washington

Name of wetland (or ID #): 18321 - WETLAND B Date of site visit: 12/24/18

Rated by JM, TA Trained by Ecology? ✔ Yes ___No Date of training 3/2015

HGM Class used for rating SLOPE 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 SNOHOMISH COUNTY

OVERALL WETLAND CATEGORY IV (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	
	Circle the appropriate ratings			
Site Potential	H M [L]	H M [L]	H M [L]	
Landscape Potential	H [M] L	H [M] L	H M [L]	
Value	H M [L]	H [M] L	[H] M L	**TOTAL**
Score Based on Ratings	**4**	**5**	**5**	**14**

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 **WLB**

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 (*can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	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 *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	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 *(can be added to another figure)*	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	1
Hydroperiods	H 1.2	1
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	5
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	5
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	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	2
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	3
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	4

Wetland name or number **WLB**

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 **WLB**

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 **WLB**

SLOPE WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

S 1.0. Does the site have the potential to improve water quality?	
S 1.1. Characteristics of the average slope of the wetland: *(a 1% slope has a 1 ft vertical drop in elevation for every 100 ft of horizontal distance*) ☐ Slope is 1% or less points = 3 ☐ Slope is > 1%-2% points = 2 ☐ Slope is > 2%-5% points = 1 ☑ Slope is greater than 5% points = 0	**0**
S 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic *(use NRCS definitions)*: Yes = 3 [No = 0]	**0**
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutants: Choose the points appropriate for the description that best fits the plants in the wetland. *Dense means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 in.* ☐ Dense, uncut, herbaceous plants > 90% of the wetland area points = 6 ☑ Dense, uncut, herbaceous plants > ½ of area points = 3 ☐ Dense, woody, plants > ½ of area points = 2 ☐ Dense, uncut, herbaceous plants > ¼ of area points = 1 ☐ Does not meet any of the criteria above for plants points = 0	**3**
Total for S 1 Add the points in the boxes above	**3**

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

S 2.0. Does the landscape have the potential to support the water quality function of the site?	
S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that generate pollutants? [Yes = 1] No = 0	**1**
S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1? Other sources _____ Yes = 1 [No = 0]	**0**
Total for S 2 Add the points in the boxes above	**1**

Rating of Landscape Potential If score is: ✔ **1-2 = M** ___ **0 = L** *Record the rating on the first page*

S 3.0. Is the water quality improvement provided by the site valuable to society?	
S 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]	**0**
S 3.2. Is the wetland in a basin or sub-basin where water quality is an issue? *At least one aquatic resource in the basin is on the 303(d) list*. Yes = 1 [No = 0]	**0**
S 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 unit is found.* Yes = 2 [No = 0]	**0**
Total for S 3 Add the points in the boxes above	**0**

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

Wetland name or number **WLB**

SLOPE WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream erosion

S 4.0. Does the site have the potential to reduce flooding and stream erosion?

S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. *Stems of plants should be thick enough (usually > 1/8 in), or dense enough, to remain erect during surface flows.* ☐ Dense, uncut, **rigid** plants cover > 90% of the area of the wetland points = 1 ☑ All other conditions points = 0	**0**

Rating of Site Potential If score is: ___ **1 = M** ✔ **0 = L** *Record the rating on the first page*

S 5.0. Does the landscape have the potential to support the hydrologic functions of the site?

S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses or cover that generate excess surface runoff? Yes = 1 No = 0	**1**

Rating of Landscape Potential If score is: ✔ **1 = M** ___ **0 = L** *Record the rating on the first page*

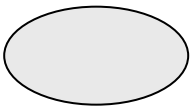
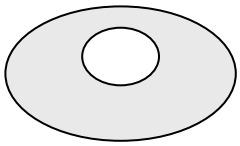
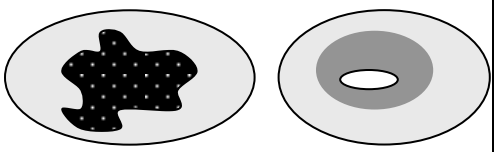
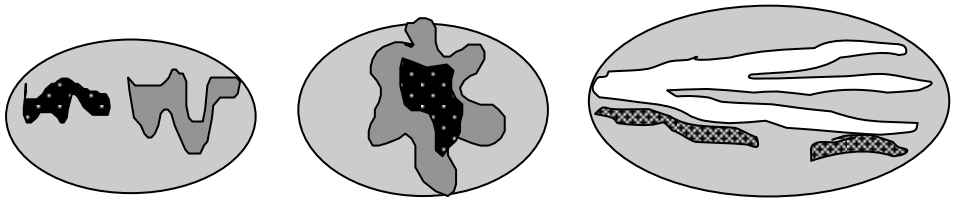
S 6.0. Are the hydrologic functions provided by the site valuable to society?

S 6.1. Distance to the nearest areas downstream that have flooding problems: ☐ The sub-basin immediately down-gradient of site has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) points = 2 ☑ Surface flooding problems are in a sub-basin farther down-gradient points = 1 ☐ No flooding problems anywhere downstream points = 0	**1**
S 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 S 6 Add the points in the boxes above	**1**

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

NOTES and FIELD OBSERVATIONS:

Wetland name or number **WLB**

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	**0**
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 ft^2. *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 All three diagrams in this row are **HIGH** = 3points 	**0**

Wetland name or number **WLB**

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. *The number of checks is the number of points.* ✔ Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long). ___ Standing snags (dbh > 4 in) within the wetland ___ 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) ✔ 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 *(cut shrubs or trees that have not yet weathered where wood is exposed)* ___ At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)* ✔ Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*)	**3**
Total for H 1 Add the points in the boxes above	**5**

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

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* % undisturbed habitat 6 **+** [(% moderate and low intensity land uses)/2] 3 **=** 9 % If total accessible habitat is: ☐ > 1/3 (33.3%) of 1 km Polygon points = 3 ☐ 20-33% of 1 km Polygon points = 2 ☐ 10-19% of 1 km Polygon points = 1 ☑ < 10% of 1 km Polygon points = 0	**0**
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. *Calculate:* % undisturbed habitat 25 **+** [(% moderate and low intensity land uses)/2] 4 **=** 29 % ☐ Undisturbed habitat > 50% of Polygon points = 3 ☐ Undisturbed habitat 10-50% and in 1-3 patches points = 2 ☑ Undisturbed habitat 10-50% and > 3 patches points = 1 ☐ Undisturbed habitat < 10% of 1 km Polygon points = 0	**1**
H 2.3. Land use intensity in 1 km Polygon: If ☑ > 50% of 1 km Polygon is high intensity land use points = (- 2) ☐ ≤ 50% of 1 km Polygon is high intensity points = 0	**-2**
Total for H 2 Add the points in the boxes above	**-1**

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

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: points = 2 ☑ It has 3 or more priority habitats within 100 m (see next page) ☐ It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) ☐ It is mapped as a location for an individual WDFW priority species ☐ It is a Wetland of High Conservation Value as determined by the Department of Natural Resources ☐ 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 ☐ Site has 1 or 2 priority habitats (listed on next page) within 100 m points = 1 ☐ Site does not meet any of the criteria above points = 0	**2**

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

Wetland name or number **WLB**

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.

☑ **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.

Wetland name or number **WLB**

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt Yes –Go to **SC 1.1** No= **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = **Category I** No - Go to **SC 1.2**	**Cat. I**
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are *Spartina*, see page 25) ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes **–** Go to **SC 2.2** No **–** Go to **SC 2.3** SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes **= Category I** No **= Not a WHCV** SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes **– Contact WNHP/WDNR and go to SC 2.4** No **= Not a WHCV** SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? Yes **= Category I** No **= Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? Yes – Go to **SC 3.3** No – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 3.3** No = **Is not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = **Is a Category I bog** No – Go to **SC 3.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = **Is a Category I bog** No **= Is not a bog**	**Cat. I**

Wetland name or number **WLB**

SC 4.0. Forested Wetlands Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? ***If you answer YES you will still need to rate the wetland based on its functions.*** ☐ **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more. ☐ **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm). Yes = **Category I** No = **Not a forested wetland for this section**	**Cat. I**
SC 5.0. Wetlands in Coastal Lagoons Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? ☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks ☐ The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* Yes – Go to **SC 5.1** No = **Not a wetland in a coastal lagoon** SC 5.1. Does the wetland meet all of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100). ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2) Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer yes you will still need to rate the wetland based on its habitat functions.*** In practical terms that means the following geographic areas: ☐ Long Beach Peninsula: Lands west of SR 103 ☐ Grayland-Westport: Lands west of SR 105 ☐ Ocean Shores-Copalis: Lands west of SR 115 and SR 109 Yes – Go to **SC 6.1** No = **not an interdunal wetland for rating** SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = **Category I** No – Go to **SC 6.2** SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? Yes = **Category II** No – Go to **SC 6.3** SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = **Category III** No = **Category IV**	**Cat I** **Cat. II** **Cat. III** **Cat. IV**
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	

Wetland name or number _____

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PARIS BETA - HARBOUR PL

WETLAND RATING FIGURE 1- WETLAND B

LEGEND

- SCRUB-SHRUB
- SEASONALLY FLOODED
- 150' FROM WL BOUNDARY
- PERENNIAL STREAM

Scale 1" = 100'

0 50 100 150 200

Wetland Resources, Inc.

Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance

9505 19th Avenue S.E. Suite 106 Everett, Washington 98208

Phone: (425) 337-3174

Fax: (425) 337-3045

Email: mailbox@wetlandresources .com

WETLAND RATING

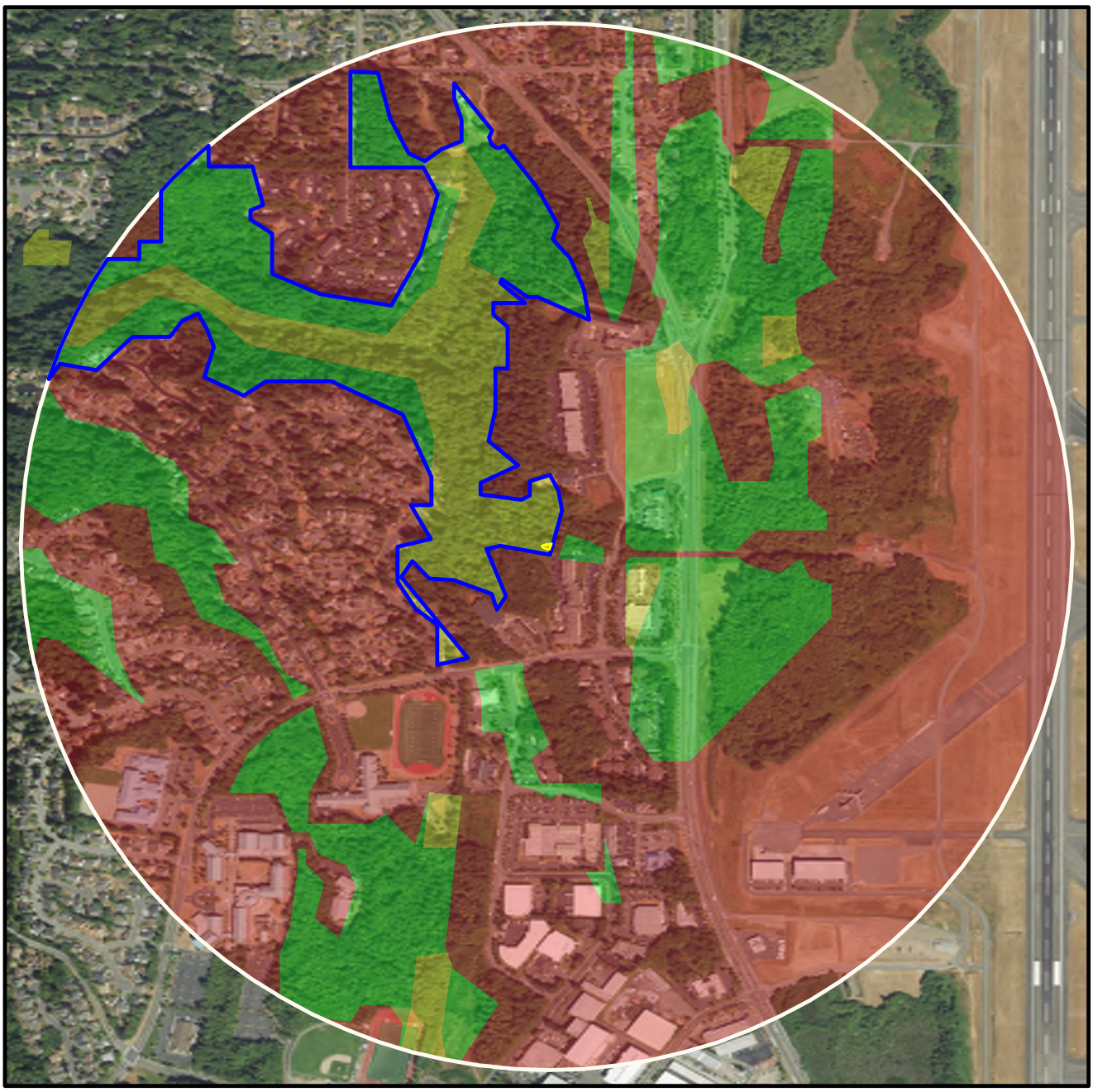
Wetland B

Paris Beta, LLC
Attn: Susan Tang
925 80th Ave NE
Medina, WA 98039

Figure B-1
WRI Job # 18321
Rated by: TA

PARIS BETA - HARBOUR PL

WETLAND RATING FIGURE 2- WETLAND B



LEGEND

- RELATIVELY UNDISTURBED
- LOW/MOD. INTENSITY
- HIGH INTENSITY
- ACCESSIBLE HABITAT
- WETLAND
- 1 KM FROM WETLAND

Scale 1" = 1,000'

0 1,000 2,000

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Phone: (425) 337-3174

Fax: (425) 337-3045

Email: mailbox@wetlandresources .com

WETLAND RATING

Wetland B

Paris Beta, LLC
Attn: Susan Tang
925 80th Ave NE
Medina, WA 98039

Figure B-2
WRI Job # 18321
Rated by: TA

PARIS BETA - HARBOUR PL

WETLAND RATING FIGURE 3- WETLAND B

LEGEND

WETLAND

AQUATIC RESOURCES ON THE 303(d) LIST

Scale 1" = 1,000'

0 1,000 2,000

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9505 19th Avenue S.E. Suite 106 Everett, Washington 98208

Phone: (425) 337-3174

Fax: (425) 337-3045

Email: mailbox@wetlandresources .com

WETLAND RATING

Wetland B

Paris Beta, LLC
Attn: Susan Tang
925 80th Ave NE
Medina, WA 98039

Figure B-3
WRI Job # 18321
Rated by: TA

PARIS BETA - HARBOUR PL

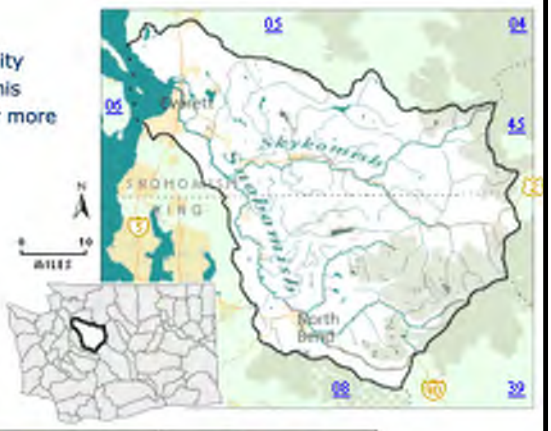
WETLAND RATING FIGURE 4- WETLAND B

WRIA 7: Snohomish

The following table lists overview information and links to specific water quality improvement projects (including total maximum daily loads, or TMDLs) for this water resource inventory area (WRIA). Please use links (where available) for more information on a project.

Counties

- King
- Snohomish



Waterbody Name	Pollutant(s)	Status**	TMDL Lead
Lake Loma	Total Phosphorus	Straight to implementation project under development	Tricia Shoblom 425-649-7288
Snohomish River	French Creek / Pilchuck River • Dissolved Oxygen • Temperature	Under development	Ralph Svrjcek 425-649-7165
	Dioxin	EPA approved	Ralph Svrjcek 425-649-7165
	Estuary • Ammonia • BOD	EPA approved	Ralph Svrjcek 425-649-7165
	Tributaries • Fecal Coliform Tributaries: • Allen Creek • Quilceda Creek • French Creek • Woods Creek • Pilchuck River • Marshlands (Wood Creek) {2}	EPA approved	Ralph Svrjcek 425-649-7165
	Snoqualmie River • Ammonia-N • BOD (5-day) • Fecal Coliform Temperature	EPA approved EPA approved Has an implementation plan	Ralph Svrjcek 425-649-7165

** ***Status*** *will be listed as one of the following: Approved by EPA, Under Development or Implementation*

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Phone: (425) 337-3174
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Email: mailbox@wetlandresources .com

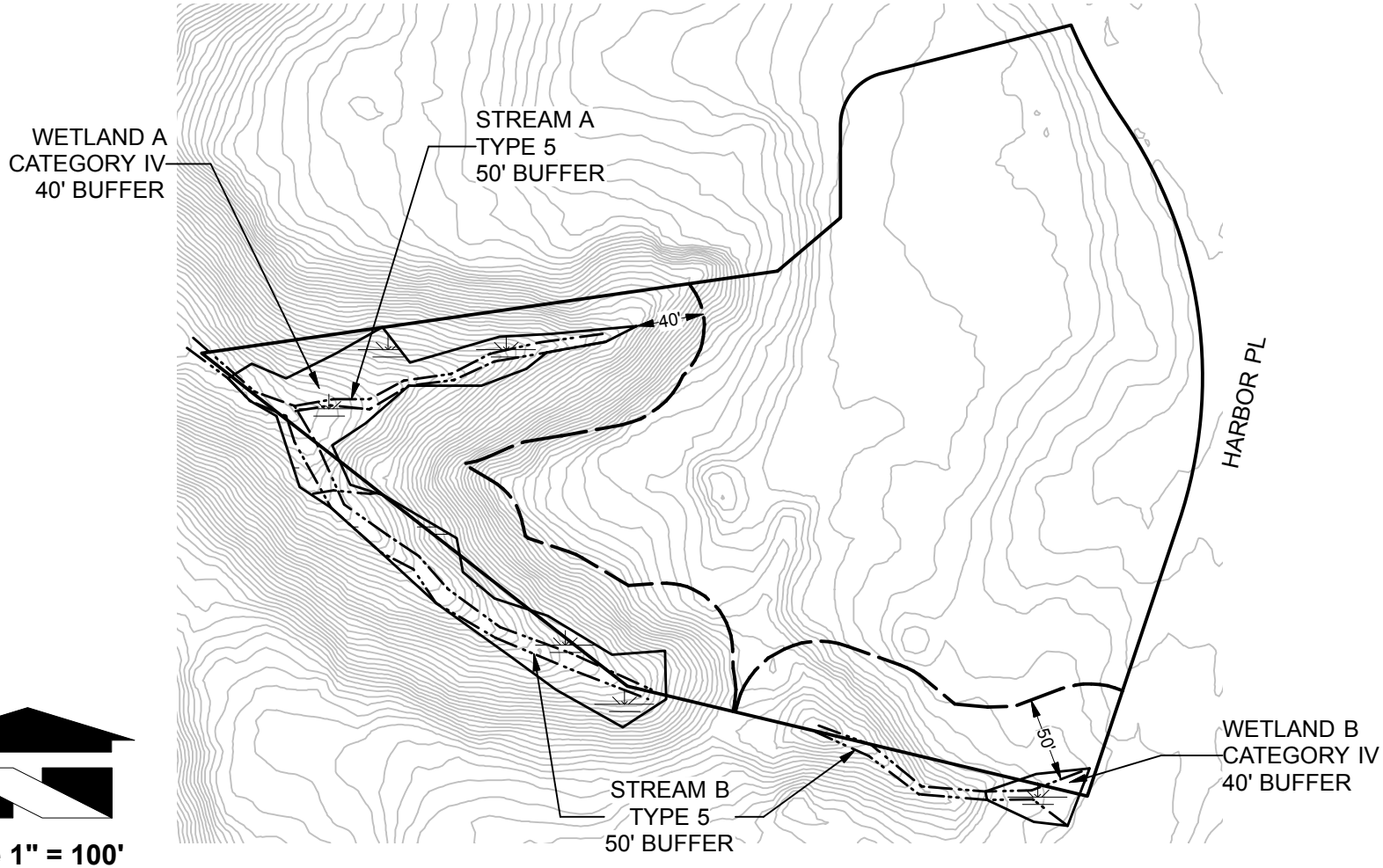
WETLAND RATING
Wetland B

Paris Beta, LLC
Attn: Susan Tang
925 80th Ave NE
Medina, WA 98039

Figure B-4
WRI Job # 18321
Rated by: TA

APPENDIX C:
CRITICAL AREA STUDY MAPS

EXISTING CONDITIONS MAP
PARIS BETA - HARBOUR PL
PORTION OF SECTION 16, TOWNSHIP 28N, RANGE 4E, W.M.



Scale 1" = 100'

0 50 100 150 200

LEGEND

- WETLAND
- BUFFER
- STREAM

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9505 19th Avenue S.E. Suite 106 Everett,Washington 98208
Phone: (425) 337-3174
Fax: (425) 337-3045
Email: mailbox@wetlandresources .com

Determination Map
Paris Beta - Harbour Pl
City Of Mukilteo

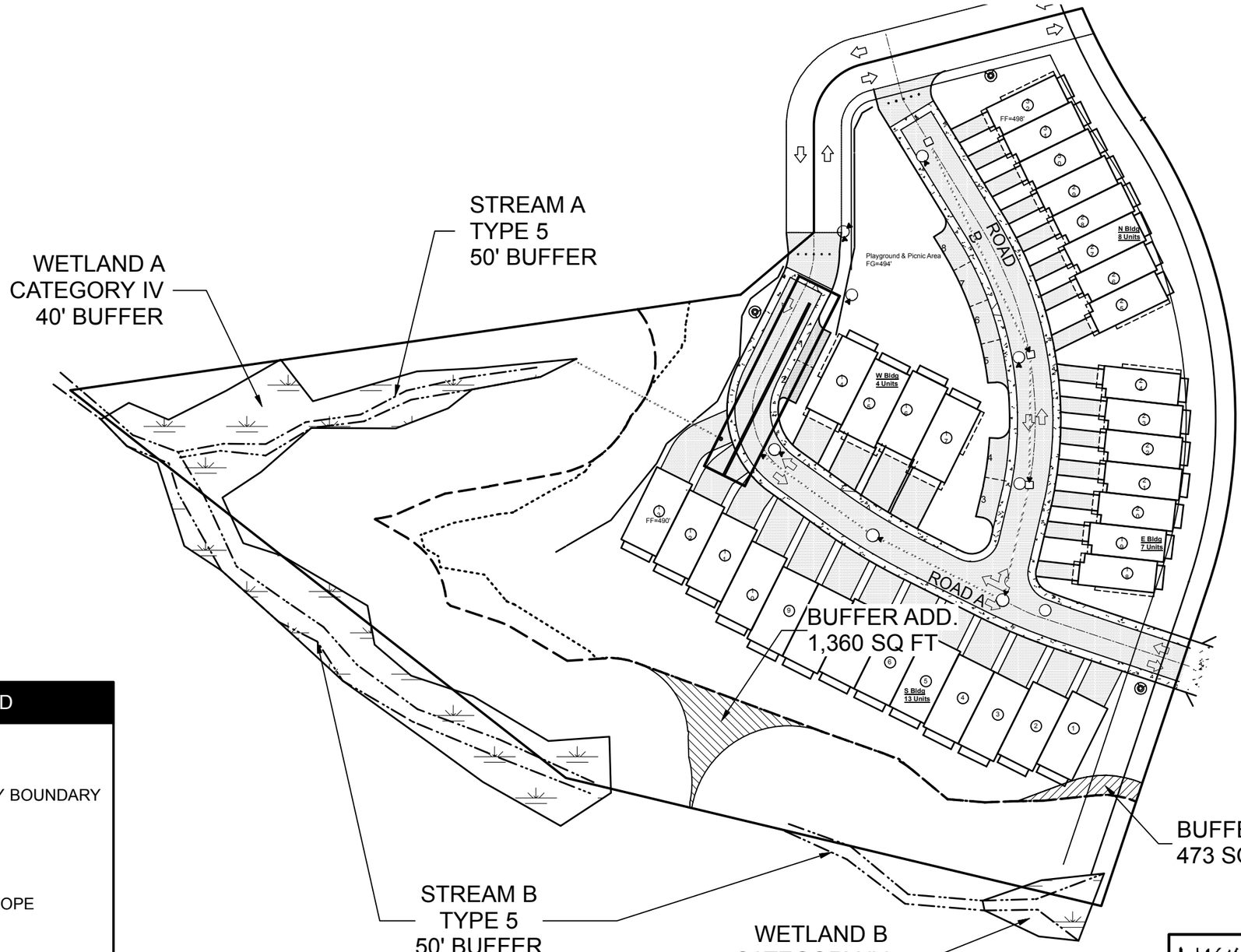
Paris Beta LLC
Attn: Susan Tang
925 80th Ave NE
Medina, WA 98039

Sheet 1/1
Project Number: 18321
Drawn by: JM
9/6/2019

CRITICAL AREA STUDY MAP

PARIS BETA - HARBOUR PL

PORTION OF SECTION 16, TOWNSHIP 28N, RANGE 4E, W.M.



LEGEND
WETLAND
PROPERTY BOUNDARY
STREAM
BUFFER
TOP OF SLOPE SETBACK
BUFFER ADDITION
BUFFER REDUCTION

Scale 1" = 60'

0 30 60 90 120

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Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance
9505 19th Avenue S.E. Suite 106 Everett,Washington 98208
Phone: (425) 337-3174
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Email: mailbox@wetlandresources .com

Critical Area Study Map
Paris Beta - Harbour Pl
City Of Mukilteo

Paris Beta LLC
Attn: Susan Tang
925 80th Ave NE
Medina, WA 98039

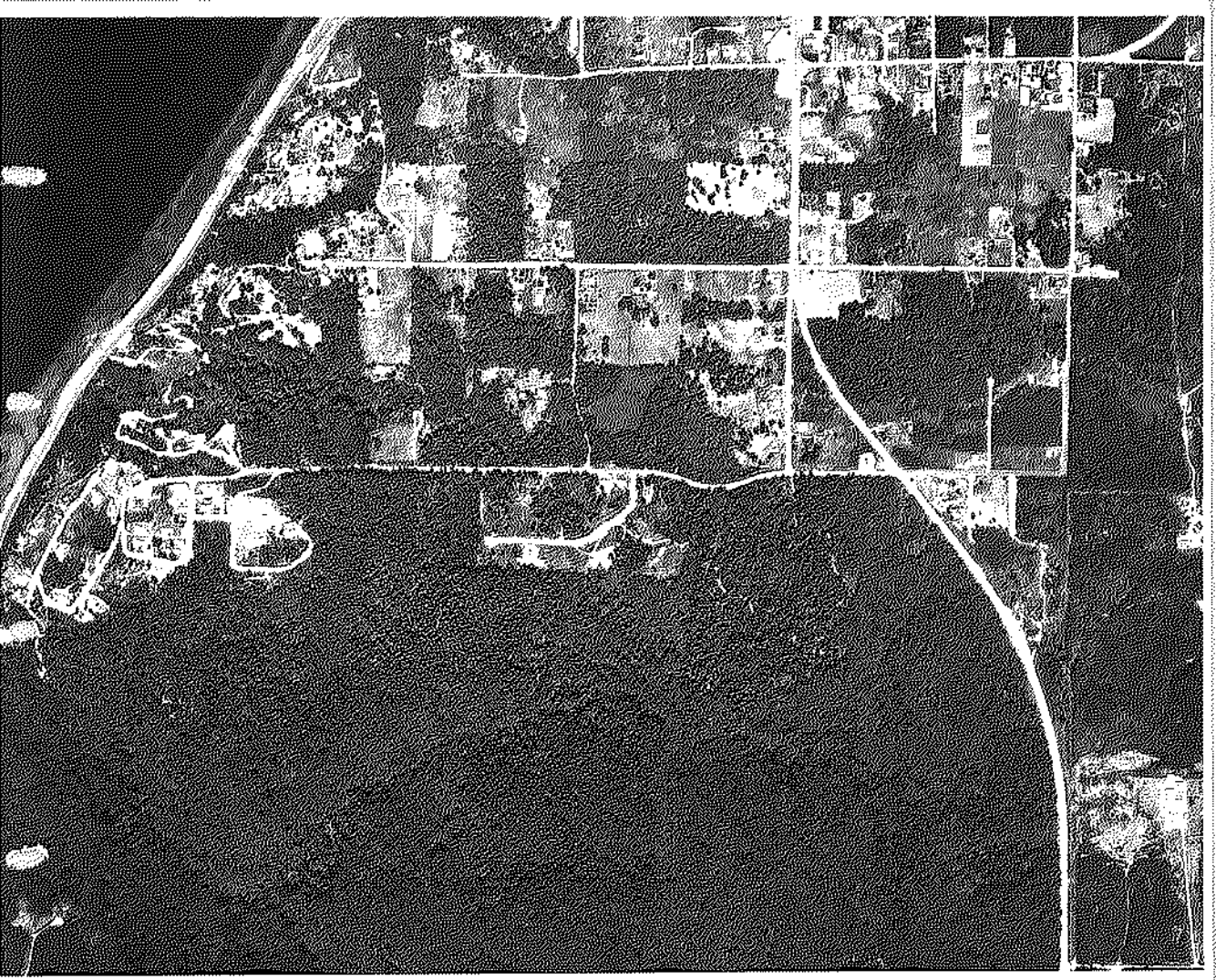
Sheet 1/1
Project Number: 18321
Drawn by: JM
9/6/2019

APPENDIX D:
Stormwater Manangement Plan

PW000010194

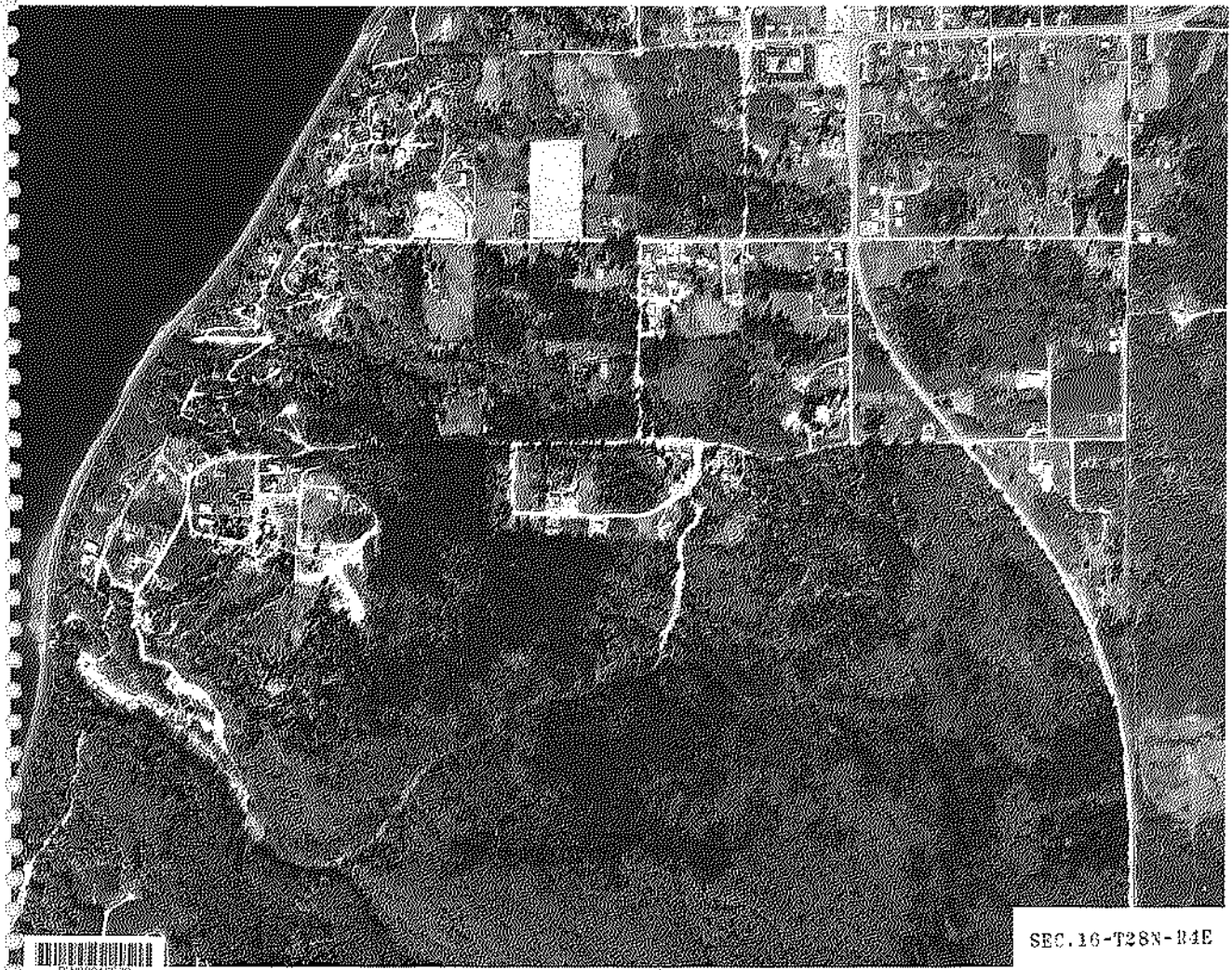
PW00014292

16-28-4



SEC. 16 T2SN - R4E

PWD0016861



PWD0010579

Sec 16 T28N R4E

PW00026846

PW00014582

S16-T28N-R42

PW00040721

SI6-T28N-R4E

PW00039769

SEC 16 T28N R4E

PWD0041267

S16 T28 R4

95

Targeted Drainage Report

Harbour Pointe Townhomes

City of Mukilteo, Washington

Tax Parcel: 28042100103200

Group Four Job No. 18-4523

May 31, 2019

Revised: August 13, 2019

Prepared For:
Paris Beta LLC
Lucy Chen
2225 94th Ave NE
Clyde Hill, WA 98004
(206) 928-5013

Prepared By:
Curt Iffrig, E.I.T
Group Four, Inc.
1901 Vernon Road, Suite #A
Lake Stevens, WA 98258
(425) 408-1152

Section I

Project Overview and Executive Summary

Existing Conditions Summary

Mitigation Summary

Upstream Analysis

Downstream Analysis

Section II

MR-1 Targeted Stormwater Site Plan

MR 2-SWPPP

MR 3-Water Pollution Source Control for New Development

MR 4-Preservation of Natural Drainage Systems and Outfalls

MR 5-On-site Storm water Management

MR 6-Runoff Treatment

MR 7- Flow Control

MR 8- Wetland Protection

MR 9- Operation and Maintenance

Appendix

A - Geotechnical report

B - Post Construction Amended Soils

C - WWHM 2012 Output

Figures

Figure 1-Vicinity Map

Figure 2-Predeveloped Site Plan

Figure 3-Proposed Site Plan

Section I

Project Overview and Executive Summary

Name: Harbour Point Townhomes
PFN: Pending
Tax Parcel: 28042100103200

Owner/Applicant:

Paris Beta LLC
Lucy Chen
2225 94th Ave NE
Clyde Hill, WA 98004
206-928-5013

Engineer:

Group Four, Inc.
P.O. Box 1059
Lake Stevens, WA 98258
425-408-1152

This targeted drainage report was prepared as part of a preliminary drainage review for the City of Mukilteo per the Stormwater Management Manual for Western Washington, 2014 (SWMMWW 2014) and the City of Mukilteo Development Standards 2017.

The applicant proposes to build 32 residential townhomes on a 3.26 ac parcel zoned PCB-S on Harbour Pl in Mukilteo, WA. The project will disturb approximately 1.78 ac and proposes approximately 24,100 sf of new roofs, 11,700 sf of new road, and 8,200 sf of driveways, 4,900 sf of sidewalk and 1,700 sf of parking stalls.

Proposed impervious surface will be mitigated by an underground detention vault that is 107.5 ft long x 22.5 ft wide and 15 ft deep. Water quality will be provided by a combination wetpool below the dead storage.

Existing Conditions Summary

The existing site is 3.26 acres in an area zoned Planed Community Business-South (PCB-S). Approximately 50% of the area is cleared and the remainder is forested. An existing asphalt road runs along the northeast property boundary. The project site is confined to the north and east of the property due to steep slopes and wetlands in the south and west. The project site moderately slopes to the south and west with an average approximate slope in the project area is between 3% and 10%. See Figure 1 for the Vicinity Map and Figure 2 for the Existing Conditions site plan.

A geotechnical assessment was prepared for the site by Associated Earth Sciences dated February 8th, 2019. This assessment found the soils on site to be Vashon Lodgement Till which is not suitable for infiltration. The geotechnical assessment report is in Appendix A.

Mitigation Summary

Presented below is a summary of proposed impervious areas treated solely by on-site storm water management. See Figure 3 for Proposed Site Plan.

TDA	Area, SF	BMP	Note
Proposed Roofs	24,100	Detention Vault	
Proposed Road	11,700	Detention Vault	
Proposed Driveways	8,200	Detention Vault	
Proposed Sidewalk	4,900	Detention Vault	
Proposed Parking	1,700	Detention Vault	
Total	**50,600**		

Upstream Analysis

There are no areas upstream that are tributary to the project site. Runoff from the uphill Harbour Place is collected in an existing storm system. There is not visual evidence of surface runoff flowing onto project site. See photos below

Downstream Analysis

The downstream was walked by Curt Iffrig on 5/23/2019. The entire site is one drainage basin that is tributary to the big gulch creek. Runoff from the site sheet flows overland to the southwest, down steep slopes and into the big gulch creek. From the site, the big gulch creek flows approximately 1.5 miles to the Puget Sound. During the site visit the weather was 70 degrees F and sunny. No problems were observed during the site visit. Erosion over the steep slopes is a potential problem which will be answered in the SWPPP plan and narrative. See photos blow.

Top Left: The site frontage on Harbour Place. **Top Right**: Cleared area on site, approximate building location. **Bottom**: Looking down into gulch approximately ¼ mile downstream.

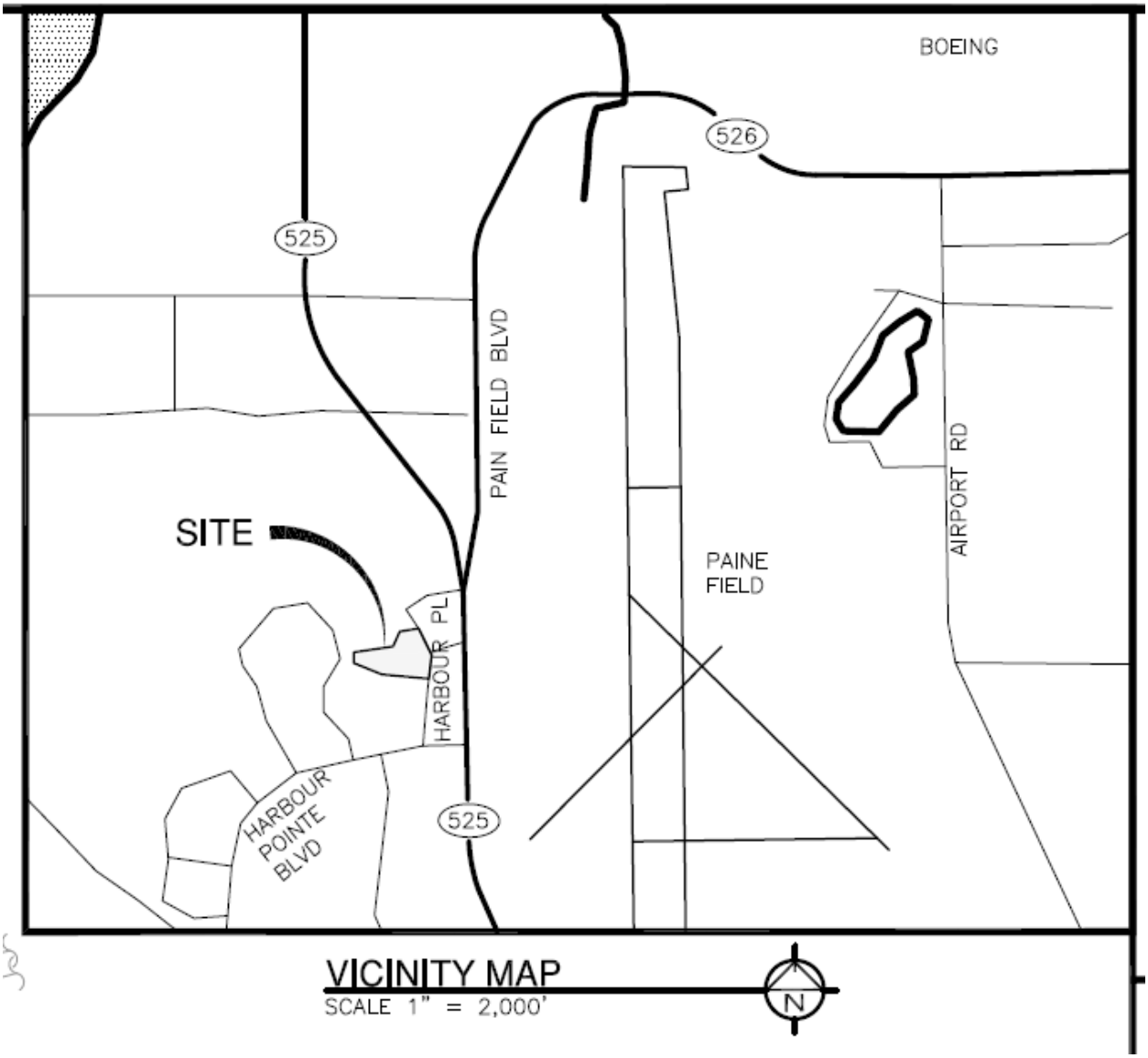


Figure 1: Vicinity Map

Section II: Minimum Requirements

Per the SWMMWW 2014, this project must comply with Minimum Requirements 1 through 9.

MR-1 Targeted Stormwater Site Plan

A Preliminary Targeted Drainage Plan has been prepared per the SWMMWW 2014 and the City of Mukilteo Development Standards. A full set of civil plans will be submitted for final design review

MR 2-SWPPP Narrative

A SWPP plan and narrative will be prepared for final design review.

MR 3-Water Pollution Source Control for New Development

Pollution source control is not required for this residential site.

MR 4-Preservation of Natural Drainage Systems and Outfalls

The detention vault will discharge to the west at the toe of the steep slope. This will maintain the site's natural discharge location. Off-site mitigation is not required for this project.

MR 5-On-site Stormwater Management

A compost-amended soil management plan has been developed utilizing BMP T5.13. The compost amended soil management plan will apply to all landscape surfaces with an area of approximately 26,900 SF (0.62 Ac). The Snohomish County Soil Management Plan will be completed for final design and included in Appendix B.

Infiltration is not feasible for this site because a geotechnical study found fine soils unsuitable for infiltration. Full dispersion is not feasible because of the steep slopes downstream of the site. Bioretention is not feasible due to the space available and the fine soils.

MR 6-Runoff Treatment

The proposed PGIS is will be treated with the combination wetpool/detention method where a wetpool constructed below the live storage in the vault. The depth and capacity of this wet pool will be determined prior to final design.

Wetpool - a constructed storm water pond
that retains a permanent pool of water

MR 7- Flow Control

The flow control requirement per the SWMMWW 2014 is described below;

"Stormwater discharges shall match developed discharge durations to predeveloped durations for the range of pre-developed discharge rates from 50% of the 2-year peak flow up to the full 50-year peak flow"

Flow control will be provided by an underground detention vault. WWHM 2012 was used to model the drainage basin and size detention vault to meet the flow control requirement.

Detention Vault

A detention vault will be used to provide flow control for runoff from proposed impervious and proposed new pervious areas. The vault will be 107.5 ft long, 22.5 ft wide and 15 ft deep. The proposed vault is sized to meet the flow control standard per the Stormwater Management Manual for Western Washington, 2014. (SWMMWW, 2014) The vault will discharge into the big gulch creek below.

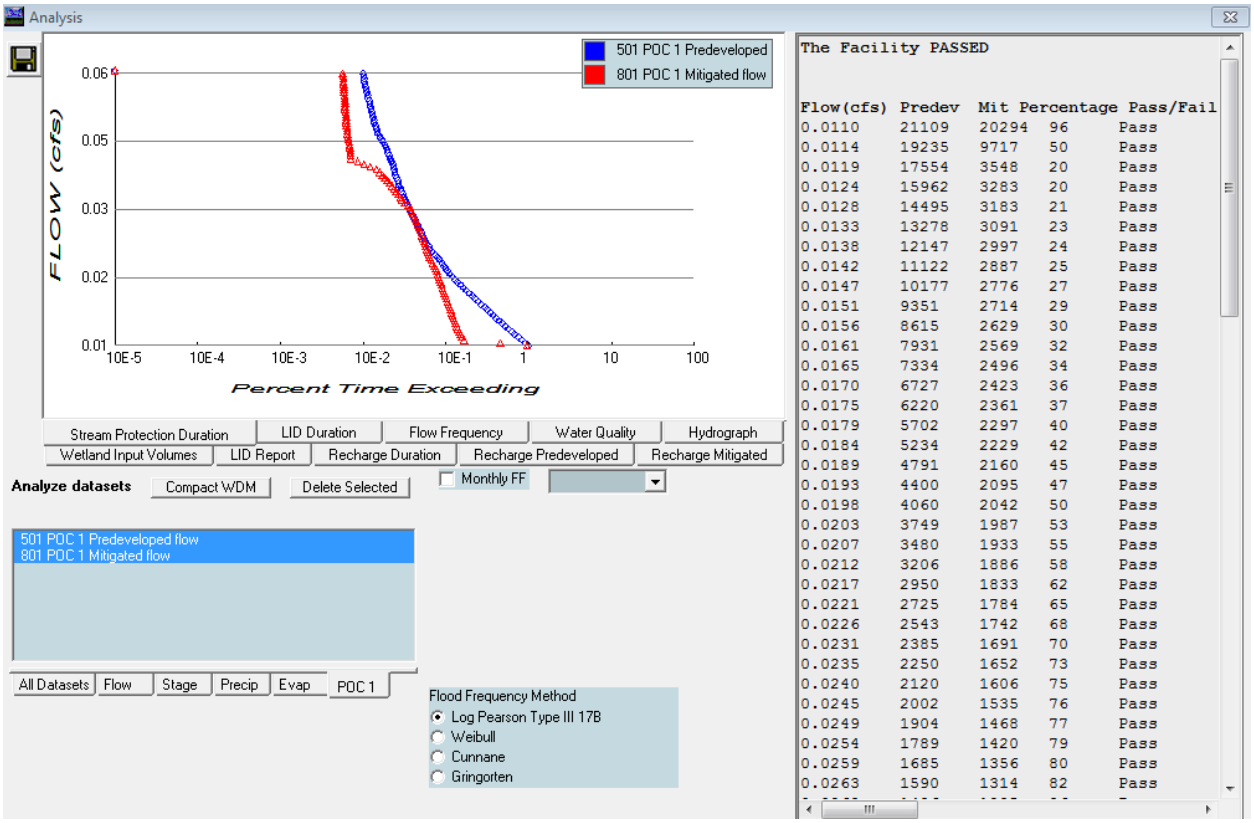
WWHM 2012 was used to model the predeveloped and developed condition, size the detention vault and demonstrate compliance with the flow control standard. The predeveloped and developed condition from that report are shown in the table below.

SURFACE	SLOPE	COVER	AREA (ac)
PRE-DEVELOPED			
Existing Forest	3-10%	Forest	1.78
DEVELOPED			
Proposed Roof	0%	Roof	0.61
Proposed Road and Frontage	3-10%	Road	0.43
Proposed Driveways and Walkways	3-10%	Driveways	0.327
Lawn and Landscape	3-10%	Lawn	0.413

The vault parameters for WWHM 2012 are shown in the table below.

