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Mount Vernon Fire Department

NEEDS ASSESSMENT & STATION PLANNING

December 14, 2018



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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INTRODUCTION

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PROJECT TEAM

MOUNT VERNON FIRE DEPARTMENT

- Bryan Brice - Fire Chief
- Mike O'Dell - Captain



CITY OF MOUNT VERNON

- Jill Boudreau - Mayor
- Peter Donovan - Project Development Manager
- Rebecca Lowell - Principal Planner
- Alan Danforth - Engineering Manager



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- Jeff Humphreys - Principal in Charge
- Brett Hanson - Architect of Record
- Paul Whitehill - Project Manager
- David Delendeck, Chauncey Drinon - Project Designer
- Josh McDowell, Sohalia Starks - Structural Engineering
- Steven Tuttle, Nicole Ferreira - Landscape Architecture
- Michael Chen, Gary Yao - Land Use Planning



HKP ARCHITECTS

- Julie Biazek - Public Outreach/Community Involvement



CUMMING

- Noel Whorton - Construction Cost Estimator
- Yar Sheets - Construction Cost Estimator



SAZAN GROUP

- Patrick Jung - Principal
- Elmo Acacio - Electrical Engineering



PERTEET

- Brian Caferro - Civil Engineering



PROJECT INTRODUCTION

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The City of Mount Vernon Fire Department is seeking to address operational, health and wellness, security, and building system issues with all three of their fire stations. Station 1 is the oldest station and was built in 1964. Stations 2 and 3 were built between 1996 to 1998. The objective is to build a new Station 1, while renovating Stations 2 and 3 to meet the department's needs and goals. These include:

- Organizing personnel and apparatus spaces to ensure the right resources at the right stations;
- Addressing safety concerns related to diesel exhaust pollutants;
- Addressing space needs deficiencies;
- Providing needed security for the sites and buildings; and
- Bringing mechanical and electrical systems up to current energy code.

To aid the City of Mount Vernon with these efforts, the City hired Mackenzie to assist with an evaluation of the existing conditions of the current facilities and work with Department staff to determine the needs of the Mount Vernon Fire Department.

Established in 1960, Mackenzie is based in Portland, Oregon, with offices in Seattle and Vancouver, Washington. The firm 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 Washington and Oregon for more than 50 counties and municipalities, providing design and engineering services for more than 50 fire facilities, 20 police facilities, and seven municipal office buildings.

At the start of the process, the goal was to develop a new Station 1 to meet the 50-year needs of the Department. A facility program was compiled which includes the spaces identified by the Mount Vernon Fire Department. The program includes the relocation of the administrative Fire Department staff, currently at Station 2, and an antique apparatus (1927 La France fire engine). This new facility is envisioned to be appropriately scaled and respectful of its historic downtown context. It will be developed to meet the current and future needs of the Mount Vernon Fire Department.

The information contained within this report provides a detailed overview of Mackenzie's work with the Mount Vernon Fire Department and City Staff. 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 Mount Vernon's consideration. Recommendations for next steps have been outlined in this report.

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 these facilities not only improve operational efficiency on a day-to-day basis, but are capable of evolving over the life of the buildings, resisting and responding to emergency events, providing critical services for the citizens of Mount Vernon, 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 City and the Mount Vernon Fire Department to determine needs for all three stations, and provide advanced concept development for Station 1, as well as facility assessments of Stations 2 and 3. This report includes the following tasks:

1. Existing Conditions Evaluation
2. Program Development
3. Concept Design
4. Public Outreach
5. Concept Design Finalization
6. Project Cost Estimate
7. Final Report and Presentation of Findings

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 multi-disciplinary approach, extensive public project experience, and lessons learned on previous fire stations and public building projects, the team provided architectural, structural, space planning, site planning, and land use planning services to meet the project's objectives and deliverables. Additionally, Mackenzie teamed with a local firm, HKP Architects, to provide expertise in public

outreach and campaign strategy. Mackenzie worked with the City and the Mount Vernon Fire Department staff to confirm the key stakeholders who needed to be involved throughout the design process. These stakeholders also provided support and strengthened dialogue between the Design Team and the Stakeholder Groups.

Task #1: Existing Conditions Assessment

Because Station 1 was built in 1964 when the department was a volunteer agency, it has substantial deficiencies and has reached the end of its useful life as an essential facility. The intent is to replace Station 1 completely. An existing facility evaluation was not performed on this station.

Mackenzie toured existing Station 2 at 1901 N Laventure Road and Station 3 at 4701 East Division Street. We examined and documented the current space deficiencies, operations, and structural deficiencies of the existing facilities as it pertains to seismic design requirements for an essential facility. This evaluation set the stage for future programming dialogue around operational requirements, department culture, and required adjacencies. In general, these are indicative of fire station facilities, as well as Mount Vernon Fire Department. The preliminary focus of this task was to examine and document: existing infrastructure; current conditions of health and welfare for firefighters; exposure to contaminants/carcinogens; access and current circulation; secure and public parking; ADA compliance; life safety compliance; and additional land use regulatory requirements.

Primary concerns noted through evaluation of the existing facility include:

- Based on the age of fire station 1, which is the oldest station with substantial deficiencies, a full replacement with a new facility is necessary.
- Neither Station 2 nor Station 3 meet the required space needs for apparatus and staff counts to serve their individual communities into the future.
- Stations 2 and 3 do not meet current standards for diesel exhaust capture from apparatus. Currently, this is provided by a whole room exhaust which is ineffective

in capturing a high enough percentage of contaminants.

- Stations 2 and 3 do not provide dedicated turnout gear rooms with their own mechanical systems. Gear is stored within the apparatus bays fully exposed to diesel contaminants.
- Stations 2 and 3 do not provide personnel decon spaces to reduce the spread of contaminants from the apparatus bay to the living quarters. This would include showers, sinks, and lockers to use after an event prior to entering the living quarters.
- Stations 2 and 3 do not currently address site security by means of cameras, gates, or fencing. Security needs to be addressed at building entry points and lobbies.
- Station 3 does not have an exercise room contributing to health and safety issues when the apparatus bay is used for this activity. Station #3 requires reconfiguration of the exercise room to stop contaminants from entering from the apparatus bay.
- The current kitchen, dining room, and dayroom is undersized for a bunk room count of seven at Station 2.
- Stations 2 and 3 do not meet current energy code requirements regarding mechanical, plumbing, electrical, and the thermal envelope.

Task #2: Program Development

In conjunction with examining present conditions, Mackenzie worked closely with the Mount Vernon Fire Department staff to better understand the current and future space needs. The facility program for Station 1 was created using the previously completed program provided by the Mount Vernon Fire Department dated February 9, 2018, while incorporating comments from current Department staff. It includes circulation space and requirements for utilitarian areas, such as mechanical, electrical, and data room spaces. It also includes identified site-related requirements, such as secure parking, visitor parking, staff patio area, recycling and trash enclosure, and emergency generator.

Mackenzie guided the Fire Department through the process of space needs identification and the required space allocations. The Design Team developed a program matrix that identified the

required spaces and the approximate sizes. 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.

The initial 2018 program totaled 20,181 square feet. After rigorous staff review, the Fire Department determined there was additional needs unaccounted for which required increasing the program size to 23,159 square feet. This total square footage includes a 25% increase for general building circulation and interstitial space (i.e. wall thickness), which has been found to be an average escalation for facilities of this type.

Projections for the site indicate a demand of 12 paved parking stalls for the public and 27 spaces for administrative staff, firefighting crews, and fire vehicles.

Task #3: Concept Design

After programming had been confirmed for Station 1, Mackenzie prepared diagrammatic floor and site diagrams for all three stations to evaluate the operational flow and larger programming adjacencies of the sites and buildings. These concepts were developed to graphically represent programming functions and their relationships to each other. They also took into consideration department culture, work philosophies, and general circulation.

Based on the input received from the Fire Department staff, the design team developed conceptual floor plans, site plans, and simple massing for Station 1. Major discussions included general floor plan layout and adjacencies, where the bunk rooms would be located in the building, and how to best plan for a ladder truck on the site. Additionally, with input from the Fire Department staff and City leadership it was determined that Snoqualmie Street would be vacated to allow more site area for the new station. This also provided for a walking path between the new fire station and a future City building to the north. This scheme, which is supported by the long-range planning by the City, Fire Department staff, and City leadership, was advanced and reflected in the drawings provided by Mackenzie.

Included in the discussion was a visioning exercise for Fire Department staff and City leadership to discuss the massing and aesthetic characteristics of Station 1. Character images were provided ranging from traditional to modern. Early on, the Fire Department provided input expressing brick as an important material for their future building. This material was widely shown in the character images.

Task #4: Public Outreach

A public open house was held at Station 1 on October 13, 2018, between 2 and 5 p.m. This event included members of the community who have a vested interest in a new fire station with the purpose of soliciting public input. The open house provided an opportunity for the public to express what a new fire station means to them prior to final development of massing and character for Station 1. This included a series of visioning boards allowing input on the aesthetic character of the new fire station facility.

The design team provided an initial draft concept design to the Fire Department staff, with input from the community, Fire Department staff, and City leadership. Given the range of aesthetic sensibilities noted from the public open house, the design concepts explored three distinct directions which included a range of aesthetic character. This included the tradition, transition and modern.

Task #5: Concept Design Finalization

Based on the selected direction and input that incorporates the massing and aesthetics identified in the visioning process, the Design Team developed a final conceptual design for Station 1. This was a collaborative process where the design team worked with the Department and City staff to refine the preferred scheme. Two options with sub-options were provided and focused on a traditional to transitional aesthetic character. The refined design enabled Mackenzie to establish a more accurate cost estimate in the next task.

Task #6: Project Cost Estimate

Based on the selected conceptual design for Station 1, conceptual floor and site plans for stations 2 and 3, Cumming developed an opinion of probable construction cost for all three fire stations and associated site development improvements for the projects. Construction costs include site improvements and, in the case of Station 1, includes costs for the abandonment of Snoqualmie Street and its redevelopment as a walking path. 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 cost, Mackenzie prepared cost forecasts for consultant costs, including architectural/engineering fees, construction management fees, special inspections, geotechnical inspections, etc. Additionally, Mackenzie worked with the Mount Vernon Fire Department to evaluate and compile potential owner costs, including fixtures, furnishings and equipment, lockers and shelving, fitness equipment, 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 costs, consultant costs, and owner costs.

Task #7: Final Report and Presentation of Findings

This report was finalized based on the process and methodology outlined above and represents the needs of the Mount Vernon Fire Department, City leadership, and the Community. Prior to issuing this final report, a second open house was held at Station 1 on December 4th between 5 to 6 p.m. This provided the community an opportunity to view what the design team produced based on their initial input for their community fire stations and an update on the associated costs.

SUMMARY OF RECOMMENDATIONS

Due to its age and structural deficiencies Mackenzie did not perform a review of existing conditions for the current Station 1. For Stations 2 and 3, an architectural, structural, MEP, Civil, and high-level building systems observation of the existing buildings was performed. These observations included review of the buildings current use, operational deficiencies, and health and safety performance. These 20-year-old buildings are well maintained. They exhibit expected physical deficiencies regarding the Mechanical, Plumbing, and Electrical systems. Structurally, the buildings have the necessary capacity for an Essential Facility. Finish materials are showing signs of wear with

failure in a few isolated areas. Major deficiencies observed are related to the operations of the facilities, hazardous working conditions, needs for additional or reorganized spaces, and station security.

Our recommendation is for the Mount Vernon Fire Department to move forward with a prompt replacement of Station 1 with a new facility that meets their operational and essential facility requirements. We recommend that the department renovate and build additions to the existing Stations 2 and 3. This will bring them up to the same operational requirements.

STATION 1



SITE PLAN
NTS

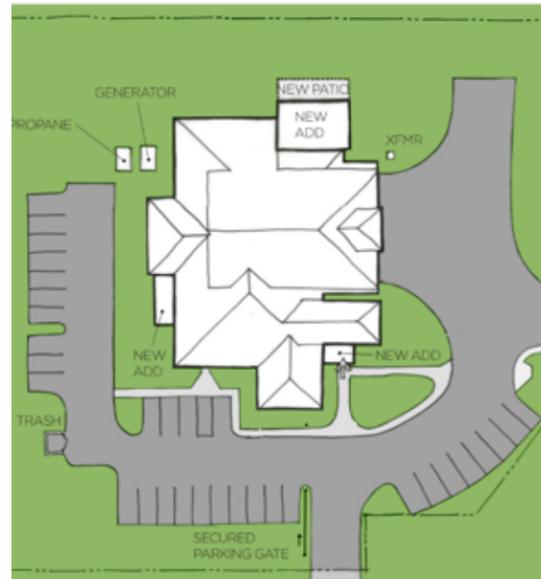


SITE AERIAL PERSPECTIVE



SITE ENTRY PERSPECTIVE

STATION 2

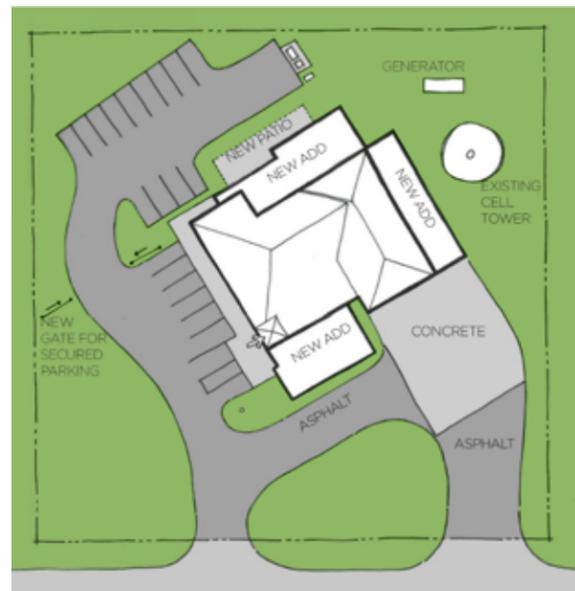


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SITE PLAN
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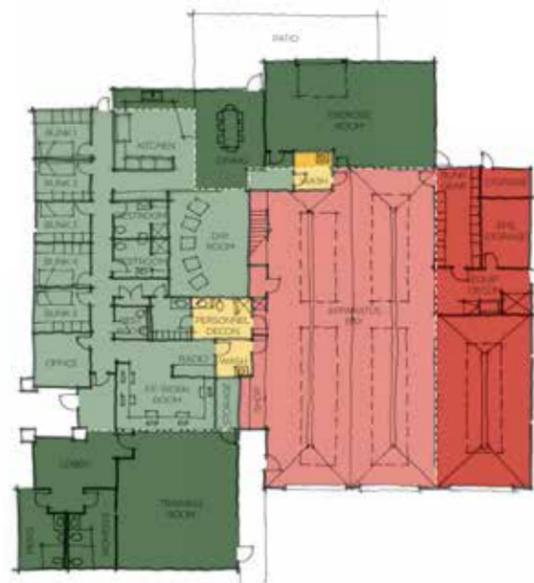


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FIRST FLOOR PLAN
NTS

STATION 3



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SITE PLAN
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FIRST FLOOR PLAN
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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 total projected cost of the projects, as described in this report, are estimated at \$29,814,058 for a new Station 1, and Renovations and Additions to Stations 2 and 3. It is encouraged that the Department and City agree on an expectation of project costs and schedule development to provide clear direction to those that represent the project. Below is a schedule outlining major phases of approximate durations based on our understanding of the City seeking voter approval of a bond in February 13, 2019.

SCHEDULE

Mount Veron Fire Department - Stations 1, 2 & 3																												
Task Name	2018		2019					2020					2021															
	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D		
FACILITY ASSESSMENTS																												
Voter Approval Process			SPECIAL ELECTION 2/13/20																									
STATION 1	STATION 1 - DESIGN + CONSTRUCTION																											
Design																												
Land Use Entitlements																												
Permitting																												
Bidding																												
Construction																												
STATION 2	STATION 2 - DESIGN + CONSTRUCTION																											
Design																												
Permitting																												
Bidding																												
Construction																												
STATION 3	STATION 3 - DESIGN + CONSTRUCTION																											
Design																												
Permitting																												
Bidding																												
Construction																												

Public Outreach/Campaign Process

The Department has begun the process of presenting the needs for the projects to the local community. This effort has entailed a community visioning session to allow attendees to observe the condition of Station 1, and to be informed of the current needs at Stations 2 and 3. During this session, input was solicited from the public to determine the aesthetic goals and civic impact for a new downtown station. It is also suggested that a process for outreach to local community organizations and private businesses, with an interest in the project, should be developed and executed. Providing consistent updates and feedback to the community ensures that the messages reach as many people as possible.

Solicit additional information following successful bond campaign:

- Obtain Topographic Survey for Stations 2 and 3**
- Obtain Hazardous Materials Survey for Stations 2 and 3**
- Obtain Geotechnical Report for Stations 2 and 3**
- Select Owner's Representative, if Desired**

EXISTING FACILITY ASSESSMENT

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EXISTING FACILITY ASSESSMENT

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The Mount Vernon Fire Department services a total population of 35,051 within an area of 12 square miles (plus one additional square mile contractually serving Fire District 1). The Department accounts for three fire stations, 11 apparatus, seven administrative staff, and 48 full-time firefighter/EMT/Paramedics who will respond to approximately 5,900 incidents in 2018, with a projection of 7,100 incidents in 2019.

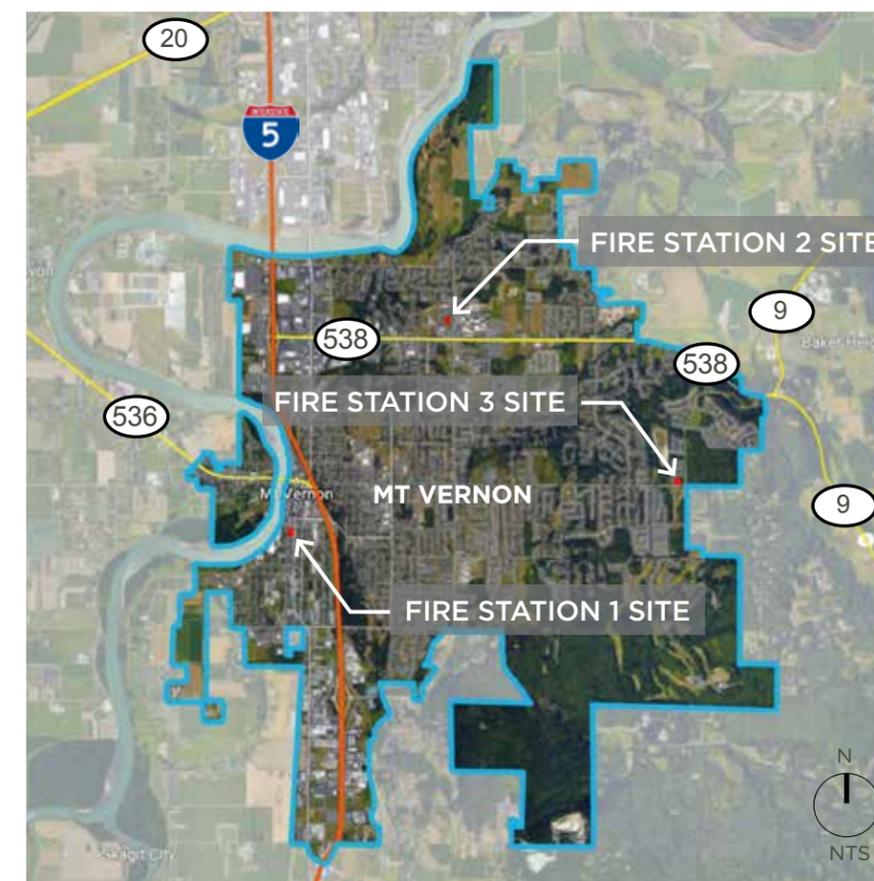
Station 1 occupies a site of approximately 17,000 square feet at 901 South 2nd Street in Mount Vernon, Washington. It was built in 1964 or 54 years old at the time of this report. It staffs a maximum of three, 24-hour employees per shift. Staff is organized in three-shifts which rotate every third day. Due to its age and substantial deficiencies, an existing conditions review was not performed.

Station 2 occupies a site of approximately 80,000 square feet at 1901 North Laventure Road in Mount Vernon, Washington. It was built approximately in

1998 or 20 years old at the time of this report. It staffs a maximum of seven, 24-hour employees per shift. Staff is organized in three-shifts which rotate every third day.

Station 3 occupies approximately 63,000 square feet at 4701 East Division Street in Mount Vernon, Washington. It was built in approximately 1997 or 21 years old at the time of this report. It staffs a maximum of three, 24-hour employees per shift. Staff is organized in three-shifts which rotate every third day.

Mackenzie performed an architectural, structural, MEP, Civil, and high-level building systems observation of the existing buildings. This included review of their current use, operational deficiencies, and health and safety performance. Mackenzie's primary observations have been summarized, along with noted photo identification, on the following pages of this section.



MOUNT VERNON, WASHINGTON

- Established: 1889
- Population: 35,051
- Size: 12.61 sq. miles
- County: Skagit

EVALUATION OF DEFICIENCIES

Overall, Stations 2 and 3 are 20-year-old buildings that are well maintained. The stations are exhibiting expected physical deficiencies regarding the Mechanical, Plumbing, and Electrical systems. Structurally, the buildings do not have the necessary capacity for an Essential Facility. Finish materials are showing signs of wear, as well as failure in a few isolated areas. Major deficiencies observed are related to the operations of the facilities, hazardous working conditions, needs for additional or reorganized spaces, and station security.

Operational Deficiencies

Stations do not have the appropriate spaces, personnel, and apparatus in the right places to serve their individual response areas. For example, the Department would like to relocate a ladder truck from Station 2 to Station 1, where it is needed. Given the community growth of the Station 3 response area, an additional EMS vehicle and new Bunk Rooms are needed. These would require additional space. Station 2 has under-sized living quarters and would benefit by moving the main administration offices to a new Station 1; thus, freeing up space for reorganization.

Health and Wellness Deficiencies

Hazardous working conditions exist in the Apparatus Bays related to exposure to vehicle exhaust at both Station 2 and 3. Currently, there is a whole room exhaust system but no capture at the tail pipe of the apparatus. Turnout gear is fully exposed to contaminants, lacking a dedicated bunker gear room with its own mechanical system. Further, neither Station 2 nor 3 have the necessary transition zones between the Apparatus Bay and the Living Quarters. This means first responders must wash their hands and boots, as well as conduct personnel decon, in close proximity. This is allowing contaminants to be transferred to the sleeping areas, office, and administration areas. Studies have shown a direct connection of such contaminants, carcinogenic exposure, and cancer related deaths in first responders.

Support Space and System Deficiencies

Living quarter areas, including Kitchen, Dining, Dayroom, and Fire Fighter Work Rooms, do not

meet the needs of the current and future staff. The Kitchen areas are under sized, providing little space for refrigerators and multiple users. There are also significant space planning issues, as seen in the location of the sink at Station 2. Based on future staff needs, Station 3 needs reorganization. This includes a new App Bay for EMS, Public Meeting Room, additional Bunk Rooms, and an Exercise Room.

Based on the current needs of the station, administration areas at Station 2 require reorganization. For example, this should include a dedicated Work Room, a secure file room, and an open area for a desk. Currently, there is not a dedicated Server Communication Room for Station 2, which is now shared in a storage mezzanine.

Security Deficiencies

Both Stations 2 and 3 have significant security issues at the interior and exterior. Neither site has the required fencing and gates to control access to the crew parking and back of station areas. Building entries and the exterior site areas are not controlled or monitored with a surveillance system. At both stations the public can enter into the response apron. Station 2 has an open reception counter, allowing public access to the secure areas of the station. Major building doorways do not include an electronic hardware system.

Building Systems at end of Useful Life

If they continue to be well maintained, the exterior shells of both Stations 2 and 3, including the roofs, are serviceable and have not reached their useful life. Interior finishes are starting to show wear, more so with Station 2. Finish styles and colors are outdated; however, still functional. The 20-year-old HVAC units are reaching their useful life. Due to the non-code compliant refrigerant, condensing units located on the roof will no longer be serviceable after 2020 so it is recommended that the systems be replaced. Further, both stations have an emergency generator that does not meet the full demands of the individual stations.

Energy Code Deficiencies

Energy code requirements have changed substantially since the mid-1990s when the structures were built. R-values for roof, wall, and

foundation insulation no longer meet the required values considered necessary to maintain interior temperatures, which increase the costs of operating the facilities. In addition, the mechanical systems no longer meet the requirements of the energy code and the plumbing system does not meet current code for flow requirements. Lighting fixtures and lighting controls are outdated, and do not meet current code for dimming and automated controls. For more detail, go to pages 01-29 and 01-52 that includes the Existing Mechanical/Plumbing Assessment and the Existing Electrical Assessment, respectfully.

Building Code Deficiencies

No major code deficiencies were observed.

ADA Deficiencies

Due to both facilities having been built recently, there were no areas with major code non-conformance noticed regarding ADA accessibility. Few minor non-compliant areas included counter/sink heights throughout the facilities, and the public reception counters at both stations.

Structural Deficiencies

A Tier 1 seismic evaluation (structural elements only) of both Stations 2 and 3 were conducted using the checklists of the ASCE 41-13. Non-structural elements are not included in the scope of this report, and will be evaluated in a later phase of the project. Both stations were classified as Immediate Occupancy under the 2015 IBC for this evaluation, meaning that the building must be able to be immediately occupied following a major seismic event with only cosmetic, non-functional damage. This is consistent with the designation of newly constructed fire stations as an "Essential Facility," which must remain operational following a seismic event.

Structural Deficiencies (Station 2)

Mount Vernon Fire Station #2 is an existing wood-framed structure, originally constructed in 1995. The existing drawings of the building were available to the design team for the evaluation of this station. The building is approximately 11,500 square feet in size with a 1,300-square-foot mezzanine used primarily for mechanical equipment and storage. In addition to the mezzanine, the original building

consists of an apparatus bay, office spaces, living quarters, storage, a kitchen, a training room, a training tower, and an exercise room. There are three overhead doors in the apparatus bay, all opening to the east side of the building.

The roof height varies between 10 feet and 38 feet tall and is made up of plywood sheathing supported by open web wood trusses that frame into wood bearing walls or beams, depending on the location. The mezzanine is at a height of about 13 feet above the finished floor and is constructed of tongue and groove plywood sheathing supported by solid sawn wood joists that frame into wood beams, wood bearing walls, or steel wide flange beams, depending on the locations. The building's lateral system consists of wood shear walls in each direction.

During the building walk-through, it appeared that a louver opening had been installed in each of the two narrow wall piers located at the ends of the east side of the apparatus bay. In the existing drawings, these wall piers were identified as shear walls. This side of the apparatus bay is not braced laterally by adjacent construction. Therefore, because of these openings, there appears to be no lateral system on the east side of the apparatus bay. This deficiency is especially concerning as damage in this area during a seismic event could prevent emergency vehicles from being able to exit the facility.

Specific structural deficiencies from this evaluation include:

- **Load Path:** A clear lateral load path to transfer the out of plane force from the walls into the roof diaphragm, then into the main lateral force resisting system, and then out into the foundations is required for compliance. The lateral force resisting system is deficient in several areas, particularly along the east side of the building as mentioned above, where there are several large openings and wall piers that do not meet the minimum aspect ratio for a shear wall. At the diaphragm level there are also areas where there are re-entrant corners without any straps or ties to transfer the lateral forces.

- Liquefaction: From the information available through geologyportal.dnr.wa.gov, it appeared that the foundation soils on the existing site appear to have a low to moderate level of susceptibility to liquefaction. However, because of the additions to the existing structure, a new geotechnical evaluation should be conducted of the soil on this site. This geotechnical evaluation can give more accurate information on the risk of liquefaction for this specific site.
- Shear Stress Check: This is a rough order of magnitude check and does not represent an in-depth analysis. However, preliminary findings suggest that the building may be laterally overstressed in both the North/South and the East/West directions during a major seismic event. This finding is more representative of localized deficiencies versus global, building-wide seismic inadequacies.
- Narrow Wood Shear Walls/Overtipping: Many of the exterior shear walls and a few interior shear walls do not pass the quick check and have a height-to-width ratio greater than 2:1, which increases the likelihood that there is not enough capacity to resist overturning forces in an earthquake.
- Openings: In addition to not passing the narrow wood shear walls and overturning checks, the wall line on the north side of the entry gallery consists of openings greater than 80% of the length and is not supported by adjacent shear walls laterally.
- Hold-Down Anchors: There are narrow shear wall segments that do not appear to have hold-downs to resist overturning.
- Diaphragm Continuity: The pop-out for the training tower that runs through the mezzanine & continues up through the roof level causes a discontinuous diaphragm at this location. Where the diaphragm of the lower roof is interrupted, the training tower is not laterally supported by shear walls or adjacent construction.
- Roof Chord Continuity/Plan Irregularities: There are re-entrant corners where straps were not provided, which causes a discontinuity in the chords of the diaphragm.

Structural Deficiencies (Station 3)

Mount Vernon Fire Station #3 is an existing wood framed structure originally constructed in 1996. The full set of structural drawings were available for this station; however, the full architectural set was not provided. Therefore, exact elevations are unknown, but approximations were made based on the information that was available. The building is approximately 10,000 square feet in size with a 750-square-foot mezzanine used primarily as an equipment deck. In addition to the mezzanine, the original building consists of an apparatus bay, office spaces, living quarters, storage, and a kitchen. There are two overhead doors in the apparatus bay, all opening to the south side of the building.

The max roof height is approximately 17 feet and is made up of plywood sheathing supported by open web wood trusses, which frame into wood bearing walls or wood beams, depending on the location. The mezzanine is at a height of about 13 feet above the finished floor and is constructed of tongue and groove plywood sheathing supported by solid sawn wood joists that frame into wood beams or wood bearing walls, depending on the location. The building's lateral system consists of wood shear walls in each direction.

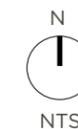
Although the shear wall piers at the ends of the south side of the apparatus bay do not have any openings, they are too narrow to qualify as shear walls per current code. Similarly to Station 2, in a seismic event, the lack of a lateral system at this location creates the possibility for a partial collapse to occur, which would prevent emergency vehicles from being able to exit the facility.

Specific structural deficiencies from this evaluation include:

- Load Path/Vertical Irregularities: A clear lateral load path to transfer the out of plane force from the walls into the roof diaphragm, then into the main lateral force resisting system, and then out into the foundations is required for compliance. The lateral force resisting system is deficient in several areas, particularly along the south side of the building, where there are several large openings and wall piers that do not meet the minimum aspect ratio for a shear wall, and at the entry where the shear wall is not continuous to the foundation level. At the diaphragm level there are also areas where there are re-entrant corners without any straps or ties to transfer the lateral forces.

- Liquefaction: From the information available through geologyportal.dnr.wa.gov, it appeared that the foundation soils on the existing site appear to have a low to moderate level of susceptibility to liquefaction. However, because of the additions to the existing structure, a new geotechnical evaluation should be conducted of the soil on this site. This geotechnical evaluation can give more accurate information on the risk of liquefaction for this specific site.
- Shear Stress Check: This is a rough order of magnitude check and does not represent an in-depth analysis. However, preliminary findings suggest that the building may be laterally overstressed in the both the North/South & the East/West directions during a major seismic event. This finding is more representative of localized deficiencies versus global, building-wide seismic inadequacies.
- Narrow Wood Shear Walls/Overtipping: Many of the exterior shear walls and a few interior shear walls do not pass the quick check and have a height-to-width ratio greater than 2:1, which increases the likelihood that there is not enough capacity to resist overturning forces in an earthquake.
- Openings: In addition to not passing the narrow wood shear walls & overturning checks, the wall lines at Grid C, Grid B, and Grid 1 consist of openings greater than 80% of the length and are not supported by adjacent construction.
- Hold-Down Anchors: There are narrow shear wall segments that do not appear to have hold-downs to resist overturning.
- Diaphragm Continuity: The pop-out for the entry that continues up through the roof level causes a dis-continuous diaphragm at this location. Where the diaphragm of the lower roof is interrupted, it is not laterally supported by shear walls that are continuous to the foundation level or by adjacent construction.
- Roof Chord Continuity/Plan Irregularities: There are re-entrant corners where straps were not provided, which causes a discontinuity in the chords of the diaphragm.

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EXISTING FIRE STATION 2

LOCATION

- 1901 N Laventure Road
Mount Vernon, WA 98273

YEAR BUILT

- 1998

SITE SIZE

- 79,952 SF (1.84 acres)

BUILDING SIZE

- 12,697 SF

PARKING ON-SITE

- 8 Public Spaces
- 24 Staff Spaces

FLOORS

- 1 story (with Equipment Loft)

ZONING

- Public Use (P)

FIRE SPRINKLERS

- Yes

CONSTRUCTION TYPE

- V-B

STAFFING

- 7 (24 hour emergency services)
- Three shifts
- Rotation every third day



View of Fire Station 2 (from Access Drive Aisle off Laventure Road)



Existing Facility Site Aerial

EXISTING FIRE STATION 2 FLOOR PLANS

- CIRCULATION
- ADMINISTRATION
- LIVING AREAS
- APPARATUS BAY

25 PHOTO LOCATION
 (Corresponding photos can be found on the following pages and are numbered to match floor plans)





1. APPARATUS BAY

- Hazardous working conditions related to exposure to vehicle exhaust
- No provisions for diesel exhaust capture at the apparatus tail pipes, utilizing a rail system or a vehicle mounted system
- Existing whole room exhaust releases contaminant through the space prior to capture



2. TURNOUT GEAR

- Turnout gear exposed to air contaminants from the Apparatus Bay
- Bay mounted storage does not allow for two sets of firefighter gear per person



3. TURNOUT GEAR

- Turnout gear is stored in a small enclosed room without provision for proper organization or ventilation
- Facility lacks the required space for turnout gear storage, including its own dedicated mechanical system



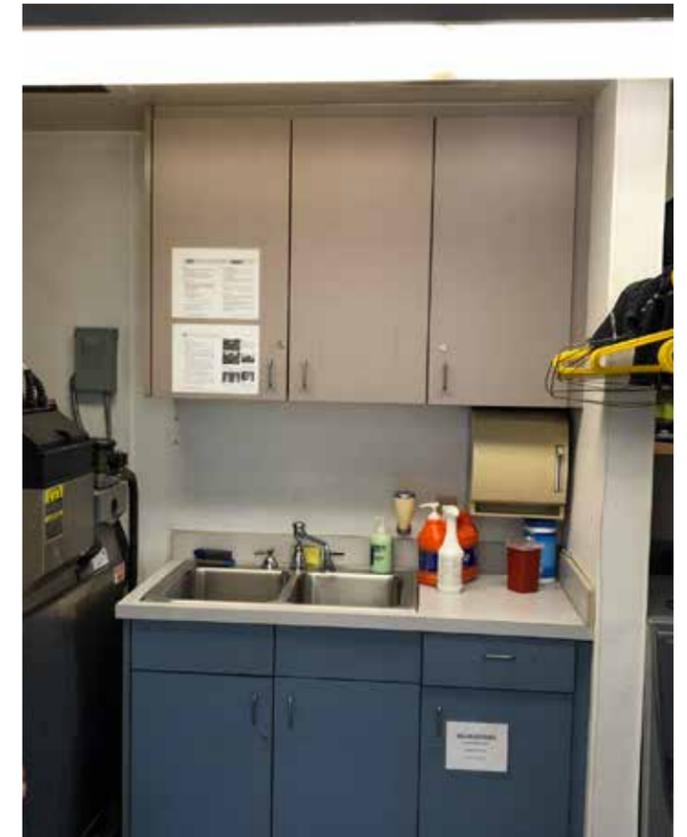
4. TURNOUT GEAR

- Second sets of turnout gear are stored in the Apparatus Bay exposed to air contaminants
- No dedicated space with proper ventilation provided

Station 2 Facility

5. DECON ROOM

- Insufficient space for cleaning gear
- Plastic laminate casework and drop-in sink does not allow for proper decontamination of the casework/sink work area
- Sink bowls are residential type, seamless sink with wash boards is not provided
- Eye wash at the sink is not provided
- Make-shift laundry area provides no separation with decontamination areas
- No personnel decon is provided with showers to reduce contaminants into the living areas after an event
- Equipment decon shower is not being used



6. FIREFIGHTER WORK ROOM

- Inadequate spaces are provided for the number of workspaces needed
- Current workstations are not in alignment with modern ergonomic needs



7. BUNK ROOMS

- Bunk rooms open up into the Apparatus Bay exposing sleeping areas to contaminants
- Low level or colored wake-up lighting is not provided
- Alerting/alarm system is outdated



Station 2 Facility



8. RESTROOMS

- Tile grout on walls and floor is a sanitary and maintenance problem



9. DAYROOM

- Room is undersized for current staffing levels
- Room does not provide for a diversity of uses



10. KITCHEN/DINING

- Both the kitchen and the dining room are undersized for staff
- The kitchen sink is pushed into a corner beyond the face of the cabinet
- Finish materials are outdated and showing signs of wear
- Existing appliances have exceeded or are near their expected life spans



11. KITCHEN/DINING

- More room is needed for refrigerators and counter workspace
- Kitchen does not meet accessibility standards

Station 2 Facility

12. EXERCISE ROOM

- Exercise room is being used as a circulation path between Apparatus Bay and the Living Quarters
- Carpet is collecting contaminants and being used for exercise routines
- Room is undersized for the staff size
- Space needs additional open area for flexibility of use



13. PUBLIC LOBBY

- No security at reception desk - open pass through
- Non-ADA compliant counter
- More space is needed for seating
- No dedicated aid room with controlled security into the station



14. PUBLIC RESTROOMS

- Tile grout on walls and floor is a sanitary and maintenance problem



15. MUSEUM

- Finished floor is cracking where the substrate does not provide isolation from the underlying concrete



Station 2 Facility



16. TRAINING ROOM

- Floor boxes have power only with no provision for communications/data
- Casework does not meet accessibility requirements



17. OFFICE AREAS

- Administration does not have a dedicated work room - No room to grow
- A dedicated secure file room is needed
- Additional space for a workstation is required



18. OFFICE AREAS

- The Fire Marshal's Office and Plans Review Room are separated from each other and inefficient in size
- Fire Marshal does not have the space to store necessary city plans on-site



19. SERVER ROOM

- A dedicated Communications Room is needed, currently shared with storage

Station 2 Facility

20. EXTERIOR

- Response drive and public drive share the same access point, which can reduce response effectiveness



21. EXTERIOR

- No separation between public circulation and the crew lot - Station grounds are not secure
- No security gates to allow controlled access are provided



22. EXTERIOR

- Areas of asphalt are showing signs of deterioration and require resurfacing



Station 2 Facility

NATIONAL FIRE PROTECTION ASSOCIATION STANDARDS

- “The National Fire Protection Association (NFPA) is an international nonprofit organization established in 1896. The company’s mission is to reduce the worldwide burden of fire and other hazards on quality of life by providing and advocating consensus codes and standards, research, training, and education.” (www.nfpa.org)
- The following table lists elements and their compliance with standards set forth by the National Fire Protection Association (NFPA). The sections listed below are the relevant sections for this study in reference to the existing Mount Vernon Fire Stations 2 and 3.

NFPA SECTION	DESCRIPTION	COMPLIANCE
NFPA 1	Fire Suppression Sprinklers	YES
NFPA 1221	Station Alerting and Communication System	YES
NFPA 1581	Minimum Sleeping Area	YES
	PPE Cleaning Area	NO
	EMS Decontamination Area	YES
NFPA 1851	Turnout Gear Storage	
	UV Exposure Protection	NO
	Thermal Exposure Protection	NO



EXISTING FIRE STATION 3

LOCATION

- 4701 E. Division Street
Mount Vernon, WA 98274

YEAR BUILT

- 1998

SITE SIZE

- 62,500 SF (1.43 acres)

BUILDING SIZE

- 5,973 SF

PARKING ON-SITE

- 8 Public Spaces
- 8 Staff Spaces

FLOORS

- 1 story (With Equipment Loft)

ZONING

- Public Use (P)

FIRE SPRINKLERS

- Yes

CONSTRUCTION TYPE

- V-B

STAFFING

- 3 (24 hour emergency services)
- Three shifts
- Rotation every third day



Station 2 Facility



View of Fire Station 3 (from Southwest Corner on Access Drive Aisle)



Existing Facility Site Aerial

EXISTING FIRE STATION 3 FLOOR PLANS

- CIRCULATION
- ADMINISTRATION
- LIVING AREAS
- APPARATUS BAY

25 PHOTO LOCATION
 (Corresponding photos can be found on the following pages and are numbered to match floor plans)



EXISTING EQUIPMENT LOFT PLAN
 NTS



EXISTING FIRST FLOOR PLAN
 NTS



1. APPARATUS BAY

- Hazardous working conditions related to exposure to vehicle exhaust
- No provisions for diesel exhaust capture at the apparatus tail pipes, utilizing a rail system or a vehicle mounted system
- Existing whole room exhaust releases contaminant through the space prior to capture



2. DECON ROOM

- Plastic laminate casework and drop-in sink does not allow for proper decontamination of the casework/sink work area
- Sink bowls are residential type, seamless sink with wash boards is not provided
- Eye wash at the sink is not provided
- Equipment decon shower is not being used
- No personnel decon is provided with showers to reduce contaminants into the living areas after an event



3. TURNOUT GEAR

- Turnout gear exposed to air contaminants from the Apparatus Bay
- Bay mounted storage does not allow for two sets of firefighter gear per person
- Facility lacks the required space for turnout gear storage, including its own dedicated mechanical system



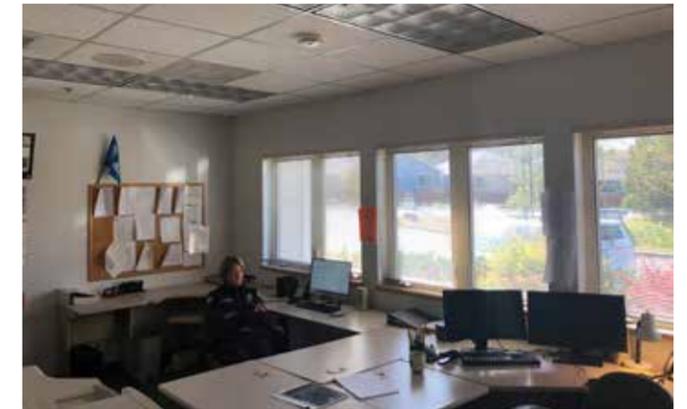
4. TURNOUT GEAR

- Second sets of turnout gear are stored in the Apparatus Bay fully exposed to air contaminants
- No dedicated space with proper ventilation provided

Station 3 Facility

5. FIREFIGHTER WORK ROOM

- Inadequately sized for future staffing projections
- Space could be utilized for future Bunk Rooms
- Current workstations are not in alignment with modern ergonomic needs



6. BUNK ROOMS

- Bunk room count will not meet the needs of future staffing projections
- Low level or colored wake-up lighting is not provided
- Alerting/alarm system is outdated
- Plastic laminate finishes are showing signs of wear



7. RESTROOMS

- Tile grout on walls and floor is a sanitary and maintenance problem
- Waterless urinals are not desired



8. DAYROOM

- Inadequately sized for future staffing projections



Station 3 Facility



9. KITCHEN/DINING

- Both the Kitchen and the Dining Room are undersized for future staffing projections
- Finish materials are outdated and showing signs of wear



10. KITCHEN/DINING

- Kitchen does not meet accessibility standards
- More room is needed for refrigerators - currently one short prior to staff increases
- Kitchen is closed in - ill suited for multiple people using the room at once



11. EXERCISE ROOM

- Building does not provide a dedicated Exercise Room
- Use in the Apparatus Bay exposes users to hazardous contaminants



12. PUBLIC LOBBY

- Reception window is not used
- Facility lacks a dedicated Aid Room with private access into the station

Station 3 Facility



13. PUBLIC LOBBY

- Floor finishes are showing signs of wear and failure



14. PUBLIC RESTROOMS

- Bathroom count does not meet the requirements for the public meeting room
- Tile grout on walls and floor is a sanitary and maintenance problem



15. TRAINING ROOM

- Door opens directly into Apparatus Bay allowing contaminants to enter Training Room



16. TRAINING ROOM

- Floor boxes have power only with no provision for communications/data
- Room does not have the electrical/data infrastructure to support TV monitors
- Finish materials in the room are showing signs of wear
- The Training Room is undersized for use as a public meeting room
- The single public restroom would not meet the needs of a public meeting room



17. MECHANICAL ROOM

- Floor finishes are failing



18. EXTERIOR

- No separation between public circulation and the crew lot - station grounds are unsecure
- No security gates to allow controlled access are provided



19. EXTERIOR

- Signage or a barrier is not provided allowing public access to use apron space as a turn-around



20. EXTERIOR

- Fencing does not include privacy slats for security

Station 3 Facility

21. EXTERIOR

- Siding and finish is showing wear on the east side of the building



Station 3 Facility

NATIONAL FIRE PROTECTION ASSOCIATION STANDARDS

- “The National Fire Protection Association (NFPA) is an international nonprofit organization established in 1896. The company’s mission is to reduce the worldwide burden of fire and other hazards on quality of life by providing and advocating consensus codes and standards, research, training, and education.” (www.nfpa.org)
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	EMS Decontamination Area	YES
NFPA 1851	Turnout Gear Storage	
	UV Exposure Protection	NO
	Thermal Exposure Protection	NO

Fire Station #2 Mount Vernon Fire Department

ELECTRICAL AND MECHANICAL SYSTEMS ASSESSMENT REPORT

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Station 3 Facility

Mechanical / Plumbing Assessment

INTRODUCTION

PURPOSE

The Mount Vernon Fire Department has requested a Facility Assessment of the mechanical systems at the Fire Station #2 located at 1901 N. Laventure Road, Mount Vernon, WA. The purpose of this study is to assess the overall condition of the facilities mechanical distribution system in the building.

