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Stevenson Fire Department Needs Assessment

May 2019



OUR HISTORY. OUR FUTURE. OUR PROMISE.

The values of our founder, Tom Mackenzie, remain the hallmarks of our firm.

Upon this foundation we have, steadily and intentionally, built leaders in architecture, interiors, engineering, and planning, focused on delivering the highest level of design excellence in service to our clients.

This mark is our signature and our promise.

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The information in this document has been obtained from sources believed reliable. Our findings have been based on limited information and on-site observation. Because of the limited scope of our initial review, these preliminary findings should not be used as a principal basis for any decision relating to the site and/or building, and confirmation of the information contained within this document with the applicable government body may be necessary.

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PROJECT TEAM

CITY OF STEVENSON FIRE DESIGN TEAM

- Leana Kinley, City Administrator
- Rob Farris, Fire Chief
- Karl Russell, Commissioner, Building Inspector, Fire Inspector, Water System Manager
- John Carlson, Skamania County, Department of Emergency Management



MACKENZIE

- Jeff Humphreys, Project Principal
- Cathy Bowman, Project Architect



SUBCONSULTANTS

- Ethan Spoo - BergerABAM
- Steve Gunn - Cost Estimator, CFI
- Greg Burr - Cost Estimator, CFI



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Introduction

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PROJECT INTRODUCTION

The Stevenson Fire Department is seeking to address serious issues at their existing Fire Station, built in 1967. The objective is to develop a facility to better meet their needs and goals; provide a more efficient operational model and layout; better align with the current space demand for the Fire Department; and allow for future prospective staff and facility growth. The improved facility will be located on a new site on the corner of SW Rock Creek Road and Foster Creek Road.

To aid the City of Stevenson with these efforts, the City selected Mackenzie to assist with an evaluation of the site conditions and work with Department staff to determine the operations-based needs.

Mackenzie, established in 1960 and based in Portland, Oregon, provides an integrated design approach to projects, including architecture, structural engineering, landscape architecture, civil engineering, land use planning, transportation planning and interior design services. Mackenzie's Public Projects team specializes in municipal and emergency response facility design, space needs evaluations, and bond campaign assistance. In the past decade, Mackenzie has worked on publicly funded projects in Oregon and Washington for more than 50 counties and municipalities, providing design and engineering services for more than 80 fire facilities, 20 police facilities and six municipal office buildings.

At the start of the design process, the goal was to develop a facility to meet the 50-year needs of the Fire Department and Skamania County's Department of Emergency Management. The validated facility program includes spaces identified in the Stevenson Fire Hall Strike Team Report for the Fire Department (completed in 2016), and ideally would also include the relocation of the Emergency Operations Center. This new facility is envisioned to be appropriately scaled and respectful of its surrounding site context and will be developed to meet the current and future needs of the Stevenson Fire Department.

The information contained within this report provides a detailed overview of Mackenzie's work with the City of Stevenson, Stevenson Fire Department, and Skamania County's Department of Emergency Management. All steps involved in this process have been documented and organized based on the associated task and are contained within the pages of this report for the City of Stevenson's consideration. Recommendations for next steps have been outlined at the end of the Executive Summary.

EXECUTIVE SUMMARY

Public facility design, specifically fire station projects, is unique in that the building and all its functions are tools required to most effectively and efficiently enhance agency operations and safety. Fire station design focuses on functionality and meeting the stringent requirements associated with protection and security of the building, its staff, and the communities they serve. Jurisdictional, state, and federal criteria for safety, security and operational procedures drive these requirements and invariably impact design considerations. These criteria ensure that this facility not only is able to improve operational efficiency on a day-to-day basis, but is capable of evolving over the life of the building, resisting and responding to emergency events, providing critical services for the citizens of Stevenson, enhancing the built environment of the surrounding area with a strong civic presence, and encouraging investment in the community.

The following report encompasses the primary tasks requested by the Stevenson Fire Department to determine the feasibility of a replacement facility for their Station in meeting the criteria stated above including:

- 1) Program Development
- 2) Visioning / Public Outreach
- 3) Plan Development
- 4) Conceptual Design
- 5) Project Cost Development

Process and Methodology

Mackenzie employed programming, communication, consensus-building, and goal-setting techniques to ensure that the final report meets the expectations of the stakeholders involved in the process. Using a multidisciplinary approach, extensive public project experience, and lessons learned on previous fire station and public building projects, the team provided architectural, structural, space planning, site planning and land use planning services to meet the project objectives and deliverables.

Mackenzie worked with the City of Stevenson and Fire Department staff to confirm the key stakeholders who needed to be involved throughout the design process and to support and strengthen dialogue between the Design Team and the City.

Task #1: Program Validation

Mackenzie worked closely with the Stevenson Fire Department staff and Department of Emergency Management to better understand the current space needs and projected those needs out based on a 20-year and 50-year growth forecast. The facility program was created using the previously completed Programming and Needs Assessment (2016), while incorporating comments from current Department staff. It includes circulation space and requirements for utilitarian areas, such as mechanical, electrical, and data room spaces; and a projection of growth with the expectation that the building will be in use for 50 years. It also includes identified site-related requirements (secure parking, visitor parking, staff patio area, recycling and trash enclosure, fueling, emergency generator, etc.).

Mackenzie guided the Fire Department through the process of space needs identification and their required space allocations. From that, the Design Team developed a program matrix that identified the required spaces, their approximate size, and amenities to be provided within them. Upon development of this document and prior to gaining Department staff approval, Mackenzie reviewed the findings with the Department to clarify any questions or comments brought up over the course of creating the matrix. During this review, as a comparison tool, Mackenzie also shared project information of similarly-sized fire facilities. The Stevenson Fire Department currently operates out of a 4,300 square foot station on First Street. It consists primarily of an apparatus bay (2 38-foot deep bays and 2 48-foot deep bays), a small meeting room, and a small storage area.

The initial 2013 program totaled 17,840 SF shared with Stevenson Fire Department, Department of Emergency Management, and Skamania Hospital District. After rigorous staff review with the City, Fire Department, and Department of Emergency Management, the facility size pared down to approximately 12,388 SF. As part of this calculation, the building square footage total includes an average 20% increase for general building circulation and interstitial space (i.e. wall thicknesses), which has been found to be a typical escalation for facilities of this type. As the design progressed past program validation, Mackenzie was able to optimize the building's circulation space and therefore bring down the total square footage to 11,800 SF. Projections for the site indicate a 20-year demand of 30 paved parking stalls for public and staff vehicles. Mackenzie further validated these identified growth projections and space needs through the use of comparable jurisdictions and newly constructed facilities in the region (see page 01-16 for trending spreadsheet).

Task #2: Visioning / Public Outreach

The next step was meeting with the stakeholder groups, including the Fire Hall Design Committee, to discuss the massing and aesthetics of the project through a series of public outreach to solicit community input. The community outreach was conducted at a city of Stevenson Fair booth where members of the community who have a vested interest in the aesthetics of the facility as well as fire staff who aren't active participants in the design meetings could vote on the aesthetics of the facility through precedent images.

Task #3: Plan Development

After programming had been confirmed, Mackenzie prepared a series of site development scenarios to evaluate the operational flow and larger programming adjacencies of the site and building. To allow for a comprehensive analysis, the Design Team advanced the two adjacency concepts that best met the functional needs of the department to illustrate in more detail the spatial adjacencies and relationships specific to the requirements of the Fire Hall. These concepts were developed to graphically represent programming functions and their relationships to each other while also taking into consideration department culture, work philosophies, and general circulation.

Mackenzie evaluated the site and building program with the Department and used it to identify the strengths and weaknesses of a few initial alternative concepts for the new facility. Preliminary site plans and floor plans were developed based on the information gathered during the programming task and reviewed with the Fire Department to obtain input on a selected scheme and required refinement.

Task #4: Concept Design

Based on the selected scheme and input that incorporates the massing and aesthetics identified in the visioning process, the Design Team developed conceptual site plans, floor plans, and elevations for the station. This was a collaborative process where the design team worked with the Department to refine the preferred scheme. The refined design enabled Mackenzie to establish a more accurate cost estimate in the next task.

Task #5: Project Cost Development

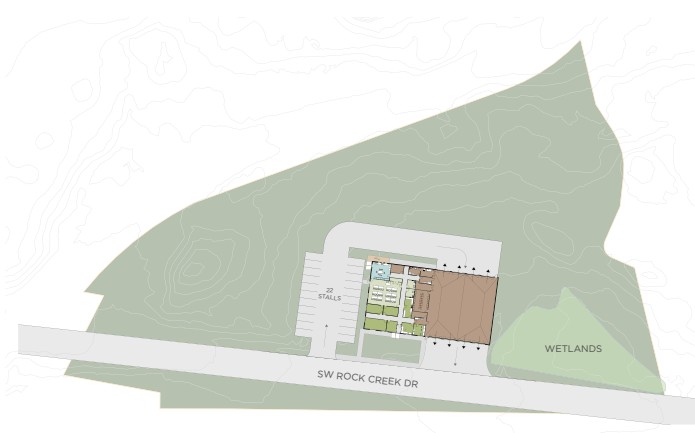
Based on the selected conceptual design, Construction Focus, Inc., developed an opinion of probable construction cost for the new Fire Hall and associated site development improvements for the project. These cost projections were comprised of the range of costs related to the anticipated raw construction costs and anticipated general contractor margins based on a publicly funded project requiring prevailing wage rates for construction.

In conjunction with the development of the construction costs, Mackenzie prepared cost forecasts for consultant costs, including architectural/engineering fees, construction management fees, special inspections, geotechnical inspections, etc. Additionally, Mackenzie worked with the Fire Hall Design Team to evaluate and compile potential owner costs, including fixtures, furnishings and equipment, lockers and shelving, moving costs, and applicable permit fees. A final cost matrix was prepared that provides a comprehensive look at all anticipated costs associated with the project summarized to reflect the construction cost, consultant costs, and owner costs.

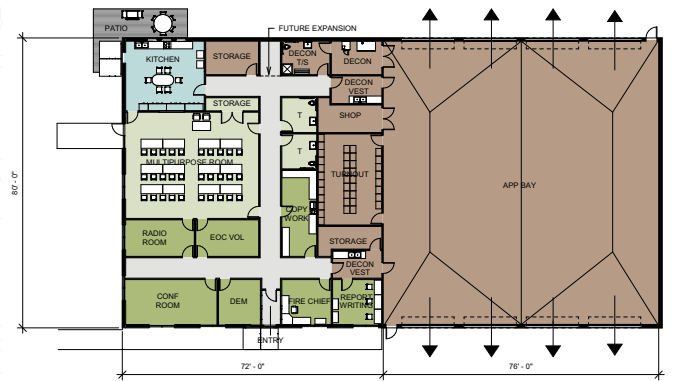
Stevenson Fire Hall		
Construction Cost - Building		\$2,841,806
Construction Cost - On-Site		\$916,103
Construction Cost - Off-Site		\$83,820
Total Construction Cost		\$3,841,829
Total Consultant Cost		\$905,363
Total Owner Cost		\$172,045
	LOW	HIGH
Contingency	\$494,203	\$1,072,847
Sales Tax (7.7%)	\$333,874	\$373,417
Total Project Cost Range	\$5,747,314	\$6,300,406

SUMMARY OF RECOMMENDATIONS

Our recommendation is for the Stevenson Fire Department to move forward with a replacement of the headquarters station promptly with a new facility that meets their operational and essential facility requirements.



Site Plan



Floor Plan



NEXT STEPS

- **Establish a desired time line and budget for the project:**

Based on the findings of Mackenzie's analysis, it is determined that the overall projected costs of the project as described in this report are estimated to be between \$5,747,314 and \$6,300,416. It is encouraged that the Department agree on an expectation of project costs and schedule development to provide clear direction to those that represent the Department and their consultants.

- **Determine funding mechanism:**

Confirm the funding mechanism(s) the Department expects to pursue to complete the project. Once determined, the Department should assess the financial impact, if any, to the local community in comparison to previous voter approvals, and the timing for pursuing the selected funding mechanism.

- **Begin the Public Outreach/Campaign Process:**

Begin the process of presenting the need for the project to local community. This effort should entail community visioning sessions to allow attendees to observe the condition of the existing station, as well as presenting the findings of the Needs Assessment process. A process for outreach to local community organizations and private business with an interest in the project should be developed and executed. Provide consistent updates and feedback to the community to ensure that the message reaches as many people as possible. Identify advocates for your project and solicit their participation in the assembly of a Public Advisory Committee (PAC). This committee should be comprised of local community members, either active in, or supportive of the needs of the City of Stevenson and the Stevenson Fire Department.

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Program Development

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PROGRAMMING SUMMARY

Mackenzie began the programming effort by working closely with Stevenson Fire Department staff to review the previously completed Fire Hall Programming and Needs Assessment (2013). Using a combination of this document and past experience with fire facilities, all while incorporating current staff feedback, Mackenzie determined current space needs and forecast future needs that will accommodate Department functions for the next 20 years, and beyond.

The initial 2013 program totaled 17,840 SF and after rigorous staff review, the Fire Department pared down the facility size to 12,338 SF - all while retaining the necessary spaces for functionality. Mackenzie has developed space standards (see pages 01-11 to 01-13) that are used to organize and indicate the spaces and sizes typically required by a fire facility of this size.

As previously mentioned, completion of the space needs assessment indicated a total requirement of 12,338 SF of building area, with a total of 4,674 SF that is comprised of the apparatus bay and its support functions. As part of the calculation, the building square footage requirement includes a 20% increase for general building circulation and interstitial space (i.e. wall thicknesses), which has been found to be an average escalation for facilities of this type.

	Square Footage at Move-In
Apparatus Bay and Support	4,674 SF
Living Quarters	2,148 SF
Administration and Building Support	1,662 SF
Community	1,798 SF
Total (Includes 20% circulation)	12,338 SF

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City of Stevenson Fire Hall, WA

9/13/2018

Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Room Type	Total Required Square Footage			Comments
	Exist	2018	2038	Exist	2018	2038	W	L	Area		Exist	2018	2038	
City of Stevenson Fire Hall, WA														
Apparatus Bay and Support Rooms												4,674	4,674	
Administration and Support												1,662	1,662	
Living Quarters												2,148	2,148	
Community / Training Rooms												1,798	1,798	
SUBTOTAL												10,282	10,282	Acres
GENERAL CIRCULATION (20%)												2,056	2,056	
TOTAL BUILDING SQUARE FOOTAGE												4,320	12,338	12,338
														0.28
TOTAL EXTERIOR REQUIREMENTS												44,704	44,704	1.03
TOTAL SITE REQUIREMENTS												57,042	57,042	1.31

PREVIOUS SQUAREFOOTAGE ASSUMPTIONS	
Existing Fire Station	4,320
2016 Fire Hall Study	11,000
Mackenzie Assessment (9/11/18)	12,338

Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Room Type	Total Required Square Footage			Comments
	Exist	2018	2038	Exist	2018	2038	W	L	Area		Exist	2018	2038	
Apparatus Bay and Support Rooms														
Apparatus Bay														
Apparatus Bay				4	4		14	70	980			3,920	3,920	4 double deep apparatus bay, 14'x14' overhead doors, exhaust ventilation system, required clearance per WAC
<i>Group Total</i>												3,920	3,920	
Apparatus Support Rooms														
Turnouts				1	1		18	22	396			396	396	(30) Lockers @ 24" wide; Open Lockers
Decontamination				1	1		10	12	120			120	120	Floor Sink, Eyewash, Stainless steel counter & sink, extractor, hooks for drying
Equipment Supply/General Storage				1	1		6	8	48			48	48	Truck cleaning supplies; flares; chains; 2x4 Fire/Hazmat locker, etc.
Shop				1	1		10	11	110			110	110	Tools and workbench & compressed air (FUTURE BUILD OUT)
Decon - Unisex Toilet/Shower Room				1	1		8	10	80			80	80	Include Decon shower, can be combined with Decon Room
Fire Riser				1	1		0	0	0			0	0	In Apparatus Bay
Mezzanine				1	1		0	0	0			0	0	Above Support Rooms; Accessed by Fork Lift; Additional Storage (Wish list) compressor/storage if mezzanine is built out
<i>Group Total</i>												754	754	
TOTAL SQUARE FOOTAGE (Apparatus Bay and Related Rooms)											4,674	4,674		

Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Room Type	Total Required Square Footage			Comments
	Exist	2018	2038	Exist	2018	2038	W	L	Area		Exist	2018	2038	
Administration and Support														
Fire Administration														
Fire Chief's Office	1	1	1		1	1	10	14	140	OFFICE		140	140	Desk, credenza, guest seating for 2, windows
Training Officer/Report Writing	1	1	1		1	1	12	16	192	OPEN		192	192	(3) Workstations (Sit/Stand) / Report Writing / Radio Charging Station
Fire District Office - District Secretary	1	1	1		1	1	8	10	80	OFFICE		80	80	Workstation and file storage area
Secure Storage					1	1	3	6	18	SECURE		18	18	Secure storage for billing, personnel, payroll, open storage for office supplies, etc.
Group Total	3	3	3									430	430	
DEM/EOC Administration														
DEM Coordinator	1	1	1		1	1	10	14	140	OFFICE		140	140	Desk, table, multi guest seating, filing cabinets, white board
Radio Room/Alternative PSAP					1	1	15	20	300	OFFICE		300	300	Radio operator room, storage of all high frequency radios, secure room, noise filter, (3) workstations
EOC Staff (volunteer)		6	8		1	1	12	16	192	OPEN		192	192	Drop in Workstations, file storage, white board,
EOC Secure Storage					1	1	8	10	80	SECURE		80	80	EOC Storage to be accessible from the multi-purpose room
Group Total	4	10	12									712	712	
Building Support														
Work / Supply / Copy / Mail / Breakroom /Kitchenette					1	1	10	16	160	OPEN		160	160	Volunteer mail boxes, bulletin board for postings; Adjacent to entry; Copy/fax machine; plotter; supply cabinet; open area that flows with a large island or counter space and additional storage. Kitchenette to include fridge, microwave, coffee maker, and sink
Conference Room					1	1	16	16	256	CLOSED		256	256	Table and Seating for 8; double as incident response planning room for EOC/DEM.
Electrical / Data (IT)					1	1	8	10	80			80	80	
Mechanical									0			0	0	On Roof / Attic Space
Janitor Closet					1	1	4	6	24			24	24	Close to Toilets & Kitchen
Group Total												520	520	
TOTAL SQUARE FOOTAGE (Administration and Building Support)											1,662	1,662		

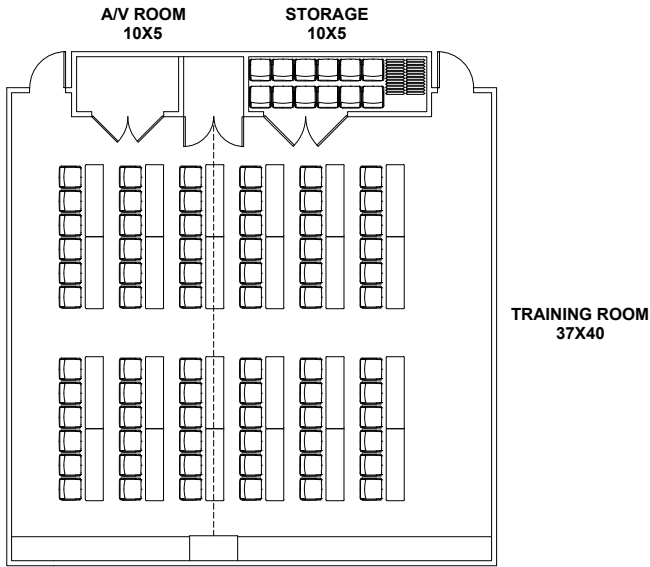
Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Room Type	Total Required Square Footage			Comments	
	Exist	2018	2038	Exist	2018	2038	W	L	Area		Exist	2018	2038		
Living Quarters															
Living Quarters															
Bunk Rooms					3	3	10	12	120	CLOSED			360	360	Bed with nighstand; exterior window for egress (FUTURE BUILD OUT)
Restroom/Shower					1	1	10	10	100	CLOSED			100	100	Unisex - the decon toilet/shower room to be close to future bunk rooms for use as additional toilet shower room
Kitchen/Day Room/ Dining					1	1	24	40	960	OPEN			960	960	(1) Dishwasher, Fridge, Range, Double Oven, Coffee Maker, etc. shift pantry; Great Room. (FUTURE BUILD OUT) - Kitchen to be shared between the multi-purpose/training room and Living Quarters.
Laundry Room					1	1	8	10	80	CLOSED			80	80	1 washer / 1 dryer - mop sink and utility sink
Fitness					1	1	20	30	600	CLOSED			600	600	(FUTURE BUILD OUT)
General Storage					1	1	6	8	48				48	48	Shelves both sides (FUTURE BUILD OUT)
Group Total													2,148	2,148	
TOTAL SQUARE FOOTAGE (Living Quarters)													2,148	2,148	

Community / Training Room															
Community / Training Room															
Entry / Lobby					1	1	8	10	80				80	80	
Training / Multi-Purpose Room					1	1	36	40	1440				1,440	1,440	Accommodate 40x people / Conference table and chairs / Video conferencing with A/V capabilities / EOC / Adjacent to EOC training storage / adjacent to kitchen / adjacent to conference room or proximity
Training Storage					1	1	10	15	150				150	150	Table / Chairs
Public Restrooms					2	2	8	8	64				128	128	ADA compliant
Group Total													1,798	1,798	
TOTAL SQUARE FOOTAGE (Community / Training Rooms)													1,798	1,798	

Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Room Type	Total Required Square Footage			Comments
	Exist	2018	2038	Exist	2018	2038	W	L	Area		Exist	2018	2038	
Exterior Requirements														
Parking														
Visitor/Personnel Parking				30	30		9	18	162			4,860	4,860	Combined Staff and Visitory Parking
<i>Group Total</i>				30	30							4,860	4,860	
Site Elements														
Apparatus Bay Aprons				10	10		15	40	600			6,000	6,000	Either side of Drive-Thru Bay
Flag Pole				1	1		4	4	16			16	16	Flag Pole area with small gathering space
Generator				1	1		8	12	96			96	96	Dual Fuel - Natural Gas/Diesel or Propane/Diesel to back up entire building
Trash / Recycling				1	1		6	3	18			18	18	Store roll out carts
Ground Maintenance Equipment Storage				1	1		9	10	90			90	90	Lawn mower, weed eater, power washer, exterior door (Wish List)
Patio				1	1		8	12	96			96	96	Gas grill, covered
<i>Group Total</i>												6,316	6,316	
SUBTOTAL											11176	11176		
GENERAL CIRCULATION (300%)											33528	33528		
TOTAL SQUARE FOOTAGE (Exterior Requirements)											44704	44704		

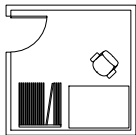
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SPACE STANDARDS



- Based on existing emergency response facilities, past experience, and general architectural standards, space standards have been developed and depicted to aid in efficiently comparing space sizes for offices, support spaces, and primary functions unique to this particular type of facility, a fire station.
- These space standards have been utilized in the development and validation of identified program elements.

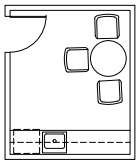
SHARED ROOM LAYOUTS



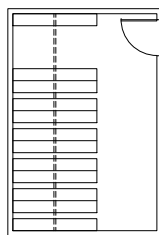
PLAN REVIEW
10X10



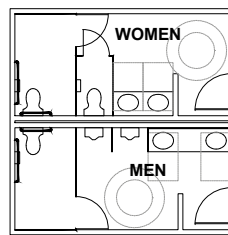
COPY ROOM
18X5



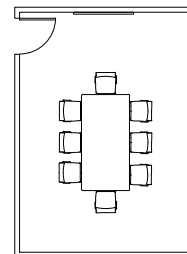
LOUNGE
10X12



RECORDS ROOM
12X18



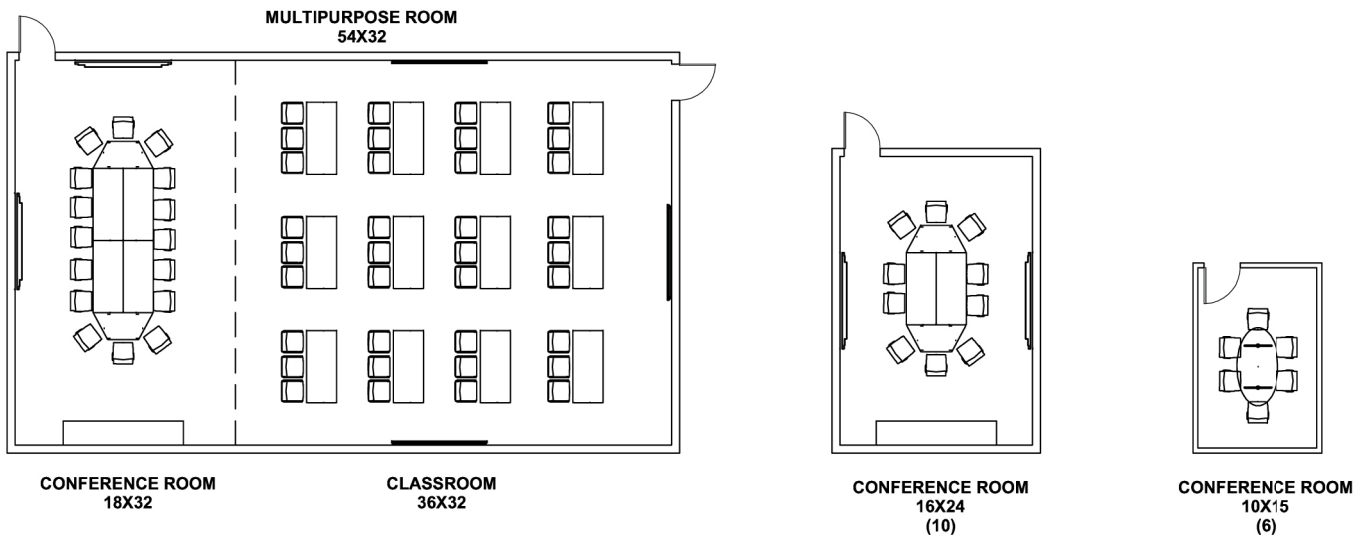
TOILET ROOM
18X18



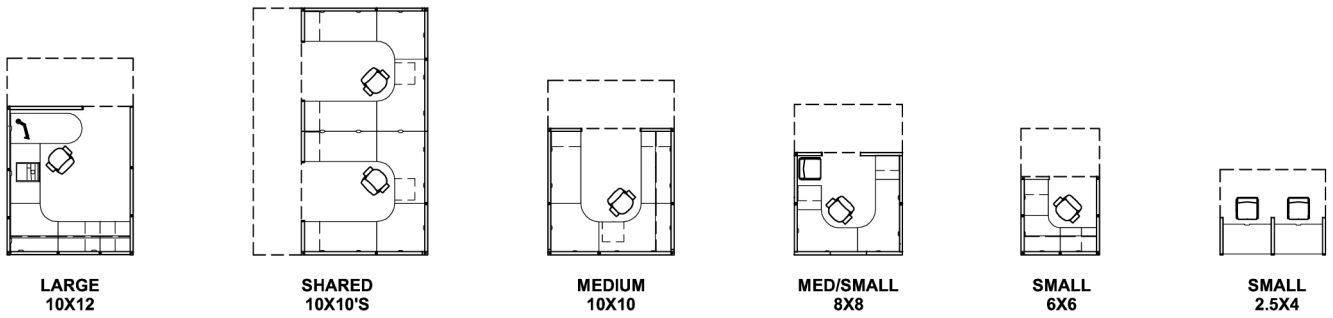
CONFERENCE
14X20

TYPICAL OFFICE SUPPORT ROOM LAYOUTS

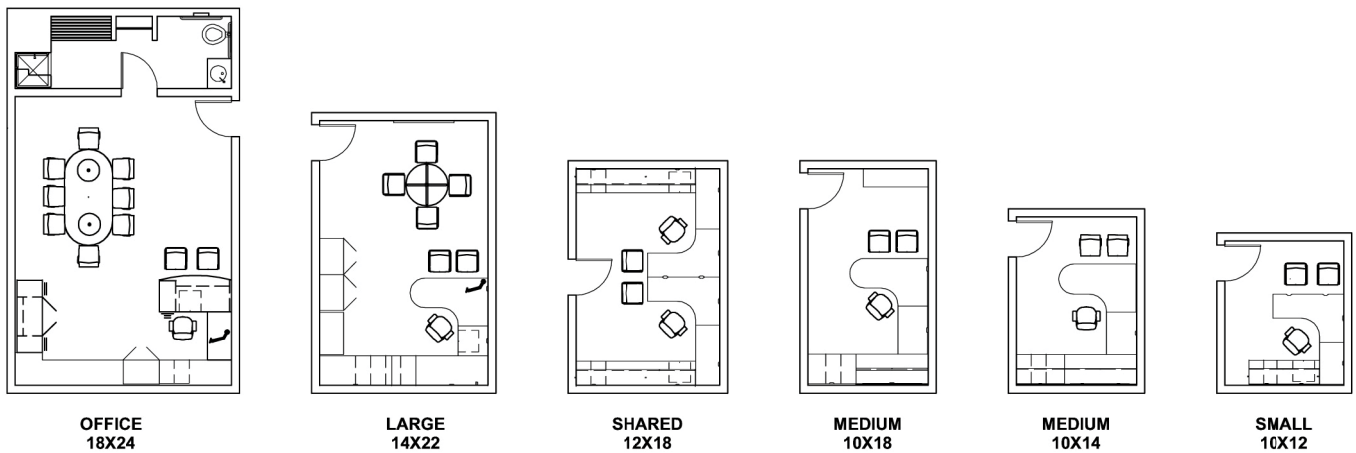
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TYPICAL CONFERENCE LAYOUTS

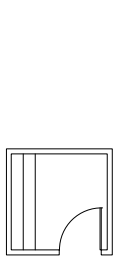


TYPICAL CUBICLE LAYOUTS

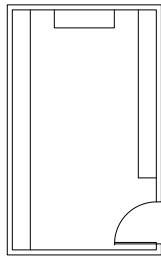


TYPICAL OFFICE LAYOUTS

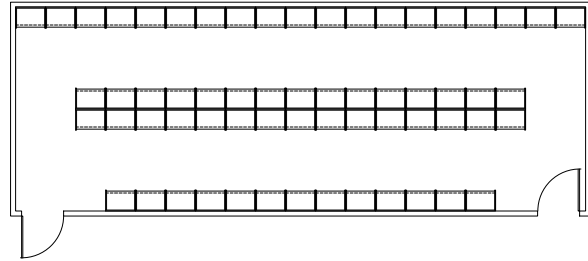
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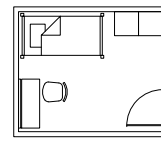
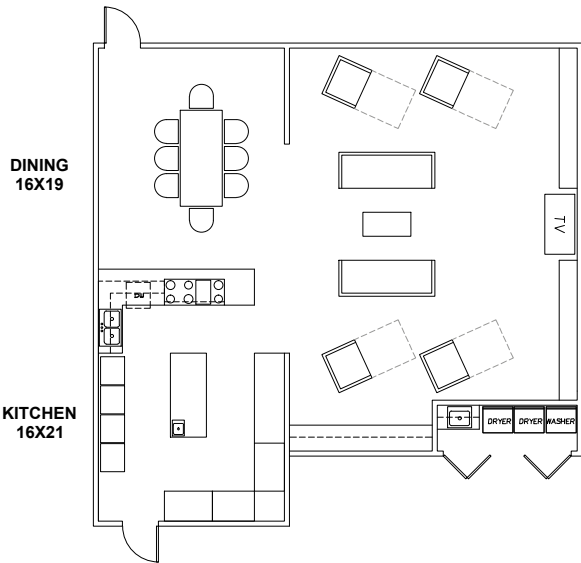
EMS STORAGE
14X29



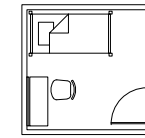
SUPPLY STORAGE
12X20



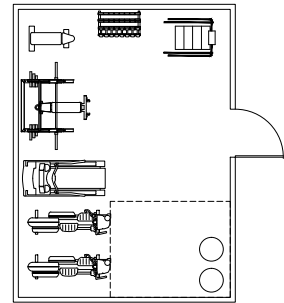
TURN OUT
48X17



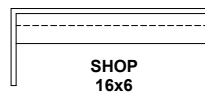
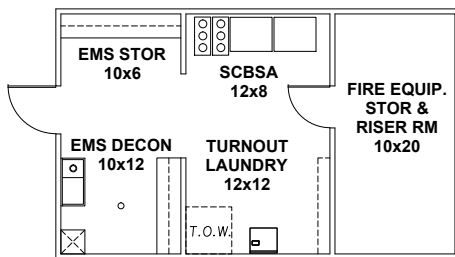
RESIDENT QUARTERS
10X12



ON-SHIFT QUARTERS
10X10



PHYSICAL TRAINING
18X24



SHOP
16X6

TYPICAL APPARATUS BAY SUPPORT ROOM LAYOUTS

Scale 1/16" = 1'-0"

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PRECEDENT FACILITIES

Facility Comparisons

The following chart on pages 01-16 and 01-17 presents a comparison of Stevenson Fire Hall to other fire station facilities to both illustrate differences and show commonalities among them.

Individual fire station programs, and thus space needs, can vary greatly due to a number of factors, including:

- Primary function(s) of the station.
- Number of staff on duty or housed in the facility.
- Department/district structure.
- Staffing approach (e.g., volunteer, career, combined).
- Unique or specialized elements (e.g., resident program, EMS, water rescue, training elements).

Differences among these elements impact the layout and size of a facility and make direct, apple-to-apple comparisons between stations challenging. The size of the apparatus bay—driven by the quantity and type of equipment it houses—is a key variable in station size. For example, a single fire station may be responsible for responding to commercial and residential structure fires, wildland fires, or water rescue calls, with specialized rigs to respond to these varying emergency needs. The presence of ladder trucks, as an example, will necessitate a greater bay depth than is typical. There may be the need for tender rigs if the department serves an area without hydrants; the greater the extent of that area the larger the number of required tender rigs may be.

The rooms and support functions off the apparatus bay will vary correspondingly in size and quantity to meet the service and support needs of the specific rigs housed in the facility. The size and makeup of the staff will, in turn, drive the size and layout of the administrative areas and living quarters. The more staff on duty at one time, the greater the needed quantity of bunk rooms, showers and toilets and the larger the day room, kitchen and dining areas will likely be. The ways in which a department interacts with the public will also influence station size. For example, a rural district providing preliminary triage or basic medical screening and care will require facilities that a station without these services would not.

FACILITY COMPARISON



<u>PROJECT</u>	<u>N. LINCOLN ROSE LODGE STATION</u>	<u>DUNDEE FIRE & RESCUE</u>
LOCATION	Lincoln City, OR	Dundee, OR
YEAR COMPLETE	Remodel 2018	2014
SITE SIZE	0.69 acres	1.5 acres
APPARATUS BAY	3,257 sf	8,184 sf
LIVING QUARTERS	0 sf	2,850 sf
ADMINISTRATION	789 sf	2,797 sf
PUBLIC	0 sf	1,574 sf
TOTAL SQ. FT.	4,046 sf	17,623 sf [†]
RESIDENT PROGRAM	YES	YES
BUNK ROOMS	0	4
RESPONSE AREA	80 sq. mi	13 sq. mi
POPULATION SERVED	12,000	5,500
QUANTITY OF STATIONS IN DISTRICT	6	1
STAFFING	Volunteer	Career/Volunteer
STATION TYPE	Satellite	Headquarters

* Response Area is not reflective of surrounding rural areas for EMS.



CLARK COUNTY
FIRE STATION 62

MCKENZIE FIRE

VANCOUVER
FIRE STATION 2

Vancouver, WA

Leaburg, OR

Vancouver, WA

Remodel 2018

2013

2018

2.03 acres

0.99 acres

2.15 acres

3,979 sf

5,237 sf

6,003 sf

1,758 sf

284 sf

4,488 sf

1,334 sf

3,268 sf

1,212 sf

98 sf

94 sf

750 sf

7,169 sf

11,031 sf

13,350 sf

YES

YES

YES

3

3

10

37 sq. mi

35 sq. mi

91 sq. mi

69,000

9,000/12,000 (tourist/yr)

246,000

4

5

10

Career/Volunteer

Career/Volunteer

Career/Volunteer

Satellite

Headquarters

Satellite

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Visioning/Public Outreach

PUBLIC OUTREACH



Columbia Gorge Interpretive Center



A1 Skamania Lodge



A2 Consumer Power Initiative - Mackenzie

A3



Cascade Locks Fire Station



A4 Rock Cove Assisted Living



A5 Snohomish County Fire Station 18 - TCA

A6



Gresham Fire Station 76 - Hennebury Eddy



A7 Roanoke Island Fire Department



A8 NLFR - Delake Station - Mackenzie

A9

VISIONING SURVEY PART A





Stevens County Station 8 - Mackenzie B1



McKenzie Fire Leaburg Station - Mackenzie B2



Canby Utility - Mackenzie B3



Salem Fire Station 7 - Mackenzie B4



Vancouver Fire Station 2 - Mackenzie B5



Montrose Fire Protection District Station 2 B6



Hood River Fire Station - Mackenzie

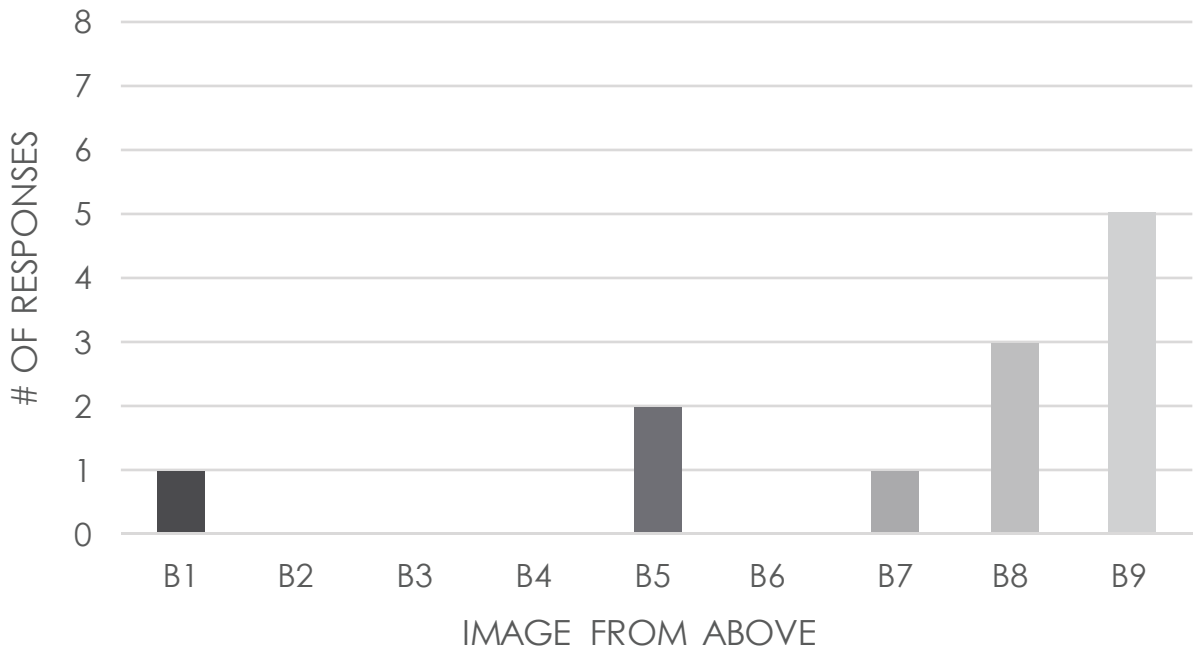


B7 Snohomish County Fire Station 21 - TCA



B8 SHED - Jensen Architects B9

VISIONING SURVEY PART B



VISIONING IMAGERY

PNW STYLE



North Lincoln Fire and Rescue Delake Station
MACKENZIE

Vancouver Fire Station 2
MACKENZIE

AFFORDABILITY

WARM AND RUSTIC



Rock Cove Assisted Living

Snohomish County Fire Station 21
TCA



Cascade Locks Fire Station

Snohomish County Fire Station 18
TCA



Shed
JENSEN ARCHITECTS

CONSTRUCTABILITY



Hood River Fire Station
MACKENZIE

LOW LIFE-CYCLE COST



Roanoke Island Fire Department
PREMIERE CONTRACTING

The preferred images from the public visioning meeting were compiled here to represent the vision of the new Fire Hall. These precedent projects were utilized to aid in the development of perspectives of the building in the following concept design section of this report.

In addition to taking note of building elements such as materiality, amount of transparency, and scale, it is also important to incorporate design ideas early on in the process about the surrounding site in which the building resides. When considering the nature of the Fire Hall site, its history, and the anticipated use by the Fire Department, it is important to closely examine and understand the outside environment and the community in which the building will reside within.

The Fire Hall site provides opportunities for shared open space. The incorporation of gathering space of all varieties is important, whether as a group or for an individual. As the building will be a pre-engineered metal building structural system, the massing will be simple, yet functional.

- Utilize local PNW style and materials.
- Reflect character of Stevenson while incorporating modern elements.
- Ease of constructability and affordable to the community.
- Support the existing neighborhood fabric.
- Create warm and inviting space.

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Plan Development

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PLAN DEVELOPMENT

Fire station facilities are unique in that the relationships of all elements are closely linked to the ability of the fire department to efficiently and effectively serve the community. Having an understanding of the relative sizes, proximity, and relationships between spaces is key. In conjunction with developing the space-needs program (see Section 1) for the Stevenson Fire Hall, Mackenzie prepared a series of site development scenarios to evaluate the operational flow and larger programmatic adjacencies of the site and building. To allow for a comprehensive analysis, the Design Team advanced the two adjacency concepts that best met the functional needs of the Department. These block diagram concepts were developed to graphically represent programming functions and their relationships to each other while also taking into consideration department culture, division work philosophies, and general circulation.

The initial site development scenarios (page 03-07) looked at locating the Apparatus Bay in line with SW Rock Creek Rd to provide easily accessible drive-thru bays with access onto SW Rock Creek Rd. The options subsequently compared the position of the living quarters, administrative functions, and community spaces in relationship to the Apparatus Bay as well site access and parking (both staff and public parking).

When evaluating these options, a key criteria that was considered was “turnout time”: how fast emergency response staff can get from where they are located in the facility to the Apparatus Bay when a call comes in. The adjacency diagrams (pages 04-08 and 04-09) and block diagrams (pages 03-08 through 03-09) specifically looked at separation of operational traffic flow and public traffic, access points to the site, apparatus turning radius, and the sequence of entry for the public.

While the adjacency and block diagrams were developed based on the relative sizes of each programmatic element, expectations of proximity, and general anticipation of building circulation; further development of the site and floor plans took into consideration many additional aspects of the context. Some examples of these aspects include building orientation, site elements (i.e. public vs. secure parking; site access points; public plaza space); zoning restrictions, and overall impact on the neighborhood. The selected site and floor plans (pages 03-10 through 03-11) reflect more refinement and development to meet Department expectations - honing in on programmed square footages, increasing efficiencies, and anticipating future growth.

①



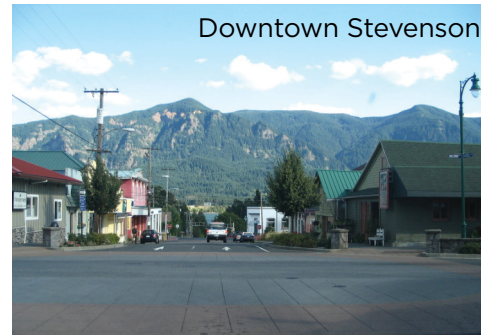
Skamania Lodge

②



Rock Cove Assisted Living

③



Downtown Stevenson

④



Bridge of the Gods

⑤



Columbia Interpretive Center

⑥

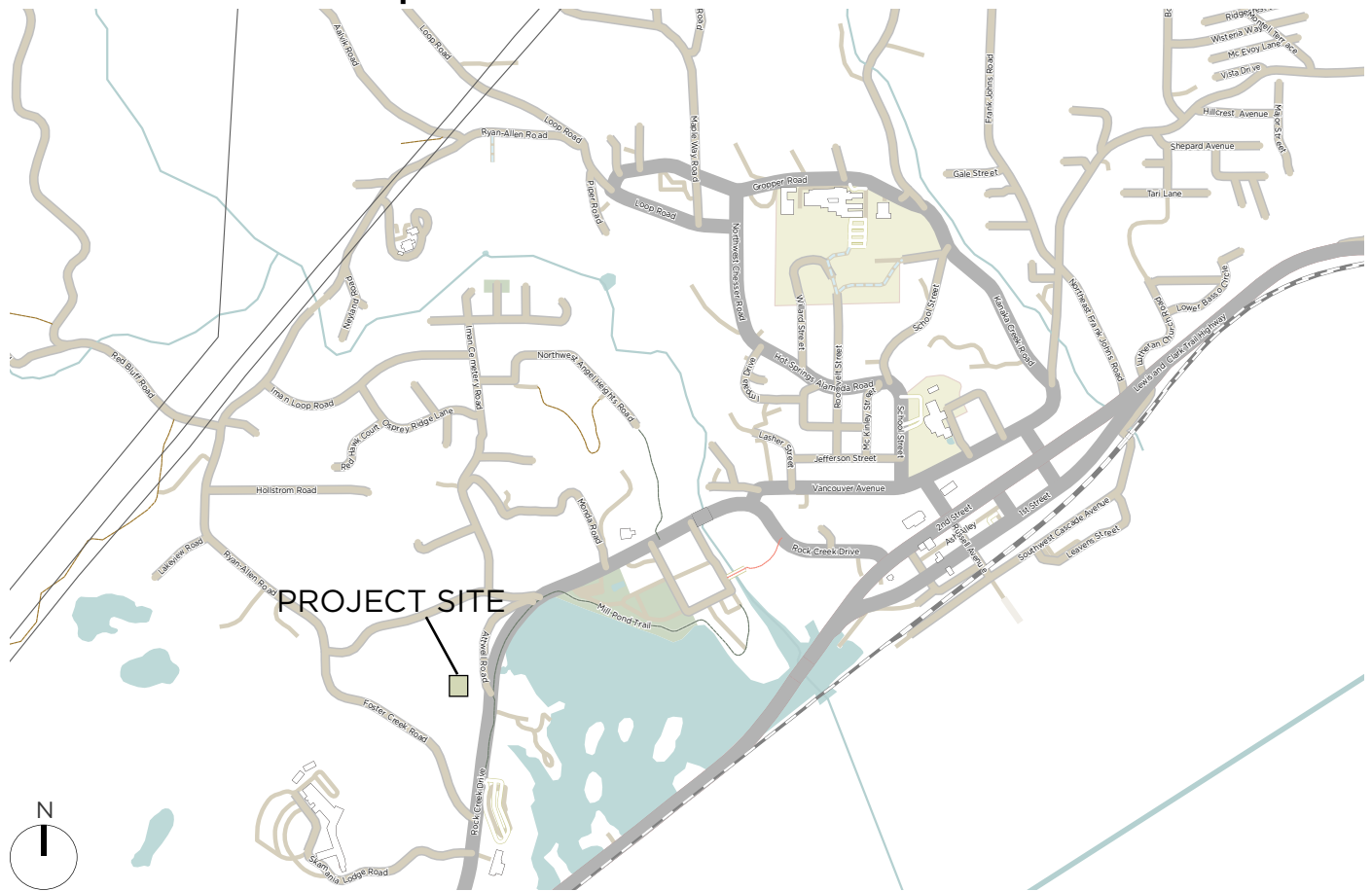


Stevenson City Hall

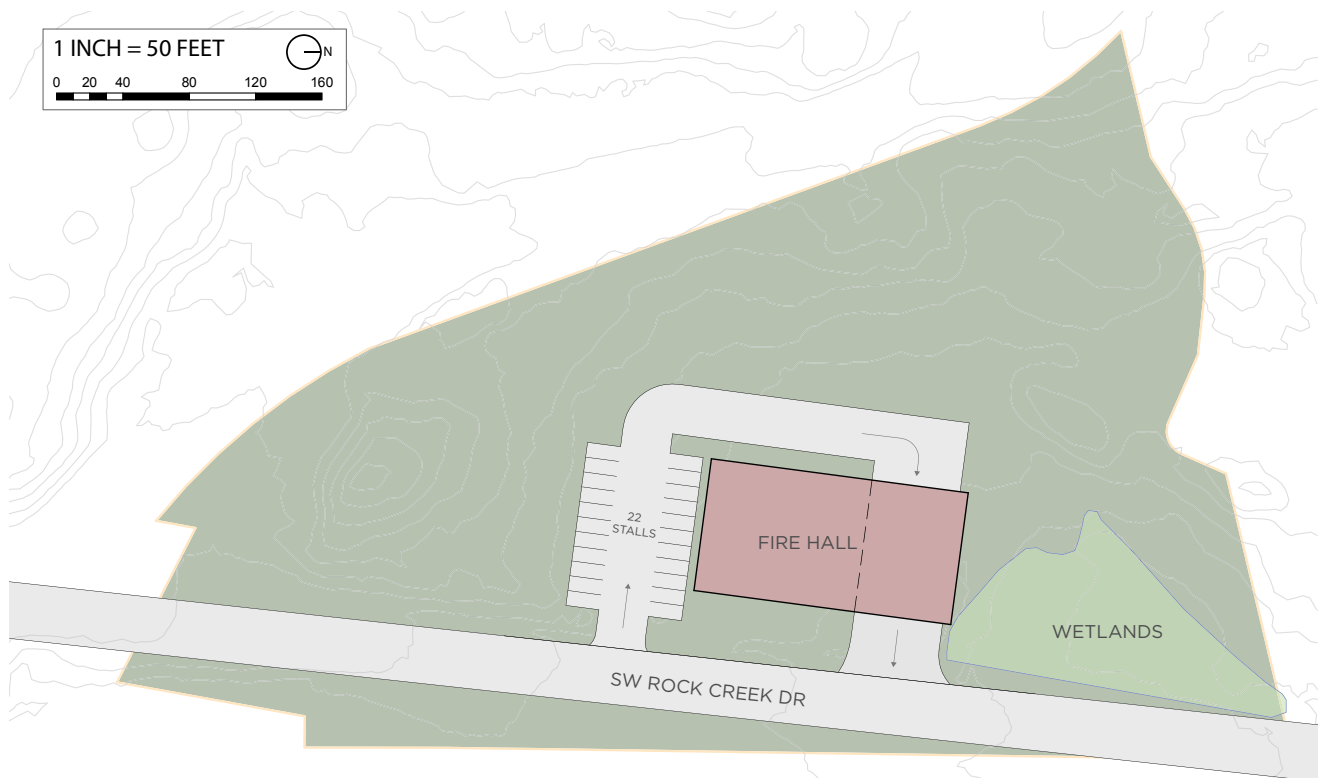
SITE ANALYSIS

The new fire facility will be located on the corner of SW Rock Creek Road and Foster Creek Road. It is located across the street from the Columbia Gorge Interpretive Center. Mackenzie spent time on and around the site observing and photographing the surrounding buildings and context in order to better understand how best to design a new fire station well-suited Stevenson, Washington.

