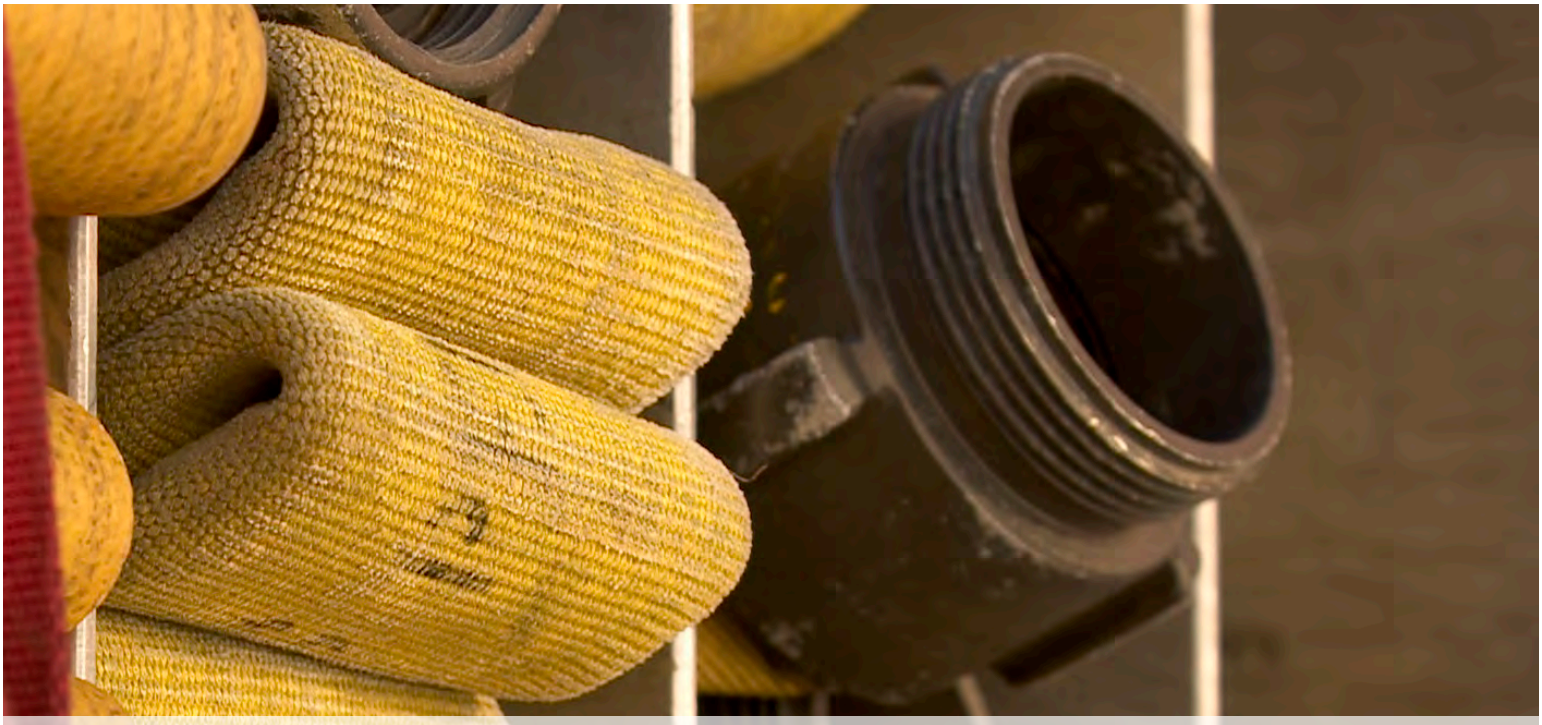


EAST PIERCE FIRE & RESCUE

CAPITAL FACILITIES PLAN

BONNEY LAKE, WASHINGTON

Revised: July 17, 2018

RICEfergusMILLER

July 17, 2018

Board of Fire Commissioners
East Pierce Fire and Rescue
18421 Old Buckley Highway, Suite F
Bonney Lake, WA 98391

Re: EPF&R Capital Facilities Plan Update

Dear Board members,

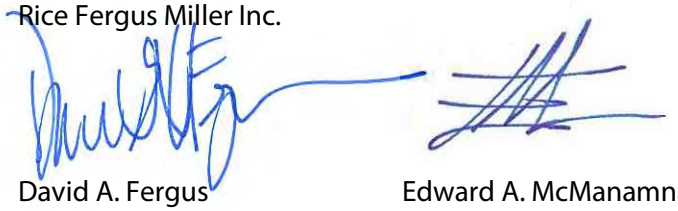
It is with great pleasure that we present this report to you as the elected representatives of the citizens of East Pierce Fire and Rescue.

These report documents have been revised and updated to reflect the changing conditions and needs of your district since the completion of the original Capital Facilities Plan in 2012.

Included in this report are the assessment of existing stations, programmatic requirements for new and remodeled facilities, conceptual drawings, and a comprehensive cost projection for all of the contemplated building elements.

Please feel free to give us a call if you have any questions about the information or recommendations that we've included. We have enjoyed working with you, your staff, and your committees and look forward with enthusiasm to the next step.

Sincerely,
Rice Fergus Miller Inc.



David A. Fergus
Principal

Edward A. McManamna
Principal

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Executive Summary

Introduction and Project Description

This capital facilities planning step has included an in-depth, district-wide, examination of the needs associated with East Pierce Fire & Rescue's capital facilities. It has included evaluating all major stations, assessing which stations should be renovated, and which should be replaced. It has examined East Pierce's supporting services (i.e., training, administrative services, vehicle maintenance and repairs, and logistics). In the case of new and remodeled structures, diagrammatic floor plans have been prepared for what these facilities might look like. And, for all the improvement projects, detailed cost estimates have been prepared for how much they would likely cost to undertake.

The planning process incorporated input from a diverse cross section of EPF&R personnel. While not easy to predict what the future may hold, the district's planning decisions were based on a 20-year perspective. To that end, the conclusions reached in this report are expected to serve the needs of the district and its citizens well into the future.

While this capital facilities process was underway, a parallel effort led by Emergency Services Consulting International (ESCI) was undertaken to determine optimal station locations, resource deployment, call types and response times, and projected population growth for the areas served by EPF&R. ESCI's work served as the basis for many of the assumptions made in terms of where stations should be located for optimal response and projected service growth over the next 20 years. A complete copy of the ESCI report is included in this Capital Facilities Plan.

Program Summary

EPFR's capital projects have been prioritized and calls and summarized as follows:

Phase 1:

- Constructing a new headquarters Fire Station 111 in Bonney Lake to replace the existing leased facility shared with the Bonney Lake Police Department.
- Replacing Fire Station 112 in Prairie Ridge onto a larger parcel of land that is better located for its response area.
- Replacing Fire Station 114 on the west side of Lake Tapps onto a larger parcel of land that can support the operational needs in this response area.
- Replacing Fire Station 118 in Edgewood on the station's current property.

- Constructing a new fire station in Tehaleh where the operational needs and response demands which are forecast to continue to grow dramatically over the next 10 years. This new station will be identified as Fire Station 117.

- Acquisition of new properties for replacements of Fire Stations 112 and 114.

Phase 2:

- Renovating and upgrading Fire Station 113 in Sumner

- Renovating and upgrading Fire Station 115 on the east side of Lake Tapps.

- Renovating and upgrading Fire Station 116 in the Foothills.

- Constructing a new Fire Station 124 in Milton in replacement of the leased facilities from the City of Milton.

Additional Priorities:

- Continued consideration for additional space and/or improvements for the district's Logistics Division, which is currently operating out of former Fire Station 121.

- Improvements and/or replacement of Fire Station 119, which the district does not own.

- Continued pursuit of training opportunities, including the possibility of constructing a training campus. Such as facility could include classrooms and administrative support, live fire and tactical training towers, and hands-on training props.

- Improvements to the district's facility and vehicle maintenance facilities, and the district's long-term storage needs.

Program Description

The average age of the existing career-staffed fire stations that are owned by EPF&R is more than 40 years. Fire Station 113 is the newest, at 20 years old, and Fire Station 118 is the oldest, originally built in 1948. All have fallen behind in relation to today's equipment and operational practices. In addition, building codes and standards have become more stringent since these stations were first constructed. Despite having had some level of remodeling and upgrading over the years, none of these stations would comply with today's building codes and standards for new construction. Attempting to meet these standards would be difficult at best and proved cost prohibitive in some cases. The recommendations included in this report balance operational and safety improvements with the costs necessary to accomplish them.

Our recommendations include the construction of several new stations. Factors leading to these conclusions included the station's response location, age and remaining useful life, and the practical ability to increase the station's capacity. The stations vulnerable to damage as the result of a significant earthquake was also given considerable consideration.

Property Needs

Property acquisition in Phase 1 has been identified for Fire Stations 112 and 114.

Fire Station 112 will be relocated southwest of the current station on a larger parcel, yet to be identified. Fire Station 114 will similarly be related to a larger parcel.

Property criteria will include topography that is relatively flat, of a size that supports the identified operational needs, has favorable zoning and land-use designations, and has minimal environmental concerns (wetlands, steep slopes, streams, flood zones, etc.).

Conceptual Design

Detailed in this report are the room-by-room requirements for all the proposed projects, preliminary plans for how these structures could be laid out, and conceptual site plans. The purpose of these preliminary plans was two-fold. First, these plans have confirmed that the identified programmatic needs can be accommodated on the subject properties (or not), or within the existing stations in the case of remodeling. The second purpose was to ensure that the professional cost estimates that were being prepared would be based on tangible and measurable information. This ensures a higher level of confidence that the projects as depicted can be accomplished within the cost estimates presented.

Architectural and Engineering Narratives

Materials, Finishes, Equipment, and Systems: Included in this Capital Facilities Plan is a preliminary selection of materials and finishes, identification of equipment needs, and confirmation of performance expectations for the fire station projects. This task was done to ensure that the construction cost estimate matched the level of quality expectations of the district. This also established a benchmark in quality that can be later adjusted, if necessary, to match the available funding or other financial limitations established by the district.

Anticipated Costs and Project Timeline:

Anticipated costs for each project are noted below. Project timelines and schedules were considered so that appropriate construction inflation could be considered.

Each project is estimated in today's dollars for labor and materials with a base year of 2018. Escalation is currently anticipated at 4.5% per year. It is recommended that, should this capital facilities plan be delayed for more than a year, that the estimates be further updated for material and labor cost escalation.

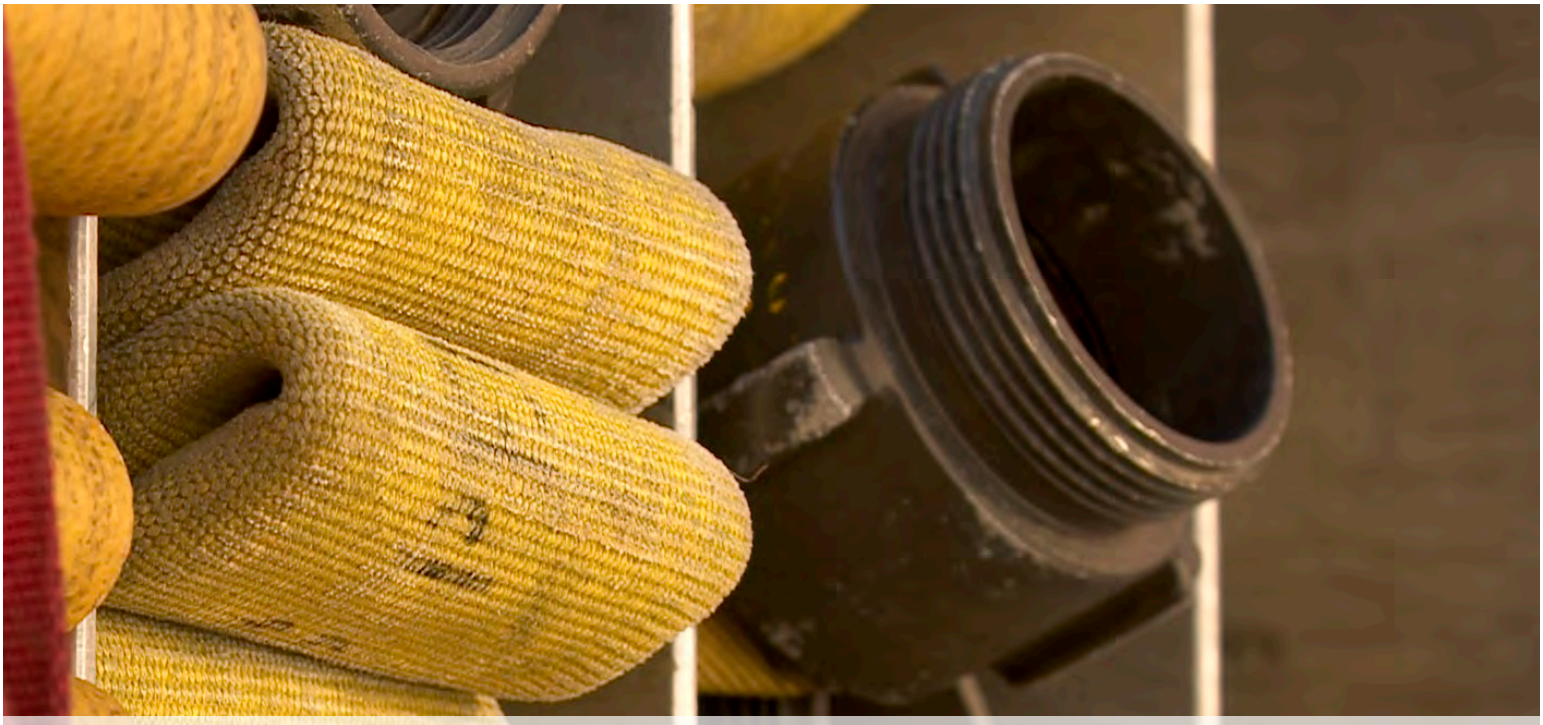
No escalation was provided for the Phase 2 projects as it is intended that those projects will be revisited and updated when their schedules are more definitive.

Phase 1 Projects

Fire Station 111 Bonney Lake	$12.3 million
Fire Station 118 Edgewood	$9.8 million
Fire Station 112 Prairie Ridge	$7.7 million
Fire Station 114 Lake Tapps West	$5.8 million
Fire Station 117 Tehaleh	$5.9 million
Total Construction:	**$41.6 million**
Project Expenses	$17.4 million
Property Acquisition	$5.5 million
Escalation	$7.0 million
Total Phase 1 Budget:	**$71.5 million**

Phase 2 Projects

Fire Station 113 Sumner	$4.6 million
Fire Station 115 Lake Tapps East	$4.2 million
Fire Station 116 Foothills	$6.0 million
Fire Station 124 Milton	$5.8 million
Total Construction:	**$20.6 million**
Project Expenses	$9.0 million
Property Acquisition	$1.5 million
Total Phase 2 Budget:	**$31.1 million**



EAST PIERCE FIRE & RESCUE

CAPITAL FACILITIES PLAN

DEPARTMENT HISTORY AND OVERVIEW

RICEfergusMILLER

Department History and Overview

Department History

East Pierce Fire & Rescue (Pierce County Fire Protection District No. 22) was created when the city of Bonney Lake Fire Department, Lake Tapps Fire District No. 22, and Pierce County Fire District No. 24 merged in 2000.

The merger provided a seamless response to emergency calls in the Bonney Lake, Lake Tapps and Prairie Ridge areas. It also resulted in enhanced services including advanced life support (paramedic services) and medical transport services for residents of the fire district. At that time, the combined district covered nearly 49 square miles and protected a population of approximately 43,000 residents from six stations.

In 2006, voters in Pierce County Fire District No. 12 and South Prairie Fire District No. 20 overwhelmingly passed a special election to formally merge those two districts with East Pierce after a three-year trial period. With the addition of these two predominantly rural, volunteer-staffed districts, East Pierce Fire & Rescue increased to 128 square miles and served a population of approximately 62,000 residents.

2008, the City of Sumner and Pierce County Fire District No. 1 also decided to merge with East Pierce. In the following year, officials from Pierce County Fire District No. 8 in Edgewood and the Milton Fire Department entered into an Administrative Services Agreement as the first step towards merging with East Pierce Fire & Rescue.

In 2010 Pierce County Fire District No. 8 in Edgewood formally merged their district with East Pierce. The result is a combined district covering approximately 152 square miles with a population of over 80,000.

In 2012 the City of Milton also merged into East Pierce Fire and Rescue.
Today, East Pierce serves a population over 90,000 citizens living in an area of approximately 153 square miles in and around Bonney Lake, Sumner, Edgewood, Milton, Lake Tapps, the Ridge Communities, Tehaleh, and the Town of South Prairie and surrounding area down to Mount Rainier National Park.

Department Description

East Pierce Fire & Rescue is a special-purpose District formed to provide fire and emergency medical services. It is governed by an independently elected board of citizens who form the Fire Commission and establish policy and represents the citizens of the fire district. These fire commissioners meet once a month to approve budgets, provide administrative oversight and authorize levy requests.

East Pierce fire commissioners serve staggered six-year terms of office. Any resident, 18 years or older, who lives within the East Pierce service area is eligible to apply for an open position on the board. All regular meetings of the East Pierce Fire & Rescue Board of Fire Commissioners are held on the third Tuesday of every month. Meetings are open to the public and offer residents an opportunity for citizen input.

East Pierce Fire & Rescue was founded on a strong commitment to customer service. The department's Mission, Vision and Values (see attached) guide the actions of the department and its employees. Exceptional customer service and a concern for the citizens, the employees and their families have become hallmarks of the culture of East Pierce Fire & Rescue.

A combination force of approximately 135 career and volunteer firefighters, provide a full range of emergency services including fire, medical and rescue response as well as special operation disciplines such as technical rescue, water rescue, wildland firefighting and hazardous materials response.

In addition, fire district personnel provide extensive non-emergency services such as fire prevention, public education and emergency management. All firefighting personnel are cross-trained as either emergency medical technicians (EMTs) or paramedics to respond to medical emergencies and fires.

In 2017, East Pierce personnel responded to 11,039 calls for service from ten (10) fire stations strategically located through the fire district – six (6) staffed, three (3) volunteer and one (1) water rescue facility. The rapid growth in the EPFR service area has resulted in a 32% increase in call volume since 2012.

East Pierce Fire & Rescue was created through many mergers and/or annexations involving four (4) cities (Bonney Lake, Sumner, Edgewood and Milton) and six (6) fire protection districts (Pierce County Fire District Nos. 1, 8, 12, 20, 22 and 24). Through these numerous mergers and/or annexations, East Pierce has acquired facilities which are old and outdated and have fallen behind departmental needs in relation to today's equipment and operational practice.

East Pierce Fire & Rescue contains seven (7) major divisions within its organizational structure (see attached organizational chart). Each of the divisions is managed by an Assistant Chief or Division Manager.

Operations Division:
The primary function of the Operations Division is to respond to emergency and non-emergency calls. East Pierce Fire & Rescue is a combination department utilizing 108 career and 12 volunteer firefighters, EMTs and paramedics. In addition to responding to the fire, emergency medical and rescue incidents, the Operations Division maintains teams of personnel with specialized training in four special operations disciplines consisting of the Wildland Team, the Water Rescue Team, the Hazardous Materials Team and the Technical Rescue Team.

Emergency Medical Services Division:
The Emergency Medical Services Division provides clinical oversight and analyzes department performance on medical aid calls. The EMS Division staff works with the Operations Division on issues related to the deployment and performance of the fire district's firefighter/EMT's and paramedics. The EMS staff also works with the Training Division to conduct training and education programs for department staff and citizens. The EMS Division is responsible for managing ambulance transport billing for the fire district.

Working to meet the needs of our diverse community, the EMS Division recently added Community Paramedicine program. This program will work with those customers that have shown a history of heavy reliance on emergency services and place them in contact with the proper social services system to get them the help they need, while reducing their reliance on emergency services.

Training Division:
Training and education is essential to maintaining critical firefighting and medical skills. In addition to the more commonly used skills, firefighters must continually update and practice special skills, such as extrication maneuvers, rope rescue, wildland firefighting, trench rescue and surface and underwater rescue.
The Training Division is responsible for assessing training needs, developing a training calendar and curriculum, providing instruction and record keeping. It also conducts evaluations of probationary personnel, crew-based training drills and assists in all testing for new employees and promotional processes.

Fire Prevention Division:
The Prevention Division provides plan review, code enforcement, juvenile fire setter intervention, and fire investigation within the cities of Bonney Lake, Sumner, Edgewood and Milton. The division also includes personnel who are responsible for providing public information and educational services in the areas of fire and personal safety to children and adults. The purpose of this division is to limit property damage and reduce deaths from fires, accidents, illnesses, drowning and other preventable causes.

Emergency Management Division:
Emergency Management involves preparing for a disaster before it occurs. The Emergency Management Division works closely with trained personnel from local police and sheriff's agencies and various city, state and federal departments to prepare for and manage large-scale emergencies. While each city is responsible for providing Emergency Management, EPFR works closely with each city to maintain a strong working relationship in preparedness and response.

Logistics Division:
The Logistics Division is responsible for the purchase, repair and maintenance of the fire district's stations, vehicles and equipment. The Logistics staff works closely with personnel from the other divisions to ensure that they have the resources necessary to perform their jobs. The division is also responsible for managing vendor contracts as well as the warehousing and distribution of supplies.

Finance Division:
The Budget and Finance Division continually reviews and analyzes finances and budget performance to ensure that district residents receive maximum value and service from their fire service. EPFR is

audited annually by the Washington State Auditor's Office, and has several years without any findings due to strict financial controls and policies.

Mission Statement

Exceptional people providing compassionate service and rapid response to our community's diverse needs.

Vision Statement

EPF&R is a regional leader providing the highest level of fire, rescue, emergency medical and prevention services to a diverse and growing community with:

- Mission-essential staffing and training.
- State-of-the-art facilities, equipment and technology
- A strong, diverse, and sustainable funding base, while maintaining stewardship of taxpayer resources.
- A safe environment for our citizens through effective and comprehensive prevention and public education programs.
- A safe and healthy workforce.

Core Values & Guiding Principles
Our community and our employees are our most important resource.

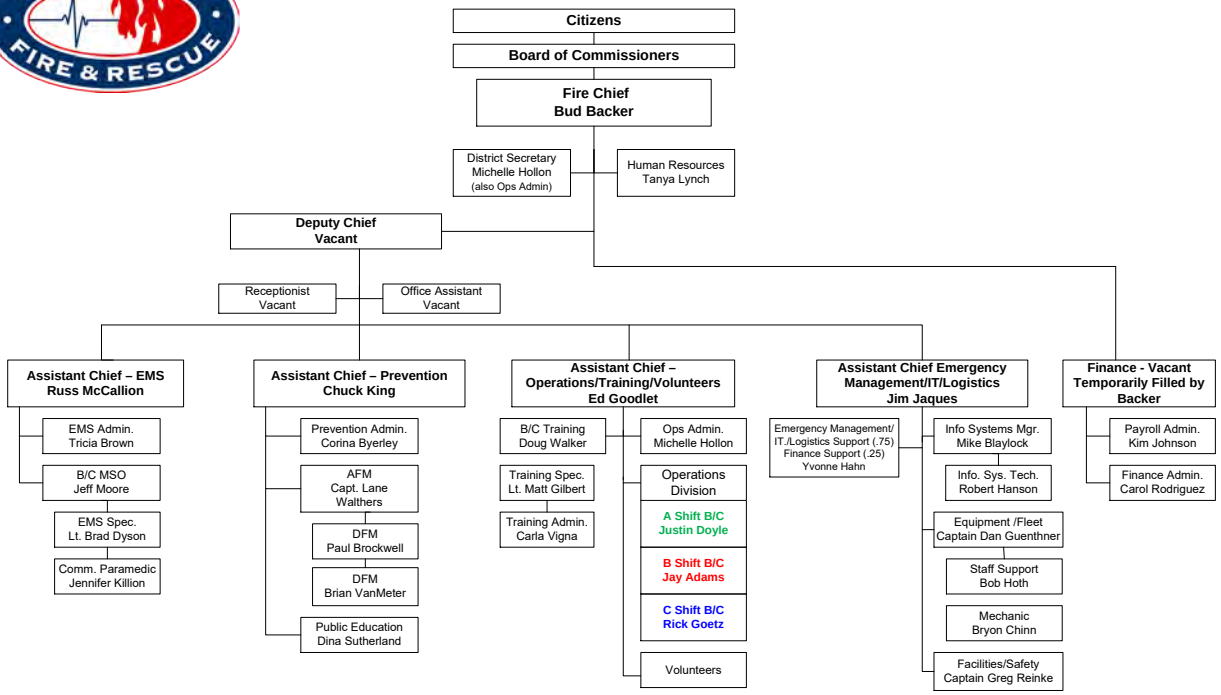
We are committed to:

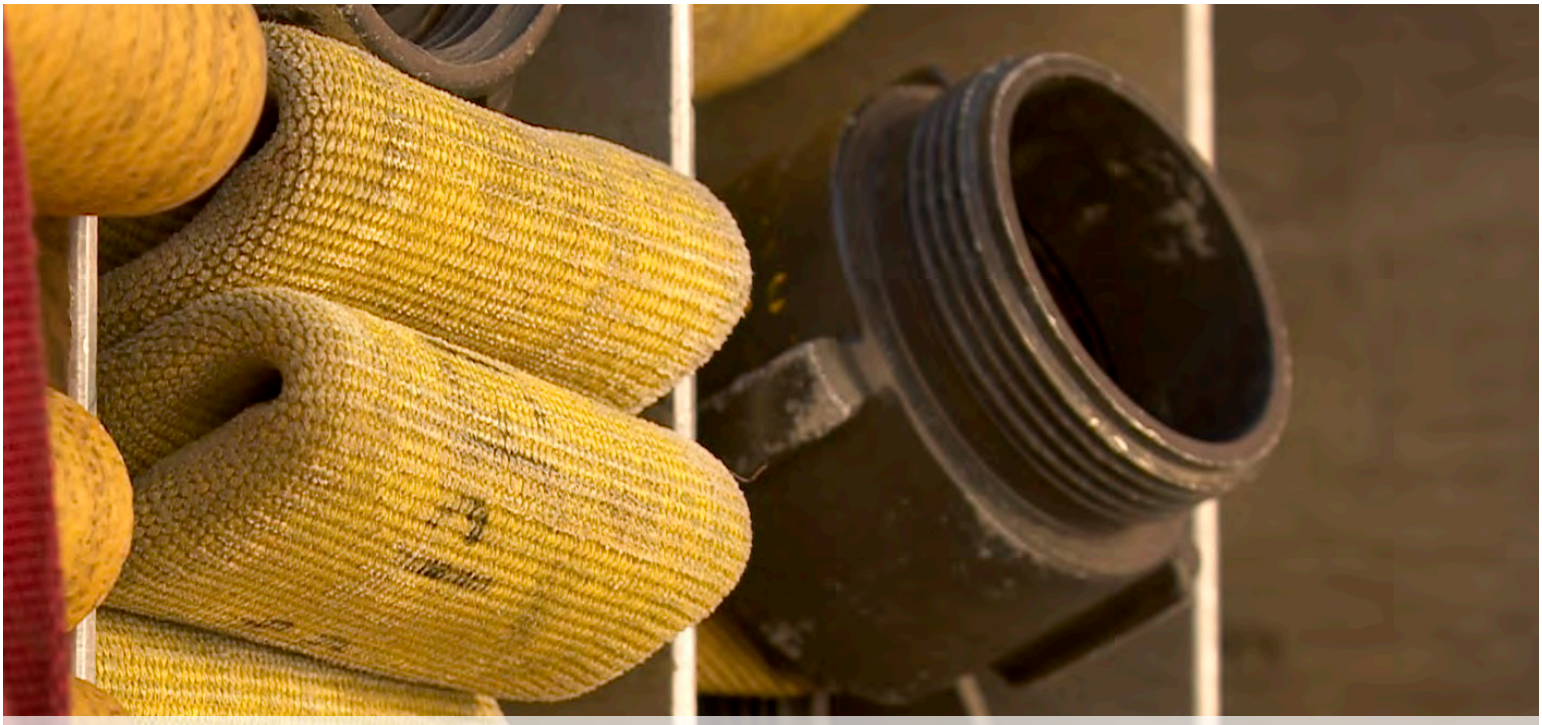
- **Doing the Right Thing**: Integrity, Trust, Respect and Commitment.

- **Everyone Must Make a Difference**: Individual and Organizational Responsibility, Accountability, Teamwork, and Collaboration.

- **Anticipating and Meeting Our Community's Needs**: Proactive Planning, Innovation, Creativity, Responsiveness, and Excellent Customer Service.

East Pierce Organizational Chart – 2018





EAST PIERCE FIRE & RESCUE

CAPITAL FACILITIES PLAN

SERVICE DEMAND AND RESPONSE ANALYSIS

RICE fergus MILLER

East Pierce Fire & Rescue

Washington

CAPITAL FACILITIES UPDATE

June 2018

Emergency Services Consulting International

Providing Expertise and Guidance that Enhances Community Safety

25030 SW Parkway Avenue, Suite 330
Wilsonville, OR 97070

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Introduction

This report updates the 2011 Capital Facilities Plan for East Pierce Fire & Rescue (EPF&R). It takes into account the changes to the growth management plans for each of the incorporated cities and the portion of unincorporated Pierce County that lies within its boundaries. The purpose of the plan is simply to ensure that fire facilities remain strategically positioned to provide timely response to emergencies at present and into the future. In addition to identifying the optimum locations for these stations, the study also projects the most effective deployment of personnel and equipment from these stations, while maintaining a level of efficient flexibility to adapt to temporal variations.

The following figure lists the inventory of facilities currently operated by East Pierce Fire & Rescue.

Figure 1: EPF&R Facilities

Existing Inventory of Facilities at East Pierce Fire & Rescue	
Station 111 | Headquarters | Bonney Lake (Staffed) 18421 Veterans Memorial Dr. E. Bonney Lake, WA 98391	Station 115 | Lake Tapps (Volunteer) 1605 210 Ave. E. Lake Tapps, WA
Station 112 | Prairie Ridge (Staffed) 12006 214th Ave. E. Bonney Lake, WA 98391	Station 119 | South Prairie (Volunteer) 350 SR 162 South Prairie, WA
Station 113 | Sumner (Staffed) 800 Harrison St. Sumner, WA 98390	Station 121 | Logistics Station | Buckley 27723 Sumner-Buckley Hwy. Buckley, WA (not assessed; not a response station)
Station 114 | Lake Tapps (Staffed) 3206 W. Tapps Dr. E. Lake Tapps, WA 98391	Station 122 | Lake Tapps – Water Rescue Facility 2905 Sumner-Tapps Hwy. E. Lake Tapps, WA 98391 (not assessed; boat storage)
Station 116 | Foothills (Staffed) 10515 234th Ave. E. Buckley, WA 98321	Station 124 | Milton (Volunteer) 1000 Laurel Street Milton, WA 98354
Station 118 | Edgewood (Staffed) 10105 24th St E Edgewood, WA 98371	

Service Delivery & Performance

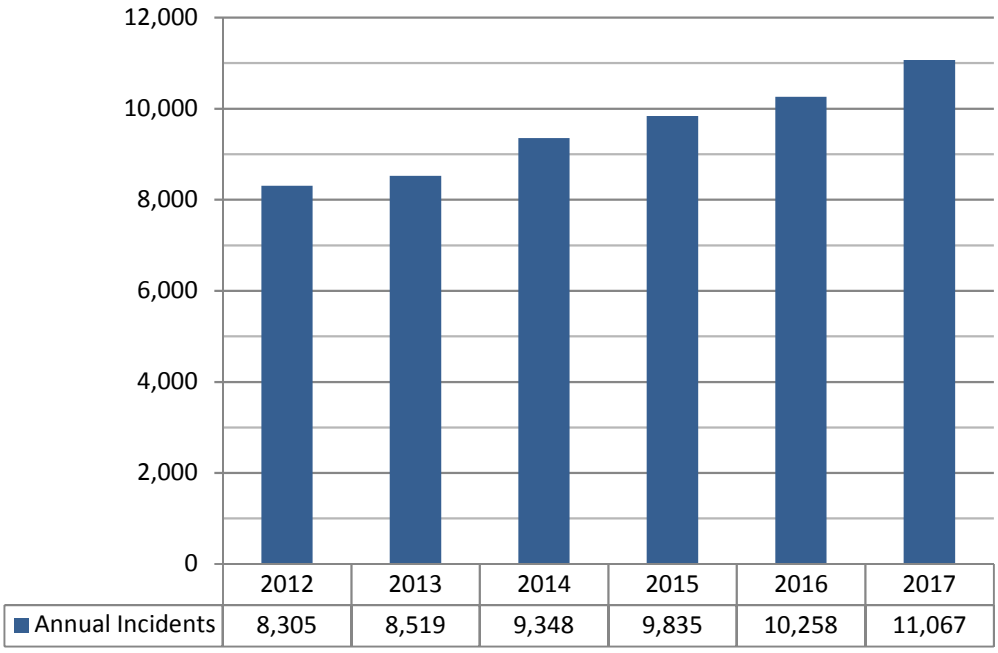
The most important aspect of any emergency services agency is its ability to deliver services when requested. This section of the report evaluates the current service delivery elements of:

- Service Demand
- Resource Distribution
- Resource Concentration
- Response Reliability
- Response Performance

SERVICE DEMAND

In the service demand study, ESCI reviews current and historical service demand by incident type and temporal variation in the EPF&R study area. GIS software is used to provide a geographic display of demand within the study area. The data is derived from incident data recorded in the EPF&R records management software and data submitted to the National Fire Incident Records System (NFIRS). The following figure displays historical service demand from 2012 through 2017.

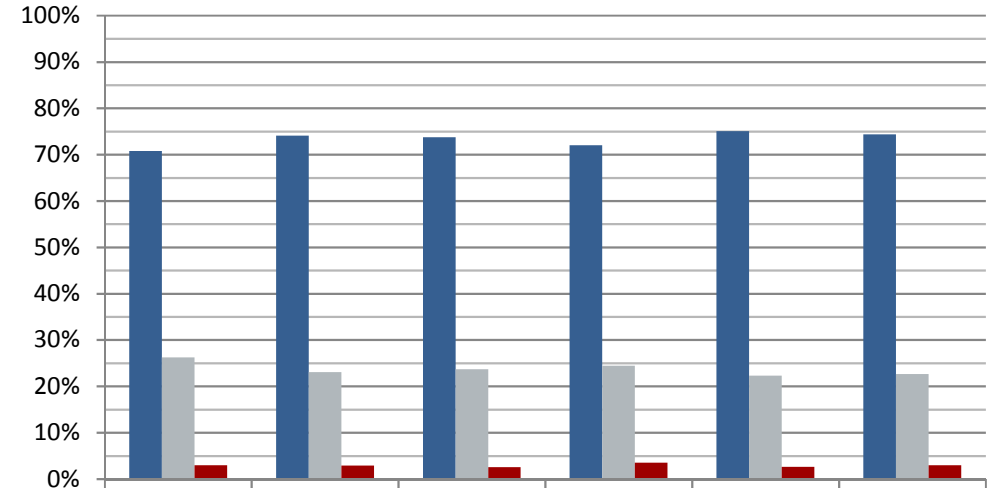
Figure 2: EPF&R Service Demand, 2012–2017



	2012	2013	2014	2015	2016	2017
Annual Incidents	8,305	8,519	9,348	9,835	10,258	11,067

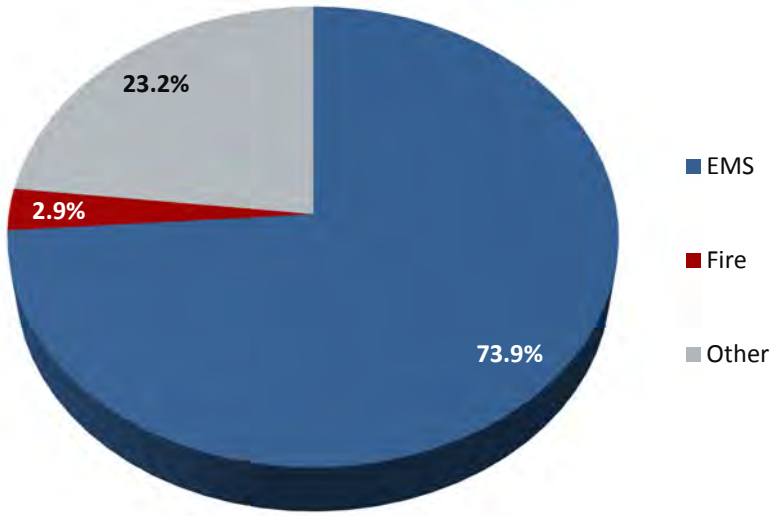
EPF&R service demand increased by over 33 percent (33.3 percent) during the time period displayed in this figure. The following figure uses National Fire Incident Records System (NFIRS) incident type definitions to categorize incidents as “Fires” (structures, vehicle, brush, any responses categorized as a 100 series incident in NFIRS), “EMS” (all calls for medical service including motor vehicle accidents [MVAs] and rescues, any responses categorized as a 300 series incident in NFIRS), and “Other” (false alarms, hazmat incidents, service calls, all other NFIRS incident series).

Figure 3: EPFR Annual Service Demand by Incident Category, 2012–2017



	2012	2013	2014	2015	2016	2017
EMS	70.8%	74.1%	73.7%	72.0%	75.1%	74.4%
Other	26.3%	23.0%	23.7%	24.4%	22.3%	22.6%
Fire	3.0%	2.9%	2.6%	3.5%	2.6%	3.0%

Figure 4: EPF&R Overall Service Demand by Incident Category, 2012–2017



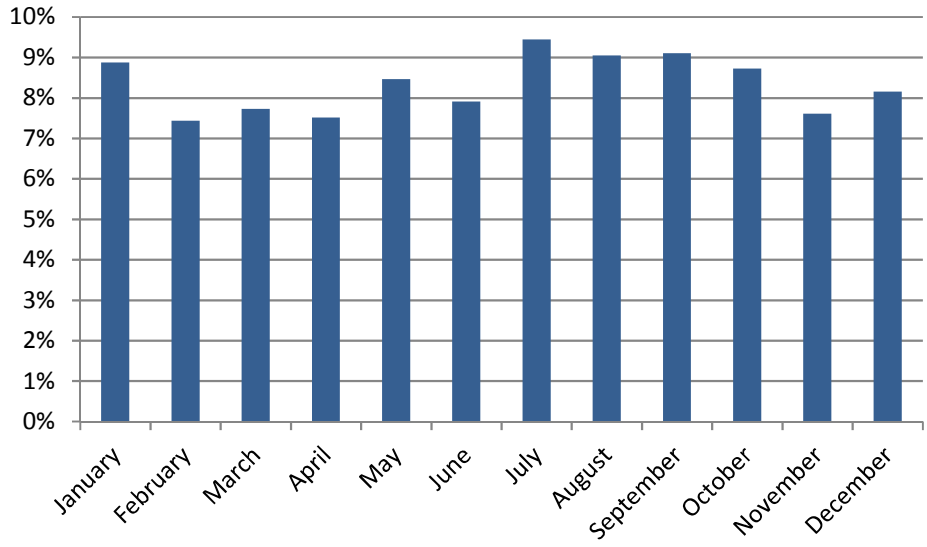
The preceding two figures demonstrate the EMS incidents represent the majority of service demand in the EPF&R service area. This is not surprising since EPF&R is the primary EMS first responder and EMS transport provider in the study area. Figure 3 demonstrates that the percentage of EMS incidents increased by nearly four percent between 2012 and 2017. Examination of the EPF&R data shows that EMS incidents increased from 5,877 incidents in 2012, to 8,231 incidents in 2017. The percentage of Fire incidents remained steady at approximately three percent, increasing from 248 fires in 2012, to 330 incidents in 2017.

Figure 4 displays that overall, EMS incidents represent approximately 74 percent (73.9%) of service demand, Fire incidents compose approximately three percent (2.9%) of incidents, and over 23 percent (23.2%) of incidents are categorized as Other. The percentages displayed are similar to comparable jurisdictions, both nationally and regionally, especially jurisdictions such as EPF&R that provide ALS and BLS transport service.

Temporal Variation

Service demand is not static, and workload varies by temporal variation. The following figures illustrate how service demand varied by month, day of week, and hour of day during 2017, to identify any periods of time that may pose different risks and hazards.

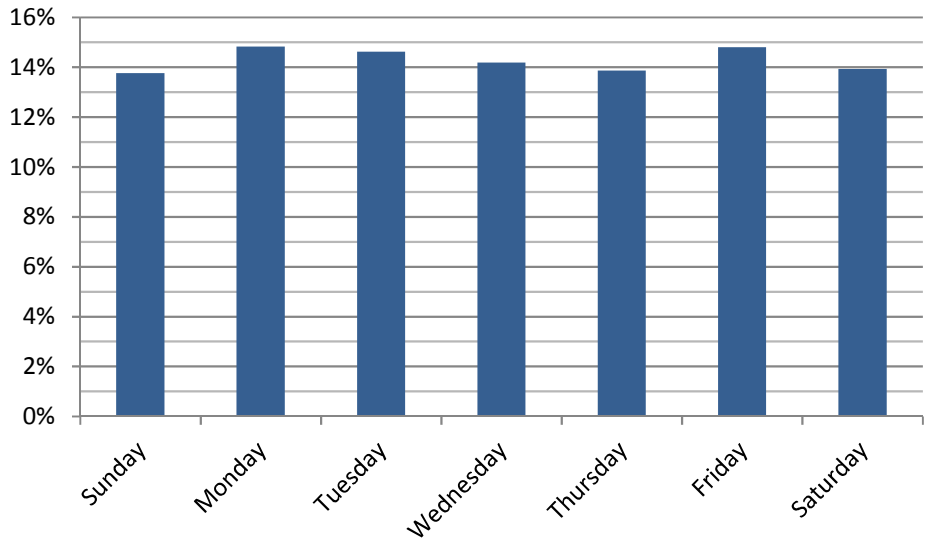
Figure 5: EPF&R Service Demand by Month, 2017



Monthly service demand varies in the EPF&R service area within a range of approximately two percent throughout the year. February, April, and November demonstrate the lowest service demand. While July, August, and September display the highest service demand.

The next figure examines service demand by day of the week.

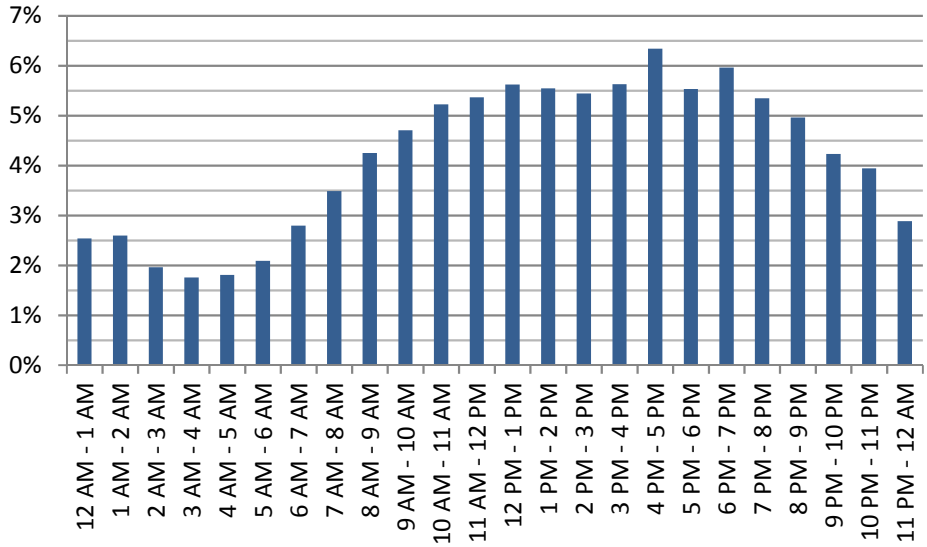
Figure 6: EPF&R Service Demand by Day of the Week, 2017



Within a range of approximately one percent, Sundays and Thursdays display the lowest service demand. Mondays and Fridays demonstrate the highest percentage of service demand by day of the week.

The final temporal analysis examines service demand by hour of the day.

Figure 7: EPF&R Service Demand by Hour of the Day

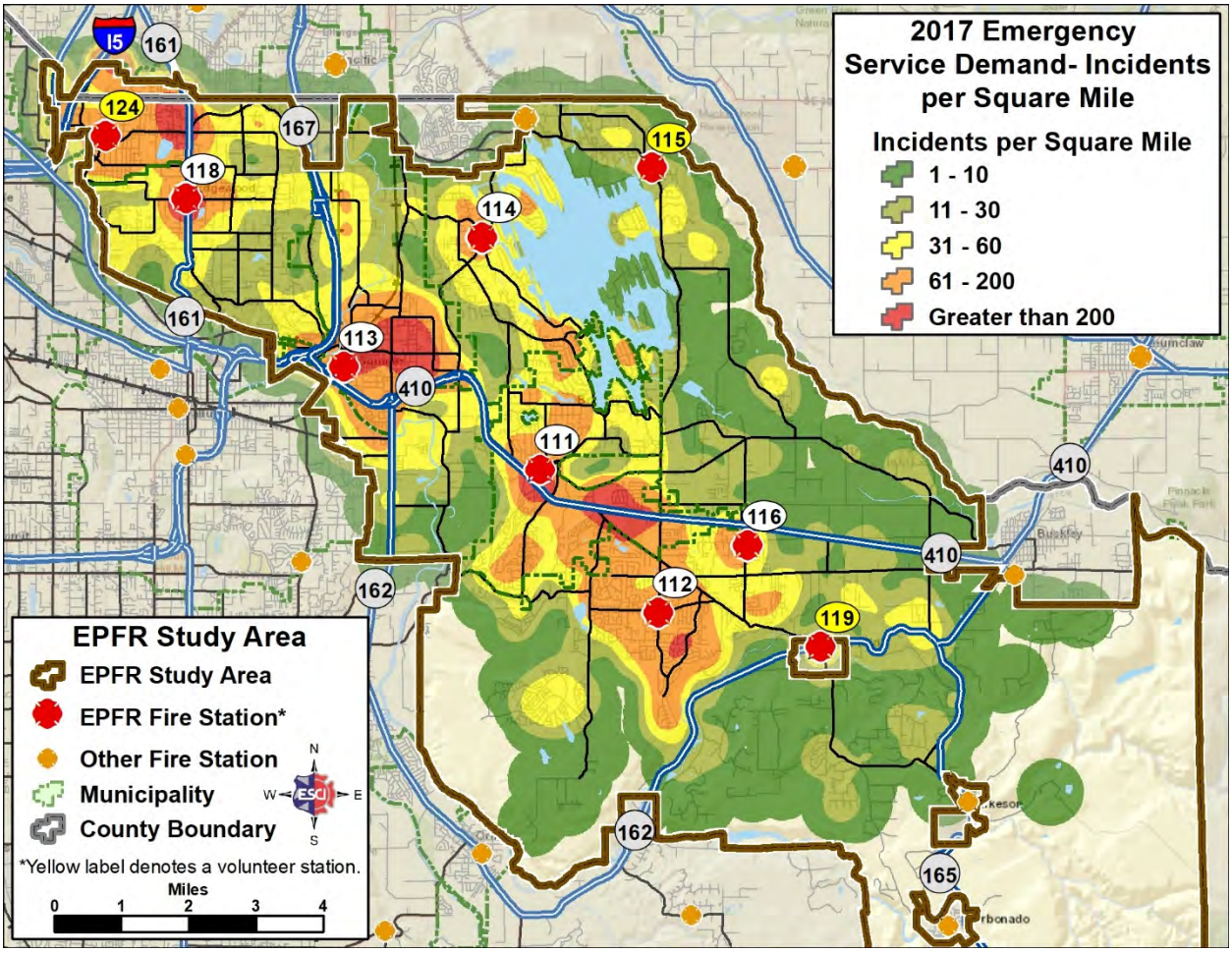


EPF&R service demand correlates with the activity of people, with workload increasing during daytime hours and decreasing during nighttime hours as shown in this figure. Incident activity is at its highest between 12 PM and 7 PM. Nearly 66 percent (65.7%) of calls for service occurred between 9 AM and 9 PM. This provides an opportunity for EPF&R to anticipate increased workload and improve response performance by deploying additional apparatus during periods of peak activity.

Geographic Service Demand

In addition to the temporal analysis of service demand, it is important to examine the geographic distribution of service demand. Using emergency incident location data provided by EPF&R, ESCI plots incident locations and calculates the mathematical density of 2017 emergency service demand in the EPF&R service area.

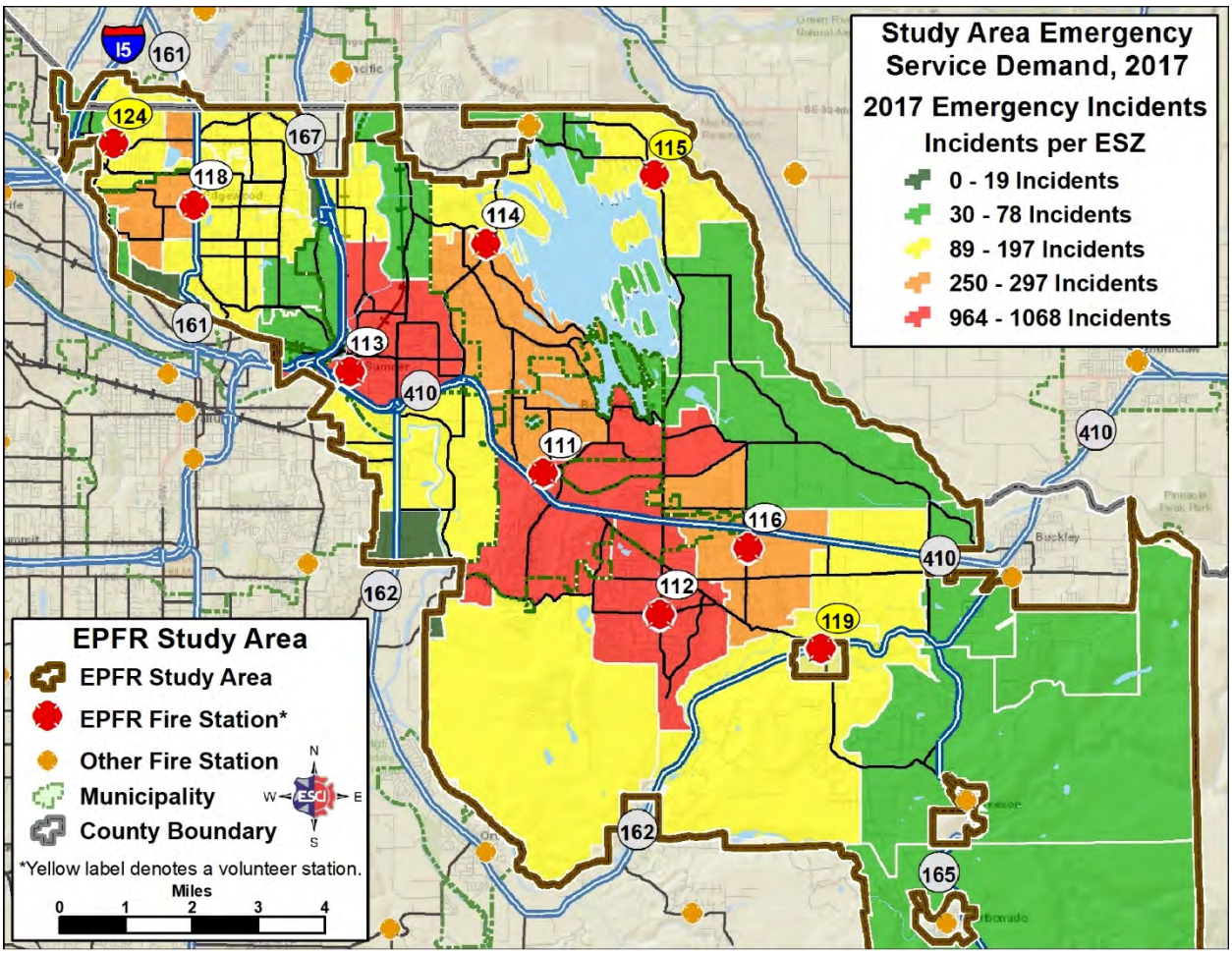
Figure 8: EPF&R Geographic Service Demand, 2017



Service demand is distributed throughout the EPF&R service area. Areas of the highest density of emergency incidents occur in the Milton, Edgewood, Sumner, and Bonney Lake areas. Additionally, the Prairie Ridge area south of Station 112 demonstrates an area of higher incident density. Not surprisingly, the incorporated urban communities served by EPF&R demonstrate the highest incident density. Emergency service demand in the more rural portions of the service area tends to be more disperse with areas of moderate incident density.

The following figure uses GIS data provide by the South Sound 911 Center to summarize 2017 emergency incidents by Emergency Service Zone (ESZ). ESZs are geographic planning areas used by the EPF&R and the dispatch center ensure that appropriate apparatus is dispatched to an incident based on the location, type of incident, and the nature of risk in the ESZ.

Figure 9: EPF&R Emergency Service Demand by Emergency Service Zone

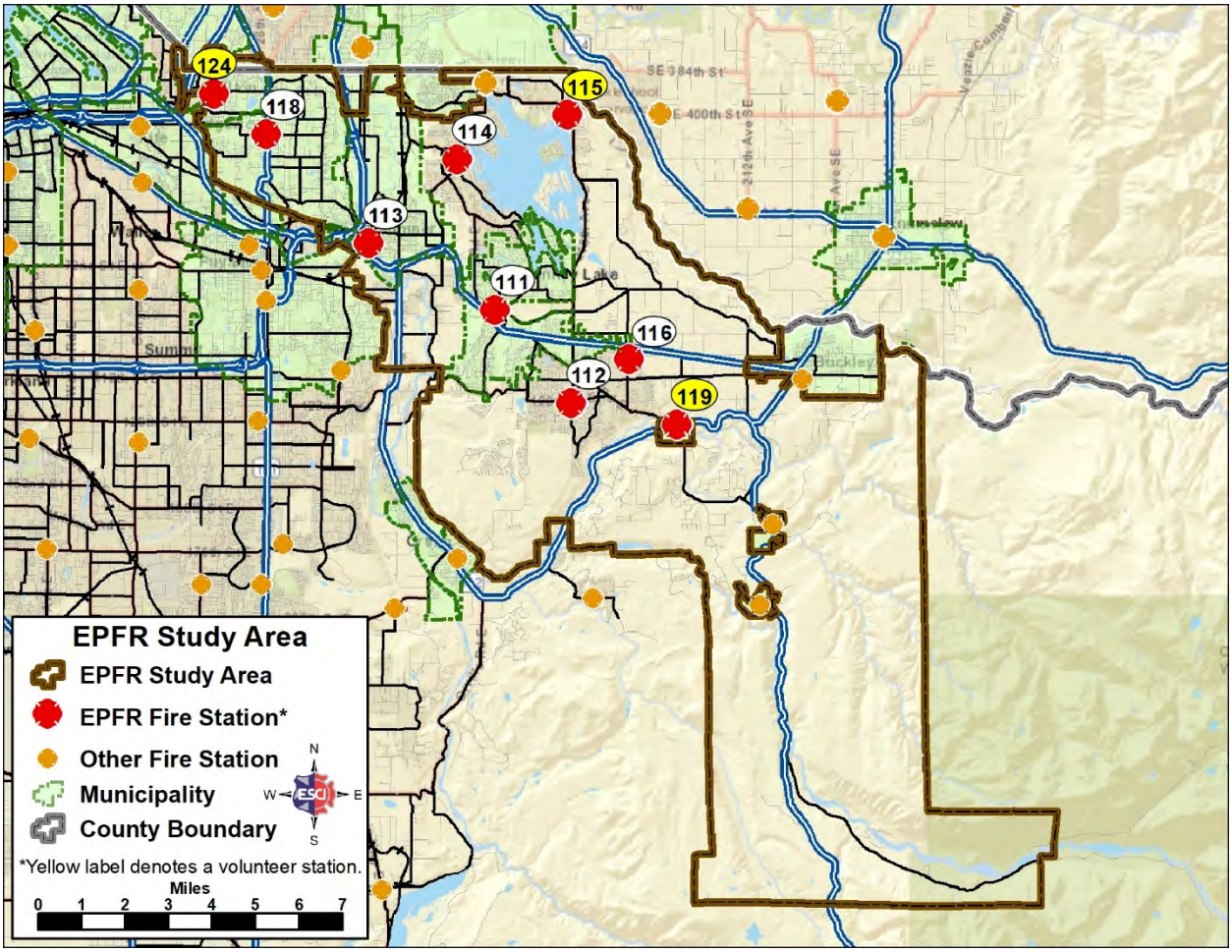


This figure displays the count of emergency incidents in each of the EPF&R emergency service zones. As in the previous figure displaying incident density, this figure reveals that most of service demand occurs in the urban areas within the service area. The ESZ immediately around Station 112 experienced the highest emergency service demand in 2017. The next ESZ to the north (Station 111 – Bonney Lake) and the ESZ around Station 113 in Milton, demonstrate service demand of 964 incident or more in 2017. Note that the EPF&R service area extends approximately 10–15 miles south of the town of Carbonado; and encompasses approximately 50 square miles of mostly undeveloped forest land. This area is not displayed in this figure. There were 34 emergency incidents in the ESZ that extends south from Wilkeson in 2017.

DISTRIBUTION

The distribution analysis presents an overview of the current distribution of fire department resources within the EPF&R service area. Figure 10 displays the EPF&R study area.

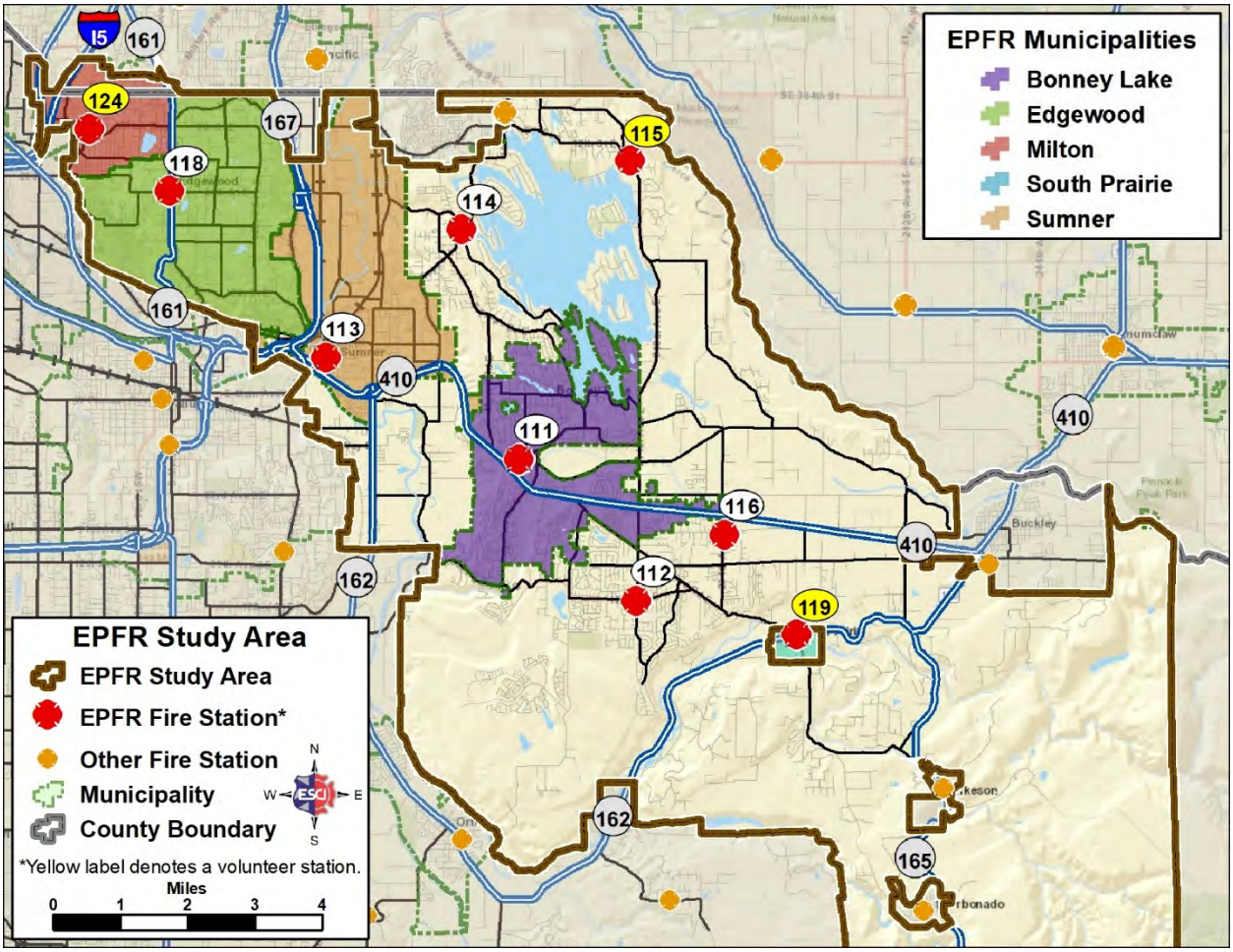
Figure 10: EPF&R Study Area



EPF&R currently provides fire protection, EMS first response, and transport (ALS and BLS), hazmat, and rescue service within the study area displayed in this figure. The service area encompasses approximately 153 square miles. EPF&R serves a mix of urban and rural areas from nine operational stations. Six of the stations are staffed 24 hours a day and three stations are unstaffed volunteer stations. Additionally, EPF&R maintains a water rescue boat storage facility (Station 122) on Lake Tapps and a logistics station (Station 123) near Buckley.

The following figure displays the incorporated municipalities served by EPF&R.

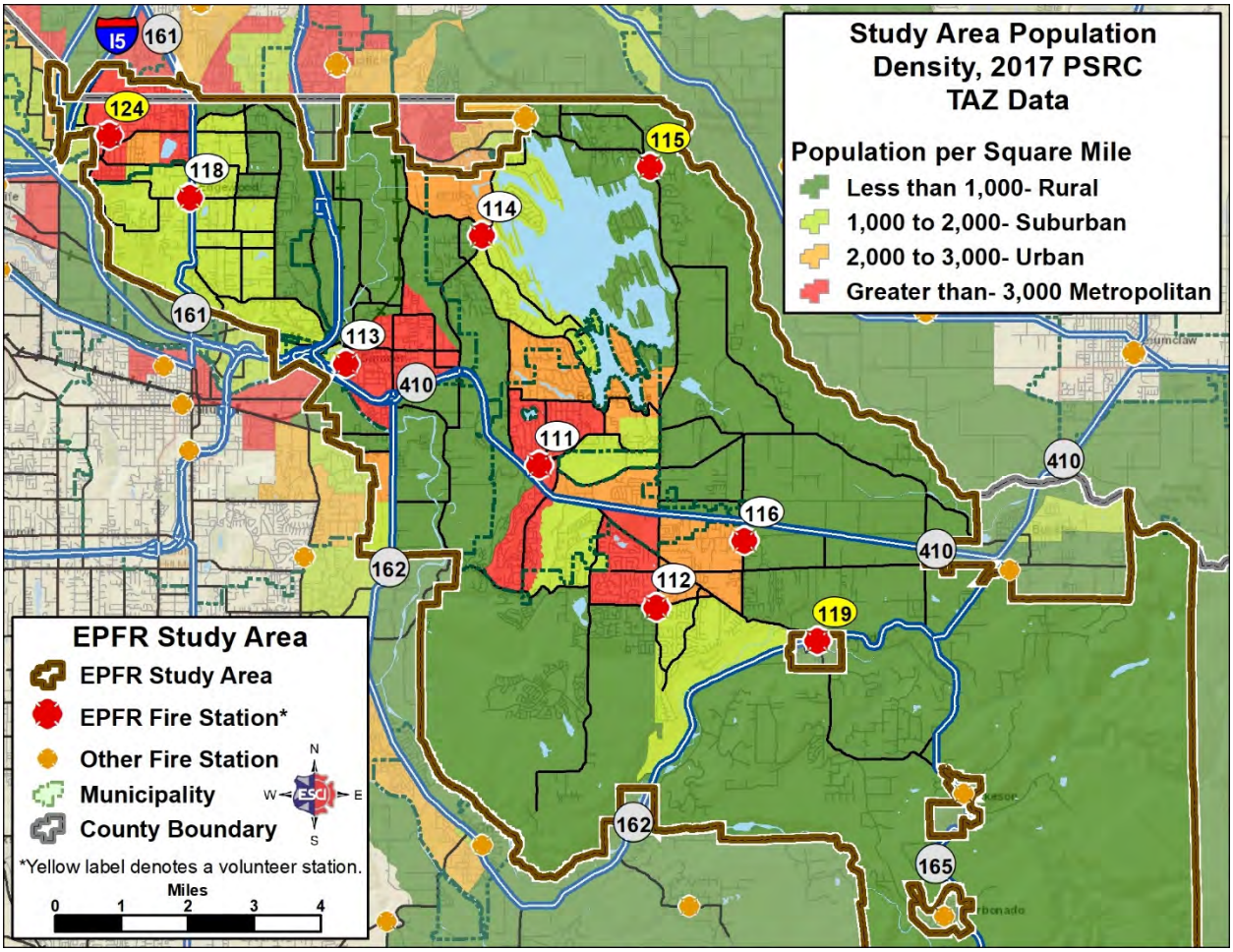
Figure 11: EPF&R Municipalities



As seen in this figure, EPF&R serves five incorporated communities within the service area. Bonney Lake is classified as a "Larger City" (reclassified from Small City in March 2017) in the Puget Sound Regional Council's (PSRC) regional growth strategy VISION 2040. Edgewood, Milton, South Prairie, and Sumner are all classified as a "Small City" in the VISION 2040 document.

The next figure displays estimated population density in the EPF&R service area using the most recent PSRC population data.

Figure 12: EPF&R Population Density, 2017 PSRC TAZ Data

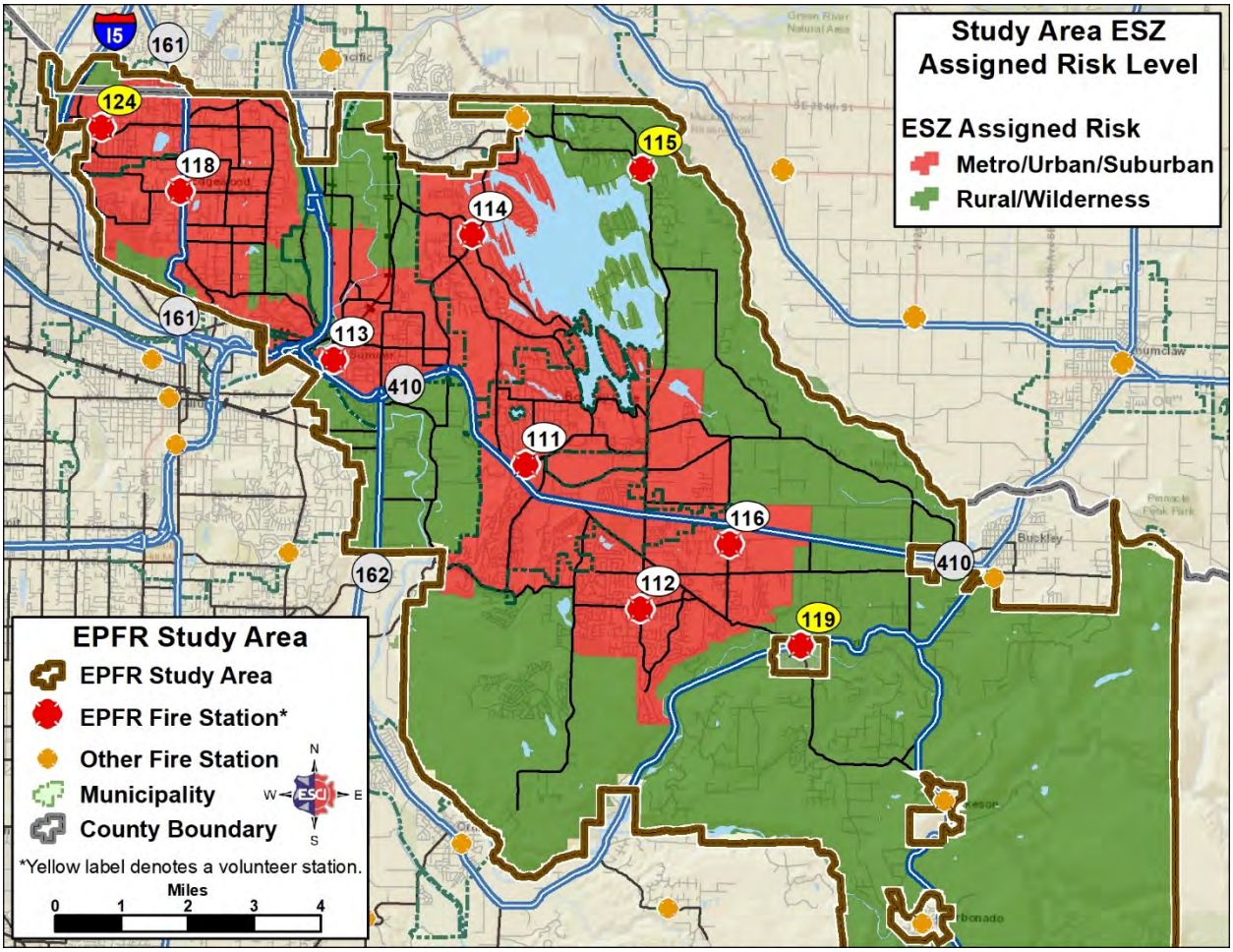


The Washington Office of Financial Management (OFM) provides annual population estimates for various geographies as mandated by the Washington Growth Management Act (GMA). ESCI uses OFM estimates for incorporated communities and the unincorporated portions of the EFP&R service area (Pierce County Fire Protection District #22) to estimate the current population as approximately 94,000 in the service area. Approximately 52 percent of the population resides in the incorporated portions of EPF&R, the remaining 48 percent live in the unincorporated portions of the EPF&R service area.

The PSRC traffic analysis zone (TAZ) 2017 data demonstrates the distribution (population per square mile) of the population throughout the study area. Further discussion of current and future population is provided in the Future Conditions section of this report.

The following figure displays the population density classification assigned to each of the EPF&R emergency service zones.

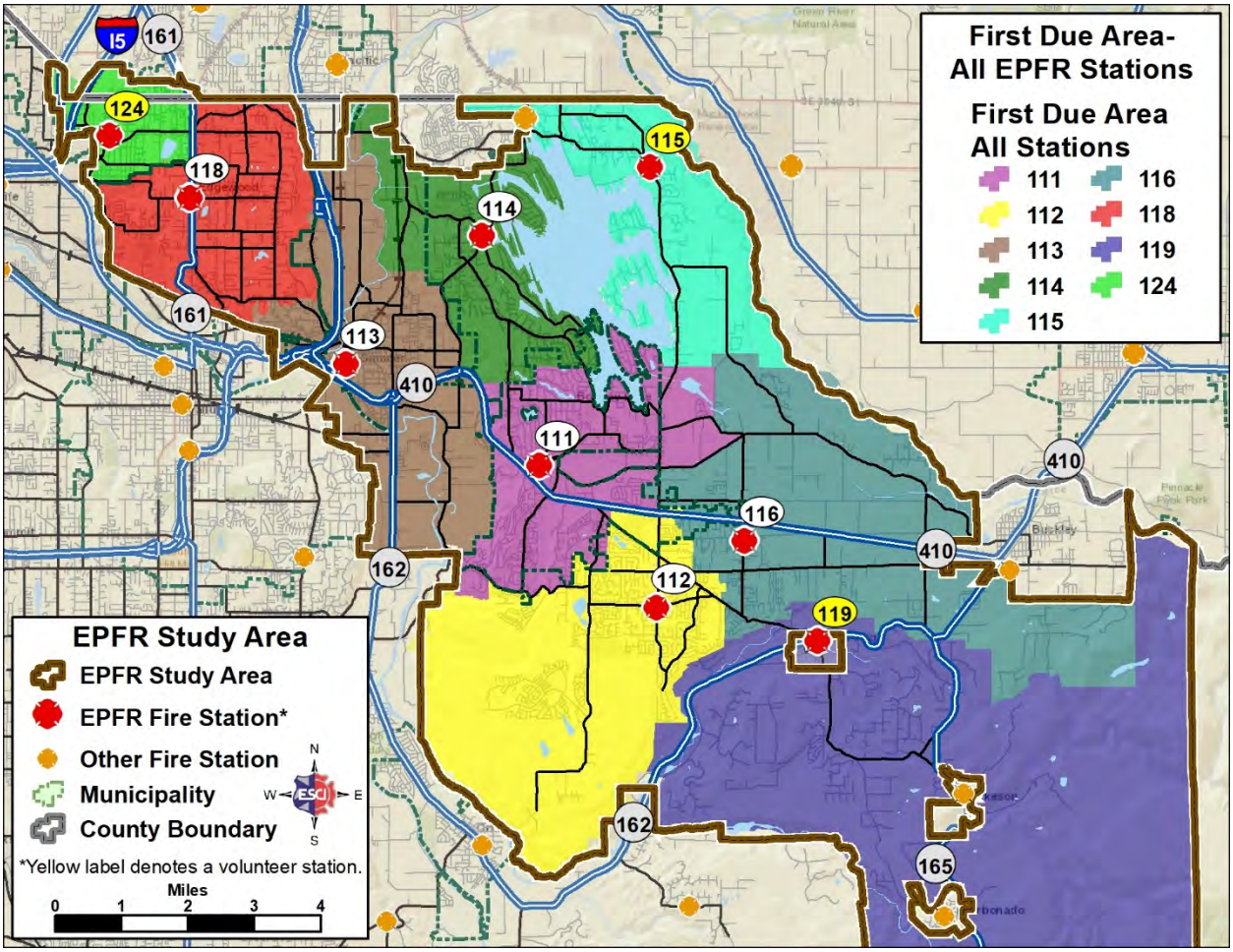
Figure 13: EPF&R ESZ Risk Based on Population Density



EPF&R has attached a population classification to each of the ESZs in the service area. These classifications are utilized to establish the risk level and define response time goals that are appropriate, given the varying levels of risk and population density that are present in the EPF&R service area.

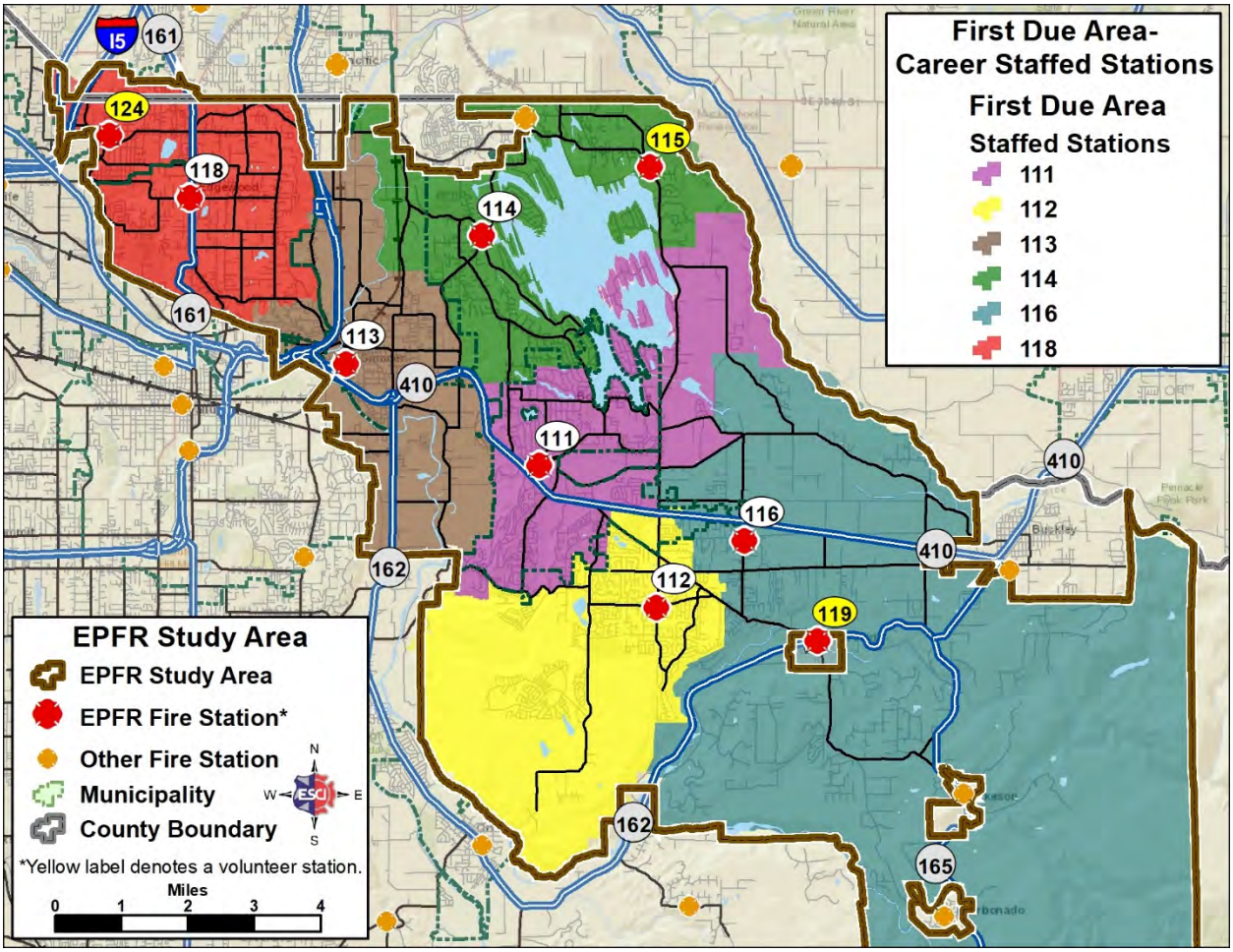
The following figure displays the distribution of all EPF&R operational fire stations throughout the service area.

Figure 14: EPF&R First Due Areas, All Stations



As displayed, each station is assigned a first due area (based on South Sound 911 ESZ data). Apparatus from the volunteer stations are always dispatched to incidents in their first due areas, but most incidents in these areas are usually handled by the nearest staffed station. Figure 15 displays the first due service areas of the career staffed stations, including the portions of the volunteer station areas handled by a career station.

Figure 15: EPF&R First Due Areas, Career Staffed Stations

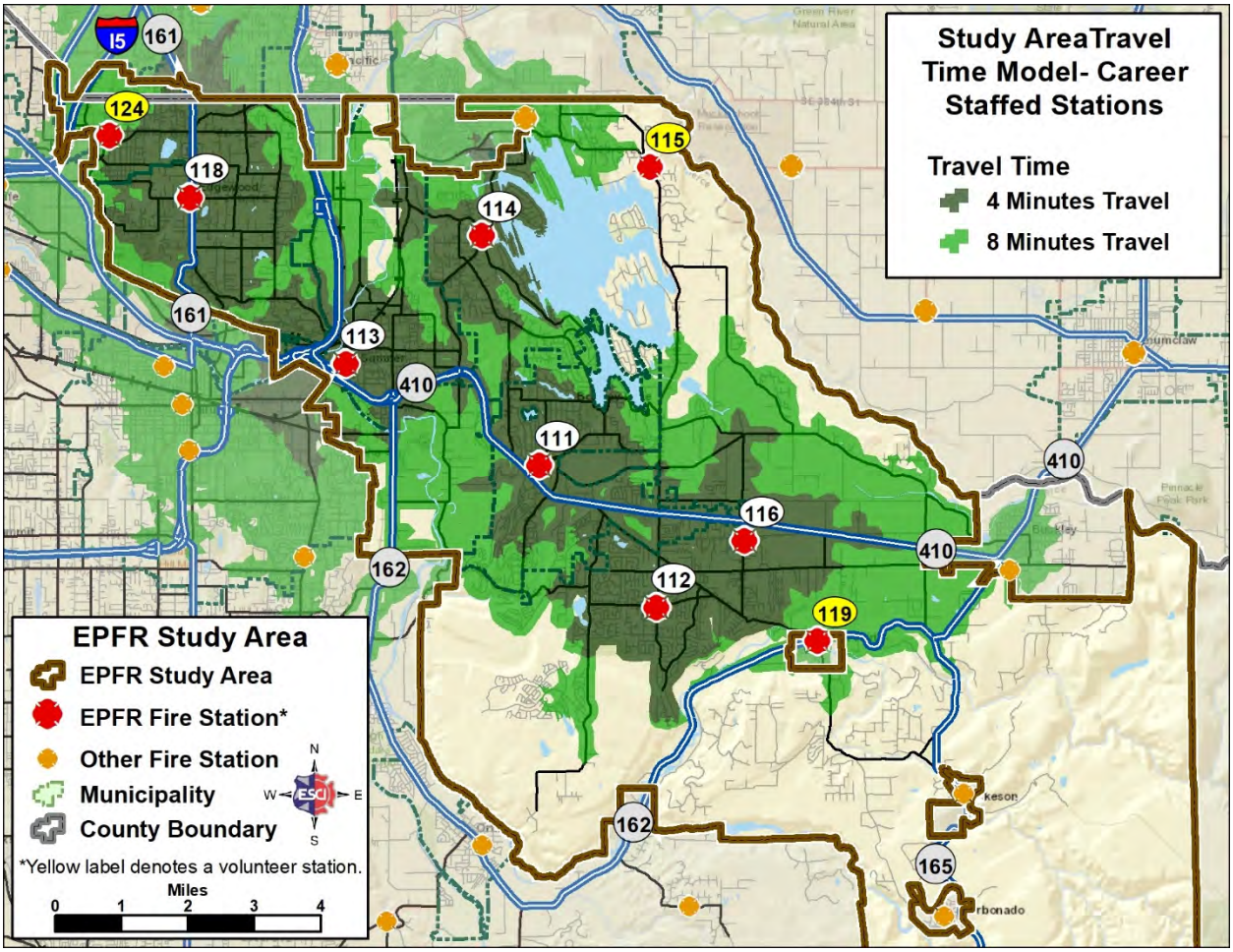


Station 118 in Edgewood is the primary responder into the Station 124 station area (Milton). Note that service demand in Milton exceeded service demand in Edgewood from 2014 through 2017. Station 114 and Station 111 handle most incidents in the Station 115 response area east of Lake Tapps. Station 116 handles responses in the Station 119 area in South Prairie and the rural area around South Prairie. Station 116 also responds to the large undeveloped area south of Carbonado.