EXISTING SPACE DESCRIPTION

The building is a single story with mezzanine level fire station built in 1996. The floor area is approximately 11,881 square feet with office space, sleeping quarters, kitchen/dining area and three fire truck bays. The building has an Entry Gallery that showcases an antique fire truck and the entry to the main Lobby. The building has a sloped roof which was recently installed.

MECHANICAL SYSTEM DESCRIPTION

EXISTING MECHANICAL SYSTEM OBSERVATIONS

HVAC system is comprised of four (4) split AC with gas furnace units. The four indoor gas furnace units are condensing type and paired together to provide supply air to two major air distribution system. The two air distribution system are designed to serve the North and South side of the building with the separation along grid line 3.

The HVAC system appears to have been modified with new gas furnaces (Photo 1 & 2), addition of the current air conditioning units (Photo 3) and the addition of multiple temperature zones with dedicated thermostats (Photo 4). The HVAC system requires a mechanical contractor to come on site to make seasonal adjustments to the thermostat setpoints. The HVAC system does not provide comfort for the building occupants throughout the year.

The four (4) outdoor condensing units are located on the roof, on the west side of the building. There are pairs of 2 ½ ton and 4 ton units that were not running at the time of the visit but appears to be operational. The units appear in need of regular maintenance (Photo 5). The refrigeration pipe insulations are deteriorating and in need of replacement (Photo 6). The condensing units use R-22 refrigerant, which are no longer allowed by Code. This refrigerant is still available for refilling

the equipment but will no longer be accessible for use at all by year 2020 in United States.

Gas radiant heaters with a wall thermostat provide heating in the Apparatus area. The system appears to be the original equipment and functional. The system does not provide comfort for the building occupant.

Reznor gas unit heater with a wall thermostat provides heating to the Tower. Typical life expectancy for this type of equipment is 20 years. The heater appears to be an original equipment and functional. The condition of these unit is not known but it's approaching its end of life expectancy. (Photo 7)

Electrical wall heaters with integral thermostats serve the bedrooms, dining and the offices. The heaters appear to be an original equipment and functional. The condition of these units is not known but it's approaching its end of life expectancy. (Photo 8)

Rooftop exhaust fan provides general exhaust for the Apparatus area. The exhaust fan is energized when the roll up door is opened and operates for a preprogrammed duration to exhaust auto fumes. (Photo 9)

General exhaust systems are in line fans located above the ceiling and terminate to roof or wall. The exhaust fans were not visually assessed but is presumed to be functional based on no odor complaints by the occupants. The condition of these units is not known but the equipment should be tested prior to design phase.

HVAC SYSTEM DESCRIPTION

Bryant Units - 2 each:

- 3,300 cfm
- 4 ton of cooling
- These units appear to be installed on April 2011 by Blyth Heating based on the hand written note on the unit. Typical life expectancy for this type of equipment is 20 years. The condition of these units is not known but the remaining life expectancy should be 13 years.

York Units - 2 each:

- 2,200 cfm
- 2 ½ ton of cooling
- These units appear to be relatively new, but the age of the unit is not known. Typical life expectancy for this type of equipment is 20 years. The condition of the unit condition is not known but the remaining life expectancy of these units should more than 10 years.

Condensing Units - 2 each:

- Model: HS-29-048-5P
- 4 ton of cooling capacity
- These units appear to be manufactured in 2005 based on their serial numbers. Typical life expectancy for this type of equipment is 20 years. The condition of the unit condition is not known but the remaining life expectancy of these units should be 7 years.

Condensing Units - 2 each:

- Model: HS-29-030-5P
- 2 ½ ton of cooling capacity
- These units appear to be manufactured in 2005 based on their serial numbers. Typical life expectancy for this type of equipment is 20 years. The condition of the unit condition is not known but the remaining life expectancy of these units should be 7 years.

CONTROL SYSTEM OBSERVATION

The HVAC system is controlled by Honeywell EnviraZone system with 9 temperature control zones. The North side of the building is controlled with one thermostat and the South side of the building is controlled with 8 thermostats. (Photo 10)

The thermostat for the North side of the building controls the two gas furnace units which provides cooling, heating and supply air. The 8 thermostats for the South side of the building controls the two gas furnace units and presumably eight ducted volume dampers which provides cooling, heating and supply air.

PLUMBING SYSTEM OBSERVATION

Plumbing system includes two gas water heaters, wall mounted water closets with flush valves, wall mounted urinals with flush valves, lavatories (wall and counter mounted), walk-in showers, sinks, drinking fountains, dishwasher, eye wash and clothes washer which all appears to be in good condition and functional. (Photos 11, 12 & 13)

The two gas hot water heaters are by different manufacturers and have been recently replace in 2014 and 2018. The combustion air is provided with ductwork located in the corner of the room. The hot water distribution system does not include a recirculation system. (Photo 13)

Air compressor located outside the mechanical/electrical room provides compressed air to the air outlets in the Apparatus area and appears to be in good condition and functional. (Photo 14)

Gas meter provides service to the HVAC system. (Photo 15)

Propane storage tank serves the emergency generator. For emergency generator system observations refer to Electrical system assessment report.

FIRE PROTECTION SYSTEM OBSERVATION

The fire protection system consists of the wet and dry risers with air compressor located in the Apparatus. The building is fully sprinkled. (Photo 16)

For Fire Alarm system observations refer to Electrical system assessment report.

RECOMMENDATIONS – MECHANICAL SYSTEM

- HVAC System
 - Replace existing HVAC system with new a system that complies with the current energy code.
 - Provide a code required Dedicated Outside Air System (DOAS).
 - Provide a proper layout of the temperature control zones.
 - Provide a new control system.
 - Provide a new air distribution system.
 - Remove all wall heaters.
- Install new auto fume exhaust system (Plymovent or equal) to capture the fumes directly at the tailpipe of vehicles in the Apparatus area.
- Evaluate replacing the gas radiant heaters in the Apparatus areas with a different heating system to address comfort issue. Recommend a system that provides warm air discharge for direct comfort.
- Retain the existing general exhaust system in the Apparatus area and maintain current operating mode.
- Plumbing system:
 - Provide new faucets if water flow at the lavatories does not comply with current low water flow requirements, the new faucets shall be installed.
 - Provide new manual flush valves If water flow does not comply with current low water flow requirements. Evaluate installation of infra-red controlled flush valves.
 - Provide new hot water recirculation system for water conservation and quicker supply of hot water.
 - Provide garbage disposal for the kitchen sink.
 - Retain the existing two gas water heaters.

Mechanical / Plumbing Assessment

**PHOTO 1 - YORK GAS FURNACE,
2 ½ TON UNIT**



**PHOTO 2 - BRYANT GAS FURNACE,
4 TON UNIT**



Mechanical / Plumbing Assessment



PHOTO 3 - CONDENSING UNITS

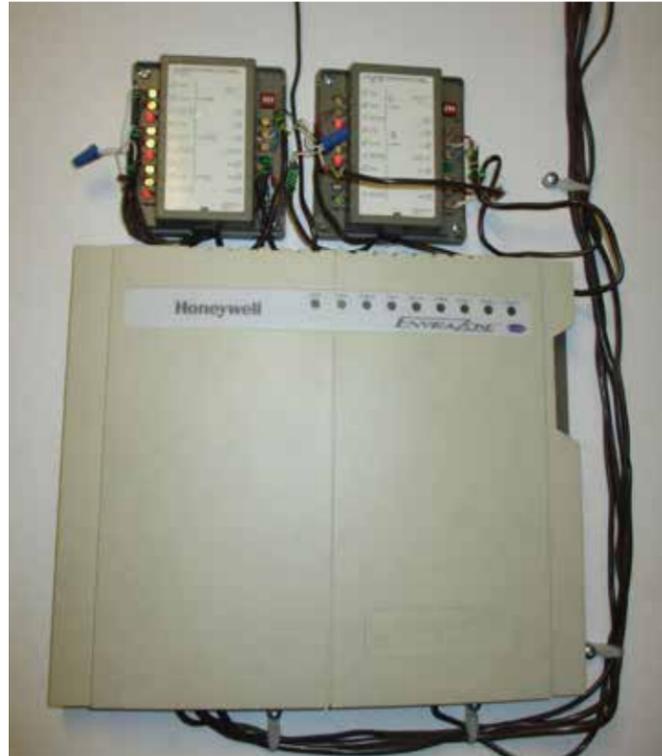


PHOTO 4 - HVAC CONTROL SYSTEM

Mechanical / Plumbing Assessment

PHOTO 5 - CONDENSING UNIT, 4 TONS



PHOTO 6 - CONDENSING UNIT INSULATION AND PIPES



Mechanical / Plumbing Assessment



PHOTO 7 - GAS UNIT HEATER



PHOTO 8 - ELECTRIC WALL HEATER

Mechanical / Plumbing Assessment

PHOTO 9 - ROOFTOP EXHAUST FAN



PHOTO 10 - THERMOSTAT



Mechanical / Plumbing Assessment



PHOTO 11 - WATER CLOSET



PHOTO 12 - URINAL

Mechanical / Plumbing Assessment

PHOTO 13 - LAVATORY



PHOTO 14 - AIR COMPRESSOR



Mechanical / Plumbing Assessment



PHOTO 15 - GAS METER



PHOTO 16 - SPRINKLER RISER

Mechanical / Plumbing Assessment

Fire Station #3 Mount Vernon Fire Department

ELECTRICAL AND MECHANICAL SYSTEMS ASSESSMENT REPORT

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PROVIDED BY SAZAN GROUP

Mechanical / Plumbing Assessment

INTRODUCTION

PURPOSE

The Mount Vernon Fire Department has requested a Facility Assessment of the mechanical systems at the Fire Station #3 located at 4701 E. Division St, Mount Vernon, WA. The purpose of this study is to assess the overall condition of the facilities mechanical distribution system in the building.

EXISTING SPACE DESCRIPTION

The building is a single story with mezzanine level fire station built in 1996. The floor area is approximately 6,644 square feet with office space, sleeping quarters, kitchen/dining area and two fire truck bays. The building has a sloped roof which was recently installed.

MECHANICAL SYSTEM DESCRIPTION

EXISTING MECHANICAL SYSTEM OBSERVATIONS

HVAC system is comprised of two (2) split AC with gas furnace units. The as built drawings show a third unit which appears to have been removed. The two indoor gas furnace units are condensing type and appears to provide supply air to two major air distribution system. The two air distribution system are designed to serve the North and South side of the building with the separation along grid line 2.5. The Exercise area with a dedicated package AC unit (ACU-4) shown on the as built drawing was not installed.

The HVAC system appears to have been modified with new gas furnaces (Photo 1), addition of the current air conditioning units (Photo 2). The HVAC system appears to be functional.

The two (2) outdoor condensing units are located on the roof, on the north side of the building. The two units were not running at the time of the visit but appears to be operational. The units appear in need of regular maintenance. (Photo 3)

Gas radiant heaters is controlled by a Hand/Off/Auto (HOA) with wall thermostat provides heating in the Apparatus area. The system appears to be the original equipment and functional. The system does not provide comfort for the building occupant. (Photo 4)

Electrical wall heaters with integral thermostats serve the bedrooms, dining and the offices. The heaters appear to be an original equipment and functional. The condition of these units is not known but it's approaching it's end of life expectancy. (Photo 5)

Rooftop exhaust fan is controlled by a Hand/Off/Auto (HOA) with wall thermostat provides general exhaust for the Apparatus area. The exhaust fan is energized by a wall switch when the roll up door is opened and operates for a preprogrammed duration to exhaust auto fumes. (Photo 6)

General exhaust systems are in line fans located above the ceiling and terminate to roof or wall. The exhaust fans were not visually assessed but is presumed to be functional based on no odor complaints by the occupants. The condition of these units is not known but the equipment should be tested prior to design phase.

CONTROL SYSTEM OBSERVATION

The HVAC system is controlled by a 7-day programmable thermostat.

PLUMBING SYSTEM OBSERVATION

Plumbing system includes one gas water heater, floor mounted water closets with flush tanks, water free wall mounted urinal, wall mounted lavatories, walk-in showers, sinks, dishwasher, and clothes washer which all appears to be in good condition and functional. (Photos 7, 8 & 9)

The gas hot water heater is Bradford White and appears to have been replaced in 2010 based on the serial code. The combustion air is provided with ductwork located in front of the water heater. The hot water distribution system does not include a recirculation system. (Photo 10)

Air compressor located adjacent to the two gas furnaces provide compressed air to the air outlets in the Apparatus area and appears to be in good

condition and functional. (Photo 11)

Gas meter provides service to the HVAC system. (Photo 12)

Propane storage tank serves the emergency generator. For emergency generator system observations refer to Electrical system assessment report.

FIRE PROTECTION SYSTEM OBSERVATION

The fire protection system consists of the wet riser located in the Apparatus. The building is fully sprinkled.

For Fire Alarm system observations refer to Electrical system assessment report.

RECOMMENDATIONS – MECHANICAL SYSTEM

- HVAC System
 - Replace existing HVAC system with new a system that complies with the current energy code.
 - Provide a code required Dedicated Outside Air System (DOAS).
 - Provide a proper layout of the temperature control zones.
 - Provide a new control system.
 - Provide a new air distribution system.
 - Remove all wall heaters.
- Install new auto fume exhaust system (Plymovent or equal) to capture the fumes directly at the tailpipe of vehicles in the Apparatus area.
- Retain the existing general exhaust system in the Apparatus area and maintain current operating mode.
- Plumbing system:
 - Replace floor mounted water closets with new wall mounted water closets with flush valves.
 - Provide new faucets if water flow at the lavatories does not comply with current low water flow requirements, the new faucets shall be installed.
 - Provide new manual flush valves If water flow does not comply with current low water flow requirements. Evaluate installation of infra-red controlled flush valves.
 - Provide new hot water recirculation system for water conservation and quicker supply of hot water.
 - Provide garbage disposal for the kitchen sink.
 - Retain the existing two gas water heaters.
 - Relocate gas meter and gas piping currently installed along the right of way for potential Apparatus Bay expansion

Mechanical / Plumbing Assessment

Mechanical / Plumbing Assessment



**PHOTO 1 - YORK GAS FURNACE,
2 1/2 TON UNIT**



PHOTO 2 - CONDENSING UNITS

Mechanical / Plumbing Assessment

PHOTO 3 - CONDENSING UNITS



**PHOTO 4 - RADIANT HEATER AND
APPARATUS BAY EXHAUST FAN
CONTROL SYSTEM**



Mechanical / Plumbing Assessment



PHOTO 5 - ELECTRIC WALL HEATER



PHOTO 6 -ROOFTOP EXHAUST FAN

Mechanical / Plumbing Assessment

PHOTO 7 - WATER CLOSET



PHOTO 8 - URINAL



Mechanical / Plumbing Assessment



PHOTO 9 - LAVATORY



PHOTO 10 - GAS WATER HEATER

Mechanical / Plumbing Assessment

PHOTO 11 - AIR COMPRESSOR



PHOTO 12 - GAS METER



Mechanical / Plumbing Assessment

Fire Station #2 Mount Vernon Fire Department

ELECTRICAL OBSERVATION & DUE DILIGENCE REPORT

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PROVIDED BY SAZAN GROUP

Electrical Assessment

GENERAL

The existing Fire Station #2 is looking into upgrades of their facility. Sazan provided a site assessment with the Fire Chief on Thursday, Sept 20. The following are some of the list of potential upgrades and needs that were discussed during our site visit:

- Converting the Museum space to a Community Room Space
- Provide additional power, lighting and connectivity to workstations, laptops for operations.
- Not enough restrooms
- Improve seating spaces and capacities
- Upgrade lighting system for better quality and energy saving measures
- Kitchen and Dining space is too small for the number of staff using it
- Paging capability desired
- Alarm Notification upgrades

LOBBY AREA LIGHTING



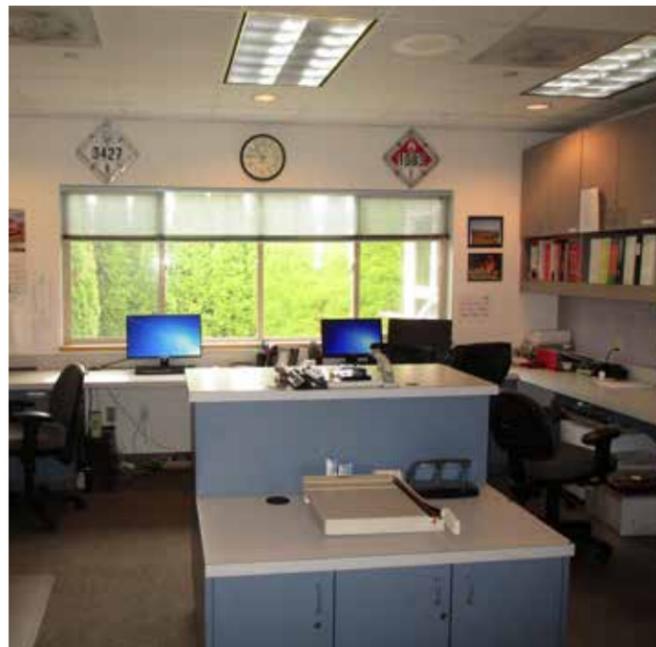
Electrical Assessment

LIGHTING

The interior lighting in general is comprised of fluorescent fixtures, with combination of recessed downlights and linear 2x4 and 1x4 fixtures in the public areas, offices and Sleeping Rooms. The Apparatus Bay consist of 8', 4 lamp continuous recessed row of fixtures. In general, the lighting system appear to be in good condition considering the age of the building.

The interior lighting controls in general are manual switches on the wall. There were no automatic lighting controls observed.

OPEN/WORK AREA STATION LIGHTING



ELECTRICAL

The electrical service to the building comes from an exterior pad mount utility transformer located approximately at the NE corner of the building to an exterior CT can and digital meter. The Main Service Panel is a 208Y/120V 3 phase 4 wire Panel M which subfeeds two branch panelboards P1 and P2, and an emergency Panel X. There is a 35kW generator set that feeds Panel X via an automatic transfer switch. All of the electrical equipment is located in the mech/electrical room up in the Mezzanine Level.

There is lighting contactor that controls the exterior lighting.

Overall, the electrical panels appear to be in good condition. No specific problems or tripping of circuits reported by the Fire Chief.

APPARATUS BAY LIGHTING



SERVICE CT CAN AND UTILITY METER



ELECTRICAL ROOM - MEZZANINE LEVEL



Electrical Assessment

STATUS AND DISPATCH CALL SYSTEM

The Status and Dispatch Call system comprised of Status board monitors in designated location within the building. Any call from the County gets displayed on these boards first and once verified audible and visible (tones/bells and lights) get activated for signal to the staff. The system currently works well with the Fire Department and would like to continue with the same protocol.

STATUS BOARD MONITOR



Electrical Assessment

PROPOSED RECOMMENDATIONS

This report recommends the consideration to upgrade the lighting system into LED. Based on our experience, a full upgrade of lighting will require LED system as a minimum in order to meet the requirements of the current Washington State Energy Code. In addition, the energy code will also require an automatic lighting control system by way of an automatic lighting control panel, lighting occupancy and daylighting sensors. Consideration of dimming features, as well as color of lamps can be taken into account in designing the system.

The overall condition of the electrical service and panels appear to be good. There appears to be capacity in the main panel to subfeed another panel if needed for the added demands of branch circuiting for any mechanical and power upgrades. This report recommends either a 30-day load demand metering of the service or, obtaining a 12-month demand data to be used in load calculations, in order to confirm available service capacity relative to the proposed upgrade in the building. It is our understanding that upgrades

to the existing generator set is a separate project that the Fire Department is tracking and is outside of this study. Any design and modification to the electrical system should be coordinated with that project.

The current alarm notification set up is not very desirable to the assigned firemen in their sleeping rooms. The lights are set up with no dimming capability, so they can be awakened by an alarm from a dark and quiet condition into a very bright light and loud audible noise. This report should consider designing a system (red light for example) that will allow a smooth transition and not shock people from deep sleep to an immediate call and noise.

Paging capability should be looked at as part of the needs mentioned by the Fire Chief.

Status and Dispatch Call system appears to be working just fine for the staff. Provide consideration to add more location of the status boards relative to the proposed upgrade.

Electrical Assessment

Fire Station #3 Mount Vernon Fire Department

ELECTRICAL OBSERVATION & DUE DILIGENCE REPORT

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PROVIDED BY SAZAN GROUP

Electrical Assessment

GENERAL

The existing Fire Station #3 is looking into upgrades of their facility. Sazan provided a site assessment with the Fire Chief on Thursday, Sept 20. The following are some of the list of potential upgrades and needs that were discussed during our site visit:

- Provide additional power, lighting and connectivity to workstations, laptops for operations.
- Improve seating spaces and capacities
- Upgrade lighting system for better quality and energy saving measures
- Kitchen and Dining space can be bigger for the number of staff using it
- Paging capability desired
- Alarm Notification upgrades

LIGHTING

The interior lighting in general is comprised of fluorescent fixtures, with combination of recessed downlights and linear 2x4 and 1x4 fixtures in the public areas, offices and Sleeping Rooms. The Apparatus Bay consist of 8', 4 lamp continuous recessed row of fixtures. In general, the lighting system appear to be in good condition considering the age of the building.

The interior lighting controls in general are manual switches on the wall. There were no automatic lighting controls observed.

ELECTRICAL

The electrical service to the building comes from an exterior pad mount utility transformer located approximately at the NE corner of the building to an exterior CT can and digital meter. The Main Service Panel is a 208Y/120V 3 phase 4 wire Panel MDP which subfeeds two branch panelboards P1 and P2, and an emergency Panel X. There is a small 7.5kW generator set that feeds Panel X via an automatic transfer switch. All of the electrical equipment is located in the mech/electrical room up in the Mezzanine/ Equipment Deck Level.

There is lighting contactor that controls the exterior lighting.

Overall, the electrical panels appear to be in good condition. No specific problems or tripping of circuits reported by the Fire Chief.

OFFICE/WORK AREA



APPARATUS BAY



ELECTRICAL ROOM - MEZZANINE LEVEL



SERVICE CT CAN AND UTILITY METER



Electrical Assessment

Electrical Assessment

STATUS AND DISPATCH CALL SYSTEM

The Status and Dispatch Call system comprised of Status board monitors in designated location within the building. Any call from the County gets displayed on these boards first and once verified audible and visible (tones/bells and lights) get activated for signal to the staff. The system currently works well with the Fire Department and would like to continue with the same protocol.

STATUS BOARD MONITOR



Electrical Assessment

PROPOSED RECOMMENDATIONS

This report recommends the consideration to upgrade the lighting system into LED. Based on our experience, a full upgrade of lighting will require LED system as a minimum in order to meet the requirements of the current Washington State Energy Code. In addition, the energy code will also require an automatic lighting control system by way of an automatic lighting control panel, lighting occupancy and daylighting sensors. Consideration of dimming features, as well as color of lamps can be taken into account in designing the system.

The overall condition of the electrical service and panels appear to be good. The proposed addition to the existing building will impact the location of the existing CT can and utility meter. This report recommends either a 30-day load demand metering of the service or, obtaining a 12-month demand data to be used in load calculations, in order to confirm available service capacity relative to the proposed upgrade in the building. It is our understanding that upgrades to the existing generator set is a separate project that the Fire

Department is tracking and is outside of this study. Any design and modification to the electrical system should be coordinated with that project.

The current alarm notification set up is not very desirable to the assigned firemen in their sleeping rooms. The lights are set up with no dimming capability, so they can be awakened by an alarm from a dark and quiet condition into a very bright light and loud audible noise. This report should consider designing a system (red light for example) that will allow a smooth transition and not shock people from deep sleep to an immediate call and noise.

Paging capability should be looked at as part of the needs mentioned by the Fire Chief.

Status and Dispatch Call system appears to be working just fine for the staff. Provide consideration to add more location of the status boards relative to the proposed upgrade.

Electrical Assessment

Mount Vernon Fire Department

EXISTING BUILDING & SITE ASSESSMENT

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PROVIDED BY PERTEET

Civil Assessment

FIRE STATION 1

SITE

Vehicle Circulation:

Good for personal vehicles. Not intended for commercial vehicles and trucks.

People Circulation:

Good.

Public Works Vehicle Parking:

None in existing use.

Personal Vehicle Parking:

69 stalls



Accessibility:

Good.

General Assessment:

The site will be fully redeveloped to serve as Fire Station No. 1. The existing use allows for straightforward redevelopment.

Civil Assessment

CIVIL

Site Overview:

Parcel P54179.

Topography and Existing Conditions:

Site is flat, slightly elevated from the surrounding streets. The site is located in downtown Mount Vernon surrounded by a variety of residential, commercial and municipal uses. Snoqualmie Street, which separates the parcel from the public library, will possibly be vacated to create a larger municipal block.



Site Access:

Good.

Sanitary Sewer:

No sewer facilities.

Drainage Systems:

Catch basins capture stormwater and convey to municipal system.

Water System:

Planters include irrigation.

On-site Paving:

Asphalt shows signs of wear, especially along south edge.

ADA Accessibility:

Good.

Civil Assessment

FIRE STATION 2

SITE

Vehicle Circulation:

Fire truck turnaround adequate for trucks up to, but not including 40 feet. 40 foot trucks only just fit and may require running over the curb. Personal vehicle traffic flow is good. Lacks a permanent second vehicle entrance/exit.

People Circulation:

Good.

Fire Department Vehicle Parking:

Parking is adequate for required fire department vehicles.

Personal Vehicle Parking:

7-14 spaces required for employees. Additional parking is available for the public.

Accessibility:

Building front entrances are ADA accessible.

General Assessment:

Site is appropriate for its current use.

CIVIL

Site Overview:

The 1.88-acre site is located at 1901 N Laventure Road, Mt Vernon, WA 98273.

Topography and Existing Conditions:

Site is generally flat, sloping slightly to the west.

Civil Assessment

Site Access:

A single driveway serves all visitors. A second entry to the south is chained off.



Sanitary Sewer:

Site is served by a 6" PVC sewer line that leaves the site in the northwest corner.

Drainage Systems:

Catch basins along a reverse crown line convey stormwater to a bioswale along the west edge of the site. A detention pond in the northwest corner of the property receives water from the roof downspout system. Both the swale and pond appear to be in good condition and fire department staff confirmed there have been no flooding issues. The swale and pond are joined in a flow control structure before discharging to the west, thence south to the municipal system.



Civil Assessment

Water System:

An 8" water line from Laventure Road enters the site.

From this 8" line, a 2" domestic service, a 6" fire department connections, and a 6" hydrant service branch off.

Asphalt shows cracking in reverse crown.

**ADA Accessibility:**

Good.

FIRE STATION 3

SITE

Vehicle Circulation:

Fire station has two access points for fire trucks allowing for large vehicle turn-around.

People Circulation:

Good.

Fire Department Vehicle Parking:

Garage will need an additional bay for future expansion. Adequate for current use.

Personal Vehicle Parking:

There are 16 guest and employee parking spots. Adequate for daily use, not intended for larger gatherings such as community meetings.

Accessibility:

Good.

General Assessment:

The site serves its current use. A new vehicle bay is desired in a future expansion to store an additional truck.

CIVIL

Site Overview:

The 1.57-acre site is located at 4701 East Division Street, Mt Vernon, WA 98273.

Topography and Existing Conditions:

The property slopes down to the northwest.

Site Access:

Good.

Sanitary Sewer:

Originally served by a septic drain field in the northeast corner of the site, per plans. Has since been connected to the municipal sewer.

Drainage Systems:

A series of catch basins convey runoff to a detention pond in the southwest corner of the site. Driveway is reverse crowned to capture runoff along the centerline. Each catch basin is equipped with an oil/water separator.



Water System:

There are two fire hydrant services (6") and one domestic water service (2") onsite. Water main in East Division Street is 12".

On-site Paving:

Asphalt paving shows cracking along centerline. Concrete garage apron is in good condition.



ADA Accessibility:

Good.

PROGRAM VALIDATION



PROGRAMMING SUMMARY

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Mackenzie began the programming effort by working closely with Mount Vernon Fire Department staff to review the previously completed Station 1 programming document dated February 9, 2018. Using this document and past experiences with fire facilities, all while incorporating current staff feedback, Mackenzie determined current space needs and forecast future needs that will accommodate Department function for the next 20 years, and beyond.

The initial 2018 program totalled 20,181 square feet and after rigorous staff review, the Fire Department determined there was additional

needs unaccounted for which required increasing the program size to 23,159 square feet. This total square footage includes a 25% increase for general building circulation and interstitial space (i.e. wall thickness), which has been found to be an average escalation for facilities of this type.

Program needs for Stations 2 and 3 were developed by means of project meetings with the Mount Vernon Fire Department Staff and project site evaluations and concept floor plans developed by Mackenzie. Meetings included the Mount Vernon Fire Department core staff, administration personnel, and staff firefighters.

STATION 1

SPACE USE	SQUARE FOOTAGE
	AT MOVE-IN
APPARATUS BAY AND SUPPORT	6,501 SF
LIVING QUARTERS	4,141 SF
ADMINISTRATION AND BUILDING SUPPORT	7,885 SF
TOTAL (INCLUDES 25% CIRCULATION)	23,159 SF

SITE USE	
TOTAL EXTERIOR REQUIREMENTS (NOT INCLUDING BUILDING FOOTPRINT AREA)	13,884 SF
TOTAL SITE REQUIREMENTS	37,043 SF

PROGRAM

STATION 2

SPACE USE	SQUARE FOOTAGE	
	EXISTING	AT MOVE-IN
APPARATUS BAY AND SUPPORT	4,370 SF	5,908 SF
LIVING QUARTERS	2,984 SF	4,029 SF
ADMINISTRATION / BUILDING SUPPORT	5,325 SF	3,771 SF
TOTAL	12,679 SF	13,708 SF

STATION 3

SPACE USE	SQUARE FOOTAGE	
	EXISTING	AT MOVE-IN
APPARATUS BAY AND SUPPORT	2,980 SF	4,660 SF
LIVING QUARTERS	1,619 SF	2,840 SF
ADMINISTRATION / BUILDING SUPPORT	1,374 SF	2,977 SF
TOTAL	5,973 SF	10,477 SF

Space / Room Use	Space Requirements			Space Size			Room Type	Total Required Square Footage			Comments
	Exist	2018	2048	W	L	Area		Exist	2018	2048	
Department: Mount Vernon Fire Department - Station 1 (Summary)											
Apparatus Bay and Support Rooms								0	6501	6501	
Living Quarters								0	4141	4141	
Administration								0	7885	7885	
SUBTOTAL								0	18527	18527	
GENERAL CIRCULATION (25%)								0	4632	4632	
TOTAL BUILDING SQUARE FOOTAGE								0	23159	23159	0.53
TOTAL EXTERIOR REQUIREMENTS								0	13884	13884	0.32
TOTAL SITE REQUIREMENTS								0	37043	37043	0.85

Department: Mount Vernon Fire Department - Station 2 (Summary)											
Apparatus Bay and Support Rooms								4370	5908	5908	Renovation - Expand into Exist. Exercise Room and back of Apparatus Bays (Leave North Bay Full Length)
Living Quarters								2984	4029	4029	Addition - Dayroom/Kitchen/Dining & Exercise Room
Administration								5325	3771	3771	Addition - New Vestibule. Renovation - Administration Areas Including New Public Restrooms.
TOTAL								12679	13708	13708	

Department: Mount Vernon Fire Department - Station 3 (Summary)											
Apparatus Bay and Support Rooms								2980	4660	4660	Addition - Short App Bay & Support Spaces
Living Quarters								1619	2840	2840	Addition - Dayroom/Kitchen/Dining & Exercise Room
Administration								1374	2977	2977	Addition - Community Room/Restrooms. Renovated - F.F. Work Room & Additional Bunk Rooms
TOTAL								5973	10477	10477	

General Comments - Station 1											
Durable exterior materials - Include masonry and wood features appropriate to local styles											
Possible operable skylights in app bays for heat removal/air flow. May not be possible due to occupied space above											
Durable finishes, stainless steel appliances, sinks, countertops in kitchen. Stained/polished concrete surfaces throughout											
Minimum concrete curb and FRP on all 4 walls of truck bays											
Vehicle exhaust system tied to timer and door opener, magnetic direct connection ventilation and track rail w/exhaust fans and ducting.											
Also consider whole space negative pressure exhaust fan											
Trench drains located beneath each truck, no water in the walkways											
Need secured parking for 20 personal suppression staff vehicles adjacent to and with access to the living-quarters wing.											
Need secured parking for 7 administrative vehicles with access to the administrative wing.											
Gas forced air heat and A/C except apparatus bays. Also consider in-floor radiant heat/cooling systems for apparatus bays and living quarters											
Natural gas – overhead drop heaters versus in floor radiant heat (see MV station 2)											
Air compressor w/ reel system low pressure system (under 120 psi) for apparatus brake tank fill and high pressure system for apparatus tire fill (direct from air compressor, 150+psi)											
Include welder in equipment maintenance/storage room											
Power drops to apparatus to have minimum 30 amp dedicated circuits											
Emergency Generator for entire building – all circuits											
Solar panel rooftop array and/or panels integrated into other design features											
Lobby configuration to include space for 1920 Fire Truck currently house at station 2 and bi-fold apparatus doors for ingress/egress.											
Also include display space and seating for 8 - 10 people											

Space / Room Use	Space Requirements			Space Size			Room Type	Total Required Square Footage			Comments
	Exist	2018	2048	W	L	Area		Exist	2018	2048	

Department: Apparatus Bay and Support Rooms											
Apparatus Bay											
Apparatus Bays		3	3	18	80	1440		0	4320	4320	Three drive thru bays, 1 partial, 14'w x 14'h doors, 5-6 vehicles total, see below (2-engines 33' length E111, future tiller ladder truck 65' (current L125 is 43'), 1 ambulance 26' length - MVFD or CVAA Med Unit, Battalion Chief SUV 19' length. Four-fold doors at response side
		1	1	18	30	540		0	540	540	
Group Total								0	4860	4860	
Apparatus Support Rooms											
SCBA Maintenance and Fill Station		1	1	15	25	375		0	375	375	All-in-one compressor, cylinder/pack storage, work bench, and fill station (SCBA's, masks, EMS) Stainless steel sink and countertops. Include drying area for masks, respirators, etc.
Equipment Decon Room		1	1	6	10	60		0	60	60	
PPE Storage / Work Room		1	1	10	15	150		0	150	150	Built-in cabinetry, shelving, and countertop work space
Bunker Gear Storage Room		1	1	16	30	480		0	480	480	Room with negative ventilation, metal cage storage racks in rows
Vehicle / Equip. / Maint. / Storage Room		1	1	10	16	160		0	160	160	Built-in cabinetry, shelving, and countertop work space
Medical Air / O2 Room		1	1	6	8	48		0	48	48	
Unisex Restroom		1	1	10	8	80		0	80	80	With toilet, sink/mirror, and built-in storage, ADA accessible
Custodial Room		1	1	4	4	16		0	16	16	Wash sink, shelving, space for mops/squeegees (Room to be ventilated)
Hose Storage		1	1	4	12	48		0	48	48	Roll-away racks positioned along apparatus bay walls
EMS Storage		1	1	14	16	224		0	224	224	EMS supplies central storage room
Group Total								0	1641	1641	
TOTAL SQUARE FOOTAGE (Apparatus Bay and Support Rooms)									0	6501	6501

Program: Apparatus Bay and Support Rooms - Station 1

Space / Room Use	Space Requirements			Space Size			Room Type	Total Required Square Footage			Comments
	Exist	2018	2048	W	L	Area		Exist	2018	2048	

Department: Living Quarters											
Living Quarters											
Decon / Shower Room		2	2	10	11	110		0	220	220	Unisex shower rooms used for transition decon (after structure fires) before entering the living quarters - See healthy in, healthy out information (Include separate access doorways from the apparatus bays and into the living area. Shower, toilet, sink/mirror, cabinet storage, and bench)
Dayroom		1	1	20	25	500		0	500	500	
Kitchen		1	1	12	18	216		0	216	216	Include 3 full size fridges, 2 dish washers, a 6 burner, gas stove top located on an island with food prep countertop space and cabinetry underneath. Two full size electric ovens, separate space for an eating bar / stools integrated into main countertop space.
Dining Area		1	1	16	20	320		0	320	320	Integrated with the kitchen, could include eating bar, table(s), chairs, and space to accommodate up to 20
Laundry / Janitor Room		1	1	10	14	140		0	140	140	Washer and electric dryer and built-in cabinetry for linens (sheets, dish towels, blankets). Shelf storage for disposables, large utility sink, space for mops, brooms, cleaners, etc.
Bunk Rooms		10	10	10	12	1200		0	1200	1200	4 lockers each and space for a small nightstand with 1 full size XL bed
Toilet Rooms		4	4	10	11	110		0	440	440	Unisex rooms each with toilet, sink/mirror, shower, and bench
Toilet Rooms		1	1	10	11	110		0	110	110	Unisex rooms each with toilet, sink/mirror, shower, and bench ADA accessible
Exercise Room		1	1	25	35	875		0	875	875	Include padded non-permeable flooring for easy cleaning/disinfecting. Include fitness equip. costs
Disposable Products Storage Room		1	1	10	12	120		0	120	120	Supply storage room. Toilet paper, paper towels etc.
Group Total								0	4141	4141	
TOTAL SQUARE FOOTAGE (Living Quarters)									0	4141	4141

Program: Living Quarters

Space / Room Use	Space Requirements			Space Size			Room Type	Total Required Square Footage			Comments
	Exist	2018	2048	W	L	Area		Exist	2018	2048	
Department: Administration											
Administration											
Fire Chief's Office		1	1	14	16	224		0	224	224	Desk and small table w/room for 2-4 chairs and/or couch
Assistant Chief's Office		1	1	14	16	224		0	224	224	
Community Paramedic Office/Aid		1	1	14	12	168		0	168	168	Provide outside access or from lobby.
Law Enforcement Office		1	1	14	12	168		0	168	168	Provide outside access
EMS QA Office		1	1	14	12	168		0	168	168	
Office Manager's Office		1	1	14	12	168		0	168	168	Locate between the fire chief and battalion chief offices
Battalion Chief's Office		1	1	14	14	196		0	196	196	Desk, file storage, small table and chairs
Captain's Office		2	2	12	12	144		0	288	288	With desk, file cabinet, seating for 2 additional
Fire Marshal's Office		1	1	14	16	224		0	224	224	Desk, plan review table and storage, locker, small table with 2 chairs. Include interior door access to file room shared with Secretary #1
Firefighter Work Stations		1	1	14	18	252		0	252	252	Room for 7 workstations; consider adjustable height desks, space for printers and cabinetry for storage
Conference Room		1	1	15	25	375		0	375	375	8-10 People
Conference Room - Small		1	1	10	12	120		0	120	120	Future Office
Secretary #1 Office		1	1	14	12	168		0	168	168	Include interior door access to file room shared with fire marshal's office
File Room		1	1	14	12	168		0	168	168	Accessed from 2 sides as described for fire marshal's office
Fire Prevention Inspector(s)		1	1	14	12	168		0	168	168	Two workstations, file storage, and two lockers. Could also be used for pub ed
Secretary #2 (Receptionist)		1	1	8	10	80	Open	0	80	80	Work station near front counter. Include space or separate room for office copy/supplies
Office Supply Storage / Copy		1	1	10	14	140		0	140	140	Separate room for office supply storage, copier/printer, and other office devices (see current station 2)
Lunch Room / Kitchen		1	1	12	14	168		0	168	168	Microwave, small electric cook top, fill size fridge, food/dish/silverware storage, sink and a table for 4-6. Small hot water heater under sink
Unisex Restroom		1	1	10	8	80		0	80	80	With toilet, shower, sink/mirror, and built-in storage, ADA accessible
Unisex Restroom w/Shower		1	1	10	12	120		0	120	120	With toilet, sink/mirror, and built-in storage, ADA accessible
Training / EOC Room		1	1	30	35	1050		0	1050	1050	Max occupancy 50? Standard A/V components with interactive whiteboards, ceiling mounted projector,
Training Storage		1	1	10	15	150		0	150	150	
EOC Storage		1	1	10	15	150		0	150	150	drop-down screen and multiple TV displays
Public Bathrooms		2	2	10	20	200		0	400	400	1 male, 1 female restroom with multiple toilet stalls and sinks/mirrors in each
Dispatch / Reception / Radio		1	1	6	10	60		0	60	60	Alarm desk w/secondary dispatch capabilities (See Station 2 for example). Include cabinetry and countertop work space
Group Total								0	5477	5477	