Downtown Stevenson Map



SITE DEVELOPMENT SCENARIOS



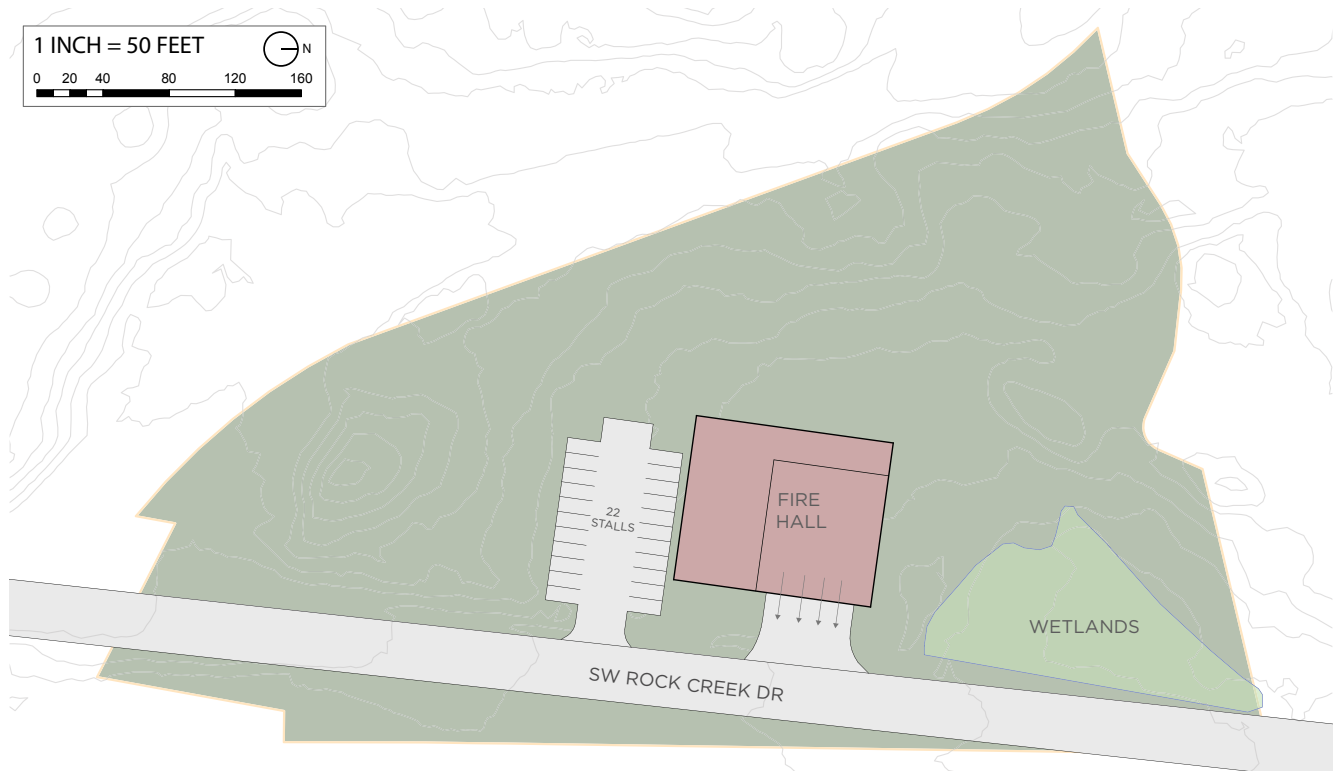
SITE OPTION A

Advantages

- Drive through bays.

Disadvantages

- Very close to the wetlands.
- Majority of the building facade faces West or East, which presents challenges with controlling glare and heat gain.



SITE OPTION B

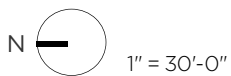
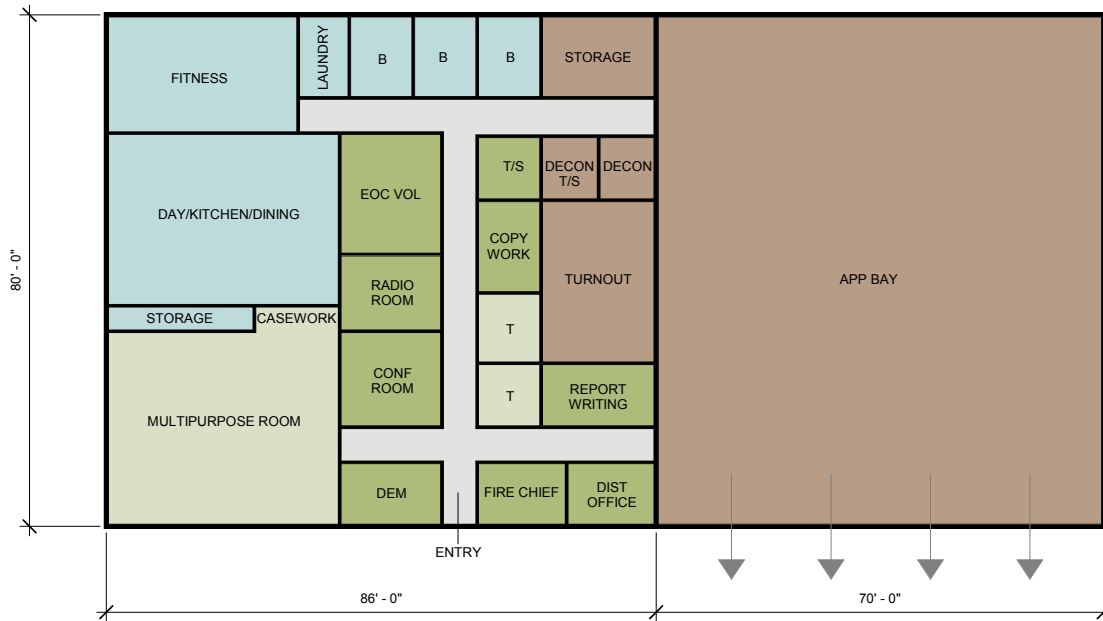
Advantages

- Optimal interior operational flow.

Disadvantages

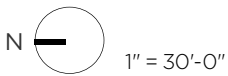
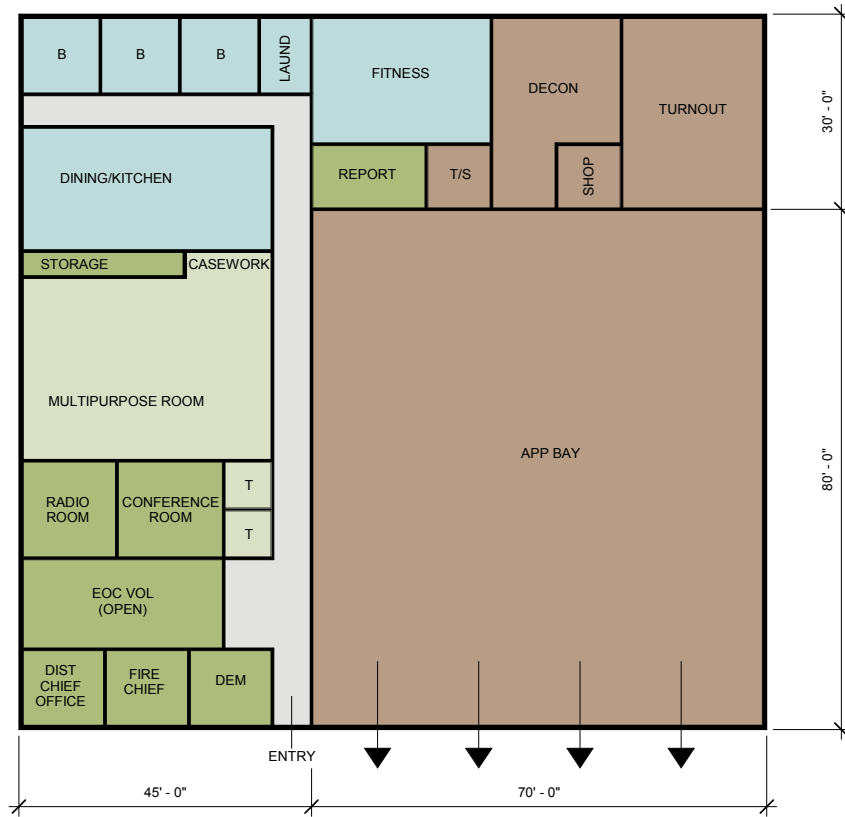
- 70% of the building facade faces west or east, which presents challenges with controlling glare and heat gain.
- Challenging massing configuration due to square nature of the building
- Back in bays.

BLOCK DIAGRAMS



BUILDING OPTION A

Apparatus Bay and Support	6,318 SF
Living Quarters	2,019 SF
Administration and Building Support	1,494 SF
Community	1,322 SF
Total (Includes 20% circulation)	11,153 SF



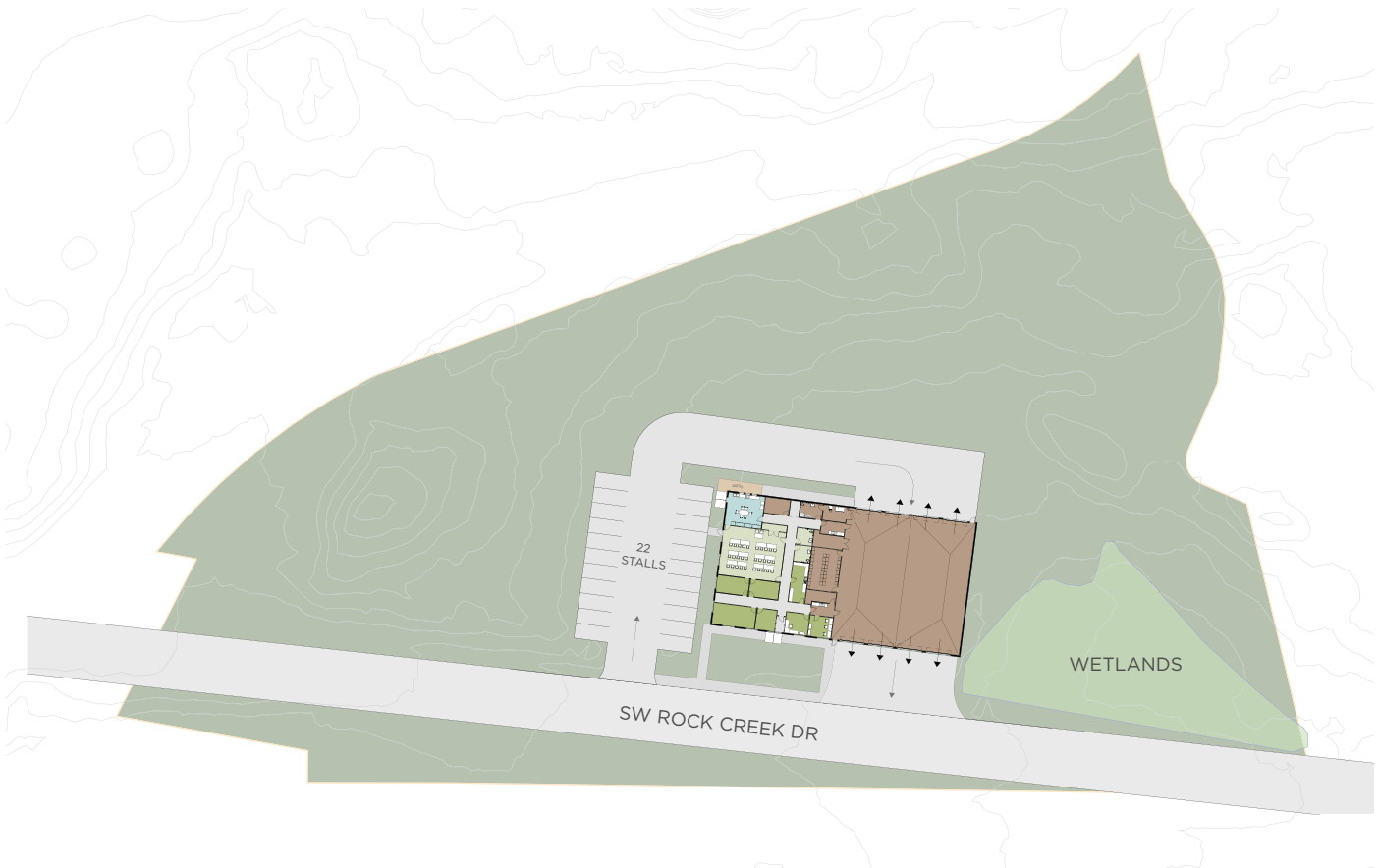
BUILDING OPTION B

Apparatus Bay and Support	6,748 SF
Living Quarters	1,726 SF
Administration and Building Support	1,372 SF
Community	1,213 SF
Total (Includes 20% circulation)	11,059 SF

SITE PLAN

A modified Option A was selected by the Department as the preferred adjacency and site plan.

The approved site plan and floor plans were developed based on feedback received during review of the preliminary site plan options and block diagram schemes. During this discussion, additional site elements were identified and the plans were further refined to meet Department expectations, honing in on programmed square footages, increasing efficiencies, and taking into consideration future growth.

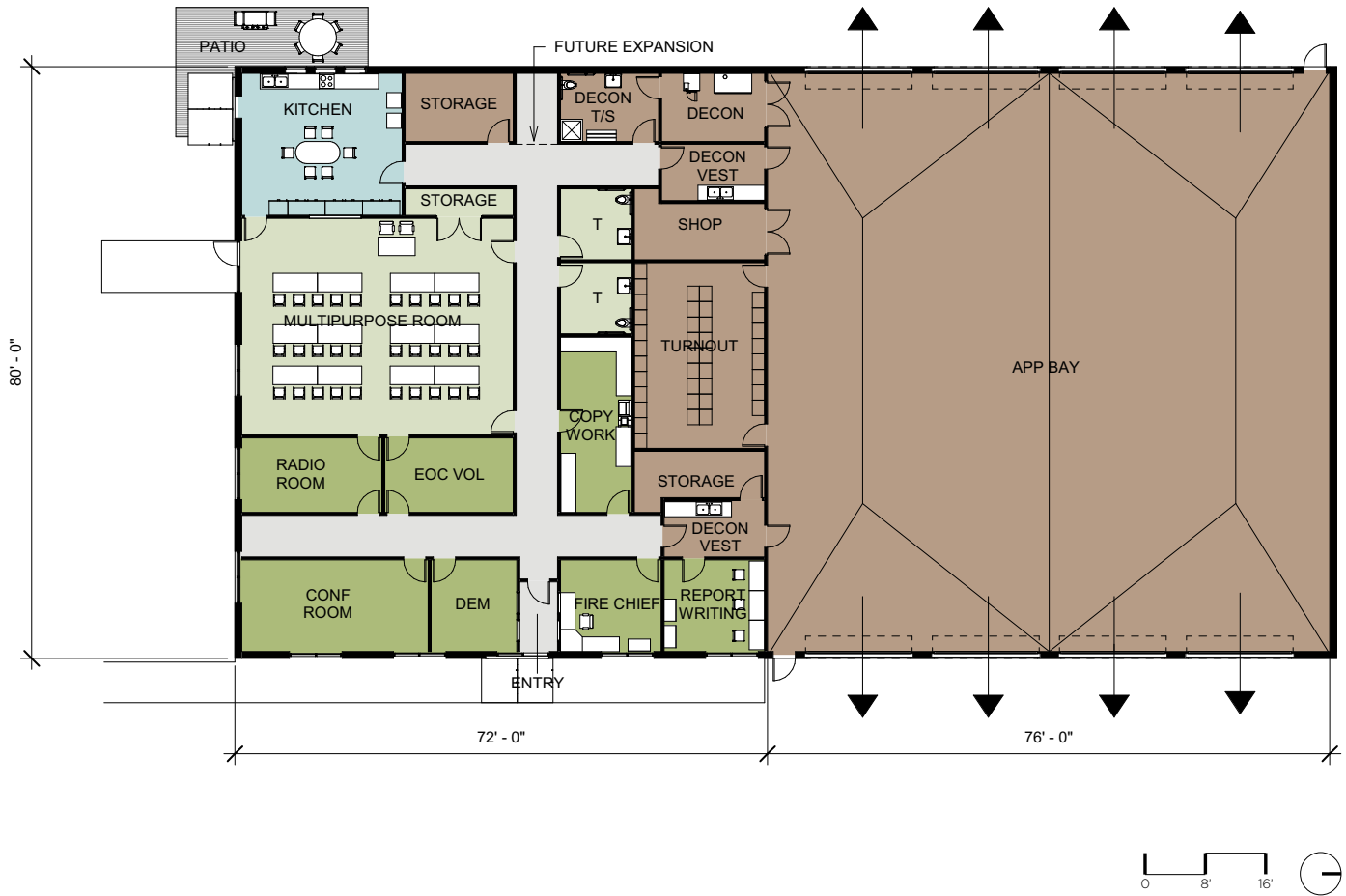


Site Summary

Total Site Area: 69,900 SF

Shared Parking: 30 Stalls

SELECTED PLAN



The block diagram for Option A was further refined to a floor plan level of detail in coordination with the Fire Hall Design Team. Access points into rooms, furniture, and equipment were added to further evaluate the proposed scheme and verify the design met the teams requirements.

As you enter the vestibule and small lobby area, the DEM and fire chief office affords a clear line of site to the front door, and access to the rest of the fire hall. The DEM support rooms are located with easy access to the multipurpose room, which will function as an E.O.C in an event of an emergency. The apparatus bay and its support rooms are located to the north. All access from the apparatus bay to administration areas have a hand washing station to remove contaminants.

Legend

- Apparatus Bay and Support
- Living Quarters
- Administration and Support
- Community
- Circulation

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Conceptual Design

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CONCEPTUAL DESIGN

Following cues from the visioning process, the Design Team worked with the District and Fire Department to craft a conceptual design molded from the key concepts. Stevenson Washington stands proud of the long and rich history that surrounds both the City and the Fire Department. Important considerations were that the building uses materials representative of the city, consider the neighboring properties for use and scale, and the building responds to a desire for street frontage. The construction techniques indicative of this design has sought to be responsible, cost-effective, long lasting, and low maintenance approaches to building construction.

To assist the Department to visualize design options, Mackenzie produced two massing studies of the new building, using the approved site and floor plans. The three massing options utilize similar material pallets to achieve aesthetic and formal massing that speaks to the variety of responses received from the community during the public visioning session. The selected material pallet reinforces the overall longevity of the building, both physically due to the durability of the materials and in terms of the external perception of the facility. The pre-engineered metal building structure allows for an open concept and simple exterior framing, while the fiber cement siding infuses a modern, minimalist aesthetic that responds to the community's desire for a low maintenance, cost-effective facility.

Responding to the rhythmic repetition of openings found at the overhead doors, Option 01 uses panel-like window openings in the panels and bays of the building, which captures the qualities found in pre-engineered metal buildings. To then break up the scale and provide larger daylighting and view opportunities at appropriate interior program spaces, wood panel and larger glass openings were introduced. The two different types of roof, one gabled and the other low slope.

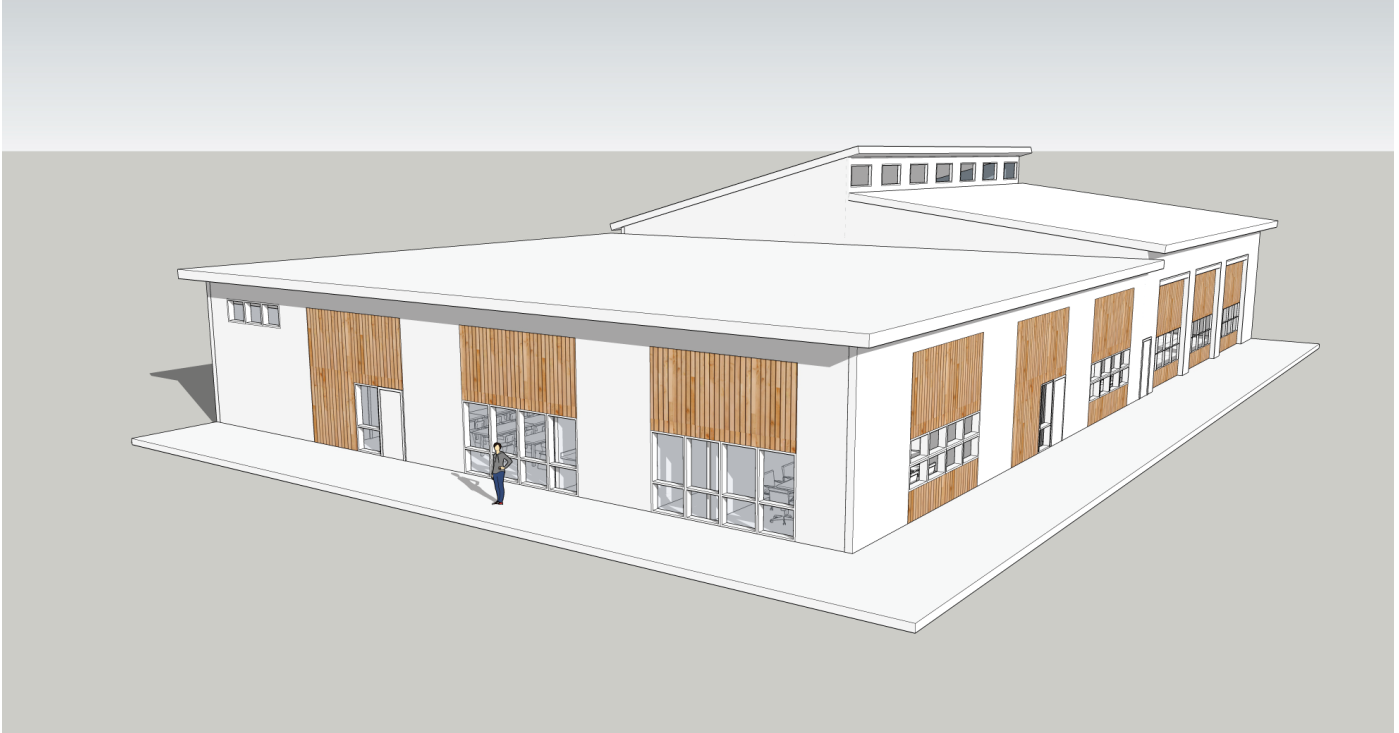
In contrast, Option 02 showcases the structural system at the south elevation with smaller individual window openings that match the glazing of the apparatus bay overhead doors. The roof is a simple gabled roof with a clerestory pop up gable to maximize natural light in the interior spaces.

Option 03 uses the same materiality of option 01 and 02, but with clerestory windows across the entire length of the building. The administration and public area are further defined by a wrapping motion of the wood siding to tie the facility with the Stevenson and Pacific Northwest look.

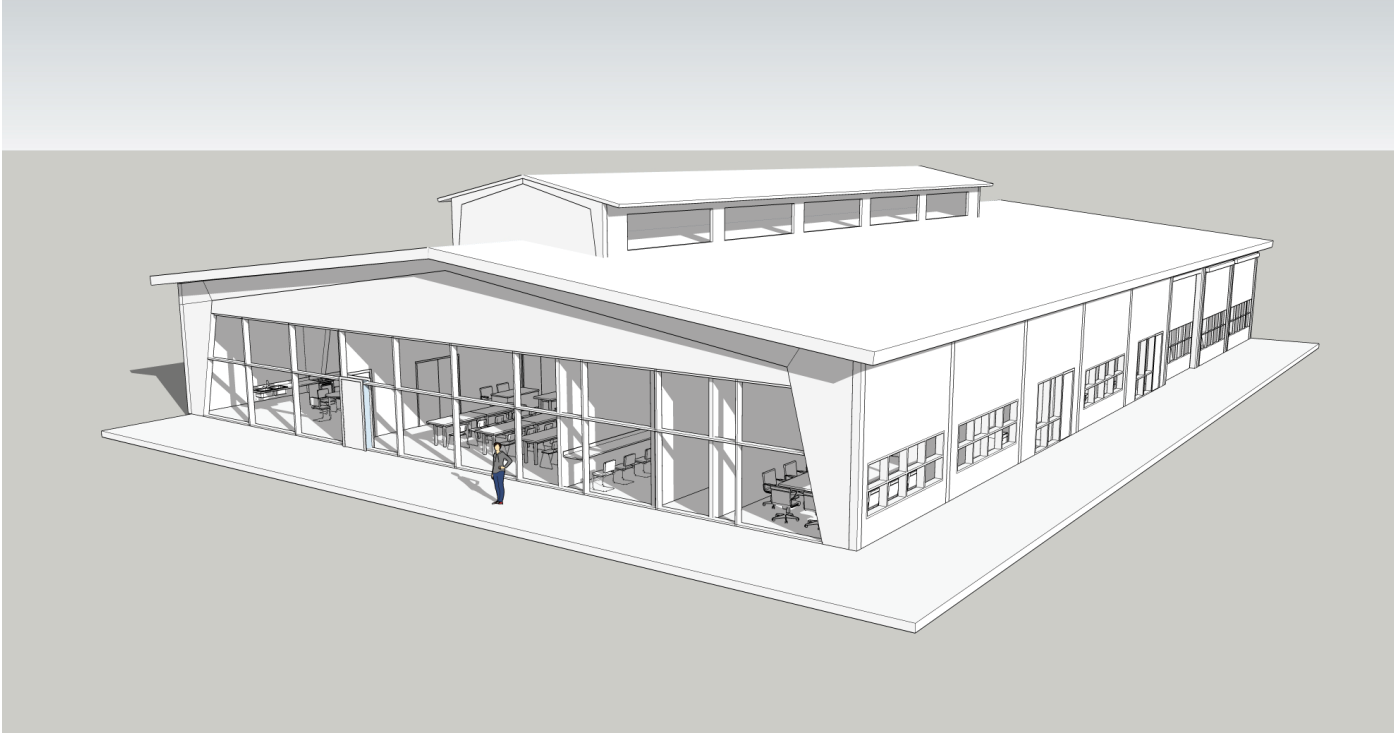
The Fire Department selected Option 03 as the preferred option for refinement and pricing. Revisions of note include adding a canopy at the entry and defining the entry to the building more clearly.

The following pages illustrate the progression of the design.

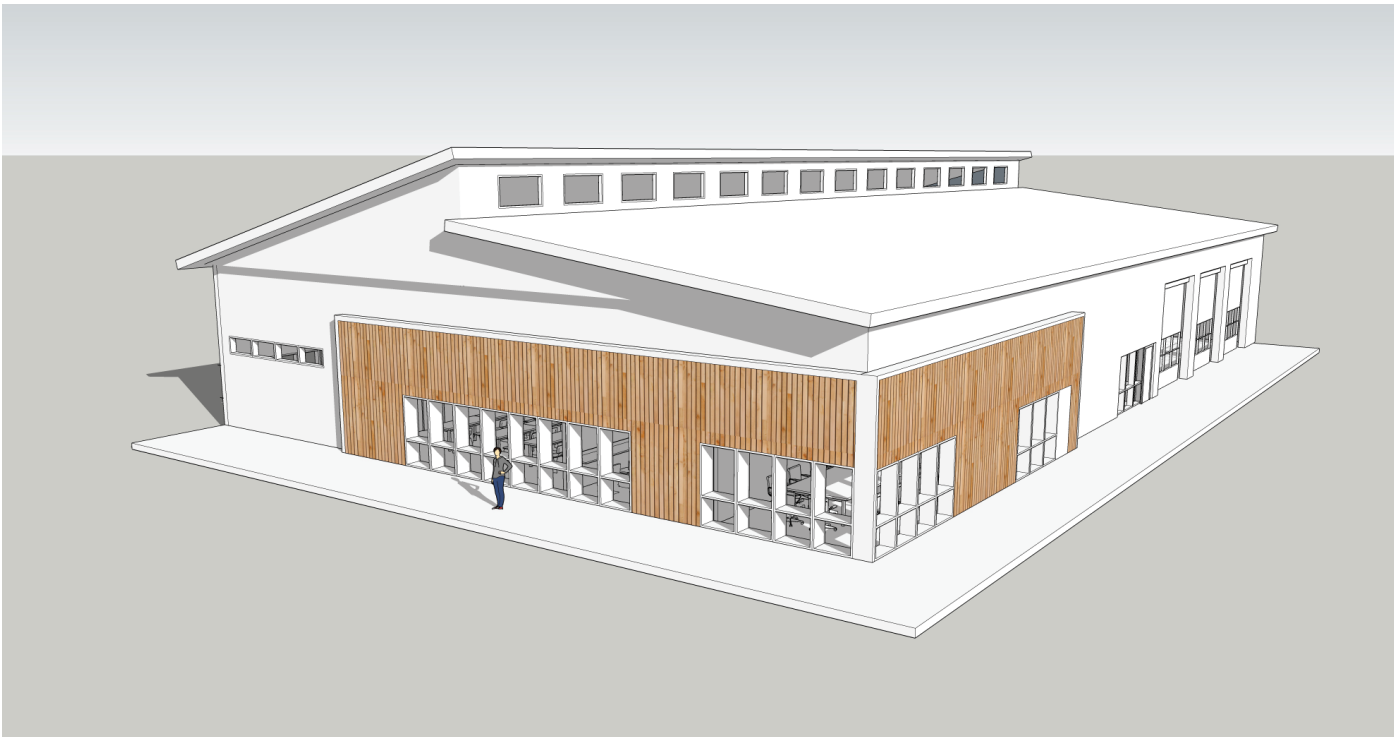
CONCEPT OPTION 01

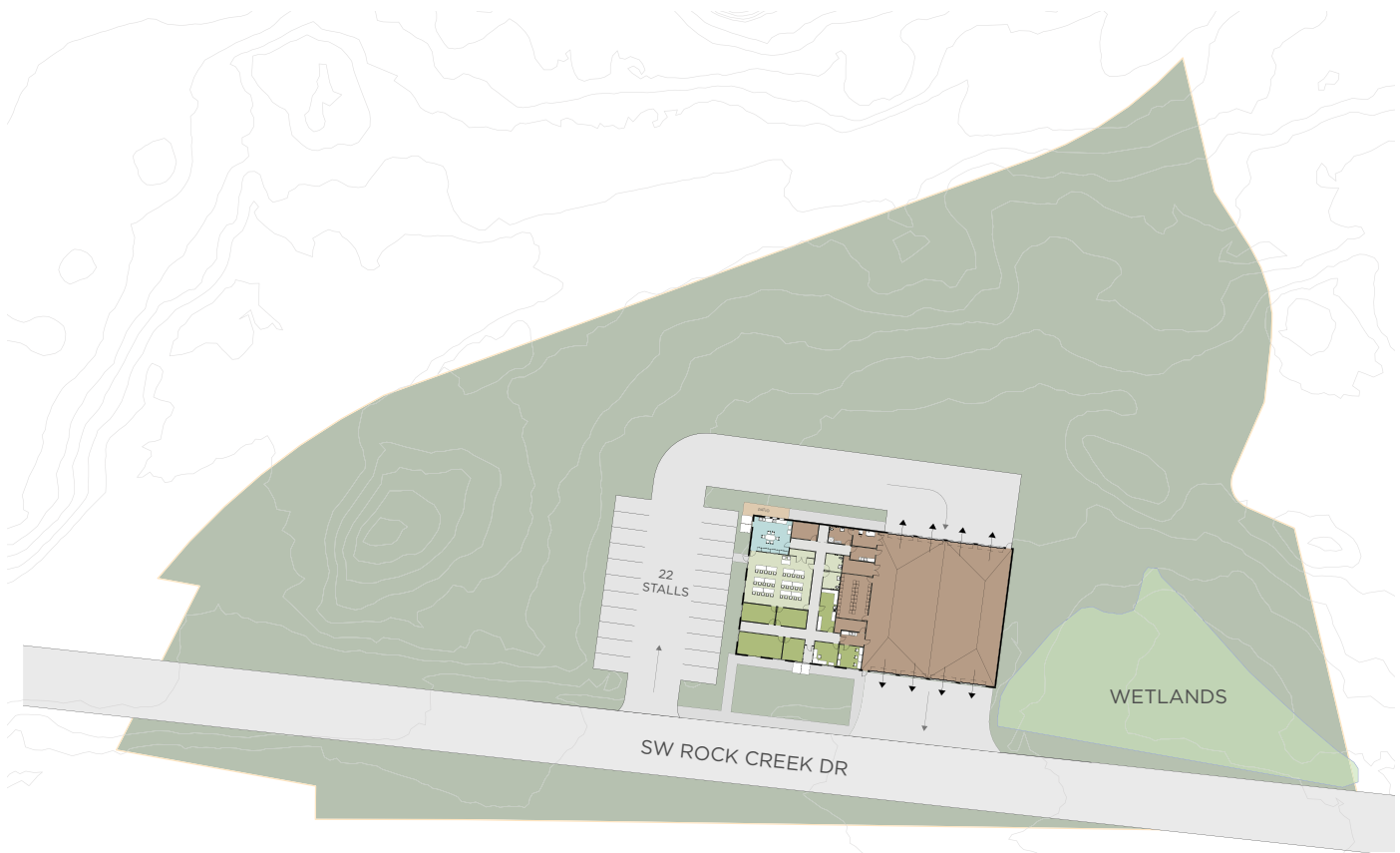


CONCEPT OPTION 02



CONCEPT OPTION 03





Site Plan



Floor Plan

SELECTED CONCEPT DESIGN



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Project Cost Development

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COST SUMMARY

Following completion of the conceptual design, Mackenzie evaluated cost impacts of the fire facility to meet Department needs for the next 30 years. The following cost summary shows projections of a total development cost, including estimated construction costs, design costs, and owner costs.

Development costs of a project are not limited to construction costs alone and require consideration of other variables. These variables differ between new construction and renovation or expansion, and invariably change from one project to the next depending on site conditions, existing building conditions, building codes, seismic zones and the environment of the construction industry. Differences between estimates arise depending on the design approach, construction costs, and design and engineering costs. Owner costs for furniture, fixtures and equipment are often constant, based on a predetermined budget set by the Department. New construction can often differ substantially due to the single variable of land acquisition. This cost, coupled with higher construction costs, often leads to this being a more expensive option.

Construction costs reflect the raw costs incurred by a general contractor for overhead and profit, bonding and insurance, securing of materials and general construction of the site and building. In addition to the identified construction costs, a design contingency is recommended to ensure dollars are carried through construction for owner changes, design omissions, unforeseen conditions or jurisdictional requirements, among others. A high and a low range of Construction Cost contingency has been calculated in the Project Cost Summaries, shown on the following pages.

Consultant costs reflect the costs incurred for project management and design of the project from conceptual design through construction administration. Though design fees can vary, these costs are generally factored using a fee based on the construction costs for the project. In addition to architectural and engineering services, costs include marketing materials and required services such as topographical surveys and special inspections. A contingency is provided for this category for any unforeseen or additionally requested design services throughout the project.

Owner costs reflect the costs generally incurred directly by the owner throughout the project. This includes all items the owner may wish to contract separately from the general construction of the project. Additional owner-related costs include relocation into the new facility, legal documentation and counsel for project documents and issuances, and jurisdictional fees associated with design review, building permits, SDCs, TIF fees and BOLI fees. A contingency is provided in this category for any unforeseen or undefined costs not currently represented.

The Jurisdictional Fee Summary reflects a preliminary estimate of the fees which will be assessed by the governing jurisdiction. This information is based on the information available at the date of the report, and the actual fees may vary at the time of permit application or issuance. For the purposes of this estimate, any fees that are expected to be credited back once the permit is issued have been removed from the summary.

The following project development cost estimate examines the construction values of the programmed design concept. The design concept has been estimated for a high range and a low range, with details of scope and assumptions detailed in the Statement of Probable Costs, found in Appendix A.

COST SUMMARY

Stevenson Fire Hall - Cost Summary Low

New Construction

3/5/2019

		Comments
Construction Cost of Facility		
Building Hardcost	\$2,841,806	
On-Site Hardcost	\$916,103	
Off-Site Hardcost	\$83,920 ²	
Subtotal	\$3,841,829	
Margins		
Owner's Contingency	\$494,203	15.0% Allowance
Sales Tax	\$333,874 ¹	7.7% Sales Tax
Subtotal	\$828,077	
Total Construction Costs	\$4,669,906	
	\$394.42 /sf	
Consultants Costs		
	Original Design	
A/E Design and Construction - Base	\$725,000	12.5% Allowance
Sustainability Certification	\$0	Excluded
Reimbursables	\$7,250	1.0% Allowance
Owner's Project Manager	\$0	Excluded
Marketing Materials	\$0	Excluded
Topo and Boundary Survey	\$12,000	Allowance
Special Inspections	\$35,000	Allowance
Geotechnical Services (Design + Inspections)	\$40,000	Allowance
Environmental Services	\$25,000 ³	Allowance
Transportation Engineering	\$7,500	Allowance
Haz. Material Survey/Testing/Mitigation Specs	\$0	Excluded
Air-Barrier Testing	\$5,500	Allowance
Commissioning	\$0	Excluded
Arborist	\$5,000	Allowance
Subtotal - Consultants	\$862,250	
Consultants Contingency	\$43,113	5.0%
Total Consultants Costs	\$905,363	
	\$76.47 /sf	
Owner Costs		
	Original Design	
Land Acquisition	\$0	Excluded
Fixtures, Furniture & Equipment (FF&E)	\$98,600 ⁴	Allowance
Fitness Equipment	\$0	Excluded
Telephone/Data/AV/Security Equipment	\$30,000	Allowance
Sustainability Registration (i.e. LEED)	\$0	Excluded
Moving Allowance	\$0	Excluded
Temporary Facilities	\$0	Excluded
Permit Fees	\$20,000	Estimated
Subtotal - Owner Costs	\$148,600	
Owner Contingency	\$11,145	7.5% of Owner Costs
Sales Tax	\$12,300 ¹	7.7% Sales Tax
Total Owner Costs	\$172,045	
	\$14.53 /sf	
Total Project Cost	\$5,747,314	
	\$485.42 /sf	
Building Size (SF):	11,840 SF	

Notes

¹ Assumes Highest Rate, Combine State, County and City Tax Rate

² Driveway and street improvements for SW Rock Creek Drive

³ Environmental Services include initial report and wetland delineation report

⁴ Furniture for DEM excluded for estimate, includes appliances, generator

Stevenson Fire Hall - Cost Summary High

New Construction

3/5/2019

		Comments
Construction Cost of Facility		
Building Hardcost	\$3,001,896	
On-Site Hardcost	\$916,103	
Off-Site Hardcost	\$83,920 ²	
Subtotal	\$4,001,919	
Margins		
Owner's Contingency	\$847,662	25.0% Allowance
Sales Tax	\$373,417 ¹	7.7% Sales Tax
Subtotal	\$1,221,079	
Total Construction Costs	\$5,222,998	
	\$441.13 /sf	
Consultants Costs		
	Original Design	
A/E Design and Construction - Base	\$725,000	12.5% Allowance
Sustainability Certification	\$0	Excluded
Reimbursables	\$7,250	1.0% Allowance
Owner's Project Manager	\$0	Excluded
Marketing Materials	\$0	Excluded
Topo and Boundary Survey	\$12,000	Allowance
Special Inspections	\$35,000	Allowance
Geotechnical Services (Design + Inspections)	\$40,000	Allowance
Environmental Services	\$25,000 ³	Allowance
Transportation Engineering	\$7,500	Allowance
Haz. Material Survey/Testing/Mitigation Specs	\$0	Excluded
Air-Barrier Testing	\$5,500	Allowance
Commissioning	\$0	Excluded
Arborist	\$5,000	Allowance
Subtotal - Consultants	\$862,250	
Consultants Contingency	\$43,113	5.0%
Total Consultants Costs	\$905,363	
	\$76.47 /sf	
Owner Costs		
	Original Design	
Land Acquisition	\$0	Excluded
Fixtures, Furniture & Equipment (FF&E)	\$98,600 ⁴	Allowance
Fitness Equipment	\$0	Excluded
Telephone/Data/AV/Security Equipment	\$30,000	Allowance
Sustainability Registration (i.e. LEED)	\$0	Excluded
Moving Allowance	\$0	Excluded
Temporary Facilities	\$0	Excluded
Permit Fees	\$20,000	Estimated
Subtotal - Owner Costs	\$148,600	
Owner Contingency	\$11,145	7.5% of Owner Costs
Sales Tax	\$12,300 ¹	7.7% Sales Tax
Total Owner Costs	\$172,045	
	\$14.53 /sf	
Total Project Cost	\$6,300,406	
	\$532.13 /sf	
Building Size (SF):	11,840 SF	

Notes

¹ Assumes Highest Rate, Combine State, County and City Tax Rate

² Driveway and street improvements for SW Rock Creek Drive

³ Environmental Services include initial report and wetland delineation report

⁴ Furniture for DEM excluded for estimate, includes appliances, generator

FACILITY COST COMPARISON



<u>PROJECT</u>	<u>MCKENZIE FIRE</u>	<u>ALBANY FIRE</u>
LOCATION	Leaburg, OR	Albany, OR
YEAR COMPLETE	2013	2017
CONSTRUCTION TYPE	Wood & Metal Framing w/ Cement Board Siding and Brick Veneer	Structural Masonry
BUILDING SIZE	11,031 sf	26,568 sf
STORIES	SINGLE	TWO
BUILDING COST per sf	\$140.44 per sf	\$189.13 per sf
SITE COST per sf of building	\$35.39 per sf of building	\$20.46 per sf of building
OFF-SITE COST per sf of building	\$0	\$1.45 per sf of building
TOTAL CONSTRUCTION COST per sf of building	\$144.63 per sf of building	\$289.46 per sf of building
FINAL CONSTRUCTION COST ESTIMATE per sf of building	\$185.97 per sf of building	\$312.60 per sf of building
LOW BID (AVERAGE BID) per sf of building	\$160.32 (\$181.18) per sf of building	\$226.33 (\$244.17) per sf of building

* - Mezzanine not included

† - Based on Mackenzie's preliminary estimate validated by Construction Focus, Inc.

City of Stevenson

May 2019



**AVERAGE
BUILT COST**

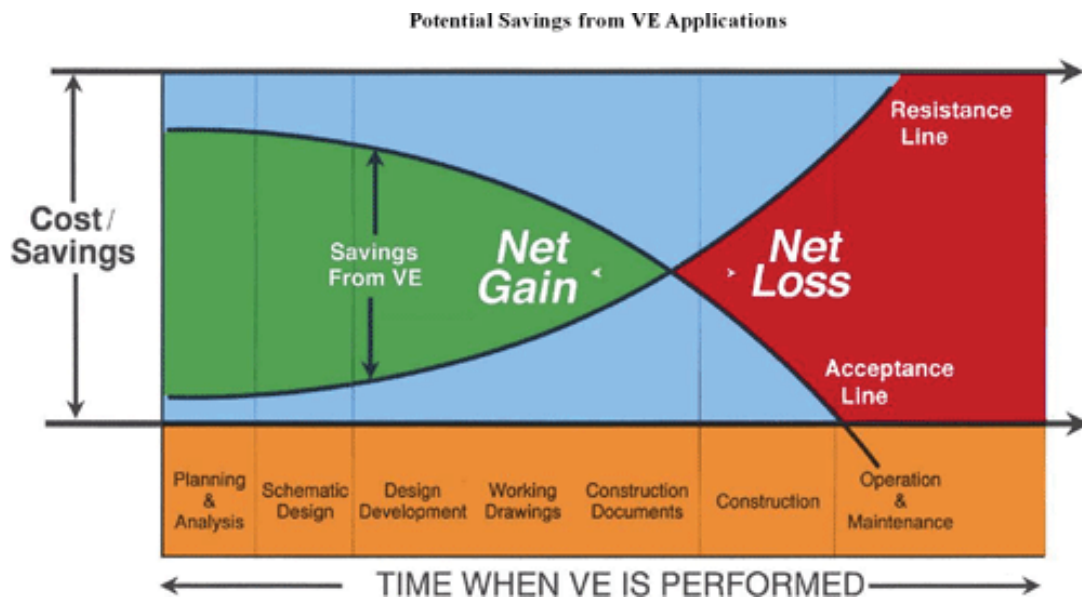


<u>VANCOUVER FIRE</u>	<u>CLARK COUNTY STATION 63</u>		<u>STEVENSON FIRE</u>
Vancouver, WA	Vancouver, WA		Stevenson, WA
2018	2019		Conceptual Design
Structural Masonry and Wood Framing w/ Cement Board Siding	Wood Framing w/ Cement Board Siding		Pre-engineered metal building with wood siding
14,524 sf	17,693 sf		11,840 sf *
SINGLE	TWO		SINGLE STORY
\$214.16 per sf	\$403.76 per sf	\$236.87	\$185.70 + per sf
\$17.33 per sf of building	\$19.29 per sf of building	\$23.12	\$28.30 + per sf of building
\$7.60 per sf of building	\$0	\$2.26	\$0
\$368.96 per sf of building	\$565.06 per sf of building	\$342.03	\$441.13 + per sf of building
\$234.49 per sf of building	\$490.41 per sf of building		N/A
\$319.55 (\$323.76) per sf of building	\$443.08 (\$466.60) per sf of building		N/A

VALUE ENGINEERING

Upon conclusion of forecasting probable costs for the facilities, at the request of Stevenson, we identified the following possible strategies to reduce costs for the facilities. These strategies are a number of the more significant strategies to reduce cost. The list is not exhaustive to include all possibilities but does illustrate several options that can be chosen for reducing project costs. As the project moves into the next phases of design, cost forecasting, validation and value engineering are normal events that we would recommend occur as the design and construction documents are being developed.

Value Engineering is a conscious and explicit set of disciplined procedures designed to seek out optimum value for both initial and long-term investment.



Courtesy of : http://www.wbdg.org/resources/value_engineering.php

The following table illustrates the value engineering strategies and applicable cost savings per station if implemented. The total of these collective strategies would yield a cost savings between 10-20% (varying per each project) over the forecasted project costs. These strategies have not been evaluated in terms of merits and the specific advantages and disadvantages of each. They have simply been denoted to illustrate some of the possibilities.

	Value Engineering Items	Cost
1	Eliminate Apparatus bay doors and utilize back-in bays	\$23,119
2	Eliminate drive thru bays - back bollards	\$4,400
3	Eliminate back drive aisles	\$127,955
4	Self perform landscape installation	\$20,250
5	Change concrete apron to asphalt 6" apron	\$5,426
6	Remove site benches	\$6,000
7	Eliminate (2) site lighting poles	\$8,500
8	Reduce on-site sidewalk	\$3,000
9	Trash Enclosure to be chain link in lieu of CMU	\$3,800
10	Change light gage framing to wood studs	\$12,546
11	If wood studs - change domestic water piping to PEX	\$1,700
12	If wood studs - change waste piping to ABS	\$3,500
13	Reduce apparatus bay trench drain by 24 feet	\$4,200
14	If wood studs - change from electrical conduit to Romex	\$6,500
15	Eliminate gypsum board soffits	\$1,749
16	Change countertop from solid surface quartz to plastic laminate	\$9,000
17	Gypsum board finish from Level 4 to Orange Peel	\$15,804
18	Appliance and Turnout Lockers purchased by City - OFOI	\$15,000
19	Shop Lockers to be casework	\$1,000
20	Remove (1) baby changing station	\$642
21	Change storefront windows to vinyl windows	\$51,615
22	Eliminate room signage and white board - OFOI	\$4,400
23	Change roller shades to horizontal blinds	\$6,336
24	Generator to be purchased by City - OFCI	\$43,000
25	apparatus bay to 4'-0" wainscot CDX plywood	\$855
26	Reduce the amount of wood siding and extrusion	\$2,500
27	Reduce the height of building by 5'-0" at non-apparatus bay area	\$44,341
28	Turn the gable roof of apparatus bay 90 degrees - non apparatus bay area roof to die into apparatus bay roof	-\$9,000

Sub-Total	\$418,138
<i>Inflation & Market Conditions (High Side) @ 6%</i>	<i>\$25,088</i>
<i>Contingency (High Side) @ 25%</i>	<i>\$110,807</i>
<i>General Conditions @ 7%</i>	<i>\$38,782</i>
<i>Profit and Overhead @ 6%</i>	<i>\$35,569</i>
<i>Performance Bond</i>	<i>\$5,655</i>
<i>Sales Tax @ 7.7%</i>	<i>\$48,821</i>
Total:	\$682,860

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Appendix A: Supporting Cost Estimate

A



February 12, 2019
Revision #0-A

**CITY OF STEVENSON
STEVENSON FIRE DEPARTMENT**



STATEMENT OF PROBABLE COST

Prepared for:
Mackenzie
Portland, OR

Prepared by:
Steve Gunn

A handwritten signature in blue ink, appearing to read "Steve Gunn".

President
Construction Focus, Inc.