The Station 113 first due area is primarily in the City of Sumner and the area on either side of SR 162 south of SR 410. Station 111 is the first due station for the majority of Bonney Lake. Station 112 covers the Prairie Ridge area and the large unincorporated portion of the EPF&R service area south of Bonney Lake, which is discussed at length in the Future Conditions section of this report.

The following figures present a travel time model from the current EPF&R staffed stations over the existing road network. Travel time is calculated using the posted speed limit and is adjusted for negotiating turns, intersections, and non-connected travel routes.

Figure 16: EPF&R Travel Time Model, Four and Eight Minutes



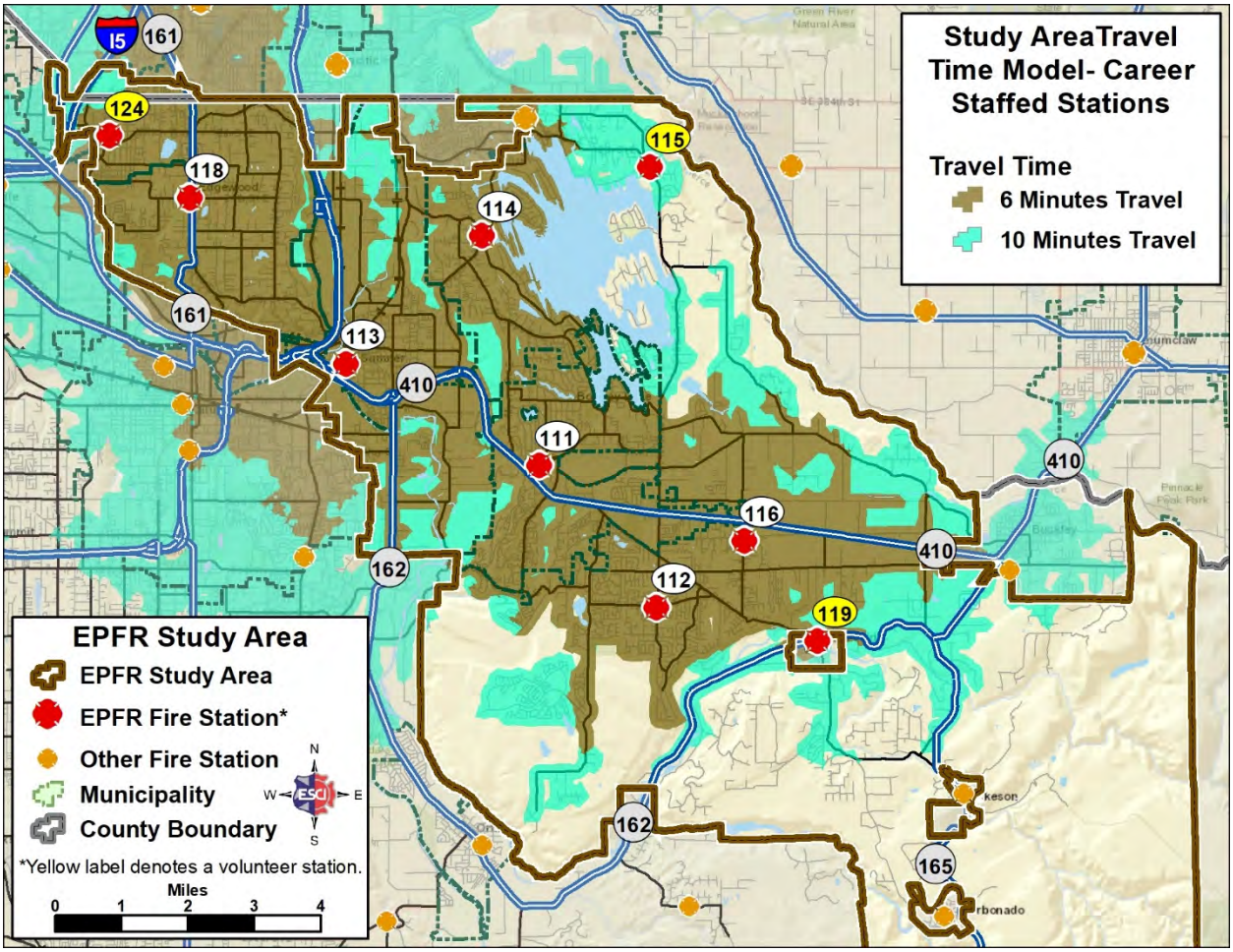
This figure demonstrates EPF&R travel time capabilities from the currently staffed EPF&R fire stations. National consensus standards, such as the *NFPA 1710*, specify that career staffed, urban fire departments should deploy resources such that 90 percent of emergency service demand can be reached in four minutes travel time or less.[1] Additionally, the NFPA 1710 standard recommends that a full first alarm for a residential structure fire arrive in eight minutes travel time or less.

Referring to Figure 13, apparatus from the EPF&R staffed stations are within four minutes or less of most of the service area classified as Metro/Urban/Suburban. All the higher density areas are within eight minutes travel of a staffed station.

As an agency that serves a mix of urban and rural areas; EPF&R has appropriately established emergency response time (travel time) goals that reflect the differing population/risk factors present in the EPF&R service area. The next figure displays potential travel time modeled at six and ten minutes travel.

[1] *NFPA 1710, Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments* (National Fire Protection Association 2014).

Figure 17: EPF&R Travel Time Model, Six and Ten Minutes



The more rural portions of the service area surrounding the more densely populated areas are within six to ten minutes travel of a staffed fire station. There are portions of the area around Station 115 that require more than ten minutes travel time from a staffed station. Additionally, some areas south of Station 119 and SR 162 cannot be reached in ten minutes travel time from a staffed station.

The following figure overlays the travel time model and 2017 emergency service demand to determine the percentage of current emergency incidents that are within the specified travel time from a EPF&R staffed station.

Figure 18: EPF&R Travel Time and Service Demand, 2017 Emergency Incidents

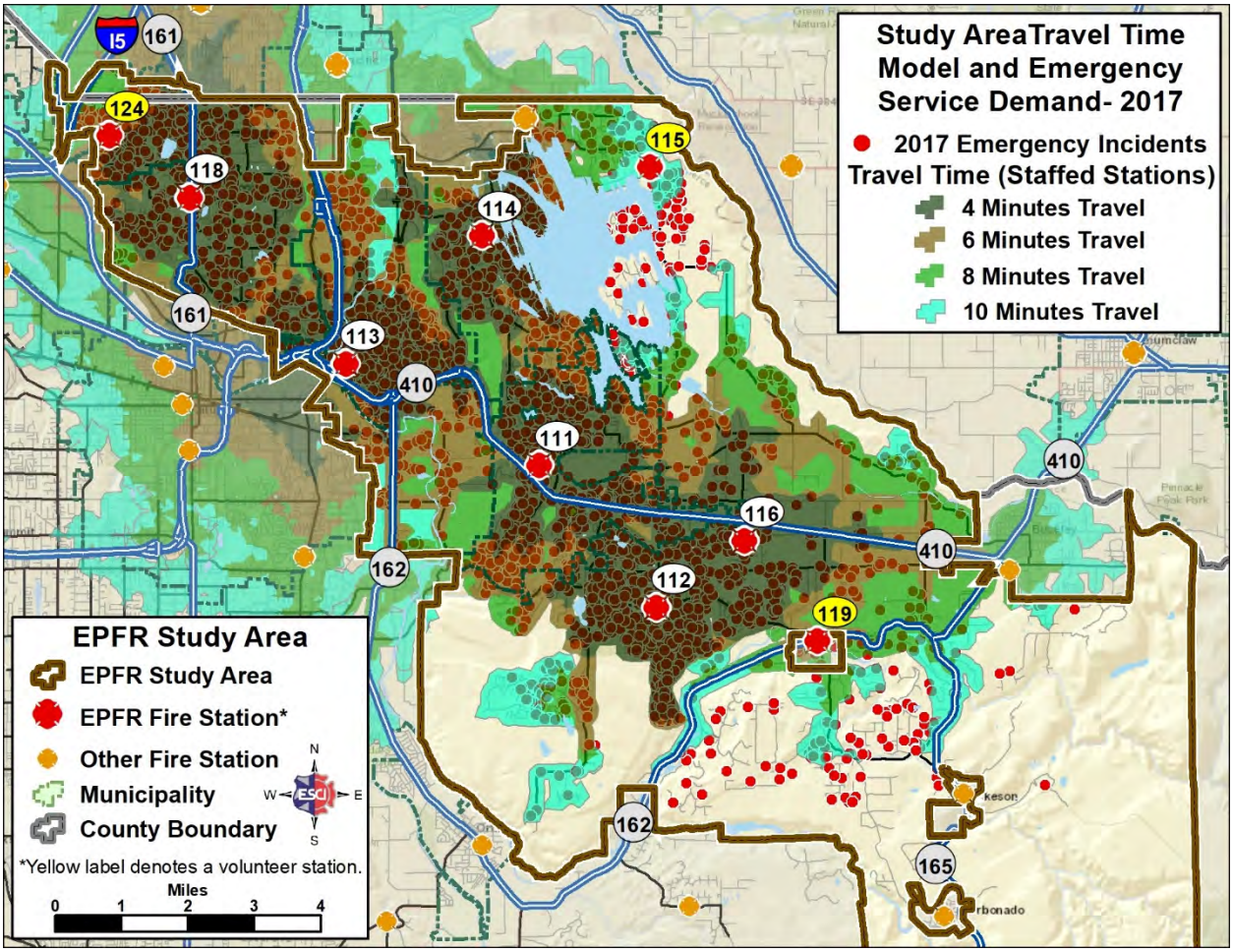


Figure 18 demonstrates the following coverage of 2017 emergency incidents:

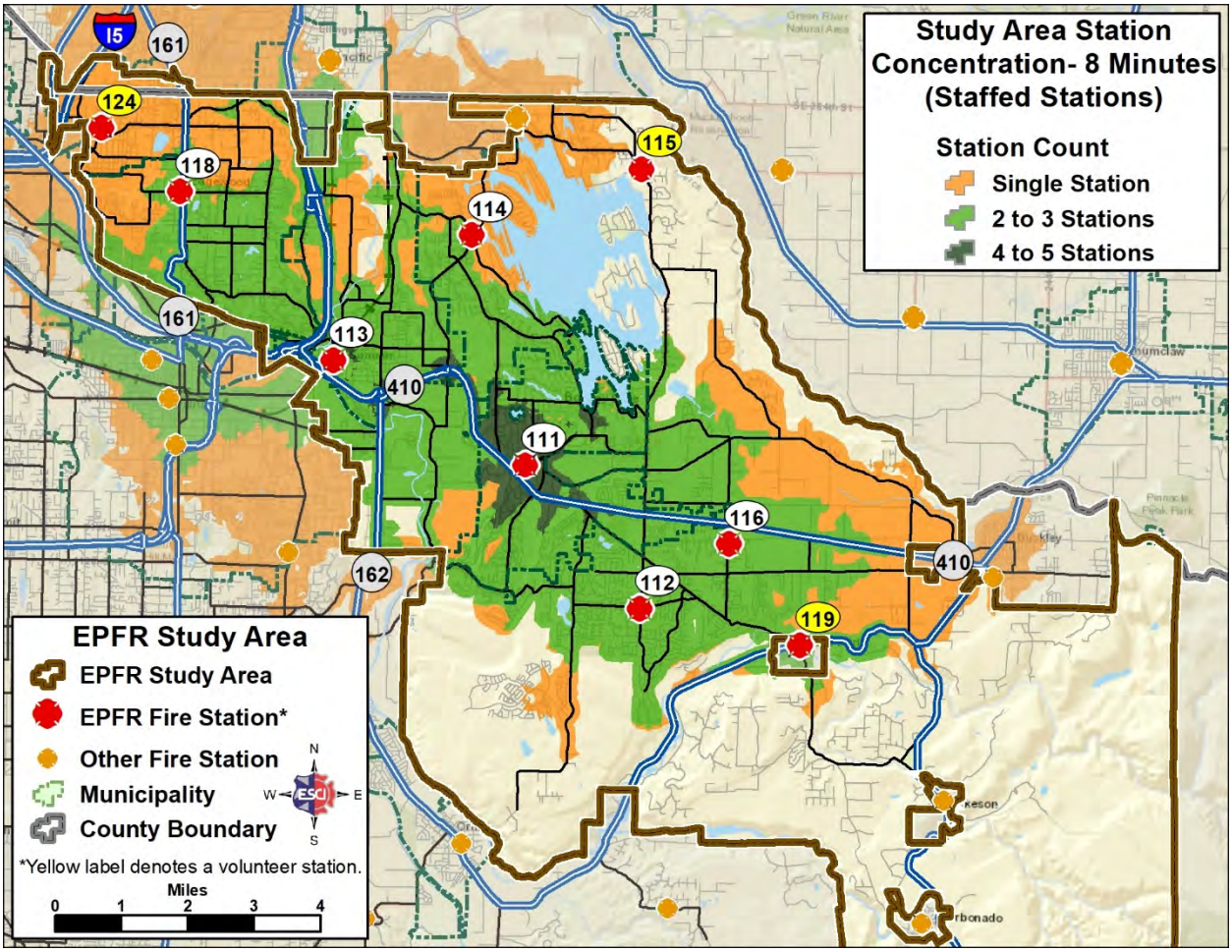
- 4 minutes travel or less – 70 percent
- 6 minutes travel or less – 88 percent
- 8 minutes travel or less – 94 percent
- 10 minutes travel or less – 97 percent

Note that the travel time models do not measure actual travel time performance. The model demonstrates potential travel time assuming all apparatus are in quarters, staffed, available to respond, and not delayed by traffic, weather conditions, or other impediments. Actual EPF&R response time performance is discussed in the Response Performance Analysis.

CONCENTRATION

Accepted firefighting procedures call for the arrival of an Effective Response Force (ERF), which is the needed personnel to effectively mitigate the type of emergency, based on its level of risk within a reasonable amount of time. This is to ensure that enough people and equipment arrive soon enough to safely control a fire or mitigate any emergency before there is substantial damage or injury. Figure 19 displays the concentration of EPF&R staffed stations available within eight minutes travel. This meets the NFPA 1710 travel time goal for the full first alarm for a residential structure fire.

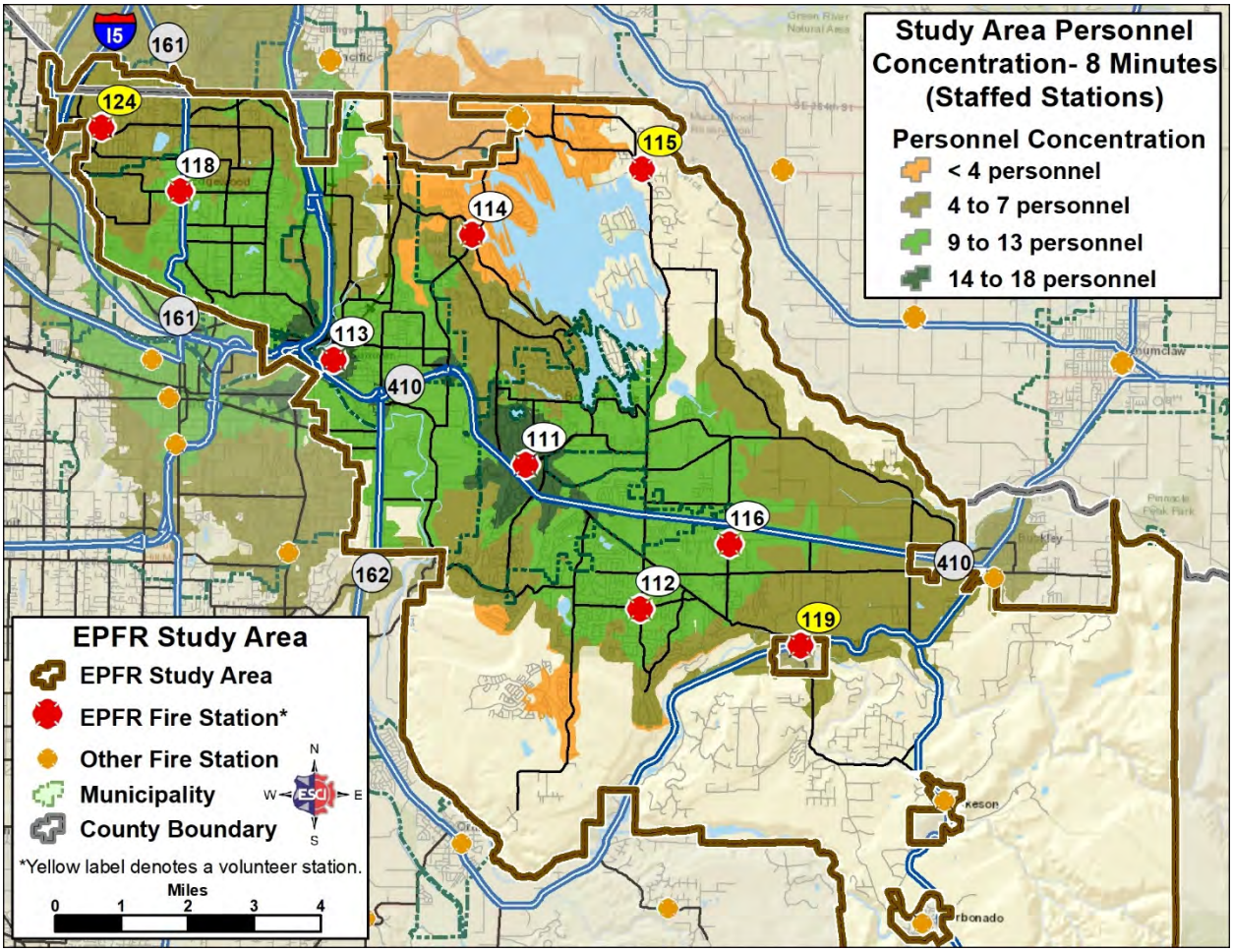
Figure 19: EPF&R Station Concentration, Eight Minutes Travel



Except for portions of the Milton/Edgewood area north and west of Station 118, the majority of the more densely developed areas in the EPF&R service area are within eight minutes travel of two to three EPF&R staffed station. A small area around Station 111 in Bonney Lake can be reached by four to five of the six staffed stations in eight minutes.

The following figure demonstrates the number of personnel available based on the current minimum staffing on duty at each station.

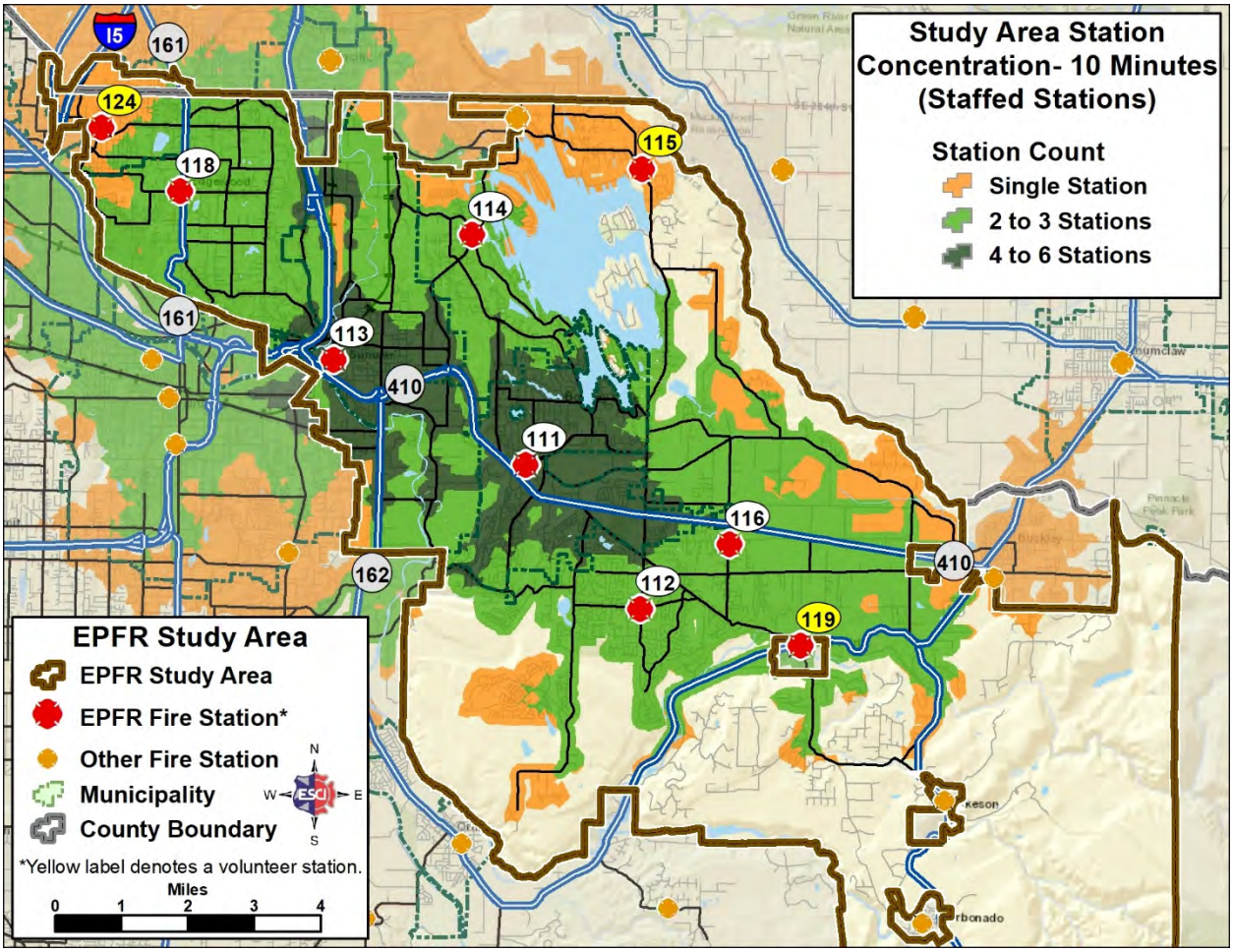
Figure 20: EPF&R Personnel Concentration, Eight Minutes Travel



At minimum staffing, EPF&R can assemble at least four to seven responders within most of the portions of the service area that experiences the greatest service demand in eight minutes travel time or less. The core area between Station 118 and Station 116 is within eight minutes travel of nine to thirteen EPF&R on duty personnel. There are two small areas around Station 111 and Station 113 where EPF&R can assemble fourteen or more personnel in eight minutes travel or less. Note that the areas north of Station 114, east of Lake Tapps (Station 115), and parts of the currently developed portions of the Tehaleh community are beyond eight minutes travel of at least four personnel. Four personnel are the minimum number of firefighting personnel required to meet the OSHA mandate known as "two in/two out." This federal mandate requires that at least four qualified firefighters be present before initiating an interior fire attack.

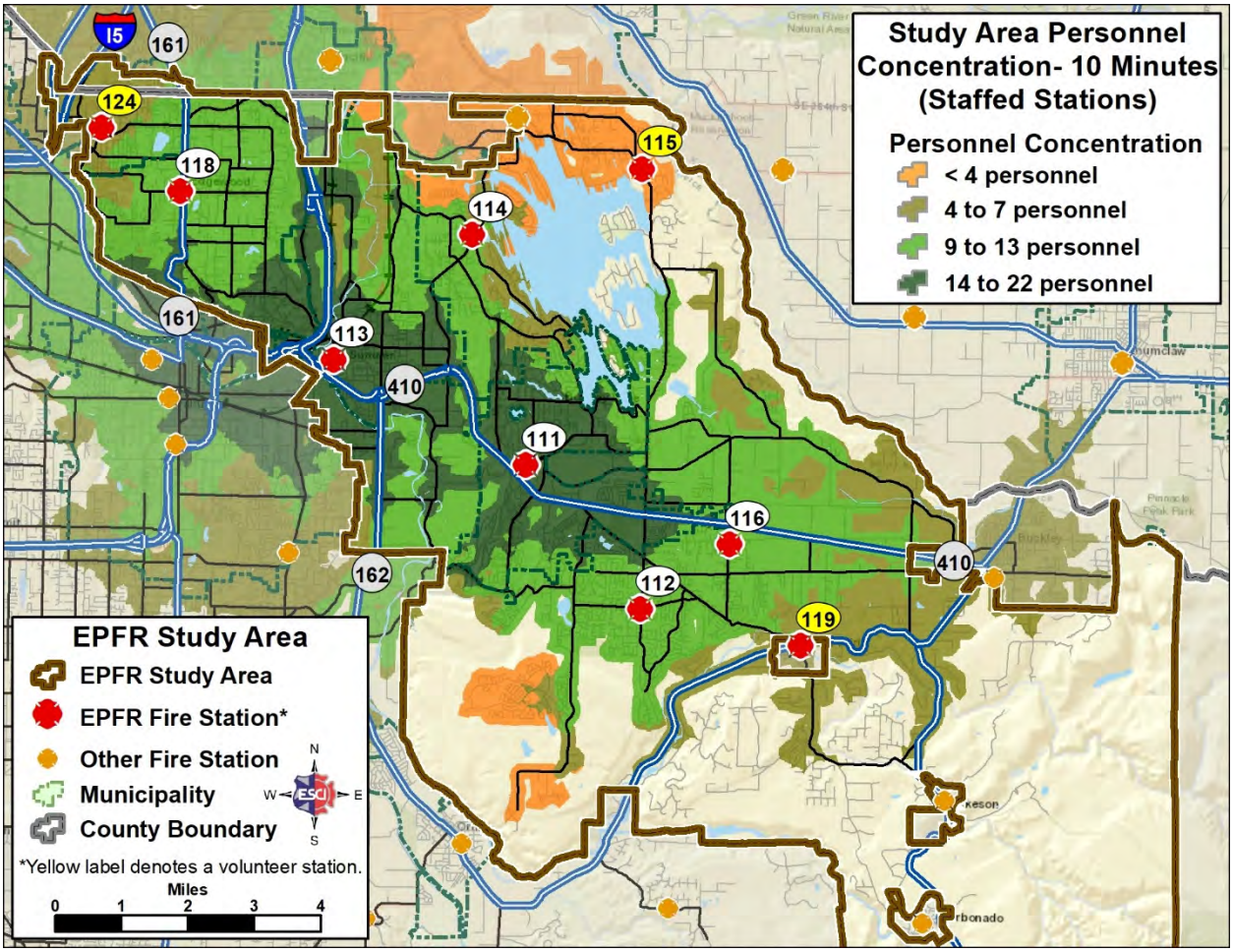
The following figure demonstrates the count of staffed stations (concentration) available in ten minutes travel or less. This represents the EPF&R response time (travel time) goal for the arrival of the full first alarm at a structure fire in the urban areas within the EPF&R service area.

Figure 21: EPF&R Station Concentration, Ten Minutes Travel



Increasing the travel time to ten minutes changes the concentration of resources available throughout the study area. The following figure demonstrates the concentration of personnel available in ten minutes travel or less throughout the service area.

Figure 22: EPF&R Personnel Concentration, Ten Minutes Travel



Increasing the travel time to ten minutes allows EPF&R to assemble up to 22 personnel at minimum staffing levels, in the stated travel time goal. The area east of Lake Tapps and some of the area in Tehaleh are still beyond ten minutes travel of four or more responders.

ESCI notes that EPF&R appropriately uses mutual or automatic aid resources from neighboring fire jurisdictions to increase the concentration of resources at the scene of an emergency. Examination of the EPF&R incident data reveals that mutual or automatic aid resources responded to approximately 50 percent of incidents coded as a structure fire in 2017.

As in the travel time models, the Concentration Analysis measures potential travel time performance, assuming that resources are in quarters and available to respond. Actual performance is discussed in the Response Performance Analysis.

RELIABILITY

The workload of emergency response units can be a factor that can affect response time performance. The busier a given unit, the less available it is for the next emergency. If a response unit is unavailable, then a unit from a more distant station (or mutual/automatic aid department) must respond, increasing overall response time. Although fire stations and response units may be distributed in a manner to provide quick response, that level of performance can only be obtained when the response unit is available in its primary service area.

Unit hour utilization (UHU) measures the amount of time that a unit is committed to an incident. The larger the number, the greater the unit's utilization and the less available it is for assignment to subsequent calls for service. The following figure displays the total time EPF&R first out apparatuses were committed to an incident in 2017, and expresses this as a percentage of the total hours in the year. Note the command vehicles and other ancillary apparatus are not included in this analysis. In addition, note that the data for the three volunteer stations (115, 119, 124) reflects the number of times these units were dispatched. In most cases, the apparatus did not respond.

Figure 23: EPF&R Unit Hour Utilization (UHU), 2017

Station	Apparatus	Count of Responses	Total Hours	UHU	Average Time Committed
Station 111	E111	2,862	1,240	14.2%	0:26:05
	M111	2,569	2,723	31.1%	1:03:50
Station 112	E112	1,793	794	9.1%	0:26:40
	M112	366	393	4.5%	1:04:56
Station 113	E113	1,663	688	7.9%	0:24:57
	M113	2,389	2,363	27.0%	0:59:35
	L113	1,268	515	5.9%	0:24:21
Station 114	M114	162	167	1.9%	1:03:26
	E114	1,297	629	7.2%	0:29:12
Station 116	M116	1,988	2,484	28.4%	1:15:17
	E116	1,586	823	9.4%	0:31:09
Station 118	M118	1,870	1,877	21.4%	1:00:27
	E118	2,356	1,064	12.1%	0:27:09
Station 115	E115	121	22	0.3%	0:10:42
	A115	194	29	0.3%	0:09:07
Station 119	E119	181	44	0.5%	0:14:44
	A119	213	48	0.5%	0:13:36
Station 124	E124	639	88	1.0%	0:08:17
	A124	619	78	0.9%	0:07:32

Not surprisingly, the EPF&R transport medic units display the highest UHU rates. EMS incidents comprise nearly 74 percent of current service demand. Transport time to the hospital, patient handoff, report writing, and restocking increases the time medic units are unavailable. On average, medic units are committed to an incident slightly over one hour (1:05:00). The UHU rate of four EPF&R medic units exceed 20 percent.

The first out fire apparatus at the staffed stations, demonstrate UHU rates from approximately six percent for the ladder truck at Station 113, to over 14 percent for the engine at Station 111. The average time a fire apparatus was committed to an incident in 2017 was approximately 27 minutes (27:05).

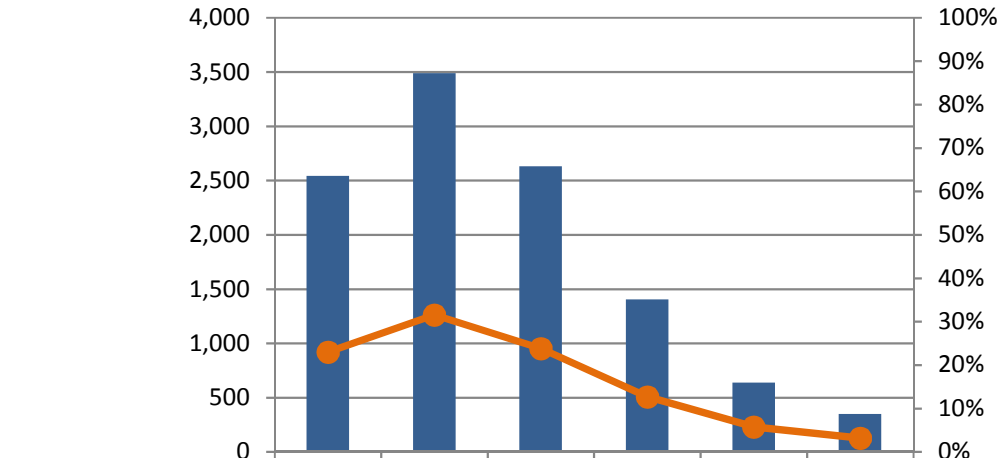
Industry best practice documents suggest that UHU rates for individual apparatus in the range of 25 to 30 percent for fire and EMS units can lead to employee burnout issues; and can negatively affect station and unit reliability.[2] Currently, the UHU rate for Medic 111 exceeds 30 percent, Medic 113 and Medic 116 exceed 25 percent, and the UHU rate for Medic 118 is over 20 percent. ESCI notes that examination of the 2011 Capital Facilities Report reveals that the highest UHU rate for EPF&R units has increased from approximately 23 percent in 2011 to over 31 percent in 2017.

Note that as unit hour utilization increases, not only are units less available for emergency responses; but also, less likely to be available for other duties, such as inspections, training, public education, and maintenance.

Simultaneous or concurrent incidents can affect a fire department's ability to muster sufficient resources to respond to additional emergencies. The following figure demonstrates the frequency of concurrent incidents experienced by EPF&R in 2017.

[2] Center for Public Safety Excellence/Commission on Fire Accreditation (CPSE/CFAI) *Standards of Cover, 5th Edition*.

Figure 24: EPF&R Concurrent Incidents, 2017



	Single Incident	2	3	4	5	6 to 10
Count of Incidents	2,544	3,488	2,630	1,403	636	349
Percent of Total	23.0%	31.6%	23.8%	12.7%	5.8%	3.2%

In 2017, just 23 percent of EPF&R service demand occurred as a single event. Over 77 percent of incidents occurred concurrently. Meaning anywhere from two to ten incidents were in progress at the same time in the EPF&R service area. Two concurrent incidents are the most frequently recorded instance of multiple incidents in progress in the 2017 data.

As with EPF&R unit hour utilization, ESCI notes that the percentage of concurrent incidents has increased since the 2011 Capital Facilities Report. The percentage of single incidents has decreased from over 48 percent in 2011 to approximately 23 percent in 2017. While the percentage of two incidents in progress simultaneously is similar (34.9 percent in 2011 and 31.6 percent in 2017); the percentage of three incidents in progress increased from 17 percent in 2011 to over 45 percent in 2017.

The ability of a fire station's first-due unit(s) to respond to an emergency incident within its assigned response area is known as unit or station reliability. The following figure demonstrates the percentage of priority incidents in 2017 that first due apparatus assigned to each of the EPF&R station areas were the first apparatus to arrive at a priority incident in their particular station area. Note that the station areas displayed include the first due areas of the volunteer stations assigned to each staffed station.

Figure 25: Station Reliability, 2017 Priority Incidents

Station	Count	Reliability
111	1,325	78.9%
112	1,180	73.1%
113	1,597	82.4%
114	692	82.2%
116	690	90.9%

118	1,559	94.2%

Response performance can be negatively affected by apparatus from a more distant station responding into a different station's first due area, due to the commitment of assigned apparatus to a different incident. To meet a 90th percentile response goal, the optimum station reliability rate should be 90 percent. Four of the six staffed EPF&R stations display station reliability rates below 90 percent. The time EPF&R units (especially medic units) are committed to incidents and the frequency of concurrent incidents affects the department's station reliability rate and emergency response performance.

RESPONSE PERFORMANCE

In the response performance analysis, ESCI reviews EPF&R emergency response performance in 2017. The department provided ESCI with 2017 incident and apparatus response data recorded and stored in the EPF&R records management system (RMS) software program. As required by the Revised Code of Washington (RCW), EPF&R has established response performance goals and provides a report documenting response performance annually.[3] EPF&R uses the standards published in the NFPA 1710 Standard for Career Fire Departments as the benchmark for the department's performance goals.[4] The following figure displays EPF&R performance goals and the department's actual response performance during 2017.

Figure 26: EPF&R Response Performance Report (RCW 52.33), 2017

Response Type	NFPA Standard/ EPF&R Standard	Turnout Time Standard (Minutes)	Percent Meeting Standard	90th Percentile Performance	Response Standard (Travel Time)	EPF&R Percent Meeting Standard	EPF&R 90th Percentile Performance
First Engine-Structure Fire	NFPA Standard	01:20	7.18%	3:28	04:00	19.51%	09:07
	Metro/Urban/Rural				04:00	27.59%	07:52
	Rural/Wilderness				06:00	16.67%	09:39
Full First Alarm-Structure Fire	NFPA Standard	01:20	N/A	N/A	08:00	0.00%	15:38
	Metro/Urban/Rural				10:00	38.89%	14:54
	Rural/Wilderness				14:00	57.14%	20:11
First Unit-First Responder or Higher-EMS Incident	NFPA Standard	01:00	17.03%	02:12	04:00	35.82%	09:12
	Metro/Urban/Rural				04:00	43.68%	07:40
	Rural/Wilderness				06:00	27.72%	12:50
First ALS Unit-EMS Incident	NFPA Standard	01:00	N/A	N/A	08:00	64.30%	13:25
	Metro/Urban/Rural				08:00	69.91%	12:21
	Rural/Wilderness				12:00	75.19%	16:34
First Unit-Other Fires	NFPA Standard	01:20	15.53%	03:07	04:00	22.85%	11:56
	Metro/Urban/Rural				04:00	31.51%	09:37
	Rural/Wilderness				06:00	18.75%	18:55
4th FF-Fire Suppression Incident	Overall	N/A	N/A	N/A	04:00	18.18%	08:57
	Metro/Urban/Rural				05:00	47.83%	07:03
	Rural/Wilderness				07:00	10.00%	10:50

[3] Chapter 35.103 and 52.33 RCW: Fire Departments-Performance Measures.
[4] NFPA 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*, National Fire Protection Association, 2014.

The data displayed in this figure and the EPF&R Annual Performance Report meets the intent of RCW Chapter 35.103. RCW 35.103 specifies that fire departments report turnout time and response time. Turnout time is defined as "the period when units receive notification of the emergency to the beginning point of response time." Response time is defined as the "time that begins when units are enroute to the emergency incident and ends when the unit arrives on scene." Appropriately, EPF&R identifies geographic areas within the service area (Metro/Urban/Suburban and Rural/Wilderness) and response performance goals within those geographic areas.

As displayed in Figure 26, EPF&R response performance for turnout time and travel time does not meet either the NFPA 1710 standards or the department's goals for the geographic risk zones within the service area. This is not to infer that EPF&R is performing poorly. However, it is important that fire department leaders and policy makers are aware of the department's current performance.

EPF&R has established performance standards that meet the requirements of the Revised Code of Washington and allow EPF&R leaders to identify deficiencies and areas for improvement. The EPF&R performance goals are based on national consensus best practices, fiscally responsible, and appear to meet current community expectations.

Looking to the future, from a service delivery and performance perspective East Pierce Fire and Rescue faces the following challenges:

- Maintain or improve current response performance.
- Improve the distribution of resources throughout the service area to improve the concentration of resources available for higher risk incidents or multiple calls for service (concurrent incidents).
- Maintain a high level of service in the face of future growth and development within the EPF&R service area.

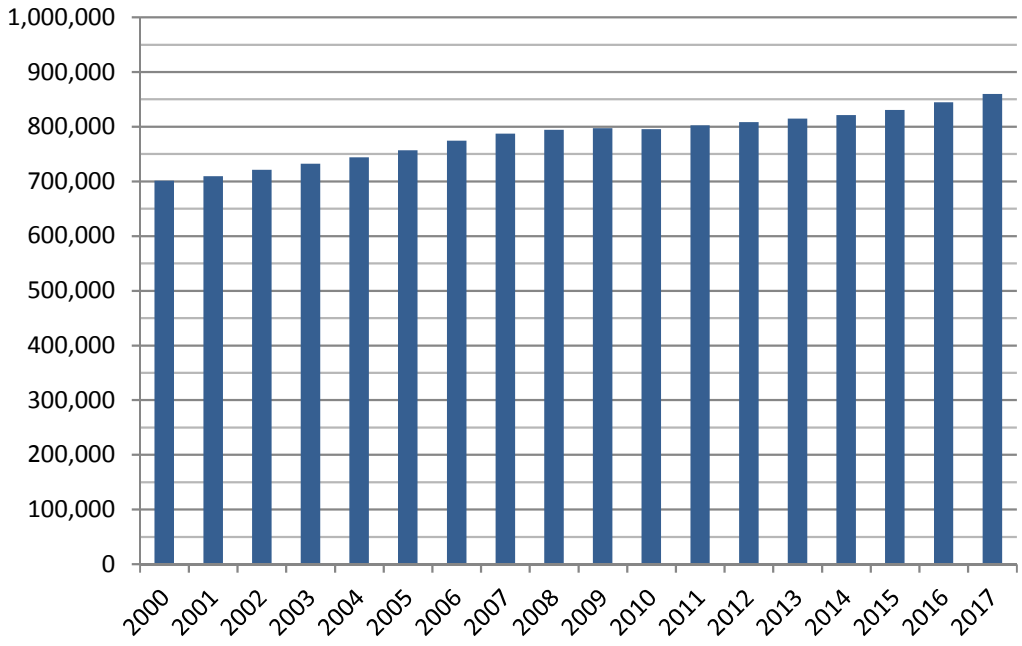
Population Projection

ESCI uses Washington Office of Financial Management (OFM) Growth Management Act population data, Puget Sound Regional Council (PSRC) traffic analysis zone (TAZ) data, and local planning documents to analyze current and future population and development in the EPF&R study area.

POPULATION HISTORY

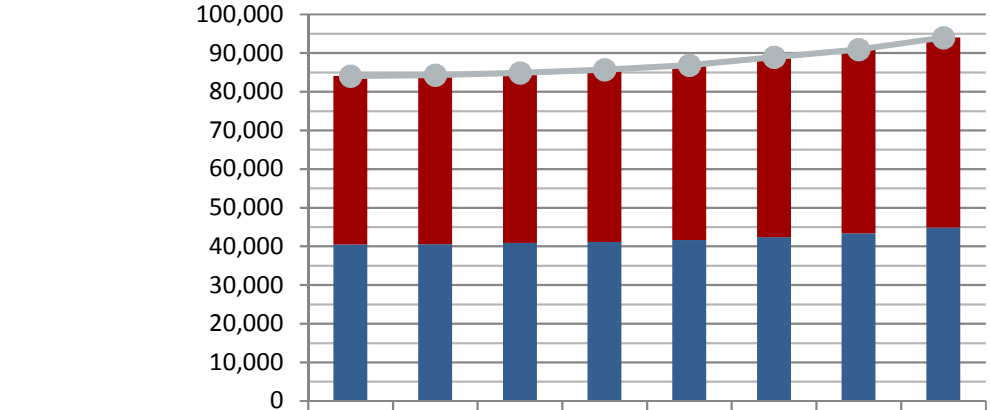
The following figure demonstrates overall population growth in Pierce County from 2000 through 2017.

Figure 27: Pierce County Historical Population Change, 2000–2017 Washington OFM Estimates



Overall, the population of the county increased from just over 700,000 to nearly 860,000 between 2000 and 2017. This represents a change of 22.6 percent for an average annual growth rate of 1.3 percent. The following figure displays OFM data for the individual municipalities (Bonney Lake, Edgewood, Milton, South Prairie, and Sumner) and the unincorporated portions of the EPF&R Fire District (Pierce County FPD #22) between 2010 and 2017.

Figure 28: EPF&R Study Area Population Change, Washington OFM (2010–2017)



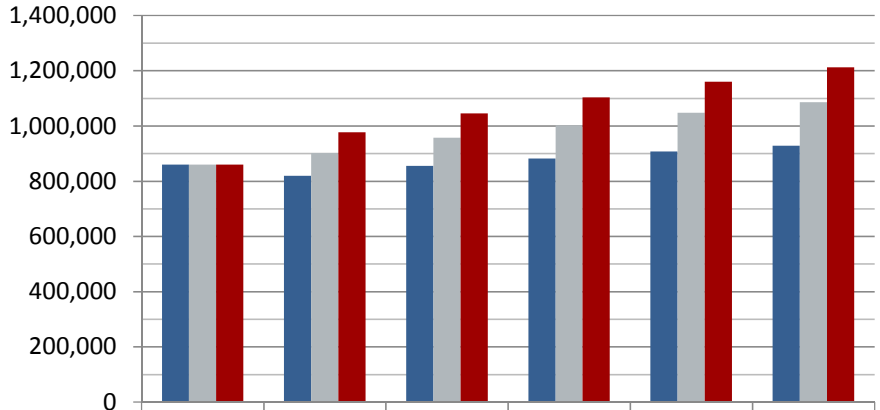
	2010	2011	2012	2013	2014	2015	2016	2017
Cities	43,614	43,765	44,045	44,610	45,290	46,585	47,570	49,175
Unincorporated EPFR	40,463	40,553	40,837	41,138	41,602	42,388	43,366	44,871
EPFR Total	84,077	84,318	84,882	85,748	86,892	88,973	90,936	94,046

The population in the incorporated portions of EPF&R grew by approximately 13 percent during the period displayed. The unincorporated portions of the district changed by nearly 11 percent. Overall, the population of the EPF&R service area increased by 11.9 percent. Note that Bonney Lake (18 percent), Milton (13 percent), and Edgewood (11 percent) experienced the greatest change in population between 2010 and 2017, according to the OFM estimates.

POPULATION GROWTH PROJECTIONS

The next figure displays the most recent (2017) OFM population projection for Pierce County. Low, Moderate, and High growth rates are provided.

Figure 29: Pierce County Population Forecast, Growth Management Act (GMA) 2017

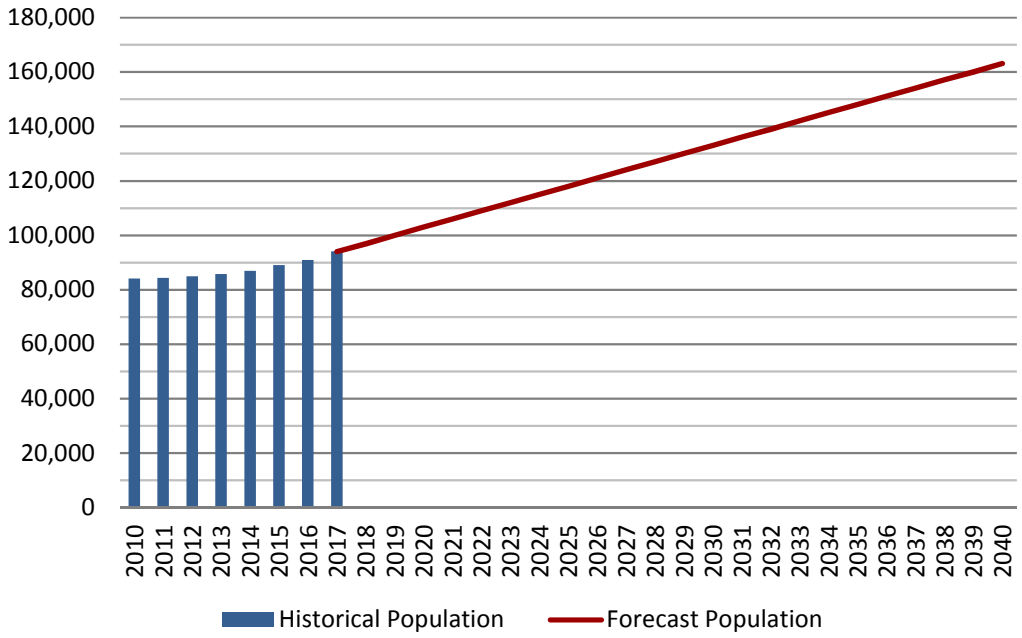


	2017	2020	2025	2030	2035	2040
Pierce- Low	859,400	819,122	855,408	881,775	907,207	927,797
Pierce- Medium	859,400	901,251	956,682	1,002,412	1,046,915	1,086,201
Pierce- High	859,400	976,763	1,044,716	1,103,192	1,160,145	1,211,501

The OFM data demonstrates the population of Pierce County increasing from 859,000 in 2017, to a low of 927,797 to a high of over 1,200,000 by 2040. This represents an average annual growth rate of .3 percent for the low range, 1.1 percent for the medium forecast, and 1.8 percent for the high range.

Using a linear forecasting model, ESCI uses historical population data for EPF&R to forecast possible population growth in the EPF&R service area.

Figure 30: EPF&R Population Forecast based on 2010–2017 OFM Estimates

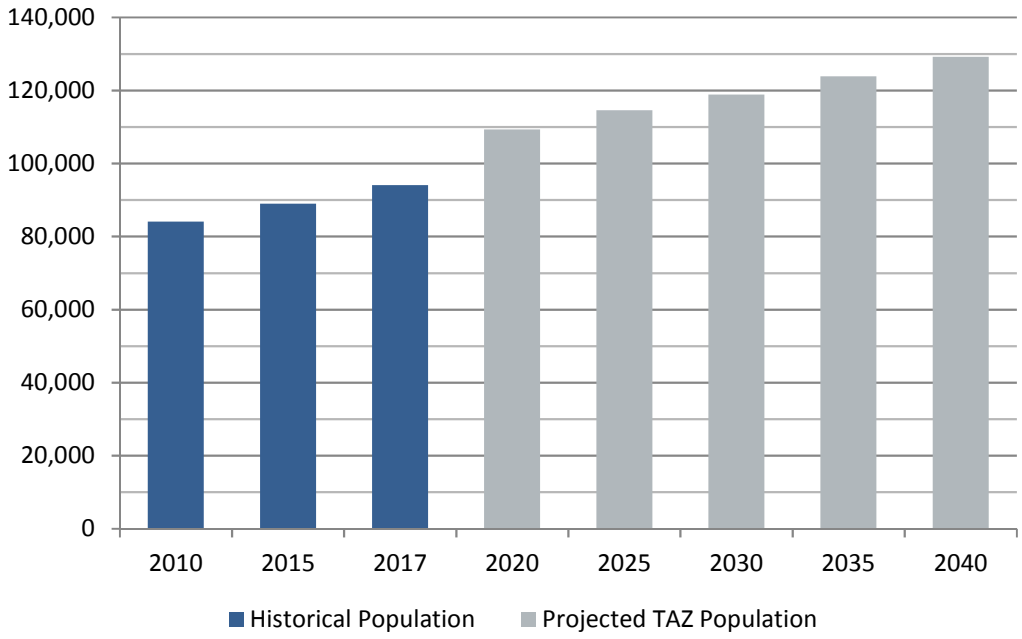


The forecast model demonstrates the population in EPF&R increasing to over 160,000 (163,104) by 2040. This represents an increase of 73.4 percent. Examination of the data reveal an annual growth rate of approximately 3 percent in the near future, falling to approximately 1.9 percent by 2040.

While linear forecast models provide mathematical estimation of future population growth based on historical data; they can fail to account for factors such as regional or local planning guidelines, which can affect development and hence population growth, sometimes positively and sometimes negatively. The goal of the Washington Growth Management Act is to provide for sustainable, organized growth throughout Washington. The Puget Sound Regional Council (PSRC) is a regional planning organization, which assists local governments in the Puget Sound region meet the goals and mandates of the GMA.

The following figure displays projected population growth in the EPF&R service area based on PSRC traffic analysis zone (TAZ) data. Traffic analysis zones are small geographic areas commonly used to display and analyze various data points at a local level.

Figure 31: EPF&R Population Projection based on PSRC Traffic Analysis Zones (TAZ)

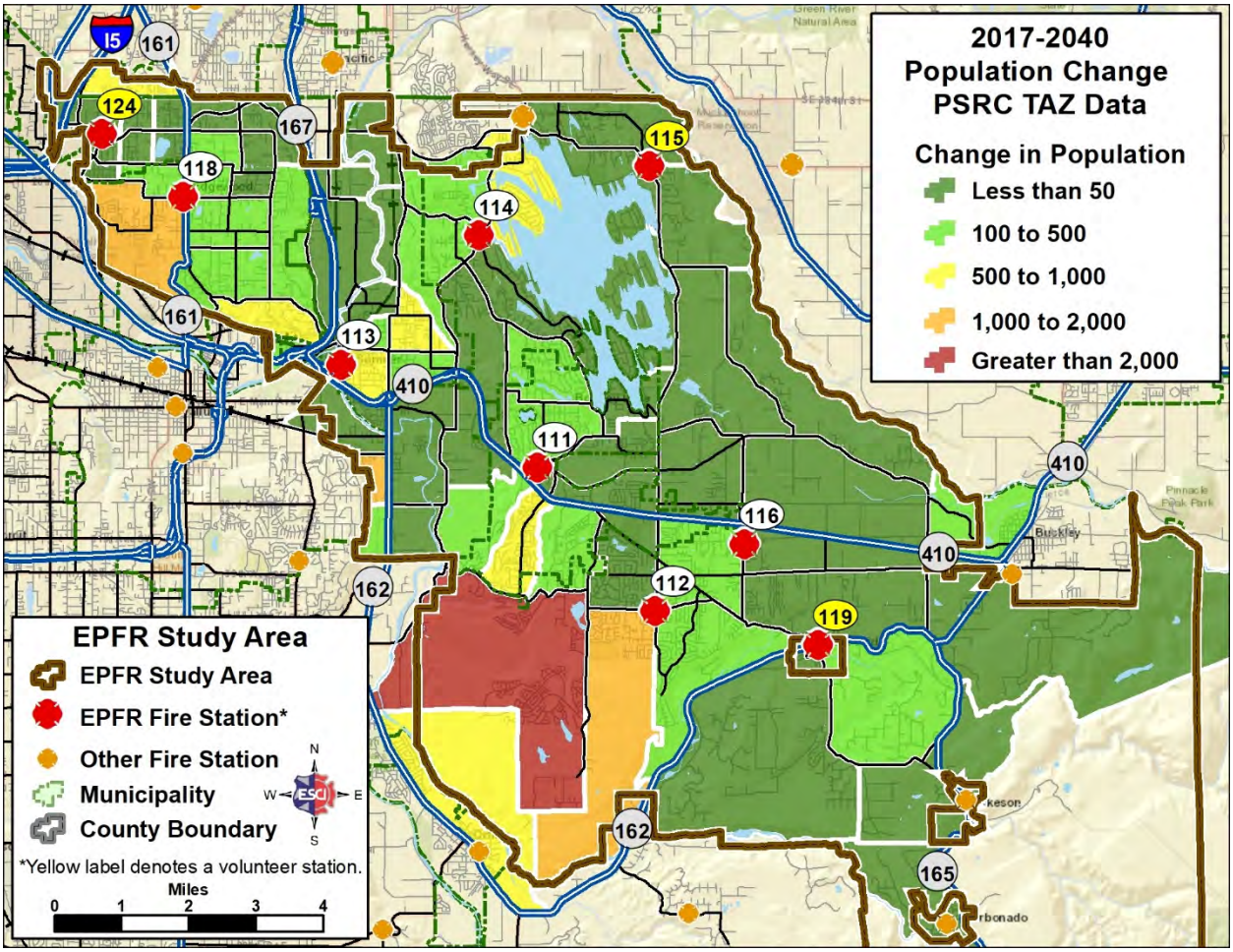


The TAZ data utilized in this analysis was released in November of 2017. The data is part of the PSRC Vision 2040 document, a regional planning document. The projections reflect local land use constraints and goals from adopted 2016/2016 comprehensive plans in the region.

Figure 31 demonstrates the population of the EPF&R service area increasing by over 37 percent (37.4 %) by 2040. The average annual growth rate is approximately 1.6 percent, which falls in the range between the Medium and High range OFM projections for Pierce County.

The following figure displays the TAZ data clipped to the boundaries of the EPF&R service area. The data is summarized by the increase in population between 2017 and 2040.

Figure 32: EPF&R Population Change, 2017–2040, PSRC TAZ Data



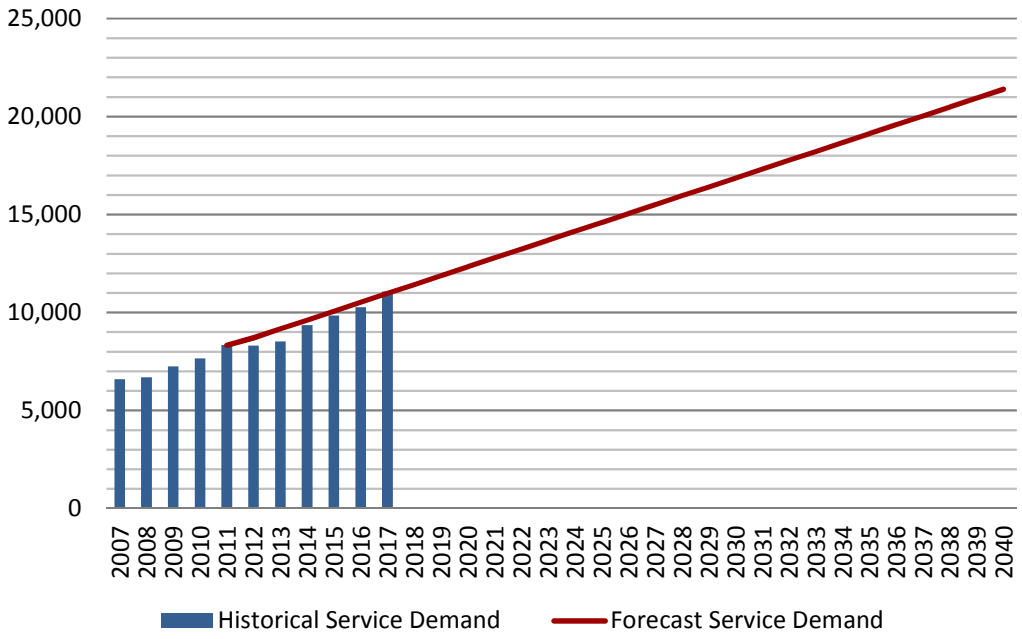
Note that by 2040, the population in the three traffic analysis zones southwest of Station 112 increases from approximately 4,000 in 2017 to over 18,600[5] in 2040. Some estimates place the population as high as 25,000 in the area. As discussed elsewhere in this document, new development in this area will profoundly affect EPF&R service demand. This area is part of the Unincorporated Pierce County UGA. Other areas expected to experience increased population activity include a portion of Bonney Lake, the area around Station 113 in Edgewood and Sumner, the southwest corner of Edgewood, and Milton, especially in the portion of King County. A portion of Sumner south of Station 111 and State Route 410 is forecast to grow faster than the surrounding area. The portions of the service area outside of the various municipal UGAs or the Pierce County UGA are constrained from high density urban development by county land use policy.

[5] Source: Puget Sound Regional Council of Governments population projection

Projected Service Demand

The following figure displays a projection of possible future service demand based on historical service demand from 2011 through 2040. Once again, a linear forecast model is applied to historical data to produce a result. In this case the forecast is started in 2011 to account for the effect of Milton joining the EPF&R service area.

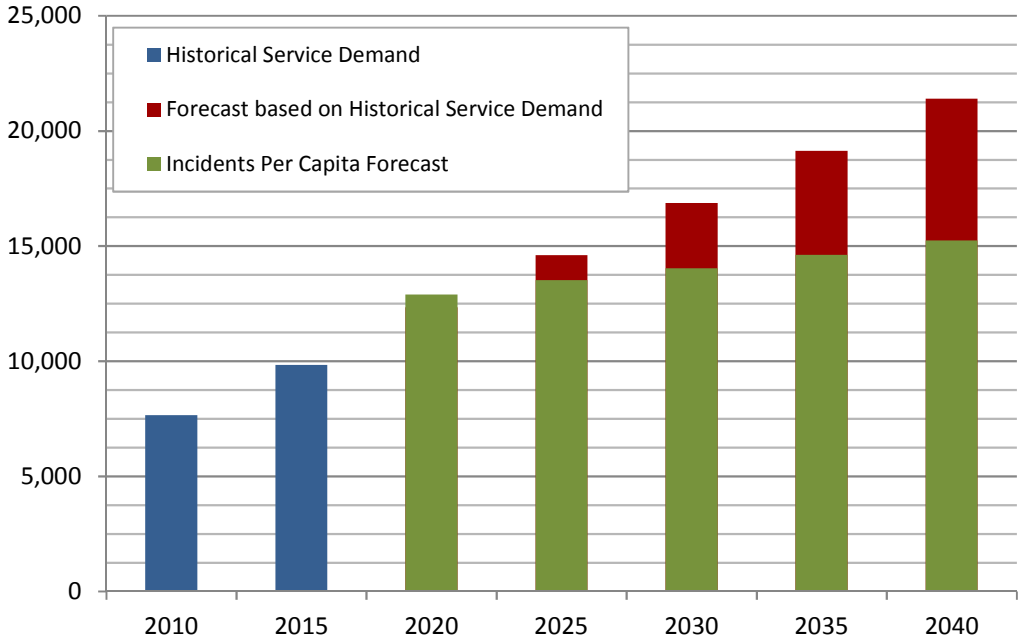
Figure 33: EPF&R Service Demand Projection, 2017–2040



The figure demonstrates that EPF&R service demand increased steadily from 2007 through 2017, increasing by over 68 percent in 10 years. The last major change to the EPF&R service area was the addition of Milton in 2011. The forecast shows EPF&R service demand increasing to over 21,000 (21,400) incidents, nearly doubling from 2017 by 2040. This represents an average annual increase of approximately 4 percent in service demand within the EPF&R jurisdiction.

The next figure compares the historical service demand forecast to a forecast based on a per capita incident rate. ESCI uses the PSRC TAZ population forecast for the EPF&R service area presented above and multiplies this by the per capita incident rate derived from historical service demand for 2014 through 2017 to forecast future service demand.

Figure 34: EPF&R Service Demand Projections—Historical Service Demand and Incidents Per Capita, 2017–2040



The incidents per capita forecast demonstrates EPF&R service demand increasing to approximately 15,245 incidents by 2040. This is an approximately 38 percent increase between 2017 and 2040. As previously described, the forecast based on historical service demand reaches over 21,400 incidents in 2040.

Population growth and human activity are primary drivers of service demand for emergency service providers. ESCI feels the PSRC TAZ data provides an accurate picture of future development and population growth in the EPF&R service area. However, applying a per capita incident rate to future population data does not appear to capture other factors that affect service demand in EPF&R. The future service demand forecast based on historical service demand appears to correlate well to current and future demand for EPF&R services.

The following figure uses the service demand projection presented in Figure 33 to summarize future service demand by station area. The historical percentage (2014–2017) of service demand by station is applied to the service demand projection to predict future service demand for each of the EPF&R stations. Additional information gleaned from the various comprehensive plans and the PSRC TAZ data within the study area is utilized to adjust the percentage of service demand based on future changes in the population or development within a station area.

Figure 35: EPF&R Projected Service Demand by Station Area

Year	Station 111	Station 112	Station 113	Station 114	Station 116	Station 118	Station 115	Station 119	Station 124	Mutual Aid	Total Incidents
2017	2,166	1,639	2,603	680	685	1,035	302	336	1,256	336	11,038
2020	2,350	1,879	2,981	769	813	1,053	367	365	1,368	389	12,335
2025	2,782	2,852	3,061	911	963	1,246	435	432	1,619	461	14,762
2030	3,214	3,295	3,536	1,052	1,112	1,440	502	499	1,871	532	17,053
2035	3,645	3,737	4,011	1,193	1,262	1,633	598	688	2,050	626	19,344
2040	4,077	4,180	4,486	1,335	1,411	1,827	637	634	2,138	675	21,400

Not surprisingly, the greatest increase in service demand occurs in the Station 112 service area; due to future development in the Tehaleh and Plateau 465 planned communities. Additionally, service demand in the first due areas of Stations 111, 113, and the combined areas of Station 118 and 124 all exceed 4,000 incidents. While service demand increases throughout the service area, areas within an urban growth area experience the greatest increase in service demand. Service demand remains consistent and relatively light in the unincorporated portions of the service area served primarily by non-career staffed stations.

Future Risk Factors

The analysis of long-range future resource deployment is an ongoing process, not one that is decided at one point in time and remains static. Circumstances change over time as the amount of service demand and the nature of the risk profile change within the EPF&R service area changes.

COMPREHENSIVE PLAN GUIDANCE

The State of Washington passed legislation commonly referred to as the "Growth Management Act (GMA)" which was codified as Chapter 36.70A RCW. In adopting the GMA, the legislature found that:

> *[U]ncoordinated and unplanned growth, together with a lack of common goals expressing the public's interest in the conservation and the wise use of our lands, pose a threat to the environment, sustainable economic development, and the health, safety, and high quality of life enjoyed by residents of this state.*

The GMA establishes fourteen goals to guide the development and adoption of local land use plans and development regulation. These goals include:

- Encouraging urban growth
- Encouraging economic development
- Retaining open space and recreation opportunities
- Preserving sites of historical and archaeological significance
- Reducing sprawl
- Protecting property rights
- Promoting efficient transportation
- Processing permits in a timely and predictable manner
- Achieving the Shoreline Management Act (RCW 90.58.020)
- Ensuring availability of affordable housing and promoting a variety of housing types and residential densities
- Ensuring public participation and coordination between adjacent jurisdictions
- Protecting the environment
- Maintaining natural resource industries
- Providing adequate public facilities and services

While all the goals of the Growth Management Act should be pursued in local comprehensive plans, it is up to each community to determine how to best balance these goals. The comprehensive plans provide an indicator of the type of growth communities will have into the future. The type of growth and the densities within the communities can have profound impacts on the services provided by EPF&R. The comprehensive plans are reviewed here to determine impacts to potential future deployment of personnel and equipment. Personnel and equipment deployment drive fire station design to a large degree. The following discussion is a summary of the comprehensive plans affecting EPF&R.

Bonney Lake

The Bonney Lake Comprehensive Plan has been amended annually since its original adoption in 1995. In addition to these regular amendments, the Growth Management Act (GMA) requires counties and cities to periodically conduct a thorough review of their plans and regulations to bring them in line with any relevant changes in the GMA, and to accommodate updated growth targets. Bonney Lake's last periodic update was completed in June 2015, with the city amending the plan as recently as December 2017.

Bonney Lake 2035 is the Comprehensive Plan the City is currently operating under.[6] A summary of the vision for the City of Bonney Lake Comprehensive Plan as it relates to and potentially impacts EPF&R, is listed in the following figure.

Figure 36: Summary of Bonney Lake 2035 Vision Elements that May Impact EPF&R

- Preservation of existing neighborhoods
- Efficient multi-modal transportation systems
- Programs supporting youth and seniors
- Support for healthy lifestyle, including health care facilities
- Balance new development with preservation of the natural resources
- Sufficient community facilities and services
- Provision of affordable housing
- Future development concentrated near transit
- Recreational opportunities and open space, including preservation of/restoring habitat
- Local economy provides employment, tax revenue, businesses of all sizes and a broad range of retail space.

The City intends to focus resources to support the development of four centers that will contribute to the City's overall character and support the regional growth strategy. The City has now designated approximately 550 acres or eleven percent of the City's area as Open-Space Conservancy.[7]

Within the downtown area, Bonney Lake envisions on and off-street parking, walkable access to retail businesses with pedestrian separation from roadways, and likely landscape buffers with public artwork an element of the attraction to downtown. Depending upon design, these buffers may impact reach to upper floors for access by aerial devices or create road-width limitations. However, safety appears to be a significant design element in the plan by shielding pedestrians from roadway hazards.

Near the center of the downtown area is an area called the Central Plaza, and is designed to be "Bonney Lake's most public place. It will serve for casual socializing and formal events with the capacity of holding several thousand people. Bonney Lake Days and farmer's markets could be held here. It will also connect the retail core to the civic campus. The plaza's centralized and accessible location with active uses on all four sides will be the key to its success." This area is essentially the courtyard of Bonney Lake and is created as a pedestrian-only design. The area is envisioned to front city hall and several two-to-four story retail spaces. Since it is intended to accommodate thousands of event attendees, emergency vehicle access will be a clear issue for portions of these buildings and for all of these events.

Near the Central Plaza and Civic Campus, new office and multi-family developments are planned to be built along an upgraded 186th Ave E. corridor. Office uses will be the primary emphasis north of 90th St. E., and multi-family residential uses will predominate to the south. They will cluster around a series of landscaped open spaces. Housing, emphasized along the southern portion of the 186th Ave. E. corridor, will include a combination of townhouses and multi-story apartment buildings, including affordable senior housing. Both 90th St. E. and 186th Ave. E. will be upgraded to include sidewalks, planting strips with street trees, and on-street parking. These features have clear impacts to emergency response, both from a built-in risk. and in terms of increased demand (senior housing).

[6] *Bonney Lake 2035* was obtained by ESCI February 14, 2018 at the following website: http://www.ci.bonney-lake.wa.us/section_business/community_development/comprehensive_plans.shtml
[7] Bonney Lake Comprehensive Plan, Chapter 1 Introduction, page 1–6.

The north downtown area is a mixed-use design, with retail, office, and multi-family residential, with multi-story apartments and townhomes. Mid-town and east-town are both somewhat limited in their growth potential without water and sewer system extension, especially in east-town.

Transportation throughout the region will evolve with regional transit systems that feed into Sounder Station in Sumner. Transit busses will become an important mode of transportation serving Bonney Lake, and traffic calming strategies will be employed. Traffic calming has a nexus with emergency response in that speed bumps and speed humps have a deleterious effect on response time by heavy fire apparatus. Studies performed in other jurisdictions have shown that for every speed hump encountered by a full sized structural fire engine slows response time by 3–4 seconds. The number of speed humps encountered on a response can add up to as many as ten in some jurisdictions, slowing response by 30–40 seconds. This is equivalent to moving a fire station one-half mile further away from an emergency incident.

In addition to speed humps, other more passive calming strategies can include traffic circles, narrower street widths, or tree plantings that create a visual effect of narrowing streets, thus slowing vehicles. While these strategies and others have positive intentions, it is important that EPF&R engage with the community planners in the design stage to avoid unintended impacts to emergency response.

Edgewood

Like Bonney Lake, Edgewood has a comprehensive plan called *Edgewood 2035*. The plan reflects Edgewood's continued conservative approach to growth. In its vision statement for 2035, it states in part, "we have preserved our rural small-town character, family-friendly neighborhoods and our trees and open spaces. Town Center is our commercial hub and home to a vibrant local economy." The thrust of their comprehensive plan calls for protecting the small-town charm of the city, much as it did in 2011.

Mixed residential and mixed-use residential serve as transitions between the rural areas and the Town Center, located south of the Town Center and on the western edge of the city southwest of 24th Street. The Town Center is located along Meridian Avenue East, generally north and south of 24th Street. The designation is intended to support a pedestrian-friendly community center that reflects Edgewood's unique local character and rural roots.[8] It allows for a range of uses including a variety of vertical and horizontal mixed-use development, pedestrian-oriented retail, multifamily residential, senior housing, and civic uses.

Commercial, business park, and industrial areas are small segments of the overall vision of Edgewood in 2035. Commercial development is limited to large-format retail, auto-oriented commercial uses and regional scale commercial uses north of the Town Center in a narrow strip along Meridian Avenue East. Business park designations aim to develop professional office, senior housing and apartments, light industrial and retail uses. Industrial development is located in the extreme southeast corner and in a small, narrow strip on its southern border. The use is intended as light and relatively clean activities such as research, light manufacturing and warehousing.

[8] Edgewood Comprehensive Plan 2035, Town Center section of Land Use, Goal LU.I.J., page 24.

Figure 37: Edgewood 2035 Growth Targets

Category	2035
Population	13,700
Housing	6,003
Employment	3,094

Figure 38: Estimated Net Developable Acres per Zoning Designation

Zoning Designation	Net Developable Acreage
Single Family 2 (SF-2)	665
Single Family 3 (SF-3)	472
Single Family 5 (SF-5)	25
Mixed Residential 1 (MR-1)	43
Mixed Residential 2 (MR-2)	24
Town Center (TC + TCDO)	38
Commercial (C)	403
Mixed Use Residential (MUR)	75
Business Park (BP)	20
Industrial (I)	7

Figure 39: Comparison of Growth Targets and Available Capacity

	Existing	2035 Target	Available Capacity	Surplus
Housing Units	3,814 units	6,003 units	5,744 units	3,555 units
Employment	1,191 jobs	3,094 jobs	2,308 jobs	405 jobs

It appears from the Edgewood Comprehensive Plan 2035, the community's growth pattern and character will not have an appreciably negative impact on EPF&R. Population growth is the single greatest driver of call volume, and Edgewood's population growth is expected to grow by 1.84 percent per year (using 2010 as a baseline) through the year 2035.

Milton

Like Edgewood, *Milton's Comprehensive Plan 2035* vision emphasizes "striving to maintain its small-town character" while, "balanc(ing) the need to grow and prosper in a sustainable manner." The City's guiding principles in shaping its future is as follows:

Guiding Principles:

- Maintain and enhance the City's small-town character.
- Create a safe place to raise families.
- Provide for strong community unity with an emphasis on family life.
- Create safe streets.
- Support a strong police and fire force.
- Strive to relieve congestion and improve safety on SR 161.
- Allow and care for varied needs of population.
- Foster and sustain neighborhood cohesiveness.
- Buffer incompatible uses and districts.
- Maintain and increase the City's trail, sidewalk, and non-motorized modes of transportation.
- Concentrate business and industry in appropriate areas.
- Preserve and enhance existing vegetation and open spaces.
- Provide opportunities for youth activities and engagement.
- Protect and enhance the City's natural resources, critical areas, and wildlife habitat.

The thrust of the City planners is to maintain and enhance the existing character of the community and concentrating business and industry in clusters. According to the currently adopted comprehensive plan, this includes the West Milton Commercial District on the far west end of the city, the Uptown area on the far east edge of the city, and town center in the south-central part of the city.

Figure 40: Milton Population Forecasts, Comprehensive Plan 2035

Year	2000	2010	2014	2020	2030	2035	2040
Population	5,795	6,968	7,265	7,452	8,434	8,884	9,335

Population growth is the single greatest driver of call volume, and Milton's population growth is expected to grow by 1.53 percent per year (using 2000 as a baseline) through the year 2035.

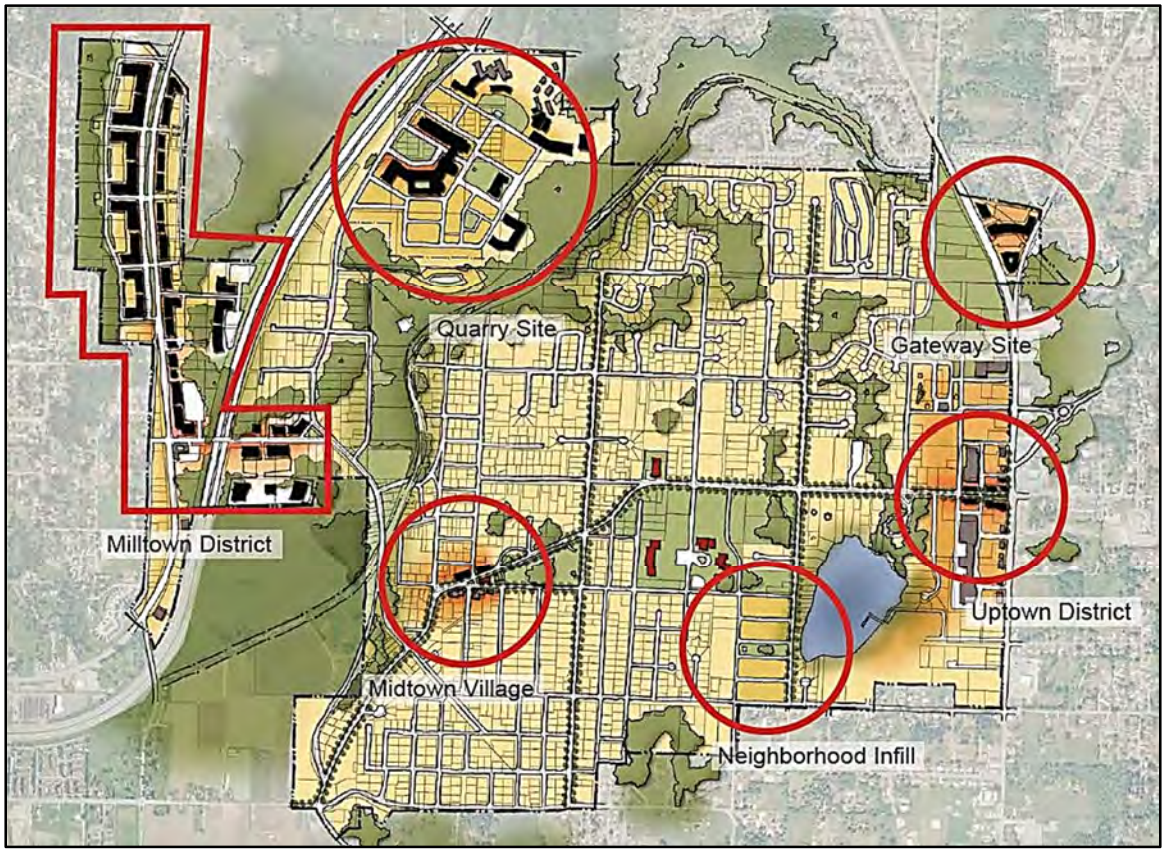
In December of 2017, Milton amended their comprehensive plan to include new population and households projections through 2040. The following figure displays the December 2017 population projection for the City of Milton.

Figure 41: Amended Milton Population and Households, December 2017

Year	2000	2010	2014	2025	2030	2035	2040
Population	5,795	6,968	7,265	8,628	9,187	9,747	10,307
Households	2,197	2,988	3,041	3,544	3,557	3,553	3,549

The Milton amended population and household projections are based on Washington OFM data, PSRC Land Use Vision data (Fall 2017), and a City of Milton population projection. The population projection demonstrates the population of Milton growing by nearly 80 percent between 2000 and 2040, at an average annual rate of approximately 1.95 percent. The amended comprehensive plan also identifies six Special Planning Areas (SPA) within the Milton UGA. At least two of these SPAs may affect future EPF&R service demand. The following figure is extracted from the City of Milton's December 2017 Comprehensive Plan amendment.

Figure 42: Milton Special Planning Areas



Potential future development along SR 99 in the West Milton Commercial District (labeled Milltown District) is anticipated to increase as commercial development along the SR 99 corridor in the adjacent cities of Fife and Federal Way increases. This would increase the number of commercial and light industrial risks in this area. The Quarry Site represents the largest aggregation of undeveloped land in Milton and has significant potential for redevelopment according to the 2017 amendment to the Milton Comprehensive Plan. Possible uses listed in the comprehensive plan include a continuing care retirement community (CCRC) and a RV resort and Sports Complex. Either of these uses would increase demand for EPF&R services in an area that is already experiencing increased service demand. Further discussion of future station options in the Milton and Edgewood area occurs elsewhere in this report.

Sumner

As with the other communities served by EPF&R, the City of Sumner completed its latest comprehensive land use plan update in December 2015. The City is still committed to maintaining a small town feeling true to its heritage, much as it did in the 2010 plan.

The Sumner vision statement for the comprehensive plan 2035 is, "Today, Sumner is bound together by its community pride, respect for neighbors, agricultural and small-town heritage, and support for small businesses as well as industry, and concern for the environment. We recognize that there are community needs—the improvement of the Downtown business area, repair of streets and sidewalks, management of traffic, along with adequate public services and parks. Our vision for the coming decades enhances our positive community ties, quality of life, and addresses community needs. We share and support this vision for the year 2035." The comprehensive plan goes on to state that the City's commitment to the community through the planning process, "shows strongly its unique 'small town' characteristics and appeal even in the face of a changing world." Further stated in its commitment to the plan, the City, "embodies our agricultural heritage, our desire for open space."

Sumner's growth management boundary extends east from the current city limits, anticipating this unincorporated area joining the city eventually. Much like the 2010 comprehensive plan, infill is still preferred over expansion to keep the environmental impacts to a minimum within the urban growth area.

As a result, lot sizes will be allowed to shrink to accommodate a growing population, with higher density housing mostly contained in the downtown core within walking distances of shops and services. Infill and clustering are encouraged for the core of the city to prevent sprawl. The vision calls for rail, Sounder commuter trains, and Sound Transit to connect Sumner to itself and to other communities. Sumner still plans for 25 percent of the population growth allocation to be satisfied through affordable housing.

Sumner has fire service and EMS goals and objectives as part of its comprehensive plan, citing the 2011 capital improvement plan EPF&R adopted:

> EPF&R will provide resources necessary from staffed, urban stations to assume a response time of five minutes or less 90 percent of the time for the first arriving unit. Further, EPF&R will provide sufficient personnel to provide an effective response force in ten minutes or less, 90 percent of the time. The comprehensive plan defers to the EPF&R Capital Facilities Plan to define what "sufficient" means as it relates to an effective response force. The Sumner comprehensive plan also calls for the city to coordinate with EPF&R on an early warning system to protect against flooding, as well as from mud flows (lahars) from Mt. Rainier.

As previously indicated in the EPF&R 2011 Capital Facilities Report, the City strives to make the community very livable. As such, strategies such as traffic calming and other measures are planned to be implemented to reduce speeds, making streets safer for pedestrians and bicyclists. EPF&R must be engaged in the implementation of these measures to avoid the inadvertent negative impacts to response times for emergency vehicles.

The town center area is designated as the one-half mile radius around the commuter rail station. This area

is punctuated with the density of mixed use development (the highest density in the city with between fifteen and forty dwelling units per acre). While this density is significant, the area will also have height restrictions for the buildings located there.

In addition, notable recent growth includes a YMCA Recreation Center in the East Sumner area that was opened last year and is intended to serve the East Pierce County region. The transportation grid is also slated for improvement, with 62nd Street East being developed between 160th Avenue East to the Sumner Tapps Highway. Intense commercial or mixed use development will occur in this area. Careful examination of these construction features is warranted as well to maintain adequate fire department access and egress from commercial structures. Sumner's zoning types and densities are depicted in Figure 43 which follows:

Figure 43: Sumner Zoning and Density

Category	Density (du=dwelling units)	Floor Area Ratio
Residential-Protection (R-P)	1 du/20 acres	–
Low Density Residential-1 (LDR-1)	2.9–5.0 du/acre	–
Low Density Residential-2 (LDR-2)	5.1–6.5 du/acre	–
Low Density Residential-3 (LDR-3)	6.6–8 du/acre	–
Medium Density (MDR)	8.1–15 du/acre	–
High Density (HDR)	12.1–25 du/acre	–
General Commercial (GC)	12.1–20 du/acre	–
Interchange Commercial (IC)	–	0.3–0.5
Neighborhood Commercial (NC)	12.1–20 du/acre	0.3–0.5
Central Business District (CBD)	12.1–30 du/acre	2.0–3.0
Mixed Use Development	15–40 du/acre	2.4–3.2
Urban Village (UV)	12.1–40 du/acre	1.0–2.0
Light (M-1)	–	0.3–0.8
Heavy (M-2)	–	0.3–0.8
Public & Private Facilities &	–	0.3–0.8
Planned Mixed Use Development	5–37.5 du/acre 0.3–0.5	–

The upper ranges of some of these designations has increased over the previous report. Notably, the mixed use upper limit has increased from 20 dwelling units per acre to 40 dwelling units per acre.