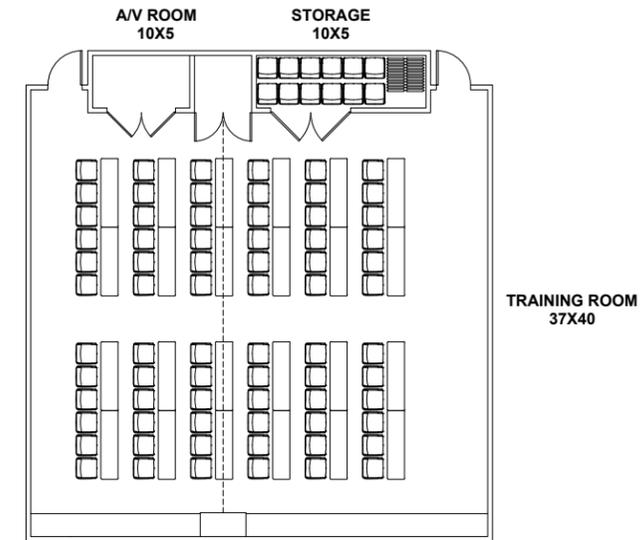
Program: Administration / Building Support

Space / Room Use	Space Requirements			Space Size			Room Type	Total Required Square Footage			Comments	
	Exist	2018	2048	W	L	Area		Exist	2018	2048		
Building Support												
Vestibule		1	1	12	8	96		0	96	96		
Lobby		1	1	25	30	750		0	750	750	Secured from entry into administrative area. Electronic door entry and panic hw w/ roll down door at front counter? Security camera to monitor area	
Museum / Historic Truck		1	1	15	30	450		0	450	450		
Stairs		2	2	10	18	180		0	360	360	Qty. 2 indicates 180 sf for each floor. Number of floors to be determined	
Elevator		2	2	10	10	100		0	200	200	Qty. 1 indicates 100 sf for each floor. Number of floors to be determined	
Elevator Mechanical Room		1	1	8	8	64		0	64	64		
Computer Server Room		1	1	12	14	168		0	168	168		
Electrical / Phone / Server Room		1	1	10	12	120		0	120	120		
Mechanical Room		1	1	10	12	120		0	120	120	Electrical panels, hot water heaters, roof access	
Fire Riser / Sprinkler Room		1	1	8	10	80		0	80	80	Exterior door access	
Janitor Closet per floor		0	0	0	4	24		0	0	0	Space currently allocated in Apparatus Support and Living Quarters areas. Can switch to per floor designation within building support if preferred	
Group Total								0	2408	2408		
TOTAL SQUARE FOOTAGE (Administration and Building Support)									0	7885	7885	

Program: Administration / Building Support [continued]

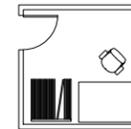
SPACE STANDARDS

Department: Exterior Requirements											
Parking											
Public Parking - Community Rm/Training		12	12	9	18	162		0	1944	1944	
Staff Parking		27	27	9	18	162		0	4374	4374	20 Suppression Staff, 7 Admin Staff
Group Total			39					0	6318	6318	
Site Elements											
Generator		1	1	10	12	120		0	120	120	
Trash / Recycling		1	1	10	20	200		0	200	200	Verify trash requirements w/ provider
Patio		1	1	8	38	304		0	304	304	BBQ
Group Total								0	624	624	
SUBTOTAL								0	6942	6942	
GENERAL CIRCULATION (100%)								0	6942	6942	
TOTAL SQUARE FOOTAGE (Exterior Requirements)								0	13884	13884	



SHARED ROOM LAYOUTS

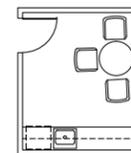
- Based on existing emergency response facilities, past experience, and general architectural standards, space standards have been developed and depicted to aid in efficiently comparing space sizes for offices, support spaces, and primary functions unique to this particular type of facility.
- These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



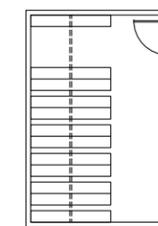
PLAN REVIEW
10X10



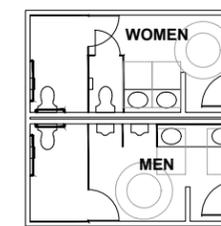
COPY ROOM
18X5



LOUNGE
10X12



RECORDS ROOM
12X18



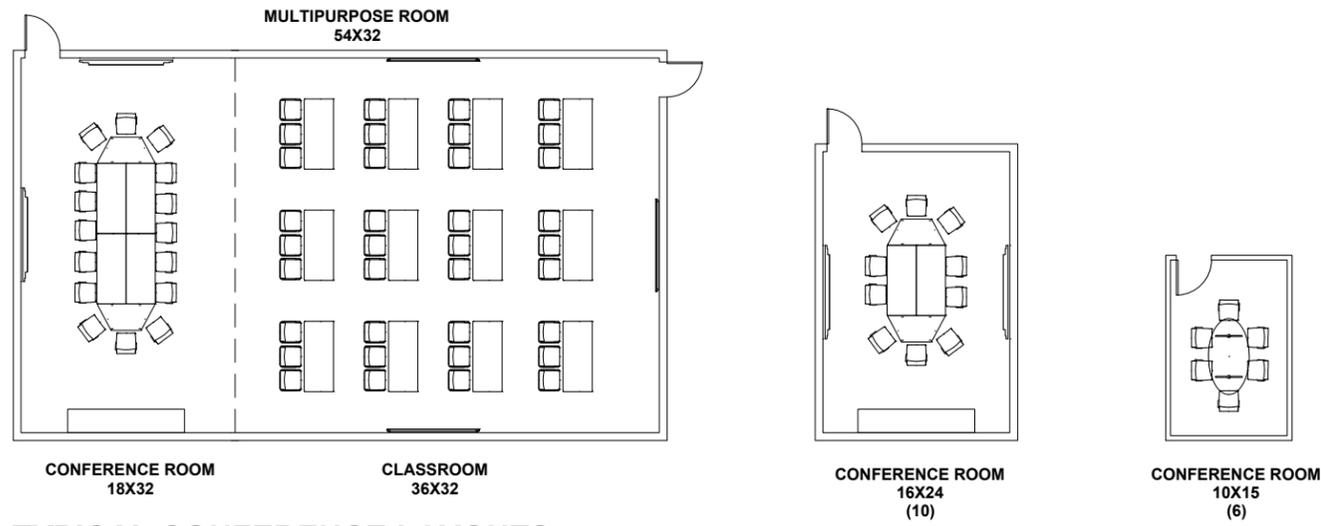
TOILET ROOM
18X18

TYPICAL OFFICE SUPPORT ROOM LAYOUTS

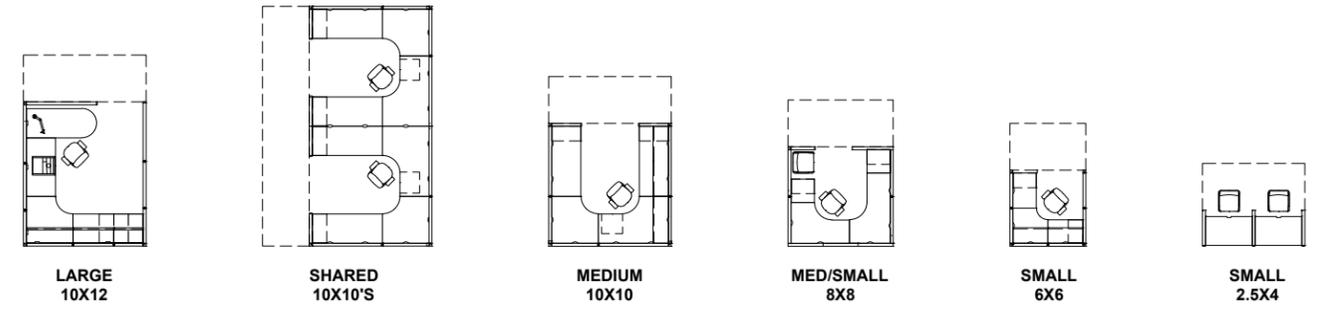
Program: Exterior Requirements

SCALE 1/16" = 1'-0"

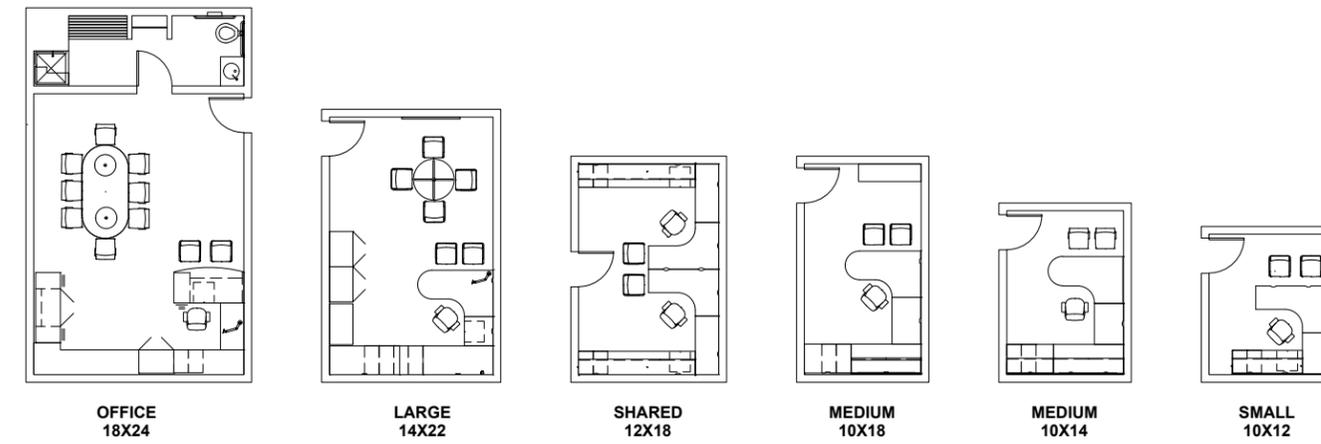
Space Standards



TYPICAL CONFERENCE LAYOUTS



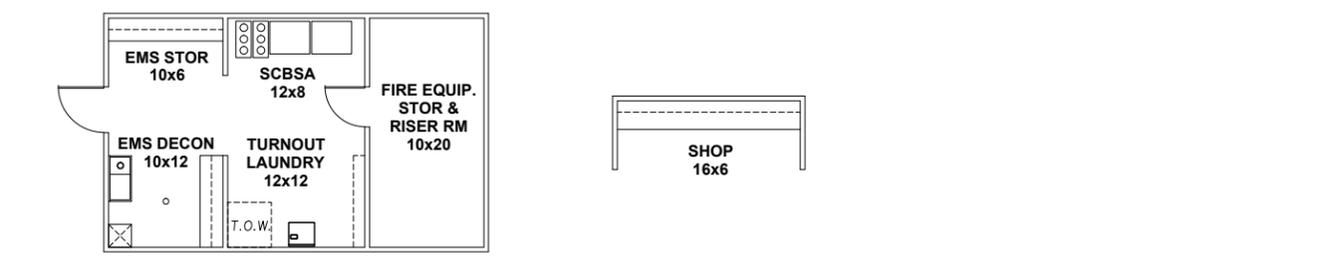
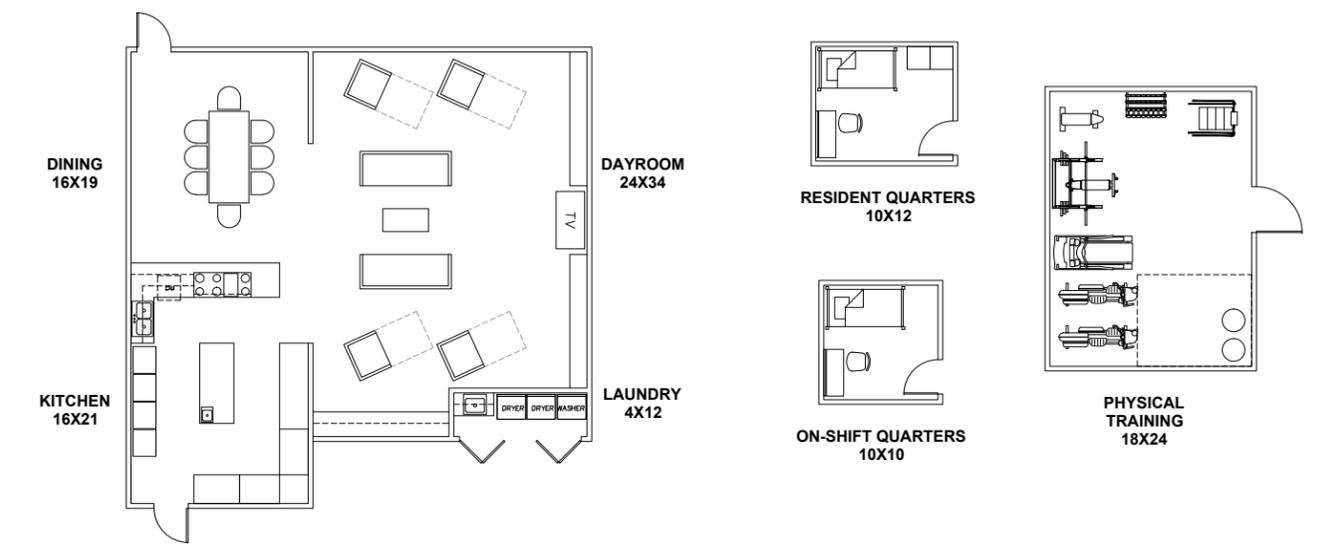
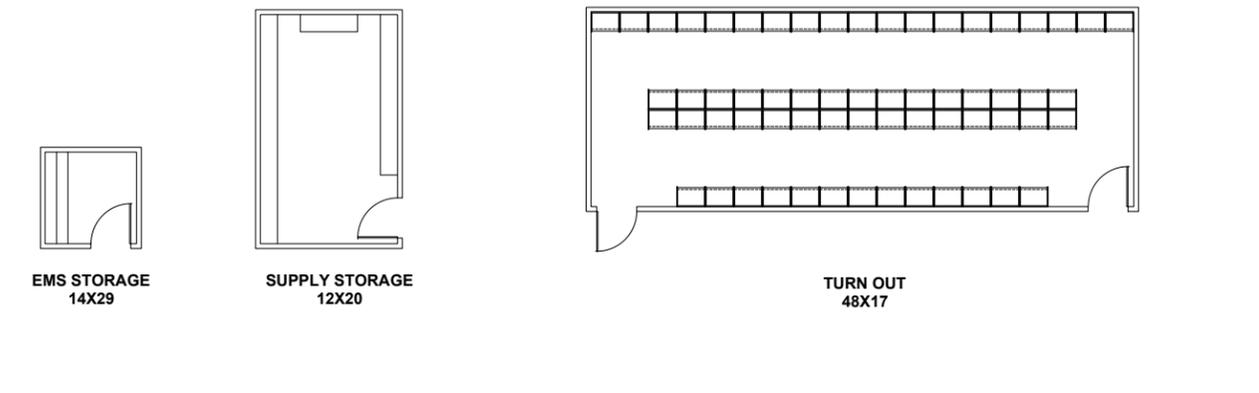
TYPICAL CUBICLE LAYOUTS



TYPICAL OFFICE LAYOUTS

Space Standards

SCALE 1/16" = 1'-0"



TYPICAL APPARATUS BAY SUPPORT ROOM LAYOUTS

SCALE 1/16" = 1'-0"

Space Standards

PLAN DEVELOPMENT

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PLAN DEVELOPMENT

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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 2) for the Mount Vernon Fire Department, 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 various site and floor plan concepts to best meet the 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 circulation.

Occupant wellness and safety were major determinates in the development of the plans. With all three stations, making the transition from the Apparatus Bays to the Living Quarters was highlighted by the transition from red to yellow to green zones. Red zones contain the Apparatus Bay and Support Spaces which contain higher levels of contaminants not acceptable to the living areas. Yellow zones are transitional zones intended for personal decontamination, including items such as hand sinks, showers, and a change of clothes. The intent is as one enters the clean green zones contaminants are significantly reduced due to the process of personal decontamination. This approach will reduce the levels of exposure to contaminants and carcinogens for the entire Fire Department staff and public.

Site and building safety were also a major concern. Strategies applied include separating the public parking areas with the staff parking lots and back of station areas. Currently at Stations 2 and 3, there are no existing barriers to keep the public from entering the restricted areas of the site. We propose secure fencing, motorized gates, electronic hardware, and security cameras to provide the security necessary for an essential facility. It is intended that this approach is taken into the interior of the building, providing clear separation between public areas and secure areas of the building. This will also include cameras at key points, electronic hardware, and pass

through barriers at reception counters. Station 1 is planned to include the same strategies, providing consistency across the stations. As an essential facility, it is critical that safety is maintained to ensure the ability to respond to events as intended.

Station 1:

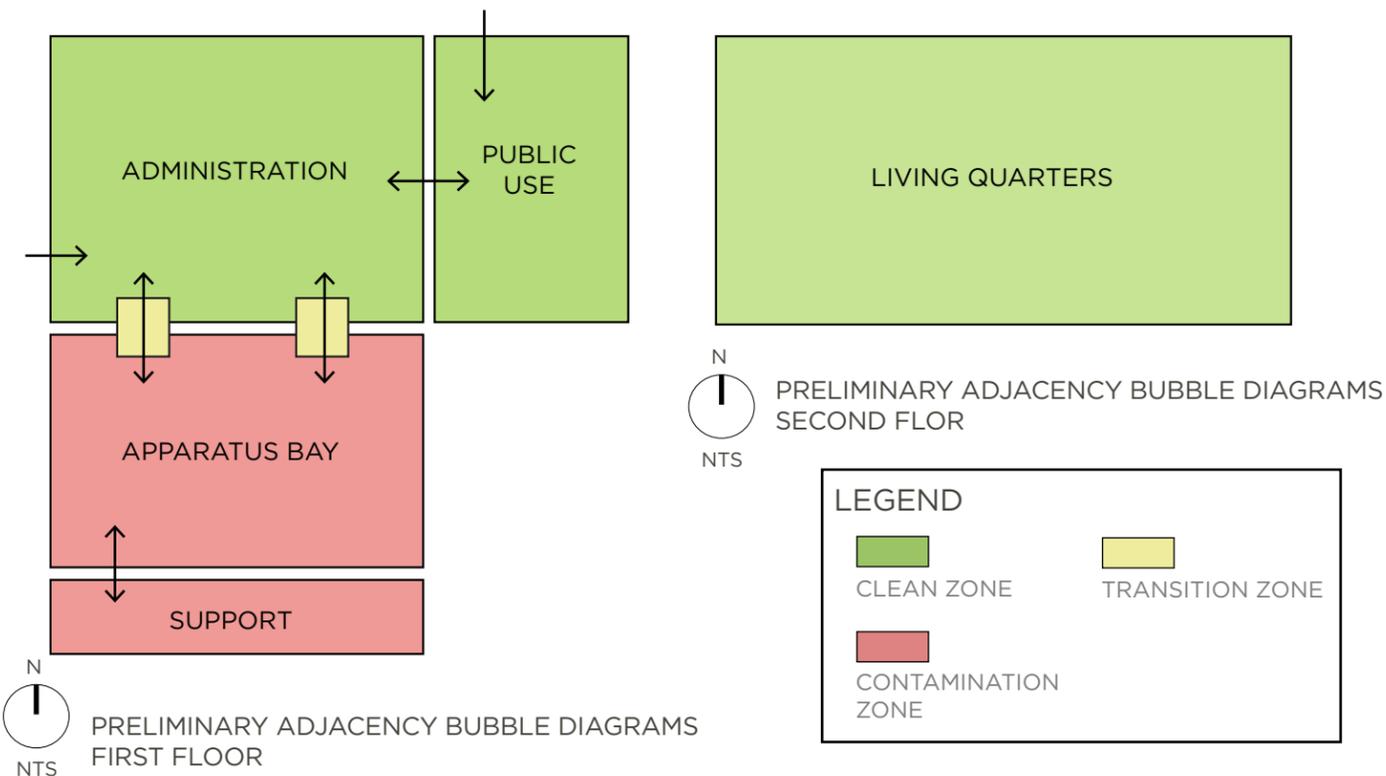
The initial site development scenarios for Station 1 (pages 03-04 and 03-05) looked at retaining the original site boundary, and locating the Apparatus Bay parallel to the adjacent alley to provide accessible drive-thru bays with access onto South 2nd Street, as well as Cleveland Avenue. The options subsequently compared the position of the living quarters, administrative functions, and community spaces in relationship to the Apparatus Bay, as well as site access and parking (both for the staff of the fire station and the public).

When evaluating these options, it became apparent that the site would be too small to functionally serve the Department. At this point, a version of the site that absorbed Snoqualmie Street, between Cleveland and 2nd, was studied. Various floor and site plan schemes were generated with the new context, while a civic plaza/walkway was introduced and developed. This plaza space took the place of the vacated Snoqualmie Street, creating a pedestrian amenity connecting the existing library to the north, the proposed station, and the city surrounding.

In the floor plan studies, “turnout time” became a key consideration or 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/block diagrams also specifically looked at separating operational traffic flow and public traffic, access points to the site, and the sequence of entry for the public. Further development of the site and floor plans then took into consideration many additional aspects of the site context. This included site elements, such as public vs. secure parking, site access points, public plaza space, zoning restrictions, and overall impact on the neighborhood. The proposed site and floor plans (pages 03-12 and 03-13) reflect more refinement and development to meet Department expectations - honing in on programmed square footages, increasing efficiencies, and taking into consideration the utilization of natural light.



N
NTS
EXISTING SITE AERIAL



Station 1 Facility

PRELIMINARY ADJACENCY PLANS

The new **Station 1** facility will be located on the site of a current parking lot, south of Snoqualmie Street, between Cleveland Avenue and South 2nd Street. Mackenzie evaluated and diagrammed preliminary adjacency floor and site plans to gauge the compact urban site. While tight, the orientation made its way to a working point with a 20,000-square-foot fire station.

At this time, further programmatic development took place, requiring a target station closer to 23,000 square feet. This new footprint rendered the site too small to accommodate ground floor building program, site circulation, and secure parking needs. Mackenzie then began looking into a new version of the site that absorbed Snoqualmie Street, between Cleveland and South 2nd. Studies of the new site began with a site analysis, and moved on into schematic site and floor plan options.



N
NTS
PRELIMINARY SITE PLAN STUDY

Station 1 Facility



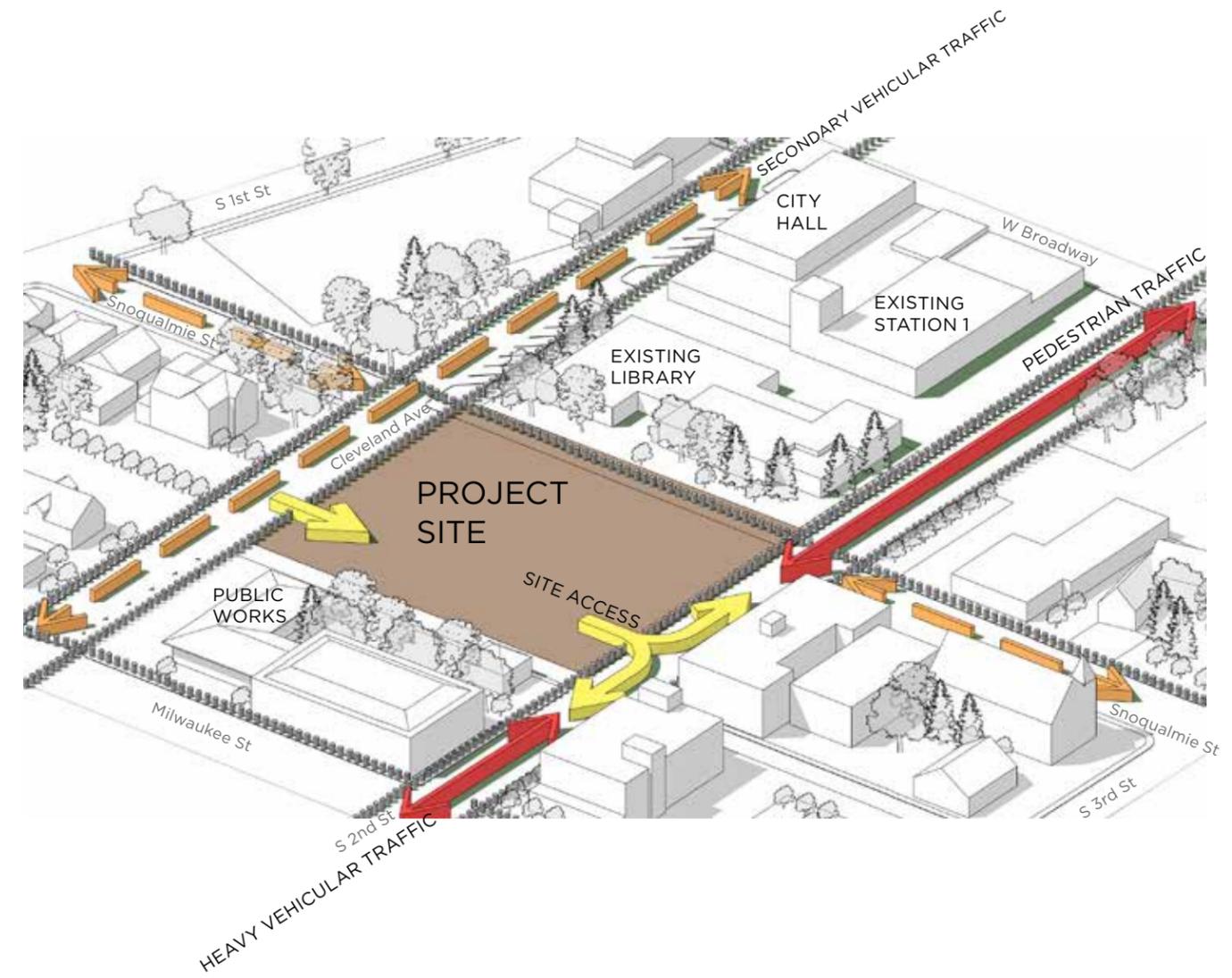
City of Mount Vernon Shared Street Vision Rendering Prepared by Makers
 Referenced in City's South Kincaid Sub-Area Plan Package, Adopted April 25, 2018



N
 |
 SITE MAP AREA
 NTS

Station 1 Facility

REFINED SITE ANALYSIS - STATION 1



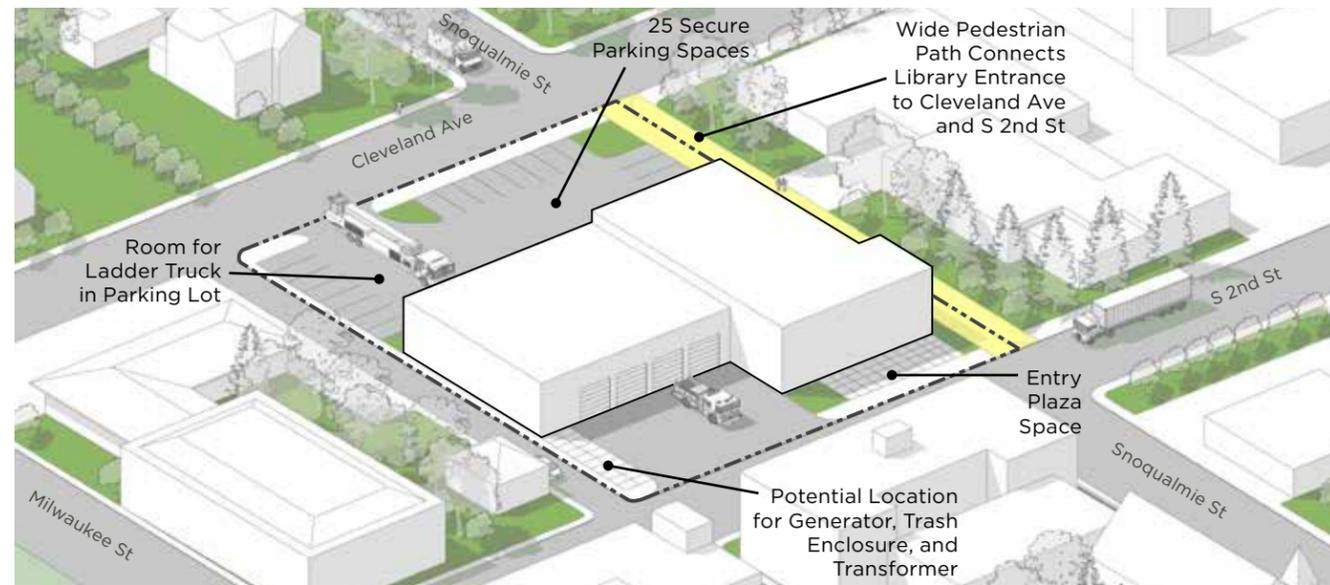
SITE DIAGRAM

Station 1 Facility

RE-WORKED SITE LAYOUT SCHEMES

Scheme 1

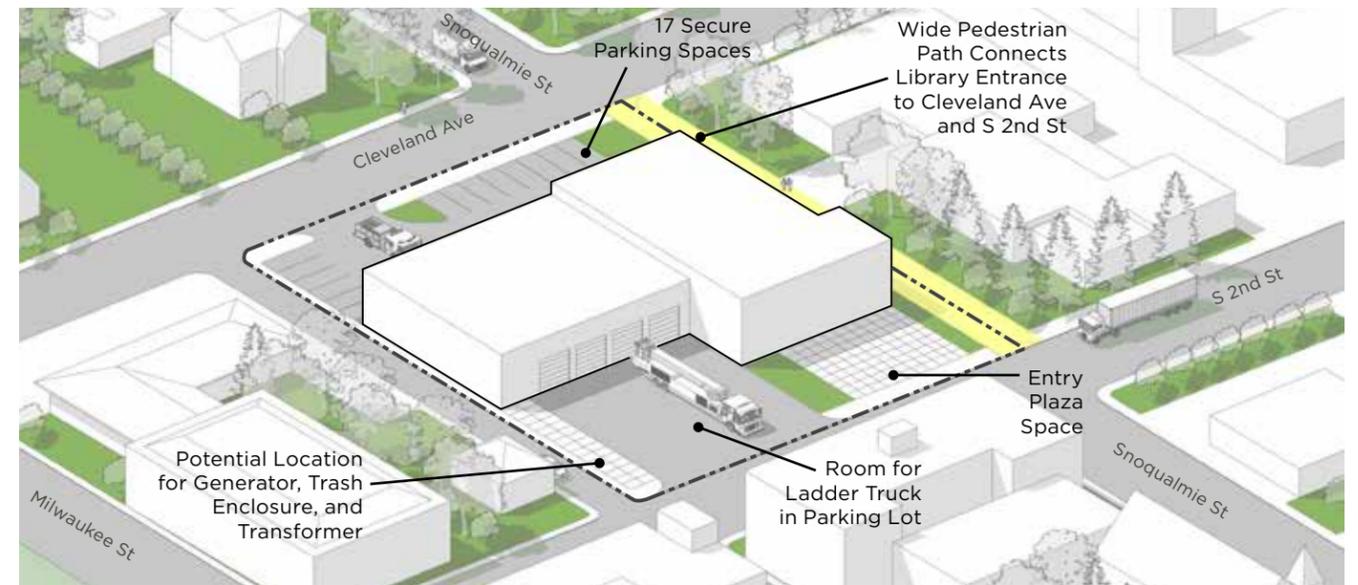
Building shifts east, to allow space for 65' ladder truck in back lot, which leaves 25 secure parking spaces.



SCHEME 1 SITE DIAGRAM

Scheme 2

Building shifts west, to allow space for 65' ladder truck on front apron, which leaves back lot with 17 secure parking spaces.



SCHEME 2 SITE DIAGRAM



SCHEME 1 SITE PLAN
N
NTS

Station 1 Facility



SCHEME 2 SITE PLAN
N
NTS

Station 1 Facility

FLOOR PLAN SCHEME OPTIONS

Scheme 1

Advantages

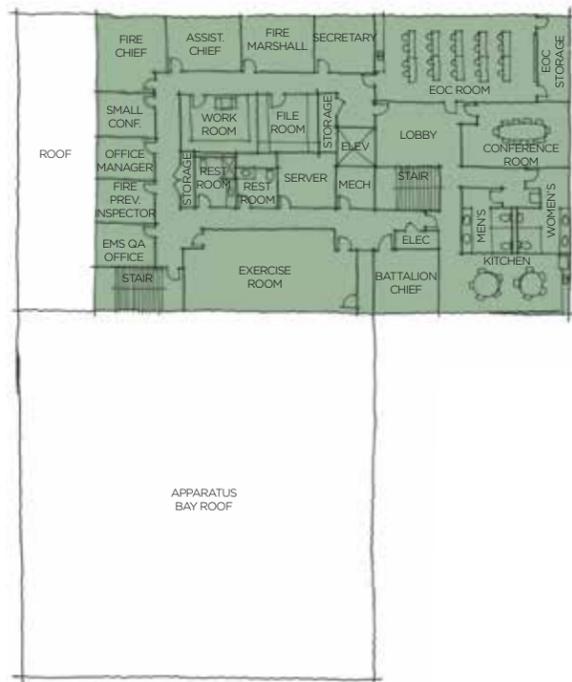
- Firefighter areas (Excluding Exercise Room) are close to Apparatus Bay - fast response times
- Firefighters flow from Apparatus Bay through Personnel Decon into Living Quarters

Disadvantages

- Sleeping Rooms have less privacy on ground level along public plaza walkway
- Kitchen / Dining area Patio falls on apparatus apron along South 2nd Street
- Public functions split between the two floors



N
FIRST FLOOR PLAN
NTS



N
SECOND FLOOR PLAN
NTS



Station 1 Facility

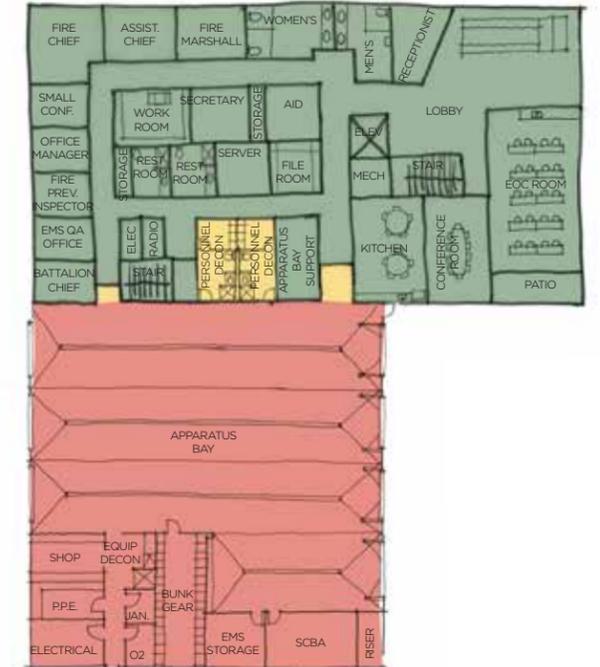
Scheme 2

Advantages

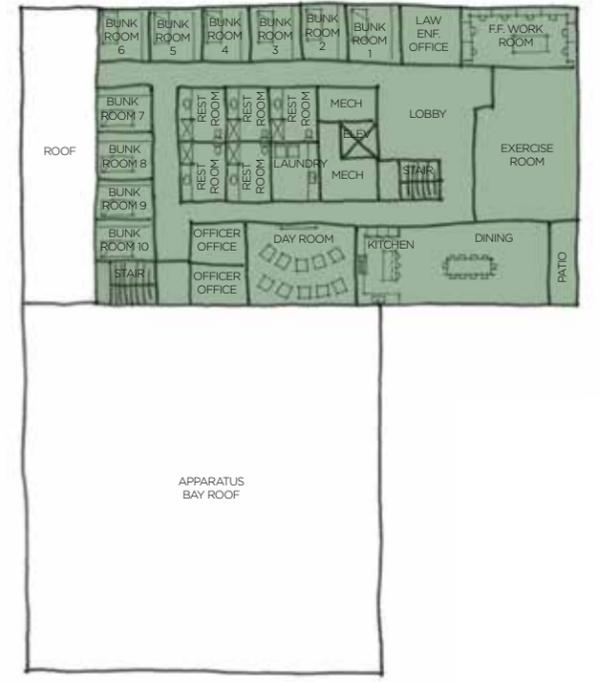
- Sleeping Rooms have more privacy upstairs
- Keeps Public function to first floor only

Disadvantages

- Firefighters have to respond to calls from second floor
- Firefighters have to go through Personnel Decon and upstairs into Living Quarters
- EOC Patio falls on apparatus apron along South 2nd Street



N
FIRST FLOOR PLAN
NTS



N
SECOND FLOOR PLAN
NTS

Station 1 Facility



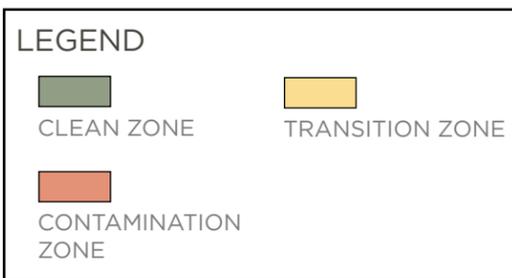
N
FIRST FLOOR PLAN
1/32" = 1'-0"



N
SECOND FLOOR PLAN
1/32" = 1'-0"

During the floor plan adjacency studies and refinement, the department expressed favor for both options presented; Scheme 1 with the living quarters on the first floor, and Scheme 2 with the administration functions on the first floor. Mackenzie advanced both floor plan options to be sure that either scheme would work within the building footprint standing at the time. This way, the building character study could move forward, allowing the Department to utilize either layout down the road.

Within both options, respective functions within the station are laid out similarly. The Apparatus Bay and Support functions occupy a taller, single story space to the south, while the Living Quarters and Administration functions stack in a two-story space to the north. In both schemes, careful thought was implemented into keeping the public functions grouped together, split from the private use. In the private sections, desired adjacencies directed the program organization to keep similar use spaces close together.



Station 1 Facility

PROPOSED SITE AND FLOOR PLANS

STATION 1:

Building Summary

- First Floor: 16,000 SF
- Second Floor: 8,000 SF
- Total SF: 24,000 SF

Site Summary

- Total Site Area: 69,901 SF
- Public Parking: 9 Stalls
- Secure Parking: 23 Stalls

Throughout the site plan organizational studies and discussions with the Department, the proposed concept below took form. The concept brings together many key elements that the Department required. With the station pushed to the east, there is ample secured parking for the staff in the rear lot. There is also adequate space in this area not only to park the 65-foot ladder truck, but also to extend the ladder and work through inspection and maintenance. Public parking that is displaced by the absorption of Snoqualmie Street is reconstituted as angled parking along the west edge of the site, and as straight-in accessible parking to the northeast.

The security wall along the staff parking area/building edge undulates in opacity in relation to need. It remains more transparent along the parking edges to create a more open, inviting feel. At the corner, the wall is half-height solid to allow for signage, and along the sleeping rooms, currently at ground level, the wall is full-height solid to provide privacy for the firefighters. The public plaza meanders between the library and the fire station, drawing the public in to experience the space. The plaza includes a mix of seatwalls, planter areas, and hardscape for circulation.



N
SITE PLAN
1" = 80'-0"

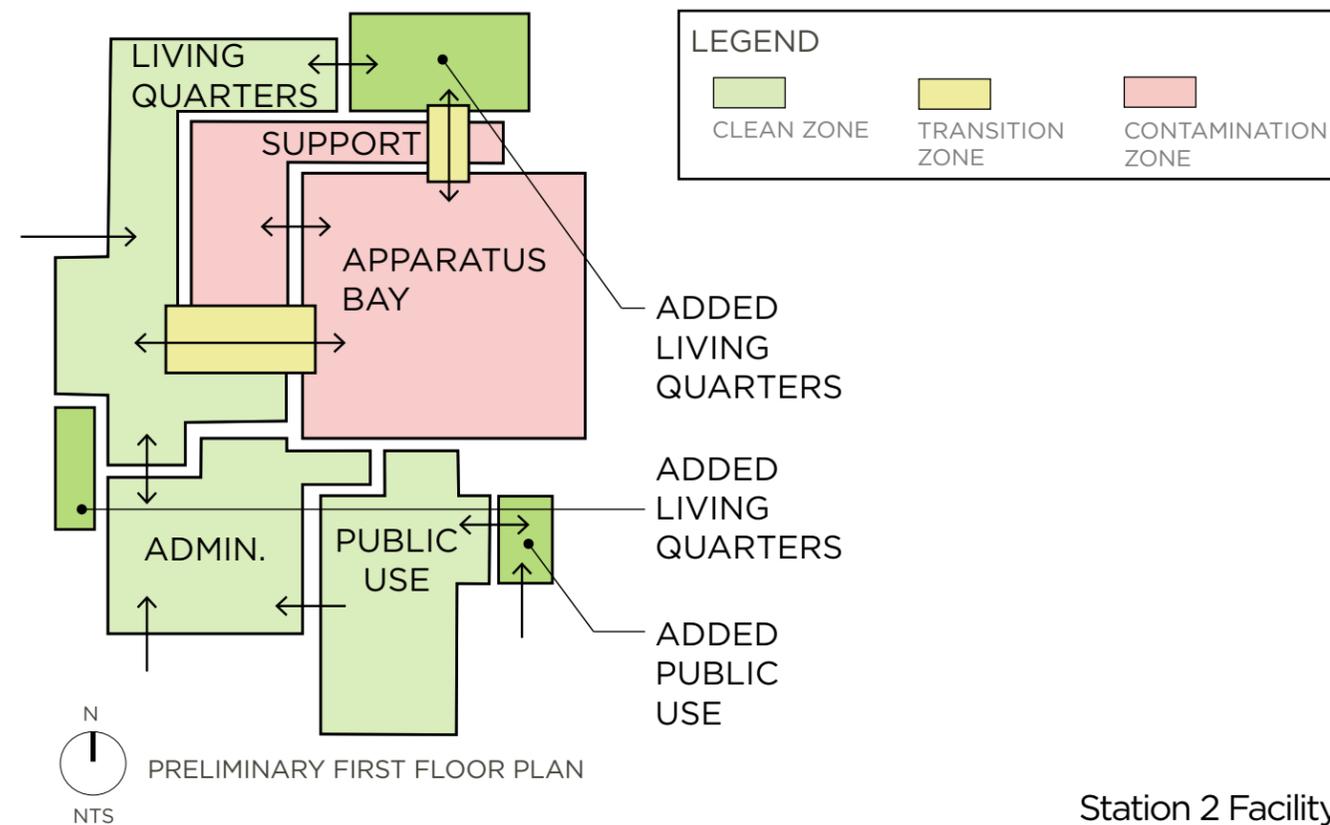
Keyed Notes

1. Concrete Seatwall
2. Line of Canopy Above
3. Potential Location for Covered CMU Trash Enclosure and Generator
4. Motorized Gate
5. 6' High Brick / Steel Picket Security Wall
6. Site Lighting Fixture
7. Pedestrian Gate
8. Flag Pole
9. Concrete Entry Patio and Pathway
10. Accessible On-Street Parking Stalls
11. Angled On-Street Parking Stalls

Station 1 Facility



N
EXISTING SITE AERIAL
NTS

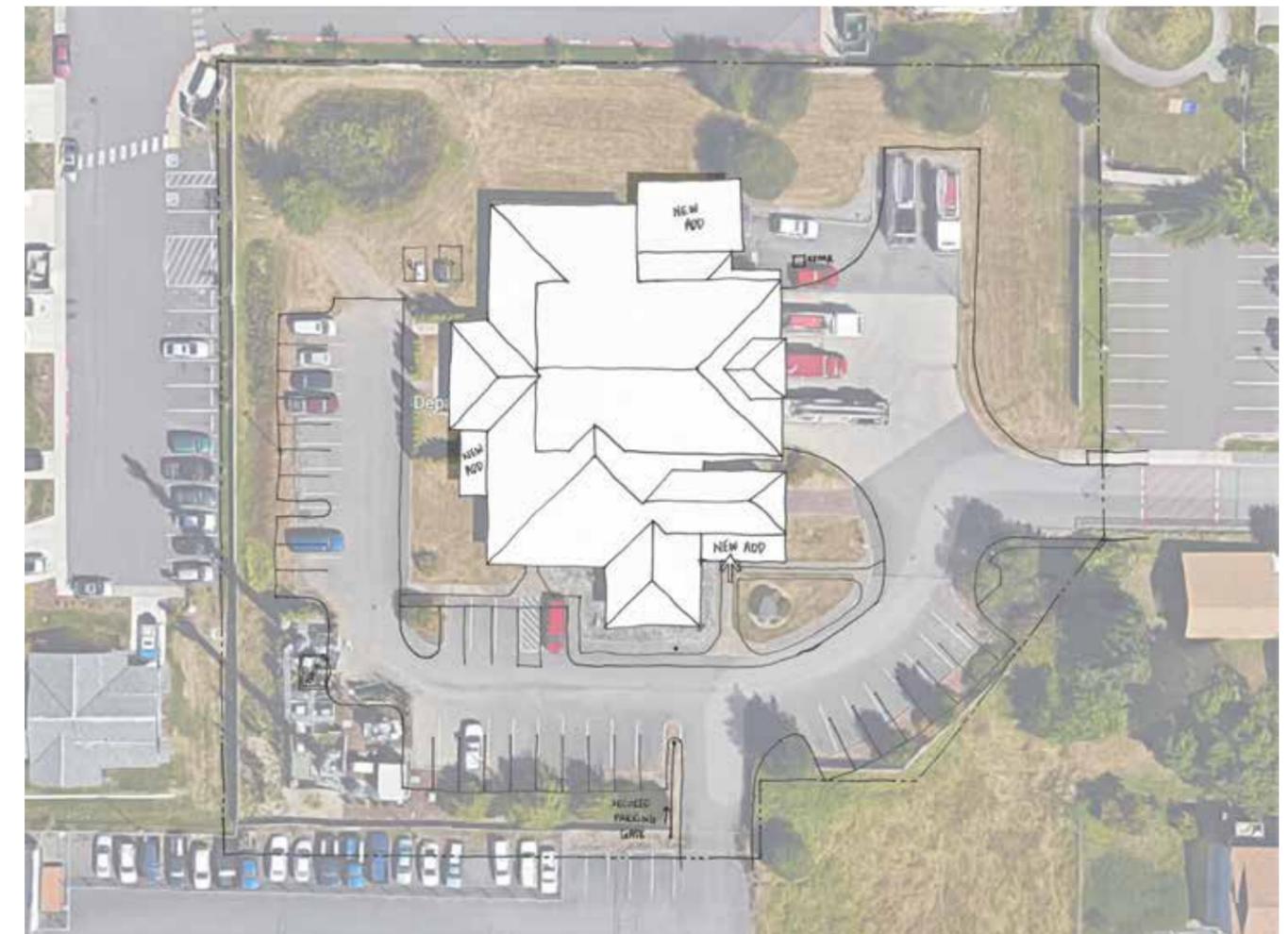


N
PRELIMINARY FIRST FLOOR PLAN
NTS
Station 2 Facility

PRELIMINARY ADJACENCY PLANS

Mackenzie assessed the current **Station 2** facility for renovation to meet the needs of the Department. The facility is currently located in the northeast quadrant of Mount Vernon, near the intersection of East College Way and North Laventure Road. Mackenzie evaluated and diagrammed preliminary adjacency floor and site plans to gain an understanding of optimal areas of new addition, existing areas to remain, and existing areas to rearrange programmatically.