STEVENSON FIRE HALL

Statement of Probable Cost

LOC	ITEM	DESCRIPTION	QNTY	UNIT	\$/UNIT	TOTAL \$
STEVENSON FIRE HALL						
Ground Floor Gross Area			11,840	SF		
Building Earthwork						35,341
	Crushed rock pad 6"		427	TON	37.00	15,799
	Footing excavation		374	CY	33.00	12,342
	Footing backfill		360	TON	20.00	7,200
Concrete						147,382
At PEMB	Pad footing	6' x 6' x 2'd	20	EA	1,650.00	33,000
Perim	Grade beam		232	LF	65.00	15,080
	Slab on grade	6"t	6,080	SF	9.00	54,720
	Slab on grade	4"t	5,760	SF	7.74	44,582
Steel						8,800
	Shell	included in PEMB				
	Stl bollard	6" round_4'h	16	EA	550.00	8,800
Rough Carpentry						19,915
	Wall sheathing	cdx_1/2"	6,840	SF	2.78	19,015
Elec	Plywood sheathing	fire rated ply	360	SF	2.50	900
Finish Carpentry						2,500
Interior	Trims	allowance	1	LS	2,500.00	2,500
Light Gage Framing						82,012
Living ext	Wall furring	ltga_3-5/8" @ 16" o.c.	3,480	SF	4.40	15,312
Appar ext	Wall furring	ltga_3-5/8" @ 16" o.c.	3,360	SF	4.40	14,784
Living ext	Wall furring	hat channel @ 16" o.c.	3,480	SF	2.80	9,744
Appar ext	Wall furring	hat channel @ 16" o.c.	3,360	SF	2.80	9,408
Interior	Wall framing	3 5/8" @ 16"oc	7,100	SF	4.40	31,240
Soffit	Soffit framing	ltga_3 5/8" @ 16"oc	150	SF	6.50	975
Soffit	Soffit wall framing	ltga_3 5/8" @ 16"oc	100	SF	5.49	549
Casework						43,130
	Base cabinet w/ doors	p-lam	50	LF	265.00	13,250
	Upper cabinet w/doors	p-lam	50	LF	145.00	7,250
	Countertop	solid surface_quartz	100	SF	125.00	12,500
	Work station	p-lam	130	SF	40.00	5,200
	Full hgt cabinet	p-lam	17	LF	290.00	4,930
Insulation & WRB						41,554
Living ext	Insulation	thermal R-25	3,480	SF	1.32	4,594
Appar ext	Insulation	thermal R-25	3,360	SF	1.32	4,435
	Insulation	acoustic batt	7,100	SF	1.00	7,100
	WRB	building wrap	3,480	SF	1.64	5,707
Under slab	Vapor barrier	Stego wrap	11,840	SF	1.20	14,208
	WRB	building wrap	3,360	SF	1.64	5,510
Cladding						72,092
Living	Wood siding	Hardie panel	2,088	SF	14.39	30,046
Apparatus	Wood siding	Hardie panel	1,792	SF	14.39	25,787
Living	Wood siding	Hardie lap_wood grain	1,392	SF	11.68	16,259

STEVENSON FIRE HALL

Statement of Probable Cost

LOC	ITEM	DESCRIPTION	QNTY	UNIT	\$/UNIT	TOTAL \$
	Roofing and Sheet Metal					
	(included in PEMB)					
	Waterproofing and Sealants					1,500
	Sealant	allowance	1	LS	1,500.00	1,500
	Doors, Frames, and Hardware					134,800
	Swing door	3x7 hm_hm frm	8	EA	2,000.00	16,000
	Swing door	3x7 sc wd_hm frm	18	EA	2,100.00	37,800
	Swing door	6x7 hm_hm frm	2	PR	4,000.00	8,000
	Swing door	6x7 sc wd_hm frm	1	PR	4,200.00	4,200
	Overhead door	steel_alum frm_1/2 glz_14x14	8	EA	8,600.00	68,800
	Glass & Glazing					94,705
Exterior	Storefront	Kawneer 451UT/glaz	1,044	SF	85.35	89,105
	Storefront door	3x7 alum	2	EA	2,400.00	4,800
	Reception window	alum_pass-thru_6x4	1	EA	800.00	800
	Floor Coverings					49,012
	Flooring	carpet tile	1,390	SF	5.50	7,645
	Flooring	polished concrete	2,806	SF	6.92	19,418
	Flooring	sealed concrete	7,075	SF	2.50	17,688
	Flooring	walk-off mat	60	SF	8.50	510
	Wall base	4" rubber	1,745	LF	2.15	3,752
	Ceilings					38,334
Apparatus	Exposed PEMB	-no ceiling -				
Living	ACT	2x4_ceiling grid w/ act	5,580	SF	6.50	36,270
	Ceiling: suspended	type: X LVL 4_5/8"_w/grid	180	SF	5.80	1,044
Soffit	Gypsum board	5/8"_gyp board_LVL-4	150	SF	6.80	1,020
	Wall Board and Wall Coverings					70,624
	Gypsum bd	5/8"_gyp board_LVL-4	14,200	SF	4.00	56,800
	Gypsum bd	5/8"_gyp board_LVL-4	3,360	SF	4.00	13,440
Janitor	Wallcover	FRP	50	SF	7.67	384
	Painting and Finishing					27,398
	Painting @ door/frame	2 top coats	12	EA	100.00	1,200
	Stain/seal @ door/frame	2 top coats	20	EA	110.00	2,200
	Painting @ gypbd	prime + 2 top coats	14,270	SF	1.00	14,270
Apparatus	Painting @ exposed structure	prime + 2 top coats	6,080	SF	1.60	9,728
	Appliances					3,600
	Appliances	allowance	4	EA	900.00	3,600
	Lockers					15,600
	Lockers	2x2 turnout storage lockers	38	EA	300.00	11,400
	Lockers	shop lockers 3x6	6	EA	700.00	4,200
	Specialties and Equipment					6,604
OFCI	Extractor cabinet		1	EA	1,500.00	1,500
	Fire extinguisher & cabinet		2	EA	360.00	720
	Toilet accessories	foldable baby changing station	2	EA	641.96	1,284
	Toilet accessories	various types	10	EA	110.00	1,100

STEVENSON FIRE HALL

Statement of Probable Cost

LOC	ITEM	DESCRIPTION	QNTY	UNIT	\$/UNIT	TOTAL \$	
Exterior	Whiteboards		1	LS	2,000.00	2,000	
	Signage						5,400
	Room signage	frosted glass/ss standoffs	20	RM	120.00	2,400	
	Signage	allowance	1	LS	3,000.00	3,000	
	PEMB						477,507
	Essential Fac PEMB	frames/roofing/erection	11,840	SF	38.53	456,195	
	PEMB	Simple Saver insulation	11,840	SF	1.80	21,312	
	Furnishings						17,568
	Window treatment	cloth roller shades	1,044	SF	12.00	12,528	
	Window treatment	blackout shades	360	SF	14.00	5,040	
	Fire Sprinklers						43,808
	Fire protection	riser/mains/drops/heads	11,840	SF	3.70	43,808	
	Plumbing						152,955
	Grille Compressor	WC	rough-in/set/finish	3	EA	3,834.00	11,502
		Lav	rough-in/set/finish	3	EA	3,644.00	10,932
Dbl sink		rough-in/set/finish	1	EA	4,833.00	4,833	
Shower		rough-in/set/finish	1	EA	5,122.00	5,122	
Water heater		100 gal elec	2	EA	5,679.00	11,358	
Hose bibs			4	EA	800.00	3,200	
Accessories		cleanouts/floor drains	11,840	SF	4.20	49,728	
Domestic water piping/insulation			240	LF	40.00	9,600	
Waste piping			180	LF	50.00	9,000	
Vent piping			140	LF	32.00	4,480	
Trench drains			104	LF	175.00	18,200	
Gas piping			1	LS	1,500.00	1,500	
Air piping			1	LS	1,500.00	1,500	
Tests/permits/coord/GCs			1	LS	12,000.00	12,000	
HVAC						186,240	
Offices		HVAC	split-system/HRV/ducted air	5,760	SF	26.00	149,760
Apparatus		HVAC	exhaust/IR heat/MUA	6,080	SF	6.00	36,480
Electrical						420,320	
		Power	svce/feeders/devices/connect	11,840	SF	13.00	153,920
		Lighting	lighting & contols	11,840	SF	11.50	136,160
	Low voltage	comm/AV/fire	11,840	SF	11.00	130,240	
STEVENSON FIRE HALL HARDCOST						2,198,702	
SITWORK							
Earthwork						164,082	
	Mobilization		1	LS	20,000.00	20,000	
	Traffic/ped control		1	LS	6,000.00	6,000	
	Temp erosion control		1	LS	4,000.00	4,000	
	Surveying		1	LS	12,000.00	12,000	
	Clearing		1	LS	15,000.00	15,000	
	Excavation	bldg_24" avg.	877	CY	38.00	33,327	

STEVENSON FIRE HALL

Statement of Probable Cost

LOC	ITEM	DESCRIPTION	QNTY	UNIT	\$/UNIT	TOTAL \$
	Excavation	hardscape_13" avg.	683	CY	38.00	25,958
	CR rock 10"	bldg & parking	1,648	TON	29.00	47,797
Over-excavation & Backfill						414,910
	Building/parking	bldg avg. 6ft/parking avg. 4ft	6,074	CY	35.00	212,590
	Backfill	crushed rock	11,240	TON	18.00	202,320
Hardscapes & Curbs						71,329
Parking	Asphalt pave 3"		120	TON	130.00	15,577
Drive	Asphalt pave 4"		198	TON	130.00	25,683
	Apron concrete 6"		1,075	SF	9.50	10,213
	Curb	type A	819	LF	23.00	18,837
	Mowstrip		85	SF	12.00	1,020
Site Improvements						58,542
North	Trash enclosure	slab/cmu walls/gates	1	EA	10,000.00	10,000
	Retaining wall		519	SF	60.00	31,140
	Flagpole		1	EA	5,500.00	5,500
On bldg	Antenna		1	EA	5,000.00	5,000
	Bike rack	stl-loop_galv	1	EA	350.00	350
	Benches		4	EA	1,500.00	6,000
	Striping	cars and lanes	420	LF	0.60	252
	Handicap symbol/sign		1	EA	300.00	300
Landscaping						20,250
	Landscaping	topsoil-12"/plants/irrig	4,500	SF	4.50	20,250
Storm						21,000
	8" PVC storm		200	LF	48.00	9,600
	Catch basin		6	EA	1,200.00	7,200
	3 Way valve & vault		1	EA	4,200.00	4,200
Sanitary						17,250
	6" Sani pipe		100	LF	80.00	8,000
	Sanitary cleanout		1	EA	450.00	450
	Oil water seperator		1	EA	8,500.00	8,500
	Connect to mainline		1	EA	300.00	300
Water						41,740
	6" Fireline w/trench		100	LF	155.00	15,500
	2" Hot tap		1	EA	4,000.00	4,000
	2" Dom water		100	LF	38.00	3,800
	2" Water meter vault		1	EA	1,000.00	1,000
	6" DDCV vault		1	EA	15,000.00	15,000
	FDC		1	EA	1,400.00	1,400
	Asphalt trench patch		104	SF	10.00	1,040
Site Electrical						107,000
	Site lighting		8	EA	3,500.00	28,000
	Generator	150KW	1	EA	50,000.00	50,000
	Conduits		300	LF	30.00	9,000
	Site laterals		500	LF	40.00	20,000
SITWORK HARD COST						916,103

STEVENSON FIRE HALL

Statement of Probable Cost

LOC	ITEM	DESCRIPTION	QNTY	UNIT	\$/UNIT	TOTAL \$
STREET WORK						
Street Construction						83,920
	Sawcut		680	LF	2.50	1,700
	Excavation		178	CY	60.00	10,680
	Traffic/ped control		1	LS	12,000.00	12,000
	Crushed rock base		300	TON	35.00	10,500
	Asphalt paving		48	TON	200.00	9,600
	Curb & gutter		680	LF	23.00	15,640
	Sidewalk		3,400	SF	7.00	23,800
STREET WORK HARDCOST						83,920
HARDCOST TOTAL						3,198,725
<p>The above HARDCOST TOTAL does not include typical general contractor markups. Those plus contingencies are listed below as part of a Low-High Range. Variables include fluctuations in market conditions, material selections, and design considerations. The Cost Estimate Range will be consolidated as we move closer to the actual Bid Date.</p>						
LOW RANGE				HIGH RANGE		
	@ 3%:	95,962	Markups:		@ 6%:	191,923
	@ 15%:	494,203	Inflation & Market Conditions		@ 25%:	847,662
		265,222	Contingency			296,682
		243,247	Gen Conditions @ 7%:			272,100
		38,673	Profit & Overhead @ 6%:			42,489
	7.70%	333,874	Performance Bond:		7.70%	373,418
			WA Tax			
		1,471,181	Markup Subtotals:		2,024,273	
		4,669,906	BASE BID TOTAL		5,222,998	
ALTERNATE						
	67,402	Additional parking			74,827	
NOTES						
This estimate assumes competitive bidding by local contractors						
Add 7% to this estimate if a CMGC is used						
EXCLUSIONS						
Design fees, permit fees, system development fees, utility hookup charges, testing.						
Hazardous materials abatement, moving expenses, fireproofing.						
Rock excavation, wet weather sitework.						

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Appendix B: Project Narrative

B

PROJECT DESCRIPTION

The new Stevenson Fire Hall consist of new single-story facility of size indicated on the drawings and associated site work as indicated on the Site Drawings. The building occupancy is primarily S-2 for the Apparatus Bay and Support Areas, and A-3 for the Multi-purpose space. The construction classification of the facility is Type III-B and a pre-engineered metal building..

The building is designed with a combination of both structural steel and wood framing with a concrete floor slab on grade; a combination of lap hardi panels and painted wood faux look of hardi panel veneer exterior walls; and aluminum storefront glazing. The project includes mechanical, electrical, low voltage and plumbing systems as well as on-site and off-site improvements.

A. SUBSTRUCTURE

A10 FOUNDATIONS

A1010 Standard Foundations

- Bearing interior and exterior stud walls on thickened slabs.
- Columns on spread footings.
- Foundation to be designed by engineer of record, based on foundation loads provided by the metal building manufacturer.

A1020 Special Foundations

- The geotechnical report by GN Northern, dated December 2018, states the proposed site may have soils that are subject to liquefaction during a seismic event. Liquefaction is a condition that may occur in some soil types after a seismic event, resulting in excessive foundation settlement – an important consideration for buildings designed to remain operational after a seismic event. See Geotechnical Report.
- The geotechnical report recommends completing “a site-specific liquefaction analysis to assess the risk of soil liquefaction of liquefaction-induced settlement at the site during a seismic event”.
- The geotechnical report’s recommends carrying a cost contingency to capture soil improvements needed to mitigate liquefaction, based on the outcome of the liquefaction analysis.

A1030 Slab on Grade

- 4” thick concrete slab-on-grade in the administration/multipurpose room half of the building.
- 6” thick concrete slab-on-grade in the apparatus bay.

A20 BASEMENTS – NOT USED

B. SHELL

B10 SUPERSTRUCTURE

B1010 Floor Construction

- Slab on grade

B1020 Roof Construction

- Roof Framing System: Pre-Engineered Metal Building (such as Nucor) Pre-engineered metal building are designed by the manufacturer and typically consist of steel moment frames in the transverse direction to resist gravity and lateral forces, and a combination of moment frames or brace frames to resist lateral forces in the longitudinal direction. This fire station is an essential facility, meaning the metal building design criteria should reflect this.
- Canopy: Framing to consist of wide flange framing, 1 ½” metal decking, supported by HSS columns.

B20 EXTERIOR ENCLOSURE

B2010 Exterior Walls

- Assume the building exterior walls will be comprised of the following:
- Option 0-A:
 - Pre Engineered Metal Building with off-set ridge gable roof and metal studs with R-25 in the wall cavity. Air and vapor barrier with gypsum board finish on the interior on side. Factory finished thru body color hardi panel lap siding – wood grain texture. Hardi panel lap siding – painted wood grain faux as shown on the perspectives.
- Option 1:
 - Pre Engineered Metal Building with a simple gable with metal studs with R-25 in the wall cavity. Air and vapor barrier with gypsum board finish on the interiors side. Vertical corrugated metal siding in lieu of hardi panel.
- Option 2:
 - Pre Engineered Metal Building with a simple gable with wood frame studs with R-25 in the wall cavity. Air and vapor barrier with gypsum board finish on the interiors side. Vertical corrugated metal siding in lieu of hardi panel.

B2020 Exterior Windows

- Frames:

- Fixed: Kawneer 451UT storefront system; Architectural Class I, clear anodized aluminum finish.
- Location: See elevations
- Glazing: 1” O/A dual seal silicone; ¼ Guardian SN 68 (#2) Clear Annealed, ½” Mill Spacer, ¼” Clear Annealed. Values: VLT (.68), SC (.43), SHGC (.38), U-Val (.29).

B2030 Exterior Doors

- Storefront Doors: Aluminum framed storefront entry system by Kawneer.
- Hollow Metal Doors: Painted, metal doors with painted fully grouted and welded steel frames.
- Overhead Coiling Doors: 511 Aluminum Glass Door System by Overhead Door Company, 12’ x 14’, Extra Heavy-Duty, Color clear anodized aluminum.

B30 ROOFING**B3010 Roof Coverings**

- Roofing: Span-lok hp metal roofing system with water tight seam design by AEP Span; mechanically fastened over ½” protection board and rigid insulation (R-30). 20-year weathertight warranty.

B3020 Roof Openings

- Option 0A - Clerestory windows as shown on the perspective drawings.
- Roof Access:
 - Provide fixed FL Series roof access ladder with Extend-A-Rail post extension, and roof hatch by Precision Ladders, LLC

C. INTERIORS**C10 INTERIOR CONSTRUCTION****C1010 Partitions**

- Option 0A & 1: Metal framing with gypsum wall board with acoustical batt insulation, typical unless noted otherwise.
- Option 2: 2x wood framing with gypsum wallboard, typical unless noted otherwise.
- Acoustical insulation in all interior walls, typical.
- Interior walls run to bottom of structural decking, typical.
- Wall Furring: Interior furred walls made of 2” polystyrene rigid insulation, 1” air gap, 2x wood studs with R-15 batt insulation and 5/8” gypsum board, painted.

C1020 Interior Doors

- Solid wood doors: Solid core, stain grade wood veneer doors with painted, fully welded hollow metal frames. Finish Natural Cherry, aged, stained to match architect's sample.
- Steel doors and fully welded frames: Painted.
- Hardware: Schlage ND series typical at interior wood doors. Panic hardware at all exterior doors and doors from Administration side into Apparatus Bay Finish brushed nickel.

Interior Glazing

- Interior Relites: Frameless butt glazing, width and height per plans. See floor plans for extent.

C1030 Fittings

- Interior signage: Provide allowance for code required.
- Lockers and Shelving: Provide 24" wide, fixed system by Ready-Rack, Inc. See floor plans for extent.
- Toilet Accessories: Bobrick Contour Series. Provide combination trash/automatic paper towel dispenser, soap dispensers at vanities, toilet stall accessories typical per restroom.

C20 STAIRS – NOT USED

C30 INTERIOR FINISHES

C3010 Wall Finishes

- All walls to receive Level 3 finish with two coats of paint over a primer coat (3 coats total), typical unless noted otherwise. Assume two accent paint colors, location TBD.
- FRP on wet walls to 3'-0" AFF in Janitor's closets.
- Wall Furring: Interior furred walls made of 2" polystyrene rigid insulation, 1" air gap, 2x wood studs with R-15 batt insulation and 5/8" gypsum board, painted.

C3020 Floor Finishes

- Carpet tiles at multipurpose room, offices, and conference rooms.
- Polished concrete throughout the administration area and all corridors and restrooms/
- Sealed concrete throughout the apparatus bay and apparatus bay support rooms.
- Walk off mat to be provided at every exterior entry as well as between apparatus bay and administration entry.

C3030 Ceiling Finishes

- Assume 10' ceiling height at all locations where not otherwise defined.
- Suspended acoustical ceiling:
 - Typical: SAT-1: Armstrong, Dune 2'-0"x2'-0" Tegular
- Open to Structure:
 - Apparatus Bay Typical: Painted structure, piping, ductwork, SAT cabling, typical where exposed.

D. SERVICES

D20 PLUMBING

D2010 Plumbing Fixtures (ADA compliant as appropriate) – See product sheets

- Water Closets: Porcelain, floor-mounted, provided with manual 1.28 GPF flushometer valves. Public water closets will be sensor-operated
- Lavatories: Porcelain, wall-mounted sinks with trap guards at restrooms.
- Sinks: Stainless steel, self-rimming. No garbage disposals will be provided.
- Faucets:
 - Two-handle faucets with wrist blades and chrome finish.
 - Public faucets will be sensor-operated.
- Showers: solid surface shower walls and receptor, adaptable for ADA.
- Mop sinks: Terrazzo construction with stainless steel rim guards
- Emergency Shower: An emergency shower and eyewash will be provided in the Apparatus Bay near the Decon Room. It will be supplied from an emergency mixing valve assembly.

D2020 Domestic Water Distribution

- Domestic cold water distributed to plumbing fixtures at an initial pressure between 50 and 80 psi using Type L copper piping above grade with lead-free solder joints, Type K copper piping below grade with brazed joints.
- PEX water piping will be accepted for sizes 2-inch and smaller.
- The domestic hot water will be provided by a central natural gas fired high efficiency water heater system with circulation system. The recirculation pump will be monitored by the BAS system.
- Hose bibbs will be provided at each end of the Apparatus Bay. There will also be hose bibbs place at 100-foot intervals around the perimeter of the Station.

D2030 Sanitary Waste & Vent

- Cast iron sanitary and storm sewer piping with heavy-duty couplings used to collect waste from plumbing fixtures and connect to building's sewer service. Solid-core PVC pipe will be accepted for sanitary vents and trap arms.
- Piping systems are to be provided with cleanouts at every 135 degree change in direction and at the upper terminal of each branch line.

- The trench drains within the Apparatus Bay will be connected to an oil/water separator prior to connecting to sanitary sewer.
- Electronic trap primers will be provided.

D2040 Storm Drainage

- Interior roof drains, cast iron piping with no-hub bands.
- Roof overflow drains to daylight to the exterior of the building, primary roof drains will connect to the site storm water system.

D2090 Other Plumbing Systems

- Natural gas distributed to mechanical units, Bar-B-Q, and water heater at 2 psi. Steel piping distributed below roof deck and within ceiling spaces, welded construction within return air plenums.
- Shop air compressor will be provided. There will be a vertical receiver with an air compressor mounted on top.
- 3/4-inch hose reels located in the ceiling over the fire trucks.

D30 HEATING, VENTILATING AND AIR CONDITIONING (HVAC)

D3050 Variable Refrigerant Volume (VRV) with Heat Recovery Ventilator (HRV), Gas Fired Radiant Heat, Electric Heat, and Exhaust

- Heating and cooling will be provided from one approximately 20 ton outdoor VRV heat recovery heat pump, connected to indoor fan coils and ceiling cassettes through refrigerant piping. Ventilation air will be ducted to occupied spaces from a single 1,200 cfm indoor HRV with fixed plate heat exchanger. Tempered ventilation air will be ducted to the inlet of the VRV fan coils and ceiling cassettes. The fan coils will be ducted to individual zones. Exhaust air will be ducted from the HRV to restrooms and Turnouts Ceiling fans will be provided in the Kitchen.
- The Apparatus Bay will be heated by low intensity gas fired radiant heat. The radiant heating system will be interlocked with the overhead doors to be turned off when the doors are opened. General exhaust will be provided by a inline exhaust fan controlled by wall-mounted push button, CO, NO₂, and opening/closing of the overhead doors. Space temperatures will be maintained between 60 and 65 degrees F during heating. There will be no mechanical cooling for this space.
- A residential range hood will be provided over the cooktop in the Kitchen.
- Shop will be provided with an electric unit heater suspended from the ceiling. The Shop will also be provided with a cabinet exhaust fan, discharging directly to the outdoors, pulling make-up air from the Apparatus Bay. Electrical room will be provided with an electric wall heater.
- Indoor design temperatures maintained between 70 and 75 degrees F year-round for spaces served by the VRV system.

- Low-pressure ductwork will be sized at 0.08” of water column and no more than 750 feet per minute (FPM). All sheet metal design and installation will be per SMACNA standards. Flexible duct is not allowed in exposed areas.

D3060 HVAC Instrumentation and Controls

- HVAC controls will consist of a series of controllers provided by the VRV manufacturer. The control system will offer trending, scheduling, downloading memory to field devices, real-time “live” graphic programs, parameter changes of properties, set point adjustments, alarm/event information, confirmation of operators, and execution of global commands. Fire alarm systems, security systems and elevator systems shall not be controlled by the HVAC control system. The control system will directly control indoor fan coils, outdoor unit, and HRV.
- Heating and cooling energy in each zone shall be controlled by a temperature sensor located in that zone. Independent perimeter systems will have at least one temperature sensor for each perimeter zone. A 5°F dead band will be used between independent heating and cooling operations within the same zone.
- Controls for the various operating conditions must include maintaining pressurization requirements.
- General exhaust for the Apparatus Bay will be controlled through a wall-mounted push button, CO or NO2 sensor, or door opening
- Ducted VRV fan coil unit controls serving Turnouts will be set up for heating only.
- Electric heaters and individual exhaust fans will be locally controlled.
- Lighting control shall be accomplished by use of separate control equipment that is not connected to the HVAC control system.

D3070 Air Distribution

- All ductwork sheet metal will be galvanized.
- Return air ducts, supply air ducts, and general exhaust ducts: SMACNA low pressure duct standards (0” to 2”).
- All supply, return, and exhaust ducts will be sealed for a maximum of class per SMACNA.
- All supply ducts upstream of terminal boxes will be leak and pressure tested for a maximum of class per SMACNA.
- Flexible Ducts: Pre-insulated with vapor barrier, used for diffuser connection and in concealed ceiling space only.
- Insulation for Ductwork:
 - Concealed supply and return ducts: R-8, 1-1/2” thick fiberglass blanket duct wrap with foil facing.
 - Exposed supply and return ducts: Insulation is not required for ductwork exposed in conditioned space.
 - Internal duct liner: 1-inch thick, Armaflex.
 - Exhaust ducts: Not insulated except for acoustic liner where required.

- Balancing Dampers: Adjustable balancing dampers in each branch take-off for proper control of balancing of the air distribution system will be provided. All operating levers will be readily accessible and be of extended type so as to not be in contact with insulation. Where dampers are inaccessible for adjustment, ceiling flush mounted concealed damper regulators with rod extension to damper, and die cast gears, as manufactured by Ventlock and Young Regulator, or equal will be provided. Dampers will be Ruskin, Johnson, or equal.
- Seismic Restraints: Piping, ductwork, and equipment will be provided with adequate restraints conforming to the Oregon Structural Specialty Code.

D3080 Testing, Adjusting, and Balancing

- An independent testing and balancing contractor will be required (as a sub-contractor to the general contractor), AABC certified to balance all air and water systems and heating and cooling equipment to the required quantities; and to verify the capacity and operating conditions of each piece of equipment.
- They will submit detailed test procedures, forms, etc. for approval prior to beginning the work.
- After balancing is complete and all airflows have been balanced to within +/- 5% of design airflow, the contractor shall submit three complete balance reports.

D40 FIRE PROTECTION

D4010 Sprinklers

- The fire sprinkler system design will be performed by the contractor and will be hydraulically designed.
- The building will be provided with a wet pipe system per NFPA 13, International Building Code, local building codes and Fire Marshal requirements. Areas subject to freezing, such as overhangs, canopies and unconditioned spaces, will be protected with a dry pipe system or dry sprinklers.
- Sprinklers, valves, switches, pipe, fittings, backflow preventers, hangers, sway braces and the like will be UL Listed or FM Global Approved for fire protection.
- There will be a new water service to the building. A double check valve backflow prevention assembly, listed for fire protection will be provided between the fire sprinkler system and the public water supply connection.
- It is anticipated that the backflow device will be located in a vault on site near the city water connection or at the main sprinkler riser. If located in an outside vault, the vault will be provided with a sump pump or other method of gravity drainage.
- The backflow preventer control valves will be electrically supervised by the fire alarm system.
- The fire sprinkler main riser will be located immediately adjacent to an exterior wall. If the fire sprinkler riser is located in a room with immediate exterior access, the system control valve can be located at the riser and no yard or wall PIV will be required.

- A fire department connection (“FDC”) with check valve and method of drainage will be provided.
- Black steel piping will be used for wet and dry sprinklers systems. Piping will be concealed where possible.
- Quick response sprinklers will be provided throughout. Finishes will be white polyester, with white polyester escutcheons, or as coordinated with the architect. Recessed sprinklers will be provided.
- Where sprinkler heads are installed in suspended ceilings a flexible sprinkler connection will be provided between the branch line(s) and the sprinkler(s). . Alternately, suspended ceilings will have sprinkler penetrations two inches larger than the sprinkler to accommodate seismic requirements and will be provided with large escutcheons.
- Seismic sway bracing, interval-and end-of-branch line restraints will be provided for the sprinkler system.
- Apparatus Bay and Equipment/Storage areas will be an Ordinary Hazard Group 2 density.
- Administrative areas will be a Light Hazard density.
- Electrical connections and wiring will be provided for a complete and operable fire protection system, including, but not limited to valve supervisory switches, flow alarms, etc. Audible electric sprinkler flow alarms on the exterior of the building will be provided. Supervisory switches, flow switches, pressure switches, and the like will be monitored by the fire alarm system.

D50 ELECTRICAL

D5010 Electrical Service and Distribution

- The building will be served with by an 600amp, 120/208V, 3 phase service with a single utility meter.
- A main electrical room will provide distribution to the building with branch panelboards spaced throughout the facility. Provide all branch panels shown in one-line diagram.
- Lighting will be served at 120V. Provide electrical connections for HVAC units as required by mechanical design. Provide duplex receptacles on 25 foot centers in shell spaces; provide GFCI duplex receptacles in all bathrooms.
- Emergency power will be provided from a 150 Kilowatt diesel fuel generator with base tank adequately sized to serve the life safety loads as well as loads designated by Owner as requiring emergency backup. Provide two automatic transfer switches, one to serve “normal” power loads and one to serve “life safety” loads.
- Anticipated Emergency Loads are
 - Life Safety Power:
 - Egress Lighting.
 - Exit signs.
 - Exterior lighting at exits.
 - Fire Alarm Control Panel.

- Standby Power:
 - Remainder of building electrical loads
- Provide receptacles and branch wiring to accommodate furniture layout. Provide receptacles on 10 foot centers in all office areas and 25 foot centers in corridors and public areas.
- Provide grounding conductor in all branch circuits.

D5020 Lighting and Branch Wiring

- Electrical, Mechanical and Fire Sprinkler rooms: Provide industrial LED luminaires with wireguards in the following areas to provide 20 footcandles.
- Lobby Areas and Public Corridors: Recessed LED narrow slot fixtures, downlights and pendant lights. Provide LED wall mounted linear fixtures to highlight photos, displays and art.
- Conference Rooms: Provide dimmable decorative linear LED direct/indirect pendant mounted fixture.
- Reception: Recessed linear LED Slot lighting.
- Corridors: LED pendant fixture.
- Offices: Provide in each space LED recessed 2x2 volumetric troffer luminaires with direct illumination spaced on 8'x8' array.
- Kitchen, Copy, Work, Apparatus Support Rooms: Provide in each space LED recessed 2x2 volumetric troffer luminaires with direct illumination spaced on 10'x10' array.
- Emergency Lighting: Provide emergency lighting of one footcandle average maintained throughout exit pathway.
- Switches: Provide switching in each of the following rooms:
 - Occupancy sensor in Janitor rooms
 - Wall switch in Electrical rooms
 - Wall switch in Fire Sprinkler room
 - Occupancy sensors in open office areas
 - Switched occupancy sensors in private office areas
 - Occupancy sensors in all storage rooms
 - Dimmable controls in all conference rooms

D5030 Communication and Security

- A microprocessor-based, analog-addressable fire detection and alarm system will be installed to provide protection for both the building occupants and the property.
- System annunciation will be located in the main entrance for fire department responders.
- Off-site notification will be provided.
- The system will utilize ADA compliant visual notification appliances with Temporal-3 audible alert throughout the building.

- Area smoke detectors will be installed in electrical rooms, telephone/data rooms, corridors, and remaining spaces as required by code. Duct-mounted smoke detectors will be installed as required by code for the air handling systems. Single-action manual pull stations will be installed at all emergency exits.
- The system will monitor the fire protection sprinkler system status.
- The system will have emergency generator backup as well as 24 hours of battery backup power in normal mode, five minutes of battery backup in alarm mode.
- Extend detection, notification and monitoring to all spaces as required by code.
- The system will utilize ADA compliant visual notification appliances with Temporal-3 audible alert throughout the building.
- Area smoke detectors will be installed in corridors, offices, open offices, conference rooms and remaining spaces as required by code. Duct-mounted smoke detectors will be installed as required by code for the air handling systems. Single-action manual pull stations will be installed at all emergency exits.

PATHWAYS FOR COMMUNICATIONS SYSTEMS

- (1) 4-inch conduit will be installed from the Telecom Room to the City
- Wire Basket style cable tray will be provided in accessible ceiling space in the corridors. The wire basket tray will be mounted to structure with trapeze style supports.
- Category rated J-hooks are required for lower density areas where cable is not routed in cable tray to bundle cables together in a common path. EMT conduit will be provided over inaccessible ceiling spaces. Metallic 2-5/8-inch by 4-inch square, 2-gang outlet boxes with single gang adapters with 1-inch metallic conduit/raceways to accessible ceiling space will be provided for routing and termination of low voltage cabling.
- A conduit pathway will be provided from the Telecom Room to the rooftop antennas.
- Raceway installed per ANSI/TIA/EIA-569-C standards.

VOICE, DATA, and CATV HORIZONTAL CABLING INFRASTRUCTURE

- This facility will be cabled with 4-pair unshielded twisted pair (UTP) Category 6 voice and data network cabling. The design and will require that the successful bidder submit at least a 20-year, end-to-end solution warranty for the completed installation of these products. Each telecommunications outlet will consist of three 8-pin connector modules. Each outlet will be capable of delivering voice or data as selected by the Owner. These locations will be coordinated with the Owner to ensure exact placement as needed.
- Each wireless outlet will be cabled with Category 6 cabling and consist of one cable per outlet. All WAPS are furnished and installed by the City.

- Each outlet will also be capable of accepting a CATV insert/cable as required by the Owner. The CATV insert will be modular and designed to be used in the modular faceplate selected. The CATV outlet locations will utilize RG-6 Quadshield coaxial cable. The specific location requirements will be coordinated with the Owner. Amplifiers and splitters will be specified as required to maintain video signal integrity to each outlet.

RACKS

- The Storage room will consist of 8'H x 19"W standalone equipment racks to support horizontal cable installation as well as Owner-provided network equipment. Quantities to be determined during design phase based on total number of cables and the amount of Owner provided and installed equipment.

WIRE MANAGEMENT

- All equipment racks will have one 6-inch vertical wire manager on each end and in between each equipment rack.
- All equipment racks will have one single unit horizontal wire manager at the top and bottom of each column of patch panels and equipment, and one double unit horizontal wire manager in between each patch panel. Wire managers will be Siemens.

ELECTRONIC ACCESS CONTROL and INTRUSION DETECTION

- Card readers will be placed at all exterior entrances, interior doors from the Lobby, the telecom room and two exterior gates. Card readers will be keypad/proximity combination units.
- Door contacts will be placed on all exterior doors and all card access controlled doors for door position monitoring. This system allows the Owner to ensure all doors are securely closed. The access control system is AMAG.

AUDIO-VISUAL SYSTEMS

- The Kitchen and conference room will have an HDMI connection from the flat screen location to a wall outlet. The flat screen is Owner furnished Contractor installed.
- The multipurpose room will have a wall mounted short throw projector system installed on the teaching wall.

PAGING AND INTERCOM SYSTEMS

- A push button intercom will be installed at the front door. The intercom will have the ability to be programmed to call outside the station if needed.
- A zoned paging system will be provided throughout the facility

PROGRAMMING AND DESIGN NOTES

- Additional programming information will be garnered from the Owner in further coordination meetings. Design reviews with the City’s technology staff will be accomplished to confirm device location and quantities.

D60 FIRE ALARM**D6010 Addressable Fire Alarm System**

- The fire alarm system design will be by the contractor and will be a deferred submittal.
- An automatic, addressable fire alarm system will be provided to meet the requirements of the adopted editions of the International Building Code and International Fire Code, with Washington Amendments, NFPA 72, and the City of Stevenson, Washington.
- The fire alarm system will provide system alarm, supervisory and trouble signal monitoring, and alarm notification for the building. A communicating transmitter will facilitate off-premises monitoring of the individual signals to a listed central station facility. The system will have batteries to provide a secondary power source in case of primary power loss to the control panel or any remote power supply.
- A fire alarm annunciator will be located in the main entrance.
- The system will utilize ADA compliant visual notification appliances in common use and public areas. Audible notification appliances will be provided throughout the building to meet audibility requirements of NFPA 72.
- Area smoke detectors will be installed in spaces as required by code as well as electrical rooms, telephone/data rooms and corridors and spaces open to corridors. Combination fire alarm system smoke/carbon monoxide detectors will be installed in sleeping rooms and in common spaces as required by code. Low frequency sounder bases will be provided in all sleeping rooms. Duct-mounted smoke detectors will be installed as required by code for the air handling systems and for fire/smoke dampers. Single-action manual pull stations will be installed at all exits and entrances to enclosed exit stairwells.
- Activation of system smoke detectors, manual pull stations, sprinkler water flow switches and suppression systems will initiate alarm signals on the fire alarm control panel (FACP) and fire alarm annunciator (FAA), and activate the audible and visual notification appliances throughout the building. Activation of sprinkler tamper switches and HVAC duct smoke detectors will initiate supervisory signals, which will announce on the FACP and the FAA.
- Control outputs will be provided for fire safety functions, such as air handler shut down, fire smoke damper closure, fire door release and elevator control.

E. EQUIPMENT AND FURNISHINGS

E10 EQUIPMENT

E1010 Commercial Equipment

- Office equipment (TBD)
- Video conference equipment provided by Owner, installed by Contractor.
- Provide allowance for blocking for all OFCI equipment.

E1020 Institutional Equipment – NOT USED

E1030 Vehicular Equipment – NOT USED

E1090 Other Equipment

- Kitchen Equipment provided by Owner, installed by Contractor, including the following:
 - (1) commercial refrigerator
 - (1) commercial ice machine
 - (1) stove with hood
 - (1) microwaves
 - (1) dishwasher
 - (1) clothes washing machine
 - (1) clothes dryer

E20 FURNISHINGS

E2010 Fixed Furnishings

- Casework: (uppers, counter, lowers)
 - Typical Countertops: Plastic Laminate, Solid Surface or Quartz (at sink locations), countertops.
- Typical Cabinet Vertical Surfaces: Plastic laminate.
- Mirrors:
 - 4'-6"H frameless mirrors, full length of counters (Men's and Women's Restrooms and Shower Rooms)
- Window Treatments:
 - Hunter Douglas roller shades with PVC-free fabric at all exterior windows.
 - Hunter Douglas roller shades, blackout at Multi Purpose Rooms windows.

E2020 Movable Furnishings – NOT USED

F. SPECIAL CONSTRUCTION AND DEMOLITION

F10 SPECIAL CONSTRUCTION – NOT USED

F20 SELECTIVE DEMOLITION – NOT USED

G. BUILDING SITEWORK

G10 SITE PREPARATION

G1010 Site Clearing

- Removal of existing trees and landscaping. Some trees and landscaping will remain with the proposed site improvements.
- Wetland mitigation as required, including some liquefaction as identified in the Geotechnical Report.

G1020 Site Demolition and Relocations – NOT USED

G1030 Site Earthwork

- Preparation on building footings and slab subgrade. Grading also includes that required for parking lot and sidewalk subgrades. Additional grading as required for landscaped areas.
- Retaining wall will be required along the northern – keystone retaining wall to be engineered as required per grading.

G1040 Hazardous Waste Remediation – NOT USED

G20 SITE IMPROVEMENTS

G2010 Roadways

- Provide new curb, sidewalk and street trees as described below and in the geotechnical report.

G2020 Parking Lots

- Asphalt, concrete curbs, striping and signage. See geotechnical report for cross section recommendations.
- Drive aisles to be as identified on the site plan concrete where shown. See geotechnical report for cross section recommendations.

G2030 Pedestrian Paving

- To extend the full length of SW Rock Creek Drive and to tie into any existing sidewalk present.

G2040 Site Development

- Optional Cost: Secure Parking lot to the north of the fire hall
- Trash enclosure to be constructed of 6ft tall Structural Brick masonry wall with steel fabricated gate leaves.
- Provide concrete retaining walls at SW property area adjacent to back drive aisle
- Provide one flag pole for station.
 - Size: 1x 35ft

G2040 Security Enclosure – NOT USED

G2050 Landscaping

- See site drawings for basic lawn and native landscape on the site.

G30 SITE CIVIL / MECHANICAL UTILITIES

G3010 Water Supply

- Site survey not available, assumed connection at SW Rock Creek Drive

G3020 Sanitary Sewer

- Site survey not available, assumed connection at SW Rock Creek Drive

G3030 Storm Sewer

- Roof areas drain to flow through planters with overflow to drywells.
- Parking area sheet flow to catch basins and piped to onsite treatment areas.

G40 SITE ELECTRICAL UTILITIES

G4010 Electrical Distribution

G4020 Site Lighting

- Parking lot; provide 250W Induction luminaire on 20 foot pole.
- Provide 12 Ft. Pedestrian lights along walking paths and building entry paths.

G4030 Site Communications and Security

- Allowance to be provided

G4090 Other Site Electrical Utilities

- Emergency generator as noted above.

G4090 Other Site Electrical Utilities

G90 OTHER SITE CONSTRUCTION

G9010 Service Tunnels – NOT USED

G9090 Other Site Systems

- Irrigation system (fully automatic irrigation system at all planting area providing 100% coverage with current technology water conservation features). Irrigation system to be temporary system to be shut down and/or removed at a maximum of 18 months.

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Appendix C: Site Report

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Site Assessment



City of Stevenson New Fire Station

Prepared for
City of Stevenson
Stevenson, Washington

January 2019

Site Assessment

**City of Stevenson
New Fire Station**

Submitted to

**City of Stevenson
Stevenson, Washington**

January 2019

Submitted by

**BergerABAM
210 East 13th Street, Suite 300
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A19.0048.00

SITE ASSESSMENT

City of Stevenson New Fire Station

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**SITE ASSESSMENT
CITY OF STEVENSON
NEW FIRE STATION**

1.0 INTRODUCTION

The City of Stevenson (City) has contracted with Mackenzie to assess the feasibility of developing a previously purchased site with a new fire station and accessory uses such as parking, circulation, and landscaped areas. If constructed, the new fire station would serve the City and Skamania County Fire District 2 and would replace the existing fire station located at 160 First Street in downtown Stevenson. The existing station has been home to the department's activities since 1912 and has housed its equipment since 1967. Population growth and time highlight its shortcomings, including the structural deficiencies exposed by a minor collision in 2011 that damaged one of the City's trucks and the building.

The City conducted a needs assessment in 2013 led by its consultant, Rice Fergus Miller, to identify a building footprint that would meet its needs and to determine whether a new fire hall could be shared with other emergency service providers, including the Skamania County Hospital District, Skamania County Department of Emergency Management, Skamania County Fire District 2, and the Stevenson Volunteer Fire Department. The Hospital District later decided that colocation with the other service providers would not serve its best interests and the footprint of the 2013 study no longer applied. In 2015–2016, the City led a process with key stakeholders to reevaluate the required building footprint and to select a site to meet the Fire Department's needs. Their findings were contained in the Stevenson Fire Hall Strike Team Report. The report recommends a 9,700-square-foot facility with room to expand to over 11,000 square feet.

In 2017, the City purchased property located near the intersection of Foster Creek Road and SW Rock Creek Drive on Parcel No. 020702003100, immediately across the street from the Rock Cove Assisted Living Community. As part of Mackenzie's team, BergerABAM is assisting the City by completing this site assessment to evaluate the required permits, development standards, permitting schedule, and fees involved in developing the site for a new fire station.

2.0 EXISTING CONDITIONS

The 3.45-acre subject site is triangular and characterized by thick vegetation and trees on its southern, western, and northern portions. The eastern portion has an existing circular gravel entrance within a cleared area. The gravel entrance road crosses the site from SW Rock Creek Drive and heads southwest where it connects to Foster Creek Road. Overhead power lines parallel both SW Rock Creek Drive and Foster Creek Road. The site is otherwise unimproved. The City's comprehensive plan maps show water lines in both Rock Creek Drive and Foster Creek Road. The City's sewer map shows that the site is within the City's sewer service area.

2.1 Comprehensive Plan and Zoning

The site is designated as Low Intensity Trade (LIT) by the City's future land use map (2013). This designation is intended to allow auto-oriented regional tourism and service industries to coexist in the same area with recreational and public/institutional uses.

The site is zoned Commercial Recreation (CR) on the City's zoning map (2016). The CR zone is implemented in areas designated LIT on the future land use map. According to the City's zoning ordinance (Stevenson Municipal Code [SMC] Title 17), trade districts are intended to "ensure that the local business community remains a healthy component of Stevenson's economy."

2.2 Natural Features, Critical and Sensitive Areas

The site slopes downhill from west to east with slopes exceeding 25 percent along the northern, western, and southern property boundaries in some locations (see Appendix A for site maps). Slopes level off in the central, eastern portion of the site in the cleared area where the existing gravel entrance drive is located. The site also slopes slightly downhill from south to north. The Natural Resource Conservation Service (NRCS) Web Soil Survey maps the on-site soils as Steever stony clay loam (2 to 30 percent slopes), a well-drained, non-hydric soil. Vegetation varies across the site and can be categorized by forested and grassy cleared areas. Vegetation in the forested areas generally consists of a combination of coniferous and deciduous tree species and an understory of woody shrubs. Vegetation along the roadside and in the cleared areas has been disturbed and consists of common facultative grasses, herbaceous species, and wetland plants.

2.2.1 Wetlands

The City's critical areas and geologic hazards map indicate the presence of a small, palustrine emergent (PEM) wetland located in the northeastern site area. Neither the National Wetland Inventory (NWI) online mapper nor Skamania County MapSifter indicates the presence of wetlands within or close to the study area. On 15 November 2018, two BergerABAM wetland scientists visited the site, conducted a wetland field investigation, and documented their findings in a wetland delineation and assessment (Appendix B). The scientists identified one wetland (Wetland A) on the northeastern part of the project site. They classified the wetland as a Category IV (lowest quality), palustrine scrub-shrub (PSS) wetland of 0.01 acre (587 square feet) with a habitat rating of 3 points.

2.2.2 Fish and Wildlife Habitat Conservation Areas

The wetlands and stream habitat areas map (Map 4.9) in the City's comprehensive plan shows an unnamed stream of unknown classification along the site's eastern boundary paralleling SW Rock Creek Drive. Neither the Washington State Department of Natural Resources (DNR) online Forest Practices Application Mapping Tool nor the United States Geologic Survey (USGS) online National Map shows a stream in this location. Additionally, the City's critical areas and geologic hazards map does not show any streams on or adjacent to the site. The BergerABAM scientists' wetland site visit did not identify any streams that would be subject to regulation by the City, state, or federal

agencies. Given that neither DNR nor USGS shows a stream located on the site and the BergerABAM scientists did not locate a stream during their site visit, this report presumes that none is present and that there are no regulated riparian or aquatic habitat conservation areas on the site. Likewise, the Washington Department of Fish and Wildlife (WDFW) online mapping tool, PHS on the Web, shows no non-riparian habitat, such as Oregon white oak, on the site.

A review of the U.S. Fish and Wildlife Service (USFWS) online application Information for Planning and Consultation (IPaC) indicates that one endangered species, three threatened species, and one proposed threatened species do, or may, occur within the boundaries of the project area. They are:

- Gray wolf (*Canis lupus*) – Endangered
- Northern spotted owl (*Strix occidentalis caurina*) – Threatened
- Yellow-billed cuckoo (*Coccyzus americanus*) – Threatened
- Bull trout (*Salvelinus confluentus*) – Threatened
- North American wolverine (*Gulo luscus*) – Proposed Threatened

The IPaC website states

The primary information used to generate a species list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near a project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

The Washington Natural Heritage Program's website states that currently there are nearly 400 plants and nonvascular species with conservation status in the state, 11 of which are also listed under the Endangered Species Act (ESA) as either endangered or threatened. Review of the USFWS website Environmental Conservation Online System shows that no threatened or endangered plant species occur or have been identified within Skamania County. In addition, the BergerABAM scientists observed no threatened or endangered plant species during their site visit.

Based on this information, BergerABAM presumes there are no fish and wildlife habitat conservation critical areas on the site.

2.2.3 Geologically Hazardous Areas

Landslide and Erosion Hazards

The City's critical areas and geologic hazards map shows potential landslide hazards and slopes 25 percent or steeper near the western and southern property boundaries on

the site. In addition, Map 4.11 of the comprehensive plan shows slopes 25 percent or greater on the site near the southern tip and northeastern corner of the property. These slopes are classified as moderately hazardous landslide areas in Table SMC 18.13.090-1. The 2018 DNR digital landslide inventory of the Columbia River Gorge identifies landslide deposits covering the entire site, as is the case with much of Stevenson and the surrounding area.

GN Northern, Inc. completed a geotechnical investigation in December 2018 of the site (Appendix C) and concurs that the site is classified as a moderate hazard.

According to NRCS, erosion hazards are not mapped on the site. The GN Northern report indicates that, even in the absence of erosion-prone soils, the site may be susceptible to erosion because of the steepness and length of the slopes on the site. However, because the City's critical area regulations rely on NRCS mapping, BergerABAM does not consider that there are erosion hazard critical areas subject to regulation on the site.

Seismic Hazards

The site is mapped as site class "D" by the Site Class Map of Skamania County, Washington (Palmer et al., 2004). The GN Northern report notes that the Liquefaction Susceptibility Map of Skamania County, Washington (Palmer et al., 2004) designates the site as having a low to moderate relative susceptibility of liquefaction. The City's critical areas ordinance identifies that Site Class D is considered a seismic hazard for residential construction, but the ordinance does not specifically identify the seismic design category or liquefaction category considered to be a seismic hazard for non-residential construction. GN Northern stated that a detailed assessment of the liquefaction potential at the site was beyond the scope of its investigation. Critical facilities such as fire stations are commonly subject to seismic design requirements. Thus, for the purposes of this site assessment report, BergerABAM presumes that the site is located within a seismic hazard area, and that a critical areas permit must be obtained for its development, which must meet the seismic design requirements of the critical areas ordinance.

2.2.4 Other Critical Areas

The City and the Federal Emergency Management Agency (FEMA) do not map critical aquifer recharge areas and special flood hazard areas on the subject site. FEMA's online Flood Insurance Rate Map panels do not include the subject site. However, FEMA is in the process of updating flood hazard mapping for Skamania County. Their new mapping, which covers the area of the subject site, indicates there is no floodplain on the site (see Appendix A). The nearest floodplain is located east of the subject site across Rock Creek Drive along Rock Cove.

For the above reasons, critical aquifer and floodplain critical areas are assumed not to be present on the site and are not discussed further in this report.

2.2.5 Shoreline Jurisdiction

Rock Cove, located east of the site, is a regulated shoreline waterbody per Revised Code of Washington 90.58.020(2)(e). The City is currently in the process of updating its adopted shoreline master program (SMP), which dates to 1975. The City adopted Skamania County's SMP, which designates shorelines as all lands within 200 feet of the ordinary high water mark of shoreline waterbodies. The City's draft SMP, which is expected to be adopted in September 2018, contains a shoreline jurisdiction map. In both the existing SMP and draft SMP update, the site falls outside shoreline jurisdiction.

2.2.6 Archaeological and Cultural Resources

The Washington Department of Archaeology and Historic Preservation's (DAHP) Washington Information System for Architectural and Archaeological Records Data (WISAARD) online mapping system indicates the site is mapped as "High Risk" for discovery of archaeological and/or historic resources and highly advises that a survey be completed. The City does not have an archaeological review process. The Washington State Governor's Executive Order 05-05 requires all state-funded capital projects to undergo archaeological review. Given that state resources may be used for the construction of the fire station and there is a high probability for encountering archaeological resources on the site, BergerABAM recommends that an archaeological assessment and/or survey be completed for the project site.

2.3 Transportation and Utility Infrastructure

The City's comprehensive plan streets map (Map 4.6) designates both SW Rock Creek Drive and Foster Creek Road as rural major collectors. According to the City's "Engineering Standards for Public Works Construction" (updated 2016), major collectors have a 60-foot right of way including two drive lanes, two parking lanes, and sidewalks and planter strips on each side. There is an existing gravel turnaround serving the site that will need to be improved in accordance with the standards in section 4.6.2 of this report.

Based on as-built information from the City, there is a 4-inch sewer lateral stubbed out for the subject parcel that is located approximately 40 feet north of the northernmost driveway on Rock Creek Drive. There is an 8-inch ductile iron water line on Ray Allen Road and a 6-inch ductile iron water line on Rock Creek Drive.

Skamania Public Utility District (PUD) is the electricity purveyor. Electrical infrastructure includes overhead lines in both Foster Creek Road and SW Rock Creek Drive adjacent to the site. Skamania PUD stated that the amperage of the lines is unknown until a load calculation is performed during a site survey. According to the PUD, connection to power would likely come from the Rock Creek Drive line.

Internet providers serving the site include Wave Broadband and CenturyLink. Wave Broadband has coaxial cable adjacent to the site in SW Rock Creek Drive with speeds of up to 250 megabits per second. Wave stated that fiber-optic line is not currently available to the site, but could be constructed, if requested. Costs to construct a fiber-

optic line would be determined in consultation with Wave representatives. CenturyLink reports that they have coaxial cable in Foster Creek Road and SW Rock Creek Drive and, additionally, have fiber-optic cable in Rock Creek Drive. The CenturyLink coaxial cable has speeds of 20 megabits per second and the fiber-optic cable of up to 1 gigabit per second.

3.0 PERMIT ASSESSMENT

This section of the report identifies the federal, state and City permits that may be required to construct a new fire station at the subject site. The permit assessment is based on a review of the City's zoning (SMC Title 17) and critical areas ordinances (SMC Chapter 18.13), and BergerABAM's knowledge and experience with state and federal permitting requirements, as well as our site visit. The potentially required permits, review agencies, permit triggers, submittal requirements, and review timelines are summarized in Table 1 in section 3.4. The permit assessment is based on the schematic site plan provided by Mackenzie. Should the schematic site plan change, the requirement for different permits may be triggered, and BergerABAM recommends updating the permit assessment.

3.1 Federal Permits

3.1.1 Section 404 Clean Water Act

A Clean Water Act (CWA) Section 404 permit is administered by the U.S. Army Corps of Engineers (USACE). This permit is required for the discharge of dredged or fill material into waters of the United States such as may be required for impacts to the on-site wetland. If project site plans change and impacts to the wetland are proposed, it may be necessary to obtain a Section 404 permit.

Any proposed impacts to the on-site wetland would require the completion of a Joint Aquatic Resources Permit Application (JARPA) and the same information would be used for a USACE permit in accordance with Section 404 of the CWA. The items that must accompany the application include completed USACE forms, background information in the form of supporting documents (wetland and waterbodies delineation, habitat assessment, revegetation plan, engineering plans, etc.), and graphics.

3.1.2 Endangered Species Act and Magnuson-Stevens Fishery Conservation and Management Act

Actions of federal agencies (i.e., issuance of federal permits) that may affect endangered species or designated critical habitat must be evaluated under Section 7 of the ESA. In addition, the action's effects on essential fish habitat must be considered in accordance with the Magnuson-Stevens Fishery Conservation and Management Act. Based on the lack of potential presence of ESA-listed species on the site, the project is not anticipated to undergo formal ESA Section 7 consultation.

3.1.3 Section 106 National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to determine how a proposed project may affect recorded or undiscovered cultural resources and/or historic properties within the permit area. Section 106 directs federal

agencies with jurisdiction over a proposed federal undertaking (i.e., federal permitting) to take into account the effect of the undertaking on any historic property listed, or eligible for listing, in the National Register of Historic Places. Compliance with Section 106 is a requirement of all Section 404 permits.

A cultural resource/historic property survey conducted by a professional archaeologist will be necessary before a Section 404 authorization can be completed. Applicants should be aware that Section 106 coordination and/or consultation may add significant time to the Section 404 permit application review process. A Section 106 permit will not be required if there are no impacts to the on-site wetland.