South Prairie

The South Prairie comprehensive plan was adopted June 23, 2015 and projects to 2035. The Town's vision statement for the comprehensive plan states in part that the citizens want, "South Prairie to remain a compact town with a vibrant business district along SR 162." The city limits annexation to only those areas that pay for its impact on existing services.

Goal #14 of the plan states, "South Prairie should retain the rural small-town quality of life. This quality of life places a premium on privacy and individual choice and a minimum of government regulation." This is not to mean that the city resists progress. In fact, Goal #13 states, "South Prairie should promote light industry in the community." Goal #15 strikes a balance, by stating, "South Prairie should promote the development of a central business district, a Town Center to serve the Town and surrounding area. The Town Center should promote the small rural atmosphere of the Town and its cultural heritage."

The town wants to remain a small, compact town with a vibrant business area along State Route 162. It appears from South Prairie's Comprehensive Plan 2035, the community's growth pattern and character will not have a significant impact on EPF&R.

FUTURE CONDITIONS

Based on all the foregoing growth forecasts, the following are station by station projected response demand through the year 2040.

Figure 44: Projected Service Demand by Station Area

Year	Sta 111	Sta 112	Sta 113	Sta 114	Sta 116	Sta 118	Sta 115	Sta 119	Sta 124	Mutual Aid	Total Incidents
2017	2,166	1,639	2,603	680	685	1,035	302	336	1,256	336	11,038
2020	2,350	1,879	2,981	769	813	1,053	367	365	1,368	389	12,334
2025	2,782	2,852	3,061	911	963	1,246	435	432	1,619	461	14,762
2030	3,214	3,295	3,536	1,052	1,112	1,440	502	499	1,871	532	17,053
2035	3,645	3,737	4,011	1,193	1,262	1,633	598	688	2,050	626	19,443
2040	4,077	4,180	4,486	1,335	1,411	1,827	637	634	2,138	675	21,400

ESCI expects EPF&R service demand to increase to approximately 21,400 incidents, by 2040. Three EPF&R stations areas will exceed 4,000 unique incidents. This is a level at which two staffed first-out apparatus per station should be considered to preserve station reliability and response performance. Additionally, unit hour utilization (UHU) rates for EMS units at Stations 111, 113, 116, and 118 are already at or near levels (25 to 30 percent) that negatively affect response reliability, personnel morale and effectiveness. The argument can be made that there is an immediate need for additional staffed EMS units to improve response reliability and response time performance in these station areas.

By 2040, combined service demand in the Edgewood/Milton station areas will exceed 4,000 incidents. Currently Station 118 handles incidents in the Station 118 (Edgewood) and Station 124 (Milton) station areas. The West Milton Commercial District and The Quarry site identified for future development are beyond four minutes travel of Station 118. Replacing the current volunteer Station 124 with a new staffed facility slightly to the west of the current station provides an opportunity to improve response performance and increase the concentration of resources available in the Edgewood/Milton area. Additional discussion of this option is provided later in the 20-Year Station Capacity Projections section.

Service demand in the current Station 112 area more than doubles between 2017 and 2040, due to the growth in the Tehaleh Employment Based Planned Community (EBPC) and other development in the Pierce County Unincorporated UGA primarily in the Station 112 station area. As discussed elsewhere, a relocation of Station 112 and an additional station (Station 117) in the area are proposed to improve reliability and response performance.

Using NFIRS property use classifications, the following figure examines 2017 incident data to determine the types of properties that generate demand for fire department services.

Figure 45: Incident Property Use by Station Area, 2017 Incidents

NFIRS Property Use Category	Station 111	Station 112	Station 113	Station 114	Station 115	Station 116	Station 118	Station 119	Station 124	Total
1 – Assembly	2.9%	2.1%	4.1%	1.9%	1.5%	0.2%	1.9%	0.3%	2.8%	2.6%
2 – Educational	2.2%	0.6%	1.6%	2.2%	2.9%	4.3%	2.0%	0.0%	0.8%	1.7%
3 – Health Care, Detention & Correction	23.9%	5.4%	10.4%	1.2%	2.2%	2.8%	17.6%	0.0%	27.0%	13.4%
4 – Residential	50.3%	74.3%	51.9%	75.0%	73.1%	78.5%	59.6%	67.9%	51.5%	59.6%
5 – Mercantile, Business	4.5%	4.7%	5.7%	1.9%	0.7%	0.6%	2.6%	1.0%	4.4%	4.0%
6 – Industrial, Utility, Defense, Agriculture, Mining	0.1%	0.9%	0.4%	0.8%	0.0%	0.5%	0.1%	3.0%	0.0%	0.4%
7 – Manufacturing, Processing	0.0%	0.0%	2.6%	0.9%	0.0%	0.0%	0.1%	0.0%	0.1%	0.7%
8 – Storage	3.2%	2.5%	6.6%	2.6%	1.5%	2.3%	2.8%	2.6%	0.5%	3.4%
9 – Outside or Special Property	12.9%	9.5%	16.7%	13.6%	18.2%	10.8%	13.3%	25.2%	13.0%	14.1%

Overall, approximately 60 percent of service demand occurred at residential properties, principally one or two-family dwellings, followed by multi-family residences. Station 116 demonstrates the highest percentage of responses to residential properties and Station 111 responded to the lowest percentage of residential responses. Over 14 percent of incidents took place on outside properties, most of these incidents happened on the transportation network—streets in commercial areas, residential streets, parking areas, highways or divided highways. Nursing homes, assisted living facilities, doctor's offices, clinics, and hospitals represent the majority of risk by property use in the Health Care/Detention category. Station 111 and Station 124 display the highest percentage of incidents occurring at a health care facility. These three property use categories represent approximately 87 percent of EPF&R service demand in 2017. The remaining incidents are distributed as displayed in this figure.

Using National Fire Incident Reporting System (NFIRS) incident type codes, ESCI categorizes incidents as *Fires* (structures, vehicle, brush, any 100 series NFIRS code), *EMS* (all calls for medical service, including MVA's and rescues, any 300 series NFIRS code), and *Other* (false alarms, hazmat incidents, service calls, all other NFIRS codes). The following figure displays the nature of service demand within the EPF&R study area in 2017, summarized as Fire, EMS, or Other incident categories by station area.

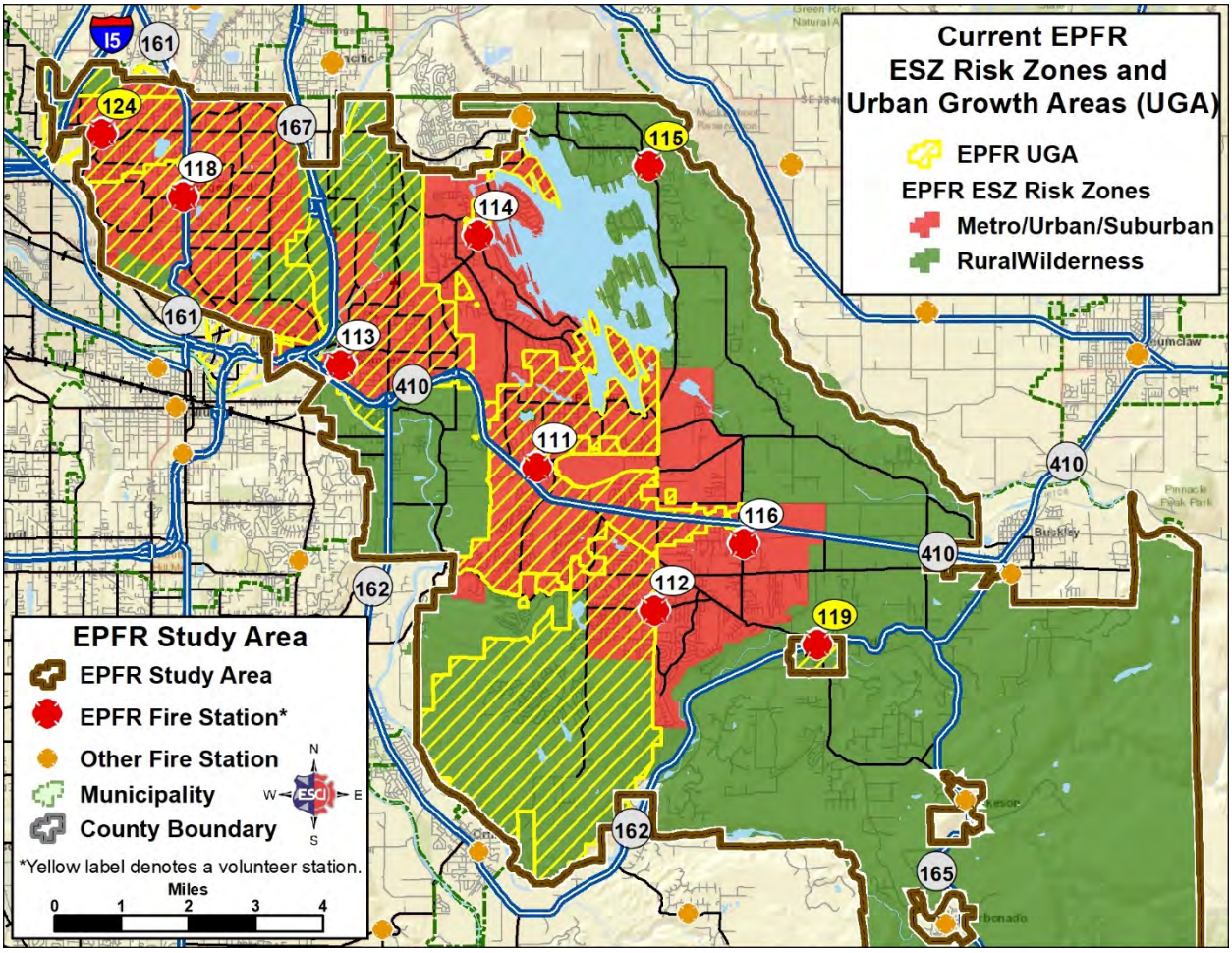
Figure 46: EPF&R Incidents by Category and Station Area, 2017

Incident Category	Station 111	Station 112	Station 113	Station 114	Station 115	Station 116	Station 118	Station 119	Station 124	Total
EMS	77.0%	76.5%	74.1%	72.8%	64.6%	76.2%	74.6%	67.3%	81.6%	74.6%
Fire	2.4%	3.7%	2.3%	2.5%	4.6%	2.3%	2.9%	5.1%	2.0%	3.0%
Other	20.6%	19.7%	23.5%	24.7%	30.8%	21.5%	22.5%	27.7%	16.4%	22.4%

As discussed in the Service Demand Analysis, EMS incidents represent nearly 75 percent of current service demand. EMS incidents in the Station 124 service area exceeded 81 percent in 2017. Overall, incidents categorized as Other are the second most frequent in the service area; comprising 22.4 percent of service demand. Note that Service Calls (public assists), Good Intent Calls (Cancelled incidents), and False Alarms make up the majority of the Other category (92 percent). Fire incidents account for approximately 3 percent of 2017 service demand. The two volunteer stations (Station 115 and Station 119) demonstrate the highest percentage of fire incidents. This may be attributed to the relatively low service demand in these two station areas; rather than a high frequency of fire incidents.

The percentage of incidents by category in the EPF&R service area is comparable to similar fire jurisdictions, nationally and regionally, that provide fire protection and EMS transport service to a mix of metropolitan, urban, suburban, and rural areas.

Figure 47: EPF&R Risk Zones (ESZ) and Urban Growth Areas



As displayed in this figure, there are emergency service zones (ESZs) currently inside either a municipal or the county UGA that are currently classified as Rural/Wilderness risk zones in the ESZ data. EPF&R should change the classification in these ESZs to Metro/Urban/Suburban. Especially, in the area southwest of Station 112, the Sumner area, and the King County portion of Milton, changing the risk classification would more accurately represent the current or future level of risk present.

The primary risk factor affecting future risk in the EPF&R service area is the projected increased population and the resulting increase in service demand. State land use planning goals (Washington Growth Management Act) ensure to some degree, that local land use plans (Municipal and County Comprehensive Plans) identify permissible land uses in urban and rural areas, which meet the stated goals of the GMA. While service demand will increase, the percentage of risk by property use should remain similar to that demonstrated currently. The notable exception to this may be incidents at health care facilities.

EMS incidents will continue to represent between 75 to 80 percent of EPF&R service demand. Meaning that in 2040, EPF&R will respond to approximately 16,000 to over 17,000 EMS incidents annually.

Staff & Equipment 20 Year Capacity Projections by Fire Station

The following figures present a brief discussion of what ESCI believes are the minimum operational needs (staffing and apparatus) to meet the future needs of each of the current and proposed EPF&R fire stations.

- ESCI assigns a minimum of three personnel to all staffed first out apparatus, regardless of apparatus type.
- Unstaffed ancillary or seasonal apparatus such as reserve engines, brush engines, tenders, heavy rescues, and rescue boats are not included.
- Any career staffed station should have apparatus bays for at least two staffed first-out apparatus and living quarters for two on duty crews (6 personnel).

Figure 48: Station 111

Station	Proposed Plan	Personnel	Apparatus	Future Service Demand (2040)	Additional Future Considerations
Station 111	Replace	Minimum 10	4-includes Battalion Chief	4,077	Living quarters and apparatus bay for additional EMS transport unit.
Discussion	Station 111 is well located to serve the current station response area, with good access throughout the EPF&R service area. The station is well positioned to house the Battalion Chief or additional apparatus for response through the service area. By 2040 service demand in this station area will increase to a level requiring at least three staffed response units. EMS incidents represent 77 percent of service demand. UHU rate for EMS apparatus exceeds 31 percent. Residential properties, health care facilities, and roadways are the primary properties types for responses. The City of Bonney Lake owns the facility which is part of the Bonney Lake Public Safety Building. EPF&R has received notice from City of Bonney Lake that the City intends to terminate their lease with the Fire District.				

Figure 49: Station 112

Station	Proposed Plan	Personnel	Apparatus	Future Service Demand (2040)	Additional Future Considerations
Station 112	Replace/ Relocate	Minimum 6	2	4,180	Living quarters and apparatus bay for at least one additional staffed apparatus.
Discussion	As discussed, the Station 112 service area includes approximately 3,000 acres of the Pierce County UGA slated for new development; the greatest amount of which is expected to occur between 2020 and 2040. Service demand is projected to grow to over 4,100 incidents or more. To better serve the expected growth in the service area, a proposed new location for this station has been identified. EMS incidents are the primary incident type (77%) in the current Station 112 area. The percentage of EMS incidents is expected to remain the same. Residential properties represent 74 percent of incident responses. New development in the Tehaleh EBPC will change the nature of risk in the Station 112 service area to some degree, but EMS incidents at residential properties will continue to be the primary risk factor. Service demand should be redistributed between Station 112, Station 116, and the proposed Station 117.				

Figure 50: Station 113

Station	Proposed Plan	Personnel	Apparatus	Future Service Demand (2040)	Additional Future Considerations
Station 113	Remodel	Minimum 6	2	4,486	Living quarters and apparatus bay for at least 1 additional staffed apparatus.
Discussion	Station 113 is currently the busiest EPF&R station and is expected to remain so. The station is well located to serve Sumner and the area south of SR 410. Appropriately, the EPF&R ladder truck is located at this station. After residential properties, commercial and storage property uses that may require an aerial apparatus are the most common property types for Station 113 responses. EMS incidents represent 74 percent of current service demand. UHU rate for the EMS unit is currently 27 percent.				

Figure 51: Station 114

Station	Proposed Plan	Personnel	Apparatus	Future Service Demand (2040)	Additional Future Considerations
Station 114	Replace	Minimum 3	1	1,335	
Discussion	Service demand in the Station 114 service area consists of largely low or moderate density residential properties (75%). Approximately 73 percent of service demand is EMS incidents. Much of the service area is unincorporated land outside of a UGA and not targeted for redevelopment. Service demand is projected to increase from approximately 680 incidents in 2017 to 1,335 incidents by 2040. However, a single staffed response unit should be adequate to handle response duties in the Station 114 service area.				

Figure 52: Station 115

Station	Proposed Plan	Personnel	Apparatus	Future Service Demand (2040)	Additional Future Considerations
Station 115	Remodel	Volunteer-0	1	637	
Discussion	Station 115 is currently an unstaffed volunteer station in a predominately low density residential area outside of any UGA. New development is not anticipated to increase service demand or change the risk level in the Station 115 service area. Station 114 and Station 111 handle the majority of service demand in the Station 115 first due area.				

Figure 53: Station 116

Station	Proposed Plan	Personnel	Apparatus	Future Service Demand (2040)	Additional Future Considerations
Station 116	Remodel	Minimum 6	2	1,411	
Discussion	The Station 116 service area is primarily rural residential in nature, except for the East Town section of Bonney Lake and an area of higher density residential properties southwest of the station. In addition, Station 116 is the closest staffed station to the volunteer Station 119 service area and responds into the large undeveloped southern portion of the EPF&R service area. Residential properties represent 79 percent of Station 116 service demand. Seventy-six percent of the service demand in the Station 116 service area are EMS incidents. New development or population growth is not expected to change the nature of risk in the current Station 116 service area. However, moving Station 112 to the proposed location southwest of the current Station 112 will most likely require adjusting the Station 116 first due area to include a portion of the higher density residential area that is currently part of the Station 112 first due area. Additionally, examination of unit utilization rates reveals that the medic unit at Station 116 is the second busiest EPF&R apparatus—due in large part to long transport times—based on Unit Hour Utilization (28.4%).				

Figure 54: Proposed Station 117

Station	Proposed Plan	Personnel	Apparatus	Future Service Demand (2040)	Additional Future Considerations
Station 117	Proposed New	Minimum 3	1	Development dependent	
Discussion	Station 117 is a proposed new station intended to address future development and the resulting increase in service demand in the area south of the current Station 112 service area. A site for this station in the Tehaleh planned community has been identified and prepared by the developer of Tehaleh. Tehaleh is being developed as an Employment Based Planned Community (EBPC); which will provide a mix of jobs, services, recreation, and housing. The risk profile for this development is similar to that of other urban growth areas in the EPF&R service area (Bonney Lake, Edgewood, Milton, Sumner). Future service demand in this area will be dependent on the rate of development in the Tehaleh community and the changes to the redistribution of incidents between Stations 112, 116, and this proposed station.				

Figure 55: Station 118

Station	Proposed Plan	Personnel	Apparatus	Future Service Demand (2040)	Additional Future Considerations
Station 118	Replace	Minimum 6	2	1,827	
Discussion	Station 118 is the primary response station for the City of Edgewood and the City of Milton. Responses to residential properties comprise the majority of response activity. Responses to health care facilities represent approximately 18 percent of service demand in Edgewood and 27 percent of service demand in Milton. Not surprisingly EMS incidents are the most common incident type. EMS incidents represent 75 percent of service demand in Edgewood and 82 percent of incidents in Milton (highest of all EPF&R stations). UHU rate for EMS unit is currently over 21 percent. Service demand in Edgewood grew by approximately 31 percent between 2014 and 2017; and is expected to increase to over 1,800 incidents by 2040. If Station 124 is relocated and staffed, staff and apparatus could be reduced to a single unit until service demand in the Edgewood/Milton area requires an additional apparatus.				

Figure 56: Station 124

Station	Proposed Plan	Personnel	Apparatus	Future Service Demand (2040)	Additional Future Considerations
Station 124	Replace/ Relocate	3	1	2,138	
Discussion	The Station 124 service area encompasses the City of Milton. An unstaffed volunteer station is located near the Milton City Hall. Career staff at Station 118 current handle response duties in Milton. Service demand in Milton increased by over 35 percent between 2014 and 2017 and comprises approximately 55 percent of service demand in the Edgewood/Milton area. Over 81 percent (81.6 percent) of incidents in Milton are EMS related. Approximately 52 percent of incidents occur at residential properties. Over 27 percent of service demand occurs at health care facilities in Milton. The City of Milton amended their Comprehensive Plan in December 2017, with a projected population of 10,307 in 2040. Additionally, the comprehensive plan identifies Special Planning Areas that will increase development and activity in the Milton service area. The City of Milton owns the current Station 124 site. It currently occupies 40% of the space within Station 124 for offices. The city has further need for space, and would like to occupy the rest of the station.				

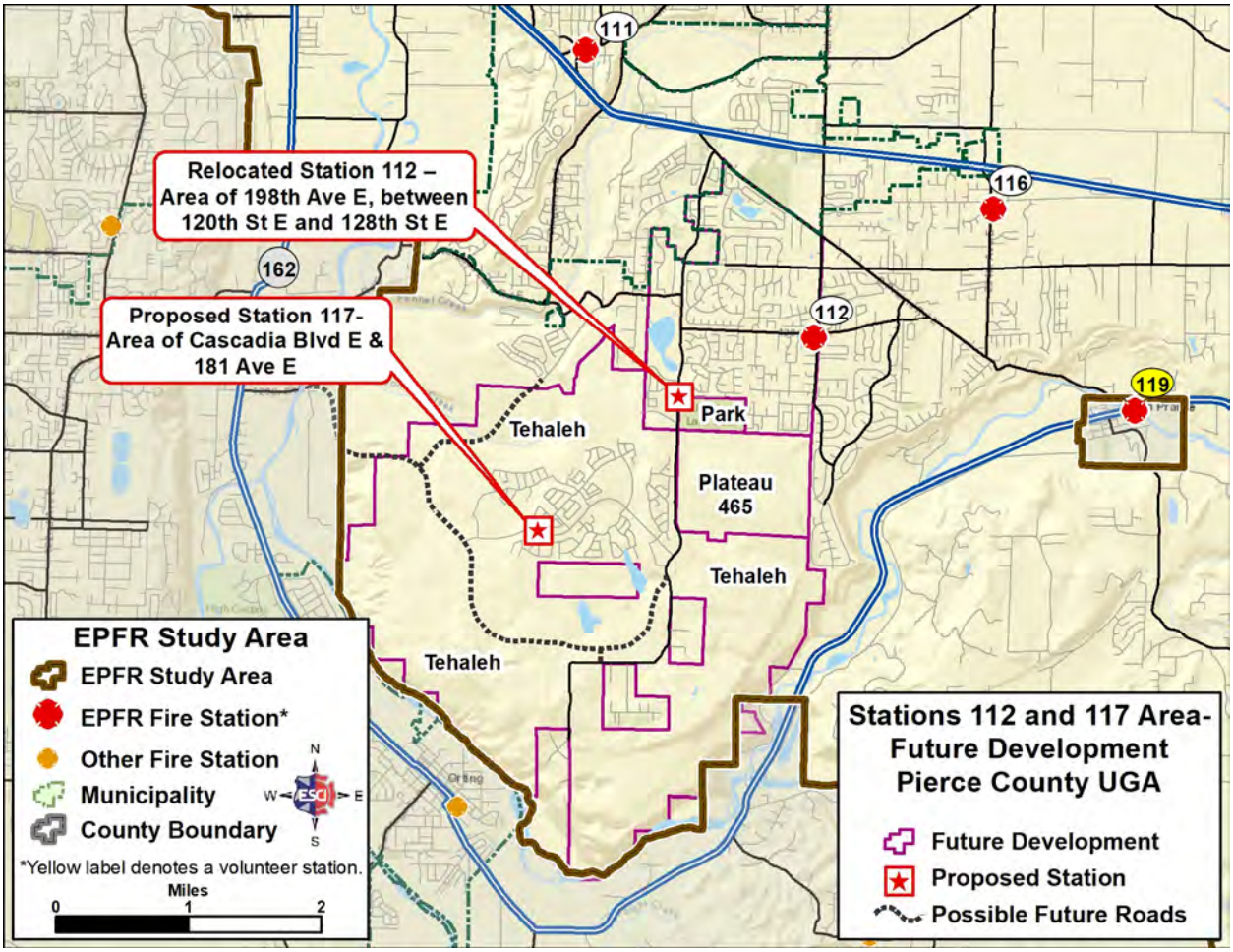
STATION 112/117 AREA ANALYSIS (TEHALEH/PLATEAU 465)

Station 112 currently serves a largely residential area south of the City of Bonney Lake. The current Station 112 first due area includes the Prairie Ridge Subdivision and the large portion of the unincorporated Pierce County UGA (PCUGA), which includes the Tehaleh EBPC and the Plateau 465 Planned Community. As discussed, the PCUGA is expected to experience the greatest amount of development and growth in the EPF&R service area between now and 2040. Service demand is predicted to at least double to over 4,100 incidents by 2040.

The current Station 112 has been identified as a priority for replacement in the EPF&R Capital Facilities Plan. This is due primarily to the current condition and size of the current facility. The current location is relatively well located to respond to service demand in the older neighborhoods that are part of the Station 112 first due area. However, most of the area slated for development in the PCUGA is beyond six minutes travel of an EPF&R fire station. An alternative to replacing Station 112 in the current location is to move this station to a location that would extend coverage to unserved areas expected to experience growth and increased service demand; while maintaining adequate coverage in the area covered from the current Station 112 service area.

The following figure displays the portions of the Pierce County UGA within the EPF&R service area expected to experience the greatest amount of growth and development by 2040.

Figure 57: Station 112/Station 117 Area and Future Development

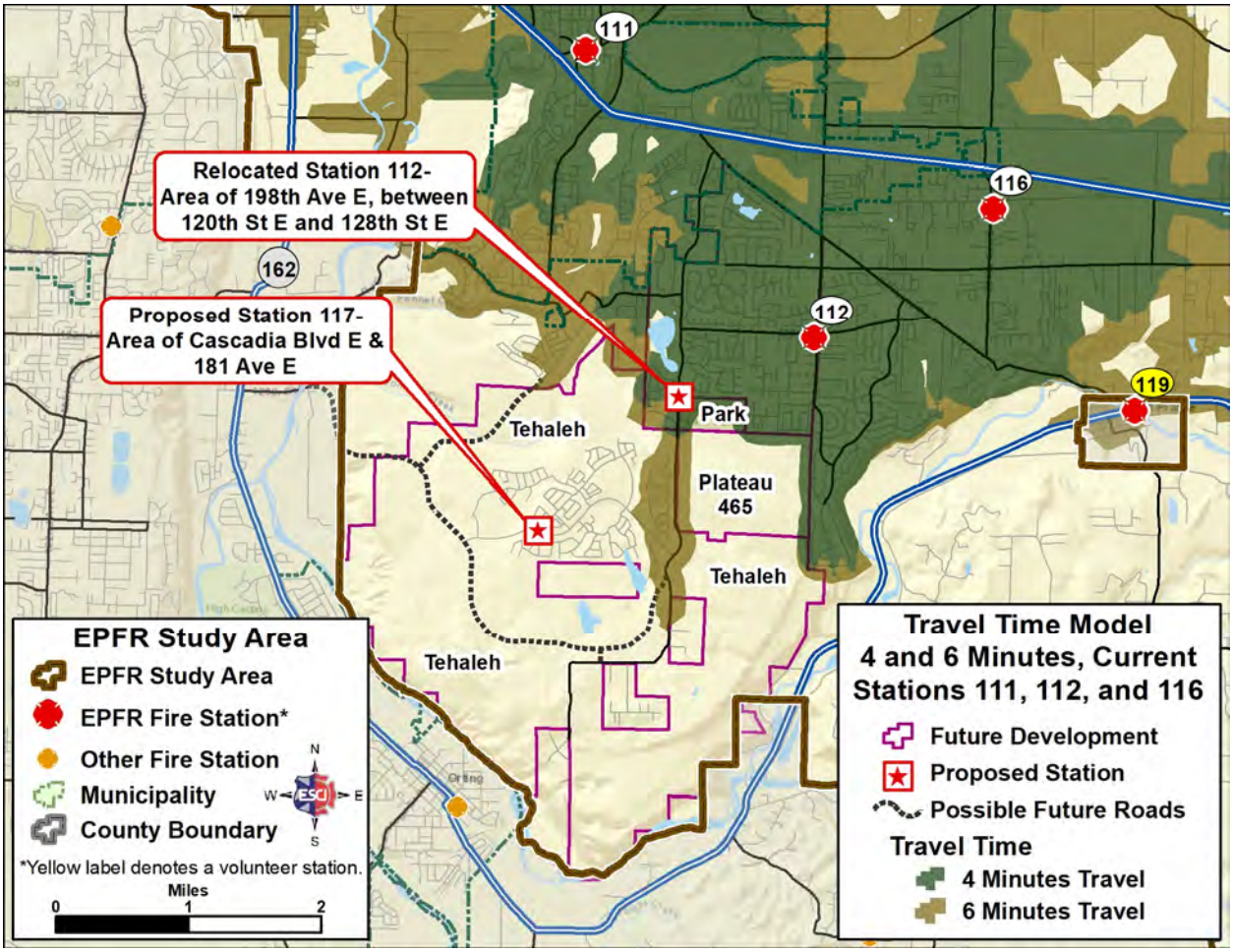


The area labeled Future Development in this figure encompasses approximately 5,300 acres of land. The approximately 4,800 acres in the Tehaleh EBPC and nearly 490 acres in Plateau 465. The feature labeled Possible Future Roads represents components of the possible future road network through the area. This data is derived from conceptual planning documents available on the Pierce County Planning Department web page. ESCI has included this data in the network dataset to provide a better picture of travel time through the area. Note that this data is only preliminary and may or may not represent the actual road network.

EPFR should work with Pierce County planners and the developers of the Plateau 465 planned community to require a connection from 198th Avenue E to the East, connecting to 215th Avenue E/Prairie Ridge Dr. This would improve service from a relocated Station 112 and Future 117 to the Prairie Ridge area, in addition to providing an option for emergency egress during evacuations. This potential egress is critical due to the Wildland Urban Interface threat that is being developed by growth in this area. The Washington Growth Management Act (GMA) mandates that public safety needs be included in the comprehensive planning process.

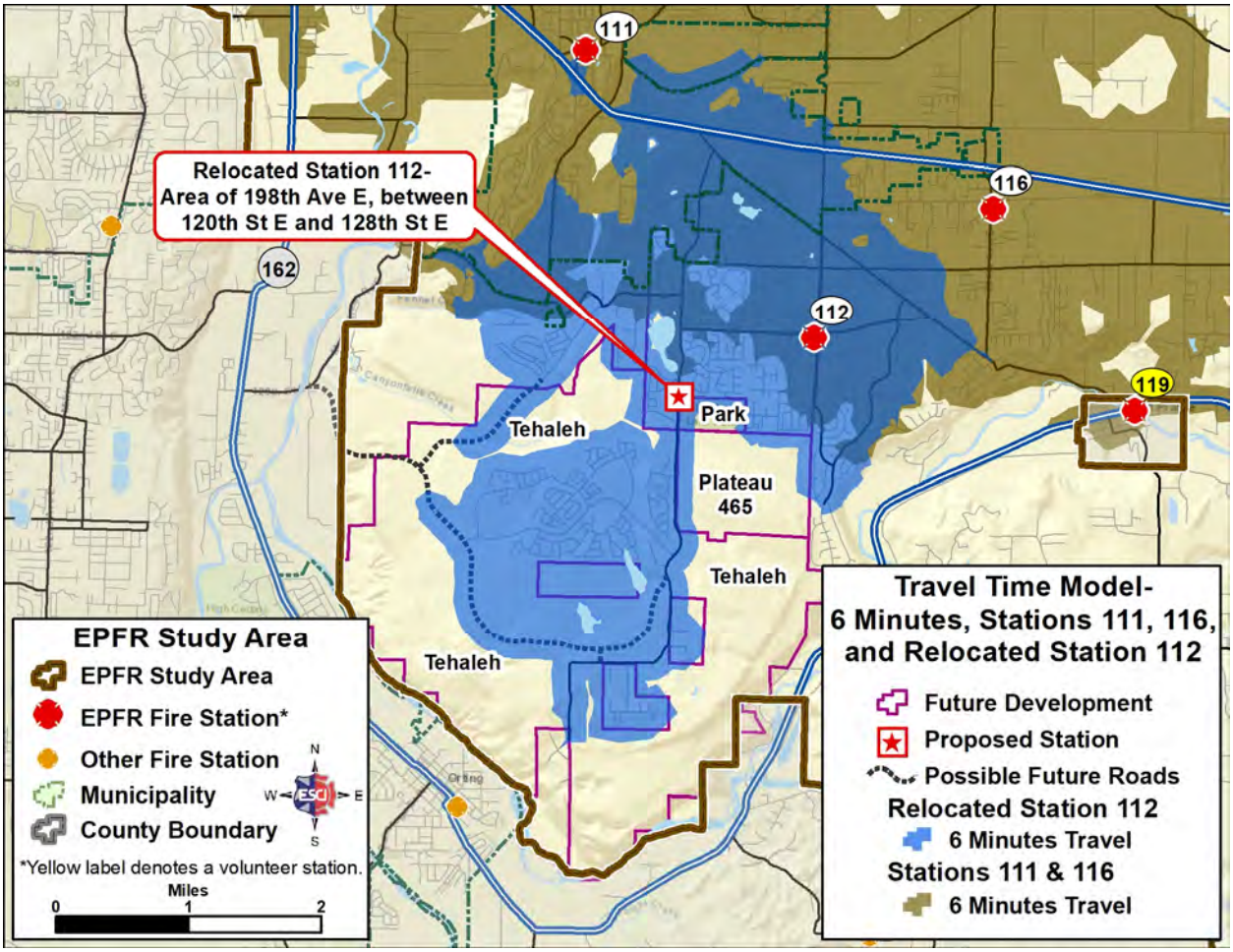
The following figure displays travel time capabilities from Stations 111, 112, and 116. The locations of the proposed relocated Station 112 and the proposed future Station 117 are also displayed.

Figure 58: Travel Time Model, Current Stations 111, 112, 116



The area around the proposed Station 117 is currently under development. There are approximately 1,100 occupied structures in this area. Examination of incident data reveals that this area generated 100 to 130 emergency incidents in 2017.

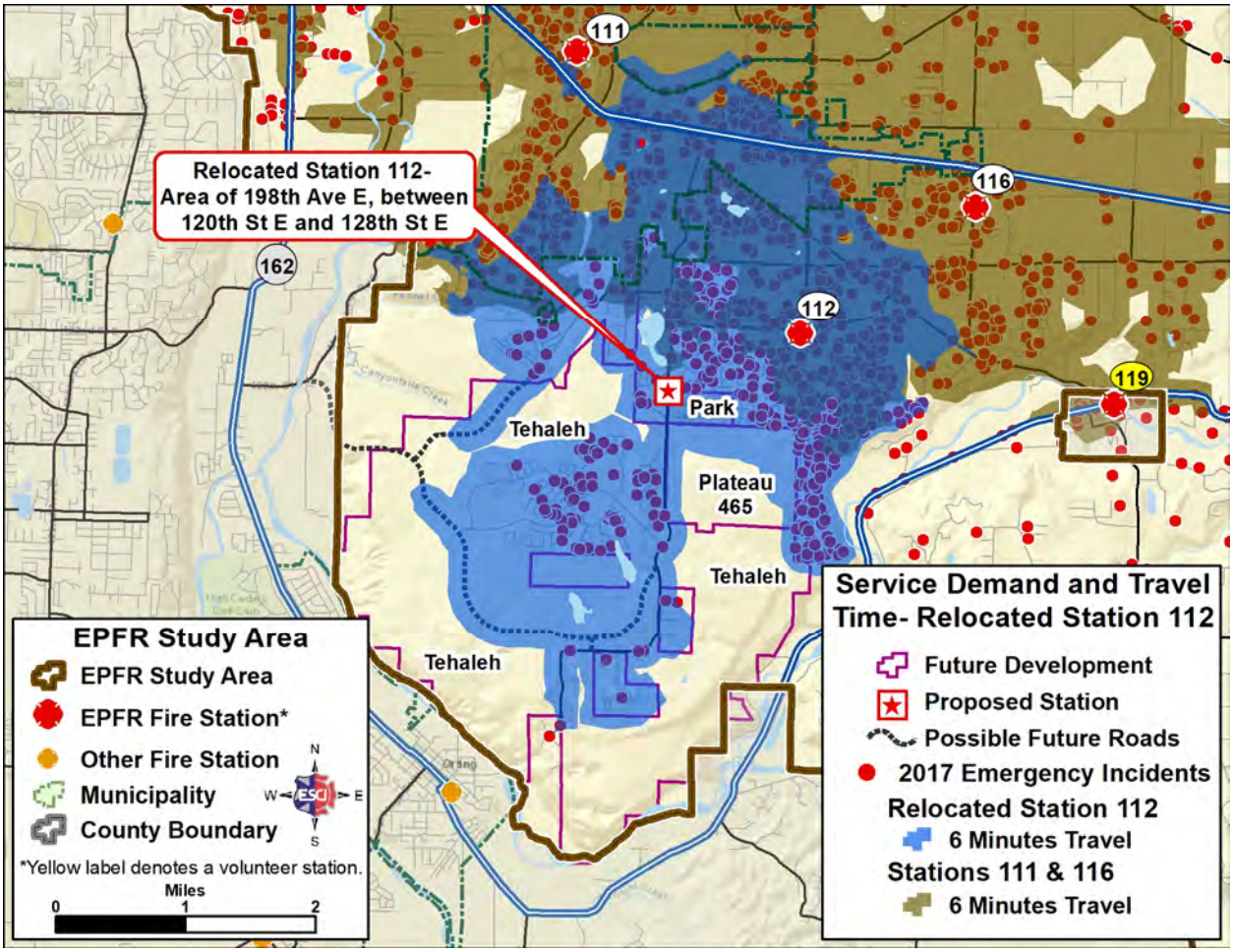
Figure 59: Six Minutes Travel Time, Relocated Station 112 and Stations 111 and 116



As displayed in this figure, relocating Station 112 to the location displayed (between 120th Street E. and 128th Street E., at or near 198th Ave. E., preferably at the edge of the park) brings the currently developed portions of Tehaleh and a large portion of the future development in the area within six minutes travel of the relocated Station 112.

The next figure overlays the six-minute service area over 2017 emergency incidents to examine the coverage of current service demand in six minutes.

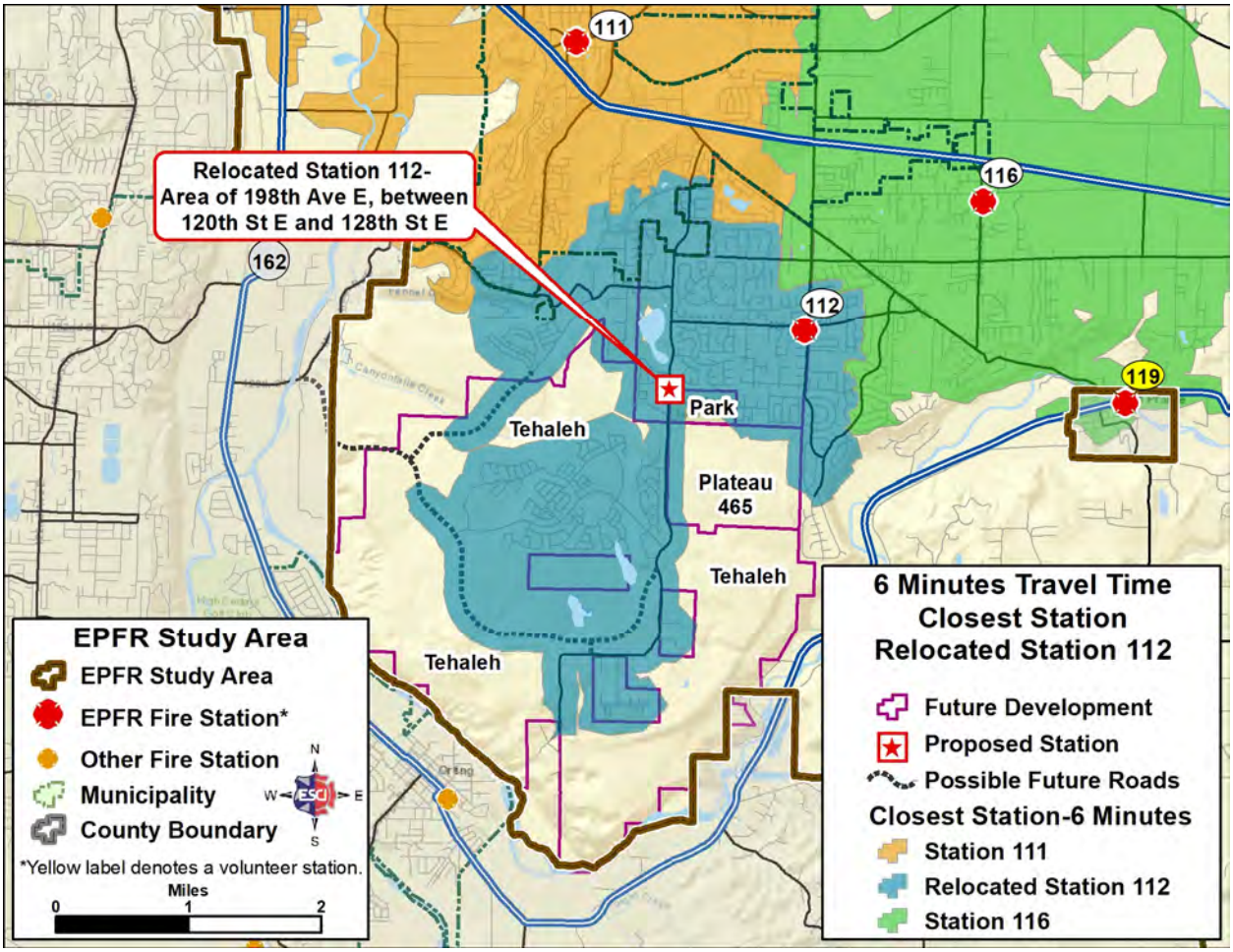
Figure 60: Relocated Station 112—Service Demand and Travel Time



Overall, moving Station 112 to the area of 198th Avenue E. between 120th and 128th Street E. results in approximately 88 percent of 2017 emergency incidents falling within six minutes travel of an EPF&R station. This is the same percentage as the overall coverage from the current station deployment. Examination of emergency incidents just in the Station 112 service area, reveals that the current deployment is within six minutes travel of approximately 92 percent of current emergency service demand. Relocating Station 112 results in slightly over 91 percent of current emergencies within six minutes travel of a fire station (21 incidents in the 2017 data). As new development and activity occurs in Tehaleh and the Plateau 465 area, service demand in the area will no doubt increase. This will erase the difference between the current and the proposed future deployment with Station 112 relocated.

The following figure displays the six minutes travel time service areas of the three stations displayed, based on the closest station by travel time over the street network. If an east-west connection is made between 198th Ave E and Prairie Ridge Drive through the Plateau 465 development, the south end of Prairie Ridge would again be serviced within six minute travel time goal.

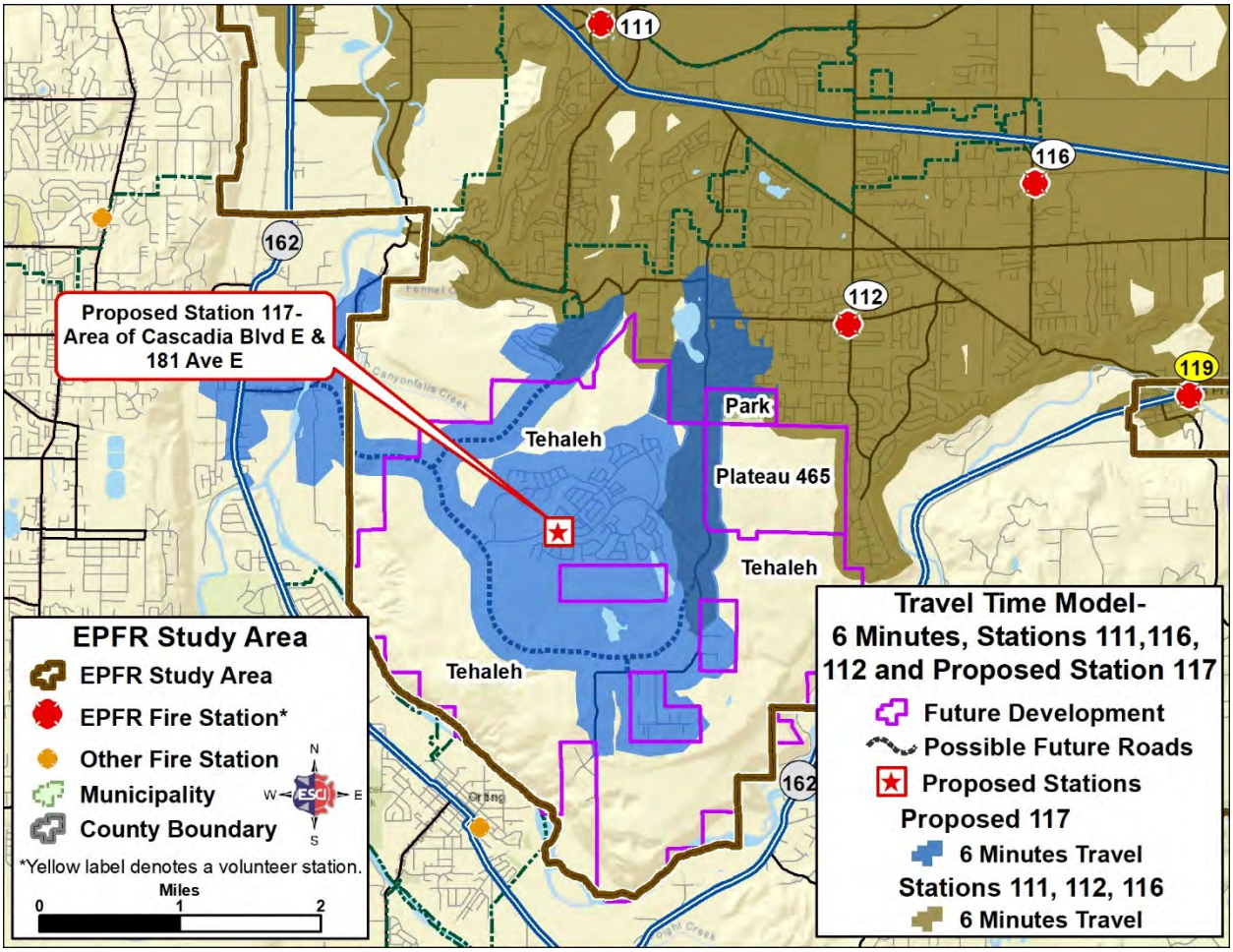
Figure 61: Closest Station, Six Minutes Travel



Moving Station 112 to the proposed location on 198th Avenue E. will cause the Station 116 service area to move to the west slightly into an area currently served by Station 112. The relocated Station 112 becomes the closest station to an area that is currently served by Station 111. Inspection of the GIS data reveals that the travel time required to reach the transition to each of the station areas averages approximately 3.5 to 4.5 minutes. Also, the far southern end of the Prairie Ridge subdivision which is beyond six minutes travel of a station in the proposed deployment, can be reached in approximately 6.5 minutes from the proposed relocated Station 112 site (and closer to 4 minutes if the east-west connector is required by the County).

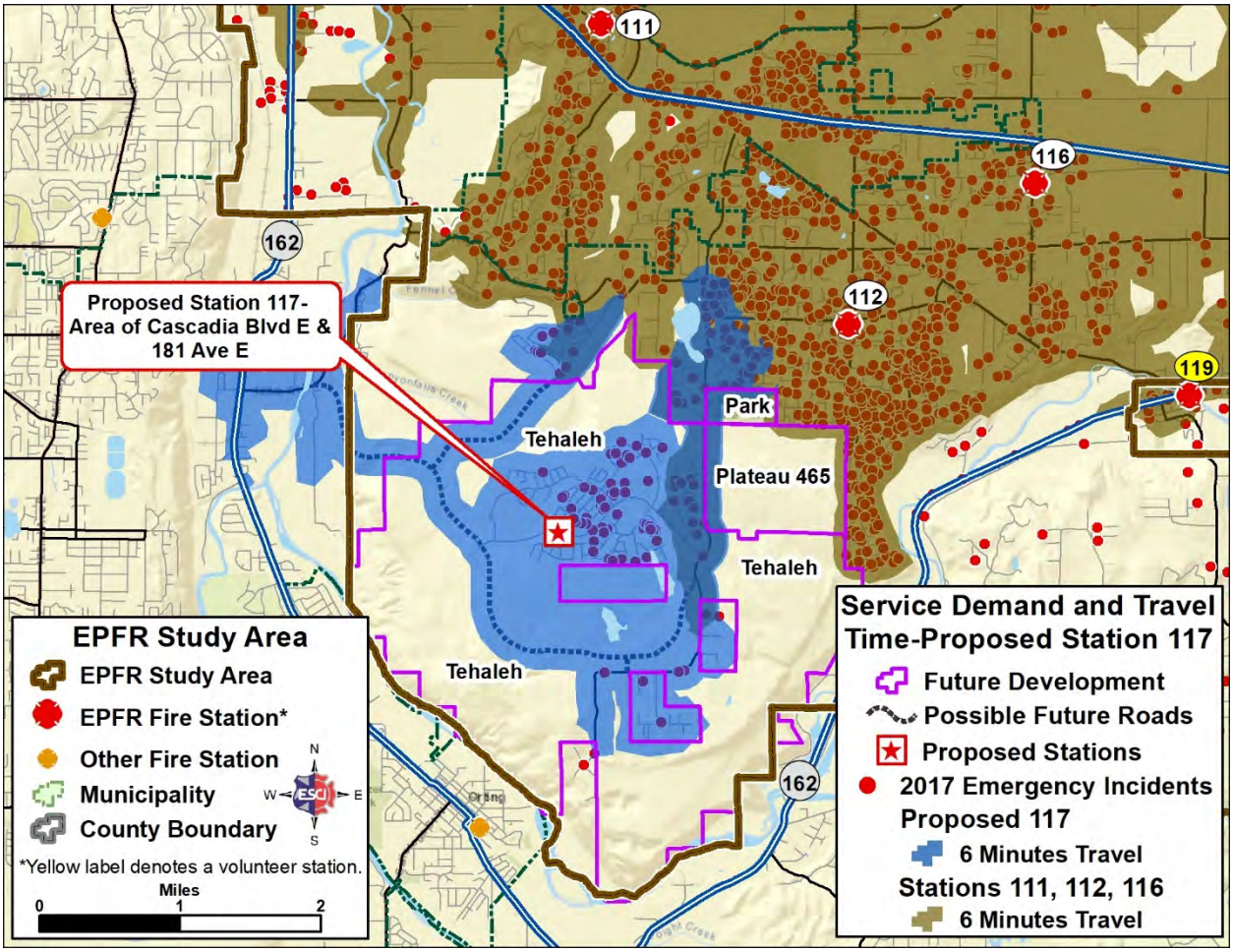
The following figures display potential travel time coverage from the proposed Station 117 location, without relocating Station 112.

Figure 62: Six Minutes Travel, Proposed Station 117 and Current Stations 111, 112, and 116



As displayed in this figure, the proposed Station 117 is well located to serve the currently developed portions of Tehaleh EBPC and future development in the area. Not surprisingly, potential travel time performance improves by one to two minutes over the relocated Station 112 location in some areas. However, in some areas (southern end of 186th Avenue E., back of Falling Waters, and others) travel time performance is similar.

Figure 63: Proposed Station 117—Service Demand and Travel Time



Overall, adding a station at the location displayed improves the coverage of 2017 emergency incidents by less than one percent to approximately 89 percent. Based on emergency incidents just in the Station 112 response area, proposed Station 117 and the current Station 112 can reach over 98 percent of 2017 emergency incidents.

ESCI notes that the difference between the coverage provided in this deployment model and the coverage provided in the previous model (relocated Station 112, Station 111, and Station 116) is approximately 100 to 150 incidents department wide and approximately 80 incidents in the Station 112 service area. Comparing the service areas of the two proposed stations reveals that the proposed Station 117 is within six minutes travel of approximately 174 incidents in the 2017 emergency data set. The relocated Station 112 location reaches 1,754 emergency incidents in six minutes travel or less.

Moving Station 112 to a proposed location in the area of 198th Avenue E. between 120th and 128th Street E. provides an opportunity to serve an area that is currently underserved and expected to continue growing; while maintaining good coverage in an area which already experiences high service demand. Additionally, the proposed site satisfies the need to replace a facility (Station 112) that may not meet the current needs of EPF&R.

STATION 112, PROPOSED STATION 117 AND PIERCE COUNTY UGA CONSIDERATIONS

Station 112 is identified as a priority for replacement in the EPF&R capital facilities plan. The station is located on a small lot with limited opportunities for expansion or relocation in the immediate area. Additionally, Station 112 is currently the first due station into the portions of the Pierce County UGA expected to experience extensive development and growth by 2040. Most of the current or planned development in the area is beyond six minutes travel of the current station location. Replacing Station 112 at the current location may not be the most cost effective way to address the current and future needs of EPF&R.

Relocating Station 112 to the location previously discussed provides an opportunity to improve coverage in a portion of the service area that is currently underserved (and projected to grow); while maintaining adequate coverage in the current Station 112 service area. This is true whether or not improvements to the transportation network due to planned development takes place. As discussed, EPF&R should advocate for transportation network interconnectivity as part of the planning and permitting process for new development in the Pierce County UGA.

A site for the proposed Station 117 in the Tehaleh EBPC has been identified and dedicated to EPF&R. This site is well located to serve current and future development in the Tehaleh area. However, relocating Station 112 to the proposed location on 198 Avenue East, would result in redundant coverage in portions of Tehaleh. GIS analysis (Figure 59: Six Minutes Travel Time, Relocated Station 112 and Stations 111 and 116 reveals that the relocated Station 112 is well located to serve current development in Tehaleh; and the portions of Tehaleh most likely to be developed in the next phase of development.

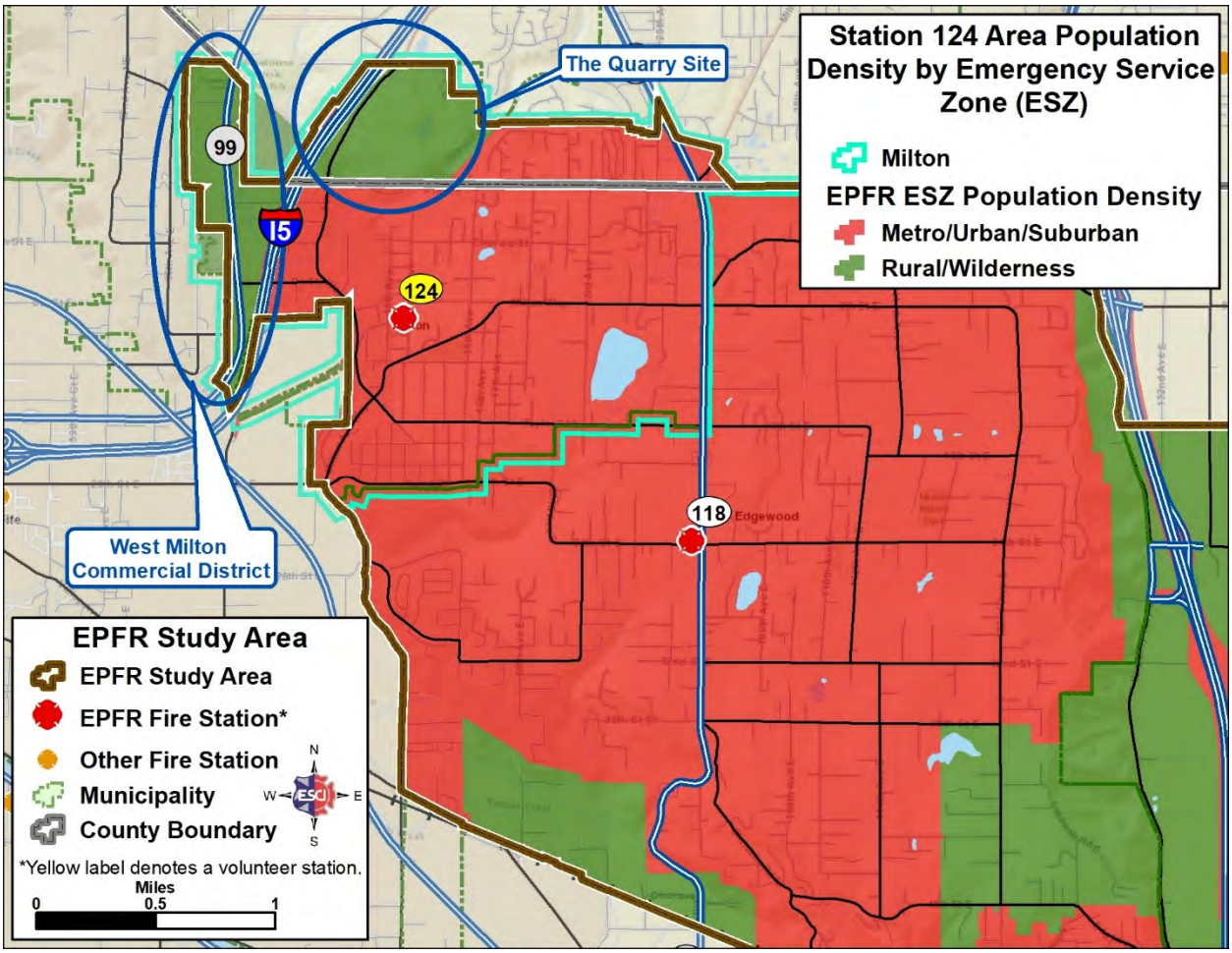
ESCI believes that relocating Station 112 to the proposed location on 198 Avenue East provides an opportunity to address the present needs of EPF&R in the Station 112 service area; and the anticipated near-term future growth in the county UGA. Construction of this station would most likely let EPF&R defer Station 117 to the last construction project for Priority 1 (phase 1). This would allow the department to validate the location or size of the proposed station based on actual development and service demand in the future.

STATION 118/124 AREA ANALYSIS (EDGEWOOD/MILTON)

As discussed, the City of Milton has requested that EPF&R relocate apparatus from the current Station 124. The station is currently an unstaffed volunteer station, which is seldom available for responses. Incidents in the Milton service area are handled by Station 118 which is staffed with a structural engine and a transport EMS unit. Minimum staffing at this station is currently four personnel and will increase to five personnel in 2019.

The Station 118/124 service area is unique in that the approximately 55 percent of service demand occurs in Milton while the station serving this area is in Edgewood. EPF&R has identified replacing Station 124 as part of the proposed capital improvement plan. The following figure displays the current location of Station 118 and Station 124.

Figure 64: Station 124 Area Population Density by ESZ



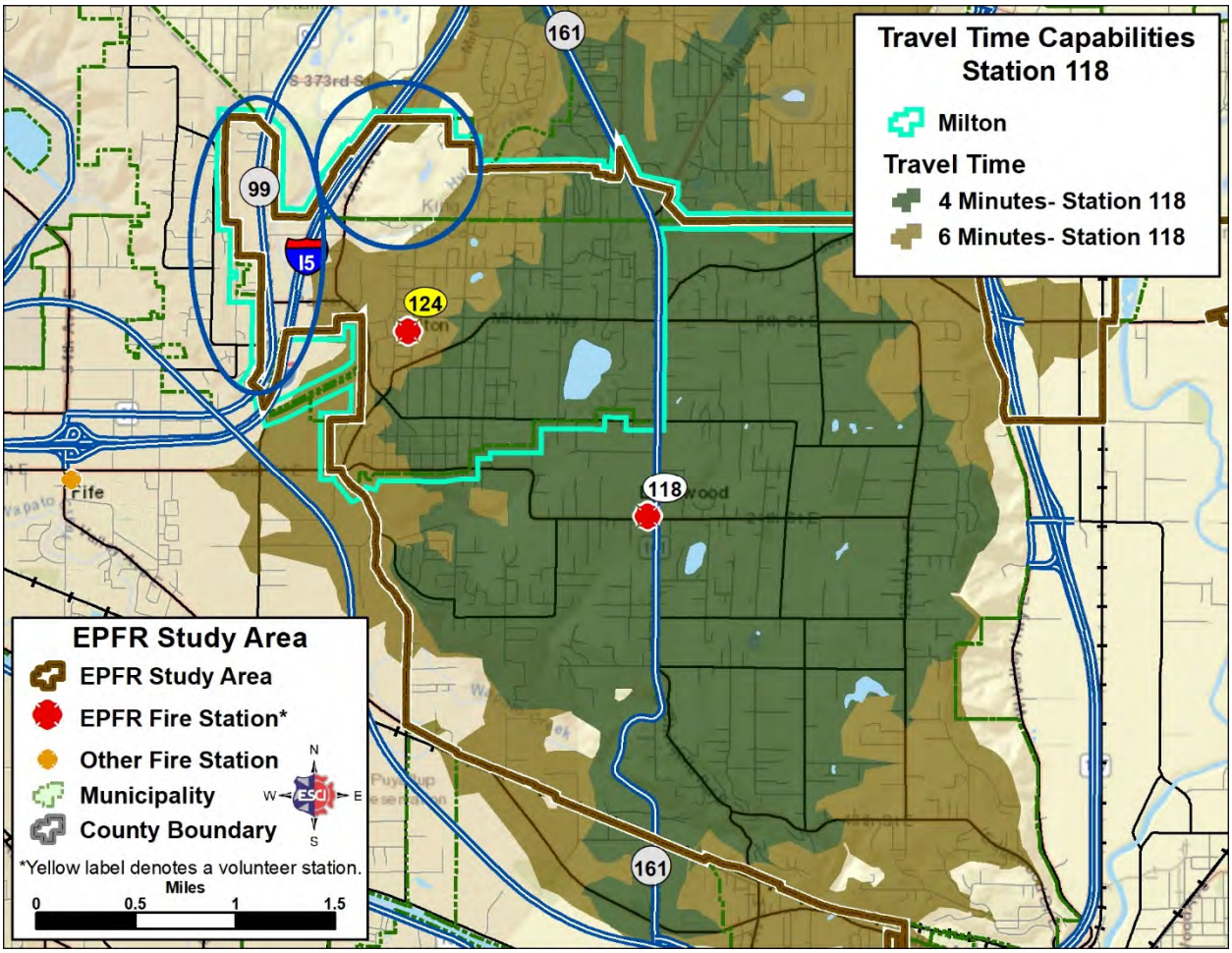
The Edgewood/Milton area is primarily an urban area with a mix of residential, commercial, and light industrial properties. The two areas labeled West Milton Commercial District and The Quarry Site are City of Milton special planning areas that are identified in the Milton Comprehensive Plan.[9]

As previously discussed, these two planning areas are identified for future development activity. In particular, a possible Continuing Care Retirement Community (CCRC) would bring a variety of housing from apartments, condominiums, and single-family dwellings to 24-hour health care facilities; with associated commercial and retail properties. This type of development could add significantly to EPF&R service demand in the area. Future development in the northwest corner of the Milton UGA will change the nature of risk in the area. The risk classification for this emergency service zone should be changed from Rural/Wilderness to Metro/Urban/Suburban and response time (travel time) goals should be adjusted accordingly.

[9] See Figure 42.

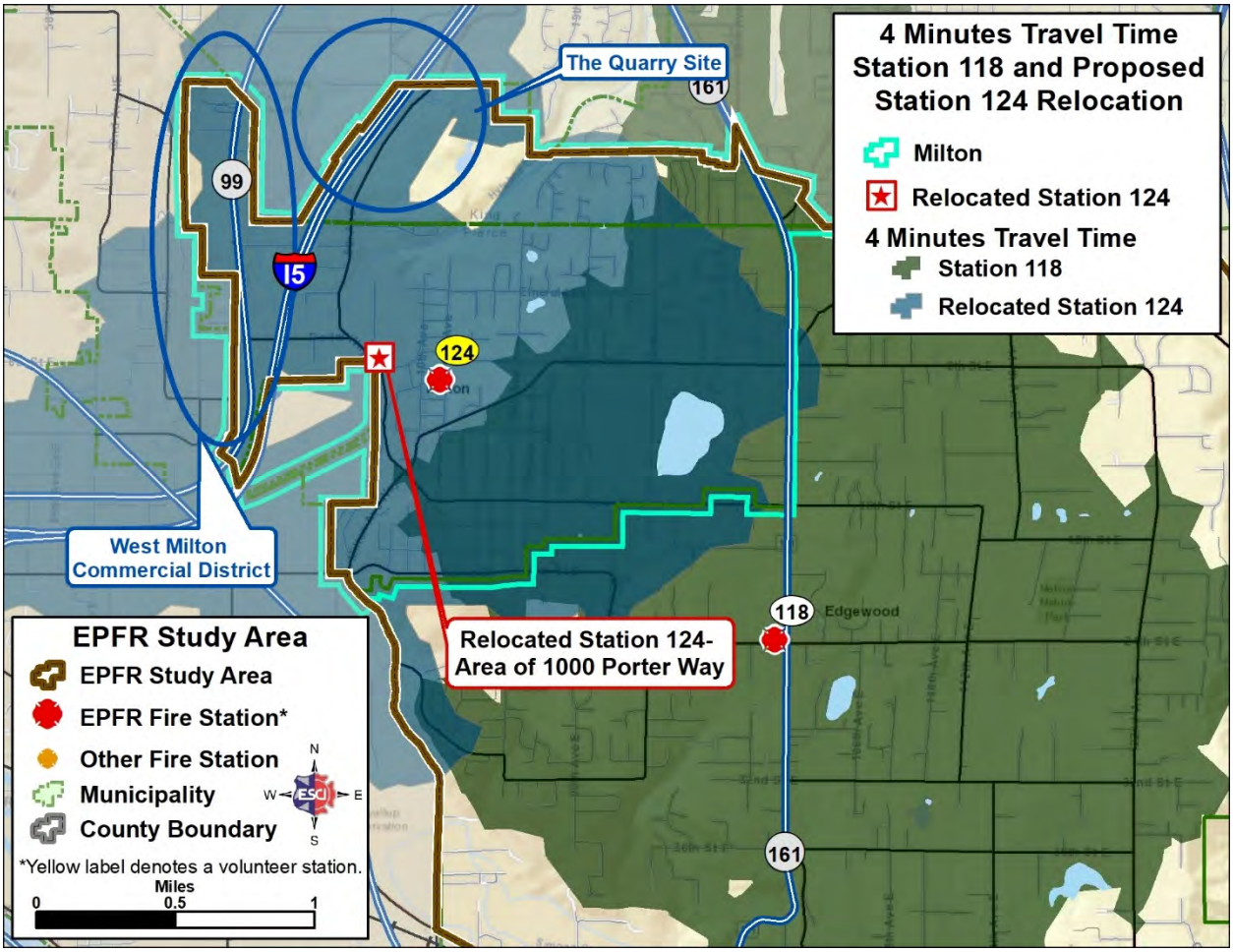
The following figure displays travel time capabilities in the Milton/Edgewood service area from Station 118.

Figure 65: Current Travel Time Capability, Station 118



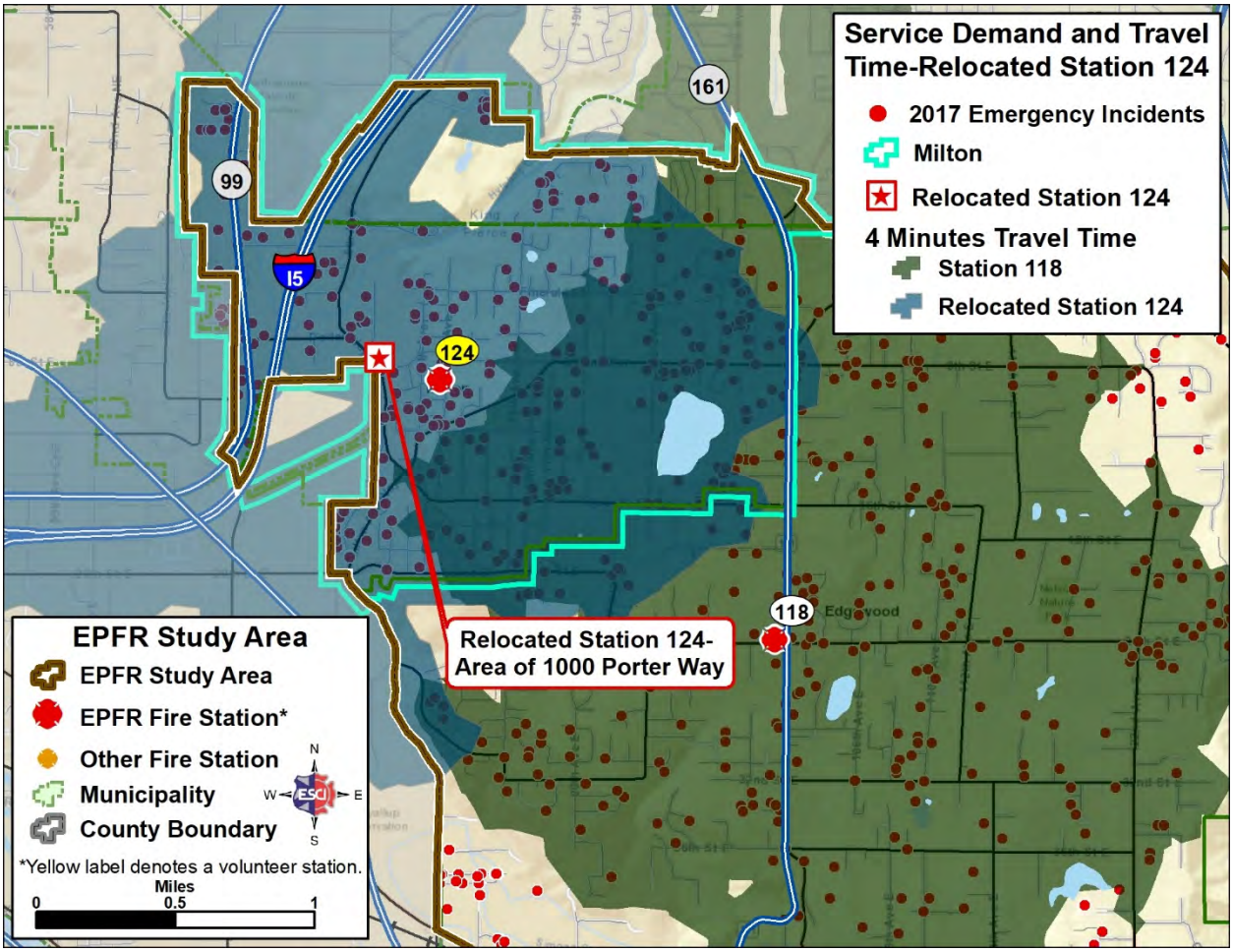
Station 118 is well located to serve the majority of the Edgewood and Milton. However, The Quarry site and the West Milton Commercial Area are both beyond four or six minutes travel of Station 118. Note that the EPF&R response time goal in urban risk zones is currently four minutes. The next figure measures travel time coverage from a proposed relocated Station 124 in the area of 1000 Porter Way.

Figure 66: Travel Time, Station 118 and Proposed Relocated Station 124



Based on the current road network, moving Station 124 to the location displayed in this figure brings the areas identified for future growth and development within four minutes travel of an EPF&R station. In the following figure, 2017 emergency incidents are displayed with the four minute service areas of Station 118 and the proposed relocated Station 124.

Figure 67: Proposed Relocated Station 124 and Service Demand



Approximately 95 percent of 2017 emergency incidents in Milton are within four minutes travel of the proposed station on Porter Way. Currently, 58 percent of emergencies in Milton are within four minutes travel of Station 118. Overall, approximately 92 percent of the approximately 1,600 emergencies (2017) in the Edgewood/Milton service area are within four minutes travel of Station 118 and proposed Station 124. Currently 70 percent of emergency incidents are within four minutes travel of Station 118.

STATION 124 CONSIDERATIONS

- The City of Milton has occupied 40% of the space within Station 124 for offices. The city has further need for space and would like to occupy the remaining portion of the station. The current facility is an unstaffed volunteer station with inadequate space or infrastructure for on duty personnel.
- Service demand in the Edgewood/Milton area grew by over 33 percent between 2014–2017. Two Special Planning Areas in the northwest corner of Milton are targeted for increased growth and development in the future.
- Relocating Station 124 to a location slightly to the west of the current station improves response performance in an area that is presently beyond four minutes or six minutes travel of Station 118.

- A facility capable of housing at least two apparatus and staff for these units provides an opportunity to improve response performance in an area already experiencing increasing service demand; and is expected to experience increasing service demand in the future.

EAST PIERCE FIRE & RESCUE

CAPITAL FACILITIES PLAN

FIRE STATION ASSESSMENTS

RICE fergus MILLER

Fire Station Assessments

Scope of Review

As part of this Capital Facilities Plan update, the following stations were reviewed by Rice Fergus Miller, along with structural engineers from Reid Middleton, mechanical (HVAC and plumbing) engineers from Sider and Byers, and electrical engineers from Sazan Group.

- Station 112 Prairie Ridge, a staffed station.
- Station 113 Sumner, a staffed station.
- Station 114 West Lake Tapps, a staffed station.
- Station 115 East Lake Tapps, a volunteer station.
- Station 116 Foothills, a staffed station.
- Station 118 Edgewood, a staffed station.
- Station 124 Milton, a volunteer station not currently owned by EPF&R.

The following stations received an architectural review by Rice Fergus Miller, with no additional engineering review.

- Station 119 South Prairie, a volunteer station not owned by EPF&R.
- Station 122 Lake Tapps Boat House, a small facility housing the Lake Tapps water rescue boat and associated equipment.

The following facilities received no assessment:

- Station 111 Bonney Lake Headquarters, a leased facility owned by City of Bonney Lake.
- Station 121 Buckley, currently used for logistics and storage only, with no emergency response.
- Station 123 Bonney Lake, a small facility currently housing a single reserve apparatus.

Criteria

Apart from determining the optimum location for a station, understanding the condition of an existing facility and determining how well it can accommodate its required program and staffing deployment is a critical aspect of determining a station's viability. There are several key criteria that we consider when evaluating existing fire stations.

- Station Location: If an existing station is poorly located in relation to its current or projected response area, there is little point in allocating resources to upgrade that station; funds should instead be allotted to replacing the station in a location that will contribute to improved standards of coverage and decreased response times.

- Apparatus Bay Size and Configuration: As the operational heart of the station and the single largest space in most stations, if the apparatus bays are not sized, sited, and configured appropriately for the required apparatus deployment it is unlikely the facility can be remodeled in a cost-effective manner to bring the apparatus bay up to current standards. Typically, if an apparatus bay is failing in one or more key aspects, it is likely that the rest of the station is also failing in terms of seismic safety, staffing accommodations, or other building code or life safety issues.

- Station ability to accommodate required program and staffing: An existing station's viability is relative to the mission asked of it, both current and future. If a station is located in a growing area and projected staffing levels and apparatus deployment are expected to increase in a substantial manner not easily or cost-effectively accommodated by the current facility, it may likely be a candidate for replacement rather than remodeling, especially if the apparatus bay is substantially impacted.

- Additional issues that may preclude remodeling a station at its current location include issues such as: poor or unsafe traffic access, existing sites that are too small or too constrained to accommodate the required program, or seismic upgrades that are cost prohibitive or technically infeasible.

General Observations

The following general comments apply to most of the stations that were reviewed, with exceptions noted.

- Good response locations: As ESCI has noted, most of EPF&R's existing stations are in good locations from a response standpoint, though strong growth in Tehaleh and Milton has put pressure on Stations 124 and 112. This is a great benefit as it makes economic sense to reuse as many existing, developed sites as possible, rather than attempt to purchase and develop new properties.

- Well maintained: In general, EPF&R has done a good job taking care of its facilities. We encountered very few maintenance issues and those that were observed were largely cosmetic and minor in nature.

- Seismic issues: None of the stations will meet the desired Immediate Occupancy standard and most will suffer damage of some kind in the event of a major seismic event. Given the age of the structures involved, this is a very typical observation.

- Life safety deficiencies: Only Stations 112 and 113 currently have fire sprinklers. Sprinklers will be needed at all stations where sleep rooms are added, as required by state law. All station except 114 and 116 have fire alarm systems, though it is likely those systems will need upgrading or replacement as part of any substantial remodeling effort.

- Electrical systems: Most stations' electrical systems are, or will soon be, within the last 10 years of service life. These systems should be updated and replaced as needed within the context of remodeling or renovation.

- Mechanical systems: Most stations contain relatively old, residential style HVAC systems. These systems will increasingly become more difficult to maintain due to age and changing refrigerant regulations and availability. We would anticipate the majority of these existing systems will need to be replaced in the context of a major remodel or renovation.

- ADA/Handicap accessibility: Most restroom facilities do not meet current ADA standards and none of the two-story stations have elevators as would be required by ADA and current building codes. In the context of a major renovation, it is likely that all restrooms would need to be brought up to current codes. It is also likely that an elevator would need to be added to any two-story station, if it exceeds the threshold of a major remodel.

Summary of Findings and Station Specific Discussion

The following comments summarize the observations and conclusions reached based on assessments of the existing facilities, information provided by the engineering consultants, and discussions with EPF&R staff and the executive committee.

- Station 111 Bonney Lake Headquarters: EPF&R currently occupies approximately 18,000 of the facility, which it shares as a lessee with the Bonney Lake Police Department. As EPF&R has grown over the years in terms of administrative staff, it has not been possible to co-locate and accommodate command staff efficiently. Currently, fire prevention staff are located at leased office space. EPF&R has also received notice that the City of Bonney Lake would like to terminate their lease with the District. As programmed, approximately 31,675 sq. ft of space is required to provide a headquarters station with sufficient administrative areas. Given these constraints and the fact that EPF&R does not own the building, no further capital facilities work is recommended for Station 111. Creation of a new headquarters station on the nearby property purchased by the District is recommended.

- Station 112 Prairie Ridge: As a 1970's era metal building, Station 112 is only 3,750 sq. ft. in size, with little opportunity for expansion on its small property. Additionally, per ESCI's report, Station 112's ideal location is to the south and west of its current site so that it can better access and serve the Tehaleh and Plateau 465 developments. For these reasons, replacement of Station 112 is recommended.

- Station 116 Foothills: Serving the southeastern portions of EPF&R, this station is generally undersized for the staffing levels required as well as being a late 1970s vintage facility.

However, from ESCI's analysis, the station's location is worth maintaining from a response standpoint. From an architectural and site planning point of view it also appears the station could be remodeled to accommodate necessary program and operational requirements. It is recommended that Station 116 be extensively remodeled with new building systems, additions, and remodeling, as well as seismic upgrades.

- Station 113 Sumner: Built in 1991, Station 113 is one of the busiest of EPF&R's staffed stations. At 8,200 sq. ft., the Sumner station is reasonably sized, well located from a response standpoint, and is generally in good condition making it a good candidate for remodeling. While staffing levels at Station 113 are not projected to increase beyond the current 9 beds, the station lacks operational support, decontamination, and storage areas. With the removal of administrative and fire marshal's staff, additional main floor space is freed up such that these needed spaces can be cost-effectively created. It is therefore recommended that Station 113 be remodeled and upgraded.

- Station 114 Lake Tapps: Originally built in 1960 and subsequently remodeled in 1970 and 1991, this small, 3,616 sq. ft. station has three key deficiencies that were noted as part of our review process. The structure, built of concrete block was noted to have numerous cracks and is believed to contain minimal reinforcing steel, which will require substantial work to correct. Secondly, it was also noted that the apparatus bays are too short to allow adequate clearances around the deployed apparatus, as required by state law. Finally, the station is situated a minimum of 15 feet from the edge of West Tapps Road, making access to and from the street difficult and potentially dangerous. Should West Tapps Road be widened by Pierce County, this condition will worsen. For these reasons, it is recommended that Station 114 be replaced with a new station. While the station is in a good location from a response standpoint, it is also near an increasingly busy intersection and the site itself is small and not likely able to accommodate the district's preferred drive-through bay configuration. It is therefore recommended that the station be rebuilt on a new piece of property, in reasonable proximity to its current location.

- Station 115 East Lake Tapps: Per ESCI's report, it is likely that Station 115 will remain a volunteer staffed station. While the station could be used as-is for a considerable amount of time, should staffing begin to exceed the 4-bed capacity currently available at the station, a remodel and addition would be reasonable and justifiable. As with EPF&R's other facilities, Station 115 is in a good location to serve its response area and there is a good-sized site in which to add to the station.

- Station 117 Tehaleh: Planning for the future Station 117 began in 2006 for what was intended to become a battalion station serving the proposed Cascadia community. The project was placed on hold in 2007 as the housing and development market began to fail and the Cascadia Corporation went into bankruptcy and receivership. Previous plans called for a 20,000 sq. ft. facility located on 3.5 acres of property with utility stubs provided by the developer. Subsequently, the station's site was relocated to another piece of land in the

development, farther to the east. While the Tehaleh development is growing quickly, it is recommended that Station 117 be built towards the end of Phase 1, once the development has matured.

- Station 118 Edgewood: As noted in ESCI's *Capital Facilities Study*, the Edgewood and Milton communities are expected to see substantial growth relative to other areas served by EPF&R. Because of this, it is anticipated that staffing at the station will grow to a minimum staffing of 6 firefighters. The current facility, originating from 1948 and remodeled over subsequent decades, has a significant number of operational deficiencies which make it a better candidate for replacement than remodel. While the station is well located in terms of its response area, it is poorly located on its site. With approximately 20 feet of clearance from the apparatus bay to the fog line of 24th Street E, safely entering traffic is a concern. This condition could worsen should Pierce County widen 24th Street further. It is also worth noting that the existing facility and building systems are generally near the end of their lifespan, and the existing apparatus bay is too small in terms of height and depth to accommodate anticipated equipment. Therefore, it is recommended that a new station be built on the existing site, immediately behind the existing stations so that the existing facility can remain in service during construction.