Model Input	Value	Note
Vault Type	Underground	
Width	22.5 ft	Design Width
Depth	15 ft	Design Depth
Length	107.5 ft	Design Length
Volume	36,281 cf	Live Storage Volume
Infiltration Rate	0	No Infiltration
Riser Height	14 ft	
Riser Diameter	18 in	Design Diameter
Notch Width	0.011 ft	Rectangular Notch
Notch Height	1.019 ft	
Orifice 1 Diameter	0.347 in	Design Diameter
Orifice 1 Elev.	0	From bottom of live storage

The probability exceedance curve below shows that the vault as designed is in compliance with the SWMMWW, 2014 flow control standard. See the full WWHM output in Appendix C.



MR 8- Wetland Protection

Runoff being discharged into downstream wetlands will be controlled by the detention vault. Uncontrolled flows will not be discharged into wetlands.

MR 9- Operation and Maintenance

SCC 30.63A.575 through SCC 30.63A.605

The detention vault and stormwater sytem are to be owned, operated and maintained by the homeowner's association according to the standards contained in the SWMMWW, 2014.

Appendices

A - Geotechnical Report

B - Post Construction Amended Soils (To be included for final design)

C - WWHM2012 Output

WWHM2012
PROJECT REPORT

Project Name: Harbor Point Prelim Revised
Site Name:
Site Address:
City :
Report Date: 5/23/2019
Gage : Everett
Data Start : 1948/10/01
Data End : 2009/09/30
Precip Scale: 0.80
Version Date: 2017/04/14
Version : 4.2.13

Low Flow Threshold for POC 1 : 50 Percent of the 2 Year

High Flow Threshold for POC 1: 50 year

PREDEVELOPED LAND USE

Name : Basin 1
Bypass: No

GroundWater: No

Pervious Land Use	acre
C, Forest, Mod	1.78
Pervious Total	1.78

Impervious Land Use	acre
Impervious Total	0
Basin Total	1.78

Element Flows To:

Surface	Interflow	Groundwater

MITIGATED LAND USE

Name : Basin 1
Bypass: No

GroundWater: No

Pervious Land Use	acre
C, Lawn, Mod	.413
Pervious Total	0.413

Impervious Land Use	acre
ROADS MOD	0.43
ROOF TOPS FLAT	0.61
DRIVEWAYS MOD	0.327
Impervious Total	1.367

Basin Total 1.78

Element Flows To:

Surface	Interflow	Groundwater
Vault 1	Vault 1	

Name : Vault 1
Width : 22.5 ft.
Length : 107.5 ft.
Depth: 15 ft.

Discharge Structure
Riser Height: 14 ft.
Riser Diameter: 18 in.
Notch Type: Rectangular
Notch Width: 0.011 ft.
Notch Height: 1.019 ft.
Orifice 1 Diameter: 0.34744 in. **Elevation:** 0 ft.

Element Flows To:

Outlet 1	Outlet 2

Vault Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.055	0.000	0.000	0.000
0.1667	0.055	0.009	0.001	0.000
0.3333	0.055	0.018	0.001	0.000
0.5000	0.055	0.027	0.002	0.000
0.6667	0.055	0.037	0.002	0.000
0.8333	0.055	0.046	0.003	0.000
1.0000	0.055	0.055	0.003	0.000
1.1667	0.055	0.064	0.003	0.000
1.3333	0.055	0.074	0.003	0.000
1.5000	0.055	0.083	0.004	0.000
1.6667	0.055	0.092	0.004	0.000
1.8333	0.055	0.101	0.004	0.000
2.0000	0.055	0.111	0.004	0.000

2.1667	0.055	0.120	0.004	0.000
2.3333	0.055	0.129	0.005	0.000
2.5000	0.055	0.138	0.005	0.000
2.6667	0.055	0.148	0.005	0.000
2.8333	0.055	0.157	0.005	0.000
3.0000	0.055	0.166	0.005	0.000
3.1667	0.055	0.175	0.005	0.000
3.3333	0.055	0.185	0.006	0.000
3.5000	0.055	0.194	0.006	0.000
3.6667	0.055	0.203	0.006	0.000
3.8333	0.055	0.212	0.006	0.000
4.0000	0.055	0.222	0.006	0.000
4.1667	0.055	0.231	0.006	0.000
4.3333	0.055	0.240	0.006	0.000
4.5000	0.055	0.249	0.006	0.000
4.6667	0.055	0.259	0.007	0.000
4.8333	0.055	0.268	0.007	0.000
5.0000	0.055	0.277	0.007	0.000
5.1667	0.055	0.286	0.007	0.000
5.3333	0.055	0.296	0.007	0.000
5.5000	0.055	0.305	0.007	0.000
5.6667	0.055	0.314	0.007	0.000
5.8333	0.055	0.323	0.007	0.000
6.0000	0.055	0.333	0.008	0.000
6.1667	0.055	0.342	0.008	0.000
6.3333	0.055	0.351	0.008	0.000
6.5000	0.055	0.360	0.008	0.000
6.6667	0.055	0.370	0.008	0.000
6.8333	0.055	0.379	0.008	0.000
7.0000	0.055	0.388	0.008	0.000
7.1667	0.055	0.397	0.008	0.000
7.3333	0.055	0.407	0.008	0.000
7.5000	0.055	0.416	0.009	0.000
7.6667	0.055	0.425	0.009	0.000
7.8333	0.055	0.435	0.009	0.000
8.0000	0.055	0.444	0.009	0.000
8.1667	0.055	0.453	0.009	0.000
8.3333	0.055	0.462	0.009	0.000
8.5000	0.055	0.472	0.009	0.000
8.6667	0.055	0.481	0.009	0.000
8.8333	0.055	0.490	0.009	0.000
9.0000	0.055	0.499	0.009	0.000
9.1667	0.055	0.509	0.009	0.000
9.3333	0.055	0.518	0.010	0.000
9.5000	0.055	0.527	0.010	0.000
9.6667	0.055	0.536	0.010	0.000
9.8333	0.055	0.546	0.010	0.000
10.000	0.055	0.555	0.010	0.000
10.167	0.055	0.564	0.010	0.000
10.333	0.055	0.573	0.010	0.000
10.500	0.055	0.583	0.010	0.000
10.667	0.055	0.592	0.010	0.000
10.833	0.055	0.601	0.010	0.000
11.000	0.055	0.610	0.010	0.000
11.167	0.055	0.620	0.010	0.000
11.333	0.055	0.629	0.011	0.000
11.500	0.055	0.638	0.011	0.000

11.667	0.055	0.647	0.011	0.000
11.833	0.055	0.657	0.011	0.000
12.000	0.055	0.666	0.011	0.000
12.167	0.055	0.675	0.011	0.000
12.333	0.055	0.684	0.011	0.000
12.500	0.055	0.694	0.011	0.000
12.667	0.055	0.703	0.011	0.000
12.833	0.055	0.712	0.011	0.000
13.000	0.055	0.721	0.011	0.000
13.167	0.055	0.731	0.014	0.000
13.333	0.055	0.740	0.019	0.000
13.500	0.055	0.749	0.024	0.000
13.667	0.055	0.758	0.030	0.000
13.833	0.055	0.768	0.036	0.000
14.000	0.055	0.777	0.042	0.000
14.167	0.055	0.786	1.116	0.000
14.333	0.055	0.795	2.925	0.000
14.500	0.055	0.805	4.681	0.000
14.667	0.055	0.814	5.797	0.000
14.833	0.055	0.823	6.512	0.000
15.000	0.055	0.832	7.129	0.000
15.167	0.055	0.842	7.697	0.000
15.333	0.000	0.000	8.226	0.000

ANALYSIS RESULTS

Stream Protection Duration

Predeveloped Landuse Totals for POC #1
Total Pervious Area:1.78
Total Impervious Area:0

Mitigated Landuse Totals for POC #1
Total Pervious Area:0.413
Total Impervious Area:1.367

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	0.021917
5 year	0.034279
10 year	0.041973
25 year	0.050939
50 year	0.057053
100 year	0.062702

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	0.011567
5 year	0.027621
10 year	0.046986

25 year	0.087945
50 year	0.136413
100 year	0.207227

Stream Protection Duration
Annual Peaks for Predeveloped and Mitigated. POC #1

Year	Predeveloped	Mitigated
1949	0.003	0.008
1950	0.028	0.011
1951	0.021	0.010
1952	0.015	0.008
1953	0.013	0.008
1954	0.038	0.011
1955	0.037	0.185
1956	0.030	0.205
1957	0.035	0.009
1958	0.024	0.010
1959	0.023	0.010
1960	0.021	0.009
1961	0.024	0.011
1962	0.014	0.008
1963	0.018	0.009
1964	0.021	0.009
1965	0.022	0.010
1966	0.012	0.008
1967	0.031	0.010
1968	0.030	0.010
1969	0.016	0.010
1970	0.017	0.009
1971	0.026	0.084
1972	0.024	0.008
1973	0.013	0.010
1974	0.026	0.011
1975	0.018	0.008
1976	0.017	0.010
1977	0.008	0.007
1978	0.016	0.008
1979	0.032	0.007
1980	0.019	0.008
1981	0.016	0.007
1982	0.024	0.011
1983	0.023	0.010
1984	0.021	0.011
1985	0.032	0.110
1986	0.083	0.011
1987	0.028	0.011
1988	0.018	0.010
1989	0.013	0.008
1990	0.023	0.009
1991	0.025	0.010
1992	0.018	0.009
1993	0.012	0.008
1994	0.008	0.010
1995	0.022	0.011
1996	0.050	0.011
1997	0.090	0.293

1998	0.012	0.010
1999	0.023	0.012
2000	0.013	0.011
2001	0.003	0.005
2002	0.022	0.033
2003	0.014	0.008
2004	0.021	0.009
2005	0.018	0.009
2006	0.050	0.257
2007	0.037	0.122
2008	0.049	0.011
2009	0.019	0.009

Stream Protection Duration
Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.0904	0.2931
2	0.0832	0.2566
3	0.0498	0.2054
4	0.0495	0.1849
5	0.0487	0.1219
6	0.0380	0.1105
7	0.0375	0.0838
8	0.0374	0.0329
9	0.0347	0.0124
10	0.0321	0.0113
11	0.0320	0.0113
12	0.0310	0.0112
13	0.0304	0.0112
14	0.0303	0.0111
15	0.0278	0.0110
16	0.0276	0.0109
17	0.0259	0.0108
18	0.0256	0.0106
19	0.0250	0.0106
20	0.0242	0.0105
21	0.0239	0.0105
22	0.0238	0.0104
23	0.0238	0.0104
24	0.0232	0.0102
25	0.0232	0.0102
26	0.0230	0.0102
27	0.0229	0.0100
28	0.0223	0.0099
29	0.0219	0.0098
30	0.0218	0.0098
31	0.0214	0.0097
32	0.0210	0.0096
33	0.0209	0.0096
34	0.0207	0.0095
35	0.0206	0.0095
36	0.0187	0.0095
37	0.0186	0.0093
38	0.0185	0.0092
39	0.0184	0.0092
40	0.0184	0.0091

41	0.0181	0.0088
42	0.0176	0.0087
43	0.0174	0.0087
44	0.0170	0.0086
45	0.0164	0.0085
46	0.0161	0.0085
47	0.0160	0.0084
48	0.0152	0.0084
49	0.0142	0.0082
50	0.0140	0.0081
51	0.0132	0.0081
52	0.0130	0.0080
53	0.0130	0.0079
54	0.0126	0.0078
55	0.0125	0.0078
56	0.0118	0.0077
57	0.0115	0.0076
58	0.0080	0.0072
59	0.0079	0.0070
60	0.0032	0.0070
61	0.0028	0.0054

Stream Protection Duration
POC #1
The Facility PASSED

The Facility PASSED.

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0110	21109	20294	96	Pass
0.0114	19235	9717	50	Pass
0.0119	17554	3548	20	Pass
0.0124	15962	3283	20	Pass
0.0128	14495	3183	21	Pass
0.0133	13278	3091	23	Pass
0.0138	12147	2997	24	Pass
0.0142	11122	2887	25	Pass
0.0147	10177	2776	27	Pass
0.0151	9351	2714	29	Pass
0.0156	8615	2629	30	Pass
0.0161	7931	2569	32	Pass
0.0165	7334	2496	34	Pass
0.0170	6727	2423	36	Pass
0.0175	6220	2361	37	Pass
0.0179	5702	2297	40	Pass
0.0184	5234	2229	42	Pass
0.0189	4791	2160	45	Pass
0.0193	4400	2095	47	Pass
0.0198	4060	2042	50	Pass
0.0203	3749	1987	53	Pass
0.0207	3480	1933	55	Pass
0.0212	3206	1886	58	Pass
0.0217	2950	1833	62	Pass
0.0221	2725	1784	65	Pass
0.0226	2543	1742	68	Pass
0.0231	2385	1691	70	Pass

0.0235	2250	1652	73	Pass
0.0240	2120	1606	75	Pass
0.0245	2002	1535	76	Pass
0.0249	1904	1468	77	Pass
0.0254	1789	1420	79	Pass
0.0259	1685	1356	80	Pass
0.0263	1590	1314	82	Pass
0.0268	1486	1285	86	Pass
0.0273	1384	1251	90	Pass
0.0277	1321	1219	92	Pass
0.0282	1252	1194	95	Pass
0.0287	1201	1158	96	Pass
0.0291	1158	1131	97	Pass
0.0296	1120	1099	98	Pass
0.0300	1077	1067	99	Pass
0.0305	1032	1035	100	Pass
0.0310	993	998	100	Pass
0.0314	965	971	100	Pass
0.0319	928	938	101	Pass
0.0324	895	910	101	Pass
0.0328	857	877	102	Pass
0.0333	822	851	103	Pass
0.0338	791	820	103	Pass
0.0342	758	785	103	Pass
0.0347	732	738	100	Pass
0.0352	707	671	94	Pass
0.0356	683	629	92	Pass
0.0361	664	595	89	Pass
0.0366	645	563	87	Pass
0.0370	626	533	85	Pass
0.0375	607	503	82	Pass
0.0380	584	474	81	Pass
0.0384	567	444	78	Pass
0.0389	556	419	75	Pass
0.0394	541	389	71	Pass
0.0398	526	364	69	Pass
0.0403	515	334	64	Pass
0.0408	505	308	60	Pass
0.0412	495	260	52	Pass
0.0417	483	219	45	Pass
0.0422	471	184	39	Pass
0.0426	459	152	33	Pass
0.0431	443	150	33	Pass
0.0436	428	150	35	Pass
0.0440	417	150	35	Pass
0.0445	405	148	36	Pass
0.0449	388	146	37	Pass
0.0454	371	145	39	Pass
0.0459	355	142	40	Pass
0.0463	339	139	41	Pass
0.0468	325	138	42	Pass
0.0473	318	137	43	Pass
0.0477	307	136	44	Pass
0.0482	302	134	44	Pass
0.0487	291	134	46	Pass
0.0491	287	134	46	Pass
0.0496	279	134	48	Pass

0.0501	274	132	48	Pass
0.0505	268	130	48	Pass
0.0510	265	129	48	Pass
0.0515	262	129	49	Pass
0.0519	257	129	50	Pass
0.0524	253	129	50	Pass
0.0529	245	127	51	Pass
0.0533	242	127	52	Pass
0.0538	236	125	52	Pass
0.0543	231	125	54	Pass
0.0547	226	125	55	Pass
0.0552	224	124	55	Pass
0.0557	222	123	55	Pass
0.0561	220	123	55	Pass
0.0566	217	122	56	Pass
0.0571	211	120	56	Pass

Water Quality BMP Flow and Volume for POC #1
On-line facility volume: 0 **acre-feet**
On-line facility target flow: 0 **cfs.**
Adjusted for 15 min: 0 **cfs.**
Off-line facility target flow: 0 **cfs.**
Adjusted for 15 min: 0 **cfs.**

LID Report

LID Technique	Used for Treatment?	Total Volumn Needs Treatment (ac-ft)	Volumn Through Facility (ac-ft)	Infiltration Volumn (ac-ft.)	Cumulative Volumn Infiltration Credit	Percent Water Quality	Comment
Vault 1 POC	N	165.97			N	0.00	
Total Volume Infiltrated		165.97	0.00	0.00	0.00	0.00	0% No Treat. Credit

Compliance with LID Standard 8
Duration Analysis Result = Failed

Perlnd and Implnd Changes

No changes have been made.

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Subsurface Exploration, Geologic Hazard, and Preliminary Geotechnical Engineering Report

BASEL MUKILTEO TOWNHOMES

Mukilteo, Washington

Prepared For:

BASEL CAPITAL HOLDINGS, LLC

Project No. 190008E001
February 8, 2019

Associated Earth Sciences, Inc.
911 5th Avenue
Kirkland, WA 98033
P (425) 827 7701

associated earth sciences incorporated

February 8, 2019
Project No. 190008E001

Basel Capital Holdings, LLC
2225 94th Avenue NE
Clyde Hill, Washington 98004

Attention: John Guo and Susan Tang

Subject: Subsurface Exploration, Geologic Hazard, and Preliminary Geotechnical Engineering Report
Basel Mukilteo Townhomes
Harbour Place and 99th Place SW
Mukilteo, Washington
Snohomish County Parcel No. 28042100103200

Dear Mr. Guo and Ms. Tang:

We are pleased to present the enclosed copy of the referenced report. This report summarizes the results of our subsurface exploration, geologic hazard, and geotechnical engineering studies and offers recommendations for the design and development of the proposed project.

We have enjoyed working with you on this study and are confident that the recommendations presented in this report will aid in the successful completion of your project. If you should have any questions, or if we can be of additional help to you, please do not hesitate to call.

Sincerely,
ASSOCIATED EARTH SCIENCES, INC.
Kirkland, Washington

Matthew A. Miller, P.E.
Principal Engineer

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SUBSURFACE EXPLORATION, GEOLOGIC HAZARD, AND PRELIMINARY GEOTECHNICAL ENGINEERING REPORT

BASEL MUKILTEO TOWNHOMES

Mukilteo, Washington

Prepared for:
Basel Capital Holdings, LLC
2225 94th Avenue NE
Clyde Hill, Washington 98004

Prepared by:
Associated Earth Sciences, Inc.
911 5th Avenue
Kirkland, Washington 98033
425-827-7701

February 8, 2019
Project No. 190008E001

I. PROJECT AND SITE CONDITIONS

1.0 INTRODUCTION

This report presents the results of our subsurface exploration, geologic hazard, and geotechnical engineering study for the proposed residential development known as "Basel Mukilteo Townhomes." The site location is shown on the "Vicinity Map," Figure 1. The approximate locations of explorations completed for this study are shown on the "Site and Exploration Plan," Figure 2. Interpretive exploration logs are included in the Appendix.

This report is based on our correspondence, a "Proposed Site Plan," dated January 7, 2019, and an ALTA/NSPS Land Title Survey by Group Four, Inc., dated January 3, 2019. This report is preliminary in that detailed project plans are not yet available. The conclusions and recommendations contained in this report should be reviewed and modified, or verified, as necessary when project plans are available.

1.1 Purpose and Scope

The purpose of this study was to provide subsurface data to be used in the design of the "Basel Mukilteo Townhomes" development. Our study included reviewing selected geologic literature, observing the excavation of exploration pits, and performing geologic studies to assess the type, thickness, distribution, and physical properties of the subsurface sediments and shallow groundwater. Geotechnical engineering studies were completed to formulate our recommendations for site preparation and grading, the types of suitable foundations and floors, allowable foundation soil bearing pressure, anticipated foundation and floor settlement, pavement recommendations, and drainage considerations. This report summarizes our current fieldwork and offers recommendations for development based on our present understanding of the project. We recommend that we be allowed to update the recommendations in this report as the project concept matures.

1.2 Authorization

This report has been prepared for the exclusive use of Basel Capital Holdings, LLC, and its agents for specific application to this project. Our work was performed in accordance with our scope of work and cost proposal, dated January 9, 2019. We were authorized to proceed by Mr. George Lee on January 10, 2019.

Within the limitations of scope, schedule, and budget, our services have been performed in accordance with generally accepted geotechnical engineering and engineering geology practices in effect in this area at the time our report was prepared. No other warranty, express or implied, is made.

2.0 PROJECT AND SITE DESCRIPTION

The subject site consists of Snohomish County Tax Parcel No. 28042100103200 located in Mukilteo, Washington. The parcel has a reported area of approximately 3.26 acres and is roughly triangular in plan view. The site is bounded to the east by Harbour Place, to the north by Harbour Pointe Montessori School, to the west by Big Gulch, and to the south by Harbour Pointe Senior Living. An underground water utility easement bisects the lot, roughly from north to south.

Site topography is somewhat terraced, sloping moderately down from Harbour Place to a relatively flat area and then sloping moderately to steeply to the north, to the west toward Big Gulch, and to the south to a wetland area. The referenced survey includes elevation contours over most of the property except for a portion near the west property boundary. Overall vertical relief of the surveyed area is on the order of 60 feet. The site is currently vacant. Vegetation varies across the property, with cleared areas and areas of Scotch broom, brambles, young deciduous trees, mature evergreens, and wetland.

Based on our correspondence and the "Proposed Site Plan," we understand that the development includes seven new townhome buildings with five to eight units each, access roads, and associated utilities and landscaping.

3.0 SUBSURFACE EXPLORATION

Our field study included observation of the excavation of ten exploration pits, EP-1 through EP-10, with a rubber-tracked, mini-excavator on January 28, 2019. The locations of the exploration pits shown on the "Site and Exploration Plan" (Figure 2) were estimated using a Global Positioning System (GPS) mobile mapping application and the referenced survey. Interpretive exploration logs are presented in the Appendix.

The various types of sediments, as well as the depths where characteristics of the sediments changed, are indicated on the exploration logs presented in the Appendix. The depths indicated on the logs where conditions changed may represent gradational variations between sediment types in the field.

The conclusions and recommendations presented in this report are based on the explorations completed for this study. The number, locations, and depths of our explorations were completed within site and budgetary constraints. Because of the nature of exploratory work below ground, extrapolation of subsurface conditions between field explorations is necessary. It should be noted that differing subsurface conditions may sometimes be present due to the random nature of deposition and the alteration of topography by past grading and/or filling. The nature and extent of any variations between the field explorations may not become fully

evident until construction. If variations are observed at that time, it may be necessary to re-evaluate specific recommendations in this report and make appropriate changes.

3.1 Exploration Pits

The exploration pits observed by Associated Earth Sciences, Inc. (AESI) were excavated using a tracked excavator under subcontract to us. The pits permitted direct, visual observation of subsurface conditions. Materials encountered in the exploration pits were studied and classified in the field by an engineer from our firm. All exploration pits were backfilled after examination and logging. Selected samples were then transported to our laboratory for further visual classification.

4.0 SUBSURFACE CONDITIONS

Subsurface conditions at the project site were inferred from the field explorations accomplished for this study, visual reconnaissance of the site, and review of selected geologic literature. The general distribution of geologic units is shown on the exploration logs. The explorations generally encountered native Vashon lodgement till, overlain in areas by deposits of artificial fill and surficial deposits of forest duff/topsoil.

4.1 Stratigraphy

The following sections present more detailed subsurface information organized from the youngest (shallowest) to the oldest (deepest) sediment types.

Forest Duff/Topsoil

A surficial soil layer of forest duff/topsoil between approximately 6 to 12 inches thick was encountered in exploration pits EP-2 through EP-6. The forest duff/topsoil generally consisted of very loose to loose, dark brown, silty fine sand with some gravel and abundant organic matter such as decaying vegetation, sticks, and roots. Due to their high organic content, forest duff/topsoil materials are not considered suitable for foundation, roadway, or slab-on-grade floor support, or for use in a structural fill. Excavated topsoil may be suitable for reuse in landscaped areas if specifically allowed by project plans.

Existing Fill

Fill soils (those not naturally placed) were encountered at the surface in exploration pits EP-1 and EP-7 through EP-10. The fill soils were observed to depths of 5.5 feet to 10.5 feet below the ground surface, and extended the full depths explored in EP-1, EP-8, and EP-9. The fill soils were highly variable, but the soil matrix generally consisted of loose to dense, silty to very silty, fine to medium sand with gravel content ranging from some to gravelly and organic content

ranging from scattered to abundant. Areas of the fill consisted of soft, sandy, silt. Organic matter observed within the fill included decaying wood debris, sticks, and root balls. Other portions of the fill contained cobbles, scattered boulders, waste such as a piece of brick, and cobble-sized clasts of diamict. The artificial fill appears to have been placed to create the relatively flat area on the site and may be encountered in other areas not explored.

Due to their organic content, waste content, and variable density, the existing fill as placed is not considered suitable for foundation support and should be removed under proposed building and paving areas. Excavated fill soils may be suitable for reuse in structural fills if they can be processed to remove excessive organic, oversized, and waste material and moisture-conditioned to achieve proper compaction, and if specifically allowed by project plans. Excavated fill soils proposed for reuse should be approved by the geotechnical engineer prior to placement.

Vashon Lodgement Till

Underlying the forest duff/topsoil and fill in explorations EP-2 through EP-7 and EP-10, we encountered dense to very dense (cemented), brownish gray, silty, gravelly, fine sand with scattered cobbles interpreted as Vashon-age lodgement till. The upper 2 to 4.5 feet in explorations EP-2 through EP-7 were weathered, characterized by a lower density (loose grading to medium dense), a higher silt content, and an orangish color. The lodgement till was deposited at the base of an active ice sheet and was subsequently compacted by the weight of the overriding glacial ice. The weathered condition was created by natural processes of freeze-thaw and bioturbation by roots and animals. In some areas, roots were observed extending through the weathered lodgement till and then spreading laterally into thick mats near the top of the unweathered lodgement till. In explorations EP-2 and EP-3, thin interbeds of lodgement till were not cemented and of lower silt content. All sediments of glacial origin may contain large cobbles or boulders at random locations.

Unweathered lodgement till typically possesses high-strength and low-compressibility attributes that are favorable for support of foundations, floor slabs, and paving, with proper preparation. Excavations into the lodgement till should be prepared to encounter random large cobbles and boulders. Lodgement till is silty and moisture-sensitive. Careful management of moisture-sensitive soils, as recommended in this report, will be needed to reduce the potential for disturbance of wet lodgement till soils and costs associated with repairing disturbed soils. Lodgement till soils are typically low permeability due to their high silt content and consolidated condition and are therefore not considered suitable for infiltration.

4.2 Published Geologic Literature

We reviewed a published geologic map of the project, *Distribution and Description of Geologic Units in the Mukilteo Quadrangle, Washington*, by J.P. Minard, 1982. The referenced map indicates that the site is expected to be underlain at shallow depths by Vashon lodgement till.

Our on-site explorations and interpretations are consistent with the conditions depicted on the published map.

4.3 Hydrology

Groundwater seepage was observed within the existing fill in explorations EP-1 and EP-10. Shallow, standing water was observed at the time of our exploration over much of the flat area of the site, and the surface soils in EP-8 and EP-9 were wet. We interpret this seepage as perched groundwater. Perched water occurs when surface water infiltrates down through relatively permeable soils, such as the existing fill, and becomes trapped or "perched" atop a comparatively impermeable barrier, such as higher silt content portions of the fill. Due to the variable character of the existing fill, groundwater seepage within the fill is difficult to predict and may occur in other areas of the fill.

Areas of elevated moisture content were observed at the base of the weathered lodgement till near the contact with underlying, unweathered lodgement till in explorations EP-2 and EP-4 through EP-6. We interpret the higher moisture as being representative of a shallow groundwater condition known as interflow. Interflow generally occurs during the months of October through June when surface water infiltrates down through a relatively permeable layer, such as weathered lodgement till, and becomes trapped atop a very low-permeability, parent sediment, such as unweathered lodgement till. Fall rains begin recharging the interflow zone, and once this zone is saturated, the shallow groundwater commonly flows laterally atop the low-permeability layer. The interflow will accumulate in topographic lows and form wetlands or surface channels/streams that may return to interflow water farther downslope.

The duration and quantity of seepage will largely depend on the soil grain-size distribution, topography, seasonal precipitation, on- and off-site land usage, and other factors.

II. GEOLOGIC HAZARDS AND MITIGATIONS

The following discussion of potential geologic hazards is based on the geologic, slope, and shallow groundwater conditions as observed and discussed herein.

The *Mukilteo Municipal Code* (MMC) 17.52A.020 defines "geologic sensitive areas" as follows:

A. *Areas subject to erosion rated moderate to severe or higher by the U.S. Department of Agriculture's Natural Resource Conservation Service;*

B. *Areas subject to erosion caused by streams, surface drainage, or along the shoreline;*

C. *Areas within a stream's channel migration zone;*

D. *Areas mapped on the City of Mukilteo's landslide hazard map having a moderate or higher rating;*

E. *Areas that are found to have, based on a site-specific inspection, all of the following characteristics:*

   1. *Springs or groundwater seepage;*

   2. *Hillsides showing intersecting geologic contacts; and*

   3. *Slopes steeper than fifteen percent, fifteen-foot rise over one-hundred-foot run.*

F. *Areas that are underlain or covered by mass wastage debris or landslide materials;*

G. *Areas of known landslides, earth movement, or containing evidence of past landslides or earth movement;*

H. *Areas of steep slopes; slopes that have forty percent (forty percent or a twenty-two-degree angle) or steeper gradients and having a vertical relief greater than ten feet, excluding constructed slopes;*

I. *Areas subject to liquefaction due to soil type and/or location or seismically induced ground disturbance such as surface rupture, fissuring, and lateral spreading;*

J. *Areas that have soil types that fall within soil category II or III per the Preliminary Surficial Geologic Map of the Mukilteo and Everett Quadrangle, Snohomish County Washington, 1976; and/or*

K. *Areas that are subject to tsunami wave action.*

The discussion will be limited to potential landslide, seismic, and erosion hazards.

5.0 LANDSLIDE HAZARDS AND MITIGATIONS

The western portion of the site and the area west of the property boundary are mapped as high landslide hazard areas on the *Geologic Features Boundary Map*: City of Mukilteo. Based on the referenced topographic survey, slopes in these areas are generally inclined up to about 100 percent with heights on the order of 20 feet (portions of the property in this area are beyond the survey extents and slope heights are estimated based on the contours shown; actual slope heights may be greater). Isolated areas of the western slopes are inclined up to about 200 percent. Slopes near the southern property boundary are inclined up to about 55 with heights on the order of 30 feet. Therefore, these western and southern slopes are considered 'steep slopes' and 'geologic sensitive areas', as defined by MMC 17.52A.020.H. We understand the City of Mukilteo requires a building setback from the top of steep slopes of not less than 25 feet.

The lodgement till sediments encountered at relatively shallow depths in our explorations in the western and southern parts of the site are typically characterized by high strength and are not considered susceptible to landsliding. Where existing fill overlies lodgement till on steep slopes, as in EP-7, the risk of landsliding of the fill is low to moderate.

In order to mitigate landslide hazards, we offer the following recommendations:

- We recommend that the proposed townhomes be set back at least 25 feet from the top of steep slopes along the western and southern property boundaries.
- Any stormwater runoff entering the site should be captured and directed away from steep slopes to an approved drainage facility.
- Site disturbance should be the minimum required to construct the project.

It is our opinion that, with implementation of the mitigations identified above and the proper application of the recommendations within this report, the proposed construction will not adversely impact the existing site slopes. However, it must be understood that no recommendations or engineering design can yield a guarantee of stable slopes. Our observations, findings, and opinions are a means to identify and reduce the inherent risks to the owner.

6.0 SEISMIC HAZARDS AND MITIGATIONS

Earthquakes occur regularly in the Puget Lowland. Most of these events are small and are not felt by people. However, large earthquakes do occur, as evidenced by the 2001, 6.8-magnitude event; the 1965, 6.5-magnitude event; and the 1949, 7.2-magnitude event. The 1949 earthquake appears to have been the largest in this region during recorded history and was centered in the Olympia area. Evaluation of earthquake return rates indicates that an earthquake of the magnitude between 5.5 and 6.0 is likely within a given 20-year period.

Generally, there are four types of potential geologic hazards associated with large seismic events: 1) surficial ground rupture, 2) seismically induced landslides, 3) liquefaction, and 4) ground motion. The potential for each of these hazards to adversely impact the proposed project is discussed below.

6.1 Surficial Ground Rupture

Generally, the largest earthquakes that have occurred in the Puget Sound area are sub-crustal events with epicenters ranging from 50 to 70 kilometers in depth. Earthquakes that are generated at such depths usually do not result in fault rupture at the ground surface. Current research indicates that surficial ground rupture is possible in areas close to the Southern Whidbey Island Fault Zone (SWIFZ). The recurrence interval of movement along the SWIFZ fault system is still unknown, although it is hypothesized to be in excess of 1,000 years. Based on our review of the online United States Geological Survey (USGS) Interactive Fault Map, the site lies about 2,000 feet south and 2 miles north of the nearest traces of the SWIFZ. Due to the distance of the suspected fault traces from the site and the suspected long recurrence interval, the risk of damage to the proposed project as a result of surface rupture along extensions of these fault strands is low, in our opinion.

6.2 Seismically Induced Landslides

Based on the presence of dense lodgement till soils at relatively shallow depth under much of the site and an absence of significant seepage near the site slopes, it is our opinion that the risk of damage to the proposed project by seismically induced landsliding is low. Provided that the mitigations identified above and the recommendations presented in this report are properly followed, no additional landslide hazard mitigation is recommended for this project.

6.3 Liquefaction

Liquefaction is a process through which unconsolidated soil loses strength as a result of vibrations, such as those which occur during a seismic event. During normal conditions, the weight of the soil is supported by both grain-to-grain contacts and by the fluid pressure within the pore spaces of the soil below the water table. Extreme vibratory shaking can disrupt the grain-to-grain contact, increase the pore pressure, and result in a temporary decrease in soil shear strength. The soil is said to be liquefied when nearly all the weight of the soil is supported by pore pressure alone. Liquefaction can result in deformation of the sediment and settlement of overlying structures. Areas most susceptible to liquefaction include those areas underlain by non-cohesive silt and sand with low relative densities, accompanied by a shallow water table.

It is our opinion that the risk of damage to the proposed development by liquefaction is low due to the dense lodgement till sediments observed at shallow depths in our explorations and no observed significant groundwater.

6.4 Ground Motion/Seismic Site Class (2015 *International Building Code*)

Structural design of the buildings should follow 2015 *International Building Code* (IBC) standards. We recommend that the project be designed in accordance with Site Class "D," as defined in IBC Table 20.3-1 of *American Society of Civil Engineers* (ASCE) *7 - Minimum Design Loads for Buildings and Other Structures*.

7.0 EROSION HAZARDS AND MITIGATIONS

Review of the U.S. Department of Agriculture's Natural Resource Conservation Service Web Soil Survey indicates that the majority of the site is mapped as Alderwood-Urban land complex, 2 to 8 percent slopes, which is subject to slight erosion hazard. The western portion of the site is mapped as Everett very gravelly sandy loam, 15 to 30 percent slopes, which is subject to moderate erosion hazard. Based on our observations, the proposed building area is not subject to erosion by streams or surface drainage. The site is not along the shoreline nor within a channel migration zone. Therefore, the site does not meet the erosion hazard criteria defined by MMC 17.52A.020.A., B., and C.

Construction which disturbs the ground surface has the potential to generate erosion, even in relatively level areas. Soils observed in our exploration pits generally consisted of silty sand, which are considered highly susceptible to erosion when disturbed. Project plans should include measures to protect bare ground during construction and while permanent vegetation is established after construction is complete. The most effective erosion control measure is the maintenance of adequate ground cover. During the local wet season (October 1 through April 30), exposed soil should not remain uncovered for more than 2 days unless it is actively being worked. Ground-cover measures can include erosion control matting, plastic sheeting, straw mulch, crushed rock or recycled concrete, or mature hydroseed.

Other Best Management Practices (BMPs) to mitigate off-site sediment transport can include:

- Scheduling grading work during drier months;
- Installing temporary erosion and sediment control (TESC) devices prior to starting stripping and grading; and
- Protecting soil stockpiles, such as by covering with plastic sheeting.

It is our opinion that the risk to the proposed project by erosion is low if temporary erosion control measures are designed, implemented, and maintained in accordance with industry standards and the recommendations contained in this report.

III. PRELIMINARY DESIGN RECOMMENDATIONS

8.0 INTRODUCTION

Our explorations indicate that, from a geotechnical engineering standpoint, the proposed townhome development is feasible provided the recommendations contained herein are properly followed. Existing fill was encountered in several of our explorations, in particular under the northern portion of the site, and should be removed from planned building and paving areas. Bearing consisting of dense lodgement till sediments was encountered in most of our explorations at relatively shallow depth, and conventional spread footings, in conjunction with rock trenches where bearing occurs deeper, may be used for building support. No suitable receptor of surface water infiltration was observed and therefore infiltration is not recommended for this project. The following report sections provide recommendations regarding site preparation, grading, foundations, floor support, drainage, paving, and infiltration potential.

9.0 SITE PREPARATION

Prior to site work, erosion and surface water control should be established around the perimeter of work areas in accordance with City of Mukilteo requirements.

Site preparation of building and paving areas should include removal of all grass, trees, brush, debris, and any other deleterious materials. Existing fill should be removed from under planned building and paving areas. Buried utilities should be removed from foundation areas and should be abandoned in place or removed from below planned new paving. After stripping, remaining roots and stumps should be removed from structural areas. Any depressions below planned final grades should be backfilled with structural fill, as discussed under the "Structural Fill" section of this report.

Excavated existing fill soils can be segregated for reuse in structural fills if they can be processed to remove excessive organic, oversized, and waste material and moisture-conditioned to achieve proper compaction, and if specifically allowed by project plans. Where any natural sediments are relatively free of organics and near their optimum moisture content for compaction, they can be segregated and considered for reuse as structural fill. Portions of the existing fill and native sediments encountered in our explorations contained significant silt fractions and are moisture-sensitive; these may be difficult to reuse as structural fill.

9.1 Temporary Cut Slopes

In our opinion, stable construction slopes should be the responsibility of the contractor and should be determined during construction. For estimating purposes, however, temporary, unsupported cut slopes can be planned at 1.5H:1V (Horizontal:Vertical) in unsaturated topsoil,

weathered lodgement till, and existing fill. Temporary slopes of 1H:1V can be planned in unsaturated, unweathered, lodgement till sediments.

These slope angles are for areas where groundwater seepage is not present at the faces of the slopes, which may require temporary dewatering in the form of pumped sumps or other measures. If ground or surface water is present when the temporary excavation slopes are exposed, flatter slope angles may be required. As is typical with earthwork operations, some sloughing and raveling may occur, and cut slopes may have to be adjusted in the field. In addition, WISHA/OSHA regulations should be followed at all times.

9.2 Site Disturbance

The topsoil, existing fill, and lodgement till soils contain fine-grained material, which makes them moisture-sensitive and subject to disturbance when wet. Where water was accumulated at the ground surface at the time of our exploration, existing fill soils pumped under the weight of the excavator. The contractor must use care during site preparation and excavation operations so that the underlying soils are not softened. If disturbance occurs, the softened soils should be removed, and the area brought to grade with structural fill.

9.3 Winter Construction

The topsoil, existing fill, and lodgement till sediments contain substantial silt and are considered highly moisture-sensitive. Existing fill and lodgement till soils excavated onsite approved for reuse may require drying during favorable dry weather conditions to allow such reuse in structural fill applications. Care should be taken to seal all earthwork areas during mass grading at the end of each workday by grading all surfaces to drain and sealing them with a smooth-drum roller. Stockpiled soils that will be used in structural fill applications should be covered whenever rain is possible.

If winter construction is expected, remediation of moisture-sensitive soils should be expected. Crushed rock fill could be used to provide construction staging areas. The stripped subgrade should be observed by the geotechnical engineer, and should then be covered with a geotextile fabric, such as Mirafi 500X or equivalent. Once the fabric is placed, we recommend using a crushed rock fill layer at least 10 inches thick in areas where construction equipment will be used. Alternatively site soils could be stabilized in place using cement treatment. This must be approved by the City of Mukilteo and taken into consideration when preparing the TESC plan.

9.4 Frozen Subgrades

If earthwork takes place during freezing conditions, all exposed subgrades should be allowed to thaw, and then be recompacted prior to placing subsequent lifts of structural fill or foundation components. Alternatively, the frozen material could be stripped from the subgrade to reveal unfrozen soil prior to placing subsequent lifts of fill or foundation components. The frozen soil

should not be reused as structural fill until allowed to thaw and adjusted to the proper moisture content, which may not be possible during winter months.

10.0 STRUCTURAL FILL

All references to structural fill in this report refer to subgrade preparation, fill type, placement, and compaction of materials, as discussed in this section. If a percentage of compaction is specified under another section of this report, the value given in that section should be used. For backfill of buried utilities in the right-of-way, the backfill should be placed and compacted in accordance with the City of Mukilteo codes and standards.

After stripping, planned excavation, and any required overexcavation have been performed to the satisfaction of the geotechnical engineer/engineering geologist, the surface of the exposed ground should be recompacted to a firm and unyielding condition. If the subgrade contains too much moisture, adequate recompaction may be difficult or impossible to obtain, and should probably not be attempted. In lieu of recompaction, the area to receive fill should be blanketed with washed rock or quarry spalls to act as a capillary break between the new fill and the wet subgrade. Where the exposed ground remains soft and further overexcavation is impractical, placement of an engineering stabilization fabric may be necessary to prevent contamination of the free-draining layer by silt migration from below.

After recompaction of the exposed ground is approved, or a free-draining rock course is laid, structural fill may be placed to attain desired grades. Structural fill is defined as non-organic soil, acceptable to the geotechnical engineer/engineering geologist, placed in maximum 8-inch loose lifts, with each lift being compacted to 95 percent of *American Society for Testing and Materials* (ASTM) D-1557. The top of the compacted fill should extend horizontally outward a minimum distance of 3 feet beyond the locations of the perimeter footings or roadway edges before sloping down at a maximum angle of 2H:1V.

The contractor should note that any proposed fill soils should be evaluated by AESI prior to their use in fills. This would require that we have a sample of the material at least 72 hours in advance to perform a Proctor test and determine its field compaction standard.

Soils in which the amount of fine-grained material (smaller than the No. 200 sieve) is greater than approximately 5 percent (measured on the minus No. 4 sieve size) should be considered moisture-sensitive. The underlying lodgement till soils are estimated to contain substantially more than 5 percent fine-grained material. Use of moisture-sensitive soil in structural fills should be limited to favorable dry weather and dry subgrade conditions. Construction equipment traversing the site when the soils are wet can cause considerable disturbance. Alternatives to drying site soils include using imported granular soils suitable for use in structural fill, or possibly treating wet soils with Portland cement.

If fill is placed during wet weather or if proper compaction cannot be obtained, a select, import material consisting of a clean, free-draining gravel and/or sand should be used. Free-draining fill consists of non-organic soil, with the amount of fine-grained material limited to 5 percent by weight when measured on the minus No. 4 sieve fraction, and at least 25 percent retained on the No. 4 sieve.

11.0 FOUNDATIONS

Conventional continuous spread footings and column pads may be used for building support when founded directly on undisturbed, dense lodgement till soils or on structural fill or rock trenches placed on undisturbed, dense lodgement till. Suitable foundation bearing soils were generally observed at the locations of our explorations at 2.5 to 5.5 feet below existing grade, except in explorations EP-1, and EP-7 through EP-9, where the lodgement till was overlain by relatively thick existing fill. Observed depths of fill are indicated on the exploration logs in the Appendix. Where bearing soils are not found at the depth of the foundation excavation for the proposed new foundations, conventional spread footings may be used in conjunction with rock trenches extended through the existing fill to lodgement till soils.

11.1 Spread Footings and Rock Trenches

For footings founded on undisturbed lodgement till we recommend an allowable soil bearing pressure of 3,000 pounds per square foot (psf). Footings placed on rock trenches, or approved structural fill, we recommend that an allowable bearing pressure of 2,500 psf be utilized for design purposes, including both dead and live loads. An increase of one third may be used for short-term wind or seismic loading. Perimeter footings should be buried at least 18 inches into the surrounding soil for frost protection. No minimum burial depth is required for interior footings; however, all footings must penetrate to the prescribed bearing stratum, and no footing should be founded in or above loose, organic, or non-structural fill soils.

Where native sediments are found deeper, footings should be placed on rock-filled trenches that extend through the existing fill to the underlying bearing stratum.

Rock-filled trenches should have a minimum width of 3 feet (or as designated by the field engineer/engineering geologist). Because of the potential for caving, actual trench widths may be greater than that specified. In order to reduce disturbance of the bearing soils exposed in the trench, it is strongly recommended that the excavator use a smooth-edge bucket.

To determine when suitable bearing has been achieved and to verify proper placement of the rock, the geotechnical engineer or their representative must be present on a full-time basis during trench excavation and backfill. Groundwater seepage was encountered within the existing fill soils at the time of our exploration and the contractor should be equipped with a pump in the event that control of groundwater seepage is required to allow visual

determination of the bearing soils. Any seepage entering the excavation overnight must be removed prior to commencing trench excavation the following day.

For trenches to be filled with crushed rock, we recommend the use of 2- to 4-inch-sized crushed rock or recycled concrete for backfill. The crushed rock must be tamped into place to achieve a tightly-packed mass; this may be done with either a "Hoepac" compactor or, more typically, with the bucket of the excavator itself. Staging areas should be maintained so that the rock is not contaminated by mud prior to placement in the trench.

Spread footings placed on rock trenches must be centered over the trenches. Any footing that is not centered over the trench must be further evaluated prior to concrete placement and may require additional trench excavation to obtain sufficient support.

It should be noted that the area bounded by lines extending downward at 1H:1V from any footing must not intersect another footing or intersect a filled area that has not been compacted to at least 95 percent of ASTM D-1557. In addition, a 1.5H:1V line extending down from any footing must not daylight because sloughing or raveling may eventually undermine the footing. Thus, footings should not be placed near the edge of steps or cuts in the bearing soils.

Anticipated settlement of footings founded as recommended above is less than 1 inch. However, disturbed soil not removed from footing excavations prior to footing placement could result in increased settlements. All footing areas should be observed by AESI prior to placing concrete to verify that the exposed soils or rock trenches can support the design foundation bearing capacity and that construction conforms with the recommendations in this report. Foundation bearing verification may also be required by the City of Mukilteo.

Perimeter footing drains should be provided as discussed under the "Drainage Considerations" section of this report.

12.0 FLOOR SUPPORT

If crawl-space floors are used, an impervious moisture barrier should be provided above the soil surface within the crawl space. Slab-on-grade floors may be used over dense native soils, or over structural fill placed as recommended in the "Site Preparation" and "Structural Fill" sections of this report. Slab-on-grade floors should be cast atop a minimum of 4 inches of washed pea gravel or washed crushed "chip" rock with less than 3 percent passing the U.S. No. 200 sieve to act as a capillary break. The floors should also be protected from dampness by covering the capillary break layer with an impervious moisture barrier at least 10 mils in thickness.

13.0 DRAINAGE CONSIDERATIONS

All footings, basement walls, and retaining walls should be provided with a drain at the footing elevation. Drains should consist of rigid, perforated, polyvinyl chloride (PVC) pipe surrounded by washed pea gravel. The level of the perforations in the pipe should be set downward and at the bottom of the footing at all locations, and the drain collectors should be constructed with sufficient gradient to allow gravity discharge away from the buildings. In addition, all foundation walls taller than 3 feet should be lined with a minimum, 12-inch-thick, washed gravel blanket drain provided to within 1 foot of finish grade that ties into the footing drain. A prefabricated drainage mat is not an acceptable alternative to the gravel blanket drain unless the entire excavation backfill consists of free-draining structural fill. Roof and surface runoff should not discharge into the footing drain system, but should be handled by a separate, rigid, tightline drain. In planning, exterior grades adjacent to foundations should be sloped downward away from the new townhomes to achieve surface drainage.