3.2 State Permits

3.2.1 Section 401 Clean Water Act – Water Quality Certification

Under Section 401 of the CWA, any activity involving a discharge into waters of the United States authorized by a federal permit must receive water quality certification from the Washington State Department of Ecology (Ecology). That agency is authorized to make 401 certification decisions for activities on all federal, public, and private lands in Washington. A Section 401 water quality certification is required if there will be impacts to the on-site wetland.

3.2.2 National Pollutant Discharge Elimination System –Construction Stormwater Permit

Ecology regulates stormwater discharges during construction through the National Pollutant Discharge Elimination System (NPDES) permit program for disturbances greater than 1 acre. When this report was being written, information about whether site disturbance would exceed 1 acre was not available, so the applicability of this permit is unknown. However, if there will be more than 1 acre of site disturbance, an NPDES 1200 Construction Stormwater Permit will be required.

3.3 City of Stevenson Permits

According to staff, the City typically reviews zoning, engineering, and building permits simultaneously. Because this project will require a conditional use permit, zoning and critical areas review will likely occur first. Applicants may optionally conduct a pre-application conference with the City. Each review/application process is discussed further below. Appendix D contains City application forms and fee schedules.

3.3.1 Pre-application Conference

Pre-application conferences are an opportunity for applicants to present a preliminary development proposal to staff and receive informal feedback regarding the applicability of regulations and potential design changes required to make the development code-compliant. Pre-application conferences, although not required by the City, are encouraged and highly advised because they are occasions to obtain information as early as possible that may influence a project's design, permitting schedule, and/or review requirements.

3.3.2 Land Use Review

Technical Completeness Review

The City does not have a formal technical completeness review process. Staff indicates that technical completeness usually occurs within two weeks after applications are submitted. Materials must be submitted that correspond to the type of applications whose approval is being requested and based on the submittal requirements in the City's code and on its application forms.

Conditional Use Permit

Fire stations require the submittal and approval of a conditional use permit (CUP) application in the CR zone. The CUP process is a quasi-judicial review with final approval authority given to the Planning Commission after a public hearing. The Planning Commission must make a decision within 30 days following the public hearing (see SMC 17.39). According to the City's website, CUP decisions are anticipated within 50 days after an application is deemed fully complete.

Critical Areas Permit

The new fire station is likely to be located in a geologically hazardous area (landslide and seismic hazards) as discussed in section 2.2.3. The City's draft critical area ordinance requires critical areas permit review for any regulated activities "within, adjacent to, or likely to affect one or more critical areas or their buffers." Reports are required specific to the type of critical area impacted. Critical areas report(s) and other submittal requirements are listed in Table 1 and on the critical areas permit application in Appendix D. The permit process includes the completion of an application form and the submittal of site plans, a geotechnical assessment, and a geotechnical stabilization report. Critical areas reports must be prepared by qualified professionals (a geotechnical engineer). City staff is the final decision-making authority for critical areas permits. Critical area permits are valid for one year after the date of issuance, but City staff may grant an extension for an unspecified period of time (see SMC 18.13.040.D). Critical areas decisions may be appealed to the Board of Adjustment.

Although the onsite wetland is exempt under SMC 18.13.100(B)(4), a wetland delineation must be submitted to verify its exempt status. Should the site plan change in the future and impact the wetland, a critical area permit for wetlands would be needed, and in that case, BergerABAM recommends updating this report with a discussion of the development standards and mitigation requirements that apply to wetlands.

Variance

The City reviews requests for variances from the terms and provisions of the land use regulatory codes. Examples of variances could include deviations from the City's numerical zoning standards such as building height or lot coverage or setbacks that exceed a 50 percent administrative adjustment authorized by SMC 17.38.040. Variances are subject to a public hearing and review by the City's Board of Adjustment and must meet the criteria listed in SMC 2.14.010, including that:

- Granting the variance does not constitute a special privilege.
- Strict application of the land use regulation would deprive the subject property of rights and privileges enjoyed by other properties in the zoning district.
- The hardship resulting in the variance request is not self-imposed.

BergerABAM's review of the schematic site plan (Appendix E) did not reveal the need for a variance application.

State Environmental Policy Act Review

The purpose of State Environmental Policy Act (SEPA) review is to determine whether a given development proposal will result in a significant environmental impact and, if significant, to identify mitigations to lessen the impact to a nonsignificant level. SEPA review is required for all developments that do not meet specific categorical exemptions in WAC 197-11-800. Because the proposed fire station is not exempt, the proposal would require the completion of a SEPA environmental checklist and a review and issuance of a determination by the City. SEPA review is conducted concurrent with land use review. The SEPA checklist is completed by the applicant and submitted with the conditional use and critical areas permit submittal requirements. According to the City's website, the SEPA determination is issued approximately 30 days after a complete land use application is submitted.

3.3.3 Engineering and Building Reviews

Based on information provided by City staff, engineering and building permit reviews typically occur at the same time as land use review. In this case, the CUP and critical areas land use reviews would occur first followed by engineering and building review. Engineering review would encompass street and utility (water, sewer, storm) design and construction. Engineering review typically, takes three weeks according to public works staff.

Building permit review would assess all structural, mechanical, electrical, and plumbing aspects of the building. Building permit review typically takes three weeks.

In order to make the driveway improvements connecting to SW Rock Creek Drive and to make the street improvements, the City Public Works Department will require a Type B right of way permit which is reviewed simultaneously with other engineering review items.

3.4 Permit Summary

The following table summarizes the federal, state, and City permits potentially required for a fire station on the subject site.

Table 1. Summary of Potential Permits

Permit	Review Agency	Permit Trigger	Submittal/Fee Requirements	Review Timelines
Federal Permits				
CWA Section 404 Authorization	USACE	Dredge and fill activities in waters of the United States (e.g., wetland) to a regulated wetland.	<ul style="list-style-type: none"> JARPA form; graphics, engineering drawings, mitigation/revegetation plan, wetland and waterbodies delineation. Fee: \$100 	6-18 months
ESA Section 7 Consultation	USFWS NOAA Fisheries/ National Marine Fisheries Service (NMFS)	Federal agencies must consult with USFWS and NMFS when actions have the potential to affect listed species.	<ul style="list-style-type: none"> Formal consultation is not anticipated. If federal permit or review is required, a no effect letter is necessary. Fee: \$0 	6-18 months
NHPA Section 106	USACE State Historic Preservation Act	Federal agencies must consider impacts of federal actions (e.g., Section 404 permit) on cultural and historic resources	<ul style="list-style-type: none"> Cultural resources report. Fee: \$0 	6-18 months
State Permits				
CWA Section 401 – Water Quality Certification	Ecology	Applicants seeking federal approval must receive water quality certification prior to issuance of federal permit. Only required if there are impacts to wetlands.	<ul style="list-style-type: none"> JARPA form, graphics, engineering drawings, mitigation/revegetation plan, water quality specific information, wetland and waterbodies delineation/habitat assessment. Fee: \$0 	3-6 months
NPDES – 1200 Construction Stormwater Permit	Ecology	Construction disturbing more than 1 acre of land will require a general or individual NPDES construction stormwater permit.	<ul style="list-style-type: none"> Application form, land use compatibility statement, erosion and sediment control plan. Fee: \$707 	2 months
City of Stevenson				
Pre-application Conference Application	City of Stevenson	Encouraged – not required	<ul style="list-style-type: none"> No specific submittal requirements. The more information, the better. 	Scheduled within 2 weeks of submittal.

Permit	Review Agency	Permit Trigger	Submittal/Fee Requirements	Review Timelines
CUP	City of Stevenson	Per SMC 17.25, fire stations are conditional uses.	<ul style="list-style-type: none"> Signed application form, property title, easements/covenants, site plan, narrative, traffic study (likely), owner names & mailing addresses of properties within 300 feet, any other information requested by director. Fee: \$500 	<ul style="list-style-type: none"> 2-week completeness review 50-day review period
Variance (if necessary)	City of Stevenson	Variation from the terms and provisions of the land use regulatory codes. No variances identified at this time.	<ul style="list-style-type: none"> Signed application form, covenants and conditions, site plan, narrative, owner names & mailing addresses of properties within 300 feet, any other information requested by director. Fee: \$500 	<ul style="list-style-type: none"> 2-week completeness review 30-day review period (grouped with CUP would be 50 days).
Critical Areas Permits (Geologically Hazardous Areas)	City of Stevenson	Regulated activities likely within, adjacent to, likely to affect critical areas (geologically hazardous areas) or buffers.	<ul style="list-style-type: none"> Application form, site plan, geotechnical assessment, geotechnical stabilization report, erosion control plan and BMPs, drainage plan, conservation covenant, wetland delineation (to verify exempt status). Fee: \$50 (wetland exemption) + \$200 (geologically hazardous critical areas permit). 	<ul style="list-style-type: none"> 2-week completeness review 30-day review period (grouped with CUP would be 50 days)
SEPA	City of Stevenson	Development of a service building exceeding 4,000 square feet and 20 parking spaces. Fill or excavation exceeding 100 cubic yards.	<ul style="list-style-type: none"> Completed SEPA checklist, any associated reports (wetland, geotech, traffic, etc.). Fee: \$200 	<ul style="list-style-type: none"> 2-week completeness review 30 day review period (grouped with CUP would be 50 days)
Engineering Review	City of Stevenson	Public projects.	<ul style="list-style-type: none"> Application form, engineered construction drawings (site, grading, storm, sewer, and water plans), stormwater report, final geotechnical report, traffic report. Fee: TBD 	<ul style="list-style-type: none"> 3 weeks

Permit	Review Agency	Permit Trigger	Submittal/Fee Requirements	Review Timelines
Building/Mechanical/ Plumbing/Electrical	City of Stevenson	Proposed fire station with associated mechanical, plumbing, and electrical infrastructure	<ul style="list-style-type: none"> • Application for Improvement; site plan • Fees: <ul style="list-style-type: none"> ○ Building: \$5,608.75 for first \$1,000,000 plus \$3.65 for each additional \$1,000 or fraction. Plan review fees – 65% of building permit fees ○ Mechanical: See fee schedule in Appendix D. 	<ul style="list-style-type: none"> • 3 weeks
Right of Way Permit	City of Stevenson	Required for work within the public right of way	<ul style="list-style-type: none"> • Right of way permit application form, plan drawings • Fee: \$50 	<ul style="list-style-type: none"> • 30-day review period.

Note: Fees are based on information current when this report was written and are subject to change.

4.0 ZONING AND CRITICAL AREA DEVELOPMENT STANDARDS

This section of the report summarizes the zoning and development standards that apply to the project based on the City's desire to construct a fire station and appurtenant facilities (parking, site circulation, landscaping, etc.) at the site.

4.1 Dimensional Standards

Development in the CR zone is subject to the development standards shown in Table 2 below.

Table 2. CR Zone Development Standards

Standard	Requirement
Lot Coverage	35%
Maximum Building Height ¹	35 feet
Minimum Setbacks	
Front	25 feet (Rock Creek Drive)
Interior side ²	0 feet (15 feet adjoining residential zone)
Street side	20 feet (Foster Creek Road)
Rear interior lot	0 feet
Rear through lot	N/A
Maximum Setbacks	N/A

Source: SMC Tables 17.25.050-1 and 17.025.060

1. Building height may be exceeded as allowed by the Planning Commission provided it does not interfere with existing or planned residential views. For each additional 10 feet in building height, an additional 15 feet of setback is required.
2. Setback along zone transitions must equal the setback from the more restrictive zone or 15 feet in this case.

The site is subject to a 35 percent lot coverage defined as the "portion of a lot that is occupied by the principal and accessory buildings, expressed as a percentage of the lot area" (see SMC 17.10.440). The lot coverage does not include improvements that are not buildings such as access drives and a parking lot. The maximum building height is 35 feet, but this height can be exceeded as approved through the Planning Commission if the increase does not interfere with existing or planned residential views. Buildings that exceed 35 feet in height must be set back an additional 15 feet adjacent to the existing or planned residences.

The triangular lot meets the definition of a corner lot (see SMC 17.10.422) because it is located at the intersection of two streets (SW Rock Creek Drive and Foster Creek Road) with an angle of less than 105 degrees. To determine which setbacks apply to this irregularly shaped lot, staff indicates that they would apply a three-part test to determine the front lot line: (1) which road provides vehicular access; (2) which road the front door faces; and (3) what direction the property's rectangle faces. If at least two of the three point to a particular lot line, that line is considered the front. Based on the provided schematic site plan and floor plan (Appendix E), the site would take access from, and therefore the front door of the building would face, Rock Creek Drive, meaning that Rock Creek Drive would be the front lot line and subject to a 25-foot

setback. Foster Creek Road would be the street side yard and subject to a 20-foot setback. The northern lot line would be the interior side yard and would be subject to a 15-foot setback equal to the side yard in the adjacent residential zone. The site does not have a rear interior or rear through lot line or setback.

Exceedance of the lot coverage or setback standards would require submittal of a variance application (see section 3.3.2 of this report). Based on the schematic site plan (Appendix E) provided by Mackenzie, the proposed site design appears to comply with setback and coverage standards.

4.2 Building and Site Design Standards

The CR zone contains building and site design standards applicable to a new fire station including the following (see SMC 17.25.070):

- Building material preference for nonglossy finishes and earth tone colors.
- Outdoor storage must be screened by fences, walls, or enclosures.
- Refuse containers must be enclosed and covered with materials matching the building.
- Screening and buffering must be provided adjacent to residential uses and on the lot perimeter.
- Pedestrian improvements must minimize vehicular conflicts including providing safety crossings.
- Improvements must be designed to minimize grading and site natural characteristics.
- Surface drainage must not affect neighboring properties.

4.3 Landscaping Requirements

Landscaping in accordance with CR zone standards requires the following (see SMC 17.25.100):

- Landscaping is required on 100 percent of the area between the right of way and the building, excluding drives, parking areas, and pathways.
- Landscaping types must be compatible with nearby landscaping and of a size, condition, and density to be initially effective.
- Wherever practical, natural vegetation and grades must be retained.

4.4 Parking and Loading Standards

Parking and loading must meet the requirements of SMC Chapter 17.42. This code chapter does not specify the number of spaces required for fire stations or similar uses; in such cases, the number of spaces that would be required is determined by the Planning Commission. The Planning Commission met in January, 2016 to discuss parking requirements for the fire station and opted to provide guidance that 30 spaces “would be an appropriate number to use.” However, based on discussions with the City’s planning director, Ben Shumaker, a final decision would need to be made to

justify any standard. If the fire station application justifies a different number of spaces, Mr. Shumaker indicated he thought “the Planning Commission would be open to it.” BergerABAM recommends providing parking spaces consistent with the latest edition of the Institute of Transportation Engineers Parking Generation Manual and accounting for peak usage of the building, including community meeting spaces. Loading spaces are required for uses that require routine delivery of goods, merchandise, or equipment and are, therefore, assumed not to be required for a fire station. Parking lot dimensions are shown in Table 3.

Table 3. Parking Lot Dimensions

Standard	Requirement
Standard stall dimensions	9 by 18 feet
Compact stall dimensions	8 by 16 feet
Drive aisles	20 feet wide (not specified two or one way)

4.5 Signs

SMC Section 17.25.145 contains CR zone sign standards. Signs placed by a government agency are permitted outright in the CR zone. Illumination can be either dark-sky or externally illuminated. Directly illuminated signs are allowed as an accessory sign when placed in windows limited to 4 square feet. Sign dimensional standards are provided in Table 4.

Table 4. Sign Standards

Standard	Regulation
Maximum sign area (Individual sign)	40 square feet
Cumulative Signage allowed	
Primary building wall ¹	10% of wall area
Secondary building wall ²	3% of wall area
Windows ³	25% of window area
Sign Height (building, freestanding)	26 feet, 12 feet
Sign setback from property line	5 feet

1. Freestanding signs are included in the cumulative area calculation for the closest primary building wall.
2. The area for signs facing more than one street is included in the cumulative area calculation for the closest primary or secondary building wall.
3. Subject to overall maximum cumulative signage of building wall.

4.6 Critical Area Development Standards

As discussed in section 2.2, the site likely contains geologically hazardous areas and wetlands. Wetlands would not be impacted by the proposal according to the schematic site plan (Appendix E).

The development standards for geologically hazardous areas – the only impacted critical area – are discussed further below.

4.6.1 Geologically Hazardous Areas

Applicants who propose development located within mapped landslide hazard areas are required to submit a geotechnical assessment and a geotechnical stabilization report that assess the risk posed by new development and include design recommendations that demonstrate that the proposed development “will not decrease the factor of safety below acceptable limits” (see SMC 18.30.090(C)(2)). There are no specific development limitation or code-required buffers in moderate hazard landslide areas. Instead, requirements for development in landslide hazard areas come from the geotechnical assessment and geotechnical stabilization report. Developments located within seismic hazards must comply with the International Building Code.

4.6.2 Street Improvements

According to City staff, a traffic study will likely be required to project trips and the necessity for road improvements. The rural major collector designation of Foster Creek Road requires a 60-foot right of way. Rock Creek Drive appears to have an approximately 100-foot existing right of way and Foster Creek Road has a 60-foot right of way meaning that dedication may not be required, but this should be confirmed with staff during the pre-application conference.

The City’s “Engineering Standards for Public Works Construction” requires driveways to be spaced 150 feet from another driveway. Based on that driveway spacing and the existing driveway location serving the Rock Cove Assisted Living Community, any new driveway may need to be located where the northern gravel driveway on the existing site is located.

5.0 FINDINGS AND RECOMMENDATIONS

This section is a summary of the key findings and recommendations of this report:

- The City of Stevenson permits that will be required include a CUP and engineering and building permits, and a critical areas permit may be required. While a pre-application conference is not required, it is strongly recommended to confirm design requirements prior to design development and permitting.
- The required state permits may include an NPDES Construction Stormwater Permit.
- The site is encumbered by a wetland and geologically hazardous critical areas. The City will conduct a critical area permit review for geologically hazardous areas at the same time as the CUP review.
- The applicant should complete an archaeological assessment and/or survey for the subject site because of the high probability of encountering resources as mapped by DAHP.
- The permit assessment contained in this report is based on the schematic site plan provided by Mackenzie. Should the site plan change, the need for different permits may be triggered and the permit assessment should be updated.
- The City does not have an adopted parking standard for fire stations. The Planning Commission selected 30 spaces as guidance, but the City’s planning director

indicated that the Commission would be open to the justification of a different number of spaces. BergerABAM recommends using the latest edition of the Institute of Transportation Engineering Parking Generation Manual to establish peak parking demand and the number of required spaces.

- The project team should confirm that street right of way dedication is not required given the apparent adequate right of way widths of Rock Creek Drive and Foster Creek Road.

**Site Assessment
City of Stevenson
Stevenson, Washington**

**Appendix A
Site Maps**

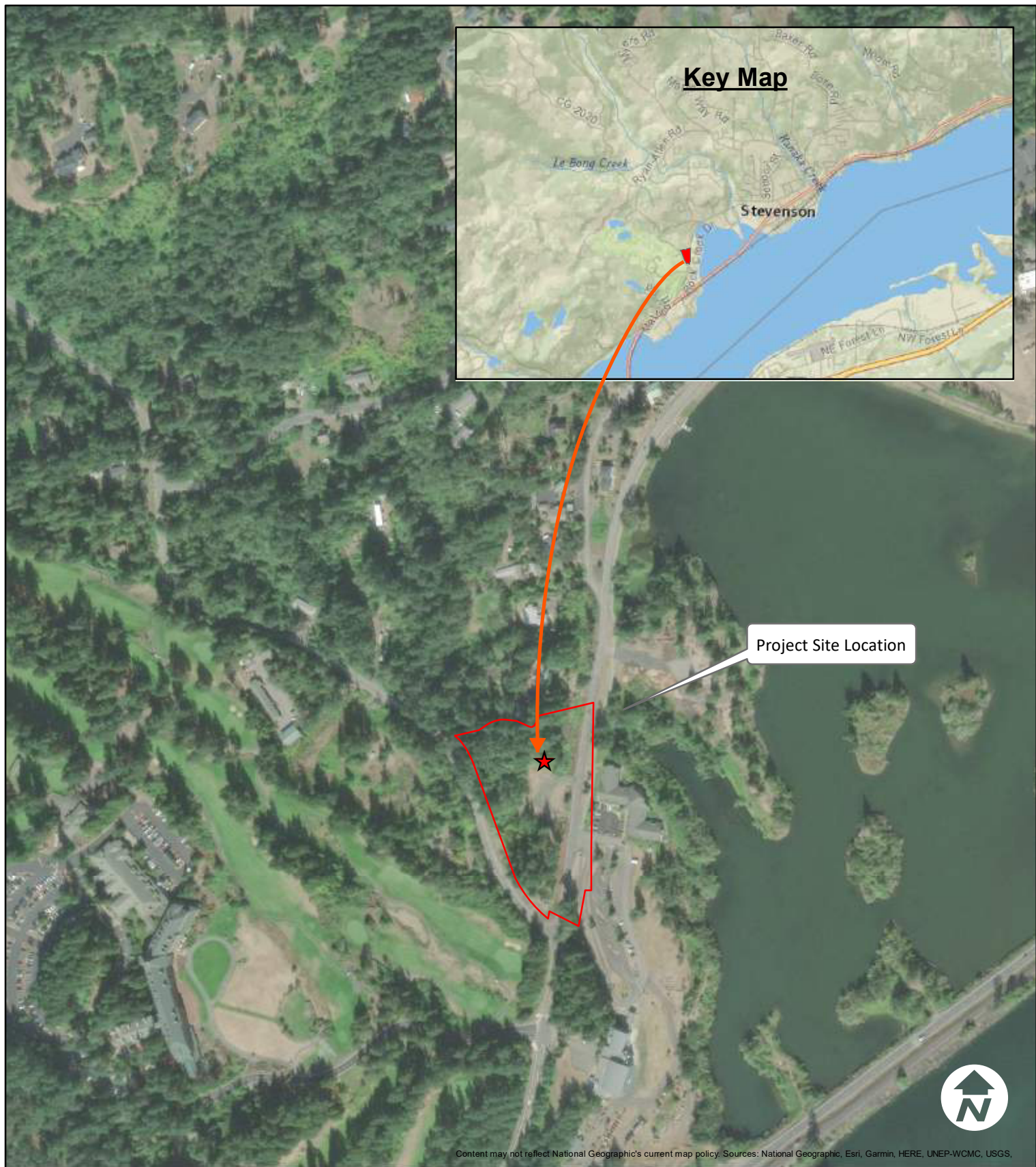


Figure 1 - Vicinity Map

Purpose: Site Assessment
 Client: City of Stevenson
 Project #: A19.0048.00
 Date: 8/22/2018



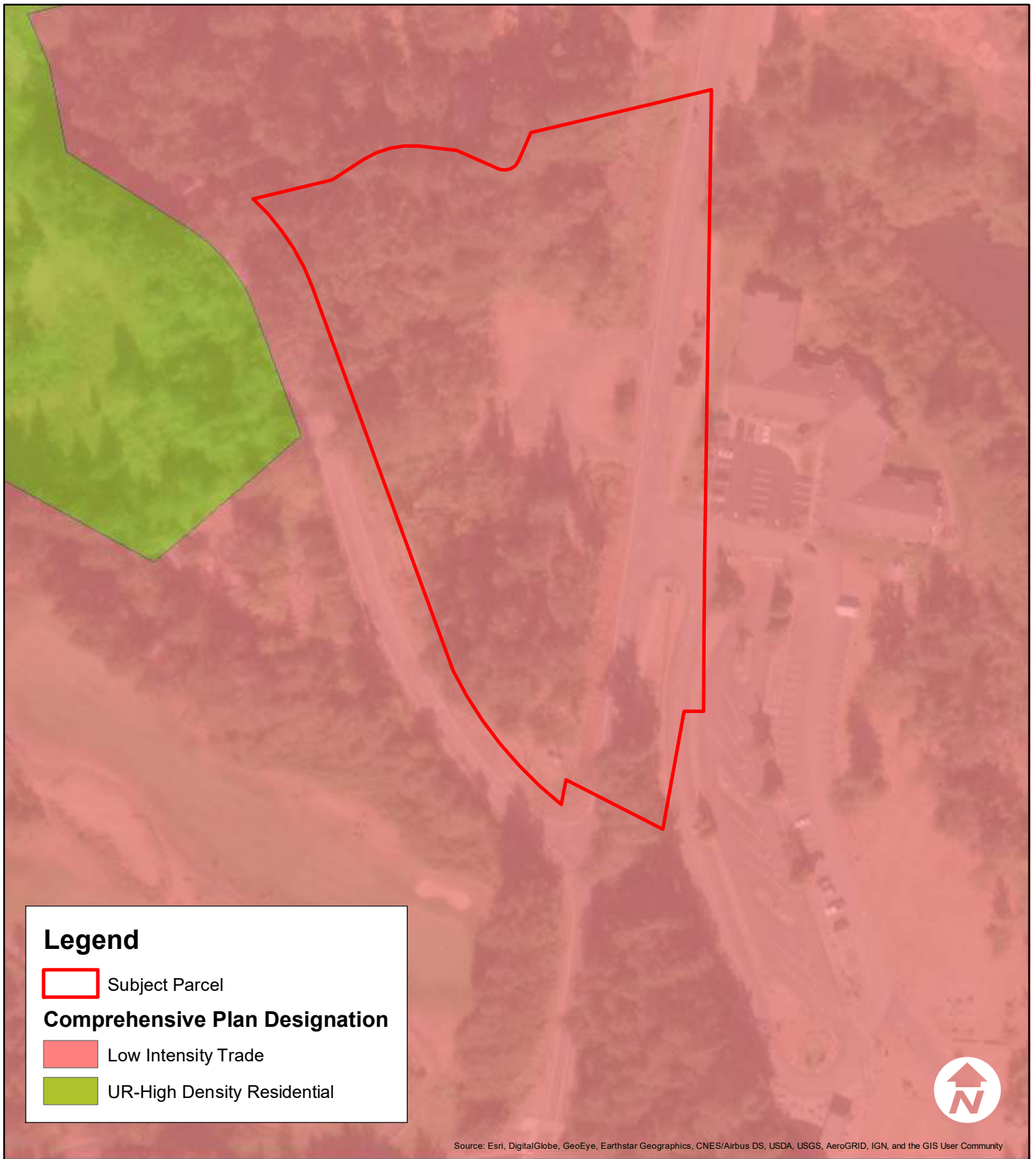
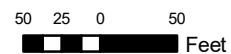


Figure 2 - Comprehensive Plan Designations

Purpose: Site Assessment
 Client: City of Stevenson
 Project #: A19.0048.00
 Date: 8/22/2018



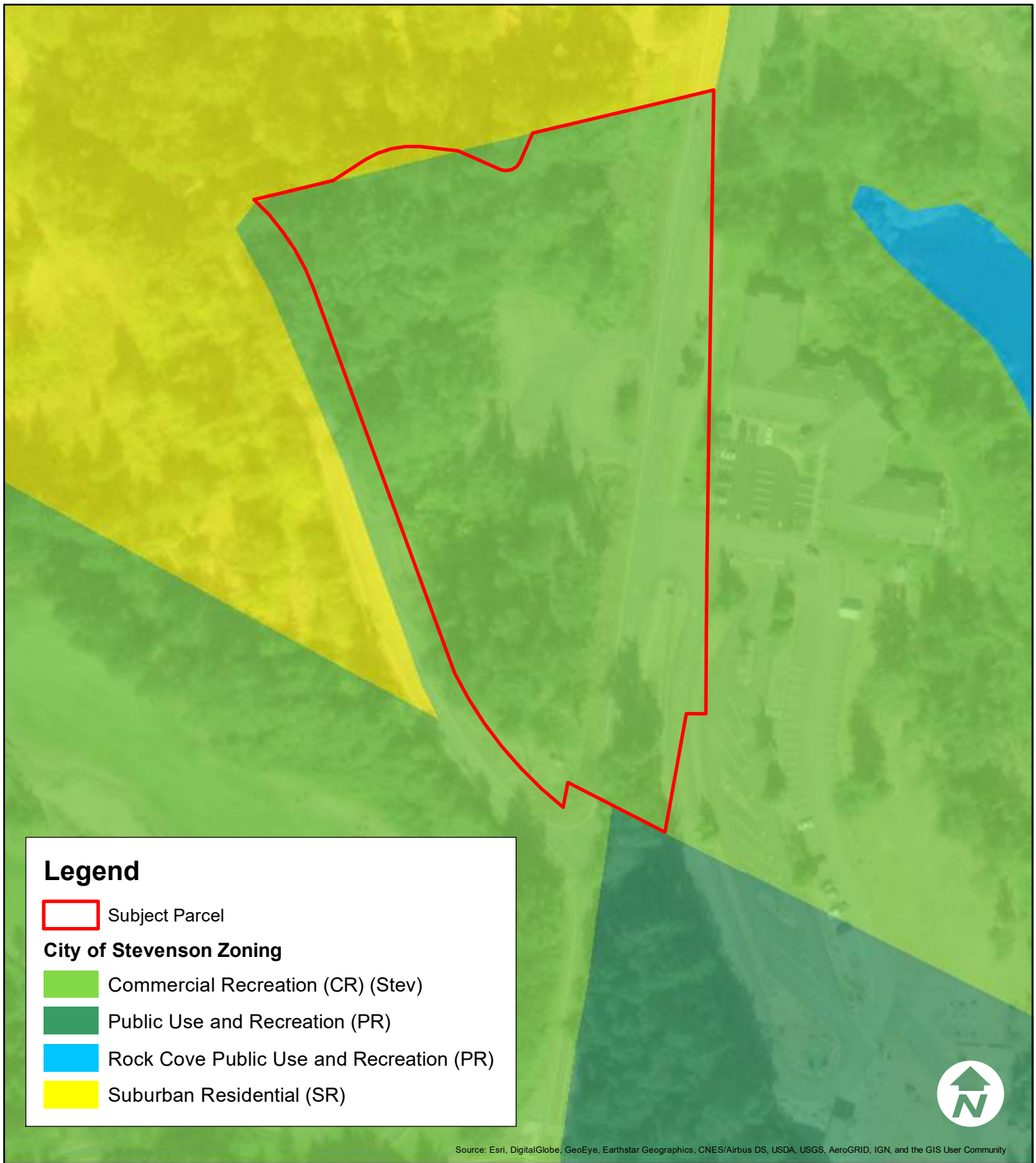


Figure 3 -Zoning Designations

Purpose: Site Assessment
 Client: City of Stevenson
 Project #: A19.0048.00
 Date: 8/22/2018

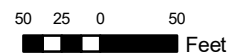




Figure 4 -Topographic Map

Purpose: Site Assessment
 Client: City of Stevenson
 Project #: A19.0048.00
 Date: 8/22/2018

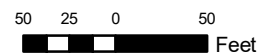
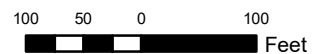




Figure 5 -Wetlands

Purpose: Site Assessment
 Client: City of Stevenson
 Project #: A19.0048.00
 Date: 12/7/2018



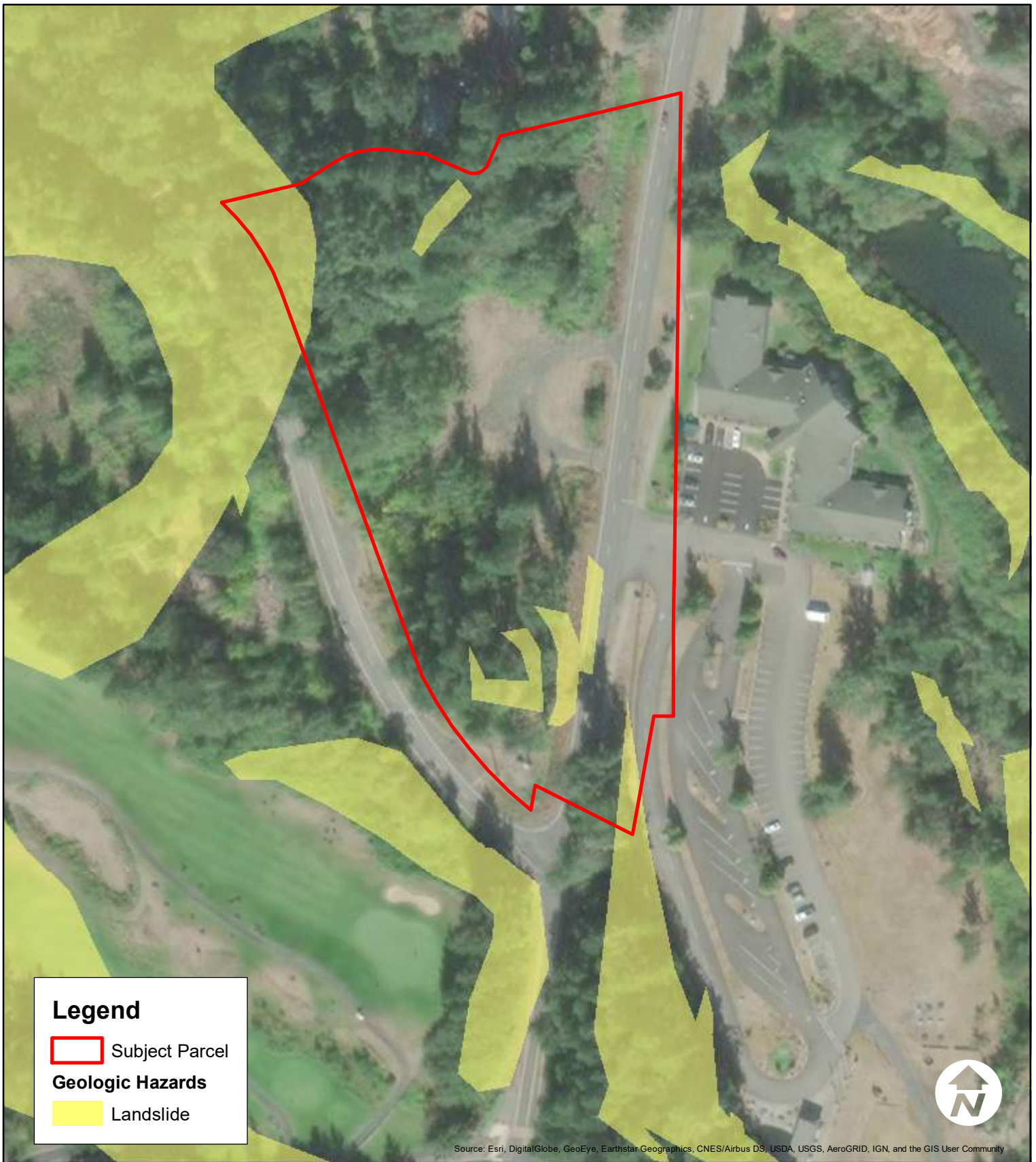
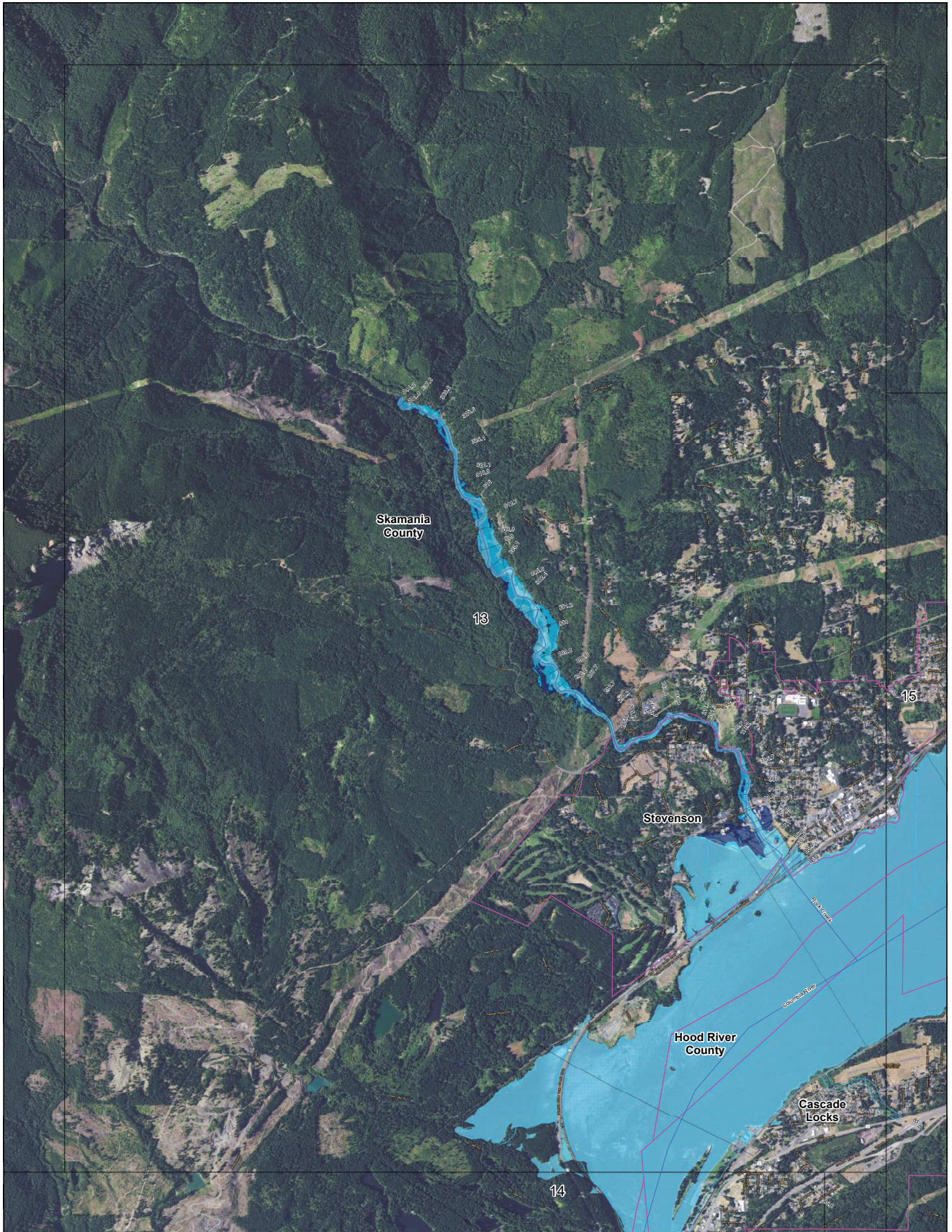


Figure 6- Geologically Hazardous Areas

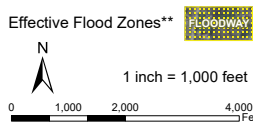
Purpose: Site Assessment
 Client: City of Stevenson
 Project #: A19.0048.00
 Date: 8/22/2018

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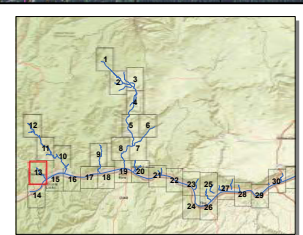




- Basic Approximate Streamlines
 - Automated Approximate Streamlines
 - Cross Sections*
 - 1% Minus
 - 1% Annual Chance
 - 1% Plus
 - Political Boundaries
 - Unresolvable with MZA
- *Labeled with 1%-Annual Chance WSEL, NAVD88 ft
 **Some or all effective data is derived from Q3 data



FEMA Region X
Middle Columbia Hood Watershed
Washington
HUC 17070105
MZA study
Draft Workmaps
January 2017



**Site Assessment
City of Stevenson
Stevenson, Washington**

**Appendix B
Wetland Delineation and Assessment**



City of Stevenson | New Fire Station Wetland Delineation and Assessment

Prepared for
City of Stevenson

Prepared by
BergerABAM

December 2018

Wetland Delineation and Assessment

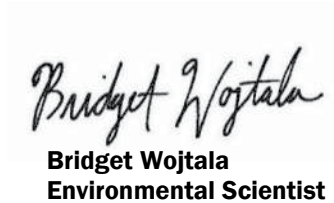
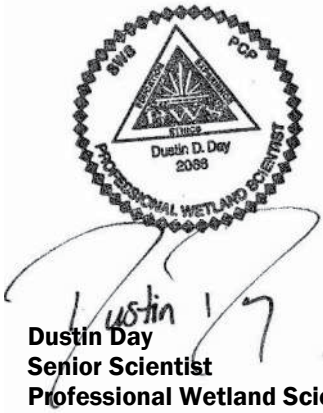
**City of Stevenson
New Fire Station**

Prepared for

**City of Stevenson
7121 E. Loop Road
Stevenson, Washington 98648**

December 2018

Prepared by



**BergerABAM
210 East 13th Street, Suite 300
Vancouver, Washington 98660**

A19.0048.01

WETLAND DELINEATION AND ASSESSMENT

**City of Stevenson
New Fire Station**

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**WETLAND DELINEATION AND ASSESSMENT
CITY OF STEVENSON
NEW FIRE STATION PROJECT**

1.0 INTRODUCTION

The City of Stevenson (City) has contracted with Mackenzie and BergerABAM to assess the feasibility of developing a new fire station and accessory uses such as parking, circulation, and landscaped areas at a previously purchased site. (Figure 1; all of the figures are included as Appendix A.) If constructed, the new fire station would serve the City and Skamania County Fire District 2 and would replace the existing fire station located at 160 First Street in downtown Stevenson. The existing station has been home to the department's activities since 1912 and has housed its equipment since 1967. Population growth and time highlight its shortcomings, including the structural deficiencies exposed by a minor collision in 2011 that damaged one of the City's trucks and the building.

A needs assessment conducted in 2013 by the City and its consultant, Rice Fergus Miller, identified a building footprint that would meet the City's needs and examined whether a new fire hall could be shared with other emergency service providers (i.e., the Skamania County Hospital District, the Skamania County Department of Emergency Management, Skamania County Fire District 2, and the Stevenson Volunteer Fire Department). The hospital district later decided that colocation with the other service providers would not serve its best interests and the footprint of the 2013 study no longer applied. In 2015–2016, the City led a process with key stakeholders to reevaluate the required building footprint and to select a site that would meet the Fire District's needs. The findings are contained in "2016 Stevenson Fire Hall Strike Team Report," which recommends a 9,700-square foot facility with room to expand to over 11,000 square feet. The site has been defined as parcel number 02070200310000 located west of SW Rock Creek Drive and east of Foster Creek Road on a City-owned, triangular parcel (Figure 2).

In preparation for the fire station project, the City contracted with BergerABAM to investigate the existence on the site of jurisdictional wetlands and waterbodies as defined and regulated by the U.S. Army Corps of Engineers (USACE), the Washington State Department of Ecology (Ecology), the Washington Department of Fish and Wildlife, and/or the City. BergerABAM delineated and assessed wetlands and waterbodies within the study area of the proposed project. The study area is mostly forested on its west and north sides. The fire station would presumably be located in a flat area on the site's eastern side with access from Rock Creek Drive. The study area was measured to be approximately 4.4 acres, and is located in the NE 1/4 of Section 42, of Township 2 North, Range 7 East of the Willamette Meridian.

Dustin Day, BergerABAM Senior Scientist and Professional Wetland Scientist (No. 2066), and Bridget Wojtala, BergerABAM Environmental Scientist, used the routine on-site

wetland delineation method described below for the delineation and assessment. They identified one palustrine scrub-shrub wetland within the study area.

2.0 METHODS

Guidance for determining wetland boundaries came from the 2010 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)* (the regional supplement) (USACE 2010). According to the regional supplement, wetlands are defined as:

... areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

The regional supplement uses three parameters in making wetland determinations: wetland hydrology, hydrophytic vegetation, and hydric soils.

- Wetland hydrology is present when an area is inundated or the water table is within 12 inches of the surface for at least 14 consecutive days of the growing season at a minimum frequency of 5 years in 10. The growing season is defined as the portion of the year when soil temperature at 19.7 inches below the soil surface is greater than biologic zero (5 degrees C).
- Hydrophytic vegetation consists of plants that, because of morphological, physiological, and/or reproductive adaptations, have the ability to grow, effectively compete, reproduce, and/or persist in anaerobic soil conditions.
- Hydric soils are soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions.

Except in atypical situations as defined in the regional supplement, evidence of a minimum of one positive wetland indicator from each of the three parameters (hydrology, vegetation, and soil) must be found in order to make a positive wetland determination.

In addition to the regional supplement, the scientists used the following information to develop a preliminary indication of where potential wetlands might exist and aid on-site data collection:

- Skamania County GIS wetland inventory data
- Hydric Soils List (U.S. Department of Agriculture [USDA] Natural Resources Conservation Service [NRCS]) States Soil Data Access (SDA) Hydric Soils List (USDA-NRCS 2018a)
- National List of Plant Species that Occur in Wetlands: Northwest Region 9 (Reed 1988)
- National Wetland Plant List (Lichvar et al. 2016)
- Preliminary Monthly Climate Data: Troutdale (National Weather Service, NOAA)
- Supplement to List of Plant Species that Occur in Wetlands: Northwest Region 9 (Reed 1993)

- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) Online Mapper (USFWS 2018)
- Washington State Wetland Rating System for Western Washington—Revised (Hruby 2014)
- Web Soil Survey (USDA-NRCS 2018b)
- Wetlands Delineation Manual, Technical Report Y-87-1 (USACE 1987)

On 15 November 2018, the two BergerABAM wetland scientists conducted a field investigation for the wetland delineation and assessment. The scientists used the methodology discussed in the regional supplement, as well as technical guidance and documentation issued by USACE and Ecology, to observe any visible wetland conditions. In this case, the BergerABAM wetland scientists used the routine on-site wetland delineation method. The scientists walked the entire site looking for visible indicators of wetland conditions. Once the general location of a wetland area had been identified, the scientists took paired data plots in areas that represented the conditions of the uplands and wetlands. In general, each plot was chosen in a uniform topographic position that was representative of a single plant community. Paired plots were generally located approximately 5 to 10 feet apart to minimize the margin of error. The scientists inspected the soils at each data point to a depth of 16 inches (or more, depending on conditions) to determine the presence or absence of hydric soil characteristics and/or wetland hydrology.

During the site visit, the scientists identified one wetland within the study area. The on-site wetland was classified according to the USFWS classification system (Cowardin et al. 1979) and the hydrogeomorphic (HGM) classification system (Adamus 2001) based on observations made in the field. In addition, the scientists recorded hydrologic conditions, soils, and vegetation at five sample plots and used a GPS unit to record the sample plot locations and wetland boundary. The wetland in the study area is discussed in greater detail in section 4.0.

3.0 SITE CHARACTERISTICS

The 4.4-acre study area is triangular, and its southern, western, and northern portions are characterized by thick vegetation and trees. The eastern portion has an existing circular gravel entrance within a cleared area. The gravel entrance road crosses the site from SW Rock Creek Drive and heads southwest where it connects to Foster Creek Road (Figure 2). Overhead power lines parallel SW Rock Creek Drive and Foster Creek Road. The City's comprehensive plan maps show water lines in both SW Rock Creek Drive and Foster Creek Road. The City's sewer map shows that the site is within the City's sewer service area.

Topographically, the site slopes downhill from west to east with slopes exceeding 25 percent along the northern, western, and southern property boundaries in some locations. Slopes level off in the central and eastern portions of the site, in the cleared area where the existing gravel entrance drive is located (Figure 3). The site also slopes

slightly downhill from south to north, with the lowest elevation found in the northeast corner (Figure 3). The vegetation within the wetland area consists of red osier dogwood (*Cornus sericea*), Oregon ash (*Fraxinus latifolia*), black cottonwood (*Populus balsamifera*), and black hawthorn (*Crataegus douglasii*), but the area is mostly bare ground.

The study area is located in the Wind-White Salmon watershed. The watershed consists of the Wind and White Salmon rivers and numerous tributary creeks and streams. The Wind and White Salmon rivers drain to the Columbia River; the Wind-White Salmon watershed covers a large portion of southeast Skamania County, and includes the entire City of Stevenson. The study area is located in the southern portion of the Wind-White Salmon watershed, near the boundary line between it and the Salmon-Washougal watershed.

3.1 Precipitation and Hydrology

The growing season for Skamania County (Troutdale Station) is 137 days, starting on 17 May and ending on 1 October (Haagen 1990). This growing season includes those dates on which average recorded temperatures are 28 degrees F or greater. According to the USACE wetland delineation manual, flooding, ponding, or saturation in the upper 12 inches of the soil profile for a period of at least 14 consecutive days during the growing season is indicative of wetland hydrology.

Table 1 displays precipitation data for the 14 days prior to and including the 15 November 2018 site visit. The information comes from the National Weather Service station in Troutdale, Oregon, approximately 30 miles southwest of the site.

Table 1. Precipitation Data for 14 Days Prior to 15 November 2018 Site Visit

Date	Rain (Inches)	Date	Rain (Inches)
1 November	0.01	9 November	0.00
2 November	0.15	10 November	0.00
3 November	0.01	11 November	0.00
4 November	0.14	12 November	0.00
5 November	0.04	13 November	0.00
6 November	0.01	14 November	0.00
7 November	0.00	15 November	0.00
8 November	0.00	Total:	0.36

Source: NOAA 2018

In addition to daily rainfall total for the 14 days prior to the 15 November 2018 site visit, the BergerABAM wetland scientists reviewed other historic precipitation data available on the NOAA website. That data shows:

- For the two weeks preceding and through the 15 November site visit, a total of 0.36 inch of precipitation was observed. Historical rainfall data shows a normal record of 3.59 inches of precipitation for these dates, so the observed precipitation is 3.23 inches below the historical normal.

- As of 15 November 2018, the observed precipitation for 2018 was 21.96 inches, 14.15 inches below the historical normal of 36.11 inches.
- The observed precipitation for the water year (beginning on 1 October 2018), through the date of the site visit, was 4.55 inches, 2.99 inches below the average of 7.54 inches for the water year through 15 November.

The site conditions were drier than the historical normal at the time of the site visit, but considered appropriate for the wetland delineation. The wetland scientists were still able to accurately evaluate the presence of wetland hydrology.

During the site investigation, the scientists documented the presence or absence of field indicators for wetland hydrology in each of the five soil pits excavated in the sample plots. Data recorded included depth of inundation, depth to water table, and/or soil saturation, when found, as well as primary and secondary indicators of wetland hydrology, including redoximorphic features along living roots, high water table, and saturation. Current hydrologic inputs come from direct precipitation, overland flow from adjacent uplands, and a seasonally high water table.

3.2 Wetlands

The NWI online mapper does not show the presence of any wetlands within or close to the site (Figure 4). Similarly, Skamania County MapSifter does not show the presence of any wetlands within or close to the study area. However, according to the City's Critical Areas & Geologic Hazards Map, there is a palustrine emergent wetland in the northeast corner of the subject site. The on-site investigation identified one palustrine scrub-shrub wetland, which is located within the wetland area identified on the Critical Areas & Geologic Hazards Map cited above.

3.3 Soils

The USDA-NRCS Web Soil Survey identifies the following soil mapping units within the study area (Figure 5). The descriptions are excerpted from the Soil Survey of Skamania County Area (Haagen 1990).

- *Steever stony clay loam, 2 to 30 percent slopes (123)* – This very deep, well-drained soil is on toe slopes and foot slopes. It formed in colluvial landslide material derived dominantly from basalt, andesite, and conglomerate. Typically, the surface is covered with a mat of decomposed needles, leaves, and twigs 2 inches thick. The upper part of the surface layer is very dark brown stony clay loam 5 inches thick, and the lower part is dark brown gravelly clay loam 7 inches thick. The upper 8 inches of the subsoil is dark brown very gravelly clay loam, and the lower 10 inches is dark brown very gravelly loam. The substratum to a depth of 60 inches or more is dark brown very gravelly loam. Permeability of this Steever soil is moderate. Available water capacity is high, runoff is medium, and the hazard of water erosion is moderate. This soil is not listed as hydric within Skamania County according to the state's SDA list of hydric soils (USDA-NRCS 2018).