- Station 119 South Prairie: Currently serving the South Prairie community as a volunteer fire station and a community center, Station 119's most pressing issue is its immediate proximity to South Prairie Creek, which has in the past flooded the station. Given this fact it is reasonable to continue to make use of the station, though it would not make sense to invest in substantial upgrades or improvements. However, as a volunteer station that will continue to be staffed as such, it is well located and houses the apparatus and equipment needed. EPF&R does not currently own this station and for this reason as well substantial remodeling or renovation is not recommended.

- Station 121 Buckley and Station 123 Bonney Lake: Station 121 is currently serving as a logistics center for EPF&R, though its location at the eastern edge of the district is not convenient to the majority of stations. Station 123 serves as a volunteer station with a single engine. Neither facility was reviewed as part of this assessment, nor did EPF&R staff identify them as priority projects needing improvement.

- Station 122 Lake Tapps Boat House: The boat house serves Lake Tapps itself, in conjunction with water rescue trained crews housed at Station 114 and 111. The boat house is generally in good condition and well suited to its mission. While additional storage and training space is desirable, it is anticipated that most of those functions could be accommodated at a new, replaced Station 114. Other than routine maintenance, no substantial remodeling is needed or recommended.

- Station 124 Milton: Serving the City of Milton and the western portion of EPF&R, Station 114 is a volunteer station of average condition for a 1982 vintage building. Given projected growth in the Milton area, it is likely that this station will remain as a volunteer facility, with the

majority of responses being handled by Station 118 in Edgewood. As this facility is owned by the City of Milton, no work for this building is recommended.

Summary of Findings and Station Specific Discussion

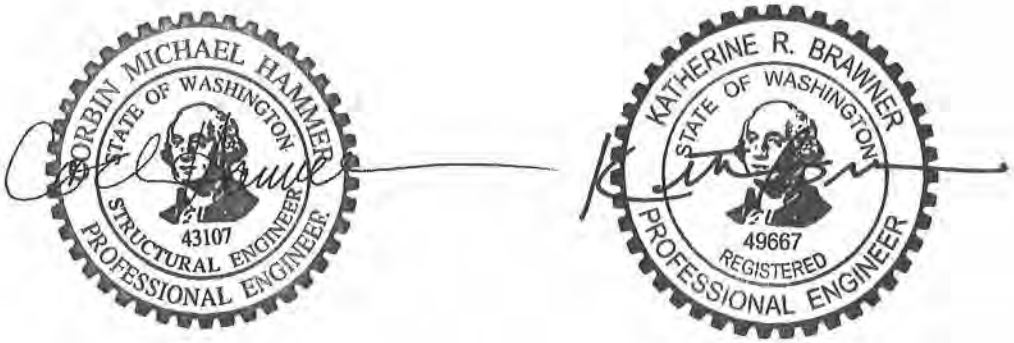
Please see the Program and Needs Analysis portion of this Capital Facilities Plan for additional information and response to the found conditions.

EAST PIERCE FIRE AND RESCUE
FIRE STATION ASSESSMENTS

ASCE 41-13 Tier 1 Seismic Evaluations - Updates

June 2018

Prepared for:
Rice Fergus Miller Architecture & Planning



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Existing Fire Station Seismic Evaluation Criteria

The seismic evaluations for the East Pierce County Fire and Rescue buildings are based on the performance-based earthquake engineering (PBEE) guidelines presented in ASCE 41-13 *Seismic Evaluation and Retrofit of Existing Buildings* (American Society of Civil Engineers, 2014). This section provides a general background of PBEE and an overview of seismic retrofit objectives, seismic hazard levels, seismic performance levels, and seismic evaluation and retrofit procedures.

The seismic evaluations do not consider compliance with the seismic requirements of the current building code for new construction. Buildings designed prior to the current building code often include structural configurations and connection detailing that have historically contributed to poor seismic performance in structures, based on post-earthquake evaluations of damaged buildings. Additionally, recent research and studies of regional seismicity have shown that the expected seismic ground motions are higher than was expected in the past. Higher ground motions, structural configurations, and poor connection detailing may result in seismic evaluation deficiencies among buildings constructed to previous building code requirements. Buildings designed to older building code standards are evaluated using evaluation and design guidelines specifically developed for existing structures by the Federal Emergency Management Agency (FEMA) and the American Society of Civil Engineers (ASCE).

The structural findings and recommendations presented in this report are based on visual observations of the buildings and a review of the record drawings. The available record documents do not contain all of the information necessary to confirm the structural configuration of some portions of the buildings, which is typical for older structures.

Reid Middleton participated in a walk-through on January 23 and 24, 2018, of Stations 112, 113, 114, 115, 116, 118, and 124 and performed limited visual observations of existing conditions. Neither destructive nor non-destructive testing was performed to confirm or supplement information shown in the record drawings.

The seismic evaluation of the buildings is based on the PBEE guidelines presented in ASCE 41-13 *Seismic Evaluation and Retrofit of Existing Buildings*. The ASCE 41 Tier 1 evaluations were completed using the Immediate Occupancy (IO) performance objective. Buildings that meet the IO performance objective will have similar seismic performance to new buildings that are designed as essential facilities. This section includes a general background of PBEE and an overview of seismic rehabilitation objectives, building performance levels, and seismic evaluation and rehabilitation procedures.

Background

ASCE 41-13 employs a Performance-Based Design methodology that allows building owners, design professionals, and the local building authorities to establish seismic hazard levels and performance goals for individual buildings. PBEE can be defined as the engineering of a structure to resist earthquake demands while also meeting the needs and objectives of building owners and other stakeholders. PBEE allows for the design and analysis of structures for different levels of seismic performance and allows these different levels of seismic performance to be related to the relative seismic hazard.

Seismic analysis and design of structures traditionally focused on one performance level – reducing the risk for loss of life in a design earthquake. The concept of designing essential facilities, which are needed immediately after an earthquake, to a higher performance standard evolved after hospitals and other critical facilities were damaged in the 1971 San Fernando, California, earthquake. That concept is balanced by the recognition that the cost of retrofitting existing buildings to higher levels of seismic performance may be onerous to both stakeholders and policy makers.

A comprehensive program was started in 1991, in cooperation with FEMA, to develop guidelines tailored to address this variation of performance levels. The first formal applications of performance-based evaluation and design guidelines were the FEMA 310 *Handbook for the Seismic Evaluation of Buildings – A Prestandard (1998)* and FEMA 273 *NEHRP Guidelines for the Seismic Rehabilitation of Buildings (1997).* Following the release of these documents in the 1990s, three additional documents were released in the following years. Another prestandard document, FEMA 356 *Prestandard and Commentary for the Seismic Rehabilitation of Buildings*, was released in the year 2000. Then, the first national standard seismic evaluation document, ASCE 31-03 *Seismic Evaluation of Existing Buildings*, was released in the year 2003. Following the release of ASCE 31-03, the first national standard seismic rehabilitation document, ASCE 41-06 *Seismic Rehabilitation of Existing Buildings*, was released in the year 2007. ASCE 31-03 and ASCE 41-06 superseded the PBEE documents produced in the previous decade. ASCE 31-03 and ASCE 41-06 used the general framework outlined by previous documents but were updated to incorporate the latest standard of PBEE for the time.

ASCE 31-03 and ASCE 41-06 still had flaws and, soon after the release of ASCE 41-06, an effort was undertaken to combine ASCE 31-03 and ASCE 41-06 into a single national standard document in an attempt to streamline the documents and eliminate discrepancies. The newest PBEE document, ASCE 41-13 *Seismic Evaluation and Retrofit of Existing Buildings*, combines information from all of the previous documents, reflects advancements in technology and analysis techniques, and incorporates case studies and lessons learned from recent earthquakes.

ASCE 41-13 provides criteria by which existing structures can be seismically evaluated and retrofitted to attain a wide range of performance levels when subjected to earthquakes of varying severity.

Seismic Hazard Levels

Earthquake ground motions are variable and complicated, and every earthquake is different. In addition, an earthquake's intensity and energy magnitude depend on fault type, fault movement, depth to epicenter, and soil strata. In earthquake-prone areas, very small and frequent earthquakes occur every few days or weeks without being noticed by humans, but large earthquakes that occur much less frequently can have a devastating effect on infrastructure and can result in the temporary displacement of large numbers of people. In addition, earthquakes are unpredictable, and the precise location, intensity, and start time of an earthquake cannot be predicted. However, earthquake hazards for certain geographic areas are well understood based on historical patterns of earthquakes from the geologic record, measured earthquake ground motions, understanding of plate tectonics, and seismological studies.

Geologists, seismologists, and geotechnical engineers have categorized the seismic hazard for particular locations using probabilistic seismic hazard levels. Each seismic hazard level describes a different probabilistic earthquake magnitude based on the probability of a certain magnitude earthquake occurring in a given time period. Table 1 displays commonly used seismic hazard levels, their corresponding probabilities of exceedance, and mean return periods.

Table 1. Probabilistic Seismic Hazard Levels and Mean Return Period.

Seismic Hazard Level	Probability of Exceedance in 50 Years	Mean Return Period (Years)
50%/50-year	50%	72
20%/50-year (BSE-1E)	20%	225
10%/50-year	10%	475
5%/50-year (BSE-2E)	5%	975
2%/50-year (BSE-2N)	2%	2,475

Seismic events with longer mean return periods and smaller probabilities of exceedance are associated with stronger seismic motions, larger ground accelerations, and more potential to damage facilities. Consequently, structures designed or retrofit to a seismic hazard level with a longer return period will generally experience better performance in an earthquake than a structure designed or retrofit to a lower seismic hazard level.

ASCE 41-13 codifies four different Seismic Hazard Levels at which to evaluate or retrofit structures. For voluntary seismic evaluations and voluntary seismic upgrades, the owner of a structure and the structural engineer can decide the Seismic Hazard Level at which it is appropriate to evaluate or retrofit a structure. The codified Seismic Hazard Levels are grouped into two categories: two Seismic Hazard Levels (BSE-1E and BSE-2E) associated with the Basic Performance Objectives for Existing Buildings (BPOE) and two Seismic Hazard Levels (BSE-1N and BSE-2N) associated with the Basic Performance Objectives Equivalent to New Building Standards (BPON).

The ASCE 41-13 defined Seismic Hazard Levels are shown in Table 1, along with their respective probabilities of exceedance in 50 years and mean return period; however, the BSE-1N Seismic Hazard Level is not shown in Table 1 because ASCE 41-13 defines the BSE-1N Seismic Hazard Level as being two-thirds of the BSE-2N Seismic Hazard Level. The BSE-1N Seismic Hazard Level cannot be directly related to a probability of exceedance or mean return period. Historically (and in previous standards), the BSE-1N Seismic Hazard Level was taken as the 10%/50-year earthquake.

Historically, existing buildings have been seismically evaluated and retrofitted to a lower Seismic Hazard Level than would be typical in new building design. This approach has been historically justified for three primary reasons:

1. It ensures recently-constructed structures are not immediately rendered seismically deficient due to minor building code changes.
2. Existing buildings often have a shorter remaining life than a new building would; therefore, lower structural resiliency is tempered by a decreased probability of a major seismic event.

3. Often the burdensome cost of retrofitting historic structures to a "new building equivalence" performance level is disproportionate to the incremental benefit.

Building Performance Levels and Seismic Retrofit Objectives

A target building performance level must be selected for the design or retrofit of a structure. The target building performance levels are discrete damage states selected from among the infinite spectrum of possible damage states that a building could experience during an earthquake. The terminology used for target building performance levels is intended to represent goals for design, but not necessarily predict building performance during an earthquake.

Since actual ground motions during an earthquake are seldom comparable to that used for design, the target building performance level may only determine relative performance during most events but not predict the actual level of damage following an event. Even given a ground motion similar to that used in design, variations from stated performance objectives should be expected. Variations in actual performance could be associated with differences in the level of workmanship, variations in actual material strengths, deterioration of materials, unknown geometry and sizes of existing members, differences in assumed and actual live loads in the building at the time of the earthquake, influence of nonstructural components, and variations in response of soils beneath the building.

ASCE 41-13 describes performance levels for structural components and nonstructural components of a structure. Historically, much attention was given to the seismic performance of structural components. However, in recent years, it has been realized that attention to the seismic performance of nonstructural components can be equally or more important than the seismic performance of structural components. The ASCE 41-13 identified Structural Performance Levels can be seen in Table 2, and the ASCE 41-13 identified Nonstructural Performance Levels can be seen in Table 3.

Table 2. Identified Structural Performance Levels.

Performance Level Abbreviation	Performance Level Name
S-1	Immediate Occupancy
S-2	Damage Control
S-3	Life Safety
S-4	Limited Safety
S-5	Collapse Prevention
S-6	Structural Performance Not Considered

Table 3. Identified Nonstructural Performance Levels.

Performance Level Abbreviation	Performance Level Name
N-A	Operational
N-B	Position Retention
N-C	Life Safety
N-D	Nonstructural Performance Not Considered

Individual Structural Performance Levels and Nonstructural Performance Levels can be aggregated to form a combined Building Performance Level. Structural performance during an earthquake is related to the amount of lateral deformation or drift of the structure and the capacity or ability of the structure to deform. Any Structural Performance Level can be combined with any Nonstructural Performance Level, although it is not recommended to combine high levels of structural performance with low levels of nonstructural performance and vice versa.

Theoretically, there are 23 different Building Performance Levels that are combinations of different Structural Performance Levels and Nonstructural Performance Levels. However, ASCE 41-13 recommends that only 15 Building Performance Levels be used in practice due to their recommendation of avoiding mismatching high and low levels of nonstructural and structural performance. ASCE 41-13 defines four specific common Building Performance Levels, as shown in Table 4. A visual representation of these common Building Performance Levels plotted against lateral deformation can be seen in Figure 1.

Table 4. Specific Common Building Performance Levels.

Performance Level Abbreviation	Performance Level Name	Structural & Nonstructural Performance Level Combination
1-A	Operational	S-1 & N-A
1-B	Immediate Occupancy	S-1 & N-B
3-C	Life Safety	S-3 & N-C
5-D	Collapse Prevention	S-5 & N-D

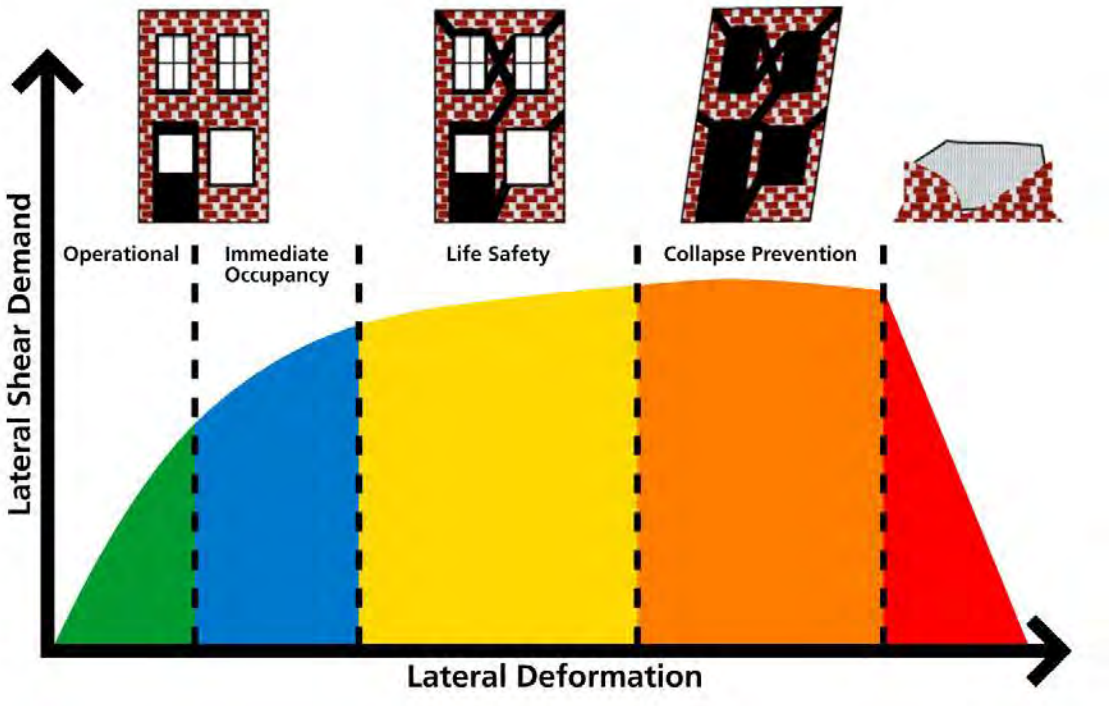


Figure 1. Building Performance Levels.

A decision must be made for each structure as to the acceptable behavior for different levels of seismic hazard, balanced with the construction cost of retrofitting a structure to obtain that behavior. ASCE 41-13 defines "baseline" basic performance objectives for structures based on their defined Risk Category. The Risk Category is the same that is defined in the International Building Code and ASCE 7. For example, for a Risk Category II structure retrofitted to the BPON standards, the structure would need to be retrofitted for the 3-B Building Performance Level at the BSE-1N Seismic Hazard Level and the 5-D Building Performance Level at the BSE-2N (2%/50-year) Seismic Hazard Level. ASCE 41-13 allows for higher (enhanced) or lower (limited) objectives to be selected based on the essential nature of the facility, the expected remaining life of the building, and the associated cost and feasibility. For example, it may not be economically feasible to retrofit historic structures to the BPON standards, and ASCE 41 allows for selection of a limited objective for such situations.

Table 5 summarizes the approximate levels of structural and nonstructural damage that may be expected at the damage states that define the structural performance levels.

Table 5. Approximate Expected Damage for Different Building Performance Levels[1].

	Building Performance Levels			
	Collapse Prevention	Life Safety	Immediate Occupancy	Operational
Overall Damage	Severe	Moderate	Light	Very Light
Permanent Drift	Large. 1% to 5%.	Some. 0.3% to 1%.	Negligible.	Same as Immediate Occupancy.
Remaining Strength and Stiffness After Earthquake	Little. Gravity system (columns and walls) functions, but building is near collapse.	Some. Gravity system functions, but building may be beyond economical repair.	Significant strength remaining. Minor cracking of structural elements.	Same as Immediate Occupancy.
Examples of Damage to Reinforced Masonry Buildings	Extensive cracking and crushing. Damage around openings at corners. Some fallen units. Transient drift to cause extensive nonstructural damage. Extensive permanent drift.	Major cracking distributed throughout wall. Some isolated crushing. Transient drift to cause nonstructural damage. Noticeable permanent drift.	Minor cracking. No out-of-plane offsets. Transient drift that causes minor or no nonstructural damage. Negligible permanent drift.	Same as Immediate Occupancy.
Examples of Damage to Steel Framing	Extensive yielding and buckling of steel bracing members. Significant connection failures.	Many braces and beams yield or buckle but do not fail totally. Moderate amount of connection failures.	Minor deformation of steel members, no connection failures.	Same as Immediate Occupancy.
Other General Description	Structure likely not repairable and not safe for reoccupancy due to potential collapse in aftershock.	Repair may be possible, but may not be economically feasible. Repairs may be required prior to reoccupancy.	Minor repairs may be required, but building is safe to occupy.	Same as Immediate Occupancy.
Nonstructural Components	Extensive damage. Some exits blocked. Infills and unbraced parapets failed or at incipient failure.	Falling hazards mitigated, but many architectural, mechanical, and electrical systems are damaged.	Minor cracking of facades, partitions, and ceilings. Equipment and contents are generally secure, but may not operate due to lack of utilities.	Negligible damage. All systems important to normal operation are functional. Power and other utilities are available, possibly from standby sources.
Comparison with New Building Design	Significantly more damage and greater risk.	Somewhat more damage and slightly higher risk.	Much less damage and lower risk.	Much less damage and lower risk.

[1]Adapted from American Society of Civil Engineers, *"Prestandard and Commentary for the Seismic Rehabilitation of Buildings,"* FEMA-356, Federal Emergency Management Agency, Washington, D.C., November 2000.

Performance, Safety, Reliability, and Construction Cost

The seismic performance, safety, and reliability of a facility must be weighed against the relative importance and construction costs associated with a facility. It is impractical for the average building to be seismically designed or retrofit to experience no damage following a major earthquake; however, steps can be taken to mitigate seismic hazards for new and existing structures.

Some facilities have more community importance or pose special risks to a community following an earthquake (for example hospitals, fire stations, or facilities housing highly toxic substances). It is reasonable that important facilities be designed or retrofit to a higher performance standard than the average structure. The relative importance of a facility must be weighed against the relative construction costs associated with facility construction. There are two types of construction costs associated with seismic hazards: the cost of initial construction or seismic retrofit construction and the cost to repair or replace a facility following an earthquake. The better a structure performs during an earthquake, the faster the structure can be returned to service and the lower the repair costs will be following the earthquake. So, expected building damage states during a seismic event can be directly linked to:

1. Repair/Replacement Costs – Cost of restoring the facility to pre-earthquake condition.
2. Public Safety – Number of critical injuries and casualties to building occupants.
3. Downtime – Length of time taken to make repairs to return a structure to service.

Figure 2 displays a graphic showing estimated performance-related consequences compared with different increasing post-earthquake structural damage states (which correspond to the design Structural Performance Levels for a given seismic hazard).

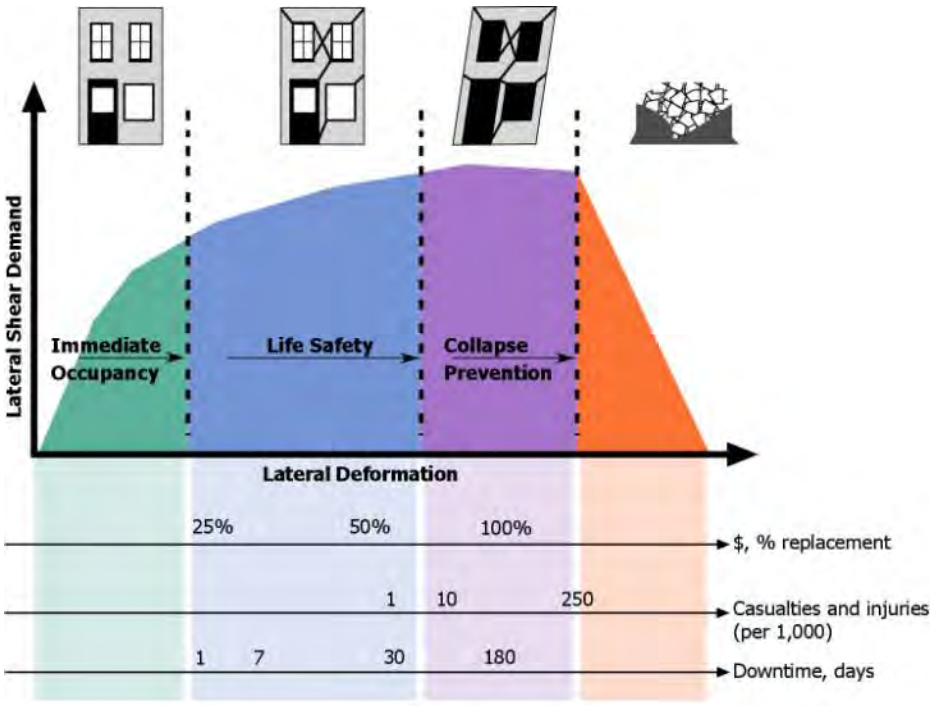


Figure 2. Estimated Performance-Related Consequences at Different Structural Performance Levels[2].

Figure 3 presents the schematic relationship between different retrofit building performance objectives and probable retrofit program cost.

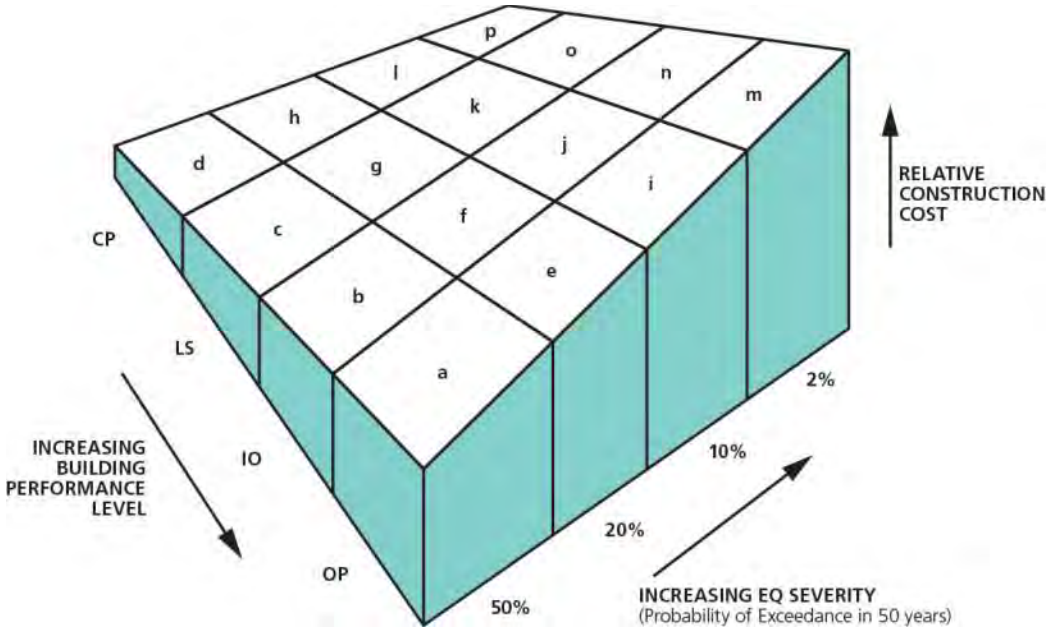


Figure 3. Surface Matrix of ASCE 41 Building Performance Levels Compared with Construction Cost[3].

[2] J. Moehle, "A Framework for Performance-Based Earthquake Engineering," *Proceedings from ATC 15-9, 10th US-Japan Workshop on the Improvement of Structural Design and Construction Practices,* Applied Technology Council, Makena, Hawaii, 2003.

[3] Adapted from Applied Technology Council, "*NEHRP Commentary for the Seismic Rehabilitation of Buildings*," FEMA-274, Federal Emergency Management Agency, Washington, D.C., October 1997.

Seismic Evaluation Procedure

The current standard for seismic evaluation and retrofit of existing buildings is the ASCE 41-13, *Seismic Evaluation and Retrofit of Existing Buildings*. ASCE 41-13 provides screening and evaluation procedures used to identify potential seismic deficiencies that may require further investigation or hazard mitigation. It presents a three-tiered review process, implemented by following a series of predefined checklists and "quick check" structural calculations. Each successive tier is designed to perform an increasingly refined evaluation procedure for seismic deficiencies identified in previous tiers in the process. See Figure 4 for a flow chart describing the evaluation process.

TIER 1 – Screening Phase

- Checklists of evaluation statements to quickly identify potential deficiencies
- Requires field investigation and/or review of record drawings
- Analysis limited to "Quick Checks" of global elements
- May proceed to Tier 2, Tier 3, or rehabilitation design if deficiencies are identified

TIER 2 – Evaluation Phase

- "Full Building" or "Deficiency Only" evaluation
- Address all Tier 1 seismic deficiencies
- Analysis more refined than Tier 1, but limited to simplified linear procedures
- Identify buildings not requiring rehabilitation

TIER 3 – Detailed Evaluation Phase

- Component-based evaluation of entire building using reduced ASCE 41 forces
- Advanced analytical procedures available if Tier 1 and/or Tier 2 evaluations are judged to be overly conservative
- Complex analysis procedures may result in construction savings equal to many times their cost

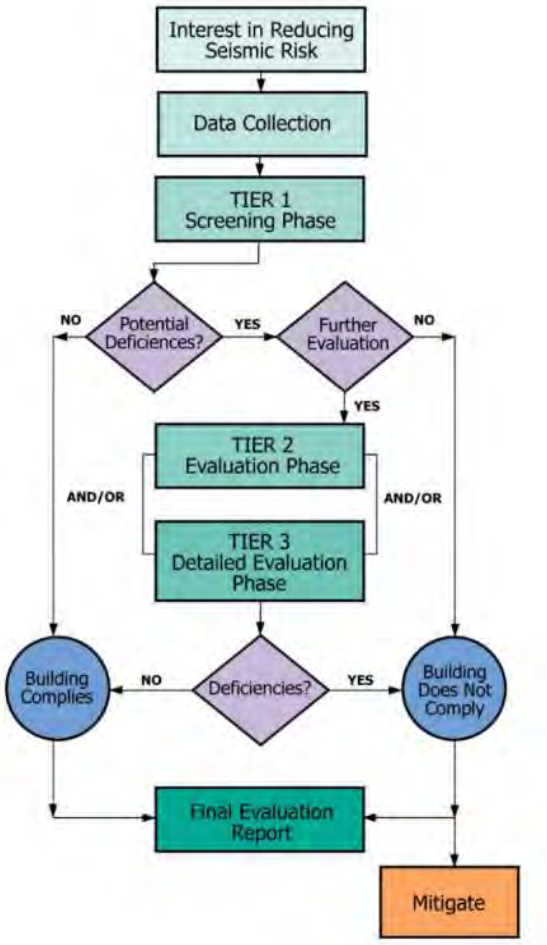


Figure 4. Flow Chart and Description of ASCE 41-13 Seismic Evaluation Procedure.

The Tier 1 checklists in ASCE 41-13 are specific to each common building type and contain seismic evaluation statements based on observed structural damage in past earthquakes. These checklists screen for potential seismic deficiencies by examining the lateral-force-resisting systems and details of construction that have historically caused poor seismic performance in similar buildings. Tier 1 screenings include basic "Quick Check" analyses for primary components of the lateral system: in this building's case, the shear walls and wall anchorage. They also include prescriptive checks for proper seismic detailing of connections, diaphragm spans and continuity, and overall system configuration. Tier 2 evaluations then follow with additional calculations and assessments to either confirm the potential deficiencies identified in the Tier 1 review or demonstrate their adequacy. A Tier 3 evaluation involves an even more detailed analysis and advanced computations to review each structural component's seismic demand and capacity. It is similar in scope and complexity to the types of analyses often required to design a new building in accordance with the International Building Code (IBC), with a comprehensive analysis aimed at evaluating each component's seismic performance. Generally, Tier 3 evaluations are not practical for typical and regular-type buildings due to the rigorous and complex calculations and procedures. As indicated in the Scope of Services, this evaluation includes a Tier 1 screening and a Tier 2 evaluation of potential deficiencies.

Seismic Retrofit Procedure

If seismic deficiencies are identified in the evaluation process, the owner and design team should review all initial conditions before proceeding with the hazard mitigation. Many conditions may affect the retrofit design significantly, such as results of the seismic evaluation and seismic hazard study, building use and occupancy requirements, presence of hazardous materials, and other anticipated building remodeling. The basic process for performance-based retrofit design is illustrated in Figure 5.

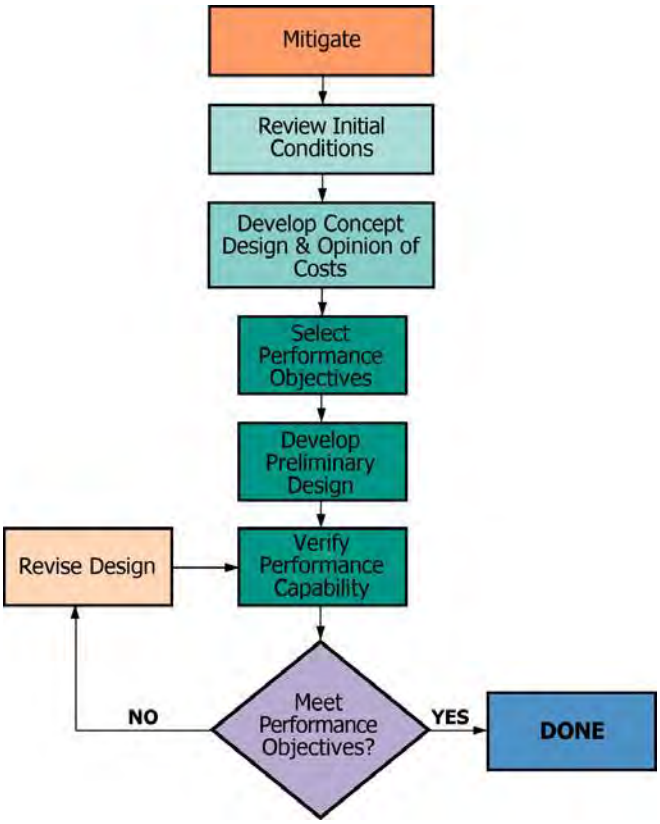


Figure 5. Seismic Rehabilitation Flow Diagram.

Following the review of initial conditions, concept designs may be performed to develop rough opinions of probable construction costs for one or more performance objectives. The owner and design team can then develop a rehabilitation strategy considering the associated costs and feasibility. Schematic and final design can then proceed through an iterative process until verification of acceptable building performance is obtained.

Limitations

The professional services described in this report were performed based on available as-built information and limited observation of the structure. No destructive testing was performed to qualify as-built conditions or verify the quality of materials and workmanship. No other warranty is made as to the professional advice included in this report. This report provides an overview of the seismic evaluation results and proposed upgrades and does not address programming and planning issues.

This report has been prepared for the exclusive use of Rice Fergus Miller Architecture & Planning and East Pierce Fire and Rescue. It is not intended for use by other parties, nor may it contain sufficient information for purposes of other parties or their uses. This report does not address any portion of the structure other than those areas mentioned, nor does it provide any warranty, either expressed or implied, for any portion of the existing structure.

Architectural Assessment: Station 112 Prairie Ridge

Scope of Review

Station 112 was reviewed by architectural, mechanical, structural, and electrical engineering consultants on May 17, 2011 and again on January 23, 2018. Please see the included reports for detailed assessments in each discipline. Cost estimating consultants were also present to observe existing conditions in preparation for their work in providing project budgets.

General Station Information

- Age and Improvement History: Originally built in 1976, Station 112 was remodeled in 1998.
- Size: Approximately 3,750 sq. ft.
- Current and Future Deployment: Engine 112, Medic 112. The station currently accommodates a minimum staffing of 2 firefighters, with room for 4. Future staffing demands indicate a minimum staffing of 6 will be required.
- This station has a drain field septic system.

Noted Operational Limitations

- Bunker Gear Storage: washing in bay gets gear wet, reducing both comfort and gear longevity.
- Storage: Operational storage limitations put pressure on apparatus bay and WAC clearances around apparatus.
- Fitness: Existing fitness space is accommodated within an unused vehicle bay. Preferred location would be within the residential portion of the station and provided with adequate ventilation and separation from vehicle and maintenance odors.
- Kitchen/Dining/Dayroom: Existing living spaces are tight with current staffing. Additional space will likely be needed with any staffing increases.
- Bathrooms: There is only a single shower available. While this is adequate for a 2-person deployment, it is extremely limited should 4 to 6 firefighters be housed at this station. It is recommended that individual, gender neutral facilities be provided at a ratio of 1 bathroom to 2 sleep rooms.

Code and WAC Limitations

- There is no decontamination sink in the apparatus bay or operational support areas to perform equipment cleaning or decontamination.

Deferred Maintenance Issues

- Station 112 is in average condition for a faculty of its age. Some rust and peeling paint was noticeable on the exterior of the building, as well as at the apparatus bay floor. Routine maintenance has been performed. Some minor sinkholes in the paving around the station was also noted.

Engineering Reviews

Please see the associated structural, mechanical, civil, and electrical reviews of Station 112 for specific discussion related to those disciplines.

Conclusions and Long-Term Viability

Though station 112 can potentially accommodate four firefighters, its small living and working spaces have relegated it to only two staffed firefighters on a routine basis. Station 112 is also a busy station with a high call volume as noted by ESCI in their report. Given that the site is small and contains a drain field, it is recommended that the station be relocated to a new site.

Fire Station 112

Structural Site Observations

Reid Middleton conducted a site visit of Station 112 on January 24, 2018, as part of this seismic evaluation. A previous site visit was conducted on May 17, 2011. Most of the pre-engineered metal building structure was visible during the site visit. Steel members did not appear to be deteriorated. Limited drawings were available for this evaluation, and most conclusions were determined through limited site investigation. ASCE 41-13 classifies Station 112 as a Steel Light Frame system, S3. This structure was checked for Immediate Occupancy criteria. The Tier 1 Preliminary Seismic Evaluation structural checklists were completed and are included for reference.

Structural System

The following table describes Fire Station 112's structural systems.

Structural System Description of Fire Station 112

System	Description
Roof	Untopped metal deck supported by steel beams and columns.
Foundations	The building's foundation system is assumed to be constructed of concrete spread footings and concrete slab on grade.
Lateral System	Pre-engineered steel moment frames provide lateral support to the structure in the transverse direction. Steel tension rods provide lateral support to the structure in the longitudinal direction.

Seismic Evaluation Findings

Seismic Deficiencies

The following table summarizes the seismic deficiencies identified during the Tier 1 evaluation. Descriptions of these deficiencies are based on this evaluation.

Identified Seismic Deficiencies for Fire Station 112

Deficiency	Description
Mezzanine	The free-standing mezzanine is not anchored to the lateral system for the main structure and does not appear to have an independent lateral system.
Liquefaction	It is unknown if there are liquefaction-susceptible soils at depths within 50 feet under the building.
Surface Fault Rupture	It is unknown if fault rupture and displacement is anticipated at the site.

Deficiency	Description
Ties between Foundation Elements	Although structural record drawings are not available, it is anticipated that the foundation elements are not restrained by beams or the slab.
Brace Axial Stress Check	Axial stress in the tension rods exceeds the minimum strength requirement.
Flexural Stress Check	Although structural record drawings are not available, moment connections are not expected to be able to develop the strength of the adjoining members or panel zones. Pre-engineered steel frames are typically designed to meet minimum requirements, not to meet the Immediate Occupancy performance objective.
Moment-Resisting Connections	Although structural record drawings are not available, moment connections are not expected to be able to develop the strength of the adjoining members or panel zones. Pre-engineered steel frames are typically designed to meet minimum requirements, not to meet the Immediate Occupancy performance objective.
Compact Members	Although structural record drawings are not available, frame elements are not expected to meet compact member requirements. Pre-engineered steel frames are typically designed to meet minimum requirements, not to meet the Immediate Occupancy performance objective.
Out-of-Plane Bracing	Brace connections at beam-column joints are not present. This can cause out-of-plane buckling to occur before the brace or joint strength is developed, which limits the frame's ability to resist seismic forces.
Bottom Flange Bracing	Brace connections at beam bottom flanges are not present. This can cause out-of-plane buckling to occur before the brace or joint strength is developed, which limits the frame's ability to resist seismic forces.
Transfer to Steel Frames	Although structural record drawings are not available, it is believed that connection elements will not have enough capacity to transfer forces. Pre-engineered steel frames are typically designed to meet minimum requirements, not to meet the Immediate Occupancy performance objective.
Steel Columns	Although structural record drawings are not available, based on observation of two column anchor bolts, it is believed that the anchorage will not have enough capacity to develop and transfer required forces. Pre-engineered steel frames are typically designed to meet minimum requirements, not to meet the Immediate Occupancy performance objective.

In addition to the identified unknown Geological Site Hazard in the Tier 1 evaluation, the *Liquefaction Susceptibility Map of Pierce County, Washington*, dated September 2004 and produced by the Washington State Department of Natural Resources, was reviewed. The area where Station 112 is located has a liquefaction susceptibility of low to moderate. During an earthquake, some settlement of the building could occur. Prior to completion of design, a site geotechnical investigation should be conducted to identify soil design parameters and actual site soil conditions.

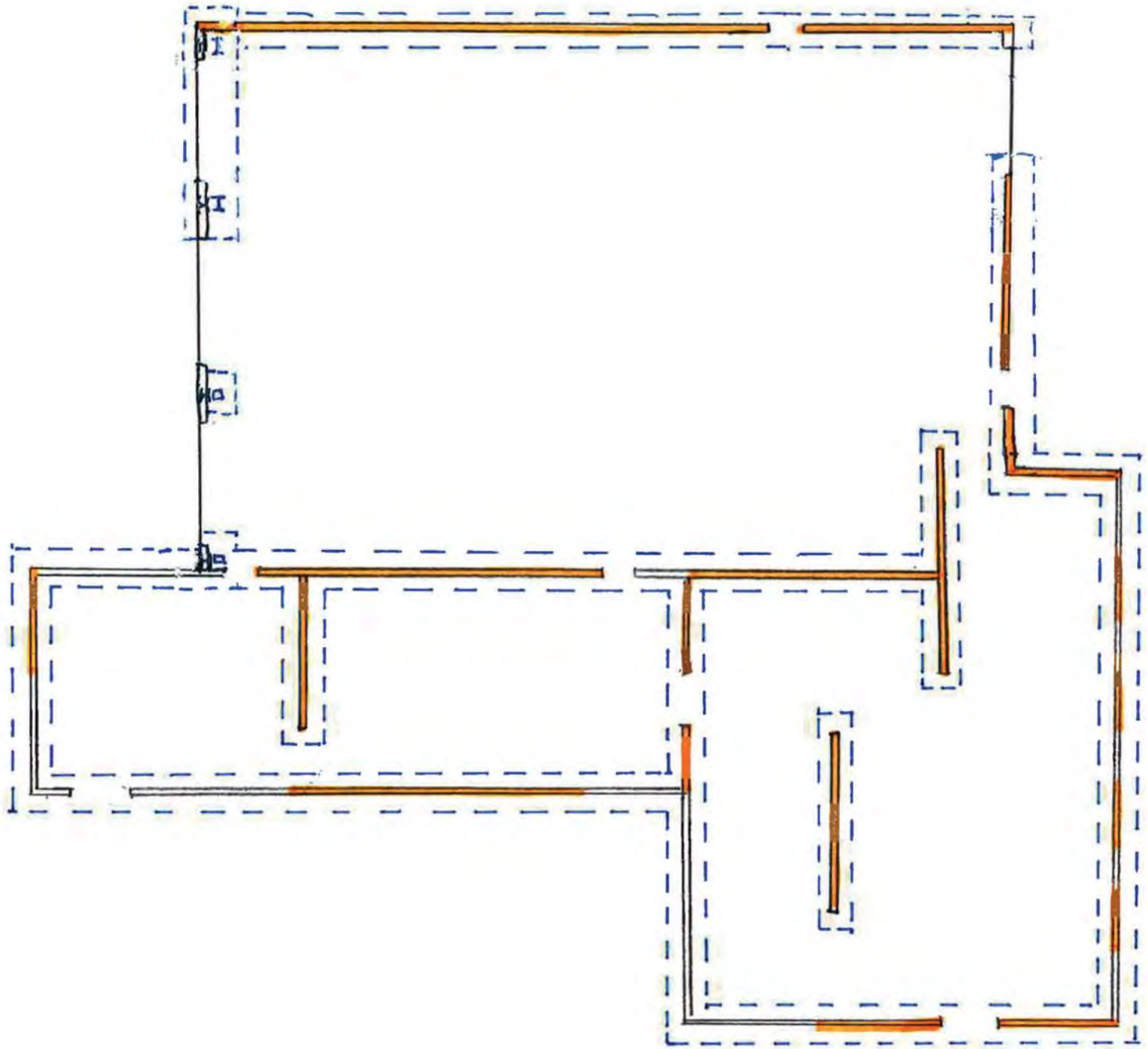
Structural Conclusions

Fire Station 112 does not meet the Immediate Occupancy performance objective, as determined by the ASCE 41 Tier 1 Evaluation. This evaluation indicates damage to the building may occur during a design-level earthquake that may cause the facility to not be occupied after the event.

A primary concern is the tension-only rod bracing in the longitudinal direction. It is expected that these tension-only braces will elongate during an earthquake, resulting in a loss of stiffness and allowing the building to have excessive deflection. An additional concern is that the building's existing moment frames and anchorage, in the transverse direction, are constructed of pre-engineered steel frames. These moment frames are traditionally designed to meet the building code's minimum requirements and do not have reserve capacity. Because seismic forces in Western Washington have increased significantly in the last 20 years, it is expected that these frames will be overstressed during an earthquake. These deficiencies may result in permanent deflection of the building and potentially a partial collapse of the roof structure, limiting the station's ability to provide first response capabilities.

This station should be replaced or seismically upgraded to meet the Immediate Occupancy performance objective. The current understanding is that the station is recommended for replacement, as it was not identified as a good candidate for a seismic retrofit given the other findings and recommendations in the overall station assessments. For additional information on the building's performance objectives and evaluation criteria, see the section titled *Existing Fire Station Seismic Evaluation Criteria.*

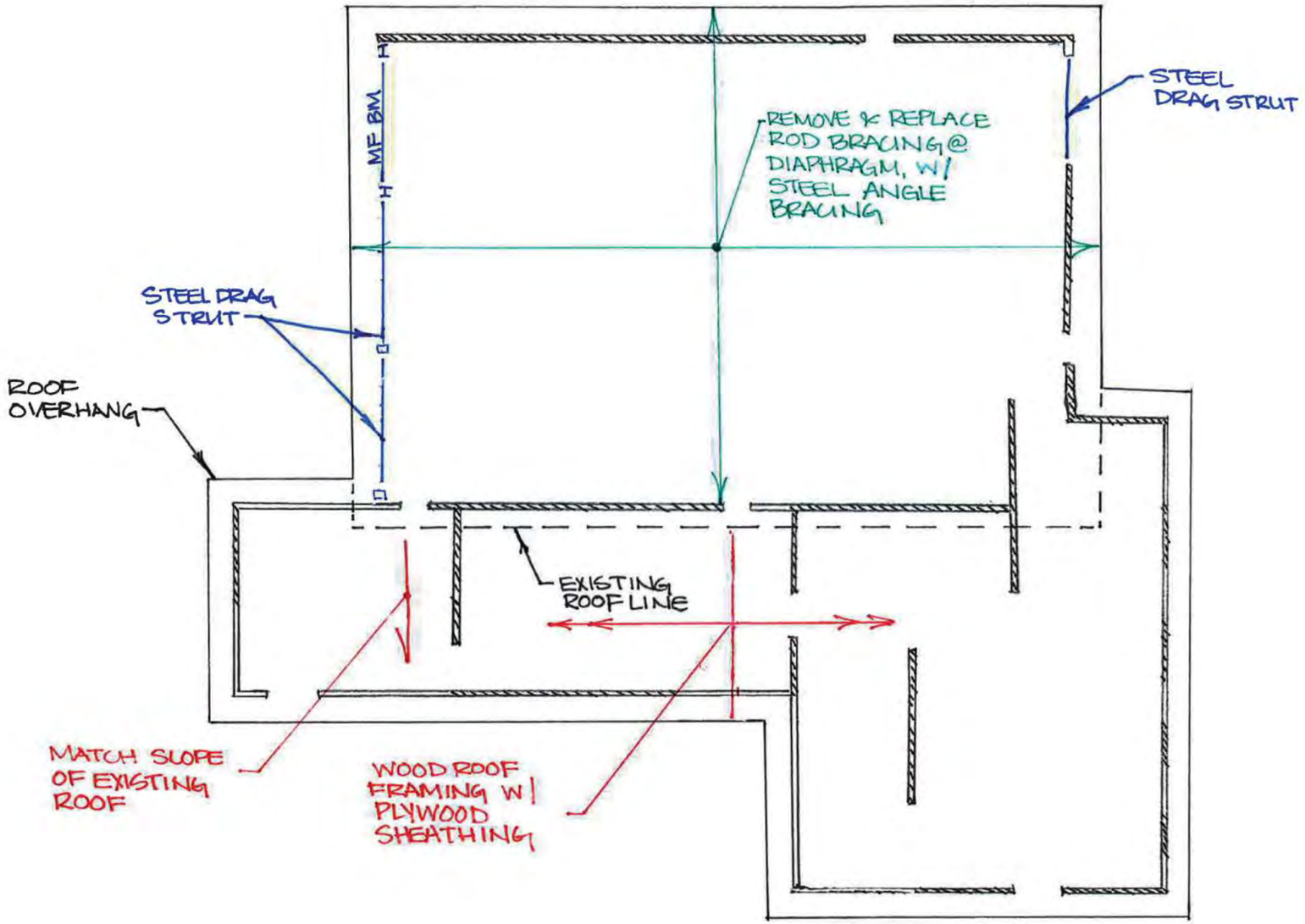
If the station is not replaced, it should be upgraded to an Immediate Occupancy performance, which would allow the station to remain functional after an earthquake and provide first response capabilities. The following plans show the conceptual retrofit design for Station 112, previously developed in 2011. These concepts, based on engineering judgment, were developed by addressing the seismic deficiencies previously noted in the ASCE 31 Tier 1 checklist, and have not been updated to the current ASCE 41-13 checklist. The concept for Station 112 includes adding a steel moment frame, steel drag struts, and horizontal steel bracing at the existing apparatus bay's roof level. New wood sheer walls would also be provided at the building's perimeter and at the proposed addition. The addition of these new elements will strengthen and stiffen the building, providing better seismic performance.



= WOOD SHEAR WALL

I O = STEEL COLUMNS

= CONCRETE FOUNDATION



= WOOD SHEAR WALL BELOW

MF BM = MOMENT FRAME BEAM

I = MOMENT FRAME COLUMN

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SIDER + BYERS
MECHANICAL ENGINEERS

EAST PIERCE FIRE & RESCUE, EXISTING STATION #112 – PRAIRIE RIDGE

Mechanical Systems Report

March 27, 2018

We visited Station #112 on January 24, 2018 to evaluate existing mechanical systems and review issues relevant to remodel possibilities and usable life span. The following is our report of the existing conditions and relevant discussion items.

EXISTING SYSTEMS

1. **Fire Sprinklers:** The building has a full coverage wet sprinkler system.

2. **Plumbing:**
   a. Water closets: China, tank type flush, in good condition.
   b. Lavatories: China, counter mounted with single handle faucets, in good condition. China, wall mounted with dual handle faucets, dated design in good condition.
   c. Sinks: Stainless steel, double bowl kitchen sink with single handle faucet, in fair condition. Cast Iron, single bowl decon sink with dual handle faucet and attached eye wash, dated design in fair/poor condition.
   d. Showers: Fiberglass enclosures with curtain, single handle mixing valve, ADA, in fair condition.
   e. Emergency Fixtures: An addon eye wash is located on the decon sink faucet.
   f. Drains: The apparatus bay has trench drains and the bathrooms have floor drains.
   g. Piping: The domestic water service pipe is copper and is insulated.
   h. Domestic hot water: The building is served by a 75 gallon gas fired water heater with 75 MBH input. This water heater is at the end of useful service.

3. **Natural Gas Service:** The building is served by natural gas which supplies the water heater, a space heating furnace and the apparatus bay overhead radiant heaters.

4. **Space Heating, Ventilation and Air Conditioning (HVAC):**
   a. Systems: The living area of the building is served by a single gas fired, split-system furnace with ground mounted condensing unit controlled by a simple thermostat. This equipment is at the end of useful service.
   b. Refrigerant: The HVAC equipment uses R-22 refrigerant which has been phased out and is no longer available in new equipment.
   c. Zoning: The building doesn't have any HVAC zoning given that there is only a single system. This system would not allow for individual sleep room control.
   d. Exhaust: The restrooms are provided with ceiling fans, in fair condition, providing source specific exhaust. The apparatus bay has a roof mounted general exhaust fan.
   e. Apparatus Bay: The apparatus bay is served by an overhead gas-fired radiant tube heating system. The bays have a Plymovent vehicle exhaust extraction track system for engine exhaust.
   f. Kitchen: The kitchen has a residential style electric range with a residential type range hood exhaust. This hood offers limited odor and

grease capture and should be considered inadequate for this application. There does appear to be an electrical appliance disconnect on station alert.

MECHANICAL IMPROVEMENT DISCUSSION

1. **Operational Related:**
   a. Plan on providing HVAC capability for individual temperature control in single sleep rooms.
   b. The existing HVAC equipment is of residential quality which does provide a low cost solution. While this was typical for fire stations of this era, residential equipment cannot provide the functional and quality requirements of a modern staffed fire station. We recommend that future HVAC system use commercial/institutional equipment which can provide:
      i. Longer equipment life.
      ii. Additional zoning for comfort and individual sleep rooms.
      iii. Better ventilation (exhaust, outside air supply and filtration) for improved indoor air quality.
      iv. Quick space temperature adjustment for firefighter recovery and rehab.
   c. Plan on providing separate dedicated Decon space to contain and separate possible contamination from living and working areas. This space would also provide privacy when personal decontamination is required. Such a space would have high volume exhaust, infrared heat for comfort and drying, personal and equipment cleaning areas and full room drainage.
   d. Plan on providing a Bunker Gear Storage room to extend life and effectiveness of gear by storage in a dark environment. Such a space would have exhaust to remove odor and moisture and heat to promote moisture evaporation.

2. **CODE Related:**
   a. Kitchen cooking appliances in fire stations are classified by Code as residential which exempts the requirement for a restaurant style Type I grease capture hood. However, since a fire station kitchen typically receives much more use than a normal house, a commercial style kitchen hood with roof mounted exhaust fan is recommended. This provides much better capture of steam and odors. Code does require make-up air be provided based on the volume of air exhausted.
   b. We understand this facility uses a septic drainage field for sanitary waste. Under current EPA rules, it would not be possible to have drains in the

apparatus bay on this same system. Drainage would need to go to a dry sump or a separate drainage system.

c. Ventilation: The Energy Code requires that outside air ventilation for fire stations be provided independently of the heating and cooling system(s) and contain energy recovery. An ERV (Energy Recovery Ventilation) system is used to supply each space directly with outside air and recovery heat out of exhaust air from restrooms, laundry, etc. Any type of heating and cooling system(s) may be used with the ERV.

3. Maintenance Related:

a. The condensing units which uses R-22 refrigerant cannot be directly replaced due to the phase out of that refrigerant. When considering replacement or upgrade of refrigerant equipment, it will need to be a newer refrigerant like R-410a. This will necessitate replacing not only the exterior condensing unit but also the indoor coil and the refrigerant piping as well.

b. We recommend replacing residential tank type toilets with commercial flush valve models. This may require an increase in the water service size.

BY: James Whigham, P.E.

SÄZÄN GROUP

DATE:	February 15, 2018
TO:	Ed McManammna – RFM Architects
FROM:	Dan Chase
PROJECT NAME:	East Pierce Fire & Rescue
SÄZÄN PROJ. NO.	292-1773
SUBJECT:	Electrical Assessment

Fire Station No. 112

A. **General:** This station dates to the 1976 and as such the electrical power systems are 40 years old or older. These systems are beyond their 30-year life expectancy and should be replaced. The stations lighting systems are inefficient and do not meet Energy Code.

B. **Utility Power System**:

- Power is from Puget Sound Energy via overhead service strike to weatherhead to pole mounted transformers. Meter number is 63277539. Service Voltage is 208Y/120V 3-phase, 4 wire. Service entrance has a rating of 200 amps.
- Service entrance panel is a newer General Electric A-line circuit breaker panel installed in (year unknown). This panel is in serviceable condition and could serve another 5 years.
- Branch circuit panels are newer General Electric circuit breaker panels installed in (year unknown). These panels are in serviceable condition and likely could serve another 5 years.

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Seattle, Washington 98101

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C. **Emergency Power System**:

- Emergency power is furnished to the station via a diesel fuel generator located outside the station. The set is a Generac set in an outside rated enclosure with a sub-base fuel tank located under the set.

- The automatic transfer switch is a Generac (date of installation unknown). ATS located inside the station. The ATS senses loss of utility power, starts the generator and transfers power to an emergency power panel. The emergency panel serves the station loads that are needed to operate in the event that utility power has failed.

- The fuel tank was thought to be sized to power the station for 48 hours.

- The set was supported via seismic spring isolators which if properly sized and installed allow the set to survive and function after a seismic event.

- The emergency system generator is in serviceable condition and with proper maintenance should continue to serve the stations needs for another 10 years.

- Newly adopted electrical codes now require the emergency generator system to separate the life safety loads from the station essential loads during future renovations.

D. **Lighting Systems**:

- Station illumination is via fluorescent lighting fixtures. The fixtures appeared to be the original fixtures installed in 1976.

- Lighting fixtures in the apparatus bay were bare tube without lamp guards. The fixtures mounted suspended from the ceiling and the lighting level appeared to be on the low end of satisfactory. Other station lighting levels appeared also to be on the low end of satisfactory.

- The fixtures in general were in serviceable condition and should function adequately for another 5 years with regular maintenance and repair. During any renovations the fixtures would need to be upgraded to LED type meeting energy code.

- Lighting control was via individual room switches. There were no occupancy sensors for control as required by current energy code.

E. **Life Safety Systems**:

- There were no electric powered exit signs at this station.
- Egress lighting in this station was via battery powered twin head egress lights. Additionally, portions of station lighting is powered by the standby generator.
- Fire Alarm system is a Silent Knight IFP-50. Detectors are installed in the station.
- The station is not fire sprinklered. Sleeping rooms did have individual smoke detectors.

F. **Station Alarm and Response**:

- District standard alarm via South Sound dispatch signal to a Plectron Station Alert Receiver.

G. **Communications**

- District standard telephone and internet/data systems are installed.
- Pubic address speakers installed throughout station.

Conclusion:

The electrical systems at this station are for the most part in old condition and during renovations power and lighting systems need to be upgraded to meet current energy code and end of life expectancy requirements.

Note: The above assessment is based on a site visit to the Station on January 24, 2018 to observe the visible electrical systems conditions. No record drawings or equipment manuals were available for this purpose. Time did not allow an assessment of the low voltage systems which would involve more time and information on the systems at each station.

END

Predesign Study
East Pierce Fire and Rescue
Station 12 Addition / Remodel

December 16, 2011

Address: 12006 214TH AV E

Parcel Number: 0519108021

Summary

The 18,600 sf site is located in Section 10, Township 19N, Range 5E, W.M., Pierce County, WA.

It is proposed to construct an addition to Station 12 and remodel the interior of the station. Upon completion, the station will include 6 sleep rooms. A community room is not planned for this station.

The scope of this Predesign Study is limited to the items discussed below.

Critical Areas

There are no mapped critical areas on the site. In addition, grading maps do not show any slopes that represent landslide hazard areas and soil maps do not show soils that are typically found in wetland areas.

Soils, Grading and Erosion Control

Soils on the site are mapped by the National Resource Conservation Service (NRCS) as Indianola loamy sand, a Type "A" or Gravel soil. Type "A" or Gravel soils have good infiltration rates and are well suited for infiltration if the depth from the bottom of the infiltration system to the hardpan layer or groundwater layer is at least 3 feet. In addition, Indianola soils have a low silt (loam) content, which makes them easier to work with in wet weather and has a low risk of erosion during construction.

There is less than 10 feet of grade change across the site based on Pierce County topographic mapping of the site. Based on the Predesign Architectural Siteplan the proposed building and site improvements will fit into the site and it appears will comply with ADA regulations. A detailed design survey will be needed before the schematic design phase is started to allow for a grading design in the schematic design phase to verify door and walkway locations can meet ADA grade requirements. By making critical grading and earthwork decisions early in the schematic design phase, if any changes are required in the shape of the building to save money in earthwork, there will be a minimal amount of design changes required in the building saving potential costs in building redesign.

Since the site is less than 1 acre, an NPDES Construction Activities permit will not be required. An Erosion and Sediment Control plan will be prepared for the project to prevent sediment laden runoff from entering downstream waters. Monitoring stormwater runoff for turbidity (the amount of sediment in the runoff) and pH (related to concrete handling activities) will not be required for this site.

Storm Drainage and Water Quality

The site is required to comply with the storm drainage and water quality regulations of the Pierce County. The County uses a continuous path methodology to compute storm infiltration and water quality volumes, which was used to determine the Predesign Study volumes.

Underground infiltration trenches are proposed to infiltrate runoff from the increased roof area and any new walk areas and disturbed landscape areas around the building. It is assumed that any disturbed pavement areas will be restricted to simply repairing damaged pavement, with no changes in grade, so these pavement areas will be exempt from storm drainage improvements per Pierce County's redevelopment regulations.

The Predesign estimated length for the infiltration trench is 200 linear feet.

Water

Since the site is currently served by domestic and fire sprinkler water, it is assumed there is adequate fire flow to the site. An allowance was provided in the Predesign Cost Estimate to upsize the domestic water service pipe diameter to provide for the new plumbing fixtures in the building.

Sanitary Sewer Service

There is currently an on-site septic system serving the station. The system will need to be inspected to verify that it is operating properly. At a minimum, the system will need to be enlarged to accommodate the increased number of employees the station will serve. If the existing system is in good shape, it will not need to be replaced, only expanded. Since Health Department regulations related to absorption rate have changed since the system was designed, a conservative absorption rate was assumed until new soil logs can be dug on the site. This should happen early in the design phase of the project so an adequate amount of space is reserved for the septic system expansion. For the Predesign Cost Estimate, it was assumed that the entire septic system would need to be replaced. The system was sized based on the number of bedrooms in the station.

Road Improvements

Pierce County has identified the site location as a "Right-of-Way Needs Area" which typically means that the width of the Right-of-Way doesn't meet the road classification for the frontage street (214th Avenue East). It could also mean that road improvements will be required of the project.

It was assumed for the Predesign Study that no road improvements would be required for this project. A pre-application conference is recommended with Pierce County is recommended to determine if any road improvements or Right-of-Way dedication would be required.

Conclusion

The site appears suitable for this development. A pre-application conference is recommended with Pierce County to determine any additional requirements the County may have on site development that may impact the costs of this project. Additionally, detailed topographic and boundary surveys, as well as a geotechnical survey, including infiltration rate and suitability of native soils to treat for water quality (cation exchange capacity), need to be done on the site.

Prepared By

Cynthia L. Jose, P.E.
Senior Project Manager

Architectural Assessment: Station 113 Sumner

Scope of Review

Station 113 was reviewed by architectural, mechanical, structural, and electrical engineering consultants on May 17, 2011 and again on January 23, 2018. Please see the included reports for detailed assessments in each discipline. Cost estimating consultants were also present to observe existing conditions in preparation for their work in providing project budgets.

General Station Information

- Age and Improvement History: Originally built in 1991, Station 113 has received no significant remodels or additions.
- Size: Approximately 8,200 sq. ft., on two floors.
- Current and Future Deployment: Rescue 113, Medic 13, Ladder 113, and EPF&R Technical Rescue trailer. The station currently accommodates a minimum staffing of 5 firefighters, with room for 9. Future staffing demands indicate a minimum staffing of 6 will be required.

Noted Operational Limitations

- The existing apparatus bay doors are only 12 feet tall, limiting the apparatus that can be accommodated in the station. The existing ladder truck is 11'-6" tall and has, in some instances damaged the door header due to lack of clearance.
- Bunker Gear Storage: washing in bay gets gear wet, reducing both comfort and gear longevity.
- Slide from Second Floor: The slide takes up significant space and presents some safety issues. Slides are not allowed under current WAC regulations.
- Storage: Operational storage limitations put pressure on apparatus bay and WAC clearances around apparatus. Additionally, the second-floor mechanical room has been used for general storage which violates current codes and limits equipment maintenance access.
- Existing large meeting room has been converted to office space for the Fire Prevention Division. It is anticipated that the Fire Prevention Division will relocate to the proposed headquarters station and that this space will revert to community usage.
- Watch office is too small for the existing 5 firefighter staff as well as the anticipated 9 personnel the station is expected to accommodate in the future. With the Fire Marshal and Information Technology offices being relocated to leased office space and ultimately to the future headquarters station, additional space would be made available to accommodate watch office expansion.

- Fitness: Existing fitness space is accommodated within an unused vehicle bay, along with the maintenance shop. Preferred location would be within the residential portion of the station and provided with adequate ventilation and separation from vehicle and maintenance odors.
- Kitchen/Dining: Existing spaces are tight with current staffing. Additional space will likely be needed with any staffing increases.
- Lockers: Currently there are a total of 10 sleep rooms (9 firefighters, 1 officer) and 27 personnel are assigned to the station. Existing lockers are too small in size and too few in quantity to accommodate crew clothing and personal items.
- Bathrooms: Existing second floor firefighter bathrooms should be remodeled to allow for a 2:1 sleep room to shower ratio to alleviate waiting for shower facilities at high-use periods. Unisex, handicap accessible bathrooms should be provided to allow gender privacy issues. For code-compliance, an accessible officer's restroom should be provided.
- Pierce County's Special Operations Response Team's (PCSORT) trench rescue trailer is housed outdoors. While the vehicle is not owned by EPF&R, it is generally recommended that response vehicles be placed in enclosed garages for enhanced response readiness, security, and improved vehicle longevity.

Code and WAC Limitations

- No decon sink for equipment: while the station does include an extractor and bunker gear dryer, there is no decon sink in the apparatus bay or operational support areas to perform equipment decontamination.
- Second floor accessibility: No elevator exists for second floor accessibility; ADA restroom accessibility compliance is also limited.

Deferred Maintenance Issues

- Wood doors weathering and delaminating: These should be replaced with either new wood doors or, preferably, hollow metal doors.
- Mechanical/lighting seismic bracing: We noticed that there was minimal seismic bracing for the overhead lighting, ductwork, and radiant tube heating systems. These should be upgraded in the context of a remodeling project.
- Roofing is approximately 16 yrs old and is in good condition.
- Paving and apparatus aprons: Paving is in average condition; some cracks are evident in the concrete apparatus aprons.
- Finishes are generally in good condition.

Conclusions and Long-Term Viability

Built in 1991, Station 113 is one of the busiest of EPF&R's staffed stations. At 8,200 sq. ft., the Sumner station is reasonably sized, well located from a response standpoint, and is generally in good condition making it a good candidate for remodeling. While staffing levels at Station 13 are not projected to increase beyond the current 9 beds, the station lacks operational support, decontamination, and storage areas. Once the new Station 111 headquarters is constructed, the areas of the building that previously contained administrative functions will be freed up such that these needed operational area can be cost-effectively created. It is therefore recommended that Station 113 be remodeled and upgraded as part of a capital facilities bond.

Fire Station 113

Structural Site Observations

Reid Middleton conducted a site visit of Station 113 on January 23, 2018, as part of this seismic evaluation. A previous site visit was conducted on May 17, 2011. Observations were limited to finished areas, except in the apparatus bay, where there was no ceiling finish. Most primary structural members were covered by architectural finishes. Partial access to the attic space was observed through an existing access hatch. Limited drawings were available for this evaluation, and most conclusions were determined through limited site investigation. ASCE 41-13 classifies Station 113 as both a Wood Frame and a Reinforced Masonry Bearing Walls system, W2 and RM1 respectively. This structure was checked for Immediate Occupancy criteria. The Tier 1 Preliminary Seismic Evaluation structural checklists were completed and are included for reference.

Structural System

The following table describes Fire Station 113's structural systems.

Structural System Description of Fire Station 113

System	Description
Roof	Plywood roof sheathing over wood joists is supported by wood shear walls at the second floor and by reinforced masonry shear walls at the first floor.
Foundations	The building's foundation system is assumed to be constructed of concrete strip footings under all shear walls, with reinforced slab on grade.
Lateral System	The building's roof is supported laterally by perimeter wood shear walls in the longitudinal and transverse directions. The second floor is supported laterally by perimeter reinforced concrete masonry unit (CMU) shear walls in the longitudinal and transverse directions.

Seismic Evaluation Findings

Seismic Deficiencies

The following table summarizes the seismic deficiencies identified during the Tier 1 evaluation. Descriptions of these deficiencies are based on this evaluation.

Identified Seismic Deficiencies for Fire Station 113

Deficiency	Description
Weak Story	The wood story above the CMU first story causes a weak story condition and a mass irregularity, creating the potential for torsional forces.
Mass	The first level is composed of CMU and the second level and diaphragms are wood. The large irregularity in each story's effective mass affects the building response and may lead to higher force demands during a seismic event.
Liquefaction	It is unknown if there are liquefaction-susceptible soils at depths within 50 feet under the building.
Surface Fault Rupture	It is unknown if fault rupture and displacement is anticipated at the site.
Walls Connected Through Floors	There are no available structural record drawings and the information could not be observed during the site walk-throughs. It is anticipated that connections may not have adequate capacity to transfer forces.
Hold-Down Anchors	There are no available structural record drawings and the information could not be observed during the site walk-throughs.
Wood Ledgers	There are no available structural record drawings and the information could not be observed during the site walk-throughs. It is anticipated that the connections at the diaphragm will induce cross grain bending due to the building age and construction.
Transfer to Shear Walls	Although structural record drawings are not available, there is a concern that the diaphragms are not adequately connected for transferring loads to the shear walls. This concern is amplified at the skylights, where the load path from the diaphragm to the lateral system appears to be discontinuous.
Wall Anchorage	There are no available structural record drawings and the information could not be observed during the site walk-throughs. It is anticipated that connections may not have adequate capacity to transfer forces.
Plan Irregularities	Re-entrant corners are present in the building plan, but the reinforcement of the diaphragm at these locations is unknown. Damage may occur at these areas if elements do not have significant capacity to resist tensile forces.

Deficiency	Description
Diaphragm Reinforcement at Openings	Skylights run along the length of the building at the roof diaphragm in multiple locations. This creates a discontinuity in the roof and lateral load path, which can increase forces in the diaphragm and chord elements.
Cross Ties	There are no available structural record drawings and the information could not be observed during the site walk-throughs. It is anticipated that cross ties are not present, which can lead to diaphragm failure.

Numerous other structural deficiencies were noted for the Wood Frame and Reinforced Masonry Bearing Walls systems, since structural drawings were not available. Further site investigation or record drawings could determine that some of these deficiencies are compliant. In addition to the identified unknown Geological Site Hazard in the Tier 1 evaluation, the *Liquefaction Susceptibility Map of Pierce County, Washington*, dated September 2004 and produced by the Washington State Department of Natural Resources, was reviewed. The area where Station 113 is located has a liquefaction susceptibility of moderate to high. During an earthquake, the station may have significant settlement and potentially differential settlement across the site. This may result in damage to the building and surrounding utilities. Prior to completion of design, a site geotechnical investigation should be conducted to identify soil design parameters and actual site soil conditions.

Structural Conclusions

Fire Station 113 does not meet the Immediate Occupancy performance objective, as determined by the ASCE 41 Tier 1 Evaluation. The evaluation indicates that some damage to the building may occur during a design-level earthquake, which may cause the facility to not be occupied. The age of construction suggests the building should have relatively good seismic performance, but as-built structural drawings of the station were not available for this evaluation and conceptual retrofit design. Without drawings or selective demolition, many as-built conditions cannot be determined; therefore, the building's seismic performance is in question.

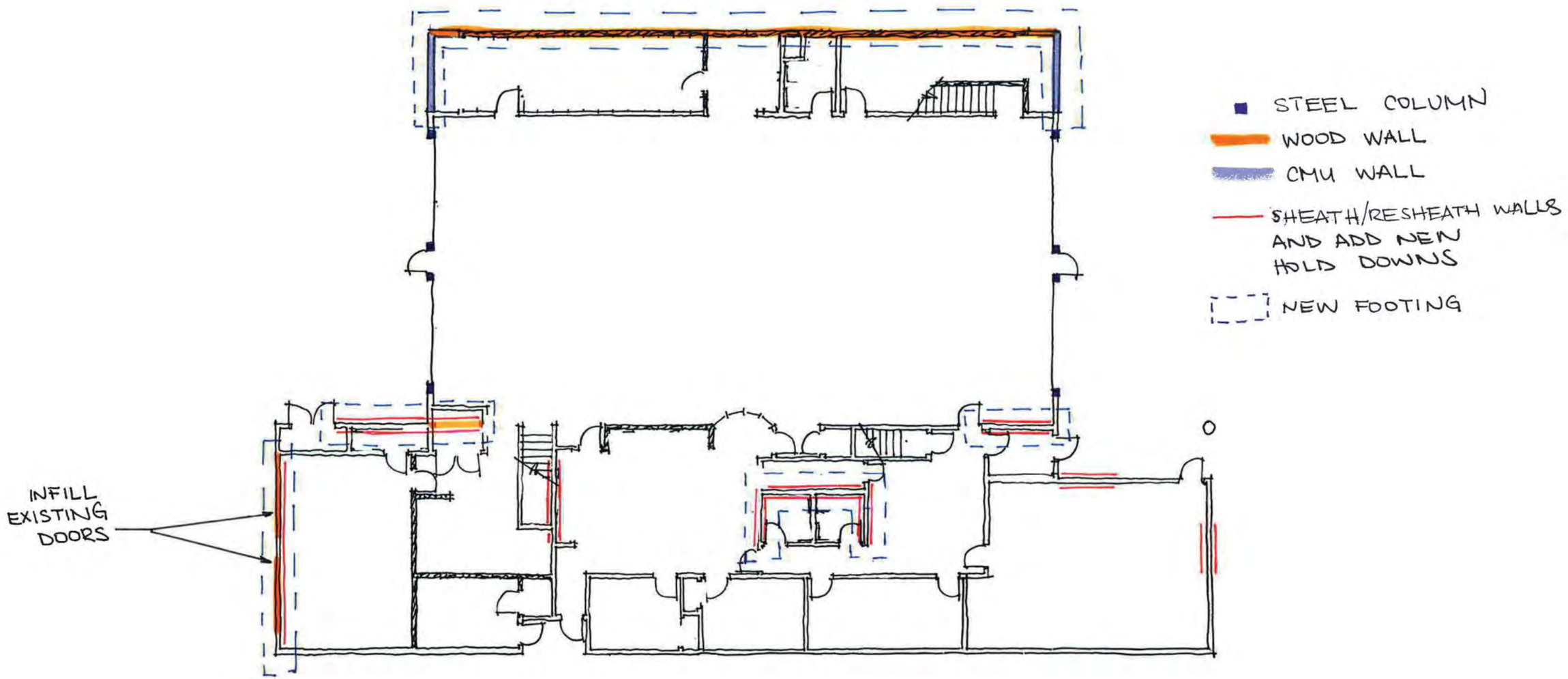
Prior to completion of the final design, selective demolition should be completed to verify whether the building's existing conditions will allow the structural design to be refined. A primary concern is the roof diaphragm's capacity to transfer loads across long spans in the station roof. A large skylight in the roof also creates a discontinuity in the roof diaphragm and a gap in the lateral load path. Additionally, the transverse lateral load path in the apparatus bay appears to be constructed of a wood shear wall stacked on top of a masonry shear wall. This configuration creates a stiffness irregularity and may result in damage during a seismic event. These deficiencies may result in a partial collapse of the roof structure, limiting the station's ability to provide first response capabilities.

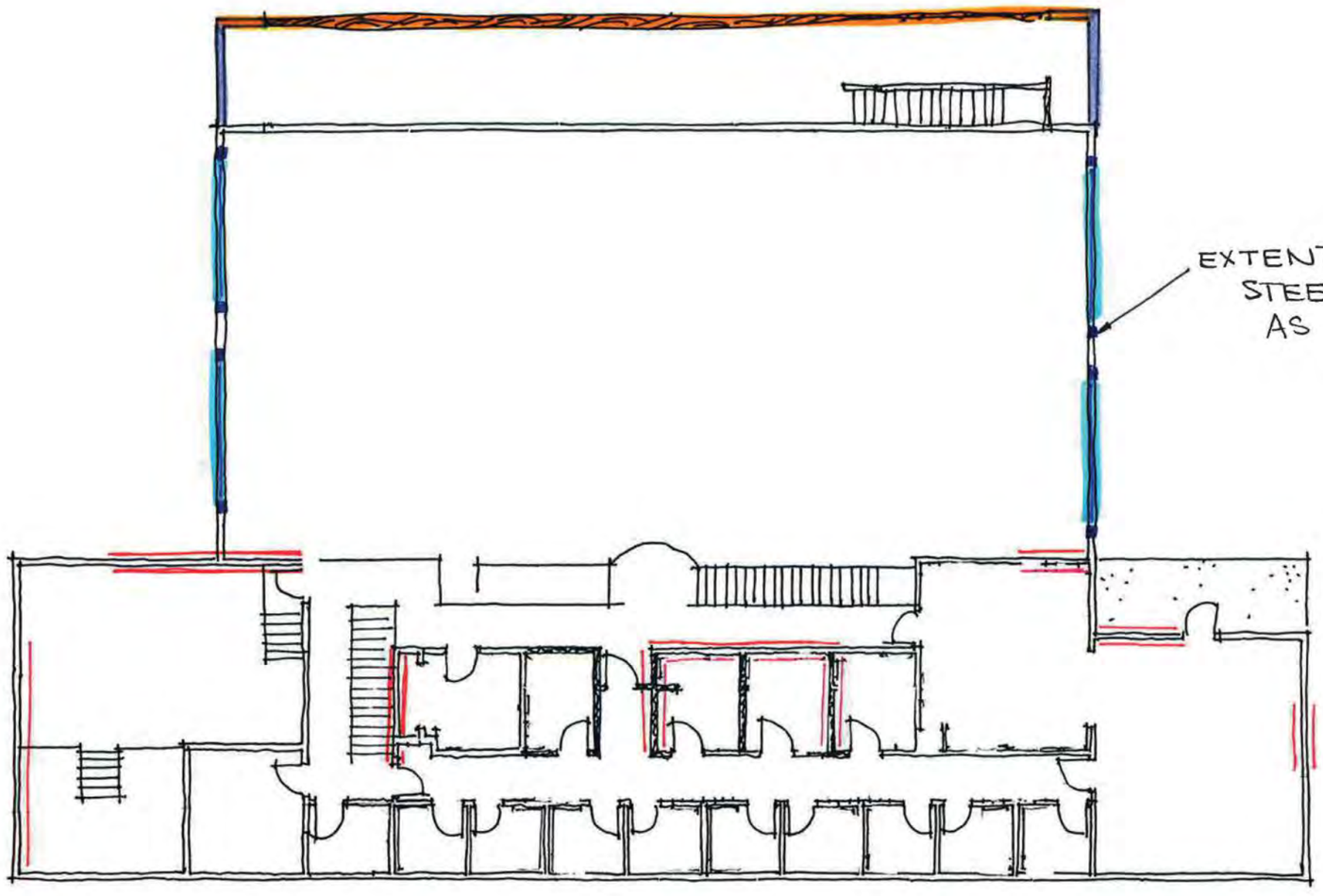
This station should be seismically upgraded to meet the Immediate Occupancy performance objective, which would allow the station to remain functional after an earthquake and provide

first response capabilities. For additional information on the building's performance objectives and evaluation criteria, see the section titled *Existing Fire Station Seismic Evaluation Criteria.*

The following plans show the conceptual retrofit design for Station 113, previously developed in 2011. These concepts, based on engineering judgment, were developed by addressing the seismic deficiencies previously noted in the ASCE 31 Tier 1 checklist. These concepts have not been updated to the current ASCE 41-13 checklists, although they are similar. Building upgrades are slated for a second project phase, and it is anticipated that code requirements may change by that time, which may result in changes to the concepts and station layout.

The concept for Station 113 includes adding nailing, blocking, and drag struts to the existing roof system. New wood shear walls would be added to the building's interior and exterior to provide additional strength and stiffness and reduce the roof diaphragm spans. The concept includes raising the apparatus door headers and adding masonry shear walls in the transverse direction of the apparatus bay. Ground improvements, such as compaction grouting beneath the existing building, may be required to mitigate settlement resulting from soil liquefaction. A site geotechnical investigation should be conducted prior to final design to further develop recommendations and identify the site's true potential for liquefaction. The addition of these new elements will strengthen and stiffen the building, providing better seismic performance.