Areas of new addition to the floor plans included a vestibule entry, extended kitchen/dining space, and an exercise room. The existing exercise room was displaced to create a more functional apparatus bay support area as program was rearranged internally. On the site, a strategically located motorized vehicle gate was proposed to separate the public and secured parking areas of the lot, giving the staff parking its own dedicated space.



N
PRELIMINARY SITE PLAN STUDY
NTS

Station 2 Facility

The concept plan development began centrally, focusing around the existing exercise room that doubled as the entryway into the apparatus bay. The exercise room was moved to an addition on the North edge of the building, keeping the area near the firefighter living quarters functions for convenience of use. In the space freed up by the move, a more functional apparatus bay support space was developed. Transitional personnel

decon and wash spaces were added to ease circulation between the living quarters and apparatus bay. Bunk gear space absorbed the existing public restroom area, and the restrooms were relocated to the Southeast. The public use area was re-organized to improve efficiency. Finally, to the West, the kitchen/dining area was extended to better serve the needs of the staff.

LEGEND

		
CLEAN ZONE	TRANSITION ZONE	CONTAMINATION ZONE

NOTE: Darker green spaces denote new addition areas.

- Building Summary**
- Existing: 12,697 SF
 - Additions: 1,332 SF
 - Total SF: 14,029 SF



FIRST FLOOR PLAN
3/64" = 1'-0"

Station 2 Facility

PROPOSED SITE AND FLOOR PLANS

STATION 2:

Site Summary

- Public Parking: 8 Stalls
- Secure Parking: 24 Stalls

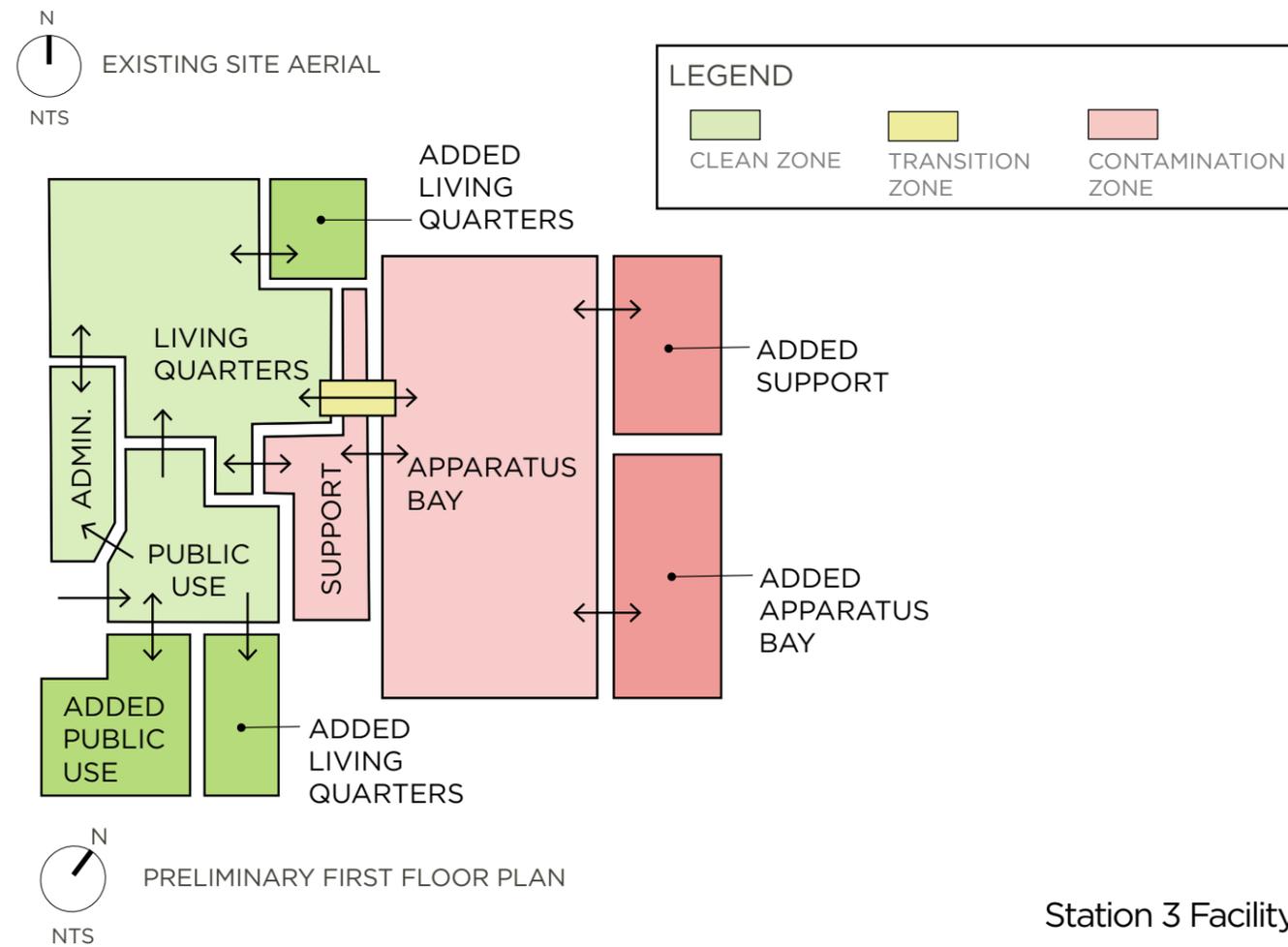
The site area modifications for **Station 2** were relatively minimal. One of the improvements focused on parking. The existing site currently has no separation between staff and public parking areas. A proposed gate was added to the plan to create a secure separation, giving both functions a proper place and boundary.

Another area of focus was an added patio space, along the North edge of the exercise room. This space gives the firefighters an outdoor use area in one of the more private sections of the site.



SITE PLAN
1" = 60'-0"

Station 2 Facility



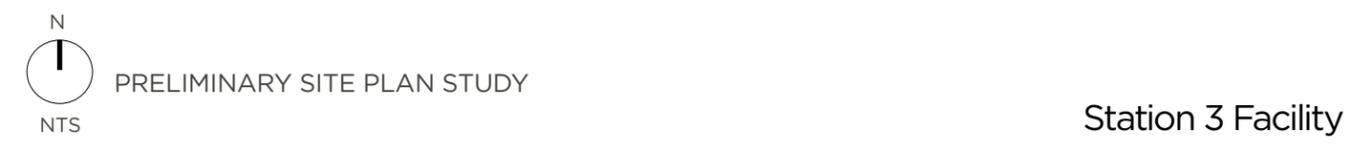
PRELIMINARY ADJACENCY PLANS

Mackenzie assessed the current **Station 3** facility for renovation to meet the needs of the Department. The facility is currently located in the central-east area of Mount Vernon, near the intersection of Division Street and Skagit Highlands Parkway. Mackenzie evaluated and diagrammed preliminary adjacency floor and site plans to gain an understanding of optimal areas of new addition, existing areas to remain, and existing areas to rearrange programmatically.

Preliminary studies identified areas of new addition to the floor plans that included a smaller third apparatus bay, apparatus support space, extended

kitchen/dining space, an exercise room, and a meeting room. The meeting room was displaced to create a more functional living quarters/administrative area in the central area of the plan.

On the site, a strategically located motorized vehicle gate was proposed to separate the public and secured parking areas of the lot, giving the staff parking its own dedicated space. The access drive was modified to allow drive through apparatus bays. The existing drive through loop was broken up by the added training/exercise rooms and additional parking was added in the remainder of the space.



The plan development for Station 3 saw some changes from the original adjacency concept. Changing areas included moving the exercise room to the North corner of the building, keeping this use near the living quarters functions for efficient circulation. This move allowed the Southern addition to house the entirety of the public functions. In turn, the central area of the plan was organized for more effective living quarters

and administrative functions. This reorganization allowed the addition of two bunk rooms, as well as transitional wash/decon spaces into and out of the apparatus bay. The remaining areas stayed similar to the original concept. The smaller apparatus bay and support space kept the space to the Northeast of the apparatus bay, and the extended kitchen/dining area remained along the Northwest edge of the building.

Building Summary

- Existing: 5,973 SF
- Additions: 4,074 SF
- Total SF: 10,047 SF



N FIRST FLOOR PLAN
3/64" = 1'-0"

Station 3 Facility

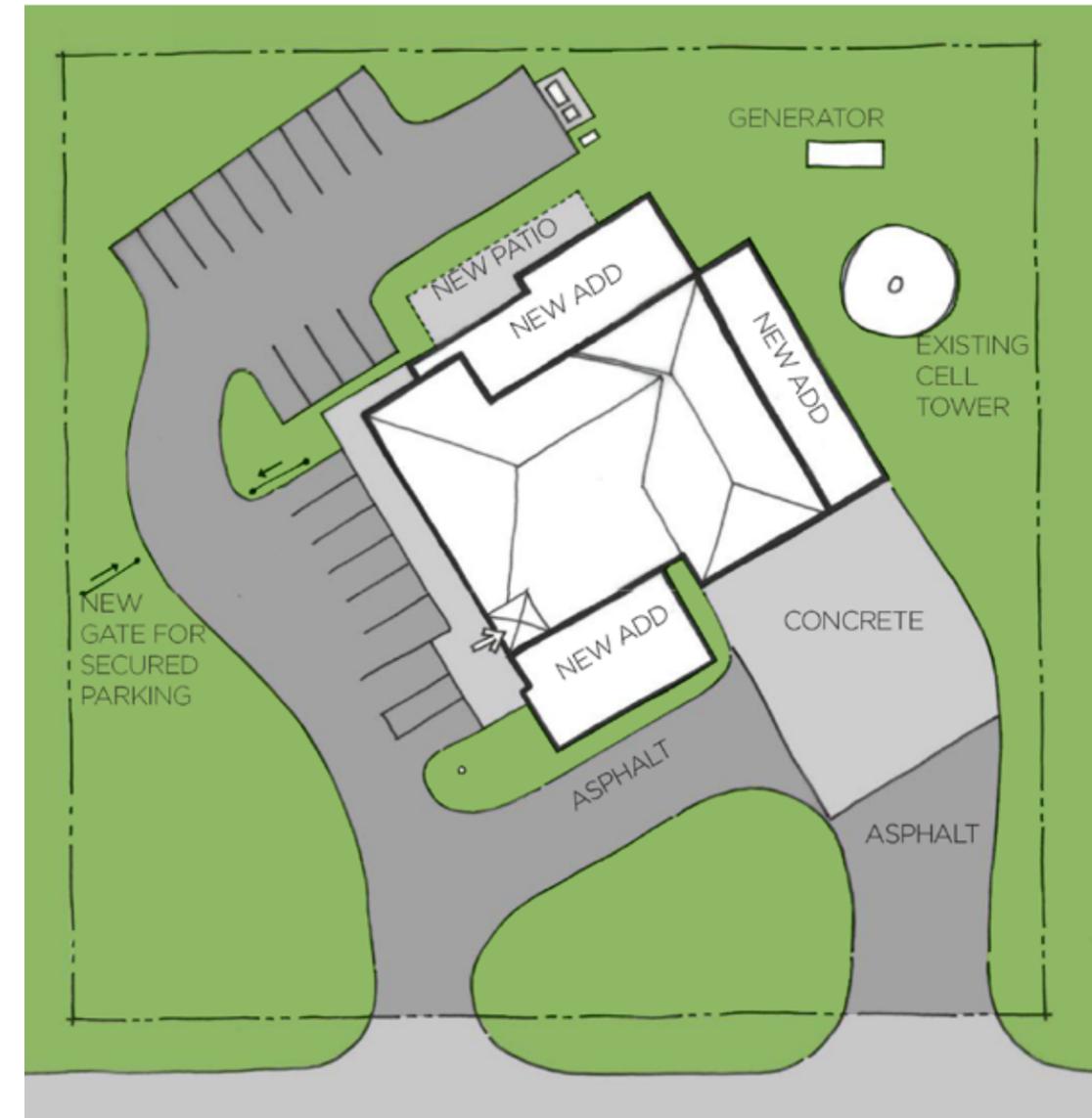
PROPOSED SITE AND FLOOR PLANS

STATION 3:

Site Summary

- Public Parking: 8 Stalls
- Secure Parking: 13 Stalls

The site plan for **Station 3** reacted along with the floor plan changes during concept development. The drive through apparatus bays gave way to a more efficient use of plan function space along the building's North edge. The access drive reverted back to the existing dead end concept. The drive through loop to the South was also re-instituted as the Southern building addition area shrunk in size. The concrete apron remains extended to serve the added smaller apparatus bay. Finally, a new patio was added at the kitchen/dining/exercise areas on a private area of the site.



N SITE PLAN
1" = 60'-0"

Station 3 Facility

VISIONING/PUBLIC OUTREACH

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PUBLIC MEETING

The goal of the visioning meeting, held on October 13, 2018 in the Fire Station 1 apparatus bay, was to provide citizens of Mount Vernon and interested community members an opportunity to engage with the City, Fire Department, and Design Team to understand and participate in the design process. Design Staff from Mackenzie and HKP Architects facilitated the open house. With assistance from Fire Chief Bryan Brice, the team described the deficiencies of the facilities and the rationale for why Station 1 needs to be replaced, and why Stations 2 and 3 need to be renovated.

After the initial informative portion of the meeting, an opportunity was provided to solicit aesthetic design feedback for the proposed new Station 1 from community members. The visioning imagery (found on pages 04-04 and 04-05) is a compilation of the images with the greatest positive response from the public. A subsequent discussion with community members helped to develop key words and phrases identified as high priorities for the community.

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VISIONING IMAGERY



ROCKS POLICE STATION
WELSH + MAJOR ARCHITECTS



SEATTLE FIRE STATION 20
SCHACHT ASLANI ARCHITECTS

SAFE/INVITING



WAYNE TOWNSHIP FIRE STATION 82
AXIS ARCHITECTURE

VISIONING IMAGERY



SHELBYVILLE FIRE STATION 2
AXIS ARCHITECTURE

The preferred images from the public visioning meeting were compiled here to represent the vision of the new Fire Station 1. 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 notes of building elements, such as material, amount of transparency, and scale, it is also important to incorporate design ideas early on in the process about the surrounding site. When considering the nature of the Station 1 site, it is important to closely examine and understand the outside environment and the community in which the building will reside.

The Station 1 site provides opportunities for shared open space, such as with the current library directly adjacent to the site. The incorporation of gathering spaces of all varieties is important, whether as a group or for an individual. As the building also will be home to a public lobby full of historic Fire Department items - such as a 1927 La France fire engine - it is important to offer transition spaces that serve as informative devices and opportunities for gathering when community members are visiting the fire station.

REPRESENTS DEPARTMENT/COMMUNITY



SHOREHAM STREET
PROJECT ORANGE ARCHITECTS



SEATTLE FIRE DEPARTMENT STATION 35
RICE FERGUS MILLER

SECURITY/STRENGTH



BOISE FIRE STATION 4
COLE ARCHITECTS

MASONRY



ALBANY FIRE STATION 11
MACKENZIE



OAK CREEK FIRE STATION 1
BRAY ARCHITECTS

LOW LIFE-CYCLE COST



CINCINNATI FIRE STATION 35
MSA DESIGN

LONGEVITY/DURABILITY

CONCEPT DESIGN

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CONCEPTUAL DESIGN

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Following cues from the visioning process, the Design Team worked with the City and the Fire Department to craft a conceptual design molded from the key concepts. The department expressed a desire for the building character to fall in a transitional style, tying elements of traditional and contemporary architecture. There was also a push for strong, traditional building materials to give the building a fire station identity. Careful consideration was taken when reacting to the multiple frontages of the building. Strong apparatus bay signage and elements are expressed along South 2nd Street at the apron. Along the pedestrian path/civic plaza space to the north, a canopy covered public entry area gives the building an urban scale, and draws people in. The construction techniques indicative of this design have sought to be responsible, cost-effective, long lasting, and low maintenance.

To assist the Department to visualize design options, Mackenzie produced three rounds of massing studies for the new building by using the approved site and floor plans.

The initial massing study focused around the idea of a traditional-contemporary style spectrum. Three options were generated; one farther to the traditional end; one to the contemporary end; and another closer to a true middle. The options utilized similar material palettes to achieve an aesthetic that speaks to the Department's requests, as well as the variety of responses received from the community during the public visioning session. The selected material palette 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.

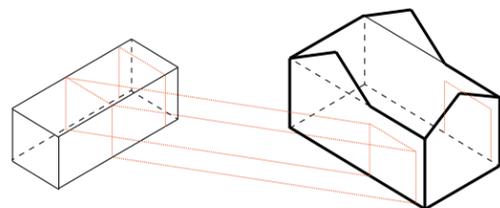
After the initial study, the Department resonated most with the true middle concept or Option B. Mackenzie then generated a revised massing option study which created two options closer to a true middle. The first option focused around a historical image of Mount Vernon's 1920 fire station. The option directly pulled elements from the old station, working them into the new station concept in a modern way. The second option remained closer to the original Option B. The design was refined per comments received in the first round of study. Each of the two options had two variants that explored the concept with and without a tower at the apparatus bay.

The Fire Department selected Option 1A (the modern historic facility with a tower at the apparatus bay) as the preferred option for refinement and pricing. Revisions of note during the design advancement include adding steel channel lintels rather than brick framing projections at the windows, use of typical cast concrete coloring at the apparatus bay framing, and the use of darker gray concrete at the entry area framing to give the space an identity. The entry area was also updated to include a wood interior/exterior soffit at the canopy, and a clean ribbon window at the second floor above the canopy.

The following pages illustrate the progression of the design.

INITIAL MASSING STUDY

OPTION A



Option A is a literal intersection of a traditional firehouse and a contemporary administrative building. The traditional brick form utilizes rhythmic repetition of openings found in historic masonry structures, incorporating steel lintels. The metal panel clad contemporary form opts for more of a linear ribbon window style, with light steel knife plate accents.

CONCEPT DIAGRAM



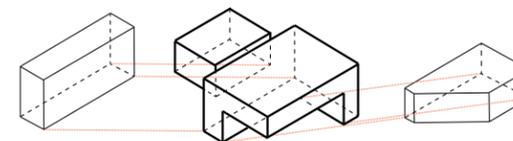
SOUTHEAST AERIAL VIEW



SITE ENTRY PERSPECTIVE

INITIAL MASSING STUDY

OPTION B



Option B utilizes two heavy brick anchors, at the apparatus bay and at the administrative building. The anchors are broken up by a central vertical metal panel element. To respond to the site influences, an angled slice occurs at the entry area, drawing pedestrians down the path and into the building. The fenestration articulates similarly to Option A, with punched windows at the brick elements, and linear windows at the metal panels.

CONCEPT DIAGRAM



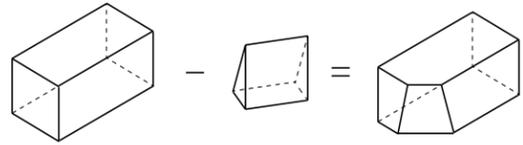
SOUTHEAST AERIAL VIEW



SITE ENTRY PERSPECTIVE

INITIAL MASSING STUDY

OPTION C



Option C gave two different languages to the two functions of the building. The apparatus bay took on a traditional rectilinear brick clad form. The administrative wing took on a metal clad form with horizontal and vertical strip window articulation. This form remained a clean box, with one large three dimensional cut at the corner. The cut draws people down the pedestrian path and into the building, while the windows above lean out and look over the plaza area.

CONCEPT DIAGRAM



SOUTHEAST AERIAL VIEW



SITE ENTRY PERSPECTIVE

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REFINED MASSING OPTIONS

OPTION 1A

Options 1A and 1B utilize the cast concrete framing elements of the historical station in different ways. At the apparatus bays, they are used traditionally, stepping back to the 4-fold doors. At the pedestrian entry, they step back to clean, mullion-less windows to accentuate the area. At this area, the heavy canopy finds a void above the planted area adjacent to the entry door. The void breaks up the

canopy and lets light in at the entry lobby area. The windows around the rest of the building take on a typical punched style, with a brick projection frame. At the metal panel element and at the apparatus bays, roof overhangs extend outward offering weather protection. At the brick towers, a more traditional cast concrete cornice is used.



SOUTHEAST AERIAL VIEW



SITE ENTRY PERSPECTIVE

REFINED MASSING OPTIONS

OPTION 1B



HISTORICAL STATION IMAGE



SOUTHEAST AERIAL VIEW



SITE ENTRY PERSPECTIVE

REFINED MASSING OPTIONS

OPTION 2A

Options 2A and 2B refined the previous study Option B. Revisions from the previous concept include the following:

- At the apparatus bays and along the administrative wing, wood soffit overhangs extend out providing weather protection.
- Underneath these overhangs, a concrete cornice detail has been added.
- The concrete masonry tower(s) that break up the brick masses extend upward, proud of the

overhang lines.

- The punched windows have been advanced, steel lintels and brick depression highlights were added.
- At the entry area, the angular cut gave way to a simpler, rectilinear form.
- Also, an angled steel feature has been added above the apparatus bay doors and above the notched entry area.



SOUTHEAST AERIAL VIEW



SITE ENTRY PERSPECTIVE

REFINED MASSING OPTIONS

OPTION 2B



SOUTHEAST AERIAL VIEW



SITE ENTRY PERSPECTIVE

SELECTED CONCEPT DESIGN

Previous Option 1A was selected by the Department and refined to a final concept. Building revisions of note were mentioned previously; however, there were also some site related updates. Those changes included adding photovoltaic panels on the roofs, adding a seatwall feature at the flag pole in the public plaza, as well as an updated fence along the secured parking lot. The fence is composed of brick, concrete, and steel elements and varies in opacity

due to programmatic need. The fence is fully opaque at the bunk room windows, giving privacy to the firefighters. At the parking areas, the fence becomes more transparent. At accent spaces such as the Northwest corner of the site, the top half is transparent, allowing a bottom opaque field prime for signage.

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SITE ENTRY PERSPECTIVE



SITE REAR PERSPECTIVE

SELECTED CONCEPT DESIGN



EAST ELEVATION
NTS



NORTH ELEVATION
NTS



WEST ELEVATION
NTS



SOUTH ELEVATION
NTS

SELECTED CONCEPT DESIGN



SOUTHEAST AERIAL VIEW

PROJECT COST DEVELOPMENT

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COST SUMMARY

Following completion of the conceptual design for Station 1 and the conceptual site and floor plans for Stations 2 and 3, Mackenzie evaluated cost impacts of the fire facilities to meet the Department’s needs for the next 20 years. This effort is reflected in the Statement of Probable Costs found in Appendix B.

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. In the case of Station 1, there will not be land acquisition costs lowering the overall costs for a new station.

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, an owner’s contingency is recommended to ensure dollars are carried through construction for owner changes, design omissions, unforeseen conditions or jurisdictional requirements, among others.

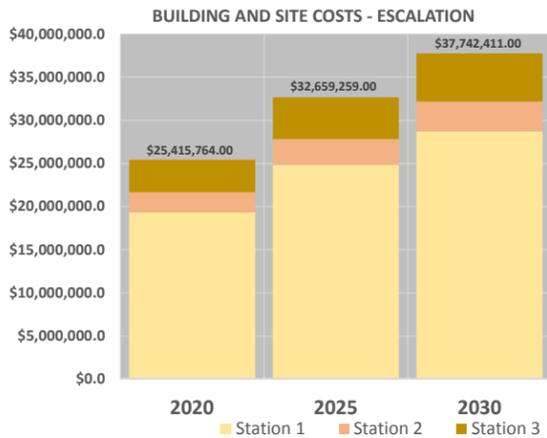
Escalation costs were calculated at 5-year intervals describing the change in construction cost if construction was pushed forward beyond the year 2020. The adjacent graph accounts for the escalation of building/site costs, owner’s construction contingency and sales tax. The escalation graph does not include consultant costs and owner costs which would also escalate over time adding to the total project costs for the years 2025 and 2030. Total project costs are calculated on the following page for the year 2020 as shown on the Mount Vernon Fire Department – Cost Summary.

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Consultant costs reflect the costs incurred for project management and design of the project from conceptual design through construction administration. Though design fee can vary, costs included in this report reflect standard A/E fee guidelines based on a percentage of construction cost as outlined by the Washington State Department of Enterprise Services. In addition to architectural and engineering services, costs include marketing materials and required services, such as geotechnical inspections 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. Some additional owner-related costs include relocation into the new facility, jurisdictional fees and furniture and equipment. 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. Reference Appendix B, pages AB-52 through AB-54 for the Jurisdictional Fee Summary.



NOTE: This chart includes total construction costs only. Project soft costs are not shown.

PROJECT COST ESTIMATE

The following project development cost estimate examines the construction values of the programmed design concept for Station 1 and conceptual floor and site plans for Station 2 and 3. Details of scope and assumptions are detailed in the Statement of Probable Costs, found in Appendix B. Construction costs include a design contingency. As the design moves forward and assumptions made in the original estimate are addressed or eliminated, the contingency factors can be reduced.

DISCIPLINE NARRATIVES FOR BASIS OF COST

<i>New Construction</i>	<i>11/16/18 Cost Est.</i>	<i>11/16/18 Cost Est.</i>	<i>11/16/18 Cost Est.</i>	Comments
Construction Cost of Facility	STATION 1	STATION 2	STATION 3	
Building Hardcost	\$13,869,478	\$1,875,403	\$3,075,446	
On-Site Hardcost	\$1,547,526	\$106,683	\$144,719	
Off-Site Hardcost	\$1,131,041	\$0	\$0	
Subtotal	\$16,548,045	\$1,982,086	\$3,220,165	
Margins				
Owner's Contingency	\$1,241,103	\$148,656	\$241,512	7.5% Allowance
Sales Tax	\$1,547,656 ¹	\$185,375 ¹	\$301,166 ¹	8.7% Combined State & City
Subtotal	\$2,788,759	\$334,031	\$542,678	
Total Construction Costs	\$19,336,804	\$2,316,117	\$3,762,843	
	\$805.70 /sf	\$165.09 /sf	\$374.52 /sf	
Consultants Costs	STATION 1	STATION 2	STATION 3	
A/E Design and Construction - Base	\$1,564,816 ²	\$296,007 ²	\$462,493 ²	A/E Guidelines - Off. Of Finacial Mgmt.-WA
Reimbursables	\$46,944	\$8,880	\$13,875	3.0% Allowance
Owner's Project Manager	\$120,000	\$35,000	\$35,000	
Marketing Materials	\$0	\$0	\$0	
Topo and Boundary Survey	\$0 ³	\$0 ³	\$0 ³	By City of M.V.
Geotechnical Investigations	\$0 ³	\$0 ³	\$0 ³	BY City of M.V.
Special Inspections	\$35,000	\$10,000	\$10,000	Allowance
Geotechnical Field Inspections	\$10,000	\$3,000	\$4,000	Allowance
Environmental Services	\$0	\$0	\$0	
Transportation Engineering	\$0	\$0	\$0	
Haz. Material Survey/Testing/Mitigation Spe	\$0	\$8,000	\$8,000	
Commissioning	\$0	\$0	\$0	
Arborist	\$0	\$0	\$0	By City
Subtotal - Consultants	\$1,776,760	\$360,887	\$533,368	
Consultants Contingency	\$133,257	\$27,067	\$40,003	7.5%
Total Consultants Costs	\$1,910,018	\$387,954	\$573,370	
	\$79.58 /sf	\$27.65 /sf	\$57.07 /sf	
Owner Costs	STATION 1	STATION 2	STATION 3	
Land Acquisition	\$0	\$0	\$0	
Fixtures, Furniture & Equipment (FF&E)	\$528,509	\$107,030	\$74,608	Allowance
Fitness Equipment	\$0	\$0	\$0	
Telephone/Data/AV/Security Equipment	\$0	\$0	\$0	
Moving Allowance	\$0	\$0	\$0	N/A
Temporary Facilities	\$0	\$0	\$0	N/A
Permit Fees	\$259,728	\$168,025	\$168,834	
Subtotal - Owner Costs	\$788,237	\$275,055	\$243,442	
Owner Contingency	\$59,118	\$20,629	\$18,258	7.5% of Owner Costs
Sales Tax	\$73,720 ¹	\$25,725 ¹	\$22,768 ¹	8.7% Combined State & City
Total Owner Costs	\$921,074	\$321,409	\$284,468	
	\$38.38 /sf	\$22.91 /sf	\$28.31 /sf	
Individual Total Project Cost	\$22,167,896	\$3,025,480	\$4,620,682	
	\$923.66 /sf	\$215.66 /sf	\$459.91 /sf	
COMBINED TOTAL PROJECT COST	\$29,814,057.53			
<i>Building Size (SF):</i>	<i>24,000 SF</i>	<i>14,029 SF</i>	<i>10,047 SF</i>	



APPENDIX A

BASIS OF COST

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Mount Vernon Fire Department – Station 1

November 19, 2018

PROJECT DESCRIPTION

The project is new construction of a 23,265 square foot fire station, One and two-story building consisting of a 16,195 square foot main floor and 7,770 square foot second floor. The building occupancies consist primarily of B-Occupancy with a training space as an A3-Occupancy, R3-Occupancy at the residence quarters and the apparatus bay as an S2-Occupancy. The construction classification is designated as a Type-V (B).

The new site is currently an existing parking lot which has minimal grade changes. The project will vacate existing Snoqualmie Street to the north. Snoqualmie Street space will be used for both the new building and a new pedestrian walking path.

The buildings will consist primarily of 8" structural brick exterior walls. Additionally, a metal wall panel system with rain screen will be used. Aluminum framed storefront system will be used for lobby and entry glazing. Windows will be a fiberglass system with operable vents. The roof structure will consist primarily of metal decking supported by open web steel joists and trusses. The second-floor structural systems will consist of a composite metal deck and concrete floor supported by open web steel joists. The typical ceiling conditions consist of acoustical suspended ceiling and the typical ceiling height is 10'-0". The roof will consist of a fully adhered single ply roofing over R38 rigid insulation.

A. SUBSTRUCTURE

A10 FOUNDATIONS

A1010 Standard Foundations

- Not Used

A1020 Special Foundations

- Based on what we know of the soils in the area and the nearby buildings already existing, it is assumed that the building will be supported on piles.
- Further information on quantity and type of piles won't be able to be provided until a geotechnical engineer can provide recommendations based on the soils at the site.

A1030 Slab on Grade

- It is unknown what the slab on grade structure will be at this time.
- If the soils have enough bearing capacity that piles are only required at the footings, it is assumed that there will be a 4" thick reinforced concrete slab-on-grade in the living quarters section of the building and a 8" thick reinforced concrete slab-on-grade in the apparatus bay.

Mount Vernon Fire Department – Station 1

November 19, 2018

- If the soils have insufficient bearing capacity to support the loading on the slab, the slab will have to be structural, with piles placed at a given spacing all throughout. Spacing and type will have to be determined later with input from a geotechnical engineer.

A20 BASEMENTS – Not Used

A2010 Basement Excavation

- Not Used

A2020 Basement Walls

- Not Used

B. SHELL

B10 SUPERSTRUCTURE

B1010 Floor Construction

- Elevated Deck:
 - 3" metal decking with 2 ½" concrete for a 5 ½" total section. Wide flange columns at approximately 30'x30' grid. Wide flange joists spaced at approximately 6'-0" o.c.

B1020 Roof Construction

- Main Roofs: Roof deck to be 1 ½" deep metal decking. Framing in apparatus bay to be open web steel joists that clear span and are spaced at about 6'-0" o.c.
 - Framing in living quarters to be steel wide flange beams and columns. See Floor Construction section above for spacing and layout.

B20 EXTERIOR ENCLOSURE

B2010 Exterior Walls

- Assume the building exterior walls will be comprised of the following:
 - 8" thick structural brick: Color TBD
 - Metal Wall Panels: Concealed faster panels by AEP Span, Prestige Series. Color TBD.
 - Cast in Place Concrete: Integral Color TBD
 - Large Metal Clad Roof Overhangs: Aluminum ACM panels over metal stud framing by North Clad. Color TBD

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- Roof Cornice: Pre-cast concrete. Integral color TBD

B2020 Exterior Windows

- Frames: Kawneer 451UT storefront system; Architectural Class I, clear anodized aluminum finish.
- 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).
- Fiberglass Windows: Integrity by Marvin, Color TBD

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.
- Four-fold Doors: FF100-600 Four-Fold door by Door Engineering and Manufacturing. Color to be custom 'red' with custom panel layout per drawings. East side of building
- Overhead Coiling Doors: 596 Thermacore Door System, size/glazing per drawings, Extra Heavy-Duty, Color factory finish White. West side of building.

B30 ROOFING

B3010 Roof Coverings

- Low Slope Roofs: GAF EverGuard TPO 60mil Single-Ply roofing membrane over protection board and 1 ½" metal deck. (R-38). 20 year warranty.

B3020 Roof Openings – Not Used

- --

C. INTERIORS

C10 INTERIOR CONSTRUCTION

C1010 Partitions

- Light gage 3 5/8" framing with gypsum wallboard, typical unless noted otherwise. See floor plans for wall definitions.
- Acoustical insulation in all interior walls, typical.
- Interior walls run to bottom of structural decking, typical.

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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 architects sample.
- Steel doors and frames: Painted.
- Hardware: Schlage ND series typical at interior wood doors. Panic hardware at exterior doors. Finish brushed nickel.

Interior Glazing

- Interior Relites: Frameless butt glazing, width per plans, 8'-0" height. See floor plans for extent.
- Sliding transaction window system at reception.
- 3M window film: see floor plans for extent.

C1030 Fittings

- Whiteboards: see floor plans for extent
- Interior signage: Provide allowance for code required and individual room signage; frosted glass signs with stainless stand-offs and individual cut lettering.
- Toilet Accessories: Bobrick Contour Series. Provide combination trash/automatic paper towel dispenser, soap dispensers at vanities, toilet stall accessories typical per restroom.
- Toilet Partitions: Hadrian Solid Plastic Toilet Partitions, headrail braced, color; black.

C20 STAIRS

C2010 Stair Construction

- Stairs: Design-build steel stair with concrete filled pans and steel risers.
- Railing and Guards: Custom steel bars with pipe rails. Painted.

C2020 Stair Finishes

- Concrete pan to receive rubber tread and riser.

C30 INTERIOR FINISHES

C3010 Wall Finishes

- All walls to receive two coats of paint over a primer coat (3 coats total), typical unless noted otherwise. See floor plans for accent paint locations.

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- P-1 (General Wall Paint): Glidden Professional, Color: TBD
- P-2 (GWB Ceilings): Glidden Professional, Color: TBD
- P-3 (Accent): Glidden Professional, Color: TBD
- P-4 (Accent): Glidden Professional, Color: TBD
- Ceramic tile w/20% accent tile on wet walls full-height in all toilet rooms. See floor plans for extent.
- Structural brick at select lobby walls. 30 LF @ 12'-0" High.
- FRP on wet walls to 4'-0" AFF in Janitor's closets., 9'-0" at apparatus bay & apparatus bay support spaces and at the exercise room.

C3020 Floor Finishes

- Carpet tile & Broadloom: see floor plans for extent
 - CPT-1 (General Field): Shaw Contract Group, Blur Tile (59596), Color: TBD
 - CPT-2 (Office Areas): Shaw Contract Group, Fade Tile (59597), Color: TBD
 - CPT-3 (Bunk Rooms): Shaw Contract Group, Switch (5A205) Broadloom, Color: TBD
- Rubber Sports Flooring: Exercise room
 - RF: Tarkett Sports, Drop Zone Speckle, 48" wide roll, Color: TBD
- Polished Concrete: Typical. L&M Petrotex treatment at apparatus bay, decon and shop spaces, stain guard sealer at kitchen/dining
- Sealed Concrete: See finish floor plans for extent.
- Static dissipative tile w/ rubber base: Server room.
 - SDT: Flexco, ESD Control Solid Vinyl Tile, 12"x12", color TBD.
- Base: typical at all locations where tile is not defined.
 - RB-1: Roppe, 4" coved base, color TBD
 - WB-1: 4"H solid wood base, stained to match architect's sample. (Training Room)

C3030 Ceiling Finishes

- Assume 10' ceiling height at all locations where not otherwise defined.
- Suspended acoustical ceiling: see reflected ceiling plans for extent
 - SAT-1: Armstrong, Dune second look 2'-0"x2'-4" Tegular
- Open to Structure: Painted structure, piping, ductwork, SAT cabling, typical where exposed.
- Soffits: Painted gypsum board.
- Wood Ceiling:
 - Exterior: Rulon Company (www.rulonco.com) Linear Closed Shiplap Style, direct attached, random lengths; stained to match architect's sample. Located at entry canopy roof

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November 19, 2018

- Interior: Rulon Company (www.rulonco.com) Linear Style, suspended, stained to match architect's sample. Provide matching perimeter trim as noted on reflected ceiling plans. See reflected ceiling plans for extent.

D. SERVICES**D10 CONVEYING****D1010 Escalators and Lifts**

- Elevator:
 - Endura Twinpost Telescopic (2-stage), 80 fpm, by ThyssenKrupp. Standard interior cab design and finishes.

D1020 Escalators and Moving Walks – NOT USED**D1090 Other Conveying Systems – NOT USED****D20 PLUMBING****D2010 Plumbing Fixtures (ADA compliant as appropriate)**

- Water Closets: Porcelain, wall-mounted, provided with sensor operated, battery-operated 1.28 GPF flushometer valves in public areas, and manual flushometer valves in private areas.
- Lavatories: Porcelain, self-rimming sinks at restrooms.
- Sinks: Stainless steel, self-rimming.
- Faucets:
 - Sensor operated, hard wired with satin chrome finish.
 - Gooseneck faucet at all kitchen/coffee locations
- Showers: Pre-molded fiberglass, accessible (roll-in)
- Mop sinks: Stainless steel

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 solder joints, Type K copper piping below grade with brazed joints.
- The domestic hot water will be provided by a central natural gas fired high-efficiency water heater system with circulation. The circulation pump will be monitored to the BAS system.

D2030 Sanitary Waste & Vent**Mount Vernon Fire Department – Station 1**

November 19, 2018

- Cast iron sanitary and storm sewer piping with standard duty couplings used to collect waste from plumbing fixtures and connect to building's sewer service.
- Piping systems are to be provided with cleanouts at every 135 degree change in direction and at the upper terminal of each branch line.

D2040 Rain Water 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 will be distributed to mechanical units and water heater at 11"WC. Steel piping distributed below roof deck and within ceiling spaces, welded construction within return air plenums.
- Compressed air will be provided for the Apparatus Bay overhead and at floor level.

D30 HEATING, VENTILATING AND AIR CONDITIONING (HVAC)**D3050 Variable Refrigerant Volume (VRV) with Rooftop Heat Recovery Ventilators (HRV)**

- Heating and cooling will be provided from one approximately 60 ton outdoor VRV heat pump, connected to indoor fan coils and ceiling cassettes through refrigerant piping. Ventilation and exhaust air will be ducted to occupied spaces from a single 2,000 cfm indoor HRV with heat exchanger, DX cooling, and natural gas heating. 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 and heated makeup air for the shops, Hose Storage, and SCBA will be provided by a 1,600 cfm indoor propane-fired furnace, inline exhaust fan, and air-to-air plate heat exchanger. Minimum space temperature in heating will be 65 degrees F. Heating for the Decon will be provided by electric unit heaters to potentially provide a space temperature of 85 degrees F. Exhaust for Decon will be provided by inline fans ducted to the exterior of the building. No mechanical cooling will be provided for any of these spaces.