- *Arents, 0 to 5 percent slopes (2)* – These very deep, well drained to somewhat excessively drained soils are on alluvial river terraces. They formed in alluvium derived dominantly from recent construction. No single profile of Arents is typical, but one commonly observed in the survey area has a surface layer of dark brown gravelly sandy loam 24 inches thick. The underlying material to a depth of 60 inches or more is stratified gravelly or very gravelly loamy sand. In some areas the surface layer is nongravelly. The permeability of these Arents is rapid. Available water capacity is moderate, runoff is slow, and the hazard of water erosion is slight. This soil is not listed as hydric within Skamania County according to the state SDA list (USDA-NRCS 2018).

The location of the soil types within the study area was obtained from the USDA-NRCS Web Soil Survey (USDA-NRCS 2018b), and the hydric classification came from the SDA list of hydric soils (USDA-NRCS 2018a). The BergerABAM scientists examined each soil pit for hydric soil indicators and recorded its soil profile and characteristics (matrix color, redoximorphic features, texture, and other features). Observations of soil conditions during the site visit were typically consistent with the map units described and identified in the USDA-NRCS soil survey. Although both of the mapped soils within the study area are non-hydric, soil conditions within the wetland area met the criteria for hydric soils.

3.4 Vegetation

Hydrophytic vegetation consists of plant species that have adapted to growing in periodically inundated or saturated substrates. Five basic groups of vegetation are recognized based on how frequently they occur in wetlands (Reed 1988 and 1993).¹ From the wettest to the driest plant communities, the categories are obligate wetland (OBL), facultative wetland (FACW), facultative (FAC), facultative upland (FACU), and obligate upland (UPL) plants. Hydrophytic vegetation is present when more than 50 percent of the dominant species have an indicator status of OBL, FACW, and/or FAC.

The BergerABAM wetland scientists documented the visual percent cover of the dominant plant community species for key sample sites. Using the five soil pit locations as centers of reference, the scientists investigated sample plots of varying proportions for dominant species of trees, shrubs, herbs, and woody vines. The composition and orientation of the plant communities within the plot determined the size and shape of each sample plot. Sample plots were set up so that their boundaries included a representative cross section of the plant community within the plot. Estimating the percent of aerial cover of each species within each stratum determined the dominance of plant species.

The scientists listed species from each stratum in descending order of percent cover, and used the USACE's 50-20 technique to determine the predominance of hydrophytic vegetation. Using this method, when the most abundant plant species are ranked in

descending order of abundance and totaled, any species immediately exceeding 50 percent cover, plus any species comprising more than 20 percent cover, represent the dominant species. If more than 50 percent of the dominant species included by these criteria are FAC or wetter, the vegetation community is considered hydrophytic.

A prevalence index is used as another method of evaluating the presence or absence of hydrophytic vegetation based on the relative dominance of species within each indicator status. Using the prevalence index, vegetation percentages within each designation (OBL, FACW, FAC, FACU, and UPL) are added together and are given a different multiplier. Once calculated, the total in the multiplied column is divided by the original percentage total before multiplying. If the number given is less than or equal to 3.0, the vegetation community is considered hydrophytic. If the number is greater than 3.0, the vegetation community is not considered hydrophytic.

A portion of the study area is maintained with a gravel driveway, while other portions are generally unmanaged. Species noted throughout the study area include the red osier dogwood (FACW), Oregon ash (FACW), black hawthorn (FAC), and black cottonwood (FAC) noted in the wetland area plus reed canarygrass (*Phalaris arundinacea*, FACW), Himalayan blackberry (*Rubus armeniacus*, FAC), western sword fern (*Polystichum munitum*, FACU), English ivy (*Hedera helix*, FACU), hairy cat's-ear (*Hypochaeris radicata*, FACU), white moth mullein (*Verbascum blattaria*, UPL), common St. John's-wort (*Hypericum perforatum*, FACU), woolly hawkweed (*Hieracium triste*, FACU), common tansy (*Tanacetum vulgare*, FACU), lemonbalm (*Melissa officinalis*, FACU), curly dock (*Rumex crispus*, FAC), common velvet grass (*Holcus lanatus*, FAC), colonial bentgrass (*Agrostis capillaris*, FAC), Canada thistle (*Cirsium arvense*, FAC), trailing blackberry (*Rubus ursinus*, FACU), and snowberry (*Symphoricarpos albus*, FACU), among others.

4.0 WETLAND A DESCRIPTION

BergerABAM's investigation of hydrology, soils, and vegetation identified one wetland within the study area (Wetland A). No streams were identified within the study area that would be subject to regulation by the City or state or federal agencies.

Appendix B contains five wetland determination forms that show the data collected during the site visit. The numbers assigned to the data sheets correspond to the sample plots, which were numbered sequentially SP1 to SP5. The wetland was rated using the revised wetland rating form that Ecology developed in 2014 (Appendix C). The wetland received a Category IV rating with a score within the range of 9 to 15 points. Figure 6 is an overview of the location of the delineated wetland within the study area, overlaid on an aerial image of the study area. Figures 7 and 8 consist of site photos taken during the field investigation.

Wetland A (0.01 acre) is in the northeast area of the subject site. This palustrine scrub-shrub wetland includes areas that are dominated by scrub-shrub wetland plant species, and while the vegetation in the scrub-shrub wetland area is composed of red osier dogwood and Oregon ash saplings, the wetland area is mostly bare ground. Hydrology is

supported by overland flow from adjacent uplands and roads, direct precipitation, and a seasonally high water table. Wetland A was rated under the depressional HGM classification and received a Category IV rating with a score of 15. Indicators of hydrology within Wetland A include drift deposits (B3), a sparsely vegetated concave surface (B8), water-stained leaves (B9), and geomorphic position (D2).

Soils within Wetland A include a 3-inch surface layer of a black (10YR 2/1) silty loam matrix to a depth of 3 inches, followed by a dark grey (10YR 4/1) matrix with 20 percent dark reddish brown (5YR 3/4) concentrations in the matrix and along pore linings, to a depth of 14 inches. Following this layer, to a depth of greater than 16 inches, is a very dark gray (10YR 3/1) matrix, with 15 percent of dark yellowish brown (10YR 3/4) concentrations in the matrix. This soil profile meets the criteria for the Depleted Dark Surface (F7) hydric soil indicator.

Table 2 is a summary of the identified wetland.

Table 2. Summary of Identified Wetland

Wetland	Wetland Classification			Wetland Area	
	Cowardin ^a	HGM	Wetland Rating	SF	Ac
Wetland A	PSS	Depressional	IV	587.09	0.01

Source: Wetland Rating System for Western WA 2014

Notes:

a Cowardin et al. (1979) or NWI class based on vegetation: PEM = Palustrine Emergent, PSS = Palustrine Scrub-Shrub, PFO = Palustrine Forested.

b HGM classification according to Hruby (2014).

c Wetland rating according to Hruby (2014).

5.0 REGULATORY REVIEW

This section is an overview of regulatory requirements as they pertain to wetlands identified within the study area that are located within the jurisdiction of the City. The new fire station will be subject to SMC Chapter 18.13.100 – Critical Area – Wetlands.

The wetlands section of the ordinance establishes protective buffers associated with wetlands and requires that proponents obtain certain permits or approvals for projects containing wetlands and/or their buffers. The ordinance requires the use of Ecology’s revised wetland rating system to determine a wetland’s category and its score for habitat, water quality, and hydrologic functions. Per guidance found in the 2014 Wetland Rating System for Western Washington, Wetland A was rated using the depressional HGM classification. The wetland received a Category IV rating with a score of 15.

According to SMC Chapter 18.13.100.4, Wetland A is exempt from all the buffer provisions of the chapter, because it is a Category IV wetland of less than 4,000 square feet that is not associated with a riparian area or its buffer; is not associated with shorelines of the state or their associated buffers; is not part of a wetland mosaic; did not score 6 or more points for habitat function based on the rating system; and contains none of the following: a priority habitat or priority area for priority species identified by the

Washington Department of Fish and Wildlife; or federally listed species or their critical habitat; or species of local importance identified in SMC 18.13.095. SMC Chapter 18.13.100.4 also states that wetlands less than 1,000 square feet that meet the above criteria and do not contain federally listed species or their critical habitat are exempt from the buffer provisions contained in the chapter. Therefore the wetland would not require a protective buffer in accordance with the SMC 18.13.100.4, but would still require a critical areas permit for any direct project related impacts to the wetland.

In addition to the City ordinance, USACE and Ecology regulate jurisdictional wetlands at the federal and state levels under sections 404 and 401 of the Clean Water Act, respectively. Because of the potential direct hydrologic connection to Rock Cove, the on-site wetland would likely be considered a jurisdictional wetland based on U.S. Environmental Protection Agency/USACE guidance. Any direct impacts to the wetland will require notifying USACE and Ecology and obtaining the appropriate approvals.

6.0 CONCLUSIONS

Activities within the identified wetland are subject to regulation by the City, Ecology, and the USACE. Any fill placed within the regulated wetland would require a critical areas permit from the City, a Section 401 water quality certification through Ecology and a Section 404 permit through the USACE. Any mitigation that would be required to compensate for wetland impacts would be determined during the permitting process.

Finally, it should be noted that the wetland boundary and classification in this report were determined using the most appropriate field techniques and best professional judgment of the wetland scientists. The City, Ecology, and the USACE have the final authority in the determination of the boundaries, categories, and jurisdictional status of wetlands under their respective jurisdictions. Therefore, BergerABAM recommends submitting this delineation and assessment report to these agencies for their concurrence before beginning any development or planning activities that would affect the wetland within the study area.

7.0 REFERENCES

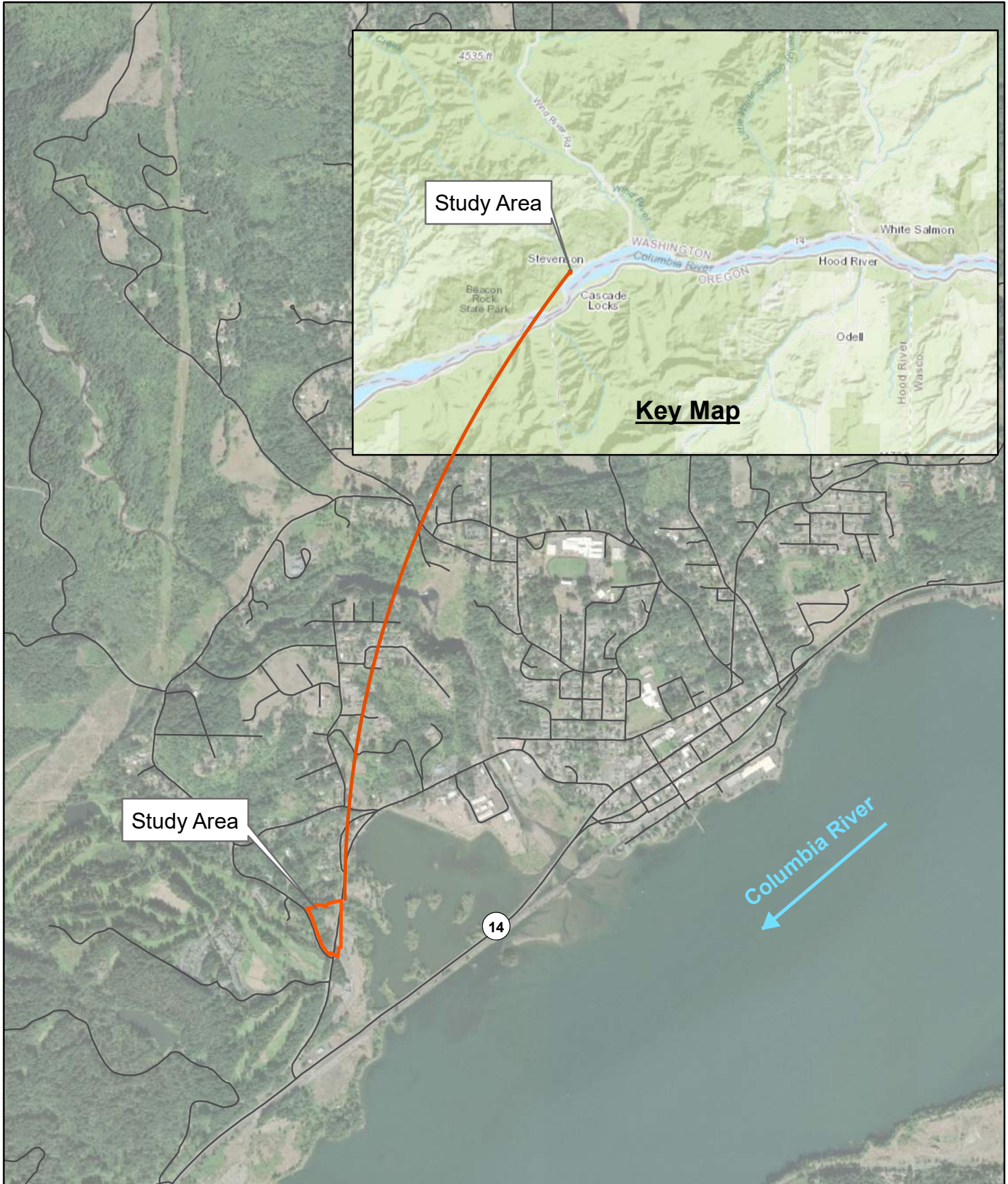
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<https://www.fws.gov/wetlands/Data/Mapper.html>

**Wetland Delineation and Assessment
New Fire Station
Stevenson, Washington**

**Appendix A
Figures**



PURPOSE: WETLAND DELINEATION

LATITUDE: 45°41'18.00"N
 LONGITUDE: 121°53'59.46"W

City of Stevenson
 7121 E. Loop Road
 Stevenson, WA 98648

STEVENSON FIRE STATION

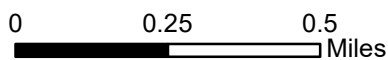
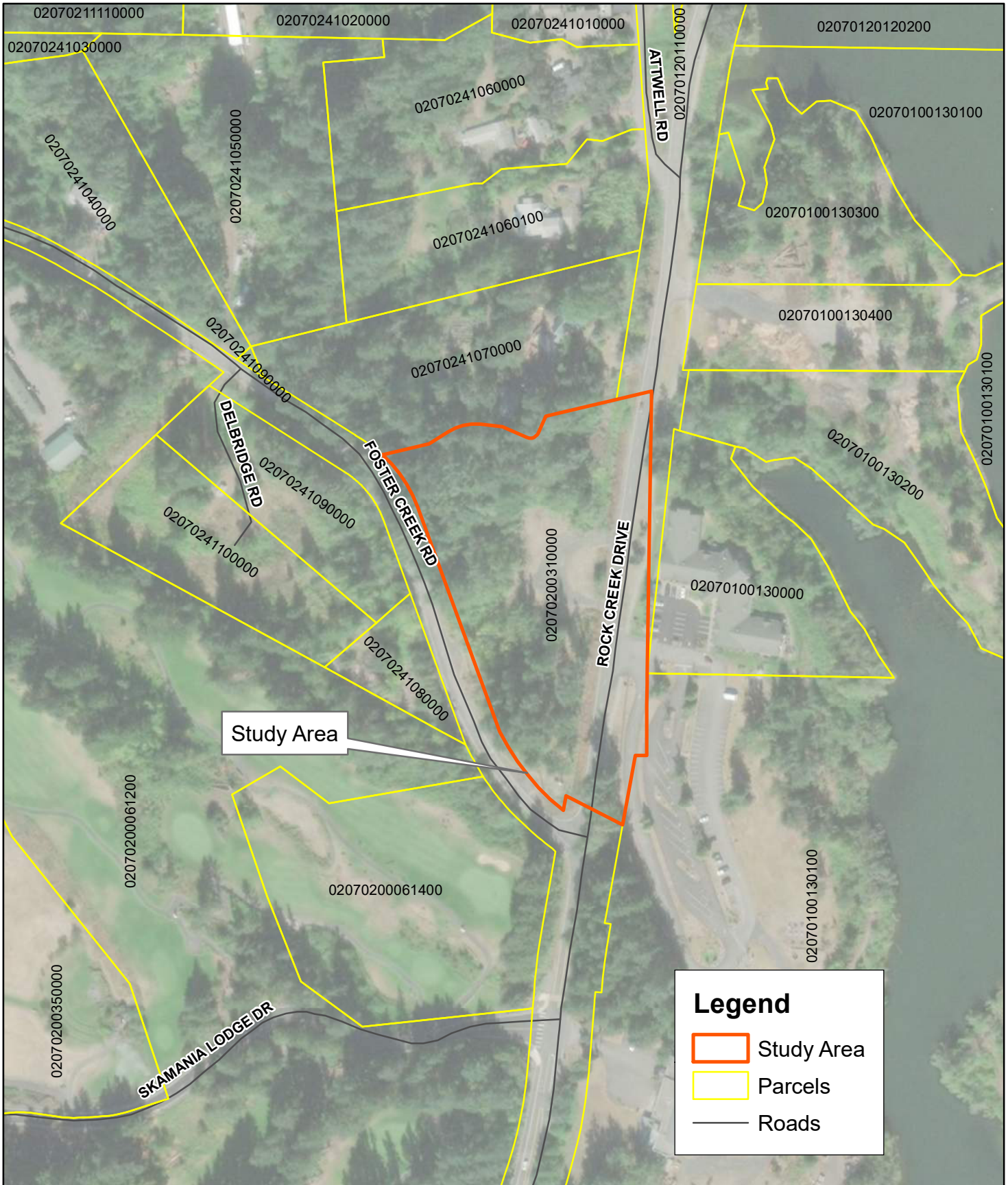


FIGURE 1: VICINITY MAP

In: Stevenson
 County: Skamania
 State: WA
 Datum: DATUM: NAD_1983

December 2018






PURPOSE: WETLAND DELINEATION

LATITUDE: 45°41'18.00"N
 LONGITUDE: 121°53'59.46"W

City of Stevenson
 7121 E. Loop Road,
 Stevenson, WA 98648

STEVENSON FIRE STATION




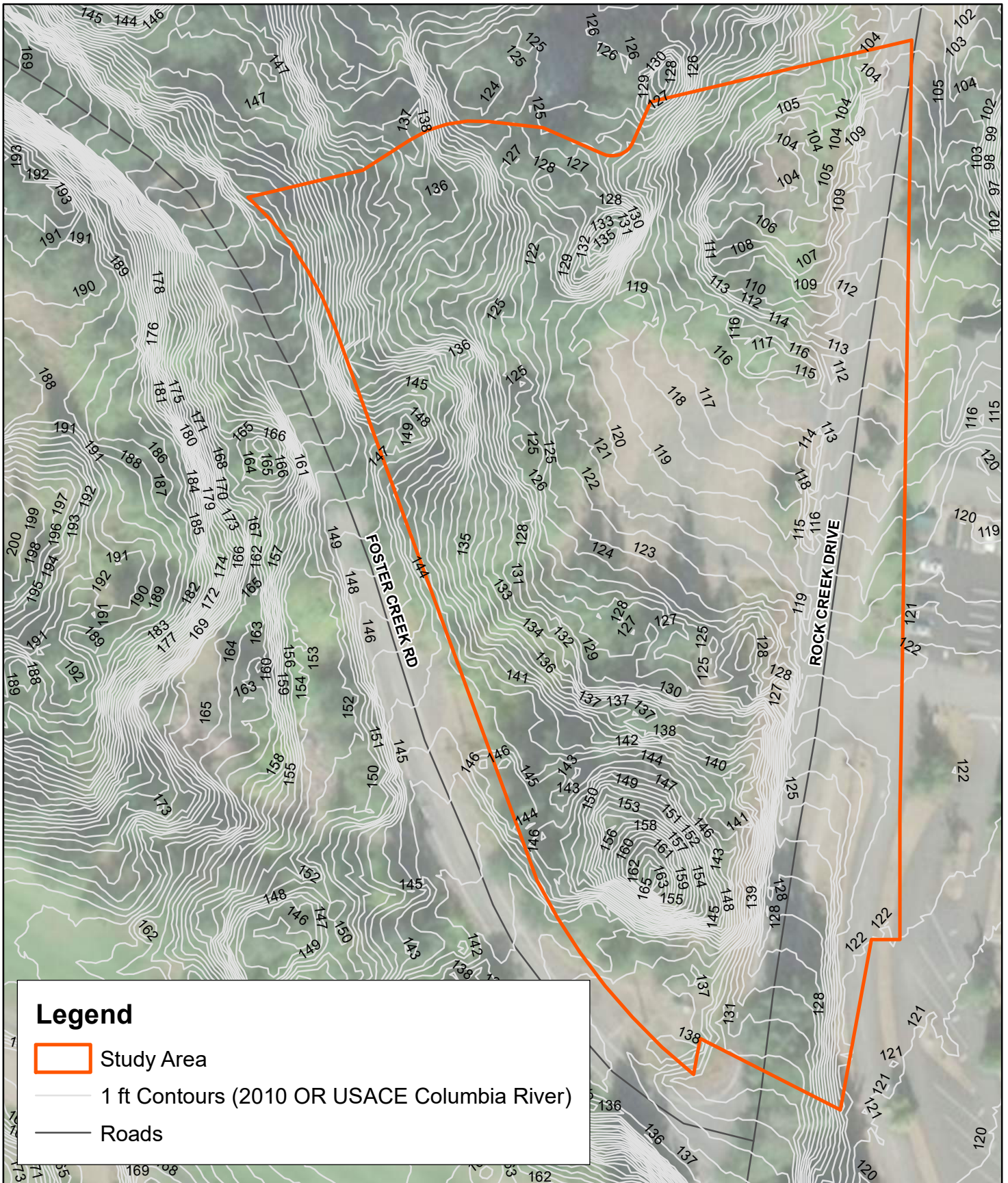
0 125 250
 Feet

FIGURE 1: PARCEL MAP

In: Stevenson
 County: Skamania
 State: WA
 Datum: DATUM: NAD_1983

December 2018





PURPOSE: WETLAND DELINEATION

LATITUDE: 45°41'18.00"N
 LONGITUDE: 121°53'59.46"W

City of Stevenson
 7121 E. Loop Road,
 Stevenson, WA 98648

STEVENSON FIRE STATION

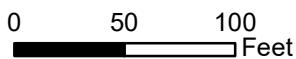
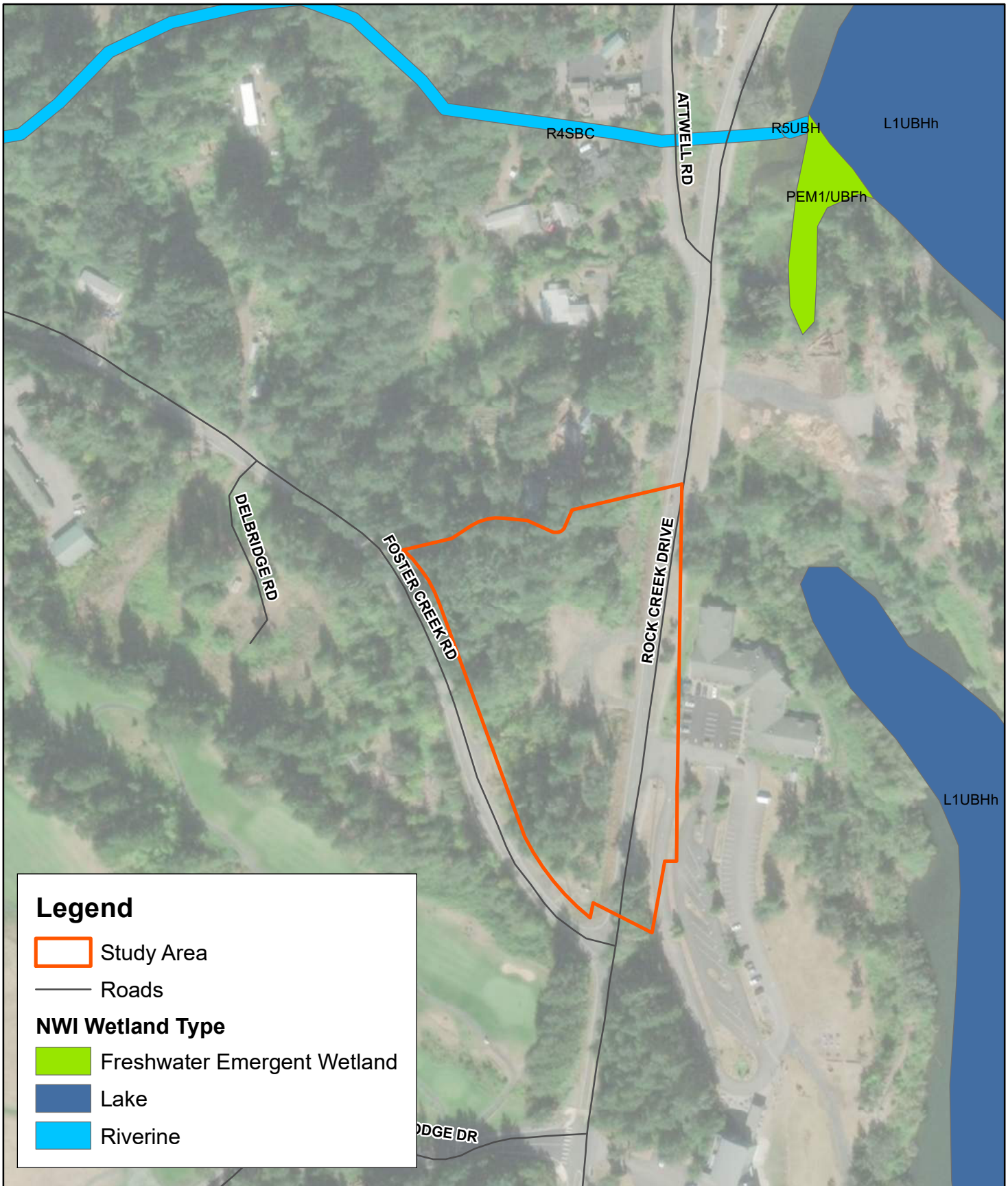


FIGURE 1: TOPO MAP



In: Stevenson
 County: Skamania
 State: WA
 Datum: DATUM: NAD_1983

December 2018








Legend

-  Study Area
-  Roads

NWI Wetland Type


-  Freshwater Emergent Wetland
-  Lake
-  Riverine

PURPOSE: WETLAND DELINEATION

LATITUDE: 45°41'18.00"N
 LONGITUDE: 121°53'59.46"W

City of Stevenson
 7121 E. Loop Road,
 Stevenson, WA 98648

STEVENSON FIRE STATION




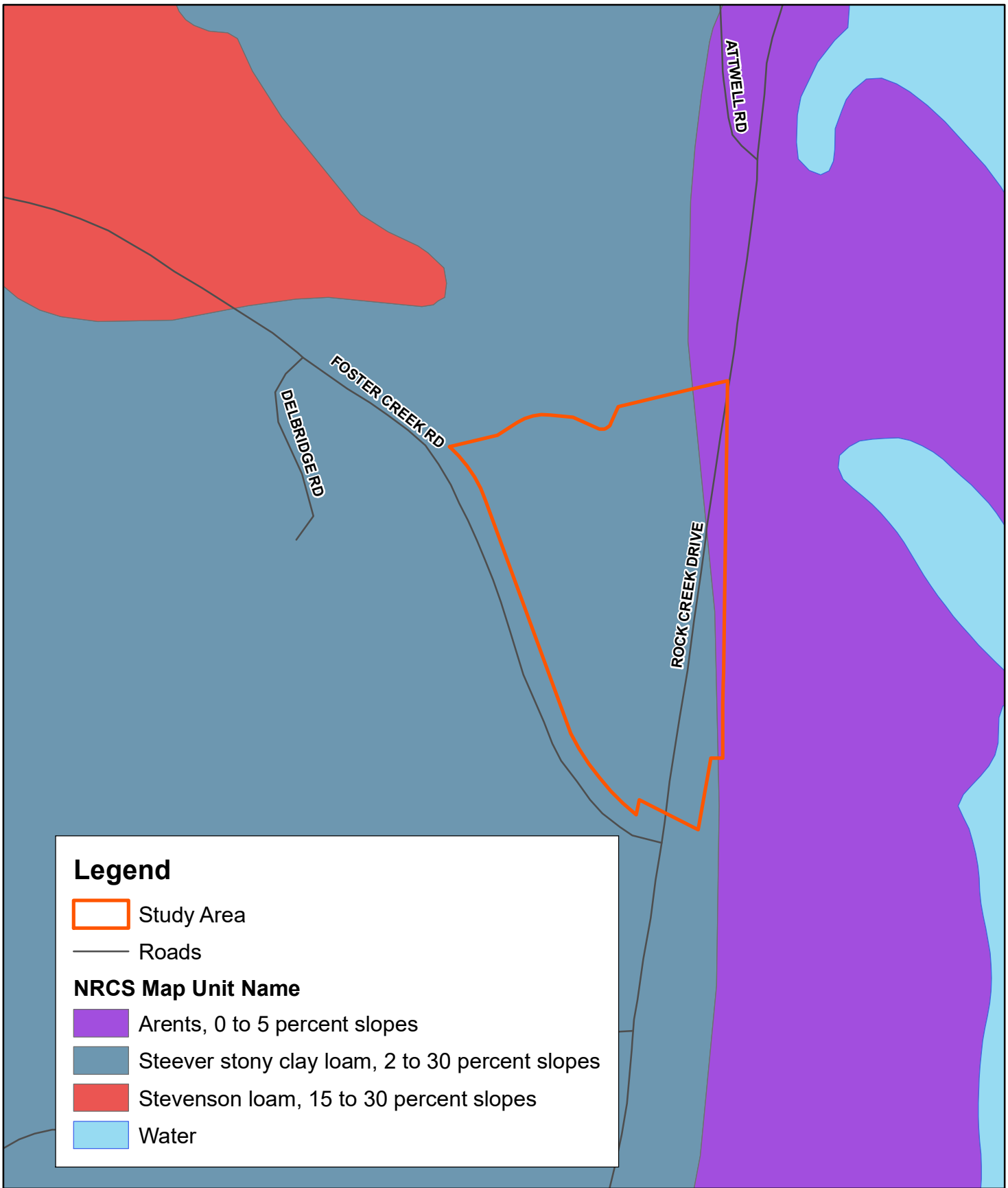
0 125 250
 Feet

FIGURE 4: NWI MAP

In: Stevenson
 County: Skamania
 State: WA
 Datum: DATUM: NAD_1983

December 2018






PURPOSE: WETLAND DELINEATION

LATITUDE: 45°41'18.00"N
 LONGITUDE: 121°53'59.46"W

City of Stevenson
 7121 E. Loop Road,
 Stevenson, WA 98648

STEVENSON FIRE STATION




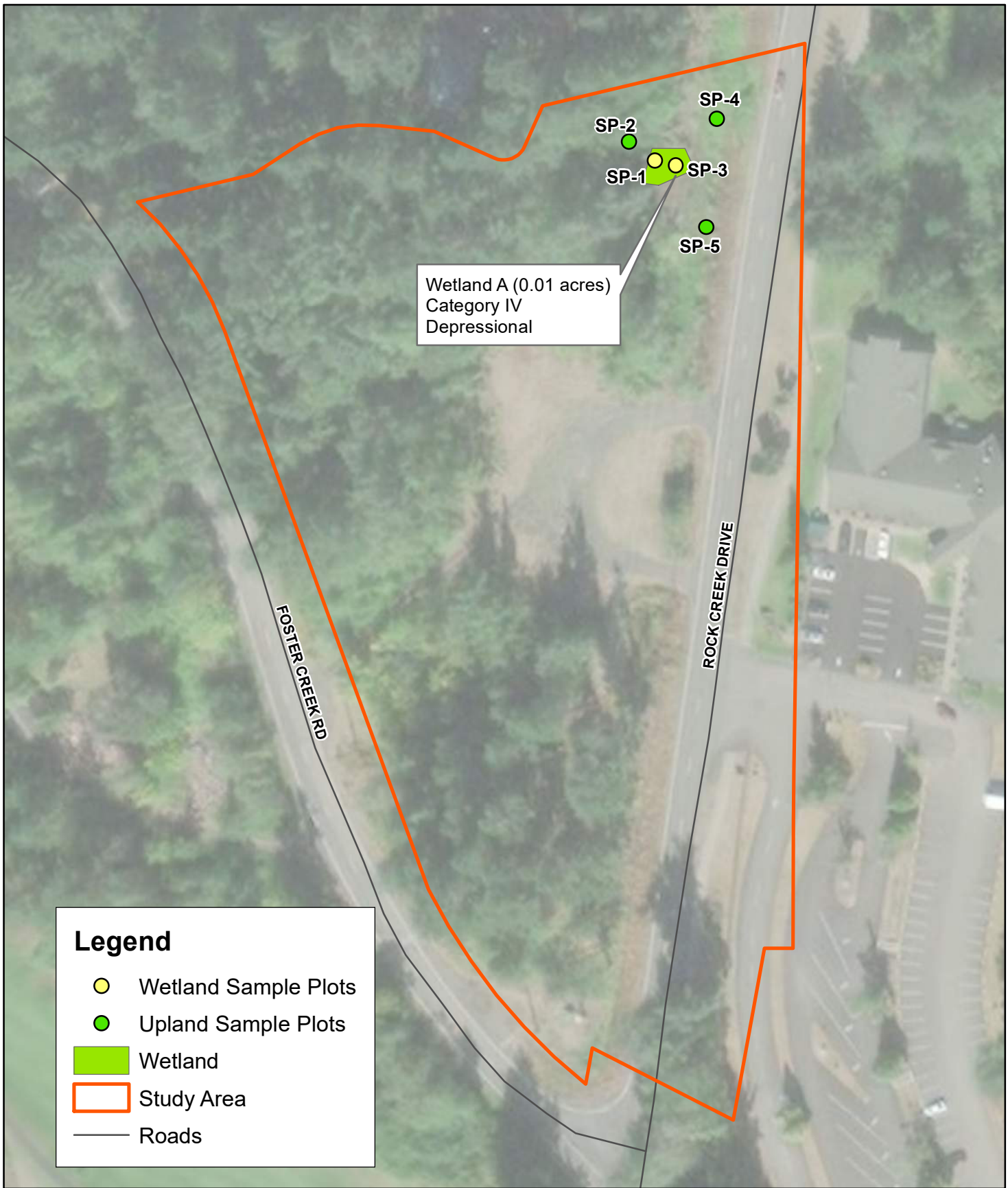
0 125 250
 Feet

FIGURE 5: SOILS

In: Stevenson
 County: Skamania
 State: WA
 Datum: DATUM: NAD_1983

December 2018





Wetland A (0.01 acres)
 Category IV
 Depressional


Legend

- Wetland Sample Plots
- Upland Sample Plots
- Wetland
- Study Area
- Roads

PURPOSE: WETLAND DELINEATION
 LATITUDE: 45°41'18.00"N
 LONGITUDE: 121°53'59.46"W

City of Stevenson
 7121 E. Loop Road,
 Stevenson, WA 98648

STEVENSON FIRE STATION




0 50 100
 Feet

FIGURE 6: DELINEATED WETLAND

In: Stevenson
 County: Skamania
 State: WA
 Datum: DATUM: NAD_1983

December 2018





Northeast portion of subject site, facing north, with Wetland A to the west.



Wetland A- located on the northeast corner of subject site, facing west



East side of subject site, facing north



Slope on the southern area of subject site, facing south



View of gravel driveway from the central portion of subject site, facing northeast



West side of subject site, facing south

<p>PURPOSE: WETLAND DELINEATION</p> <p>LATITUDE: 45°41'18.00"N LONGITUDE: 121°53'59.46"W</p> <p>City of Stevenson 7121 E. Loop Road, Stevenson, WA 98648</p>	<p>STEVENSON FIRE STATION</p> 	<p>FIGURE 7: SITE PHOTOS</p> <p>In: Stevenson County: Skamania State: WA Datum: DATUM: NAD_1983</p> <p>December 2018</p>
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**Wetland Delineation and Assessment
New Fire Station
Stevenson, Washington**

**Appendix B
Wetland Determination Data Forms**

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

Project/Site: New Fire Station Project City/County: Stevenson/Skamania County Sampling Date: 15 November 2018
 Applicant/Owner: City of Stevenson State: WA Sampling Point: SP-1
 Investigator(s): Dustin Day, Bridget Wojtala Section, Township, Range: NE 1/4 of Section 42, T2N, R7E
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): <5%
 Subregion (LRR): LRR A Lat: 45°41'18.00"N Long: 121°53'59.46"W Datum: None
 Soil Map Unit Name: Steever stony clay loam 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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: National Weather Service data indicated that precipitation for November 2018 prior to the site visit was 3.23 inches below the observed normal for the month.	

VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Populus balsamifera</u>	5%	no	FAC	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
5% = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
<u>Sapling/Shrub Stratum</u> (Plot size: _____)				
1. <u>Fraxinus latifolia</u>	20%	yes	FACW	
2. <u>Cornus sericea</u>	10%	yes	FACW	
3. <u>Crataegus douglasii</u>	10%	yes	FAC	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
40% = Total Cover				
<u>Herb Stratum</u> (Plot size: _____)				Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ 5 - 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.
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
_____ = Total Cover				
<u>Woody Vine Stratum</u> (Plot size: _____)				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover				
% Bare Ground in Herb Stratum <u>100%</u>				
Remarks:				

SOIL

Sampling Point: SP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
1-3	10YR 2/1							
3-14	10YR 4/1		5YR 3/4	20				
14-16+	10 YR 3/1		10 YR 3/4	5				
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.)						Indicators for Problematic Hydric Soils³:		
<input type="checkbox"/> Histosol (A1)			<input type="checkbox"/> Sandy Redox (S5)			<input type="checkbox"/> 2 cm Muck (A10)		
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Stripped Matrix (S6)			<input type="checkbox"/> Red Parent Material (TF2)		
<input type="checkbox"/> Black Histic (A3)			<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)			<input type="checkbox"/> Very Shallow Dark Surface (TF12)		
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Loamy Gleyed Matrix (F2)			<input type="checkbox"/> Other (Explain in Remarks)		
<input type="checkbox"/> Depleted Below Dark Surface (A11)			<input type="checkbox"/> Depleted Matrix (F3)			³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.		
<input type="checkbox"/> Thick Dark Surface (A12)			<input type="checkbox"/> Redox Dark Surface (F6)					
<input type="checkbox"/> Sandy Mucky Mineral (S1)			<input checked="" type="checkbox"/> Depleted Dark Surface (F7)					
<input type="checkbox"/> Sandy Gleyed Matrix (S4)			<input type="checkbox"/> Redox Depressions (F8)					
Restrictive Layer (if present):								
Type: _____								
Depth (inches): _____						Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Remarks:								

HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)	
<input type="checkbox"/> Surface Water (A1)	<input checked="" type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input checked="" type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)	
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)			
<input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8)			
Field Observations:			
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Water Table Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	
Saturation Present? (includes capillary fringe)	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	
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: New Fire Station Project City/County: Stevenson/Skamania County Sampling Date: 15 November 2018
 Applicant/Owner: City of Stevenson State: WA Sampling Point: SP-2
 Investigator(s): Dustin Day, Bridget Wojtala Section, Township, Range: NE 1/4 of Section 42, T2N, R7E
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): <5%
 Subregion (LRR): LRR A Lat: 45°41'18.00"N Long: 121°53'59.46"W Datum: None
 Soil Map Unit Name: Steever stony clay loam 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 <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: National Weather Service data indicated that precipitation for November 2018 prior to the site visit was 3.23 inches below the observed normal for the month.	

VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status															
1. <u>Pseudotsuga menziesii</u>	10%	no	UPL	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50%</u> (A/B)														
2. <u>Populus balsamifera</u>	10%	no	FAC															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
20% = Total Cover				Prevalence Index worksheet: <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:50%;">Total % Cover of:</th> <th style="width:50%;">Multiply by:</th> </tr> </thead> <tbody> <tr> <td>OBL species <u>0%</u></td> <td>x 1 = <u>0%</u></td> </tr> <tr> <td>FACW species <u>20%</u></td> <td>x 2 = <u>40%</u></td> </tr> <tr> <td>FAC species <u>15%</u></td> <td>x 3 = <u>45%</u></td> </tr> <tr> <td>FACU species <u>45%</u></td> <td>x 4 = <u>180%</u></td> </tr> <tr> <td>UPL species <u>10%</u></td> <td>x 5 = <u>50%</u></td> </tr> <tr> <td>Column Totals: <u>90%</u> (A)</td> <td><u>315%</u> (B)</td> </tr> </tbody> </table> Prevalence Index = B/A = <u>3.5</u>	Total % Cover of:	Multiply by:	OBL species <u>0%</u>	x 1 = <u>0%</u>	FACW species <u>20%</u>	x 2 = <u>40%</u>	FAC species <u>15%</u>	x 3 = <u>45%</u>	FACU species <u>45%</u>	x 4 = <u>180%</u>	UPL species <u>10%</u>	x 5 = <u>50%</u>	Column Totals: <u>90%</u> (A)	<u>315%</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0%</u>	x 1 = <u>0%</u>																	
FACW species <u>20%</u>	x 2 = <u>40%</u>																	
FAC species <u>15%</u>	x 3 = <u>45%</u>																	
FACU species <u>45%</u>	x 4 = <u>180%</u>																	
UPL species <u>10%</u>	x 5 = <u>50%</u>																	
Column Totals: <u>90%</u> (A)	<u>315%</u> (B)																	
40% = Total Cover																		
<u>Sapling/Shrub Stratum</u> (Plot size: _____)																		
1. <u>Symphoricarpos albus</u>	20%	yes	FACU															
2. <u>Cornus sericea</u>	20%	yes	FACW															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
40% = Total Cover																		
<u>Herb Stratum</u> (Plot size: _____)																		
1. <u>Polystichum munitum</u>	10%	no	FACU	Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation ___ 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ 5 - 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.														
2. <u>Rubus ursinus</u>	10%	no	FACU															
3. <u>Rubus armeniacus</u>	5%	no	FAC															
4. <u>Hedera helix</u>	5%	no	FACU															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
30% = Total Cover																		
<u>Woody Vine Stratum</u> (Plot size: _____)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
_____ = Total Cover																		
% Bare Ground in Herb Stratum <u>70%</u>																		
Remarks: Mossy ground cover																		

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

Project/Site: New Fire Station Project City/County: Stevenson/Skamania County Sampling Date: 15 November 2018
 Applicant/Owner: City of Stevenson State: WA Sampling Point: SP-3
 Investigator(s): Dustin Day, Bridget Wojtala Section, Township, Range: NE 1/4 of Section 42, T2N, R7E
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): <5%
 Subregion (LRR): LRR A Lat: 45°41'18.00"N Long: 121°53'59.46"W Datum: None
 Soil Map Unit Name: Steever stony clay loam 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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: National Weather Service data indicated that precipitation for November 2018 prior to the site visit was 3.23 inches below the observed normal for the month.	

VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
= Total Cover				
<u>Sapling/Shrub Stratum</u> (Plot size: _____)				
1. <i>Fraxinus latifolia</i>	20%	yes	FACW	
2. <i>Cornus sericea</i>	5%	no	FACW	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
25% = Total Cover				
<u>Herb Stratum</u> (Plot size: _____)				
1. <i>Phalaris arundinacea</i>	10%	yes	FACW	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
10% = Total Cover				
<u>Woody Vine Stratum</u> (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover				
% Bare Ground in Herb Stratum <u>90%</u>				

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
 Total Number of Dominant Species Across All Strata: 2 (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 = _____
 FACW species _____ x 2 = _____
 FAC species _____ x 3 = _____
 FACU species _____ x 4 = _____
 UPL species _____ x 5 = _____
 Column Totals: _____ (A) _____ (B)
 Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:
 ___ 1 - Rapid Test for Hydrophytic Vegetation
 2 - Dominance Test is >50%
 ___ 3 - Prevalence Index is ≤3.0¹
 ___ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 ___ 5 - Wetland Non-Vascular Plants¹
 ___ Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Remarks:	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
----------	--

SOIL

Sampling Point: SP-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)							
Depth (inches)	Matrix		Redox Features			Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹		
0-1	10YR 2/1						Organic layer
1-16+	10YR 4/1		7.5YR 3/4	20			
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.)				Indicators for Problematic Hydric Soils³:			
<input type="checkbox"/> Histosol (A1)		<input type="checkbox"/> Sandy Redox (S5)		<input type="checkbox"/> 2 cm Muck (A10)		<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Histic Epipedon (A2)		<input type="checkbox"/> Stripped Matrix (S6)		<input type="checkbox"/> Very Shallow Dark Surface (TF12)		<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Black Histic (A3)		<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)		<input type="checkbox"/> Loamy Gleyed Matrix (F2)		<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Hydrogen Sulfide (A4)		<input type="checkbox"/> Loamy Gleyed Matrix (F2)		<input type="checkbox"/> Depleted Matrix (F3)		<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)		<input type="checkbox"/> Depleted Matrix (F3)		<input type="checkbox"/> Redox Dark Surface (F6)		<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Thick Dark Surface (A12)		<input type="checkbox"/> Redox Dark Surface (F6)		<input type="checkbox"/> Depleted Dark Surface (F7)		<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)		<input checked="" type="checkbox"/> Depleted Dark Surface (F7)		<input type="checkbox"/> Redox Depressions (F8)		³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		<input type="checkbox"/> Redox Depressions (F8)		<input type="checkbox"/> Redox Depressions (F8)		<input type="checkbox"/> Redox Depressions (F8)	
Restrictive Layer (if present):							
Type: _____							
Depth (inches): _____						Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Remarks:							

HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)	
<input type="checkbox"/> Surface Water (A1)	<input checked="" type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input checked="" type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)	
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)			
<input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8)			
Field Observations:			
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Water Table Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	
Saturation Present? (includes capillary fringe)	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	
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: New Fire Station Project City/County: Stevenson/Skamania County Sampling Date: 15 November 2018
 Applicant/Owner: City of Stevenson State: WA Sampling Point: SP-4
 Investigator(s): Dustin Day, Bridget Wojtala Section, Township, Range: NE 1/4 of Section 42, T2N, R7E
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): <5%
 Subregion (LRR): LRR A Lat: 45°41'18.00"N Long: 121°53'59.46"W Datum: None
 Soil Map Unit Name: Steever stony clay loam 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 <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: National Weather Service data indicated that precipitation for November 2018 prior to the site visit was 3.23 inches below the observed normal for the month.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
= Total Cover				
Sapling/Shrub Stratum (Plot size: _____)				
1. <u>Symphoricarpos albus</u>	5%	yes	FACU	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
5% = Total Cover				
Herb Stratum (Plot size: _____)				
1. <u>Rubus armeniacus</u>	25%	yes	FAC	
2. <u>Hypochaeris radicata</u>	10%	no	FACU	
3. <u>Verbascum blattaria</u>	10%	no	UPL	
4. <u>Cornus sericea</u>	10%	no	FACW	
5. <u>Epilobium sp.</u>	5%	no	_____	
6. <u>Tanacetum vulgare</u>	5%	no	FACU	
7. <u>Hieracium triste</u>	5%	no	FACU	
8. <u>Hypericum perforatum</u>	5%	no	FACU	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
85% = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover				
% Bare Ground in Herb Stratum <u>15%</u>				
Remarks:				

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
 Total Number of Dominant Species Across All Strata: 2 (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

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

Hydrophytic Vegetation Indicators:
 ___ 1 - Rapid Test for Hydrophytic Vegetation
 ___ 2 - Dominance Test is >50%
 ___ 3 - Prevalence Index is ≤3.0¹
 ___ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 ___ 5 - Wetland Non-Vascular Plants¹
 ___ Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No

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

Project/Site: New Fire Station Project City/County: Stevenson/Skamania County Sampling Date: 15 November 2018
 Applicant/Owner: City of Stevenson State: WA Sampling Point: SP-5
 Investigator(s): Dustin Day, Bridget Wojtala Section, Township, Range: NE 1/4 of Section 42, T2N, R7E
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): <5%
 Subregion (LRR): LRR A Lat: 45°41'18.00"N Long: 121°53'59.46"W Datum: None
 Soil Map Unit Name: Steever stony clay loam 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 <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: National Weather Service data indicated that precipitation for November 2018 prior to the site visit was 3.23 inches below the observed normal for the month.	

VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
= Total Cover				
<u>Sapling/Shrub Stratum</u> (Plot size: _____)				
1. <u>Symphoricarpos albus</u>	10%	yes	FACU	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
10% = Total Cover				
<u>Herb Stratum</u> (Plot size: _____)				
1. <u>Melissa officinalis</u>	40%	yes	FACU	
2. <u>Rumex crispus</u>	10%	no	FAC	
3. <u>Agrostis capillaris</u>	10%	no	FAC	
4. <u>Phalaris arundinacea</u>	5%	no	FACW	
5. <u>Tanacetum vulgare</u>	5%	no	FACU	
6. <u>Holcus lanatus</u>	5%	no	FAC	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
75% = Total Cover				
<u>Woody Vine Stratum</u> (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover				
% Bare Ground in Herb Stratum <u>25%</u>				

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
 Total Number of Dominant Species Across All Strata: 2 (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

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

Hydrophytic Vegetation Indicators:
 ___ 1 - Rapid Test for Hydrophytic Vegetation
 ___ 2 - Dominance Test is >50%
 ___ 3 - Prevalence Index is ≤3.0¹
 ___ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 ___ 5 - Wetland Non-Vascular Plants¹
 ___ Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

Remarks:

**Wetland Delineation and Assessment
New Fire Station
Stevenson, Washington**

**Appendix C
Wetland Rating Forms**

Wetland name or number Wetland A

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland A Date of site visit: 11/15/2018
 Rated by Dustin Day and Bridget Wojtala Trained by Ecology? Yes No Date of training 09/2014
 HGM Class used for rating Depressional Wetland has multiple HGM classes? Y N

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

OVERALL WETLAND CATEGORY 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

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

FUNCTION	Improving Water Quality			Hydrologic			Habitat			
<i>Circle the appropriate ratings</i>										
Site Potential	H	<input checked="" type="radio"/> M	L	H	<input checked="" type="radio"/> M	L	H	M	<input checked="" type="radio"/> L	
Landscape Potential	H	<input checked="" type="radio"/> M	L	H	<input checked="" type="radio"/> M	L	H	M	<input checked="" type="radio"/> L	
Value	<input checked="" type="radio"/> H	M	L	H	M	<input checked="" type="radio"/> L	H	M	<input checked="" type="radio"/> L	TOTAL
Score Based on Ratings	7			5			3			15

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
<input checked="" type="radio"/> None of the above	

Wetland name or number Wetland A

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	2
Hydroperiods	D 1.4, H 1.2	2
Location of outlet (<i>can be added to map of hydroperiods</i>)	D 1.1, D 4.1	2
Boundary of area within 150 ft of the wetland (<i>can be added to another figure</i>)	D 2.2, D 5.2	2
Map of the contributing basin	D 4.3, D 5.3	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	1
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	4
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	N/A

Riverine Wetlands

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

Lake Fringe Wetlands

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

Slope Wetlands

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

Wetland name or number Wetland A

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 Wetland A

NO – go to 6

YES – The wetland class is **Riverine**

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

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

NO – go to 7

YES – The wetland class is **Depressional**

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

NO – go to 8

YES – The wetland class is **Depressional**

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

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

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

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

Wetland name or number Wetland A

DEPRESSIONAL AND FLATS WETLANDS		
Water Quality Functions - Indicators that the site functions to improve water quality		
D 1.0. Does the site have the potential to improve water quality?		
D 1.1. <u>Characteristics of surface water outflows from the wetland:</u> Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). points = 3 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1	2	
D 1.2. <u>The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions).</u> Yes = 4 No = 0		0
D 1.3. <u>Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes):</u> Wetland has persistent, ungrazed, plants > 95% of area points = 5 Wetland has persistent, ungrazed, plants > ½ of area points = 3 Wetland has persistent, ungrazed plants > 1/10 of area points = 1 Wetland has persistent, ungrazed plants < 1/10 of area points = 0	1	
D 1.4. <u>Characteristics of seasonal ponding or inundation:</u> <i>This is the area that is ponded for at least 2 months. See description in manual.</i> Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is > ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0	4	
Total for D 1		7

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

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

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

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

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

Wetland name or number Wetland A**DEPRESSIONAL AND FLATS WETLANDS****Hydrologic Functions** - Indicators that the site functions to reduce flooding and stream degradation

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

D 4.1. Characteristics of surface water outflows from the wetland:

Wetland is a depression or flat depression with no surface water leaving it (no outlet)	points = 4	2
Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet	points = 2	
Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch	points = 1	
Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing	points = 0	

D 4.2. Depth of storage during wet periods: *Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part.*

Marks of ponding are 3 ft or more above the surface or bottom of outlet	points = 7	3
Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet	points = 5	
Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet	points = 3	
The wetland is a "headwater" wetland	points = 3	
Wetland is flat but has small depressions on the surface that trap water	points = 1	
Marks of ponding less than 0.5 ft (6 in)	points = 0	

D 4.3. Contribution of the wetland to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.*

The area of the basin is less than 10 times the area of the unit	points = 5	3
The area of the basin is 10 to 100 times the area of the unit	points = 3	
The area of the basin is more than 100 times the area of the unit	points = 0	
Entire wetland is in the Flats class	points = 5	

Total for D 4

Add the points in the boxes above

8

Rating of Site Potential If score is: 12-16 = H X 6-11 = M 0-5 = L

Record the rating on the first page

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

D 5.1. Does the wetland receive stormwater discharges?