STEEL COLUMN
WOOD WALL
CMU WALL
SHEATH/RESHEATH WALLS AND ADD NEW HOLD DOWNS
NEW FOOTING
INFILL EXISTING DOORS



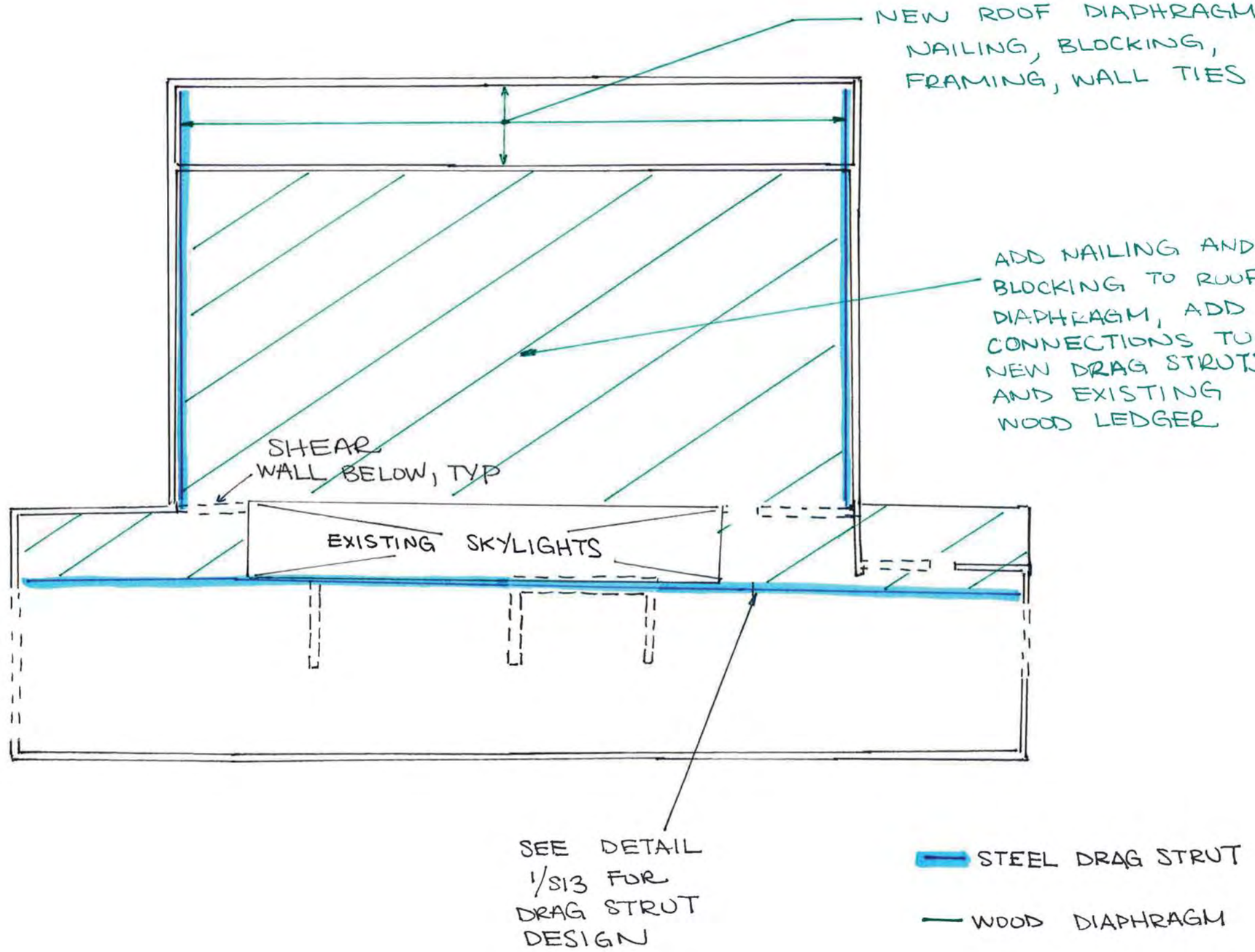
STEEL BEAM ABOVE DOOR

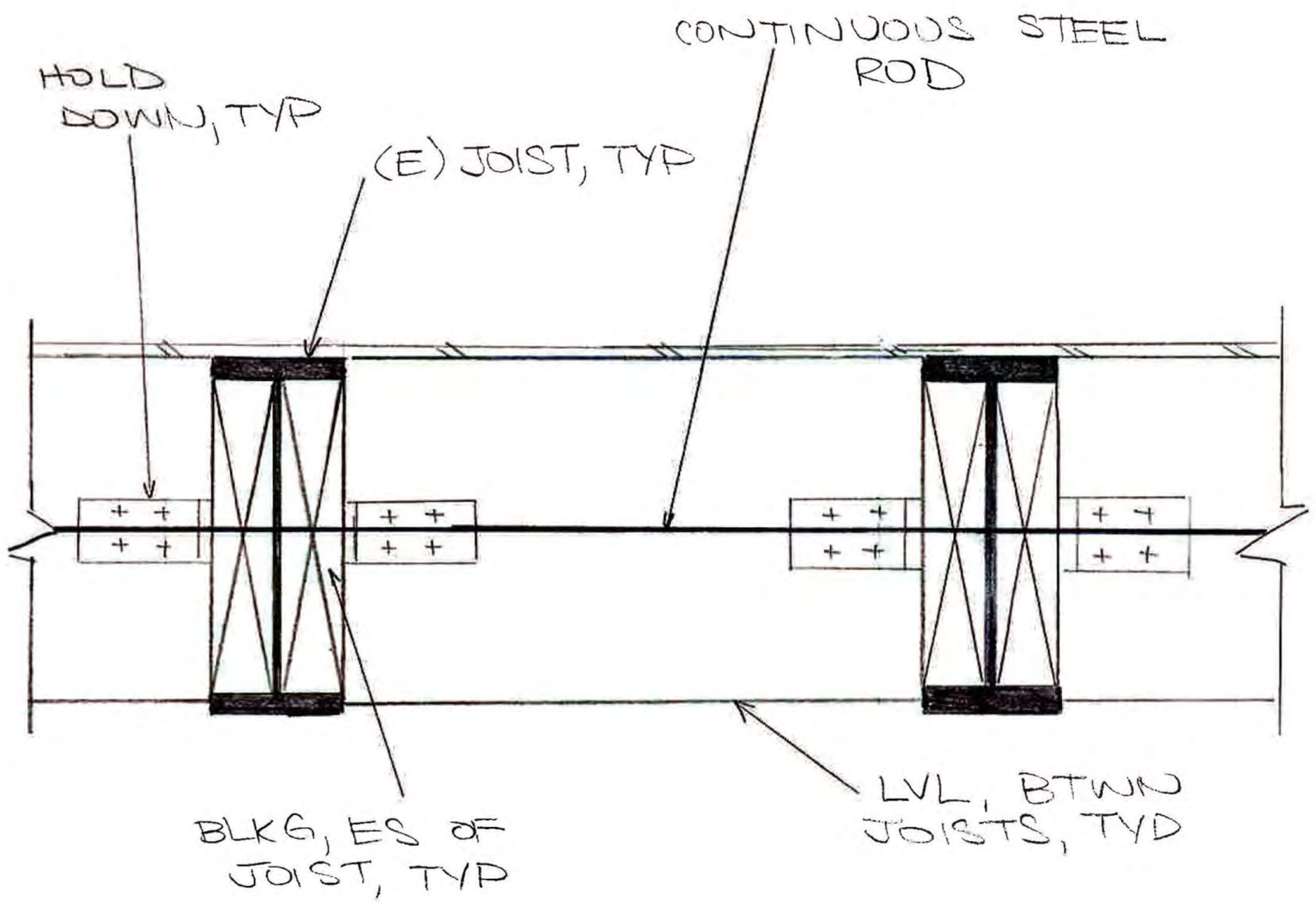
WOOD WALL

CMU WALL

STEEL COLUMN

SHEATH/RESHEATH WALLS


NEW ROOF DIAPHRAGM; NAILING, BLOCKING, FRAMING, WALL TIES
ADD NAILING AND BLOCKING TO ROOF DIAPHRAGM, ADD CONNECTIONS TO NEW DRAG STRUTS AND EXISTING WOOD LEDGER
SHEAR WALL BELOW, TYP
EXISTING SKYLIGHTS
SEE DETAIL 1/S13 FOR DRAG STRUT DESIGN
STEEL DRAG STRUT
WOOD DIAPHRAGM



1 / S13 Drag Strut Detail

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MECHANICAL ENGINEERS

EAST PIERCE FIRE & RESCUE, EXISTING STATION #113 - SUMNER

Mechanical Systems Report

March 27, 2018

We visited Station #113 on January 23, 2018 to evaluate existing mechanical systems and discuss issues relevant to remodel possibilities and usable life span. The following is our report of the existing conditions.

EXISTING SYSTEMS

1. **Fire Sprinklers:** The building has a full coverage wet sprinkler system.

2. **Plumbing:**
   a. Water closets: China, tank type flush, in good condition.
   b. Urinals: China, flush valve, in fair condition.

c. Lavatories: China, counter mounted with single handle faucets, in fair condition. China, wall mounted with dual handle faucets, in good condition.
d. Sinks: Stainless steel, double bowl kitchen sink with dual handle faucet, in fair condition. Stainless steel, single bowl decon sink with dual handle faucet and attached eye wash, in fair condition. Stainless steel, single bowl break room sink with dual handle faucet, in fair condition. Stainless steel, single bowl sink with single handle faucet, in fair condtion.
e. Showers: Fiberglass enclosures with door, dual handle mixing valve, dated design in fair/poor condition.
f. Emergency Fixtures: An addon eye wash is located on the decon sink faucet.
g. Drains: The apparatus bay has trench drains in each bay.
h. Piping: The domestic water service pipe is copper and is insulated.
i. Domestic hot water: The building is served by two instantaneous gas fired water heaters, in new condition.
j. Compressed air: The station has a shop air compressor with piping to wall outlets and reels. This system appears adequately sized and serviceable.

3. **Natural Gas Service:** The building is served by natural gas which supplies the water heater, four (4) space heating furnaces and the apparatus bay overhead radiant heaters.

4. **Space Heating, Ventilation and Air Conditioning (HVAC):**
   a. Systems: The living area of the building is served by four gas-fired, split-system furnaces with ground mounted condensing units and one ductless split-system heat pump, each with a standalone programmable thermostat control. The gas furnaces are newer Trane models, in good condition. The split-system heat pump is a newer Mitsubishi model, in good condition. The condensing units do not appear to be have been replaced with the furnaces and are of mixed manufacturers and ages ranging from good to poor condition.
   b. Refrigerant: The HVAC equipment uses R-22 refrigerant which has been phased out and is no longer available in new equipment.
   c. Zoning: The building HVAC zoning is minimal given the size and layout of the station and does not provide an acceptable level of occupant comfort. These systems would not allow for individual sleep room control.
   d. Exhaust: The restrooms are provided with source specific exhaust.
   e. Apparatus Bay: The apparatus bay is served by an overhead gas-fired radiant tube heating system. The bays have a Plymovent vehicle exhaust extraction track system for engine exhaust. The exhaust fan is mounted outside on the wall and appears in good condition.
   f. Kitchen: The kitchen has a residential style electric island cooktop with a built-in, under counter, downflow exhaust. This type of exhaust offers

negligible odor and grease capture and should be considered inadequate for this application. There are also a pair of built-in ovens and microwaves.

MECHANICAL IMPROVEMENT DISCUSSION

1. **Operational Related:**
   a. Plan on providing HVAC capability for individual temperature control in single sleep rooms.
   b. The existing HVAC equipment is of residential quality which does provide a low cost solution. While this was typical for fire stations of this era, residential equipment cannot provide the functional and quality requirement of a modern staffed fire station. We recommend that future HVAC system use commercial/institutional equipment which can provide:
      i. Longer equipment life.
      ii. Additional zoning for comfort and individual sleep rooms.
      iii. Better ventilation (exhaust, outside air supply and filtration) for improved indoor air quality.
      iv. Quick space temperature adjustment for firefighter recovery and rehab.
   c. Plan on providing separate dedicated Decon space to contain and separate possible contamination from living and working areas. This space would also provide privacy when personal decontamination is required. Such a space would have high volume exhaust, infrared heat for

comfort and drying, personal and equipment cleaning areas and full room drainage.

d. Plan on providing a Bunker Gear Storage room to extend life and effectiveness of gear by storage in a dark environment. Such a space would have exhaust to remove odor and moisture and heat to promote moisture evaporation.

2. CODE Related:

a. WAC 296-305-06503(15) requires new or remodeled kitchens to have cooking appliance disconnects activated by alarm for gas and electricity. We recommend this be retrofitted for existing kitchens.

b. Kitchen cooking appliances in fire stations are classified by Code as residential which exempts the requirement for a restaurant style Type I grease capture hood. However, since a fire station kitchen typically receives much more use than a normal house, a commercial style kitchen hood with roof mounted exhaust fan is recommended. This provides much better capture of steam and odors. Code does require make-up air be provided based on the volume of air exhausted.

c. Ventilation: The Energy Code requires that outside air ventilation for fire stations be provided independently of the heating and cooling system(s) and contain energy recovery. An ERV (Energy Recovery Ventilation) system is used to supply each space directly with outside air and recovery heat out of exhaust air from restrooms, laundry, etc. Any type of heating and cooling system(s) may be used with the ERV.

3. Maintenance Related:

a. The condensing units which uses R-22 refrigerant cannot be directly replaced due to the phase out of that refrigerant. When considering replacement or upgrade of refrigerant equipment, it will need to be a newer refrigerant like R-410a. This will necessitate replacing not only the exterior condensing unit but also the indoor coil and the refrigerant piping as well.

b. We recommend replacing residential tank type toilets with commercial flush valve models. This may require an increase in the water service size.

BY: James Whigham, P.E.

SÄZÄN GROUP

DATE:	February 15, 2018
TO:	Ed McManammna – RFM Architects
FROM:	Dan Chase
PROJECT NAME:	East Pierce Fire & Rescue
SÄZÄN PROJ. NO.	292-1773
SUBJECT:	Electrical Assessment

Fire Station No. 113

A. **General:** This station was built in 1991. The electrical power systems are in serviceable condition. The stations lighting systems are inefficient and do not meet Energy Code.

B. **Utility Power System**:

- Power is from Puget Sound Energy via underground conduit to pole mounted transformers. Meter number is Z02672514. Service Voltage is 208Y/120V 3-phase, 4 wire. Service entrance secondary conduit is 4", supporting a service amp rating of 400 amps.
- Service entrance panel is the original Siemens fused switch panel installed in 1991 (26 years ago). This panel is in good condition and has another 5 years of life to reach its 30-year life expectancy.
- Branch circuit panels are the original Siemens circuit breaker panels installed in 1991 (20 years ago). These panels are in serviceable condition and have another 5 years of life to reach their 30-year life expectancy.

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C. **Emergency Power System**:

- Emergency power is furnished to the station via a diesel fuel generator located outside the station. The set is a Generac set in an outside rated enclosure with a sub-base fuel tank located under the set.
- A Generac automatic transfer switch located inside the station senses loss of utility power, starts the generator and transfers power to an emergency power panel. The emergency panel serves the station loads that are needed to operate in the event that utility power has failed.
- The fuel tank was thought to be sized to power the station for 48 hours.
- The set was supported via seismic spring isolators which if properly sized and installed allow the set to survive and function after a seismic event.
- The emergency system is in serviceable condition and with proper maintenance should continue to serve the stations needs for another 10 years.
- Newly adopted electrical codes now require the emergency generator system to separate the life safety loads from the station essential loads during future renovations.

D. **Lighting Systems**:

- Station illumination is via fluorescent lighting fixtures. The fixtures were the original fixtures installed in 1991, with an energy upgrade to T5 lamps performed recently.
- Lighting levels appeared to be satisfactory at this station.
- The fixtures are in serviceable condition and should function adequately for another 10 years. Any lighting altered by remodeling and any station additions will need to utilize LED type fixtures and controls meeting Energy Code.
- The light fixtures in the apparatus bay were not seismically braced.
- Lighting control was via individual room switches. There were no occupancy sensors for control as required by current energy code.

E. **Life Safety Systems**:

- Electric powered exit signs, red in color were installed at this station. These were battery backup type which are designed to stay illuminated for 90 minutes after power failure.
- Egress lighting in this station was via lights powered by the standby generator.
- Fire Alarm system is a FireLite by FPi. Reporting has been upgraded to Wi-fi reporting.
- The station is fully fire sprinklered. System smoke detectors are installed in corridors. Sleeping rooms did have individual smoke detectors.

F. **Station Alarm and Response**:

- District standard alarm via South Sound dispatch signal to a Plectron Station Alert Receiver.

G. **Communications**

- District standard telephone and internet/data systems are installed.
- Pubic address speakers installed throughout station.

Conclusion:

The electrical systems at this station are for the most part in good condition and with proper maintenance should serve the needs to the station for the next 15-20 years.

Note: The above assessment is based on a site visit to the Station on January 23, 2018 to observe the visible electrical systems conditions. No record drawings or equipment manuals were available for this purpose. Time did not allow an assessment of the low voltage systems which would involve more time and information on the systems at each station.

END

Predesign Study
East Pierce Fire and Rescue
Station 13 Addition / Remodel

December 16, 2011

Address: 800 HARRISON ST

Parcel Number: 0420243176

Summary

The 31,160 sf site, in the City of Sumner, is located in Section 24, Township 20N, Range 4E, W.M., Pierce County, WA.

It is proposed to construct an addition to Station 13 and remodel the interior of the station. Upon completion, the station will include 9 sleep rooms. A community room is also planned for this station.

The scope of this Predesign Study is limited to the items discussed below.

Critical Areas

There are no mapped critical areas on the site. In addition, grading maps do not show any slopes that represent landslide hazard areas and soil maps do not show soils that are typically found in wetland areas.

Soils, Grading and Erosion Control

Soils on the site are mapped by the National Resource Conservation Service (NRCS) as Puyallup Fine Sandy Loam, a Type "B" or Gravel soil. Type "B" or Gravel soils have moderate infiltration rates and can be used for infiltration if the depth from the bottom of the infiltration system to the hardpan layer or groundwater layer is at least 3 feet. In addition, Puyallup soils have some silt (loam) content, which can make them difficult to work with in wet weather and increases the risk of erosion during construction as well as increases the potential for transporting sediment laden runoff off-site, which is a violation of permitting requirements discussed below in the Erosion Control paragraph.

There is less than 10 feet of grade change across the site based on Pierce County topographic mapping of the site. Based on the Predesign Architectural Siteplan the proposed building and site improvements will fit into the site and it appears will comply with ADA regulations. A detailed design survey will be needed before the schematic design phase is started to allow for a grading design in the schematic design phase to verify door and walkway locations can meet ADA grade requirements. By making critical grading and earthwork decisions early in the schematic design phase, if any changes are required in the shape of the building to save money in earthwork, there will be a minimal amount of design changes required in the building saving potential costs in building redesign.

Since the site is less than 1 acre, an NPDES Construction Activities permit will not be required. An Erosion and Sediment Control plan will be prepared for the project to prevent sediment laden runoff from entering downstream waters. Monitoring stormwater runoff for turbidity (the amount of sediment in the runoff) and pH (related to concrete handling activities) will not be required for this site.

Storm Drainage and Water Quality

The site is required to comply with the storm drainage and water quality regulations of the Pierce County. The County uses a continuous path methodology to compute storm infiltration and water quality volumes, which was used to determine the Predesign Study volumes.

Underground infiltration trenches are proposed to infiltrate runoff from the increased roof area and any new walk areas and disturbed landscape areas around the building. It is assumed that any disturbed pavement areas will be restricted to simply repairing damaged pavement, with no changes in grade, so these pavement areas will be exempt from storm drainage improvements per Pierce County's redevelopment regulations.

The Predesign estimated length for the infiltration trench is 35 linear feet.

Water

The building is currently served by both domestic and fire sprinkler water. It is assumed that improvements will not be required to either water service.

Sanitary Sewer Service

There are no proposed sewer improvements for this project.

Road Improvements

It was assumed for the Predesign Study that no road improvements would be required for this project. A pre-application conference is recommended with the City of Sumner is recommended to determine if any road improvements or Right-of-Way dedication would be required.

Conclusion

The site appears suitable for this development. A pre-application conference is recommended with the City of Sumner to determine any additional requirements the City may have on site development that may impact the costs of this project. Additionally, detailed topographic and boundary surveys, as well as a geotechnical survey, including infiltration rate and suitability of native soils to treat for water quality (cation exchange capacity), need to be done on the site.

Prepared By

Cynthia L. Jose, P.E.
Senior Project Manager

Architectural Assessment: Station 114 West Lake Tapps

Scope of Review

Station 114 was reviewed by architectural, mechanical, structural, and electrical engineering consultants on May 17, 2011 and again on January 23, 2018. Please see the included reports for detailed assessments in each discipline. Cost estimating consultants were also present to observe existing conditions in preparation for their work in providing project budgets.

General Station Information

- Age and Improvement History: Originally built in 1960, with remodeling noted in 1970. A second minor interior remodel was performed in 1991 which also included site work and utility provisions for the portable classroom building behind the station.
- Size: Approximately 3,616 sq. ft., not including the portable classroom.
- Current and Future Deployment: Engine 114 and Medic 114. The station currently accommodates a minimum staffing of 2 firefighters, with room for 4. Future staffing demands indicate a minimum staffing of 3 will be required.
- A modular structure behind the station includes storage for central supplies and medical supplies as well as several administrative offices.

Noted Operational Limitations

- The existing apparatus bay doors are only 12 feet tall, limiting the apparatus that can be accommodated in the station.
- The existing community room has been converted to office space. To accommodate training needs, a portable facility was installed in the south parking lot which has eliminated existing parking capacity at the station.
- Apparatus bay floor drains: No floor drains are present. This fact, combined with an on-site septic system, will mean that no-vehicle washing will be permissible within the station as oil-contaminated wash water is not allowed to be directed to a sanitary septic drain field. A separate wash facility with a dedicated infiltration drain field would be required.
- Operational Storage: There is no dedicated operational storage space within the existing facility, which requires bunker gear, ladders, and other equipment to be stored within the crowded apparatus bays.
- Bunker Gear Storage: Bunker gear is currently stored in the apparatus bay, reducing gear longevity due to UV exposure.

Code and WAC Limitations

- Apparatus Bay: Existing apparatus bays are too short to accommodate the assigned engine and do not provide the necessary 3-foot clearances required by WAC 296-305. Given the existing concrete masonry structure of the apparatus bays, increasing the depth of the bays would likely not be cost effective.
- Restrooms: Neither of the existing men's or women's restrooms are handicap accessible or ADA compliant.
- Existing parking to the west of the station appears to encroach substantially into existing Pierce County right-of-way. This issue would need to be discussed and resolved with the county as part of a redevelopment project.
- No fire sprinkler system is installed. Should sleep room quantity be increased, a fire sprinkler system will be required.

Deferred Maintenance Issues

- The concrete masonry structure appears to be largely un-insulated at the walls, noticeably in the apparatus bays and day room.
- Cracks were noticed in several locations at the exterior of the building's concrete masonry shell. This is particularly critical as the facility does not appear to be constructed with any type of rain screen or cavity wall construction which would allow any water getting into the cracks to be channeled safely out of the wall. In the existing condition, any water seeping into the masonry cracks could infiltrate into living spaces and could cause water damage as well as potential mold and mildew issues.
- Interior finishes, roofing, and overall facility maintenance is in good condition.

Engineering Reviews

Please see the associated structural, mechanical, civil, and electrical reviews of Station 114 for specific discussion related to those disciplines.

Conclusions and Long-Term Viability

Three key deficiencies that were noted as part of our review process preclude remodeling or salvaging this facility. Firstly, the structure, built of concrete block was noted to have numerous cracks and is believed to contain minimal reinforcing steel, which will require substantial work to correct.

Secondly, it was also noted that the apparatus bays are too short to allow adequate clearances around the deployed apparatus, as required by state law. Finally, the station is situated just 15 to 20 feet from the edge of West Tapps Road, making access to and from the street difficult and potentially dangerous. Should West Tapps Road be widened by Pierce County, this condition will worsen.

For these main reasons, it is recommended that Station 114 be replaced with a new station. Given that the station is in a good location, it is our opinion that a new facility could be rebuilt on the existing site in a manner that will provide acceptable and safe access to West Tapps Road, as well as provide a new, modern station.

Fire Station 114

Structural Site Observations

Reid Middleton conducted a site visit of Station 114 on January 23, 2018, as part of this seismic evaluation. A previous site visit was conducted on May 17, 2011. Most of the structure was covered by architectural finishes and was not visible. Limited drawings were available for this evaluation, and most conclusions were determined through limited site investigation.
ASCE 41-13 classifies Station 114 as a Reinforced Masonry Bearing Walls system, RM1. This structure was checked for Immediate Occupancy criteria. The Tier 1 Preliminary Seismic Evaluation structural checklists were completed and are included for reference.

Structural System

The following table describes Fire Station 114's structural systems.

Structural System Description of Fire Station 114

System	Description
Roof	Wood 3x decking supported on wood beams and joists, bearing on wood stud walls and reinforced concrete masonry unit (CMU) walls.
Hose Tower	The hose tower consists of wood stud walls above the main building roof and CMU bearing walls below the main building roof height.
Foundations	The building's foundation system is assumed to be constructed of concrete strip footings and concrete slab on grade.
Lateral System	CMU and wood shear walls provide lateral support to the structure in the longitudinal and transverse directions.

Seismic Evaluation Findings

Seismic Deficiencies

The following table summarizes the seismic deficiencies identified during the Tier 1 evaluation. Descriptions of these deficiencies are based on this evaluation.

Identified Seismic Deficiencies for Fire Station 114

Deficiency	Description
Vertical Discontinuities	Discontinuity occurs where the main building roof meets the hose tower. This can cause additional forces that supporting elements must have the capacity to develop.
Mass	A mass irregularity occurs at the hose tower. This can cause additional concentrated loads due to the varying distribution of building mass and stiffness.

Deficiency	Description
Liquefaction	It is unknown if there are liquefaction-susceptible soils at depths within 50 feet under the building.
Surface Fault Rupture	It is unknown if fault rupture and displacement is anticipated at the site.
Shear Stress Check	The shear stress in the reinforced masonry walls exceeds 70 lbs/square inch, indicating that the walls do not have adequate strength, which can lead to failure of portions of the walls.
Reinforcing Steel	Although structural record drawings are not available, cracking in the masonry suggests that the wall is lightly reinforced, thus limiting the lateral system's capacity.
Cross Ties	There appears to be a lack of out-of-plane masonry wall ties. This results in a lack of positive connection at the roof structure.

Numerous other structural deficiencies were noted as unknown for Station 114 due to lack of available structural drawings. These deficiencies include Ties between Foundation Elements, Transfer to Shear Walls, Foundation Dowels, Girder-Column Connections, Wall Anchorage, Reinforcing at Wall Openings, Straight Sheathing, Spans, and Diagonally Sheathed and Unblocked Diaphragms. Further site investigation or record drawings could determine that some of these deficiencies are compliant.

In addition to the identified unknown Geological Site Hazard in the Tier 1 evaluation, the *Liquefaction Susceptibility Map of Pierce County, Washington,* dated September 2004 and produced by the Washington State Department of Natural Resources, was reviewed. The area where Station 114 is located has a liquefaction susceptibility of very low. During an earthquake the site is not anticipated to experience liquefaction.

Structural Conclusions

Fire Station 114 does not meet the Immediate Occupancy performance objective. The evaluation indicates that some damage to the building may occur during a design-level earthquake that may cause the facility to not be occupied. Of primary concern is the apparent lack of out-of-plane masonry wall ties. The lack of these positive connections can result in the roof structure separating from the perimeter bearing walls, potentially resulting in a collapse of the roof structure. An additional concern is that cracks are present in the existing masonry walls. These cracks are evidence that the walls are lightly reinforced and have been damaged previously, potentially by past earthquakes. These deficiencies may result in a partial collapse of the structure, limiting the station's ability to provide first response capabilities.

This station should be replaced or seismically upgraded to meet the Immediate Occupancy performance objective if it continues to function as a fire station. A seismic upgrade concept for this station was not completed, based on the current understanding that the station is

recommended for replacement and was not identified as a good candidate for a seismic retrofit given the other findings and recommendations in the overall station assessments. For additional information on the building's performance objectives and evaluation criteria, see the section titled *Existing Fire Station Seismic Evaluation Criteria.*

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SIDER + BYERS
MECHANICAL ENGINEERS

EAST PIERCE FIRE & RESCUE, EXISTING STATION #114 – WEST TAPPS

Mechanical Systems Report

March 27, 2018

We visited Station #114 on January 23, 2018 to evaluate existing mechanical systems and discuss issues relevant to remodel possibilities and usable life span. The following is our report of the existing conditions.

EXISTING SYSTEMS

1. **Fire Sprinklers:** The building does not have a sprinkler system.

2. **Plumbing:**
   a. Water closets: China, tank type flush, in fair condition.
   b. Urinals: China, flush valve, in fair condition.
   c. Lavatories: China, counter mounted with single handle faucets, in fair condition.
   d. Sinks: Stainless steel, double bowl kitchen sink with single handle faucet, in good condition. Stainless steel, single bowl scullery decon sink with dual handle faucet and attached eye wash, in good condition.
   e. Showers: Fiberglass enclosure, dual handle mixing valve, dated design in poor condition. Only one shower located in men's restroom.
   f. Emergency Fixtures: An addon eye wash is located on the decon sink faucet.
   g. Drains: There are no drains in the apparatus bay.
   h. Piping: The domestic water service pipe is copper and is insulated.
   i. Domestic hot water: The building is served by a 50 gallon gas fired water heater with 40 MBH input, in good condition.

3. **Natural Gas Service:** The building is served by natural gas which supplies the water heater, a space heating furnace and two unit heaters in the apparatus bay and fitness room.

4. **Space Heating, Ventilation and Air Conditioning (HVAC):**
   a. Systems: The living area of the building is served by a gas fired, split-system furnace located in the attic with a roof mounted condensing unit controlled by a standalone programmable thermostat. This equipment is new.
   b. Zoning: The building doesn't have any HVAC zoning given that there is only a single system. This system would not allow for individual sleep room control.
   c. Exhaust: The restrooms are provided with source specific exhaust.
   d. Apparatus Bay: The apparatus bay is served by a suspended gas fired unit heater which is old, in fair condition. The bays have a Plymovent vehicle exhaust extraction track system for engine exhaust. The exhaust fan is mounted outside on the wall and appears in good condition.
   e. Kitchen: The kitchen has a residential style gas range with a residential type range hood exhaust. This system offers limited odor and grease capture and should be considered inadequate for this application. There does appear to be a range appliance disconnect on station alert.

MECHANICAL IMPROVEMENT DISCUSSION

1. **Operational Related:**
   a. Plan on providing HVAC capability for individual temperature control in single sleep rooms.
   b. The building envelope appears to be uninsulated. We recommend adding building insulation to reduce energy costs and improve occupant comfort.
   c. The existing HVAC equipment is of residential quality which does provide a low cost solution. While this was typical for fire stations of this era, residential equipment cannot provide the functional and quality requirement of a modern staffed fire station. We recommend that future HVAC system use commercial/institutional equipment which can provide:
      i. Longer equipment life.
      ii. Additional zoning for comfort and individual sleep rooms.
      iii. Better ventilation (exhaust, outside air supply and filtration) for improved indoor air quality.
      iv. Quick space temperature adjustment for firefighter recovery and rehab.
   d. Plan on providing separate dedicated Decon space to contain and separate possible contamination from living and working areas. This space would also provide privacy when personal decontamination is required. Such a space would have high volume exhaust, infrared heat for comfort and drying, personal and equipment cleaning areas and full room drainage.

e. Plan on providing a Bunker Gear Storage room to extend life and effectiveness of gear by storage in a dark environment. Such a space would have exhaust to remove odor and moisture and heat to promote moisture evaporation.

2. CODE Related:

a. WAC 296-305-06503(15) requires new or remodeled kitchens to have cooking appliance disconnects active by alarm for gas and electricity. We recommend this be retrofitted for existing kitchens.
b. WAC 296-305-06503(6) requires renovations that consist of more than 60% of the assessed evaluation of the stations be protected with a sprinkler system.
c. Kitchen cooking appliances in fire stations are classified by Code as residential which exempts the requirement for a restaurant style Type I grease capture hood. However, since a fire station kitchen typically receives much more use than a normal house, a commercial style kitchen hood with roof mounted exhaust fan is recommended. This provides much better capture of steam and odors. Code does require make-up air be provided based on the volume of air exhausted.
d. We understand this facility uses a septic drainage field for sanitary waste. Under current EPA rules, it would not be possible to have drains in the apparatus bay on this same system. Drainage would need to go to a dry sump or a separate drainage system.
e. None of the restrooms/showers meet ADA requirements. Remodel options would need to include at least one ADA restroom and shower facility which would be available to both genders.
f. Ventilation: The Energy Code requires that outside air ventilation for fire stations be provided independently of the heating and cooling system(s) and contain energy recovery. An ERV (Energy Recovery Ventilation) system is used to supply each space directly with outside air and recovery heat out of exhaust air from restrooms, laundry, etc. Any type of heating and cooling system(s) may be used with the ERV.

3. Maintenance Related:

a. We recommend replacing residential tank type toilets with commercial flush valve models. This may require an increase in the water service size.

BY: James Whigham, P.E.

SÄZÄN GROUP

DATE:	February 15, 2018
TO:	Ed McManammna – RFM Architects
FROM:	Dan Chase
PROJECT NAME:	East Pierce Fire & Rescue
SÄZÄN PROJ. NO.	292-1773
SUBJECT:	Electrical Assessment

Fire Station No. 114

A. **General:** This station dates to 1960 and as such the electrical power systems are 40 years old or older. These systems are beyond their 30-year life expectancy and should be replaced. The stations lighting systems are inefficient and do not meet Energy Code.

B. **Utility Power System**:

- Power is from Puget Sound Energy via overhead service strike to weatherhead from pole mounted transformers. PSE meter is located on the outside of the building. Service Voltage is 120/240V 1-phase, 3 wire. Service entrance rated 200 amps, single phase.
- Service entrance panel is the original 1960 circuit breaker panel. This panel is by Square D and is the residential type QO load center. This panel is in old condition and is past its 30-year life expectancy. This gear should be replaced during any renovations.
- Branch circuit panels were also the original 1960 Square D QO circuit breaker panels. These panels are in old condition and are past their 30-year life expectancy. This gear should be replaced during any renovations.

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Seattle, Washington 98101

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sazan.com

C. **Emergency Power System**:

- Emergency power is furnished to the station via a natural gas fuel generator located inside a room attached to the station. The set is a Briggs Straton Model 040210. No on-site fuel storage was located at this site.
- A new Briggs Straton automatic transfer switch located inside the room senses loss of utility power, starts the generator and transfers power to an emergency power panel. The emergency panel serves the station loads that are needed to operate in the event that utility power has failed.
- There is no fuel storage at this site. A seismic event that severed the natural gas line to the site would leave the station without emergency power.
- The set was not supported via properly sized seismic spring isolators.
- Newly adopted electrical codes now require the emergency generator system to separate the life safety loads from the station essential loads during future renovations.

D. **Lighting Systems**:

- Station illumination is via fluorescent lighting fixtures. The fixtures were older fixtures, with older T12 lamps.
- Lighting levels in the apparatus bays appeared satisfactory. Other rooms and spaces appeared to be a mixture of satisfactory and on the low end of satisfactory.
- The fixtures are in older condition and should be replaced in conjunction with any construction undertaken at this station to energy efficient LED types.
- The light fixtures in the apparatus bay were bare lamp fixtures without guards surface mounted from the ceiling.
- Lighting control was via individual room switches. There were no occupancy sensors for control as required by current energy code.

E. **Life Safety Systems**:

- The station did not have electric powered exit signs.
- Egress lighting in this station was via lights powered by the standby generator.
- The station did not contain a fire alarm system. The station was not fully detectored. Sleeping rooms did have individual smoke detectors.
- The station is not fire sprinklered. Sleeping rooms did have individual smoke detectors.

F. **Station Alarm and Response**:

- District standard alarm via South Sound dispatch signal to a Plectron Station Alert Receiver.

G. **Communications**

- District standard telephone and internet/data systems are installed.
- Pubic address speakers installed throughout station.

Conclusion:

The electrical systems at this station are for the most part in older condition and should be replaced in conjunction with construction taking place at this station. On site fuel storage should be installed to fuel the generator following a seismic event.

Note: The above assessment is based on a site visit to the Station on January 23, 2018 to observe the visible electrical systems conditions. No record drawings or equipment manuals were available for this purpose. Time did not allow an assessment of the low voltage systems which would involve more time and information on the systems at each station.

END

Predesign Study
East Pierce Fire and Rescue
Station 14 Replacement

December 16, 2011

Address: 3206 W TAPPS DR E

Parcel Numbers: 5065001860, 5065001870

Summary

The 35,350 sf site is located in Section 17, Township 20N, Range 5E, W.M., Pierce County, WA.

The existing Station 14 is being replaced on this site with a new station that will have 6 sleep rooms. A community room is not planned for this station.

The scope of this Predesign Study is limited to the items discussed below.

Critical Areas

There is a 100-year flood plain mapped for this site. The flood plain mapping for Lake Tapps has been attached. A Pre-application Conference with Pierce County will need to be held to determine the impact that the flood plain has on the redevelopment of this site. Generally for Critical Facilities, the finished floor of the building must be 3 ft above the flood stage and the road way elevation must be 1 ft above the flood stage. A detailed topographic survey of the site and access road will need to done to determine what those elevations need to be. Additionally, the 100-year flood elevation of Lake Tapps will need to be determined. Frequently, the County will already know the flood stage elevation for major lakes. For the Predesign study, since there have been no flooding issues with the existing station and based on the existing site topography, it is assumed that the necessary elevations may be achieved. However, the site topographic survey should be completed early in the Schematic Design phase so the building may be properly placed on the site and any potential cost issues related to the flood plain elevation can be determined early into the Project's Schematic Design phase to allow for any potential scope reductions to reduce the Project's overall cost (because of flood plain mitigation cost increases) to happen while the Building Design is in its earliest stages, preventing a costly redesign process.

There are no other mapped critical areas on the site. In addition, grading maps do not show any slopes that represent landslide hazard areas and soil maps do not show soils that are typically found in wetland areas.

Soils, Grading and Erosion Control

Soils on the site are mapped by the National Resource Conservation Service (NRCS) as Alderwood Gravelly Sandy Loam, a Type "C" or Till soil. Type "C" or Till soils have slow infiltration rates, but can be used for infiltration if the depth from the bottom of the infiltration system to the hardpan layer or groundwater layer is at least 3 feet. In addition, Alderwood soils have a higher silt (loam) content, which makes them difficult to work with in wet weather and increases the risk of erosion during construction as well as increases the potential for transporting sediment laden runoff off-site, which is a violation of permitting requirements discussed below in the Erosion Control paragraph.

There is 30 feet of grade change across the site from East to West based on Pierce County topographic mapping of the site. The Easterly portion of the site is relatively level with the Westerly portion of the site sloping upward, away from the lake. Based on the Predesign Architectural Siteplan the proposed building and site improvements will fit into the site and it appears will comply with ADA regulations. Some retaining walls may be necessary on the west side of the building to provide a level building pad area as well as an exit walkway for the rear of the building. A detailed design survey will be needed before the schematic design phase is started to allow for a grading design in the schematic design phase to set the finished floor elevation in relation to the flood plain elevation and minimize earthwork and retaining walls as much as possible. By making critical grading and earthwork decisions early in the schematic design phase, if any changes are required in the shape of the building to save money in earthwork, there will be a minimal amount of design changes required in the building saving potential costs in building redesign.

Since the site is less than 1 acre, an NPDES Construction Activities permit will not be required. An Erosion and Sediment Control plan will be prepared for the project to prevent sediment laden runoff from entering downstream waters. Monitoring stormwater runoff for turbidity (the amount of sediment in the runoff) and pH (related to concrete handling activities) will not be required for this site.

Storm Drainage and Water Quality

The site is required to comply with the storm drainage and water quality regulations of the Pierce County. The County uses a continuous path methodology to compute storm infiltration and water quality volumes, which was used to determine the Predesign Study volumes.

Underground infiltration trenches are proposed to infiltrate runoff from the increased roof area and any new walk areas and disturbed landscape areas around the building. It is assumed that any disturbed pavement areas will be restricted to simply repairing damaged pavement, with no changes in grade, so these pavement areas will be exempt from storm drainage improvements per Pierce County's redevelopment regulations.

The Predesign estimated length for the infiltration trench is 450 linear feet.

Water

It is assumed there is adequate fire flow to the site. A new fire sprinkler system will be installed in the building. The site is currently served by domestic water, but an allowance was provided in the Predesign Cost Estimate to upsize the domestic water service pipe diameter to provide for the new plumbing fixtures in the building.

Sanitary Sewer Service

There is currently an on-site septic system serving the station. The system will need to be inspected to verify that it is operating properly. At a minimum, the system will need to be enlarged to accommodate the increased number of employees the station will serve. If the existing system is in good shape, it will not need to be replaced, only expanded. Since Health Department regulations related to absorption rate have changed since the system was designed, a conservative absorption rate was assumed until new soil logs can be dug on the site. This should happen early in the design phase of the project so an adequate amount of space is reserved for the septic system expansion. For the Predesign Cost Estimate, it was assumed that the entire septic system would need to be replaced. The system was sized based on the number of bedrooms in the station.

Road Improvements

It was assumed for the Predesign Study that no road improvements would be required for this project. A pre-application conference is recommended with the Pierce County is recommended to determine if any road improvements or Right-of-Way dedication would be required.

Conclusion

The site appears suitable for this development. A pre-application conference is recommended with Pierce County to determine any additional requirements the County may have on site development that may impact the costs of this project. Additionally, detailed topographic and boundary surveys, as well as a geotechnical survey, including infiltration rate and suitability of native soils to treat for water quality (cation exchange capacity), need to be done on the site.

Prepared By

Cynthia L. Jose, P.E.
Senior Project Manager

EPFR Station 14 terrain

Pierce County

Regulated Flood Hazard Area - publicgis
Regulated Flood Hazard Area
Tax Parcels
Tax Parcels
Fire Districts
Fire Districts
Fire Stations
Fire Stations

EDGE OF 100-YEAR FLOODPLAIN

STATION 14 SITE

Disclaimer: The map features are approximate and are intended only to provide an indication of said feature. Additional areas that have not been mapped may be present. This is not a survey. The County assumes no liability for variations ascertained by actual survey. ALL DATA IS EXPRESSLY PROVIDED 'AS IS' AND 'WITH ALL FAULTS'. The County makes no warranty of fitness for a particular purpose. 2011/10/13

PREDESIGN STUDY CIVIL ADDENDUM by Reid Middleton

East Pierce Fire and Rescue
Station 114 Replacement

Under the *Storm Drainage and Water Quality* Section, infiltration as a stormwater management BMP is not ideal for this site. The underlying soils are mapped as Alderwood Gravelly Sandy Loam which are till soils that have low infiltration capabilities. Given the size of the project site and limited space for above ground stormwater facilities, an appropriate flow control strategy, if required, is to use an underground detention system. Possible systems include underground pipes, precast detention units, or plastic storage units. Water quality requirements can be addressed with proprietary media filtration units such as Stormfilter or Modular wetlands. Improvements that replace or create more than 2,000 square feet of impervious surfacing will require some form of stormwater management. Detention and water quality will be sized based on the latest Western Washington Hydrologic Model (WWHM) that meets the Pierce County Stormwater Management & Site Development Manual.

Mark Davis, PE

Architectural Assessment: Station 115 East Lake Tapps

Scope of Review

Station 115 was reviewed by architectural, mechanical, structural, and electrical engineering consultants on May 17, 2011 and again on January 23, 2018. Please see the included reports for detailed assessments in each discipline. Cost estimating consultants were also present to observe existing conditions in preparation for their work in providing project budgets.

General Station Information

- Age and Improvement History: Originally built in 1980, Station 115 has not received any significant remodels or additions.
- Size: Approximately 5,476 sq. ft.
- Current and Future Deployment: Engine 115, Engine 159 and Medic 115. The station currently an unoccupied volunteer station with accommodations for 4 firefighters.

Noted Operational Limitations

- Apparatus bay floor drains: While floor drains are present at this station, the station site contains an on-site septic system. As a result, no-vehicle washing will be permissible within the station as oil-contaminated wash water is not allowed to be directed to a sanitary septic drain field. A separate wash facility with a dedicated infiltration drain field would be required.
- Operational Storage: There is no dedicated operational storage space within the existing facility, which requires bunker gear, ladders, and other equipment to be stored within the crowded apparatus bays.
- Bunker Gear Storage: Bunker gear is currently stored in the apparatus bay, reducing gear longevity due to UV exposure.
- Fitness: Existing fitness space is accommodated within an unused vehicle bay. Preferred location would be within the residential portion of the station and provided with adequate ventilation and separation from vehicle and maintenance odors.

Code and WAC Limitations

- Restrooms: Neither of the existing men's or women's restrooms are handicap accessible or ADA compliant.
- No decon sink for equipment: while the station does include an extractor and bunker gear dryer, there is no decon sink in the apparatus bay or operational support areas to perform equipment decontamination.

- Fire Sprinklers: No fire sprinkler system is installed at Station 115. A system will be required with any expansion of the sleep rooms.

Deferred Maintenance Issues

- The station is in generally good condition, though EPF&R staff noted that the facility has had a history of mechanical and furnace related maintenance issues.
- The existing roof was noted to be nearing its end of life and will likely need to be replaced within the next 5 years. Some leak-damaged soffits were noted at the rear of the apparatus bay.
- Men's bathroom vinyl tile is in poor condition and should be replaced.

Engineering Reviews

Please see the associated structural, mechanical, civil, and electrical reviews of Station 115 for specific discussion related to those disciplines.

Conclusions and Long-Term Viability

Per ESCI's report, it is not likely that Station 115 will transition from volunteer to career staffing in the coming decades. And while the station could be used as-is for a considerable amount of time, should staffing begin to exceed the 4-bed capacity currently available at the station, a remodel and addition would be reasonable and justifiable. Station 115 is one of EPF&R's newer facilities and, as such, would make a good base for an upgrade. As with EPF&R's other facilities, Station 115 is in a good location to serve its response area and there is a good-sized site in which to add to the station.

Fire Station 115

Structural Site Observations

Reid Middleton conducted a site visit of Station 115 on January 23, 2018, as part of this seismic evaluation. A previous site visit was conducted on May 17, 2011. Most of the roof structure was covered by architectural finishes and was not visible. Limited drawings were available for this evaluation, and most conclusions were determined through limited site investigation. ASCE 41-13 classifies Station 115 as a Reinforced Masonry Bearing Walls system, RM1. This structure was checked for Immediate Occupancy criteria. The Tier 1 Preliminary Seismic Evaluation structural checklists were completed and are included for reference.

Structural System

The following table describes Fire Station 115's structural systems.

Structural System Description of Fire Station 115

System	Description
Roof	The roof structure is constructed of light framed wood trusses with plywood roof sheathing.
Hose Tower	The hose tower consists of masonry bearing walls with a wood roof structure.
Foundations	The building's foundation system is assumed to be constructed of concrete strip footings and concrete slab on grade.
Lateral System	Concrete masonry unit (CMU) and wood shear walls provide lateral support to the structure in the longitudinal and transverse directions. The roof diaphragm is constructed of plywood sheathing.

Seismic Evaluation Findings

Seismic Deficiencies

The following table summarizes the seismic deficiencies identified during the Tier 1 evaluation. Descriptions of these deficiencies are based on this evaluation.

Identified Seismic Deficiencies for Fire Station 115

Deficiency	Description
Geometry	A geometric irregularity occurs at the hose tower.
Mass	A mass irregularity occurs at the hose tower.
Liquefaction	It is unknown if there are liquefaction-susceptible soils at depths within 50 feet under the building.

Deficiency	Description
Surface Fault Rupture	It is unknown if fault rupture and displacement is anticipated at the site.
Ties Between Foundation Elements	Ties between foundation elements are necessary to resist seismic forces. The size and location of foundation ties could not be verified during the site investigation, and record drawings are not available.
Shear Stress Check	The shear stress in the masonry walls exceeds the values calculated in the quick-check procedure. Additional evaluation may indicate that the walls have adequate capacity.
Reinforcing Steel	Although structural record drawings are not available, it is believed that further investigation may indicate that reinforcing meets minimum requirements, which would make this check compliant.
Wood Ledgers	The connection between the masonry walls and roof diaphragm induces cross grain bending in the ledgers. This may result in failure of the ledger element, creating a gap in the structure's lateral load path.
Transfer to Shear Walls	The connection between the roof diaphragm and the shear walls does not have capacity to develop the forces from the roof diaphragm. This may limit the connection's ability to transfer the loads required for the Immediate Occupancy performance objective.
Foundation Dowels	Foundation dowels are necessary to resist shear wall overturning. The size and location of foundation dowels could not be verified during site investigation, and record drawings are not available.
Wall Anchorage	The masonry walls in the apparatus bay are not braced for out-of-plane wall forces. This may result in a partial collapse of the wall during a seismic event.
Reinforcing at Wall Openings	There are no available structural record drawings, and the information could not be observed during the site walk-throughs. It is anticipated that trim reinforcing is present, which would make the check compliant.

Deficiency	Description
Cross Ties	There are no available structural record drawings, and the information could not be observed during the site walk-throughs. It is anticipated that cross ties are not present, which can lead to diaphragm failure.
Diagonally Sheathed and Unblocked Diaphragm	The station's roof diaphragm is unblocked and has spans that exceed 25 feet. Because of this configuration, the structural roof diaphragm may not have the required lateral strength and stiffness to resist the required earthquake loads.
Stiffness of Wall Anchors	Wall anchors were not observed during the site investigation, and record drawings are not available.

Some of the deficiencies noted above result from lack of available record drawings. They are noted as deficient based on engineering judgment and previous experience with buildings of similar vintage and construction type.

In addition to the identified unknown Geological Site Hazard in the Tier 1 evaluation, the *Liquefaction Susceptibility Map of Pierce County, Washington,* dated September 2004 and produced by the Washington State Department of Natural Resources, was reviewed. The area where Station 115 is located has a liquefaction susceptibility of very low. During an earthquake, the site is not anticipated to experience liquefaction.

Structural Conclusions

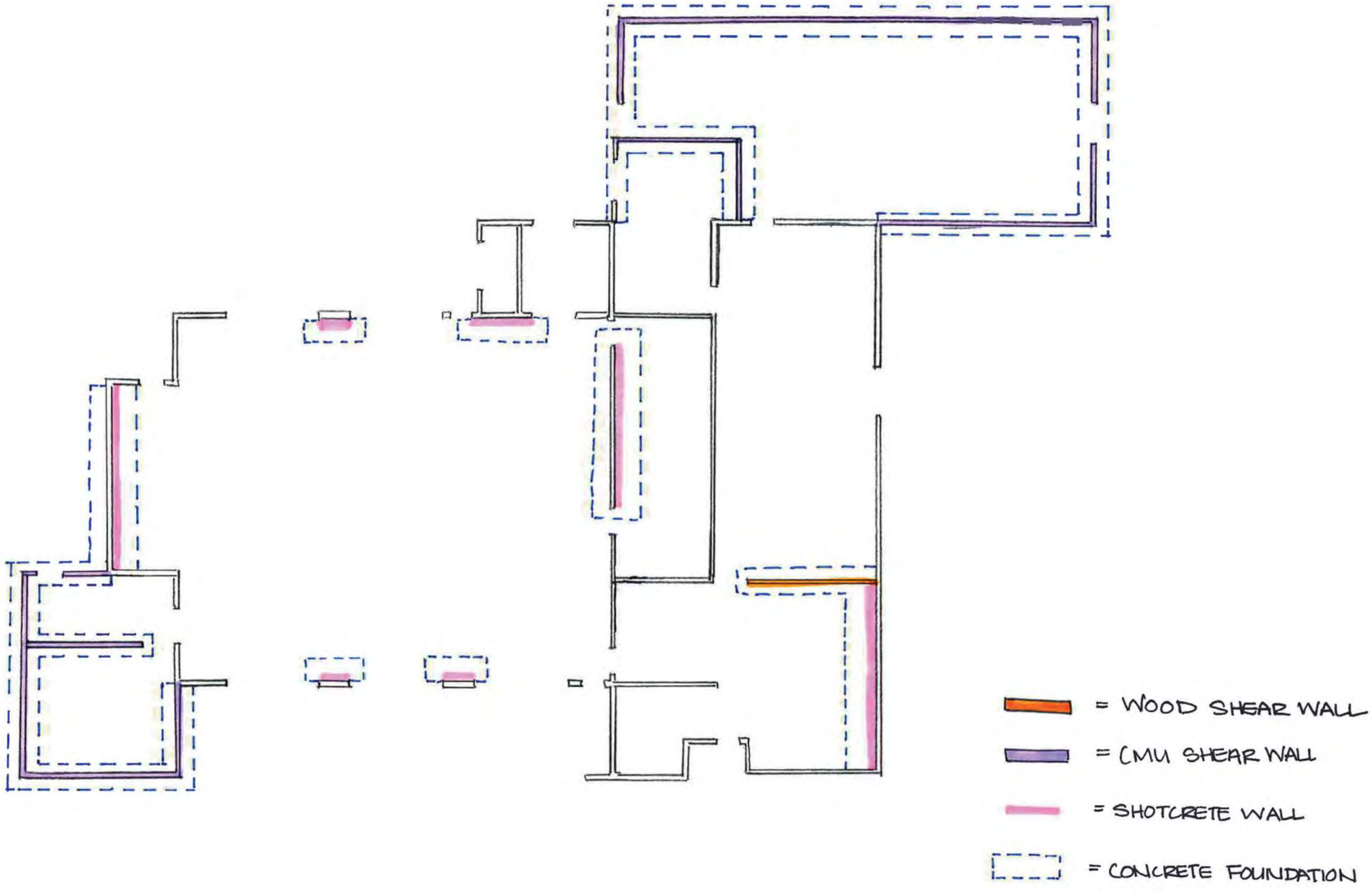
Fire Station 115 does not meet the Immediate Occupancy performance objective. The evaluation indicates some damage to the building may occur during a design-level earthquake that may cause the facility to not be occupied. The primary concern for Station 115 is that the masonry walls are not sufficiently tied to the roof structure for out-of-plane wall forces. This may result in the diaphragm separating from the masonry bearing walls, causing a partial collapse of the roof structure. Additionally, the roof diaphragm is unblocked. This type of construction has less structural capacity and stiffness than a blocked condition and may become overstressed during an earthquake, limiting the roof's ability to transfer lateral loads to the masonry shear walls. These deficiencies may limit the station's ability to provide first response capabilities.

This station should be seismically upgraded to meet the Immediate Occupancy performance objective, which would allow the station to remain functional after an earthquake and provide first response capabilities. For additional information on the building's performance objectives and evaluation criteria, see the section titled *Existing Fire Station Seismic Evaluation Criteria.*

The following plans show the conceptual retrofit design for Station 115, previously developed in 2011. These concepts, based on engineering judgment, were developed by addressing the

seismic deficiencies previously noted in the ASCE 31 Tier 1 checklist. These concepts have not been updated to the current ASCE 41-13 checklists, although they are similar. Building upgrades are slated for a second project phase, and it is anticipated that code requirements may change by that time, which may result in changes to the concepts and station layout.

The concept for Station 115 includes adding blocking at the roof diaphragms, adding out-of-plane wall ties at the masonry walls, and strengthening portions of the existing masonry walls by adding shotcrete. The concept also proposes to remove the existing hose tower. This will reduce the overall mass of the structure and eliminate a discontinuity. The addition of these new elements will strengthen and stiffen the building, providing better seismic performance.

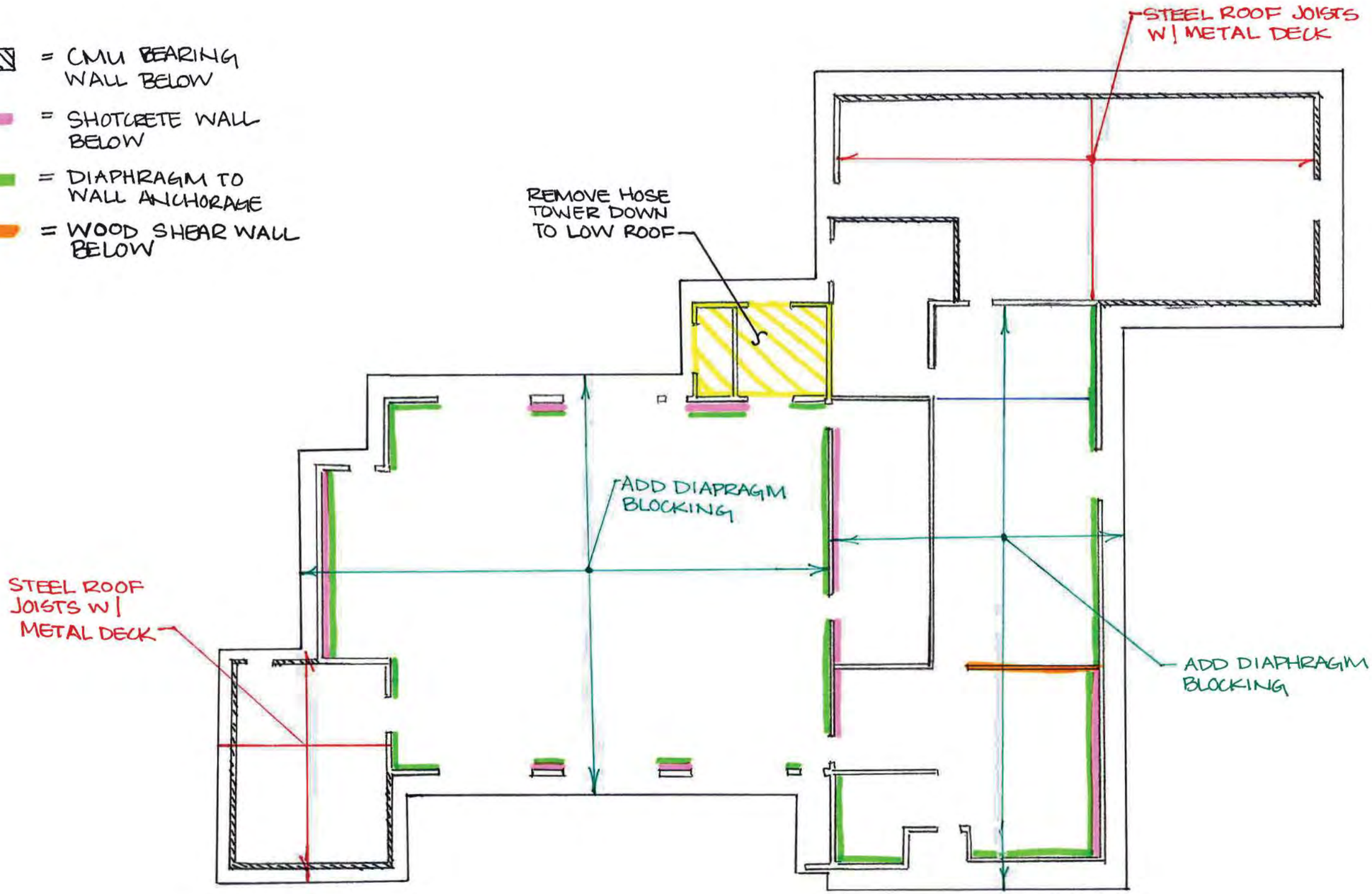

= WOOD SHEAR WALL
= CMU SHEAR WALL
= SHOTCRETE WALL
= CONCRETE FOUNDATION

= CMU BEARING WALL BELOW

= SHOTCRETE WALL BELOW

= DIAPHRAGM TO WALL ANCHORAGE

= WOOD SHEAR WALL BELOW



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MECHANICAL ENGINEERS

EAST PIERCE FIRE & RESCUE, EXISTING STATION #115 – EAST TAPPS

Mechanical Systems Report

March 27, 2018

We visited Station #115 on January 23, 2018 to evaluate existing mechanical systems and discuss issues relevant to remodel possibilities and usable life span. The following is our report of the existing conditions.

EXISTING SYSTEMS

1. **Fire Sprinklers:** The building does not have a sprinkler system.

2. **Plumbing:**
   a. Water closets: China, tank type flush, in fair/poor condition.
   b. Urinals: China, flush valve, in good condition.
   c. Lavatories: China, counter mounted with dual handle faucets, dated design in fair/poor condition.
   d. Sinks: Stainless steel, single bowl kitchen sink with single handle faucet, in fair condition.
   e. Showers: Fiberglass enclosure with single handle mixing valve, dated design in poor condition.
   f. Emergency Fixtures: No eyewash or decon sink in apparatus bay.
   g. Drains: The apparatus bay has a trench drain located in the center bay. The bathrooms have floor drains.
   h. Piping: The domestic water service pipe is galvanized and is not insulated.
   i. Domestic hot water: Unknown.

3. **Natural Gas Service:** The building is served by natural gas which supplies two space heating furnaces and two unit heaters in the apparatus bay.

4. **Space Heating, Ventilation and Air Conditioning (HVAC):**
   a. Systems: The living area of the building is served by two gas fired furnaces located in the attic with no air conditioning. This equipment is in fair condition.
   b. Zoning: As the building doesn't have air conditioning, HVAC zoning is less of an issue however the zoning would still be considered minimal. These systems would not allow for individual sleep room control.
   c. Exhaust: The restrooms are provided with source specific exhaust.
   d. Apparatus Bay: The apparatus bay is served by two suspended gas fired unit heaters which are old, in fair/poor condition. The bays have a Plymovent vehicle exhaust extraction track system for engine exhaust. The exhaust fan is mounted outside on the wall and appears in good condition.
   e. Kitchen: The kitchen has a residential style gas range with a residential type range hood exhaust. This system offers limited odor and grease capture and should be considered inadequate for this application. There does appear to be an appliance disconnect on station alarm.

MECHANICAL IMPROVEMENT DISCUSSION

1. **Operational Related:**
   a. Plan on providing HVAC capability for individual temperature control in single sleep rooms.
   b. The existing HVAC equipment is of residential quality which does provide a low cost solution. While this was typical for fire stations of this era, residential equipment cannot provide the functional and quality requirement of a modern staffed fire station. We recommend that future HVAC system use commercial/institutional equipment which can provide:
      i. Longer equipment life.
      ii. Additional zoning for comfort and individual sleep rooms.
      iii. Better ventilation (exhaust, outside air supply and filtration) for improved indoor air quality.
      iv. Quick space temperature adjustment for firefighter recovery and rehab.
   c. Plan on providing an emergency eye wash and hand washing station in the apparatus bay.
   d. Plan on providing separate dedicated Decon space to contain and separate possible contamination from living and working areas. This

space would also provide privacy when personal decontamination is required. Such a space would have high volume exhaust, infrared heat for comfort and drying, personal and equipment cleaning areas and full room drainage.

e. Plan on providing a Bunker Gear Storage room to extend life and effectiveness of gear by storage in a dark environment. Such a space would have exhaust to remove odor and moisture and heat to promote moisture evaporation.

2. CODE Related:

a. WAC 296-305-06503(6) requires renovations that consist of more than 60% of the assessed evaluation of the stations be protected with a sprinkler system.
b. Kitchen cooking appliances in fire stations are classified by Code as residential which exempts the requirement for a restaurant style Type I grease capture hood. However, since a fire station kitchen typically receives much more use than a normal house, a commercial style kitchen hood with roof mounted exhaust fan is recommended. This provides much better capture of steam and odors. Code does require make-up air be provided based on the volume of air exhausted.
c. None of the restrooms/showers meet ADA requirements. Remodel options would need to include at least one ADA restroom and shower facility which was available to both genders.
d. Ventilation: The Energy Code requires that outside air ventilation for fire stations be provided independently of the heating and cooling system(s) and contain energy recovery. An ERV (Energy Recovery Ventilation) system is used to supply each space directly with outside air and recovery heat out of exhaust air from restrooms, laundry, etc. Any type of heating and cooling system(s) may be used with the ERV.

3. Maintenance Related:

a. Plan on providing HVAC equipment with air conditioning for occupant comfort and rehab.
b. Plan on replacing all galvanized domestic water pipe with copper.
c. We recommend replacing residential tank type toilets with commercial flush valve models. This may require an increase in the water service size.

BY: James Whigham, P.E.

SÄZÄN GROUP

DATE:	February 15, 2018
TO:	Ed McManammna – RFM Architects
FROM:	Dan Chase
PROJECT NAME:	East Pierce Fire & Rescue
SÄZÄN PROJ. NO.	292-1773
SUBJECT:	Electrical Assessment

Fire Station No. 115

A. **General:** This station was built in 1980. The electrical power systems are in serviceable condition. The stations lighting systems are inefficient and do not meet Energy Code.

B. **Utility Power System**:

- Power is from Puget Sound Energy via underground conduit to pole mounted transformers. Meter number is J65510384. Service Voltage is 120/240V 1-phase, 3 wire. Service entrance has a rating of 600 amps.
- Service entrance panel is the original General Electric fused switch panel installed in 1980 (31 years ago). This panel is in serviceable condition and likely could serve another 5 years, however it is past its 30-year life expectancy.
- Branch circuit panels are the original General Electric circuit breaker panels installed in 1980 (31 years ago). These panels are in serviceable condition and likely could serve another 5 years, however they are past their 30-year life expectancy.

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Seattle, Washington 98101

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Fax 206.267.1701

sazan.com

C. **Emergency Power System**:

- Emergency power is furnished to the station via a diesel fuel generator located outside the station. The set is a Generac set in an outside rated enclosure with a sub-base fuel tank located under the set.

- The automatic transfer switch is by Thomson Technology (date of installation unknown). ATS located inside the station. The ATS senses loss of utility power, starts the generator and transfers power to an emergency power panel. The emergency panel serves the station loads that are needed to operate in the event that utility power has failed.

- The fuel tank was thought to be sized to power the station for 48 hours.

- The set was supported via seismic spring isolators which if properly sized and installed allow the set to survive and function after a seismic event.

- The emergency system generator is in serviceable condition and with proper maintenance should continue to serve the stations needs for another 10 years.

- The ATS age and condition are unknown and if older than 30 years old, is past its life expectancy and should be replaced.

- Newly adopted electrical codes now require the emergency generator system to separate the life safety loads from the station essential loads during future renovations.

D. **Lighting Systems**:

- Station illumination is via fluorescent lighting fixtures with a few incandescent accent lights. The fixtures were the original fixtures installed in 1980.

- Lighting fixtures in the apparatus bay were lensed fixtures mounted to the ceiling and the lighting level appeared to be on the low end of satisfactory. Other station lighting levels appeared to be satisfactory.

- The fixtures in general were in good condition and should function adequately for another 5 years with regular maintenance and repair. During any renovations the fixtures would need to be upgraded to LED type meeting energy code.

- Lighting control was via individual room switches. There were no occupancy sensors for control as required by current energy code.

E. **Life Safety Systems**:

- There were no electric powered exit signs at this station.
- Egress lighting in this station was via battery powered twin head egress lights. Additionally, portions of station lighting are powered by the standby generator.
- Fire Alarm system is a Silent Knight IFP-50. Reporting has been upgraded to Wi-fi reporting. Detectors are installed in the station. The station is not fire sprinklered. Sleeping rooms did have individual smoke detectors.

F. **Station Alarm and Response**:

- District standard alarm via South Sound dispatch signal to a Plectron Station Alert Receiver.

G. **Communications**

- District standard telephone and internet/data systems are installed.
- Pubic address speakers installed throughout station.

Conclusion:

The electrical systems at this station are for the most part in good condition and with proper maintenance should serve the needs to the station for another 10 years.

During renovations power and lighting systems need to be upgraded to meet current energy code and end of life expectancy requirements.

Note: The above assessment is based on a site visit to the Station on January 23, 2018 to observe the visible electrical systems conditions. No record drawings or equipment manuals were available for this purpose. Time did not allow an assessment of the low voltage systems which would involve more time and information on the systems at each station.

END

Predesign Study
East Pierce Fire and Rescue
Station 15 Addition / Remodel

December 16, 2011

Address: 1605 210TH AV E

Parcel Number: 0520101009

Summary

The 55,000 sf site is located in Section 10, Township 20N, Range 5E, W.M., Pierce County, WA.

It is proposed to construct an addition to Station 15 and remodel the interior of the station. Upon completion, the station will include 6 sleep rooms. A community room is not planned for this station.

The scope of this Predesign Study is limited to the items discussed below.

Critical Areas

The site is listed as a Fish and Wildlife Critical Area for: "PC Hydro, WDFW Priority Habitat and Species". A Pre-application Conference with Pierce County will need to be held to determine if any special requirements will be placed upon this project because of this listing. Because the site is currently developed and the site improvements, including the building addition, will follow the Pierce County Redevelopment Regulations AND the building is between the addition and the shoreline, it was assumed for the Predesign study that no other requirements would be placed on the project. A Wildlife Study may be required for this project. In addition, a Hydrogeologic Study may be required for the septic system. Both of these services can be provided by a full-service Geotechnical Engineering company.

The site is located in a mapped Landslide Hazard Area. Site grading will comply with landslide hazard regulations. The building addition is not located within the critical steep slope areas of the site. The project Geotechnical Engineer will most likely be required to issue a letter stating that the grading design for the project, as well as the building location, are in compliance with the Pierce County Landslide Hazard Regulations. In the past, a letter from a Civil Engineer was not sufficient.

The site is located in a mapped "Hydrology" area for Wetlands, meaning the hydrology of the site area promotes ground conditions for wetlands to be formed. A wetland survey will need to be done for the site prior to submitting for any permits, including a Conditional Use Permit, if required.

There are no other mapped critical areas on the site.

Soils, Grading and Erosion Control

Soils on the site are mapped by the National Resource Conservation Service (NRCS) as Alderwood Gravelly Sandy Loam, a Type "C" or Till soil. Type "C" or Till soils have slow infiltration rates, but can be used for infiltration if the depth from the bottom of the infiltration system to the hardpan layer or groundwater layer is at least 3 feet. In addition, Alderwood soils

have a higher silt (loam) content, which makes them difficult to work with in wet weather and increases the risk of erosion during construction as well as increases the potential for transporting sediment laden runoff off-site, which is a violation of permitting requirements discussed below in the Erosion Control paragraph.

There is approximately 15 feet of grade change across the site from West to East based on Pierce County topographic mapping of the site. Based on the Predesign Architectural Siteplan the proposed building and site improvements will fit into the site and it appears will comply with ADA regulations. A detailed design survey will be needed before the schematic design phase is started to allow for a grading design in the schematic design phase to verify door and walkway locations can meet ADA grade requirements. By making critical grading and earthwork decisions early in the schematic design phase, if any changes are required in the shape of the building to save money in earthwork, there will be a minimal amount of design changes required in the building saving potential costs in building redesign.

If more than 1 acre of land disturbing activities will happen during construction on this site, an NPDES Construction Activities permit will be required as part of the Federal Clean Water Act. In the State of Washington, the Washington State Department of Ecology (WADOE) provides coverage under their NPDES permit, which requires Owners to file a Notice of Intent (NOI) with WADOE. As part of the NOI process, a Public Notice is required, which the Civil Engineer helps the Owner prepare. In addition, a Stormwater Pollution Prevention Plan, including an Erosion and Sediment Control Plan and Stormwater Pollution Prevention Booklet, both prepared by the Civil Engineer and developed. Only the application and a copy of the Public Notice are submitted to WADOE. NOTE: The NOI cannot be submitted to WADOE until the SEPA approval has been granted to the project by Pierce County. The NOI must be submitted to WADOE a minimum of 67 days prior to the start of any land disturbing activities. During construction, the Contractor is required to monitor stormwater runoff from the site for turbidity (the amount of sediment in the runoff … if it doesn't look "clear" it is in violation) and pH (related to concrete handling activities). The SWPPP includes measures to reduce turbidity and pH in stormwater runoff. Minimizing site disturbance during wet weather months (October – April) will reduce the likelihood of violating turbidity requirements. The Contractor has some control over scheduling sitework activities. The remainder of control over the schedule is dependant in when the project is bid and the duration of the Contract.

Storm Drainage and Water Quality

The site is required to comply with the storm drainage and water quality regulations of the Pierce County. The County uses a continuous path methodology to compute storm infiltration and water quality volumes, which was used to determine the Predesign Study volumes.

Underground infiltration trenches are proposed to infiltrate runoff from the increased roof area and any new walk areas and disturbed landscape areas around the building. It is assumed that any disturbed pavement areas will be restricted to simply repairing damaged pavement, with no changes in grade, so these pavement areas will be exempt from storm drainage improvements per Pierce County's redevelopment regulations.

The Predesign estimated length for the infiltration trench is 800 linear feet.

Water

It is assumed there is adequate fire flow to the site. A new fire sprinkler system will be installed in the building. The site is currently served by domestic water, but an allowance was provided in the Predesign Cost Estimate to upsize the domestic water service pipe diameter to provide for the new plumbing fixtures in the building.

Sanitary Sewer Service

There is currently an on-site septic system serving the station. The system will need to be inspected to verify that it is operating properly. At a minimum, the system will need to be enlarged to accommodate the increased number of employees the station will serve. If the existing system is in good shape, it will not need to be replaced, only expanded. Since Health Department regulations related to absorption rate have changed since the system was designed, a conservative absorption rate was assumed until new soil logs can be dug on the site. This should happen early in the design phase of the project so an adequate amount of space is reserved for the septic system expansion. For the Predesign Cost Estimate, it was assumed that the entire septic system would need to be replaced. The system was sized based on the number of bedrooms in the station.

Road Improvements

Pierce County has identified the site location as a "Right-of-Way Needs Area" which typically means that the width of the Right-of-Way doesn't meet the road classification for the frontage street (210th Avenue East). It could also mean that road improvements will be required of the project.

It was assumed for the Predesign Study that no road improvements would be required for this project. A pre-application conference is recommended with the Pierce County is recommended to determine if any road improvements or Right-of-Way dedication would be required.

Conclusion

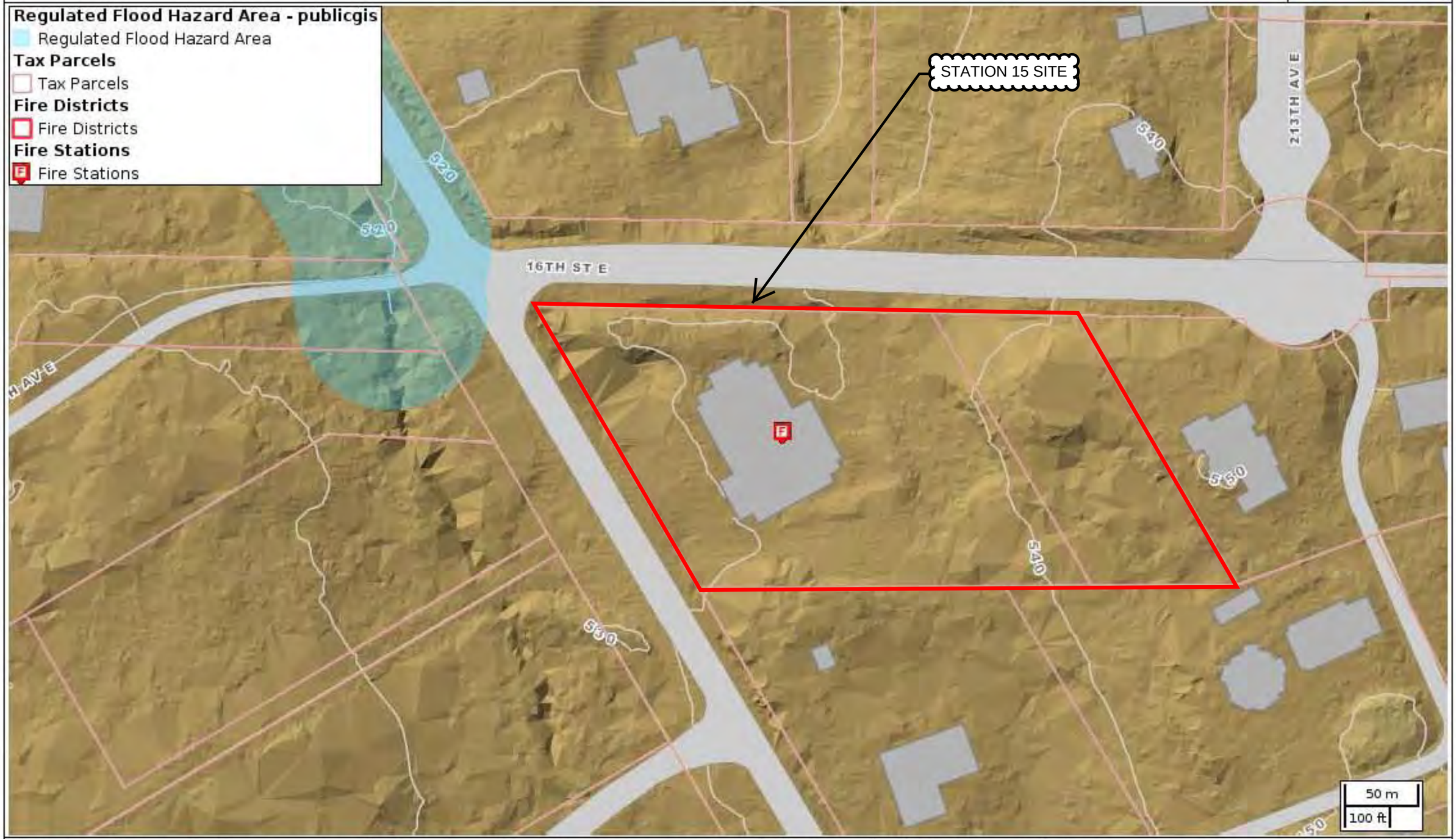
The site appears suitable for this development. A pre-application conference is recommended with Pierce County to determine any additional requirements the County may have on site development that may impact the costs of this project. Additionally, detailed topographic and boundary surveys, as well as a geotechnical survey, including infiltration rate and suitability of native soils to treat for water quality (cation exchange capacity), and a wetland inventory need to be done on the site. Also there is the potential that a wildlife inventory and a hydrogeologic survey will need to be done.

Prepared By

Cynthia L. Jose, P.E.
Senior Project Manager

EPFR Station 15 terrain

Pierce County



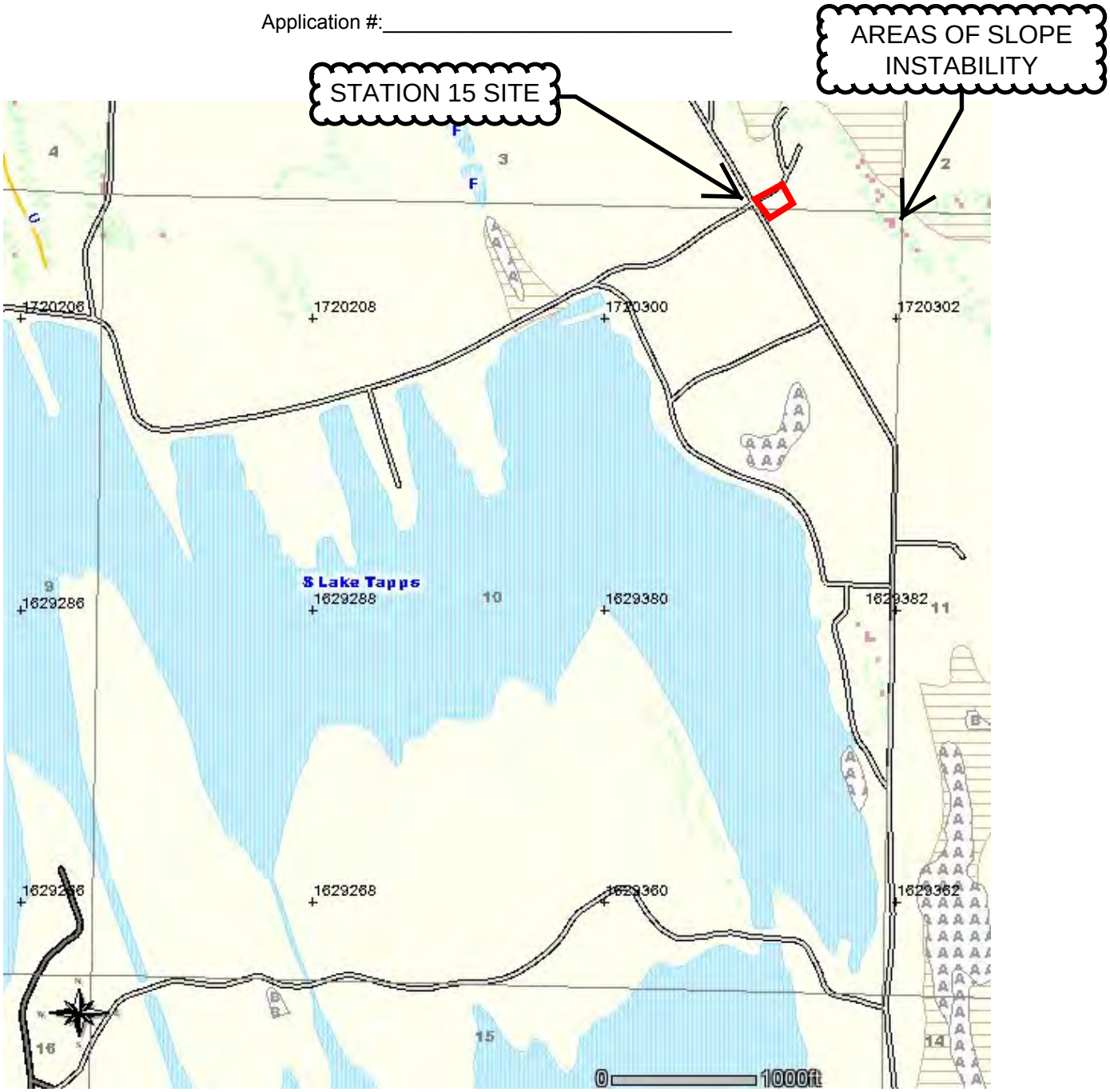
Disclaimer: The map features are approximate and are intended only to provide an indication of said feature. Additional areas that have not been mapped may be present. This is not a survey. The County assumes no liability for variations ascertained by actual survey. ALL DATA IS EXPRESSLY PROVIDED 'AS IS' AND 'WITH ALL FAULTS'. The County makes no warranty of fitness for a particular purpose.

2011/10/13

FOREST PRACTICE RESOURCE MAP

TOWNSHIP 20 NORTH HALF 0, RANGE 5 EAST (W.M.) HALF 0, SECTION 10

Application #:_____



This box displays resource information not shown on the map, but is found within this section. For information on the identified resource, contact the agency listed.

Agency	Issue of Concern	Phone Number
Dept. of Ecology - SW	Ground Water	(360) 407-6300
Dept. of Ecology - SW	Reservoir	(360) 407-6300
Dept. of Ecology - SW	Surface Water	(360) 407-6300

Tuesday, December 20, 2011 3:21:27 PM
NAD 83

FPARS MAPS LEGEND

BOUNDARIES

- County Boundary
- Townships
- Section Survey Lines

WATER BODIES

- Open Water
- Flats/Gravel Bars
- Ice
- Man Made Feature
- Wet Area
- ? ? ? ? Unknown/Unclassified

ELEVATION

- 200 Contours, 40' interval

STREAMS

- F Stream Water Type S, F, N
- U U, unknown
- X X, non-typed per WAC 222-16
- * Water Type Change

TRANSPORTATION

- Paved Road
- Unpaved Road / Surface Unknown
- Abandoned Road (not on Activity map)
- Orphaned Road (not on Activity map)
- Trail
- Railroad

SITE CLASS – On Site Class Map only

- Site Class I
- Site Class II
- Site Class III
- Site Class IV
- Site Class V

SITE INDEX – On Site Class Map only

- Non-Commercial or Marginally Commercial
- No Data
- Red Alder

SLOPE– On Resource Map only

- Medium Slope Instability
- High Slope Instability

SOILS – On Resource Map only

- Hydric Soils
- Highly Unstable
- Highly Erodible
- Highly Unstable & Highly Erodible
- No Data or Gravel Pits

RAIN ON SNOW – On Resource Map only

- RS Rain on Snow
- SD Snow Dominant

WETLANDS – Resource & Water Type Maps only

- A A A A A A A A A A Type A
- B B B B B B B B B B Type B
- FW FW FW FW Forested
- OW OW OW OW other

OTHER

- WAU (Activity, Base & Water Type maps)
- WRIA (Activity, Base & Water Type maps)
- Fire Shutdown Zones (Activity & Base maps only)
- + Map Registration Tics (All map types)

Notes to Applicant or other user:

See the FPA/N instructions for Activity Map standards.