- The Apparatus Bays will be heated by natural gas-fired unit heaters. The unit heaters will be interlocked with the overhead doors to be turned off when the doors are opened. Exhaust will be provided by utility set exhaust fans and hose reels connected to vehicle tailpipes exhausted to an exterior wall. Multiple hose reels will be connected to a single exhaust fan. Space temperatures will be maintained between 60 and 65 degrees F during heating. There will be no mechanical cooling for this space.
- The Server Room and Elevator Machine Room will be served by individual split system heat pumps.
- Indoor design temperatures maintained between 70 and 75 degrees F year-round.
- Low-pressure ductwork will be sized at 0.08" of water column. All sheet metal design and installation will be per SMACNA standards. Flexible duct is not allowed in exposed areas.

D3060 HVAC Instrumentation and Controls

- The system will consist of 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.
- 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.
- 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 International Codes.

D3080 Testing, Adjusting, and Balancing

- An independent testing and balancing contractor will be required (as a sub-contractor to the general contractor), minimum qualifications for acceptance shall be the General Membership standards of the Associated Air Balance Council (AABC) or the National Environmental Air Balancing Bureau (NEBB) 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 +/- 10% of design airflow, the contractor shall submit three complete balance reports.

D40 FIRE PROTECTION

D4010 Sprinklers

- Each station will be provided with a wet pipe system per NFPA 13, 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.

- Quick response sprinklers will be provided in Light Hazard areas.
- Piping will be concealed where possible.
- Polyester finish with polyester escutcheon. Sprinklers in unfinished areas will be bronze finish.
- Concealed heads in gypsum board ceilings. Semi-recessed heads in suspended ceilings.

D4020 Fire Pump

- Pending an evaluation of the flow and pressure provided by the public water supply, a fire pump may be required to serve the sprinkler system.

D4030 Fire Protection Specialties

- Fire extinguisher cabinets: Semi-recessed, red w/ individual cut white letters (assume 8x total).

D4090 Other Fire Protection Systems

D50 ELECTRICAL

D5010 Electrical Service and Distribution

- The building will be served with by a 600 amp, 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.
- Provide connection for elevator.
- Emergency power
 - Station 21: Emergency power will be provided from an existing 165 Kilowatt diesel fuel generator with base tank provided by the Owner and installed by the contractor. The generator will 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.

- Station 22: Emergency power will be from a new 100 Kilowatt diesel fuel generator with base tank sized adequately 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.
- 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 connections for all systems furniture, 3 circuits for every 6 stations.
- Provide standby power to all lighting and receptacle loads in the following areas; Briefing, Patrol, Sergeants, Detectives, Multipurpose, EOC, Lockers, Sally port and Interview rooms.
- Provide grounding conductor in all branch circuits.

D5020 Lighting and Branch Wiring

- Electrical, Mechanical and Fire Sprinkler rooms: Provide LED strip lighting fixtures.
- Lobby Areas and Public Corridors: Provide recessed LED linear slot luminaire installed in between wood slat surfaces.
- Restrooms: Provide recessed LED downlight and LED wall mounted vanity over water closet areas. Provide LED recessed downlights over vanities.
- 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 Elevator Equipment room
 - Wall switch in Electrical rooms
 - Wall switch in Fire Sprinkler room
 - Occupancy sensors in all storage rooms
- Conference Rooms: Provide dimmable decorative linear fluorescent direct/indirect pendant mounted fixture with LED wallwash downlighting along perimeter of the room. Luminaires: Focalpoint 12 series and Lightolier LED downlight.
- Corridors: LED downlighting.
- Open Office and Enclosed Office open to structure: Provide pendant mounted linear fluorescent direct/indirect pendant mounted fixtures.
- Enclosed Office with drop ceiling: Provide recessed LED 2’x2’ volumetric troffer fixtures.
- Break, Copy, Work, Break and Archive Rooms: Provide in each space LED recessed 2x2 volumetric troffer luminaires with direct illumination spaced on 10’x10’ array.

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.

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 will be based on this manufacturer 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 (TO) will consist of three 8-pin connector modules. Each outlet will be capable of delivering voice or data as selected by the Owner. These TO locations will be coordinated with the Owner to ensure exact placement as needed.

- Each TO 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 for the TO. The CATV outlet locations will utilize RG-6 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 TO.
- Provide telecommunications outlet (TO) in all spaces, minimum 3 per office and 3 per cubicle. Each 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 TO locations will be coordinated with the Owner to ensure exact placement as needed.

RACKS

- Each TR (also identified as MDF/IDF) will consist of 7'x19" 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.
- All racks will be seismically braced with overhead ladder racking and properly anchored floor hardware.
- Vertical power strips will be provided on each side of all racks.

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. Additional horizontal wire manager will also be provided for Owner-installed equipment.

ELECTRONIC ACCESS CONTROL and INTRUSION DETECTION

- Card readers will be placed at main entrances and other secure areas as directed by the Owner. Card readers will be proximity type.
- Door contacts will be placed on exterior doors intrusion detection. This system allows the Owner to ensure all doors are securely closed and armed. Keypads will be placed for arming/disarming.

IP VIDEO SURVEILLANCE SYSTEM

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- IP Video Surveillance system will be provided for monitoring in areas shown on the drawings. A Network Video Recorder (NVR) will be utilized. The NVR will be sized to accommodate 30-day storage on all cameras.
- Monitoring of IP Video Surveillance will be via use of PC workstations, local or remote from the facility. The video management software will be determined by owner.

AUDIO-VISUAL SYSTEMS

- Training Room: The Training Room will have an HD, ceiling mounted projector with a 16:9 aspect ratio. Ceiling speakers will be installed for audio reinforcement. The audio reinforcement will have wired and wireless microphones as well as be connected to the projector. HDMI cabling will be in floor boxes on each side of the screen to accommodate a podium. All AV equipment will reside in a wall mounted, lockable cabinet within the storage room. An LCD wall mounted touch panel will be programmed and installed for all AV control.
- Several offices/conference rooms will have HDMI (point to point) and CATV outlets for Owner furnished, Contractor installed flat screens.

PROGRAMMING AND DESIGN NOTES

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

D5090 Other Electrical Systems

D60 FIRE ALARM

D6010 Fire Station 1:

- 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

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- Area smoke detectors will be installed in electrical rooms, telephone/data rooms, corridors, and remaining spaces as required by code. Combination smoke/carbon monoxide detectors will be installed in bunk rooms and in common spaces as required by code. 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.
- 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.

E. EQUIPMENT AND FURNISHINGS

E10 EQUIPMENT

E1010 Commercial Equipment

- Office equipment (supplied by Owner)
- Video conference equipment provided by Owner, installed by Contractor.
- (2) recessed motorized projection screens and ceiling mounted projectors.
- Lockers & Turnout Gear Racks will be OFCI.
- Provide allowance for blocking for all OFCI equipment.

E1020 Institutional Equipment – NOT USED

E1030 Vehicular Equipment

- Rolling gate
 - Provide electrical motor for power operation of sliding metal gate. Size motor adequately to accommodate weight of gate. Minimum requirements as follows:
 - a. Industry Standard: ASTM F1184.
 - b. Operation: Power operated, except emergency manual operation.
 - c. Minimum Speed: 1 foot per second.
 - d. Controller: Card Reader.
 - e. Drive Rail: Manufacturer's standard.
 - f. Motor Enclosure: NEMA 12.
 - g. Motor Size: 1HP gear reduction motor, 208v, 3 phase.
 - h. Control Circuit: Solid State, electro mechanical relays.
 - i. Machine Housing: 1/4 inch galvanized steel base and 14 gage steel cover with baked enamel factory finish.
 - j. Gear Reducer: 50 to 1 in continuous oil bath.
 - k. Battery Backup: Standard backup system.

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- Provide pedestal on both sides to activate gate and remotes for vehicles, a loop sensor in the pavement, as well as a push button activator inside building.

E1090 Other Equipment

- Kitchen Equipment provided by Contractor, installed by Contractor, including the following:
 - Station 1:
 - (1) commercial refrigerator at Admin Kitchen
 - (4) commercial refrigerators with ice maker at Kitchen
 - (1) commercial stove with hood at Kitchen
 - (1) microwave at Admin Breakroom
 - (2) microwaves at Kitchen
 - (1) dishwasher at Admin Kitchen
 - (2) dishwasher at Kitchen
 - (2) garbage disposals
 - (2) clothes washing machine (Front Loading Stacked)
 - (2) clothes dryer (Front Loading Stacked)
 - (2) Coffee maker, plumbed
 - (2) Insta-Hot, sink mounted
- Physical Training Equipment provided and installed by Owner.

E20 FURNISHINGS

E2010 Fixed Furnishings

- Casework: (uppers, counter, lowers)
 - Kitchen Countertop: Stainless Steel – seamless.
 - Typical Countertops: Plastic Laminate Typical.
 - Colors: TBD
 - Typical Cabinet Vertical Surfaces: Plastic laminate
 - PL-1: Wilsonart, Color: TBD
 - PL-2: Wilsonart, Color: TBD
 - PL-3: Wilsonart, Color: TBD
 - Display Case
 - Recessed, wood framed display case with glass sliding doors and glass shelves. Location: Lobby Area
 - Mirrors:
 - 7'-0"H frameless tempered mirrors, sized per plan (Fitness Room – Assume 20 LF)
 - 4'-6"H frameless mirrors, full length of counters (Men's and Women's Restrooms)

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- Window Treatments:
 - Mtl. Mini Blinds, Offices including Office Sidelights, Color: TBD.
 - Black-Out Honeycomb Blinds, Bunk Rooms, Color TBD
 - Roller Shades, by Hunter Douglas, EOC/Training Room & Large Conference Room, Color TBD

E2020 Movable Furnishings – NOT USED

F. SPECIAL CONSTRUCTION AND DEMOLITION

F10 SPECIAL CONSTRUCTION

F1010 Special Structures

F1020 Integrated Construction

F1030 Special Construction Systems

F1040 Special Facilities

F1050 Special Controls and Instrumentation

F20 SELECTIVE DEMOLITION

F2010 Building Elements Demolition

F2020 Hazardous Components Abatement

G. BUILDING SITEWORK

G10 SITE PREPARATION

G1010 Site Clearing

- Removal of existing asphalt, trees & landscaping of the existing parking lot.

G1020 Site Demolition and Relocations

- Demolition will include existing asphalt paving, storm drains, and sidewalks at both sides of Snoqualmie Street. Trees, sidewalks, irrigation and electrical service boxes at Cleveland and South 2nd Street. Site lighting and sidewalk lighting. Utility poles in the alley along the south side of the property.

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- G1030 Site Earthwork
- Preparation on building footings, slab subgrade & response apron. Grading also includes that required for parking lots and sidewalk subgrades. Additional grading as required for walking path and landscaped areas.
- G1040 Hazardous Waste Remediation – NOT USED
- G20 SITE IMPROVEMENTS
- G2010 Roadways
- Snoqualmie St to be vacated, new curbing, sidewalk and street markings to be installed.
 - Cleveland Ave curb bulb-outs to be demolished and replaced. New sidewalks, driveway and street markings to be installed.
 - S 2nd Street new sidewalk, driveway, and street markings to be installed.
 - A fire station signal or activated warning light will be required on S 2nd Street.
 - 8" concrete response apron at S. 2nd Street.
 - Thickened asphalt at rear station drive.
- G2020 Parking Lots
- Asphalt, concrete curbs, striping and signage.
- G2030 Pedestrian Paving
- Existing Snoqualmie Street Walking Path: concrete paving, reference site plan.
- G2040 Site Development
- Trash enclosure to be constructed of 6ft tall concrete reinforced masonry in custom coursing wall with steel fabricated gate leaves.
 - Provide two flag poles: 1x 35ft and 1x 30ft within a landscape feature.
 - At the Snoqualmie Street Walkway: provide landscaping, pedestrian lighting, and benches
- G2040 Security Enclosure
- Secure lot to be enclosed with a combination of structural brick, pre-cast caps and metal fencing & lighting. 6ft high total. Refer to drawings.
- G2050 Landscaping

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- See concept drawings for extents.
- G30 SITE CIVIL / MECHANICAL UTILITIES
- G3010 Water Supply
- See Civil Utility Plans for extent.
- G3020 Sanitary Sewer
- See Civil Utility Plans for extent.
- G3030 Storm Sewer
- Roof areas drain to flow through planters with overflow to piped system.
 - Parking area sheet flow to swales with outfall tied to existing storm and piped to onsite treatment areas.
 - Flow control will be required for all new and replaced hard surfaces. A vault with approximately 50,000 CF of storage will be necessary. (~\$550,000)
 - Water quality treatment will be required for all new and replaced pollution generating surfaces (parking and driveway areas).
- G3040 Heating Distribution
- G3050 Cooling Distribution
- G3060 Fuel Distribution
- Assume natural gas service
- G3090 Other Site Mechanical Utilities
- G40 SITE ELECTRICAL UTILITIES
- G4010 Electrical Distribution
- G4020 Site Lighting
- Parking lot; provide LED luminaire on 20 foot pole on 80 foot spacing.
 - Provide 12 Ft. LED Pedestrian lights along walking paths and building entry paths.
- G4030 Site Communications and Security

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- Criteria to be provided
- G4090 Other Site Electrical Utilities
 - Emergency generator. See Electrical drawings.
- 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).

Mount Vernon Fire Department – Stations 2&3

November 19, 2018

PROJECT DESCRIPTION**Station 2:**

The proposed work would include an addition to reconfigure the kitchen/dayroom, an addition for a new weight room and a new entry vestibule. The new plan reconfigures the administration portion of the building, bunker gear storage, dayroom, kitchen/dining and the existing weight room space. MEP systems will be replaced and enhanced including a new station alerting system.

Station 3:

The proposed work would include an addition to reconfigure the kitchen/dayroom, an addition for a new weight room and an addition for a new meeting/community room. The new plan reconfigures the existing meeting room and offices to increase the bunk room count to five. Additionally, a new addition for an apparatus bay and support spaces will be added. MEP systems will be replaced and enhanced including a new station alerting system.

Site work Station 2&3:

Work will include the resurfacing of existing asphalt drives, a motorized security gate to access the crew parking lot areas, site & entry security cameras and new BBQ plazas. Additionally, Station 3 will get an expanded concrete apron to accommodate a new apparatus bay.

A. SUBSTRUCTURE**A10 FOUNDATIONS****A1010 Standard Foundations**

- The additions on both Station 2 and Station 3 will receive wood bearing and shear walls on continuous strip footings. It is estimated that the strip footings will be 1'-6"x1'-0" x continuous with a 6" stem wall. Hold downs will be located at the ends of each wall and at any openings.
- Limited demolition of existing footings is expected. Shoring may be required.
- New footings and columns required in some locations to support the ends of new drag beams. See Keynote 4 on Station 2 diagram and Keynote 5 on Station 3 diagram.

A1020 Special Foundations

- A new grade beam will be required underneath the apparatus bay opening at the east addition of Station 3 to take out the lateral loads needed to be resisted by the new Simpson moment frame in this location.

A1030 Slab on Grade

- 4" thick concrete slab-on-grade for all additions on Station 2.

- 8” thick concrete slab-on-grade in the apparatus bay space of the east addition on Station 3. 4” thick concrete slab-on-grade for the other additions on Station 3.

A20 BASEMENTS – NOT USED

B. SHELL

B10 SUPERSTRUCTURE

B1010 Floor Construction – NOT USED

B1020 Roof Construction

- The roof will be plywood of ½” thickness or greater.
- Roof framing for the additions on both stations will be either solid sawn wood joists or gang nail trusses. Assume 2’-0” o.c. spacing.
- Demolition and replacement of existing roof trusses will be required at SCBA, Storage, & Equipment Decon areas on Station 2 in order to achieve the roof slopes and elevations desired.
- Drag beams, roof strapping, or other form of lateral ties are required at the locations marked in blue on the attached diagrams.

B20 EXTERIOR ENCLOSURE

B2010 Exterior Walls

- Assume the building exterior walls will be comprised of the following:
 - The exterior bunk room walls will be 2x6 bearing stud/shear walls with structural sheathing. Hold downs are anticipated at openings and ends of walls.
 - Additional seismic/wind loading required to be resisted at exterior shear walls as shown in pink on attached diagrams. Retrofits or upgrades such as additional shear wall nailing, adding plywood to the other side of the wall to make it a 2-sided shear wall, or adding/upgrading hold downs at the ends of these walls may be required.
 - In addition to the pink walls shown on the diagram for Station 3, the same type of upgrades as listed in the previous bullet point may need to be made to up to 50% of the other exterior walls not already indicated because of the extent of additions being added to the building.
 - Rain screen with hardi panel with lap siding on new stud wall and sheathing. New batt insulation to fill 2x6 cavity with 2” rigid insulation and new WRB.

B2020 Other Exterior Lateral Elements

- A new Simpson moment frame is required at the apparatus bay opening (south wall) of the east addition on Station 3.

B2030 Exterior Windows

- Frames:
 - Fixed: Kawneer 451UT storefront system; Architectural Class I, clear anodized aluminum finish.
 - Location: Station 2- vestibule, kitchen & exercise room and Station 3 lobby, kitchen & exercise room
- Fiberglass Windows: Integrity by Marvin, Typical windows, Color TBD
- 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).

B2040 Exterior Doors

- Hollow Metal Doors: Painted, metal doors with painted fully grouted and welded steel frames.
- All overhead doors to be replaced. Overhead doors with 3 rows of glass. 596 Thermacore Door System, 14’-0” w x 14’-0” h, Extra Heavy Duty, Color Factory Finish White.

B30 ROOFING

B3010 Roof Coverings

- Roofing: Typical assembly, Match existing asphalt roofing. Install new roofing over underlayment. Provide flashing, gutters and downspouts.
- Low Slope Roofs: GAF EverGuard TPO 60mil Single-Ply roofing membrane over protection board and R-38 rigid insulation. 20 year warranty

C. INTERIORS

C10 INTERIOR CONSTRUCTION

C1010 Partitions

- Assume the building structural walls will be comprised of the following:
 - Shearwalls to be 2x6 DF-L #2 wood bearing stud walls with plywood sheathing. Solid sawn end posts with holdowns at each end. See Structural plans.

- Interior bearing walls to be 2x6 DF-L #2 bearing stud walls. See Structural plans.
 - 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.
- C1020 Interior Shear Walls
- Because of the extent of the additions on Station 3, retrofits or upgrades such as additional shear wall nailing, adding plywood to the other side of the wall to make it a 2-sided shear wall, or adding/upgrading hold downs at the ends of up to 50% of the interior shear walls may be required.
- C1030 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 architects sample.
 - Steel doors and fully welded frames: Painted.
 - Hardware: Schlage ND series typical at interior wood doors. Panic hardware from lobby entry/vestibules, meeting room and exercise room. Finish brushed nickel.
- C1040 Fittings
- Interior signage: Provide allowance for code required and individual room signage; frosted glass signs with stainless stand-offs and individual cut lettering.
 - Lockers and Shelving:
 - Provide 24" wide, fixed system by Ready-Rack, Inc. See floor plans for turnout lockers
 - Toilet Accessories: Bobrick Contour Series. Provide combination trash/paper towel dispenser, soap dispensers at vanities, toilet stall accessories typical per restroom.
- C20 STAIRS
- C2010 Stair Construction
- Not Used
- C2020 Stair Finishes
- 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: 5'-0" AFF at public restrooms, 9'-0" AFF at Turnout Gear Storage, 9'-0" apparatus bay and support spaces.
- C3020 Floor Finishes
- Rubber Sports Flooring: Exercise room
 - RF: Tarkett Sports, Drop Zone Speckle, 48" wide roll, Color: TBD
 - Typical Flooring: replace all flooring except apparatus bays and support spaces, price at \$6.00 SF.
- C3030 Ceiling Finishes
- Assume 10'-0" ceiling height at all locations where not otherwise defined.
 - Suspended acoustical ceiling: at second floor and new offices
 - SAT-1: Armstrong, Dune 2'-0"x2'-0" Tegular
 - Painted Gypsum Board: new Toilet/Shower Rooms, Decon, Turnout, Generator, Storage
 - Open to Structure:
 - Typical: Painted structure, piping, ductwork, SAT cabling, typical where exposed.
 - Multi-Purpose Room: Suspended acoustical ceiling with 2'-0" border soffit in the multi-purpose room.
 - Soffits: Painted gypsum board.
- D. SERVICES**
- D10 CONVEYING
- D1010 Escalators and Lifts –
- Not Used
- D1020 Escalators and Moving Walks – *NOT USED*
- D1090 Other Conveying Systems – *NOT USED*
- D20 PLUMBING
- See Sazan Engineers Narrative

D30 HEATING, VENTILATION AND AIR CONDITIONING

See Sazan Engineers Narrative

D40 FIRE PROTECTION

See Sazan Engineers Narrative

D50 ELECTRICAL

See Sazan Engineers Narrative

E. EQUIPMENT AND FURNISHINGS**E10 EQUIPMENT****E1010 Commercial Equipment**

- Office equipment (TBD)
- Video conference equipment provided by Owner, installed by Contractor.
- Lockers & Turnout Gear Racks will be OFCI.
- 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:
 - Station 2:
 - (3) commercial refrigerators with ice maker at Kitchen
 - (1) commercial stove with hood at Kitchen
 - (2) microwaves at Kitchen
 - (2) dishwasher at Kitchen
 - (1) garbage disposals, at Kitchen
 - (1) Coffee maker, plumbed at Kitchen
 - (1) Insta-Hot, sink mounted at Kitchen
 - Station 3:
 - (3) commercial refrigerators with ice maker at Kitchen
 - (1) commercial stove with hood at Kitchen
 - (2) microwaves at Kitchen

- (2) dishwasher at Kitchen
- (1) garbage disposals at Kitchen
- (2) Coffee maker, plumbed at Kitchen and Meeting Room
- (1) Insta-Hot, sink mounted at Kitchen

- Physical Training Equipment provided and installed by Owner.

E20 FURNISHINGS**E2010 Fixed Furnishings**

- Casework: (uppers, counter, lowers)
 - Typical Countertops: Plastic Laminate, Solid Surface or Quartz (at sink locations).
 - Kitchen Countertops: Stainless Steel – seamless.
 - Typical Cabinet Vertical Surfaces: Plastic laminate.
 - Mirrors:
 - 7'-0"H frameless mirrors, sized per plan (Physical Training Room)
 - 4'-6"H frameless mirrors, full length of counters (Toilet and Shower Rooms)
- Window Treatments:
 - Mtl. Mini Blinds, Offices including Office Sidelights, Color: TBD.
 - Black-Out Honeycomb Blinds, Bunk Rooms, Color TBD
 - Roller Shades, by Hunter Douglas, Training Room, Color TBD

E2020 Movable Furnishings – NOT USED**F. SPECIAL CONSTRUCTION AND DEMOLITION****F10 SPECIAL CONSTRUCTION****F1010 Special Structures – NOT USED****F1020 Integrated Construction – NOT USED****F1030 Special Construction Systems – NOT USED****F1040 Special Facilities – NOT USED****F1050 Special Controls and Instrumentation – NOT USED****F20 SELECTIVE DEMOLITION****F2010 Building Elements Demolition – NOT USED****F2020 Hazardous Components Abatement – NOT USED**

G. BUILDING SITEWORK**G10 SITE PREPARATION**

G1010 Site Clearing – NOT USED

G1020 Site Demolition and Relocations – NOT USED

G1030 Site Earthwork

- NOT USED

G1040 Hazardous Waste Remediation – NOT USED

G20 SITE IMPROVEMENTS

G2010 Roadways

- Grind and overlay drive lanes.
- Seal coat parking areas.

G2020 Parking Lots

- Asphalt, striping.

G2030 Pedestrian Paving – NOT USED

G2040 Site Development

- NOT USED

G2040 Security Enclosure – NOT USED

G2050 Landscaping – NOT USED

G30 SITE CIVIL / MECHANICAL UTILITIES

G3010 Water Supply – NOT USED

G3020 Sanitary Sewer – NOT USED

G3030 Storm Sewer

- Roof areas drain through downspouts and sheet flow to catch basins and piped to storm sewers.

- Parking area sheet flow to inverted crown, conveyed to catch basins and piped to storm sewers..

G40 SITE ELECTRICAL UTILITIES

G4010 Electrical Distribution – NOT USED

G4020 Site Lighting – NOT USED

- NOT USED

G4030 Site Communications and Security

- Criteria to be provided

G4090 Other Site Electrical Utilities – NOT USED

G4090 Other Site Electrical Utilities – NOT USED

G90 OTHER SITE CONSTRUCTION

G9010 Service Tunnels – NOT USED

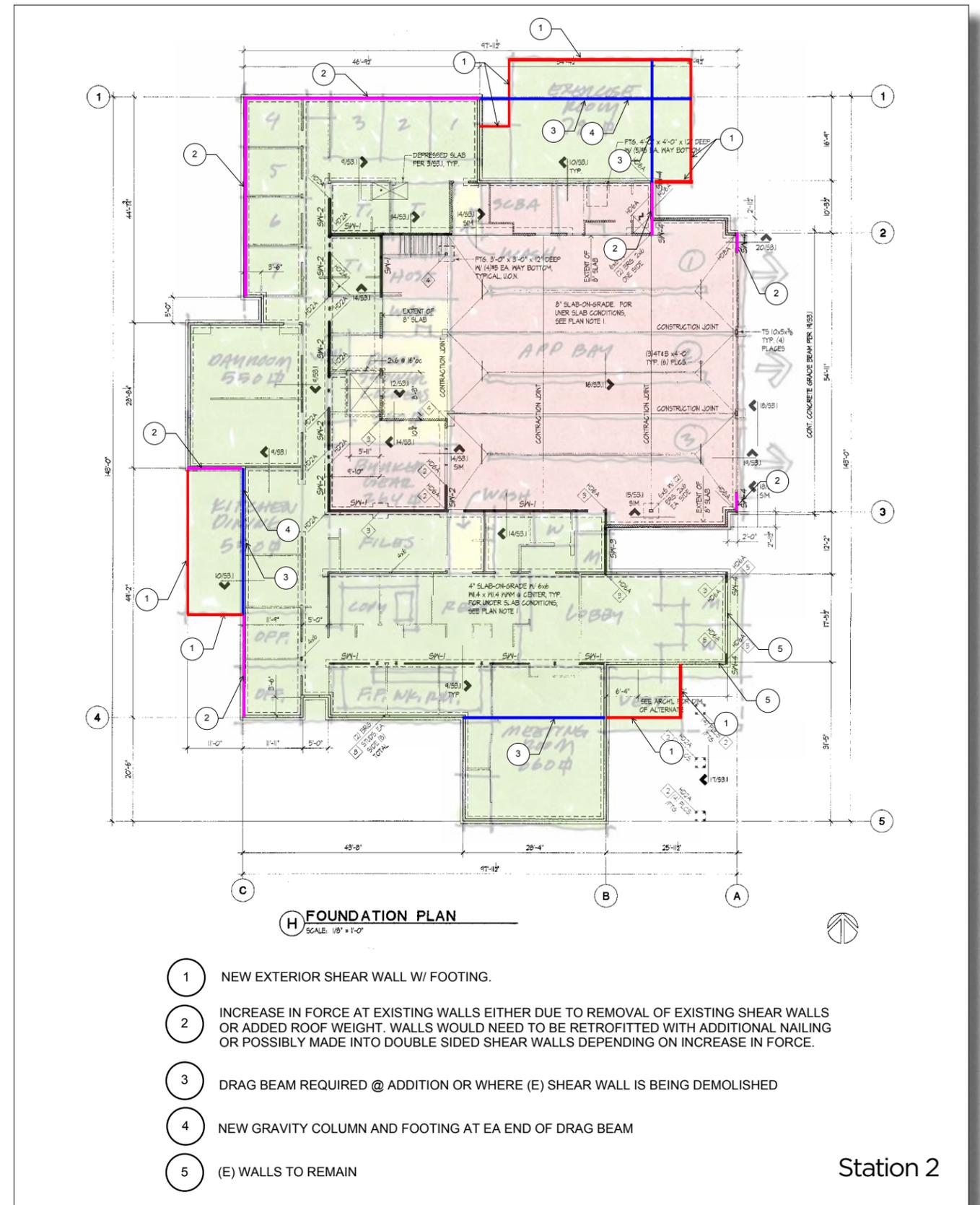
G9090 Other Site Systems – NOT USED

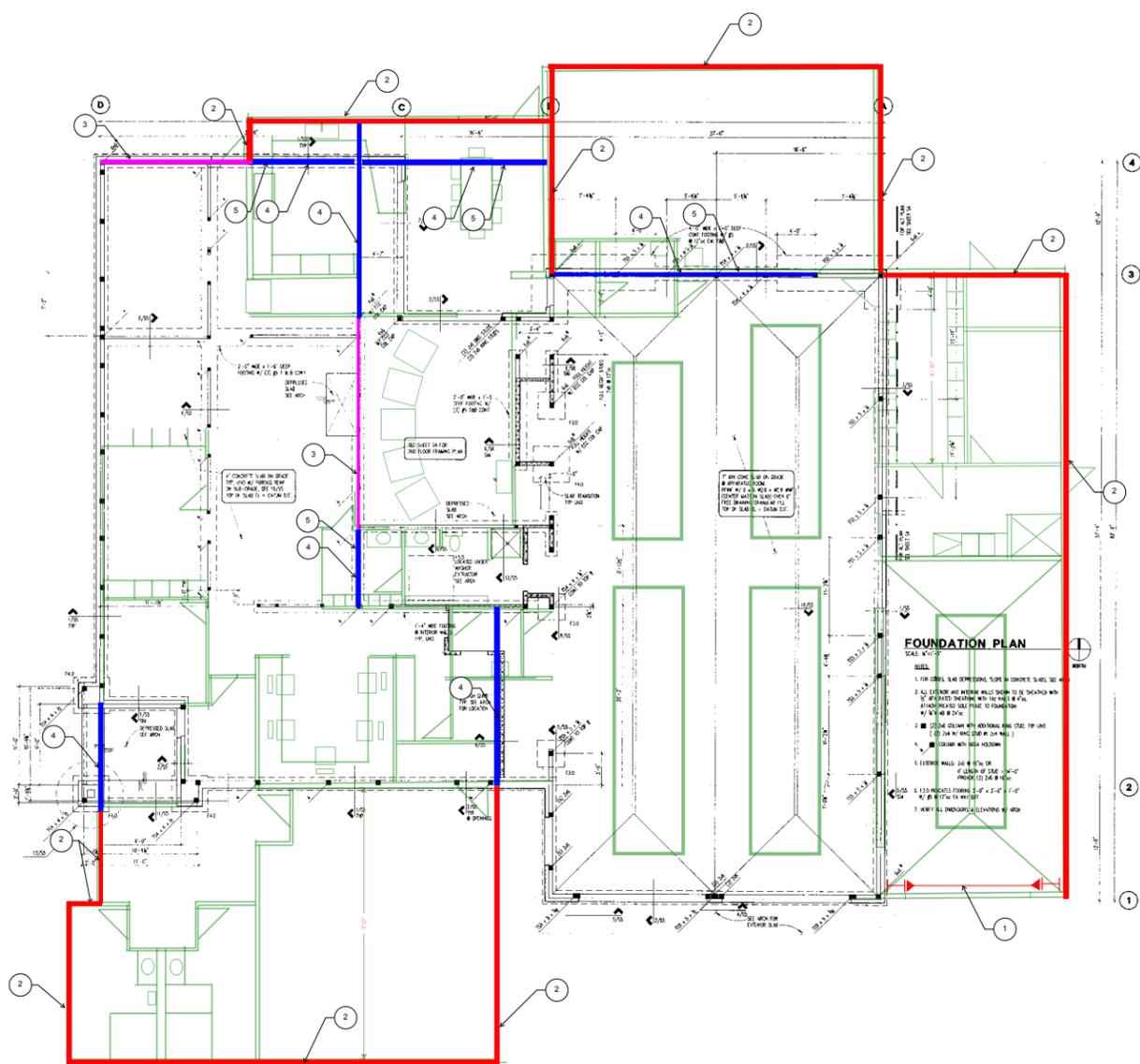
BASIS OF COST

Structural

The additions on both Station 2 and Station 3 will receive wood bearing and shear walls on continuous strip footings. It is estimated that the strip footings will be 1'-6" x 1'-0" x continuous with a 6" stem wall. Hold downs will be located at the ends of each wall and at any openings. Limited demolition of existing footings is expected. Shoring may be required. New footings and columns will be required in some locations to support the ends of new drag beams. See Keynote 4 on Station 2 diagram and Keynote 5 on Station 3 diagram. The roof will be plywood of 1/2" thickness or greater. Roof framing for the additions on both stations will be either solid sawn wood joists or gang nail trusses. Assume 2'-0" on center spacing for the roof framing. Demolition and replacement of existing roof trusses will be required at SCBA, Storage, & Equipment Decon areas on Station 2 in order to achieve the roof slopes and elevations desired. Drag beams, roof strapping, or other form of lateral ties are required at the locations marked in blue on the attached diagrams.

Additional seismic/wind loading is required to be resisted at exterior shear walls as shown in pink on attached diagrams. Retrofits or upgrades such as additional shear wall nailing, adding plywood to the other side of the wall to make it a 2-sided shear wall, or adding/upgrading hold downs at the ends of these walls may be required. In addition to the pink walls shown on the diagram for Station 3, the same type of upgrades as listed in the previous bullet point may need to be made to up to 50% of the other exterior walls not already indicated because of the extent of additions being added to the building. A new Simpson moment frame is required at the apparatus bay opening (south wall) of the east addition on Station 3. A new grade beam will be required underneath the apparatus bay opening at the east addition of Station 3 to take out the lateral loads needed to be resisted by the new Simpson moment frame in this location.





- 1 SIIMPSON MOMENT FRAME & GRADE BEAM @ NEW APP BAY OPENING
- 2 NEW SHEAR WALL W/ FOOTING.
- 3 INCREASE IN FORCE AT EXISTING WALLS EITHER DUE TO REMOVAL OF EXISTING SHEAR WALLS OR ADDED ROOF WEIGHT. WALLS WOULD NEED TO BE RETROFITTED WITH ADDITIONAL NAILING OR POSSIBLY MADE INTO DOUBLE SIDED SHEAR WALLS DEPENDING ON INCREASE IN FORCE.
- 4 DRAG BEAM REQUIRED @ ADDITION OR WHERE (E) SHEAR WALL IS BEING DEMOLISHED.
- 5 NEW GRAVITY COLUMN AND FOOTING AT EA END OF DRAG BEAM

Station 3



MEMORANDUM

November 8, 2018

Project Name: Fire Station #2 - Mount Vernon
 Sazan Project #: 532-1862

Subject: Preliminary Mechanical Design Criteria Specification

Sazan Group provided a facility assessment to Fire Station #2, approximate size 12,697 sf located at 1901 N Laventure Rd, Mt. Vernon, WA 98273. Based on that assessment, the following design criteria specifications were developed to support the preliminary recommendations on system upgrades and the new 1,303 sf addition.

HVAC System:

1. Demolition of four outdoor condensing units, four indoor gas furnaces with cooling coils and associated air distribution system.
2. Demolish thirteen electric wall heaters with integral thermostats bedrooms, dining and the offices.
3. Demolition of Honeywell control system with 9 temperature sensors.
4. Demolish gas radiant heaters in the Apparatus areas.
5. Demolish kitchen exhaust hood system.
6. Provide VRF system with fourteen temperature zones served by fan coils, ceiling or wall cartridges.
7. Provide 500 CFM Dedicated Outside Air System (DOAS) with gas heater.
8. Provide auto fume exhaust system (Plymovent or equal) to capture the fumes directly at the tailpipe of vehicles in the Apparatus area.
9. Provide three 200 MBH gas unit heaters in the Apparatus area.
10. Provide kitchen exhaust hood and associated ductwork.
11. Provide 1,600 CFM ceiling exhaust fan with associated duct to serve the new Exercise Room.
12. Provide two 380 CFM ceiling exhaust fan with associated duct to serve the new Personnel Decon rooms.
13. Provide two 250 CFM ceiling exhaust fan with associated duct to serve the new restrooms.

Plumbing System:

1. Demolish plumbing system in two restrooms located adjacent to the Lobby.
2. Demolish kitchen sink and associated piping.
3. Demolish hose bibb at the exterior wall of the Dining/Kitchen.
4. Demolish hose bibb at the exterior wall of the SCBA room.
5. Provide new faucets at existing lavatories.
6. Provide plumbing system for the two new restrooms.
7. Provide plumbing system for the two new Personal Decon rooms.
8. Provide kitchen sink with garbage disposal.
9. Provide hose bibb at the exterior wall of the new Kitchen.
10. Provide hose bibb at the exterior wall of the new Exercise room.
11. Modify plumbing distribution system (Cold water, Hot water, Hot water recirc, Waste & Vent) to accommodate the new plumbing fixtures.

Fire Protection System:

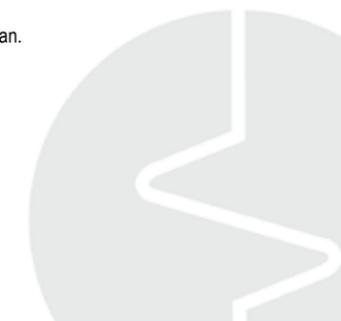
1. Modify sprinkler system based on the new architectural floor plan.

600 Stewart Street
 Suite # 1400
 Seattle, WA 98101
 206.267.1700

111 SW Fifth Avenue
 Suite # 2120
 Portland, OR 97204
 503.416.2400

saan.com

END OF MEMORANDUM





MEMORANDUM

November 8, 2018

Project Name: Fire Station #2- Mount Vernon
Sazan Project #: 532-1862

Subject: Preliminary Electrical Design Criteria Specification

Sazan Group provided a facility assessment to Fire Station #2, approximate size 12,697 sf located at 1901 N Laventure Rd, Mt. Vernon, WA 98273. The project intends to provide additional 1,303 sf of Kitchen/Dining Room space, a new Exercise room; and a new Vestibule. Based on that assessment, the following design criteria specifications were developed to support the preliminary recommendations on system upgrades.

Lighting:

1. Demolition of existing interior lighting system consisting predominantly of recessed fluorescent 2x4 fixtures, downlights, 1x4 fixtures, pendants and tracklights, and exit signs. Rough order of magnitude for fixture quantity to be removed: 230.
2. Installation of new LED efficient lighting system for lighting upgrades. The replacement LED fixtures anticipated will generally follow the same looks as the existing (recessed 2x4, 1x4 and round downlights), shall be dimmable and 3500-degree Kelvin temperature rating. Rough order of magnitude for fixture quantity is equal to the ones being removed but less wattage and power usage.
3. Provide dimming capabilities for lighting in the sleeping rooms.
4. A new automatic lighting control system is anticipated and will be required by Code, based on the lighting upgrades noted above. The automatic lighting control system will consist of lighting occupancy sensors, daylight harvesting sensors and a programmable lighting control panel with time clock capabilities. Occupancy sensors will be located approximately every 30 to 40' in public corridors, one in each bathrooms, offices, conference rooms and all other applicable spaces with the exception of the mechanical and electrical rooms. Daylight harvesting sensors will be located where daylighting features (windows, etc) are present in the building.
5. Provide LED lighting and associated automatic lighting control for new additional spaces (Exercise Room, Vestibule and Kitchen/Dining Area).
6. Provide LED Lighting and lighting control for new Women's and Men's restrooms.
7. Provide new lighting and lighting control for new Bunker Gear Storage room taking over existing public restroom and storage.

Electrical:

1. Maintain existing electrical service and distribution panels. Provide 30 day or 12-month demand load study to verify electrical service load capacity for proposed renovation.
2. Disconnect power to existing mechanical system scheduled for demolition and/or replacement. Refer to preliminary mechanical design criteria specification for reference.
3. Provide power for new mechanical equipment, including new disconnect switches, conduit and wiring. Refer to mechanical design criteria specification for reference.
4. Provide 120V receptacles to renovated areas and in conjunction with Architect's proposed plan layout.
5. Provide dedicated 20A circuits and 120V receptacles for new additional spaces (Exercise Room, Vestibule and Kitchen/Dining Area). Provide power for Kitchen exhaust fan. See mechanical.
6. Provide GFCI type 120V, 20A receptacles for new Women's and Men's Restroom. Provide power for mechanical exhaust fans. See mechanical for reference.
7. Provide 20A circuits and 120V receptacles for new Bunker Gear Storage room taking over the existing public restroom and storage.

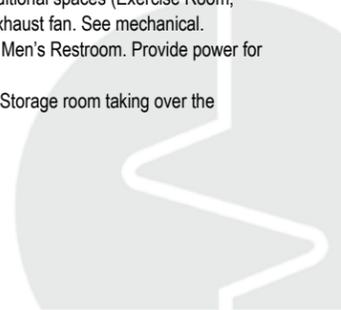
Paging, Status and Dispatch Call System:

1. Provide electrical and data connection to status board monitors.

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MEMORANDUM

November 8, 2018

Project Name: Fire Station #3 - Mount Vernon
Sazan Project #: 532-1862

Subject: Preliminary Mechanical Design Criteria Specification

Sazan Group provided a facility assessment to Fire Station #3, approximate size is 5,973 sf located at 19746 E. Hickox Road, Mt. Vernon, WA 98273. Based on that assessment, the following design criteria specifications were developed to support the preliminary recommendations on system upgrades and the new 4,187 sf addition.

HVAC System:

1. Demolition of two outdoor condensing units, two indoor gas furnaces with cooling coils and associated air distribution system.
2. Demolish seven electric wall heaters with integral thermostats bedrooms, dining, drying and the offices.
3. Demolition of two thermostats.
4. Demolish gas radiant heaters in the Apparatus areas.
5. Demolish kitchen exhaust hood system.
6. Provide VRF system with ten temperature zones served by fan coils, ceiling or wall cartridges.
7. Provide 500 CFM Dedicated Outside Air System (DOAS) with gas heater.
8. Provide auto fume exhaust system (Plymovent or equal) to capture the fumes directly at the tailpipe of vehicles in the Apparatus area.
9. Provide three 200 MBH gas unit heaters in the Apparatus area.
10. Provide kitchen exhaust hood and associated ductwork.
11. Provide 1,500 CFM roof exhaust fan with associated duct to serve the new Exercise Room.
12. Provide 220 CFM ceiling exhaust fan with associated duct to serve the new Personnel Decon.
13. Provide 400 CFM roof exhaust fan with associated duct to serve the new Equip Decon.
14. Provide two 250 CFM ceiling exhaust fan with associated duct to serve the new restrooms.
15. Provide 140 CFM ceiling exhaust fan with associated duct to serve the new restroom adjacent to Personnel Decon.
16. Provide 1,500 CFM roof exhaust fan to serve the new Apparatus area.

Plumbing System:

1. Demolish kitchen sink and associated piping.
2. Demolish waterless urinal in Mens restroom.
3. Demolish floor mounted water closets and associated fixtures in Mens and Womens room.
4. Demolish hose bibb at the exterior wall of the Dining/Kitchen.
5. Provide new wall mounted water closets and associated fixture in Mens and Womens room.
6. Provide new faucets at existing lavatories.
7. Provide new urinal with associated fixture in Mens restroom.
8. Provide plumbing system for the two new washrooms.
9. Provide plumbing system for the three new restrooms.
10. Provide plumbing system for the new Personal Decon room.
11. Provide plumbing system for the new Equip Decon room.
12. Provide hose bibb at the exterior wall of the new Equip Decon.
13. Provide hose bibb at the exterior wall of the new Kitchen.
14. Provide kitchen sink with garbage disposal.
15. Modify plumbing distribution system (Cold water, Hot water, Hot water recirc, Waste & Vent) to accommodate the new plumbing fixtures.
16. Relocate gas meter and gas piping currently installed along the right of way for the new Apparatus Bay.