Yes = 1 No = 0

1

D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff?

Yes = 1 No = 0

0

D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at >1 residence/ac, urban, commercial, agriculture, etc.)?

Yes = 1 No = 0

0

Total for D 5

Add the points in the boxes above

1

Rating of Landscape Potential If score is: 3 = H X 1 or 2 = M 0 = L

Record the rating on the first page

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

D 6.1. The unit is in a landscape that has flooding problems. *Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met.*

The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds):

- Flooding occurs in a sub-basin that is immediately down-gradient of unit. points = 2
 - Surface flooding problems are in a sub-basin farther down-gradient. points = 1
- Flooding from groundwater is an issue in the sub-basin. points = 1

The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. *Explain why* _____ points = 0

There are no problems with flooding downstream of the wetland. points = 0

0

D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan?

Yes = 2 No = 0

0

Total for D 6

Add the points in the boxes above

0

Rating of Value If score is: 2-4 = H 1 = M X 0 = L

Record the rating on the first page

City of Stevenson

May 2019

Wetland name or number _____

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 $> \frac{3}{4}$ area of wetland	points = 8
Depressions cover $> \frac{1}{2}$ area of wetland	points = 4
Depressions present but cover $< \frac{1}{2}$ area of wetland	points = 2
No depressions present	points = 0
R 1.2. Structure of plants in the wetland (areas with $>90\%$ cover at person height, not Cowardin classes)	
Trees or shrubs $> \frac{2}{3}$ area of the wetland	points = 8
Trees or shrubs $> \frac{1}{3}$ area of the wetland	points = 6
Herbaceous plants (> 6 in high) $> \frac{2}{3}$ area of the wetland	points = 6
Herbaceous plants (> 6 in high) $> \frac{1}{3}$ area of the wetland	points = 3
Trees, shrubs, and ungrazed herbaceous $< \frac{1}{3}$ area of the wetland	points = 0
Total for R 1	Add the points in the boxes above

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
R 2.2. Does the contributing basin to the wetland include a UGA or incorporated area?	Yes = 1 No = 0
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
R 2.4. Is $> 10\%$ of the area within 150 ft of the wetland in land uses that generate pollutants?	Yes = 1 No = 0
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
Total for R 2	Add the points in the boxes above

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
R 3.2. Is the wetland along a stream or river that has TMDL limits for nutrients, toxics, or pathogens?	Yes = 1 No = 0
R 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? (<i>answer YES if there is a TMDL for the drainage in which the unit is found</i>)	Yes = 2 No = 0
Total for R 3	Add the points in the boxes above

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

Wetland name or number _____

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

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 $> \frac{1}{3}$ area OR emergent plants $> \frac{2}{3}$ area points = 7

Forest or shrub for $> \frac{1}{10}$ area OR emergent plants $> \frac{1}{3}$ area points = 4

Plants do not meet above criteria points = 0

Total for R 4

Add the points in the boxes above

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

R 5.2. Does the up-gradient watershed include a UGA or incorporated area?

Yes = 1 No = 0

R 5.3. Is the up-gradient stream or river controlled by dams?

Yes = 0 No = 1

Total for R 5

Add the points in the boxes above

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

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

Total for R 6

Add the points in the boxes above

Rating of Value If score is: 2-4 = H 1 = M 0 = L

Record the rating on the first page

Wetland name or number _____

LAKE FRINGE WETLANDS	
Water Quality Functions - Indicators that the site functions to improve water quality	
L 1.0. Does the site have the potential to improve water quality?	
L 1.1. Average width of plants along the lakeshore (<i>use polygons of Cowardin classes</i>):	
Plants are more than 33 ft (10 m) wide	points = 6
Plants are more than 16 ft (5 m) wide and <33 ft	points = 3
Plants are more than 6 ft (2 m) wide and <16 ft	points = 1
Plants are less than 6 ft wide	points = 0
L 1.2. Characteristics of the plants in the wetland: Choose the appropriate description that results in the highest points, and do not include any open water in your estimate of coverage. The herbaceous plants can be either the dominant form or as an understory in a shrub or forest community. <i>These are not Cowardin classes. Area of cover is total cover in the unit, but it can be in patches. Herbaceous does not include aquatic bed.</i>	
Cover of herbaceous plants is >90% of the vegetated area	points = 6
Cover of herbaceous plants is $> \frac{2}{3}$ of the vegetated area	points = 4
Cover of herbaceous plants is $> \frac{1}{3}$ of the vegetated area	points = 3
Other plants that are not aquatic bed $> \frac{2}{3}$ unit	points = 3
Other plants that are not aquatic bed in $> \frac{1}{3}$ vegetated area	points = 1
Aquatic bed plants and open water cover $> \frac{2}{3}$ of the unit	points = 0
Total for L 1	Add the points in the boxes above

Rating of Site Potential If score is: 8-12 = H 4-7 = M 0-3 = L

Record the rating on the first page

L 2.0. Does the landscape have the potential to support the water quality function of the site?	
L 2.1. Is the lake used by power boats?	Yes = 1 No = 0
L 2.2. Is > 10% of the area within 150 ft of wetland unit on the upland side in land uses that generate pollutants?	Yes = 1 No = 0
L 2.3. Does the lake have problems with algal blooms or excessive plant growth such as milfoil?	Yes = 1 No = 0
Total for L 2	Add the points in the boxes above

Rating of Landscape Potential: If score is: 2 or 3 = H 1 = M 0 = L

Record the rating on the first page

L 3.0. Is the water quality improvement provided by the site valuable to society?	
L 3.1. Is the lake on the 303(d) list of degraded aquatic resources?	Yes = 1 No = 0
L 3.2. Is the lake in a 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
L 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? <i>Answer YES if there is a TMDL for the lake or basin in which the unit is found.</i>	Yes = 2 No = 0
Total for L 3	Add the points in the boxes above

Rating of Value If score is: 2-4 = H 1 = M 0 = L

Record the rating on the first page

Wetland name or number _____

LAKE FRINGE WETLANDS**Hydrologic Functions** - Indicators that the wetland unit functions to reduce shoreline erosion

L 4.0. Does the site have the potential to reduce shoreline erosion?		
L 4.1. Distance along shore and average width of Cowardin classes along the lakeshore (do not include Aquatic bed): <i>Choose the highest scoring description that matches conditions in the wetland.</i>		
> ¾ of distance is Scrub-shrub or Forested at least 33 ft (10 m) wide		points = 6
> ¾ of distance is Scrub-shrub or Forested at least 6 ft (2 m) wide		points = 4
> ¼ distance is Scrub-shrub or Forested at least 33 ft (10 m) wide		points = 4
Plants are at least 6 ft (2 m) wide (any type except Aquatic bed)		points = 2
Plants are less than 6 ft (2 m) wide (any type except Aquatic bed)		points = 0

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

L 5.0. Does the landscape have the potential to support the hydrologic functions of the site?		
L 5.1. Is the lake used by power boats with more than 10 hp?	Yes = 1 No = 0	
L 5.2. Is the fetch on the lake side of the unit at least 1 mile in distance?	Yes = 1 No = 0	
Total for L 5	Add the points in the boxes above	

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

L 6.0. Are the hydrologic functions provided by the site valuable to society?		
L 6.1. Are there resources along the shore that can be impacted by erosion? If more than one resource is present, choose the one with the highest score.		
There are human structures or old growth/mature forests within 25 ft of OHWM of the shore in the unit		points = 2
There are nature trails or other paths and recreational activities within 25 ft of OHWM		points = 1
Other resources that could be impacted by erosion		points = 1
There are no resources that can be impacted by erosion along the shores of the unit		points = 0

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

NOTES and FIELD OBSERVATIONS:

Wetland name or number _____

<u>SLOPE WETLANDS</u>	
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: <i>(a 1% slope has a 1 ft vertical drop in elevation for every 100 ft of horizontal distance)</i>	
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
S 1.2. <u>The soil 2 in below the surface (or duff layer)</u> is true clay or true organic <i>(use NRCS definitions)</i> : Yes = 3 No = 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. <i>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.</i>	
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
Total for S 1	Add the points in the boxes above

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
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
Total for S 2	Add the points in the boxes above

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
S 3.2. Is the wetland in a basin or sub-basin where water quality is an issue? <i>At least one aquatic resource in the basin is on the 303(d) list.</i>	
	Yes = 1 No = 0
S 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? <i>Answer YES if there is a TMDL for the basin in which unit is found.</i>	
	Yes = 2 No = 0
Total for S 3	Add the points in the boxes above

Rating of Value If score is: 2-4 = H 1 = M 0 = L

Record the rating on the first page

Wetland name or number _____

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

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

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

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

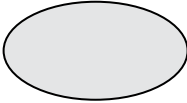
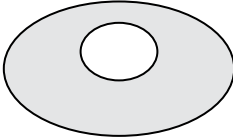
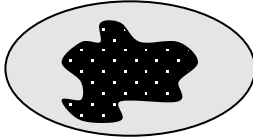
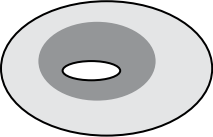
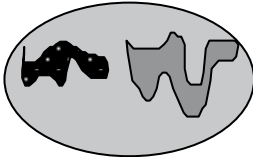
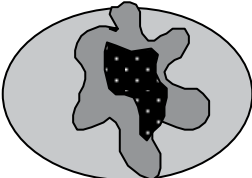
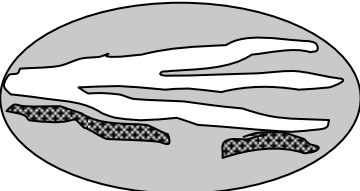
Total for S 6

Add the points in the boxes above

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 Wetland A

These questions apply to wetlands of all HGM classes.	
HABITAT FUNCTIONS - Indicators that site functions to provide important habitat	
H 1.0. Does the site have the potential to provide habitat?	
<p>H 1.1. Structure of plant community: <i>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.</i></p> <p> <input type="checkbox"/> Aquatic bed 4 structures or more: points = 4 <input type="checkbox"/> Emergent 3 structures: points = 2 <input checked="" type="checkbox"/> Scrub-shrub (areas where shrubs have > 30% cover) 2 structures: points = 1 <input type="checkbox"/> Forested (areas where trees have > 30% cover) 1 structure: points = 0 </p> <p><i>If the unit has a Forested class, check if:</i></p> <p> <input type="checkbox"/> 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 </p>	0
<p>H 1.2. Hydroperiods</p> <p>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 (<i>see text for descriptions of hydroperiods</i>).</p> <p> <input type="checkbox"/> Permanently flooded or inundated 4 or more types present: points = 3 <input checked="" type="checkbox"/> Seasonally flooded or inundated 3 types present: points = 2 <input type="checkbox"/> Occasionally flooded or inundated 2 types present: points = 1 <input type="checkbox"/> Saturated only 1 type present: points = 0 </p> <p> <input type="checkbox"/> Permanently flowing stream or river in, or adjacent to, the wetland <input type="checkbox"/> Seasonally flowing stream in, or adjacent to, the wetland </p> <p> <input type="checkbox"/> Lake Fringe wetland 2 points <input type="checkbox"/> Freshwater tidal wetland 2 points </p>	1
<p>H 1.3. Richness of plant species</p> <p>Count the number of plant species in the wetland that cover at least 10 ft². <i>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</i></p> <p> If you counted: > 19 species points = 2 5 - 19 species points = 1 < 5 species points = 0 </p>	0
<p>H 1.4. Interspersion of habitats</p> <p>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. <i>If you have four or more plant classes or three classes and open water, the rating is always high.</i></p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>None = 0 points</p> </div> <div style="text-align: center;">  <p>Low = 1 point</p> </div> <div style="text-align: center;">  <p>Moderate = 2 points</p> </div> <div style="text-align: center;">  </div> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 20px;"> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> </div> <p>All three diagrams in this row are HIGH = 3 points</p>	1

Wetland name or number Wetland A

<p>H 1.5. Special habitat features:</p> <p>Check the habitat features that are present in the wetland. <i>The number of checks is the number of points.</i></p> <p><input type="checkbox"/> Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long).</p> <p><input type="checkbox"/> Standing snags (dbh > 4 in) within the wetland</p> <p><input type="checkbox"/> Undercut banks are present for at least 6.6 ft (2 m) and/or overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m)</p> <p><input type="checkbox"/> Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (<i>cut shrubs or trees that have not yet weathered where wood is exposed</i>)</p> <p><input type="checkbox"/> At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (<i>structures for egg-laying by amphibians</i>)</p> <p><input checked="" type="checkbox"/> Invasive plants cover less than 25% of the wetland area in every stratum of plants (<i>see H 1.1 for list of strata</i>)</p>		1
Total for H 1	Add the points in the boxes above	3

Rating of Site Potential If score is: 15-18 = H 7-14 = M X 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?	
<p>H 2.1. Accessible habitat (include <i>only habitat that directly abuts wetland unit</i>).</p> <p>Calculate: % undisturbed habitat $\frac{2.2}{3} + [(\% \text{ moderate and low intensity land uses})/2] \frac{0.15}{3} = \frac{2.35}{3} \%$</p> <p>If total accessible habitat is:</p> <p>> $\frac{1}{3}$ (33.3%) of 1 km Polygon points = 3</p> <p>20-33% of 1 km Polygon points = 2</p> <p>10-19% of 1 km Polygon points = 1</p> <p>< 10% of 1 km Polygon points = 0</p>	
<p>H 2.2. Undisturbed habitat in 1 km Polygon around the wetland.</p> <p>Calculate: % undisturbed habitat $\frac{27}{3} + [(\% \text{ moderate and low intensity land uses})/2] \frac{3.8}{3} = \frac{30.8}{3} \%$</p> <p>Undisturbed habitat > 50% of Polygon points = 3</p> <p>Undisturbed habitat 10-50% and in 1-3 patches points = 2</p> <p>Undisturbed habitat 10-50% and > 3 patches points = 1</p> <p>Undisturbed habitat < 10% of 1 km Polygon points = 0</p>	
<p>H 2.3. Land use intensity in 1 km Polygon: If</p> <p>> 50% of 1 km Polygon is high intensity land use points = (- 2)</p> <p>≤ 50% of 1 km Polygon is high intensity points = 0</p>	
Total for H 2	Add the points in the boxes above

Rating of Landscape Potential If score is: 4-6 = H 1-3 = M X < 1 = L

Record the rating on the first page

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

Record the rating on the first page

City of Stevenson

May 2019

Wetland name or number Wetland A

WDFW Priority Habitats

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

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

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

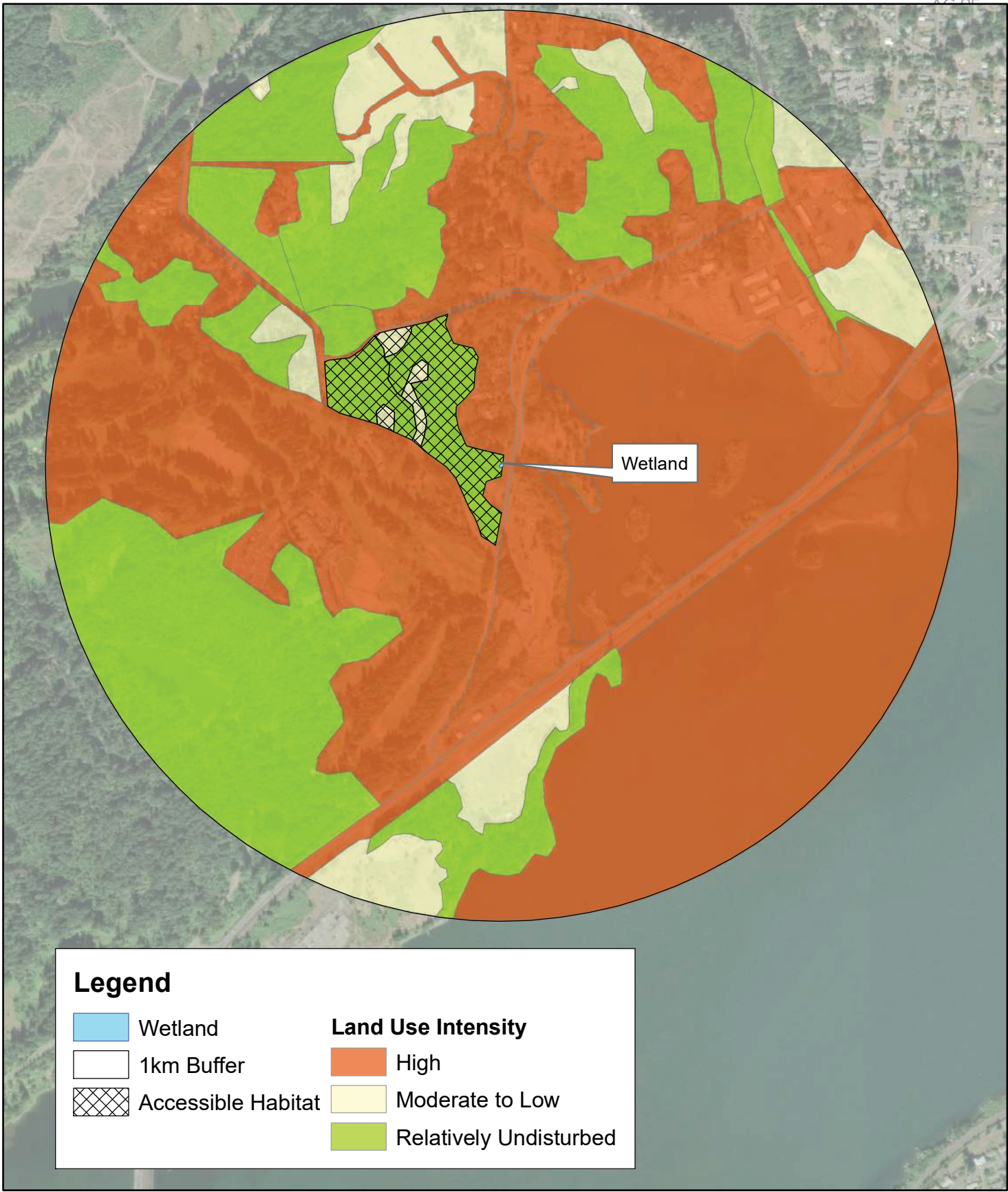
Wetland Type	Category
<i>Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.</i>	
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity 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 <i>Spartina</i> , 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 unmowed 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? <i>Use the key below. If you answer YES you will still need to rate the wetland based on its functions.</i> 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 Wetland A







<p>SC 4.0. Forested Wetlands</p> <p>Does the wetland have at least <u>1 contiguous acre</u> of forest that meets one of these criteria for the WA Department of Fish and Wildlife’s forests as priority habitats? <i>If you answer YES you will still need to rate the wetland based on its functions.</i></p> <ul style="list-style-type: none"> — 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). <p style="text-align: right;">Yes = Category I No = Not a forested wetland for this section</p>	<p>Cat. I</p>
<p>SC 5.0. Wetlands in Coastal Lagoons</p> <p>Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?</p> <ul style="list-style-type: none"> — 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 (<i>needs to be measured near the bottom</i>) <p style="text-align: right;">Yes – Go to SC 5.1 No = Not a wetland in a coastal lagoon</p> <p>SC 5.1. Does the wetland meet all of the following three conditions?</p> <ul style="list-style-type: none"> — 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 ft²) <p style="text-align: right;">Yes = Category I No = Category II</p>	<p>Cat. I</p> <p>Cat. II</p>
<p>SC 6.0. Interdunal Wetlands</p> <p>Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? <i>If you answer yes you will still need to rate the wetland based on its habitat functions.</i></p> <p>In practical terms that means the following geographic areas:</p> <ul style="list-style-type: none"> — 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 <p style="text-align: right;">Yes – Go to SC 6.1 No = not an interdunal wetland for rating</p> <p>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</p> <p>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</p> <p>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</p>	<p>Cat I</p> <p>Cat. II</p> <p>Cat. III</p> <p>Cat. IV</p>
<p>Category of wetland based on Special Characteristics</p> <p>If you answered No for all types, enter “Not Applicable” on Summary Form</p>	




Wetland name or number Wetland A

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Legend

 Wetland	Land Use Intensity
 1km Buffer	 High
 Accessible Habitat	 Moderate to Low
	 Relatively Undisturbed

<p>PURPOSE: WETLAND DELINEATION</p> <p>LATITUDE: 45°41'18.00"N LONGITUDE: 121°53'59.46"W</p>	<p>STEVENSON FIRE STATION</p> 	<p>FIGURE 1: LAND USE INTENSITY</p> <p>In: Stevenson County: Skamania State: WA Datum: DATUM: NAD_1983</p>
<p>City of Stevenson 1525 Broadway Street Longview, WA 98632</p>	<p>0 0.05 0.1 0.2 0.3 Miles</p> 	<p>Stevenson Fire Department December 2018 2180193.00</p> 



Legend

150ft Buffer

Cowardin Class

Scrub-Shrub

Hydroperiod

Saturated Only

Seasonally Flooded or Inundated

PURPOSE: WETLAND DELINEATION

LATITUDE: 45°41'18.00"N
 LONGITUDE: 121°53'59.46"W

City of Stevenson
 1525 Broadway Street
 Longview, WA 98632

STEVENSON FIRE STATION

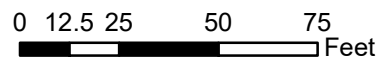


FIGURE 2: HYDROPERIOD AND COWARDIN CLASS

In: Stevenson
 County: Skamania
 State: WA
 Datum: DATUM: NAD_1983



December 2018





Wetland

Legend

-  Wetland
-  ContributingBasin

PURPOSE: WETLAND DELINEATION

LATITUDE: 45°41'18.00"N
 LONGITUDE: 121°53'59.46"W

City of Stevenson
 1525 Broadway Street
 Longview, WA 98632

STEVENSON FIRE STATION

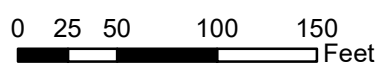


FIGURE 3: CONTRIBUTING BASIN

In: Stevenson
 County: Skamania
 State: WA
 Datum: DATUM: NAD_1983

December 2018









Figure 4. 303(d) Map - Listed Waters in Basin.




Assessed Waters/Sediment

Water

-  Category 5 - 303d
-  Category 4C
-  Category 4B
-  Category 4A
-  Category 2
-  Category 1

Sediment

-  Category 5 - 303d
-  Category 4C
-  Category 4B
-  Category 4A
-  Category 2
-  Category 1

**Site Assessment
City of Stevenson
Stevenson, Washington**

**Appendix C
Geotechnical Site Investigation Report**



GEOTECHNICAL SITE INVESTIGATION REPORT

NEW FIRE HALL

SW ROCK CREEK DRIVE

STEVENSON, WASHINGTON

GNN PROJECT NO. 218-1038

DECEMBER 2018

Prepared for

CITY OF STEVENSON

7121 E. LOOP ROAD

P.O. BOX 371

STEVENSON, WA 98648

Prepared by

GN NORTHERN, INC.

CONSULTING GEOTECHNICAL ENGINEERS

YAKIMA, WASHINGTON

(509) 248-9798 / (541) 387-3387

*Common Sense Approach to Earth and Engineering
Since 1995*



At GN Northern our mission is to serve our clients in the most efficient, cost effective way using the best resources and tools available while maintaining professionalism on every level. Our philosophy is to satisfy our clients through hard work, dedication and extraordinary efforts from all of our valued employees working as an extension of the design and construction team.

December 10, 2018

City of Stevenson
7121 E. Loop Road
P.O. Box 371
Stevenson, WA 98648

Attn: Leana (Johnson) Kinley, EMPA, CMC, City Administrator

**Subject: Geotechnical Site Investigation Report
New Fire Hall
SW Rock Creek Drive
Stevenson, Washington**

GNN Project No. 218-1038

Dear Ms. Kinley,

As requested, GN Northern (GNN) has completed a geotechnical site investigation for the proposed fire station to be constructed at a vacant site located on SW Rock Creek Drive, northwest of the intersection with Foster Creek Road, in the City of Stevenson, Washington.


Based on the findings of our subsurface study, we conclude that the site is suitable for the proposed construction provided that our geotechnical recommendations presented in this report are followed during the design and construction phases of the project.

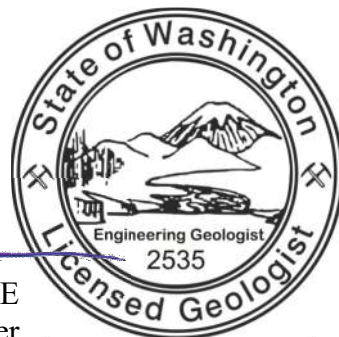
This report describes in detail the results of our investigation, summarizes our findings and presents our recommendations concerning earthwork and the design and construction of foundation for the proposed project. It is important that GN Northern provide consultation during the design phase as well as field compaction testing and geotechnical monitoring services during the earthwork phase to ensure implementation of the geotechnical recommendations.

If you have any questions regarding this report, please contact us at 509-248-9798 or 541-387-3387.

Respectfully submitted,

GN Northern, Inc.


Karl A. Harmon, LEG, PE
Senior Geologist/Engineer



Karl A. Harmon


M. Yousuf Memon, PE
Geotechnical Engineer



Exp: 7-15-2020

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APPENDICES

- APPENDIX I – VICINITY MAP (FIGURE 1), SITE EXPLORATION MAP (FIGURE 2)
- APPENDIX II – EXPLORATORY TEST-PIT LOGS, KEY CHART (FOR SOIL CLASSIFICATION)
- APPENDIX III – LABORATORY TESTING RESULTS
- APPENDIX IV – SITE & EXPLORATION PHOTOGRAPHS
- APPENDIX V – NRCS SOIL SURVEY
- APPENDIX VI – USGS DESIGN MAPS SUMMARY

1.0 PURPOSE AND SCOPE OF SERVICES

This report has been prepared for the proposed fire station to be constructed at a vacant site located on SW Rock Creek Drive, northwest of the intersection with Foster Creek Road, in the City of Stevenson, Washington; site location is shown on the *Vicinity Map* (Figure 1, Appendix I). Our investigation was conducted to collect information regarding subsurface conditions and present recommendations for suitability of the subsurface materials to support the proposed building and allowable bearing capacity for the proposed construction.

GN Northern, Inc. has prepared this report for use by the client and their design consultants in the design of the proposed development. Do not use or rely upon this report for other locations or purposes without the written consent of GN Northern, Inc.

Our study was conducted in general accordance with our *Proposal for Geotechnical Engineering Services* dated November 9, 2018. Notice to proceed was provided on November 15, 2018 in the form of a Professional Services Contract.

A draft site plan (*Option A: Site*) prepared by Mackenzie, dated 10/2/2018, was provided by Ms. Kinley via email on October 24, 2018. Field exploration, consisting of six (6) test-pits, was completed on December 4, 2018. Locations of the exploratory test-pits are shown on the *Site Exploration Map* (Figure 2, Appendix I), and detailed test-pit logs are presented in Appendix II.

This report has been prepared to summarize the data obtained during this study and to present our recommendations based on the proposed construction and the subsurface conditions encountered at the site. Results of the field exploration were analyzed to develop recommendations for site development, earthwork, pavements, and foundation bearing capacity. Design parameters and a discussion of the geotechnical engineering considerations related to construction are included in this report.

2.0 PROPOSED CONSTRUCTION

Based on the information presented on the draft site plan, we understand that a new ~12,400 SF fire hall building is proposed at the site. A parking lot with 22 stalls is planned along the south side of the building, with drive-lanes providing access to and from SW Rock Creek Road. Based on the 2016 Stevenson Fire Hall Strike Team Report referenced within the scope of work described in the

City of Stevenson's Request for Qualifications for the project, the fire station building will include an apparatus bay to house two brush trucks, one tender and up to three fire engines, along with cleanup and storage areas, a training room, offices for the fire chief and director, restrooms and utility rooms, and may also include sleeping, shower, laundry and copy rooms.

Structural loading information was not available at the time of this report. Based on our experience with similar projects, we expect maximum wall loads to be on the order of 3,000 plf and maximum column loads to be less than 75 kips. It shall be noted that assumed loading is based on limited preliminary information provided at the time of this report. If loading conditions differ from those described herein, GNN should be given an opportunity to perform re-analysis. Settlement tolerances for structures are assumed to be limited to 1 inch, with differential settlement limited to ½ inch.

3.0 FIELD EXPLORATION & LABORATORY TESTING

The field exploration was completed on December 4, 2018. A local public utility clearance was obtained prior to the field exploration. Six (6) exploratory test-pits were completed within the footprint of the proposed development; locations are shown on *Site Exploration Map* (Figure 2). Test-pits were excavated by Riley Materials using a Link-Belt 145x4 excavator to depths of approximately 13 to 14.5 feet below existing ground surface (BGS) and logged by a GNN field geologist/engineer. Upon completion, all excavations were loosely backfilled with excavation spoils.

The soils observed during our field exploration were classified according to the Unified Soil Classification System (USCS), utilizing the field classification procedures as outlined in ASTM D2488. A copy of the USCS Classification Chart is included in Appendix II. Photographs of the site and exploration are presented in Appendix IV. Depths referred to in this report are relative to the existing ground surface elevation at the time of our investigation. The surface and subsurface conditions described in this report are as observed at the time of our field investigation.

Representative samples of the subsurface soils obtained from the field exploration were selected for testing to determine the index properties of the soils in general accordance with ASTM procedures. The following laboratory tests were performed:

Table 1: Laboratory Tests Performed

Test	To determine
Particle Size Distribution (ASTM D6913)	Soil classification based on proportion of sand, silt, and clay-sized particles
Natural Moisture Content (ASTM D2216)	Soil moisture content indicative of in-situ condition at the time samples were taken
Atterberg Limits (ASTM D4318)	Liquid limit, plastic limit and plasticity index of soils

Results of the laboratory test are included on the test-pit logs and are also presented in graphic form in Appendix III attached to the end of the report.

4.0 SITE CONDITIONS

The project site is located northwest of the intersection of SW Rock Creek Drive and Foster Creek Road, approximately 0.3-miles north of State Highway 14 in the City of Stevenson, Washington. The 3.45-acre parcel is currently identified by the Skamania County Assessor as Parcel No. 02070200310000, and is located within Section 42, Township 2 North and Range 7 East, Willamette Meridian. Surrounding properties include existing residence(s) to the north, an assisted living facility on the east side of Rock Creek Drive, and a portion of the Skamania Lodge golf course on the southwest side of Foster Creek Road.

Based on our observations, the site currently includes a relatively flat area in the east-central portion of the site surrounded by natural hummocky terrain along the south, west and north sides. The central portion of the site is currently accessed via two un-paved driveways that also include buried culverts at the drainage ditch crossing along Rock Creek Drive. Surface conditions across the site include a dense growth of mature trees and vegetation, while the central portion of the site includes a gravel cover at the surface with a sparse vegetation growth. The City of Stevenson's Critical Areas & Geologic Hazards Map and the site plan prepared by MacKenzie identify a low-lying area in the northeastern portion of the site as a 'wetland'. Based on Google Earth topography, site elevations range from 163' at the peak of an elevated nob in the southern portion of the site to 102' in the low-lying area in the northeast portion. Surface elevations within the proposed building footprint range from 123' near the southwest corner to 115' along the northeast portion.

The history of past use and development of the property was not investigated as part of our scope of services for this geotechnical site investigation. However, from a cursory review of available USGS historic aerial photographs, it appears that the site had been developed by at least 1973. The USGS topographic map from 1979 shows a building structure in the north-central portion of the site (see Figure 2). The noted building later appears to be absent in the 1984 USGS historic aerial photo. A 2005 Lidar image of the area, available through the WA DNR Lidar Portal, also shows the apparent site disturbance and land leveling in this portion of the site. Buried wood debris encountered during our exploration in the vicinity of the pre-existing building (see *Subsurface Conditions* section below) further confirms man-made site alterations in this portion of the site.

5.0 SITE & REGIONAL GEOLOGY

The City of Stevenson and Skamania County are located in the South Cascades physiographic province that extends from the Columbia River to the south to Interstate 90 to the north, and is dominated by three massive stratovolcanoes. The current day volcanoes are the most recent installments of a 40-million-year-old volcanic complex called the Cascades Volcanic Arc. The bedrock geology of the western Columbia Gorge is dominated by Oligocene to early Miocene volcanoclastic rocks and minor interbedded lava flows of the ancestral Cascade Volcanic Arc. At many locations, the ancestral arc rocks are unconformably overlain by lava flows of the middle Miocene Columbia River Basalt Group, late Miocene to Pliocene fluvial deposits, or Quaternary olivine-phyric mafic lavas (Pierson et al., 2016).

The western part of the Columbia River Gorge is characterized by massive landslides on the Washington side, and the instability of these land masses is associated with abundant rainfall, high relief, composition and structure of the underlying rocks, tectonic uplift associated with the structural evolution of the Cascade Range and Yakima Fold Belt, and valley-side erosion by the incising Columbia River, which flows across the uplifting terrains (Pierson et al., 2016). Cascadia landslide complex is one such landslide feature that spans from the town of North Bonneville to the western portion of Stevenson. The Cascade landslide complex is subdivided into four individual landslides: the Carpenters Lake, Bonneville, and Red Bluffs landslides, as well as a reactivated part of the Red Bluffs landslide body known as the Crescent Lake landslide. Immediately east of the Cascade landslide complex is the newly recognized Stevenson landslide which is occupied by the City of Stevenson.

The project site is located near the eastern toe of the Red Bluffs landslide, approximately 1-mile east of the reactivated Crescent Lake landslide. The head scarp of the Red Bluffs landslide is located approximately 3½ miles northwest of the site. Surface geology at the site is mapped as Quaternary landslide deposits [Qls] of the Red Bluffs landslide (mass wasting deposits), consisting of poorly sorted blocks, boulders, gravels, and fines sediments produced by the gravitational failure and rotational-translational slide of bedrock and/or unconsolidated sediments above the bedrock (Korosec, 1987).

6.0 SUBSURFACE CONDITIONS

Based on the findings of our field exploration, subsurface soils at the project site include a variably-thick layer of artificial fill soils atop the native silty sand stratum (mass wasting deposits). The undocumented artificial fill soils were noted in the upper approximately 2.5 to 4 feet across the site, and as deep as 7 to 9 feet in test-pit TP-4 in the central portion of the proposed building. Fill soils were generally classified as Silty Gravel with Sand, and included significant wood debris and organic-rich clayey soils in the northern portion of the site. The fill soils at the site are likely to be related to the previous historic development at the site. The apparent native underlying soils were classified as Silty Sand with Gravel and included varying amounts of cobbles and boulders. The native soil stratum typically appeared medium dense. Test-pit logs in Appendix II show detailed descriptions and stratification of the soils encountered.

6.1 NRCS Soil Survey

Although altered at the surface, the soil survey map of the site prepared by the Natural Resources Conservation Service (NRCS) identifies the site soils as *Steever stony clay loam* with typical profile described as *stony clay loam* grading to *very gravelly loam*. Based on the NRCS map (Appendix V), these units generally consists of *well drained* materials.

6.2 Groundwater

Groundwater was encountered within the test-pits at depths ranging from approximately 10 to 12.5 feet BGS at the time of our exploration in early December. Approximate correlating groundwater elevations ranged from 113' in the southwest portion to 104' near the northeast portion. A review of the Washington Department of Ecology's online water well log database revealed a lack of nearby water wells in the site vicinity. Water levels within the nearby Rock Cove portion of the

Columbia River, controlled by the down-river Bonneville Dam, are typically noted at an elevation approximately 35 feet below the site elevation. Therefore, we believe groundwater at the site is not directly affected by pool elevations in the Columbia River, and is likely controlled by the complex hydrogeological conditions of the up-gradient mass-wasting landslide deposits. Groundwater levels will fluctuate with irrigation, precipitation, drainage, and regional pumping from wells.

7.0 GEOLOGIC HAZARDS

Potential geologic hazards that may affect the proposed development include: [i] landslides & slope instability, [ii] seismic hazards (ground shaking, surface fault rupture, soil liquefaction, and other secondary earthquake-related hazards), and [iii] flooding & erosion. A small area near the western portion of the subject property is mapped by the City of Stevenson's Critical Areas & Geologic Hazards Map as 'Potentially Unstable Slope' which refers to an area with slopes of 25% or greater per Stevenson Municipal Code (SMC), Chapter 18.13, Section 18.13.090, Critical Area - Geologically Hazardous Areas. A discussion follows on the specific hazards to this site:

7.1 Landslides

The Bonneville landslide has been dated to have occurred from 1416-1452 A.D. by a combination of dating methods. The Red Bluffs landslide has crosscutting morphologic features suggesting a younger age than that of the Bonneville landslide, with an age range of 1760-1770 A.D. The Crescent Lake landslide has reactivated within the last few decades and currently is moving downslope at an average rate of 11–18 cm/year and possibly as fast as 25 cm/year (Pierson et al., 2016). Results of another recent study (Hu et al., 2015) showed that the central upper part of the Crescent Lake landslide moved a total of 700 mm downslope during a 4-year observation period from 2007 to 2011, and that the movement was seasonal and showed a strong correlation with winter precipitation. In contrast to the Crescent Lake landslide, coherent parts of Red Bluffs, Bonneville and Stevenson landslides were observed to remain stable during the observation period.

Although considered a recent landslide (< 1,000 years old), the Red Bluffs landslide is not considered an active landslide (movement in last 20 years). Based on Table 18.13.090-1, Landslide Hazard Classification, of the Stevenson Municipal Code (SMC), the landslide hazard for the site classifies as 'Moderate Hazard'.

7.2 Regional Faulting & Surface Fault Rupture

The nearest regional faulting with Quaternary displacement (< 130,000 years) consists of the Faults near The Dalles located approximately 12 miles east of the project site (Czajkowski, 2014). Published slip rates for these faults are listed at less than 0.2 mm/year. For the purposes of this report, an active fault is defined as a fault that has had displacement within the Holocene epoch or last 11,700 years. Due to the lack of any known active fault traces in the immediate site vicinity, surface fault rupture is unlikely to occur at the subject property. While future fault rupture could occur at other locations, rupture would most likely occur along previously established fault traces.

7.3 Earthquakes & Seismic Conditions

Earthquakes caused by movements along crustal faults, generally in the upper 10 to 15 miles, occur on the crust of the North America tectonic plate when built-up stresses near the surface are released. The two largest crustal earthquakes felt in the state of Washington included the 1872, M 6.8 quake near Lake Chelan and the 1936, M 6.0 Walla Walla earthquake. Noteworthy to the City of Stevenson, the Mount Saint Helens Seismic Zone is located approximately 30 miles towards the north-northwest. The following list provides information gathered from the online USGS database regarding historic earthquakes (≥ 4.0 M) within the past 50 years for epicenters within 100 kilometers of project site, sorted by magnitude (largest to smallest):

Table 2: Earthquakes within 100-kilometers of project site

Date(s) of Event	Magnitude(s)	Nearby Faults / Seismic Zone	Distance from Site (miles)
March to May, 1980	4.0 - 5.7	Mt. Saint Helens Seismic Zone	32.6 - 47.2
March 25, 1993	5.6	Mt. Angel Fault Zone	56.6
February 14, 1981	5.2	Mt. Saint Helens Seismic Zone	48.4
May 13, 1981	4.5	Mt. Saint Helens Seismic Zone	49.5
June 29, 2002	4.5	Faults near The Dalles	26.4
March 1, 1982	4.4	Mt. Saint Helens Seismic Zone	48.4
February 14, 2011	4.3	Mt. Saint Helens Seismic Zone	43.7
July 14, 2008	4.2	<i>unknown</i>	60.1
December 13, 1974	4.1	Faults near The Dalles	32.6
February 2, 1981	4.0	Toppenish Ridge Fault Zone	59.1

Based on seismic scenarios published by the Washington State Department of Natural Resources (DNR), M 7.0 Mount Saint Helens and M 7.1 Mill Creek earthquake events would result in a shaking intensity of ‘V’ (moderate shaking) on the Modified Mercalli Intensity (MMI) scale. We further used the USGS deaggregation tool which provides the relative contributions of hazard for

each seismic source based on Probabilistic Seismic Hazard Analysis (PSHA). Based on the deaggregation, it appears that about 23% of the contribution to the probabilistic hazard at the site comes from the Cascadia Subduction Zone, with the remaining contribution primarily from the shallower sources.

7.4 Soil Liquefaction

Liquefaction is the loss of soil strength from sudden shock (usually earthquake shaking), causing the soil to become a fluid mass. In general, for the effects of liquefaction to be manifested at the surface, groundwater levels must be within 50 feet of the ground surface and the soils within the saturated zone must also be susceptible to liquefaction. Based on the published Liquefaction Susceptibility Map of Skamania County, Washington (Palmer et al., 2004a), the site is mapped with a ‘low to moderate’ relative susceptibility for seismically-induced liquefaction to occur. A detailed assessment of the liquefaction potential at the site, including liquefaction-induced settlement and the effects of lateral spreading, is beyond the scope of this investigation.

7.5 Secondary Seismic Hazards

Additional secondary seismic hazards related to ground shaking include ground subsidence, tsunamis, and seiches. The site is far inland, so the hazard from tsunamis is non-existent. The potential hazard from seiches is also very low due to the elevation difference between the site and nearest water body.

7.6 Site Slopes

While hummocky terrain prevails across the majority of the site, the proposed area of development is relatively flat and level. A topographic plan of the site was unavailable at the time of this report. A field reconnaissance of the subject property was performed to observe site conditions and look for common geomorphic features of landslides as well as indications of possible signs demonstrating recent activity and instability of slide masses. No apparent indications of recent failures or significant slope instability were observed.

7.7 Flooding and Erosion

The subject property is mapped by Federal Emergency Management Agency (FEMA) as Zone ‘C’ which translates to areas of minimal flooding. Portions of the subject property are however situated in areas where sheet flow and erosion may occur. Soil erodibility is only one of several factors

affecting the erosion susceptibility. Soil erosion by water also increases with the length and steepness of the site slopes due to the increased velocity of runoff and resulting greater degree of scour and sediment transport. The need for and design of erosion protection measures is within the purview of the design Civil Engineer. Appropriate erosion and sediment control plan(s) and a drainage plan shall be prepared by the project civil engineer with the final construction drawings. Erosion should be mitigated with appropriate BMPs consisting of proper drainage design including collecting and disposal (conveyance) of water to approved points of discharge in a non-erosive manner. Appropriate project design, construction, and maintenance will be necessary to mitigate the site erosion hazards.

8.0 SEISMIC DESIGN PARAMETERS

Based on subsurface data obtained during or field exploration, along with our review of the published NEHRP Site Class Map of Skamania County, Washington (Palmer et al., 2004b), a site class ‘D’ as defined by 2015 International Building Code (IBC) is applicable. According to Mapped Spectral Acceleration obtained from the USGS Seismic Design Maps using the 2015 IBC (Appendix VI), the following site-specific design values may be used:

Table 3: IBC Design Response Spectra Parameters

Seismic Design Parameter	Value (unit)
S_s	0.657 (g)
S_1	0.292 (g)
F_a	1.275 (unitless)
F_v	1.815 (unitless)
SM_s	0.838 (g)
SM_1	0.530 (g)
SD_s	0.558 (g)
SD_1	0.354 (g)

S_s = MCE spectral response acceleration at short periods

S_1 = MCE spectral response acceleration at 1-second period

F_a = Site coefficient for short periods

F_v = Site coefficient for 1-second period

SM_s = MCE spectral response acceleration at short periods as adjusted for site effects

SM_1 = MCE spectral response acceleration at 1-second period as adjusted for site effects

SD_s = Design spectral response acceleration at short periods

SD_1 = Design spectral response acceleration at 1-second period

It shall be noted that determination of an appropriate site class requires shear wave velocity, soil undrained shear strength, or standard penetration resistance (N-value) data in the upper 100 feet of the subsurface profile, which was beyond the scope of this investigation.

9.0 SUMMARY OF FINDINGS & CONCLUSIONS

Conditions imposed by the proposed development have been evaluated on the basis of assumed elevations and engineering characteristics of the subsurface materials encountered in the exploratory test-pits, and their anticipated behavior both during and after construction. The following is a summary of our findings, conclusions and professional opinions based on the data obtained from a review of selected technical literature and the site evaluation.

- Based on the findings of this geotechnical evaluation and our understanding of the proposed development, from a geotechnical perspective, it is our opinion that the site is suitable for the proposed development, provided the soil design parameters and site-specific recommendations in this report are followed in the design and construction of the project.
- Final design plans for the proposed development, including topographic, grading, drainage and finished elevations, were not provided at the time of this report. Once the plans are finalized, GNN **must** be provided an opportunity to review final design plans to provide revised recommendations if/as necessary.
- Site soils include a variably-thick layer of artificial fill soils atop the native silty sand with gravel. The undocumented artificial fill soils extended to depths ranging from 2.5 to 9 feet and included significant wood debris in the northern portion of the site.
- Groundwater was encountered within the test-pits at depths ranging from approximately 10 to 12.5 feet BGS at the time of our exploration in early December. Groundwater conditions will likely be a factor for design and construction at the site.
- The onsite silty sand and gravel soils, screened and processed to be free of oversize rocks (>5 inches) and any deleterious materials including trash and debris, are generally suitable for reuse as engineered fill and utility trench backfill.
- The proposed fire station building may be supported on conventional shallow foundations bearing on a layer of crushed rock atop the recompacted native subgrade in accordance with the recommendations of this report. However, due to presence of artificial fill soils with significant trash/debris within the proposed building footprint, over-excavation of the unsuitable fill soils to a competent native stratum and replacement with engineered fill will be required.

- Site grading shall incorporate the requirements of IBC 2015, Appendix J *Grading*.
- Upon completion, all test-pit excavations were loosely backfilled with excavation spoils. The contractor is responsible to locate the test-pits to re-excavate the loose soils and re-place as compacted engineered fill.
- The underlying geologic condition for seismic design is site class 'D'. The *minimum* seismic design should comply with the 2015 International Building Code (IBC) and ASCE 07-10, Minimum Design Loads for Buildings and Other Structures.
- The near-surface site soils are susceptible to wind and water erosion when exposed during grading operations. Preventative measures and appropriate BMPs to control runoff and reduce erosion should be incorporated into site grading plans.
- Based on the findings of our site evaluation, we recommend completing a site-specific liquefaction analysis to assess the risk of soil liquefaction and liquefaction-induced settlement at the site during a seismic event. Site-specific liquefaction analysis requires a 50-foot deep boring with continuous penetration testing.

10.0 GEOTECHNICAL RECOMMENDATIONS

The following geotechnical recommendations are based on our current understanding of the proposed project depicted on the site plan (Option A: Site) prepared by Mackenzie, dated 10/2/2018. The report is prepared to comply with the 2015 International Building Code Section 1803, Geotechnical Investigations, and as required by Subsection 1803.2, Investigations Required. Please note that Soil Design Parameters and Recommendations presented in this **Design-Level** report are predicated upon appropriate geotechnical monitoring and testing of the site preparation and foundation and building pad construction by a representative of GNN's Geotechnical-Engineer-of-Record (GER). Any deviation and nonconformity from this requirement may invalidate, partially or in whole, the following recommendations. We recommend that we be engaged to review grading and foundation plans in order to provide revised, augmented, and/or additional geotechnical recommendations as required.

10.1 Site Development – Grading

Site grading shall incorporate the requirements of IBC 2015 Appendix J. The project GER or a representative of the GER should observe site clearing, grading, and the bottoms of excavations before placing fills. Local variations in soil conditions may warrant increasing the depth of over-excavation and recompaction. Seasonal weather conditions may adversely affect grading operations. To improve compaction efforts and prevent potential pumping and unstable ground conditions, we suggest performing site grading during dryer periods of the year.

Soil conditions shall be evaluated by in-place density testing, visual evaluation, probing, and proof-rolling of the imported fill and re-compacted on-site soil as it is prepared to check for compliance with recommendations of this report. A moisture-density curve shall be established in accordance with the ASTM D1557 method for all onsite soils and imported fill materials used as structural fill.

10.2 Clearing and Grubbing

At the start of site grading, any vegetation, large roots, non-engineered/artificial fill, including trash and debris, and any abandoned underground utilities shall be removed from the proposed building and structural areas. The surface shall be stripped of all topsoil and/or organic growth (vegetation) that may exist within the proposed structural areas. The topsoil and organic rich soils shall either be stockpiled on-site separately for future use or be removed from the construction area. Depth of stripping can be minimized with real-time onsite observation of sufficient removals. Areas disturbed during clearing shall be properly backfilled and compacted as described below.

10.3 Suitability of the Onsite Soils as Engineered Fill

The onsite silty sand and gravel soils, screened and processed to be free of oversize rocks (>5 inches) and deleterious materials including trash and debris, are generally suitable for reuse as engineered fill and utility trench backfill. The clay-rich soils encountered within the fill strata in the northern portion of the site are not considered suitable for re-use. Suitable onsite soils shall be placed in maximum 8-inch lifts (loose) and compacted to at least 95% relative compaction (ASTM D1557) near its optimum moisture content. Compaction of these soils shall be performed within a range of $\pm 2\%$ of optimum moisture to achieve the proper degree of compaction.

10.4 Temporary Excavations

It shall be the responsibility of the contractor to maintain safe temporary slope configurations since the contractor is at the job site, able to observe the nature and conditions of the slopes and be able to monitor the subsurface conditions encountered. Unsupported vertical cuts deeper than 4 feet are not recommended if worker access is necessary. The cuts shall be adequately sloped, shored or supported to prevent injury to personnel from caving and sloughing. The contractor and subcontractors shall be aware of and familiar with applicable local, state and federal safety regulation including the current OSHA Excavation and Trench Safety Standards, and OSHA Health and Safety Standards for Excavations, 29 CFR Part 1929, or successor regulations.

According to chapter 296-155 of the Washington Administrative Code (WAC), it is our opinion that the soil encountered at the site is classified as Type C soils. We recommend that temporary, unsupported, open cut slopes shall be no steeper than 1.5 feet horizontal to 1.0 feet vertical (1.5H:1V) in Type C soils. No heavy equipment should be allowed near the top of temporary cut slopes unless the cut slopes are adequately braced. Final (permanent) fill slopes should be graded to an angle of 2H:1V or flatter. Where unstable soils are encountered, flatter slopes may be required.

10.5 Utility Excavation, Pipe Bedding and Trench Backfill

To provide suitable support and bedding for the pipe, we recommend the utilities be founded on suitable bedding material consisting of clean sand and/or sand & gravel mixture. To minimize trench subgrade disturbance during excavation, the excavator should use a smooth-edged bucket rather than a toothed bucket.

Pipe bedding and pipe zone materials shall conform to Section 9-03.12(3) of the *2018 WSDOT Standard Specifications*. Pipe bedding should provide a firm uniform cradle for support of the pipes. A minimum 4-inch thickness of bedding material beneath the pipe should be provided. Prior to installation of the pipe, the pipe bedding should be shaped to fit the lower part of the pipe exterior with reasonable closeness to provide uniform support along the pipe. Pipe bedding material should be used as pipe zone backfill and placed in layers and tamped around the pipes to obtain complete contact. To protect the pipe, bedding material should extend at least 6 inches above the top of the pipe.

Placement of bedding material is particularly critical where maintenance of precise grades is essential. Backfill placed within the first 12 inches above utility lines should be compacted to at least 90% of the maximum dry density (ASTM D1557), such that the utility lines are not damaged during backfill placement and compaction. In addition, rock fragments greater than 1 inch in maximum dimension should be excluded from this first lift. The remainder of the utility excavations should be backfilled and compacted to 95% of the maximum dry density as determined by ASTM D1557.