14.0 CAST-IN-PLACE RETAINING WALLS AND BASEMENT WALLS

All backfill behind foundation walls or around foundation units should be placed per our recommendations for structural fill and as described in this section of the report. Horizontally backfilled walls that are free to yield laterally at least 0.1 percent of their height may be designed using an equivalent fluid pressure equal to 35 pounds per cubic foot (pcf). Fully restrained, horizontally backfilled, rigid walls that cannot yield should be designed for an equivalent fluid pressure of 50 pcf. Walls with sloping backfill up to a maximum gradient of 2H:1V should be designed using an equivalent fluid pressure of 55 pcf for yielding conditions or 75 pcf for fully restrained conditions. If parking areas are adjacent to walls, a surcharge equivalent to 2 feet of soil should be added to the wall height in determining lateral design forces.

As required by the 2015 IBC, retaining wall design should include a seismic surcharge pressure in addition to the equivalent fluid pressures presented above. Considering the site soils and the recommended wall backfill materials, we recommend a seismic surcharge pressure of 5H and 10H psf, where H is the wall height in feet for the “active” and “at-rest” loading conditions, respectively. The seismic surcharge should be modeled as a rectangular distribution with the resultant applied at the midpoint of the walls.

The lateral pressures presented above are based on the conditions of a uniform, horizontal backfill consisting of excavated on-site soils or imported structural fill, compacted to 90 percent of ASTM D-1557. A higher degree of compaction is not recommended, as this will increase the pressure acting on the walls. A lower compaction may result in settlement of the slab-on-grade or other structures supported above the walls. Thus, the compaction level is critical and must be tested by our firm during placement. Surcharges from adjacent footings or heavy construction equipment must be added to the above values. Perimeter footing drains

should be provided for all retaining walls, as discussed under the "Drainage Considerations" section of this report.

It is imperative that proper drainage be provided so that hydrostatic pressures do not develop against the walls. This would involve installation of a minimum 1-foot-wide blanket drain to within 1 foot of finish grade for the full wall height using imported, washed gravel against the walls. If situations exist where a footing drain is not feasible for a foundation wall or retaining wall, the wall should be designed for saturated lateral earth pressures and a hydrostatic surcharge. We should be allowed to offer situation-specific recommendations if this situation arises. The use of drainage improvements as recommended herein does not alleviate the need for waterproofing where finished spaces are planned on the interior side of basement walls. Backfilled walls with finished interior space should be waterproofed in accordance with recommendations of the building designer.

14.1 Passive Resistance and Friction Factors

Lateral loads can be resisted by friction between the foundation and the native soils or supporting structural fill soils, and by passive earth pressure acting on the buried portions of the foundations. The foundations must be backfilled with structural fill and compacted to at least 95 percent of the maximum dry density to achieve the passive resistance provided below. We recommend the following allowable design parameters:

- Passive equivalent fluid = 250 pcf
- Coefficient of friction = 0.35

These are allowable values and include a factor of safety.

15.0 PAVEMENT RECOMMENDATIONS

The pavement sections included in this report section are for streets and parking areas onsite and are not applicable to right-of-way improvements. If any new paving of public streets is required, we should be allowed to offer situation-specific recommendations.

The proposed project includes construction of a paved access road and driveways. Pavement areas should be prepared in accordance with the "Site Preparation" section of this report. Once excavation to subgrade elevation is complete, the resulting surface should be proof-rolled with a loaded dump truck or other suitable equipment. Any soft, loose, yielding areas or areas exposing existing fill should be excavated to expose suitable bearing soils. If the stripped native soil or existing fill pavement subgrade can be compacted to a firm and unyielding condition as determined by the geotechnical engineer/engineering geologist, no additional overexcavation is required. Structural fill can then be placed to achieve desired grades, if needed.

Upon completion of the recompaction and structural fill, a pavement section consisting of 2½ inches of asphaltic concrete pavement (ACP) underlain by 4 inches of 1¼-inch crushed surfacing base course is the recommended minimum in areas of planned passenger car driving and parking. In heavy traffic areas, a minimum pavement section consisting of 4 inches of ACP underlain by 2 inches of $^{5}/_{8}$-inch crushed surfacing top course and 4 inches of 1¼-inch crushed surfacing base course is recommended. The crushed rock courses must be compacted to 95 percent of the maximum density, as determined by ASTM D-1557. All paving materials should meet gradation criteria contained in the current Washington State Department of Transportation (WSDOT) Standard Specifications.

Depending on construction staging and desired performance, the crushed base course material may be substituted with asphalt treated base (ATB) beneath the final asphalt surfacing. The substitution of ATB should be as follows: 4 inches of crushed rock can be substituted with 3 inches of ATB, and 6 inches of crushed rock may be substituted with 4 inches of ATB. ATB should be placed over a native or structural fill subgrade compacted to a minimum of 95 percent relative density, and a 1½- to 2-inch thickness of crushed rock to act as a working surface. If ATB is used for construction access and staging areas, some rutting and disturbance of the ATB surface should be expected. The general contractor should remove affected areas and replace them with properly compacted ATB prior to final surfacing.

16.0 STORMWATER

16.1 Infiltration Potential

For any site, management of surface water by infiltration requires an underlying deposit of unsaturated soil of sufficient permeability, lateral extent, and vertical thickness to receive infiltrated stormwater. Our explorations encountered forest duff/topsoil, existing fill, and Vashon lodgement till underlying the site. Forest duff/topsoil is not suitable as an infiltration receptor and it is not permitted to use fill soils as receptors of stormwater infiltration. Lodgement till has significant silt content and is of high density, resulting in low permeability. Therefore, lodgement till is not considered a suitable receptor of infiltrated stormwater. In our opinion, shallow infiltration is not considered feasible at the project site based on the subsurface conditions.

16.2 Infiltration Alternatives

Onsite alternatives to stormwater infiltration may include a detention pond or stormwater vault. If such strategies are selected for the project, we should be allowed to offer situation-specific recommendations. It should be noted that excavations below explored depths or in unexplored areas of the site may encounter different conditions than those encountered during this study and additional field explorations may be prudent.

17.0 PROJECT DESIGN AND CONSTRUCTION MONITORING

This report is based on the previously referenced site plan that was current at the time this report was written. We are available to provide additional geotechnical consultation as the project design develops and possibly changes from that upon which this report is based. We recommend that AESI perform a geotechnical review of the plans prior to construction. In this way, our earthwork and foundation recommendations may be properly interpreted and implemented in the design.

We are also available to provide geotechnical engineering and monitoring services during construction. The integrity of the foundations for townhomes and of retaining walls depends on proper site preparation and construction procedures. In addition, engineering decisions may have to be made in the field in the event that variations in subsurface conditions become apparent. Construction monitoring services are not part of the current scope of work. If these services are desired, please let us know, and we will prepare a cost proposal.

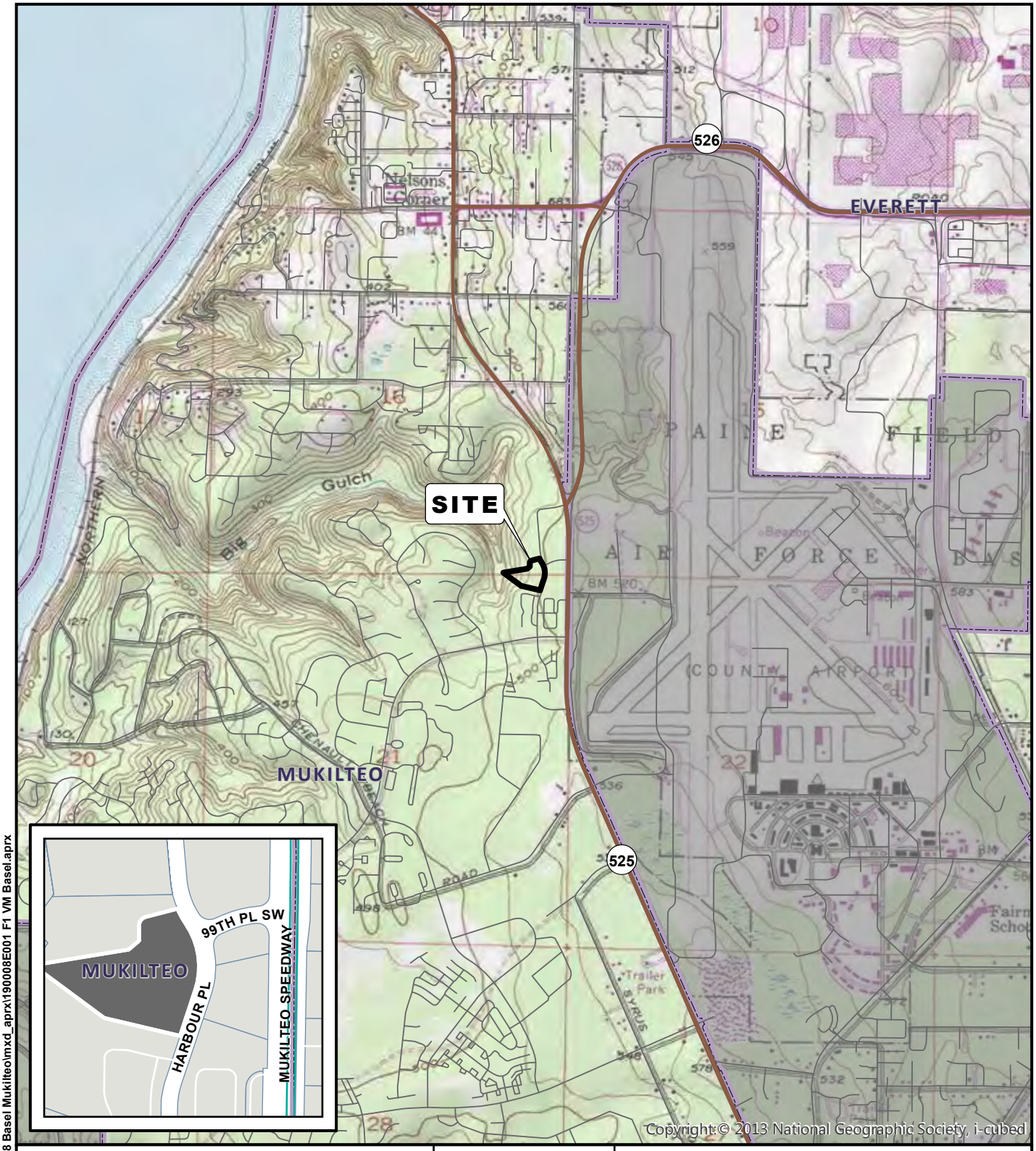
We have enjoyed working with you on this study and are confident these recommendations will aid in the successful completion of your project. If you should have any questions or require further assistance, please do not hesitate to call.

Sincerely,
ASSOCIATED EARTH SCIENCES, INC.
Kirkland, Washington

Nicki Shobert, E.I.T.
Senior Staff Engineer

Matthew A. Miller, P.E.
Principal Engineer

Attachments: Figure 1: Vicinity Map
Figure 2: Site and Exploration Plan
Appendix: Exploration Logs



DATA SOURCES / REFERENCES:
USGS: 7.5' SERIES TOPOGRAPHIC MAPS, ESRI/I-CUBED/NATIONAL GEOGRAPHIC SOCIETY 2013
SNOHOMISH CO: STREETS, CITY LIMITS, PARCELS, 2/19
LOCATIONS AND DISTANCES SHOWN ARE APPROXIMATE

N

0 1000 2000
FEET

NOTE: BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION

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VICINITY MAP

BASEL MUKILTEO TOWNHOUSES
MUKILTEO, WASHINGTON

PROJ NO.	DATE:	FIGURE:
190008E001	2/19	1

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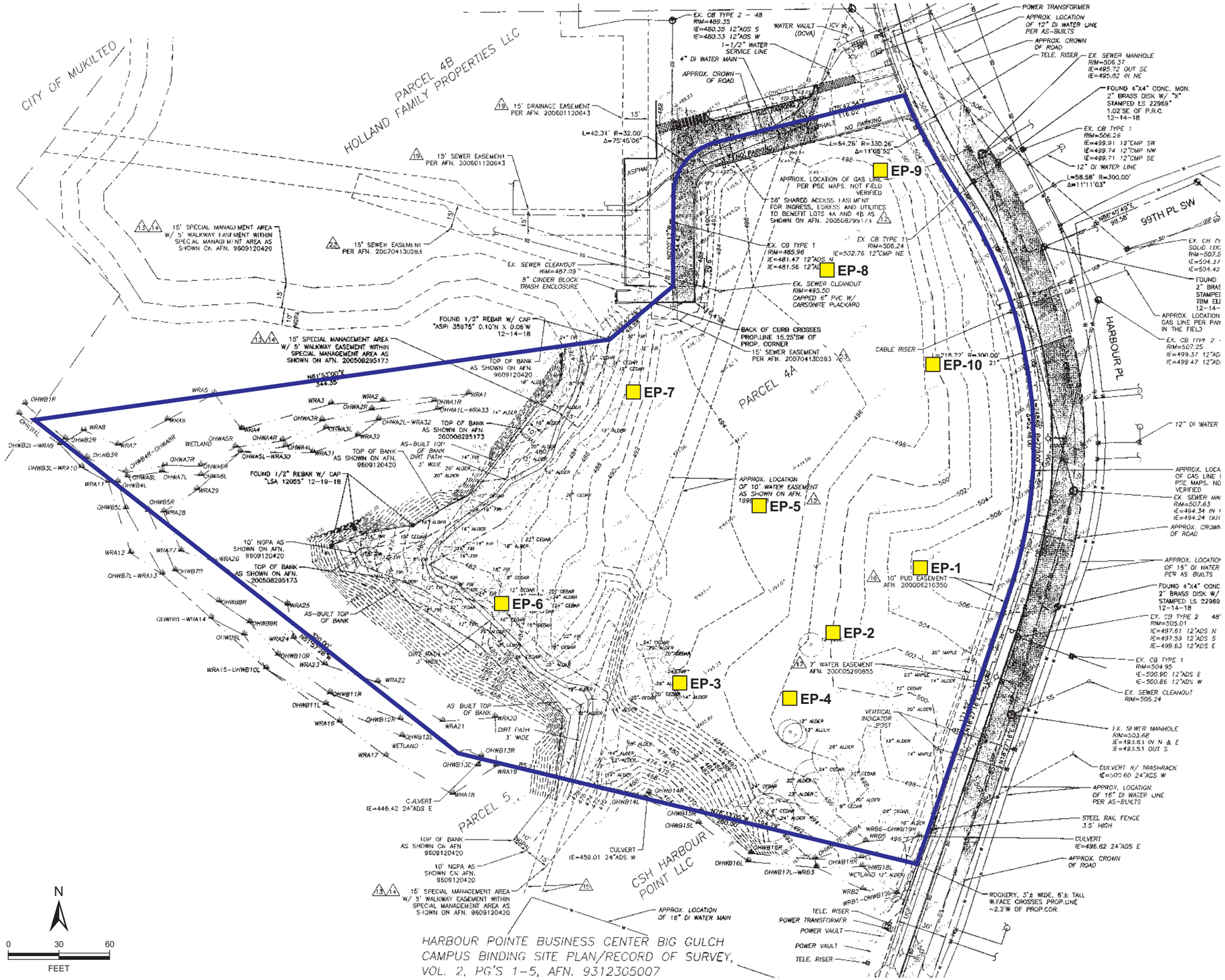

190008 Basel \ 190008E001 F2 S-E.cdr

LEGEND:

SITE BOUNDARY

EP EXPLORATION PIT

CONTOUR INTERVAL = 2'

NOTE: LOCATION AND DISTANCES SHOWN ARE APPROXIMATE.

NOTES:

1. BASE MAP REFERENCE: GROUP FOUR, HARBOUR POINT TOWNHOUSES, ALTA / NSPS LAND TITLE SURVEY, SHEET 1, 1/3/19

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SITE AND EXPLORATION PLAN

BASEL MUKILTEO TOWNHOUSES
MUKILTEO, WASHINGTON

PROJ NO.	DATE:	FIGURE:
190008E001	2/19	2

APPENDIX

Exploration Logs

Coarse-Grained Soils - More than 50% [1] Retained on No. 200 Sieve	Gravels - More than 50% [1] of Coarse Fraction Retained on No. 4 Sieve	≤5% Fines [5]	GW	Well-graded gravel and gravel with sand, little to no fines
			GP	Poorly-graded gravel and gravel with sand, little to no fines
		≥12% Fines [5]	GM	Silty gravel and silty gravel with sand
			GC	Clayey gravel and clayey gravel with sand
	Sands - 50% [1] or More of Coarse Fraction Passes No. 4 Sieve	≤5% Fines [5]	SW	Well-graded sand and sand with gravel, little to no fines
			SP	Poorly-graded sand and sand with gravel, little to no fines
		≥12% Fines [5]	SM	Silty sand and silty sand with gravel
			SC	Clayey sand and clayey sand with gravel
Fine-Grained Soils - 50% [1] or More Passes No. 200 Sieve	Silts and Clays Liquid Limit Less than 50		ML	Silt, sandy silt, gravelly silt, silt with sand or gravel
			CL	Clay of low to medium plasticity; silty, sandy, or gravelly clay, lean clay
			OL	Organic clay or silt of low plasticity
	Silts and Clays Liquid Limit 50 or More		MH	Elastic silt, clayey silt, silt with micaceous or diatomaceous fine sand or silt
			CH	Clay of high plasticity, sandy or gravelly clay, fat clay with sand or gravel
			OH	Organic clay or silt of medium to high plasticity
Highly Organic Soils			PT	Peat, muck and other highly organic soils

Terms Describing Relative Density and Consistency

	Density	SPT [2] blows/foot
Coarse-Grained Soils	Very Loose	0 to 4
	Loose	4 to 10
	Medium Dense	10 to 30
	Dense	30 to 50
	Very Dense	>50
	Consistency	**SPT [2] blows/foot**
Fine-Grained Soils	Very Soft	0 to 2
	Soft	2 to 4
	Medium Stiff	4 to 8
	Stiff	8 to 15
	Very Stiff	15 to 30
	Hard	>30

Test Symbols

G = Grain Size
M = Moisture Content
A = Atterberg Limits
C = Chemical
DD = Dry Density
K = Permeability

Component Definitions

Descriptive Term	Size Range and Sieve Number
Boulders	Larger than 12"
Cobbles	3" to 12"
Gravel	3" to No. 4 (4.75 mm)
Coarse Gravel	3" to 3/4"
Fine Gravel	3/4" to No. 4 (4.75 mm)
Sand	No. 4 (4.75 mm) to No. 200 (0.075 mm)
Coarse Sand	No. 4 (4.75 mm) to No. 10 (2.00 mm)
Medium Sand	No. 10 (2.00 mm) to No. 40 (0.425 mm)
Fine Sand	No. 40 (0.425 mm) to No. 200 (0.075 mm)
Silt and Clay	Smaller than No. 200 (0.075 mm)

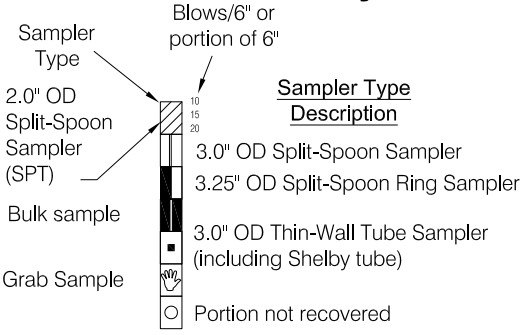
[3] Estimated Percentage

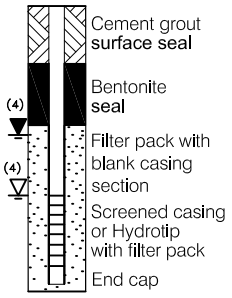
Component	Percentage by Weight
Trace	<5
Some	5 to <12
Modifier (silty, sandy, gravelly)	12 to <30
Very *modifier* (silty, sandy, gravelly)	30 to <50

Moisture Content

Dry - Absence of moisture, dusty, dry to the touch
Slightly Moist - Perceptible moisture
Moist - Damp but no visible water
Very Moist - Water visible but not free draining
Wet - Visible free water, usually from below water table

Symbols





(1) Percentage by dry weight
(2) (SPT) Standard Penetration Test (ASTM D-1586)
(3) In General Accordance with Standard Practice for Description and Identification of Soils (ASTM D-2488)
(4) Depth of ground water
▼ ATD = At time of drilling
▽ Static water level (date)
(5) Combined USCS symbols used for fines between 5% and 12%

Classifications of soils in this report are based on visual field and/or laboratory observations, which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field or laboratory testing unless presented herein. Visual-manual and/or laboratory classification methods of ASTM D-2487 and D-2488 were used as an identification guide for the Unified Soil Classification System.

blocks \ dwg \ log_key.dwg LAYOUT: Layout 4 -2014 Qty Chng

LOG OF EXPLORATION PIT NO. EP-1

Depth (ft)

This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplfication of actual conditions encountered.

DESCRIPTION

Elev: 507 ft

Fill

Loose to medium dense, moist, dark brown, silty, gravelly, fine to medium SAND; frequent cobbles; abundant organics (SM).

1

Grades to brown at 0.5 feet.

Grades to scattered roots at 1.5 feet.

2

3

Tighter digging due to cobbles?

Blocks of dark brown and gray; wood debris (cut log); decaying, organic odor.

4

5

Operator notes tighter, fewer cobbles.

6

Blocks of gray to bluish gray.

7

Medium dense, moist, gray, silty, medium SAND, some gravel; frequent root balls; occasional cobbles (SM).

8

9

Fewer root balls.

10

Bottom of exploration pit at depth 10 feet
Minor seepage at 8 feet. Minor to moderate seepage at 9.5 feet. Minor sloughing ~8 to 10 feet.

11

12

KCTP3 190008.GPJ February 6, 2019

Basel Mukilteo Townhouses
Mukilteo, WA

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Project No. 190008E001

1/28/19

LOG OF EXPLORATION PIT NO. EP-2

This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplfication of actual conditions encountered.

Depth (ft)	DESCRIPTION	Elev: 500 ft
	Topsoil	
1	Loose, moist grading to dry, dark brown, silty, fine SAND, some gravel; abundant roots; occasional cobbles (SM).	
	Weathered Vashon Lodgment Till	
2	Loose to medium dense, moist, orangish brown, silty, fine SAND, some gravel; frequent cobbles; scattered roots (SM).	
	Becomes medium dense.	
3		
	Vashon Lodgment Till	
4	Dense, moist to very moist, gray to brownish gray, very silty, gravelly, fine SAND; abundant cobbles; occasional root wads; poorly cemented; unsorted (SM).	
5		
	Increasingly cemented.	
6	Grades to silty.	
7	Interbed of dense, moist, brownish gray, silty, fine SAND, some gravel; weakly cemented in areas; unsorted (SM).	
8		
	Bottom of exploration pit at depth 8 feet No seepage. No caving.	
9		
10		
11		
12		

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LOG OF EXPLORATION PIT NO. EP-3

Depth (ft)

This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplfication of actual conditions encountered.

DESCRIPTION

Elev: 494 ft

Forest Duff / Topsoil - 6 inches

Loose, moist, dark brown, silty, fine SAND, some gravel; abundant roots (SM).

Weathered Vashon Lodgment Till

1 Loose to medium dense, moist, orangish brown, silty, fine SAND, some gravel; scattered roots (SM).

2

Vashon Lodgment Till

3 Medium dense, moist, brownish gray, silty, fine SAND, some gravel; occasional cobbles; unsorted (SM).

4

5 Tighter digging, becomes dense and slightly darker. Poorly cemented.

6

7

More frequent and larger clasts of diamict; better cemented.

8

Interbed of dense, moist, brown, fine SAND, some silt to silty, trace gravel; unsorted (SP-SM).

9

10 Bottom of exploration pit at depth 9.5 feet
No seepage. No caving.

11

12

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LOG OF EXPLORATION PIT NO. EP-4

Depth (ft)

This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplfication of actual conditions encountered.

DESCRIPTION

Elev: 498 ft

Forest Duff / Topsoil - 8 to 12 inches

Loose, moist, dark brown to brown, silty, fine SAND, some gravel; abundant organics (SM).

1

Weathered Vashon Lodgment Till

Loose to medium dense, moist, orangish brown with areas of gray, very silty, fine SAND, some gravel; scattered roots; poorly cemented in areas (SM).

2

3

Medium dense to dense, moist to very moist, brownish gray with sme iron oxide mottling, silty, gravelly, fine SAND; occasional cobbles; unsorted (SM).

4

Grades to no iron oxide mottling.

5

Vashon Lodgment Till

Grades to diamict.

6

7

8

9

Grades to be darker, some gravel, and less cemented.

10

Bottom of exploration pit at depth 10 feet
No seepage. No caving.

11

12

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LOG OF EXPLORATION PIT NO. EP-5

Depth (ft)

This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplfication of actual conditions encountered.

DESCRIPTION

Elev: 494.5 ft

Forest Duff / Topsoil - 6 to 12 inches

Very loose to loose, moist, dark brown, silty, fine SAND, some gravel (SM).

1

Weathered Vashon Lodgment Till

Loose, moist, orangish brown, silty, fine SAND, some gravel; occasional cobbles (SM).

2

3

Medium dense, moist to very moist, brownish gray with iron oxide mottling, silty, fine SAND, trace gravel; unsorted (SM).

4

Vashon Lodgment Till

5

Grades to moist, no iron oxide mottling, and diamict.

6

Tight digging, very dense.

7

8

Bottom of exploration pit at depth 8 feet
No seepage. No caving.

9

10

11

12

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LOG OF EXPLORATION PIT NO. EP-6

Depth (ft)

This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplfication of actual conditions encountered.

DESCRIPTION

Elev: 482 ft

Forest Duff / Topsoil - 6 inches

Loose, slightly moist, dark brown, silty, fine SAND, some gravel; abundant roots (SM).

Weathered Vashon Lodgment Till

1 Loose to medium dense, slightly moist, orangish brown, silty, fine SAND, some gravel; scattered roots; occasional cobbles; unsorted (SM).

2

3 Grades to brownish gray with iron oxide mottling.

4 Grades to medium dense.

5

Vashon Lodgment Till

Grades to very moist.

Dense, moist, brownish gray, silty, fine SAND, some gravel; unsorted; weakly diamict (SM).

6

7

Diamict grades stronger.

8 Occasional iron oxide mottling in seams.

9

10

Bottom of exploration pit at depth 10 feet
No seepage. No caving.

11

12

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LOG OF EXPLORATION PIT NO. EP-7

Depth (ft)

This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplfication of actual conditions encountered.

DESCRIPTION

Elev: 488 ft

Fill

Soft, moist to very moist, brownish gray, sandy, SILT to silty, fine SAND; scattered roots; occasional cobbles; massive (ML-SM).

1

2

Interval of medium dense, moist, gray to brownish gray, silty, fine SAND, some gravel; unsorted; poorly cemented (till fill?) (SM).

3

4

5

6

Weathered Vashon Lodgment Till

Medium dense to dense, moist, brownish gray with heavy iron oxide staining, silty, fine SAND, some gravel; unsorted (SM).
Tighter digging.

7

8

Vashon Lodgment Till

Dense, moist, brownish gray, silty, fine SAND, some gravel; unsorted; diamict (SM).

9

10

Bottom of exploration pit at depth 10 feet
No seepage. No caving.

11

12

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LOG OF EXPLORATION PIT NO. EP-8

This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplfication of actual conditions encountered.

Depth (ft)	DESCRIPTION	Elev: 497 ft
	Fill	
1	Loose, wet, brownish gray with faint iron oxide, very silty, fine SAND, some gravel; scattered shallow roots and organics (SM).	
2	Occasional wood debris (sticks).	
3	Grades to medium dense, moist, less iron oxide and scattered wood debris.	
4		
5	Grades to medium dense to dense, gray, scattered organic debris, clasts of diamict, and blocky. Small boulder.	
6		
7	Grades to greenish gray with some iron oxide speckling; clasts of diamict; scattered wood debris.	
8		
9	Roots and sticks, chunks of brick. Medium dense to dense, moist, gray and dark brown and tannish gray, silty, gravelly, fine SAND; blocky clasts of diamict (SM).	
10		
11	Bottom of exploration pit at depth 10.5 feet No seepage. Moderate caving from east side wall ~5 to ~7 feet.	
12		

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1/28/19

KCTP3 190008.GPJ February 6, 2019

LOG OF EXPLORATION PIT NO. EP-9

This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplfication of actual conditions encountered.

Depth (ft)	DESCRIPTION	Elev: 498 ft
	Fill	
	Loose, wet, brownish gray, very silty, fine SAND, some gravel; scattered organics (SM).	
1	Small boulders and blocky cobbles.	
2		
	Blocks of decayed organics.	
3		
	Medium dense, moist, grayish brown with iron oxide mottling, silty, fine SAND, some gravel; occasional cobbles (SM).	
4		
5		
6	Medium dense, moist, dark brown to black and bluish gray and orangish tan, very silty, fine SAND, some gravel; scattered organics; clasts of diamict (SM). Small and large wood debris; decaying organic odor.	
7	Grading to mostly dark brown to black, abundant wood debris.	
8	Boulder at 8 feet.	
	Less wood debris.	
9	Medium dense, very moist to wet, brownish gray, silty, gravelly, fine SAND; abundant cobbles; blocks of diamict (SM).	
10		
11	Bottom of exploration pit at depth 10.5 feet Seepage 0 to 1 foot. Moderate caving from west pit wall ~7 to 10.5 feet.	
12		

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LOG OF EXPLORATION PIT NO. EP-10

Depth (ft)

This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplfication of actual conditions encountered.

DESCRIPTION

Elev: 500 ft

Fill

Very loose, slightly moist, dark brown, silty, fine SAND, some gravel (SM).

1

Scattered roots to ~2 feet.

2

Grades to moist and dark brown to black.

Block of soil with wood debris; occasional cobbles.

3

Root wad.

4

Loose,wet, jumbled, frequent wood debris.

5

Vashon Lodgment Till

Dense, moist, gray, silty, fine SAND, some gravel; unsorted; diamict (SM).

6

7

Tough digging.

8

Bottom of exploration pit at depth 8 feet
Minor seepage from NW pit corner at 4.5 feet. Minor caving from north pit wall 0 to 4.5 feet.

9

10

11

12

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1/28/19

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March 22, 2019
Project No. 190008E001

Basel Capital Holdings, LLC
2225 94th Avenue NE
Clyde Hill, Washington 98004

Attention: Susan Tang

Subject: Additional Subsurface Explorations
Basel Mukilteo Townhomes
Harbour Place and 99th Place SW
Mukilteo, Washington

Dear Ms. Tang:

Associated Earth Sciences, Inc. (AESI) is pleased to present this letter-report providing a summary of our additional subsurface explorations and slope stability analyses for the proposed townhomes development in Mukilteo, Washington. The project location is shown on the "Vicinity Map," Figure 1. This letter-report has been prepared for the exclusive use of Basel Capital Holdings, LLC, and their agents, for specific application to this project. Within the limitations of scope, schedule, and budget, our services have been performed in accordance with generally accepted geotechnical engineering practices in effect in this area at the time our letter-report was prepared. No other warranty, express or implied, is made. Our observations, findings, and opinions are a means to identify and reduce the inherent risks to the owner.

INTRODUCTION

We recently completed an initial phase of subsurface explorations, reported in our "Subsurface Exploration, Geologic Hazard, and Preliminary Geotechnical Engineering Report," dated February 8, 2019. Following the completion of that phase of work, new project elements have been proposed for consideration, including a stormwater vault near the western site slopes and a reduced steep slope setback near the southern site slopes. This letter-report is meant to be an addendum to our original geotechnical report.

The primary purpose of this study was to evaluate the site slopes near the proposed vault location and where the reduced setback is being considered. Our current services included a surface reconnaissance of site slopes and observing the drilling of three exploratory borings to obtain additional surface and subsurface information. The additional information was used in performing two slope stability analyses and developing geotechnical recommendations for the stormwater vault and steep slope setback.

SUBSURFACE EXPLORATION

We explored subsurface conditions at the site on March 11, 2019. A total of three exploration borings were drilled on the project site. The approximate locations of the borings and our previous explorations are shown on the "Site and Exploration Plan," Figure 2. The exploration borings were drilled using a track-mounted drilling rig subcontracted to AESI. The borings were continuously observed and logged by a field engineer from our firm. The interpretive exploration logs are based on the field logs, drilling action, and observation of the samples collected.

Disturbed but representative samples were obtained by using the Standard Penetration Test (SPT) procedure in accordance with *American Society for Testing and Materials* (ASTM) D-1586. This test and sampling method consists of driving a standard, 2-inch outside-diameter, split-barrel sampler a distance of 18 inches into the soil with a 140-pound hammer free-falling a distance of 30 inches. The number of blows for each 6-inch interval is recorded, and the number of blows required to drive the sampler the final 12 inches is known as the Standard Penetration Resistance ("N") or blow count. If a total of 50 blows are recorded at or before the end of one 6-inch interval, the blow count is recorded as the number of blows for the corresponding number of inches of penetration. The resistance, or N-value, provides a measure of the relative density of granular soils or the relative consistency of cohesive soils. These values are plotted on the attached boring logs.

The samples obtained from the split-barrel sampler were classified in the field and representative portions placed in water-tight containers. The samples were then transported to our laboratory for further visual classification and laboratory testing, as necessary.

The various types of soil and groundwater elevations, as well as the depths where soil and groundwater characteristics changed, are indicated on the exploration boring logs presented in Appendix A of this letter-report. The locations of our explorations were approximated by measuring from known site features.

Because of the nature of exploratory work below ground, extrapolation of subsurface conditions between field explorations is necessary. It should be noted that differing subsurface conditions may sometimes be present due to the random nature of deposition and the alteration of topography by any past grading and/or filling. The nature and extent of any

variations between the field explorations may not become evident until construction. If variations are observed at that time, it may be necessary to re-evaluate specific recommendations in this letter-report and make the appropriate changes.

SUBSURFACE CONDITIONS

Our exploration borings encountered existing fill over Vashon lodgement till. The observed soils were generally similar to soils observed during our earlier subsurface exploration. A detailed discussion of site and local geology was provided in our referenced report.

Exploration borings EB-1 and EB-3 were located in the area of the proposed reduced setback near the southern site slopes. In EB-1 and EB-3, observed sediments were generally loose to medium dense, brownish gray, silty, fine to medium sand with trace to some gravel interpreted as existing fill. In EB-3, areas of the fill contained organic debris. Existing fill extended to depths of about 20 and 11 feet in EB-1 and EB-3, respectively. Underlying the fill in EB-1, we observed dense, brownish gray grading to bluish gray, silty, fine to medium sand with trace to some gravel interpreted as Vashon lodgement till. Underlying the fill in EB-3, we observed dense, gray, silty, fine to medium sand with trace to some gravel interpreted as weathered Vashon lodgement till. The lodgement till extended to the full depths explored of 30.5 and 16.5 feet in EB-1 and EB-3, respectively.

Exploration boring EB-2 was located in the area of the proposed stormwater vault near the western site slopes. In EB-2, observed sediments generally consisted of loose to medium dense, gray to brown with blocks of orange and dark brown, silty, fine to medium sand with trace to some gravel, interpreted as existing fill. Existing fill extended to a depth of 21 feet. Areas of the existing fill contained sandy silt. Areas of the fill contained scattered, decaying, organic particles. Underlying the fill in EB-2, observed sediments were generally dense (cemented), gray to bluish gray, silty, fine sand with trace to some gravel interpreted as Vashon lodgement till. Lodgement till extended to the full depth explored of 26.5 feet in EB-2; EB-2 was terminated by the driller due to practical refusal on a suspected boulder.

A thin interval of higher moisture content was observed at the time of drilling in EB-1 at a depth of about 20 feet, interpreted as perched water. A discussion of site hydrology was provided in our referenced report.

SLOPE STABILITY ANALYSES

To assess the landslide potential during static and design-level seismic events, we performed slope stability analyses for Cross-Section A-A' near the southern property boundary and for Cross-Section B-B' near the west property boundary (Figure 2.) The slope models were based on the subsurface conditions encountered at our exploration locations and topography acquired

from the "ALTA / NSPS Land Title Survey for Harbour Pointe Townhouses," by Group Four, Inc., dated January 3, 2019, and King County Light Detection and Ranging (LIDAR) records (2016). Four conditions were considered for each cross-section: existing static, existing seismic, proposed static, and proposed seismic conditions. For Cross-Section A-A', the proposed condition consisted of a foundation load located approximately 35 feet from the top of the slope. For Cross-Section B-B', the proposed condition considered a stormwater vault located as shown on the "Proposed Site Plan," by Basel Architects, PLLC, dated February 22, 2019 with an assumed bottom depth of 25 feet below the ground surface.

Our analysis was completed with the aid of GeoStudio SLOPE/W 2016 computer software by GEOSLOPE International Ltd. This program accepts input to define subsurface conditions to calculate potential slip surfaces and corresponding factors of safety. Factors of safety of 1.5 for static conditions and 1.2 for seismic conditions are considered to be the minimum by the *City of Mukilteo Municipal Code* (MMC) 17B.52A.0.80 for development within geologic hazard areas/buffers.

We used the Morgenstern and Price method of analysis in the SLOPE/W software.

The stability of the slope under seismic conditions was modeled using a horizontal ground acceleration of 0.303 g. This value is equivalent to ½ of the peak horizontal ground acceleration based on a 2 percent probability of exceedance in 50 years in accordance with the 2015 *International Building Code* (IBC).

Soil parameters (unit weight, internal friction angle, and cohesion) were estimated based on standard penetration values, past experience, and typical ranges of soil parameters for similar material. The assumed parameters are shown on Figures 3 through 10.

Figure 3 "Slope Stability Cross-Section A-A', Static, Existing" presents the calculated slip surfaces corresponding to a factor of safety less than the code minimum of 1.5 for static conditions with a minimum factor of safety greater than or equal to 1.3. Figure 4 "Slope Stability Cross-Section A-A', Seismic, Existing" presents the calculated slip surfaces corresponding to a factor of safety less than the code minimum of 1.2 for seismic conditions with a minimum factor of safety greater than or equal to 1.000 for seismic conditions. For the proposed conditions, shown on Figure 5 "Slope Stability Cross-Section A-A', Static, Proposed" and Figure 6 "Slope Stability Cross-Section A-A', Seismic, Proposed," the calculated factors of safety did not change from the existing conditions. The slip surfaces calculated for less than the code minimum in a seismic condition extended the farthest back from the top of slope, a distance of approximately 40 feet at the location analyzed.

Figure 7 "Slope Stability Cross-Section B-B', Static, Existing" presents the calculated slip surface corresponding to the lowest calculated factor of safety, with a minimum factor of safety for the

existing site topography greater than or equal to 1.7 for static conditions. Figure 8 "Slope Stability Cross-Section B-B', Seismic, Existing" presents the calculated slip surfaces corresponding to a factor of safety less than the code minimum of 1.2 for seismic conditions, with a minimum factor of safety calculated for the existing site topography greater than or equal to 1.1 for seismic conditions. For the proposed conditions, shown on Figure 9 "Slope Stability Cross-Section B-B', Static, Proposed" and Figure 10 "Slope Stability Cross-Section B-B', Seismic, Proposed," the calculated factors of safety did not change from existing conditions. The slip surfaces calculated for less than the code minimum in a seismic condition extended the farthest back from the top of slope, a distance of approximately 30 feet from the top of the slope at the location analyzed.

Based upon our analysis it appears that the risk of slope movement does not increase due to the site development provided the following recommendations are followed.

RECOMMENDATIONS

Based on the observed soil and groundwater conditions and based on the slope stability analyses, it is our opinion that the risk of landsliding of the existing slope at Cross-Section A-A' is low to moderate under static conditions and moderate to high under seismic conditions, and the risk of landsliding of the existing slope at Cross-Section B-B' is low under static conditions and moderate to high under seismic conditions.

In order to mitigate landslide hazards, we offer the following recommendations:

- We recommend that the proposed structures be set back at least 40 feet from the top of the steep slope near the southern property boundary.

- We recommend that the proposed structures be set back at least 30 feet from the top of the steep slope near the western property boundary.

- Any stormwater runoff entering the site should be captured and directed away from the steep slope. In no instance should surface water be permitted to discharge near the top of, or over the steep slope. Water from other sources, such as leaking utilities, should not be permitted to discharge near or over the steep slope.

- Site disturbance should be the minimum required to construct the project.

Based on the referenced project site plan, we understand that several townhomes are located partially within these recommended setbacks. Where building locations cannot be adjusted, we recommend that footings within the recommended setbacks be deepened to depths at which

the same horizontal distance between the footing and the slope surface is maintained. We are available to work with the design team in order to develop suitable bearing depths.

It is our opinion that, with implementation of the mitigations identified above and the proper application of the recommendations within this letter-report and our referenced report, the risk of damage to the proposed project by landsliding is low. However, it must be understood that no recommendations or engineering design can yield a guarantee of stable slopes. Our observations, findings, and opinions are a means to identify and reduce the inherent risks to the owner.

STORMWATER VAULT

Detention vault foundations supported entirely on dense to very dense lodgement till may be designed using an allowable foundation soil bearing pressure of 5,000 pounds per square foot (psf). The detention vault may be designed to resist at-rest lateral earth pressures as described in the "Cast-In-Place Foundation Walls and Basement Walls" section of our referenced report, assuming drained conditions. If it is not possible to construct the vault with a foundation drain, hydrostatic surcharges must be incorporated and a lateral pressure of 90 pounds per cubic foot (pcf) (equivalent fluid) should be assumed, representing combined soil and hydrostatic loads, under active conditions. If paved surfaces are to be constructed above the backfill soils, lateral pressures should include a uniform traffic surcharge of equivalent to 2 additional feet of soil depth.

Our deepest exploration boring, EB-2, in the area of the proposed detention facility extended to a depth of about 26.5 feet below the ground surface. Excavations below this depth may encounter different conditions than those encountered during this study. If materially different conditions are encountered during construction, AESI should be notified and allowed to review and modify, or verify, our recommendations.

CLOSURE

AESI should be allowed to review project plans once available to ensure proper interpretation and application of the recommendations contained in this letter-report. If project plans change substantially from those which these analyses and this letter-report are based on, we should be allowed to modify or verify our conclusions and recommendations, as necessary.

We appreciate the opportunity to be of continued service to you on this project. Should you have any questions regarding this letter-report or other geotechnical aspects of the project, please call us at your earliest convenience.

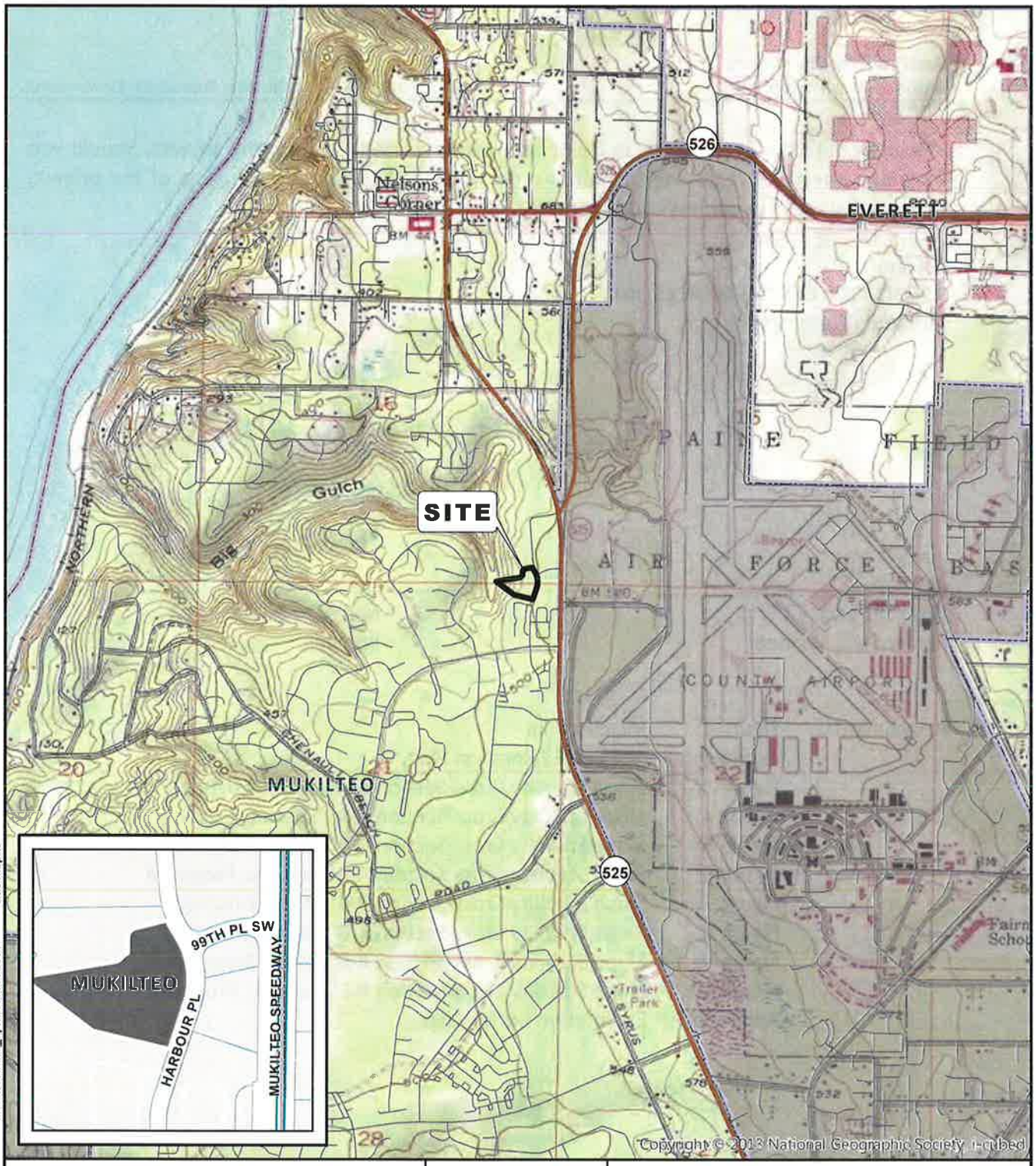
Sincerely,
ASSOCIATED EARTH SCIENCES, INC.
Kirkland, Washington

Nicki Shobert, E.I.T.
Senior Staff Engineer

Matthew A. Miller, P.E.
Principal Engineer

Attachments:

	Figure 1:	Vicinity Map
	Figure 2:	Site and Exploration Plan
	Figure 3:	Slope Stability Cross-Section A-A', Static, Existing
	Figure 4:	Slope Stability Cross-Section A-A', Seismic, Existing
	Figure 5:	Slope Stability Cross-Section A-A', Static, Proposed
	Figure 6:	Slope Stability Cross-Section A-A', Seismic, Proposed
	Figure 7:	Slope Stability Cross-Section B-B', Static, Existing
	Figure 8:	Slope Stability Cross-Section B-B', Seismic, Existing
	Figure 9:	Slope Stability Cross-Section B-B', Static, Proposed
	Figure 10:	Slope Stability Cross-Section B-B', Seismic, Proposed
	Appendix A:	Exploration Boring Logs



DATA SOURCES / REFERENCES:
USGS: 7.5' SERIES TOPOGRAPHIC MAPS, ESRI/I-CUBED/NATIONAL GEOGRAPHIC SOCIETY 2013
SNOHOMISH CO: STREETS, CITY LIMITS, PARCELS, 2/19
LOCATIONS AND DISTANCES SHOWN ARE APPROXIMATE

N

0 1000 2000
FEET

NOTE: BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION

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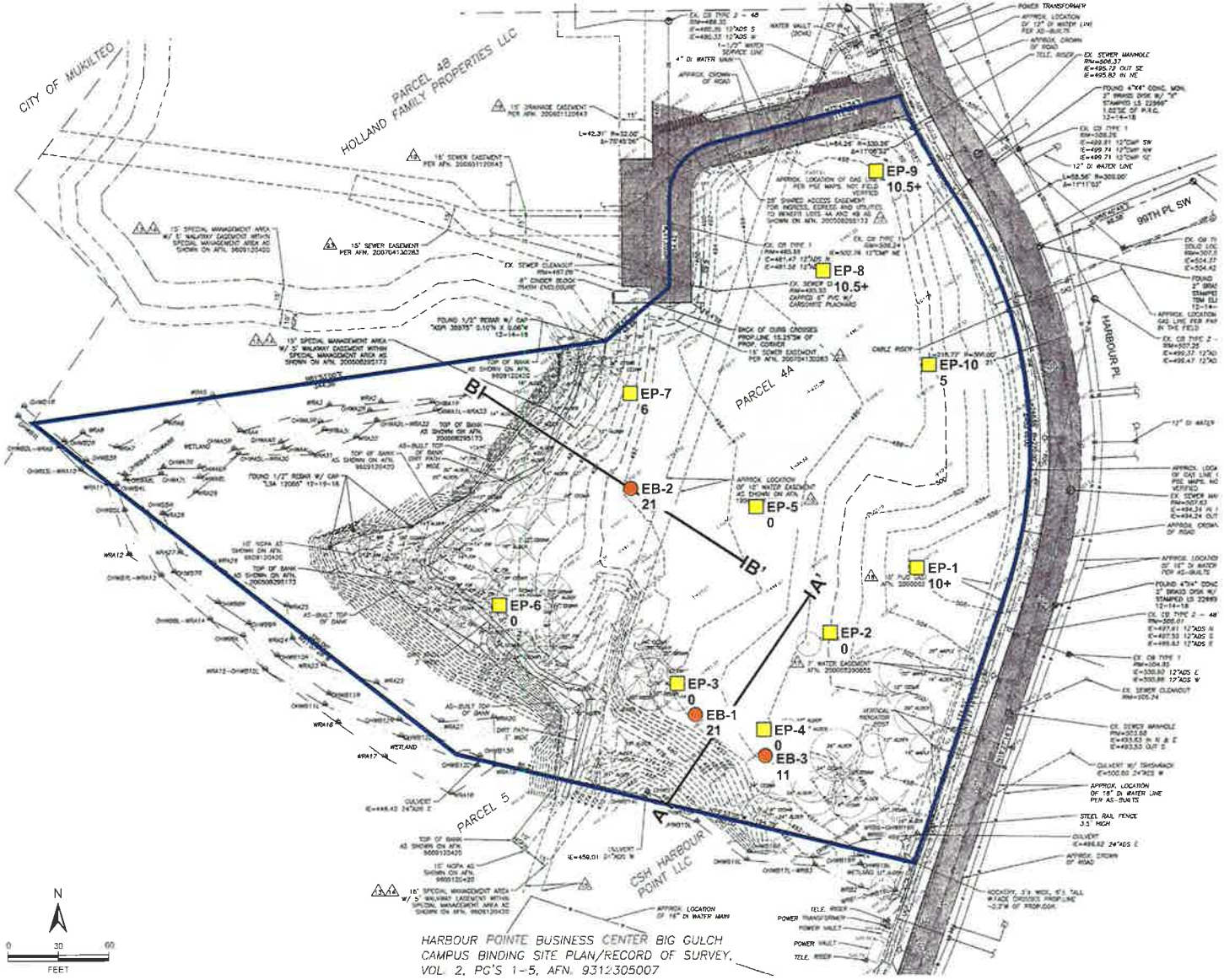
VICINITY MAP

BASEL MUKILTEO TOWNHOUSES
MUKILTEO, WASHINGTON

PROJ NO.	DATE:	FIGURE:
190008E001	2/19	1

Document Path: G:\GIS_Projects\aaY2019\190008 Basel Mukilteo\mxd_aprx\190008E001 F1 VM Basel.aprx



LEGEND:

- SITE BOUNDARY
- EP — EXPLORATION PIT WITH DEPTH (FT) OF EXISTING FILL
- EB — EXPLORATION BORING PIT WITH DEPTH (FT) OF EXISTING FILL

CONTOUR INTERVAL = 2'

NOTE: LOCATION AND DISTANCES SHOWN ARE APPROXIMATE.