Site indices are based on the WA-DNR State Soil Survey. If the site index does not exist or indicates red alder, noncommercial, or marginally commercial species, the following apply:

a) If red alder is indicated and the whole RMZ width is within that site index, then use site class V. If red alder is indicated for only a portion of the RMZ width, or there is on-site evidence that the site has historically supported conifer, then use the site class for conifer in the most physiographically similar adjacent soil polygon.

b) In Western Washington, if there is no site index information, use the site class for conifer in the most physiographically similar adjacent soil polygon.

c) In Eastern Washington, if there is no site index information, assume site class III, unless site specific information indicates otherwise.

d) If the soil polygon indicates noncommercial or marginally commercial, then use site class V.

See Forest Practices Rules WAC 222-16-010 for a more complete definition of site class.

Disclaimer: Features shown on Forest Practices Application Review System (FPARS) maps represent data stored in the Washington State Department of Natural Resources (DNR) Geographic Information Systems database. As some of the data sets rely on outside sources of information, the DNR cannot accept responsibility for errors or omissions, and therefore there are no warranties that accompany this material.

PREDESIGN STUDY CIVIL ADDENDUM by Reid Middleton

East Pierce Fire and Rescue
Station 115 Addition/Remodel

Under the *Storm Drainage and Water Quality* Section, infiltration as a stormwater management BMP is not ideal for this site. The underlying soils are mapped as Alderwood Gravelly Sandy Loam which are till soils that have low infiltration capabilities. Given the available forested and grass areas on the site, using Low Impact Development (LID) techniques such as bioretention cells could be applicable. flow control, if needed, would use an underground detention system. Possible systems include underground pipes, precast detention units, or plastic storage units. Water quality requirements can be addressed with proprietary media filtration units such as Stormfilter or Modular wetlands. Improvements that replace or create more than 2,000 square feet of impervious surfacing will require some form of stormwater management. LID techniques will be required and bioretention in any landscape area is recommended. Detention and water quality will be sized based on the latest Western Washington Hydrologic Model (WWHM) that meets the Pierce County Stormwater Management & Site Development Manual.

Mark Davis, PE

Architectural Assessment: Station 116 Foothills

Scope of Review

Station 116 was reviewed by architectural, mechanical, structural, and electrical engineering consultants on May 17, 2011 and again on January 23, 2018. Please see the included reports for detailed assessments in each discipline. Cost estimating consultants were also present to observe existing conditions in preparation for their work in providing project budgets.

General Station Information

- Age and Improvement History: Originally built in 1979, Station 116 received a community room and apparatus bay addition in 1988.
- Size: Approximately 8,372 sq. ft.
- Current and Future Deployment: Engine 116, Medic 116, Medic 169, Rescue 116 and Brush 116. The station currently accommodates a minimum of 4 firefighters. Future staffing demands indicate that this station will be staffed by a minimum of 6 firefighters.

Noted Operational Limitations

- Community/Training Room: Given the tight sleeping quarters, kitchen and dining room, approximately half of the existing community room has been converted to dining and an officer's sleep room.
- Bunker Gear Storage: Bunker gear is currently stored in the apparatus bay, reducing gear longevity due to UV exposure.
- Fitness: Existing fitness space is accommodated within an unused vehicle bay. Preferred location would be within the residential portion of the station and provided with adequate ventilation and separation from vehicle and maintenance odors.
- Several district vehicles and trailers were noted as being located either outdoors or under temporary carports. It is recommended that vehicles be placed in enclosed garages for enhanced response readiness, security, and greater vehicle longevity.
- Laundry: Station laundry facilities are located in the apparatus bay. For firefighter safety and hygiene, it is recommended that any laundry facilities used for staff clothing be located within the living areas, away from the apparatus bay.

Code and WAC Limitations

- Fire Sprinklers: No fire sprinkler system is installed at Station 116. A system will be required with any expansion of the sleep rooms.
- Insulation was noted missing at several concrete block walls. These areas will need to be insulated to current codes as part of any remodel or station upgrade.

Deferred Maintenance Issues

- The station is in generally good condition for a facility of its age and no immediate issues were noted.

Engineering Reviews

Please see the associated structural, mechanical, civil, and electrical reviews of Station 16 for specific discussion related to those disciplines.

Conclusions and Long-Term Viability

Station 116's greatest assets are its good service location and the large site that it inhabits. While the building itself is old and in need of upgrades and additional space to accommodate larger crew sizes, the existing site and building can sustain these changes.

Fire Station 116

Structural Site Observations

Reid Middleton conducted a site visit of Station 116 on January 24, 2018, as part of this seismic evaluation. A previous site visit was conducted on May 17, 2011. Most of the structure was covered by architectural finishes and was not visible. Limited drawings were available for this evaluation. Most conclusions were determined through limited site investigation. ASCE 41-13 classifies Station 116 as both a Wood Frame and Reinforced Masonry Bearing Walls system, W2 and RM1 respectively. This structure was checked for Immediate Occupancy criteria. The Tier 1 Preliminary Seismic Evaluation structural checklists were completed and are included for reference.

Structural System

The following table describes Fire Station 116's structural systems.

Structural System Description of Fire Station 116

System	Description
Roof	In the 1988 addition, plywood decking is supported by manufactured wood trusses bearing on wood stud walls and reinforced concrete masonry unit (CMU) walls. In the original building, it appears that plywood decking is supported by wood I-joists bearing on reinforced CMU walls.
Mezzanine	Plywood decking is supported on wood I-joists.
Foundations	The building's foundation system is constructed of concrete strip footings and concrete slab on grade.
Lateral System	CMU and wood shear walls provide lateral support to the structure in the longitudinal and transverse directions.

Seismic Evaluation Findings

Seismic Deficiencies

The following table summarizes the seismic deficiencies identified during the Tier 1 evaluation. Descriptions of these deficiencies are based on this evaluation.

Identified Seismic Deficiencies for Fire Station 116

Deficiency	Description
Mezzanine	The mezzanine is only tied to the main structure on one side. Structural record drawings do not include the mezzanine.
Liquefaction	It is unknown if there are liquefaction-susceptible soils at depths within 50 feet under the building.
Surface Fault Rupture	It is unknown if fault rupture and displacement is anticipated at the site.
Shear Stress Check	The shear stress in the wood shear walls exceeds the limit for structural panel sheathing.
Narrow Wood Shear Walls	Some wood shear walls in the dayroom have an aspect ratio greater than 1.5-to-1.
Diagonally Sheathed and Unblocked Diaphragms	The unblocked roof diaphragm spans more than the maximum 30 feet between wood shear walls.
Reinforcing Steel	The reinforcing ratio is less than the required 0.002.
Wood Ledgers	Connections between wall panels and the diaphragm induce cross-grain bending in the wood ledgers.
Reinforcing at Wall Openings	Trim reinforcing is not shown in the record drawings. Lack of trim reinforcing can result in extensive cracking at openings.
Cross Ties	There appears to be a lack of out-of-plane masonry wall ties. This results in a lack of positive connection at the roof structure.

Numerous other structural deficiencies were noted as unknown for Station 114 due to the lack of available structural drawings. These deficiencies include Ties Between Foundation Elements, Hold-Down Anchors, Wood Posts, Wood Sills, Girder/Column Connection, Roof Chord Continuity, Spans, Wood Sill Bolts, Transfer to Shear Walls, Plan Irregularities, and Stiffness of Wall Anchors. Further site investigation or record drawings could determine that some of these deficiencies are compliant.

In addition to the identified unknown Geological Site Hazard in the Tier 1 evaluation, the *Liquefaction Susceptibility Map of Pierce County, Washington,* dated September 2004 and produced by the Washington State Department of Natural Resources, was reviewed. The area where Station 116 is located has a liquefaction susceptibility of moderate to high. During an earthquake, the station may have significant settlement and potentially differential settlement across the site. This may result in damage to the building and surrounding utilities. Prior to completion of design, a site geotechnical investigation should be conducted to identify soil design parameters and actual site soil conditions.

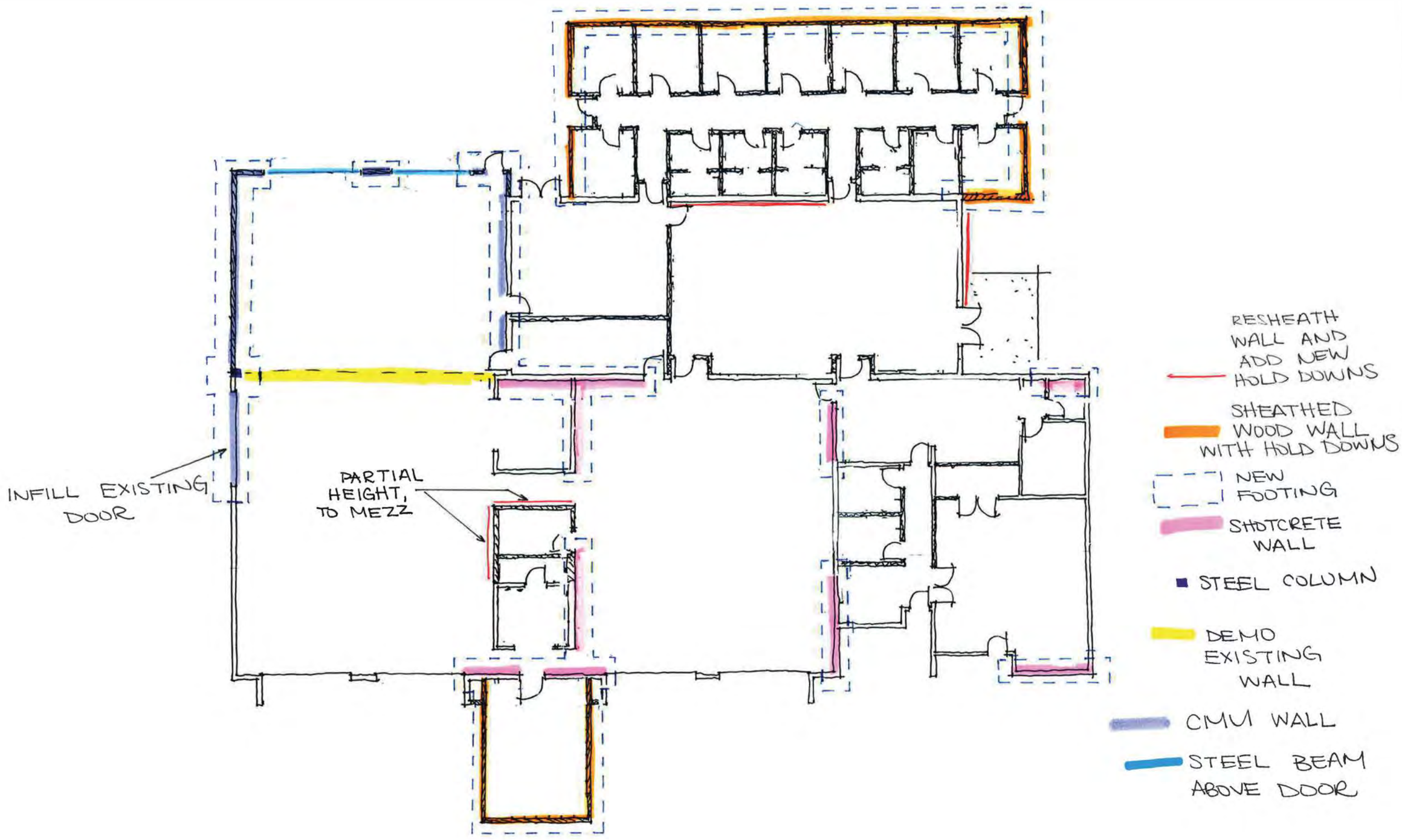
Structural Conclusions

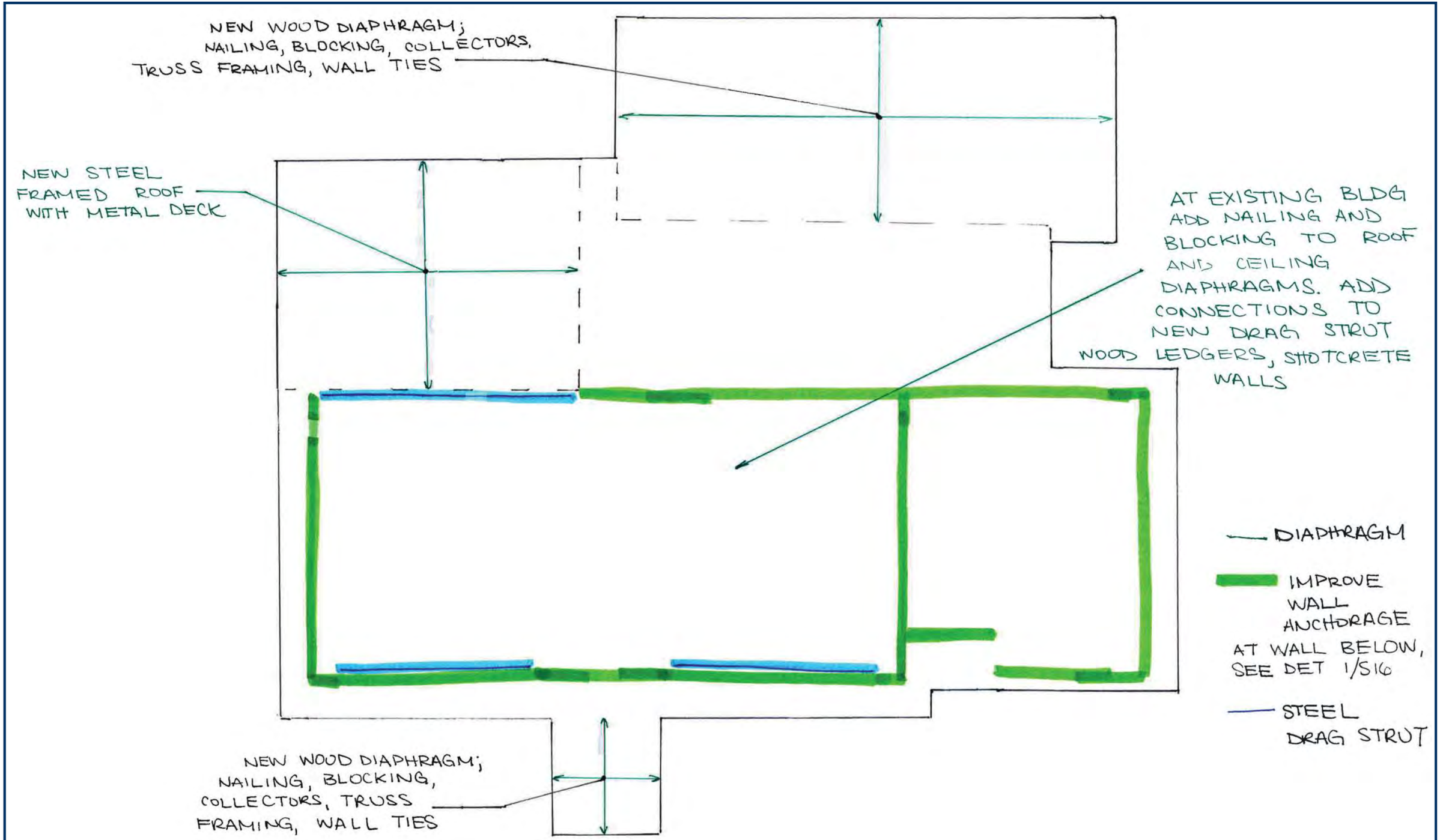
Fire Station 116 does not meet the Immediate Occupancy performance objective. This evaluation indicates that some damage to the building may occur during a design-level earthquake that may cause the facility to not be occupied. The primary concern for Station 116 is that the masonry walls are not sufficiently tied to the roof structure for out-of-plane wall forces. This may result in the masonry walls separating from the masonry bearing walls, allowing a partial collapse of the roof structure. A second concern is that a separate sloping roof structure was added above the existing flat roof, which adds a significant amount of mass to the structure and could result in overstressed conditions in the lateral force-resisting system. Additionally, the roof diaphragm is unblocked. This type of construction has less structural capacity and stiffness than a blocked condition and may become overstressed during an earthquake, limiting the roof's ability to transfer lateral loads to the masonry and wood shear walls. These deficiencies may limit the station's ability to provide first response capabilities.

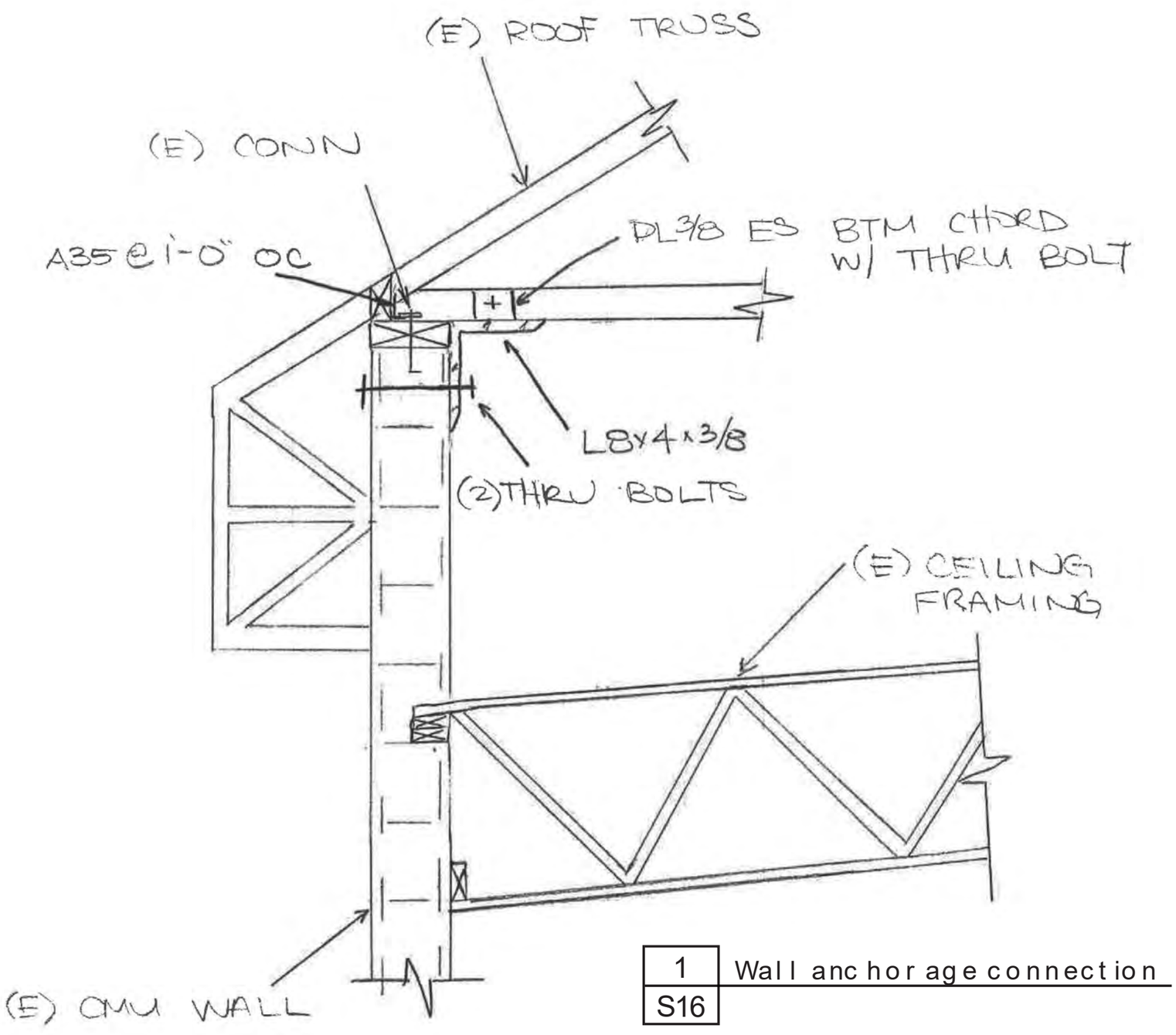
This station should be seismically upgraded to meet the Immediate Occupancy performance objective, which would allow the station to remain functional after an earthquake and provide first response capabilities. For additional information on the building's performance objectives and evaluation criteria, see the section titled *Existing Fire Station Seismic Evaluation Criteria.*

The following plans show the conceptual retrofit design for Station 116, previously developed in 2011. These concepts, based on engineering judgment, were developed by addressing the seismic deficiencies previously noted in the ASCE 31 Tier 1 checklist. These concepts have not been updated to the current ASCE 41-13 checklists, although they are similar. Building upgrades are slated for a second project phase, and it is anticipated that code requirements may change by that time, which may result in changes to the concepts and station layout.

The concept for Station 116 includes adding blocking and drag struts at the roof diaphragms, adding out-of-plane wall ties at the masonry walls, and strengthening portions of the existing masonry walls by adding shotcrete. The concept also proposes to add plywood sheathing and hold-downs to existing wood perimeter walls. Ground improvements, such as compaction grouting beneath the existing building, may be required to mitigate settlement resulting from soil liquefaction. A site geotechnical investigation should be conducted prior to final design to further develop recommendations and identify the site's true potential for liquefaction. The addition of these new elements will strengthen and stiffen the building, providing better seismic performance.


INFILL EXISTING DOOR
PARTIAL HEIGHT, TO MEZZ
RESHEATH WALL AND ADD NEW HOLD DOWNS
SHEATHED WOOD WALL WITH HOLD DOWNS
NEW FOOTING
SHOTCRETE WALL
STEEL COLUMN
DEMO EXISTING WALL
CMU WALL
STEEL BEAM ABOVE DOOR


NEW WOOD DIAPHRAGM; NAILING, BLOCKING, COLLECTORS, TRUSS FRAMING, WALL TIES
NEW STEEL FRAMED ROOF WITH METAL DECK
AT EXISTING BLDG ADD NAILING AND BLOCKING TO ROOF AND CEILING DIAPHRAGMS. ADD CONNECTIONS TO NEW DRAG STRUT WOOD LEDGERS, SHOTCRETE WALLS
DIAPHRAGM
IMPROVE WALL ANCHORAGE AT WALL BELOW, SEE DET 1/S16
STEEL DRAG STRUT
NEW WOOD DIAPHRAGM; NAILING, BLOCKING, COLLECTORS, TRUSS FRAMING, WALL TIES



1	Wall anchorage connection
S16	

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MECHANICAL ENGINEERS

EAST PIERCE FIRE & RESCUE, EXISTING STATION #116 - BUCKLEY

Mechanical Systems Report

March 27, 2018

We visited Station #116 on January 24, 2018 to evaluate existing mechanical systems and discuss issues relevant to remodel possibilities and usable life span. The following is our report of the existing conditions.

EXISTING SYSTEMS

1. **Fire Sprinklers:** The building does not have a sprinkler system.

2. **Plumbing:**
   a. Water closets: China, tank type flush, in fair condition.
   b. Lavatories: China, counter mounted with dual handle faucets, in fair condition. China, wall mounted with single handle faucets, in fair condition.
   c. Sinks: Stainless steel, double bowl kitchen sink with single handle faucet, in fair condition. Stainless steel, double bowl apartment sink with double handle faucet, in fair condition. Stainless steel, double bowl scullery decon sink with dual handle faucet and attached eye wash, in good condition.
   d. Showers: Fiberglass enclosures with curtain, single handle mixing valve, in fair condition.
   e. Emergency Fixtures: An addon eye wash is located on the decon sink faucet.
   f. Drains: The original section of the apparatus bay has a trench drains located in each bay. The added apparatus bay does not have drainage.
   g. Piping: From what was visible the domestic water service piping is copper pipe and does have insulation.
   h. Domestic hot water: Gas-fired instantaneous water heater, in good condition.
   i.

j. Compressed air: The station has a shop air compressor which is older, adequately sized and in serviceable condition.

3. **Natural Gas Service:** The building is served by natural gas which supplies two space heating furnaces and the apparatus bay unit heaters.

4. **Space Heating, Ventilation and Air Conditioning (HVAC):**
   a. Systems: The living area of the building is served by two gas fired gas fired, split-system furnaces with ground mounted condensing units each with a standalone programmable thermostat control. This equipment is at the end of useful service.
   b. Refrigerant: The HVAC equipment uses R-22 refrigerant which has been phased out and is no longer available in new equipment.
   c. Zoning: The building HVAC zoning is marginal given the size and layout of the station. These systems would not allow for individual sleep room control.
   d. Exhaust: The restrooms are provided with source specific exhaust.
   e. Apparatus Bay: Each section of the apparatus bay is served by a suspended gas fired unit heater, in fair condition. The bays have a Plymovent vehicle exhaust extraction system for engine exhaust.

f. Kitchen: The kitchen has a residential style electric range with a residential type range hood exhaust. The meeting room has a similar installation. These systems offer limited odor and grease capture and should be considered inadequate for their application.

MECHANICAL IMPROVEMENT DISCUSSION

1. Operational Related:

a. Plan on providing HVAC capability for individual temperature control in single sleep rooms.
b. The existing HVAC equipment is of residential quality which does provide a low cost solution. While this was typical for fire stations of this era, residential equipment cannot provide the functional and quality requirement of a modern staffed fire station. We recommend that future HVAC system use commercial/institutional equipment which can provide:
    i. Longer equipment life.
    ii. Additional zoning for comfort and individual sleep rooms.
    iii. Better ventilation (exhaust, outside air supply and filtration) for improved indoor air quality.
    iv. Quick space temperature adjustment for firefighter recovery and rehab.
c. Plan on providing separate dedicated Decon space to contain and separate possible contamination from living and working areas. This space would also provide privacy when personal decontamination is required. Such a space would have high volume exhaust, infrared heat for

comfort and drying, personal and equipment cleaning areas and full room drainage.

d. Plan on providing a Bunker Gear Storage room to extend life and effectiveness of gear by storage in a dark environment. Such a space would have exhaust to remove odor and moisture and heat to promote moisture evaporation.

2. CODE Related:

a. WAC 296-305-06503(15) requires new or remodeled kitchens to have cooking appliance disconnects active by alarm for gas and electricity. We recommend this be retrofitted for existing kitchens.
b. WAC 296-305-06503(6) requires renovations that consist of more than 60% of the assessed evaluation of the stations be protected with a sprinkler system.
c. Kitchen cooking appliances in fire stations are classified by Code as residential which exempts the requirement for a restaurant style Type I grease capture hood. However, since a fire station kitchen typically receives much more use than a normal house, a commercial style kitchen hood with roof mounted exhaust fan is recommended. This provides much better capture of steam and odors. Code does require make-up air be provided based on the volume of air exhausted. The meeting room range would require a Type I hood.
d. We understand this facility uses a septic drainage field for sanitary waste. Under current EPA rules, it would not be possible to have drains in the apparatus bay on this same system. Drainage would need to go to a dry sump or a separate drainage system.
e. Ventilation: The Energy Code requires that outside air ventilation for fire stations be provided independently of the heating and cooling system(s) and contain energy recovery. An ERV (Energy Recovery Ventilation) system is used to supply each space directly with outside air and recovery heat out of exhaust air from restrooms, laundry, etc. Any type of heating and cooling system(s) may be used with the ERV.

3. Maintenance Related:

a. The condensing units which uses R-22 refrigerant cannot be directly replaced due to the phase out of that refrigerant. R-22 will remain readily available for service use until January 1, 2015 when the next step in phase out will reduce availability. When considering replacement or upgrade of refrigerant equipment, it will need to be a newer refrigerant like R-410a. This will necessitate replacing not only the exterior condensing unit but also the indoor coil and possible the piping as well.

b. We recommend replacing residential tank type toilets with commercial flush valve models. This may require an increase in the water service size.

BY: James Whigham, P.E.

SÄZÄN GROUP

DATE:	February 15, 2018
TO:	Ed McManammna – RFM Architects
FROM:	Dan Chase
PROJECT NAME:	East Pierce Fire & Rescue
SÄZÄN PROJ. NO.	292-1773
SUBJECT:	Electrical Assessment

Fire Station No. 116

A. **General:** This station dates to the 1979 and as such the electrical power systems are 38 years old or older. These systems are beyond their 30-year life expectancy and should be replaced. The stations lighting systems are inefficient and do not meet Energy Code.

B. **Utility Power System**:

- Power is from Puget Sound Energy via underground power to pole mounted transformers. Meter number is U10230254. Service Voltage is 120/240 1-phase, 3 wire. Service entrance has a rating of 400 amps, single phase.
- Service entrance panel is a newly installed Eaton circuit breaker panel.
- Branch circuit panels are Challenger circuit breaker panels (38 years old) installed in 1979. These panels are past their life expectancy. Challenger is no longer in business so the panels are not supported and spare parts are not readily available.

600 Stewart St., Ste 1400
Seattle, Washington 98101

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Fax 206.267.1701

sazan.com

C. **Emergency Power System**:

- Emergency power is furnished to the station via a newly installed 100 KW Kohler set with a 200-gallon diesel sub-base fuel tank under the set.
- A newly installed automatic transfer switch located inside the station senses loss of utility power, starts the generator and transfers power to an emergency power panel. The emergency panel serves the station loads that are needed to operate in the event that utility power has failed.
- The fuel tank size of 200 gallons is sized to power the station for 48 hours.
- The set was supported via seismic spring isolators.
- Newly adopted electrical codes now require the emergency generator system to separate the life safety loads from the station essential loads during future renovations.

D. **Lighting Systems**:

- Station illumination is via fluorescent lighting fixtures. The fixtures were older fixtures installed (date unknown), with older T12 lamps.
- Lighting levels appeared to be on the low end of satisfactory at this station.
- The fixtures are in old condition and should be replaced in conjunction with any construction undertaken at this station with LED fixtures meeting energy code.
- The light fixtures in the apparatus bay are type with reflector and exposed lamp fixtures with out guards surface mounted to the ceiling.
- Lighting control was via individual room switches. There were no occupancy sensors for control as required by current energy code.

E. **Life Safety Systems**:

- No electric powered exit signs are installed at this station.
- Egress lighting in this station was via lights powered by the standby generator.
- The station is not fire sprinklered. Sleeping rooms did have individual smoke detectors.

F. **Station Alarm and Response**:

- District standard alarm via south Sound dispatch signal to a Plectron Station Alert Receiver.

G. **Communications**

- District standard telephone and internet/data systems are installed.
- Pubic address speakers installed throughout station.

Conclusion:

The electrical systems at this station are for the most part in older condition and should be replaced in conjunction with construction taking place at this station.

Note: The above assessment is based on a site visit to the Station on January 24, 2018 to observe the visible electrical systems conditions. No record drawings or equipment manuals were available for this purpose. Time did not allow an assessment of the low voltage systems which would involve more time and information on the systems at each station.

END

Predesign Study
East Pierce Fire and Rescue
Station 16 Addition / Remodel

December 16, 2011

Address: 10515 234TH AV E

Parcel Numbers: 0519017041, 0519017041

Summary

The 99,506 sf site is located in Section 1, Township 19N, Range 5E, W.M., Pierce County, WA.

It is proposed to construct an addition to Station 16 and remodel the interior of the station. Upon completion, the station will include 9 sleep rooms. A community room is also planned for this station.

The scope of this Predesign Study is limited to the items discussed below.

Critical Areas

The site is mapped as "National Wetland, Hydric Soils", which means that a wetland that is in the National Wetlands inventory is in the vicinity of the site and soils on the site are the type of soils that promote ground conditions for wetlands to be formed. Attached is a Forest Practices Resource Map from the Washington State Department of Natural Resources which shows the approximate location of the site outlined in red. The map legend is also attached. The Hydric Soils are indicated by the "parallel line" hatching and the National Wetlands are hatched with the letter "A". The wetlands are near the site but do not appear to impact the site, even if a 150 foot "no-touch" buffer is required from the wetland, which is the largest buffer required by the Pierce County Critical Areas Ordinance.

There are no other mapped critical areas on the site. In addition, grading maps do not show any slopes that represent landslide hazard.

Soils, Grading and Erosion Control

Soils on the site are mapped by the National Resource Conservation Service (NRCS) as Buckley Loam, a Type "D" or Till soil. Type "D" or Till soils have very slow infiltration rates and are generally unsuitable for infiltration. In addition, Buckley soils have a very higher silt (loam) content, which makes them extremely difficult to work with in wet weather and increases the risk of erosion during construction as well as increases the potential for transporting sediment laden runoff off-site, which is a violation of permitting requirements discussed below in the Erosion Control paragraph.

There is approximately 10 feet of grade change across the site based on Pierce County topographic mapping of the site. Based on the Predesign Architectural Siteplan the proposed building and site improvements will fit into the site and it appears will comply with ADA regulations. A detailed design survey will be needed before the schematic design phase is started to allow for a grading design in the schematic design phase to verify door and walkway locations can meet ADA grade requirements. By making critical grading and earthwork decisions early in the schematic design phase, if any changes are required in the shape of the

building to save money in earthwork, there will be a minimal amount of design changes required in the building saving potential costs in building redesign.

If more than 1 acre of land disturbing activities will happen during construction on this site, an NPDES Construction Activities permit will be required as part of the Federal Clean Water Act. In the State of Washington, the Washington State Department of Ecology (WADOE) provides coverage under their NPDES permit, which requires Owners to file a Notice of Intent (NOI) with WADOE. As part of the NOI process, a Public Notice is required, which the Civil Engineer helps the Owner prepare. In addition, a Stormwater Pollution Prevention Plan, including an Erosion and Sediment Control Plan and Stormwater Pollution Prevention Booklet, both prepared by the Civil Engineer and developed. Only the application and a copy of the Public Notice are submitted to WADOE. NOTE: The NOI cannot be submitted to WADOE until the SEPA approval has been granted to the project by Pierce County. The NOI must be submitted to WADOE a minimum of 67 days prior to the start of any land disturbing activities. During construction, the Contractor is required to monitor stormwater runoff from the site for turbidity (the amount of sediment in the runoff … if it doesn't look "clear" it is in violation) and pH (related to concrete handling activities). The SWPPP includes measures to reduce turbidity and pH in stormwater runoff. Minimizing site disturbance during wet weather months (October – April) will reduce the likelihood of violating turbidity requirements. The Contractor has some control over scheduling sitework activities. The remainder of control over the schedule is dependant in when the project is bid and the duration of the Contract.

Storm Drainage and Water Quality

The site is required to comply with the storm drainage and water quality regulations of the Pierce County. The County uses a continuous path methodology to compute storm infiltration and water quality volumes, which was used to determine the Predesign Study volumes.

Underground infiltration trenches are proposed to infiltrate runoff from the increased roof area and any new walk areas and disturbed landscape areas around the building. It is assumed that any disturbed pavement areas will be restricted to simply repairing damaged pavement, with no changes in grade, so these pavement areas will be exempt from storm drainage improvements per Pierce County's redevelopment regulations.

The Predesign estimated length for the infiltration trench is 375 linear feet.

Water

It is assumed there is adequate fire flow to the site. A new fire sprinkler system will be installed in the building. The site is currently served by domestic water, but an allowance was provided in the Predesign Cost Estimate to upsize the domestic water service pipe diameter to provide for the new plumbing fixtures in the building.

Sanitary Sewer Service

There is currently an on-site septic system serving the station. The system will need to be inspected to verify that it is operating properly. At a minimum, the system will need to be enlarged to accommodate the increased number of employees the station will serve. If the existing system is in good shape, it will not need to be replaced, only expanded. Since Health Department regulations related to absorption rate have changed since the system was designed, a conservative absorption rate was assumed until new soil logs can be dug on the site. This should happen early in the design phase of the project so an adequate amount of space is reserved for the septic system expansion. For the Predesign Cost Estimate, it was assumed that the entire septic system would need to be replaced. The system was sized based on the number of bedrooms in the station.

Road Improvements

It was assumed for the Predesign Study that no road improvements would be required for this project. A pre-application conference is recommended with Pierce County is recommended to determine if any road improvements or Right-of-Way dedication would be required.

Conclusion

The site appears suitable for this development. A pre-application conference is recommended with Pierce County to determine any additional requirements the County may have on site development that may impact the costs of this project. Additionally, detailed topographic and boundary surveys, as well as a geotechnical survey, including infiltration rate and suitability of native soils to treat for water quality (cation exchange capacity), and a wetland inventory need to be done on the site.

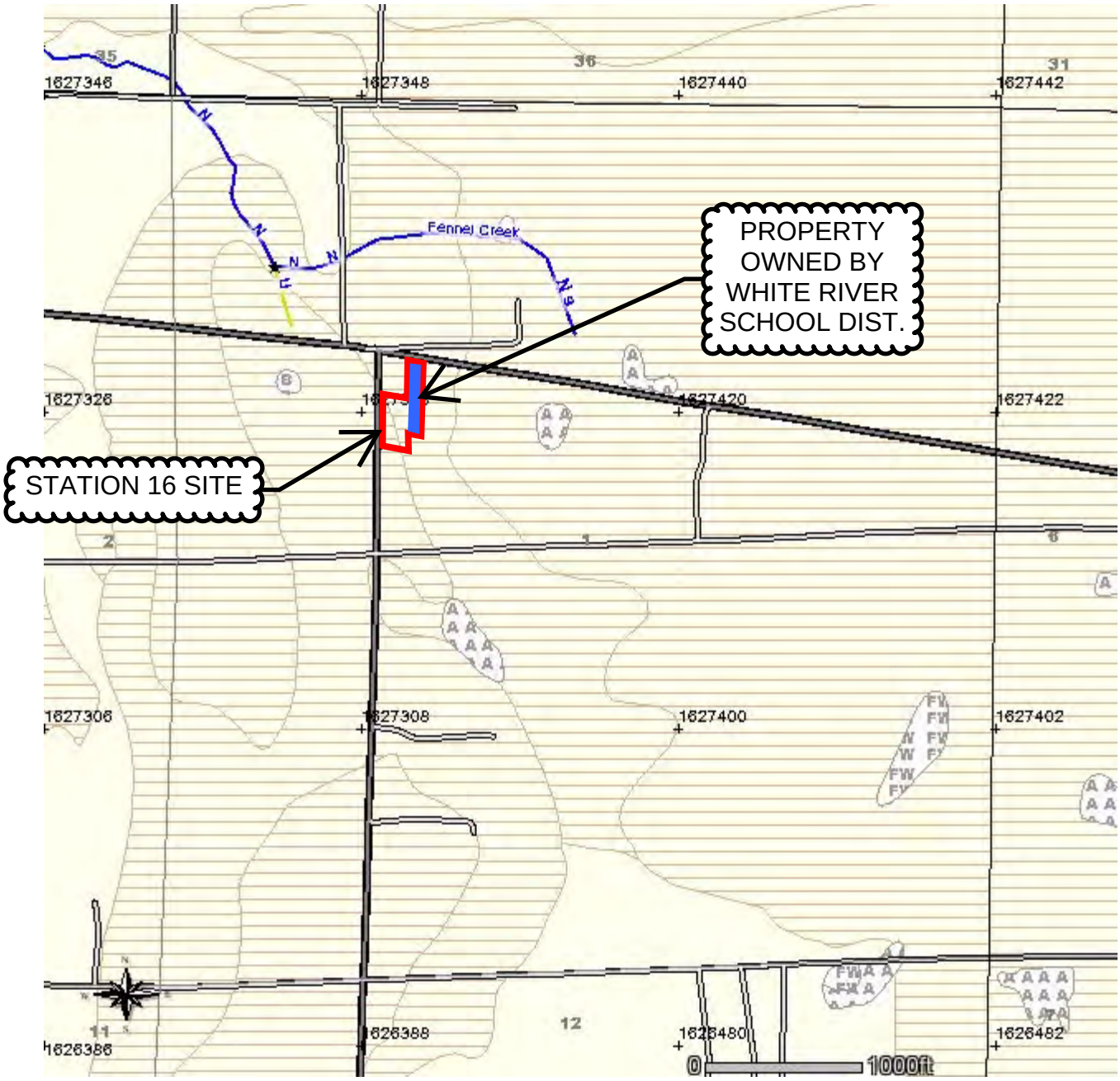
Prepared By

Cynthia L. Jose, P.E.
Senior Project Manager

FOREST PRACTICE RESOURCE MAP

TOWNSHIP 19 NORTH HALF 0, RANGE 5 EAST (W.M.) HALF 0, SECTION 1

Application #:_____



This box displays resource information not shown on the map, but is found within this section. For information on the identified resource, contact the agency listed.		
Agency	**Issue of Concern**	**Phone Number**
Dept. of Ecology - SW	Ground Water	(360) 407-6300

Tuesday, December 20, 2011 3:24:47 PM
NAD 83

FPARS MAPS LEGEND

BOUNDARIES

- County Boundary
- Townships
- Section Survey Lines

WATER BODIES

- Open Water
- Flats/Gravel Bars
- Ice
- Man Made Feature
- Wet Area
- Unknown/Unclassified

ELEVATION

- Contours, 40' interval

STREAMS

- Stream Water Type S, F, N
- U, unknown
- X, non-typed per WAC 222-16
- * Water Type Change

TRANSPORTATION

- Paved Road
- Unpaved Road / Surface Unknown
- Abandoned Road (not on Activity map)
- Orphaned Road (not on Activity map)
- Trail
- Railroad

SITE CLASS – On Site Class Map only

- Site Class I
- Site Class II
- Site Class III
- Site Class IV
- Site Class V

SITE INDEX – On Site Class Map only

- Non-Commercial or Marginally Commercial
- No Data
- Red Alder

SLOPE– On Resource Map only

- Medium Slope Instability
- High Slope Instability

SOILS – On Resource Map only

- Hydric Soils
- Highly Unstable
- Highly Erodible
- Highly Unstable & Highly Erodible
- No Data or Gravel Pits

RAIN ON SNOW – On Resource Map only

- RS Rain on Snow
- SD Snow Dominant

WETLANDS – Resource & Water Type Maps only

- Type A
- Type B
- Forested
- other

OTHER

- WAU (Activity, Base & Water Type maps)
- WRIA (Activity, Base & Water Type maps)
- Fire Shutdown Zones (Activity & Base maps only)
- + Map Registration Tics (All map types)

Notes to Applicant or other user:

See the FPA/N instructions for Activity Map standards.

Site indices are based on the WA-DNR State Soil Survey. If the site index does not exist or indicates red alder, noncommercial, or marginally commercial species, the following apply:

a) If red alder is indicated and the whole RMZ width is within that site index, then use site class V. If red alder is indicated for only a portion of the RMZ width, or there is on-site evidence that the site has historically supported conifer, then use the site class for conifer in the most physiographically similar adjacent soil polygon.

b) In Western Washington, if there is no site index information, use the site class for conifer in the most physiographically similar adjacent soil polygon.

c) In Eastern Washington, if there is no site index information, assume site class III, unless site specific information indicates otherwise.

d) If the soil polygon indicates noncommercial or marginally commercial, then use site class V.

See Forest Practices Rules WAC 222-16-010 for a more complete definition of site class.

Disclaimer: Features shown on Forest Practices Application Review System (FPARS) maps represent data stored in the Washington State Department of Natural Resources (DNR) Geographic Information Systems database. As some of the data sets rely on outside sources of information, the DNR cannot accept responsibility for errors or omissions, and therefore there are no warranties that accompany this material.

PREDESIGN STUDY CIVIL ADDENDUM by Reid Middleton

East Pierce Fire and Rescue
Station 116 Addition/Remodel

Under the *Storm Drainage and Water Quality* Section, infiltration as a stormwater management BMP is not ideal for this site. The underlying soils are mapped as Buckley Loam which are till soils that have low infiltration capabilities. Given the available forested and grass areas on the site, using Low Impact Development (LID) techniques such as bioretention cells could be applicable. flow control, if needed, would use an underground detention system. Possible systems include underground pipes, precast detention units, or plastic storage units. Water quality requirements can be addressed with proprietary media filtration units such as Stormfilter or Modular wetlands. Improvements that replace or create more than 2,000 square feet of impervious surfacing will require some form of stormwater management. LID techniques will be required and bioretention in any landscape area is recommended. Detention and water quality will be sized based on the latest Western Washington Hydrologic Model (WWHM) that meets the Pierce County Stormwater Management & Site Development Manual.

Mark Davis, PE

Architectural Assessment: Station 118 Edgewood

Scope of Review

Station 118 was reviewed by architectural, mechanical, structural, and electrical engineering consultants on May 17, 2011 and again on January 23, 2018. Please see the included reports for detailed assessments in each discipline. Cost estimating consultants were also present to observe existing conditions in preparation for their work in providing project budgets.

General Station Information

- Age and Improvement History: Originally built in 1948, Station 118 was last remodeled in 1988. The station was connected to the new sanitary sewer in 24th Street E in 2016.
- Size: Approximately 8,175 sq. ft.
- Current and Future Deployment: Engine 118, Engine 189 and Medic 118, Medic 189, and a third reserve engine. The station currently accommodates a minimum of 4-6 career firefighters. Future staffing demands indicate that this station will be staffed by a minimum of 6 firefighters.

Noted Operational Limitations

- Bunker Gear Storage: Bunker gear is currently stored in the apparatus bay, reducing gear longevity due to UV exposure.
- Site: Station 118 is located directly on its south property line and approximately 20 feet from the fog line of 24th Street E. Public parking at the front of the building has been compromised due to road widening projects and the existing apparatus bay aprons are insufficient to allow apparatus to maneuver easily into traffic as well as backing into bays. Should further roadway widening projects occur, this situation will likely worsen.
- Apparatus Bays: the existing bays have 10' high overhead doors, limiting the height of apparatus that can be housed at the station and precluding most modern engines and ladder trucks. There are also numerous cracks in the concrete floors indicating potential slab failure. While the bays are drive-through, the quantity of reserve apparatus means that most apparatus must be backed into the station. Given the volume of traffic on 24th Street E and the proximity of the building to the street, drive-through bays will be required.
- Fitness: Existing fitness space for weight training equipment is accommodated within an unused vehicle bay while fitness space for cardio equipment is located in the dayroom. Preferred location would be in a dedicated fitness room within the residential portion of the station and provided with adequate ventilation and separation from vehicle and maintenance odors.

- Living Quarters: Existing sleeping facility is a single room offering minimal privacy and gender neutrality. There is also only a single shower to serve the entire facility. It is recommended that one shower facility be provided for every two sleeping rooms.
- Office Space: Existing watch office is too small to accommodate work stations for the entire crew. The existing administrative and reception areas are underutilized now that the command staff formerly stationed in the facility have moved to Station 111.

Code and WAC Limitations

- Fire Sprinklers: No fire sprinkler system is installed at Station 118. A system will be required with any expansion of the sleep rooms.
- No decon sink for equipment: there is no decon sink in the apparatus bay or operational support areas to perform equipment decontamination as required by WAC.

Deferred Maintenance Issues

- Numerous cracks were noted in the concrete floor of the apparatus bay.
- Interior wood doors are worn and in need of refinishing or replacement.

Engineering Reviews

Please see the associated structural, mechanical, civil, and electrical reviews of Station 118 for specific discussion related to those disciplines.

Conclusions and Long-Term Viability

As noted in ESCI's *Capital Facilities Study*, the Edgewood and Milton communities are expected to see substantial growth relative to other areas served by EPF&R. The current facility, originating from 1948 and remodeled over subsequent decades, has a significant number of operational deficiencies which make it a better candidate for replacement than remodel.

While the station is well located in terms of its response area, it is poorly located on its site. With approximately 20 feet of clearance from the apparatus bay to the fog line of 24th Street E, safely entering traffic is a concern. This condition could worsen should Pierce County widen 24th Street further.

It is also worth noting that the existing facility and building systems are generally near the end of their lifespan, and the existing apparatus bay is too small in terms of height and depth to accommodate anticipated equipment. Therefore, it is recommended that a new station be built on the existing site, immediately behind the existing stations so that the existing facility can remain in service during construction.

Fire Station 118

Structural Site Observations

Reid Middleton conducted a site visit of Station 118 on May 17, 2011, as part of this seismic evaluation. Observations were limited to finished areas, and most primary structural members were covered by architectural finishes. The record drawings show that the original building was comprised of unreinforced masonry walls (URM) with a wood diaphragm. During additions and renovations to the building, most URM walls were removed and replaced with wood shear walls. At the few locations where URM walls remain, they were anchored to the wood shear walls running parallel and directly next to them. The plywood diaphragm, structural members, and shear walls did not show signs of deterioration, distress, or decay. ASCE 41-13 classifies Station 116 as a Wood Frame system, W2. The structure was checked for Immediate Occupancy criteria. The Tier 1 Preliminary Seismic Evaluation structural checklists were completed and are included for reference.

Structural System

The following table describes Fire Station 118's structural systems.

Structural System Description of Fire Station 118

System	Description
Roof	Glued laminated beams support plywood roof sheathing at the apparatus bay. Wood ceiling joists and girders support plywood roof sheathing throughout the remainder of the building. Wood shear walls and steel pipe columns provide gravity support to the roof framing.
Foundations	The building's foundation system is constructed of concrete strip and spread footings. A 6-inch reinforced slab on grade is located in the apparatus bay. The remaining building area has a 4-inch reinforced slab on grade.
Lateral System	The building's roof is supported laterally by perimeter and interior wood shear walls in the longitudinal and transverse directions.

Seismic Evaluation Findings

Seismic Deficiencies

The following table summarizes the seismic deficiencies identified during the Tier 1 evaluation. Descriptions of these deficiencies are based on this evaluation.

Identified Seismic Deficiencies for Fire Station 118

Deficiency	Description
Liquefaction	It is unknown if there are liquefaction-susceptible soils at depths within 50 feet under the building.
Surface Fault Rupture	It is unknown if fault rupture and displacement is anticipated at the site.
Narrow Wood Shear Walls	Narrow wood shear walls with an aspect ratio greater than 1.5 to 1 are used to resist lateral forces developed in the building at the apparatus bay. Walls between the apparatus bay doors have lengths of 4 feet and 2.5 feet, which exceeds the maximum aspect ratio. These walls are heavily relied upon for shear strength in the transverse direction.

In addition to the identified unknown Geological Site Hazard in the Tier 1 evaluation, the *Liquefaction Susceptibility Map of Pierce County, Washington,* dated September 2004 and produced by the Washington State Department of Natural Resources, was reviewed. The area where Station 118 is located has a liquefaction susceptibility of very low. During an earthquake, the site is not anticipated to experience liquefaction.

Structural Conclusions

The findings of the ASCE 41-13 Tier 1 Evaluation indicate Fire Station 118 does not meet the Immediate Occupancy performance objective. The evaluation indicates that some damage to the building may occur during a design-level earthquake that may limit the station's ability to provide first response capabilities. The primary concern is the narrow wood shear walls located at the front and rear of the apparatus bay. These walls provide the primary lateral support for the transverse direction of the apparatus bay, and having narrow walls may lead to excessive deflection in the walls and limit the walls' ability to resist lateral loads. This deficiency may lead to permanent deflection at the apparatus bay doors, preventing them from operating correctly.

It is recommended that a more detailed Tier 2 or Tier 3 evaluation be completed on Station 118. Further evaluation would determine the distribution of loads to the narrow wood shear walls and transfer of lateral forces to the foundation. If the existing construction does not allow for adequate transfer of lateral forces, the station should be replaced or upgraded seismically to meet the Immediate Occupancy performance objective. A seismic upgrade concept for this station was not completed, based on the current understanding that the station is recommended for replacement and was not identified as a good candidate for a seismic retrofit given the other findings and recommendations in the overall station assessments. For additional information on the building's performance objectives and evaluation criteria, see the section titled *Existing Fire Station Seismic Evaluation Criteria.*

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SIDER + BYERS
MECHANICAL ENGINEERS

EAST PIERCE FIRE & RESCUE, EXISTING STATION #118 - EDGEWOOD

Mechanical Systems Report

March 27, 2018

We visited Station #118 on January 23, 2018 to evaluate existing mechanical systems and discuss issues relevant to remodel possibilities and usable life span. The following is our report of the existing conditions.

EXISTING SYSTEMS

1. **Fire Sprinklers:** The building does not have a sprinkler system.

2. **Plumbing:**
   a. Water closets: China, tank type flush, in good condition.
   b. Urinals: China, flush valve, in good condition.
   c. Lavatories: China, counter mounted with single handle faucets, in good condition. China, wall mounted with single handle faucets, in good condition.
   d. Sinks: Stainless steel, single bowl kitchen sink with dual handle faucet, dated design in fair condition. Stainless steel, single bowl decon sink with dual handle faucet and attached eye wash, dated design in fair/poor condition.
   e. Showers: Tiled enclosures with door, single handle mixing valve, in fair condition.
   f. Emergency Fixtures: An addon eye wash is located on the laundry room sink faucet.
   g. Drains: The apparatus bay has a single trench drain located in the third bay.
   h. Piping: From what was visible the domestic water service piping is partially galvanized pipe and does have insulation.
   i. Domestic hot water: The building is served by a 100 gallon gas fired water heater with 80 MBH input. This water heater is old and at the end of useful service.

j. Compressed air: The station has a shop air compressor which is adequately sized and in good condition.

3. **Natural Gas Service:** The building is served by natural gas which supplies the water heater, three space package rooftop units and the apparatus bay unit heater.

4. **Space Heating, Ventilation and Air Conditioning (HVAC):**
   a. Systems: The living area of the building is served by three gas fired packaged rooftop air conditioning units each with a standalone programmable thermostat control. (The roof was not accessed to evaluate equipment condition). Package rooftop equipment of this type has a 15-20 year life span.
   b. Refrigerant: We assume the HVAC equipment uses R-22 refrigerant which has been phased out and is no longer available in new equipment.
   c. Zoning: The building HVAC zoning is marginal given the size and layout of the station. These systems would not allow for individual sleep room control.
   d. Exhaust: The restrooms are provided with source specific exhaust.
   e. Apparatus Bay: The apparatus bay is served by a suspended gas fired unit heater, in good condition. The bays have a Plymovent vehicle exhaust extraction track system for engine exhaust. A general exhaust fan is mounted on the outside wall and appears in fair condition.
   f. Kitchen: The kitchen has a residential style gas range with a residential type range hood exhaust. This system offers limited odor and grease capture and should be considered inadequate for this application.

MECHANICAL IMPROVEMENT DISCUSSION

1. **Operational Related:**
   a. Plan on providing HVAC capability for individual temperature control in single sleep rooms.
   b. The existing HVAC equipment is of residential quality which does provide a low cost solution. While this was typical for fire stations of this era, residential equipment cannot provide the functional and quality requirement of a modern staffed fire station. We recommend that future HVAC system use commercial/institutional equipment which can provide:
      i. Longer equipment life.
      ii. Additional zoning for comfort and individual sleep rooms.
      iii. Better ventilation (exhaust, outside air supply and filtration) for improved indoor air quality.
      iv. Quick space temperature adjustment for firefighter recovery and rehab.
   c. Plan on providing separate dedicated Decon space to contain and separate possible contamination from living and working areas. This space would also provide privacy when personal decontamination is required. Such a space would have high volume exhaust, infrared heat for comfort and drying, personal and equipment cleaning areas and full room drainage.
   d. Plan on providing a Bunker Gear Storage room to extend life and effectiveness of gear by storage in a dark environment. Such a space

would have exhaust to remove odor and moisture and heat to promote moisture evaporation.

2. CODE Related:

a. WAC 296-305-06503(15) requires new or remodeled kitchens to have cooking appliance disconnects active by alarm for gas and electricity. We recommend this be retrofitted for existing kitchens.
b. WAC 296-305-06503(6) requires renovations that consist of more than 60% of the assessed evaluation of the stations be protected with a sprinkler system.
c. Kitchen cooking appliances in fire stations are classified by Code as residential which exempts the requirement for a restaurant style Type I grease capture hood. However, since a fire station kitchen typically receives much more use than a normal house, a commercial style kitchen hood with roof mounted exhaust fan is recommended. This provides much better capture of steam and odors. Code does require make-up air be provided based on the volume of air exhausted.
d. Ventilation: The Energy Code requires that outside air ventilation for fire stations be provided independently of the heating and cooling system(s) and contain energy recovery. An ERV (Energy Recovery Ventilation) system is used to supply each space directly with outside air and recovery heat out of exhaust air from restrooms, laundry, etc. Any type of heating and cooling system(s) may be used with the ERV.

3. Maintenance Related:

a. Plan on replacing all galvanized domestic water pipe with copper.
b. We recommend replacing the existing water heater with a new high efficiency gas fired model.
c. We recommend replacing residential tank type toilets with commercial flush valve models. This may require an increase in the water service size.

BY: James Whigham, P.E.

SÄZÄN GROUP

DATE:	February 15, 2018
TO:	Ed McManammna – RFM Architects
FROM:	Dan Chase
PROJECT NAME:	East Pierce Fire & Rescue
SÄZÄN PROJ. NO.	292-1773
SUBJECT:	Electrical Assessment

Fire Station No. 118

A. **General:** This station is old having been built in 1948. The electrical power systems where updated in past years (date unknown). The power systems are in serviceable condition. The stations lighting systems are inefficient and do not meet Energy Code.

B. **Utility Power System**:

- Power is from Puget Sound Energy via underground service via roof weatherheads and conduit to a pad mounted transformer. Meter number is Ho99365059. Service Voltage is 120/240 1-phase, 3 wire. Service entrance secondary conduit is (2) 2", service mast conduits supporting a service amp rating of 400 amps, single phase. Recently installed 4" underground conduit to padmounted transformer bring the power to the weatherheads.

- Service entrance panel is a Siemens circuit breaker panel installed (date unknown). This panel is in serviceable condition and has another 5 years of life to reach its 30-year life expectancy.

- Branch circuit panels were also Siemens circuit breaker panels installed (date unknown). These panels are in serviceable condition and have another 5 years of life to reach their 30-year life expectancy.

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C. **Emergency Power System**:

- Emergency power is furnished to the station via a recently installed diesel fuel generator located outside the station. The set is a 100 KW Kohler set with a 200-gallon diesel sub-base fuel tank located under the set.
- A recently installed Cummins automatic transfer switch located inside the station senses loss of utility power, starts the generator and transfers power to an emergency power panel. The emergency panel serves the station loads that are needed to operate in the event that utility power has failed.
- The 200-gallon fuel tank should power the station for 48 hours.
- The set was supported via seismic spring isolators.
- Newly adopted electrical codes now require the emergency generator system to separate the life safety loads from the station essential loads during future renovations.

D. **Lighting Systems**:

- Station illumination is via fluorescent lighting fixtures. The fixtures were older fixtures installed (date unknown), with older T12 lamps.
- Lighting levels appeared to be on the low end of satisfactory at this station.
- The fixtures are in old condition and should be replaced in conjunction with any construction undertaken at this station with energy efficient LED type fixtures.
- The light fixtures in the apparatus bay were bare lamp fixtures with out guards surface mounted to the ceiling.
- Lighting control was via individual room switches. There were no occupancy sensors for control as required by current energy code.

E. **Life Safety Systems**:

- Electric powered exit signs, mixture of green and red in color were installed at this station. These were battery backup type which are designed to stay illuminated for 90 minutes after power failure.
- Egress lighting in this station was via lights powered by the standby generator.
- Fire Alarm system contains smoke detectors in the corridors.
- The station is not fire sprinklered. System smoke detectors are installed in corridors. Sleeping rooms did have individual smoke detectors.

F. **Station Alarm and Response**:

- District standard alarm via South Sound Dispatch signal to a Plectron Station Alert Receiver.

G. **Communications**

- District standard telephone and internet/data systems are installed.
- Pubic address speakers installed throughout station.

Conclusion:

The electrical systems at this station are for the most part in older condition and should be replaced in conjunction with construction taking place at this station.

Note: The above assessment is based on a site visit to the Station on January 23, 2018 to observe the visible electrical systems conditions. No record drawings or equipment manuals were available for this purpose. Time did not allow an assessment of the low voltage systems which would involve more time and information on the systems at each station.

END

Predesign Study
East Pierce Fire and Rescue
Station 18 Replacement

December 16, 2011

Address: 10105 24TH ST E

Parcel Numbers: 0420091028, 0420091025, 0420091052

Summary

The 107,434 sf site, in the City of Edgewood, is located in Section 33, Township 20N, Range 5E, W.M., Pierce County, WA.

A new fire station is proposed to replace the existing Station 18 facility that is currently on the site. The current proposal assumes the existing station would remain in use while the new station was constructed behind the existing station. Once the new station was completed, the existing station would be demolished and the remainder of the site work would be completed. The Predesign Cost Estimate was completed based on the above phasing of construction and demolition. The new station is proposed to be a 12 bedroom facility with a community room.

The scope of this Predesign Study is limited to the items discussed below.

Critical Areas

There is a 100-year flood plain mapped for this site. The flood plain mapping has been attached. A Pre-application Conference with the City of Edgewood will need to be held to determine the impact that the flood plain has on the redevelopment of this site. Generally for Critical Facilities, the finished floor of the building must be 3 ft above the flood stage and the road way elevation must be 1 ft above the flood stage. A detailed topographic survey of the site and access road will need to done to determine what those elevations need to be. Additionally, the 100-year flood elevation will need to be determined. The City will already know the flood stage elevation, if not, a Consultant may be hired to determine the flood stage elevation. For the Predesign study, based on the existing site topography, it is assumed that the necessary elevations may be achieved. However, the site topographic survey should be completed early in the Schematic Design phase so the building may be properly placed on the site and any potential cost issues related to the flood plain elevation can be determined early into the Project's Schematic Design phase to allow for any potential scope reductions to reduce the Project's overall cost (because of flood plain mitigation cost increases) to happen while the Building Design is in its earliest stages, preventing a costly redesign process. Additionally, a "flood gate" was added to Predesign Cost Estimate for the storm detention outlet pipe, which would be needed to ensure that a flood event would not back up into the on-site detention system.

There are no other mapped critical areas on the site. In addition, grading maps do not show any slopes that represent landslide hazard areas and soil maps do not show soils that are typically found in wetland areas.

Soils, Grading and Erosion Control

Soils on the site are mapped by the National Resource Conservation Service (NRCS) as Kapowsin Gravelly Loam and Kitsap Silt Loam, Type "D" or Till soils. Type "D" or Till soils have very slow infiltration rates and are generally unsuitable for infiltration. In addition, Kapowsin and Kitsap soils have a very higher silt (loam) content, which makes them extremely difficult to work with in wet weather and increases the risk of erosion during construction as well as increases the potential for transporting sediment laden runoff off-site, which is a violation of permitting requirements discussed below in the Erosion Control paragraph.

There is approximately 15 feet of grade change across the site from West to East based on Pierce County topographic mapping of the site. Based on the Predesign Architectural Siteplan the proposed building and site improvements will fit into the site and it appears will comply with ADA regulations. A detailed design survey will be needed before the schematic design phase is started to allow for a grading design in the schematic design phase to set the finished floor elevation in relation to the flood plain elevation and minimize earthwork and retaining walls as much as possible. By making critical grading and earthwork decisions early in the schematic design phase, if any changes are required in the shape of the building to save money in earthwork, there will be a minimal amount of design changes required in the building saving potential costs in building redesign.

Since more than 1 acre of land disturbing activities will happen during construction on this site, an NPDES Construction Activities permit will be required as part of the Federal Clean Water Act. In the State of Washington, the Washington State Department of Ecology (WADOE) provides coverage under their NPDES permit, which requires Owners to file a Notice of Intent (NOI) with WADOE. As part of the NOI process, a Public Notice is required, which the Civil Engineer helps the Owner prepare. In addition, a Stormwater Pollution Prevention Plan, including an Erosion and Sediment Control Plan and Stormwater Pollution Prevention Booklet, both prepared by the Civil Engineer and developed. Only the application and a copy of the Public Notice are submitted to WADOE. NOTE: The NOI cannot be submitted to WADOE until the SEPA approval has been granted to the project by Pierce County. The NOI must be submitted to WADOE a minimum of 67 days prior to the start of any land disturbing activities. During construction, the Contractor is required to monitor stormwater runoff from the site for turbidity (the amount of sediment in the runoff … if it doesn't look "clear" it is in violation) and pH (related to concrete handling activities). The SWPPP includes measures to reduce turbidity and pH in stormwater runoff. Minimizing site disturbance during wet weather months (October – April) will reduce the likelihood of violating turbidity requirements. The Contractor has some control over scheduling sitework activities. The remainder of control over the schedule is dependant in when the project is bid and the duration of the Contract.

Storm Drainage and Water Quality

The site is required to comply with the storm drainage and water quality regulations of the City of Edgewood. The City uses a continuous path methodology to compute storm infiltration and water quality volumes, which was used to determine the Predesign Study volumes.

An underground detention vault with a multi-celled wet vault is planned to meet both the water quality and detention requirements for the site since there is not adequate space on the site for a less expensive open pond. Because of the nearby flood plain and the Type D soil, the vault will need to be designed to withstand buoyancy, so it will not "float" if the surrounding soil is saturated with water when the vault itself contains minimal amounts of stormwater. The site grading will need to consider the vault design and balance the costs of the vault with the costs of filling the site, since the top and bottom slabs of the vault are the most costly elements of the vault, so the more height between the top and bottom of the vault (or the more height or fill between the lowest surface elevation and the vault discharge point), the lower the cost of the vault.

The Predesign estimated volume for the infiltration pond is 29,000 cf, with an additional 9,000 cf of storage for the multi-celled wet pond.

Water

It is assumed there is adequate fire flow to the site. A new fire sprinkler system will be installed in the building. The site is currently served by domestic water, but an allowance was provided in the Predesign Cost Estimate to upsize the domestic water service pipe diameter to provide for the new plumbing fixtures in the building.

Sanitary Sewer Service

There is currently an on-site septic system on the site. The system is a mound system with a pre-treatment system in place. The site has a history of septic system failures. The current Predesign siteplan would require the existing septic system to be removed and a new septic system to be installed, which would also need to be a mound system.

The Predesign Cost Estimate assumed that a new on-site mound septic system with pre-treatment would be installed in a new location. It is assumed that vehicle washing will not occur at this site and apparatus bay floor drains will discharge into a holding tank. If vehicle washing will be done inside the apparatus bay, the holding tank will need to be sized accordingly, which will increase the frequency the holding tank will need to be pumped. Vehicle wash water is not allowed to be discharged into a septic system and this site is not suitable for a wash bay infiltration system.

However, a sanitary sewer main may be installed in the near future that could serve the site. If that sewer main is installed, A sewer service will need to be extended to the building. Vehicle washing can be either inside or outside the building, but is assumed to happen inside the apparatus bay in the Predesign estimate. Apparatus floor drains and wash bay water will need to be pre-treated prior to discharging into the sanitary sewer system. Building sewage will connect separately to the sewer service.

Road Improvements

It was assumed for the Predesign Study that no road improvements would be required for this project. A pre-application conference is recommended with the City of Edgewood is recommended to determine if any road improvements or Right-of-Way dedication would be required.

Conclusion

The site appears suitable for this development. A pre-application conference is recommended with the City of Edgewood to determine any additional requirements the City may have on site development that may impact the costs of this project. Additionally, detailed topographic and boundary surveys, as well as a geotechnical survey, including infiltration rate and suitability of native soils to treat for water quality (cation exchange capacity), and a wetland inventory need to be done on the site.

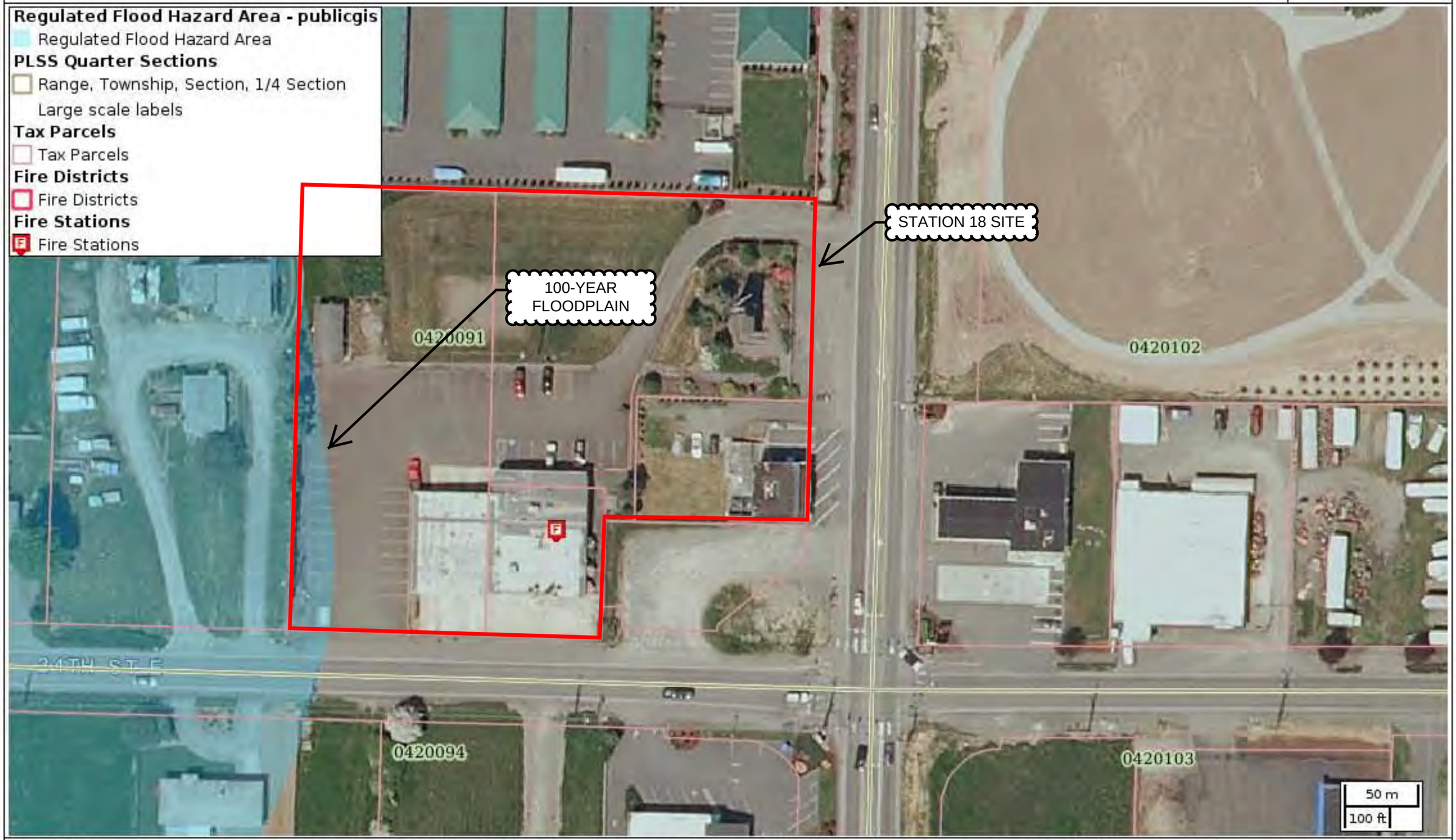
Prepared By

Cynthia L. Jose, P.E.
Senior Project Manager

EPFR Sta. 18 Aerial Map

Pierce County

Regulated Flood Hazard Area - publicgis
Regulated Flood Hazard Area
PLSS Quarter Sections
Range, Township, Section, 1/4 Section
Large scale labels
Tax Parcels
Tax Parcels
Fire Districts
Fire Districts
Fire Stations
Fire Stations



Disclaimer: The map features are approximate and are intended only to provide an indication of said feature. Additional areas that have not been mapped may be present. This is not a survey. The County assumes no liability for variations ascertained by actual survey. ALL DATA IS EXPRESSLY PROVIDED 'AS IS' AND 'WITH ALL FAULTS'. The County makes no warranty of fitness for a particular purpose. 2011/10/13

PREDESIGN STUDY CIVIL ADDENDUM by Reid Middleton

East Pierce Fire and Rescue
Station 118 Replacement

Under the *Critical Areas* Section, according to the City of Edgewood critical areas map, the project site is not within any critical areas. Based on the Pierce County GIS mapping, the project site does not appear be located within a flood hazard zone. Review with the city is recommended to verify any flood plain delineation of the project site prior to any redevelopment.

Under the *Soils, Grading and Erosion Control* Section, the Kapowsin Gravelly Ashy Loam which encompasses the western half of the site has a hydrologic soil group B designation. This soil group has favorable infiltration capabilities.

Under the *Storm Drainage and Water Quality* Section, infiltration as a stormwater management BMP may be suitable. Soil infiltration tests will be required to verify the soil composition and infiltration rates of the soil. Given the possible infiltrative soil layer, using Low Impact Development (LID) techniques such as bioretention cells could be used for both flow control and water quality. Flow control using detention, if needed, would use an underground detention system. Possible systems include underground pipes, precast detention units, or plastic storage units. Water quality requirements can be addressed with proprietary media filtration units such as Stormfilter or Modular wetlands. Improvements that replace or create more than 2,000 square feet of impervious surfacing will require some form of stormwater management. LID techniques will be required and bioretention in any landscape area is recommended. Detention and water quality will be sized based on the latest Western Washington Hydrologic Model (WWHM) that meets the Pierce County Stormwater Management & Site Development Manual.

Mark Davis, PE

Architectural Assessment: Station 124 Milton

Scope of Review

Station 124 was reviewed by architectural, mechanical, structural, and electrical engineering consultants on May 17, 2011 and again on January 23, 2018. Please see the included reports for detailed assessments in each discipline.

General Station Information

- Age and Improvement History: Originally built in 1982, Station 124 is a one-story station with a partial mezzanine. Subsequent minor additions and remodels have been performed over the years.
- Size: Approximately 6,337 sq. ft.
- Current and Future Deployment: Station 124 is a volunteer station housing up to 3 firefighters and the following apparatus: Engine 124, Engine 1249 and Aid 124.

Noted Operational Limitations

- Bunker Gear Storage: Bunker gear is currently stored in the apparatus bay, reducing gear longevity due to UV exposure.
- Vehicle exhaust point capture system: No vehicle tailpipe exhaust capture system is installed at this station. For firefighter health and safety, these types of systems are recommended at all stations.
- Generator: The existing generator is located inside the building, using up valuable floor space as well as creating noise and odors within the facility. As noted in the electrical assessment for this station, the existing generator is very old and should be replaced.
- Station layout: The station is owned by the City of Milton and a portion of the facility's former living quarters and community room has been converted to city staff offices. This arrangement now requires firefighter to exit the building from the sleeping areas and then enter the apparatus bay via an exterior door. The City has also taken one of the apparatus bays for its own use, limiting expansion and flexibility for EPF&R.

Code and WAC Limitations

- ADA Compliance: Existing restrooms do not meet current accessibility requirements.

Deferred Maintenance Issues

- Hose tower: the existing hose tower was noted as having some water intrusion and weatherization issues. These should be reviewed and corrected as soon as feasible to prevent further damage to the structure or mold/mildew problems.
- Double –wide overhead doors: The existing overhead doors are each two bays wide. Given their size they will need additional maintenance care over the years. Should the station be substantially remodeled, consideration should be given to converting these doors to a pair of single-bay overhead doors.
- Water damage: Some damage was noted at downspout areas. As with the hose tower, these issues should be examined and corrected in the near term to prevent further damage.

Engineering Reviews

Please see the associated structural, mechanical, civil, and electrical reviews of Station 124 for specific discussion related to those disciplines.

Conclusions and Long-Term Viability

Per ESCI's report, Station 124 is expected to remain as a volunteer facility. As such, it is generally in average condition for its age and mission and major improvements are not recommended. It is recommended that the water damage-related maintenance issues be resolved to prevent continuing damage.

Identified Seismic Deficiencies for Fire Station 124

Deficiency	Description
Adjacent Building	A small shed located off the east end of the sleeping quarters was not reflected in the record drawings. It is unclear through site investigation if this building is independent from the main building.
Vertical Irregularity	A vertical irregularity occurs where the roof diaphragms meet the hose tower.
Geometry	Re-entrant corners located at the hose tower present a geometrical deficiency where concentrated horizontal loads will cause stresses.
Liquefaction	It is unknown if there are liquefaction-susceptible soils at depths within 50 feet under the building.
Surface Fault Rupture	It is unknown if fault rupture and displacement is anticipated at the site.
Wood Ledgers	The wood ledgers are insufficient to prevent cross-grain bending. The existing bolted connection is known to induce cross-grain bending, causing a weak connection.
Transfer to Shear Walls	The available record drawings do not provide diaphragm-to-shear wall connections, and these areas were not visible during the site investigation. Inadequate transfer of loads can result in high, concentrated loads at locations that may not have been adequately designed for large forces.
Plan Irregularities	Re-entrant corners between the hose tower and the apparatus bay and sleeping quarter walls have potentially inadequate tensile capacity. The available record drawings do not show detailing of the reinforcement at re-entrant corners.
Straight Sheathing	Multiple plywood diaphragms exceed the 1-to-1 aspect ratio.

In addition to the identified unknown Geological Site Hazard in the Tier 1 evaluation, the *Liquefaction Susceptibility Map of Pierce County, Washington,* dated September 2004 and produced by the Washington State Department of Natural Resources, was reviewed. The area where Station 124 is located has a liquefaction susceptibility of very low. The site is located adjacent to areas that contain peat and areas of moderate to high liquefaction potential. While the site is not expected to experience liquefaction during a seismic event, it is recommended that additional site geotechnical investigation be performed because the site is located close to areas of concern.

Structural Conclusions

Fire Station 124 does not meet the Immediate Occupancy performance objective. The evaluation indicates that some damage to the building may occur during a design-level earthquake that may

cause the facility to not be occupied. The primary concern is the diaphragm-to-wall connections. This deficiency may result in the roof structure separating from the masonry bearing walls, resulting in a partial collapse of the roof structure. Additionally, the irregularities noted have historically resulted in poor seismic performance in similar buildings when these connections have not been detailed properly.

This station should be replaced or seismically upgraded to meet the Immediate Occupancy performance objective if it continues function as a fire station. A seismic upgrade concept for this station was not completed, based on the current understanding that the station is recommended for replacement and was not identified as a good candidate for a seismic retrofit given the other findings and recommendations in the overall station assessments. For additional information on the building's performance objectives and evaluation criteria, see the section titled *Existing Fire Station Seismic Evaluation Criteria.*

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SIDER + BYERS
MECHANICAL ENGINEERS

EAST PIERCE FIRE & RESCUE, EXISTING STATION #124 - MILTON

Mechanical Systems Report

March 27, 2018

We visited Station #124 on January 23, 2018 to evaluate existing mechanical systems and discuss issues relevant to remodel possibilities and usable life span. The following is our report of the existing conditions.

EXISTING SYSTEMS

1. **Fire Sprinklers:** The building does not have a sprinkler system.

2. **Plumbing:**
   a. Water closets: China, tank type flush, in fair condition.
   b. Urinals: China, flush valve, in fair condition.
   c. Lavatories: China, counter mounted with single handle faucets, in fair condition. China, wall mounted with single faucets, in fair condition.
   d. Sinks: China, double bowl kitchen sink with single handle faucet, in fair condition. Stainless steel, double bowl scullery decon sink with dual handle faucet and attached eye wash, in good condition.
   e. Showers: Fiberglass enclosures with door, single handle mixing valve, dated design in fair condition.
   f. Emergency Fixtures: An addon eye wash is located on the decon sink faucet.
   g. Drains: The apparatus bay has square traffic drains in each bay.
   h. Piping: The domestic water service pipe is copper but did not appear to have insulation.
   i. Domestic hot water: The building is served by a residential electric water heater, in good condition.

3. **Natural Gas Service:** The building does not currently have natural gas service.

4. **Space Heating, Ventilation and Air Conditioning (HVAC):**
   a. Systems: The living area of the building is served by an electric, split-system furnace with an exterior condensing unit located on the roof. (The roof was not accessed to evaluate equipment condition). Equipment of this type has a 10-15 year life span.
   b. Refrigerant: We assume given the age that the HVAC equipment uses R-22 refrigerant which has been phased out and is no longer available in new equipment.
   c. Zoning: The building doesn't have any HVAC zoning given that there is only a single system. This is a small station but still does not seem adequate as there are separate office and living areas. This system would not allow for individual sleep room control.
   d. Exhaust: The restrooms are provided with source specific exhaust.
   e. Apparatus Bay: The apparatus bay is served by two electric forced air heaters which discharge air through the floor drains. The bays do not have a vehicle engine exhaust extraction system.
   f. Kitchen: The kitchen has a residential style electric range with a residential type range hood exhaust. This system offers limited odor and grease capture and should be considered inadequate for this application.

MECHANICAL IMPROVEMENT DISCUSSION

1. **Operational Related:**
   a. Plan on providing a vehicle exhaust capture system. (Such ventilation would be required in a new station per WAC 296-305-06511(4).)
   b. Plan on providing additional HVAC zoning for occupant comfort. At a minimum provide separate systems for the office and living areas.
   c. Plan on providing HVAC capability for individual temperature control in single sleep rooms.
   d. The existing HVAC equipment is of residential quality which does provide a low cost solution. While this was typical for fire stations of this era, residential equipment cannot provide the functional and quality requirement of a modern staffed fire station. We recommend that future HVAC system use commercial/institutional equipment which can provide:
      i. Longer equipment life.
      ii. Additional zoning for comfort and individual sleep rooms.
      iii. Better ventilation (exhaust, outside air supply and filtration) for improved indoor air quality.
      iv. Quick space temperature adjustment for firefighter recovery and rehab.

e. Plan on providing separate dedicated Decon space to contain and separate possible contamination from living and working areas. This space would also provide privacy when personal decontamination is required. Such a space would have high volume exhaust, infrared heat for comfort and drying, personal and equipment cleaning areas and full room drainage.
f. Plan on providing a Bunker Gear Storage room to extend life and effectiveness of gear by storage in a dark environment. Such a space would have exhaust to remove odor and moisture and heat to promote moisture evaporation.
g. Plan on revising apparatus bay heating air distribution and/or system such that supply air is not contaminated by being supplied through the floor drains.