Onsite soils are considered suitable for utility trench backfill provided they are free of oversize material and trash/debris and can be adequately compacted. All excavations should be wide enough to allow for compaction around the haunches of pipes and underground tanks. We recommend that utility trenching, installation, and backfilling conform to all applicable federal, state, and local regulations such as OSHA and WISHA for open excavations.

Compaction of backfill material should be accomplished with soils within $\pm 2\%$ of their optimum moisture content in order to achieve the minimum specified compaction levels recommended in this report. However, initial lift thickness could be increased to levels recommended by the manufacturer to protect utilities from damage by compacting equipment.

10.6 Temporary Dewatering

Groundwater was encountered as shallow as 10 feet BGS at the time of our field exploration in late December. Seasonal variations, particularly during winter/spring, may elevate the groundwater table. Consequently, dewatering of excavations will be required for excavations extending below the groundwater table to facilitate construction. Dewatering should be accomplished in advance of construction, as necessary, so that excavation and placement of foundations, pipe, pipe bedding and backfill materials are completed in relatively dry conditions. Dewatering should be performed such that the groundwater level around nearby existing structures is unaffected, as lowering the water level around existing structures could induce settlements. Design and implementation of dewatering systems should be the responsibility of the contractor.

We recommend that the contract documents require the Contractor to prepare and submit a dewatering plan for review and approval by the geotechnical engineer. Contractor shall also be made responsible for the dewatering system installation and maintenance. In addition, the

Contractor should be responsible for control of surface water and should employ sloping, slope protection, ditching, sumps, and other measures as necessary.

10.7 Imported Crushed Rock Structural Fill

Imported structural fill shall consist of well-graded, crushed aggregate material meeting the grading requirements of Washington State Department of Transportation (WSDOT) Standard Specification 9-03.9(3) (1-1/4 inch minus Base Course Material) presented here:

Table 4: WSDOT Standard Spec. 9-03.9(3)

Sieve Size	Percent Passing (by Weight)
1¼ Inch Square	99 - 100
1 Inch Square	80 - 100
5/8 Inch Square	50 – 80
U.S. No. 4	25 - 45
U.S. No. 40	3 – 18
U.S. No. 200	Less than 7.5

A fifty (50) pound sample of each imported fill material shall be collected by GNN personnel prior to placement to ensure proper gradation and establish the moisture-density relationship (proctor curve).

10.8 Compaction Requirements for Engineered Fill

All fill or backfill shall be approved by a representative of the GER, placed in uniform lifts, and compacted to a minimum 95% of the maximum dry density as determined by ASTM D1557. The compaction effort must be verified by a representative of the GER in the field using a nuclear density gauge in accordance with ASTM D6938. The thickness of the loose, non-compacted, lift of structural fill shall not exceed 8 inches for heavy-duty compactors or 4 inches for hand operated compactors.

10.9 Foundation Bearing Support

Building structures may be supported on conventional shallow foundations bearing on recompacted dense native gravel stratum in accordance with the recommendations of this report. The minimum footing depth shall be 24 inches below adjacent grades for frost protection and bearing capacity considerations.

Following completion of site clearing and grubbing operations, all foundation areas shall be over-excavated to expose the native silty sand with gravel layer. We anticipate the native soils within the

footprint of the proposed structure at approximate depths of 2.5 to 9 feet BGS. In order to reduce the risk of differential settlement, we recommend the differential in depth of foundation over-excavation be limited to 50% (i.e. if the deepest required foundation over-ex is 8 feet, then no portion of the foundation excavation shall be less than 4 feet). The exposed native silty sand shall be moisture-conditioned (as necessary) and compacted to at least 95 percent of the maximum dry density as determined by the ASTM D1557 method to a minimum depth of 12 inches. Any soft spots encountered during compaction shall be over-excavated an additional 12 inches and replaced as compacted fill. Depending on the time of the year and the finished site elevations, deeper foundation over-excavations may extend into groundwater; consequently, appropriate means of dewatering shall be employed by the contractor (see *Temporary Dewatering* section).

Foundation backfill shall consist of suitable screened/processed onsite soils (see *Suitability of Onsite Soils as Engineered Fill*) and/or imported 2-inch minus Gravel Borrow material (meeting the grading and quality requirements of 2018 WSDOT Standard Spec. Sec. 9-03.14(1)). The upper 12 inches of backfill directly below the foundations shall consist of imported 1¼"-minus crushed rock structural fill placed as engineered fill, moisture-conditioned and compacted to at least 95 percent of the maximum dry density as determined by the ASTM D1557.

Footings constructed in accordance with the above recommendations may be designed for an allowable bearing capacity of **2,500 pounds per square foot (psf)**. The allowable bearing pressure may be increased by 1/3 for short-term transient loading conditions. The estimated total settlement for footings is approximately 1-inch with differential settlement less than half that magnitude. The weight of the foundation concrete below grade may be neglected in dead load computations. Footings, foundations and masonry walls should be reinforced as necessary to reduce the potential for distress caused by differential movement.

Lateral forces on foundations from short term wind and seismic loading would be resisted by friction at the base of foundations and passive earth pressure against the buried portions. We recommend an allowable passive earth pressure for the compacted onsite soil of **220 pcf**. This lateral foundation resistance value includes a factor of safety of 1.5. We recommend a coefficient of friction of **0.45** be used between cast-in-place concrete and imported crushed rock fill. An appropriate factor of safety should be used to calculate sliding resistance at the base of footings.

10.10 Slab-on-Grade Floors

Place a minimum 6-inch layer of crushed aggregate fill beneath the slabs. The material shall meet the *WSDOT Specification* section 9-03.9 (3), “Crushed Surfacing Top Course”, with less than 5 percent passing the No. 200 sieve (fines). The crushed rock material shall be compacted to at least 95% of the maximum dry density as determined by the ASTM D1557 method. Prior to placing the crushed rock layer, any artificial fill soils shall be completely removed and the native subgrade shall be moisture-conditioned (as necessary) and compacted to at least 95 percent of the maximum dry density as determined by the ASTM D1557 method to a minimum depth of 12 inches. Any soft spots or areas displaying pumping/deformation during compaction shall be over-excavated an additional 12 inches, backfilled with imported granular structural fill and re-compacted.

We recommend a modulus of subgrade reaction equal to 120 pounds per cubic inch (pci) based on a value for gravel presented in the Portland Cement Association publication No. EB075.01D. Slab thickness, reinforcement and joint spacing shall be determined by a licensed engineer based on the intended use and loading.

An appropriate vapor retarder (15-mil polyethylene liner) shall be used (ASTM E1745/E1643) beneath areas receiving moisture sensitive resilient flooring/VCT where prevention of moisture migration through slab is essential. The slab designer should refer to ACI 302 and/or ACI 360 for procedures and cautions regarding the use and placement of a vapor retarder. If a vapor retarder is used, we recommend placing a sand layer over the vapor retarder and immediately below the slab to promote proper curing and protect the vapor retarder during rebar placement. Relative humidity (RH) and moisture vapor emission rate (MVER) of concrete floor slabs shall be tested and measured in accordance with ASTM F2170-18 and ASTM E1869 when the building has been properly conditioned. Manufacturer's guidelines shall be adhered to in performing the slab moisture test. The architect shall determine the need and use of a vapor retarder and sand layer.

10.11 Perimeter Footing Drain

We recommend installing perimeter foundation drain systems. The drain-tiles should be installed adjacent to the outside of the footings with the drain pipe set at the bottom of footing. The drain-tile should be covered with a minimum of 6 inches of ½- to ¾ inch free-draining gravel and wrapped with a water-permeable geo-textile fabric (Mirafi ®140N or an equivalent) to limit the migration of fines that could clog the system. An alternative pre-wrapped perforated drain-tile may

also be considered that would eliminate the need for wrapped aggregate around the drain pipe. The drain pipe should be installed with the perforations oriented downward.

If site topography allows, the drain-tile system should outlet by gravity drainage down slope from the structure; otherwise, it should be routed to an interior sump constructed below the footing subgrade elevation. The sump dimensions should be a minimum of 18 inches in diameter and extend a minimum of 24 inches below the bottom of the footing elevation to allow space for the pump, piping, and storage volume. Discharge from the sump should be conveyed to the surface a sufficient distance from the structure to limit re-infiltration to the drain-tile system.

10.12 Flexible Pavement

Due to the presence of undocumented artificial fills throughout the project site, remedial grading will be required to minimize the risk of pavement distress. We recommend that the new pavement section be constructed on an improved subgrade. Due to the presence of undocumented artificial fills soils at the site, pavement areas shall be over-excavated to completely remove all artificial fill soils and trash/debris to eliminate any potential risk of future distresses. Based on our subsurface exploration, we anticipate the likely depth of over-excavation to be on the order of maximum 9 feet BGS. Deeper depths of artificial fill soils may be encountered in isolated and/or unexplored areas, and will require proper over-ex and removal.

After appropriate over-excavation is complete and confirmed by a representative of the GER, the exposed native subgrade shall be scarified, moisture-conditioned to near-optimum and compacted to minimum 95% of the maximum density (per ASTM D1557) and to a dense and non-yielding surface. After a suitable subgrade is confirmed by a representative of the GER, the over-excavation shall be backfilled with engineered structural fill soil consisting of suitable/screened onsite soil (see *Suitability of Onsite Soils as Engineered Fill*) and/or imported 2-inch minus Gravel Borrow material (meeting the grading and quality requirements of 2018 WSDOT Standard Spec. Sec. 9-03.14(1)). Engineered structural fill soils shall be placed in max. 8-inch thick loose lifts and each lift compacted to 95% of ASTM D1557.

The following table presents recommended light-duty and heavy-duty asphalt pavement sections for proposed project to constructed atop the prepared subgrade:

Table 5: Recommended Asphalt Concrete Paving Sections

Traffic	Asphalt Thickness (inches)	Crushed Aggregate Base Course (inches)	Subgrade
Heavy Duty†	4.0	10*	upper 12 inches scarified, moisture conditioned and re-compacted to at least 95% of the maximum dry density as determined by ASTM D1557
Standard Duty ††	3.0	6	

†Heavy duty applies to pavements subjected to truck traffic and drive lanes

††Standard duty applies to general parking areas

*The upper 2" of crushed rock should be top course rock placed over the base course layer

Pavement section recommendations assume proper drainage and construction monitoring. Pavement shall be constructed on a dense and non-yielding surface. All fills used to raise low areas must be compacted structural fills and shall be placed under engineering control conditions. The HMAC utilized for the project should be designed and produced in accordance with Section 5-04 Hot Mix Asphalt of the Washington Department of Transportation 2018 Standard Specifications for Road and Bridge Construction (WSDOT Specifications). Aggregate Base material shall comply with Section 9-03.9(3) Crushed Surfacing of the WSDOT Specifications. Aggregate base or pavement materials should not be placed when the surface is wet.

10.13 Concrete (Rigid) Pavement Section

Concrete pavement design recommendations are based on an assumed modulus of rupture of 550 psi and a compressive strength of 4000 psi for concrete. Concrete mixture shall be Class 4000, 1" aggregate, and use severe exposure. Reinforcing steel shall be ASTM A615 Grade 60 and consist of #4's at 18" each way in center of the section (special care shall be taken during construction to locate the reinforcing steel in the center of the mat). Construction joints (sawcuts) shall be 1/8" to 1/4" wide and T/4 deep and provided at a maximum of 15' spacing in each direction. 15' spacing is appropriate for 1" or 1 1/4" aggregate. If 3/4" aggregate is used, 10' spacing shall be used instead.

Table 6: Recommended Concrete (PCC) Pavement Section

Area Designation	Pavement Section	
	PCC Concrete (inches)	Crushed Aggregate Base Course (inches)
Fire Station Apron Area	6	6

10.14 Subgrade Protection

The degree to which construction grading problems develop is expected to be dependent, in part, on the time of year that construction proceeds and the precautions which are taken by the contractor to protect the subgrade. The fine-grained soils currently present on site are considered to be moisture and disturbance sensitive due to their fines content and may become unstable (pumping) if allowed to increase in moisture content and are disturbed (rutted) by construction traffic if wet. If necessary, the construction access road should be covered with a layer of gravel or quarry spalls course. The soils are also susceptible to erosion in the presence of moving water. The soils shall be stabilized to minimize the potential of erosion into the foundation excavation. The site shall be graded to prevent water from ponding within construction areas and/or flowing into excavations. Accumulated water must be removed immediately along with any unstable soil. Foundation concrete shall be placed and excavations backfilled as soon as possible to protect the bearing grade. We further recommend that soils that become unstable are to be either:

- Removed and replaced with structural compacted gravel fill, or
- Mechanically stabilized with a coarse crushed aggregate (possibly underlain with a geotextile) and compacted into the subgrade.

10.15 Surface Drainage

With respect to surface water drainage, we recommend that the ground surface be sloped to drain away from the structure. Final exterior site grades shall promote free and positive drainage from the building areas. Water shall not be allowed to pond or to collect adjacent to foundations or within the immediate building area. We recommend that a gradient of at least 5% for a minimum distance of 10 feet from the building perimeter be provided, except in paved locations. In paved areas, a minimum gradient of 1% should be provided unless provisions are included for collection/disposal of surface water adjacent to the structure. Catch basins, drainage swales, or other drainage facilities should be aptly located. All surface water such as that coming from roof downspouts and catch basins be collected in tight drain lines and carried to a suitable discharge point, such as a storm drain system. Surface water and downspout water should not discharge into a perforated or slotted subdrain, nor should such water discharge onto the ground surface adjacent to the building. Cleanouts should be provided at convenient locations along all drain lines.

10.16 Wet Weather Conditions

The near surface project site soils are fine-grained and sensitive to moisture during handling and compaction. Proceeding with site earthwork operations using these soils during wet weather could add project costs and/or delays. The stability of exposed soils may rapidly deteriorate due to a change in moisture content. Therefore, if at all possible, complete site clearing, preparation, and earthwork during periods of warm, dry weather when soil moisture can be controlled by aeration. During or subsequent to wet weather, drying or compacting the on-site soils will be difficult. It may be necessary to amend the on-site soils or import granular materials for use as structural fill. If earthwork takes place in wet weather or wet conditions, the following recommendations should be followed:

- Fill material should consist of clean, granular soil, and not more than 3 percent fines (by weight) should pass the No. 200 sieve. Fines should be non-plastic. These soils would have to be imported to the site.
- Earthwork should be accomplished in small sections and carried through to completion to reduce exposure to wet weather. Soils that becomes too wet for compaction should be removed and replaced with clean, granular material.
- The construction area ground surface should be sloped and sealed to reduce water infiltration, to promote rapid runoff, and to prevent water ponding.
- To prevent soil disturbance, the size or type of equipment may have to be limited.
- Work areas and stockpiles should be covered with plastic. Straw bales, straw wattles, geotextile silt fences, and other measures should be used as appropriate to control soil erosion.
- Excavation and fill placement should be observed on a full-time basis by a representative of GER to determine that unsuitable materials are removed and that suitable compaction and site drainage is achieved.

11.0 REFERENCES

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- U.S. Geologic Survey (USGS), Earthquake Hazards Program, U.S. Seismic Design Maps, online tool, website: earthquake.usgs.gov/designmaps/us/application.php
- Washington State Department of Natural Resources (DNR), Washington Division of Geology and Earth Resources, on-line mapping tool, <https://fortress.wa.gov/dnr/protectiongis/geology/>

12.0 CONTINUING GEOTECHNICAL SERVICES

GNN recommends that the Client should maintain an adequate program of geotechnical consultation, construction monitoring, and soils testing during the final design and construction phases to monitor compliance with GNN's geotechnical recommendations. Maintaining GNN as the geotechnical consultant from beginning to end of the project will provide continuity of services. If GN Northern, Inc. is not retained by the owner/developer and/or the contractor to provide the recommended geotechnical inspections/observations and testing services, the geotechnical engineering firm or testing/inspection firm providing tests and observations shall assume the role and responsibilities of Geotechnical Engineer-of-Record.

GNN can provide construction monitoring and testing as additional services. The costs of these services are not included in our present fee arrangement, but can be obtained from our office. The recommended construction monitoring and testing includes, but is not necessarily limited to, the following:

- Consultation during the design stages of the project.
- Review of the grading and drainage plans to monitor compliance and proper implementation of the recommendations in GNN's Report.
- Observation and quality control testing during site preparation, grading, and placement of engineered fill as required by the local building ordinances.
- Geotechnical engineering consultation as needed during construction

13.0 LIMITATIONS OF THE GEOTECHNICAL SITE INVESTIGATION REPORT

This GEOTECHNICAL SITE INVESTIGATION REPORT (“Report”) was prepared for the exclusive use of the Client. GN Northern, Inc.’s (GNN) findings, conclusions and recommendations in this Report are based on selected points of field exploration, and GNN’s understanding of the proposed project at the time the Report is prepared. Furthermore, GNN’s findings and recommendations are based on the assumption that soil, rock and/or groundwater conditions do not vary significantly from those found at specific exploratory locations at the project site. Variations in soil, bedrock and/or groundwater conditions could exist between and beyond the exploration points. The nature and extent of these variations may not become evident until during or after construction. Variations in soil, bedrock and groundwater may require additional studies, consultation, and revisions to GNN’s recommendations in the Report.

In many cases the scope of geotechnical exploration and the test locations are selected by others without consultation from the geotechnical engineer/consultant. GNN assumes no responsibility and, by preparing this Report, does not impliedly or expressly validate the scope of exploration and the test locations selected by others.

This Report’s findings are valid as of the issued date of this Report. However, changes in conditions of the subject property or adjoining properties can occur due to passage of time, natural processes, or works of man. In addition, applicable building standards/codes may change over time. Accordingly, findings, conclusions, and recommendations of this Report may be invalidated, wholly or partially, by changes outside of GNN’s control. Therefore, this Report is subject to review and shall not be relied upon after a period of **one (1) year** from the issued date of the Report.

In the event that any changes in the nature, design, or location of structures are planned, the findings, conclusions and recommendations contained in this Report shall not be considered valid unless the changes are reviewed by GNN and the findings, conclusions, and recommendations of this Report are modified or verified in writing.

This Report is issued with the understanding that the owner or the owner’s representative has the responsibility to bring the findings, conclusions, and recommendations contained herein to the attention of the architect and design professional(s) for the project so that they are incorporated

into the plans and construction specifications, and any follow-up addendum for the project. The owner or the owner's representative also has the responsibility to verify that the general contractor and all subcontractors follow such recommendations during construction. It is further understood that the owner or the owner's representative is responsible for submittal of this Report to the appropriate governing agencies. The foregoing notwithstanding, no party other than the Client shall have any right to rely on this Report and GNN shall have no liability to any third party who claims injury due to reliance upon this Report, which is prepared exclusively for Client's use and reliance.

GNN has provided geotechnical services in accordance with generally accepted geotechnical engineering practices in this locality at this time. GNN expressly disclaims all warranties and guarantees, express or implied.

Client shall provide GNN an opportunity to review the final design and specifications so that earthwork, drainage and foundation recommendations may be properly interpreted and implemented in the design and specifications. If GNN is not accorded the review opportunity, GNN shall have no responsibility for misinterpretation of GNN's recommendations.

Although GNN can provide environmental assessment and investigation services for an additional cost, the current scope of GNN's services does not include an environmental assessment or an investigation for the presence or absence of wetlands, hazardous or toxic materials in the soil, surface water, groundwater, or air on, below, or adjacent to the subject property.

APPENDICES

Appendix I
Site Vicinity Map (Figure 1)
Site Exploration Map (Figure 2)



FIGURE 1: VICINITY MAP

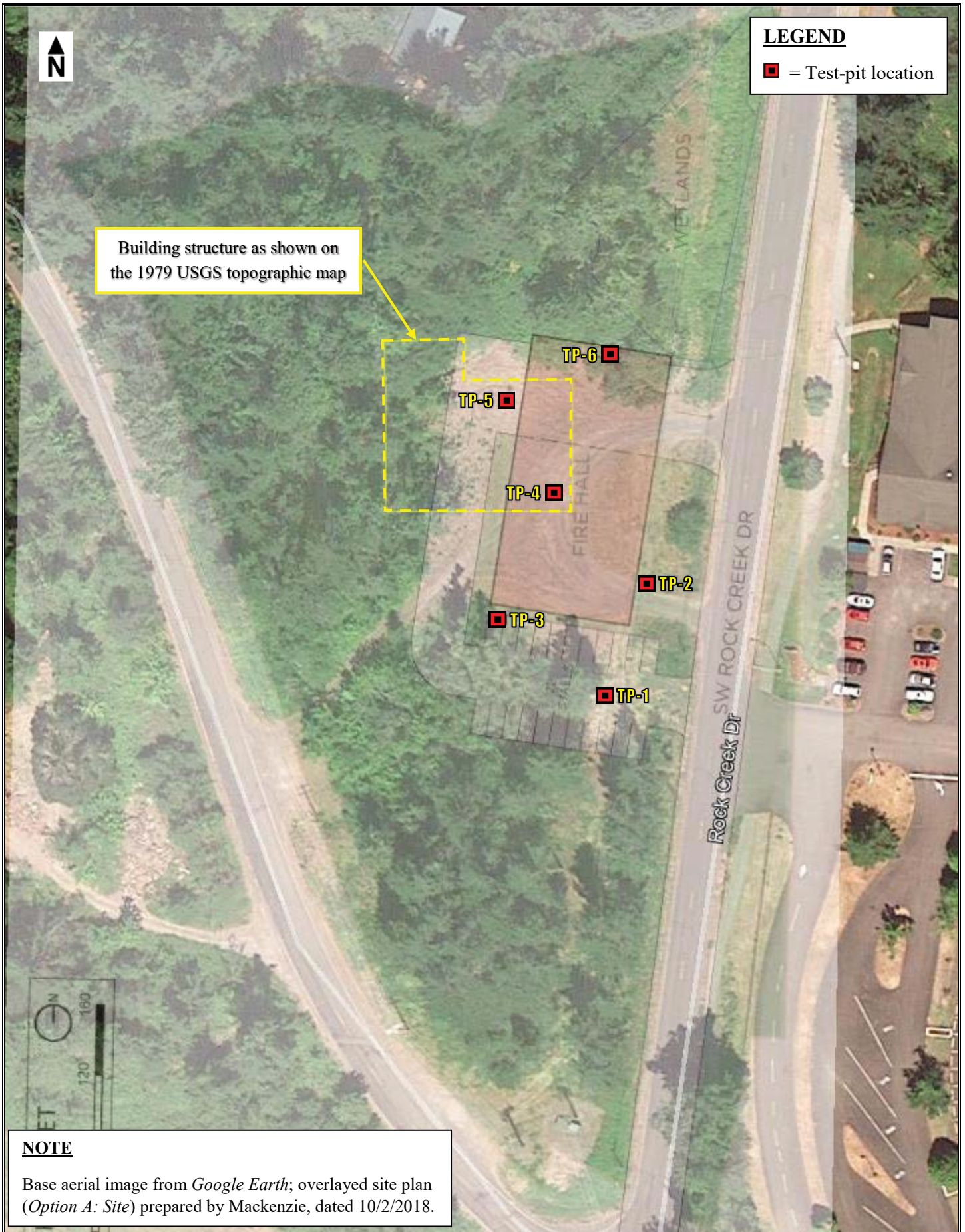


FIGURE 2: SITE EXPLORATION MAP

Appendix II
Exploratory Test-Pit Logs
Key Chart (for Soil Classification)



GN Northern Inc.
 11115 E. Montgomery, Suite C
 Spokane Valley, WA, 99206
 Telephone: (509) 248-9798
 Fax: (509) 248-4220

TEST PIT NUMBER TP-1

CLIENT City of Stevenson **PROJECT NAME** New Fire Hall
PROJECT NUMBER 218-1038 **PROJECT LOCATION** SW Rock Creek Drive, Stevenson, WA
DATE STARTED 12/4/18 **COMPLETED** 12/4/18 **GROUND ELEVATION** 126 ft **TEST PIT SIZE** 24 X 96 inches
EXCAVATION CONTRACTOR Riley Materials **GROUND WATER LEVELS:**
EXCAVATION METHOD Link-Belt 145x4 Excavator **AT TIME OF EXCAVATION** ---
LOGGED BY MYM **CHECKED BY** KAH **AT END OF EXCAVATION** ---
NOTES Approx. GPS Coords.: 45°41'14.87"N, 121°53'59.85"W **AFTER EXCAVATION** ---

GENERAL BH / TP / WELL - GINT STD US LAB.GDT - 12/10/18 17.53 - C:\USERS\GN NORTHERN\DROPBOX\ACTIVE PROJECTS\218-1038 NEW FIRE HALL, STEVENSON\218-1038.LOGX.GPJ

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0					
2.5			GM		FILL: SILTY GRAVEL WITH SAND, (GM) brown, subrounded, moist, appears loose to medium dense, with cobbles, with boulders, with roots
3.5					122.5
5.0	GB	MC = 29% Fines = 16%			SILTY SAND WITH GRAVEL, (SM) brown, fine grained, moist, appears medium dense, some medium to coarse sand, (APPARENT NATIVE)
7.5			SM		
10.0	GB	MC = 17% Fines = 16%			- becomes dry to damp
12.5					
14.0					112.0

- Groundwater not encountered at time of excavation
 - Referenced elevations are approximate and based on Google Earth topography
 Bottom of test pit at 14.0 feet.

City of Stevenson

May 2019

TEST PIT NUMBER TP-2



GN Northern Inc.
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 Fax: (509) 248-4220

CLIENT City of Stevenson
PROJECT NUMBER 218-1038
DATE STARTED 12/4/18 **COMPLETED** 12/4/18
EXCAVATION CONTRACTOR Riley Materials
EXCAVATION METHOD Link-Belt 145x4 Excavator
LOGGED BY MYM **CHECKED BY** KAH
NOTES Approx. GPS Coords.: 45°41'15.50"N, 121°53'59.52"W

PROJECT NAME New Fire Hall
PROJECT LOCATION SW Rock Creek Drive, Stevenson, WA
GROUND ELEVATION 120 ft **TEST PIT SIZE** 24 X 96 inches
GROUND WATER LEVELS:
AT TIME OF EXCAVATION ---
AT END OF EXCAVATION ---
▼ AFTER EXCAVATION 12.50 ft / Elev 107.50 ft

GENERAL BH / TP / WELL - GINT STD US LAB.GDT - 12/10/18 17:53 - C:\USERS\GN NORTHERN\DROPBOX\ACTIVE PROJECTS\218-1038 NEW FIRE HALL, STEVENSON\218-1038 LOGX.GPJ

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0					
0.5					119.5 TOPSOIL
2.5			GM		APPARENT FILL: SILTY GRAVEL WITH SAND, (GM) brown, subrounded, moist, appears loose to medium dense
2.8	GB	MC = 38% Fines = 30%			117.3 SILTY SAND WITH GRAVEL, (SM) brown, fine grained, moist, appears medium dense, with cobbles, with boulders, with gravel, (APPARENT NATIVE)
5.0					
7.5			SM		- pocket of gravels & cobbles noted on west excavation wall from ~4 to 7.5 feet
10.0					
12.5					▼
14.5					105.5

- Groundwater level at ~12.5' BGS after excavation
 - Referenced elevations are approximate and based on Google Earth topography
 Bottom of test pit at 14.5 feet.



GN Northern Inc.
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TEST PIT NUMBER TP-3

CLIENT City of Stevenson
PROJECT NUMBER 218-1038
DATE STARTED 12/4/18 **COMPLETED** 12/4/18
EXCAVATION CONTRACTOR Riley Materials
EXCAVATION METHOD Link-Belt 145x4 Excavator
LOGGED BY MYM **CHECKED BY** KAH
NOTES Approx. GPS Coords.: 45°41'15.30"N, 121°54'0.69"W

PROJECT NAME New Fire Hall
PROJECT LOCATION SW Rock Creek Drive, Stevenson, WA
GROUND ELEVATION 124 ft **TEST PIT SIZE** 24 X 96 inches
GROUND WATER LEVELS:
AT TIME OF EXCAVATION ---
AT END OF EXCAVATION ---
▼ AFTER EXCAVATION 11.00 ft / Elev 113.00 ft

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION
0.0					
0.5				TOPSOIL	123.5
2.5		GM		APPARENT FILL: SILTY GRAVEL WITH SAND, (GM) brown, subrounded, moist, appears loose to medium dense	121.5
5.0				- becomes dry to damp	
7.5		SM		SILTY SAND WITH GRAVEL, (SM) brown, fine grained, moist, appears medium dense, with cobbles, with boulders, with gravel, (APPARENT NATIVE)	
10.0					
12.5					
13.5				▼	110.5

- Groundwater level at ~11' BGS after excavation
 - Referenced elevations are approximate and based on Google Earth topography
 Bottom of test pit at 13.5 feet.

City of Stevenson

May 2019

GENERAL BH / TP / WELL - GINT STD US LAB.GDT - 12/10/18 17:53 - C:\USERS\GN NORTHERN\DR\PROX5-ACTIVE PROJECTS\218-1038 NEW FIRE HALL, STEVENSON\218-1038 LOGX.GPJ



GN Northern Inc.
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 Telephone: (509) 248-9798
 Fax: (509) 248-4220

TEST PIT NUMBER TP-4

CLIENT <u>City of Stevenson</u>	PROJECT NAME <u>New Fire Hall</u>
PROJECT NUMBER <u>218-1038</u>	PROJECT LOCATION <u>SW Rock Creek Drive, Stevenson, WA</u>
DATE STARTED <u>12/4/18</u> COMPLETED <u>12/4/18</u>	GROUND ELEVATION <u>119 ft</u> TEST PIT SIZE <u>24 X 96 inches</u>
EXCAVATION CONTRACTOR <u>Riley Materials</u>	GROUND WATER LEVELS:
EXCAVATION METHOD <u>Link-Belt 145x4 Excavator</u>	AT TIME OF EXCAVATION <u>---</u>
LOGGED BY <u>MYM</u> CHECKED BY <u>KAH</u>	AT END OF EXCAVATION <u>---</u>
NOTES <u>Approx. GPS Coords.: 45°41'16.01"N, 121°54'0.25"W</u>	▼ AFTER EXCAVATION <u>10.25 ft / Elev 108.75 ft</u>

GENERAL BH / TP / WELL - GINT STD US LAB.GDT - 12/10/18 17:53 - C:\USERS\GN NORTHERN\DRPBOX\5-ACTIVE PROJECTS\218-1038 NEW FIRE HALL, STEVENSON\218-1038 LOGX.GPJ

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0					
2.5					FILL: SILTY GRAVEL WITH SAND, (GM) brown, subrounded, moist to wet, appears loose
4.0	GB	MC = 28% LL = 50 PL = 26 Fines = 29%	GM		- becomes Clayey Sand (SC), black to greenish blue, with buried wood debris and organics
7.5	GB	MC = 24% Fines = 0%			- POSSIBLE NATIVE
9.0					110.0
10.0			SM		SILTY SAND WITH GRAVEL, (SM) brown, fine grained, moist to wet, appears medium dense, (APPARENT NATIVE)
12.5					106.0
					13.0

- Groundwater level at ~10.25' BGS after excavation
 - Referenced elevations are approximate and based on Google Earth topography
 Bottom of test pit at 13.0 feet.



GN Northern Inc.
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TEST PIT NUMBER TP-5

CLIENT City of Stevenson **PROJECT NAME** New Fire Hall
PROJECT NUMBER 218-1038 **PROJECT LOCATION** SW Rock Creek Drive, Stevenson, WA
DATE STARTED 12/4/18 **COMPLETED** 12/4/18 **GROUND ELEVATION** 118 ft **TEST PIT SIZE** 24 X 96 inches
EXCAVATION CONTRACTOR Riley Materials **GROUND WATER LEVELS:**
EXCAVATION METHOD Link-Belt 145x4 Excavator **AT TIME OF EXCAVATION** ---
LOGGED BY MYM **CHECKED BY** KAH **AT END OF EXCAVATION** ---
NOTES Approx. GPS Coords.: 45°41'16.54"N, 121°54'0.65"W **▼ AFTER EXCAVATION** 10.50 ft / Elev 107.50 ft

GENERAL BH / TP / WELL - GINT STD US LAB.GDT - 12/10/18 17:53 - C:\USERS\GN NORTHERN\DRP\BOX5-ACTIVE PROJECTS\218-1038 NEW FIRE HALL, STEVENSON\218-1038 LOGX.GPJ

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0					
0.5					CRUSHED GRAVEL
2.5			GM		FILL: SILTY GRAVEL WITH SAND, (GM) brown to black, subrounded, moist, appears loose to medium dense, some cobbles, with organic odor, some trash/debris (wood, glass)
4.8					
5.0	GB	MC = 26% Fines = 18%			SILTY SAND WITH GRAVEL, (SM) brown, fine grained, moist, appears medium dense, some gravel, some medium to coarse sand, (APPARENT NATIVE)
7.5			SM		
10.0					▼
12.5					
13.5					

- Groundwater level at ~10.5' BGS after excavation
 - Referenced elevations are approximate and based on Google Earth topography
 Bottom of test pit at 13.5 feet.

City of Stevenson

May 2019



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TEST PIT NUMBER TP-6

CLIENT City of Stevenson **PROJECT NAME** New Fire Hall

PROJECT NUMBER 218-1038 **PROJECT LOCATION** SW Rock Creek Drive, Stevenson, WA

DATE STARTED 12/4/18 **COMPLETED** 12/4/18 **GROUND ELEVATION** 116 ft **TEST PIT SIZE** 24 X 96 inches

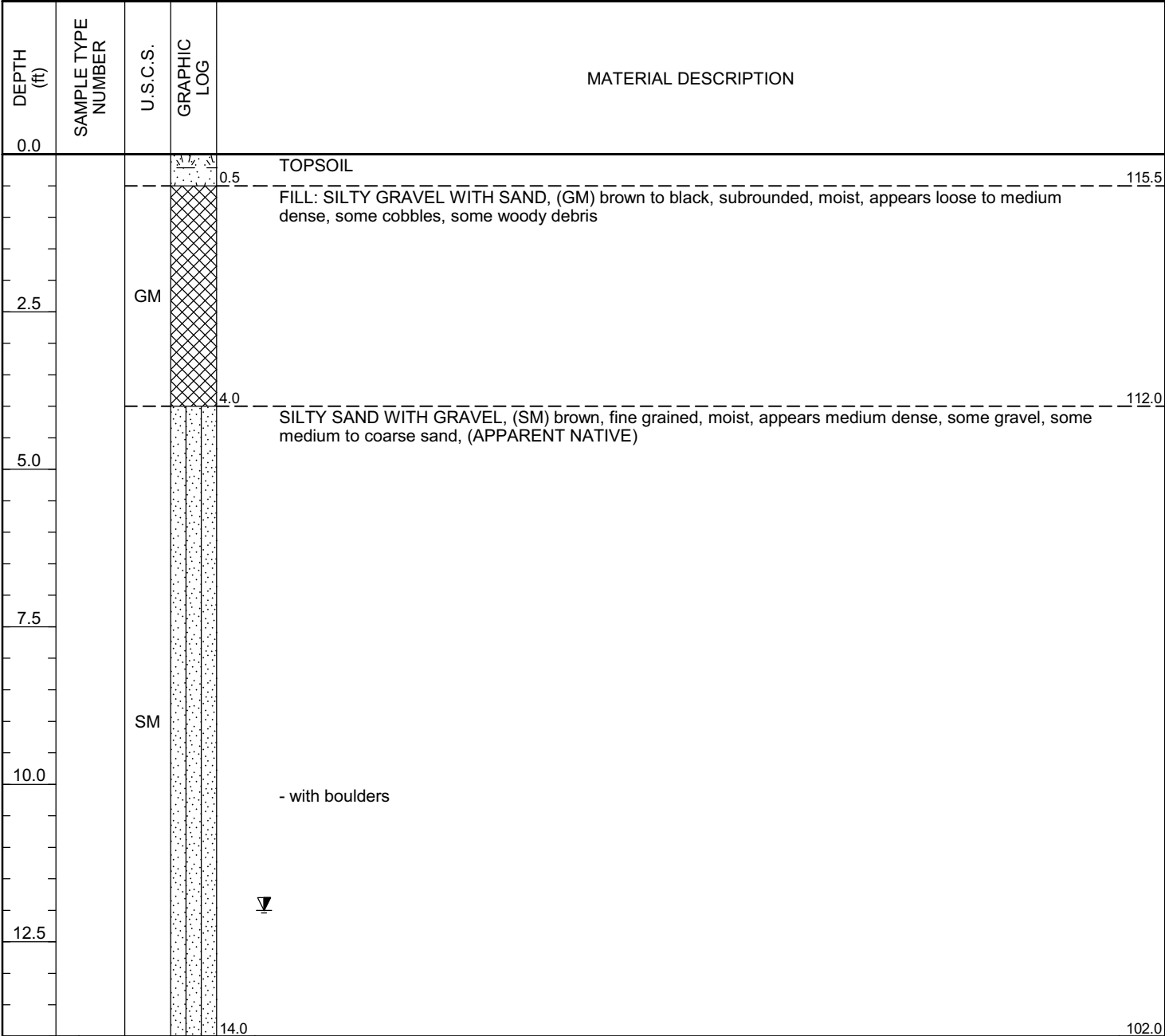
EXCAVATION CONTRACTOR Riley Materials **GROUND WATER LEVELS:**

EXCAVATION METHOD Link-Belt 145x4 Excavator **AT TIME OF EXCAVATION** ---

LOGGED BY MYM **CHECKED BY** KAH **AT END OF EXCAVATION** ---

NOTES Approx. GPS Coords.: 45°41'16.80"N, 121°53'59.81"W **▼ AFTER EXCAVATION** 12.00 ft / Elev 104.00 ft

GENERAL BH / TP / WELL - GINT STD US LAB.GDT - 12/10/18 17:59 - C:\USERS\GN NORTHERN\DRP\BOX5-ACTIVE PROJECTS\218-1038 NEW FIRE HALL, STEVENSON\218-1038 LOGX.GPJ



- Groundwater level at ~12' BGS after excavation
 - Referenced elevations are approximate and based on Google Earth topography
 Bottom of test pit at 14.0 feet.

KEY CHART

RELATIVE DENSITY OR CONSISTENCY VERSUS SPT N-VALUE					
COARSE-GRAINED SOILS			FINE-GRAINED SOILS		
DENSITY	N (BLOWS/FT)	FIELD TEST	CONSISTENCY	N (BLOWS/FT)	FIELD TEST
Very Loose	0 – 4	Easily penetrated with ½-inch reinforcing rod pushed by hand	Very Soft	0 – 2	Easily penetrated several inches by thumb
Loose	4 – 10	Difficult to penetrate with ½-inch reinforcing rod pushed by hand	Soft	2 – 4	Easily penetrated one inch by thumb
Medium -Dense	10 – 30	Easily penetrated with ½-inch rod driven with a 5-lb hammer	Medium-Stiff	4 – 8	Penetrated over ½-inch by thumb with moderate effort
Dense	30 – 50	Difficult to penetrate with ½-inch rod driven with a 5-lb hammer	Stiff	8 – 15	Indented about ½-inch by thumb but penetrated with great effort
Very Dense	> 50	penetrated only a few inches with ½-inch rod driven with a 5-lb hammer	Very Stiff	15 – 30	Readily indented by thumb
			Hard	> 30	Indented with difficulty by thumbnail

USCS SOIL CLASSIFICATION			
MAJOR DIVISIONS		GROUP DESCRIPTION	
Coarse-Grained Soils <50% passes #200 sieve	Gravel and Gravelly Soils <50% coarse fraction passes #4 sieve	Gravel (with little or no fines)	GW Well-graded Gravel
		Gravel (with >12% fines)	GP Poorly Graded Gravel
			GM Silty Gravel
			GC Clayey Gravel
	Sand and Sandy Soils >50% coarse fraction passes #4 sieve	Sand (with little or no fines)	SW Well-graded Sand
			SP Poorly graded Sand
Sand (with >12% fines)		SM Silty Sand	
		SC Clayey Sand	
Fine-Grained Soils >50% passes #200 sieve	Silt and Clay Liquid Limit < 50	ML Silt	
		CL Lean Clay	
		OL Organic Silt and Clay (low plasticity)	
	Silt and Clay Liquid Limit > 50	MH Inorganic Silt	
		CH Inorganic Clay	
		OH Organic Clay and Silt (med. to high plasticity)	
Highly Organic Soils		PT Peat	Top Soil

LOG SYMBOLS		
	2S	2" OD Split Spoon (SPT)
	3S	3" OD Split Spoon
	NS	Non-Standard Split Spoon
	ST	Shelby Tube
	CR	Core Run
	BG	Bag Sample
	TV	Torvane Reading
	PP	Penetrometer Reading
	NR	No Recovery
	GW	Groundwater Table

MODIFIERS	
DESCRIPTION	RANGE
Trace	<5%
Little	5% – 12%
Some	>12%

MOISTURE CONTENT	
DESCRIPTION	FIELD OBSERVATION
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but not visible water
Wet	Visible free water

SOIL CLASSIFICATION INCLUDES

1. Group Name
2. Group Symbol
3. Color
4. Moisture content
5. Density / consistency
6. Cementation
7. Particle size (if applicable)
8. Odor (if present)
9. Comments

MAJOR DIVISIONS WITH GRAIN SIZE							
SIEVE SIZE							
12"	3"	3/4"	4	10	40	200	
GRAIN SIZE (INCHES)							
12	3	0.75	0.19	0.079	0.0171	0.0029	
Boulders	Cobbles	Gravel		Sand			Silt and Clay
		Coarse	Fine	Coarse	Medium	Fine	

Conditions shown on boring and testpit logs represent our observations at the time and location of the fieldwork, modifications based on lab test, analysis, and geological and engineering judgment. These conditions may not exist at other times and locations, even in close proximity thereof. This information was gathered as part of our investigation, and we are not responsible for any use or interpretation of the information by others.

Appendix III
Laboratory Testing Results



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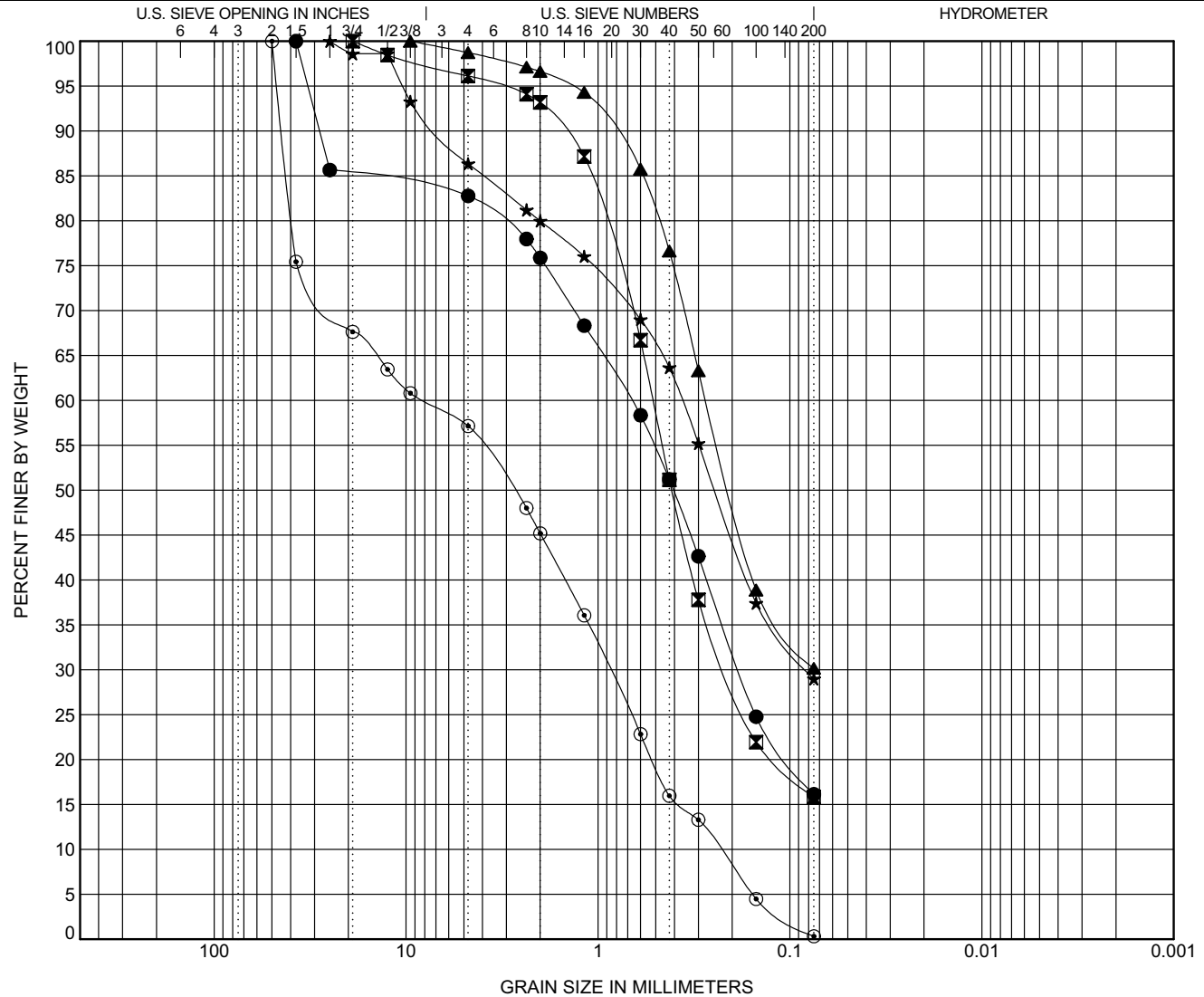
GRAIN SIZE DISTRIBUTION

CLIENT City of Stevenson

PROJECT NAME New Fire Hall

PROJECT NUMBER 218-1038

PROJECT LOCATION SW Rock Creek Drive, Stevenson, WA



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification					LL	PL	PI	Cc	Cu
● TP-1	4.0	SILTY SAND WITH GRAVEL (SM)									
☒ TP-1	9.5	SILTY SAND (SM)									
▲ TP-2	3.0	SILTY SAND (SM)									
★ TP-4	3.0	CLAYEY SAND (SC)					50	26	24		
◎ TP-4	8.0	POORLY GRADED SAND WITH GRAVEL (SP)								0.40	35.27
BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay		
● TP-1	4.0	37.5	0.671	0.184		17.2	66.6		16.1		
☒ TP-1	9.5	19	0.517	0.213		3.9	80.3		15.8		
▲ TP-2	3.0	9.5	0.273			1.3	68.6		30.2		
★ TP-4	3.0	25	0.365	0.081		13.7	57.3		29.0		
◎ TP-4	8.0	50	8.164	0.866	0.231	42.9	56.8		0.3		

GRAIN SIZE - TEMPLATE - JESSE.GDT - 12/10/18 - 17:54 - C:\USERS\GN NORTHERN\DROPBOX\5-ACTIVE PROJECTS\218-1038 NEW FIRE HALL - STEVENSON\218-1038 LOGX.GPJ



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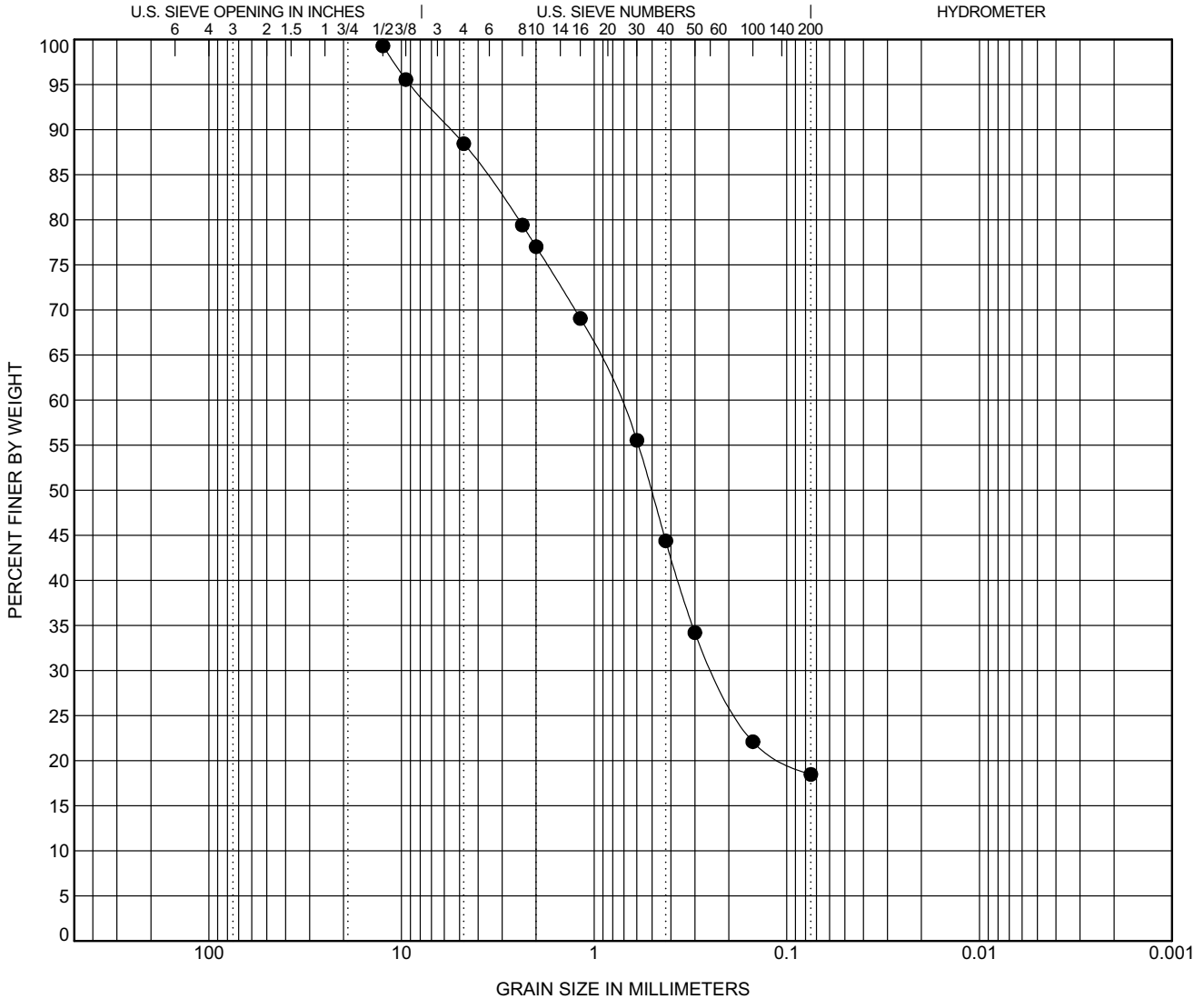
GRAIN SIZE DISTRIBUTION

CLIENT City of Stevenson

PROJECT NAME New Fire Hall

PROJECT NUMBER 218-1038

PROJECT LOCATION SW Rock Creek Drive, Stevenson, WA



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
● TP-5	5.0	SILTY SAND (SM)					

BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● TP-5	5.0	12.5	0.75	0.236		10.8	70.0	18.5	

GRAIN SIZE - TEMPLATE_JESSE.GDT - 12/10/18 17:54 - C:\USERS\GN NORTHERN\ROPOX\5-ACTIVE PROJECTS\218-1038 NEW FIRE HALL - STEVENSON\218-1038 LOGX.GPJ

Appendix IV
Site & Exploration Photographs



View of site conditions looking north



View of site conditions looking southwest



Excavation of test-pit TP-1 looking north



View of exposed soil profile within test-pit TP-1



Excavation of test-pit TP-2 looking south



View of exposed soil profile within test-pit TP-2



Excavation of test-pit TP-3 looking west



View of exposed soil profile within test-pit TP-3



Excavation of test-pit TP-4 looking north



View of exposed soil profile within test-pit TP-4



View of exposed soil profile within test-pit TP-4



View of exposed soil profile within test-pit TP-5

Appendix V
NRCS Soil Survey



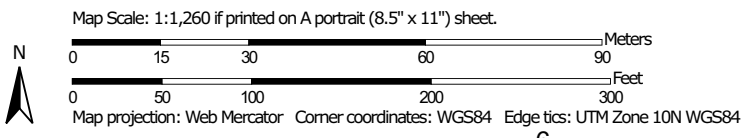
A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Skamania County Area, Washington

New Fire Hall



Custom Soil Resource Report Soil Map



Skamania County Area, Washington

2—Arents, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 1hhrw

Elevation: 0 to 200 feet

Mean annual precipitation: 40 to 80 inches

Mean annual air temperature: 45 to 52 degrees F

Frost-free period: 90 to 200 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Arents and similar soils: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arents

Setting

Landform: Terraces

Typical profile

H1 - 0 to 24 inches: gravelly sandy loam

H2 - 24 to 60 inches: extremely gravelly sandy loam

Properties and qualities

Slope: 0 to 5 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3s

Hydrologic Soil Group: A

Hydric soil rating: No

123—Steever stony clay loam, 2 to 30 percent slopes

Map Unit Setting

National map unit symbol: 1hhq7

Elevation: 50 to 1,500 feet

Mean annual precipitation: 70 to 85 inches

Mean annual air temperature: 48 degrees F

Frost-free period: 130 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Steever and similar soils: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Steever**Setting**

Landform: Mountain slopes

Typical profile

H1 - 0 to 5 inches: stony clay loam

H2 - 5 to 12 inches: gravelly clay loam

H3 - 12 to 60 inches: very gravelly loam

Properties and qualities

Slope: 2 to 30 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: B

Forage suitability group: Droughty Soils (G003XF403WA)

Hydric soil rating: No

Appendix VI
USGS Design Maps Summary

USGS Design Maps Summary Report

User-Specified Input

Report Title City of Stevenson - New Fire Hall

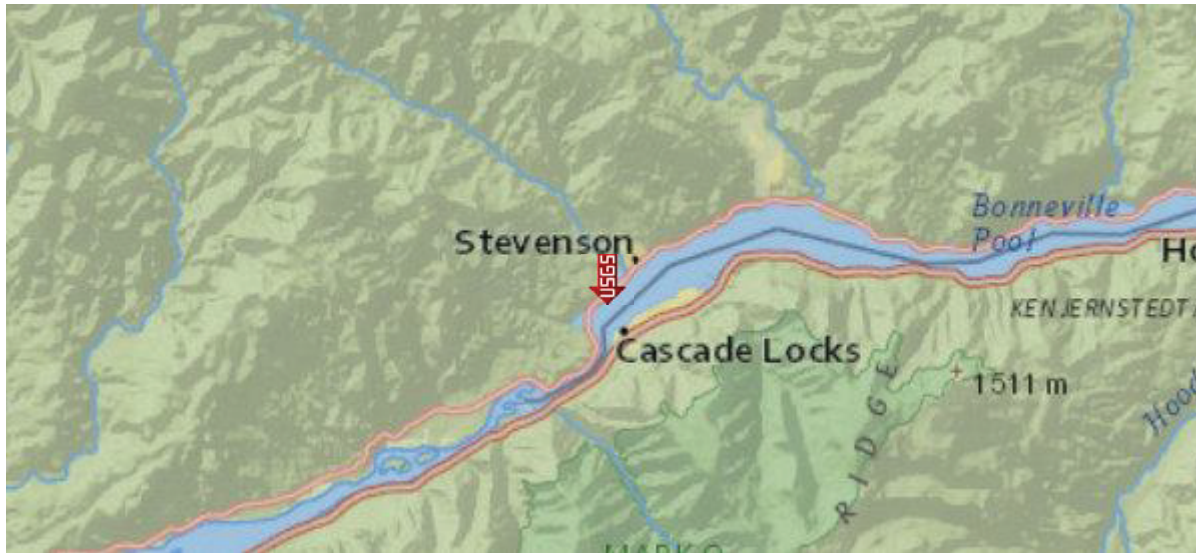
Sun December 9, 2018 04:47:30 UTC

Building Code Reference Document 2012/2015 International Building Code
(which utilizes USGS hazard data available in 2008)

Site Coordinates 45.68782°N, 121.90026°W

Site Soil Classification Site Class D - "Stiff Soil"

Risk Category IV (e.g. essential facilities)

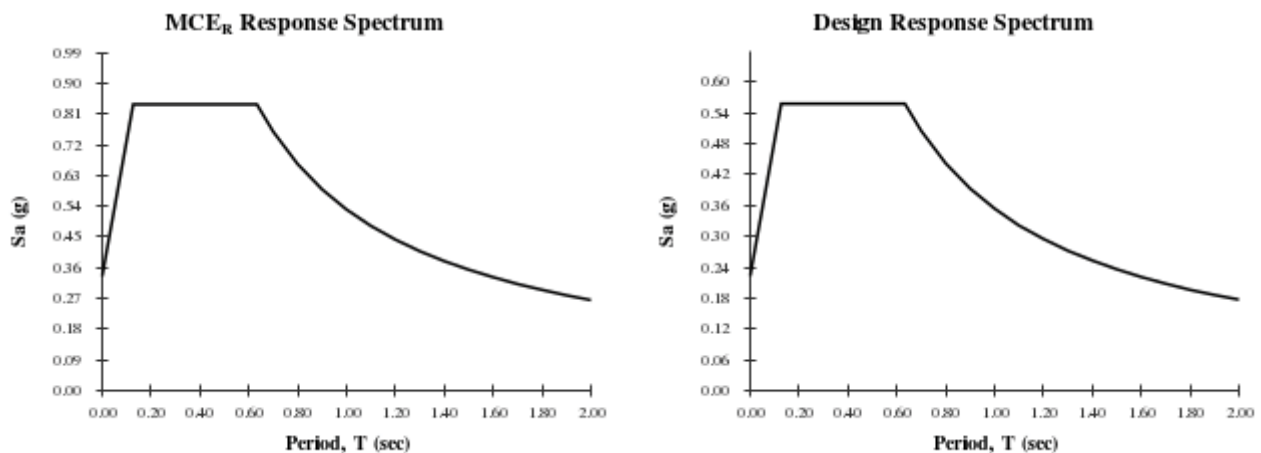


USGS-Provided Output

$S_S = 0.657 \text{ g}$ $S_{MS} = 0.838 \text{ g}$ $S_{DS} = 0.558 \text{ g}$

$S_1 = 0.292 \text{ g}$ $S_{M1} = 0.530 \text{ g}$ $S_{D1} = 0.354 \text{ g}$

For information on how the S_S and S_1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the "2009 NEHRP" building code reference document.