NOTES:
1. BASE MAP REFERENCE: GROUP FOUR, HARBOUR POINT TOWNHOUSES, ALTA / NSPS LAND TITLE SURVEY, SHEET 1, 1/3/19

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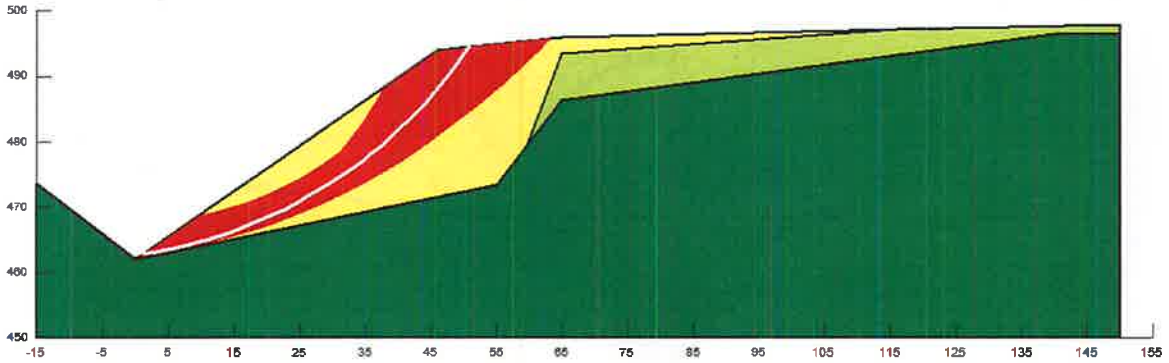
SITE AND EXPLORATION PLAN

BASEL MUKILTEO TOWNHOUSES
MUKILTEO, WASHINGTON

PROJ NO.	DATE:	FIGURE:
190008E001	3/19	2

190008 Basel \ 190008E001 F2 S-E 3-19.cdr



LEGEND:

- EXISTING FILL
- LODGEMENT TILL
- WEATHERED LODGEMENT TILL
- STATIC FACTOR OF SAFETY <1.5

NOTE: LOCATION AND DISTANCES SHOWN ARE APPROXIMATE.

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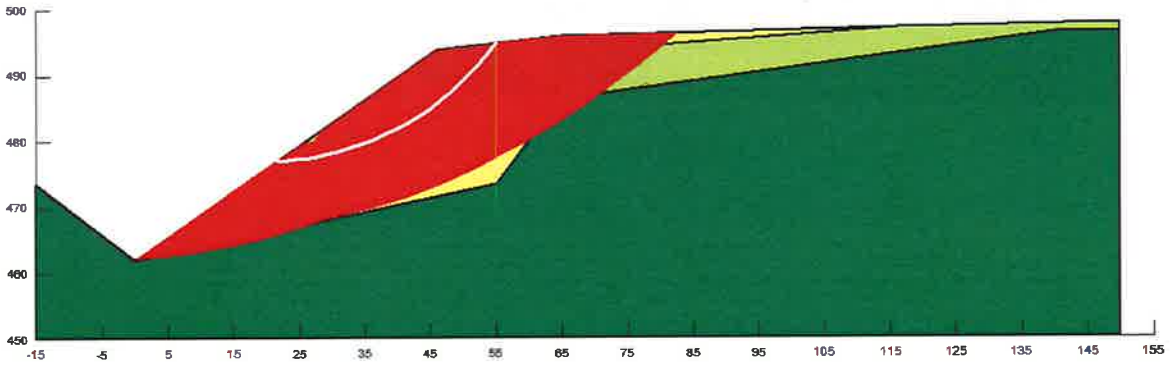
SLOPE STABILITY CROSS-SECTION A-A'

STATIC EXISTING CONDITIONS

BASEL MUKILTEO TOWNHOUSES
MUKILTEO, WASHINGTON

PROJ NO.	DATE:	FIGURE:
190008E001	3/19	3

190008 Basel \ 190008E001 F3.cdr



LEGEND:

- EXISTING FILL
- LODGEMENT TILL
- WEATHERED LODGEMENT TILL
- STATIC FACTOR OF SAFETY <1.5

NOTE: LOCATION AND DISTANCES SHOWN ARE APPROXIMATE.

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SLOPE STABILITY CROSS-SECTION A-A'

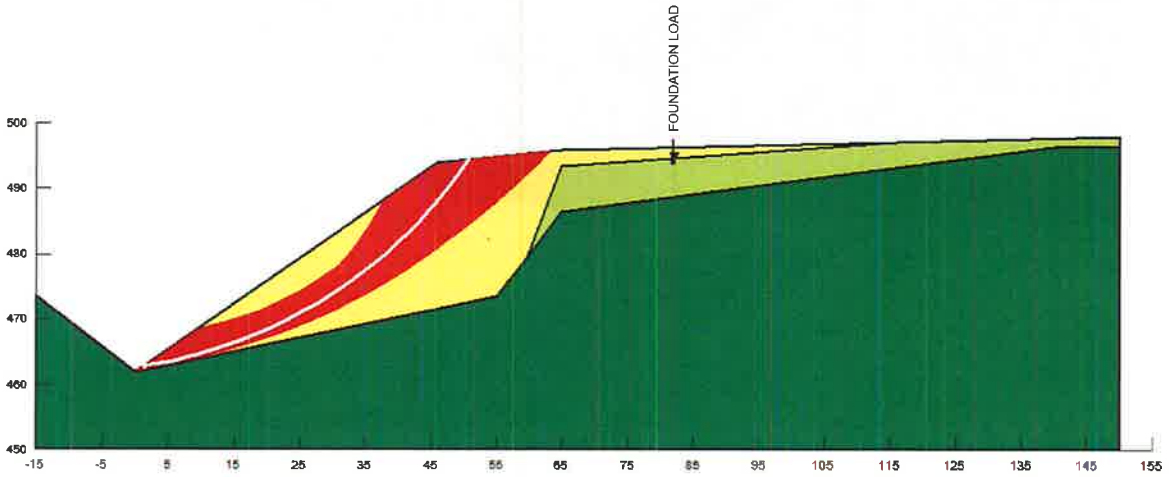
SEISMIC EXISTING CONDITIONS

BASEL MUKILTEO TOWNHOUSES

MUKILTEO, WASHINGTON

PROJ NO.	DATE:	FIGURE:
190008E001	3/19	4

190008 Basel \ 190008E001 F4.cdr



LEGEND:

- EXISTING FILL
- LODGEMENT TILL
- WEATHERED LODGEMENT TILL
- STATIC FACTOR OF SAFETY <1.5

NOTE: LOCATION AND DISTANCES SHOWN ARE APPROXIMATE.

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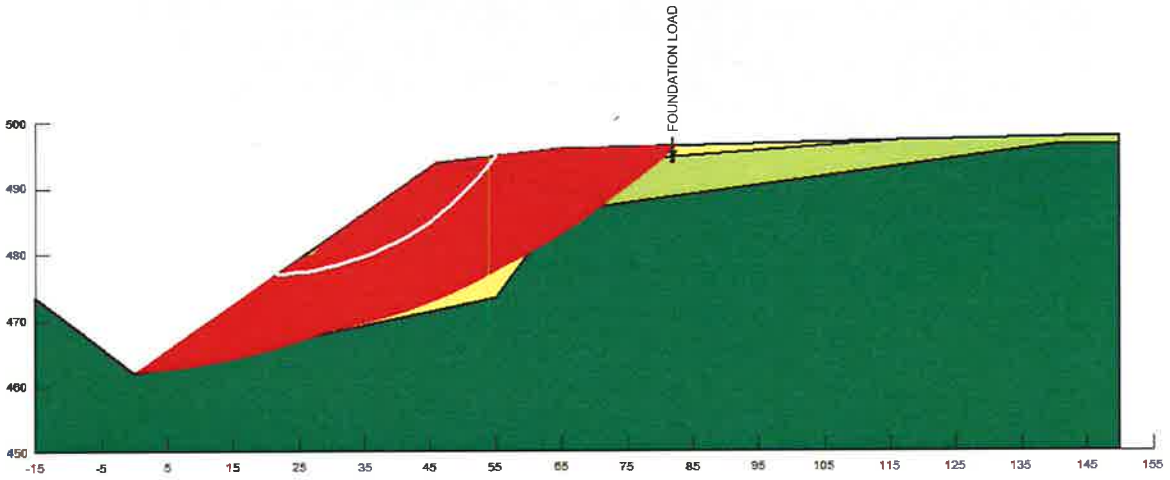
SLOPE STABILITY CROSS-SECTION A-A'

STATIC PROPOSED CONDITIONS

BASEL MUKILTEO TOWNHOUSES
MUKILTEO, WASHINGTON

PROJ NO.	DATE:	FIGURE:
190008E001	3/19	5

190008 Basel I 190008E001 FS.cdr



LEGEND:

- EXISTING FILL
- LODGEMENT TILL
- WEATHERED LODGEMENT TILL
- STATIC FACTOR OF SAFETY <1.5

NOTE: LOCATION AND DISTANCES SHOWN ARE APPROXIMATE.

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SLOPE STABILITY CROSS-SECTION A-A'
SEISMIC PROPOSED CONDITIONS
BASEL MUKILTEO TOWNHOUSES
MUKILTEO, WASHINGTON

PROJ NO.	DATE:	FIGURE:
190008E001	3/19	6

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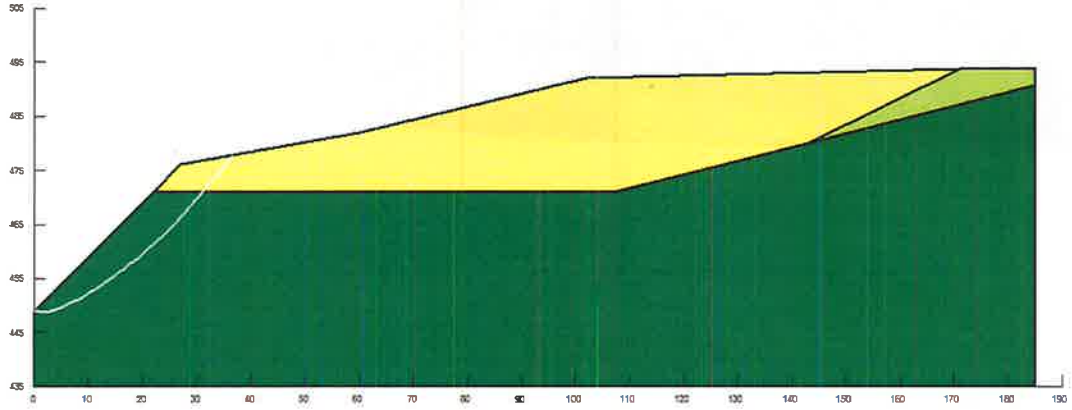

LEGEND:

- EXISTING FILL
- LODGEMENT TILL
- WEATHERED LODGEMENT TILL

NOTE: LOCATION AND DISTANCES SHOWN ARE APPROXIMATE.

BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION.

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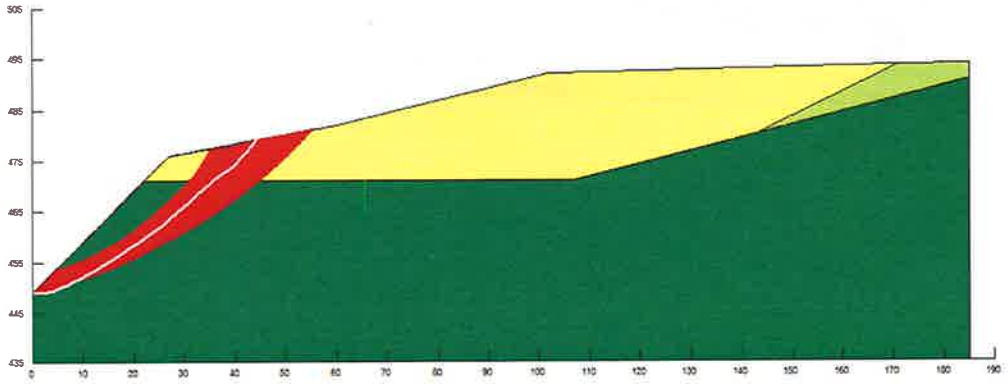
SLOPE STABILITY CROSS-SECTION B-B'

STATIC EXISTING CONDITIONS

BASEL MUKILTEO TOWNHOUSES
MUKILTEO, WASHINGTON

PROJ NO.	DATE:	FIGURE:
190008E001	3/19	7

190008 Basel \ 190008E001 F7 cdr



LEGEND:

- EXISTING FILL
- LODGEMENT TILL
- WEATHERED LODGEMENT TILL
- STATIC FACTOR OF SAFETY <1.5

NOTE: LOCATION AND DISTANCES SHOWN ARE APPROXIMATE

BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION

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SLOPE STABILITY CROSS-SECTION B-B'

SEISMIC EXISTING CONDITIONS

BASEL MUKILTEO TOWNHOUSES
MUKILTEO, WASHINGTON

PROJ NO.	DATE:	FIGURE:
190008E001	3/19	8

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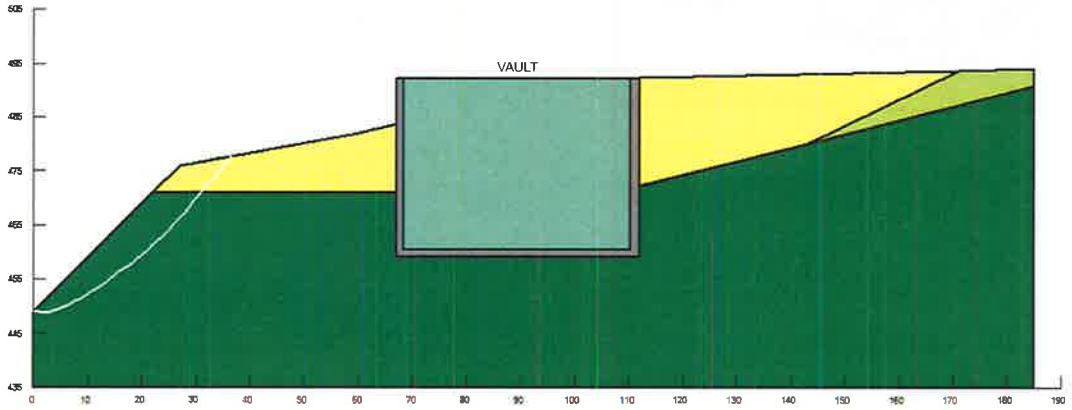

LEGEND:

- CONCRETE
- EXISTING FILL
- LODGEMENT TILL
- WATER
- WEATHERED LODGEMENT TILL

NOTE: LOCATION AND DISTANCES SHOWN ARE APPROXIMATE.

BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION

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SLOPE STABILITY CROSS-SECTION B-B'
STATIC PROPOSED CONDITIONS
BASEL MUKILTEO TOWNHOUSES
MUKILTEO, WASHINGTON

PROJ NO.	DATE:	FIGURE:
190008E001	3/19	9

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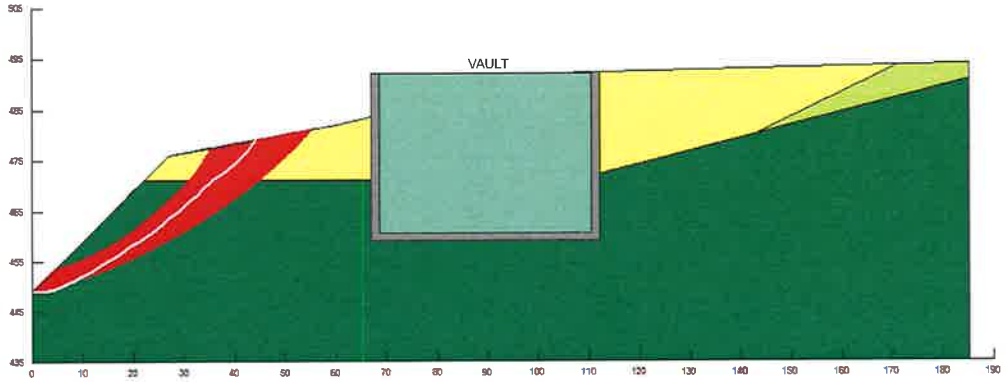

LEGEND:

- CONCRETE
- EXISTING FILL
- LODGEMENT TILL
- WATER
- WEATHERED LODGEMENT TILL
- STATIC FACTOR OF SAFETY <1.5

NOTE: LOCATION AND DISTANCES SHOWN ARE APPROXIMATE.

BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION.

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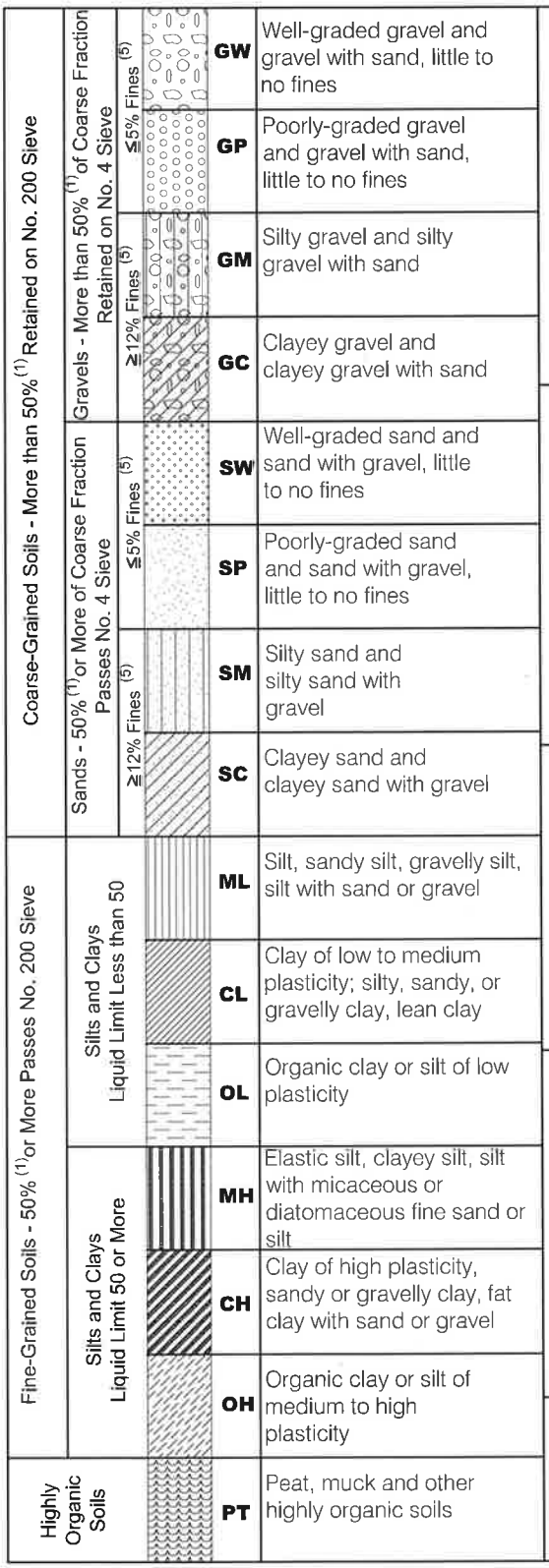
SLOPE STABILITY CROSS-SECTION B-B'
SEISMIC PROPOSED CONDITIONS
BASEL MUKILTEO TOWNHOUSES
MUKILTEO, WASHINGTON

PROJ NO.	DATE:	FIGURE:
190008E001	3/19	10

190008 Basel \ 190008E001 F10.cdr

APPENDIX A

Exploration Logs



Terms Describing Relative Density and Consistency

Coarse-Grained Soils	Density	SPT (2) blows/foot
	Very Loose	0 to 4
	Loose	4 to 10
	Medium Dense	10 to 30
	Dense	30 to 50
	Very Dense	>50

Fine-Grained Soils	Consistency	SPT (2) blows/foot
	Very Soft	0 to 2
	Soft	2 to 4
	Medium Stiff	4 to 8
	Stiff	8 to 15
	Very Stiff	15 to 30
	Hard	>30

Test Symbols

G = Grain Size
M = Moisture Content
A = Atterberg Limits
C = Chemical
DD = Dry Density
K = Permeability

Component Definitions

Descriptive Term	Size Range and Sieve Number
Boulders	Larger than 12"
Cobbles	3" to 12"
Gravel	3" to No. 4 (4.75 mm)
Coarse Gravel	3" to 3/4"
Fine Gravel	3/4" to No. 4 (4.75 mm)
Sand	No. 4 (4.75 mm) to No. 200 (0.075 mm)
Coarse Sand	No. 4 (4.75 mm) to No. 10 (2.00 mm)
Medium Sand	No. 10 (2.00 mm) to No. 40 (0.425 mm)
Fine Sand	No. 40 (0.425 mm) to No. 200 (0.075 mm)
Silt and Clay	Smaller than No. 200 (0.075 mm)

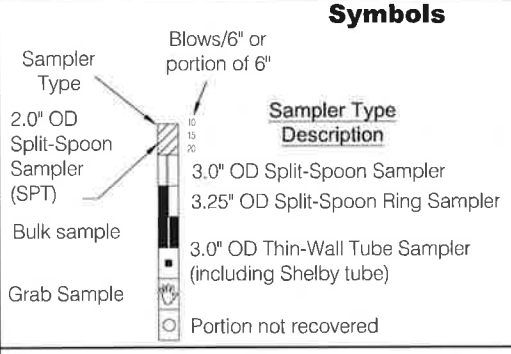
(3) Estimated Percentage

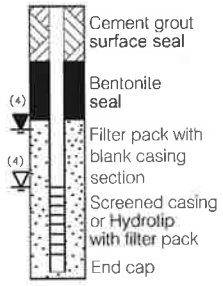
Component	Percentage by Weight
Trace	<5
Some	5 to <12
Modifier (silty, sandy, gravelly)	12 to <30
Very *modifier* (silty, sandy, gravelly)	30 to <50

Moisture Content

Dry - Absence of moisture, dusty, dry to the touch
Slightly Moist - Perceptible moisture
Moist - Damp but no visible water
Very Moist - Water visible but not free draining
Wet - Visible free water, usually from below water table

Symbols





(1) Percentage by dry weight
(2) (SPT) Standard Penetration Test (ASTM D-1586)
(3) In General Accordance with Standard Practice for Description and Identification of Soils (ASTM D-2488)
(4) Depth of ground water
▼ ATD = At time of drilling
▽ Static water level (date)
(5) Combined USCS symbols used for fines between 5% and 12%

Classifications of soils in this report are based on visual field and/or laboratory observations, which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field or laboratory testing unless presented herein. Visual-manual and/or laboratory classification methods of ASTM D-2487 and D-2488 were used as an identification guide for the Unified Soil Classification System.

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EXPLORATION LOG KEY

FIGURE A1

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Exploration Log

Project Number	Exploration Number	Sheet
190008E001	EB-1	1 of 1

Project Name	Basel Mukilteo Townhomes	Ground Surface Elevation (ft)	~494
Location	Mukilteo, WA	Datum	NAVD 88
Driller/Equipment	Holocene / Diedrich D-50	Date Start/Finish	3/11/19,3/11/19
Hammer Weight/Drop	140# / 30"	Hole Diameter (in)	7

Depth (ft)	ST	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/6"	Blows/Foot (10 20 30 40)	Other Tests
				Fill					
5		S-1		No recovery, catchers being used. Cuttings consist of moist, gray, silty, fine to medium SAND, trace gravel; slightly plastic (SM).			5 4 7	▲11	
10		S-2		Moist, brownish gray, silty, fine to medium SAND, trace to some gravel; unsorted (SM).			3 6 10	▲16	
15		S-3		Moist, brownish gray with band of iron oxide, silty, fine to medium SAND, trace gravel; unsorted (SM). Becomes clayey, SILT, some sand; slightly plastic (ML).			4 2 3	▲5	
20		S-4		Moist with wet seam (2 inches thick), brownish gray, silty, fine SAND, some gravel; unsorted; lightly cemented; broken gravel stuffed in top of sampler and in tip; blowcounts likely overstated (SM).		▼	29 50/3"		▲50/3"
				Vashon Lodgment Till Grinding and bouncing.					
25		S-5		Moist, brownish gray, silty, fine to medium SAND, trace to some gravel; somewhat disaggregated but appears unsorted and cemented; outside of sampler is wet (SM).			50/4"		▲50/4"
30		S-6		Moist, gray to bluish gray, silty, fine SAND, trace gravel; gravel is unsorted; cemented (SM).			50/6"		▲50/6"
				Bottom of exploration boring at 30.5 feet. Groundwater seepage encountered at 20 feet.					

Sampler Type (ST):

- 2" OD Split Spoon Sampler (SPT)
- 3" OD Split Spoon Sampler (D & M)
- Grab Sample
- No Recovery
- Ring Sample
- Shelby Tube Sample
- M - Moisture
- ▽ Water Level ()
- ▼ Water Level at time of drilling (ATD)

Logged by: NS
Approved by: CJK

AESIBOR 190008.GPJ March 19, 2019

associated earth sciences incorporated

Exploration Log

Project Number	Exploration Number	Sheet
190008E001	EB-2	1 of 1

Project Name	Basel Mukilteo Townhomes	Ground Surface Elevation (ft)	~492
Location	Mukilteo, WA	Datum	NAVD 88
Driller/Equipment	Holocene / Diedrich D-50	Date Start/Finish	3/11/19,3/11/19
Hammer Weight/Drop	140# / 30"	Hole Diameter (in)	7

Depth (ft)	ST	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/6"	Blows/Foot (10 20 30 40)	Other Tests
				Fill					
5		S-1		Moist, gray with blocks of orange and dark brown, silty, fine SAND to sandy, SILT, trace gravel; scattered black organic particles (SM/ML).			5 6 5	▲11	
10		S-2		Moist to very moist, grayish brown with areas of iron oxide mottling near tip, silty, fine to medium SAND, trace to some gravel; unsorted; slightly plastic (SM).			3 3 5	▲8	
15		S-3		As above; blocks of light gray and no areas of iron oxide; interval (1/2 inch thick) of wet and coarser sand.		▼	3 2 4	▲6	
20		S-4		Moist, brown, clayey, SILT, some fine sand; massive; seam (1/4 inch thick) of sandy silt; broken gravel stuffed in sampler (ML).			27 50/4"		▲50/4"
				Vashon Lodgment Till Moist, gray to bluish gray, silty, fine SAND, trace gravel; unsorted; cemented (SM).					
25		S-5		Moist, gray to dark gray, silty, fine SAND, some gravel; broken gravel stuffed in sampler; bedded (1/2 to 1 inch thick seams) (SM). Grinding on suspected boulder at 26 feet. Driller indicates refusal "in till".			30 50/1"		▲50/1"
				Bottom of exploration boring at 26 feet. Groundwater seepage encountered at 15 feet.					
30									

Sampler Type (ST):

- 2" OD Split Spoon Sampler (SPT)
- 3" OD Split Spoon Sampler (D & M)
- Grab Sample
- No Recovery
- Ring Sample
- Shelby Tube Sample
- M - Moisture
- Water Level ()
- Water Level at time of drilling (ATD)

Logged by: NS
Approved by: CJK

AESIBOR 190008.GPJ March 19, 2019

associated earth sciences incorporated

Exploration Log

Project Number	Exploration Number	Sheet
190008E001	EB-3	1 of 1

Project Name	Basel Mukilteo Townhomes	Ground Surface Elevation (ft)	~496
Location	Mukilteo, WA	Datum	NAVD 88
Driller/Equipment	Holocene / Diedrich D-50	Date Start/Finish	3/11/19,3/11/19
Hammer Weight/Drop	140# / 30"	Hole Diameter (in)	7

Depth (ft)	ST	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/6"	Blows/Foot (10 20 30 40)	Other Tests
				Fill Grinding and bouncing, driller indicates concrete. Moved ~3 feet west.					
5		S-1		Upper 9 inches: moist, brown, very silty, fine SAND, trace gravel; scattered charcoal; rotting stick and abundant fine roots; unsorted; slough? (SM). Lower 9 inches: moist, gray, silty, fine to medium SAND, trace to some gravel; unsorted; slightly plastic (SM).			3 3 8	▲11	
10		S-2		Upper 6 inches: moist, brown, very silty, fine SAND, trace gravel; scattered charcoal; rotting stick and abundant fine roots; unsorted; slough? (SM). **Weathered Vashon Lodgment Till** Lower 12 inches: moist, gray, silty, fine to medium SAND, trace gravel; unsorted; grades to some silt near tip (SM). Driller notes denser and more gravelly at 11 feet.			7 9 18	▲27	
15		S-3		Moist, gray with iron oxide mottling, silty, fine SAND, some gravel; grades to some silt near tip; unsorted; cemented (SM).			4 18 29	▲47	
				Bottom of exploration boring at 16.5 feet. No groundwater encountered.					
20									
25									
30									

Sampler Type (ST):

- 2" OD Split Spoon Sampler (SPT)
- 3" OD Split Spoon Sampler (D & M)
- Grab Sample
- No Recovery
- Ring Sample
- Shelby Tube Sample
- M - Moisture
- Water Level ()
- Water Level at time of drilling (ATD)

Logged by: NS
Approved by: CJK

AESIBOR 190008.GPJ March 19, 2019

associated
earth sciences
incorporated

September 20, 2019
Project No. 190008E001

Basel Capital Holdings, LLC
2225 94th Avenue NE
Clyde Hill, Washington 98004

Attention: Susan Tang

Subject: Pipe Pile Recommendations
Basel Mukilteo Townhomes
Harbour Place and 99th Place SW
Mukilteo, Washington

Dear Ms. Tang:

Associated Earth Sciences, Inc. (AESI) is pleased to present this letter providing a summary of our additional foundations study for the proposed townhomes development in Mukilteo, Washington. This letter is considered an addendum to our earlier geotechnical report, "Subsurface Exploration, Geologic Hazard, and Preliminary Geotechnical Engineering Report, Basel Mukilteo Townhomes," dated February 8, 2019, as modified by our letter-report, "Additional Subsurface Explorations," dated March 22, 2019.

Based on our review of the current site plan, "Harbour Pointe Townhomes," by Group Four, Inc., revised date August 22, 2019, and our discussions with the project team, we understand that several townhouse buildings are planned to be located within the recommended steep slope setback near the southeast corner of the property. We previously recommended a building setback of 40 feet from the top of this slope. The purpose of our current work was to provide geotechnical recommendations to mitigate the landslide hazard associated with a reduced building setback of 25 feet.

The referenced site plan shows portions of units 3 through 8 of the S Building extending within the previously recommended 40 foot setback from the top of the steep slope. From review of our previous slope stability analysis for this slope, Section AA', the seismic condition was determined to be the critical condition. Figure 1 shows the critical slip surface under seismic conditions with a factor of safety of 1.2, which is considered the minimum allowable per the Mukilteo Municipal Code (MCC) 17.52A.080.B.

Based on our slope stability analysis, the existing fill and weathered lodgement till soils near the steep slope are considered potentially susceptible to slope movement under seismic conditions. Therefore, in order to reduce the setback to 25 feet from the top of the steep slope, we recommend that the buildings should be supported by foundations that extend through the existing fill and weathered lodgement till soils into the underlying, glacially consolidated lodgement till soils. Foundations could consist of grade beams supported by driven, small-diameter pipe piles or other deep foundations. The following section presents our recommendations for pipe piles.

Pipe Pile Recommendations

Small-diameter pipe piles could be used for support of buildings and portions of buildings located between 25 and 40 feet of the top of the steep slope. Pipe piles should be driven until refusal in unweathered lodgement till soils. The depth to unweathered lodgement till is variable within the proposed building footprints, but, for preliminary estimating purposed, pile lengths of about 10 to 15 feet should be assumed. Actual pile lengths may differ significantly from the estimated range depending on location variations in soil conditions, pile size, and driving equipment used. Allowable axial capacities for pipe piles are provided below in Table 1.

Table 1
Small-Diameter Pipe Pile Recommendations

Nominal Pipe Diameter	Minimum Wall Thickness	Minimum Hammer Size	Allowable Axial Capacity	Driving Time (seconds/inch)
4-inch	Schedule 40	1,100 lb	20 kips	10
6-inch	Schedule 40	3,000 lb	30 kips	6

lb = pounds

In order for the stated pile capacities to apply, the pipe piles should be driven to refusal, which is defined as less than 1 inch of penetration during the specified period of continuous driving. No lateral capacity would be provided by vertically installed pin piles. Lateral capacity could be attained through the use of batter piles or passive resistance over the buried portions of the grade beams. Piles may be battered up to 15 degrees to develop additional lateral capacity. Lateral capacity of battered piles may be taken as the horizontal component of the axial pile load. Battered piles inclined up to 15 degrees should be designed with an allowable axial compressive capacity equal to that used for vertical piles. Pile spacing, locations, splicing details, foundation connection details, grade beam design, and any other structural design recommendations should be determined by a structural engineer.

Installation of the pin piles should be observed full-time by an AESI representative to verify that the refusal and embedment criteria are met and that materials, equipment, and procedures conform with our recommendations. This is also typically required by the SDCI.

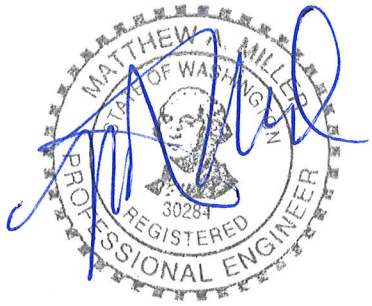
We further recommend that load testing in accordance with the ASTM Quick Load Test (ASTM D-1143) be performed to 200 percent of the allowable pile capacity on a minimum of 3 percent (1 pile minimum, 5 piles maximum) of the piles larger than 2 inches in diameter.

CLOSURE

AESI should be allowed to review project plans prior to finalization to ensure proper interpretation and application of the recommendations contained in this letter and our referenced geotechnical report and letter-report. If project plans change substantially from those on which these analyses and this letter are based, we should be allowed to modify or verify our conclusions and recommendations, as necessary.

We appreciate the opportunity to be of continued service to you on this project. Should you have any questions regarding this letter or other geotechnical aspects of the project, please call us at your earliest convenience.

Sincerely,
ASSOCIATED EARTH SCIENCES, INC.
Kirkland, Washington

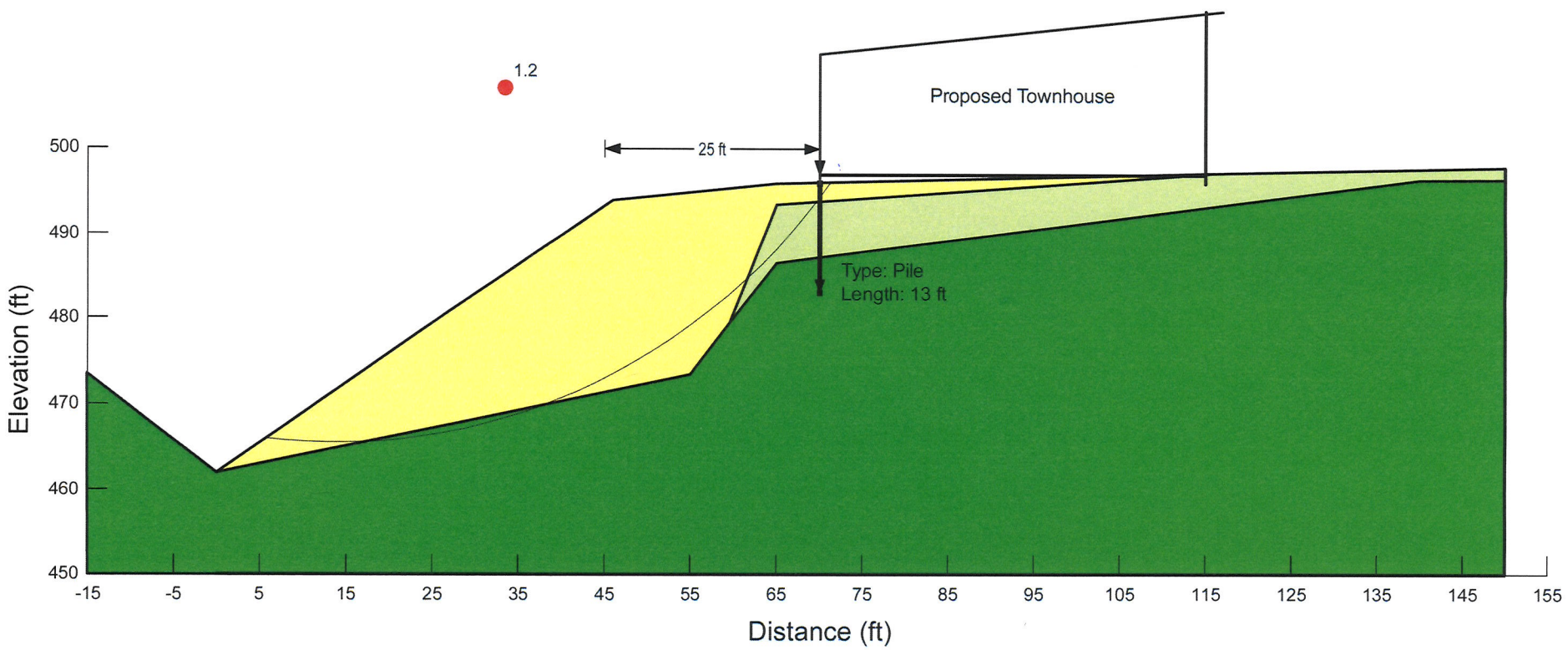


Nicki Shobert, E.I.T.
Senior Staff Engineer

Matthew A. Miller, P.E.
Principal Engineer

Attachments:

Figure 1 Slope Stability Cross-Section A-A', Seismic, Proposed



			(pcf)	(psf)	(°)
	Existing Fill	Mohr-Coulomb	120	110	32
	Lodgement Till	Mohr-Coulomb	130	300	38
	Weathered Lodgement Till	Mohr-Coulomb	130	150	36

Horizontal Seismic Coefficient = 0.303

SLOPE/W Analysis
AA' seismic proposed.gsz
9/20/2019 1:225

Gibson Traffic Consultants, Inc.
2813 Rockefeller Avenue
Suite B
Everett, WA 98201
425.339.8266

Basel Mukilteo Townhomes
Traffic Impact Analysis

Prepared for: Basel Architects, PLLC
Jurisdiction: City of Mukilteo

August 2019

GTC #19-039

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Turning Movements ..... B
Counts C
LOS Analysis ..... D
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1. INTRODUCTION

Gibson Traffic Consultants, Inc. (GTC) has been retained to complete a traffic impact analysis (TIA) for the proposed Basel Mukilteo Townhomes located west of Harbour Place just to the south of Harbour Pointe Montessori School.

Matthew Palmer, responsible for the traffic analysis and report, is a licensed professional engineer (Civil) in the State of Washington and a current member of the Washington State section of ITE.

The Basel Mukilteo Townhomes development will consist of 32 multi-family low-rise residential units. The site is currently vacant. Access to the site will be a through a full access approximately 330 feet south of the existing Montessori school access with emergency accesses to the existing school access on the north side of the site. The emergency accesses will be controlled with bollards. A site vicinity map is included in **Figure 1**.

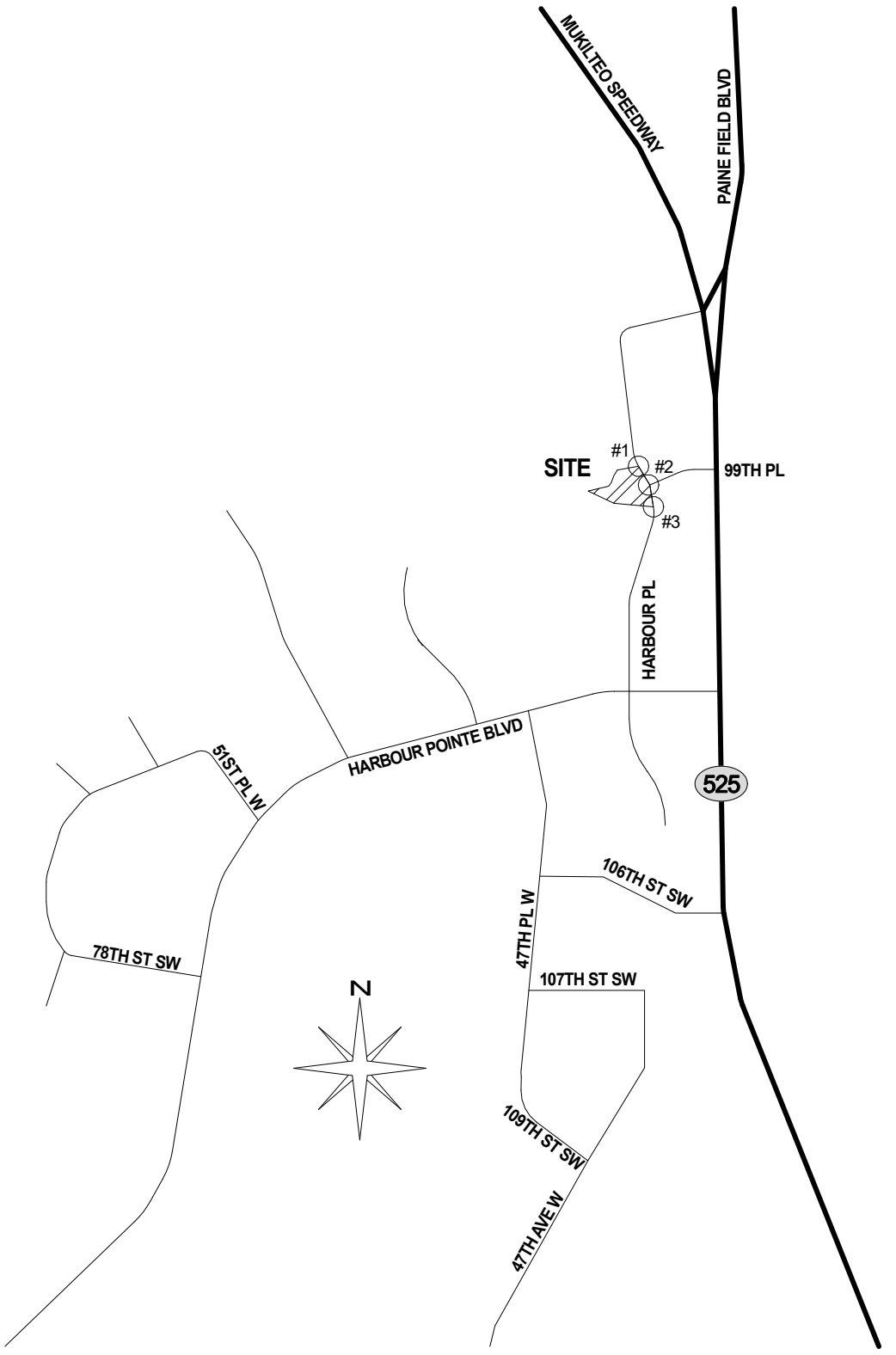
2. METHODOLOGY & ANALYSIS SCOPING

Trip generation for the development is based upon national research data for land uses contained in the Institute of Transportation Engineers' (ITE) *Trip Generation, 10th Edition* (2017). The average trip generation rates for the ITE Land Use Code (LUC) 220, Multi-Family (Low-Rise).

The analysis required was based on the Transportation Concurrency Evaluation and Determination of Transportation Impact Fees from the City of Mukilteo. The following two intersections were identified for the existing and future AM and PM peak-hour level of service analysis, including the highest road classification for the intersection:

- Harbour Place at School Driveway (TWSC) – Collector arterial
- Harbour Place at 99th Place SW (TWSC) – Collector arterial
- Harbour Place at South Driveway (TWSC) – Collector arterial

The new south driveway to Harbour Place was only analyzed in the future with development scenario. The AM peak-hour analysis was conducted because of public comments relating to the access to the school. There have been numerous iterations of the site plan and the one included with this study provides the best circulation options for the proposed development while providing emergency access for both the development and the existing school.