2. CODE Related:

a. WAC 296-305-06503(15) requires new or remodeled kitchens to have cooking appliance disconnects active by alarm for gas and electricity. We recommend this be retrofitted for existing kitchens.
b. WAC 296-305-06503(6) requires renovations that consist of more than 60% of the assessed evaluation of the stations be protected with a sprinkler system.
c. Kitchen cooking appliances in fire stations are classified by Code as residential which exempts the requirement for a restaurant style Type I grease capture hood. However, since a fire station kitchen typically receives much more use than a normal house, a commercial style kitchen hood with roof mounted exhaust fan is recommended. This provides much better capture of steam and odors. Code does require make-up air be provided based on the volume of air exhausted.
d. None of the restrooms/showers meet ADA requirements. Remodel options would need to include at least one ADA restroom and shower facility.
e. Ventilation: The Energy Code requires that outside air ventilation for fire stations be provided independently of the heating and cooling system(s) and contain energy recovery. An ERV (Energy Recovery Ventilation) system is used to supply each space directly with outside air and recovery heat out of exhaust air from restrooms, laundry, etc. Any type of heating and cooling system(s) may be used with the ERV.

3. Maintenance Related:

a. The condensing units which uses R-22 refrigerant cannot be directly replaced due to the phase out of that refrigerant. When considering replacement or upgrade of refrigerant equipment, it will need to be a

newer refrigerant like R-410a. This will necessitate replacing not only the exterior condensing unit but also the indoor coil and the refrigerant piping as well.

b. The three electric furnaces are old and at the end of their serviceable life. We suspect the condensing unit is also at the end of its serviceable life. Plans should be made for the upgrade or replacement of these systems.
c. Long term the availability of natural gas should be investigated and considered as the primary heat source for the building.
d. We recommend replacing residential tank type toilets with commercial flush valve models. This may require an increase in the water service size.

BY: James Whigham, P.E.

SÄZÄN GROUP

DATE:	February 15, 2018
TO:	Ed McManammna – RFM Architects
FROM:	Dan Chase
PROJECT NAME:	East Pierce Fire & Rescue
SÄZÄN PROJ. NO.	292-1773
SUBJECT:	Electrical Assessment

Fire Station No. 124

A. **General:** This station dates to the 1982 remodel and as such the electrical power systems are 36 years old or older. These systems are beyond their 30-year life expectancy and should be replaced. The stations lighting systems are inefficient and do not meet Energy Code.

B. **Utility Power System**:

- Power is from Puget Sound Energy via underground service to the interior service panel. Meter number is 76 290 762. Service Voltage is 208Y/120V 3-phase, 4 wire. Service entrance rated 800 amps, three phase.
- Service entrance panel is a fused switch type that was likely installed in the 1982 remodel. This panel is by GTE/Sylvania who no longer manufactures panelboards. This panel is in fair condition and has reached its 30-year life expectancy. This gear is no longer supported by the manufacturer so it should be replaced during any renovations.
- Branch circuit panels were also GTE Sylvania circuit breaker panels likely installed during the 1982 renovations. These panels are in fair condition and have reached their 30-year life expectancy. This gear is no longer supported by the manufacturer so it should be replaced during any renovations.

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C. **Emergency Power System**:

- Emergency power is furnished to the station via an ancient (pre-1982) diesel fuel generator located inside a room attached to the station. The set is of unknown manufacturer and needs to be replaced immediately. A diesel fuel tank was located inside this same room.
- An ancient automatic transfer switch located inside the room senses loss of utility power, starts the generator and transfers power to an emergency power panel. The emergency panel serves the station loads that are needed to operate in the event that utility power has failed.
- The fuel tank was size is unknown, it may be sized to power the station for 48 hours.
- The set was not supported via properly sized seismic spring isolators.
- The emergency system was very old and is not currently scheduled to be replaced with a new outdoor set. This needs to be done very soon.
- Newly adopted electrical codes now require the emergency generator system to separate the life safety loads from the station essential loads during future renovations.

D. **Lighting Systems**:

- Station illumination is via fluorescent lighting fixtures. The fixtures were older fixtures installed (date unknown), with older T12 lamps.
- Lighting levels in the apparatus bays appeared satisfactory. Other rooms and spaces appeared to be a mixture of satisfactory and on the low end of satisfactory.
- The fixtures are in older condition and should be replaced in conjunction with any construction undertaken at this station to energy efficient LED type fixtures.
- The light fixtures in the apparatus bay were bare lamp fixtures with reflector but without guards suspended from the ceiling.
- Lighting control was via individual room switches. There were no occupancy sensors for control as required by current energy code.

E. **Life Safety Systems**:

- Electric powered exit signs were not checked at this station.
- Egress lighting in this station was via lights powered by the standby generator.
- Fire Alarm system by FPi is in newer condition. Reporting has been upgraded to use Wi-fi reporting. The station was fully detectored. Sleeping rooms did have individual smoke detectors.
- The station is not fire sprinklered. System smoke detectors are installed through out the station. Sleeping rooms did have individual smoke detectors.

F. **Station Alarm and Response**:

- District standard alarm via South Sound Dispatch signal to a Plectron Station Alert Receiver.

G. **Communications**

- District standard telephone and internet/data systems are installed.
- Pubic address speakers installed throughout station.

Conclusion:

The electrical systems at this station are for the most part in older condition and should be replaced in conjunction with construction taking place at this station.

Note: The above assessment is based on a site visit to the Station on January23, 2018 to observe the visible electrical systems conditions. No record drawings or equipment manuals were available for this purpose. Time did not allow an assessment of the low voltage systems which would involve more time and information on the systems at each station.

END

Architectural Assessment: Station 119 South Prairie

Scope of Review

Station 19 was reviewed by architectural consultants on May 18, 2011 and again on January 23, 2018.

General Station Information

- Age and Improvement History: Built in 1986, Station 119 has received an apparatus bay addition and remodeling. It is 5,735 sq. ft., with two-stories. This station also serves as a community center for South Prairie, which also owns the facility. Station 119 will house the District's vehicle maintenance program in one bay.
- Size: Approximately 5,735 sq. ft.
- Current and Future Deployment: Station 119 is a volunteer station serving 8-12 non-resident firefighters. The following apparatus are housed there: Engine 119, Tender 119 and Aid 119. The "Safety House" trailer is also housed at the station.

Noted Operational Limitations

- Bunker Gear Storage: Bunker gear is currently stored in the apparatus bay, reducing gear longevity due to UV exposure.
- Fitness: No physical training area is provided at this station.

Code and WAC Limitations

- ADA Compliance: the second floor living quarters and restrooms are not handicap accessible and no elevator exists. Should a substantial remodel or addition occur, it is likely that an elevator would be required.
- Fire Sprinklers: The station is not equipped with a fire sprinkler system. Given the existing sleeping quarters, any substantial renovation will require sprinklers to be installed.

Deferred Maintenance Issues

- Hose tower: Efflorescence was noted near the top of the hose tower, possibly indicating weatherization problems. Additional investigation should be performed to determine the extent of infiltration and possible remediation.
- The asphalt composition shingle siding is nearing its end of life and is worn at many locations. It should be replaced prior to complete failure in order to protect the structure.

Conclusions and Long-Term Viability

Station 119 is in generally good condition and serves its current purpose as a volunteer station. However, being situated adjacent to a river, the station's site has a history of flooding. It is also not anticipated that this station will be converted to full time staffing at any point within the next 20 years. For these reasons the station is not suitable for long-term use or substantial renovation, expansion, or remodeling.

Architectural Assessment: Station 122 Boat House

Scope of Review

Station 122 was reviewed by architectural consultants on May 18, 2011 and again on January 23, 2018.

General Station Information

- Age and Improvement History: Built in 1989, Station 122 has not received any significant remodels or additions.
- Size: Approximately 1,438 sq. ft.
- Current and Future Deployment: Station 122 is an unstaffed facility housing the district's water rescue boat and associated decontamination, storage, and restroom/shower facilities. It also includes a small classroom/training room.

Noted Operational Limitations

- Emergency generator: Station 122 is scheduled to receive a new emergency generator in the future, though no generator is in place at this time.

Code and WAC Limitations

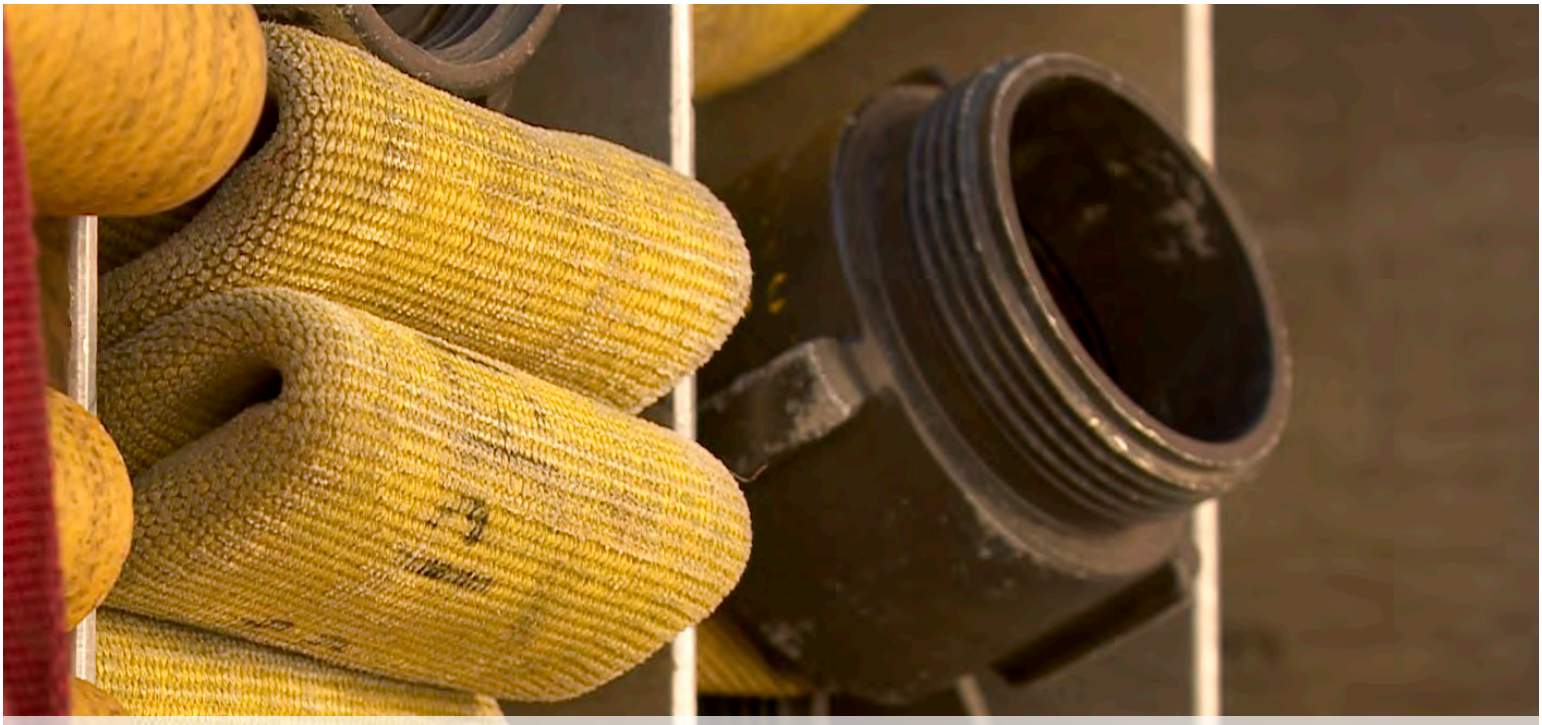
- Restrooms: Existing facilities are not handicap accessible.
- Insulation: Wall insulation does not exist at the boat launch area. While this was most likely acceptable at the time of construction, it is likely that insulation and energy code upgrades would be required if any expansion or substantial remodel work is undertaken. No freeze-related issues have been reported.

Deferred Maintenance Issues

- Station 122 is generally in good repair, with a relatively new roof. Some minor bird-related damage was noted at the gypsum sheathing eave soffits. The district has recently replaced the unit heater in the boat bay, as well as the launch system electronics and winch mechanism.

Conclusions and Long-Term Viability

Station 122 is well suited for its current role as the home of the Lake Tapps water rescue boat. While handicap restroom facilities are not available we would accept them as existing non-conformances since there is no public access to the station and all crews are sourced from other facilities. Apart from noted maintenance issues, no additional work is anticipated or recommended unless the station's mission changes or expands substantially.



EAST PIERCE FIRE & RESCUE

CAPITAL FACILITIES PLAN

FIRE STATION PROGRAM AND NEEDS ANALYSIS

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Fire Station Program and Needs Analysis

Project Description

East Pierce Fire & Rescue's 2018 Capital Facilities Plan includes remodeling three existing stations and constructing six fire stations across the district that are a combination of replacements and new facilities.

Given the scale of the proposed improvement projects, together with the logistics of undertaking them, EPF&R has prioritized their projects into the following categories:

Phase 1

Fire Station 111 is currently in a portion of building leased from the City of Bonney Lake that it outgrew years ago. A new Headquarters Station 111 would be constructed on a nearby parcel located on Main Street that was purchased by the district in 2012.

Fire Station 112 in Prairie Ridge would be replaced on a new parcel southwest of the current station. This station was built in 1976 and is unable to serve its response demands given the station's limited capacity and small property size. The new location would more effectively serve the recent growth in the Tehaleh area, which does not currently have a fire station.

Fire Station 114 on the west side of Lake Tapps was originally built in 1970. The station has significant structural and seismic deficiencies, as well as operational deficiencies that include bays that are too short for modern fire engines. The property is small and unable to support any expansion, so this station would be replaced on a larger parcel in the same general vicinity. Its response location is excellent.

Fire Station 118 in Edgewood is the oldest station in the district. It lacks adequate bays, modern fire station features for decontaminating personnel, and space for proper caring and storing of equipment. The property is in an excellent response location and is large, so this station is proposed to be replaced on the same property.

Fire Station 117 would be a new station located in Tehaleh where it could serve that growing area, Plateau 465, and surrounding developments. In the coming years Tehaleh is expected to be one of the fastest-growing areas within the district with significant increases in residential and commercial construction and population.

Phase 2

Improvements to Fire Station 113 in Sumner would include interior modernizing and a small addition.

Improvements to Fire Station 115 on the east side of Lake Tapps would include remodeling and additions in support of transitioning it from a volunteer station to a 24-hour career-staffed station.

Improvements to Fire Station 116 in the Foothills would include interior modernizing and building additions.

Fire Station 124 is currently in a portion of an existing fire station leased from the City of Milton. A new station would be constructed on a new parcel where it would best serve Milton and the surrounding communities.

Additional Priorities

There are several other needs the district will likely need to undertake in the next 10 to 20-year horizon. This would include improvements to Station 121 (currently used exclusively for Logistics), Station 119 (operating out of an existing fire station not owned by the district), and Station 122 (the district's Boathouse on Lake Tapps). Increasing demands on the district in coming years are also expected to necessitate capital improvements for training, vehicle maintenance, and logistics.

Goals and Objectives

In the development of the programmatic needs and requirements, the following overarching goals and objectives were established for all the district's capital improvement projects regardless of the size, budget, or geographic location:

- Health and safety improvements for the emergency personnel that work out of these stations, including structural measures that preserve the integrity of the station after a significant earthquake.
- Improvements for the wellness of building occupants, including relocating fitness equipment out of apparatus bays and into dedicated fitness rooms.
- Fire sprinklers at all new and remodeled facilities.
- Improvements to the living quarters that align the capacity of the station in personnel with the station's call volume.
- For existing stations that are being remodeled, improved privacy and gender-neutrality would be incorporated.
- Improvements in support of caring and storing modern equipment, including appropriate decontamination facilities.
- Improvements to bring these existing stations into reasonable compliance with current building codes, standards, and modern fire station design practices.
- Improvements in the operational efficiency of the station.
- Stocking of disaster supplies in a dedicated space at all stations. Supplies would be isolated and easily accessible in the event of a regional disaster.

Program

The following guidelines were used in defining the extent of improvements to be undertaken at each station, remodels and new construction alike.

Regarding upgrading existing stations to be equivalent to new construction, current codes, and modern operational standards, these statements provide a benchmark for what is most pressing to be upgraded and to what extent. Exceptions would be taken only where full compliance is cost prohibitive and/or infeasible.

Site Improvements:

- Site Security, Parking: All stations, new and remodeled, shall have a secure parking area (fenced and gated) for station crews.
- Sewer System: All stations, new and remodeled, shall be connected to a sanitary sewer system in lieu of septic systems and drain fields where sewers are available.
- Apparatus Maneuvering: Apparatus aprons shall be of adequate size to allow emergency vehicles to safely return to the apparatus bay without requiring maneuvering and backing in the street to the apron. Drive-through bays shall be provided where possible.

Exterior Improvements:

- Thermal Insulation: All existing stations when remodeled shall meet the minimum WA State Energy Code requirement for insulation at exterior walls, roofs and attics.
- Existing Roof and Siding Systems: At all existing stations when remodeled, current roofing and associated flashings, drains, and gutters shall be replaced.

Interior Improvements:

- ADA Access: All 2-story stations, new and remodeled, shall have an elevator that serves all occupied areas of any upper floors, excepting only storage and maintenance spaces.
- Bunker Gear Room: All stations, new and remodeled, shall have a dedicated storage room for bunker gear.
- Decontamination Facilities: All stations, new and remodeled, shall have a dedicated decontamination area equipped with a heavy duty stainless steel scullery sink, wide drain boards, commercial pre-rinse hand spray, a wash-down shower area, a deluge shower and eye wash, bunker gear extractor, and a bunker gear drying cabinet.
- Shop: All stations, new and remodeled, shall have a dedicated shop space for maintenance and repair of equipment.
- Hazardous Material Removal: At all existing stations when remodeled, all identifiable hazardous materials shall be removed, including vinyl asbestos tile, asbestos pipe insulation, asbestos window glazing putty, asbestos roofing mastics, and PCB's in light fixtures. No underground fuel storage tanks are known to exist at any stations.

- Sleep Rooms: All stations shall have a minimum of 6 single occupant sleep rooms with a bed, (4) shift lockers, desk and individual temperature control.
- Community Room: Provide a room suitable for community access at all stations identified as Community 2 or larger.
- Improved building security, including consideration for the use of a proximity-card access system.

Structural:

- Seismic Renovation: All existing stations when remodeled shall be seismically upgraded to meet an Immediate Occupancy (IO) performance objective (i.e., will be safe to re-occupy immediate following an earthquake) using Tier 1 seismic evaluations in accordance with ASCE 31-03, *Seismic Evaluation of Existing Buildings.*

Mechanical:

- Modify Existing HVAC Systems: All existing stations when remodeled shall have HVAC systems that, at a minimum, provide specific exhaust at Restrooms, Shower Rooms, Locker Rooms, Work Rooms, Maintenance Rooms, Laundry Rooms and Storage Rooms; and have 24/7 programmable controls to reduce energy use.
- All stations, new and remodeled, shall include a fire sprinkler system.

Electrical:

- Existing Service: The electrical service size at all existing stations shall include a minimum 20% spare capacity, and switchboards and panel boards shall have 30% spare capacity for additional circuit breakers to be added in the future.
- Stand-by Power, Exterior Generator: All stations, new and remodeled, shall have an enclosed, sound attenuated, diesel, stand-by generator, sized to provide power to the entire station for a minimum of 72 hours.
- All stations, new and remodeled, shall include a fire alarm system.
- All stations, new and remodeled, shall include an alerting system connected district-wide.
- All cooking devices at all stations, new and remodeled, shall have a disconnect and reset button that is activated by the station's alerting system.
- Provide a new, modern alerting system similar to the type currently installed at Station 116.

Space Program and Station Types

In addition to the program components noted above, each station was classified by size and mission and a generic, standardized station design was developed as a way of understanding how a uniform, prototypical station program and station design might be utilized throughout the district. The square footage summary below was developed based on these identified needs for each station. In general

terms, each station was classified as one of four types, depending on staffing and deployment requirements. From smallest to largest, the four model station types are:

- *Community 1:* A three-bay (single-deep) station with sleep rooms and accommodations for up to 7 firefighters.
- *Community 2:* A three-bay (double-deep) station with sleep rooms and accommodations for up to 9 firefighters, and a modest community room.
- *Battalion Station:* A four-bay (double deep) station with sleep rooms and accommodations for up to 11 firefighters and a battalion chief. A large community room would be provided at all Battalion stations.
- *Headquarters:* A four-bay (double-deep) station which includes all the requirements of a Battalion Station, as well as the district administration needs outlined below. A large community room would be provided at the Headquarters station that could also serve as a Emergency Operations Center in the case of a regional disaster.

Station Deployment Capabilities

The following summarizes the deployment capabilities of each of EPF&R's stations based on this Capital Facilities Report in terms of sleeping rooms and apparatus bay space. No facility replacements, upgrades or remodeling are planned for any EPF&R building other than those listed below.

- Station 111 Bonney Lake: *Headquarters Station.*
    - Sleep Rooms: 12 total.
    - Bays: 4 stacked, drive-through capable.
- Station 112 Prairie Ridge: *Community 2 Station.*
    - Sleep Rooms: 9 total.
    - Bays: 4 stacked, drive-through preferred
- Station 113 Sumner: *Community 2 Station.*
    - Sleep Rooms: 9 total.
    - Bays: 2 stacked (existing), drive-through capable.
- Station 114 West Lake Tapps: *Community 1 Station.*
    - Sleep Rooms: 7 total.
    - Bays: 3 single deep bays, drive-through preferred
- Station 115 East Lake Tapps: *Community 1 Station.*

- Sleep Rooms: 6 total.
- Bays: 2 drive-through and 1 back-in (existing)

- Station 116 Foothills: *Community 2 Station.*
  - Sleep Rooms: 9 total.
  - Bays: 2 stacked and 2 back-in (existing).
- Station 117 Cascadia: *Community 1 Station.*
  - Sleep Rooms: 7 total.
  - Bays: 3 single-deep, drive-through preferred.
- Station 118 Edgewood: *Battalion Station.*
  - Sleep Rooms: 12 total.
  - Bays: 4 stacked, drive-through preferred.

Station Specific Discussion and Conclusions

While each station's potential replacement was considered based on its current condition, operational needs, and future deployment requirements, sensitivity to budget given the current economic climate and the willingness of voters to approve a large bond measure was also a key factor. To that end, each project was carefully examined to determine what value-engineering could be undertaken to both achieve the goals stated above, while at the same time minimizing costs through careful reuse and renovation of existing facilities. The following discussion summarizes the recommended scenario for each station. In addition, this Capital Facilities Plan includes site and floor plans as well as detailed room space allocations to clearly indicate what is included in each station.

Station 111 Bonney Lake Headquarters: At 31,675 sq. ft., the new headquarters facility will replace the 18,000 sq. ft. currently leased by EPF&R from the City of Bonney Lake. In addition to maintaining emergency response to the core Bonney Lake area, it will consolidate all of EPF&R's command staff at one location while still providing the important daily contact opportunities between staff and firefighters that a responding headquarters station can provide. Upon completion, the new headquarters will save the district approximately $362,000 per year in lease and debt payments. In addition to its administrative and emergency response functions, Station 111 will continue to serve as one of the most visible and public service-oriented of EPF&R's stations as it continues to host public education programs such as first aid and CPR training, life jacket and bicycle helmet distribution, and car seat inspections. Public access to the facility will be enhanced through a greater access to public meeting rooms, and more public parking.

Station 112 Prairie Ridge: Fire Station 112 is one of the smallest while also one of the busiest of EPF&R's stations. It is a 1970's era metal building on a small sized parcel of land. The property is not large enough to support enough additions to the building to support its current service load, let alone the

anticipated future demands. By relocating Fire Station 112 on a larger parcel further to the southwest, two issues are resolved: the replacement station can be appropriately sized on a larger parcel and can better serve the overall Tehaleh area in the interim until Fire Station 117 can be appropriately staffed and built.

Station 113 Sumner: As one of the newer and more modern facilities in the district, Fire Station 113 was identified as a Phase 2 project. Its improvements will include an addition on the north side of the station for equipment and decontamination facilities that will help take the pressure from the already crowded apparatus bays. Logistics, public education, and fire marshal staff have recently been relocated from the Station, which has freed up additional space for crew works areas, offices, and support spaces. On the second floor, new, gender-neutral and ADA compliant restrooms and individual sleep rooms would be created. Mechanical and electrical systems would also be upgraded to modern standards. Seismic upgrades would be performed to improve earthquake performance.

Station 114 West Lake Tapps: Station 114 has numerous deficiencies that preclude remodeling, including poor site location, an undersized apparatus bay, and a cracking, un-insulated masonry building shell. As such, a new facility on a new site is the most cost-effective long-term solution. The new Station 114 would provide a three-bay facility with accommodations for up to 7 firefighters as well as an apparatus bay that can accommodate the special operations needs of the water rescue team.

Station 115 East Lake Tapps: This volunteer-staffed station will likely be transitioned to full-time staffing within the next 20 years as the areas to the east of Lake Tapps experience additional development. When that happens, remodeling and additions will be undertaken to provide additional living, working, and operational support areas to accommodate a staff of up to 6 firefighters. Seismic upgrades, along with electrical, mechanical, and plumbing improvements would allow another 20 years of service for this building.

Station 116 Foothills: This station is the easternmost staffed station in the district. It is well located for its response area and sits on a sizable lot. To extend the life of this station, a comprehensive remodel with a modest expansion is recommended to accommodate up to 9 firefighters. Like stations 113 and 115, seismic improvements to bring the station up to Immediate Occupancy standards would be included, as well as mechanical, electrical, and plumbing improvements.

Station 117 Tehaleh: This new station's primary objective is serving the Tehaleh community, which is still in the early stages of its development. Considerably more development is expected in the future, and with it will be improvements to the road network leading in and out the area. Current calls for service are low in comparison to other stations. As such, it is recommended that the timing of this station be largely determined by how rapidly this area develops. Additionally, it is recommended that a "modular" station be provided so that it can grow as needs and surrounding populations increase, which is reflected in this report.

Station 118 Edgewood: Originally built in 1948, the Edgewood station is the oldest station in EPF&R's inventory, yet it serves one of the fastest growing areas as identified in ESCI's Capital Facilities Study.

As was noted in the assessment portion of this Capital Facilities Report, Station 118 suffers from poor siting, an undersized and failing apparatus bay, and aged mechanical and electrical systems. Therefore, a new facility based on the Battalion Station program is recommended.

Estimated Costs

The estimated costs for remodeling and upgrading these stations, including all anticipated project expenses, are included in the project budget section of this Capital Facilities Plan.

Area Summary: Station 111 Bonney Lake

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Apparatus and Operations				
	Apparatus Bays	74' x 80'		5,920 sf
	Battery Charging Alcove			48 sf
	Fire Clean-up / Decon Area			154 sf
	Bunker Gear Storage			504 sf
	Shop			192 sf
	Air Fill Station / Bottle Storage			150 sf
	Compressor (Station Air)			70 sf
	Storage			635 sf
	Apparatus Bay Restroom			60 sf
	Janitorial / Wash Equipment			70 sf
	Subtotal Apparatus and Operations			**7,803 sf**
Public, Community, and Administrative				
	Public Lobby			600 sf
	Vestibule			96 sf
	Reception	2 @	120 sf	240 sf
	Public Restrooms (Men's and Women's)			360 sf
	Public Education and Reception			360 sf
	First Aid Room			300 sf
	Community Training Room			1,600 sf
	Community Room Storage			400 sf
	Community Training Kitchen			72 sf
	Administrative Offices	4 @	204 sf	816 sf
	Administrative Offices	4 @	192 sf	768 sf
	Administrative Offices	4 @	168 sf	672 sf
	Administrative Offices	6 @	144 sf	864 sf
	Administrative Offices	6 @	132 sf	792 sf
	Administrative Offices	6 @	120 sf	720 sf
	Administrative Offices	8 @	96 sf	768 sf
	Admin Workroom			350 sf
	Admin Conference Room			512 sf
	Admin Library			448 sf
	Admin Restrooms			160 sf
	Admin Kitchenette / Break Room			240 sf
	Admin Shower/Locker Rooms			320 sf
	Janitorial			75 sf
	Records Storage			672 sf
	Public and Administrative			**12,205 sf**

Operational Work Areas					
	Station Duty Office				600 sf
	Company Officer's Office	2 @	120	sf	240 sf
	BC Office	1 @	143	sf	143 sf
	BC-Sleep Room				140 sf
	BC-Restroom				80 sf
	Subtotal Operation Work Areas				**1,203** sf
Residential Areas					
	Kitchen /Dining				1,200 sf
	Dayroom				600 sf
	Fitness				600 sf
	Firefighter sleep rooms	11 @	140	sf	1,540 sf
	Toilet / Shower Rooms	6 @	80	sf	480 sf
	Laundry / Utility / Janitorial				190 sf
	Storage				212 sf
	Subtotal Residential Areas				**4,822** sf
	Subtotal Apparatus, Operational, Residential and Public				**26,033 sf**
	Allowance for circulation				5,642 sf
	Building Total:				**31,675 sf**

Vicinity Map - New Station 111 Headquarters Site

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ARCHITECTURE & PLANNING

Predesign Study
East Pierce Fire and Rescue
New Station 11

December 16, 2011

Address: Sumner Buckley Highway and 184th Avenue East

Parcel Numbers: 5640001108, 5640001021, 5640000943, 5640001109

Summary

The 136,296 sf site, in the City of Bonney Lake, is located in Section 33, Township 20N, Range 5E, W.M., Pierce County, WA.

A new fire station is proposed to replace the existing Station 11 facility that is co-located with the City of Bonney Lake Police Department. The new station is proposed to be a two story, 11 bedroom facility with administrative offices and a community room.

The scope of this Predesign Study is limited to the items discussed below.

Critical Areas

There are no mapped critical areas on the site. In addition, grading maps do not show any slopes that represent landslide hazard areas and soil maps do not show soils that are typically found in wetland areas.

Soils, Grading and Erosion Control

Soils on the site are mapped by the National Resource Conservation Service (NRCS) as Alderwood Gravelly Sandy Loam, a Type "C" or Till soil. Type "C" or Till soils have slow infiltration rates, but can be used for infiltration if the depth from the bottom of the infiltration system to the hardpan layer or groundwater layer is at least 3 feet. In addition, Alderwood soils have a higher silt (loam) content, which makes them difficult to work with in wet weather and increases the risk of erosion during construction as well as increases the potential for transporting sediment laden runoff off-site, which is a violation of permitting requirements discussed below in the Erosion Control paragraph.

There was approximately 40 feet of grade change across the site from North to Southwest. For the pre-design cost estimate, it was assumed that the site was graded uniformly, but the grade change still existed and would need to be addressed in site grading. Predesign grading sketches using the Predesign Architectural Siteplan show it is possible to account for the grade changes across the site. A detailed design survey will be needed before the schematic design phase is started to allow for a grading design in the schematic design phase to place the two-story building and apparatus apron in a location that allows for apparatus movement and maintains ADA access to the building while balancing the earthwork costs of the site development, which has the potential to be the most expensive element in sitework and can be the easiest to control. By making critical grading and earthwork decisions early in the schematic design phase, if any changes are required in the shape of the building to save money in earthwork, there will be a minimal amount of design changes required in the building saving potential costs in building redesign.

Since more than 1 acre of land disturbing activities will happen during construction on this site, an NPDES Construction Activities permit will be required as part of the Federal Clean Water Act. In the State of Washington, the Washington State Department of Ecology (WADOE) provides coverage under their NPDES permit, which requires Owners to file a Notice of Intent (NOI) with WADOE. As part of the NOI process, a Public Notice is required, which the Civil Engineer helps the Owner prepare. In addition, a Stormwater Pollution Prevention Plan, including an Erosion and Sediment Control Plan and Stormwater Pollution Prevention Booklet, both prepared by the Civil Engineer and developed. Only the application and a copy of the Public Notice are submitted to WADOE. NOTE: The NOI cannot be submitted to WADOE until the SEPA approval has been granted to the project by Pierce County. The NOI must be submitted to WADOE a minimum of 67 days prior to the start of any land disturbing activities. During construction, the Contractor is required to monitor stormwater runoff from the site for turbidity (the amount of sediment in the runoff … if it doesn't look "clear" it is in violation) and pH (related to concrete handling activities). The SWPPP includes measures to reduce turbidity and pH in stormwater runoff. Minimizing site disturbance during wet weather months (October – April) will reduce the likelihood of violating turbidity requirements. The Contractor has some control over scheduling sitework activities. The remainder of control over the schedule is dependant in when the project is bid and the duration of the Contract.

Storm Drainage and Water Quality

The site is required to comply with the storm drainage and water quality regulations of the City of Bonney Lake. The City uses a continuous path methodology to compute storm infiltration and water quality volumes, which was used to determine the Predesign Study volumes.

This site discharges into a regional storm detention system. Water quality measures are required for the site. Based on the Predesign Siteplan, approximately 14,000 cf of multi-celled wet pond will be required for this site. A wet pond is the least expensive method of providing water quality and this site has adequate space for a wet pond.

Water

Since this site is near the current Station 11 site, it is assumed that there is adequate fire flow and water service available for the site. The commercial developer that platted the site provided water stub-outs to each of the 4 lots on the site. New fire sprinkler service will be provided to the building.

Sanitary Sewer Service

Sanitary sewer is available to the site. A sewer service will need to be extended to the building. Vehicle washing can be either inside or outside the building, but is assumed to happen inside the apparatus bay in the Predesign estimate. Apparatus floor drains and wash bay water will need to be pre-treated prior to discharging into the sanitary sewer system. Building sewage will connect separately to the sewer service.

Road Improvements

The commercial developer that platted the site provided curb, gutter and sidewalk along Sumner Buckley Highway and 184th Avenue East. A new curb cut will need to be provided for the apparatus apron. In addition, a road variance will need to be provided for the width of the apparatus apron driveway. Additional requirements may be placed on the project by the City of Bonney Lake.

Conclusion

The site appears suitable for this development. A pre-application conference is recommended with the City of Bonney Lake to determine any additional requirements the City may have on

site development that may impact the costs of this project. Additionally, detailed topographic and boundary surveys, as well as a geotechnical survey need to be done on the site.

Prepared By

Cynthia L. Jose, P.E.
Senior Project Manager

Headquarters Fire Station 111 – Site Plan

July 17, 2018

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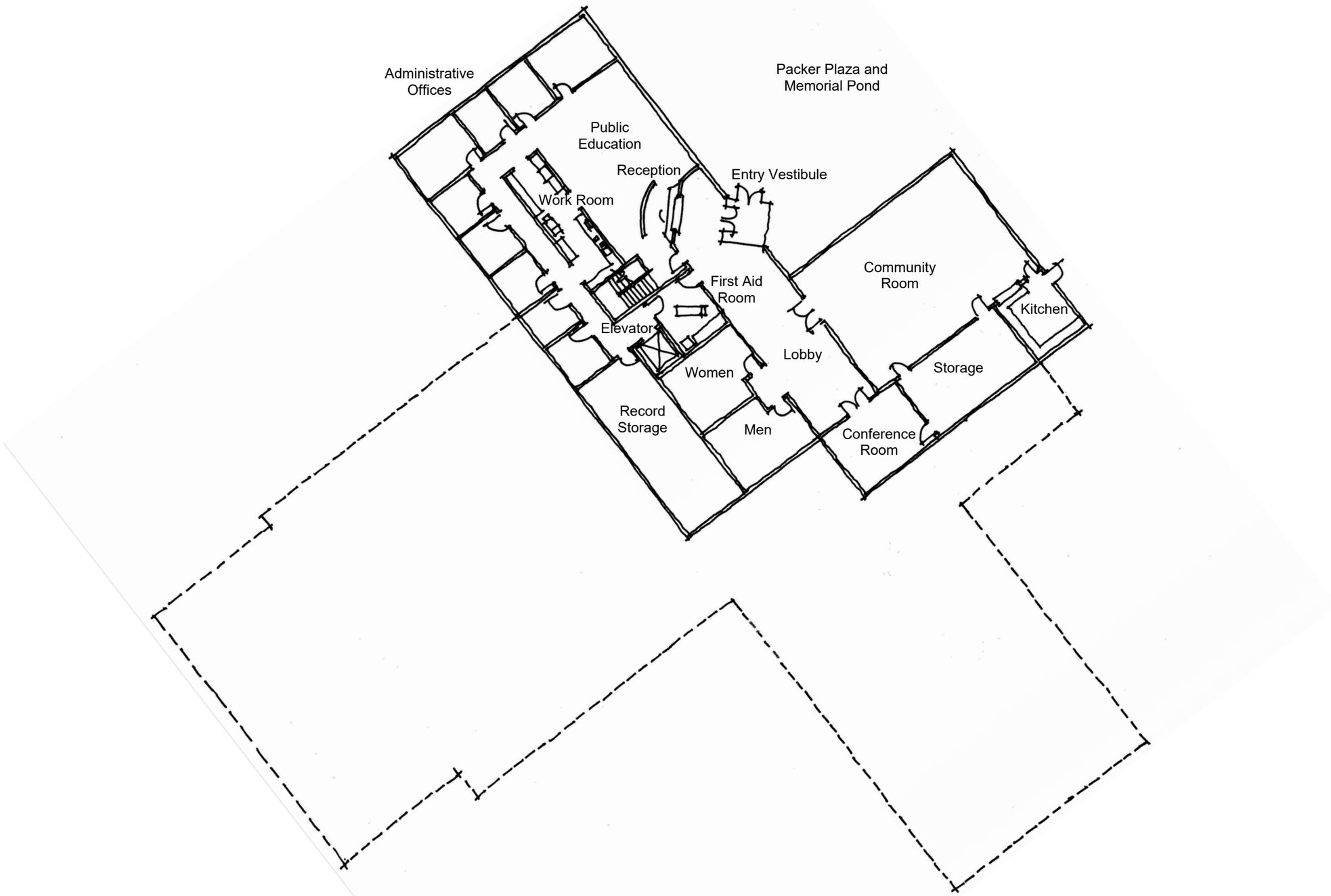

Headquarters Fire Station 111 – Lower Floor Plan

July 17, 2018

RICE fergus MILLER ARCHITECTURE & PLANNING

Headquarters Fire Station 111 – Upper Floor Plan

July 17, 2018

RICE fergus MILLER ARCHITECTURE & PLANNING

Area Summary: Station 112 Prairie Ridge

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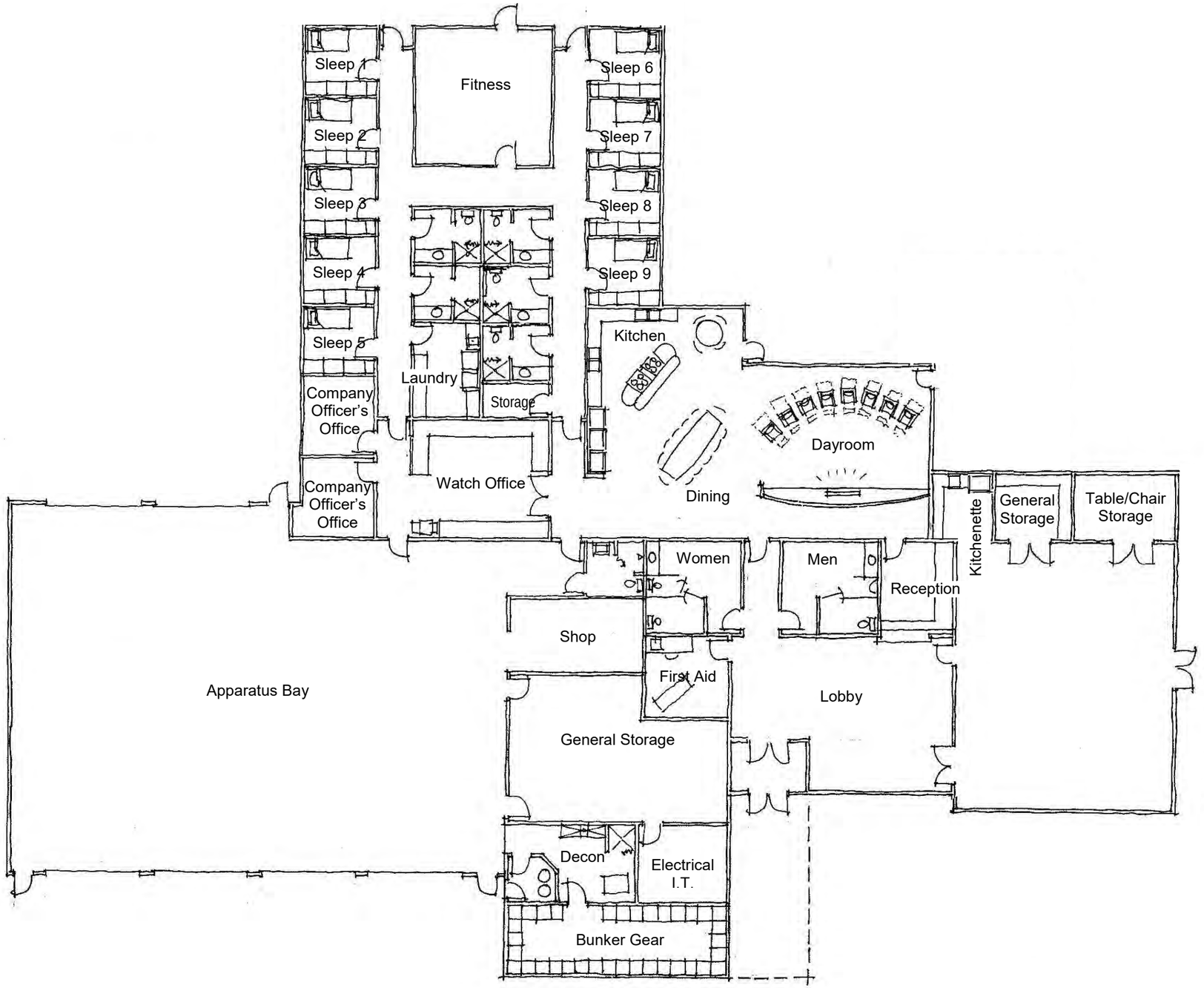
Apparatus and Operations					
	Apparatus Bays	74' x 80'			5,920 sf
	Battery Charging Alcove				32 sf
	Fire Clean-up / Decon Area				154 sf
	Bunker Gear Storage				360 sf
	Shop				192 sf
	Bottle Storage				24 sf
	Compressor (Station Air)				70 sf
	Storage				558 sf
	Apparatus Bay Restroom				60 sf
	Janitorial / Wash Equipment				70 sf
	Subtotal Apparatus and Operations				**7,440 sf**
Public / Community Areas					
	Public Lobby				288 sf
	Vestibule				96 sf
	Public Restrooms	2 @	130	sf	260 sf
	Community (Training) Room				720 sf
	Community Room Storage (Table & Chairs)				120 sf
	Training Room Kitchen / Janitorial				120 sf
	Subtotal Public/ Community Areas				**1,604** sf
Operational Work Areas					
	Watch Office	1 @	520	sf	520 sf
	Office	1 @	120	sf	120 sf
	Office	1 @	125	sf	125 sf
	Subtotal Operation Work Areas				**765** sf
Residential Areas					
	Kitchen/Dining				720 sf
	Dayroom				360 sf
	Physical Fitness / Wellness				500 sf
	Firefighter Sleep Rooms	9 @	140	sf	1,260 sf
	Toilet / Shower Rooms	5 @	80	sf	400 sf
	Laundry / Utility / Janitorial				190 sf
	Storage				140 sf
	Subtotal Residential Areas				**3,570** sf
	Sub-Subtotal Appartus, Operational, Public & Residential				**13,379 sf**
	Allowance for circulation				2,721 sf
	Building Total:				**16,100 sf**



Fire Station 112 – Floor Plan

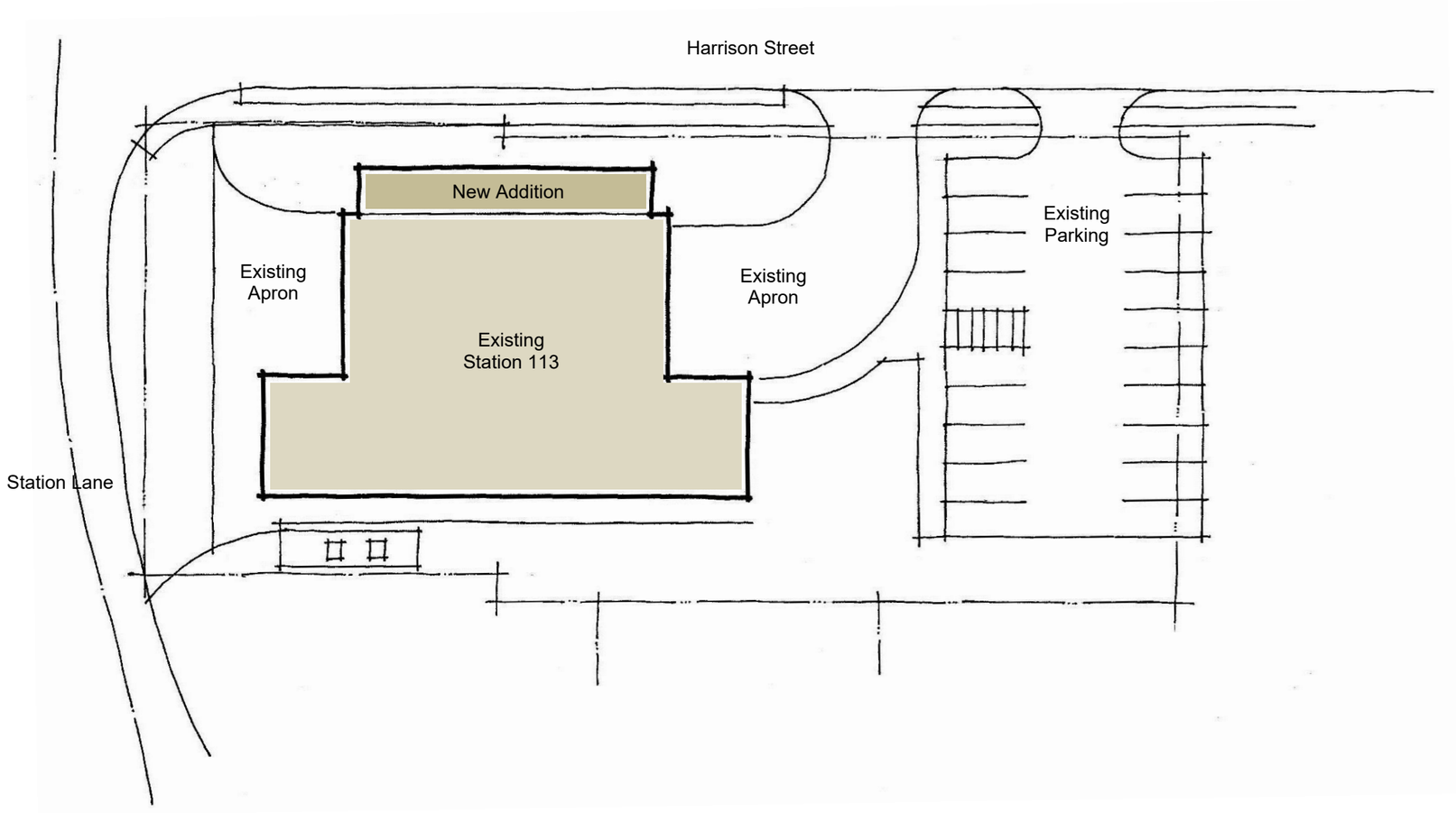
July 17, 2018

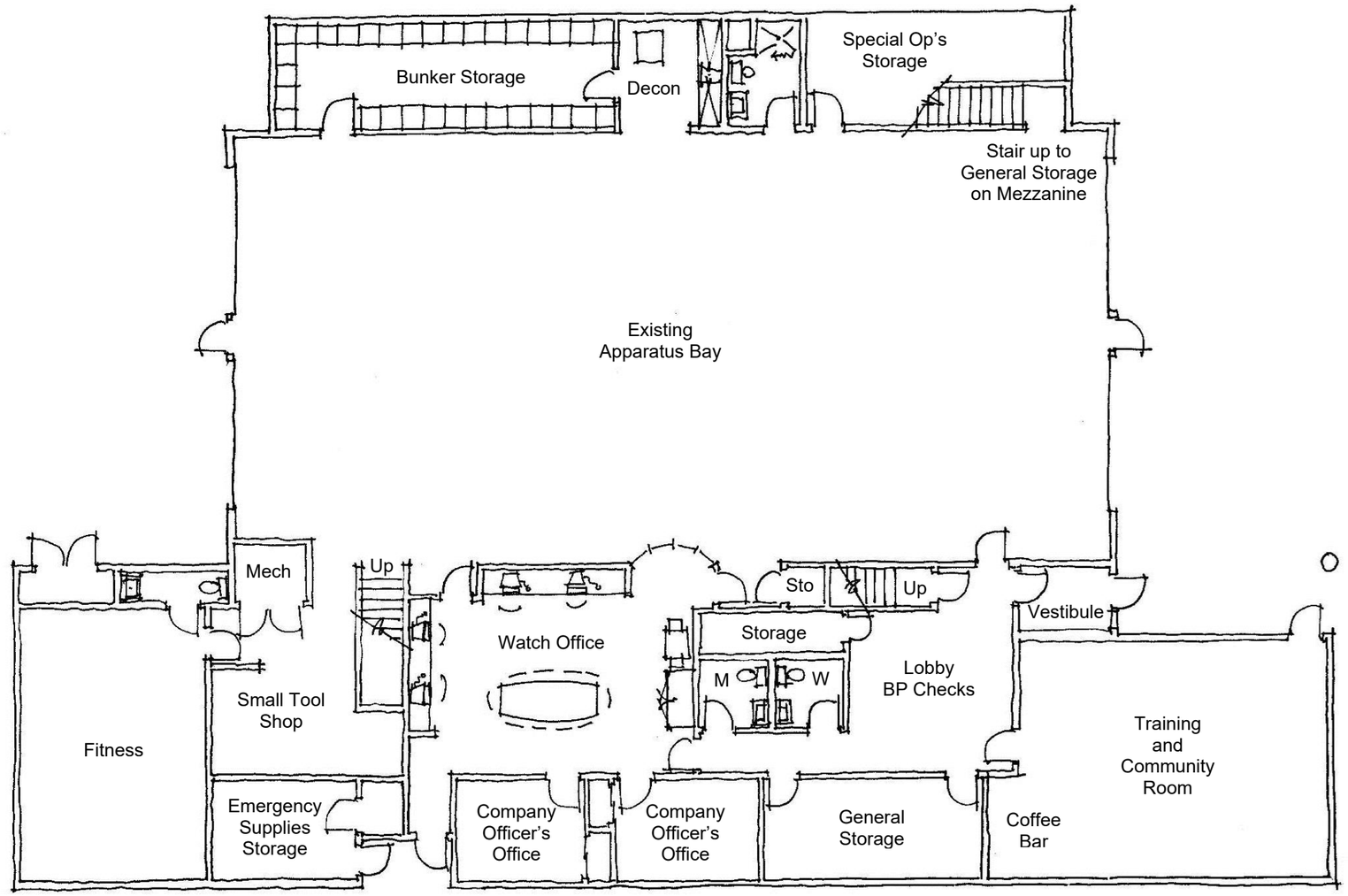
RICE fergus MILLER ARCHITECTURE & PLANNING

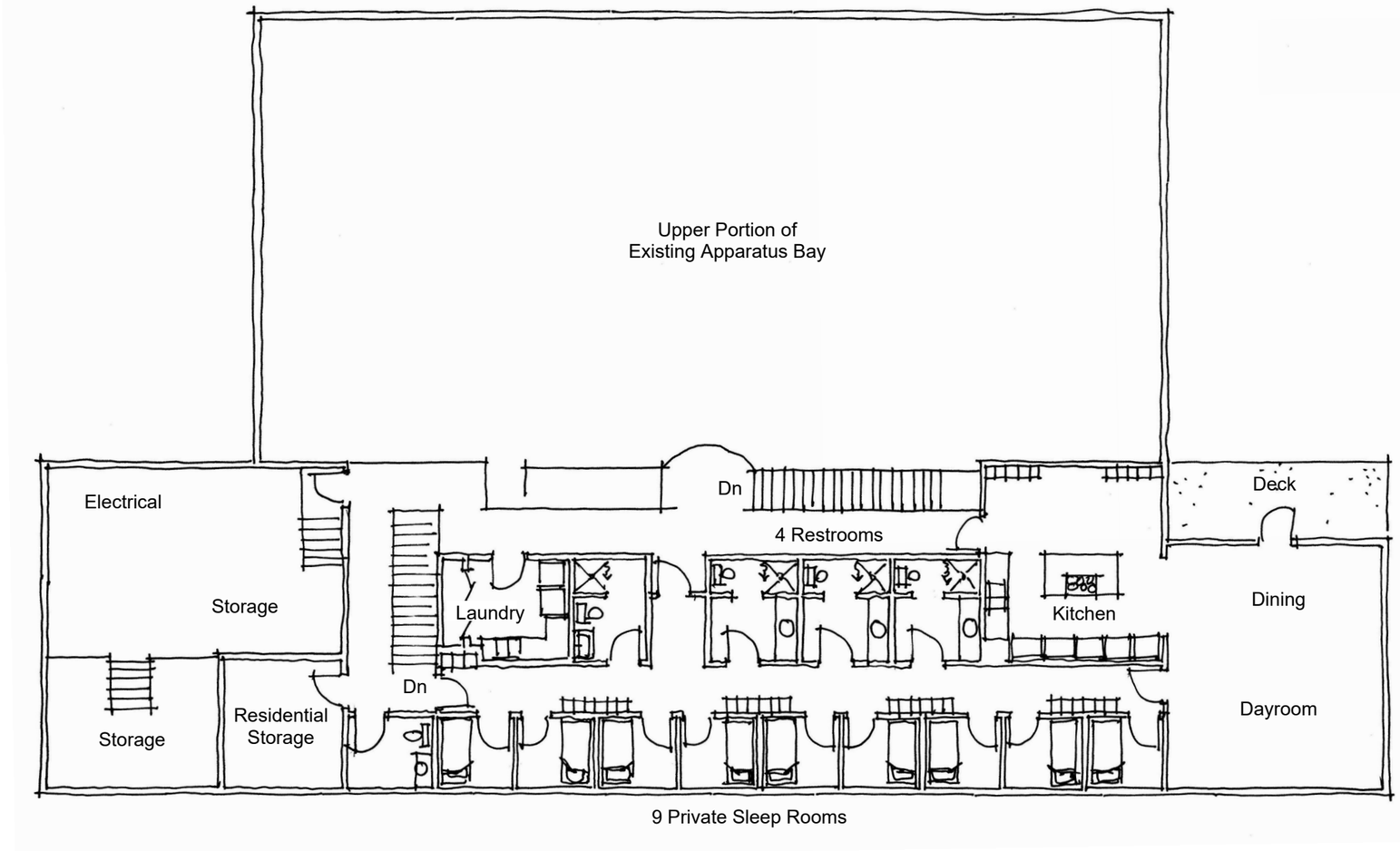
Area Summary: Station 113 Sumner

RICE fergus MILLER

Apparatus and Operations					
	Apparatus Bays				3,344 sf
	Fire Clean-up / Decon Area				100 sf
	Bunker Gear Storage				320 sf
	Shop				148 sf
	Special Ops Storage				186 sf
	EMS Storage				156 sf
	Apparatus Bay Restroom				80 sf
	Mechanical Room				56 sf
	Mechanical / Electrical Room				476 sf
	Subtotal Apparatus and Operations				**4,866 sf**
Operational Work Areas					
	Watch Office	1 @	416	sf	416 sf
	Station (Duty) Office	1 @	140	sf	140 sf
	Company Officer Office	1 @	140	sf	140 sf
	Subtotal Operation Work Areas				**696** sf
Public / Community Areas					
	Public Lobby				176 sf
	Lobby Storage				56 sf
	Vestibule				80 sf
	Public Restrooms	2 @	60	sf	120 sf
	General Storage				200 sf
	Community (Training) Room				600 sf
	Subtotal Public/ Community Areas				**1,232** sf
Residential Areas					
	Dining/Dayroom				440 sf
	Kitchen				288 sf
	Physical Fitness / Wellness				498 sf
	Firefighter Sleep Rooms	9 @	64	sf	576 sf
	Toilet / Shower Rooms	4 @	80	sf	320 sf
	Laundry / Utility				96 sf
	Storage				120 sf
	Restroom	1 @	64	sf	64 sf
	Subtotal Residential Areas				**2,402** sf
	Sub-Subtotal Appartus, Operational, Public & Residential				**9,196 sf**
	Allowance for circulation				**2,822 sf**
	Building Total:				**12,018 sf**


Harrison Street
New Addition
Existing
Apron
Existing
Apron
Existing
Station 113
Existing
Parking
Station Lane

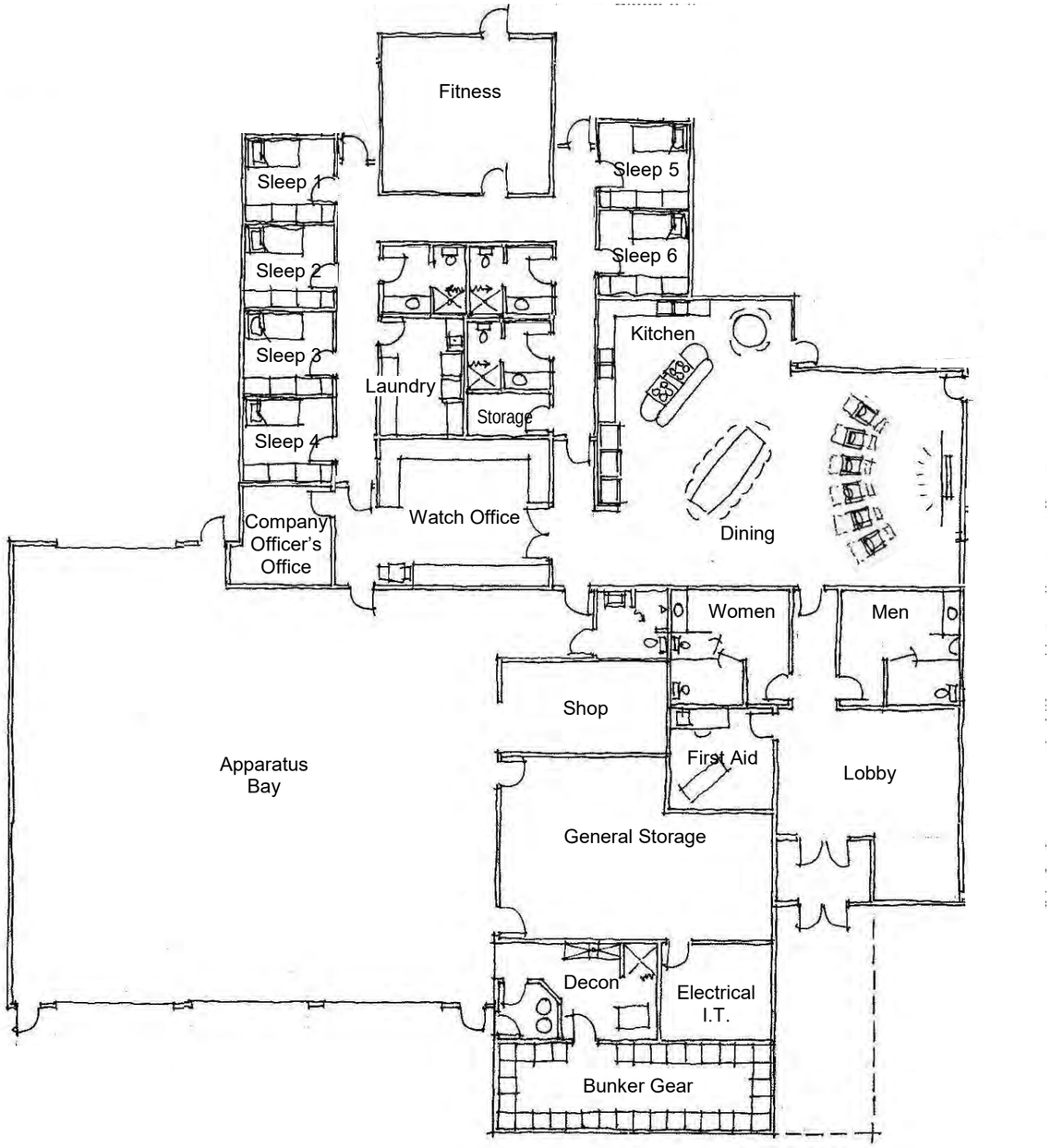

Bunker Storage
Decon
Special Op's Storage
Stair up to General Storage on Mezzanine
Existing Apparatus Bay
Mech
Up
Watch Office
Sto
Up
Storage
Vestibule
M
W
Lobby BP Checks
Small Tool Shop
Fitness
Training and Community Room
Emergency Supplies Storage
Company Officer's Office
Company Officer's Office
General Storage
Coffee Bar


Upper Portion of
Existing Apparatus Bay
Electrical
Storage
Storage
Residential
Storage
Dn
Laundry
Dn
4 Restrooms
Kitchen
Deck
Dining
Dayroom
9 Private Sleep Rooms

Area Summary: Station 114 West Lake Tapps

RICE fergus MILLER

Apparatus and Operations					
	Apparatus Bays	58' x 50'			2,900 sf
	Battery Charging Alcove				16 sf
	Fire Clean-up / Decon Area				154 sf
	Bunker Gear Storage				288 sf
	Shop				192 sf
	Bottle Storage				24 sf
	Compressor (Station Air)				70 sf
	Storage				322 sf
	Apparatus Bay Restroom				60 sf
	Janitorial / Wash Equipment				70 sf
	Subtotal Apparatus and Operations				**3,644 sf**
Public / Community Areas					
	Public Lobby				120 sf
	Vestibule				96 sf
	Public Restroom	1 @	64	sf	64 sf
	Janitorial				60 sf
	Subtotal Public/ Community Areas				**340** sf
Operational Work Areas					
	Watch Office	1 @	480	sf	480 sf
	Office	1 @	120	sf	120 sf
	Subtotal Operation Work Areas				**600** sf
Residential Areas					
	Kitchen/Dining				480 sf
	Dayroom				240 sf
	Physical Fitness / Wellness				400 sf
	Firefighter Sleep Rooms	6 @	140	sf	840 sf
	Toilet / Shower Rooms	3 @	80	sf	240 sf
	Laundry / Utility / Janitorial				190 sf
	Storage				104 sf
	Subtotal Residential Areas				**2,494** sf
	Sub-Subtotal Appartus, Operational, Public & Residential				**7,078 sf**
	Allowance for circulation				**2,322 sf**
	Building Total:				**9,400 sf**



Fire Station 114 – Floor Plan

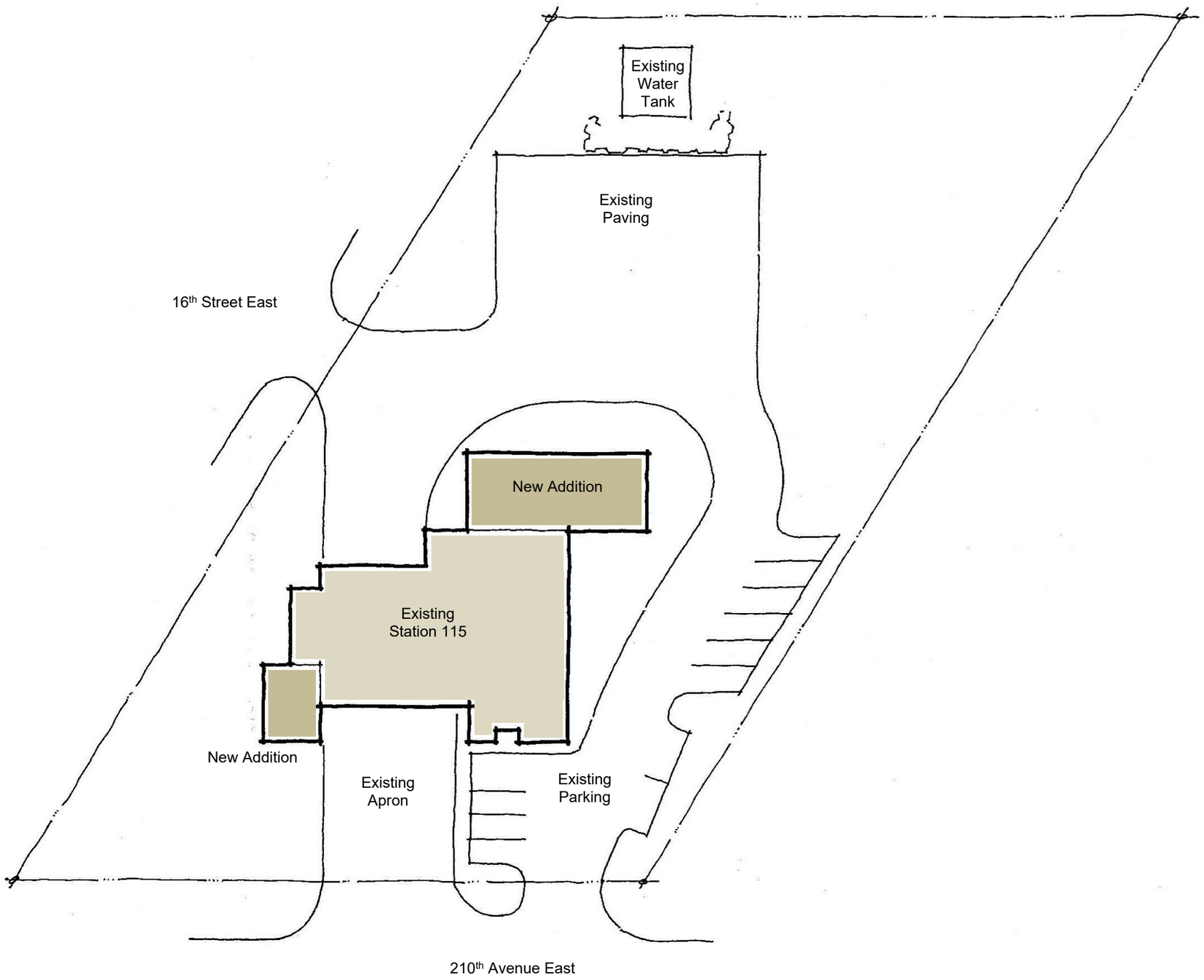
July 17, 2018

RICE fergus MILLER ARCHITECTURE & PLANNING

Area Summary: Station 115 East Lake Tapps

RICE fergus MILLER

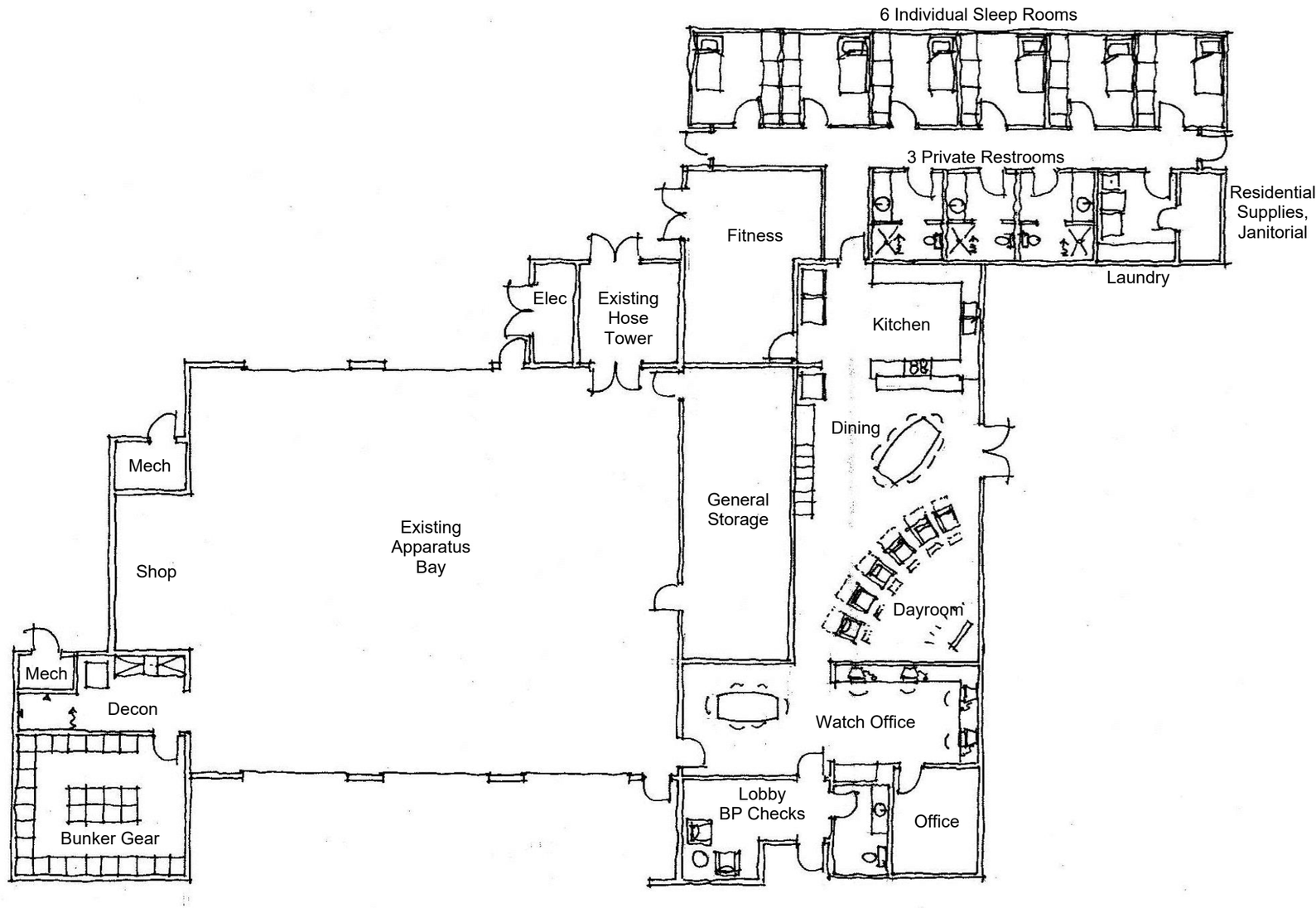
Apparatus and Operations					
	Apparatus Bays				2,688 sf
	Fire Clean-up / Decon Area				148 sf
	Bunker Gear Storage				320 sf
	Shop				144 sf
	General Storage				396 sf
	Existing Hose Tower				144 sf
	Electrical Room				60 sf
	Mechanical Rooms				78 sf
	Subtotal Apparatus and Operations				**3,978 sf**
Operational Work Areas					
	Watch Office	1 @	376	sf	376 sf
	Station (Duty) Office	1 @	120	sf	120 sf
	Subtotal Operation Work Areas				**496** sf
Public / Community Areas					
	Public Lobby				132 sf
	Public Restrooms	1 @	60	sf	60 sf
	Subtotal Public/ Community Areas				**192** sf
Residential Areas					
	Dining/Dayroom				960 sf
	Kitchen				336 sf
	Physical Fitness / Wellness				292 sf
	Firefighter Sleep Rooms	6 @	100	sf	600 sf
	Toilet / Shower Rooms	3 @	80	sf	240 sf
	Laundry / Utility				90 sf
	Janitorial				50 sf
	Subtotal Residential Areas				**2,568** sf
	Sub-Subtotal Appartus, Operational, Public & Residential				**7,234 sf**
	Allowance for circulation				**913 sf**
	Building Total:				**8,147 sf**



Fire Station 115 Site Improvement Plan

July 17, 2018

RICE fergus MILLER
ARCHITECTURE & PLANNING


6 Individual Sleep Rooms
3 Private Restrooms
Residential Supplies, Janitorial
Laundry
Fitness
Elec
Existing Hose Tower
Kitchen
Dining
Mech
Shop
Existing Apparatus Bay
General Storage
Dayroom
Mech
Decon
Watch Office
Lobby BP Checks
Office
Bunker Gear

Area Summary: Station 116 Foothills

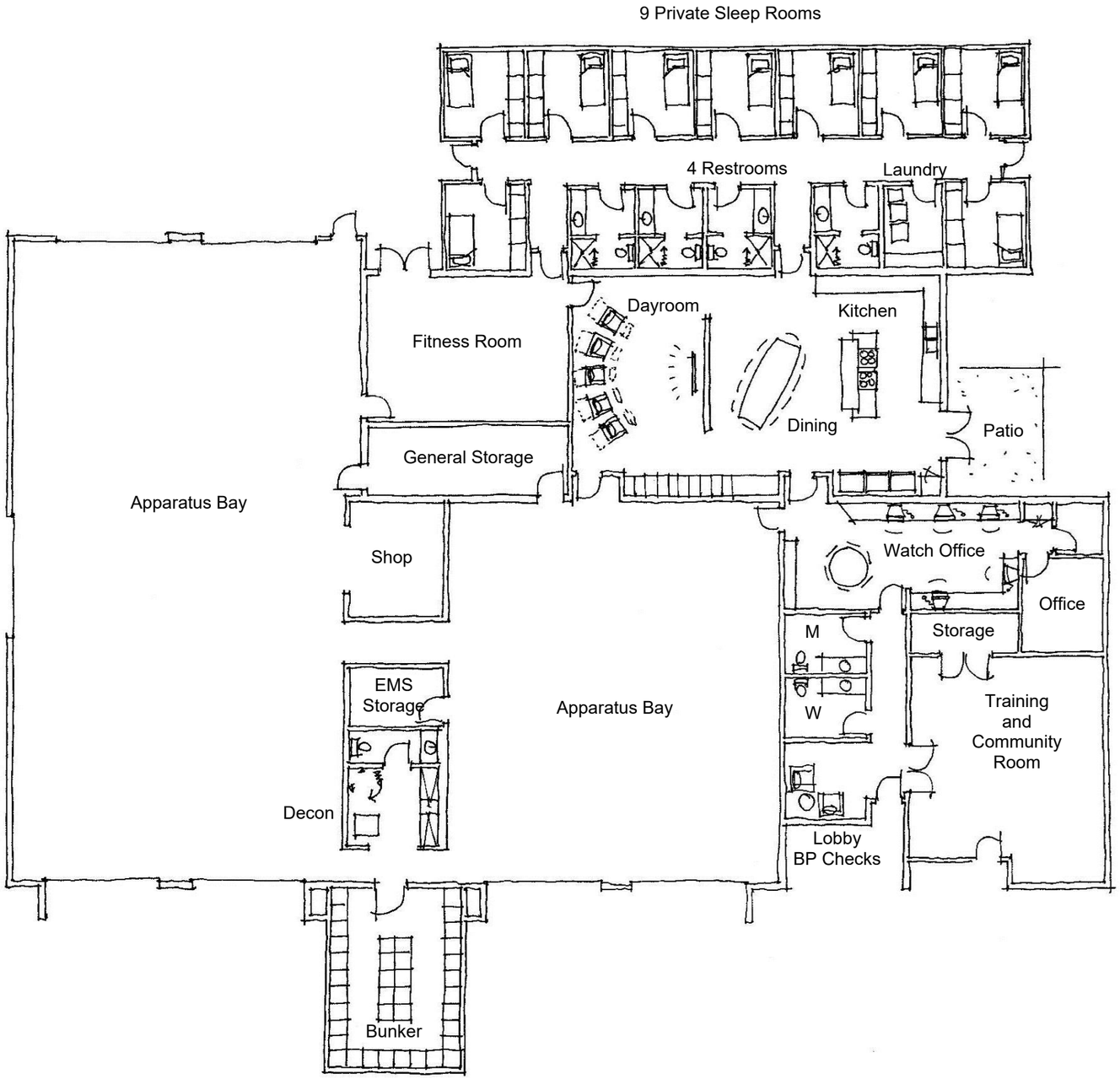
RICE fergus MILLER

Apparatus and Operations					
	Apparatus Bay 1				3,840 sf
	Apparatus Bay 2				1,840 as
	Fire Clean-up / Decon Area				168 sf
	Bunker Gear Storage				352 sf
	Shop				180 sf
	General Storage				192 sf
	EMS Storage				96 sf
	Subtotal Apparatus and Operations				**6,668 sf**
Operational Work Areas					
	Watch Office	1 @	336	sf	336 sf
	Watch Office Storage	1 @	42	sf	42 sf
	Station (Duty) Office	1 @	110	sf	110 sf
	Subtotal Operation Work Areas				**488** sf
Public / Community Areas					
	Public Lobby				124 sf
	Public Restrooms	2 @	70	sf	140 sf
	Community Room	1 @	606	sf	606 sf
	Community Room Storage	1 @	65	sf	65 sf
	Subtotal Public/ Community Areas				**935** sf
Residential Areas					
	Dining/Dayroom				760 sf
	Kitchen				384 sf
	Physical Fitness / Wellness				450 sf
	Firefighter Sleep Rooms	9 @	100	sf	900 sf
	Toilet / Shower Rooms	4 @	64	sf	256 sf
	Laundry / Utility				70 sf
	Subtotal Residential Areas				**2,820** sf
	Sub-Subtotal Appartus, Operational, Public & Residential				**10,911 sf**
	Allowance for circulation				**3,016 sf**
	Building Total:				**13,927 sf**

Fire Station 116 Site Improvement Plan

July 17, 2018

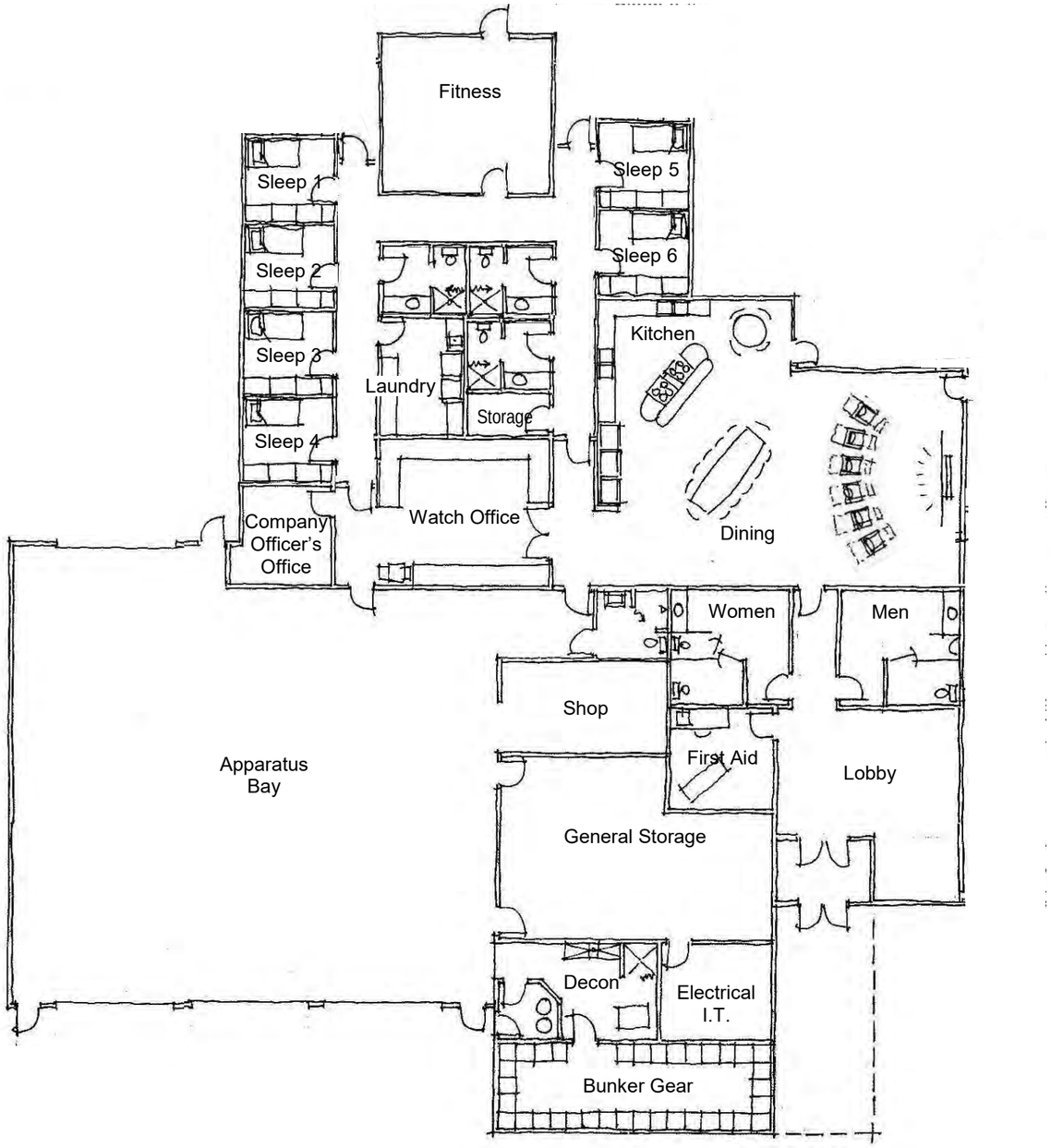
RICE fergus MILLER
ARCHITECTURE & PLANNING


9 Private Sleep Rooms
4 Restrooms
Laundry
Dayroom
Kitchen
Fitness Room
Dining
Patio
General Storage
Apparatus Bay
Shop
Watch Office
Office
M
Storage
EMS
Storage
Apparatus Bay
W
Training
and
Community
Room
Decon
Lobby
BP Checks
Bunker