Although this information is a product of the U.S. Geological Survey, we provide no warranty, expressed or implied, as to the accuracy of the data contained therein. This tool is not a substitute for technical subject-matter knowledge.

**Site Assessment
City of Stevenson
Stevenson, Washington**

**Appendix D
City Application Forms and Fee Schedules**

Tracking Number: _____



CONDITIONAL USE PERMIT APPLICATION

PO Box 371 Stevenson, Washington 98648

Phone: (509)427-5970 Fax: (509)427-8202

Applicant/Contact: _____
 Mailing Address: _____
 Phone: _____ Fax: _____
 E-Mail Address (Optional): _____

Property Owner: _____
 Mailing Address: _____
 Phone: _____ Fax: _____

If There are Additional Property Owners, Please Attach Additional Pages and Signatures as Necessary

Property Address (Or Nearest Intersection): _____

Tax Parcel Number: _____ **Zoning:** _____

Lot Size: _____ **Current Use of Property:** _____

Brief Narrative of Request: _____

Water Supply Source: _____ **Sewage Disposal Method:** _____

I/we hereby provide written authorization for the City to reasonably access to the subject property to examine the proposal and carry out the administrative duties of the Stevenson Municipal Code.

I/we hereby certify my/our awareness that application fees are non-refundable, there is no guarantee that a permit will be issued, and that any permit issued as a result of this application may be revoked if at any time in the future it is determined that the statements in support of this application are false or misleading.

Incomplete applications will not be accepted. • Please ensure that all submittals are included

Signature of Applicant: _____ **Date:** _____

Signature of Property Owner: _____ **Date:** _____

For Official Use Only:
Date Application Received _____ • Date Application Complete _____



SUBMIT TO:
City Hall
7121 NE Loop Road

Conditional Use Permit

Submittal Requirements

A Conditional Use is a use listed as conditional in the relevant zoning district and permitted only after review as provided in SMC 17.39. A Conditional Use Permit is a permit issued by the Planning Commission that authorizes the recipient to make use of property in accordance with the requirements of SMC 17- Zoning as well as any additional requirements imposed by the Planning Commission.

Applications for a Conditional Use Permit are subject to review by the Planning Commission. In granting a Conditional Use Permit, the Planning Commission must find that the development in its proposed location:

1. Will not endanger the public health or safety;
2. Will not substantially reduce the value of adjoining or abutting property;
3. Will be in harmony with the area in which it is located; and
4. Will be in conformity with the Comprehensive Plan, transportation plan, or other plan officially adopted by the Council.

The following information is required for all Conditional Use Permit Applications. Applications without the required information will not be accepted. Site plans are to be prepared by a qualified professional, submitted on 8½"x11" or 11"x17" paper, and drawn to a standard engineering scale (e.g. 1"=10', 1"=20', ½"=1', etc.).

- Application Fee** (Amount: _____ Date: _____ Receipt #: _____)
- Completed and Signed Conditional Use Permit Application**
- Copies of the Property Title or Other Proof of Ownership**
- Descriptions of Any Existing Restrictive Covenants or Conditions**
- Two (2) Copies of a Site Plan, Clearly Showing the Following:**
 - The Location and Dimensions of All Existing and Proposed Structures
 - A Floor Plan of the Structure Housing the Proposed Conditional Use
 - A North Arrow and Scale
 - The Location and Dimensions of Any Drainfields, Public Utilities, Easements, Rights-of-Way or Streets within or Adjacent to Any Affected Lot
 - The Location and Dimensions of All Parking Areas
- A Narrative Discussing How the Proposal Meets the Four Criteria Described Above**
- A List of the Names and Mailing Addresses of All Property Owners Within 300 Feet of the Subject Property** (Obtainable Through the Skamania County Assessor's Office)
- Any Information Associated with Proposals Reviewed under SMC 17.39**
- Any Other Information Requested by the Planning Director to Aid the Planning Commission in Evaluating the Conditional Use Permit Application**

Tracking Number: _____

CRITICAL AREAS PERMIT APPLICATION

Critical Areas Permits, Exemption Requests, Reasonable Use Allowances



PO Box 371 Stevenson, Washington 98648

Phone: (509)427-5970 Fax: (509)427-8202

Request:

- Critical Areas Permit
- Written Determination of Exemption
- Reasonable Use Allowance

Applicant/Contact: _____

Mailing Address: _____

Phone: _____ Fax: _____

E-Mail Address (Optional): _____

Property Owner: _____

Mailing Address: _____

Phone: _____ Fax: _____

If There are Additional Property Owners, Please Attach Additional Pages and Signatures as Necessary

Subject Property Address (Or Nearest Intersection): _____

Tax Parcel Number: _____ **Zoning:** _____

Brief Project Summary: _____

Water Supply Source: _____ **Sewage Disposal Method:** _____

Critical Areas On or Near Subject Property (Check All That Apply):

- Geologic Hazard Area
- Fish & Wildlife Habitat Area
- Wetland Area
- Critical Aquifer Recharge Area

Any Additional Information Regarding Critical Areas on or Near Subject Property: _____

As the property owners of the real property described in this proposal, our signatures indicate our approval of this proposal, with the understanding that the proposal is subject to review, approval, and/or denial under SMC 18.13.

I/we hereby provide written authorization for the City to reasonably access to the subject property to examine the proposal and carry out the administrative duties of the Stevenson Municipal Code.

Incomplete applications will not be accepted. • Please ensure that all submittals are included

Signature of Applicant: _____ **Date:** _____

Signature of Property Owner: _____ **Date:** _____

For Official Use Only:
Date Application Received _____ • Date Application Complete _____



SUBMIT TO:
City Hall
7121 NE Loop Road

Critical Areas

Submittal Requirements

The following information is required for all Critical Areas Applications. Applications without the required information will not be accepted. Site plans are to be prepared by a qualified professional, submitted on 8½"x11" or 11"x17" paper, and drawn to a standard engineering scale (e.g. 1"=10', 1"=20', ¼"=1', etc.).

Application Fee (Amount: _____ Date: _____ Receipt #: _____)

Completed and Signed Critical Areas Permit Application

Any Associated Land Use and Building Permit Applications

Two (2) Complete Site Plan Proposals—Drawn to scale, showing the proposal site and all adjoining areas within 100 feet, and including the following:

- A Vicinity Map
- A North Arrow
- All property boundary lines **and** dimensions
- The location and width of all public and private roads
- The location and size of all existing structures, utility lines, easements, septic tanks and drainfields, wells, and other improvements
- The location and extent of all proposed structures and/or uses
- The location, species, and diameter of all significant trees
- The location and description of all critical areas and buffers

The following information is required for a Critical Areas Permit in Geologic Hazard Areas. All Reports are to be prepared by a Qualified Professional. Only those reports that apply to a proposal are required, and it is the responsibility of the applicant to determine which reports will be required. The City of Stevenson maintains a map inventory to aid in this determination and you are encouraged to meet with City staff prior to submitting an application.

Landslide Hazard Areas

- Geotechnical Assessment, Including
 - Existing and Available Geologic Information
 - LIDAR-Based Geologic Map
 - Surface and Probable Subsurface Geologic Conditions
 - Site Plan Delineating Landslide Hazards
 - Contour Map Delineating
- Geotechnical Stabilization Report (For High & Moderate Hazard Areas)
 - Surface and Subsurface Geology, Hydrology, Soils, and Vegetation (Soil and Rock Unit Descriptions, Groundwater Levels, Springs, Water Seepage Areas, etc.)
 - Site History
 - Topographic Data at scale of 1"=50' and 2-foot contour intervals
 - Engineering Geology Analysis and Results
 - Confirming Hazard Category
 - Summarizing Borings, Test Pits, and All Other Methods and Tests
 - Providing Monitoring Results of Groundwater Levels, Surface Surveys, and Inclinometer Measurements
 - Detailing a Geologic Site Model
 - Geotechnical Engineering Analysis and Results
 - Estimating Slope Stability and Effects of Construction Over Time
 - Providing the Assumed or Established Site and Subsurface Conditions used in the Stability Analysis
 - Describing the Method of Analysis and Results
 - Suggesting Mitigation of Adverse Site Conditions and/or Slope Stabilization Measures
 - Recommending
 - That Site Grading and Structures Will Not Reduce Slope Stability on Lands Containing no Obvious Instability and Modest Proposed Improvements
 - That Proposed Development Will Not Decrease the Factor of Safety Below Acceptable Limits Determined by the Geotechnical Engineer on Lands Containing Active Landslides, Inactive Landslide Complexes, or Designated as Potentially Unstable Slopes

Critical Areas

Submittal Requirements, Continued

Erosion Hazard Areas

- Erosion Control Plan
 - o Minimizing Alteration of Topography and Vegetation Removal and Disturbance,
 - o Designing Foundations that Conform to Existing Topography and Reduce Topographic Modification
 - o Designing Roads, Driveways, Trails, Walkways, and Parking Areas with Low Gradients and/or parallel to the natural site contours
- Erosion Control Management Practices
 - o Installation of Erosion and Sedimentation Controls (e.g. Silt Fences, Earthen Berms, etc.) Prior to Any Clearing or Grading
 - o Implementation of BMPs to Protect Disturbed Areas from Erosion (e.g. Vegetative Ground Cover, Filter Fabrics, etc.)
- Drainage Plan
 - o Designing Surface Drainage Including Downspouts that avoid draining to Erosion Hazard Areas
 - o Incorporating the Following Activities only when a Qualified Professional Determines finds that such systems will not result in an increase in erosion and verifies that such systems are installed as designed and function as predicted.
 - Stormwater Retention and Detention Systems, Including Percolation Systems Utilizing Buried Pipe
 - On-Site Sewage Disposal System Drainfields Which are Also in Compliance With City Regulations
 - Utility Lines and Pipes

The following information is often required for a Critical Areas Permit in Fish & Wildlife Habitat Areas. All Reports are to be prepared by a Qualified Professional. Only those reports that apply to a proposal are required, and it is the responsibility of the applicant to determine which reports will be required. The City of Stevenson maintains a map inventory to aid in this determination and you are encouraged you meet with City staff prior to submitting an application.

Preliminary Habitat Assessment, Including the Following (For Proposals Near Habitat Areas)

- The Name and Contact Information for the Applicant
- The Name and Address of the Qualified Professional Preparing the Report
- The Dates, Names, and Qualifications of the Persons Preparing the Report and Documentation of Any Fieldwork Performed on the Site
- A Description of the General Character of the Property, Including
 - o Location
 - o Existing Developments
 - o Vegetation Types
 - o Adjacent Land Uses
 - o Past Land Uses on the Property (If Available)
- A Detailed Description of the Critical Area and a Qualitative Analysis of its General Condition
- Recent Photographs of the Property, Including Detailed Photos of the Habitat Resource in Question
- The Classifications of the Fish and Wildlife Conservation Area as Defined by this Chapter
- An Outline of Standard Buffer Widths, Available Buffer Reductions, or Potential Opportunities for Enhancement/Mitigation

Habitat Mitigation Plan, Including the Following (For Proposals Affecting Habitat Areas or Buffers)

- The Information Required in a Preliminary Habitat Assessment
- A Site Plan Showing
 - o Critical Areas
 - o Buffers
 - o Dimensions and Limits of Areas to be Cleared
 - o Proposed Construction Sequencing
 - o Grading and Excavation Details, Including Erosion and Sedimentation Control Features
 - o Detailed Site Diagrams or Other Drawings Showing Construction Techniques or Final Outcomes

Critical Areas

Submittal Requirements, Continued

Habitat Mitigation Plan, Continued

- A Description of the Specific Efforts Made to Avoid and Minimize Impacts to Priority Habitats and Their Buffers
- A Brief Narrative of the Proposed Activities Subject to This Chapter and Include Specific Citations of the Applicable Chapter Sections
- The Anticipated Impacts to the Habitat Area or Buffer, the Proposed Mitigation Actions, and the Purposes of the Compensation Measures
- The Environmental Goals and Objectives of the Proposed Mitigation and the Goals and Objectives Must be Related to the Functions and Values of the Impacted Critical Area
- A Program for Monitoring the Construction and Maturation of the Mitigation Project, and Ultimately to Assess the Success or Failure of the Proposed Mitigation Measures
- Measureable Performance Standards for Evaluating Whether or Not the Goals and Objectives of the Mitigation Project have been Successfully Attained and Whether or Not the Requirements of the Chapter have been Met (e.g. Water Quality Standards, Vegetation Abundance Indices, Species Richness and Diversity Targets, Habitat Diversity Indices, etc.)
- The Potential Courses of Action and Any Corrective Measures to be Taken When Monitoring or Evaluation Indicates Projected Performance Standards have Not been Met

The following information is often required for a Critical Areas Permit in Wetland Areas. All Reports are to be prepared by a Qualified Professional. Only those reports that apply to a proposal are required, and it is the responsibility of the applicant to determine which reports will be required. The City of Stevenson maintains a map inventory to aid in this determination and you are encouraged you meet with City staff prior to submitting an application.

Preliminary Wetland Assessment

- The Name and Contact Information for the Applicant
- The Name and Address of the Qualified Professional Preparing the Report
- The Project Extent and Location
- The Soil Series Information for the Site According to Natural Resources Conservation Service Maps
- A Narrative Explaining
 - The Existing Improvements or Developments on the Site
 - The Surrounding Land Uses
 - The Detailed Notes on Vegetation Present
 - The Results of Soil Test Pits Including Soil Color and Saturation Levels
 - The Presence or Absence of Wetland Indicators
- The Photographs of the Site

Wetland Delineation (For Proposals on Sites Containing Wetlands)

- The Name and Contact Information for the Applicant
- The Name and Address of the Primary Author(s) of the Wetland Delineation Report
- A USGS Topographic Map With Site Clearly Defined
- A National Wetland Inventory Map Showing Site
- A Soil Conservation Service Soils Map of the Site
- A Site Map at a Scale no Smaller than 1"=400", if Practical, Showing
 - Wetland Boundaries (As Staked and Flagged in the Field)
 - Sample Sites and Sample Transects
 - Boundaries of Forested Areas
 - Boundaries of Wetland Rating Classes if Multiple Rating Classes Exist
- An Aerial Photograph of the Project Area (At a Scale No Smaller than 1"=400")
- A Discussion of Methods and Results With Special Emphasis on Technique Used from the Wetlands Delineation Manual
- The Acreage of Each Wetland Identified on the Site Based on a Survey
- All Completed Field Data Sheets (US Army Corps of Engineers Format for Three Parameter Application) Numbered to Correspond to Each Sample Site

Critical Areas

Submittal Requirements, Continued

- | | |
|--------------------------|--|
| <input type="checkbox"/> | <p>Wetland Mitigation Plan, Including the Following (For Proposals Impacting Wetlands and Buffers)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Baseline Information <ul style="list-style-type: none"> ○ The Wetland Delineation Report ○ Descriptions and Maps of the Vegetative Conditions at the Site ○ Descriptions and Maps of the Hydrological Conditions at the Site ○ A Description of the Soil Conditions at the Site Based on On-Site Analysis ○ A topographic Map of the Site ○ An Assessment of the Functional Uses of the Existing Wetland and Buffer <input type="checkbox"/> Enhancement Plan <ul style="list-style-type: none"> ○ The Goals and Objectives of the Proposed Project ○ A Description of the Wetland Type to be Created, Rehabilitated, Restored, or Enhanced ○ A Description of the Specific Efforts Made to Avoid and Minimize Impacts to the Wetland Areas and Their Buffers ○ A Map Showing Proposed Wetland and Buffer (Base and Proposed Buffers) ○ A Site Plan ○ A Discussion and Map of the Density and Materials of Plantings ○ A Preliminary Drainage Plan Identifying the Location of Proposed Drainage Facilities ○ A Discussion of Water Sources for the Wetland <input type="checkbox"/> Detailed Construction Plan <ul style="list-style-type: none"> ○ The Construction Sequence ○ The Grading and Excavation Details ○ The Water and Nutrient Requirements for Planting ○ The Specification of Substrate Stockpiling Techniques ○ The Planting Instructions ○ Site and Cross-Sectional Diagrams ○ A Topographic Map Showing Slope Percentage and Final Grade <input type="checkbox"/> Quantitative Performance Standards <input type="checkbox"/> Monitoring Program (5-Year Minimum) <ul style="list-style-type: none"> ○ Hydrologic Monitoring Stations ○ Vegetation Plots ○ Photo Stations <input type="checkbox"/> Contingency Plan |
|--------------------------|--|

The following information is required in order to determine whether a Critical Areas Report is necessary for Critical Aquifer Recharge Areas. If required, all Reports are to be prepared by a Qualified Professional. Proposals meeting one or more of the Primary Criteria below, or two or more of the Secondary Criteria below, then a Vulnerability Rating Report will be required. It is the responsibility of the applicant to determine which reports will be required. The City of Stevenson maintains a map inventory to aid in this determination and you are encouraged you meet with City staff prior to submitting an application.

- | | |
|--------------------------|---|
| <input type="checkbox"/> | <p>Primary Criteria</p> <ul style="list-style-type: none"> <input type="checkbox"/> The Development Proposal is Within a Wellhead Protection Area Designated Under WAC 246-290 Public Water Supplies <input type="checkbox"/> The Development Proposal is Within an Aquifer Recharge Area Mapped and Identified by a Qualified Groundwater Scientist <input type="checkbox"/> The Site will be Utilized for Processing, Storing, or Handling a Hazardous Substance (as now or hereafter defined in RCW 70.105D Hazardous Waste Cleanup-Model Toxics Control Act), in Applications or Quantities Larger Than is Typical of Household Use <input type="checkbox"/> The Site Will be Utilized for Hazardous Waste Treatment and Storage as Set Forth in RCW 70.105 Hazardous Waste Management, as now or hereafter amended |
| <input type="checkbox"/> | <p>Secondary Criteria</p> <ul style="list-style-type: none"> <input type="checkbox"/> The Site Contains Highly Permeable Soils as Designated in the NRCS Soil Survey for Skamania County <input type="checkbox"/> The Development Proposal is Within a Sole Source Aquifer Recharge Area Designated Pursuant to the Federal Safe Drinking Water Act |

Critical Areas

Submittal Requirements, Continued

- Secondary Criteria, Continued**
 - The Development Proposal Involves a Major or Short Subdivision and Includes Present or Future Plans to Construct Three or More Dwelling units Where the Dwelling Units will not be Connected to a Public Sewer System and Any of the Lots are Less Than One (1) Net Acre in Size
 - The Development Proposal Involves a Commercial and/or Industrial Site That is not on a Public Sewer System and the Main Structure Exceeds Four Thousand (4,000) Square Feet
 - The Development is Within Two Hundred (200) Feet of the Ordinary High Water Mark of a Perennial River, Stream, Lake or Pond
- Vulnerability Rating, Including the Following** (When Required)
 - Permeability of the Vadose Zone (Upper and Lower)
 - Depth to Groundwater
 - Slope or Gradient
 - Contaminant Loading Rating

The following information is required to evaluate whether a Written Determination of Exemption will be issued. All requirements of the specific exemption request must be met in order for the City to issue a Written Determination of Exemption. Only those reports that apply to a proposal are required, and it is the responsibility of the applicant to determine which reports will be required.

- | | |
|--|--|
| <input type="checkbox"/> Forest Practices | <input type="checkbox"/> Agricultural Activities |
| <input type="checkbox"/> Seismic Hazard Areas | <input type="checkbox"/> Volcanic Hazard Areas |
| <input type="checkbox"/> Frequently Flooded Areas | <input type="checkbox"/> Weed Control |
| <input type="checkbox"/> Tree Removal | <input type="checkbox"/> Site Investigation |
| <input type="checkbox"/> Recreation | <input type="checkbox"/> Emergencies |
| <input type="checkbox"/> Utilities | <input type="checkbox"/> Trails |
| <input type="checkbox"/> Activities Subject to Previous Review | |

The following information is required when an applicant asserts that SMC 18.13 would deny all Reasonable Economic Use of a legal lot. All analyses and reports are to be prepared by a Qualified Professional. Only those reports that apply to a proposal are required, and it is the responsibility of the applicant to determine which reports will be required. The City of Stevenson maintains a map inventory to aid in this determination and you are encouraged you meet with City staff prior to submitting an application.

- A Description of the Amount of the Site which is within the Setbacks and Buffers Required Under this Chapter and SMC 17- Zoning**
- An Analysis of the Impact that the Proposal would have on all Applicable Critical Areas**
- An Analysis of whether any other Reasonable Use is Possible that would Result in Less Impact on Critical Areas and Associated Buffers**
- An Analysis of any Modifications Needed to the Required Front, Side, and Rear Setbacks; and Buffer Widths to Provide for a Reasonable use of the Site while Providing Greater Protection to Critical Areas**
- A Design of the Proposal so that the Amount of Development Proposed as Reasonable Use will have the Least Impact Practicable on Critical Areas**
- Such Other Information as the City Determines is Reasonably Necessary to Evaluate the Issue of Reasonable Use as it Relates to the Proposal**

Tracking Number: _____



VARIANCE APPLICATION

PO Box 371 Stevenson, Washington 98648

Phone: (509)427-5970 Fax: (509)427-8202

Applicant/Contact: _____
 Mailing Address: _____
 Phone: _____ Fax: _____
 E-Mail Address (Optional): _____

Property Owner: _____
 Mailing Address: _____
 Phone: _____ Fax: _____

If There are Additional Property Owners, Please Attach Additional Pages and Signatures as Necessary

Property Address (Or Nearest Intersection): _____

Tax Parcel Number: _____ **Zoning:** _____

Lot Size: _____ **Current Use of Property:** _____

Brief Narrative of Request: _____

Water Supply Source: _____ **Sewage Disposal Method:** _____

I/we hereby provide written authorization for the City to reasonably access to the subject property to examine the proposal and carry out the administrative duties of the Stevenson Municipal Code.

I/we hereby certify my/our awareness that application fees are non-refundable, there is no guarantee that a permit will be issued, and that any permit issued as a result of this application may be revoked if at any time in the future it is determined that the statements in support of this application are false or misleading.

Incomplete applications will not be accepted. • Please ensure that all submittals are included

Signature of Applicant: _____ **Date:** _____

Signature of Property Owner: _____ **Date:** _____

For Official Use Only:
 Date Application Received _____ • Date Application Complete _____



SUBMIT TO:
City Hall
7121 NE Loop Road

Variance

Submittal Requirements

A Variance is an authorization from the Board of Adjustment to a property owner to depart from the literal requirements of the provisions of SMC 17-Zoning or SMC 16.02-Short Plat & Short Subdivisions because the strict enforcement of their provisions would cause the owner undue hardship in view of the facts and conditions applying to the specific parcel of property. A Variance will be granted by the Board of Adjustment when it finds that:

1. *The granting of the variance will not constitute a grant of special privilege inconsistent with the limitations upon other properties in the vicinity and district in which the subject property is located;*
2. *The strict application of the land use regulation is found to deprive the subject property of rights and privileges enjoyed by other property in the vicinity and under identical zoning district classifications, because of special circumstances applicable to the subject property, including size, shape, topography, location or surroundings;*
3. *The granting of the variance will not be materially detrimental to the public welfare or injurious to the property or improvements in the vicinity and zoning district in which the subject property is located.*
4. *The granting of the variance will not be detrimental to the purposes of the land use regulatory code from which the variance is requested, and will not conflict with the goals and policies of the comprehensive plan;*
5. *The hardship creating the need for a variance is not self-imposed and that the variance requested is the minimum variance which will alleviate the hardship.*

The following information is required for all Variance Applications. Applications without the required information will not be accepted. Site plans are to be submitted on 8½"x11" or 11"x17" paper, and drawn to a standard engineering scale (e.g. 1"=10', 1"=20', ¼"=1', etc.).

- Application Fee** (Amount: _____ Date: _____ Receipt #: _____)
- Completed and Signed Variance Application**
- Descriptions of Any Existing Restrictive Covenants or Conditions**
- Two (2) Copies of a Site Plan, Clearly Showing the Following:**
 - The Location and Dimensions of All Existing and Proposed Structures
 - A Floor Plan of Any Structure Involved with a Variance Request
 - A North Arrow and Scale
 - The Location and Dimensions of Any Drainfields, Public Utilities, Easements, Rights-of-Way or Streets within or Adjacent to Any Affected Lot
 - The Location and Dimensions of All Parking Areas
- A Narrative Discussing How the Proposal Meets the Five (5) Criteria Described Above**
- A List of the Names and Mailing Addresses of All Property Owners Within 300 Feet of the Subject Property** (Obtainable Through the Skamania County Assessor's Office)
- Any Other Information Requested by the Planning Director to Aid the Planning Commission in Evaluating the Variance Request**



APPLICATION FOR IMPROVEMENT

Page 1 of 2

SUBMIT TO:

City of Stevenson
 7121 E Loop Road
 PO Box 371
 Stevenson, WA 98648
 Phone 509-427-5970 FAX 509-427-8202
<http://ci.stevenson.wa.us/>

For Office Use Only:

Date Received: _____

Building Permit # _____

This *Application for Improvement* is used to apply for Building Permits, Plumbing Permits, Mechanical Permits, Roofing Permits, Fill & Grade Permits, Land Use Permits, Sign Permits, etc. Two copies of a completed Site Plan are to be submitted with your Application for Improvement. Additional items are required to be submitted for one and two family dwellings and multi-family / commercial buildings (see separate checklists).

Owner:

Name: _____

Mailing Address: _____

City, State, Zip: _____

Phone Numbers: _____

Physical Address: _____

Tax Lot # _____

Approach Street Name: _____

Nearest Cross Streets: _____

Contractor:

Name: _____

Contractors License #: _____

Mailing Address: _____

City, State, Zip: _____

Phone Numbers: _____

Complete description of all work to be performed: (this section must be completed on all applications)

Building ... Width _____ Length _____ Height _____ Area (sq.ft.) _____

Applicant's estimate of value \$ _____



APPLICATION FOR IMPROVEMENT

Page 2 of 2

I hereby certify that the above information is true and correct, and agree to comply with all City Ordinances and State Laws regulating building and construction. Furthermore, I understand that I will be subject to field inspections and plan checks in accordance with the 2012 International Construction Code. I hereby authorize the City of Stevenson reasonable access to the subject property to examine the proposal and carry out the administrative duties of the Stevenson Municipal Code.

As an owner/builder you are allowed to contract with licensed contractors to complete your building project. By signing this form you are stating you have no intent to hire unlicensed personnel to complete your construction project.

If applicant has not received prior approval for water and sewer service, the building permit may be delayed.

This APPLICATION becomes null and void if a Permit is not issued within 180 days after completion of review by the Building Inspector and/or Planner. The applicant may request **in writing** an extension of the application period subject to Planning and Building Inspector approvals.

Signature

Date


Printed Name

IMPORTANT TAX BREAK INFORMATION FOR ADDITIONS TO SINGLE FAMILY RESIDENCES

When you construct an ADDITION onto a single-family residence, you are allowed a tax break for up to three years, PROVIDED:

1. You file a "Notice of Intent to Construct" prior to the improvement being made. The forms are available from the Skamania County Assessor's office.
2. The improvement represents 30% or less of the original value of the structure.
3. The exemption cannot be claimed more than once in a five year period.
4. The tax break starts after you file a "Notice of Completion" with the Assessor's Office.

*** For additional information please call the County Assessor's office at (509) 427-3720.

Planning Fees		The City of Stevenson		509-427-5970	
		Effective August 1st, 2017		509-427-8202 (fax)	
Resolution 296		PO Box 371		www.ci.stevenson.wa.us	
Stevenson, WA 98648					
Annexation		Planned Unit Development		\$1,500.00 plus \$75 per lot	
Election Method	\$750.00	Reduction in City Boundaries		\$1,000.00	
Notice of Intent	\$500.00	Shorelines Management Program			
Petition	\$250.00	Substantial Development,		\$1,000.00	
Zoning New Areas	\$250.00	Conditional Use, and/or Variance			
Appeals		Statement of Exemption		\$25.00	
To City Council	\$0.00	Short Plat		\$1,500.00 plus \$75 per lot	
To Board of Adjustment	\$0.00	SEPA Checklist		\$200.00	
Boundary Line Adjustment		Subdivision			
Typical	\$150.00	Preliminary Plat		\$1,500.00 plus \$75 per lot	
Combination of Lots	\$75.00	Variance		\$750.00	
Comprehensive Plan Revision	\$1,250.00	Final Plat		\$0.00 plus \$100 per lot	
Conditional Use	\$500.00	Variance		\$500.00	
Critical Areas		City Utility Extension Beyond Plan Area		\$500.00	
Written Determination of Exemption	\$25.00	Zoning			
Critical Areas Permit (CAP)	\$200.00	Resolution of Intent		\$1,000.00	
CAP Plus Mitigation & Monitoring Plans	\$500.00	Rezoning Request		\$1,250.00	
Reasonable Use Allowance (RUA)	\$300.00	Zoning Interpretation		\$0.00	
RUA Plus Mitigation & Monitoring Plans	\$600.00	Zoning Verification Letter		\$200.00	
Land Use/ Building Permit	\$25.00	Miscellaneous Charges:			
Nonconforming Use Review (BOA)	\$500.00	8 1/2 x 11 & 8 1/2 x 14 copies		\$0.10	
Ordinance Revisions	\$1,000.00	11 x 17 copies		\$0.25	
Parking		Color City Map (11 x 17)		\$1.50	
Joint Use of Parking	\$500.00	Zoning Map		\$1.50	
Parking Interpretation	\$0.00	Blank Mylar		\$50.00	
*Outside Consultant Review Fees					
When it is necessary to utilize the services of professional consultants such as but not limited to engineers, surveyors, hydrologists, biologists or other specialists to assist the City with its review of the applications identified in this Fee Schedule (i.e., SEPA, Short Plat, Planned Unit Development, Subdivision, Critical Areas, Mobile Home Park, etc.), the costs for the outside consultant's reviews will be the responsibility of the applicant. The costs for these services will be billed monthly to the applicant based on all actual costs for labor,					
**Publication, Recording & Election Fees					
Publication fees are included in application fees, however, when it is necessary to record a document associated with a successful application and/or when it is necessary to hold an election associated with a request, the actual cost of such recording and/or election shall be the responsibility of the applicant.					
***Hearing Examiner					
For any appeal or proposal reviewed by the City of Stevenson Hearing Examiner, 50% of the costs for the Hearing Examiner will be the responsibility of the proponent. This fee will be charged in lieu of the amounts listed above. The costs for these services will be billed monthly to the applicant based at 50% of the actual invoice received by the City. Final permits and/or plat approvals will not be issued until all costs have been met.					
***Planned Unit Developments					
Subdivision Preliminary Plat and Short Plat application fees may be waived, at the discretion of the Planning Director, for projects which have obtained approval as a Planned Unit Development.					


CITY OF STEVENSON BUILDING PERMIT FEES

City of Stevenson
 PO Box 371, Stevenson, WA 98648
 Phone 509-427-5970 FAX 509-427-8202
<http://ci.stevenson.wa.us/>

A. Building Permits:

The determination of value or valuation under any of the provisions of this code shall be made by the Building Official. The Building Official shall use the square footage building valuation data standards set forth in the International Code Council's Building Safety Journal as updated to guide the establishment of valuation for a permit. A copy of said valuation standards shall be on file and available for public use and inspection at Stevenson City Hall.

<u>Total Valuation</u>	<u>Fee</u>
\$1.00 to \$500.00	\$23.50
\$501 to \$2,000	\$23.50 for the first \$500.00 plus \$3.05 for each additional \$1,000.00, or fraction thereof, to and including \$2,000.00.
\$2,001 to \$25,000	\$69.25 for the first \$2,000.00 plus \$14.00 for each additional \$1,000.00 or fraction thereof, to and including \$25,000.00.
\$25,001 to \$50,000	\$391.25 for the first \$25,000.00 plus \$10.10 for each additional \$1,000.00, or fraction thereof, to and including 50,000.00
\$50,001 to \$100,000	\$643.75 for the first \$50,000.00 plus \$7.00 for each additional \$1,000, or fraction thereof, to and including 100,000.00
\$100,001 to \$500,000	\$993.75 for the first \$100,000.00 plus \$5.60 for each additional \$1,000.00, or fraction thereof, to and including \$500,000.00
\$500,001 to \$1,000,000	\$3,233.75 for the first \$500,000.00 plus \$4.75 for each additional \$1,000.00, or fraction thereof, to and including \$1,000,000.00.
\$1,000,001 and up	\$5,608.75 for the first \$1,000,000.00 plus \$3.65 for each additional \$1,000.00, or fraction thereof.
+ Plan Review Fees	65% of the building permit fee.
A1. Roofing Permits:	Fees will be \$50.00 for the first \$3,200 value plus \$50.00 for each additional \$3,200 or fraction thereof.
A2. Public Fireworks Display Permit (RCW 70.77.131)	\$90.00
A3. Manufactured Homes:	Fees for placement permits follow the schedule above with the exception of the 65% fee for the plan review.
A4. "SAME AS" plans:	The Building Official may waive a portion of the plan review fee if the same plan is submitted for more than one permit.
A5. Demolition Permits	(Fees will be a flat assessment. Applies only to structures over 200 square feet) \$10.00
A6. Fire Suppression Systems.	Fees for Fire Suppression or Prevention Systems will follow the schedule above (A).
E. Other Inspections and Fees:	
1. Inspections outside of normal business hours (minimum charge - two hours)	\$52.00/hr
2. Re-Inspections	\$45.00/hr
3. Inspections for which no fee is specifically indicated (minimum charge - one-half (1/2) hour)	\$45.00/hr
4. Additional plan review required by changes, additions or revisions to plans (minimum charge - one-half (1/2) hour)	\$45.00/hr
5. For use of outside consultants for plan checking and inspections, or both	Actual costs
F. Planning Department Review of Building Permit Application	\$10.00
1. For new construction, remodels with a foot print alteration, all sign and grading permits.	

IMPORTANT TAX BREAK INFORMATION FOR ADDITIONS TO SINGLE FAMILY RESIDENCES

When you construct an ADDITION onto a single-family residence, you are allowed a tax break for a period of three years, PROVIDED:

1. You file a "Notice of Intent to Construct" PRIOR TO THE IMPROVEMENT BEING MADE. These forms are available from the Skamania County Assessor's office.
2. The improvement represents 30% or less of the CURRENT ASSESSED VALUE of the structure.
3. The exemption cannot be claimed more than once in a five year period.
4. The tax break starts AFTER you file a "Notice of Completion" with the Assessor's Office. Otherwise you will be taxed at the regular rate.

*** For additional information call the County Assessor.

H:\Building Department\2016 Bldg Stuff\Application for Improvement etc



MECHANICAL FEE SCHEDULE

PAGE 1 OF 2

For Office Use Only:

Date Received: _____

Permit # _____

Owner Name: _____

Submit this fee schedule attached to a completed "Application for Improvement" when mechanical fees apply.
 A Mechanical Permit may be part of a Building Permit or issued as a stand-alone permit when applicable.

Mechanical Permit Fee Schedule:
Fee

1. For the issuance of each mechanical permit	\$23.50	
2. For issuing each supplemental permit for which the original permit has not expired, been canceled or finalized.	\$10.70	

Unit Fee Schedule

(Note: The following do not include permit-issuing fees)

1. Furnaces		
For the installation or relocation of forced-air or gravity-type furnace or burner, including ducts and vents attached to such appliance up to and including 100,000 btu/h (29.3 kW)	\$14.80	
For the installation or relocation of forced-air or gravity-type furnace or burner, including ducts and vents attached to such appliance over 100,000 btu/h (29.3 kW)	\$18.20	
For the installation or relocation of each floor furnace, including vent	\$14.80	
For the installation or relocation of each suspended heater, recessed wall heater or floor mounted unit heater.	\$14.80	
2. Appliance Vents		
For the installation, relocation or replacement of each appliance vent installed and not included in an appliance permit.	\$7.25	
3. Repairs or Additions		
For the repair of, the alternation of, or addition to each heating appliance, refrigeration unit, cooling unit, absorption unit, or each heating, cooling absorption or evaporative cooling system, including installation of controls regulated by the Mechanical Code.	\$13.70	
4. Boilers, Compressors and Absorption Systems		
For the installation or relocation of each boiler or compressor to and including 3 horsepower (10.6 kW) or each absorption system to and including 100,000 Btu/h (29.3kW)	\$14.70	
For the installation or relocation of each boiler or compressor over 3 horsepower (10.6 kW) to and including 15 horsepower (52.7 kW), or each absorption system over 100,000 Btu/h (29.3kW) to and including 500,000 Btu/h (146.6kW)	\$27.15	
For the installation or relocation of each boiler or compressor over 15 horsepower (52.7 kW) to and including 30 horsepower (105.5 kW), or each absorption system over 500,000 Btu/h (146.6 kW) to and including 1,000,000 Btu/h (291.3 kW)	\$37.25	
For the installation or relocation of each boiler or compressor over 30 horsepower (105.7 kW) to and including 50 horsepower (176 kW), or each absorption system over 1,000,000 Btu/h (293.1 kW) to and including 1,750,000 Btu/h (512.9 kW)	\$55.47	
For the installation or relocation of each boiler or compressor over 50 horsepower (176 kW) or each absorption system over 1,750,000 Btu/h (512.9 kW).	\$92.65	



MECHANICAL FEE SCHEDULE
PAGE 2 OF 2

5. Air Handlers	
For each air handling unit to and including 10,000 cubic feet per minute (cfm) (4719 L/s), including ducts attached thereto <i>Note: This fee does not apply to an air-handling unit which is a portion of a factory-assembled appliance, cooling system, evaporative cooler or absorption unit for which a permit is required elsewhere in the Mechanical Code.</i>	\$10.65
For each air-handling unit over 10,000 cfm (4710 L/s)	\$18.10
6. Evaporative Coolers	
For each evaporative cooler other than a portable type	\$10.65
7. Ventilation and Exhaust	
For each ventilation fan connected to a single duct.	\$7.25
For each ventilation system which is not a portion of any heating or air-condition system.	\$10.65
For the install action of each hood which is served by a mechanical exhaust, including the ducts	\$10.65
8. Incinerators	
For the installation or relocation of each domestic type incinerator	\$18.20
9. Solid Fuel Burning Appliance	
For the installation or relocation of each domestic type Solid Fuel Burning Appliance	\$30.00
10. Miscellaneous	
When applicable, permit fees for fuel gas piping shall be as follows:	
For each gas piping system of one to four outlets	\$5.00
For each gas piping system of five or more outlets, for each outlet	\$1.00
When applicable, permit fees for process piping shall be as follows:	
For each appliance or piece of equipment regulated by the Mechanical Code but not classed in other application categories or for which no other fee is listed in the table.	\$10.65

Total	
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PLUMBING FEE SCHEDULE

For Office Use Only:

Date Received: _____

Permit # _____

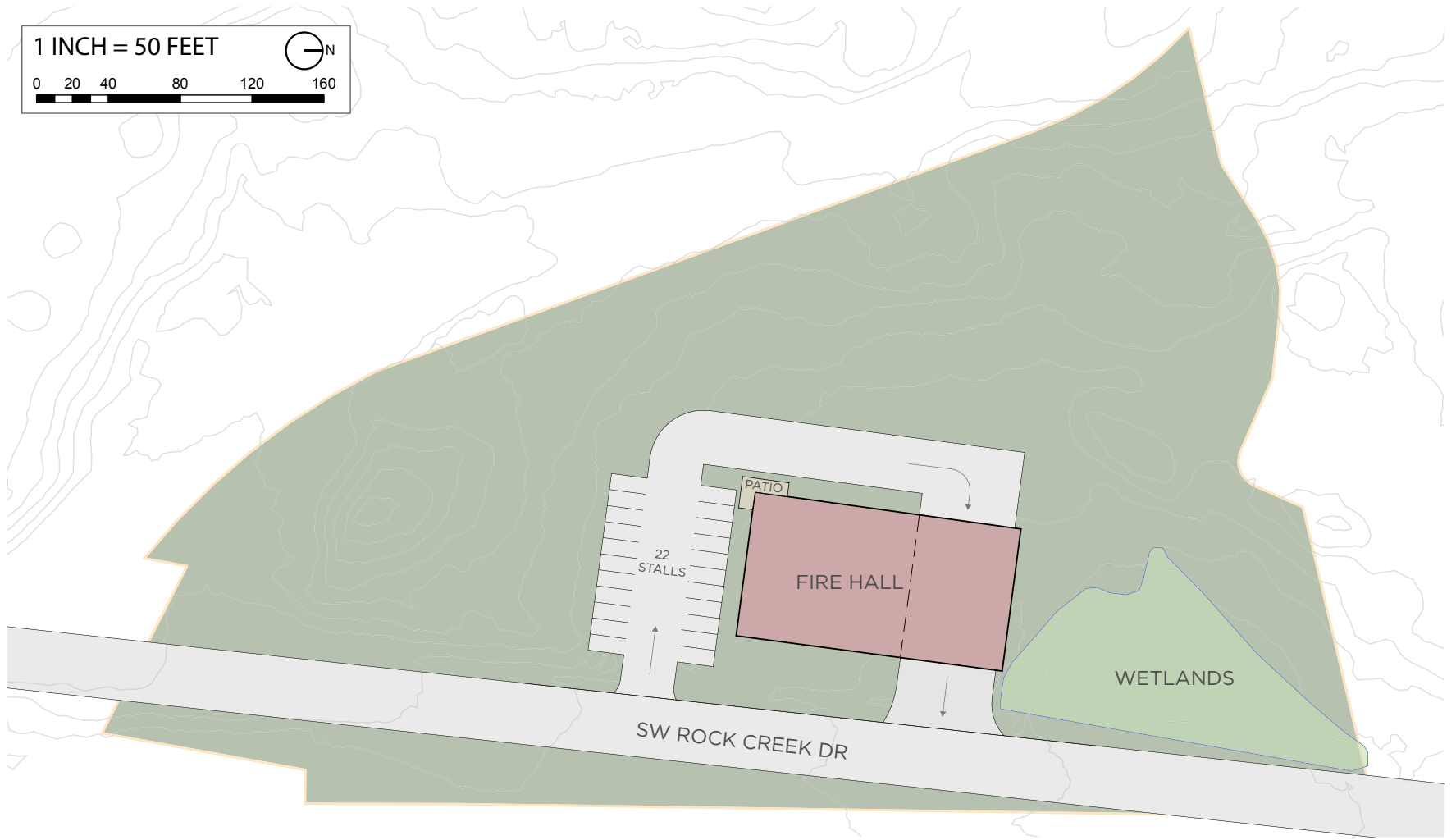
Owner Name: _____

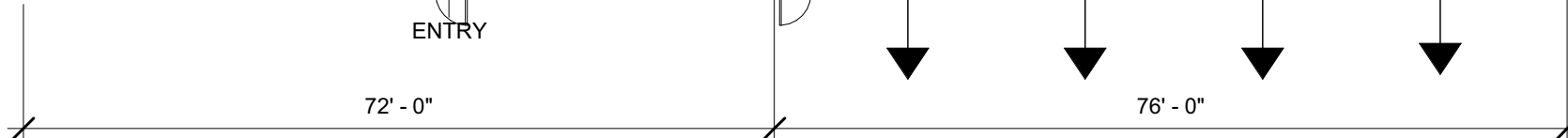
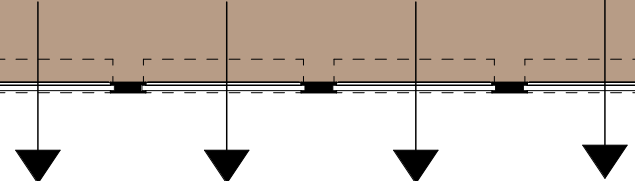
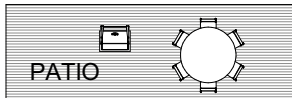
Submit this fee schedule attached to a completed "Application for Improvement" when plumbing fees apply. A Plumbing Permit may be part of a Building Permit or issued as a stand-alone permit when applicable.

Plumbing Permit Fee Schedule:		Fee:
1. For issuing each permit.	\$22.00	
2. For issuing each supplemental permit	\$10.00	
Unit Fee Schedule		
(Note: The following do not include permit-issuing fee)		
1. For each additional plumbing fixture on one trap or a set of fixtures on one trap (including water, drainage piping and backflow protection therefore	\$7.00	
2. For each building sewer and each trailer park sewer	\$15.00	
3. Rainwater systems - per drain (inside building)	\$7.00	
4. For each private sewage disposal system (where permitted)	\$40.00	
5. For each water heater and or vent	\$7.00	
6. For each gas piping system of one to five outlets	\$5.00	
7. For each additional gas piping system outlet, per outlet	\$1.00	
8. For each industrial waste pretreatment interceptor including its trap and vent, except kitchen-type grease interceptors functioning as fixture traps	\$7.00	
9. For each installation, alteration or repair of water piping and/or water, each	\$7.00	
10. For each repair or alteration of a drainage or vent piping, each fixture	\$7.00	
11. For each lawn sprinkler system on any one meter including backflow protection devices therefore.	\$7.00	
12. For atmospheric-type vacuum breakers no included in item 12: 1 to 5	\$5.00	
Over 5, each	\$1.00	
13. For each back flow protective device other than atmospheric type vacuum breakers: 2 inch (51 mm) diameter and smaller	\$7.00	
Over 2 inch (51 mm) diameter	\$15.00	
14. For each gray water system	\$40.00	
15. For initial installation and testing of a reclaimed water system.	\$30.00	
16. For each annual cross-connection testing of a reclaimed water system (excluding initial test)	\$32.05	
17. For each medical gas piping system serving one to five inlet(s)/outlet(s) for a specific gas	\$53.40	
18. For each additional medical gas inlet(s)/outlets(s)	\$5.35	
	Total	

**Site Assessment
City of Stevenson
Stevenson, Washington**

**Appendix E
Schematic Site and Floor Plan**







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