Fire Protection System:

1. Modify sprinkler system based on the new architectural floor plan.

END OF MEMORANDUM

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MEMORANDUM

November 8, 2018

Project Name: Fire Station #3- Mount Vernon
 Sazan Project #: 532-1862

Subject: Preliminary Electrical Design Criteria Specification

Sazan Group provided a facility assessment to Fire Station #3, approximate size is 5973sf with 4,187 sf addition located at 19746 E. Hickox Road, Mt. Vernon, WA 98273. Based on that assessment, the following design criteria specifications were developed to support the preliminary recommendations on system upgrades.

Lighting:

1. Demolition of existing interior lighting system consisting predominantly of recessed fluorescent 2x4 fixtures, downlights, 1x4 fixtures, pendants and tracklights, and exit signs. Rough order of magnitude for fixture quantity to be removed: 165.
2. Installation of new LED efficient lighting system for lighting upgrades. The replacement LED fixtures anticipated will generally follow the same looks as the existing (recessed 2x4, 1x4 and round downlights), shall be dimmable and 3500-degree Kelvin temperature rating. Rough order of magnitude for fixture quantity is equal to the ones being removed but less wattage and power usage.
3. Provide dimming capabilities for lighting in the sleeping rooms.
4. A new automatic lighting control system is anticipated and will be required by Code, based on the lighting upgrades noted above. The automatic lighting control system will consist of lighting occupancy sensors, daylight harvesting sensors and a programmable lighting control panel with time clock capabilities. Occupancy sensors will be located approximately every 30 to 40' in public corridors, one in each bathrooms, offices, conference rooms and all other applicable spaces with the exception of the mechanical and electrical rooms. Daylight harvesting sensors will be located where daylighting features (windows, etc) are present in the building.
5. Provide LED lighting and automatic lighting controls to new additions (Exercise Room, Dining, Expanded Kitchen, Bunk Gear, Storage, Equip Decon, Training, Lobby, Men's and Women's Restroom).

Electrical:

1. Relocate existing CT can and utility meter to make way for the proposed addition to the building.
2. Provide 30 day or 12-month demand load study to verify electrical service load capacity for proposed renovation.
3. Disconnect power to existing mechanical system scheduled for demolition and/or replacement. Refer to preliminary mechanical design criteria specification for reference.
4. Provide power for new mechanical equipment, including new disconnect switches, conduit and wiring. Refer to mechanical design criteria specification for reference.
5. Provide 120V receptacles to renovated areas and in conjunction with Architect's proposed plan layout.
6. Provide branch circuits, 120V power, GFCI and standard receptacles for the new additions (Exercise Room, Dining, Expanded Kitchen, Bunk Gear, Storage, Equip Decon, Training, Lobby, Men's and Women's Restroom.)

Paging, Status and Dispatch Call System:

1. Provide electrical and data connection to additional status board monitors.

END OF MEMORANDUM

SUPPORTING COST ESTIMATES

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APPENDIX B

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Mount Vernon Fire Department
Mount Vernon, WA

Conceptual - Rev 4
December 3, 2018
Cumming Project No. 18-01155.00



Prepared for Mackenzie

1325 FOURTH AVENUE, SUITE 1010 • SEATTLE • WASHINGTON • 98101
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EXECUTIVE SUMMARY

1.1 Introduction

This estimate has been prepared, pursuant to an agreement between Mackenzie and Cumming, for the purpose of establishing a probable cost of construction at the conceptual design stage.

The project scope is the renovation of two existing fire stations, and the construction of a new, 24,000 sf, fire station.

1.2 Project Schedule

	Start	Finish	Duration
Design & Engineering	Feb-19	Mar-20	12 months
Construction	Mar-20	Apr-21	14 months

1.3 Key Assumptions & Exclusions

This document should be read in association with Methods and Assumptions sections. Key assumptions built into the above cost breakdown include

Key Assumptions

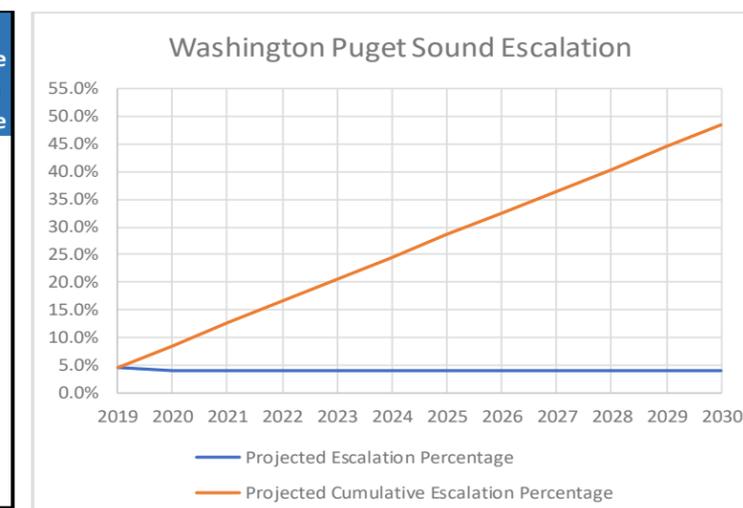
- Design/Bid/Build
- Single Phase Construction

Key Exclusions

- Project Soft Costs, other than specified furnishings & equipment
- Department Relocation
- AV Equipment supply (OFCI video conference install is included)
- Existing building demo (partial demo at renovations is included)
- Soil remediation and treatments (piles are included at FS #1)
- WSST

1.4 Escalation Projection

Year	Projected Escalation Percentage	Projected Cumulative Escalation Percentage
2019	4.5%	4.5%
2020	4.0%	8.5%
2021	4.0%	12.5%
2022	4.0%	16.5%
2023	4.0%	20.5%
2024	4.0%	24.5%
2025	4.0%	28.5%
2026	4.0%	32.5%
2027	4.0%	36.5%
2028	4.0%	40.5%
2029	4.0%	44.5%
2030	4.0%	48.5%



APPROACH & METHODOLOGY

Basis of Estimate	- List documents used - Final Concept Design 11.2.2018 Reduced - dated 11/2/18 - MVFD_Exist Plan Markups for Costing-11.01.18 - dated 11/1/18 - MVFD_Narrative Scope Station 2- Electrical - dated 11/8/18 - MVFD_Narrative Scope Station 2-Sazan Mech - dated 11/8/18 - MVFD_Narrative Scope Station 3- Electrical - dated 11/8/18 - MVFD_Narrative Scope Station 3- Sazan Mech - dated 11/8/18 - MVFD_Prelim Cost Spec Stat 2.3-11.06.18 - dated 11/6/18 - MVFD_Preliminary Spec-06.11.18 - dated 11/6/18
Estimate Format	A component cost classification format has been used for the preparation of this estimate. It classifies costs by building system / element.
Cost Mark Ups	The following % mark ups have been included in each design option: - General Conditions (7.00% on direct costs) - General Requirements (3.00% compound) - Bonds & Insurance (2.00% compound) - Contractor's Fee (4.00% compound) - Aggregated Design Contingency (10.36% compound) - Construction Contingency (0.00% compound)
Escalation	- Escalation to MOC, 09/29/20 (8.30% compound)
Design Contingency	An allowance of 9% for undeveloped design details has been included in this estimate. As the design of each system is further developed, details which historically increase cost become apparent and must be incorporated into the estimate while decreasing the % burden.
Construction Schedule	Construction schedule has not been developed as of publication of this estimate.
Method of Procurement	The estimate is based on a Design/Bid/Build delivery model.
Bid Conditions	This estimate has been based upon competitive bid situations (minimum of 3 bidders) for all items of subcontracted work.
Basis For Quantities	To a small degree, this estimate has been based upon the actual measurement of different items of work, however the vast majority is based on parametric measurements used in conjunction with other projects of a similar nature.
Basis for Unit Costs	Unit costs as contained herein are based on current bid prices in the northern Puget Sound area. Sub overheads and profit are included in each line item unit cost. Their overhead and profit covers each sub's cost for labor burden, materials, and equipment, sales taxes, field overhead, home office overhead, and profit. The general contractor's overhead is shown separately on the master summary
Sources for Pricing	This estimate was prepared by a team of qualified cost consultants experienced in estimating construction costs at all stages of design. These consultants have used pricing data from Cumming's database for municipal facility construction, updated to reflect current conditions in the north Puget Sound area.

APPROACH & METHODOLOGY

Key Exclusions	The following items have been excluded from our estimate: - Project Soft Costs, other than specified furnishings & equipment - Department Relocation - AV Equipment supply (OFCI video conference install is included) - Existing building demo (partial demo at renovations is included) - Soil remediation and treatments (piles are included at FS #1) - WSST
Items Affecting Cost Estimate	Items which may change the estimated construction cost include, but are not limited to: - Modifications to the scope of work included in this estimate. - Unforeseen sub-surface conditions. - Restrictive technical specifications or excessive contract conditions. - Any specified item of material or product that cannot be obtained from 3 sources. - Any other non-competitive bid situations. - Bids delayed beyond the projected schedule.
Statement of Probable Cost	Cumming has no control over the cost of labor and materials, the general contractor's or any subcontractor's method of determining prices, or competitive bidding and market conditions. This estimate is made on the basis of the experience, qualifications, and best judgement of a professional consultant familiar with the construction industry. Cumming, however, cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from this or subsequent cost estimates. Cumming's staff of professional cost consultants has prepared this estimate in accordance with generally accepted principles and practices. This staff is available to discuss its contents with any interested party. Pricing reflects probable construction costs obtainable in the project locality on the target dates specified and is a determination of fair market value for the construction of this project. The estimate is not a prediction of low bid. Pricing assumes competitive bidding for every portion of the construction work for all sub and general contractors with a range of 3 - 4 bidders for all items of work. Experience and research indicates that a fewer number of bidders may result in higher bids. Conversely, an increased number of bidders may result in more competitive bid day responses.
Recommendations	Cumming recommends that the Owner and the Architect carefully review this entire document to ensure it reflects their design intent. Requests for modifications of any apparent errors or omissions to this document must be made to Cumming within ten days of receipt of this estimate. Otherwise, it will be assumed that its contents have been reviewed and accepted. If the project is over budget or there are unresolved budget issues, alternate systems / schemes should be evaluated before proceeding into further design phases. It is recommended that there are preparations of further cost estimates throughout design by Cumming to determine overall cost changes since the preparation of this preliminary estimate. These future estimates will have detailed breakdowns indicating materials by type, kind, and size, priced by their respective units of measure.

SCOPE ASSUMPTIONS

Description	Assumed Scope
General Project Info	<ul style="list-style-type: none"> - Local GC laydown / compound area within proximity. - Local trade parking available both onsite (partial) and offsite. - All sub trades to be competitively bid. - Labor pool from Puget Sound area.
Detailed Assumptions	
1. Substructure / Foundations	<ul style="list-style-type: none"> - Mass excavation and off haul. - Piles assumed at Station #1. - Continuous footings / spread footings for existing building additions and for Station #1. - Sub slab drainage and vault for Station #1.
2. Structure	<ul style="list-style-type: none"> - Assumed slab on grade, steel columns, structural steel, metal decks at Station #1. - Assume modifications to wooden structures at Stations #2 and #3.
3. Envelope / Roofing	<ul style="list-style-type: none"> - Station #1. <ul style="list-style-type: none"> - Exterior substrate of metal studs, densglas sheathing, batt insulation. - Blend of exterior brick veneer, cast in place walls, and composite metal panel systems. - Exterior storefront glazing. - Assumed 60 mil TPO or similar roof. - Assume metal and wood T&G soffits. - Stations #2 and #3. <ul style="list-style-type: none"> - Wood framed walls with composite paneling. Storefront at Station #2 vestibule. - Wood framed roof with composition roofing.
4. Interiors	<ul style="list-style-type: none"> - Station #1. <ul style="list-style-type: none"> - Metal stud framed, to deck, interior construction. - Stations #1, #2, and #3. <ul style="list-style-type: none"> - Solid core wood interior doors. - Floor allowances for range of finishes - Assume gypsum board ceilings in restrooms and personnel decon rooms. - Assume open to structure ceiling in mechanical, electrical, storage, stairs, apparatus bays, and apparatus bay support rooms. - Assume SC wood doors with HM frames. - Wall allowances for range of finishes. - Allowance for restroom partitions and specialties. - Allowance for install of miscellaneous OFCI equipment. - Allowance for casework. - Assume wood framing (stations #2 and #3)
5. Vert. Transportation	<ul style="list-style-type: none"> - Two-stop elevator for Station #1.

SCOPE ASSUMPTIONS

Description	Assumed Scope
6. Plumbing	- Plumbing is a cost per square foot allowance.
7. HVAC	- HVAC is a cost per square foot allowance.
8. Electrical	- Electrical is a cost per square foot allowance.
9. Fire Protection	- Fire Protection is a cost per square foot allowance.
10. Sitework	<ul style="list-style-type: none"> - Station #1. <ul style="list-style-type: none"> - Demo of Snoqualmie St between Cleveland Ave and S 2nd St, including asphalt and concrete complete. - Allowance for removal of utilities in Snoqualmie St, and rerouting around site via S 2nd St, alley south of station, and Cleveland Ave. - Clear, grub, and cut and fill of site, assuming balanced site. - Dewatering as required. - Pedestrian plaza pavement, and seat wall, extending north to library, terminating at south face of library. - Trees as shown in plans. Allowance for irrigated landscaping in plan space shown as landscaped. - Onsite and offsite sidewalks and miscellaneous flat work. - CMU trash enclosure. - Asphalt drives and parking, with additional offsite parking. - Allowance for underground stormwater storage vault. - Allowance for domestic and fire water. - Allowance for sanitary sewer. - Allowance for stormwater drainage. - Allowance for natural gas service. - Station #2. <ul style="list-style-type: none"> - New concrete patios. - Allowance for site adjustments at new vestibule. - 6' high security fence with privacy slats. - Allowance for new powered cantilever gate/fence with battery backup and proximity reader on pedestal. - Station #3. <ul style="list-style-type: none"> - New concrete apron and modified asphalt approach. - Allowance for new powdered double-swing gate/fence with battery backup and proximity reader on pedestal. - Allowance for modified and new landscape and driveway edge.

SCOPE ASSUMPTIONS

Description	Assumed Scope
11. Exclusions	- Project Soft Costs, other than specified furnishings & equipment - Department Relocation - AV Equipment supply (OFCI video conference install is included) - Existing building demo (partial demo at renovations is included) - Soil remediation and treatments (piles are included at FS #1) - WSST

SUMMARY

Element	Area	Cost / SF	Total
Fire Station #1	24,000	\$689.50	\$16,548,045
Fire Station #2	4,289	\$462.13	\$1,982,086
Fire Station #3	5,634	\$571.56	\$3,220,165
Total Estimated Construction Cost	33,923	\$641.17	\$21,750,296

Breakouts

Fire Station #1			
Building			\$13,869,478
Sitework			\$1,547,526
Offsite Work			\$1,131,041
Fire Station #1			
Special Foundations	<i>Includes piles, some dewatering, stormwater vault</i>		\$1,544,157
Snoqualmie Street Work	<i>Includes streetwork, but does not include site improvements</i>		\$752,439
Snoqualmie Plaza	<i>Includes flatwork, landscape, lighting, fence, and flagpole</i>		\$171,967
Fire Station #2			
Building			\$1,824,196
Sitework			\$157,890
Fire Station #3			
Building			\$3,011,730
Sitework			\$208,435

Escalation

Project Delayed 5 years to 2025 Construction Start			
Fire Station #1			\$21,264,238
Fire Station #2			\$2,546,981
Fire Station #3			\$4,137,912
TOTAL			\$27,949,130
Project Delayed 10 years to 2030 Construction Start			
Fire Station #1			\$24,573,847
Fire Station #2			\$2,943,398
Fire Station #3			\$4,781,945
TOTAL			\$32,299,190

SUMMARY MATRIX

Element	Fire Station #1 24,000 SF			Fire Station #2 4,289 SF		
	Subsystem	System	Cost/SF	Subsystem	System	Cost/SF
A) SUBSTRUCTURE		\$930,260	\$38.76		\$27,306	\$6.37
10 Foundations	\$638,800		\$26.62	\$13,320		\$3.11
40 Slabs-on-Grade	\$179,670		\$7.49	\$13,986		\$3.26
90 Substructure Related Activities	\$111,790		\$4.66			
B) SHELL		\$2,751,196	\$114.63		\$207,495	\$48.38
10 Superstructure	\$886,624		\$36.94	\$31,968		\$7.45
20 Exterior Vertical Enclosures	\$1,441,001		\$60.04	\$129,828		\$30.27
30 Exterior Horizontal Enclosures	\$423,571		\$17.65	\$45,699		\$10.65
C) INTERIORS		\$1,255,259	\$52.30		\$242,863	\$56.62
10 Interior Construction	\$946,741		\$39.45	\$119,248		\$27.80
20 Interior Finishes	\$308,518		\$12.85	\$123,615		\$28.82
D) SERVICES		\$4,912,827	\$204.70		\$675,248	\$157.44
10 Conveying	\$150,000		\$6.25			
20 Plumbing	\$930,480		\$38.77	\$127,563		\$29.74
30 Heating, Ventilation, and Air Conditioning (HVAC)	\$1,071,360		\$44.64	\$140,232		\$32.70
40 Fire Protection	\$146,400		\$6.10	\$18,250		\$4.26
50 Electrical	\$1,639,387		\$68.31	\$175,849		\$41.00
60 Communications	\$300,000		\$12.50	\$53,613		\$12.50
70 Electronic Safety and Security	\$491,600		\$20.48	\$139,600		\$32.55
80 Integrated Automation	\$183,600		\$7.65	\$20,142		\$4.70
E) EQUIPMENT & FURNISHINGS		\$201,440	\$8.39		\$36,768	\$8.57
10 Equipment	\$33,440		\$1.39	\$6,745		\$1.57
20 Furnishings	\$168,000		\$7.00	\$30,023		\$7.00
F) SPECIAL CONSTRUCTION & DEMOLITION					\$42,890	\$10.00
30 Demolition				\$42,890		\$10.00
G) SITEWORK		\$1,941,114	\$80.88		\$106,683	\$24.87
10 Site Preparation	\$627,057		\$26.13			
20 Site Improvements	\$519,057		\$21.63	\$106,683		\$24.87
30 Liquid and Gas Site Utilities	\$725,000		\$30.21			
Subtotal Cost		\$11,992,095	\$499.67		\$1,339,253	\$312.25
General Conditions	7.0%	\$839,447	\$34.98	\$93,748		\$21.86
General Requirements	3.0%	\$384,946	\$16.04	\$42,990		\$10.02
Bonds & Insurance	2.0%	\$264,330	\$11.01	\$29,520		\$6.88
Contractor's Fee	4.0%	\$539,233	\$22.47	\$60,220		\$14.04
Aggregated Design Contingency	10.4%	\$1,261,805	\$52.58	\$264,694		\$61.71
Escalation to MOC, 09/29/20	8.3%	\$1,266,190	\$52.76	\$151,661		\$35.36
Total Estimated Construction Cost		\$16,548,045	\$689.50		\$1,982,086	\$462.13

SUMMARY MATRIX

Element	Fire Station #3 5,634 SF			Overall Totals		
	Subsystem	System	Cost/SF	Subsystem	System	Cost/SF
A) SUBSTRUCTURE		\$83,517	\$14.82		\$1,041,083	\$30.69
10 Foundations	\$40,740		\$7.23	\$692,860		\$20.42
40 Slabs-on-Grade	\$42,777		\$7.59	\$236,433		\$6.97
90 Substructure Related Activities				\$111,790		\$3.30
B) SHELL		\$607,815	\$107.88		\$3,566,506	\$105.14
10 Superstructure	\$134,791		\$23.92	\$1,053,383		\$31.05
20 Exterior Vertical Enclosures	\$334,778		\$59.42	\$1,905,607		\$56.17
30 Exterior Horizontal Enclosures	\$138,246		\$24.54	\$607,516		\$17.91
C) INTERIORS		\$391,973	\$69.57		\$1,890,095	\$55.72
10 Interior Construction	\$261,056		\$46.34	\$1,327,045		\$39.12
20 Interior Finishes	\$130,917		\$23.24	\$563,050		\$16.60
D) SERVICES		\$893,888	\$158.66		\$6,481,963	\$191.08
10 Conveying				\$150,000		\$4.42
20 Plumbing	\$208,701		\$37.04	\$1,266,744		\$37.34
30 Heating, Ventilation, and Air Conditioning (HVAC)	\$178,143		\$31.62	\$1,389,735		\$40.97
40 Fire Protection	\$30,533		\$5.42	\$195,183		\$5.75
50 Electrical	\$230,994		\$41.00	\$2,046,230		\$60.32
60 Communications	\$70,425		\$12.50	\$424,038		\$12.50
70 Electronic Safety and Security	\$151,110		\$26.82	\$782,309		\$23.06
80 Integrated Automation	\$23,983		\$4.26	\$227,725		\$6.71
E) EQUIPMENT & FURNISHINGS		\$57,544	\$10.21		\$295,752	\$8.72
10 Equipment	\$18,106		\$3.21	\$58,291		\$1.72
20 Furnishings	\$39,438		\$7.00	\$237,461		\$7.00
F) SPECIAL CONSTRUCTION & DEMOLITION		\$56,340	\$10.00		\$99,230	\$2.93
30 Demolition	\$56,340		\$10.00	\$99,230		\$2.93
G) SITEWORK		\$144,719	\$25.69		\$2,192,516	\$64.63
10 Site Preparation				\$627,057		\$18.48
20 Site Improvements	\$144,719		\$25.69	\$770,459		\$22.71
30 Liquid and Gas Site Utilities				\$725,000		\$21.37
Subtotal Cost		\$2,235,796	\$396.84		\$15,567,144	\$459
General Conditions	7.0%	\$156,506	\$27.78	\$1,089,700		\$32.12
General Requirements	3.0%	\$71,769	\$12.74	\$499,705		\$14.73
Bonds & Insurance	2.0%	\$49,281	\$8.75	\$343,131		\$10.11
Contractor's Fee	4.0%	\$100,534	\$17.84	\$699,987		\$20.63
Aggregated Design Contingency	10.4%	\$359,884	\$63.88	\$1,886,383		\$55.61
Escalation to MOC, 09/29/20	8.3%	\$246,394	\$43.73	\$1,664,245		\$49.06
Total Estimated Construction Cost		\$3,220,165	\$571.56		\$21,750,296	\$641.17

SCHEDULE OF AREAS AND CONTROL QUANTITIES

Schedule of Areas	Fire Station #1	Fire Station #2	Fire Station #3	SF
1. Enclosed Areas (x 100%)				
Level 1	16,000			16,000
Level 2	8,000			8,000
Existing - Untouched		9,711	4,526	14,237
Additions		1,303	4,187	5,490
Renovations		2,986	1,447	4,433
Total Enclosed	24,000	14,000	10,160	48,160
2. Unenclosed Areas				
Sitework	25,020	1,902	6,427	33,349
Offsite Work	4,740			4,740
Total Unenclosed	29,760	1,902	6,427	19,045

Fire Station #1

Mount Vernon Fire Department
 Mount Vernon, WA
 Conceptual - Rev 4

Project # 18-01155.00
 12/03/18

SUMMARY - FIRE STATION #1

Element	Subsystem	System	Cost / SF
A - SUBSTRUCTURE		\$930,260	\$38.76
A10 Foundations	\$638,800		\$26.62
A1010 Standard Foundations	\$638,800		\$26.62
A40 Slabs-on-Grade	\$179,670		\$7.49
A4010 Standard Slabs-on-Grade	\$175,670		\$7.32
A4040 Pits and Bases	\$4,000		\$0.17
A90 Substructure Related Activities	\$111,790		\$4.66
A9010 Substructure Excavation	\$31,940		\$1.33
A9020 Construction Dewatering	\$79,850		\$3.33
B - SHELL		\$2,751,196	\$114.63
B10 Superstructure	\$886,624		\$36.94
B1010 Floor Construction	\$432,300		\$18.01
B1020 Roof Construction	\$394,324		\$16.43
B1080 Stairs	\$60,000		\$2.50
B20 Exterior Vertical Enclosures	\$1,441,001		\$60.04
B2010 Exterior Walls	\$1,130,266		\$47.09
B2020 Exterior Windows	\$181,335		\$7.56
B2050 Exterior Doors and Grilles	\$129,400		\$5.39
B30 Exterior Horizontal Enclosures	\$423,571		\$17.65
B3010 Roofing	\$423,571		\$17.65
C - INTERIORS		\$1,255,259	\$52.30
C10 Interior Construction	\$946,741		\$39.45
C1010 Interior Partitions	\$589,374		\$24.56
C1030 Interior Doors	\$175,000		\$7.29
C1070 Suspended Ceiling Construction	\$20,207		\$0.84
C1090 Interior Specialties	\$156,960		\$6.54
C20 Interior Finishes	\$308,518		\$12.85
C2010 Wall Finishes	\$65,486		\$2.73
C2030 Flooring	\$140,053		\$5.84
C2040 Stair Finishes	\$5,000		\$0.21
C2050 Ceiling Finishes	\$97,979		\$4.08
D - SERVICES		\$4,912,827	\$204.70
D10 Conveying	\$150,000		\$6.25
D1010 Vertical Conveying Systems	\$150,000		\$6.25
D20 Plumbing	\$930,480		\$38.77
D2010 Domestic Water Distribution	\$393,600		\$16.40
D2020 Sanitary Drainage	\$192,480		\$8.02
D2030 Building Support Plumbing Systems	\$293,760		\$12.24
D2050 General Service Compressed-Air	\$50,640		\$2.11
D30 Heating, Ventilation, and Air Condition (HVAC)	\$1,071,360		\$44.64
D3030 Cooling Systems	\$756,960		\$31.54
D3050 Facility HVAC Distribution Systems	\$314,400		\$13.10
D40 Fire Protection	\$146,400		\$6.10
D4010 Fire Suppression	\$146,400		\$6.10
D50 Electrical	\$1,639,387		\$68.31
D5010 Facility Power Generation	\$250,000		\$10.42
D5020 Electrical Service and Distribution	\$360,000		\$15.00

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SUMMARY - FIRE STATION #1

Element	Subsystem	System	Cost / SF
D5030 General Purpose Electrical Power	\$210,000		\$8.75
D5040 Lighting	\$504,000		\$21.00
D60 Communications	\$300,000		\$12.50
D6010 Data Communications	\$132,000		\$5.50
D6030 Audio-Video Communication	\$168,000		\$7.00
D70 Electronic Safety and Security	\$491,600		\$20.48
D7010 Access Control and Intrusion Detection	\$99,600		\$4.15
D7050 Detection and Alarm	\$276,000		\$11.50
D7070 Electronic Monitoring and Control	\$96,000		\$4.00
D80 Integrated Automation	\$183,600		\$7.65
D8010 Integrated Automation Facility Controls	\$183,600		\$7.65
E - EQUIPMENT & FURNISHINGS		\$201,440	\$8.39
E10 Equipment	\$33,440		\$1.39
E1010 Vehicle and Pedestrian Equipment			
E1030 Commercial Equipment	\$9,440		\$0.39
E1040 Institutional Equipment	\$24,000		\$1.00
E20 Furnishings	\$168,000		\$7.00
E2010 Fixed Furnishings	\$168,000		\$7.00
G - SITEWORK		\$1,941,114	\$80.88
G10 Site Preparation	\$627,057		\$26.13
G1010 Site Clearing	\$2,502		\$0.10
G1020 Site Elements Demolition	\$609,542		\$25.40
G1070 Site Earthwork	\$15,013		\$0.63
G20 Site Improvements	\$519,057		\$21.63
G2010 Roadways	\$72,000		\$3.00
G2020 Parking Lots	\$71,365		\$2.97
G2030 Pedestrian Plazas and Walkways	\$151,492		\$6.31
G2060 Site Development	\$138,750		\$5.78
G2080 Landscaping	\$85,450		\$3.56
G30 Liquid and Gas Site Utilities	\$725,000		\$30.21
G3010 Water Supply	\$75,000		\$3.13
G3020 Sanitary Sewerage Utilities	\$35,000		\$1.46
G3030 Storm Drainage Utilities	\$600,000		\$25.00
G3090 Liquid and Gas Site Utilities Supplementary Components	\$15,000		\$0.63
Subtotal	\$11,992,095		\$499.67
General Conditions	7.00%	\$839,447	\$34.98
Subtotal	\$12,831,542		\$534.65
General Requirements	3.00%	\$384,946	\$16.04
Subtotal	\$13,216,488		\$550.69
Bonds & Insurance	2.00%	\$264,330	\$11.01
Subtotal	\$13,480,818		\$561.70
Contractor's Fee	4.00%	\$539,233	\$22.47
Subtotal	\$14,020,051		\$584.17
Design Contingency	9.00%	\$1,261,805	\$52.58

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SUMMARY - FIRE STATION #1

Element	Subsystem	System	Cost / SF
Subtotal		\$15,281,855	\$636.74
Escalation to MOC, 09/29/20	8.29%	\$1,266,190	\$52.76
TOTAL ESTIMATED CONSTRUCTION COST		\$16,548,045	\$689.50

Total Area: 24,000 SF

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DETAIL ELEMENTS - FIRE STATION #1

Element	Quantity	Unit	Unit Cost	Total
A - SUBSTRUCTURE				
A10 Foundations				
A1010 Standard Foundations				
Piles & pile caps - allowance	15,970	sf	\$30.00	\$479,100
Foundation footings and stem walls	15,970	sf	\$10.00	\$159,700
				\$638,800
A10 Foundations				\$638,800
A40 Slabs-on-Grade				
A4010 Standard Slabs-on-Grade				
Slab on grade, complete	15,970	sf	\$11.00	\$175,670
				\$175,670
A4040 Pits and Bases				
Elevator pit	1	ea	\$4,000.00	\$4,000
				\$4,000
A40 Slabs-on-Grade				\$179,670
A90 Substructure Related Activities				
A9010 Substructure Excavation				
Foundation excavation and fill	15,970	sf	\$2.00	\$31,940
				\$31,940
A9020 Construction Dewatering				
Dewatering allowance	15,970	sf	\$2.50	\$39,925
Dewatering premium (associated with piles)	15,970	sf	\$2.50	\$39,925
				\$79,850
A90 Substructure Related Activities				\$111,790
A - SUBSTRUCTURE				\$930,260
B - SHELL				
B10 Superstructure				
B1010 Floor Construction				
Second floor deck, concrete on metal decking, reinforced, including columns and framing	7,860	sf	\$55.00	\$432,300

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DETAIL ELEMENTS - FIRE STATION #1

Element	Quantity	Unit	Unit Cost	Total
				\$432,300
B1020 Roof Construction				
Roof structure with metal deck, including columns and framing	14,083	sf	\$28.00	\$394,324
				\$394,324
B1080 Stairs				
Egress stairs	2 flights		\$30,000.00	\$60,000
				\$60,000
B10 Superstructure				\$886,624
B20 Exterior Vertical Enclosures				
B2010 Exterior Walls				
Structural brick, framed, insulated, gypsum board interior	13,020	sf	\$61.00	\$794,196
CIP concrete fascia, framed, insulated, gypsum board interior	2,241	sf	\$85.00	\$190,485
Metal siding, framed, insulated, gypsum board interior	1,032	sf	\$60.00	\$61,920
Cast concrete cornice	823	lf	\$75.00	\$61,725
Metal trim	338	sf	\$50.00	\$16,900
Steel lintel	336	lf	\$15.00	\$5,040
				\$1,130,266
B2020 Exterior Windows				
Exterior glazing at lobby - storefront	825	sf	\$95.00	\$78,375
Exterior glazing - fiberglass framed	1,716	sf	\$60.00	\$102,960
				\$181,335
B2050 Exterior Doors and Grilles				
3'x7' HM door and frame	4	ea	\$3,350.00	\$13,400
6'x7' double interior storefront door	1	ea	\$11,000.00	\$11,000
East apparatus bay - four-fold doors	7	ea	\$15,000.00	\$105,000
West apparatus bay doors - overhead coiling		ea	\$8,000.00	
				\$129,400
B20 Exterior Vertical Enclosures				\$1,441,001
B30 Exterior Horizontal Enclosures				
B3010 Roofing				
Flat roof, complete	14,083	sf	\$25.00	\$352,075
Metal soffit	72	sf	\$25.00	\$1,800
Wood T&G soffit	228	sf	\$42.00	\$9,576
Parapets (framing included in exterior walls)	4,008	sf	\$15.00	\$60,120

DETAIL ELEMENTS - FIRE STATION #1

Element	Quantity	Unit	Unit Cost	Total
				\$423,571
B30 Exterior Horizontal Enclosures				\$423,571
B - SHELL				\$2,751,196
C - INTERIORS				
C10 Interior Construction				
C1010 Interior Partitions				
Partition walls, to deck, insulated	32,743	sf	\$18.00	\$589,374
				\$589,374
C1020 Interior Windows				
Sidelites at offices, conference rooms, and EOC room	16	ea	\$325.00	\$5,200
				\$5,200
C1030 Interior Doors				
3'x7' wood door with frame	75	ea	\$2,200.00	\$165,000
6'x7' double interior storefront door	1	ea	\$10,000.00	\$10,000
				\$175,000
C1070 Suspended Ceiling Construction				
Framed ceilings, with gypsum board	1,837	sf	\$11.00	\$20,207
				\$20,207
C1090 Interior Specialties				
Restroom specialties	1,440	sf	\$15.00	\$21,600
Building specialties - allowance	22,560	sf	\$6.00	\$135,360
				\$156,960
C10 Interior Construction				\$946,741
C20 Interior Finishes				
C2010 Wall Finishes				
Painting	65,486	sf	\$1.00	\$65,486
				\$65,486
C2030 Flooring				
Flooring allowances - including base Office & quarters - assume primarily carpet and tile	8,030	sf	\$7.00	\$56,210

DETAIL ELEMENTS - FIRE STATION #1

Element	Quantity	Unit	Unit Cost	Total
Ground floor - assume polished concrete	15,970	sf	\$5.25	\$83,843
				<u>\$140,053</u>
C2040 Stair Finishes				
Allowances	1	ls	\$5,000.00	\$5,000
				<u>\$5,000</u>
C2050 Ceiling Finishes				
Painted hard ceilings	1,837	sf	\$0.86	\$1,580
Painted open to structure	8,456	sf	\$2.66	\$22,493
Suspended acoustical ceilings	13,536	sf	\$5.46	\$73,907
				<u>\$97,979</u>
C20 Interior Finishes				\$308,518
C - INTERIORS				\$1,255,259
D - SERVICES				
D10 Conveying				
D1010 Vertical Conveying Systems				
Passenger elevator	2	stop	\$75,000.00	\$150,000
				<u>\$150,000</u>
D10 Conveying				\$150,000
D20 Plumbing				
D2010 Domestic Water Distribution				
Domestic water piping	24,000	sf	\$8.35	\$200,400
Fixture w/rough-in	24,000	sf	\$8.05	\$193,200
				<u>\$393,600</u>
D2020 Sanitary Drainage				
Waste/vent piping	24,000	sf	\$8.02	\$192,480
				<u>\$192,480</u>
D2030 Building Support Plumbing Systems				
Equipment	24,000	sf	\$1.85	\$44,400
Natural gas system	24,000	sf	\$2.12	\$50,880
Roof Drainage	24,000	sf	\$3.47	\$83,280

DETAIL ELEMENTS - FIRE STATION #1

Element	Quantity	Unit	Unit Cost	Total
Condensate Drainage	24,000	sf	\$2.60	\$62,400
Testing/ firestopping / seismic/ misc	24,000	sf	\$2.20	\$52,800
				<u>\$293,760</u>
D2050 General Service Compressed-Air				
Compressed air	24,000	sf	\$2.11	\$50,640
				<u>\$50,640</u>
D20 Plumbing				\$930,480
D30 Heating, Ventilation, and Air Conditioning (HVAC)				
D3030 Cooling Systems				
Air side equipment (Split sys, heat pumps, fans)	24,000	sf	\$28.65	\$687,600
Test / balance / firestopping / seismic	24,000	sf	\$2.89	\$69,360
				<u>\$756,960</u>
D3050 Facility HVAC Distribution Systems				
Air distribution	24,000	sf	\$13.10	\$314,400
				<u>\$314,400</u>
D30 Heating, Ventilation, and Air Conditioning (HVAC)				\$1,071,360
D40 Fire Protection				
D4010 Fire Suppression				
Automatic Sprinkler System	24,000	sf	\$6.10	\$146,400
				<u>\$146,400</u>
D40 Fire Protection				\$146,400
D50 Electrical				
D5010 Facility Power Generation				
Generator and ATS	24,000	sf	\$10.42	\$250,000
				<u>\$250,000</u>
D5020 Electrical Service and Distribution				
Distribution Equipment	24,000	sf	\$15.00	\$360,000
				<u>\$360,000</u>
D5030 General Purpose Electrical Power				
HVAC and Equipment Connections	24,000	sf	\$2.25	\$54,000

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DETAIL ELEMENTS - FIRE STATION #1

Element	Quantity	Unit	Unit Cost	Total
Convenience Power	24,000	sf	\$6.50	\$156,000
				\$210,000
D5040 Lighting				
Lighting and Lighting Control	24,000	sf	\$21.00	\$504,000
				\$504,000
D5080 Miscellaneous Electrical Systems				
Photovoltaic panels	6,500	sf	\$19.41	\$126,155
Photovoltaic backbone	6,500	sf	\$29.11	\$189,232
				\$315,387
D50 Electrical				\$1,639,387
D60 Communications				
D6010 Data Communications				
Voice and Data System	24,000	sf	\$5.50	\$132,000
				\$132,000
D6030 Audio-Video Communication				
PA System	24,000	sf	\$7.00	\$168,000
				\$168,000
D60 Communications				\$300,000
D70 Electronic Safety and Security				
D7010 Access Control and Intrusion Detection				
Access Control System - includes electronic access for all doors	24,000	sf	\$4.15	\$99,600
				\$99,600
D7050 Detection and Alarm				
Security System	24,000	sf	\$1.50	\$36,000
Fire Alarm System	24,000	sf	\$10.00	\$240,000
				\$276,000
D7070 Electronic Monitoring and Control				
CCTV System	24,000	sf	\$4.00	\$96,000
				\$96,000
D7090 Electronic Safety and Security Supplementary Components				

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DETAIL ELEMENTS - FIRE STATION #1

Element	Quantity	Unit	Unit Cost	Total
Alerting System - allowance	1	ls	\$20,000.00	\$20,000
				\$20,000
D70 Electronic Safety and Security				\$491,600
D80 Integrated Automation				
D8010 Integrated Automation Facility Controls				
Direct Digital Controls	24,000	sf	\$7.65	\$183,600
				\$183,600
D80 Integrated Automation				\$183,600
D - SERVICES				\$4,912,827
E - EQUIPMENT & FURNISHINGS				
E10 Equipment				
E1030 Commercial Equipment				
Install only OFCI food service equipment	1,180	sf	\$8.00	\$9,440
				\$9,440
E1040 Institutional Equipment				
Miscellaneous OFCI equipment install allowance	24,000		\$1.00	\$24,000
				\$24,000
E10 Equipment				\$33,440
E20 Furnishings				
E2010 Fixed Furnishings				
Casework allowance	24,000	sf	\$7.00	\$168,000
				\$168,000
E2050 Movable Furnishings				
Excluded				
				\$168,000
E20 Furnishings				\$168,000
E - EQUIPMENT & FURNISHINGS				\$201,440
G - SITEWORK				

DETAIL ELEMENTS - FIRE STATION #1

Element	Quantity	Unit	Unit Cost	Total
G10 Site Preparation				
G1010 Site Clearing				
Site clear and grub	25,021	sf	\$0.10	\$2,502
				<u>\$2,502</u>
G1020 Site Elements Demolition				
Site demolition allowance	25,021	sf	\$2.00	\$50,042
Offsite demolition allowance	4,740	sf	\$3.00	\$14,220
Snoqualmie Street demolition and associated allowances				
Demo asphalt	9,600	sf	\$1.00	\$9,600
Demo sidewalk	2,400	sf	\$3.00	\$7,200
Demo curb and gutter	480	lf	\$6.00	\$2,880
Demo storm drains	2	ea	\$250.00	\$500
Demo trees	12	ea	\$1,500.00	\$18,000
Demo electrical service boxes	2	ea	\$250.00	\$500
Demo site lighting	6	ea	\$500.00	\$3,000
Haul and dispose	2,500	lcy	\$20.00	\$50,000
Potholing allowance	9,600	sf	\$1.00	\$9,600
Mass excavation - assume 5' deep, includes compacted fill	1,800	cy	\$45.00	\$81,000
Remove utilities as required	240	lf	\$200.00	\$48,000
Cut, trench, relay utilities around site, fill, patch - allowance	580	lf	\$500.00	\$290,000
New fire station warning light	1	ea	\$25,000.00	\$25,000
				<u>\$609,542</u>
G1050 Site Remediation				
Excluded				
G1070 Site Earthwork				
Cut, fill, fine grading - assume balanced site	25,021	sf	\$0.50	\$12,511
Erosion control allowance	25,021	sf	\$0.10	\$2,502
				<u>\$15,013</u>
G10 Site Preparation				\$627,057
G20 Site Improvements				
G2010 Roadways				
Asphalt drives, including curb and gutter	8,000	sf	\$9.00	\$72,000
				<u>\$72,000</u>
G2020 Parking Lots				
Asphalt parking, including curbs, and markings	8,080	sf	\$7.00	\$56,560
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DETAIL ELEMENTS - FIRE STATION #1

Element	Quantity	Unit	Unit Cost	Total
Offsite parking, including curbs, and markings	1,645	sf	\$9.00	\$14,805
				<u>\$71,365</u>
G2030 Pedestrian Plazas and Walkways				
Pedestrian Plaza concrete, including all associated work	1,586	sf	\$16.00	\$25,376
Pedestrian Plaza concrete, including all associated work	3,009	sf	\$16.00	\$48,144
Onsite flatwork, including all associated work	750	sf	\$14.00	\$10,500
Offsite flatwork, including all associated work	3,549	sf	\$16.00	\$56,784
Offsite flatwork, including all associated work	668	sf	\$16.00	\$10,688
				<u>\$151,492</u>
G2060 Site Development				
Trash enclosure	1	ea	\$15,000.00	\$15,000
Flag pole	1	ea	\$12,000.00	\$12,000
Brick/steel picket security fence	222	lf	\$100.00	\$22,200
Brick/steel picket security fence	108	lf	\$100.00	\$10,800
Pedestrian Gate	9	lf	\$250.00	\$2,250
Motorized gate	34	lf	\$2,250.00	\$76,500
				<u>\$138,750</u>
G2080 Landscaping				
Seat wall	35	lf	\$250.00	\$8,750
Large trees	6	ea	\$3,500.00	\$21,000
Medium trees	6	ea	\$1,100.00	\$6,600
Medium trees	3	ea	\$1,100.00	\$3,300
Medium trees	1	ea	\$1,100.00	\$1,100
General landscaping, including irrigation	6,235	sf	\$6.00	\$37,410
General landscaping, including irrigation	1,215	sf	\$6.00	\$7,290
				<u>\$85,450</u>
G20 Site Improvements				\$519,057
G30 Site Mechanical Utilities				
G3010 Water Utilities				
Domestic and fire water - allowance	1	ls	\$75,000.00	\$75,000
				<u>\$75,000</u>
G3020 Sanitary Sewerage Utilities				
Sanitary sewage - allowance	1	ls	\$35,000.00	\$35,000
				<u>\$35,000</u>
G3030 Storm Drainage Utilities				
Stormdrain, including underground storage vault system	1	ls	\$600,000.00	\$600,000
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DETAIL ELEMENTS - FIRE STATION #1