GIBSON TRAFFIC CONSULTANTS

TRAFFIC IMPACT STUDY
GTC #19-039

BASEL MUKILTEO TOWNHOMES (32 UNITS)

CITY OF MUKILTEO

LEGEND

DEVELOPMENT SITE

STUDY INTERSECTION

FIGURE 1

SITE VICINITY MAP

Traffic congestion on roadways is generally measured in terms of LOS at critical intersections. In accordance with the *Highway Capacity Manual 6th Edition*, roadway facilities and intersections are rated between LOS A and F, with LOS A being free flow and LOS F being forced flow or over-capacity conditions. The LOS at signalized intersections and all-way stop-controlled intersections are based on the average stopped delay for all entering vehicles. The LOS at two-way stop-controlled intersections is based on stopped delay times for the critical approach or movement(s). Geometric characteristics and conflicting traffic movements are taken into consideration when determining LOS values. A summary of the level of service criteria has been included in **Table 1**.

Table 1: Level of Service Criteria for Intersections

Level of [1] Service	Expected Delay	Intersection Control Delay (Seconds per Vehicle)	
		Unsignalized Intersections	**Signalized** Intersections
A	Little/No Delay	≤10	≤10
B	Short Delays	>10 and ≤15	>10 and ≤20
C	Average Delays	>15 and ≤25	>20 and ≤35
D	Long Delays	>25 and ≤35	>35 and ≤55
E	Very Long Delays	>35 and ≤50	>55 and ≤80
F	Extreme Delays[2]	>50	>80

[1] **Source:** *Highway Capacity Manual 6th Edition.*

LOS A: Free-flow traffic conditions, with minimal delay to stopped vehicles (no vehicle is delayed longer than one cycle at signalized intersection).
LOS B: Generally stable traffic flow conditions.
LOS C: Occasional back-ups may develop, but delay to vehicles is short term and still tolerable.
LOS D: During short periods of the peak hour, delays to approaching vehicles may be substantial but are tolerable during times of less demand (i.e. vehicles delayed one cycle or less at signal).
LOS E: Intersections operate at or near capacity, with long queues developing on all approaches and long delays.
LOS F: Jammed conditions on all approaches with excessively long delays and vehicles unable to move at times.

[2] When demand volume exceeds the capacity of the lane, extreme delays will be encountered with queuing which may cause severe congestion affecting other traffic movements in the intersection.

GTC utilized a 2.0-percent annual compounded growth rate to account for background traffic growth in the site vicinity when determining the through traffic volumes for the future with development level of service at the site access. This growth rate is based on the previous traffic studies prepared in the City of Mukilteo. The City of Mukilteo has a LOS standard of E or better for principal and minor arterials and a LOS standard of D or better for collector streets and local roads/streets.

The city of Mukilteo has a requirement of at least two years of growth for horizon year. Therefore, the year 2021 has been used as the "horizon year" in the analysis.

3. PROPOSED DEVELOPMENT CONDITIONS

3.1 Trip Generation

The daily, AM peak-hour and PM peak-hour trips anticipated to be generated by the proposed development were estimated by trip generation data contained in the ITE *Trip Generation Manual,* 10th Edition (2017). The ITE Land Use Code (LUC) 220, Multi-Family (Low-Rise), was used for the proposed development. Average trip generation rates were used with the number of dwelling units as the independent variable.

The development will generate 234 ADT with 15 AM peak-hour trips (4 inbound/11 outbound) and 18 PM peak-hour trips (11 inbound/7 outbound). A Trip Generation summary for the new trips is included in **Table 2**.

Table 2: Trip Generation Summary

Basel Mukilteo Townhomes		**Average Daily Trips**			**AM Peak-Hour Trips**			**PM Peak-Hour Trips**		
		Inbound	**Outbound**	**Total**	**Inbound**	**Outbound**	**Total**	**Inbound**	**Outbound**	**Total**
ITE LUC 220, Multi-Family (Low-Rise), 32 Units	Generation Rate	7.32 Trips Per Unit			0.46 Trips Per Unit			0.56 Trips Per Unit		
	Splits	50%	50%	100%	23%	77%	100%	63%	37%	100%
	Trips	117	117	234	3.39	11.33	14.72	11.29	6.63	17.92
NEW TRIPS		117	117	234	3.39	11.33	14.72	11.29	6.63	17.92

The trip generation calculations are included in the attachments.

3.2 Trip Distribution

The trip distribution is based on existing counts and employment in the region. The residential distribution has approximately 47% of the development's trips traveling to and from the north, seven percent on SR-525 and forty percent on Paine Field Boulevard. The other 53% will travel to and from the south, ten percent on Harbour Pointe Boulevard, three percent on 47th Place W and forty percent on SR-525. All the site traffic will use the full south access. A detailed trip distribution for the AM peak-hour and PM peak-hour are included in **Figure 2** and **Figure 3**, respectively.

3.3 Existing Volumes and Level of Service

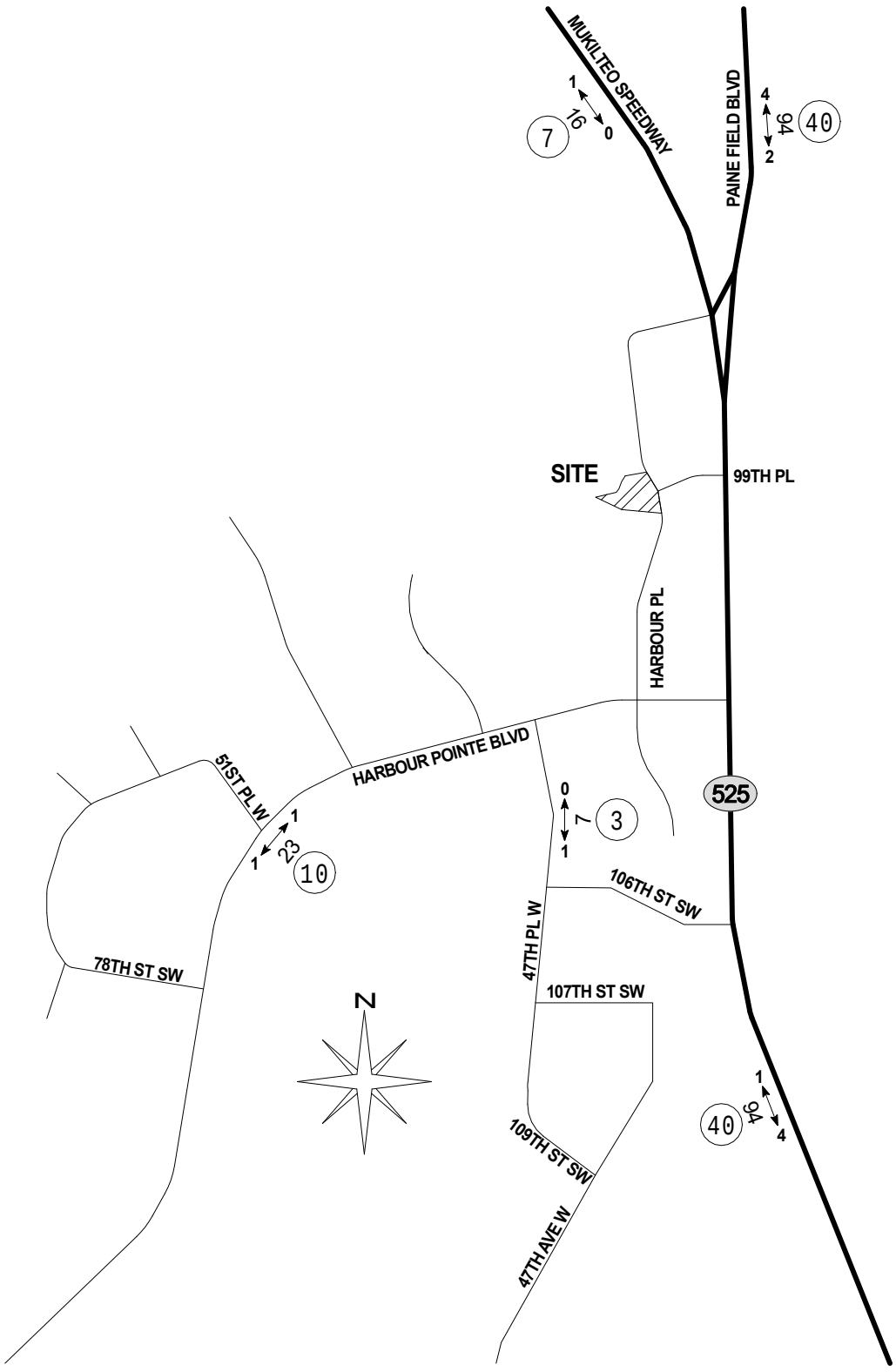
Existing counts were conducted by IDAX on May 11, 2016 for the PM peak-hour and by Traffic Data Gathering (TDG) on May 1, 2019 for the AM peak-hour. The existing channelization and intersection control were utilized at the study intersections for determining the level of service. The existing intersection volumes for the AM and PM peak-hours are displayed in **Figure 4**. The intersection of Harbour Place at School Driveway/Access and Harbour Place at 99th place currently operate at LOS B or better during the AM and PM peak-hours. The existing level of service results have been summarized in **Table 3**. The level of service calculations are included in the attachments.

Table 3: Existing Intersection Level of Service Summary

Intersection	Control	Peak-Hour	Existing Conditions	
			LOS	Delay
1. Harbour Place at School Dwy/Access	Two-Way Stop	AM	B	10.0 sec
		PM	A	9.2 sec
2. Harbour Place at 99th Place SW	Two-Way Stop	AM	A	9.9 sec
		PM	A	9.8 sec

3.4 Sight Distance

The new access to Harbour Place will have approximately 330 feet of spacing south of the existing Montessori school access. The posted speed limit is 25 mph on Harbour Place. With clearing along the site frontage there would be approximately 282 feet of sight distance for a vehicle approaching from the north. Per Mukilteo Municipal Code 17.20.060, the required sight distance for 25 mph is 300 feet. Therefore, the development is requesting a variance to AASHTO standards which shows an acceptable intersection sight distance of 280 feet for a posted speed limit of 25 mph. AASHTO is referenced throughout the 2017 Development Standards including in Table 14 showing the minimum street criteria by classification for minimum sight distance of various roadway types. The existing school driveway will have approximately 329 feet of sight distance to the south across the development's frontage.



GIBSON TRAFFIC CONSULTANTS

TRAFFIC IMPACT STUDY
GTC #19-039

BASEL MUKILTEO TOWNHOMES (32 UNITS)

CITY OF MUKILTEO

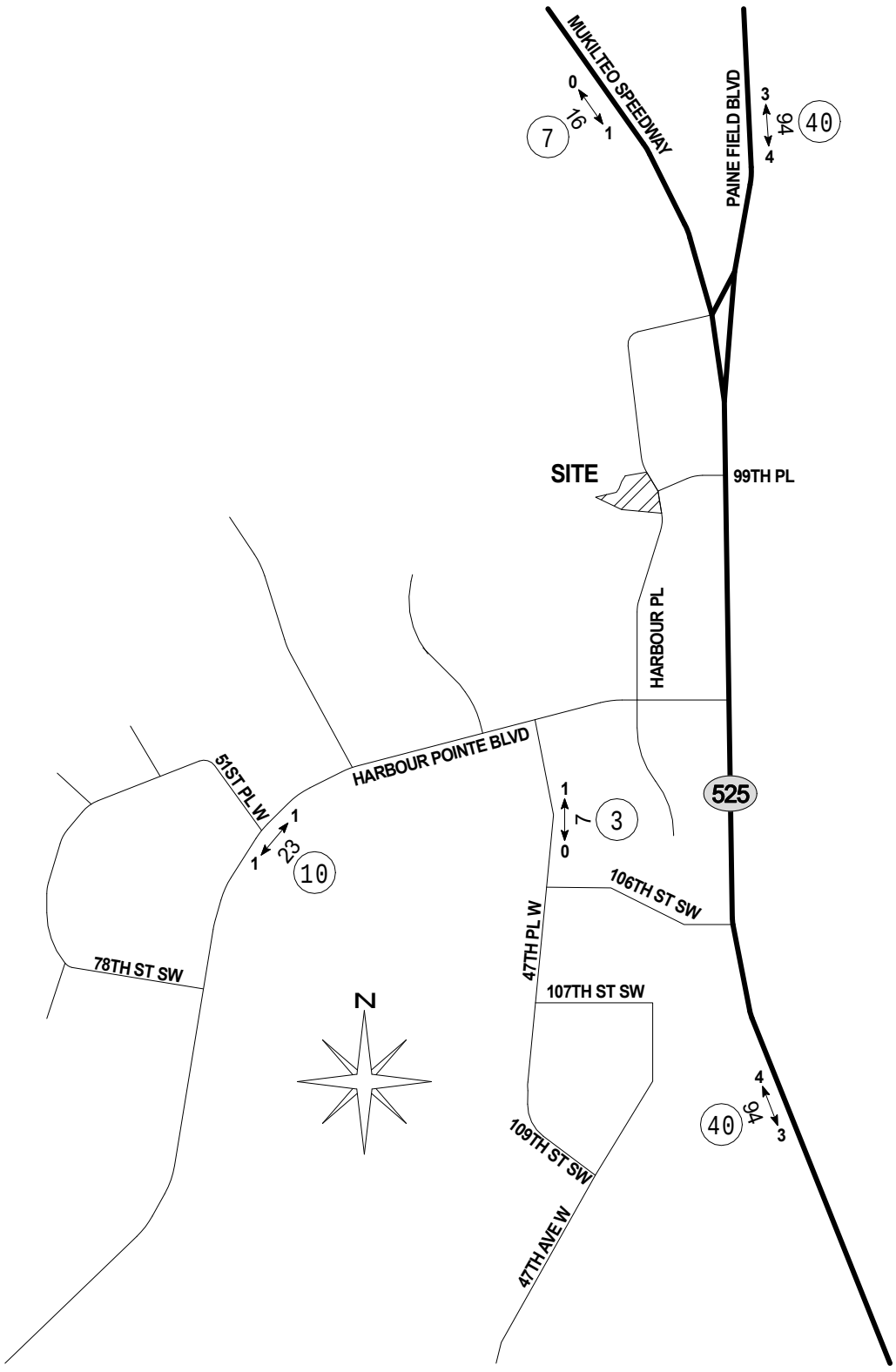
LEGEND

AM AWDT PEAK — NEW DAILY TRAFFIC / NEW AM PEAK-HOUR TRIPS

(25) — TRIP DISTRIBUTION %

FIGURE 2

AM PEAK-HOUR TRIP DISTRIBUTION



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BASEL MUKILTEO TOWNHOMES (32 UNITS)

CITY OF MUKILTEO

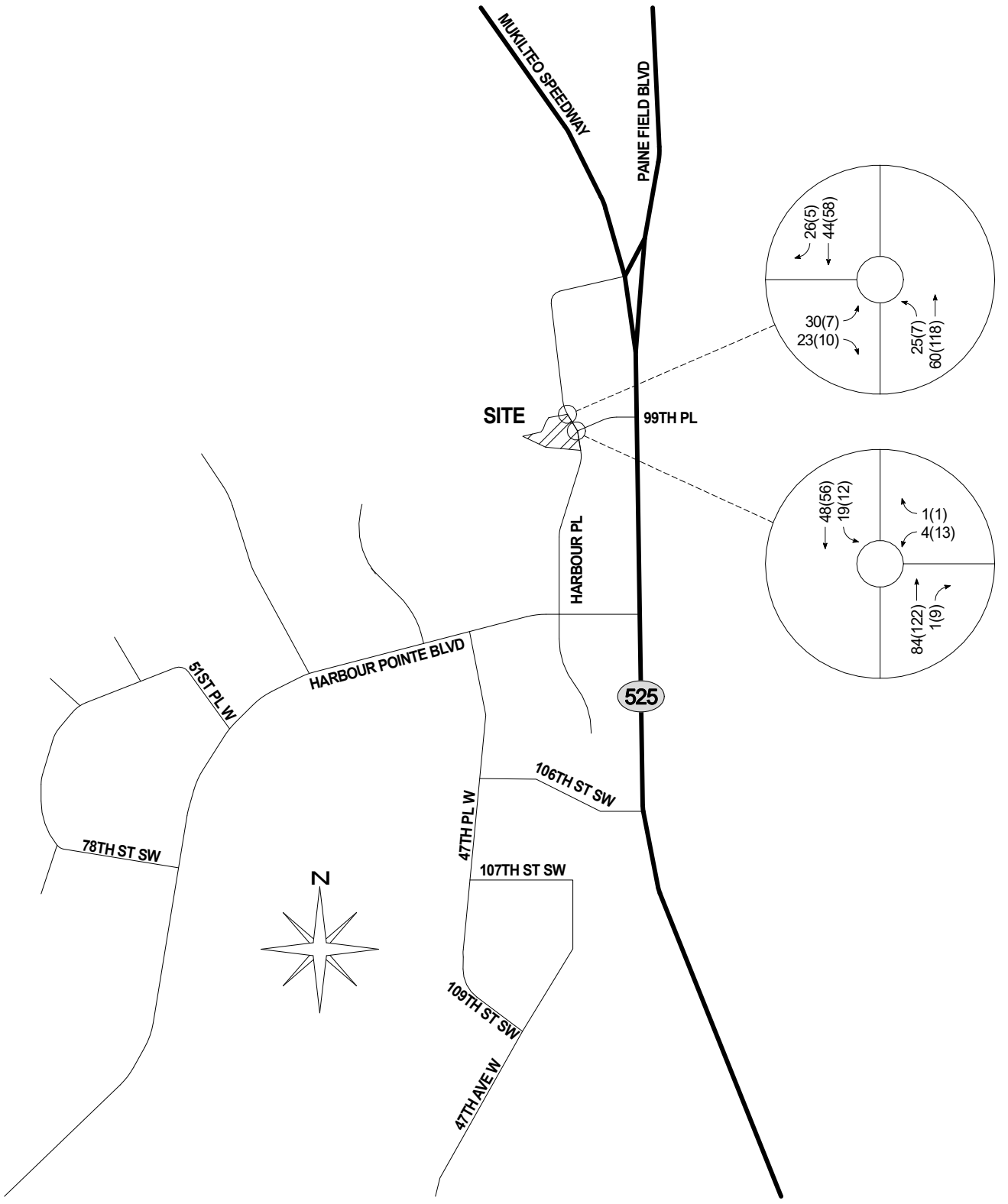
LEGEND

AWDT
PM ◄► PEAK — NEW DAILY TRAFFIC / NEW PM PEAK-HOUR TRIPS

25 — TRIP DISTRIBUTION %

FIGURE 3

PM PEAK-HOUR TRIP DISTRIBUTION



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BASEL MUKILTEO TOWNHOMES (32 UNITS)

CITY OF MUKILTEO

LEGEND

AM(PM)→ AM(PM) PEAK-HOUR TURNING MOVEMENT VOLUMES

FIGURE 4

EXISTING INTERSECTION VOLUMES PEAK-HOUR

4. FUTURE CONDITIONS

4.1 2021 Baseline Volumes and Level of Service

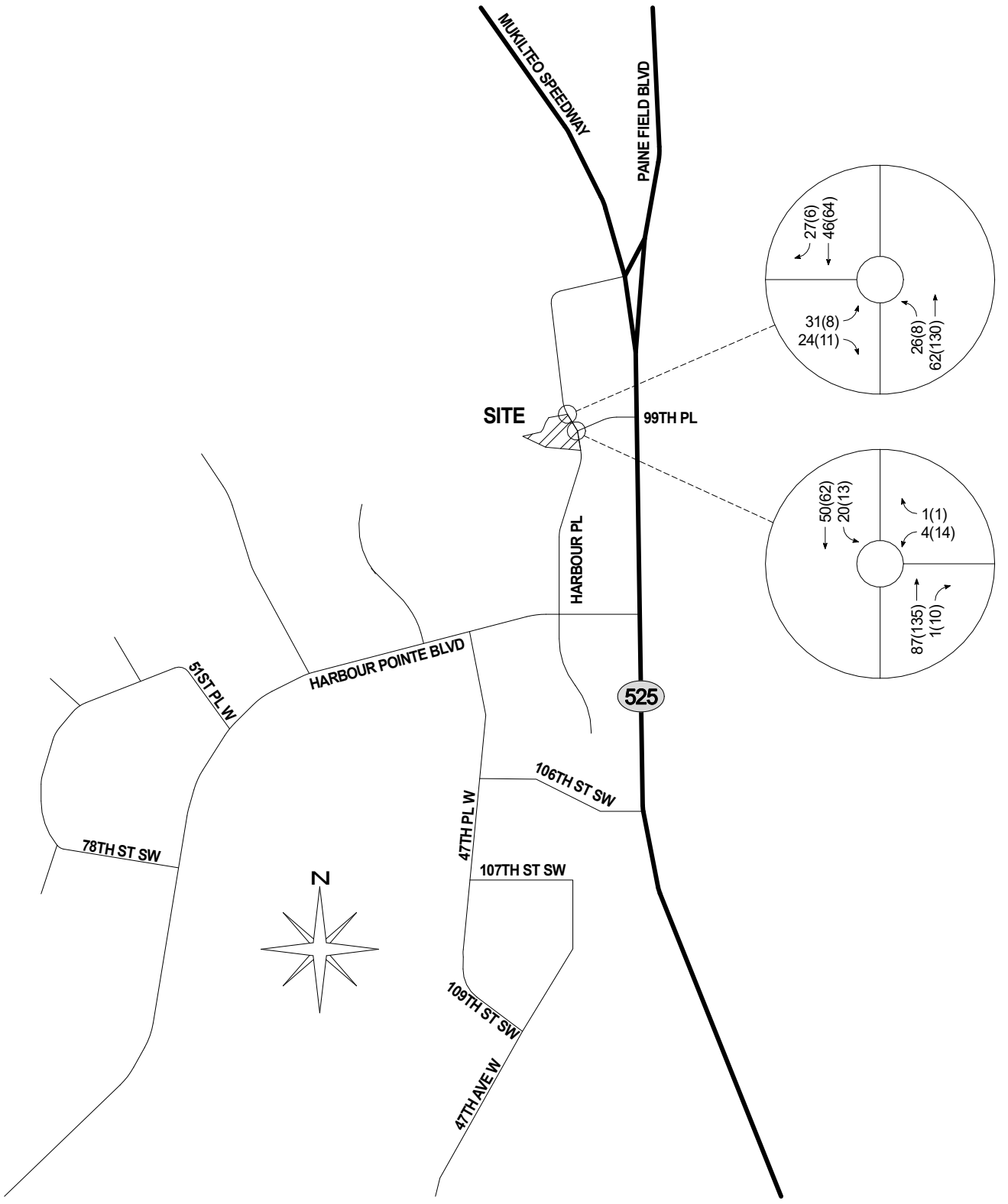
The 2021 baseline turning movement volumes are derived by adding a 2% annual compounding growth rate to the existing volumes from the counts at the study intersections. The 2021 baseline AM and PM peak-hour turning movement volumes are shown in **Figure 5**.

4.2 2021 Future with Development Volumes and Level of Service

The 2021 future with development turning movement volumes are derived by adding development trips to the 2021 baseline volumes from the counts at the study intersections. The 2021 future with development AM and PM peak-hour turning movement volumes are shown in **Figure 6**. The 2021 baseline and future with development level of service analysis results at the study intersection have been summarized in **Table 4**. The study intersections operate at acceptable level of service with the development traffic added. The queuing at the new south driveway to the proposed development shows less than 1 vehicle; therefore, there would be no interaction with the driveways to the individual units.

Table 4: Intersection Level of Service Summary

Intersection	Control	Peak-Hour	Existing Conditions		2021 Baseline Conditions		2021 Future w Development	
			LOS	Delay	LOS	Delay	LOS	Delay
1. Harbour Place at School Dwy/Access	Two-Way Stop	AM	B	10.0 sec	B	10.1 sec	B	10.1 sec
		PM	A	9.2 sec	A	9.3 sec	A	9.3 sec
2. Harbour Place at 99th Place SW	Two-Way Stop	AM	A	9.9 sec	A	9.9 sec	B	10.0 sec
		PM	A	9.8 sec	A	9.9 sec	A	9.9 sec
3. Harbour Place at South Driveway	Two-Way Stop	AM	---	---	---	---	A	9.3 sec
		PM	---	---	---	---	A	9.3 sec



GIBSON TRAFFIC CONSULTANTS

TRAFFIC IMPACT STUDY
GTC #19-039

BASEL MUKILTEO TOWNHOMES (32 UNITS)

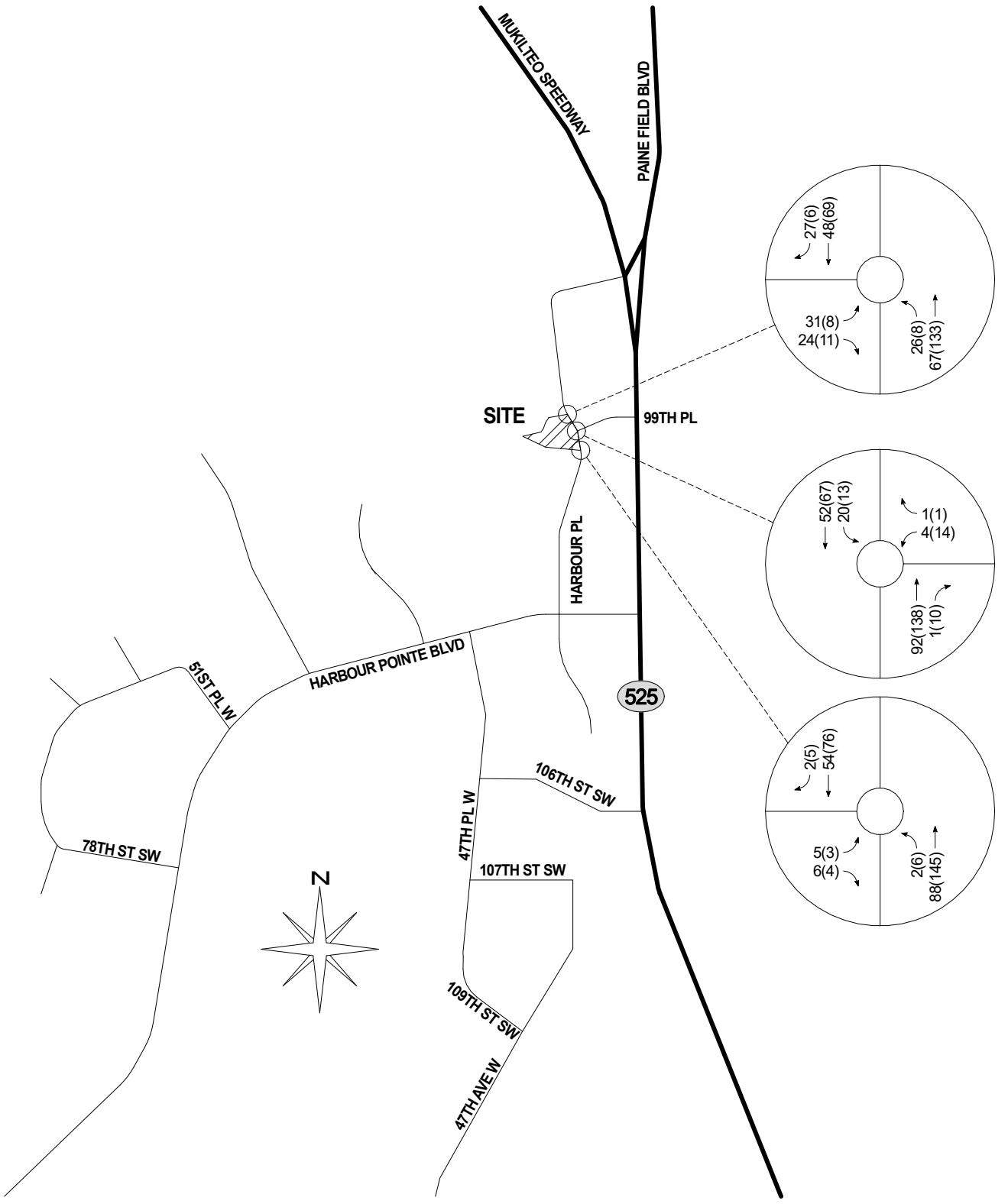
CITY OF MUKILTEO

LEGEND

AM(PM)→ AM(PM) PEAK-HOUR TURNING MOVEMENT VOLUMES

FIGURE 5

2021 BASELINE INTERSECTION VOLUMES PEAK-HOUR



GIBSON TRAFFIC CONSULTANTS

TRAFFIC IMPACT STUDY
GTC #19-039

BASEL MUKILTEO TOWNHOMES (32 UNITS)

CITY OF MUKILTEO

LEGEND

AM(PM)→ AM (PM) PEAK-HOUR TURNING MOVEMENT VOLUMES

FIGURE 6

2021 FUTURE WITH DEVELOPMENT INTERSECTION VOLUME PEAK-HOUR

5. CURRENT ALLOWABLE ZONING

The site is zoned to allow for 10,000 SF of retail with access provided to the existing Montessori school access.

The daily, AM peak-hour and PM peak-hour trips anticipated to be generated by the existing zoning were estimated by trip generation data contained in the ITE *Trip Generation Manual,* 10th Edition (2017). The ITE Land Use Code (LUC) 820, Shopping Center, was used for the proposed development. Average trip generation rates were used with the number of dwelling units as the independent variable. Also, a 34% pass-by rate was utilized to reflect trips already on the road system

The existing zoning would generate fewer trips during the AM peak-hour than the PM peak-hour; this confirms that the PM peak-hour is the critical commuter peak for the level of service comparison analysis. The 10,000 SF of retail will generate 249 ADT with 6 AM peak-hour trips (4 inbound/2 outbound) and 25 PM peak-hour trips (12 inbound/13 outbound). A Trip Generation summary for the new trips is included in **Table 5**. This is an increase of 15 ADT and 7 PM peak-hour trips over the proposed development.

Table 5: Current Allowable Zoning Trip Generation Summary

Existing Zoning		Average Daily Trips			AM Peak-Hour Trips			PM Peak-Hour Trips		
		Inbound	Outbound	Total	Inbound	Outbound	Total	Inbound	Outbound	Total
ITE LUC 820, Shopping Center, 10,000 SF	Generation Rate	37.75 Trips Per Unit			0.94 Trips Per Unit			3.81 Trips Per Unit		
	Splits	50%	50%	100%	62%	38%	100%	48%	52%	100%
	Trips	189	189	378	6	3	9	18	20	38
PASS-BY TRIPS		-64	-65	-129	-2	-1	-3	-6	-7	-13
NEW TRIPS		125	124	249	4	2	6	12	13	25

The trip generation calculations are included in the attachments.

The level of service was analyzed under the existing zoning conditions with access being provided by the existing access driveway to the Montessori school. Using the distribution with 47% northbound/53% southbound and the 38 PM peak-hour trips (access would have full number of trips) would result in the LOS of the access driveway going to LOS A with 9.6 seconds of delay (0.3 second increase over the proposed development).

6. TRAFFIC MITIGATION

The Washington Growth Management Act and Revised Code of Washington 82.02.050(2) authorize local jurisdictions to establish proportionate share traffic mitigation fees in order to fund capital facilities, such as roads and intersections.

6.1 City of Mukilteo

The City of Mukilteo assesses traffic impact fees based on $1,875 per new PM peak-hour trip. The development will generate 17.92 new PM peak-hour trips and therefore is obligated to pay a traffic mitigation fee of $33,600.00 to the City of Mukilteo.

6.2 Snohomish County

The interlocal agreement between Snohomish County and the City of Mukilteo allows Snohomish County to request traffic mitigation fees from any new developments in the City of Mukilteo. The development is not anticipated to impact Snohomish County roadways and therefore the owner is not required to pay mitigation fees to Snohomish County.

Trip Generation

Basel Mukilteo Townhomes
GTC #19-039

Trip Generation for: Weekday
(a.k.a.): Average Weekday Daily Trips (AWDT)

									NET EXTERNAL TRIPS BY TYPE											
									IN BOTH DIRECTIONS						DIRECTIONAL ASSIGNMENTS					
			Gross Trips				Internal Crossover		TOTAL	PASS-BY		DIVERTED LINK		NEW	PASS-BY		DIVERTED LINK		NEW	
LAND USES	VARIABLE	ITE LU code	Trip Rate	% IN	% OUT	In+Out (Total)	% of Gross Trips	Trips In+Out (Total)	In+Out (Total)	% of Ext. Trips	In+Out (Total)	% of Ext. Trips	In+Out (Total)	In+Out (Total)	In	Out	In	Out	In	Out
Multi-Family (Low-Rise)	32 units	220	7.32	50%	50%	234	0%	0	234	0%	0	0%	0	234	0	0	0	0	117	117
Totals						234		0	234		0		0	234.24	0	0	0	0	117	117

Basel Mukilteo Townhomes
GTC #19-039

Trip Generation for: **Weekday, Peak Hour of Adjacent Street Traffic, One Hour between 7 and 9 AM**
(a.k.a.): **Weekday AM Peak Hour**

									NET EXTERNAL TRIPS BY TYPE											
									IN BOTH DIRECTIONS						DIRECTIONAL ASSIGNMENTS					
			Gross Trips				Internal Crossover		TOTAL	PASS-BY		DIVERTED LINK		NEW	PASS-BY		DIVERTED LINK		NEW	
LAND USES	VARIABLE	ITE LU code	Trip Rate	% IN	% OUT	In+Out (Total)	% of Gross Trips	Trips In+Out (Total)	In+Out (Total)	% of Ext. Trips	In+Out (Total)	% of Ext. Trips	In+Out (Total)	In+Out (Total)	In	Out	In	Out	In	Out
Multi-Family (Low-Rise)	32 units	220	0.46	23%	77%	15	0%	0	15	0%	0	0%	0	15	0	0	0	0	3	11
Totals						15		0	15		0		0	14.72	0	0	0	0	3	11

Basel Mukilteo Townhomes
GTC #19-039

Trip Generation for: Weekday, Peak Hour of Adjacent Street Traffic, One Hour between 4 and 6 PM
(a.k.a.): Weekday PM Peak Hour

									NET EXTERNAL TRIPS BY TYPE											
									IN BOTH DIRECTIONS						DIRECTIONAL ASSIGNMENTS					
			Gross Trips				Internal Crossover		TOTAL	PASS-BY		DIVERTED LINK		NEW	PASS-BY		DIVERTED LINK		NEW	
LAND USES	VARIABLE	ITE LU code	Trip Rate	% IN	% OUT	In+Out (Total)	% of Gross Trips	Trips In+Out (Total)	In+Out (Total)	% of Ext. Trips	In+Out (Total)	% of Ext. Trips	In+Out (Total)	In+Out (Total)	In	Out	In	Out	In	Out
Multi-Family (Low-Rise)	32 units	220	0.56	63%	37%	18	0%	0	18	0%	0	0%	0	18	0	0	0	0	11	7
Totals						18		0	18		0		0	17.92	0	0	0	0	11	7

Basel Mukilteo Townhomes
GTC #19-039

AM Peak-Hour

%	New ADT	New AM Peak Hour Trips		
		In	Out	Total
100%	234	3	11	14.72
1%	2.34	0.03	0.11	0.15
2%	4.68	0.07	0.23	0.29
3%	7.03	0.10	0.34	0.44
4%	9.37	0.14	0.45	0.59
5%	**11.71**	**0.17**	**0.57**	**0.74**
6%	14.05	0.20	0.68	0.88
7%	16.40	0.24	0.79	1.03
8%	18.74	0.27	0.91	1.18
9%	21.08	0.31	1.02	1.32
10%	**23.42**	**0.34**	**1.13**	**1.47**
11%	25.77	0.37	1.25	1.62
12%	28.11	0.41	1.36	1.77
13%	30.45	0.44	1.47	1.91
14%	32.79	0.47	1.59	2.06
15%	**35.14**	**0.51**	**1.70**	**2.21**
16%	37.48	0.54	1.81	2.36
17%	39.82	0.58	1.93	2.50
18%	42.16	0.61	2.04	2.65
19%	44.51	0.64	2.15	2.80
20%	**46.85**	**0.68**	**2.27**	**2.94**
21%	49.19	0.71	2.38	3.09
22%	51.53	0.75	2.49	3.24
23%	53.88	0.78	2.61	3.39
24%	56.22	0.81	2.72	3.53
25%	**58.56**	**0.85**	**2.83**	**3.68**
26%	60.90	0.88	2.95	3.83
27%	63.24	0.92	3.06	3.97
28%	65.59	0.95	3.17	4.12
29%	67.93	0.98	3.29	4.27
30%	**70.27**	**1.02**	**3.40**	**4.42**
31%	72.61	1.05	3.51	4.56
32%	74.96	1.08	3.63	4.71
33%	77.30	1.12	3.74	4.86
34%	79.64	1.15	3.85	5.00
35%	**81.98**	**1.19**	**3.97**	**5.15**
36%	84.33	1.22	4.08	5.30
37%	86.67	1.25	4.19	5.45
38%	89.01	1.29	4.31	5.59
39%	91.35	1.32	4.42	5.74
40%	**93.70**	**1.36**	**4.53**	**5.89**
41%	96.04	1.39	4.65	6.04
42%	98.38	1.42	4.76	6.18
43%	100.72	1.46	4.87	6.33
44%	103.07	1.49	4.99	6.48
45%	**105.41**	**1.53**	**5.10**	**6.62**
46%	107.75	1.56	5.21	6.77
47%	110.09	1.59	5.33	6.92
48%	112.44	1.63	5.44	7.07
49%	114.78	1.66	5.55	7.21
50%	**117.12**	**1.70**	**5.67**	**7.36**

%	New ADT	New AM Peak Hour Trips		
		In	Out	Total
100%	234	3	11	15
51%	119.46	1.73	5.78	7.51
52%	121.80	1.76	5.89	7.65
53%	124.15	1.80	6.00	7.80
54%	126.49	1.83	6.12	7.95
55%	**128.83**	**1.86**	**6.23**	**8.10**
56%	131.17	1.90	6.34	8.24
57%	133.52	1.93	6.46	8.39
58%	135.86	1.97	6.57	8.54
59%	138.20	2.00	6.68	8.68
60%	**140.54**	**2.03**	**6.80**	**8.83**
61%	142.89	2.07	6.91	8.98
62%	145.23	2.10	7.02	9.13
63%	147.57	2.14	7.14	9.27
64%	149.91	2.17	7.25	9.42
65%	**152.26**	**2.20**	**7.36**	**9.57**
66%	154.60	2.24	7.48	9.72
67%	156.94	2.27	7.59	9.86
68%	159.28	2.31	7.70	10.01
69%	161.63	2.34	7.82	10.16
70%	**163.97**	**2.37**	**7.93**	**10.30**
71%	166.31	2.41	8.04	10.45
72%	168.65	2.44	8.16	10.60
73%	171.00	2.47	8.27	10.75
74%	173.34	2.51	8.38	10.89
75%	**175.68**	**2.54**	**8.50**	**11.04**
76%	178.02	2.58	8.61	11.19
77%	180.36	2.61	8.72	11.33
78%	182.71	2.64	8.84	11.48
79%	185.05	2.68	8.95	11.63
80%	**187.39**	**2.71**	**9.06**	**11.78**
81%	189.73	2.75	9.18	11.92
82%	192.08	2.78	9.29	12.07
83%	194.42	2.81	9.40	12.22
84%	196.76	2.85	9.52	12.36
85%	**199.10**	**2.88**	**9.63**	**12.51**
86%	201.45	2.92	9.74	12.66
87%	203.79	2.95	9.86	12.81
88%	206.13	2.98	9.97	12.95
89%	208.47	3.02	10.08	13.10
90%	**210.82**	**3.05**	**10.20**	**13.25**
91%	213.16	3.08	10.31	13.40
92%	215.50	3.12	10.42	13.54
93%	217.84	3.15	10.54	13.69
94%	220.19	3.19	10.65	13.84
95%	**222.53**	**3.22**	**10.76**	**13.98**
96%	224.87	3.25	10.88	14.13
97%	227.21	3.29	10.99	14.28
98%	229.56	3.32	11.10	14.43
99%	231.90	3.36	11.22	14.57
100%	**234.24**	**3.39**	**11.33**	**14.72**

Basel Mukilteo Townhomes
GTC #19-039

PM Peak-Hour

%	New ADT	New PM Peak Hour Trips		
		In	Out	Total
100%	234	11	7	17.92
1%	2.34	0.11	0.07	0.18
2%	4.68	0.23	0.13	0.36
3%	7.03	0.34	0.20	0.54
4%	9.37	0.45	0.27	0.72
5%	**11.71**	**0.56**	**0.33**	**0.90**
6%	14.05	0.68	0.40	1.08
7%	16.40	0.79	0.46	1.25
8%	18.74	0.90	0.53	1.43
9%	21.08	1.02	0.60	1.61
10%	**23.42**	**1.13**	**0.66**	**1.79**
11%	25.77	1.24	0.73	1.97
12%	28.11	1.35	0.80	2.15
13%	30.45	1.47	0.86	2.33
14%	32.79	1.58	0.93	2.51
15%	**35.14**	**1.69**	**0.99**	**2.69**
16%	37.48	1.81	1.06	2.87
17%	39.82	1.92	1.13	3.05
18%	42.16	2.03	1.19	3.23
19%	44.51	2.15	1.26	3.40
20%	**46.85**	**2.26**	**1.33**	**3.58**
21%	49.19	2.37	1.39	3.76
22%	51.53	2.48	1.46	3.94
23%	53.88	2.60	1.52	4.12
24%	56.22	2.71	1.59	4.30
25%	**58.56**	**2.82**	**1.66**	**4.48**
26%	60.90	2.94	1.72	4.66
27%	63.24	3.05	1.79	4.84
28%	65.59	3.16	1.86	5.02
29%	67.93	3.27	1.92	5.20
30%	**70.27**	**3.39**	**1.99**	**5.38**
31%	72.61	3.50	2.06	5.56
32%	74.96	3.61	2.12	5.73
33%	77.30	3.73	2.19	5.91
34%	79.64	3.84	2.25	6.09
35%	**81.98**	**3.95**	**2.32**	**6.27**
36%	84.33	4.06	2.39	6.45
37%	86.67	4.18	2.45	6.63
38%	89.01	4.29	2.52	6.81
39%	91.35	4.40	2.59	6.99
40%	**93.70**	**4.52**	**2.65**	**7.17**
41%	96.04	4.63	2.72	7.35
42%	98.38	4.74	2.78	7.53
43%	100.72	4.85	2.85	7.71
44%	103.07	4.97	2.92	7.88
45%	**105.41**	**5.08**	**2.98**	**8.06**
46%	107.75	5.19	3.05	8.24
47%	110.09	5.31	3.12	8.42
48%	112.44	5.42	3.18	8.60
49%	114.78	5.53	3.25	8.78
50%	**117.12**	**5.65**	**3.32**	**8.96**

%	New ADT	New PM Peak Hour Trips		
		In	Out	Total
100%	234	11	7	18
51%	119.46	5.76	3.38	9.14
52%	121.80	5.87	3.45	9.32
53%	124.15	5.98	3.51	9.50
54%	126.49	6.10	3.58	9.68
55%	**128.83**	**6.21**	**3.65**	**9.86**
56%	131.17	6.32	3.71	10.04
57%	133.52	6.44	3.78	10.21
58%	135.86	6.55	3.85	10.39
59%	138.20	6.66	3.91	10.57
60%	**140.54**	**6.77**	**3.98**	**10.75**
61%	142.89	6.89	4.04	10.93
62%	145.23	7.00	4.11	11.11
63%	147.57	7.11	4.18	11.29
64%	149.91	7.23	4.24	11.47
65%	**152.26**	**7.34**	**4.31**	**11.65**
66%	154.60	7.45	4.38	11.83
67%	156.94	7.56	4.44	12.01
68%	159.28	7.68	4.51	12.19
69%	161.63	7.79	4.57	12.36
70%	**163.97**	**7.90**	**4.64**	**12.54**
71%	166.31	8.02	4.71	12.72
72%	168.65	8.13	4.77	12.90
73%	171.00	8.24	4.84	13.08
74%	173.34	8.35	4.91	13.26
75%	**175.68**	**8.47**	**4.97**	**13.44**
76%	178.02	8.58	5.04	13.62
77%	180.36	8.69	5.11	13.80
78%	182.71	8.81	5.17	13.98
79%	185.05	8.92	5.24	14.16
80%	**187.39**	**9.03**	**5.30**	**14.34**
81%	189.73	9.14	5.37	14.52
82%	192.08	9.26	5.44	14.69
83%	194.42	9.37	5.50	14.87
84%	196.76	9.48	5.57	15.05
85%	**199.10**	**9.60**	**5.64**	**15.23**
86%	201.45	9.71	5.70	15.41
87%	203.79	9.82	5.77	15.59
88%	206.13	9.94	5.83	15.77
89%	208.47	10.05	5.90	15.95
90%	**210.82**	**10.16**	**5.97**	**16.13**
91%	213.16	10.27	6.03	16.31
92%	215.50	10.39	6.10	16.49
93%	217.84	10.50	6.17	16.67
94%	220.19	10.61	6.23	16.84
95%	**222.53**	**10.73**	**6.30**	**17.02**
96%	224.87	10.84	6.36	17.20
97%	227.21	10.95	6.43	17.38
98%	229.56	11.06	6.50	17.56
99%	231.90	11.18	6.56	17.74
100%	**234.24**	**11.29**	**6.63**	**17.92**

Basel Mukilteo Townhomes
GTC #19-039

Current Allowable Zoning

Trip Generation for: Weekday
(a.k.a.): Average Weekday Daily Trips (AWDT)

									NET EXTERNAL TRIPS BY TYPE									
									IN BOTH DIRECTIONS						DIRECTIONAL ASSIGNMENTS					
			Gross Trips				Internal Crossover		TOTAL	PASS-BY		DIVERTED LINK		NEW	PASS-BY		DIVERTED LINK		NEW	
LAND USES	VARIABLE	ITE LU code	Trip Rate	% IN	% OUT	In+Out (Total)	% of Gross Trips	Trips In+Out (Total)	In+Out (Total)	% of Ext. Trips	In+Out (Total)	% of Ext. Trips	In+Out (Total)	In+Out (Total)	In	Out	In	Out	In	Out
Shopping Center	10.000 K SF	820	37.75	50%	50%	378	0%	0	378	34%	128	0%	0	249	64	64	0	0	125	125
Totals						378		0	378		128		0	249.15	64	64	0	0	125	125

Basel Mukilteo Townhomes
GTC #19-039

Current Allowable Zoning

Trip Generation for: Weekday, Peak Hour of Adjacent Street Traffic, One Hour between 7 and 9 AM
(a.k.a.): Weekday AM Peak Hour

									NET EXTERNAL TRIPS BY TYPE											
									IN BOTH DIRECTIONS						DIRECTIONAL ASSIGNMENTS					
			Gross Trips				Internal Crossover		TOTAL	PASS-BY		DIVERTED LINK		NEW	PASS-BY		DIVERTED LINK		NEW	
LAND USES	VARIABLE	ITE LU code	Trip Rate	% IN	% OUT	In+Out (Total)	% of Gross Trips	Trips In+Out (Total)	In+Out (Total)	% of Ext. Trips	In+Out (Total)	% of Ext. Trips	In+Out (Total)	In+Out (Total)	In	Out	In	Out	In	Out
Shopping Center	10.000 K SF	820	0.94	62%	38%	9	0%	0	9	34%	3	0%	0	6	2	1	0	0	4	2
Totals						9		0	9		3		0	6.20	2	1	0	0	4	2

Basel Mukilteo Townhomes
GTC #19-039

Current Allowable Zoning

Trip Generation for: Weekday, Peak Hour of Adjacent Street Traffic, One Hour between 4 and 6 PM
(a.k.a.): Weekday PM Peak Hour

									NET EXTERNAL TRIPS BY TYPE											
									IN BOTH DIRECTIONS						DIRECTIONAL ASSIGNMENTS					
			Gross Trips				Internal Crossover		TOTAL	PASS-BY		DIVERTED LINK		NEW	PASS-BY		DIVERTED LINK		NEW	
LAND USES	VARIABLE	ITE LU code	Trip Rate	% IN	% OUT	In+Out (Total)	% of Gross Trips	Trips In+Out (Total)	In+Out (Total)	% of Ext. Trips	In+Out (Total)	% of Ext. Trips	In+Out (Total)	In+Out (Total)	In	Out	In	Out	In	Out
Shopping Center	10.000 K SF	820	3.81	48%	52%	38	0%	0	38	34%	13	0%	0	25	6	7	0	0	12	13
Totals						38		0	38		13		0	25.15	6	7	0	0	12	13

Basel Mukilteo Townhomes
GTC #19-039

Current Allowable Zoning

AM Peak-Hour

%	New ADT	New AM Peak Hour Trips		
		In	Out	Total
100%	249	4	2	6.20
1%	2.49	0.04	0.02	0.06
2%	4.98	0.08	0.05	0.12
3%	7.47	0.12	0.07	0.19
4%	9.97	0.15	0.09	0.25
5%	**12.46**	**0.19**	**0.12**	**0.31**
6%	14.95	0.23	0.14	0.37
7%	17.44	0.27	0.17	0.43
8%	19.93	0.31	0.19	0.50
9%	22.42	0.35	0.21	0.56
10%	**24.92**	**0.38**	**0.24**	**0.62**
11%	27.41	0.42	0.26	0.68
12%	29.90	0.46	0.28	0.74
13%	32.39	0.50	0.31	0.81
14%	34.88	0.54	0.33	0.87
15%	**37.37**	**0.58**	**0.35**	**0.93**
16%	39.86	0.61	0.38	0.99
17%	42.36	0.65	0.40	1.05
18%	44.85	0.69	0.42	1.12
19%	47.34	0.73	0.45	1.18
20%	**49.83**	**0.77**	**0.47**	**1.24**
21%	52.32	0.81	0.50	1.30
22%	54.81	0.84	0.52	1.36
23%	57.30	0.88	0.54	1.43
24%	59.80	0.92	0.57	1.49
25%	**62.29**	**0.96**	**0.59**	**1.55**
26%	64.78	1.00	0.61	1.61
27%	67.27	1.04	0.64	1.67
28%	69.76	1.08	0.66	1.74
29%	72.25	1.11	0.68	1.80
30%	**74.75**	**1.15**	**0.71**	**1.86**
31%	77.24	1.19	0.73	1.92
32%	79.73	1.23	0.76	1.98
33%	82.22	1.27	0.78	2.05
34%	84.71	1.31	0.80	2.11
35%	**87.20**	**1.34**	**0.83**	**2.17**
36%	89.69	1.38	0.85	2.23
37%	92.19	1.42	0.87	2.29
38%	94.68	1.46	0.90	2.36
39%	97.17	1.50	0.92	2.42
40%	**99.66**	**1.54**	**0.94**	**2.48**
41%	102.15	1.57	0.97	2.54
42%	104.64	1.61	0.99	2.60
43%	107.13	1.65	1.01	2.67
44%	109.63	1.69	1.04	2.73
45%	**112.12**	**1.73**	**1.06**	**2.79**
46%	114.61	1.77	1.09	2.85
47%	117.10	1.80	1.11	2.91
48%	119.59	1.84	1.13	2.98
49%	122.08	1.88	1.16	3.04
50%	**124.58**	**1.92**	**1.18**	**3.10**

%	New ADT	New AM Peak Hour Trips		
		In	Out	Total
100%	249	4	2	6
51%	127.07	1.96	1.20	3.16
52%	129.56	2.00	1.23	3.22
53%	132.05	2.04	1.25	3.29
54%	134.54	2.07	1.27	3.35
55%	**137.03**	**2.11**	**1.30**	**3.41**
56%	139.52	2.15	1.32	3.47
57%	142.02	2.19	1.35	3.53
58%	144.51	2.23	1.37	3.60
59%	147.00	2.27	1.39	3.66
60%	**149.49**	**2.30**	**1.42**	**3.72**
61%	151.98	2.34	1.44	3.78
62%	154.47	2.38	1.46	3.84
63%	156.96	2.42	1.49	3.91
64%	159.46	2.46	1.51	3.97
65%	**161.95**	**2.50**	**1.53**	**4.03**
66%	164.44	2.53	1.56	4.09
67%	166.93	2.57	1.58	4.15
68%	169.42	2.61	1.60	4.22
69%	171.91	2.65	1.63	4.28
70%	**174.41**	**2.69**	**1.65**	**4.34**
71%	176.90	2.73	1.68	4.40
72%	179.39	2.76	1.70	4.46
73%	181.88	2.80	1.72	4.53
74%	184.37	2.84	1.75	4.59
75%	**186.86**	**2.88**	**1.77**	**4.65**
76%	189.35	2.92	1.79	4.71
77%	191.85	2.96	1.82	4.77
78%	194.34	3.00	1.84	4.84
79%	196.83	3.03	1.86	4.90
80%	**199.32**	**3.07**	**1.89**	**4.96**
81%	201.81	3.11	1.91	5.02
82%	204.30	3.15	1.94	5.08
83%	206.79	3.19	1.96	5.15
84%	209.29	3.23	1.98	5.21
85%	**211.78**	**3.26**	**2.01**	**5.27**
86%	214.27	3.30	2.03	5.33
87%	216.76	3.34	2.05	5.39
88%	219.25	3.38	2.08	5.46
89%	221.74	3.42	2.10	5.52
90%	**224.24**	**3.46**	**2.12**	**5.58**
91%	226.73	3.49	2.15	5.64
92%	229.22	3.53	2.17	5.70
93%	231.71	3.57	2.19	5.77
94%	234.20	3.61	2.22	5.83
95%	**236.69**	**3.65**	**2.24**	**5.89**
96%	239.18	3.69	2.27	5.95
97%	241.68	3.72	2.29	6.01
98%	244.17	3.76	2.31	6.08
99%	246.66	3.80	2.34	6.14
100%	**249.15**	**3.84**	**2.36**	**6.20**

Basel Mukilteo Townhomes
GTC #19-039

Current Allowable Zoning

PM Peak-Hour

%	New ADT	New PM Peak Hour Trips		
		In	Out	Total
100%	249	12	13	25.15
1%	2.49	0.12	0.13	0.25
2%	4.98	0.24	0.26	0.50
3%	7.47	0.36	0.39	0.75
4%	9.97	0.48	0.52	1.01
5%	**12.46**	**0.60**	**0.65**	**1.26**
6%	14.95	0.72	0.78	1.51
7%	17.44	0.84	0.92	1.76
8%	19.93	0.97	1.05	2.01
9%	22.42	1.09	1.18	2.26
10%	**24.92**	**1.21**	**1.31**	**2.52**
11%	27.41	1.33	1.44	2.77
12%	29.90	1.45	1.57	3.02
13%	32.39	1.57	1.70	3.27
14%	34.88	1.69	1.83	3.52
15%	**37.37**	**1.81**	**1.96**	**3.77**
16%	39.86	1.93	2.09	4.02
17%	42.36	2.05	2.22	4.28
18%	44.85	2.17	2.35	4.53
19%	47.34	2.29	2.49	4.78
20%	**49.83**	**2.41**	**2.62**	**5.03**
21%	52.32	2.53	2.75	5.28
22%	54.81	2.66	2.88	5.53
23%	57.30	2.78	3.01	5.78
24%	59.80	2.90	3.14	6.04
25%	**62.29**	**3.02**	**3.27**	**6.29**
26%	64.78	3.14	3.40	6.54
27%	67.27	3.26	3.53	6.79
28%	69.76	3.38	3.66	7.04
29%	72.25	3.50	3.79	7.29
30%	**74.75**	**3.62**	**3.92**	**7.55**
31%	77.24	3.74	4.05	7.80
32%	79.73	3.86	4.19	8.05
33%	82.22	3.98	4.32	8.30
34%	84.71	4.10	4.45	8.55
35%	**87.20**	**4.22**	**4.58**	**8.80**
36%	89.69	4.35	4.71	9.05
37%	92.19	4.47	4.84	9.31
38%	94.68	4.59	4.97	9.56
39%	97.17	4.71	5.10	9.81
40%	**99.66**	**4.83**	**5.23**	**10.06**
41%	102.15	4.95	5.36	10.31
42%	104.64	5.07	5.49	10.56
43%	107.13	5.19	5.62	10.81
44%	109.63	5.31	5.76	11.07
45%	**112.12**	**5.43**	**5.89**	**11.32**
46%	114.61	5.55	6.02	11.57
47%	117.10	5.67	6.15	11.82
48%	119.59	5.79	6.28	12.07
49%	122.08	5.91	6.41	12.32
50%	**124.58**	**6.04**	**6.54**	**12.58**

%	New ADT	New PM Peak Hour Trips		
		In	Out	Total
100%	249	12	13	25
51%	127.07	6.16	6.67	12.83
52%	129.56	6.28	6.80	13.08
53%	132.05	6.40	6.93	13.33
54%	134.54	6.52	7.06	13.58
55%	**137.03**	**6.64**	**7.19**	**13.83**
56%	139.52	6.76	7.32	14.08
57%	142.02	6.88	7.46	14.34
58%	144.51	7.00	7.59	14.59
59%	147.00	7.12	7.72	14.84
60%	**149.49**	**7.24**	**7.85**	**15.09**
61%	151.98	7.36	7.98	15.34
62%	154.47	7.48	8.11	15.59
63%	156.96	7.60	8.24	15.84
64%	159.46	7.72	8.37	16.10
65%	**161.95**	**7.85**	**8.50**	**16.35**
66%	164.44	7.97	8.63	16.60
67%	166.93	8.09	8.76	16.85
68%	169.42	8.21	8.89	17.10
69%	171.91	8.33	9.03	17.35
70%	**174.41**	**8.45**	**9.16**	**17.61**
71%	176.90	8.57	9.29	17.86
72%	179.39	8.69	9.42	18.11
73%	181.88	8.81	9.55	18.36
74%	184.37	8.93	9.68	18.61
75%	**186.86**	**9.05**	**9.81**	**18.86**
76%	189.35	9.17	9.94	19.11
77%	191.85	9.29	10.07	19.37
78%	194.34	9.41	10.20	19.62
79%	196.83	9.54	10.33	19.87
80%	**199.32**	**9.66**	**10.46**	**20.12**
81%	201.81	9.78	10.59	20.37
82%	204.30	9.90	10.73	20.62
83%	206.79	10.02	10.86	20.87
84%	209.29	10.14	10.99	21.13
85%	**211.78**	**10.26**	**11.12**	**21.38**
86%	214.27	10.38	11.25	21.63
87%	216.76	10.50	11.38	21.88
88%	219.25	10.62	11.51	22.13
89%	221.74	10.74	11.64	22.38
90%	**224.24**	**10.86**	**11.77**	**22.64**
91%	226.73	10.98	11.90	22.89
92%	229.22	11.10	12.03	23.14
93%	231.71	11.23	12.16	23.39
94%	234.20	11.35	12.30	23.64
95%	**236.69**	**11.47**	**12.43**	**23.89**
96%	239.18	11.59	12.56	24.14
97%	241.68	11.71	12.69	24.40
98%	244.17	11.83	12.82	24.65
99%	246.66	11.95	12.95	24.90
100%	**249.15**	**12.07**	**13.08**	**25.15**

Turning Movements

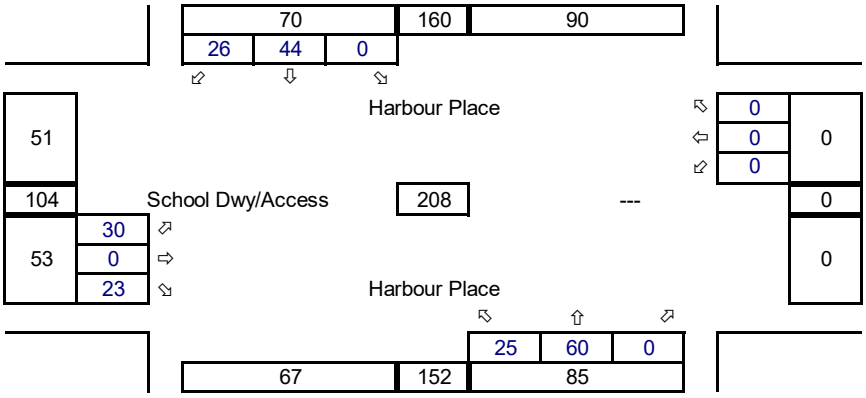
1 Harbour Pl @ School-Access

Synchro ID: 1

Existing
Average Weekday
AM Peak Hour

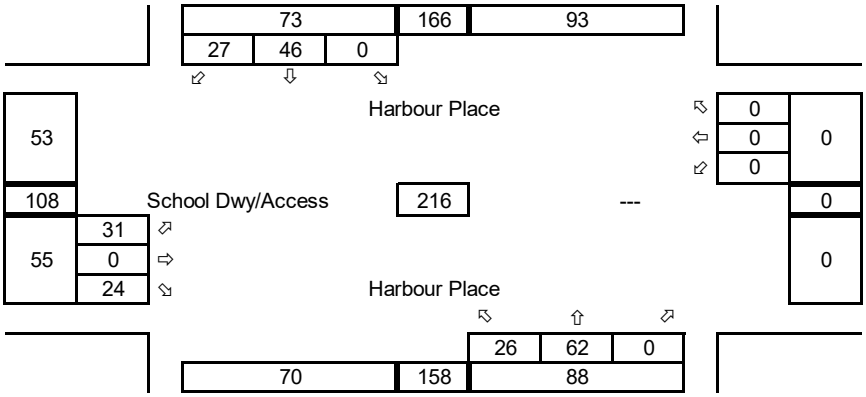
Year: **5/1/19**

Data Source: TDG

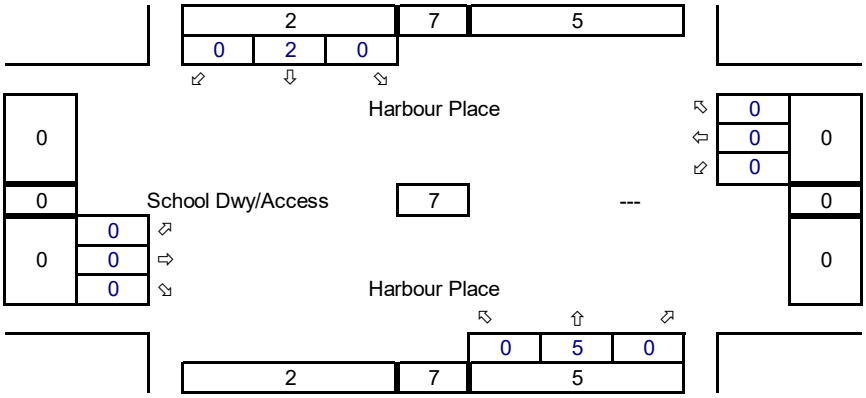


Future without Project
Average Weekday
AM Peak Hour

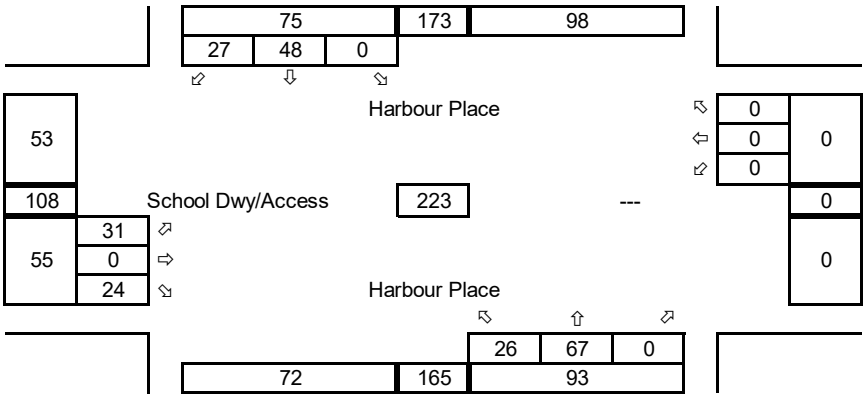
Year: 2021
Growth Rate = 2.0%
Years of Growth = 2
Total Growth = 1.0404



Total Project Trips
Average Weekday
AM Peak Hour



Future with Project
Average Weekday
AM Peak Hour



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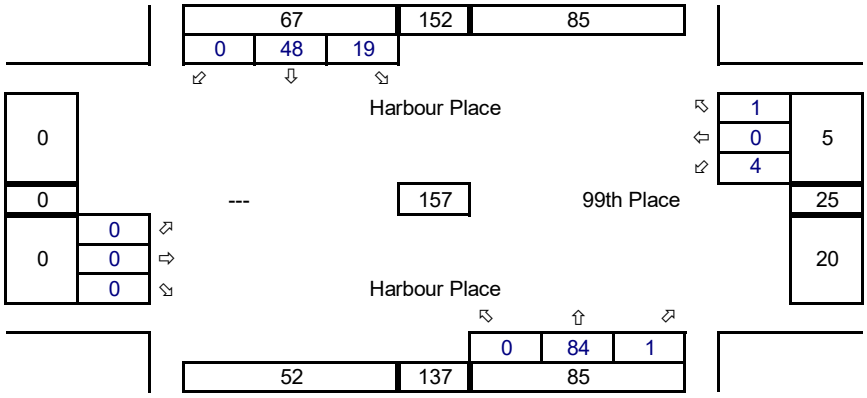
2 Harbour Pl @ 99 Pl

Synchro ID: 2

Existing
Average Weekday
AM Peak Hour

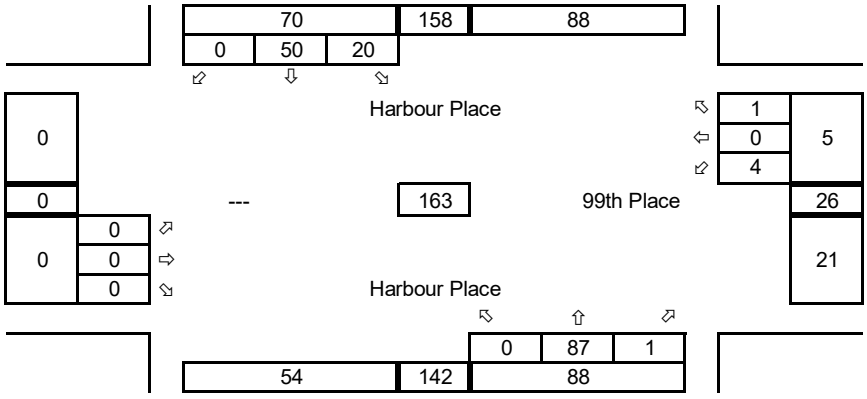
Year: **5/1/19**

Data Source: TDG

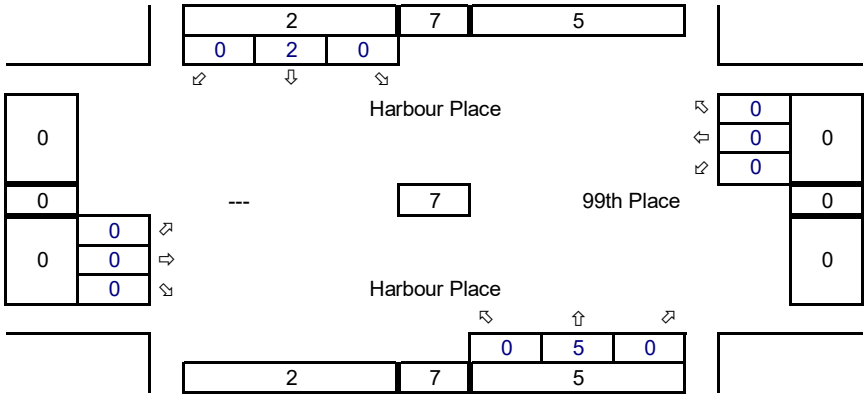


Future without Project
Average Weekday
AM Peak Hour

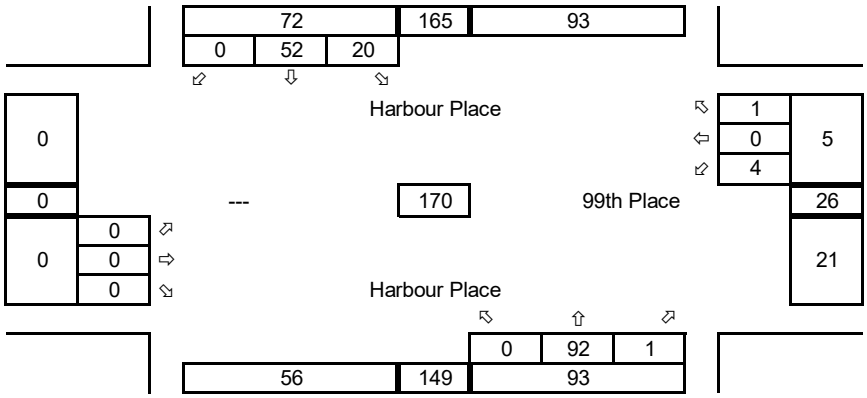
Year: 2021
Growth Rate = 2.0%
Years of Growth = 2
Total Growth = 1.0404



Total Project Trips
Average Weekday
AM Peak Hour



Future with Project
Average Weekday
AM Peak Hour



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3 Harbour Pl @ South Access

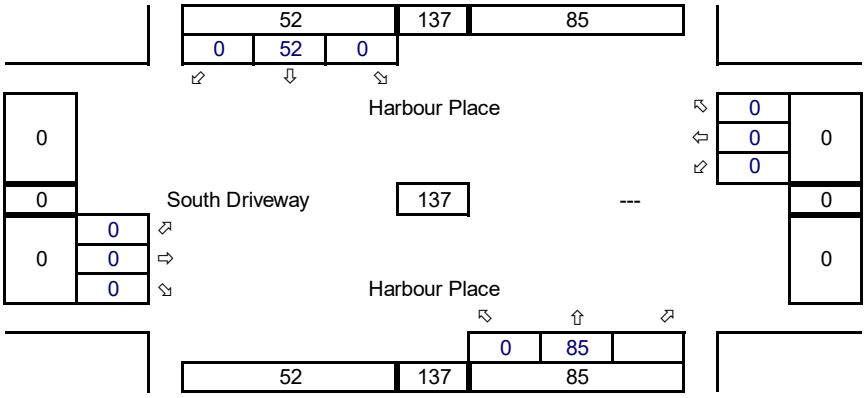
Synchro ID: 3

Existing
Average Weekday
AM Peak Hour

Year: **5/1/19**

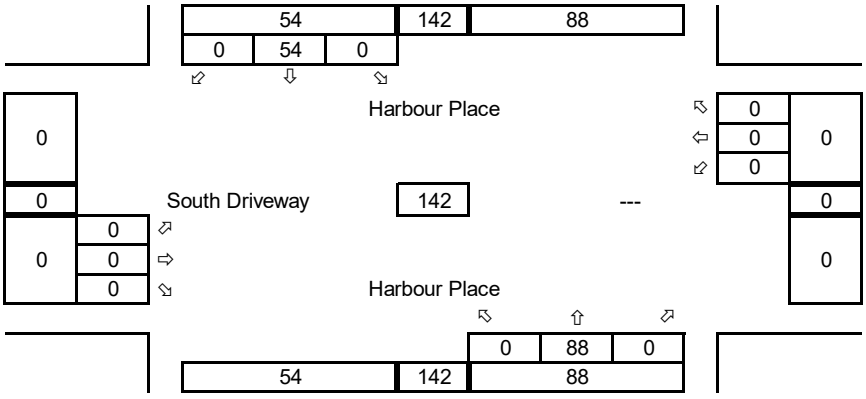
Data Source: TDG

From Hrbour Pl at 99th Pl

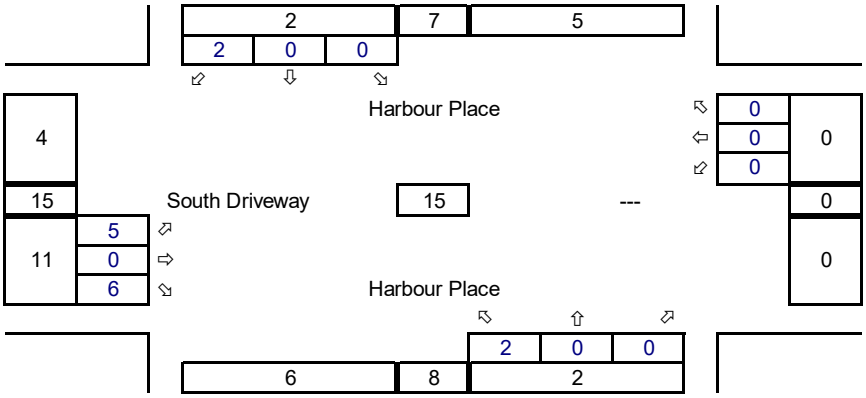


Future without Project
Average Weekday
AM Peak Hour

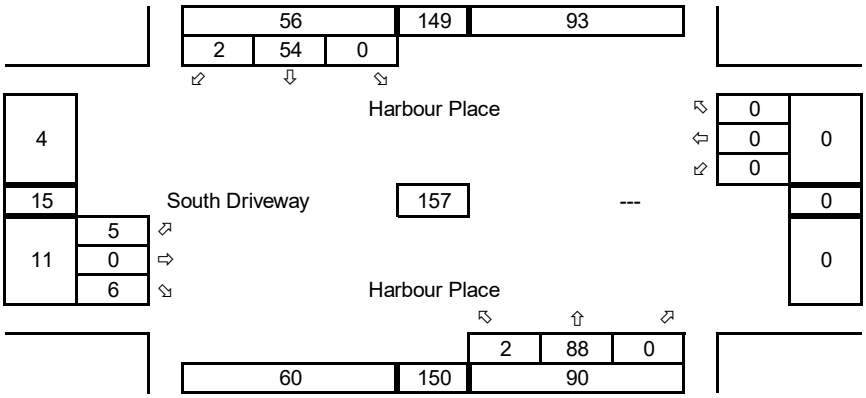
Year: 2021
Growth Rate = 2.0%
Years of Growth = 2
Total Growth = 1.0404



Total Project Trips
Average Weekday
AM Peak Hour



Future with Project
Average Weekday
AM Peak Hour



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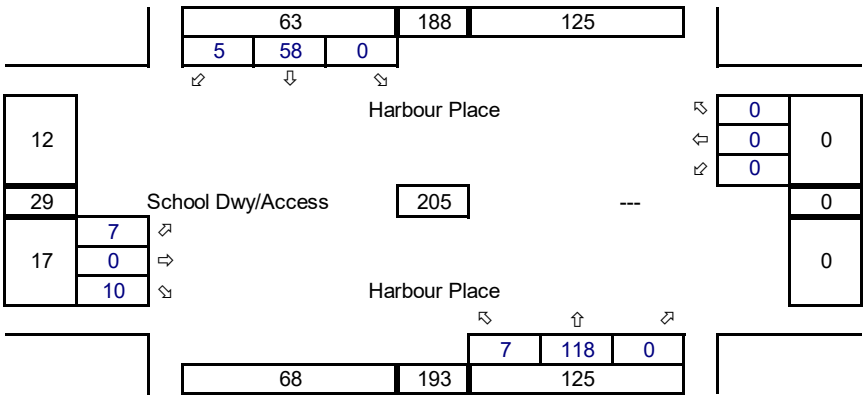
1 Harbour Pl @ School-Access

Synchro ID: 1

Existing
Average Weekday
PM Peak Hour

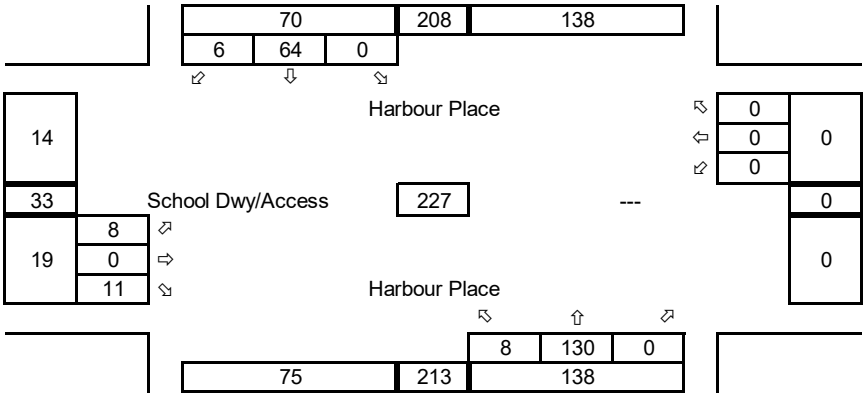
Year: **5/11/16**

Data Source: idax

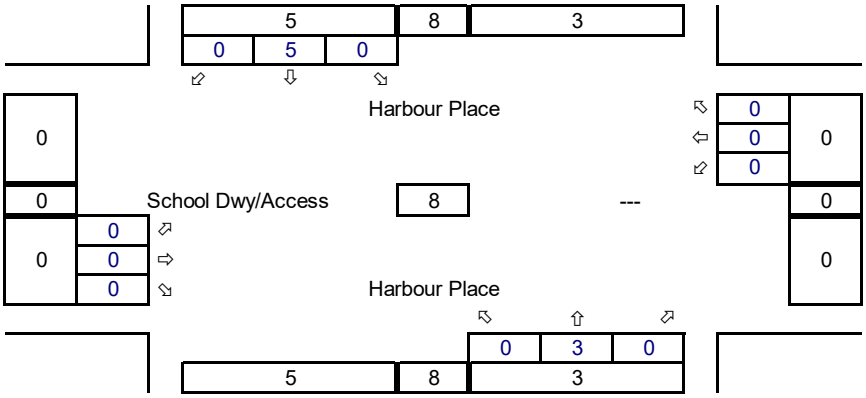


Future without Project
Average Weekday
PM Peak Hour

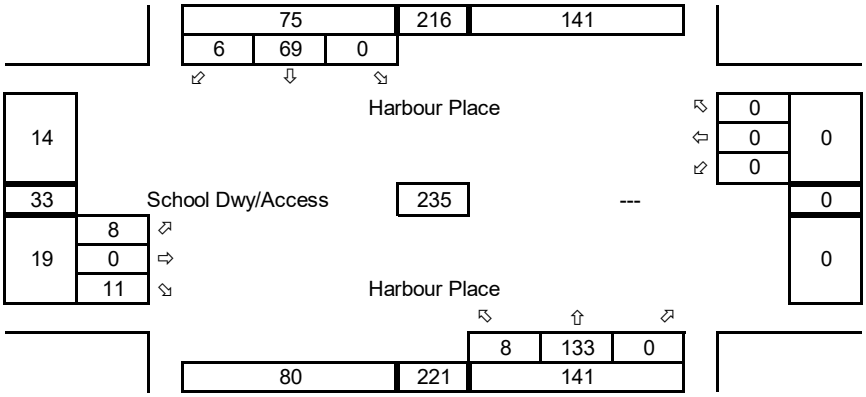
Year: 2021
Growth Rate = 2.0%
Years of Growth = 5
Total Growth = 1.1041



Total Project Trips
Average Weekday
PM Peak Hour



Future with Project
Average Weekday
PM Peak Hour



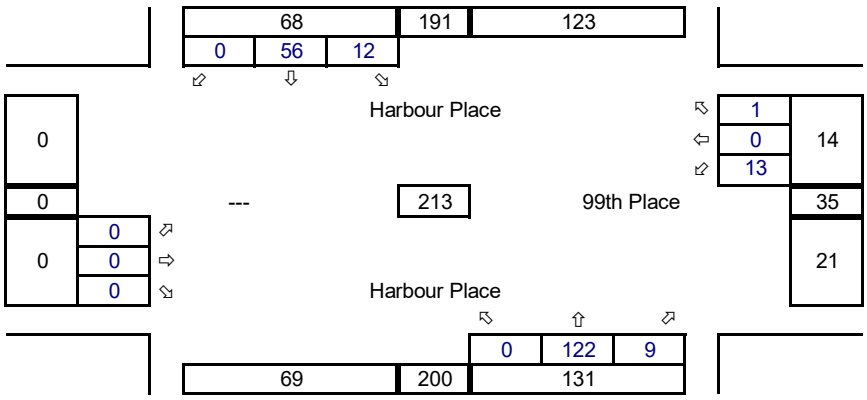
2 Harbour Pl @ 99 Pl

Synchro ID: 2

Existing
Average Weekday
PM Peak Hour

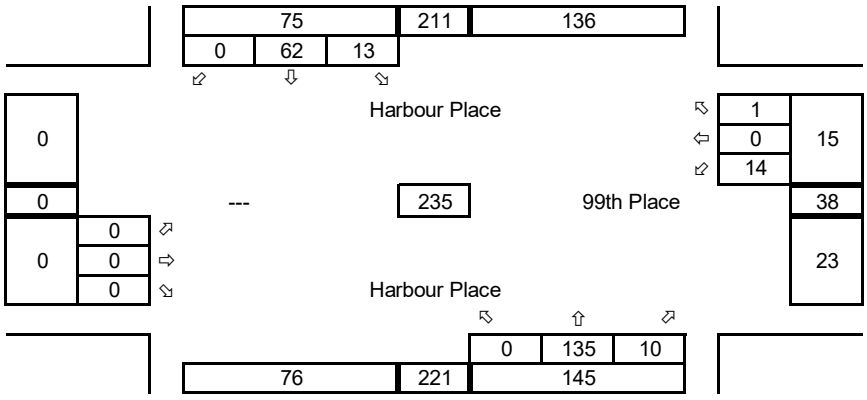
Year: **5/11/16**

Data Source: idax

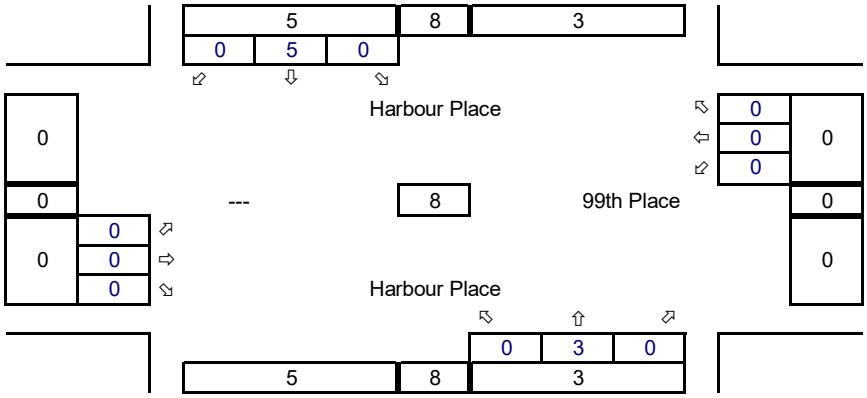


Future without Project
Average Weekday
PM Peak Hour

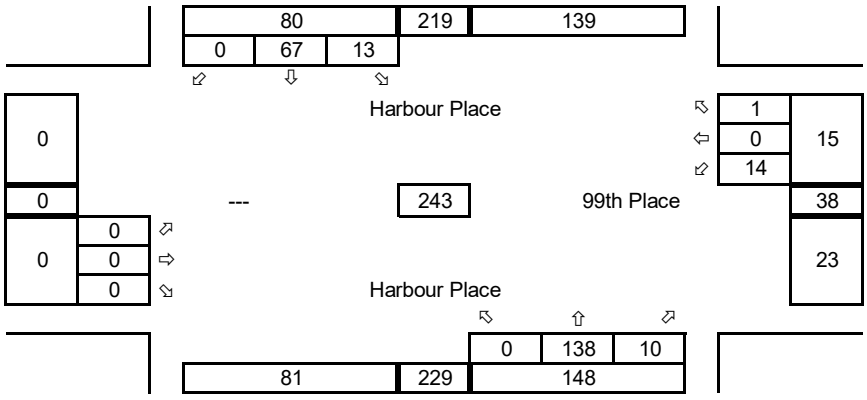
Year: 2021
Growth Rate = 2.0%
Years of Growth = 5
Total Growth = 1.1041



Total Project Trips
Average Weekday
PM Peak Hour



Future with Project
Average Weekday
PM Peak Hour



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3 Harbour Pl @ South Access

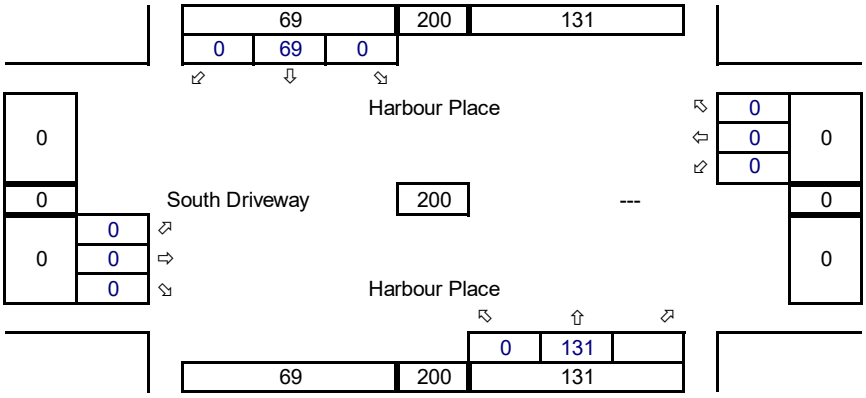
Synchro ID: 3

Existing
Average Weekday
PM Peak Hour

Year: **5/11/16**

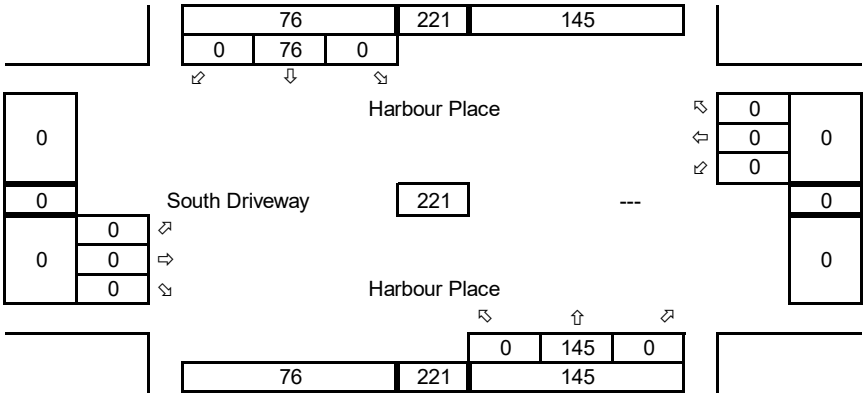
Data Source: idax

From Hrbour Pl at 99th Pl

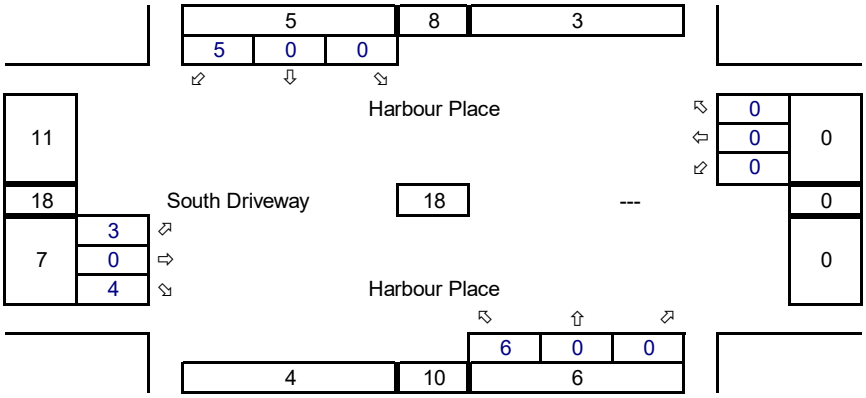


Future without Project
Average Weekday
PM Peak Hour

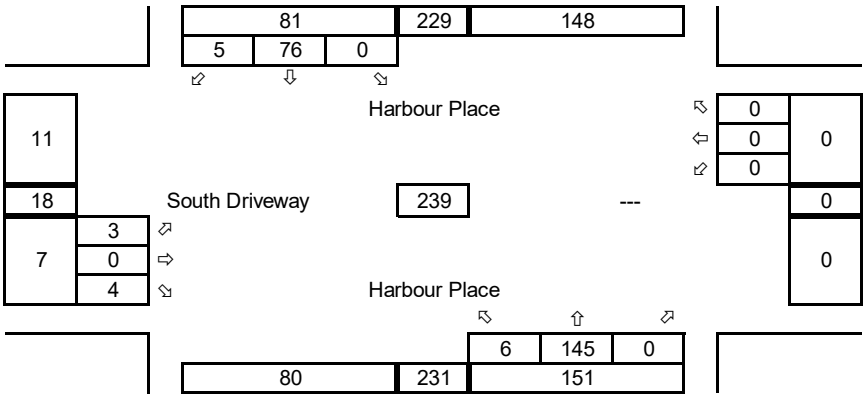
Year: 2021
Growth Rate = 2.0%
Years of Growth = 5
Total Growth = 1.1041



Total Project Trips
Average Weekday
PM Peak Hour



Future with Project
Average Weekday
PM Peak Hour

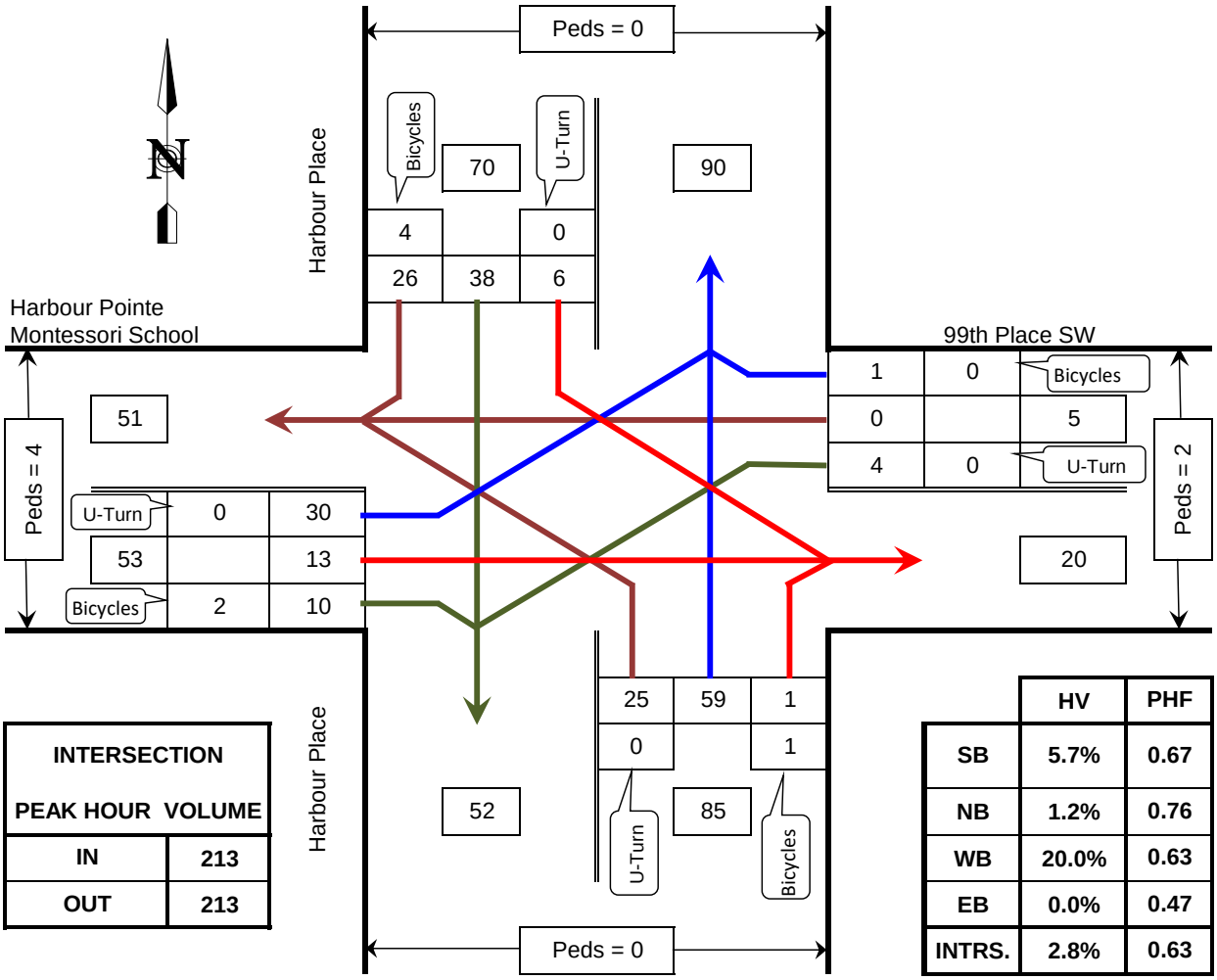


Counts

TRAFFIC DATA GATHERING

TURNING MOVEMENTS DIAGRAM

7:00 AM - 9:00 AM PEAK HOUR: 7:45 AM TO 8:45 AM



INTERSECTION PEAK HOUR VOLUME	
IN	213
OUT	213

	HV	PHF
SB	5.7%	0.67
NB	1.2%	0.76
WB	20.0%	0.63
EB	0.0%	0.47
INTRS.	2.8%	0.63

PHF = Peak Hour Factor
HV = Heavy Vehicle

Harbour Place @ 99th Place SW/Harbour Pointe Montessori School

Mukilteo, WA

COUNTED BY: TDG

DATE OF COUNT: Wed. 5/1/19

REDUCTION DATE: Thu. 5/2/19

TIME OF COUNT: 7:00 AM - 9:00 AM

TRAFFIC DATA GATHERING

INTERSECTION TURNING MOVEMENTS REDUCTION SHEET

LOCATION: Harbour Place @ 99th Place SW/Harbour Pointe Montessori School
Mukilteo, WA

DATE OF COUNT: Wed. 5/1/19
TIME OF COUNT: 7:00 AM - 9:00 AM

COUNTED BY: TDG
DATE OF REDUCTION: 5/2/2019

TIME INTERVAL ENDING AT	FROM NORTH ON Harbour Place							FROM SOUTH ON Harbour Place							FROM EAST ON 99th Place SW							FROM WEST ON Harbour Pointe Montessori School							INTERVAL TOTALS
	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	
05:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	1	20	1	0	1	1	0	0	10	0	0	0	0	0	5	0	1	2	0	0	0	0	0	0	38
07:30 AM	0	2	0	0	2	15	1	0	1	1	0	2	29	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	52
07:45 AM	0	0	0	0	1	6	2	0	0	0	0	1	12	0	0	1	0	0	0	0	0	3	0	0	0	1	1	1	25
08:00 AM	0	1	0	0	1	11	3	0	1	0	0	4	11	0	0	0	0	0	1	0	0	1	0	0	0	5	2	0	38
08:15 AM	0	0	0	0	0	10	2	0	0	0	0	5	13	0	0	0	0	0	1	0	0	0	0	0	0	2	0	0	33
08:30 AM	0	1	1	0	1	8	8	0	0	0	0	6	18	0	0	0	0	0	1	0	0	1	1	0	0	8	5	3	58
08:45 AM	0	2	3	0	4	9	13	0	0	1	0	10	17	1	2	0	1	0	1	0	1	2	1	0	0	15	6	7	84
09:00 AM	0	0	0	0	0	9	2	0	0	0	0	2	11	0	0	0	0	0	0	0	1	0	0	0	0	2	1	0	28
PEAK HOUR TOTALS	0	4	4	0	6	38	26	0	1	1	0	25	59	1	2	0	1	0	4	0	1	4	2	0	0	30	13	10	INTERSECTION
ALL MOVEMENTS				70							85							5							53				213
% HV			5.7%							1.2%							20.0%							0.0%					2.8%
PEAK HOUR FACTOR				0.67							0.76							0.63							0.47				0.63