Element	Quantity	Unit	Unit Cost	Total
				\$600,000
G3090 Liquid and Gas Site Utilities Supplementary Components				
Natural gas - allowance	1	ls	\$15,000.00	\$15,000
				\$15,000
G30 Site Mechanical Utilities				\$725,000
G40 Site Electrical Utilities				
G4010 Site Electric Distribution Systems				
Site power - allowance	1	ls	\$50,000.00	\$50,000
				\$50,000
G4050 Site Lighting				
Site lighting - allowance	1	ls	\$10,000.00	\$10,000
Site lighting - allowance	1	ls	\$10,000.00	\$10,000
				\$20,000
G - SITEWORK				\$1,941,114

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Fire Station #2

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SUMMARY - FIRE STATION #2

Element	Subsystem	System	Cost / SF
A - SUBSTRUCTURE		\$27,306	\$6.37
A10 Foundations	\$13,320		\$3.11
A1010 Standard Foundations	\$13,320		\$3.11
A40 Slabs-on-Grade	\$13,986		\$3.26
A4010 Standard Slabs-on-Grade	\$13,986		\$3.26
B - SHELL		\$207,495	\$48.38
B10 Superstructure	\$31,968		\$7.45
B1020 Roof Construction	\$31,968		\$7.45
B20 Exterior Vertical Enclosures	\$129,828		\$30.27
B2010 Exterior Walls	\$85,008		\$19.82
B2020 Exterior Windows	\$25,420		\$5.93
B2050 Exterior Doors and Grilles	\$19,400		\$4.52
B30 Exterior Horizontal Enclosures	\$45,699		\$10.65
B3010 Roofing	\$45,699		\$10.65
C - INTERIORS		\$242,863	\$56.62
C10 Interior Construction	\$119,248		\$27.80
C1010 Interior Partitions	\$63,017		\$14.69
C1030 Interior Doors	\$24,200		\$5.64
C1090 Interior Specialties	\$32,031		\$7.47
C20 Interior Finishes	\$123,615		\$28.82
C2010 Wall Finishes	\$10,431		\$2.43
C2030 Flooring	\$82,903		\$19.33
C2050 Ceiling Finishes	\$30,281		\$7.06
D - SERVICES		\$675,248	\$157.44
D20 Plumbing	\$127,563		\$29.74
D2010 Domestic Water Distribution	\$67,668		\$15.78
D2020 Sanitary Drainage	\$34,398		\$8.02
D2030 Building Support Plumbing Systems	\$25,497		\$5.94
D30 Heating, Ventilation, and Air Condition (HVAC)	\$140,232		\$32.70
D3030 Cooling Systems	\$79,716		\$18.59
D3050 Facility HVAC Distribution Systems	\$60,516		\$14.11
D40 Fire Protection	\$18,250		\$4.26
D4010 Fire Suppression	\$18,250		\$4.26
D50 Electrical	\$175,849		\$41.00
D5020 Electrical Service and Distribution	\$42,890		\$10.00
D5030 General Purpose Electrical Power	\$37,529		\$8.75
D5040 Lighting	\$90,069		\$21.00
D5080 Miscellaneous Electrical Systems	\$5,361		\$1.25
D60 Communications	\$53,613		\$12.50
D6010 Data Communications	\$23,590		\$5.50
D6030 Audio-Video Communication	\$30,023		\$7.00
D70 Electronic Safety and Security	\$139,600		\$32.55
D7010 Access Control and Intrusion Detection	\$53,120		\$12.39
D7050 Detection and Alarm	\$49,324		\$11.50
D7070 Electronic Monitoring and Control	\$17,156		\$4.00
D80 Integrated Automation	\$20,142		\$4.70
D8010 Integrated Automation Facility Controls	\$20,142		\$4.70

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 12/03/18

SUMMARY - FIRE STATION #2

Element	Subsystem	System	Cost / SF
E - EQUIPMENT & FURNISHINGS		\$36,768	\$8.57
E10 Equipment	\$6,745		\$1.57
E1010 Vehicle and Pedestrian Equipment			
E1030 Commercial Equipment	\$2,456		\$0.57
E1040 Institutional Equipment	\$4,289		\$1.00
E20 Furnishings	\$30,023		\$7.00
E2010 Fixed Furnishings	\$30,023		\$7.00
F - SPECIAL CONSTRUCTION & DEMOLITION		\$42,890	\$10.00
F30 Demolition	\$42,890		\$10.00
F3030 Selective Demolition	\$42,890		\$10.00
G - SITEWORK		\$106,683	\$24.87
G20 Site Improvements	\$106,683		\$24.87
G2030 Pedestrian Plazas and Walkways	\$15,288		\$3.56
G2060 Site Development	\$16,125		\$3.76
G2080 Landscaping	\$19,020		\$4.43
Subtotal		\$1,339,253	\$312.25
General Conditions	7.00%	\$93,748	\$21.86
Subtotal		\$1,433,000	\$334.11
General Requirements	3.00%	\$42,990	\$10.02
Subtotal		\$1,475,990	\$344.13
Bonds & Insurance	2.00%	\$29,520	\$6.88
Subtotal		\$1,505,510	\$351.02
Contractor's Fee	4.00%	\$60,220	\$14.04
Subtotal		\$1,565,730	\$365.06
Design Contingency	16.91%	\$264,694	\$61.71
Subtotal		\$1,830,425	\$426.77
Escalation to MOC, 09/29/20	8.29%	\$151,661	\$35.36
TOTAL ESTIMATED CONSTRUCTION COST		\$1,982,086	\$462.13

Total Area: 4,289 SF

DETAIL ELEMENTS - FIRE STATION #2

Element	Quantity	Unit	Unit Cost	Total
A - SUBSTRUCTURE				
A10 Foundations				
A1010 Standard Foundations				
Foundation - new addition - vestibule	128	sf	\$10.00	\$1,280
Foundation - new addition - exercise room	897	sf	\$10.00	\$8,970
Foundation - new addition - kitchen / dining	307	sf	\$10.00	\$3,070
				\$13,320
A10 Foundations				\$13,320
A40 Slabs-on-Grade				
A4010 Standard Slabs-on-Grade				
Slab on grade - new addition - vestibule	128	sf	\$10.50	\$1,344
Slab on grade - new addition - exercise room	897	sf	\$10.50	\$9,419
Slab on grade - new addition - kitchen / dining	307	sf	\$10.50	\$3,224
				\$13,986
A40 Slabs-on-Grade				\$13,986
A - SUBSTRUCTURE				\$27,306
B - SHELL				
B10 Superstructure				
B1020 Roof Construction				
Roof construction - new addition - vestibule	128	sf	\$24.00	\$3,072
Roof construction - new addition - exercise room	897	sf	\$24.00	\$21,528
Roof construction - new addition - kitchen / dining	307	sf	\$24.00	\$7,368
				\$31,968
B10 Superstructure				\$31,968
B20 Exterior Vertical Enclosures				
B2010 Exterior Walls				
Full wall assembly - allow for composite wood siding				
Exterior walls - new addition - vestibule	332	sf	\$44.00	\$14,608
Exterior walls - new addition - exercise room	1,077	sf	\$44.00	\$47,388
Exterior walls - new addition - kitchen / dining	523	sf	\$44.00	\$23,012
				\$85,008
B2020 Exterior Windows				
Exterior windows - new addition - vestibule	116	sf	\$95.00	\$11,020

DETAIL ELEMENTS - FIRE STATION #2

Element	Quantity	Unit	Unit Cost	Total
Exterior windows - fiberglass framed - new addition - exercise room	162	sf	\$60.00	\$9,720
Exterior windows - fiberglass framed - new addition - kitchen / dining	78	sf	\$60.00	\$4,680
				\$25,420
B2050 Exterior Doors and Grilles				
Exterior doors - new addition - vestibule	1	ea	\$3,350.00	\$3,350
Exterior doors - new addition - exercise room	2	ea	\$3,350.00	6700
Exterior doors - new addition - exercise room - glazed garage door	1	ea	\$6,000.00	6000
Exterior doors - new addition - kitchen / dining	1	ea	\$3,350.00	\$3,350
				\$19,400
B20 Exterior Vertical Enclosures				\$129,828
B30 Exterior Horizontal Enclosures				
B3010 Roofing				
Roofing - new addition - vestibule	128	sf	\$35.00	\$4,480
Roofing - new addition - exercise room	897	sf	\$35.00	\$31,395
Roofing - new addition - kitchen / dining	307	sf	\$32.00	\$9,824
				\$45,699
B30 Exterior Horizontal Enclosures				\$45,699
B - SHELL				\$207,495
C - INTERIORS				
C10 Interior Construction				
C1010 Interior Partitions				
Partitions - new addition - exercise room	200	sf	\$18.00	\$3,600
Partitions - space designated for new wall framing	2,306	sf	\$21.00	\$48,426
Partitions - new bunker gear storage room	299	sf	\$10.00	\$2,990
Partitions - framing and fixture for new vestibule	115	sf	\$21.00	\$2,415
Partitions - reconfigure SCBA into Personal Decon	266	sf	\$21.00	\$5,586
				\$63,017
C1030 Interior Doors				
Interior doors - new addition - exercise room	1	ea	\$2,200.00	\$2,200
Interior doors - space designated for new wall framing	6	ea	\$2,200.00	\$13,200
Interior doors - new bunker gear storage room	1	ea	\$2,200.00	\$2,200
Interior doors - framing and fixture for new vestibule	1	ea	\$2,200.00	\$2,200
Interior doors - reconfigure SCBA into Personal Decon	2	ea	\$2,200.00	\$4,400
				\$24,200

DETAIL ELEMENTS - FIRE STATION #2

Element	Quantity	Unit	Unit Cost	Total
C1090 Interior Specialties				
Interior specialties - new addition - vestibule	128	sf	\$6.00	\$768
Interior specialties - new addition - exercise room	897	sf	\$6.00	\$5,382
Interior specialties - new addition - kitchen / dining	307	sf	\$11.00	\$3,377
Interior specialties - space designated for new wall framing	2,306	sf	\$6.00	\$13,836
Interior specialties - new bunker gear storage room	299	sf	\$8.00	\$2,392
Interior specialties - framing and fixture for new vestibule	115	sf	\$6.00	\$690
Interior specialties - reconfigure SCBA into Personal Decon	266	sf	\$21.00	\$5,586
				<u>\$32,031</u>
C10 Interior Construction				\$119,248
C20 Interior Finishes				
C2010 Wall Finishes				
Wall finishes - new addition - vestibule	648	sf	\$1.00	\$648
Wall finishes - new addition - exercise room	2,128	sf	\$1.00	\$2,128
Wall finishes - new addition - kitchen / dining	1,053	sf	\$1.00	\$1,053
Wall finishes - space designated for new wall framing	2,306	sf	\$2.33	\$5,381
Wall finishes - new bunker gear storage room	299	sf	\$1.11	\$332
Wall finishes - framing and fixture for new vestibule	115	sf	\$2.33	\$268
Wall finishes - reconfigure SCBA into Personal Decon	266	sf	\$2.33	\$621
				<u>\$10,431</u>
C2030 Flooring				
Flooring allowances - including base				
Flooring - new addition - vestibule - assume recessed walk-off mat	128	sf	\$75.00	\$9,600
Flooring - new addition - exercise room	897	sf	\$15.00	\$13,455
Flooring - new addition - kitchen / dining	307	sf	\$18.00	\$5,526
Flooring - space designated for new wall framing	2,306	sf	\$15.00	\$34,590
Flooring - new bunker gear storage room - assume polished concrete	299	sf	\$5.25	\$1,570
Flooring - framing and fixture for new vestibule	115	sf	\$18.00	\$2,070
Flooring - reconfigure SCBA into Personal Decon - assm. pol. concrete	266	sf	\$18.00	\$4,788
Flooring - day room	628	sf	\$18.00	\$11,304
				<u>\$82,903</u>
C2050 Ceiling Finishes				
Ceiling finishes - new addition - vestibule - assume ACT	128	sf	\$5.50	\$704
Ceiling finishes - new addition - exercise room - assume ACT	897	sf	\$5.50	\$4,934
Ceiling finishes - new addition - kitchen / dining - assume ACT & GWB	307	sf	\$7.75	\$2,379
Ceiling finishes - space designated for new wall framing - assume ACT	2,306	sf	\$5.50	\$12,683
Ceiling finishes - new bunker gear storage room - assume painted GWB	299	sf	\$7.75	\$2,317
Ceiling finishes - framing and fixture for new vestibule - assume GWB	115	sf	\$10.00	\$1,150
Ceiling finishes - reconfigure SCBA into Personal Decon - assume GWB	266	sf	\$10.00	\$2,660
Ceiling finishes - day room - assume ACT	628	sf	\$5.50	\$3,454

DETAIL ELEMENTS - FIRE STATION #2

Element	Quantity	Unit	Unit Cost	Total
				<u>\$30,281</u>
C20 Interior Finishes				\$123,615
C - INTERIORS				\$242,863
D - SERVICES				
D20 Plumbing				
D2010 Domestic Water Distribution				
New				
Domestic water piping	1,303	sf	\$8.35	\$10,880
Fixture w/rough-in	1,303	sf	\$6.00	\$7,818
Renovation				
Domestic water piping	2,986	sf	\$8.35	\$24,933
Fixture w/rough-in	2,986	sf	\$8.05	\$24,037
				<u>\$67,668</u>
D2020 Sanitary Drainage				
New				
Waste/vent piping	1,303	sf	\$8.02	\$10,450
Renovation				
Waste/vent piping	2,986	sf	\$8.02	\$23,948
				<u>\$34,398</u>
D2030 Building Support Plumbing Systems				
New				
Equipment	1,303	sf	\$1.85	\$2,411
Natural gas system	1,303	sf	\$2.00	\$2,606
Roof Drainage	1,303	sf	\$3.47	\$4,521
Condensate Drainage	1,303	sf	\$2.60	\$3,388
Testing/ firestopping / seismic/ misc	1,303	sf	\$2.20	\$2,867
Renovation				
Demolition	2,986	sf	\$1.25	\$3,733
Testing/ firestopping / seismic/ misc	2,986	sf	\$2.00	\$5,972
				<u>\$25,497</u>
D20 Plumbing				\$127,563
D30 Heating, Ventilation, and Air Conditioning (HVAC)				
D3030 Cooling Systems				
New				
Air side equipment (Split sys, heat pumps, fans)	1,303	sf	\$15.00	\$19,545

side equipment (Split sys, heat pumps, fans)	2,986	sf	\$16.00	\$47,776
st / balance / firestopping / seismic	2,986	sf	\$2.89	\$8,630
				\$79,716
AC Distribution Systems				
distribution	1,303	sf	\$13.10	\$17,069
ion				
molition	2,986	sf	\$1.45	\$4,330
distribution	2,986	sf	\$13.10	\$39,117
				\$60,516
on, and Air Conditioning (HVAC)				\$140,232
ession				
omatic Sprinkler System	1,303	sf	\$6.10	\$7,948
ion				
omatic Sprinkler System - relocate heads	2,986	sf	\$3.45	\$10,302
				\$18,250
				\$18,250
ervice and Distribution				
ion Equipment	4,289	sf	\$10.00	\$42,890
				\$42,890
urpose Electrical Power				
nd Equipment Connections	4,289	sf	\$2.25	\$9,650
ence Power	4,289	sf	\$6.50	\$27,879
				\$37,529
and Lighting Control				
	4,289	sf	\$21.00	\$90,069
				\$90,069
ous Electrical Systems				
on	4,289	sf	\$1.25	\$5,361

Mount Vernon Fire Department
Mount Vernon, WA
Conceptual - Rev 4

Project # 18-01155.00
12/03/18

DETAIL ELEMENTS - FIRE STATION #2

Element	Quantity	Unit	Unit Cost	Total
				\$5,361
D50 Electrical				\$175,849
D60 Communications				
D6010 Data Communications				
Voice and Data System	4,289	sf	\$5.50	\$23,590
				\$23,590
D6030 Audio-Video Communication				
PA System	4,289	sf	\$7.00	\$30,023
				\$30,023
D60 Communications				\$53,613
D70 Electronic Safety and Security				
D7010 Access Control and Intrusion Detection				
Access Control System - includes electronic access for all doors	12,800	sf	\$4.15	\$53,120
				\$53,120
D7050 Detection and Alarm				
Security System	4,289	sf	\$1.50	\$6,434
Fire Alarm System	4,289	sf	\$10.00	\$42,890
				\$49,324
D7070 Electronic Monitoring and Control				
CCTV System	4,289	sf	\$4.00	\$17,156
				\$17,156
D7090 Electronic Safety and Security Supplementary Components				
Alerting System - allowance	1	ls	\$20,000.00	\$20,000
				\$20,000
D70 Electronic Safety and Security				\$139,600
D80 Integrated Automation				
D8010 Integrated Automation Facility Controls				
New				
Direct Digital Controls	1,303	sf	\$4.00	\$5,212

Mount Vernon Fire Department
 Mount Vernon, WA
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Project # 18-01155.00
 12/03/18

DETAIL ELEMENTS - FIRE STATION #2

Element	Quantity	Unit	Unit Cost	Total
Renovation				
Direct Digital Controls	2,986	sf	\$5.00	\$14,930
				<u>\$20,142</u>

D80 Integrated Automation \$20,142

D - SERVICES \$675,248

E - EQUIPMENT & FURNISHINGS

E10 Equipment

E1030 Commercial Equipment

Install only OFCI ood services equipment - new addition - kitchen / dining	307	sf	\$8.00	\$2,456
				<u>\$2,456</u>

E1040 Institutional Equipment

Miscellaneous OFCI equipment install allowance	4,289	sf	\$1.00	\$4,289
				<u>\$4,289</u>

E10 Equipment \$6,745

E20 Furnishings

E2010 Fixed Furnishings

Casework allowance	4,289	sf	\$7.00	\$30,023
				<u>\$30,023</u>

E2050 Movable Furnishings

 Excluded

E20 Furnishings \$30,023

E - EQUIPMENT & FURNISHINGS \$36,768

F - SPECIAL CONSTRUCTION & DEMOLITION

F30 Demolition

F3030 Selective Demolition

Miscellaneous demolition	4,289	sf	\$10.00	\$42,890
				<u>\$42,890</u>

F30 Demolition \$42,890

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 Mount Vernon, WA
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DETAIL ELEMENTS - FIRE STATION #2

Element	Quantity	Unit	Unit Cost	Total
F - SPECIAL CONSTRUCTION & DEMOLITION				\$42,890

G - SITEWORK

G20 Site Improvements

G2010 Roadways

Retop all asphalt	25,000	sf	\$2.25	\$56,250
				<u>\$56,250</u>

G2030 Pedestrian Plazas and Walkways

New concrete patio, including all associated work	1,092	sf	\$14.00	\$15,288
				<u>\$15,288</u>

G2060 Site Development

6' high chainlink fence with privacy slats	40	lf	\$50.00	\$2,000
New powered cantilever gate fence	33	lf	\$125.00	\$4,125
Allowance for sitework for new vestibule	1	ls	\$10,000.00	\$10,000
				<u>\$16,125</u>

G2080 Landscaping

Allowance for landscaping	1,902	sf	\$10.00	\$19,020
				<u>\$19,020</u>

G20 Site Improvements \$106,683

G - SITEWORK \$106,683

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Project # 18-01155.00
 12/03/18

Fire Station #3

Mount Vernon Fire Department
 Mount Vernon, WA
 Conceptual - Rev 4

Project # 18-01155.00
 12/03/18

SUMMARY - FIRE STATION #3

Element	Subsystem	System	Cost / SF
A - SUBSTRUCTURE			\$83,517
A10 Foundations			\$7.23
A1010 Standard Foundations	\$40,740		\$7.23
A40 Slabs-on-Grade			\$7.59
A4010 Standard Slabs-on-Grade	\$42,777		\$7.59
B - SHELL			\$607,815
B10 Superstructure			\$23.92
B1010 Floor Construction	\$134,791		\$6.57
B1020 Roof Construction	\$37,015		\$17.35
B20 Exterior Vertical Enclosures			\$59.42
B2010 Exterior Walls	\$334,778		\$44.65
B2020 Exterior Windows	\$251,548		\$9.14
B2050 Exterior Doors and Grilles	\$51,480		\$5.64
B30 Exterior Horizontal Enclosures			\$24.54
B3010 Roofing	\$138,246		\$24.54
C - INTERIORS			\$391,973
C10 Interior Construction			\$46.34
C1010 Interior Partitions	\$261,056		\$23.14
C1030 Interior Doors	\$130,389		\$12.11
C1090 Interior Specialties	\$68,200		\$11.09
C20 Interior Finishes			\$23.24
C2010 Wall Finishes	\$62,467		\$1.61
C2030 Flooring	\$130,917		\$15.25
C2050 Ceiling Finishes	\$9,056		\$6.38
D - SERVICES			\$893,888
D20 Plumbing			\$37.04
D2010 Domestic Water Distribution	\$208,701		\$18.06
D2020 Sanitary Drainage	\$101,738		\$8.27
D2030 Building Support Plumbing Systems	\$46,603		\$9.97
D2050 General Service Compressed-Air	\$56,173		\$0.74
D30 Heating, Ventilation, and Air Condition (HVAC)			\$31.62
D3030 Cooling Systems	\$178,143		\$18.15
D3050 Facility HVAC Distribution Systems	\$102,239		\$13.47
D40 Fire Protection			\$5.42
D4010 Fire Suppression	\$30,533		\$5.42
D50 Electrical			\$41.00
D5020 Electrical Service and Distribution	\$230,994		\$10.00
D5030 General Purpose Electrical Power	\$56,340		\$8.75
D5040 Lighting	\$49,298		\$21.00
D5080 Miscellaneous Electrical Systems	\$118,314		\$1.25
D60 Communications			\$12.50
D6010 Data Communications	\$70,425		\$5.50
D6030 Audio-Video Communication	\$30,987		\$7.00
D70 Electronic Safety and Security			\$26.82
D7010 Access Control and Intrusion Detection	\$151,110		\$7.77
D7050 Detection and Alarm	\$43,783		\$11.50
D7070 Electronic Monitoring and Control	\$64,791		\$4.00
	\$22,536		

SUMMARY - FIRE STATION #3

Element	Subsystem	System	Cost / SF
D80 Integrated Automation			\$4.26
D8010 Integrated Automation Facility Controls	\$23,983		\$4.26
E - EQUIPMENT & FURNISHINGS		\$57,544	\$10.21
E10 Equipment	\$18,106		\$3.21
E1010 Vehicle and Pedestrian Equipment	\$10,000		\$1.77
E1030 Commercial Equipment	\$2,472		\$0.44
E1040 Institutional Equipment	\$5,634		\$1.00
E20 Furnishings	\$39,438		\$7.00
E2010 Fixed Furnishings	\$39,438		\$7.00
F - SPECIAL CONSTRUCTION & DEMOLITION		\$56,340	\$10.00
F30 Demolition	\$56,340		\$10.00
F3030 Selective Demolition	\$56,340		\$10.00
G - SITEWORK		\$144,719	\$25.69
G20 Site Improvements	\$144,719		\$25.69
G2010 Roadways	\$57,935		\$10.28
G2030 Pedestrian Plazas and Walkways	\$55,034		\$9.77
G2060 Site Development	\$1,750		\$0.31
G2080 Landscaping	\$30,000		\$5.32
Subtotal		\$2,235,796	\$396.84
General Conditions	7.00%	\$156,506	\$27.78
Subtotal		\$2,392,302	\$424.62
General Requirements	3.00%	\$71,769	\$12.74
Subtotal		\$2,464,071	\$437.36
Bonds & Insurance	2.00%	\$49,281	\$8.75
Subtotal		\$2,513,352	\$446.10
Contractor's Fee	4.00%	\$100,534	\$17.84
Subtotal		\$2,613,887	\$463.95
Design Contingency	13.77%	\$359,884	\$63.88
Subtotal		\$2,973,771	\$527.83
Escalation to MOC, 09/29/20	8.29%	\$246,394	\$43.73
TOTAL ESTIMATED CONSTRUCTION COST		\$3,220,165	\$571.56

Total Area: 5,634 SF

DETAIL ELEMENTS - FIRE STATION #3

Element	Quantity	Unit	Unit Cost	Total
A - SUBSTRUCTURE				
A10 Foundations				
A1010 Standard Foundations				
Foundation - new addition - apparatus bay	1,448	sf	\$10.00	\$14,480
Foundation - new addition - exercise room & dining	1,229	sf	\$10.00	\$12,290
Foundation - new addition - training room, lobby, and restrooms	1,397	sf	\$10.00	\$13,970
				\$40,740
A10 Foundations \$40,740				
A40 Slabs-on-Grade				
A4010 Standard Slabs-on-Grade				
Slab on grade - new addition - apparatus bay	1,448	sf	\$10.50	\$15,204
Slab on grade - new addition - exercise room & dining	1,229	sf	\$10.50	\$12,905
Slab on grade - new addition - training room, lobby, and restrooms	1,397	sf	\$10.50	\$14,669
				\$42,777
A40 Slabs-on-Grade \$42,777				
A - SUBSTRUCTURE \$83,517				
B - SHELL				
B10 Superstructure				
B1010 Floor Construction				
Storage mezzanine above new apparatus bay	673	sf	\$55.00	\$37,015
				\$37,015
B1020 Roof Construction				
Roof construction - new addition - apparatus bay	1,448	sf	\$24.00	\$34,752
Roof construction - new addition - exercise room & dining	1,229	sf	\$24.00	\$29,496
Roof construction - new addition - training room, lobby, and restrooms	1,397	sf	\$24.00	\$33,528
				\$97,776
B10 Superstructure \$134,791				
B20 Exterior Vertical Enclosures				
B2010 Exterior Walls				
Full wall assembly - allow for composite wood siding				
Exterior walls - new addition - apparatus bay	2,630	sf	\$44.00	\$115,720
Exterior walls - new addition - exercise room & dining	1,402	sf	\$44.00	\$61,688
Exterior walls - new addition - training room, lobby, and restrooms	1,685	sf	\$44.00	\$74,140

DETAIL ELEMENTS - FIRE STATION #3

Element	Quantity	Unit	Unit Cost	Total
				<u>\$251,548</u>
B2020 Exterior Windows				
Fiberglass framed windows				
Exterior windows - new addition - apparatus bay	395	sf	\$60.00	\$23,700
Exterior windows - new addition - exercise room & dining	210	sf	\$60.00	\$12,600
Exterior windows - new addition - training room, lobby, and restrooms	253	sf	\$60.00	\$15,180
				<u>\$51,480</u>
B2050 Exterior Doors and Grilles				
Exterior doors - new addition - apparatus bay	2	ea	\$3,350.00	6700
Exterior doors - new addition - apparatus bay - four-fold door	1	ea	\$15,000.00	\$15,000
Exterior doors - new addition - exercise room & dining	2	ea	\$3,350.00	6700
Exterior doors - new addition - training room, lobby, and restrooms	1	ea	\$3,350.00	\$3,350
				<u>\$31,750</u>
B20 Exterior Vertical Enclosures				\$334,778
B30 Exterior Horizontal Enclosures				
B3010 Roofing				
Roofing - new addition - apparatus bay	1,448	sf	\$32.00	\$46,336
Roofing - new addition - exercise room & dining	1,229	sf	\$35.00	\$43,015
Roofing - new addition - training room, lobby, and restrooms	1,397	sf	\$35.00	\$48,895
				<u>\$138,246</u>
B30 Exterior Horizontal Enclosures				\$138,246
B - SHELL				\$607,815
C - INTERIORS				
C10 Interior Construction				
C1010 Interior Partitions				
Partitions - new addition - apparatus bay	1,448	sf	\$21.00	\$30,408
Partitions - new addition - exercise room & dining	1,229	sf	\$21.00	\$25,809
Partitions - new addition - training room, lobby, and restrooms	1,397	sf	\$21.00	\$29,337
Partitions - converted office to new bunkroom	236	sf	\$21.00	\$4,956
Partitions - modified closet w/ new casework and wall framing	22	sf	\$21.00	\$462
Partitions - new wall framing for new vestibule and hall	119	sf	\$21.00	\$2,499
Partitions - storage mezzanine above new apparatus bay	673	sf	\$21.00	\$14,133
Partitions - area designated for rework	761	sf	\$21.00	\$15,981
Partitions - renovated kitchen	309	sf	\$21.00	\$6,489
Partitions - framing modifications for new office	15	sf	\$21.00	\$315

DETAIL ELEMENTS - FIRE STATION #3

Element	Quantity	Unit	Unit Cost	Total
				<u>\$130,389</u>
C1030 Interior Doors				
Interior doors - new addition - apparatus bay	7	ea	\$2,200.00	\$15,400
Interior doors - new addition - exercise room & dining	6	ea	\$2,200.00	\$13,200
Interior doors - new addition - training room, lobby, and restrooms	7	ea	\$2,200.00	\$15,400
Interior doors - converted office to new bunkroom	1	ea	\$2,200.00	\$2,200
Interior doors - new wall framing for new vestibule and hall	1	ea	\$2,200.00	\$2,200
Interior doors - storage mezzanine above new apparatus bay	3	ea	\$2,200.00	\$6,600
Interior doors - area designated for rework	4	ea	\$2,200.00	\$8,800
Interior doors - renovated kitchen	2	ea	\$2,200.00	\$4,400
				<u>\$68,200</u>
C1090 Interior Specialties				
Interior specialties - new addition - apparatus bay	1,448	sf	\$11.00	\$15,928
Interior specialties - new addition - exercise room & dining	1,229	sf	\$8.00	\$9,832
Interior specialties - new addition - training room, lobby, and restrooms	1,397	sf	\$16.00	\$22,352
Interior specialties - converted office to new bunkroom	236	sf	\$6.00	\$1,416
Interior specialties - modified closet w/ new casework and wall framing	22	sf	\$6.00	\$132
Interior specialties - new wall framing for new vestibule and hall	119	sf	\$6.00	\$714
Interior specialties - storage mezzanine above new apparatus bay	673	sf	\$6.00	\$4,038
Interior specialties - area designated for rework	761	sf	\$6.00	\$4,566
Interior specialties - renovated kitchen	309	sf	\$11.00	\$3,399
Interior specialties - framing modifications for new office	15	sf	\$6.00	\$90
				<u>\$62,467</u>
C10 Interior Construction				\$261,056
C20 Interior Finishes				
C2010 Wall Finishes				
Wall finishes - new addition - apparatus bay	1,448	sf	\$1.00	\$1,448
Wall finishes - new addition - exercise room & dining	1,229	sf	\$1.00	\$1,229
Wall finishes - new addition - training room, lobby, and restrooms	1,397	sf	\$1.00	\$1,397
Wall finishes - converted office to new bunkroom	236	sf	\$2.33	\$551
Wall finishes - modified closet w/ new casework and wall framing	22	sf	\$2.33	\$51
Wall finishes - new wall framing for new vestibule and hall	119	sf	\$2.33	\$278
Wall finishes - storage mezzanine above new apparatus bay	673	sf	\$2.33	\$1,570
Wall finishes - area designated for rework	761	sf	\$2.33	\$1,776
Wall finishes - renovated kitchen	309	sf	\$2.33	\$721
Wall finishes - framing modifications for new office	15	sf	\$2.33	\$35
				<u>\$9,056</u>
C2030 Flooring				
Flooring allowances - including base				
Flooring - new addition - apparatus bay - assume polished concrete	1,448	sf	\$5.25	\$7,602
Flooring - new addition - exercise room & dining	1,229	sf	\$17.50	\$21,508

DETAIL ELEMENTS - FIRE STATION #3

Element	Quantity	Unit	Unit Cost	Total
Flooring - new addition - training room, lobby, and restrooms	1,397	sf	\$17.50	\$24,448
Flooring - converted office to new bunkroom	236	sf	\$15.00	\$3,540
Flooring - modified closet w/ new casework and wall framing - assume polished concrete	22	sf	\$5.25	\$116
Flooring - new wall framing for new vestibule and hall - assume polished concrete	119	sf	\$5.25	\$625
Flooring - storage mezzanine above new apparatus bay - assume polished concrete	673	sf	\$5.25	\$3,533
Flooring - area designated for rework	761	sf	\$15.00	\$11,415
Flooring - renovated kitchen	309	sf	\$18.00	\$5,562
Flooring - framing modifications for new office	15	sf	\$15.00	\$225
Flooring - day room	409	sf	\$18.00	\$7,362
				<u>\$85,935</u>
C2050 Ceiling Finishes				
Ceiling finishes - new addition - appartus bay - assume painted OTS	1,448	sf	\$3.00	\$4,344
Ceiling finishes - new addition - exercise room & dining - assume ACT	1,229	sf	\$5.50	\$6,760
Ceiling finishes - new addition - training room, lobby, and restrooms - assume GWB	1,397	sf	\$10.00	\$13,970
Ceiling finishes - converted office to new bunkroom - assume ACT	236	sf	\$5.50	\$1,298
Ceiling finishes - modified closet w/ new casework and wall framing - assume painted OTS	22	sf	\$3.00	\$66
Ceiling finishes - new wall framing for new vestibule and hall - assume ACT	119	sf	\$5.50	\$655
Ceiling finishes - area designated for rework - assume ACT	761	sf	\$5.50	\$4,186
Ceiling finishes - renovated kitchen - assume ACT & GWB	309	sf	\$7.50	\$2,318
Ceiling finishes - framing modifications for new office - assume ACT	15	sf	\$5.50	\$83
Ceiling finishes - day room - assume ACT	409	sf	\$5.50	\$2,250
				<u>\$35,927</u>
C20 Interior Finishes				<u>\$130,917</u>
C - INTERIORS				\$391,973
D - SERVICES				
D20 Plumbing				
D2010 Domestic Water Distribution				
New				
Domestic water piping	4,187	sf	\$8.35	\$34,961
Fixture w/rough-in	4,187	sf	\$8.00	\$33,496
Renovation				
Domestic water piping	1,447	sf	\$10.00	\$14,470
Fixture w/rough-in	1,447	sf	\$13.00	\$18,811
				<u>\$101,738</u>
D2020 Sanitary Drainage				

DETAIL ELEMENTS - FIRE STATION #3

Element	Quantity	Unit	Unit Cost	Total
New				
Waste/vent piping	4,187	sf	\$8.02	\$33,580
Renovation				
Waste/vent piping	1,447	sf	\$9.00	\$13,023
				<u>\$46,603</u>
D2030 Building Support Plumbing Systems				
New				
Equipment	4,187	sf	\$1.85	\$7,746
Natural gas system	4,187	sf	\$2.00	\$8,374
Roof Drainage	4,187	sf	\$3.47	\$14,529
Condensate Drainage	4,187	sf	\$2.60	\$10,886
Testing/ firestopping / seismic/ misc	4,187	sf	\$2.20	\$9,211
Renovation				
Demolition	1,447	sf	\$1.25	\$1,809
Testing/ firestopping / seismic/ misc	1,447	sf	\$2.50	\$3,618
				<u>\$56,173</u>
D2050 General Service Compressed-Air				
New				
Compressed air	4,187	sf	\$1.00	\$4,187
				<u>\$4,187</u>
D20 Plumbing				\$208,701
D30 Heating, Ventilation, and Air Conditioning (HVAC)				
D3030 Cooling Systems				
New				
Air side equipment (Split sys, heat pumps, fans)	4,187	sf	\$15.00	\$62,805
Test / balance / firestopping / seismic	4,187	sf	\$2.89	\$12,100
Renovation				
Air side equipment (Split sys, heat pumps, fans)	1,447	sf	\$16.00	\$23,152
Test / balance / firestopping / seismic	1,447	sf	\$2.89	\$4,182
				<u>\$102,239</u>
D3050 Facility HVAC Distribution Systems				
New				
Air distribution	4,187	sf	\$13.10	\$54,850
Renovation				
Demolition	1,447	sf	\$1.45	\$2,098
Air distribution	1,447	sf	\$13.10	\$18,956
				<u>\$75,904</u>

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DETAIL ELEMENTS - FIRE STATION #3

Element	Quantity	Unit	Unit Cost	Total
D30 Heating, Ventilation, and Air Conditioning (HVAC)				
				\$178,143
D40 Fire Protection				
D4010 Fire Suppression				
New				
Automatic Sprinkler System	4,187	sf	\$6.10	\$25,541
Renovation				
Automatic Sprinkler System - relocate heads	1,447	sf	\$3.45	\$4,992
				\$30,533
D40 Fire Protection				\$30,533
D50 Electrical				
D5020 Electrical Service and Distribution				
Distribution Equipment				
	5,634	sf	\$10.00	\$56,340
				\$56,340
D5030 General Purpose Electrical Power				
HVAC and Equipment Connections				
	5,634	sf	\$2.25	\$12,677
Convenience Power				
	5,634	sf	\$6.50	\$36,621
				\$49,298
D5040 Lighting				
Lighting and Lighting Control				
	5,634	sf	\$21.00	\$118,314
				\$118,314
D5080 Miscellaneous Electrical Systems				
Demolition				
	5,634	sf	\$1.25	\$7,043
				\$7,043
D50 Electrical				\$230,994
D60 Communications				
D6010 Data Communications				
Voice and Data System				
	5,634	sf	\$5.50	\$30,987
				\$30,987
D6030 Audio-Video Communication				
PA System				
	5,634	sf	\$7.00	\$39,438
				\$39,438

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DETAIL ELEMENTS - FIRE STATION #3

Element	Quantity	Unit	Unit Cost	Total
D60 Communications				
				\$70,425
D70 Electronic Safety and Security				
D7010 Access Control and Intrusion Detection				
Access Control System - includes electronic access for all doors				
	10,550	sf	\$4.15	\$43,783
				\$43,783
D7050 Detection and Alarm				
Security System				
	5,634	sf	\$1.50	\$8,451
Fire Alarm System				
	5,634	sf	\$10.00	\$56,340
				\$64,791
D7070 Electronic Monitoring and Control				
CCTV System				
	5,634	sf	\$4.00	\$22,536
				\$22,536
D7090 Electronic Safety and Security Supplementary Components				
Alerting System - allowance				
	1	ls	\$20,000.00	\$20,000
				\$20,000
D70 Electronic Safety and Security				\$151,110
D80 Integrated Automation				
D8010 Integrated Automation Facility Controls				
New				
Direct Digital Controls				
	4,187	sf	\$4.00	\$16,748
Renovation				
Direct Digital Controls				
	1,447	sf	\$5.00	\$7,235
				\$23,983
D80 Integrated Automation				\$23,983
D - SERVICES				\$893,888
E - EQUIPMENT & FURNISHINGS				
E10 Equipment				
E1010 Vehicle and Pedestrian Equipment				
Powered double swing gate w/ battery backup and proximity card reader on pedestal				
	1	pair	\$10,000.00	\$10,000

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DETAIL ELEMENTS - FIRE STATION #3

Element	Quantity	Unit	Unit Cost	Total
				\$10,000
E1030 Commercial Equipment				
Install only food services equipment - renovated kitchen	309	sf	\$8.00	\$2,472
				\$2,472
E1040 Institutional Equipment				
Miscellaneous OFCI equipment install allowance	5,634	sf	\$1.00	\$5,634
				\$5,634
E10 Equipment				\$18,106
E20 Furnishings				
E2010 Fixed Furnishings				
Casework allowance	5,634	sf	\$7.00	\$39,438
				\$39,438
E2050 Movable Furnishings				
Excluded				
				\$39,438
E20 Furnishings				\$39,438
E - EQUIPMENT & FURNISHINGS				\$57,544
F - SPECIAL CONSTRUCTION & DEMOLITION				
F30 Demolition				
F3030 Selective Demolition				
Miscellaneous demolition	5,634	sf	\$10.00	\$56,340
				\$56,340
F30 Demolition				\$56,340
F - SPECIAL CONSTRUCTION & DEMOLITION				\$56,340
G - SITEWORK				
G20 Site Improvements				
G2010 Roadways				
New asphalt roadway, including all associated work	2,486	sf	\$10.00	\$24,860
Retop all asphalt	14,700	sf	\$2.25	\$33,075

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DETAIL ELEMENTS - FIRE STATION #3

Element	Quantity	Unit	Unit Cost	Total
				\$57,935
G2030 Pedestrian Plazas and Walkways				
New concrete apron, including all associated work	3,931	sf	\$14.00	\$55,034
				\$55,034
G2060 Site Development				
6' chain link fence incl. all footings	35	lf	\$50.00	\$1,750
				\$1,750
G2080 Landscaping				
Allowance for modified landscape and driveway edge	1	ls	\$30,000.00	\$30,000
				\$30,000
G20 Site Improvements				\$144,719
G - SITEWORK				\$144,719



Mount Vernon Fire Station #1 [Headquarters Station]		Job Number:	2180238.00
PRELIMINARY GOVERNMENTAL AND JURISDICTIONAL FEES ESTIMATE		Date:	10/21/2018
City of Mount Vernon		Prepared By:	BXH
Please note: the following estimate is provided as a convenience to our clients; it is not intended to replace the actual fees assessed by the governing jurisdictions. Every effort has been made to accurately estimate the fees that will be associated with the example project; however, the following information is based solely on the information available on the date of this estimate, and actual fees may vary at the time of permit application or issuance.			
ASSUMPTIONS			
Building Floor Area (Total):		24,000	SF
Building Valuation (ICC):	Per Architect 11/29/2018	\$13,869,478	
Total Site Area:	Per Skagit County Tax Assessor	40,511	SF
Fill/Grade Quantity:		2000	Cubic yards
Plumbing Fixture Units:	Based on previous similar projects	250	
Water Meter Size:		2	Inch
Sanitary Sewer Lateral Size:		6	Inch
PM Peak Hour Trips (Fire and Rescue Station ITE Code 575):	Based on 10th Edition ITE Trip Generation Manual; PM Peak hour trips are calculated by a City-contracted traffic engineer	12	Trips
ESTIMATES			
Land Use Application & Review			
Planning Review Fee:	Included as part of building plan review	\$0	
Site Plan Approval/Review:	Includes CEDD staff review	\$300	
SEPA Environmental Checklist Fee:	Includes 100% of consultant cost if technical review requested by the City	\$200	
Design Review Fee:	Design review applicable to residential units only.	\$0	
		SUBTOTAL:	\$500.00
Construction Permit & Related Fees			
Building Permit Fee:	Based on project valuation; \$5,608.75 for the first \$1,000,000.00 plus \$3.65 for each additional \$1,000.00 or fraction thereof	\$52,582.34	
Building Plan Review Fee:	65% of building permit fee	\$34,178.52	
Building Inspection Fee:	Inspection fees included in the building plan review fee	\$0	
Fire Plan Review:	Assumed as part of building plan review; per City Staff	\$0	
State Surcharge:		\$25.00	
Fill & Grade Permit Fee:	Rate for over 1000 cubic yards of fill & grade	\$750.00	
Construction Plan Review:	Based on CEDD Staff Time; This estimate assumes 20 hours of review	\$1,500.00	
Construction Inspection Fee:	Based on CEDD Staff Time; This estimate assumes 40 hours of review	\$3,000.00	
Fire Permit:	Per City Staff; not assessed for City owned facility	\$0	
Administrative/Technology Fee:	3% of Building Permit and Building Plan Check Fee	\$2,602.83	
		SUBTOTAL:	\$94,638.69
Systems Development Charges (SDCs)			
Traffic Impact Fee:	Per PM peak hour trip; rate for non-residential use	\$12,269	
Transportation Concurrence Review:	100% of consultant cost plus CEDD Staff Time; this estimate assumes 5 hours of review	\$24,060	
Stormwater Permit Fee:	CEDD Staff Time; this estimate assumes for 10 hours of review	\$750	
Stormwater SDC:	No stormwater impact fees per City of Mount Vernon Impact & Connection Fee Summary or per MVMC	N/A	
Sanitary Sewer SDC:	No stormwater system development charge per City of Mount Vernon Impact & Connection Fee Summary or per MVMC	N/A	
Sanitary Sewer Connection Fee:	Per fixture unit; to be verified by City Building Official	\$83,000	
Sewer Permit Fee:	For new sewer connection	\$50	
Sewer Inspection Fee:	.01 per SF to 100,000, plus 0.005 per SF additional. \$50.00 min-\$1,500 max	\$240	
Water SDC:	Fee based on meter size; per Skagit Valley Public Utility District; includes service activation charge	\$38,940	
Water Meter Installation Charge:	Based on connection charge type and meter size; 1.5 inch and greater sized meters are assessed at the cost of time and materials	\$0	
Fire Impact Fee:	\$0.22 per square foot of building floor area	\$5,280	
Parks Impact Fee:	Parks Impact Fee applicable to residential units only.	\$0	
School Impact Fee:	School Impact Fee applicable to residential units only.	\$0	
Police Mitigation Fee:		N/A	
Administration Fee:	1% of total impact fees for nonresidential permits	\$564.89	
		SUBTOTAL:	\$164,588.92
		SUBTOTAL:	\$259,727.61
		Estimated Fees and Permits:	\$259,727.61
		Add 10% Contingency:	\$25,972.76
		TOTAL FEE ESTIMATE:	\$285,700.38
GENERAL NOTES			
A. Traffic impact fees apply to all new non-residential buildings and additions to existing buildings. The number of average trips per peak P.M. hours are calculated by a traffic engineer contracted by the City. This estimate assumes a PM peak hour trip count based on the average trip rate for ITE Land Use Code 575 Fire and Rescue Station as contained in the ITE Trip Generation Manual, 10th Edition. Estimation of traffic impact fees for this estimate will need to be verified by City contracted traffic engineer.			
B. Consultant cost for transportation concurrency review is assessed at \$2,056 per PM Peak Hour Trip, per City staff.			
C. A \$1000 hearing examiner fee is required in the case a decision made by the Site Plan Review Committee (SPRC) is appealed to the Hearing Examiner.			
D. Community and Economic Development Department (CEDD) staff time is billed at \$75.00 per hour with a minimum of one (1) hour of review.			
E. Fixture unit counts are completed by the City's Building Official using the Uniform Plumbing Code.			
F. Per City Staff, Sewer Inspection Fee is assessed as a permit fee per unit, in addition to the Sewer Permit Fee.			
G. Per the Skagit Public Utility District 2018 Water Policy Manual- Appendix A Rates, Fees, Charges and Deposits.			
H. Sewer permit and inspection fees are not assessed as impact fees.			