HV = Heavy Vehicle
PHF = Peak Hour Factor

7:00 AM - 9:00 AM PEAK HOUR: 7:45 AM TO 8:45 AM

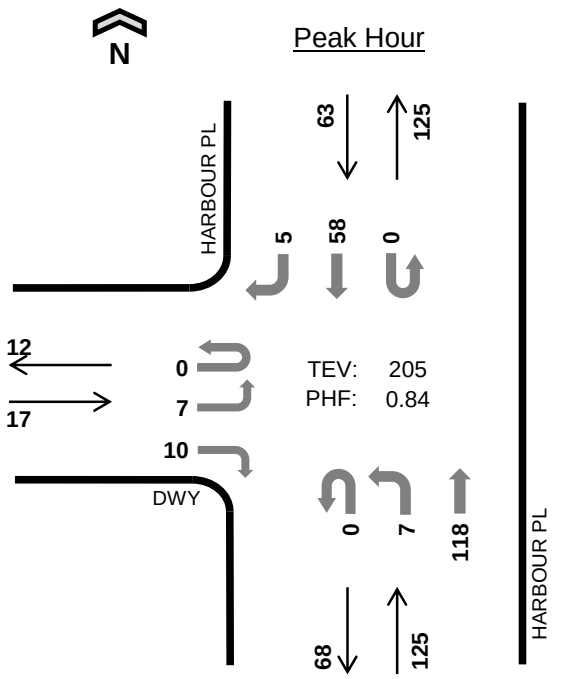
ROLLING HOUR COUNT

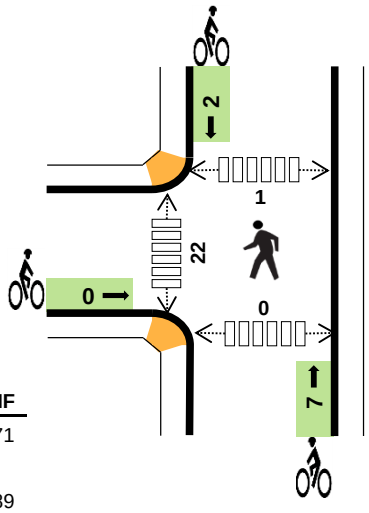
TIME INTERVAL	FROM NORTH ON Harbour Place							FROM SOUTH ON Harbour Place							FROM EAST ON 99th Place SW							FROM WEST ON Harbour Pointe Montessori School							INTERVAL TOTALS
	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	
5:00 AM - 6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 AM - 6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 AM - 6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 AM - 6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 AM - 7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM - 8:00 AM	0	3	0	0	5	52	7	0	3	2	0	7	62	1	0	1	0	0	7	0	1	6	0	0	0	6	4	1	153
7:15 AM - 8:15 AM	0	3	0	0	4	42	8	0	2	1	0	12	65	1	0	1	0	0	3	0	0	4	0	0	0	8	4	1	148
7:30 AM - 8:30 AM	0	2	1	0	3	35	15	0	1	0	0	16	54	0	0	1	0	0	3	0	0	5	1	0	0	16	8	4	154
7:45 AM - 8:45 AM	0	4	4	0	6	38	26	0	1	1	0	25	59	1	2	0	1	0	4	0	1	4	2	0	0	30	13	10	213
8:00 AM - 9:00 AM	0	3	4	0	5	36	25	0	0	1	0	23	59	1	2	0	1	0	3	0	2	3	2	0	0	27	12	10	203
7:00 AM - 9:00 AM Total:	0	6	4	0	10	88	32	0	3	3	0	30	121	2	2	1	1	0	10	0	3	9	2	0	0	33	16	11	356

HARBOUR PL
DWY

Peak Hour

Date: Wed, May 11, 2016
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:30 PM to 5:30 PM





	HV %:	PHF
EB	0.0%	0.71
WB	-	-
NB	0.0%	0.89
SB	0.0%	0.66
TOTAL	0.0%	0.84

Two-Hour Count Summaries

Interval Start	DWY				0				HARBOUR PL				HARBOUR PL				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	2	0	0	0	0	0	1	28	0	0	0	18	0	49	0
4:15 PM	0	2	0	0	0	0	0	0	0	0	23	0	0	0	17	1	43	0
4:30 PM	**0**	**1**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**5**	**27**	**0**	**0**	**0**	**10**	**2**	**47**	0
4:45 PM	**0**	**1**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**33**	**0**	**0**	**0**	**22**	**2**	**61**	200
5:00 PM	**0**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**34**	**0**	**0**	**0**	**13**	**1**	**53**	204
5:15 PM	**0**	**2**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**1**	**24**	**0**	**0**	**0**	**13**	**0**	**44**	**205**
5:30 PM	0	0	0	0	0	0	0	0	0	0	18	0	0	0	19	0	37	195
5:45 PM	0	0	0	0	0	0	0	0	0	0	19	0	0	0	11	0	30	164
Count Total	0	9	0	12	0	0	0	0	0	8	206	0	0	0	123	6	364	0
Peak Hour	**0**	**7**	**0**	**10**	**0**	**0**	**0**	**0**	**0**	**7**	**118**	**0**	**0**	**0**	**58**	**5**	**205**	**0**

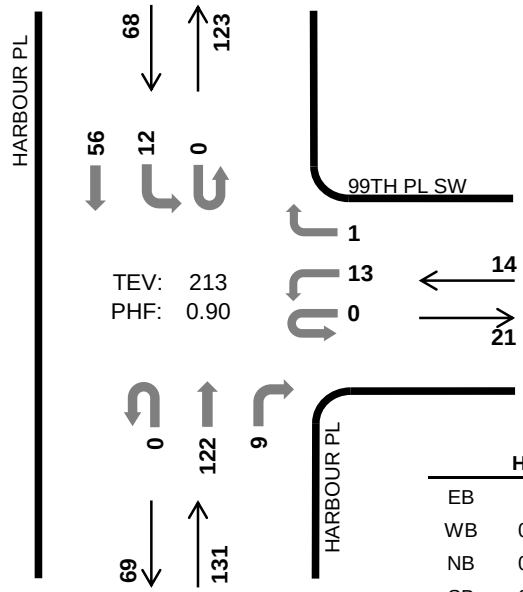
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	0	0	1	*1*	0	0	0	1	*1*	0	0	0	0	*0*
4:15 PM	0	0	0	0	*0*	0	0	1	1	*2*	0	4	0	0	*4*
4:30 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**1**	**1**	***2***	**0**	**6**	**1**	**0**	*7*
4:45 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**3**	**0**	***3***	**0**	**8**	**0**	**0**	*8*
5:00 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**1**	**1**	***2***	**0**	**2**	**0**	**0**	*2*
5:15 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**2**	**0**	***2***	**0**	**6**	**0**	**0**	***6***
5:30 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	7	0	0	*7*
5:45 PM	0	0	0	0	*0*	0	0	1	2	*3*	0	3	0	0	*3*
Count Total	0	0	0	1	*1*	0	0	9	6	*15*	0	36	1	0	*37*
Peak Hr	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**7**	**2**	***9***	**0**	**22**	**1**	**0**	***23***

HARBOUR PL
99TH PL SW

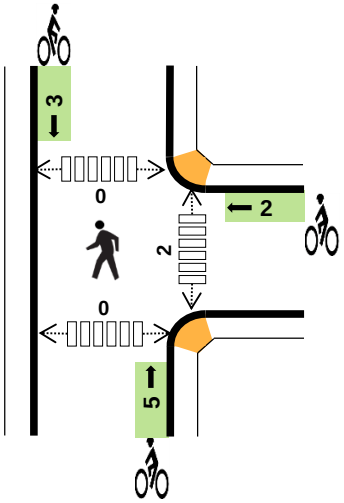
N

Peak Hour



	HV %:	PHF
EB	-	-
WB	0.0%	0.70
NB	0.0%	0.84
SB	0.0%	0.71
TOTAL	0.0%	0.90

Date: Wed, May 11, 2016
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:15 PM to 5:15 PM



Two-Hour Count Summaries

Interval Start	0				99TH PL SW				HARBOUR PL				HARBOUR PL				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	0	0	3	0	0	0	0	29	1	0	0	20	0	53	0
4:15 PM	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**23**	**1**	**0**	**1**	**16**	**0**	**45**	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**1**	**0**	**0**	**32**	**2**	**0**	**2**	**10**	**0**	**51**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**32**	**2**	**0**	**6**	**18**	**0**	**59**	208
5:00 PM	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**35**	**4**	**0**	**3**	**12**	**0**	**58**	**213**
5:15 PM	0	0	0	0	0	4	0	0	0	0	25	0	0	4	12	0	45	213
5:30 PM	0	0	0	0	0	3	0	1	0	0	18	0	0	2	16	0	40	202
5:45 PM	0	0	0	0	0	4	0	0	0	0	18	0	0	0	12	0	34	177
Count Total	0	0	0	0	0	27	0	2	0	0	212	10	0	18	116	0	385	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**13**	**0**	**1**	**0**	**0**	**122**	**9**	**0**	**12**	**56**	**0**	**213**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	0	0	1	*1*	0	0	0	1	*1*	0	0	0	0	*0*
4:15 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**1**	**1**	***2***	**0**	**0**	**0**	**0**	*0*
4:30 PM	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**1**	**1**	***3***	**1**	**0**	**0**	**0**	*1*
4:45 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**3**	**0**	***3***	**0**	**0**	**0**	**0**	*0*
5:00 PM	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**1**	***2***	**1**	**0**	**0**	**0**	***1***
5:15 PM	0	0	0	0	*0*	0	0	2	0	*2*	1	0	0	0	*1*
5:30 PM	0	0	0	0	*0*	0	0	0	0	*0*	2	0	2	0	*4*
5:45 PM	0	0	0	0	*0*	0	0	1	2	*3*	0	0	0	0	*0*
Count Total	0	0	0	1	*1*	0	2	8	6	*16*	5	0	2	0	*7*
Peak Hr	**0**	**0**	**0**	**0**	***0***	**0**	**2**	**5**	**3**	***10***	**2**	**0**	**0**	**0**	***2***

LOS Analysis

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	30	23	25	60	44	26
Future Vol, veh/h	30	23	25	60	44	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	63	63	63	63	63	63
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	48	37	40	95	70	41

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	266	91	111	0	-	0
Stage 1	91	-	-	-	-	-
Stage 2	175	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	723	967	1479	-	-	-
Stage 1	933	-	-	-	-	-
Stage 2	855	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	703	967	1479	-	-	-
Mov Cap-2 Maneuver	708	-	-	-	-	-
Stage 1	908	-	-	-	-	-
Stage 2	855	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10	2.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1479	-	801	-	-
HCM Lane V/C Ratio	0.027	-	0.105	-	-
HCM Control Delay (s)	7.5	-	10	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	1	84	1	19	48
Future Vol, veh/h	4	1	84	1	19	48
Conflicting Peds, #/hr	0	0	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	25	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	63	63	63	63	63	63
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	6	2	133	2	30	76

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	272	136	0	0	137	0
Stage 1	136	-	-	-	-	-
Stage 2	136	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	722	918	-	-	1459	-
Stage 1	895	-	-	-	-	-
Stage 2	895	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	705	916	-	-	1456	-
Mov Cap-2 Maneuver	719	-	-	-	-	-
Stage 1	874	-	-	-	-	-
Stage 2	895	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.9	0	2.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	719	916	1456	-
HCM Lane V/C Ratio	-	-	0.009	0.002	0.021	-
HCM Control Delay (s)	-	-	10.1	8.9	7.5	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	0.1	-

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	31	24	26	62	46	27
Future Vol, veh/h	31	24	26	62	46	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	63	63	63	63	63	63
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	49	38	41	98	73	43

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	275	95	116	0	-	0
Stage 1	95	-	-	-	-	-
Stage 2	180	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	715	962	1473	-	-	-
Stage 1	929	-	-	-	-	-
Stage 2	851	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	695	962	1473	-	-	-
Mov Cap-2 Maneuver	702	-	-	-	-	-
Stage 1	903	-	-	-	-	-
Stage 2	851	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.1	2.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1473	-	796	-	-
HCM Lane V/C Ratio	0.028	-	0.11	-	-
HCM Control Delay (s)	7.5	-	10.1	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	1	87	1	20	50
Future Vol, veh/h	4	1	87	1	20	50
Conflicting Peds, #/hr	0	0	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	25	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	63	63	63	63	63	63
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	6	2	138	2	32	79

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	284	141	0	0	142	0
Stage 1	141	-	-	-	-	-
Stage 2	143	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	710	912	-	-	1453	-
Stage 1	891	-	-	-	-	-
Stage 2	889	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	693	910	-	-	1450	-
Mov Cap-2 Maneuver	710	-	-	-	-	-
Stage 1	870	-	-	-	-	-
Stage 2	889	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.9	0	2.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	710	910	1450	-
HCM Lane V/C Ratio	-	-	0.009	0.002	0.022	-
HCM Control Delay (s)	-	-	10.1	9	7.5	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	0.1	-

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	31	24	26	67	48	27
Future Vol, veh/h	31	24	26	67	48	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	63	63	63	63	63	63
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	49	38	41	106	76	43

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	286	98	119	0	-	0
Stage 1	98	-	-	-	-	-
Stage 2	188	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	704	958	1469	-	-	-
Stage 1	926	-	-	-	-	-
Stage 2	844	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	684	958	1469	-	-	-
Mov Cap-2 Maneuver	695	-	-	-	-	-
Stage 1	900	-	-	-	-	-
Stage 2	844	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.1	2.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1469	-	790	-	-
HCM Lane V/C Ratio	0.028	-	0.111	-	-
HCM Control Delay (s)	7.5	-	10.1	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	1	92	1	20	52
Future Vol, veh/h	4	1	92	1	20	52
Conflicting Peds, #/hr	0	0	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	25	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	63	63	63	63	63	63
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	6	2	146	2	32	83

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	296	149	0	0	150	0
Stage 1	149	-	-	-	-	-
Stage 2	147	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	699	903	-	-	1444	-
Stage 1	884	-	-	-	-	-
Stage 2	885	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	682	901	-	-	1441	-
Mov Cap-2 Maneuver	703	-	-	-	-	-
Stage 1	863	-	-	-	-	-
Stage 2	885	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10	0	2.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	703	901	1441	-
HCM Lane V/C Ratio	-	-	0.009	0.002	0.022	-
HCM Control Delay (s)	-	-	10.2	9	7.6	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	0.1	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	6	2	88	54	2
Future Vol, veh/h	5	6	2	88	54	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	25	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	63	63	63	63	63	63
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	10	3	140	86	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	234	88	89	0	-	0
Stage 1	88	-	-	-	-	-
Stage 2	146	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	754	970	1506	-	-	-
Stage 1	935	-	-	-	-	-
Stage 2	881	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	752	970	1506	-	-	-
Mov Cap-2 Maneuver	754	-	-	-	-	-
Stage 1	933	-	-	-	-	-
Stage 2	881	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	0.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1506	-	858	-	-
HCM Lane V/C Ratio	0.002	-	0.02	-	-
HCM Control Delay (s)	7.4	-	9.3	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	10	7	118	58	5
Future Vol, veh/h	7	10	7	118	58	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	12	8	140	69	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	228	72	75	0	-	0
Stage 1	72	-	-	-	-	-
Stage 2	156	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	760	990	1524	-	-	-
Stage 1	951	-	-	-	-	-
Stage 2	872	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	756	990	1524	-	-	-
Mov Cap-2 Maneuver	753	-	-	-	-	-
Stage 1	946	-	-	-	-	-
Stage 2	872	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	0.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1524	-	876	-	-
HCM Lane V/C Ratio	0.005	-	0.023	-	-
HCM Control Delay (s)	7.4	-	9.2	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	13	1	122	9	12	56
Future Vol, veh/h	13	1	122	9	12	56
Conflicting Peds, #/hr	0	0	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	25	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	14	1	136	10	13	62

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	231	143	0	0	148	0
Stage 1	143	-	-	-	-	-
Stage 2	88	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	762	910	-	-	1446	-
Stage 1	889	-	-	-	-	-
Stage 2	940	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	754	908	-	-	1443	-
Mov Cap-2 Maneuver	755	-	-	-	-	-
Stage 1	879	-	-	-	-	-
Stage 2	940	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	1.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	755	908	1443	-
HCM Lane V/C Ratio	-	-	0.019	0.001	0.009	-
HCM Control Delay (s)	-	-	9.9	9	7.5	-
HCM Lane LOS	-	-	A	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	0	-

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	11	8	130	64	6
Future Vol, veh/h	8	11	8	130	64	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	13	10	155	76	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	255	80	83	0	-	0
Stage 1	80	-	-	-	-	-
Stage 2	175	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	734	980	1514	-	-	-
Stage 1	943	-	-	-	-	-
Stage 2	855	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	729	980	1514	-	-	-
Mov Cap-2 Maneuver	733	-	-	-	-	-
Stage 1	936	-	-	-	-	-
Stage 2	855	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	0.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1514	-	858	-	-
HCM Lane V/C Ratio	0.006	-	0.026	-	-
HCM Control Delay (s)	7.4	-	9.3	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	1	135	10	13	62
Future Vol, veh/h	14	1	135	10	13	62
Conflicting Peds, #/hr	0	0	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	25	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	16	1	150	11	14	69

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	255	158	0	0	163	0
Stage 1	158	-	-	-	-	-
Stage 2	97	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	738	893	-	-	1428	-
Stage 1	875	-	-	-	-	-
Stage 2	932	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	729	891	-	-	1425	-
Mov Cap-2 Maneuver	738	-	-	-	-	-
Stage 1	865	-	-	-	-	-
Stage 2	932	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.9	0	1.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	738	891	1425	-
HCM Lane V/C Ratio	-	-	0.021	0.001	0.01	-
HCM Control Delay (s)	-	-	10	9	7.6	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	0	-

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	11	8	133	69	6
Future Vol, veh/h	8	11	8	133	69	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	13	10	158	82	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	264	86	89	0	-	0
Stage 1	86	-	-	-	-	-
Stage 2	178	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	725	973	1506	-	-	-
Stage 1	937	-	-	-	-	-
Stage 2	853	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	720	973	1506	-	-	-
Mov Cap-2 Maneuver	728	-	-	-	-	-
Stage 1	930	-	-	-	-	-
Stage 2	853	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	0.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1506	-	852	-	-
HCM Lane V/C Ratio	0.006	-	0.027	-	-
HCM Control Delay (s)	7.4	-	9.3	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	1	138	10	13	67
Future Vol, veh/h	14	1	138	10	13	67
Conflicting Peds, #/hr	0	0	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	25	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	16	1	153	11	14	74

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	263	161	0	0	166	0
Stage 1	161	-	-	-	-	-
Stage 2	102	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	730	889	-	-	1424	-
Stage 1	873	-	-	-	-	-
Stage 2	927	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	721	887	-	-	1421	-
Mov Cap-2 Maneuver	733	-	-	-	-	-
Stage 1	863	-	-	-	-	-
Stage 2	927	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.9	0	1.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	733	887	1421	-
HCM Lane V/C Ratio	-	-	0.021	0.001	0.01	-
HCM Control Delay (s)	-	-	10	9.1	7.6	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	0	-

Intersection						
Int Delay, s/veh	0.5					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	4	6	145	76	5
Future Vol, veh/h	3	4	6	145	76	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	25	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	5	7	173	90	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	280	93	96	0	-	0
Stage 1	93	-	-	-	-	-
Stage 2	187	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	710	964	1498	-	-	-
Stage 1	931	-	-	-	-	-
Stage 2	845	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	706	964	1498	-	-	-
Mov Cap-2 Maneuver	720	-	-	-	-	-
Stage 1	926	-	-	-	-	-
Stage 2	845	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1498	-	842	-	-
HCM Lane V/C Ratio	0.005	-	0.01	-	-
HCM Control Delay (s)	7.4	-	9.3	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	1.9

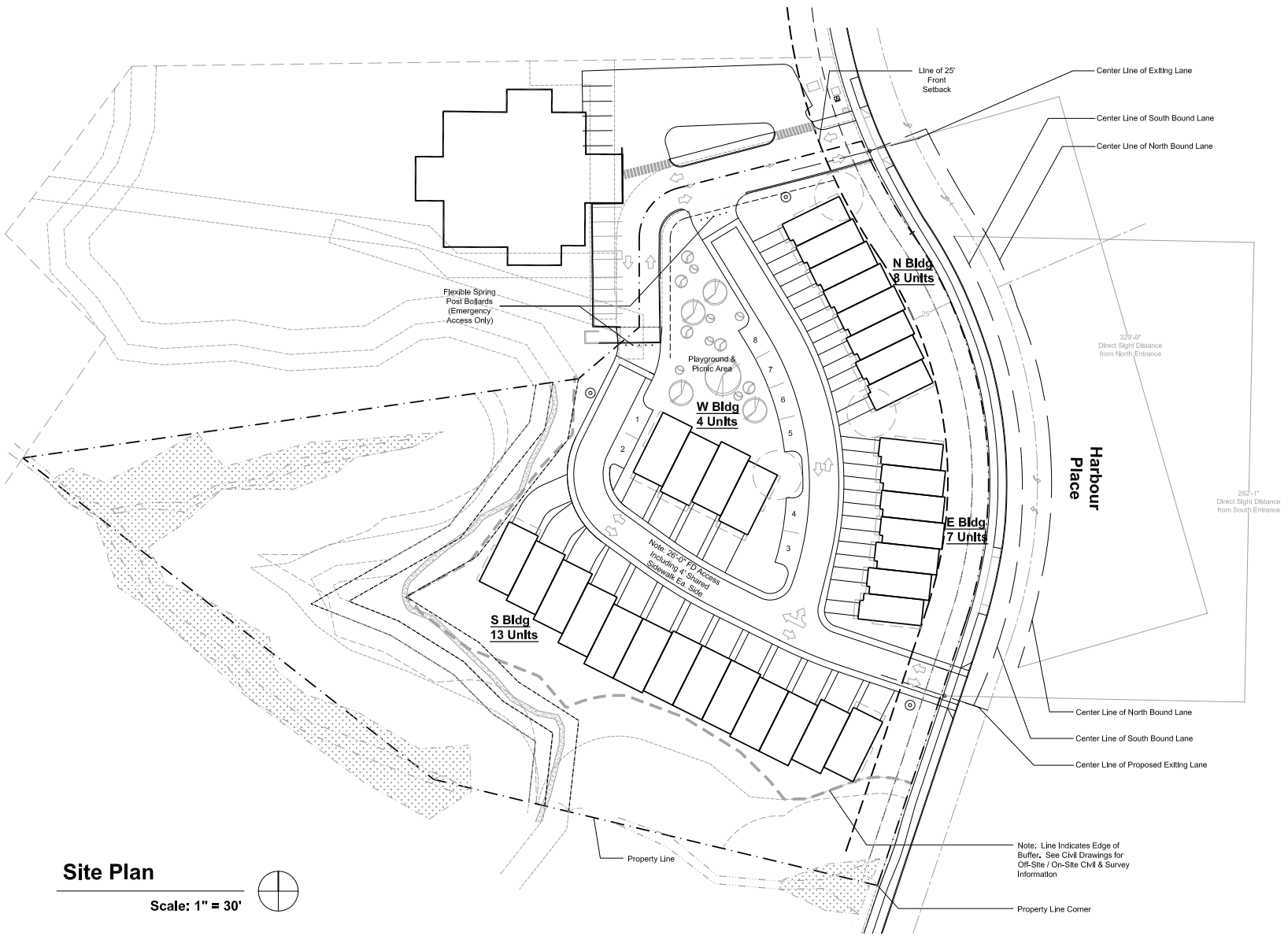
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	17	22	18	130	64	14
Future Vol, veh/h	17	22	18	130	64	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	26	21	155	76	17

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	282	85	93	0	-	0
Stage 1	85	-	-	-	-	-
Stage 2	197	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	708	974	1501	-	-	-
Stage 1	938	-	-	-	-	-
Stage 2	836	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	698	974	1501	-	-	-
Mov Cap-2 Maneuver	708	-	-	-	-	-
Stage 1	925	-	-	-	-	-
Stage 2	836	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1501	-	837	-	-
HCM Lane V/C Ratio	0.014	-	0.055	-	-
HCM Control Delay (s)	7.4	-	9.6	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Site Plan



Site Plan

Scale: 1" = 30'

Lemons Architecture PLLC
98 Yesler Way
Seattle, WA 98104
206.306.6952
LemonsArchitecture.com

10848 REGISTERED ARCHITECT
JONATHAN LEMONS
STATE OF WASHINGTON

ISSUE	DATE
Major Sector Amendment Phase	2019.08.16

Site Plan
Harbour Pointe Community
1000 Harbour Place
Mukilteo, WA 98275

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JOB NUMBER:

A1.0

EXISTING MONTESSORI
1 LEVEL RETAIL STRIP MALL 10,000 SF
Line of 25' Front Setback
Center Line of Exiting Lane
Center Line of South Bound Lane
Center Line of North Bound Lane
Harbour Place
Center Line of North Bound Lane
Center Line of South Bound Lane
Center Line of Proposed Exiting Lane
Property Line
Note: Line Indicates Edge of Buffer. See Civil Drawings for Off-Site / On-Site Civil & Survey Information
Property Line Corner
Retail Strip Mall - Site Plan
Scale: 1"=30'
8.8.19
Site Plan
Scale: 1" = 30'

MAJOR SECTOR AMENDMENT
OCTOBER 2019

IMPACT ANALYSIS REPORT

This Impact Analysis Report is submitted as required by the Mukilteo Municipal Code (MMC) Table 3 – Permit Submittal Requirements (17.13.040) Other – Impact analysis report for the Harbour Pointe Townhouses Major Sector Amendment to amend the existing Sector 3 Development Agreement to allow the proposal. This Impact Analysis is provided to summarize those impacts anticipated with development of the proposed 32-unit attached residential townhouse development on the 3.3-acre site. The applicant has submitted detailed reports and plans, held community meetings with neighbors, and had two pre-application meetings with the City of Mukilteo, in preparation of a responsive townhouse development proposal for the subject site. The following project impacts are also detailed within the SEPA Environmental Checklist, project application materials and consultant reports. Within this Impact Analysis, the impacts are provided in the same order as found in the Checklist, Section B. Environmental Elements, which includes the following detailed within this analysis:

1. Earth
   - Earthwork and Drainage
3. Water (a. Surface Water)
   - Wetlands and Streams
4. Plants
   - Landscaping
7. Environmental Health (b. Noise)
8. Land and Shoreline Use
   - Compatibility
14. Transportation
   - Transit
15. Public Services
   - City Services (police, fire, and parks)
   - School District Services (schools)

1. Earth
- Earthwork/Drainage

Roads and building sites would be cleared, graded and compacted as necessary to achieve proper grading transition, drainage and structural stability. Approximately 1,000 cubic yards of material will be cut, and approximately 1,100 cubic yards will be used for fill. Fill material will be from on-site cut material, and excess cut material will be exported off-site.

Surface runoff during construction and after development would be controlled by the drainage system according to approved drainage and temporary erosion control plans. Best management practices (BMPs) will be incorporated into the grading activity. A Temporary Erosion and Sedimentation Control plan (TESC) will be put in place and will incorporate erosion control measures. To the extent possible the disturbed area of the project site will be limited to minimize erosion potential. Operation and maintenance activities, and storage and disposal at the construction site will be conducted to minimize the potential for contamination of stormwater runoff. Enhanced water quality treatment is incorporated into the project design.

Drainage detention and controlled release will limit erosion impacts, and primary treatment in the form of live and dead storage will settle sediments. The location and design of permanent storm drainage facilities will match existing drainage patterns and runoff rates in compliance with City regulations.

3. Water
- Wetlands and Streams

The South Fork of Big Gulch Creek lies just west of the site and an unnamed tributary, with associated wetlands, flows along the south property line of the site. Two wetlands (Wetlands A and B) and two streams (Streams A and B) were identified on the subject property. Pursuant to MMC, critical areas, wetlands, and fish and wildlife habitat conservation areas were assessed adjacent to the subject site, that may project regulated buffers onto the property. The South Fork of Big Gulch Creek is located approximately 100 feet west of the subject property. No additional off-site features were identified.

To accommodate the proposed development, the applicant is proposing minor buffer averaging, pursuant to MMC 17.52C.090 and 17.52B.100. The buffer adjacent to Building-S (Lot-1) will be reduced by 473 square feet (SF). This portion of the buffer will be reduced by an average of 10-feet, with a minimum buffer of width of 40 feet. The proposed reduction plan is thereby less impactful than the maximum 17.5-ft reduction allowed. The area proposed for the buffer reduction is currently dominated by Himalayan blackberry with no significant trees. As such, reducing this area will have the least impact in terms of buffer function, and will not adversely impact the functions and values of the subject wetland. This proposed mitigation will not reduce the total area of buffer on the subject property. As compensatory mitigation, 1,360 SF of additional buffer (a 2.9:1 mitigation ratio) will be provided between the two distinct wetland and stream areas, creating contiguous protected buffer along the southern property line. This buffer addition area will help to establish a connected riparian and wetland corridor. An open canopy of big leaf maple and red alder currently dominates the area proposed for additional buffer. The proposed buffer averaging plan provides an additional 337 SF of buffer protected in perpetuity. The averaging plan summarized below (***Table 1***) provides an increase to wetland and stream functions and values by increasing the total buffer area, and by providing a connected corridor, which will maintain quantity, density, and structural diversity of the native plant assemblage within the on-site buffer, thereby improving attenuation of floodflow, biofiltration function, and the quality of wildlife habitat provided (see submitted *Critical Areas Plan* for additional detail).

Table 1 – Summary of Proposed Actions

Action	Impact Area	Compensatory Mitigation	Mitigation to Impact Ratio
Buffer Reduction	473 square feet	1,360 square feet of Buffer Addition	2.9:1

Source: *Critical Area Study*, Wetlands Resources Inc. 2019

Clearing, grading, and building construction will take place outside the buffers of the stream and associated wetlands, subject to land-disturbing restrictions pursuant to City code.

The wetland and stream buffers will be protected in their natural condition within designated areas. In the City of Mukilteo, regulated streams, wetlands and their buffers are designated collectively as Native Growth Protection Areas (NGPAs). All NGPAs will be shown on the development site plans and protected as described in MMC 17.52.035. See ***Landscape section*** of this Impact Analysis for additional discussion of the critical areas.

4. Plants
- Landscaping

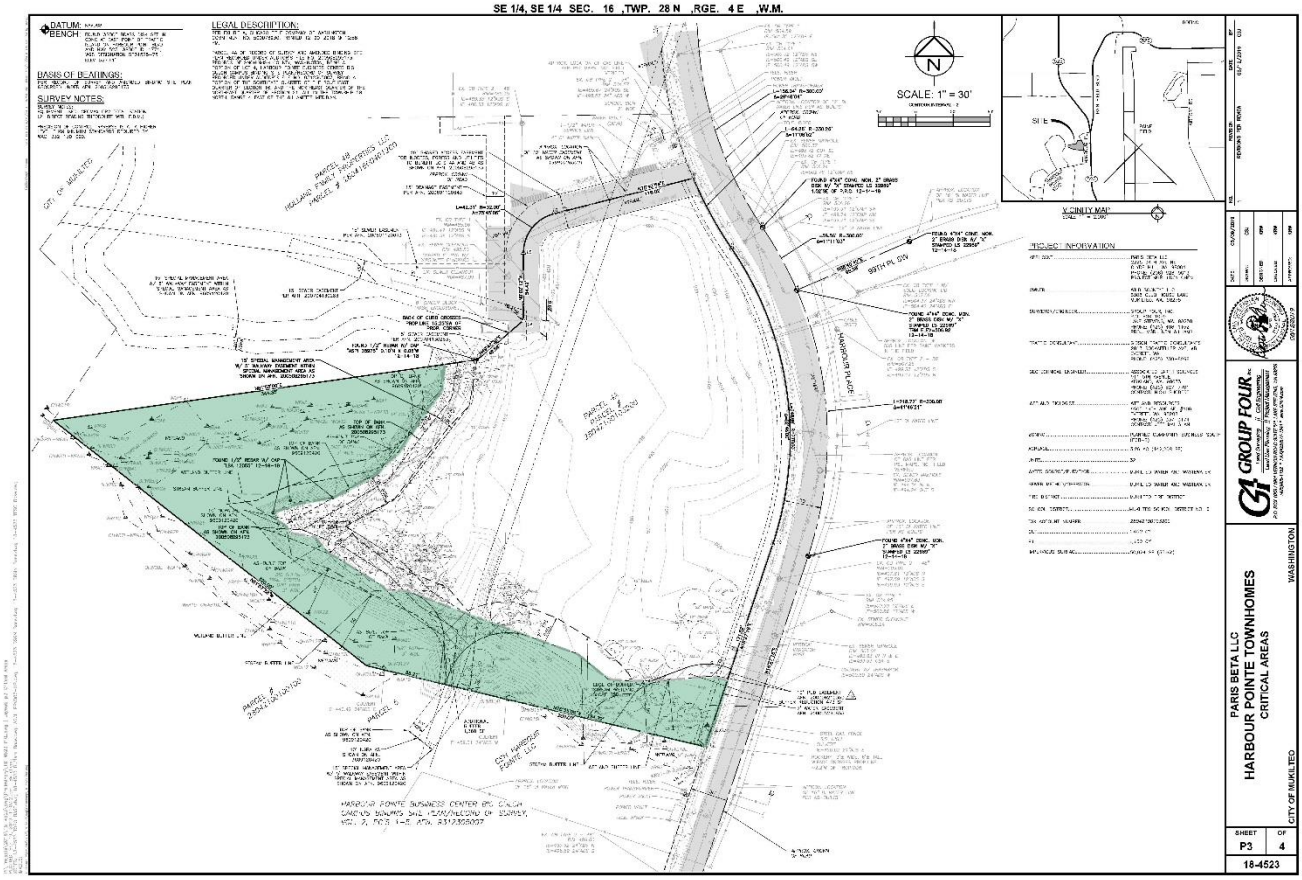
All cleared areas, excluding buildings and parking, will be landscaped upon completion of the project. Hydro-seeding may possibly occur on barren areas, per City requirements. Landscaping requirements will be provided consistent with City code requirements.

The proposed development plan has minimized the disturbance to the existing natural vegetation outside the project footprint whenever feasible, including protection of the NGPA area where trees and vegetation will remain protected and undisturbed. Onsite critical areas signages will be placed in compliance with City codes and standards. The project will be consistent within the requirements of the Sector 3 Development Agreement, which includes Landscape, Trail and NGPA Standards. The Harbour Place Streetscape will be enhanced as required by Exhibit 2B Development Standards and Design Guidelines Lot 4A, 12 through 16. This will include enhancing the Harbour Place Streetscape planting strip; preparation of a landscape plan with building permits; installation of a pervious surface pathway to the existing Big Gulch trail on the property; creating diversity in color, texture and pattern of hardscape, as well as incorporating site features (seating area, play area and/or installation of public art); and inclusion of pedestrian scale lighting of common space, guest parking area and sidewalks.

Typical onsite landscaping will include integration of the residential units to the adjacent natural areas. The site rendering shows the landscaping and elevations of the townhouses. The building elevation shows the trees in front of the units to aesthetically soften the building, which is further attenuated by the variation of color and façade. This preliminary design has been shared at the community meetings (March and April of 2019) and received positive feedbacks from the neighbors.

As previously detailed in the *Wetlands section*, the wetland and stream buffers will be protected in their natural condition within designated Native Growth Protection Areas (NGPAs). All NGPAs will be shown on the development site plans and protected as described in MMC 17.52.035. The submitted ***Critical Areas Plan*** *(see following inset)* shows areas that will remain protected within the Native Growth Protection Areas (NGPAs) with no development encroachment (the green colored zone). This area includes the critical areas (wetlands and streams) and its associated buffer.

According to the Washington State Department of Fisheries and Wildlife's Priority Habitats and Species on the Web database, there were no threatened or endangered vegetation species identified on or known to exist on or adjacent to the proposal site.



7. Environmental Health
- Noise

Per WAC 173-60-30, the Harbour Pointe Townhomes project is classified as Class A EDNA and will comply to allowable noise level defined in WAC 173-60-040. The maximum permissible noise levels should be 55dBA at the townhomes. The proposed project is intended to comply with the noise ordinances and regulations per MMC Chapter 8.18 Noise Control.

It is not anticipated that the adjacent uses will adversely impact the proposal, nor will the proposed residential use adversely impact those closest neighboring uses (private pre-school and senior housing).

It should be noted that during the construction period, the provisions in WAC 173-60-40, can be exempted for construction activities per WAC 173-60-050.3.a.

The City of Mukilteo prohibits construction noise (9.45.080 MMC) Monday through Friday before seven a.m. and after nine p.m. and Saturdays/Sundays/holidays (defined in RCW 1.16.050), before nine a.m. and after seven p.m.

8. Land and Shoreline Use
- Compatibility with Adjacent Uses

The Basel Townhomes project site is bounded to the east by Harbour Place, to the north by Harbour Pointe Montessori School, to the west by Big Gulch, and to the south by Harbour Pointe Senior Living. There are currently no residential multi-family townhomes within the project's immediate vicinity. Compatibility of the project with adjacent uses has been established by adherence to the City's municipal code, which includes design standards and is detailed within the submitted proposal reports.

The project site is part of the "Mukilteo Town Square" neighborhood area, which consists of Staybridge Suites, Harbour Point Business Center, and the Harbour Pointe Montessori School. The project proponents have worked to gain favorable support from these neighboring businesses/uses through ongoing communication and design collaboration. This includes design features and considerations described within the *Landscaping, Critical Areas, Transportation and Noise sections* of this analysis.

Immediate disturbance from site construction has been considered and will be mitigated by allowing site access via the new south proposed entrance and locating the construction office trailer nearby to minimize traffic, noise, and inconvenience to the Harbour Pointe Montessori School. The shared egress with the school will only be used by emergency vehicles and is intended to avoid cross-traffic pollination between the residents of the townhouses and the school after project completion.

The project is designed also to have a direct, physical connection to the Big Gulch trail to allow its residents full access to the natural trail system, thereby utilizing this recreational and environmental amenity. A wetland and stream buffer zone will be in place on the south side, which also serves to provide a transitional zone between the Harbour Pointe Senior Living and the proposed townhomes.

Further discussion on compatibility was described in the Checklist 8.g. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

> The proposed development of townhouses is subject to impact mitigation fees for schools, parks and traffic. (Refer to the Cost Benefit Analysis prepared for the proposal.)
>
> Compatibility of the proposal is measured by consistency with the adopted comprehensive plan, zoning code, and environmental review. The proposal has been designed to provide this consistency with zoning, grading, building, critical areas, landscaping, storm and surface water, and other regulations adopted by the City. The project would meet or exceed the standards of all applicable City land use codes and regulations. Extensive reports have been prepared and submitted with this application to address the consistency with codes and regulations.
>
> The proposal would further the goals and policies of the adopted City Comprehensive Plan as it is consistent with the following elements:

Land Use

LU2: Development regulations and standards that improve the quality of life of Mukilteo residents and promote the city's single-family residential character should be adopted.

LU9: The City shall manage and regulate development in critical areas and the shoreline to allow reasonable and appropriate uses in those areas while protecting them against adverse effects and shall regularly evaluate these regulations and programs to ensure they continue to use the best available science to protect environmentally sensitive areas from negative impacts associated with development.

LU13: New development and redevelopment, both in Mukilteo and at Snohomish County/Paine Field Airport, should be complementary to each other and should support general aviation and the aerospace industry over all other airport uses.

Housing

HO2: Housing policies, programs, and regulations designed to support and promote sustainability and which minimize the impact on environmentally sensitive areas should be developed.

HO5: A wide variety of housing options should be encouraged in the city's residential and mixed use zoning districts to meet demands for housing, including affordable housing.

Transportation

TR2: Future development shall be required to pay its proportionate share of the cost to increase the City's transportation system's ability to handle the additional traffic generated by the development.

TR9: Pedestrian and bicycle facilities, streetscape standards, and traffic calming methods should be installed to improve connectivity between parks, retail centers, schools, and regional transportation nodes and to promote a pedestrian and bicycle friendly environment.

14. Transportation

A detailed, expanded traffic impact report of the Harbour Pointe Townhomes project is provided in the August 2019 Traffic Impact Analysis by Gibson Traffic Consultants submitted as part of the Major Sector Amendment Application on September 20, 2019.

Access to the Harbour Pointe Townhomes will be through a full access approximately 330 feet south of the existing private pre-school access with emergency accesses to the existing school access on the north side.

The project will generate 234 ADT with 15 AM peak hour trips and 18 PM peak hour trips. The residential distribution has approximately 47% of the development's trips traveling to and from the north and 53% traveling from the south. The project is requesting a sight distance variance from City standards to meet AASHTO standards.

A current allowable zoning trip generation comparison is included in the August 2019 Traffic Impact Analysis. The allowable zoning of 10,000 SF of retail will generate 249 ADT with 6 AM peak hour trips and 25 PM peak-hour trips. This is an increase of 15 ADT and 7 PM peak hour trips and a decrease of 9 AM peak hour trips over the proposed development.

The City of Mukilteo assesses traffic impact fees based on $1,875 per new peak hour trip. The project will generate 17.92 new PM peak hour trips and is obligated to pay a traffic mitigation fee of $33,600 to the City of Mukilteo. The project is not anticipated to impact Snohomish County roadways and therefore is not required to pay mitigation fees to Snohomish County.

Transit

The proposed development will have very limited impact to the local transit system. According to the Mukilteo Comprehensive Plan 2015-2035, with only 1.9% of the total city area vacant, the opportunities for the types of redevelopment that might generate significant traffic and transit impacts are very limited. The City of Mukilteo's land use policies will have little impact on transportation conditions. According to the United States Census Bureau, the City has a total area of 9.5 square miles, of which 6.4 square miles is land. Thus, the City's vacant land area is around 3,390,000 square feet. The proposed development site is 3.26 acres (142,000± SF), only 4.19% of the City's vacant area. Moreover, the project has only 32 units/townhomes, which is a low to moderate density development.

Therefore, with the limited proportion of the total vacant area and a low to moderate density development, the proposed project will generate little impact to transit.

15. Public Services
- City Services (police, fire, and parks)
- School District Services (schools)

City Services (police, fire, and parks)

Leland Consulting Group (LCG) on behalf of Basel Capital completed a Cost-Benefit Analysis during August and September 2019 for the proposed 32-unit townhome project. The Cost-Benefit Analysis is submitted for the Major Sector Amendment Application on September 20, 2019. It provides analysis of impact to City services with detailed supporting data.

To evaluate the long-run impact of the proposed townhome project, the analysis assumes a 1-year construction period (2020), as well as 10 years of property occupancy (2021 through 2030). Total, present value of costs is $323,980, and present value of revenues (including mitigation fees of School/ Park/ City Traffic) is $910,549. The project generates a net benefit of $586,569. ***Table 2*** below summarized the revenues and costs associated with townhome project.

Table 2: Summary of Benefits and Costs for Townhome Project

Townhomes

Total Present Value of Benefits and Costs

Revenues

Tax or Fee Type		**Present Value**
Property Tax	Operation	$279,569
Sales Tax	During Construction	$124,048
	Operation	$0
Real Estate Excise Tax (REET)	Initial Home Sales	$107,019
	Ongoing Home Sales	$153,683
Mitigation fees	School	$181,015
	Park	$49,569
	City Traffic	$32,308
Total		**$910,549**
Cost		($323,980)
Net Benefit or (Cost)		**$586,569**

Source: Cost-Benefit Analysis for Proposed Development of Harbour Place Property, Leland Consulting Group, September 5, 2019.

The cost of City services (police, fire, parks) is included in the estimate of total cost. The total cost of $323,980 shown in ***Table 1*** represent a proportionate share of the City's General Fund costs. The General Fund is the City's primary funding source for the following core City functions: Police, Fire, Community Development, Public Works, Council, Executive, Human Resources, Legal, Finance, Information Technology, and "non-departmental". The total cost estimate covers a much wider range than Police, Fire and Parks.

The City's cost to serve each property were estimated as follows. By combining the City's total population (estimated at 21,647 in 2019) with the number of employees who work in the City

(estimated at 9,730 in 2019), LCG get a total number of people served by the City (31,377). The City's 2019 general fund budget is $13,903,878. Therefore, the annual cost to serve one person (whether resident or employee) is about $443. The townhome project is estimated to have about 82 residents (2.56/unit). ***Table 3*** shows the demographics of the proposed development site. According to CoStar (***Table 3***), the average household size in local community is 2.5. LCG assumes 3% annual increase for the costs, and 4% discount rate. The discount rate accounts for both inflation (of revenues and costs), and some risks that revenues will not materialize. The present value of total costs in a 10-year period is $323,980.

Table 3: Population, Household Demographics

Population	1 Mile	3 Mile	10 Mile
2019 Total Population:	5,540	82,450	564,939
2024 Population:	5,987	88,817	613,039
Pop Growth 2019-2024:	8.07%	7.72%	8.51%
Average Age:	40.00	36.60	38.40
Households			
2019 Total Households:	2,131	32,341	218,985
HH Growth 2019-2024:	7.46%	7.53%	8.39%
Median Household Inc:	$95,247	$69,060	$80,827
Avg Household Size:	2.50	2.50	2.50
2019 Avg HH Vehicles:	2.00	2.00	2.00

Source: CoStar

In summary, the revenues generated by the proposed project ($910,549) will be adequate to pay for the anticipated costs ($323,980) of incremental use of City services.

School District Services (schools)

The Mukilteo School District (District) provided Projected Student Enrollment 2018-2023 in the Mukilteo School District No.6 Capital Facilities Plan 2018-2023. The following table (***Table 4***) shows the Modified Cohort Enrollment Projections (including housing permit data and birth rate data). According to the table, the total District enrollment in 2019-2023 will be increasing from 15,772 to 17,121. The average household size in the proposed development's local community is 2.5. The project will bring about 16 more students to the local school district, representing approximately 0.1% of the current enrollment projection of the District. Therefore, the impact of proposed development to the local school system will be limited.

Table 4: Modified Cohort Enrollment Projections
(including housing permit data and birth rate data)

Grade	Actual 2017	Projections 2018	2019	2020	2021	2022	2023
K	1,146	1,194	1,203	1,233	1,276	1,273	1,284
1	1,157	1,213	1,268	1,278	1,310	1,356	1,353
2	1,144	1,189	1,232	1,288	1,296	1,328	1,374
3	1,206	1,178	1,213	1,257	1,311	1,318	1,352
4	1,240	1,247	1,199	1,235	1,279	1,335	1,342
5	1,303	1,263	1,266	1,218	1,254	1,299	1,355
6	1,174	1,309	1,270	1,274	1,222	1,258	1,304
7	1,159	1,200	1,328	1,289	1,290	1,238	1,275
8	1,213	1,176	1,225	1,355	1,315	1,316	1,263
9	1,154	1,233	1,184	1,233	1,364	1,338	1,339
10	1,130	1,160	1,234	1,185	1,233	1,383	1,356
11	1,012	1,057	1,080	1,148	1,108	1,181	1325
12	1,037	1,028	1,069	1,092	1,166	1,126	1,200
Total K-5	**7,196**	**7,284**	**7,382**	**7,508**	**7,726**	**7,909**	**8,060**
Total 6-8	**3,546**	**3,686**	**3,823**	**3,918**	**3,827**	**3,812**	**3,841**
Total 9-12	**4,333**	**4,479**	**4,567**	**4,658**	**4,872**	**5,028**	**5,220**
District Total	**15,075**	**15,448**	**15,772**	**16,084**	**16,425**	**16,749**	**17,121**

Source: Mukilteo School District No.6 Capital Facilities Plan 2018-2023

The proposed development of 32-units/townhomes will contribute $188,256 as the School Mitigation Fee. According to the City of Mukilteo 2019 Master Fee Schedule, the school mitigation fee for each Multi-Family/ Duplex/ Townhomes 2+ Bedrooms is $5,883. The school mitigation fee will effectively offset the limited impact to the local school district.

LELAND CONSULTING GROUP

Cost-Benefit Analysis for Proposed Development of Harbour Place Property

Date September 10, 2019
To Lucy Chen and Maria Hui, Basel Capital
From Brian Vanneman, Leland Consulting Group
Subject Cost-Benefit Analysis | Harbour Place Property

This memorandum summarizes a Cost-Benefit Analysis for a 3.2-acre property located near 9850 Harbour Place, in Mukilteo, Washington ("the subject site"). The subject site does not have an exact address yet as it is undeveloped; the site's parcel number is 28042100103200.

Basel Capital is proposing to purchase and develop the subject site. Their current development concept is to develop 32 townhomes.