Mount Vernon Fire Station #2		Job Number:	2180238.00
PRELIMINARY GOVERNMENTAL AND JURISDICTIONAL FEES ESTIMATE		Date:	11/29/2018
City of Mount Vernon		Prepared By:	BXH
Please note: the following estimate is provided as a convenience to our clients; it is not intended to replace the actual fees assessed by the governing jurisdictions. Every effort has been made to accurately estimate the fees that will be associated with the example project; however, the following information is based solely on the information available on the date of this estimate, and actual fees may vary at the time of permit application or issuance.			
ASSUMPTIONS			
Building Floor Area (Total):		14,000	SF
Building Floor Area (Addition):		1,303	SF
Building Valuation (ICC):	Per Architect 11/29/2018	\$1,875,403	
Total Site Area:	Per Skagit County Tax Assessor	87,120	SF
Fill/Grade Quantity:		1000	Cubic yards
Plumbing Fixture Units:	Based on previous similar projects	250	
Water Meter Size:		2	Inch
Sanitary Sewer Lateral Size:		6	Inch
PM Peak Hour Trips (Fire and Rescue Station ITE Code 575):	PM Peak hour trips are calculated by a City-contracted traffic engineer	7	Trips
ESTIMATES			
Land Use Application & Review			
Planning Review Fee:	Included as part of building plan review	\$0	
Site Plan Approval/Review:	Includes CEDD staff review	\$300	
SEPA Environmental Checklist Fee:	Includes 100% of consultant cost if technical review requested by the City	\$200	
Design Review Fee:	Design review applicable to residential units only.	\$0	
		SUBTOTAL:	\$500.00
Construction Permit & Related Fees			
Building Permit Fee:	Based on project valuation; \$5,608.75 for the first \$1,000,000.00 plus \$3.65 for each additional \$1,000.00, or fraction thereof.	\$8,803.97	
Building Plan Review Fee:	65% of building permit fee	\$5,722.58	
Building Inspection Fee:	Inspection fees included in the building plan review fee	\$0	
Fire Plan Review:	Assumed as part of building plan review; per City Staff	\$0	
State Surcharge:		\$25.00	
Fill & Grade Permit Fee:	Rate for over 1000 cubic yards of fill & grade	\$750.00	
Construction Plan Review:	Based on CEDD Staff Time; This estimate assumes 20 hours of review	\$1,500.00	
Construction Inspection Fee:	Based on CEDD Staff Time; This estimate assumes 40 hours of review	\$3,000.00	
Fire Permit:	Per City Staff; not assessed for City owned facility	\$0	
Administrative/Technology Fee:	3% of Building Permit and Building Plan Check Fee	\$435.80	
		SUBTOTAL:	\$20,237.35
Systems Development Charges (SDCs)			
Transportation Impact Fee:	Per PM peak hour trip	\$7,157	
Transportation Concurrence Review:	100% of consultant cost plus CEDD Staff Time; this estimate assumes 5 hours of review	\$14,191	
Stormwater Permit Fee:	CEDD Staff Time; this estimate assumes for 10 hours of review	\$750	
Stormwater SDC:	No stormwater impact fees per City of Mount Vernon Impact & Connection Fee Summary or per MVMC	N/A	
Sanitary Sewer SDC:	No stormwater system development charge per City of Mount Vernon Impact & Connection Fee Summary or per MVMC	N/A	
Sanitary Sewer Connection Fee:	Per fixture unit; to be verified by City Building Official	\$83,000	
Sewer Permit Fee:	For new sewer connection	\$50	
Sewer Inspection Fee:	.01 per SF to 100,000, plus 0.005 per SF additional. \$50.00 min-\$1,500 max	\$140	
Water SDC:	Fee based on meter size; per Skagit Valley Public Utility District; includes service activation charge	\$38,920	
Water Meter Installation Charge:	Based on connection charge type and meter size; 1.5 inch and greater sized meters are assessed at the cost of time and materials	\$0	
Fire Impact Fee:	\$0.22 per square foot of building floor area	\$3,080	
Parks Impact Fee:	Parks Impact Fee applicable to residential units only.	\$0	
School Impact Fee:	School Impact Fee applicable to residential units only.	\$0	
Police Mitigation Fee:		N/A	
Administration Fee:	1% of total impact fees for nonresidential permits	\$491.57	
		SUBTOTAL:	\$147,288.12
		SUBTOTAL:	\$168,025.47
		Estimated Fees and Permits:	\$168,025.47
		Add 10% Contingency:	\$16,802.55
		TOTAL FEE ESTIMATE:	\$184,828.02
GENERAL NOTES			
A. Traffic impact fees apply to all new non-residential buildings and additions to existing buildings. The number of average trips per peak P.M. hours are calculated by a traffic engineer contracted by the City. This estimate assumes a PM peak hour trip count based on the average trip rate for ITE Land Use Code 575 Fire and Rescue Station as contained in the ITE Trip Generation Manual, 10th Edition. Estimation of traffic impact fees for this estimate will need to be verified by City contracted traffic engineer.			
B. Consultant cost for transportation concurrency review is assessed at \$2,056 per PM Peak Hour Trip, per City staff.			
C. A \$1000 hearing examiner fee is required in the case a decision made by the Site Plan Review Committee (SPRC) is appealed to the Hearing Examiner.			
D. Community and Economic Development Department (CEDD) staff time is billed at \$75.00 per hour with a minimum of one (1) hour of review.			
E. Fixture unit counts are completed by the City's Building Official using the Uniform Plumbing Code.			
F. Per City Staff, Sewer Inspection Fee is assessed as a permit fee per unit, in addition to the Sewer Permit Fee.			
G. Per the Skagit Public Utility District 2018 Water Policy Manual- Appendix A Rates, Fees, Charges and Deposits.			
H. Sewer permit and inspection fees are not assessed as impact fees.			



ASCE 41-13 STRUCTURAL ANALYSIS

Mount Vernon Fire Station #3		Job Number:	2180238.00
PRELIMINARY GOVERNMENTAL AND JURISDICTIONAL FEES ESTIMATE		Date:	11/29/2018
City of Mount Vernon		Prepared By:	BXH
Please note: the following estimate is provided as a convenience to our clients; it is not intended to replace the actual fees assessed by the governing jurisdictions. Every effort has been made to accurately estimate the fees that will be associated with the example project; however, the following information is based solely on the information available on the date of this estimate, and actual fees may vary at the time of permit application or issuance.			
ASSUMPTIONS			
Building Floor Area (Total):		10,160	SF
Building Floor Area (Addition):	No additions proposed. Ground up building.	4,187	SF
Building Valuation (ICC):	Per Architect 11/29/2018	\$3,075,466	
Total Site Area:	Per Skagit County Tax Assessor	62,291	SF
Fill/Grade Quantity:		1000	Cubic yards
Plumbing Fixture Units:	Based on previous similar projects	250	
Water Meter Size:		2	Inch
Sanitary Sewer Lateral Size:		6	Inch
PM Peak Hour Trips (Fire and Rescue Station ITE Code 575):	PM Peak hour trips are calculated by a City-contracted traffic engineer	5	Trips
ESTIMATES			
Land Use Application & Review			
Planning Review Fee:	Included as part of building plan review	\$0	
Site Plan Approval/Review:	Includes CEDD staff review	\$300	
SEPA Environmental Checklist Fee:	Includes 100% of consultant cost if technical review requested by the City	\$200	
Design Review Fee:	Design review applicable to residential units only.	\$0	
		SUBTOTAL:	\$500.00
Construction Permit & Related Fees			
Building Permit Fee:	Based on project valuation; \$5,608.75 for the first \$1,000,000.00 plus \$3.65 for each additional \$1,000.00, or fraction thereof.	\$13,184.20	
Building Plan Review Fee:	65% of building permit fee	\$8,569.73	
Building Inspection Fee:	Inspection fees included in the building plan review fee	\$0	
Fire Plan Review:	Assumed as part of building plan review, per City Staff	\$0	
State Surcharge:		\$25.00	
Fill & Grade Permit Fee:	Rate for over 1000 cubic yards of fill & grade	\$750.00	
Construction Plan Review:	Based on CEDD Staff Time; This estimate assumes 20 hours of review	\$1,500.00	
Construction Inspection Fee:	Based on CEDD Staff Time; This estimate assumes 40 hours of review	\$3,000.00	
Fire Permit:	Per City Staff; not assessed for City owned facility	\$0	
Administrative/Technology Fee:	3% of Building Permit and Building Plan Check Fee	\$652.62	
		SUBTOTAL:	\$27,681.55
Systems Development Charges (SDCs)			
Transportation Impact Fee:	Per PM peak hour trip	\$5,194	
Transportation Concurrence Review:	100% of consultant cost plus CEDD Staff Time; this estimate assumes 5 hours of review	\$10,402	
Stormwater Permit Fee:	CEDD Staff Time; this estimate assumes for 10 hours of review	\$750	
Stormwater SDC:	No stormwater impact fees per City of Mount Vernon Impact & Connection Fee Summary or per MVMC	N/A	
Sanitary Sewer SDC:	No stormwater system development charge per City of Mount Vernon Impact & Connection Fee Summary or per MVMC	N/A	
Sanitary Sewer Connection Fee:	Per fixture unit; to be verified by City Building Official	\$83,000	
Sewer Permit Fee:	For new sewer connection	\$50	
Sewer Inspection Fee:	.01 per SF to 100,000, plus 0.005 per SF additional. \$50.00 min-\$1,500 max	\$102	
Water SDC:	Fee based on meter size; per Skagit Valley Public Utility District; includes service activation charge	\$38,920	
Water Meter Installation Charge:	Based on connection charge type and meter size; 1.5 inch and greater sized meters are assessed at the cost of time and materials	\$0	
Fire Impact Fee:	\$0.22 per square foot of building floor area	\$2,235	
Parks Impact Fee:	Parks Impact Fee applicable to residential units only.	\$0	
School Impact Fee:	School Impact Fee applicable to residential units only.	\$0	
Police Mitigation Fee:		N/A	
Administration Fee:	1% of total impact fees for nonresidential permits	\$463.49	
		SUBTOTAL:	\$140,652.29
		SUBTOTAL:	\$168,833.84
		Estimated Fees and Permits:	\$168,833.84
		Add 10% Contingency:	\$16,883.38
		TOTAL FEE ESTIMATE:	\$185,717.23
GENERAL NOTES			
A. Traffic impact fees apply to all new non-residential buildings and additions to existing buildings. The number of average trips per peak P.M. hours are calculated by a traffic engineer contracted by the City. This estimate assumes a PM peak hour trip count based on the average trip rate for ITE Land Use Code 575 Fire and Rescue Station as contained in the ITE Trip Generation Manual, 10th Edition. Estimation of traffic impact fees for this estimate will need to be verified by City contracted traffic engineer.			
B. A \$1000 hearing examiner fee is required in the case a decision made by the Site Plan Review Committee (SPRC) is appealed to the Hearing Examiner.			
C. Community and Economic Development Department (CEDD) staff is billed at \$75.00 per hour with a minimum of one (1) hour of review.			
D. Fixture unit counts are completed by the City's Building Official using the Uniform Plumbing Code.			
E. Per City Staff, Sewer Inspection Fee is assessed as a permit fee per unit, in addition to the Sewer Permit Fee.			
F. Per the Skagit Public Utility District 2018 Water Policy Manual - Appendix A Rates, Fees, Charges and Deposits.			
G. Sewer permit and inspection fees are not assessed as impact fees.			



APPENDIX C

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Project: Mount Vernon Facility Assessment - Station 2 Location: Mount Vernon, WA

Completed by: SIW Date: 12/14/2018

16.1.210 IMMEDIATE OCCUPANCY BASIC CONFIGURATION CHECKLIST

Very Low Seismicity

Building System

General

- C **NC** N/A U LOAD PATH: The structure shall contain a complete, well-defined load path, including structural elements and connections, that serves to transfer the inertial forces associated with the mass of all elements of the building to the foundation. (Commentary: Sec. A.2.1.1. Tier 2: Sec. 5.4.1.1)
- C NC **N/A** U ADJACENT BUILDINGS: The clear distance between the building being evaluated and any adjacent building is greater than 4% of the height of the shorter building. This statement need not apply for the following building types: W1, W1a, and W2. (Commentary: Sec. A.2.1.2. Tier 2: Sec. 5.4.1.2)
- C** NC N/A U MEZZANINES: Interior mezzanine levels are braced independently from the main structure or are anchored to the seismic-force-resisting elements of the main structure. (Commentary: Sec. A.2.1.3. Tier 2: Sec. 5.4.1.3)

Building Configuration

- C NC **N/A** U WEAK STORY: The sum of the shear strengths of the seismic-force-resisting system in any story in each direction shall not be less than 80% of the strength in the adjacent story above. (Commentary: Sec. A.2.2.2. Tier 2: Sec. 5.4.2.1)
- C NC **N/A** U SOFT STORY: The stiffness of the seismic-force-resisting system in any story shall not be less than 70% of the seismic-force-resisting system stiffness in an adjacent story above or less than 80% of the average seismic-force-resisting system stiffness of the three stories above. (Commentary: Sec. A.2.2.3. Tier 2: Sec. 5.4.2.2)
- C** NC N/A U VERTICAL IRREGULARITIES: All vertical elements in the seismic-force-resisting system are continuous to the foundation. (Commentary: Sec. A.2.2.4. Tier 2: Sec. 5.4.2.3)
- C NC **N/A** U GEOMETRY: There are no changes in the net horizontal dimension of the seismic-force-resisting system of more than 30% in a story relative to adjacent stories, excluding one-story penthouses and mezzanines. (Commentary: Sec. A.2.2.5. Tier 2: Sec. 5.4.2.4)
- C NC **N/A** U MASS: There is no change in effective mass more than 50% from one story to the next. Light roofs, penthouses, and mezzanines need not be considered. (Commentary: Sec. A.2.2.6. Tier 2: Sec. 5.4.2.5)
- C NC **N/A** U TORSION: The estimated distance between the story center of mass and the story center of rigidity is less than 20% of the building width in either plan dimension. (Commentary: Sec. A.2.2.7. Tier 2: Sec. 5.4.2.6)

Low Seismicity: Complete the Following Items in Addition to the Items for Very Low Seismicity.

Geologic Site Hazards

- C** NC N/A U LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could jeopardize the building's seismic performance shall not exist in the foundation soils at depths within 50 ft under the building. (Commentary: Sec. A.6.1.1. Tier 2: 5.4.3.1)
- C** NC N/A U SLOPE FAILURE: The building site is sufficiently remote from potential earthquake-induced slope failures or rockfalls to be unaffected by such failures or is capable of accommodating any predicted movements without failure. (Commentary: Sec. A.6.1.2. Tier 2: 5.4.3.1)
- C** NC N/A U SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are not anticipated. (Commentary: Sec. A.6.1.3. Tier 2: 5.4.3.1)

Moderate and High Seismicity: Complete the Following Items in Addition to the Items for Low Seismicity.

Foundation Configuration

- C **NC** N/A U OVERTURNING: The ratio of the least horizontal dimension of the seismic-force-resisting system at the foundation level to the building height (base/height) is greater than 0.65. (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)
- C** NC N/A U TIES BETWEEN FOUNDATION ELEMENTS: The foundation has ties adequate to resist seismic forces where footings, piles, and piers are not restrained by beams, slabs, or soils classified as Site Class A, B, or C. (Commentary: Sec. A.6.2.2. Tier 2: Sec. 5.4.3.4)

Project: Mount Vernon Facility Assessment - Station 2 Location: Mount Vernon, WA
 Completed by: SIW Date: 12/14/2018

16.310 IMMEDIATE OCCUPANCY STRUCTURAL CHECKLIST FOR BUILDING TYPE W2: WOOD FRAMES, COMMERCIAL AND INDUSTRIAL

Very Low Seismicity

Seismic-Force-Resisting System

- C **NC** N/A U REDUNDANCY: The number of lines of shear walls in each principal direction is greater than or equal to 2. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec. 5.5.1.1)
- C **NC** N/A U SHEAR STRESS CHECK: The shear stress in the shear walls, calculated using the Quick Check procedure of Section 4.5.3.3, is less than the following values (Commentary: Sec. A.3.2.7.1. Tier 2: Sec. 5.5.3.1.1):
 Structural panel sheathing 1,000 lb/ft
 Diagonal sheathing 700 lb/ft
 Straight sheathing 100 lb/ft
 All other conditions 100 lb/ft
- C **NC** **N/A** U STUCCO (EXTERIOR PLASTER) SHEAR WALLS: Multi-story buildings do not rely on exterior stucco walls as the primary seismic-force-resisting system. (Commentary: Sec. A.3.2.7.2. Tier 2: Sec. 5.5.3.6.1)
- C **NC** **N/A** U GYPSUM WALLBOARD OR PLASTER SHEAR WALLS: Interior plaster or gypsum wallboard is not used as shear walls on buildings more than one story high with the exception of the uppermost level of a multi-story building. (Commentary: Sec. A.3.2.7.3. Tier 2: Sec. 5.5.3.6.1)
- C **NC** N/A U NARROW WOOD SHEAR WALLS: Narrow wood shear walls with an aspect ratio greater than 2-to-1 are not used to resist seismic forces. (Commentary: Sec. A.3.2.7.4. Tier 2: Sec. 5.5.3.6.1)
- C **NC** N/A U WALLS CONNECTED THROUGH FLOORS: Shear walls have an interconnection between stories to transfer overturning and shear forces through the floor. (Commentary: Sec. A.3.2.7.5. Tier 2: Sec. 5.5.3.6.2)
- C **NC** **N/A** U HILLSIDE SITE: For structures that are taller on at least one side by more than one-half story because of a sloping site, all shear walls on the downhill slope have an aspect ratio less than 1-to-2. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec. 5.5.3.6.3)
- C **NC** **N/A** U CRIPPLE WALLS: Cripple walls below first-floor-level shear walls are braced to the foundation with wood structural panels. (Commentary: Sec. A.3.2.7.7. Tier 2: Sec. 5.5.3.6.4)
- C **NC** N/A U OPENINGS: Walls with openings greater than 80% of the length are braced with wood structural panel shear walls with aspect ratios of not more than 1.5-to-1 or are supported by adjacent construction through positive ties capable of transferring the seismic forces. (Commentary: Sec. A.3.2.7.8. Tier 2: Sec. 5.5.3.6.5)
- C **NC** N/A U HOLD-DOWN ANCHORS: All shear walls have hold-down anchors, constructed per acceptable construction practices, attached to the end studs. (Commentary: Sec. A.3.2.7.9. Tier 2: Sec. 5.5.3.6.6)

Connections

- C **NC** N/A U WOOD POSTS: There is a positive connection of wood posts to the foundation. (Commentary: Sec. A.5.3.3. Tier 2: Sec. 5.7.3.3)
- C **NC** N/A U WOOD SILLS: All wood sills are bolted to the foundation. (Commentary: Sec. A.5.3.4. Tier 2: Sec. 5.7.3.3)
- C **NC** N/A U GIRDER/COLUMN CONNECTION: There is a positive connection using plates, connection hardware, or straps between the girder and the column support. (Commentary: Sec. A.5.4.1. Tier 2: Sec. 5.7.4.1)

Foundation System

- C **NC** **N/A** U DEEP FOUNDATIONS: Piles and piers are capable of transferring the lateral forces between the structure and the soil. (Commentary: Sec. A.6.2.3.)
- C **NC** N/A U SLOPING SITES: The difference in foundation embedment depth from one side of the building to another shall not exceed one story high. (Commentary: Sec. A.6.2.4)

Low, Moderate, and High Seismicity: Complete the Following Items in Addition to the Items for Very Low Seismicity.

Seismic-Force-Resisting System

- C **NC** N/A U NARROW WOOD SHEAR WALLS: Narrow wood shear walls with an aspect ratio greater than 1.5-to-1 are not used to resist seismic forces. (Commentary: Sec. A.3.2.7.4. Tier 2: Sec. 5.5.3.6.1)

Diaphragms

- C **NC** N/A U DIAPHRAGM CONTINUITY: The diaphragms are not composed of split-level floors and do not have expansion joints. (Commentary: Sec. A.4.1.1. Tier 2: Sec. 5.6.1.1)
- C **NC** N/A U ROOF CHORD CONTINUITY: All chord elements are continuous, regardless of changes in roof elevation. (Commentary: Sec. A.4.1.3. Tier 2: Sec. 5.6.1.1)
- C **NC** N/A U PLAN IRREGULARITIES: There is tensile capacity to develop the strength of the diaphragm at reentrant corners or other locations of plan irregularities. (Commentary: Sec. A.4.1.7. Tier 2: Sec. 5.6.1.4)
- C **NC** **N/A** U DIAPHRAGM REINFORCEMENT AT OPENINGS: There is reinforcing around all diaphragm openings larger than 50% of the building width in either major plan dimension. (Commentary: Sec. A.4.1.8. Tier 2: Sec. 5.6.1.5)
- C **NC** **N/A** U STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 1-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)
- C **NC** N/A U SPANS: All wood diaphragms with spans greater than 12 ft consist of wood structural panels or diagonal sheathing. Wood commercial and industrial buildings may have rod-braced systems. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)
- C **NC** **N/A** U DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 30 ft and aspect ratios less than or equal to 3-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)
- C **NC** N/A U OTHER DIAPHRAGMS: The diaphragm does not consist of a system other than wood, metal deck, concrete, or horizontal bracing. (Commentary: Sec. A.4.7.1. Tier 2: Sec. 5.6.5)

Connections

- C **NC** N/A U WOOD SILL BOLTS: Sill bolts are spaced at 4 ft or less, with proper edge and end distance provided for wood and concrete. (Commentary: Sec. A.5.3.7. Tier 2: Sec. 5.7.3.3)

11/29/2018

Design Maps Summary Report

USGS Design Maps Summary Report

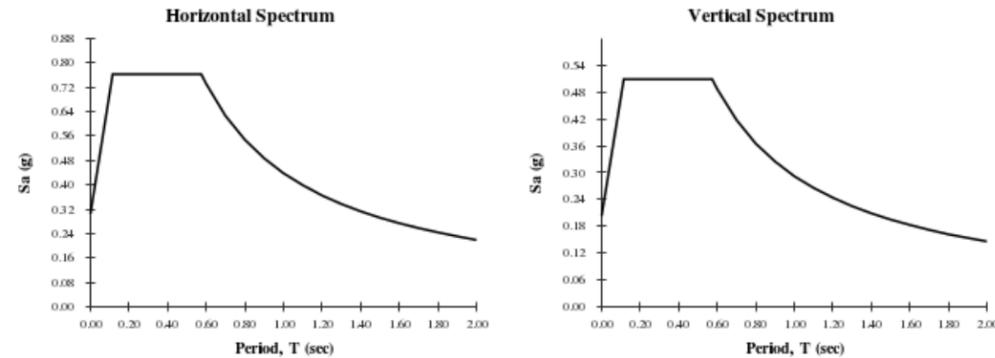
User-Specified Input

Report Title Mount Vernon Station 2
 Fri November 30, 2018 01:05:51 UTC
Building Code Reference Document ASCE 41-13 Retrofit Standard, BSE-1N
 (which utilizes USGS hazard data available in 2008)
Site Coordinates 48.43758°N, 122.31349°W
Site Soil Classification Site Class D - "Stiff Soil"



USGS-Provided Output

$S_{XS,BSE-1N}$ 0.763 g
 $S_{X1,BSE-1N}$ 0.438 g



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.

<https://prod01-earthquake.cr.usgs.gov/designmaps/us/summary.php?template=minimal&latitude=48.437577000000005&longitude=-122.31348836210...> 1/1

$DL_{ROOF} = 15 \text{ PSF (EXIST DWLS)} \Rightarrow DL_{SER} = 13 \text{ PSF}$
 $DL_{WALL} = 12 \text{ PSF}$
 $V = CS_a W \Rightarrow C = 1.3 \text{ (TABLE 4.8)}$
 $T = C_h h_n^0 = 0.02 (33')^{0.75} = 0.275$
 $S_a = S_{x1} / T = 0.438 / 0.275 = 1.59 > S_{XS} = 0.763$
 $V = 1.3 (0.763) W = 0.992 W$

WORST CASE SHEAR WALL (N-S)
 $V_j = 0.992 \left[\frac{(20')(61')}{2} (13 \text{ PSF}) + \frac{(20')(19')}{2} (12 \text{ PSF}) \right] = 13.17 \text{ k}$
 $l_w = 8.91'$

$M_s = 2.0$
 $v_{jAVG} = \frac{1}{2.0} \left(\frac{13.17 \text{ k}}{8.91'} \right) = 0.739 \text{ k/ft} = 739 \text{ PLF} < 1000 \text{ PLF} \therefore \text{COMPLIANT}$

WORST CASE SHEAR WALLS (E-W)
 $V_j = 0.992 \left[\frac{(12.17')(72')}{2} + \frac{(17.5')(17.5')}{2} \right] (13 \text{ PSF}) + \frac{(12.17' + 17.5')(13.5')}{2} (12 \text{ PSF}) = 18.87 \text{ k}$
 $l_w = 8'$

$M_s = 2.0$
 $v_{jAVG} = \frac{1}{2.0} \left(\frac{18.87 \text{ k}}{8'} \right) = 1.179 \text{ PLF} > 1000 \text{ PLF} \therefore \text{NON-COMPLIANT}$

OVERTURNING CHECK (WORST CASE)
 $0.6 S_a < l/h$
 $0.6 S_a = 0.6 (0.763) = 0.458$
 $l/h = 2'/10' = 0.2 < 0.458 \therefore \text{NON-COMPLIANT}$

MOUNT VERNON STATION 2

M Mackenzie
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 Architecture • Interiors • Planning • Engineering

By: SIW
 Date: 11/28/18
 Job#: 2180238.00
 Sht. _____ of _____
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Project: Mount Vernon Facility Assessment - Station 3 Location: Mount Vernon, WA
 Completed by: SIW Date: 12/14/2018

16.1.2IO IMMEDIATE OCCUPANCY BASIC CONFIGURATION CHECKLIST

Very Low Seismicity

Building System

General

- C **NC** N/A U LOAD PATH: The structure shall contain a complete, well-defined load path, including structural elements and connections, that serves to transfer the inertial forces associated with the mass of all elements of the building to the foundation. (Commentary: Sec. A.2.1.1. Tier 2: Sec. 5.4.1.1)
- C NC **N/A** U ADJACENT BUILDINGS: The clear distance between the building being evaluated and any adjacent building is greater than 4% of the height of the shorter building. This statement need not apply for the following building types: W1, W1a, and W2. (Commentary: Sec. A.2.1.2. Tier 2: Sec. 5.4.1.2)
- C** NC N/A U MEZZANINES: Interior mezzanine levels are braced independently from the main structure or are anchored to the seismic-force-resisting elements of the main structure. (Commentary: Sec. A.2.1.3. Tier 2: Sec. 5.4.1.3)

Building Configuration

- C NC **N/A** U WEAK STORY: The sum of the shear strengths of the seismic-force-resisting system in any story in each direction shall not be less than 80% of the strength in the adjacent story above. (Commentary: Sec. A.2.2.2. Tier 2: Sec. 5.4.2.1)
- C NC **N/A** U SOFT STORY: The stiffness of the seismic-force-resisting system in any story shall not be less than 70% of the seismic-force-resisting system stiffness in an adjacent story above or less than 80% of the average seismic-force-resisting system stiffness of the three stories above. (Commentary: Sec. A.2.2.3. Tier 2: Sec. 5.4.2.2)
- C **NC** N/A U VERTICAL IRREGULARITIES: All vertical elements in the seismic-force-resisting system are continuous to the foundation. (Commentary: Sec. A.2.2.4. Tier 2: Sec. 5.4.2.3)
- C NC **N/A** U GEOMETRY: There are no changes in the net horizontal dimension of the seismic-force-resisting system of more than 30% in a story relative to adjacent stories, excluding one-story penthouses and mezzanines. (Commentary: Sec. A.2.2.5. Tier 2: Sec. 5.4.2.4)
- C NC **N/A** U MASS: There is no change in effective mass more than 50% from one story to the next. Light roofs, penthouses, and mezzanines need not be considered. (Commentary: Sec. A.2.2.6. Tier 2: Sec. 5.4.2.5)
- C NC **N/A** U TORSION: The estimated distance between the story center of mass and the story center of rigidity is less than 20% of the building width in either plan dimension. (Commentary: Sec. A.2.2.7. Tier 2: Sec. 5.4.2.6)

Low Seismicity: Complete the Following Items in Addition to the Items for Very Low Seismicity.

Geologic Site Hazards

- C** NC N/A U LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could jeopardize the building's seismic performance shall not exist in the foundation soils at depths within 50 ft under the building. (Commentary: Sec. A.6.1.1. Tier 2: 5.4.3.1)
- C** NC N/A U SLOPE FAILURE: The building site is sufficiently remote from potential earthquake-induced slope failures or rockfalls to be unaffected by such failures or is capable of accommodating any predicted movements without failure. (Commentary: Sec. A.6.1.2. Tier 2: 5.4.3.1)
- C** NC N/A U SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are not anticipated. (Commentary: Sec. A.6.1.3. Tier 2: 5.4.3.1)

Moderate and High Seismicity: Complete the Following Items in Addition to the Items for Low Seismicity.

Foundation Configuration

- C **NC** N/A U OVERTURNING: The ratio of the least horizontal dimension of the seismic-force-resisting system at the foundation level to the building height (base/height) is greater than 0.6S_v. (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)
- C** NC N/A U TIES BETWEEN FOUNDATION ELEMENTS: The foundation has ties adequate to resist seismic forces where footings, piles, and piers are not restrained by beams, slabs, or soils classified as Site Class A, B, or C. (Commentary: Sec. A.6.2.2. Tier 2: Sec. 5.4.3.4)

Project: Mount Vernon Facility Assessment - Station 3 Location: Mount Vernon, WA
 Completed by: SIW Date: 12/14/2018

16.3IO IMMEDIATE OCCUPANCY STRUCTURAL CHECKLIST FOR BUILDING TYPE W2: WOOD FRAMES, COMMERCIAL AND INDUSTRIAL

Very Low Seismicity

Seismic-Force-Resisting System

- C** NC N/A U REDUNDANCY: The number of lines of shear walls in each principal direction is greater than or equal to 2. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec. 5.5.1.1)
- C **NC** N/A U SHEAR STRESS CHECK: The shear stress in the shear walls, calculated using the Quick Check procedure of Section 4.5.3.3, is less than the following values (Commentary: Sec. A.3.2.7.1. Tier 2: Sec. 5.5.3.1.1):

Structural panel sheathing	1,000 lb/ft
Diagonal sheathing	700 lb/ft
Straight sheathing	100 lb/ft
All other conditions	100 lb/ft
- C NC **N/A** U STUCCO (EXTERIOR PLASTER) SHEAR WALLS: Multi-story buildings do not rely on exterior stucco walls as the primary seismic-force-resisting system. (Commentary: Sec. A.3.2.7.2. Tier 2: Sec. 5.5.3.6.1)
- C NC **N/A** U GYPSUM WALLBOARD OR PLASTER SHEAR WALLS: Interior plaster or gypsum wallboard is not used as shear walls on buildings more than one story high with the exception of the uppermost level of a multi-story building. (Commentary: Sec. A.3.2.7.3. Tier 2: Sec. 5.5.3.6.1)
- C **NC** N/A U NARROW WOOD SHEAR WALLS: Narrow wood shear walls with an aspect ratio greater than 2-to-1 are not used to resist seismic forces. (Commentary: Sec. A.3.2.7.4. Tier 2: Sec. 5.5.3.6.1)
- C **NC** N/A U WALLS CONNECTED THROUGH FLOORS: Shear walls have an interconnection between stories to transfer overturning and shear forces through the floor. (Commentary: Sec. A.3.2.7.5. Tier 2: Sec. 5.5.3.6.2)
- C NC **N/A** U HILLSIDE SITE: For structures that are taller on at least one side by more than one-half story because of a sloping site, all shear walls on the downhill slope have an aspect ratio less than 1-to-2. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec. 5.5.3.6.3)
- C NC **N/A** U CRIPPLE WALLS: Cripple walls below first-floor-level shear walls are braced to the foundation with wood structural panels. (Commentary: Sec. A.3.2.7.7. Tier 2: Sec. 5.5.3.6.4)
- C **NC** N/A U OPENINGS: Walls with openings greater than 80% of the length are braced with wood structural panel shear walls with aspect ratios of not more than 1.5-to-1 or are supported by adjacent construction through positive ties capable of transferring the seismic forces. (Commentary: Sec. A.3.2.7.8. Tier 2: Sec. 5.5.3.6.5)
- C **NC** N/A U HOLD-DOWN ANCHORS: All shear walls have hold-down anchors, constructed per acceptable construction practices, attached to the end studs. (Commentary: Sec. A.3.2.7.9. Tier 2: Sec. 5.5.3.6.6)

Connections

- C** NC N/A U WOOD POSTS: There is a positive connection of wood posts to the foundation. (Commentary: Sec. A.5.3.3. Tier 2: Sec. 5.7.3.3)
- C** NC N/A U WOOD SILLS: All wood sills are bolted to the foundation. (Commentary: Sec. A.5.3.4. Tier 2: Sec. 5.7.3.3)
- C** NC N/A U GIRDER/COLUMN CONNECTION: There is a positive connection using plates, connection hardware, or straps between the girder and the column support. (Commentary: Sec. A.5.4.1. Tier 2: Sec. 5.7.4.1)

Foundation System

- C NC **N/A** U DEEP FOUNDATIONS: Piles and piers are capable of transferring the lateral forces between the structure and the soil. (Commentary: Sec. A.6.2.3.)
- C** NC N/A U SLOPING SITES: The difference in foundation embedment depth from one side of the building to another shall not exceed one story high. (Commentary: Sec. A.6.2.4)

Low, Moderate, and High Seismicity: Complete the Following Items in Addition to the Items for Very Low Seismicity.

Seismic-Force-Resisting System

C **NC** N/A U **NARROW WOOD SHEAR WALLS:** Narrow wood shear walls with an aspect ratio greater than 1.5-to-1 are not used to resist seismic forces. (Commentary: Sec. A.3.2.7.4. Tier 2: Sec. 5.5.3.6.1)

Diaphragms

C **NC** N/A U **DIAPHRAGM CONTINUITY:** The diaphragms are not composed of split-level floors and do not have expansion joints. (Commentary: Sec. A.4.1.1. Tier 2: Sec. 5.6.1.1)

C **NC** N/A U **ROOF CHORD CONTINUITY:** All chord elements are continuous, regardless of changes in roof elevation. (Commentary: Sec. A.4.1.3. Tier 2: Sec. 5.6.1.1)

C **NC** N/A U **PLAN IRREGULARITIES:** There is tensile capacity to develop the strength of the diaphragm at reentrant corners or other locations of plan irregularities. (Commentary: Sec. A.4.1.7. Tier 2: Sec. 5.6.1.4)

C NC **N/A** U **DIAPHRAGM REINFORCEMENT AT OPENINGS:** There is reinforcing around all diaphragm openings larger than 50% of the building width in either major plan dimension. (Commentary: Sec. A.4.1.8. Tier 2: Sec. 5.6.1.5)

C NC **N/A** U **STRAIGHT SHEATHING:** All straight sheathed diaphragms have aspect ratios less than 1-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)

C **NC** N/A U **SPANS:** All wood diaphragms with spans greater than 12 ft consist of wood structural panels or diagonal sheathing. Wood commercial and industrial buildings may have rod-braced systems. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)

C NC **N/A** U **DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS:** All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 30 ft and aspect ratios less than or equal to 3-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)

C **NC** N/A U **OTHER DIAPHRAGMS:** The diaphragm does not consist of a system other than wood, metal deck, concrete, or horizontal bracing. (Commentary: Sec. A.4.7.1. Tier 2: Sec. 5.6.5)

Connections

C **NC** N/A U **WOOD SILL BOLTS:** Sill bolts are spaced at 4 ft or less, with proper edge and end distance provided for wood and concrete. (Commentary: Sec. A.5.3.7. Tier 2: Sec. 5.7.3.3)

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USGS Design Maps Summary Report

User-Specified Input

Report Title Mount Vernon Station 3

Fri November 30, 2018 01:00:08 UTC

Building Code Reference Document ASCE 41-13 Retrofit Standard, BSE-1N
(which utilizes USGS hazard data available in 2008)

Site Coordinates 48.42092°N, 122.28029°W

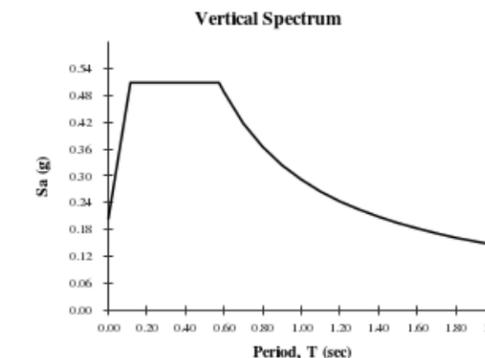
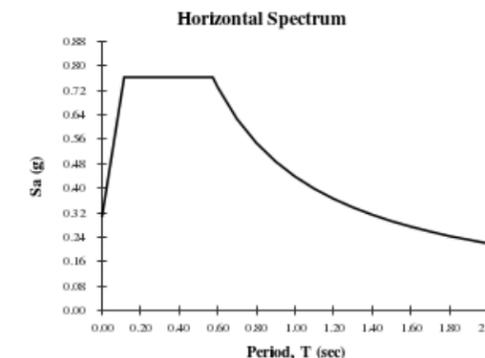
Site Soil Classification Site Class D – "Stiff Soil"



USGS-Provided Output

$S_{XS,BSE-1N}$ 0.763 g

$S_{X1,BSE-1N}$ 0.438 g



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$$DL_{\text{ROOF}} = 20 \text{ PSF} \rightarrow DL_{\text{SEU}} \approx 18 \text{ PSF}$$

$$DL_{\text{WALL}} = 12 \text{ PSF}$$

$$V = CS_a W \Rightarrow C = 1.3$$

$$T = 0.02(20')^{0.75} = 0.19$$

$$S_a = S_{xi}/T = 0.438/0.19 = 2.3 > S_{xs} = 0.763$$

$$V = 1.3(0.763)W = 0.992W$$

WORST CASE SHEAR WALL (E-W)

$$V_j = 0.992 \left[\frac{(70')(37')}{2} (18 \text{ PSF}) + \frac{(17.25')(37')}{2} (12 \text{ PSF}) \right] = 26.9 \text{ k}$$

$$l_w = 7'$$

$$M_s = 2.0$$

$$v_{\text{avg}} = \frac{1}{2.0} \left(\frac{26.9 \text{ k}}{7'} \right) = 1.923 \text{ PLF} > 1.000 \text{ PLF} \therefore \text{NON-COMPLIANT}$$

WORST CASE SHEAR WALL (N-S)

$$V_j = 0.992 \left[\frac{(70')(37')}{2} + \frac{(62.33')(16.5')}{2} \right] (18 \text{ PSF}) + 0.992 \left[\frac{(37')(17.25')}{2} + \frac{(16.5')(17.75')}{2} \right] (12 \text{ PSF})$$

$$= 30.83 \text{ k} + 5.54 \text{ k} = 36.37 \text{ k}$$

$$l_w = 16.83'$$

$$M_s = 2.0$$

$$v_{\text{avg}} = (36.37 \text{ k} / 16.83') (1/2.0) = 1.061 \text{ PLF} > 1.000 \text{ PLF} \therefore \text{NON-COMPLIANT}$$

OVERTURNING CHECK (WORST CASE)

$$0.6 \leq l/h$$

$$0.6 \leq (0.6)(0.763) = 0.458$$

$$l/h = 3.5' / 17.25' = 0.2 < 0.458 \therefore \text{NON-COMPLIANT}$$

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MOUNT VERNON STATION 3



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