As part of the City of Mukilteo's review and entitlement process, the City asked that Basel Capital complete a cost-benefit analysis, which would "address any anticipated revenue to the City from the proposed development as well as an estimated cost to the City for providing services (i.e. police and fire) to serve the proposed development."

In order to further understand the potential costs and benefits to the City, City staff asked Basel Capital to evaluate the costs and benefits associated with two different development options. The first is Basel Capital's proposed 32-townhouse project. The second is a 10,000 square foot retail/commercial center. Such a retail center would currently be allowed on the site, as would other different types of commercial development.

This memorandum summarizes the Cost-Benefit Analysis for both development options, completed by Leland Consulting Group (LCG) on behalf of Basel Capital during August and September 2019.

Summary of Findings

Figure 1 below summarizes the cost-benefit findings for both development options. Total, present values for both costs and benefits are shown, covering a 1-year construction period (2020), as well as 10 years of property occupancy and operation (2021 through 2030). This analysis shows that the townhome project generates a net benefit of $586,569, and the retail project generates a net benefit of $370, 972.

Figure 1 shows eight different types of City revenues, including property tax, sales tax (during construction and operation), real estate excise taxes (initial sales and ongoing sales over time), and mitigation fees (school, park, and city traffic fees). Another critical source of City revenue is utility fees (electricity, telephone, natural gas, television (cable), and garbage fees). The utility fee revenue received by the City on an annual basis is about the same as the amount of retail sales tax the City receives (about $2.7 million city-wide). Utility fees are not shown or included in LCG's calculation of City benefits. If they were included, the total and net benefits of both projects would be larger.

The property tax levy rate shown below includes both the City's base rate and the City's Emergency Medical Services rate. The sales tax rate shown below include both the City's base rate and the City's Transportation Benefit District rate.

Figure 1. Summary of Costs-Benefit Analysis for Townhome and Retail Options

Townhomes

Total Present Value of Benefits and Costs

Revenues

Tax or Fee Type		Present Value
Property Tax	Operation	$279,569
Sales Tax	During Construction	$124,048
	Operation	$0
Real Estate Excise Tax (REET)	Initial Home Sales	$107,019
	Ongoing Home Sales	$153,683
Mitigation fees	School	$181,015
	Park	$49,569
	City Traffic	$32,308
Total		**$910,549**

Cost	($323,980)
Net Benefit or (Cost)	**$586,569**

Retail

Total Present Value of Benefits and Costs

Revenues

Tax or Fee Type		Present Value
Property Tax	Operation	$47,976
Sales Tax	During Construction	$25,120
	Operation	$300,653
Real Estate Excise Tax (REET)	Initial Sale	$18,365
	Future Sale (1)	$25,368
Mitigation fees	School	$0
	Park	$0
	City Traffic	$45,072
Total		**$441,608**

Cost	($70,635)
Net Benefit or (Cost)	**$370,972**

Discount Rate (Both Scenarios)	4.0%

The costs shown in Figure 1 represent a proportionate share of the City's General Fund costs. The General Fund is the City's primary funding source for the following core City functions: Police, Fire, Community Development, Public Works, Council, Executive, Human Resources, Legal, Finance, Information Technology, and "non-departmental."

The City's cost to serve each property were estimated as follows. By combining the City's total population (estimated at 21,647 in 2019) with the number of employees who work in the City (estimated at 9,730 in 2019), we get a total number of people served by the City (31,377). The City's 2019 general fund budget is $13,903,878. Therefore, the annual cost to serve one person (whether resident or employee) is about $443. There will be more residents of the townhome project (about 82) than employees in the retail project (about 18), and therefore the cost to serve the townhome project is higher.

LCG uses a discount rate of 4.0% in order to discount future costs and revenues (e.g., for property taxes collected in 2030) back to current (2019) dollars. The discount rate accounts for both inflation (of revenues and costs), and some risk that revenues will not materialize.

Figure 2. Summary of Revenue Types, Tax Rates, and Base Year Revenues

Townhomes

Summary of Revenue Types, Tax Rates, and Base Year Revenues

Revenues			**Tax Base**		**Tax Rate**		**Base Year Revenue**		**Annual**
Tax or Fee Type			Description	$	City	Other	City	Other	**Inflation**
Property Tax	Operation	Ongoing	Market Value	$22,260,000	1.48	6.72	$33,052	$149,480	1.0%
Sales Tax	During Construction	One-Time	Construction Cost	$13,580,000	0.95%	9.55%	$129,010	$1,296,890	
	Operation	Ongoing	Annual Retail Sales	$0	0.95%	9.55%	$0	$0	2.6%
REET	Initial Home Sales	One-Time	Market Value	$22,260,000	0.50%	1.28%	$111,300	$284,928	
	Ongoing Home Sales	Ongoing	Av. Annual Transactions	$3,180,000	0.50%	1.28%	$15,900	$40,704	4.1%
Mitigation fees	School	One-Time	Multi Family Townhomes	32	$5,883		$188,256		
	Park	One-Time	Multi Family Units	32	$1,611		$51,552		
	City Traffic	One-Time	PM Peak Hour Trips	17.92	$1,875		$33,600		
Total							**$562,670**	**$1,772,002**	
Cost to City							($36,585)		3.0%

Retail

Summary of Revenue Types, Tax Rates, and Base Year Revenues

Revenues			**Tax Base**			**Tax Rate**	**Base Year Revenue**		**Annual**
Tax or Fee Type			Description	$	City	Other	City	Other	**Inflation**
Property Tax	Operation	Ongoing	Market Value	$3,820,000	1.48	6.72	$5,672	$25,652	1.0%
Sales Tax	During Construction	One-Time	Construction Cost	$2,750,000	0.95%	9.55%	$26,125	$262,625	
	Operation	Ongoing	Annual Retail Sales	$3,500,000	0.95%	9.55%	$33,250	$334,250	2.6%
REET	During Construction	One-Time	Initial Sale	$3,820,000	0.50%	3.0%	$19,100	$114,600	
	Operation	Ongoing	Future Sale (1)	$3,820,000	0.50%	3.0%	$19,100	$114,600	4.1%
Mitigation fees	School	One-Time	NA						
	Park	One-Time	NA						
	City Traffic	One-Time	PM Peak Hour Trips	25.0	$1,875		$46,875		
Total							**$150,122**	**$851,727**	
Cost to City							($7,976)		3.0%

Figure 2 above shows many of the inputs and assumptions that inform the CBA, including the various tax bases (e.g., the developments' market value and annual retail sales), rates (City and "other" rates), and estimated "base year" (2019) revenues. In some cases, revenues do not actually take place in the 2019. For example, retail sales taxes generated from retail sales would not be generated until 2021, when the retail center would theoretically open. An annual inflation rate is also shown. Some types of revenue are expected

to increase more quickly than others. For example, while property tax revenues can only increase by 1% per year (with some exceptions), we expect the market value of the townhomes, which will affect REET revenues, to increase by 4.1% per year, consistent with the last decade. It is worth noting that most of the revenues generated by new development do not go to the City, but to other jurisdictions such as the Mukilteo School District, Sno-Isle Library, Port of Everett, Snohomish County, Sound Transit, and State of Washington. While the benefits that accrue to these other jurisdictions are shown at a conceptual level in the "Other" columns below, revenues for each jurisdiction are not broken out.

Figure 3 shows the benefits and costs to the City by year. The townhome project generates significantly more up-front revenues (during construction) than the retail project. This is partly because the townhome project is a much more valuable and more expensive project to build compared to the retail project (market value of $22.28 versus $3.8 million). The townhome project will generate significant property tax and REET during occupancy. We assume the average household remains in its home for 7 years, and then moves/sells, which means that on average, 4.6 homes will transact each year. This generates an ongoing revenue stream that should increase faster than the baseline rate of inflation (e.g., consumer price index). By contrast, since the retail center is just one real estate asset (compared to 32 townhomes), we assume it transacts just once during the 10-year evaluation period.

Figure 3. Annual Revenues and Costs

Townhomes

Annual Revenues and Costs

Year		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Year #		0	1	2	3	4	5	6	7	8	9	10
Tax or Fee Type		Construction										
Property Tax	Operation		**$33,052**	$33,382	$33,716	$34,053	$34,394	$34,738	$35,085	$35,436	$35,790	$36,148
Sales Tax	During Construction	$129,010										
	Operation		**$0**	$0	$0	$0	$0	$0	$0	$0	$0	$0
REET	Initial Home Sales	$111,300										
	Ongoing Home Sales		**$15,900**	$16,555	$17,237	$17,947	$18,687	$19,457	$20,259	$21,093	$21,962	$22,867
Mitigation fees	School	$188,256										
	Park	$51,552										
	City Traffic	$33,600										
Total		**$513,718**	**$48,952**	**$49,937**	**$50,953**	**$52,001**	**$53,081**	**$54,195**	**$55,344**	**$56,529**	**$57,753**	**$59,016**
Cost		$0	**($36,585)**	($37,682)	($38,813)	($39,977)	($41,176)	($42,412)	($43,684)	($44,995)	($46,344)	($47,735)
Net Benefit or (Cost)		$513,718	$12,367	$12,255	$12,141	$12,024	$11,904	$11,783	$11,660	$11,535	$11,408	$11,281

Retail

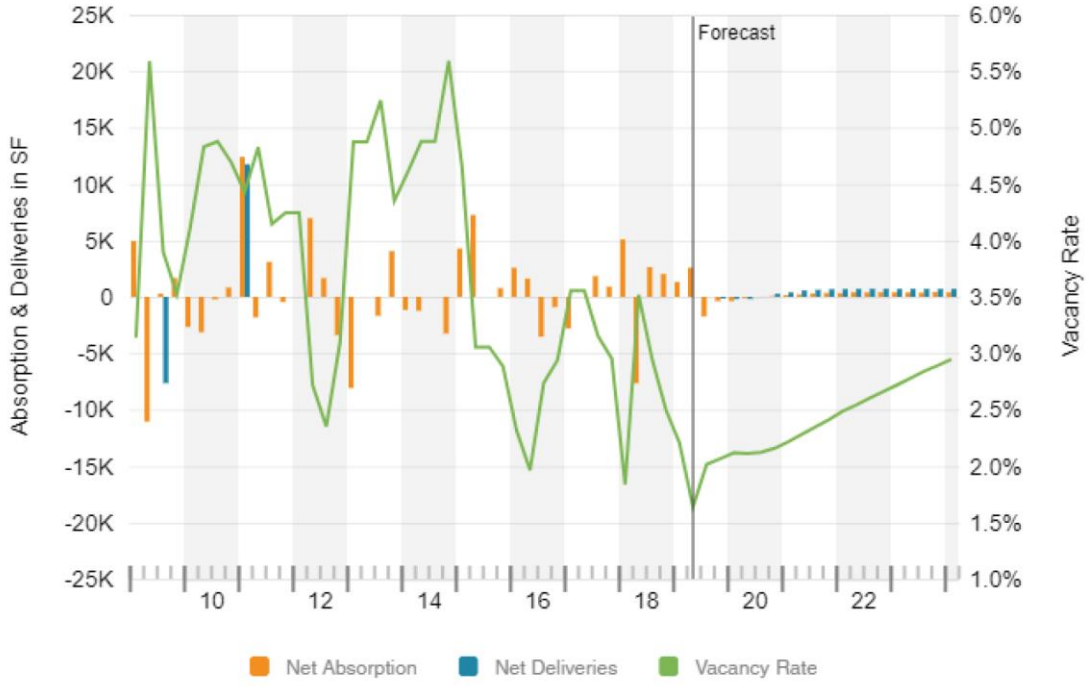
Annual Revenues and Costs

Year		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Year #		0	1	2	3	4	5	6	7	8	9	10
Tax or Fee Type		Construction										
Property Tax	Operation		**$5,672**	$5,729	$5,786	$5,844	$5,902	$5,961	$6,021	$6,081	$6,142	$6,203
Sales Tax	During Construction	$26,125										
	Operation		**$33,250**	$34,105	$34,982	$35,881	$36,804	$37,750	$38,721	$39,716	$40,737	$41,785
REET	Initial Sale		$19,100									
	Future Sale (1)									**$26,383**		
Mitigation fees	School	$0										
	Park	$0										
	City Traffic	$46,875										
Total		**$73,000**	**$58,022**	**$39,834**	**$40,768**	**$41,725**	**$42,706**	**$43,711**	**$44,742**	**$72,180**	**$46,879**	**$47,988**
Cost		$0	**($7,976)**	($8,216)	($8,462)	($8,716)	($8,977)	($9,247)	($9,524)	($9,810)	($10,104)	($10,407)
Net Benefit or (Cost)		$73,000	$50,046	$31,618	$32,306	$33,009	$33,729	$34,465	$35,217	$62,370	$36,775	$37,581

Retail Development Context

While this analysis evaluates two ways that the subject site could be developed, one (the townhome option) is an actual development proposal, while the other (the retail option) is conceptual and theoretical. Therefore, the revenues associated with the retail project are also theoretical. This is worth considering, particularly given the fact that retail development has slowed significantly (both in the Puget Sound region and nationwide) and the future appetite for new retail development is lower than in past decades. One significant reason for this is the fast-increasing role of online retailing, and corresponding decreasing demand for bricks and mortar retail. Figure 4 shows retail absorption, deliveries (new construction), and vacancy for the City of Mukilteo over the past decade, and CoStar's projection for the next few years. According to CoStar, Mukilteo has seen only one new retail project in the past decade (shown in blue, approximately 12,000 square feet, in 2011). One or more small retail properties were also demolished or removed from inventory in 2009. This means the City should not have a high degree of confidence that new retail projects will be built in the future. That said, the City's overall retail tax revenues could increase in the coming decade, if vacancies remain low, sales at existing stores increase, and other types of commercial and residential construction continue.

Figure 4. Retail Absorption, Deliveries (New Construction), and Vacancy



Source: CoStar.

Additional Information (Appendices)

This section includes additional background information that supports the above Cost-Benefit Analysis.

Figure 5. Market Value of Proposed Townhome Project

Unit Type	Sale Price	Units	Total Value
Type A	$600,000	15	$9,000,000
Type B	$780,000	17	$13,260,000
Total		**32**	**$22,260,000**
Average	$695,625		

Figure 6. Taxes Levied by the City of Mukilteo

The City's base rate and EMS fund were used in this analysis.

FUND		RATE	2018 Est. REVENUE	NOTES
GENERAL	REAL & PERSONAL PROPERTY TAX LEVY	$1.0467	$4,966,958	Rate is per $1,000 of Assessed Valuation
GENERAL	RETAIL SALES & USE TAX	0.85%	$2,700,000	Rate is 1%; .15% goes to Snohomish County
GENERAL	NATURAL GAS UTILITY TAX	6%	$ 415,000	
GENERAL	ELECTRICITY TAX	6%	$ 940,000	
GENERAL	GARBAGE COLLECTION TAX	6%	$ 295,000	
GENERAL	TELEVISION CABLE TAX	6%	$ 425,000	
GENERAL	TELEPHONE UTILITY TAX	6%	$ 475,000	
GENERAL	STORM DRAINAGE TAX	6%	$ 195,000	
GENERAL	LEASEHOLD EXCISE TAX	4%	$ 82,000	
GENERAL	ADMISSIONS TAX	4%	$ 70,000	
TBD	TRANSPORTATION BENEFIT DISTRICT SALES & USE TAX	0.10%	$ 185,000	
STREET	COMMERCIAL PARKING TAX	8%/25%	$ 55,000	8% for South of Harbour Pointe Blvd. N./25% for North
HOTEL/MOTEL	HOTEL/MOTEL TRANSIENT TAX	2%	$ 245,000	
EMS	EMERGENCY MEDICAL SERVICES PROPERTY TAX LEVY	$0.3963	$1,880,842	Rate is per $1,000 of Assessed Valuation
REET I	LOCAL REAL ESTATE EXCISE TAX; FIRST QUARTER PERCENT	0.25%	$ 700,000	
REET II	LOCAL REAL ESTATE EXCISE TAX; SECOND QUARTER PERCENT	0.25%	$ 700,000	

For additional information please visit:
https://mukilteowa.gov/
https://www.codepublishing.com/WA/Mukilteo/
https://snohomishcountywa.gov/2208/Annual-Reports

Based on rates as of 10/2018

Figure 7. Mitigation Fees, City of Mukilteo

School

Single Family	$4,342.00
Multi-Family, 1 Bedroom	None
Multi-Family / Duplex / Townhomes 2+ Bedrooms	$5,883.00

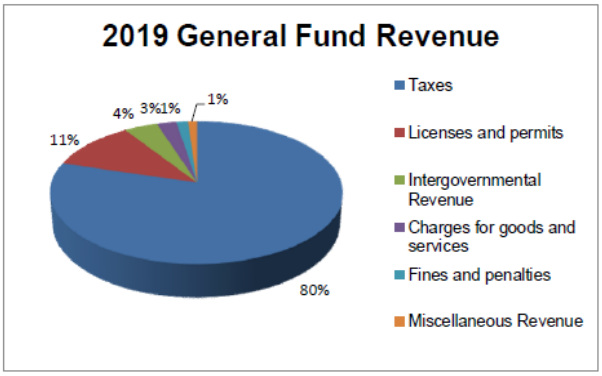
Park Mitigation

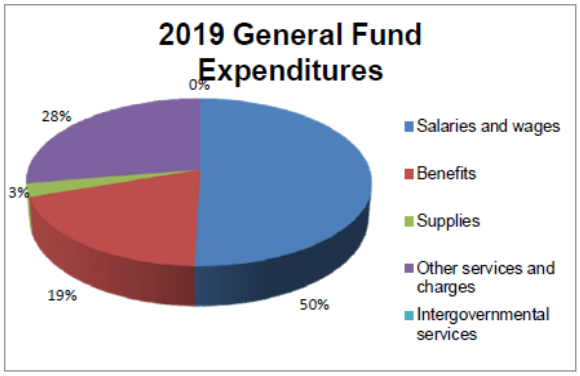
Single Family	$2,438.00
Multi-Family (per dwelling unit)	$1,611.00

City Traffic Mitigation (Ord. 1132-see staff for area subject to this fee)

Per PM Peak Hour Trip	$1,875.00

Figure 8. General Fund Revenues and Expenditures, City of Mukilteo 2019 Adopted Budget





	2017 Actuals	2018 Budget	2018 Estimated Actuals	2019 Budget	Change in Budget ($)	Change in Budget (%)
Revenues:						
Taxes	$ 10,861,796	$ 11,210,958	$ 10,963,958	$ 11,527,000	$ 316,042	2.8%
Licenses and permits	1,331,067	1,480,500	1,449,500	1,610,500	130,000	8.8%
Intergovernmental Revenue	668,742	687,700	694,700	606,000	(81,700)	-11.9%
Charges for goods and services	332,988	330,800	329,000	359,400	28,600	8.6%
Fines and penalties	136,507	181,550	180,350	210,350	28,800	15.9%
Miscellaneous Revenue	840,541	210,000	259,000	166,000	(44,000)	-21.0%
Total Revenues	**$ 14,171,641**	**$ 14,101,508**	**$ 13,876,508**	**$ 14,479,250**	**$ 377,742**	**2.7%**
Expenditures:						
Salaries and wages	$ 6,773,717	$ 6,631,728	$ 6,929,350	$ 7,013,100	$ 381,372	5.8%
Benefits	2,516,215	2,534,935	2,588,040	2,693,040	158,105	6.2%
Supplies	407,535	372,575	382,050	358,850	(13,725)	-3.7%
Other services and charges	4,025,205	3,741,703	3,864,447	3,838,888	97,185	2.6%
Intergovernmental services	-	-	-	-	-	-
Total Expenditures	**$ 13,722,672**	**$ 13,280,941**	**$ 13,763,887**	**$ 13,903,878**	**$ 622,937**	**4.7%**

Figure 9. Current Levy Rates and Property Taxes Generated by Subject Site, Snohomish County Assessor

Distribution of Current Taxes

District	Rate	Amount	Voted Amount	Non-Voted Amount
CENTRAL PUGET SOUND REGIONAL TRANSIT AUT	0.21	$372.85	$0.00	$372.85
CITY OF MUKILTEO	1.46	$2,629.50	$668.83	$1,960.67
MUKILTEO SCHOOL DISTRICT NO 6	2.52	$4,540.01	$4,540.01	$0.00
PORT OF EVERETT	0.25	$453.96	$0.00	$453.96
SNO-ISLE INTERCOUNTY RURAL LIBRARY	0.47	$847.26	$0.00	$847.26
SNOHOMISH COUNTY-CNT	0.72	$1,290.34	$0.00	$1,290.34
STATE	2.57	$4,620.25	$0.00	$4,620.25
SNOHOMISH CONSERVATION DISTRICT		$7.10	$0.00	$7.10
TOTAL	8.19	$14,761.27	$5,208.84	$9,552.43

Figure 10. Mukilteo Single-Family Values over Time, Zillow

(ZHVI is Zillow Home Value Index.)

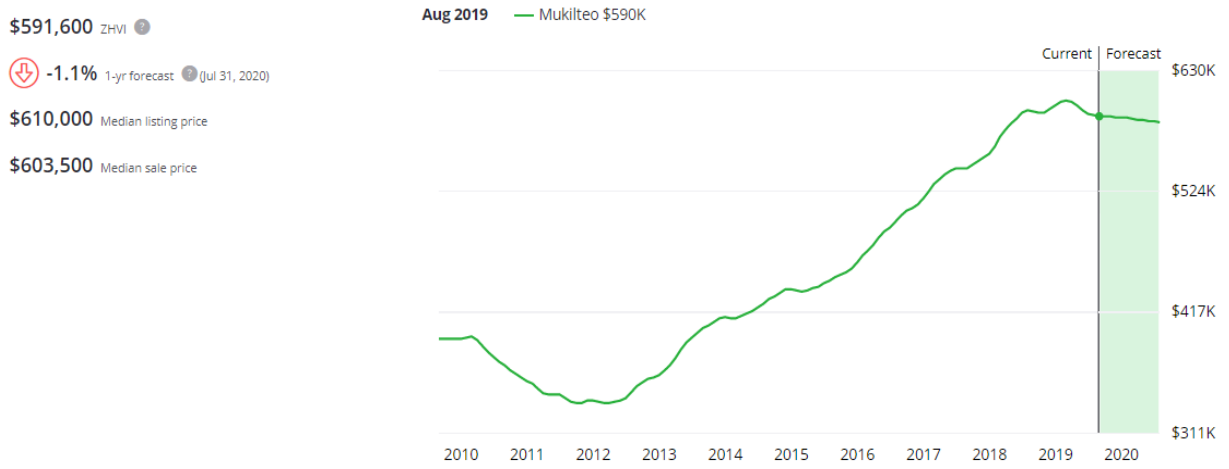
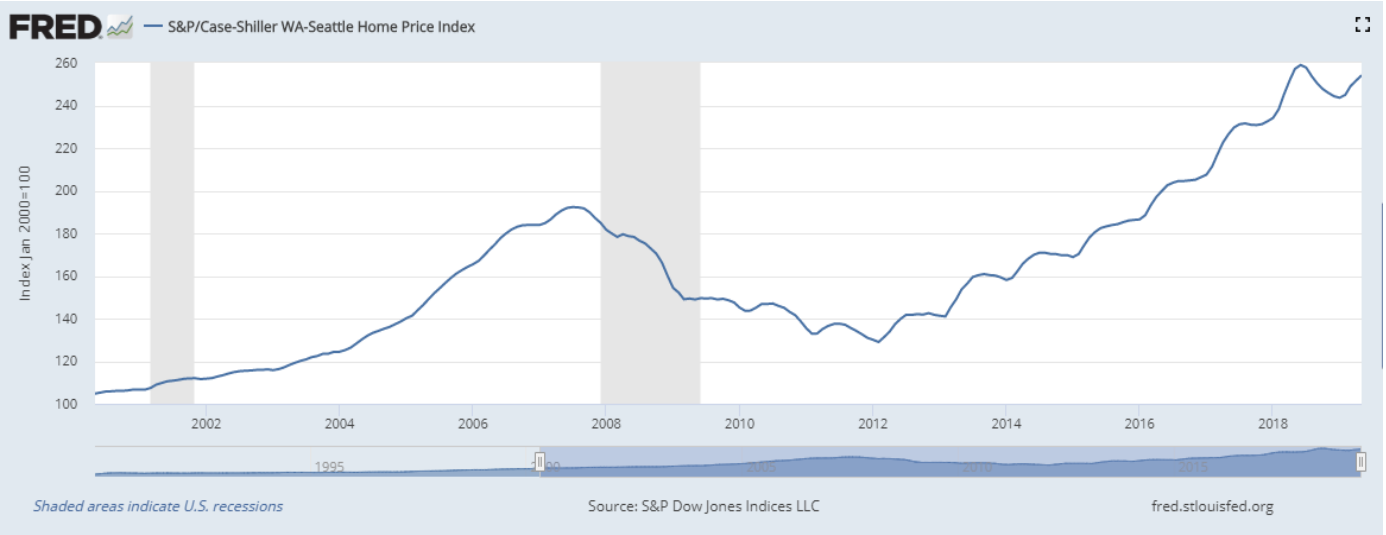


Figure 11. Seattle Metropolitan Area Home Price Index, Federal Reserve Bank/Case-Schiller Index



AMENDMENT TO DEVELOPMENT AGREEMENT

For Mukilteo Town Square

THIS AMENDMENT TO DEVELOPMENT AGREEMENT ("Agreement') amends the Sector 3 Development Agreement recorded November 29, 2007 under Snohomish County Recording No. 200711290678. This AMENDMENT is entered into by and between THE CITY OF MUKILTEO, a Washington municipal corporation ("City") and Wild Sockeye, LLC, a Washington limited liability company, ("SOCKEYE"), Holland Family Properties, LLC , a Washington limited liability company, ("HOLLAND"), Industrial Park Condominium Owners Association, a Washington non-profit corporation ("IPCOA"), Mukilteo Land, LLC, a Washington limited liability company ("MUKILTEO LAND"), Mukilteo Hotel, LLC, a Washington limited liability company ("MUKILTEO HOTEL"), Harbour Place 1, LLC, a Washington limited liability company ("HARBOUR PLACE 1"), Harbour Place 2, LLC, a Washington limited liability company ("HARBOUR PLACE 2"), (collectively SOCKEYE, and HOLLAND, IPCOA, MUKILTEO LAND, MUKILTEO HOTEL, HARBOUR PLACE 1 and HARBOUR PLACE 2 are hereinafter referred to as the "Owners") (collectively the City and the Owners are referred to as the "Parties").

RECITALS

A. SOCKEYE owns the property legally described in Exhibit 1A (the "Sockeye Property"), HOLLAND owns the property legally described in Exhibit 1B (the "Holland Property"), IPCOA owns that property legally described in Exhibit 1C (the "IPCOA Property"), MUKILTEO LAND owns that property legally described in Exhibit 1D (the "Mukilteo Land Property"), MUKILTEO HOTEL owns that property legally described in Exhibit 1E (the "Mukilteo Hotel Property"), HARBOUR PLACE 1 owns that property legally described in Exhibit 1F (the "Harbour Place 1 Property"), and HARBOUR PLACE 2 owns that property legally described in Exhibit 1G (the "Harbour Place 2 Property").

B. The Sockeye Property, the Holland Property, the IPCOA Property, the Mukilteo Land Property, the Mukilteo Hotel Property, the Harbour Place 1 Property, and the Harbour Place 2 Property collectively referred to as the "Property", are located within Sector 3 of the Harbour Pointe Master Plan ("Sector 3") originally adopted as the Possession Shores Master Plan in April 1978 by Snohomish County and subsequently by the City of Mukilteo in March 1991. The 1993 Record of Survey and Binding Site Plan (Rec. No. 9312305007) created Lots 1-12. The original 2002 development agreement applied only to the Property (then constituting Lots 4-10). The Property was then subject to a revised binding site plan, Record of Survey and Binding Site Plan (Rec. No. 200508295173), which created Lots 4A and 4B. The 2007 Development Agreement (Rec. No. 200711290678) was then adopted to replace the original development agreement and was implemented by a revised binding site plan, Record of Survey and Binding Site Plan (Rec. No. 200803275001), which created New Parcels 1-4. The Sockeye Property comprises Lot 4A, the Holland Property comprises Lot 4B, the IPCOA Property comprises New Parcel 1, the Mukilteo Land Property comprises New Parcel 2, the Mukilteo Hotel Property comprises New

DRAFT SEPT 20, 2019

Parcel 3, the Harbour Place 1 Property comprises New Parcel 4, and the Harbour Place 2 Property comprises Lot 10.

C. SOCKEYE as the Individual Parcel Owner of Lot 4A desires to develop a townhome development on Lot 4A which will create a horizontal mixed-use development with the existing school on Lot 4B, the industrial condominiums on New Parcel 1, the existing hotel on New Parcels 2 and 3, and the development of a neighborhood shopping center, office, and hotel on New Parcel 4 and Lot 10 of the Property. The townhome development will benefit all properties by developing a vacant parcel with a use that is complimentary to the existing and future uses.

D. The Property is part of the City's zoning district called Planned Community Business-South (PCB-S). The City allows townhomes in the PCB-S if authorized by a development agreement approved by the City Council. Mukilteo Municipal Code, Table 17.16.040, Note 9. This Amendment to the 2007 Development Agreement constitutes the development agreement approval authorizing townhomes on Lot 4A according to the development standards in this Amendment.

E. The Parties desire to tailor the development to the site and specify applicable development standards utilizing this development agreement.

NOW, THEREFORE, for good and valuable consideration, the receipt of which is acknowledged, the Parties agree as follows:

DRAFT SEPT 20, 2019

INTRODUCTION

This document is designed as an Amendment to the Sector 3 Development Agreement recorded November 29, 2007 under Snohomish County Recording No. 200711290678 (2007 Development Agreement). This Amendment seeks to address the changes to the 2007 Development Agreement to implement the townhome project on Lot 4A. This Amendment does not repeat all the provisions of the 2007 Development Agreement. Rather, this Amendment is supplementary to the 2007 Development Agreement which shall continue to apply, but this Amendment will take precedence in case of a conflict.

1. PROJECT DESCRIPTION -- AMENDED.

1.1. Project Elements.

1.1.1. Lot 4A is currently vacant and will be developed as a townhome development designed for 32 townhome dwelling units (the Project).

1.1.2. The planned development on Lot 4A is illustrated in Exhibit 2A.

1.2. Primary Uses and Primary Placement of Uses. The Primary Use of Lot 4A is modified to allow a 32-unit townhome development.

1.3. Allowable Development. The Project shall not exceed the following ("Allowable Development"):

- 32 townhomes.

1.4. Development Vesting Period. The terms and entitlements granted by this Agreement shall continue for a term of five (5) years from the Effective Date with an additional automatic five (5) year extension.

2. PROJECT DEVELOPMENT STANDARDS -- AMENDED.

The following constitute the development and design standards, mitigation measures and other conditions of development of the Project as provided in this Agreement (collectively "Development Standards"):

2.1. Permitted Land Uses, Density and Zoning. Lot 4A is zoned Planned Community Business - South ("PCB-S") and this Amendment authorizes up to 32 townhomes on Lot 4A but subject to other provisions of this Amendment and to the 2007 Development Agreement.

2.2. Building and Infrastructure Design Standards.

2.2.1. Bulk Standards. The setbacks, yards, bulk, height and other regulations are set forth in Exhibit 2B.

2.2.2. Landscape, Trail, NGPA Standards. The landscape standards are set forth in Exhibit 2B.

2.2.3. Parking Standards. The parking standards are set forth in Exhibit 2B.

2.2.4. Road, Street Lighting, Street Furniture and Streetscape Standards. The road and streetscape standards are set forth in Exhibit 2B.

2.2.5. Building Design Standards. The building standards are set forth in Exhibit 2B.

2.2.6. Signage Standards. The signage standards are set forth in Exhibit 2B.

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SEPT 20, 2019

GENERAL PROVISIONS.

The other provisions of the 2007 Development Agreement remain in effect.

The Notice provision at Section 6.17 is updated as follows:

Notice. All communications, notices and demands of any kind which a party under this Agreement requires or desires to give to any other party shall be in writing and either (i) delivered personally, (ii) sent by facsimile transmission or email with an additional copy mailed first class, or (iii) deposited in the U.S. mail, certified mail postage prepaid, return receipt requested, and addressed as follows:

If to the City:
City of Mukilteo
4480 Chennault Beach Road
Mukilteo, WA 98275
Attn: Mayor's Office
Phone: (425) 355-4141
Fax: (425) 347-4544

with a copy to:
Ogden Murphy & Wallace
2100 Westlake Center Tower
1601 Fifth Avenue Seattle, WA 98101
Attn- James E. Haney
Phone: (206) 447-7000
Fax: (206) 447-0215

If to SOCKEYE:
Wild Sockeye, LLC
Attn: Daniel Parks
6308 Clubhouse Lane
Mukilteo, WA 98275

If to HOLLAND:
Holland Family Properties, LLC
Margaret and Fred Holland
12221 Possession Way
Mukilteo, WA 98275

If to IPCOA:
Industrial Park Condominium Owners Association
9700 Harbour Place, Unit 124
Mukilteo, WA 98275

DRAFT
SEPT 20, 2019

If to MUKILTEO LAND, MUKILTEO HOTEL,
HARBOUR PLACE 1, or HARBOUR PLACE 2:

360 Investment Manager LLC
Attn: Shaiza Damji
_____
_____

Notice by hand delivery or facsimile shall be effective upon receipt. If deposited in the mail, notice shall be deemed delivered 48 hours after deposited. Any party at any time by notice to the other party may designate a different address or person to which such notice or communication shall be given.

This AMENDMENT TO DEVELOPMENT AGREEMENT was approved by the City Council on _____, 2019, and after being signed shall be recorded with the Snohomish County Auditor's Office.

CITY OF MUKILTEO, a Washington municipal corporation

By:_____

Its: Mayor

Approved as to Form:

_____

Lot 4A:
Wild Sockeye LLC

_____

Name: _____

Title: _____

Date: _____

Lot 4B:
Holland Family Properties LLC

_____

DRAFT
SEPT 20, 2019

Name: _____

Title: _____

Date: _____

New Parcel 1:
Industrial Park Condominium Owners Association

_____

Name: Paul Dennis

Title: President

Date: _____

New Parcel 2:
Mukilteo Land LLC
By: Mukilteo Land Manager, LLC, Its Managing Member
By: 360 Investments LLC, Its Managing Member
By: 360 Investment Manager LLC

_____

Name: Shaiza Damji

Title: _____

Date: _____

New Parcel 3:
Mukilteo Hotel LLC
By: Mukilteo Hotel Manager, LLC, Its Managing Member
By: 360 Investments LLC, Its Managing Member
By: 360 Investment Manager LLC

_____

Name: Shaiza Damji

Title: _____

Date: _____

New Parcel 4:
Harbour Place 1 LLC
By: 360 Holdings LLC, Its Managing Member
By: 360 Investments LLC, Its Managing Member
By: 360 Investment Manager LLC

_____

Name: Shaiza Damji

DRAFT
SEPT 20, 2019

Title: _____

Date: _____

Lot 10:

Harbour Place 2 LLC

By: 360 Holdings LLC, Its Managing Member

By: 360 Investments LLC, Its Managing Member

By: 360 Investment Manager LLC

_____

Name: Shaiza Damji

Title: _____

Date: _____

DRAFT
SEPT 20, 2019

STATE OF WASHINGTON)
) ss.
County of _____)

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged that (he/she) signed this instrument, and on oath stated that (he/she) was authorized to execute the instrument and acknowledged it as the MAYOR of CITY OF MUKILTEO to be the free and voluntary act of such party for the uses and purposes mentioned in this instrument.

DATED: _____, 2019

_____
NOTARY PUBLIC, in and for the
State of Washington,
residing at _____
My appointment expires _____

DRAFT
SEPT 20, 2019

STATE OF WASHINGTON)
) ss.
County of _____)

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged that (he/she) signed this instrument, and on oath stated that (he/she) was authorized to execute the instrument and acknowledged it as the _____ of WILD SOCKEYE LLC to be the free and voluntary act of such party for the uses and purposes mentioned in this instrument.

DATED: _____, 2019

_____
NOTARY PUBLIC, in and for the
State of Washington,
residing at _____
My appointment expires _____

STATE OF WASHINGTON)
) ss.
County of _____)

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged that (he/she) signed this instrument, and on oath stated that (he/she) was authorized to execute the instrument and acknowledged it as the _____ of HOLLAND FAMILY PROPERTIES LLC to be the free and voluntary act of such party for the uses and purposes mentioned in this instrument.

DATED: _____, 2019

_____
NOTARY PUBLIC, in and for the
State of Washington,
residing at _____
My appointment expires _____

STATE OF WASHINGTON)
) ss.
County of _____)

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged that (he/she) signed this instrument, and on oath stated that (he/she) was authorized to execute the instrument and acknowledged it as the _____ of INDUSTRIAL PARK CONDOMINIUM OWNERS ASSOCIATION to be the free and voluntary act of such party for the uses and purposes mentioned in this instrument.

DATED: _____, 2019

_____
NOTARY PUBLIC, in and for the
State of Washington,
residing at _____
My appointment expires _____

DRAFT
SEPT 20, 2019

STATE OF WASHINGTON)
) ss.
County of _____)

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged that (he/she) signed this instrument, and on oath stated that (he/she) was authorized to execute the instrument and acknowledged it as the _____ of 360 INVESTMENT MANAGER LLC to be the free and voluntary act of such party for the uses and purposes mentioned in this instrument.

DATED: _____, 2019

_____
NOTARY PUBLIC, in and for the
State of Washington,
residing at _____
My appointment expires _____

DRAFT
SEPT 20, 2019

EXHIBIT 1A
Wild Sockeye LLC
Lot 4A Legal Description

PARCEL 4A OF RECORD OF SURVEY AND AMENDED BINDING SITE PLAN RECORDED UNDER AUDITOR'S FILE NUMBER 200508295173, RECORDS OF SNOHOMISH COUNTY, WASHINGTON, BEING A PORTION OF LOT 4, HARBOUR POINTE BUSINESS CENTER BIG GULCH CAMPUS BINDING SITE PLAN/RECORD OF SURVEY RECORDED UNDER AUDITOR'S FILE NUMBER 9312305007, BEING A PORTION OF THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 16, AND THE NORTHEAST QUARTER OF THE NORTHEAST QUARTER OF SECTION 21, ALL IN TOWNSHIP 28 NORTH, RANGE 4 EAST, W.M.

SITUATE IN THE COUNTY OF SNOHOMISH, STATE OF WASHINGTON

EXHIBIT 1B
Holland Family Properties LLC
Lot 4B Legal Description

PARCEL 4B OF SURVEY AND AMENDED BINDING SITE PLAN AS RECORDED UNDER RECORDING NO 200508295173, RECORDS OF SNOHOMISH COUNTY AUDITOR

SITUATE IN THE CITY OF MUKILTEO, COUNTY OF SNOHOMISH, STATE OF WASHINGTON.

EXHIBIT 1C
IPCOA
New Parcel 1 Legal Description

NEW PARCEL 1 OF RECORD OF SURVEY AND AMENDED BINDING SITE PLAN RECORDED UNDER AUDITOR'S FILE NUMBER 200803275001, RECORDS OF SNOHOMISH COUNTY, WASHINGTON

ALSO KNOWN AS INDUSTRIAL PARK CONDOMINIUM ACCORDING TO THE SURVEY MAP AND PLANS RECORDED UNDER AUDITOR'S FILE NUMBER 200105045001 AND DECLARATION THEREOF RECORDED UNDER AUDITOR'S FILE NUMBER 200105040032, AND ANY AMENDMENTS THERETO, RECORDS OF SNOHOMISH COUNTY, WASHINGTON; TOGETHER WITH THAT PORTION OF VACATED HARBOUR PLACE THAT ATTACHED BY OPERATION OF LAW ACCORDING TO CITY OF MUKILTEO ORDINANCE NO. 1188, DATED MARCH 17, 2008, RECORDED UNDER AUDITOR'S FILE NUMBER 200803270008.

SITUATE IN THE COUNTY OF SNOHOMISH, STATE OF WASHINGTON

DRAFT SEPT 20, 2019

EXHIBIT 1D
Mukilteo Land LLC
New Parcel 2 Legal Description

NEW PARCEL 2 OF RECORD OF SURVEY AND AMENDED BINDING SITE PLAN RECORDED UNDER AUDITOR'S FILE NUMBER 200803275001, BEING A PORTION OF THE SOUTHEAST QUARTER OF SECTION 16, TOWNSHIP 28 NORTH, RANGE 4 EAST, W.M., RECORDS OF SNOHOMISH COUNTY, WASHINGTON

SITUATE IN THE COUNTY OF SNOHOMISH, STATE OF WASHINGTON

EXHIBIT 1E
Mukilteo Hotel LLC
New Parcel 2 Legal Description

NEW PARCEL 3 OF RECORD OF SURVEY AND AMENDED BINDING SITE PLAN RECORDED UNDER AUDITOR'S FILE NUMBER 200803275001, BEING A PORTION OF THE SOUTHEAST QUARTER OF SECTION 16, TOWNSHIP 28 NORTH, RANGE 4 EAST, W.M., RECORDS OF SNOHOMISH COUNTY, WASHINGTON

SITUATE IN THE COUNTY OF SNOHOMISH, STATE OF WASHINGTON

EXHIBIT 1F
Harbour Place 1 LLC
New Parcel 4 Legal Description

NEW PARCEL 4 OF RECORD OF SURVEY AND AMENDED BINDING SITE PLAN RECORDED UNDER AUDITOR'S FILE NUMBER 200803275001, RECORDS OF SNOHOMISH COUNTY, WASHINGTON, BEING A PORTION OF THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 16, TOWNSHIP 28 NORTH, RANGE 4 EAST, W.M.,

SITUATE IN THE COUNTY OF SNOHOMISH, STATE OF WASHINGTON

EXHIBIT 1G
Harbour Place 2 LLC
Lot 10 Legal Description

NEW PARCEL 10 OF CITY OF MUKILTEO BOUNDARY LINE ADJUSTMENT RECORDED UNDER AUDITOR'S FILE NUMBER 199910060039, RECORD OF SURVEY RECORDED UNDER AUDITOR'S FILE NUMBER 199910065001, SAID PARCEL BEING LOT 10 AND A PORTION OF LOTS 4, 5 AND TRACT A, CITY OF MUKILTEO BINDING SITE PLAN RECORDED UNDER AUDITOR'S FILE NUMBER 9312305007, BEING A PORTION OF THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 16 AND OF THE NORTHEAST QUARTER OF THE NORTHEAST QUARTER OF-SECTION 21, ALL IN TOWNSHIP 28 NORTH, RANGE 4 EAST, W.M., RECORDS OF SNOHOMISH-COUNTY, WASHINGTON.

SITUATE IN THE COUNTY OF SNOHOMISH, STATE OF WASHINGTON.

DRAFT SEPT 20, 2019

EXHIBIT 2A
Proposed Site Plan Lot 4A

DRAFT
SEPT 20, 2019

EXHIBIT 2B

Development Standards and Design Guidelines Lot 4A

General Statement

1. Development of Lot 4A shall comply with the development standards and design guidelines set forth in this Exhibit.

2. The development standards and design guidelines in this Exhibit supplement the standards in the Development Agreement at Exhibits 2.1, 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.2.5, 2.2.6, and 2.3, which shall continue to apply to the extent reasonable for the townhome project but the standards in this Exhibit will take precedence in case of a conflict.

Lot 4A Permitted Land Uses

3. Lot 4A may be developed for townhome dwellings according to this Development Agreement Amendment and consistent with the Site Plan in Exhibit 2A and these development standards in Exhibit 2B.

4. Associated uses as set forth in MMC 17.16.040 under the category Residential and Associated Uses for the MR and PCB(S) zoning districts are prohibited, except home occupation and model home/sales office are authorized.

Lot 4A Bulk Standards and Other Development Standards

5. MR Standards Apply: The project shall comply with the MR standards in the Structure Bulk Matrix, MMC 17.20.020 Table 2, except modified as follows.

6. Maximum Lot Coverage: 40%.

7. Maximum Building Height: 35’.

8. Property Line Setbacks:
   a. Front (from Harbour Place): 25’.
   b. Rear: 25’.
   c. Side: Minimum total 15’ with a minimum single side setback of 5’.
   d. Building separation shall be a minimum of 15’.
   e. Multistory structures over two stories shall increase setbacks for each additional story as follows:
      i. Front: no additional setback required.
      ii. Rear: three feet.
      iii. Side: five feet total with minimum side increased by three feet.
      iv. Building separation: no additional setback required.

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9. Roadway Setbacks:
   a. Drive Aisle (Fire Lane): 10' for habitable areas; 20' for private garages. The drive aisle setbacks shall be applied pursuant to reference notes 24 and 25 of MMC 17.20.025; except the drive aisle setback for Buildings N and E as delineated on the Site Plan (Exhibit 2A) shall be 15' in lieu of no setback required in reference note 25 for units with the entire footprint as a garage (Note 25.b.ii); except the drive aisle setback for the garage side with no vehicle access shall be 10'.

10. Maximum Hard Surface Coverage: 80%.

11. If the project is built in phases with separate lots, then the entire property in the Site Plan (Exhibit 2A) shall be considered a single, unified development site for purposes of MMC 17.20.025(20).

Landscape, Trail, and NGPA Standards

12. Harbour Place Streetscape. At the development parcel, the Harbour Place Streetscape was developed with a planting strip and sidewalk, but the planting strip was planted only with grass. The planting strip shall be planted according to the Development Agreement at Exhibit 2.2.2, Section 2.2 or otherwise as approved by the Planning & Community Development Department.

13. Internal Landscaping. The internal common areas within the developed area shall be landscaped. A landscape plan shall be submitted with building permits and approved by the Planning & Community Development Department.

14. Open Space Area. Lot 4A has a substantial area of open space due to the recorded trail easement and wetland and slope critical areas and buffers. These open space areas can be maintained according to existing agreements and other city requirements. A pervious surface pathway may be constructed from the townhomes to the existing Big Gulch trail on the property; use of concrete and gravel are not acceptable trail materials.

15. Hardscape. Use differentiating materials and scoring as patterns in hardscape to create diversity in color, texture and pattern. Encourage use of space by incorporating seating area, play area and installation of public art.

16. Lighting. Pedestrian scale lighting shall be provided to create a condition of personal security which shall include lighting of common space, guest parking area and sidewalks.

Parking Standards

17. Parking spaces. Two off street parking spaces are required per dwelling unit, and one guest parking per every four dwelling units shall be provided in compliance with MMC Table 17.56.040 Off Street Parking Requirements.

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Road and Streetscape Standards

18. New Access. The townhome project is authorized to add a new primary access to Harbour Place. The City may approve the access with a shorter unobstructed sight distance than required by Exhibit 2.2.4 of the 2007 Development Agreement.

Building Standards/Design Guideline

19. Overall architectural design:

    a. Architectural design shall strive for consistency and unity of composition in its exterior elevations.

    b. Design shall include details that are complimentary to overall design. Overly contrasting color and materials shall be avoided.

    c. Use architectural styles that are associated with traditional neighborhood design and newer multifamily designs that delineate separation of the units using color, material and pattern.

    d. Utilize parapets, cornices, shed roofs, dormers and other secondary roof forms to create variety in the units and break up the massing of the overall buildings.

    e. Windows shall be articulated and modulated using decorative trim and repetitive window sizes and patterns to create a rhythm.

    f. Primary building entry shall be clearly identifiable with well-defined walkway leading from sidewalk system.

Signage Standards

20. Neighborhood or community identification sign shall comply with MMC 17.80.090.

Sensitive/Critical Area Standards

21. The project complies with current critical area regulations. The stream buffer at the rear of S building in the Site Plan in Exhibit 2A is authorized to be reduced and replaced with additional buffer as shown on the Site Plan. The requirements shown in the prior 2005 Binding Site Plan are superseded (Recording No. 20050828173).

22. Fencing and signage requirements for Native Growth Protection Area (NGPA) shall follow current city code.

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SEPT 20, 2019