Area Summary: Station 117 Tehaleh

RICE fergus MILLER

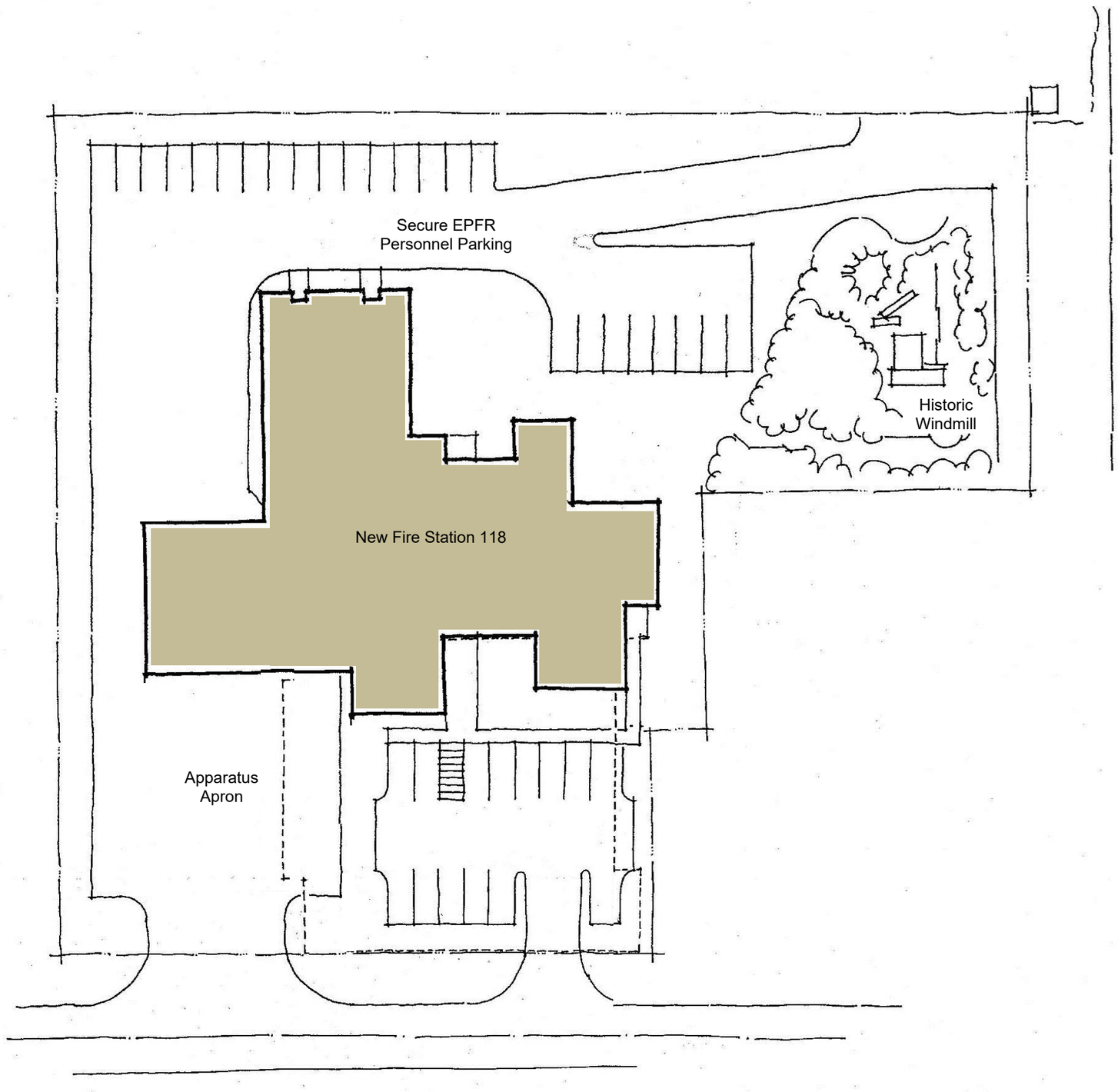
Apparatus and Operations					
	Apparatus Bays	58' x 50'			2,900 sf
	Battery Charging Alcove				16 sf
	Fire Clean-up / Decon Area				154 sf
	Bunker Gear Storage				288 sf
	Shop				192 sf
	Bottle Storage				24 sf
	Compressor (Station Air)				70 sf
	Storage				322 sf
	Apparatus Bay Restroom				60 sf
	Janitorial / Wash Equipment				70 sf
	Subtotal Apparatus and Operations				**3,644 sf**
Public / Community Areas					
	Public Lobby				120 sf
	Vestibule				96 sf
	Public Restroom	1 @	64	sf	64 sf
	Janitorial				60 sf
	Subtotal Public/ Community Areas				**340** sf
Operational Work Areas					
	Watch Office	1 @	480	sf	480 sf
	Office	1 @	120	sf	120 sf
	Subtotal Operation Work Areas				**600** sf
Residential Areas					
	Kitchen/Dining				480 sf
	Dayroom				240 sf
	Physical Fitness / Wellness				400 sf
	Firefighter Sleep Rooms	6 @	140	sf	840 sf
	Toilet / Shower Rooms	3 @	80	sf	240 sf
	Laundry / Utility / Janitorial				190 sf
	Storage				104 sf
	Subtotal Residential Areas				**2,494** sf
	Sub-Subtotal Appartus, Operational, Public & Residential				**7,078 sf**
	Allowance for circulation				**2,322 sf**
	Building Total:				**9,400 sf**


Fitness
Sleep 1
Sleep 2
Sleep 3
Sleep 4
Sleep 5
Sleep 6
Laundry
Storage
Kitchen
Dining
Watch Office
Company Officer's Office
Women
Men
Shop
First Aid
Lobby
Apparatus Bay
General Storage
Decon
Electrical I.T.
Bunker Gear

Area Summary: Station 118 Edgewood

RICEfergusMILLER

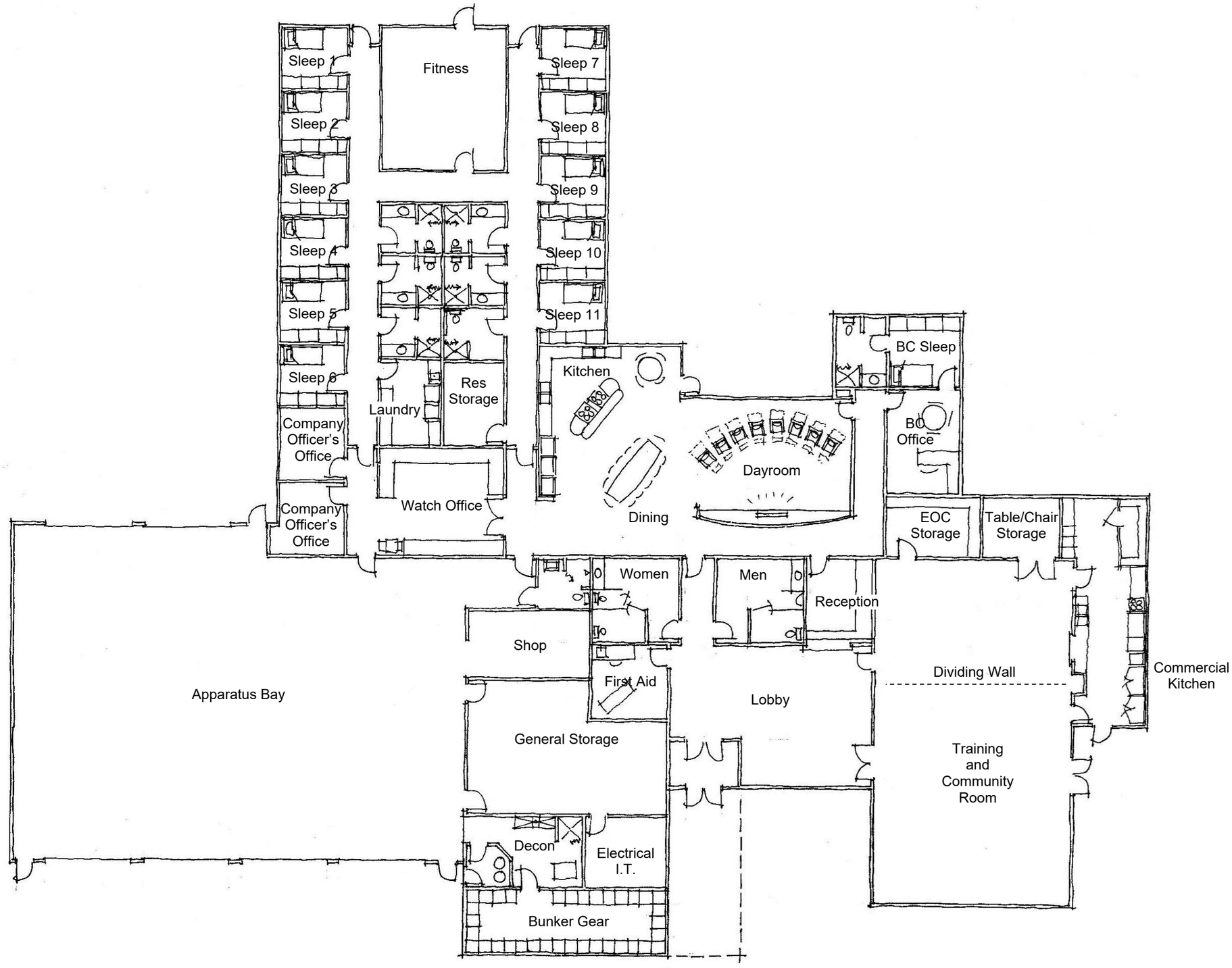
Apparatus and Operations					
	Apparatus Bays	74' x 80'			5,920 sf
	Battery Charging Alcove				48 sf
	Fire Clean-up / Decon Area				154 sf
	Bunker Gear Storage				432 sf
	Shop				192 sf
	Air Fill Station / Bottle Storage				150 sf
	Compressor (Station Air)				70 sf
	Storage				635 sf
	Apparatus Bay Restroom				60 sf
	Janitorial / Wash Equipment				70 sf
	Subtotal Apparatus and Operations				**6,966 sf**
Public / Community Areas					
	Public Lobby				360 sf
	Vestibule				96 sf
	Reception Area				120 sf
	Public Restrooms	2 @	130	sf	260 sf
	Community (Training) Room				900 sf
	Community Room Storage (Table & Chairs)				150 sf
	Training Room Kitchen				75 sf
	Janitorial				60 sf
	Subtotal Public/ Community Areas				**2,021** sf
Operational Work Areas					
	Watch Office	1 @	560	sf	560 sf
	Office	1 @	120	sf	120 sf
	Office	1 @	125	sf	125 sf
	BC - Office	1 @	143	sf	143 sf
	BC - Sleep Room	1 @	140	sf	140 sf
	BC - Restroom	1 @	80	sf	80 sf
	Subtotal Operational Work Areas				**1,168** sf
Residential Areas					
	Kitchen/Dining				960 sf
	Dayroom				480 sf
	Physical Fitness / Wellness				600 sf
	Firefighter Sleep Rooms	11 @	140	sf	1,540 sf
	Toilet / Shower Rooms	6 @	80	sf	480 sf
	Laundry / Utility / Janitorial				190 sf
	Storage				176 sf
	Subtotal Residential Areas				**4,426** sf
	Sub-Subtotal Appartus, Operational, Public & Residential				**14,581 sf**
	Allowance for circulation				**2,292 sf**
	Building Total:				**16,873 sf**



Fire Station 118 - Site Improvement Plan

July 17, 2018

RICE fergus MILLER
ARCHITECTURE & PLANNING



Fire Station 118 – Floor Plan (Replacement)

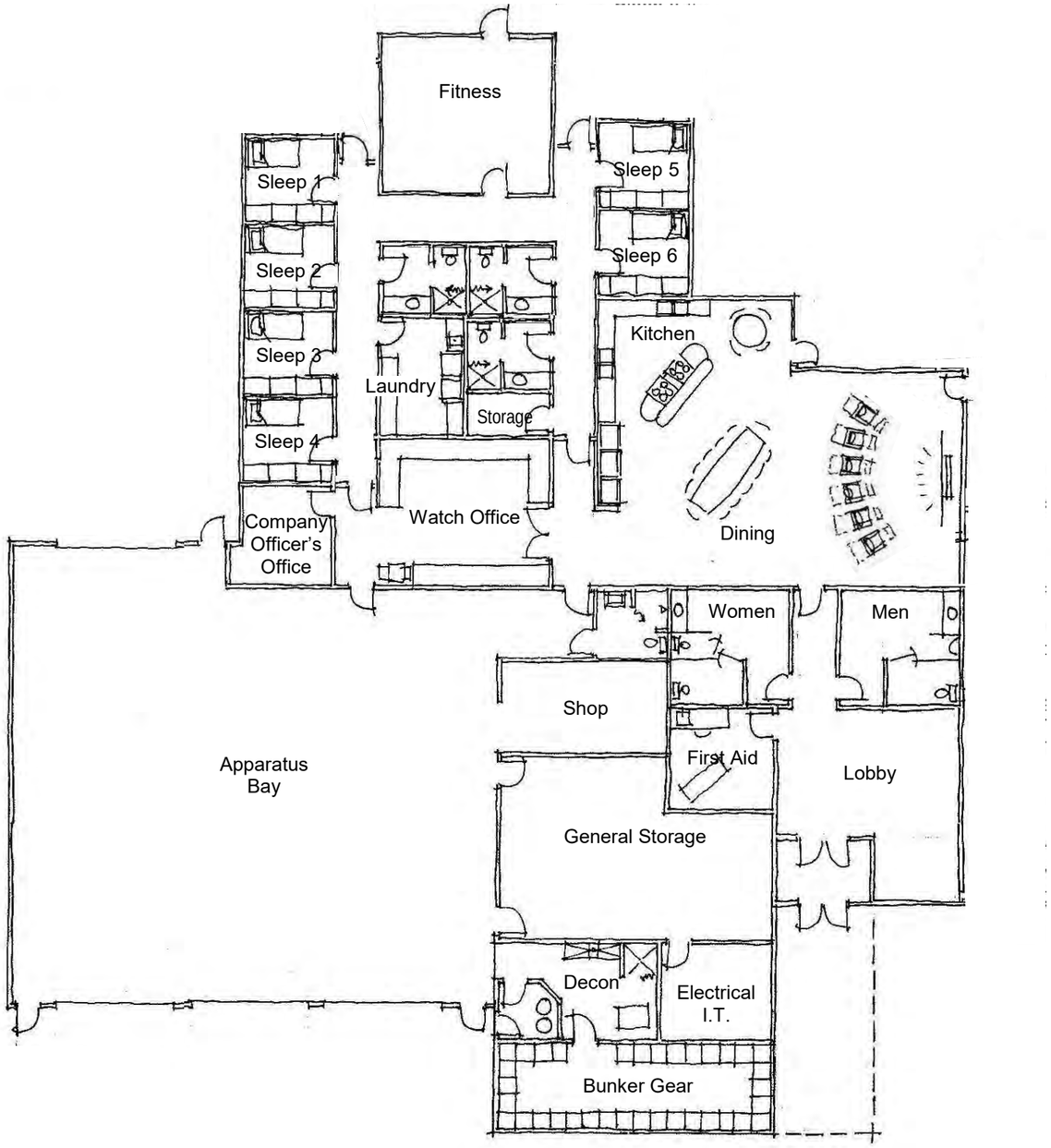
July 17, 2018

RICE fergus MILLER ARCHITECTURE & PLANNING

Area Summary: Station 124 Milton

RICEfergusMILLER

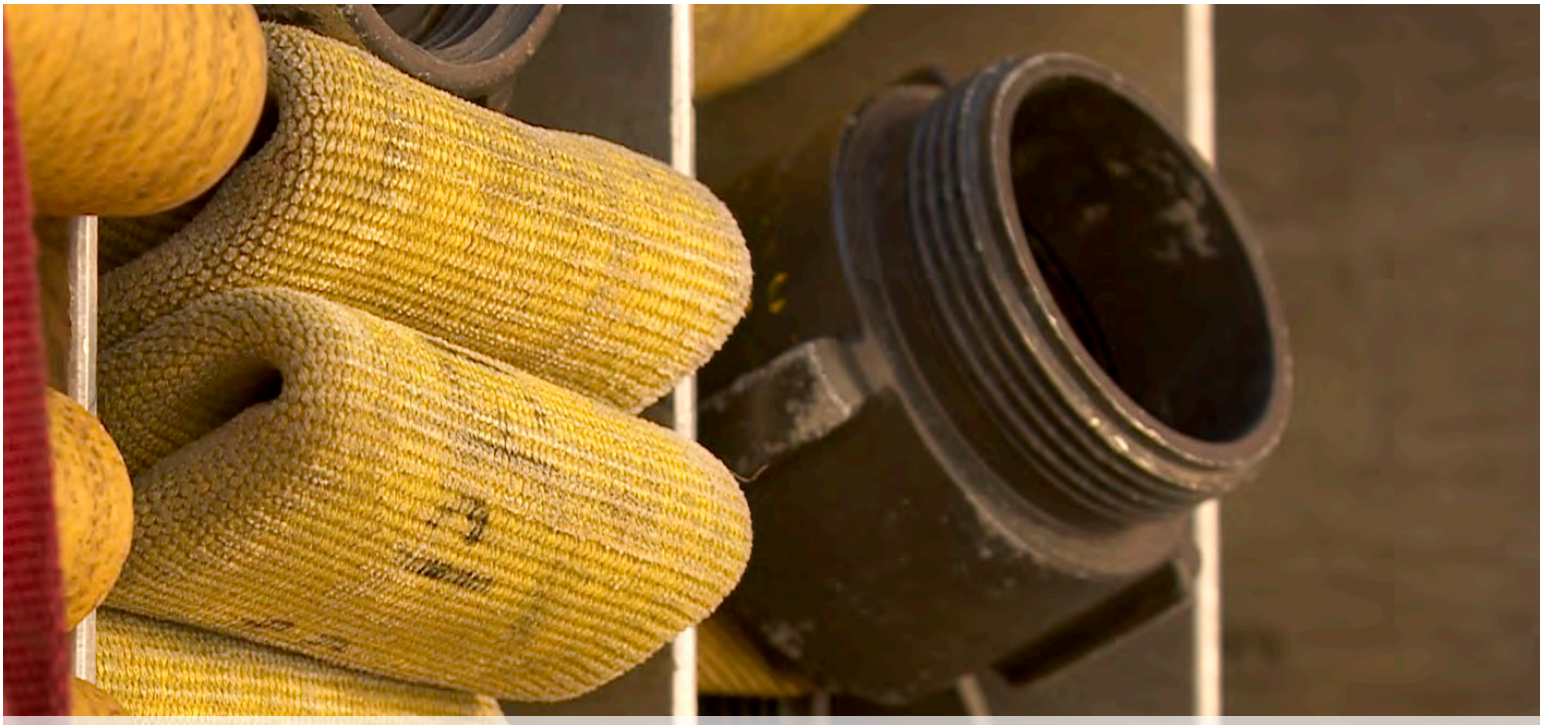
Apparatus and Operations					
	Apparatus Bays	58' x 50'			2,900 sf
	Battery Charging Alcove				16 sf
	Fire Clean-up / Decon Area				154 sf
	Bunker Gear Storage				288 sf
	Shop				192 sf
	Bottle Storage				24 sf
	Compressor (Station Air)				70 sf
	Storage				322 sf
	Apparatus Bay Restroom				60 sf
	Janitorial / Wash Equipment				70 sf
	Subtotal Apparatus and Operations				**3,644 sf**
Public / Community Areas					
	Public Lobby				120 sf
	Vestibule				96 sf
	Public Restroom	1 @	64	sf	64 sf
	Janitorial				60 sf
	Subtotal Public/ Community Areas				**340** sf
Operational Work Areas					
	Watch Office	1 @	480	sf	480 sf
	Office	1 @	120	sf	120 sf
	Subtotal Operation Work Areas				**600** sf
Residential Areas					
	Kitchen/Dining				480 sf
	Dayroom				240 sf
	Physical Fitness / Wellness				400 sf
	Firefighter Sleep Rooms	6 @	140	sf	840 sf
	Toilet / Shower Rooms	3 @	80	sf	240 sf
	Laundry / Utility / Janitorial				190 sf
	Storage				104 sf
	Subtotal Residential Areas				**2,494** sf
	Sub-Subtotal Appartus, Operational, Public & Residential				**7,078 sf**
	Allowance for circulation				**2,322 sf**
	Building Total:				**9,400 sf**



Fire Station 124 – Floor Plan

July 17, 2018

RICE fergus MILLER ARCHITECTURE & PLANNING



EAST PIERCE FIRE & RESCUE

CAPITAL FACILITIES PLAN

IDENTIFIED FACILITY NEED:

TRAINING AND LOGISTICS CAMPUS

RICE*fergus*MILLER

Identified Facility Needs: Training & Logistics Campus

Introductory Note to the Updated Capital Facilities Plan:

East Pierce Fire & Rescue acknowledges the need for improved training and logistic facilities and understands that these needs will become increasingly critical to address as the district continues to grow. However, at this time the District has chosen to focus on operational and fire station facility needs as part of this Capital Facilities Plan Update and the Phase One bond measure.

It is recommended that the District include training and logistic facilities as part of a Phase Two bond measure. It is also recommended that additional study be conducted to determine and update facility needs and to explore potential partnerships in providing for the training needs of EPF&R's firefighters.

The following information is reproduced from the 2012 Capital Facilities Plan and is included for reference. The costs indicated below are referenced to 2015 and have not been updated for this edition.

Project Description

In concert with their long range strategic vision, East Pierce Fire & Rescue plans to construct a training and logistics campus in the central area of their district.

Training Need: The campus will provide enhanced training opportunities for East Pierce's personnel in live fire fighting, search and rescue, emergency vehicle driving, vehicle extrication, routine hose and laddering exercises, and technical rescues. Currently, many of these tasks are handled at Station 16 or at locations such as commercial properties or park and ride lots. As the community that EPF&R serves has grown, training opportunities within the community have become more and more difficult, often resulting in the need for crews to travel out of their service area to accomplish their required training. As crews move out of the district to train, the time and staffing impacts require the district to pay overtime, drastically increasing training costs.

Logistical Need: Through the natural course of growth and consolidation with neighboring fire districts, East Pierce's supporting and logistics services have become scattered throughout the district. It is the intention of this project to bring those supporting services together and consolidate them into a single location for greater efficiency, both operationally and financially. These supporting services include administrative personnel, training officers, vehicle and facility maintenance, and centralized supplies. Ideally, training and logistics will be placed on a single campus to allow "one stop shopping" so that crews can train, have their vehicles serviced, and pick up supplies in one convenient, centrally located campus.

Program

The facilities listed below are intended to address the needs noted above and to provide cost effective training opportunities that keep crews within their response area to the greatest extent possible.

The training and logistics campus will include the following facilities:

- **Classroom and Apparatus Building:** This 17,000 square foot building will accommodate the district's training staff and on-site classrooms as well as training support spaces such as bunker storage, personnel lockers, and decontamination facilities. It will also provide bay space for reserve vehicles to be used for training exercises.
- **Vehicle Maintenance and Warehouse Building:** This 24,506 square foot building will accommodate emergency vehicle maintenance and repair, shops, and centralized bulk storage. Also included are offices for mechanics and logistics staff. This facility will serve as the district's unified shipping and receiving center.
- **Tactical Training Tower:** This 6,100 square foot building will provide hands-on training opportunities for emergency personnel in hose evolutions, search and rescue, incident command, laddering, high rise aerial maneuvers, fire sprinklers, and standpipe operations. This tower will create situational occupancies that simulate multi-floor office buildings, retail shops, schools, restaurants, and basements. Prop material storage is also included.
- **Residential Burn Building:** This 3,580 square foot building will provide hands-on training opportunities for emergency personnel for situational occupancies that simulate single family homes, apartments, condominiums, hotels, and duplexes. This facility will incorporate propane fueled training props to simulate a live fire environment.
- **Rehab and Restroom Building:** A 1,450 square foot structure will provide an open-air canopy area on the drill grounds for pre-briefing and de-briefing training exercises, rehabilitation after a training evolution, and drill ground restrooms.
- **Vehicle Storage:** A 6,380 square foot structure will provide both covered and fully enclosed areas for storage of specialized equipment and special ops trailers, as well as the district's collection of antique fire engines.
- **Outdoor Training:** Available space for the following training opportunities have been incorporated into the campus site planning: Emergency vehicle driver training, outdoor live fire props, collapsed trench rescue, vehicle extrication, embankment rescue, and confined space rescue utilizing utility vaults and underground piping. Other than the paved driving areas, no funding for individual outdoor training site props has been included in this plan.

Property and Campus Location

As this Capital Facilities Plan has evolved, two scenarios for siting the campus were developed and evaluated, one including the headquarters station and one without. While the district's preference was to include the headquarters station within the training and logistics campus, it became apparent from ESCI's analysis of Station 111's response area that a new Station 111 would need to be located within approximately 6 blocks of the existing facility in order to maintain call response times.

In considering the campus' size requirements and the existing property parcels available in close proximity to Station 11, it became apparent that removing Station 11 from the training and logistics campus would allow greater options and flexibility for both projects to achieve their critical site criteria.

While a specific site has not been obtained as of this date, an ideal parcel will have the following characteristics:

- Location: a central location, convenient to the majority of the district is preferred to minimize travel times. Given that the campus constitutes critical infrastructure for the district, locations in the valleys are not preferred due to potential flood and lahar hazards.
- Size: For the facilities and functions anticipated, approximately 10 to 15 acres is desirable.

Estimated Costs

The combined estimated cost of the highest priority campus facilities and site improvements is $20.0 million, including off-site improvements, and all project soft costs. Cost escalation to 2015 is included for the highest priority projects noted below; no escalation is included for the remaining projects. It is anticipated that budgets and timelines will be assessed at the time the district anticipates moving forward on remaining projects. Property acquisition costs are also not included. Overall costs for each facility are summarized below:

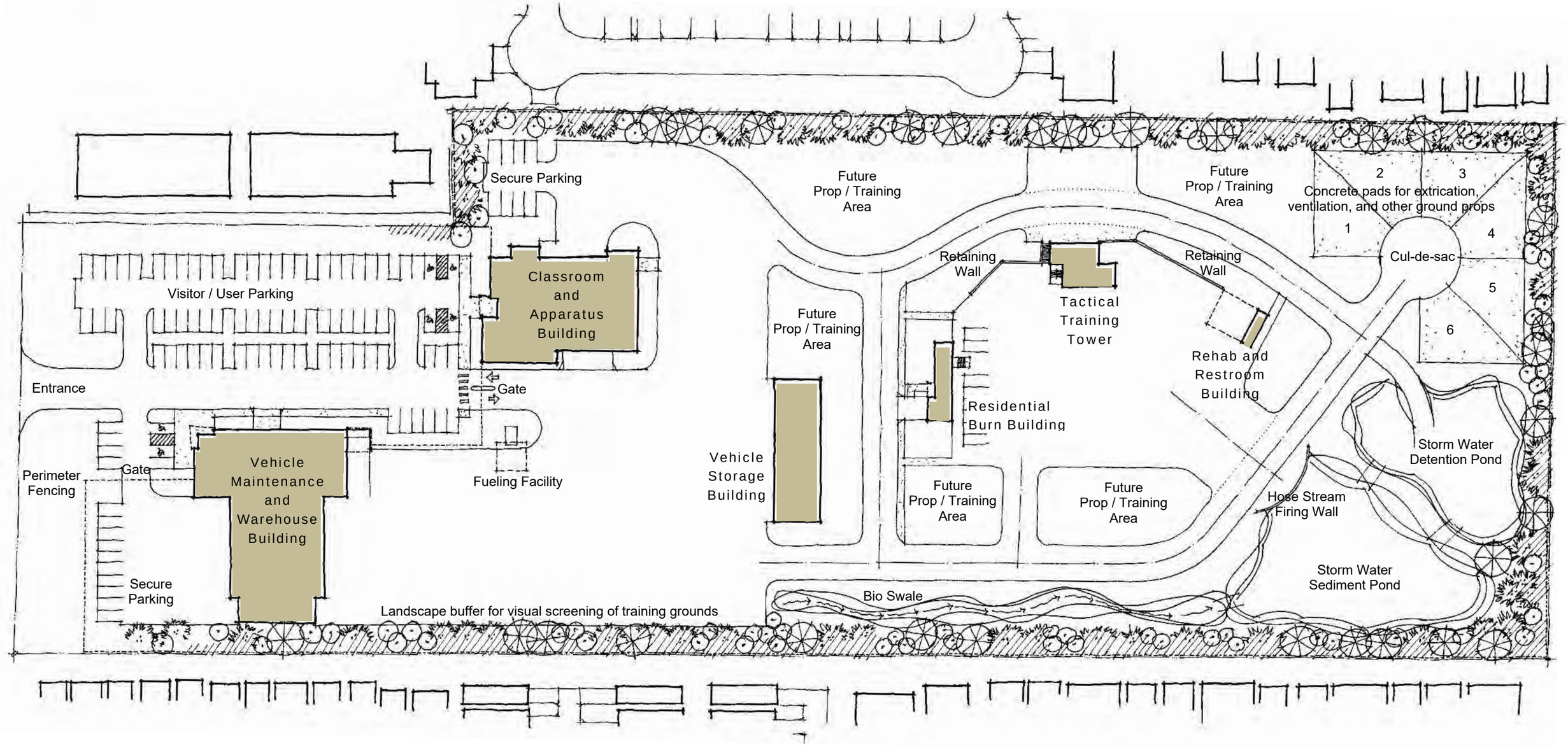
Highest Priority Training and Logistics Campus Projects

Training Campus Site Development	$8.9 million
Tactical Tower	$2.3 million
Residential Burn Building	$2.0 million
Classroom & Apparatus Building	$6.8 million
Total:	**$20.0 million**

Remaining Projects

Vehicle Maintenance & Warehouse	$6.9 million
Rehab & Restroom Building	$0.5 million
Vehicle Storage	$1.1 million
Total:	**$8.5 million**

It is also important to note that the site development costs pertain to the entire site and that no site development costs are included in any of the facility costs. Should the district embark on any individual building, some portion of the site development costs would need to be factored into the project's budget based on an appropriate level of site and infrastructure development.



Training and Logistics Campus – Master Site Plan

RICE fergus MILLER
ARCHITECTURE & PLANNING

Classroom and Apparatus Building

Project Description

The Classroom and Apparatus Building is a 17,000 sq. ft. structure situated at the entrance to the training and logistics campus. It is the only structure on the campus located outside of the training ground security fencing and serves as the point of entry for those visiting or using the training facilities. It includes parking for staff and visitors commensurate with the anticipated uses in the building.

The building will house the district's instructors and training staff. The building's educational facilities include two large "clean" classrooms, smaller breakout rooms, and an EMS lab. The facility includes offices, restrooms, break rooms, and support spaces for training staff. A two-bay apparatus garage is included to provide reserve vehicles prepared and suited to training activities. Other support areas for training include bunker gear cleaning and storage rooms, SCBA fill and maintenance areas, and decontamination, laundry, general storage, and shower and locker areas for staff and students.

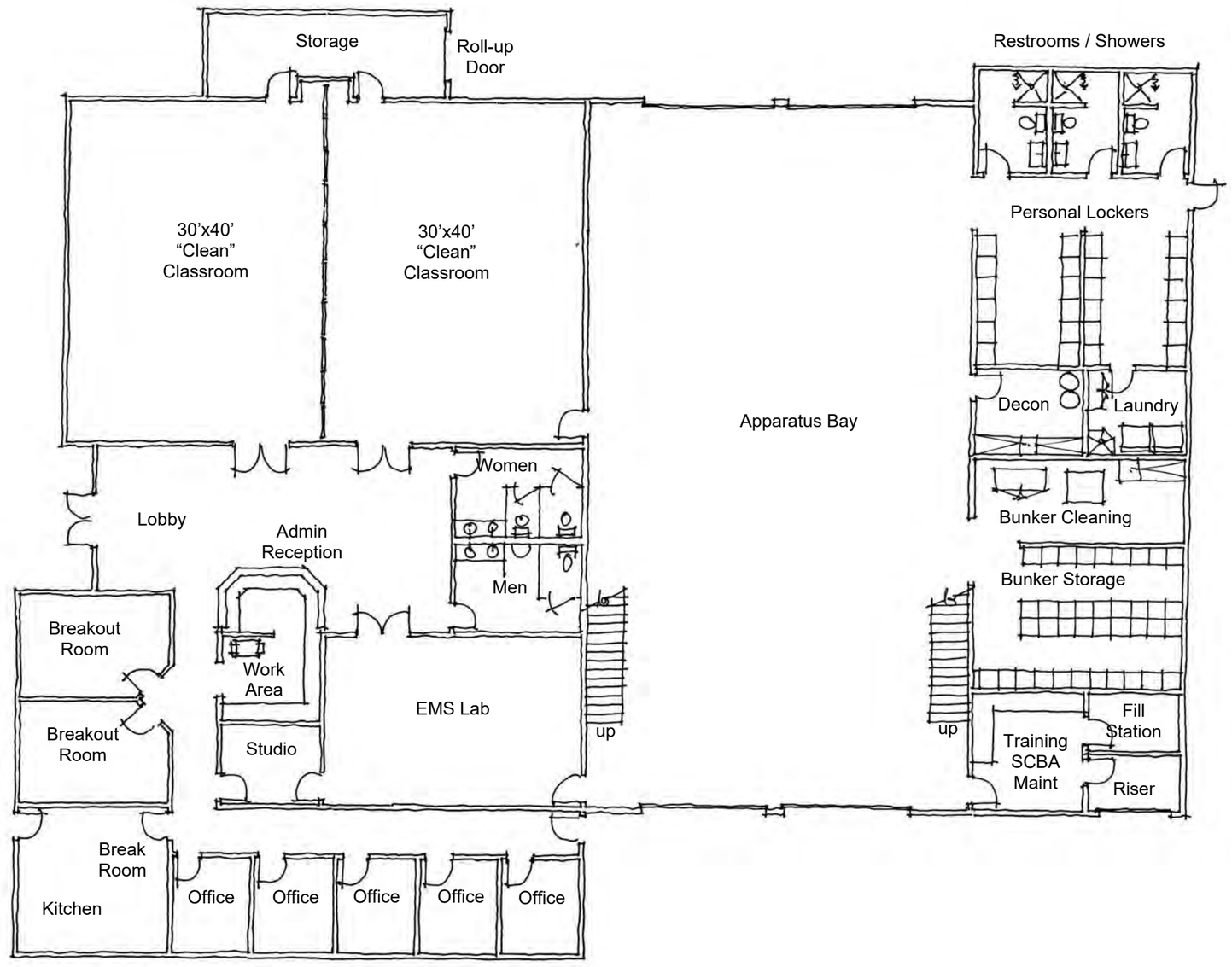
Facts

- Size: 17,000 square feet.
- Floors: Slab on grade (1st Floor); steel framed with concrete topping (2nd Floor).
- Exterior Walls: Wood/steel framed with combination of CMU veneer and metal siding.
- Roof: Wood trusses with plywood sheathing, rigid insulation, and standing seam roofing.

Area Summary: Classroom & Apparatus

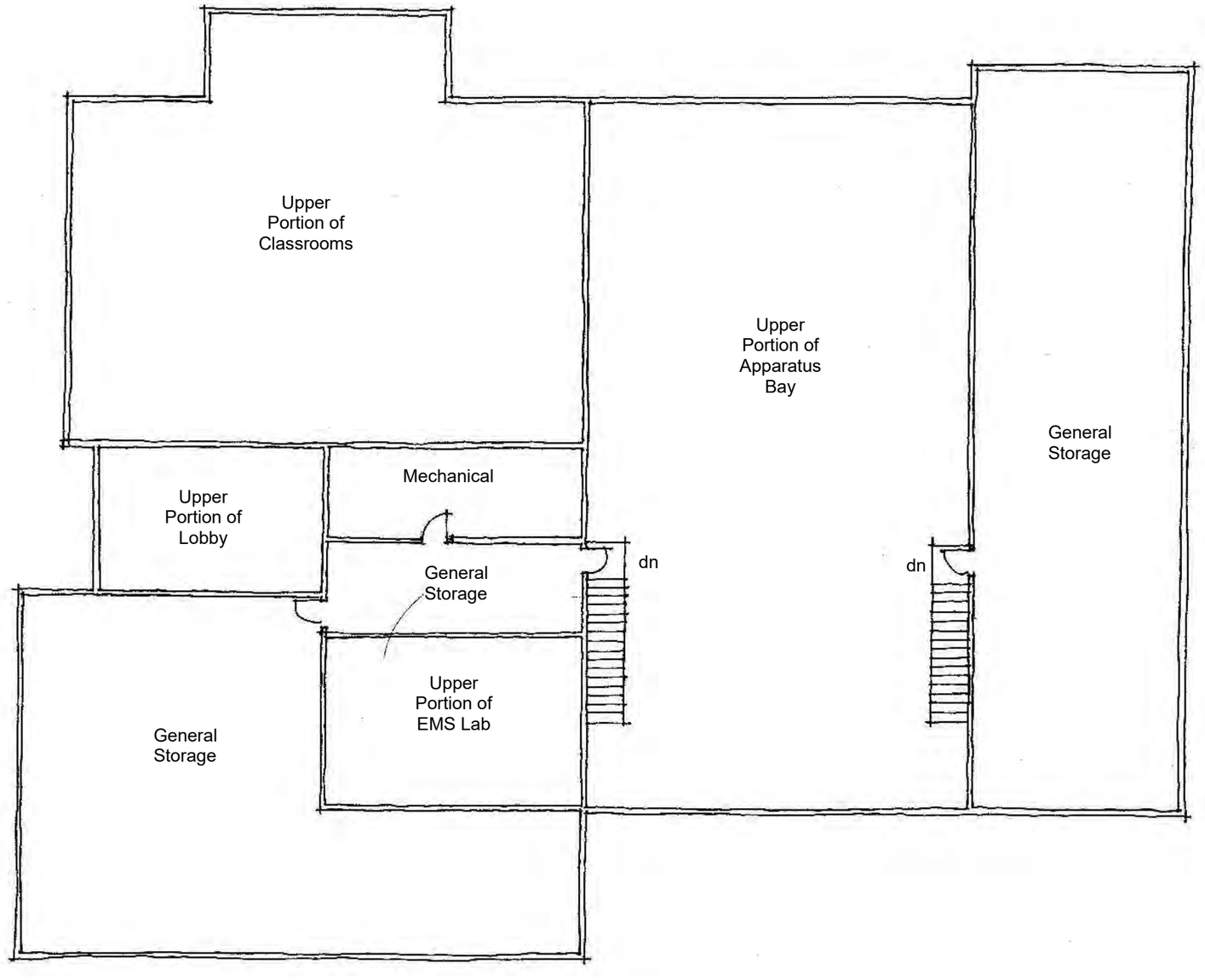
RICE fergus MILLER

Apparatus and Operations					
	Apparatus Bays				3,600 sf
	Fire Clean-up / Decon Area				120 sf
	Laundry				120 sf
	Bunker Gear Storage				432 sf
	Personal Lockers				432 sf
	Restroom/Showers	3 @	96	sf	288 sf
	SCBA Storage				168 sf
	Gear Cleaning				240 sf
	Fill Station				84 sf
	Riser				84 sf
	Mechanical Room -2nd Floor				280 sf
	Subtotal Apparatus and Operations				**5,848**
Classroom Areas					
	Offices	5 @	96	sf	480 sf
	Breakroom				289 sf
	Conference Room(s)	2 @	204	sf	408 sf
	EMS Lab/Classroom				551 sf
	Restroom(s)	2 @	147	sf	294 sf
	Studio				99 sf
	Classroom(s)	2 @	1,200	sf	2,400 sf
	Storage				270 sf
	Reception				192 sf
	Lobby				224 sf
	Admin				414 sf
	Subtotal Classroom Areas				**5,621**
Storage - 2nd Floor					
	General Storage	1 @	2,064	sf	2,064 sf
	General Storage	1 @	280	sf	280 sf
	General Storage	1 @	1,264	sf	1,264 sf
	Subtotal Storage- 2nd Floor				**3,608**
	Sub-Subtotal Apparatus, Classroom, Storage				**15,077**
	Allowance for circulation				**1,923**
	Building Total:				**17,000**



Training and Logistics Campus – Classroom and Apparatus Building Main Floor

RICE fergus MILLER ARCHITECTURE & PLANNING



Training and Logistics Campus – Classroom and Apparatus Building Upper Floor

RICEfergusMILLER ARCHITECTURE & PLANNING

Vehicle Maintenance and Warehouse Building

Project Description

This 24,506 sq. ft. building will serve both the logistical and vehicle maintenance needs for the district. For vehicle maintenance, three double-deep bays with mobile lifts are planned, as well as an electronics bay for radio maintenance and other tasks needing a cleaner environment. Support spaces for bulk storage of vehicle fluids, spare parts, and reference materials are included as well as a vehicle wash bay. For logistics, warehouse space is included on both floors with chain link fencing to be provided for apportioning spaces. Shipping and receiving is accommodated on the main floor with both a loading dock for tractor/trailers and a sally port for smaller delivery vehicles provided. Conference, break room, offices, and restroom/showers are provided for staff at this facility.

Facts

Size:	24,506 square feet (approximately)
Floors:	Slab on grade (main floor), wood/steel with concrete topping (second floor).
Exterior Walls:	Wood/steel framing with CMU veneer and metal siding.
Roof:	Wood trusses, plywood sheathing, and standing seam metal roofing

Area Summary: Vehicle Maint./Warehouse

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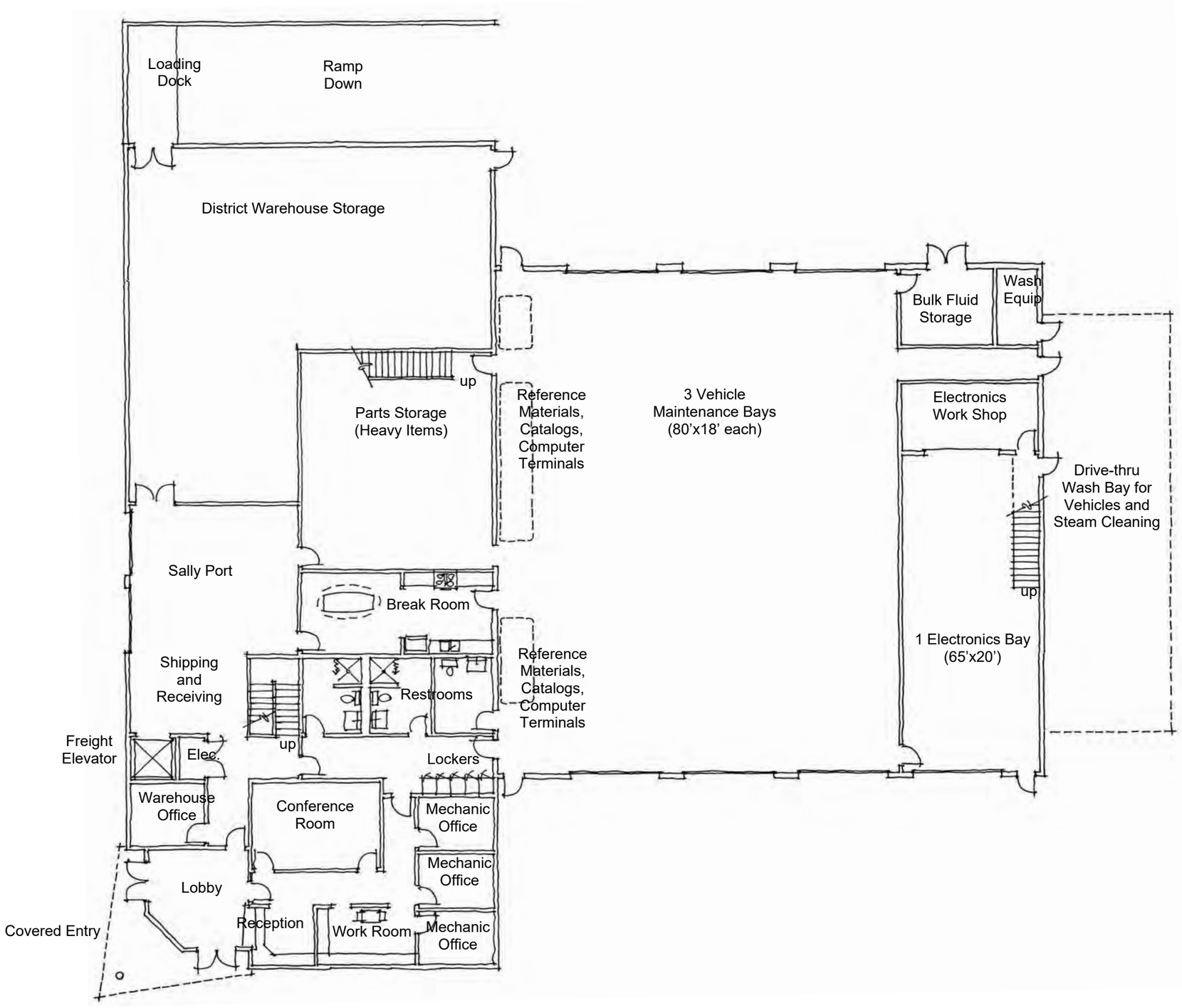
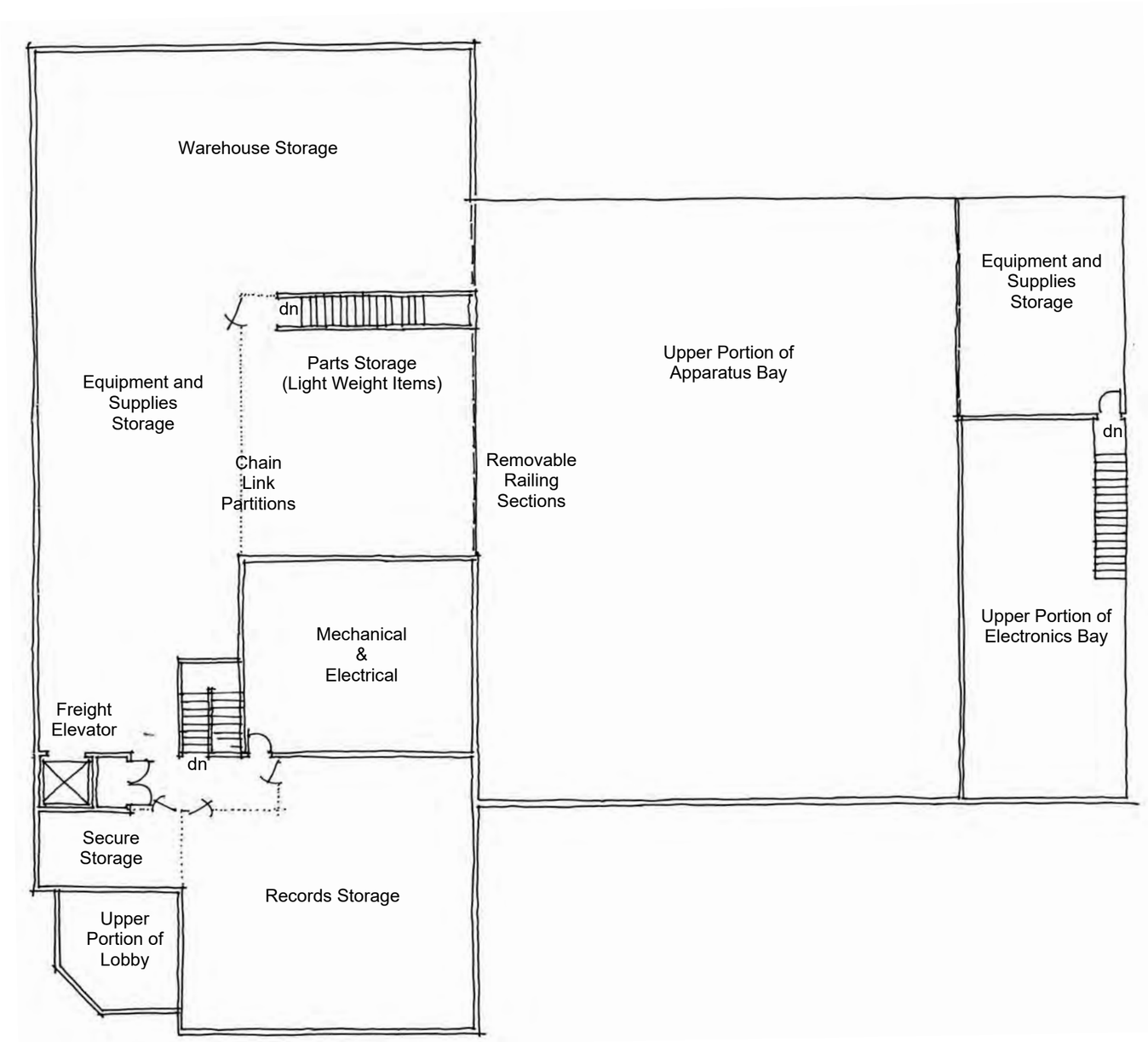
Vehicle Maintenance					
	Vehicle Maintence Bays				4,836 sf
	Electronics Repair Bay				956 sf
	Electronics Work Shop				264 sf
	Parts Storage				1,020 sf
	Parts Storage				900 sf
	Fluids Storage				168 sf
	Wash Equipment				72 sf
	Mechanical Offices	3@	96	sf	288 sf
	Electrical Room				28 sf
	Mechanical / Electrical Room				672 sf
	Lobby				218 sf
	Reception				100 sf
	Conference				280 sf
	Workroom				150 sf
	Breakrooom				360 sf
	Restrooms	2 @	100	sf	200 sf
	Restroom with Shower	1 @	100	sf	100 sf
	Wash Bay				864 sf
	Subtotal Fleets and Facilities				**11,476 sf**
Warehouse & Logistics					
	Warehouse Office				96 sf
	Loading Dock				152 sf
	Shipping/Receiving				572 sf
	District Warehouse Storage - 1st Floor				2,422 sf
	Warehouse Storage - 2nd Floor				1,792 sf
	Equipment Supply Storage				560 sf
	Equipment Supply Storage				308 sf
	Records Storage				1,368 sf
	Subtotal Warehouse & Distribution				**7,270** sf
	Sub-Subtotal Vehicle Maintenance & Warehouse				**18,746 sf**
	Allowance for circulation				**5,760 sf**
	Building Total:				**24,506 sf**



Training and Logistics Campus – Vehicle Maintenance and Warehouse Building Main Floor

RICE fergus MILLER ARCHITECTURE & PLANNING


Warehouse Storage
dn
Parts Storage
(Light Weight Items)
Equipment and
Supplies
Storage
Chain
Link
Partitions
Removable
Railing
Sections
Upper Portion of
Apparatus Bay
Equipment and
Supplies
Storage
dn
Upper Portion of
Electronics Bay
Mechanical
&
Electrical
Freight
Elevator
dn
Secure
Storage
Records Storage
Upper
Portion of
Lobby

Tactical Training Tower

Project Description

This 6,100 square foot structure will provide hands-on training opportunities for emergency personnel in multi-company and technical rescue scenarios. This includes rope rescues, ground ladders, and high angle rescue from aerial apparatus, search and rescue, and victim extrications. Additionally, this five-story structure will provide high rise training opportunities with a multi-story stair tower for elevated hose evolutions, standpipes, and hose connections. It is anticipated that the site will be graded such that the first floor will be set as a daylight basement to allow for a variety of tactical training scenarios.

Facts

- Size: 6,100 square feet.
- Floors: Slab on grade (Basement); cast-in-place structural concrete (1st Floor and above).
- Exterior Walls: Reinforced CMU/concrete.
- Roof: Cast-in-place structural concrete with waterproofing.

Area Summary: Tactical Training Tower

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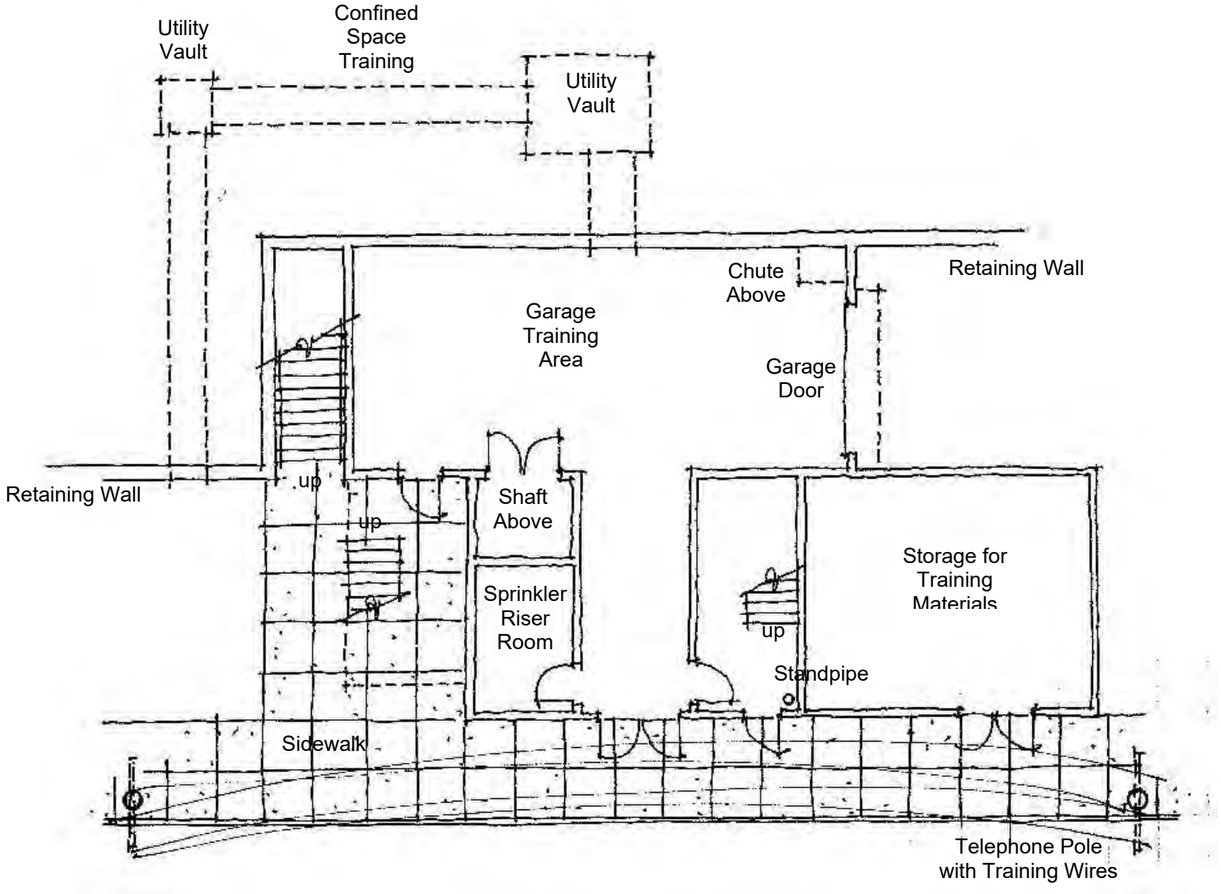
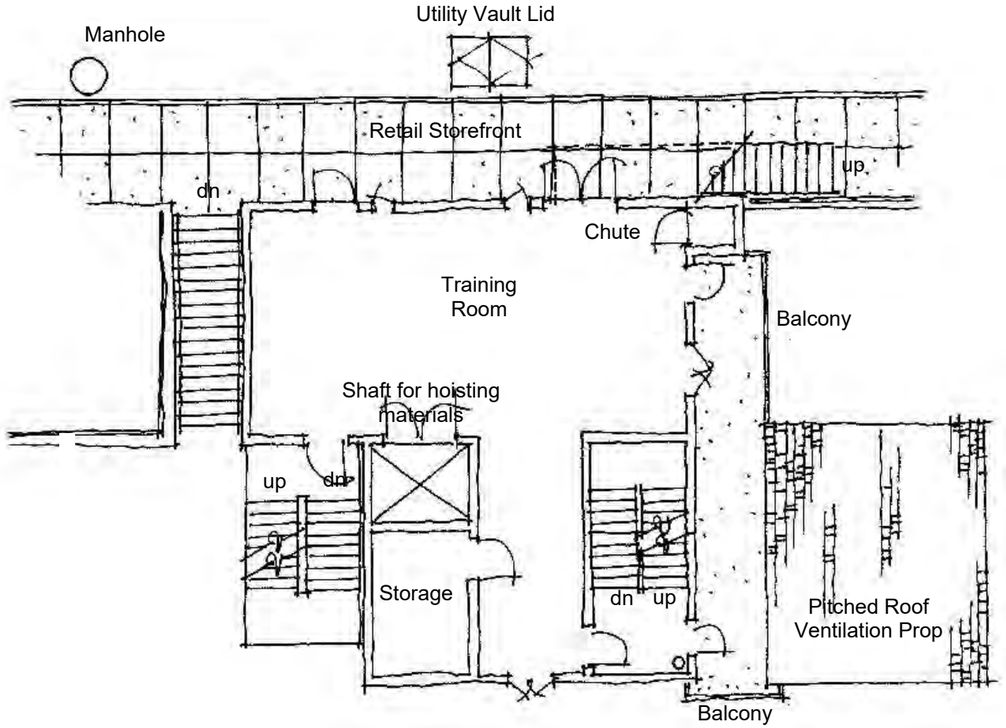
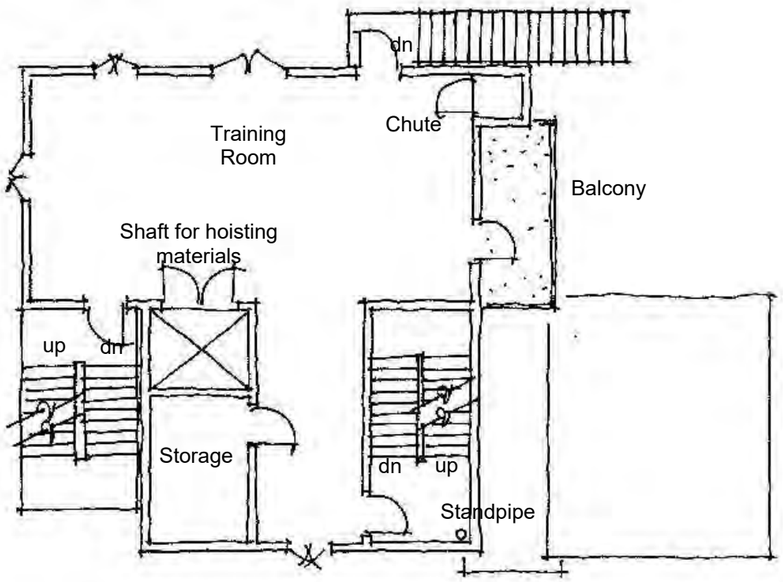
1st Floor		
	Garage Training Area	864 sf
	Storage	460 sf
	Shaft	56 sf
	Riser Room	120 sf
	Subtotal 1st Floor	**1,500 sf**
2nd Floor		
	Training Area	662 sf
	Storage	96 sf
	Subtotal 2nd Floor	**758** sf
3rd Floor		
	Training Area	844 sf
	Storage	96 sf
	Subtotal 3rd Floor	**940** sf
4th Floor		
	Training Area	844 sf
	Storage	96 sf
	Balcony	100 sf
	Subtotal 4th Floor	**1,040 sf**
5th Floor		
	Training Area	730 sf
	Storage	260 sf
	Electric Hoist	56 **sf**
	Subtotal 5th Floor	**1,046 sf**
6th Floor		
	Roof	516 **sf**
	Subtotal 1st - 5th floors	**5,284 sf**
	Allowance for circulation @	**816 sf**
	Building Total:	**6,100 sf**



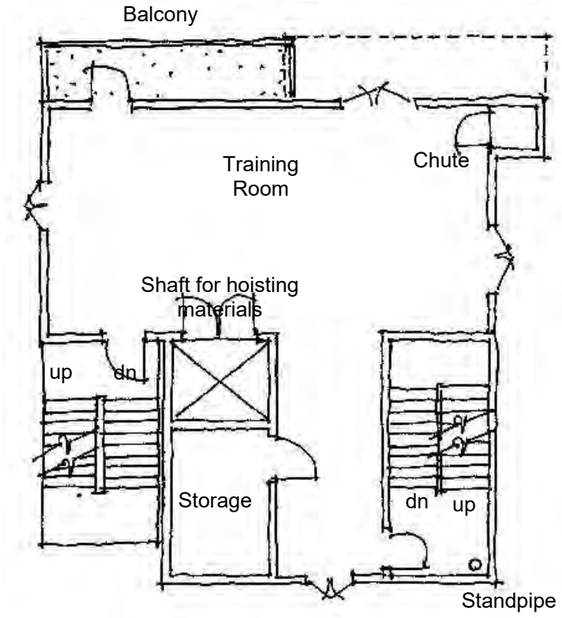
First Floor



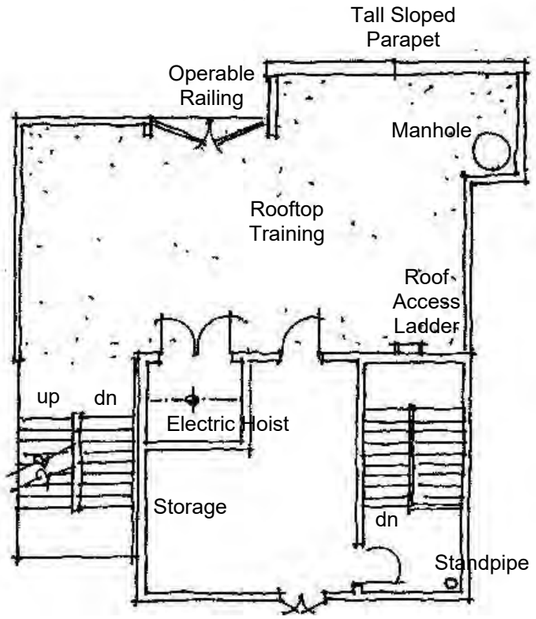
Second Floor



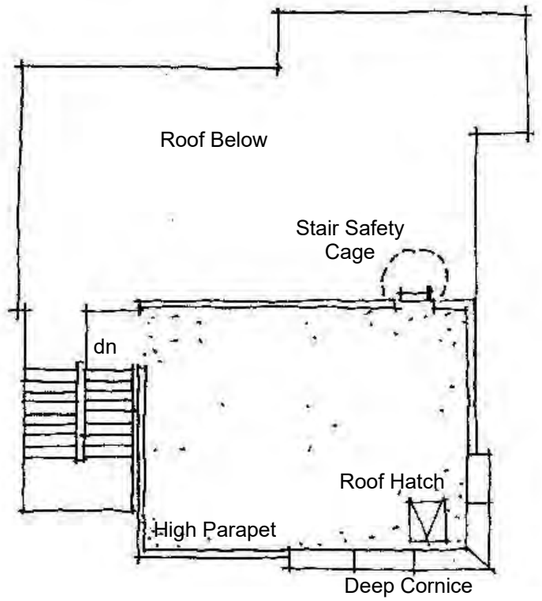
Third Floor



Fourth Floor



Fifth Floor



Sixth Floor

Residential Burn Building

Project Description

The residential burn building is a 3,580 sq. ft. building which will simulate a typical two-story single-family home or low-rise apartment. With bedrooms upstairs and garage and living spaces below, this structure is designed to support propane fueled training simulation props. Also included is a basement with two stairways for access. A pitched roof ventilation prop is provided at the roof level. The building will be designed so that multiple rooms can support live fire drills. All burn rooms shall meet NFPA standards for a safe training environment. The building will be design specifically for teaching fire behavior and extinguishing in residential scenarios.

Facts

- Size: 3,580 square feet (approximately)
- Floors: Slab on grade (1st Floor); cast-in-place structural concrete (above 1st Floor)
- Exterior Walls: Concrete and reinforced CMU
- Roof: Reinforced cast-in-place concrete

Area Summary: Residential Burn Building

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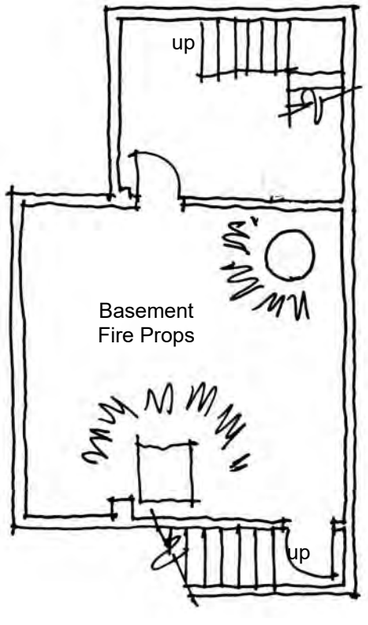
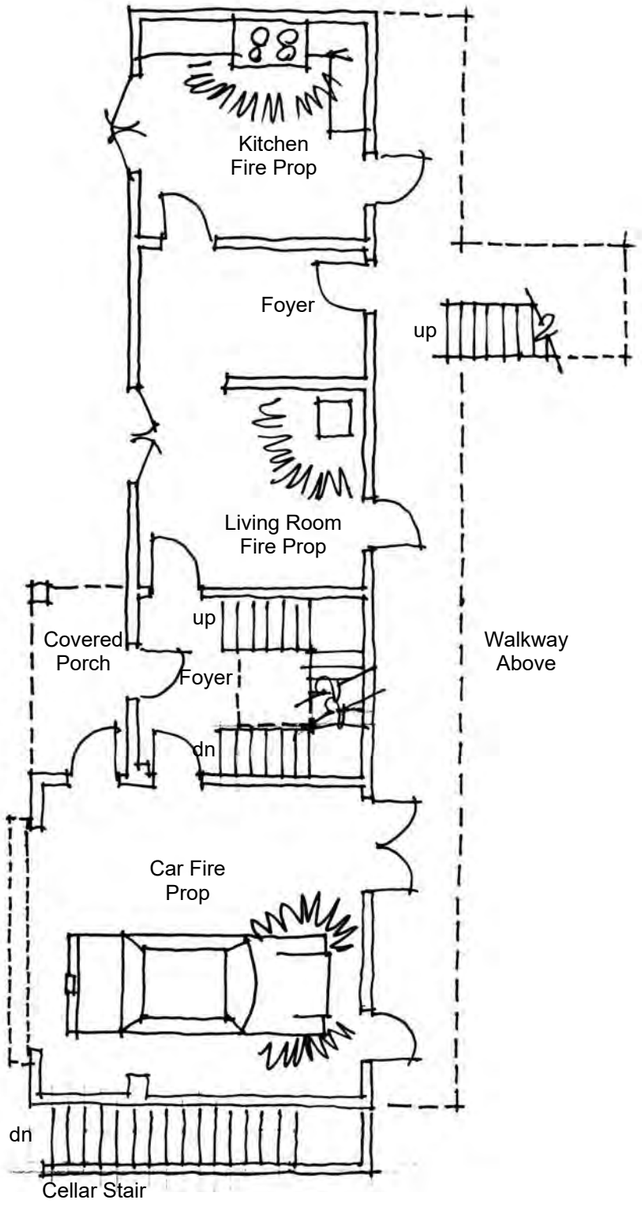
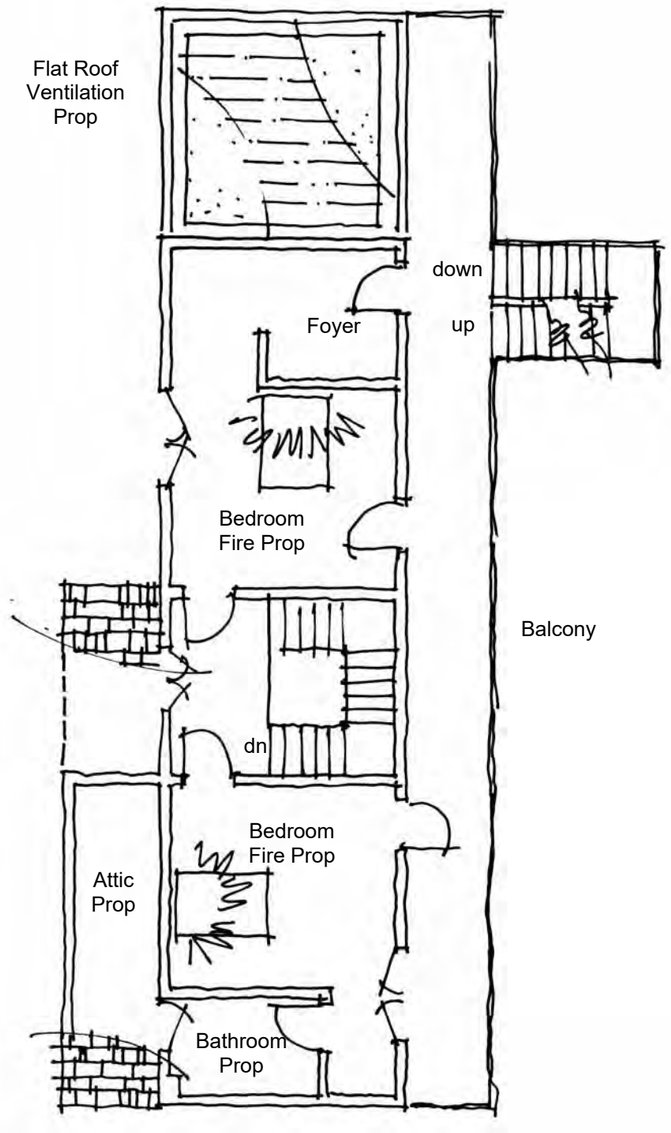
Basement					
	Basement				360 sf
	Subtotal Basement				**360 sf**
1st Floor					
	Car Prop				400 sf
	Foyer	1 @	84	sf	84 sf
	Foyer	1 @	112	sf	112 sf
	Living Room Prop				168 sf
	Kitchen Prop				196 sf
	Subtotal1st Floor				**960** sf
2nd Floor					
	Foyer	1 @	55	sf	55 sf
	Foyer	1 @	64		64 sf
	Balcony				340 sf
	Bedroom Prop	1 @	192	sf	192 sf
	Bedroom Prop	1 @	208	sf	192 sf
	Attic Prop				100 sf
	Flat Roof Prop				196
	Subtotal 2nd Floor				**1,139** sf
	Roof Prop				728 sf
	Subtotal Roof				**728** sf
	Subtotal Basement , 1s, 2nd, Roof				**3,187 sf**
	Allowance for circulation @				**393**
	Building Total:				**3,580 sf**



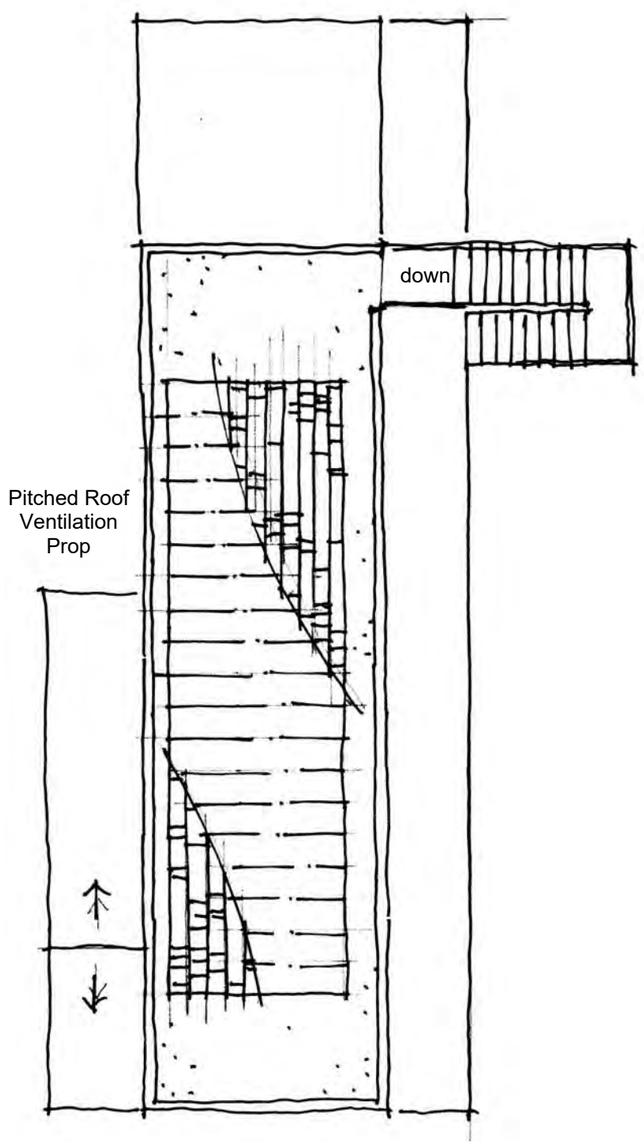
Basement



First Floor



Second Floor



Roof

Rehab and Restroom Building

Project Description

This 1,450 square foot structure is a simple, open air canopy that provides trainees with a place out of the elements prior to, and after, training exercises. The primary purpose is to provide shelter for "rehab", specifically, a place for hydration, nutrition, blood pressure checks, equipment checks, and other safety procedures. Additionally, these facilities will be used as outdoor classrooms with whiteboards and instruction materials for pre-briefing and de-briefing training exercises.

Facts

- Size: 1,450 square feet.
- Floors: Slab on grade.
- Exterior Walls: Wood framing and reinforced CMU.
- Roof: Wood trusses, plywood sheathing, and standing seam metal roofing

Area Summary: Rehab & Restroom Building

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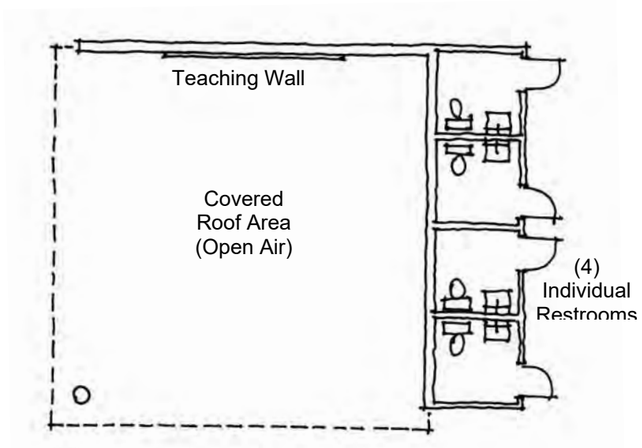
Rehab/Restroom Building					
	Training Canopy Area				1,194 sf
	Restroom(s)	4 @	64	sf	256 sf
	Subtotal Rehab/Restroom Bldg				**1,450 sf**
	Allowance for circulation				
	Building Total:				**1,450 sf**


Teaching Wall
Covered
Roof Area
(Open Air)
(4)
Individual
Restrooms

Area Summary: Vehicle Storage Building

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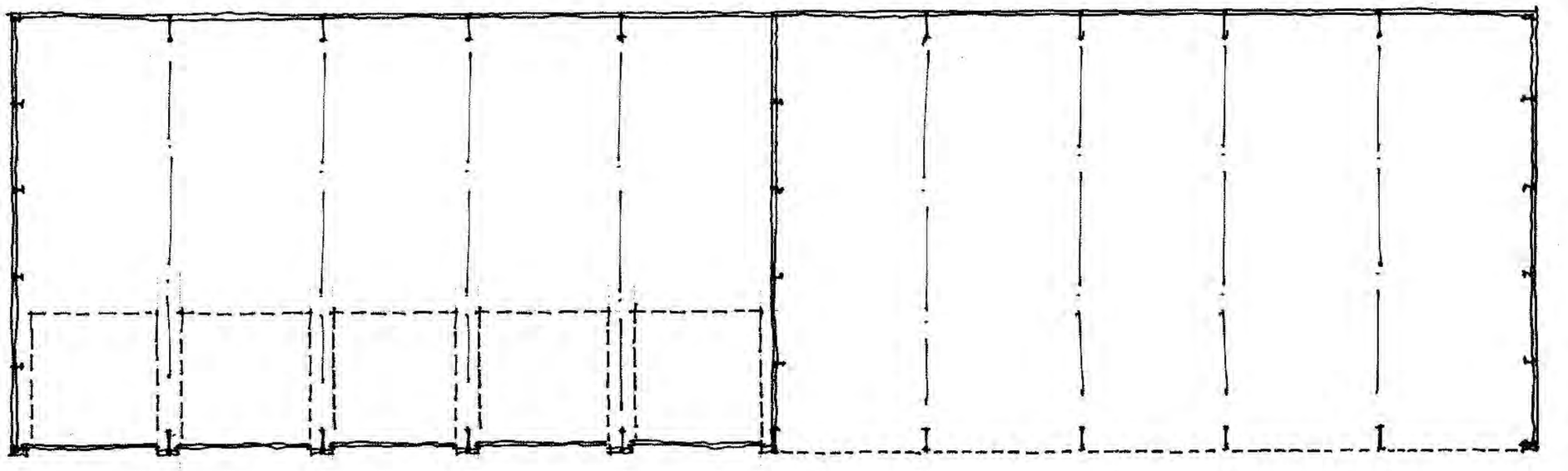
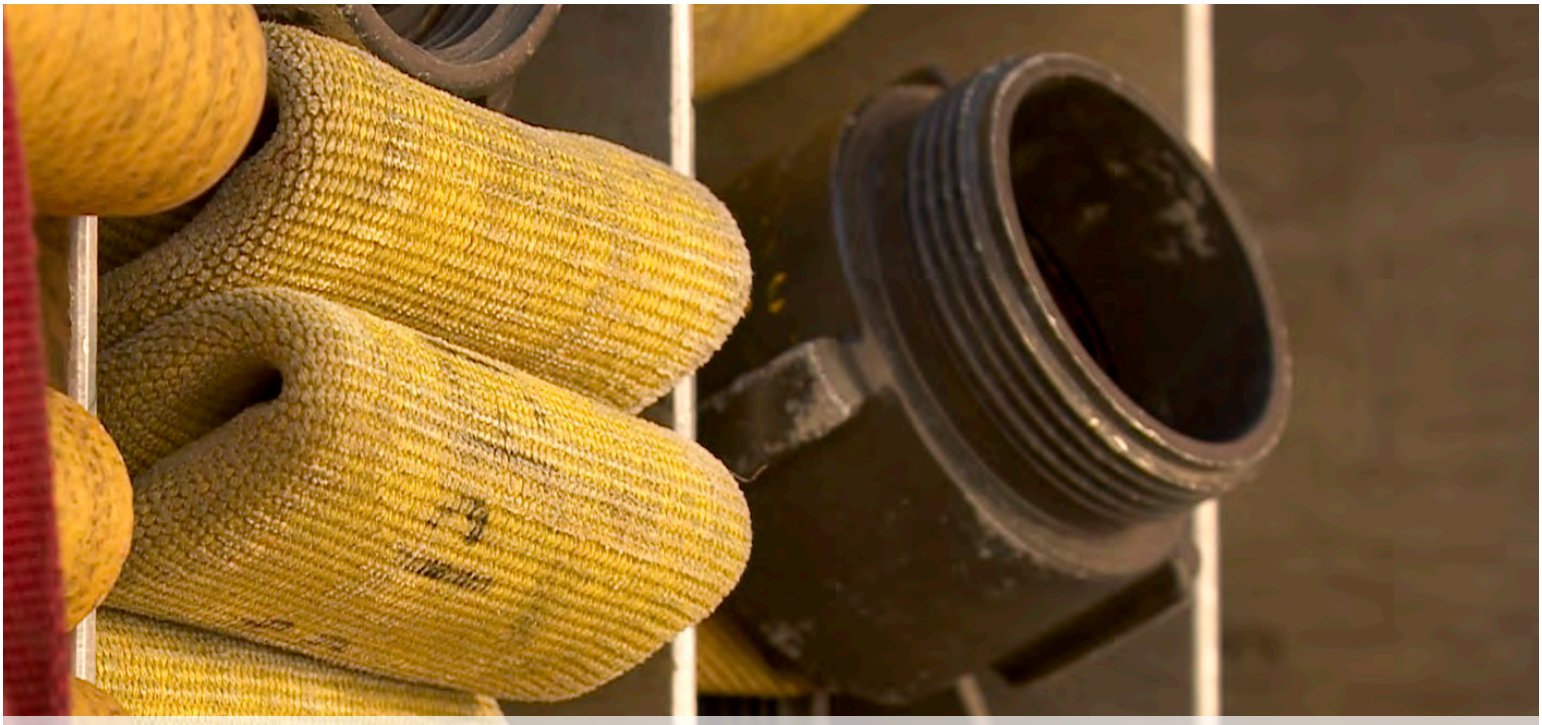
Vehicle Storage Building		
	Enclosed Garage Space	3,190 sf
	Open Canopy	3,190 sf
	Subtotal Rehab/Restroom Bldg	**6,380 sf**
	Allowance for circulation	**n/a**
	Building Total:	**6,380 sf**

Metal Siding / Steel Structure
140’x 40’ Overall



5 – Enclosed Bays with 12’x12’ Overhead Doors
Minimal Heating
(14’x40’ each)

5 - Open Air Bays
(14’x40’ each)



EAST PIERCE FIRE & RESCUE

CAPITAL FACILITIES PLAN

COST DEVELOPMENT

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Cost Development

Introduction and Cost Methodology

Included in this Capital Facilities Plan are cost estimates and overall project budgeting for all projects. These costs were developed by The Robinson Company, a professional cost estimating and project management consultant in conjunction with cost and scope input provided by Sider and Byers (mechanical and plumbing engineering), Warner Engineering (civil engineering), Sazan Group (electrical engineering), and Rice Fergus Miller.

The budget summary includes construction costs, defined as the anticipated bid price of the project, including all contractor overhead and profit as well as soft costs, defined as all the non-construction related fees, taxes, and costs required to perform the project. These are discussed in detail below. It is important to note that the estimated price constitutes a "best professional recommendation" given the available data and information known about the project at the time of the estimate. As such, it does not represent either a "low bid" or the maximum price that could come in on bid day.

The projects noted as Phase 1 are estimated in today's dollars for labor and materials and are escalated to the dates shown on the master spreadsheet. Escalation is currently anticipated at 4.5% per year. It is recommended that, should this capital facilities plan be delayed for more than one year, that the estimates be updated for material and labor cost escalation. No escalation was provided for the Phase 2 projects as it is intended that those projects will be revisited and updated when their schedules are more definitive.

Budgetary Components

Construction Costs: The budgetary costs included on the summary sheet are provided in the following categories:

- *New or Renovated Building Costs (w/building demolition):* This is the cost for the labor and materials to construct the facility. Costs assume prevailing wage rates and a generally competitive bid climate.
- *Site Development and Off-Site Costs:* This is the cost of labor and materials to construct the site improvements for the facility. As above, costs assume prevailing wage rates and a generally competitive bid climate. Site development cost, combined with the building cost, comprises the construction budget for the project.
- *Training/Burn Prop Allowances:* No work or allowances are currently provided for training or burn props.
- *Hazardous Material Abatement Costs:* These are typically included as an allowance in each existing building remodel and demolition project.

- *Traffic Signalization Allowance:* No signalization work is currently requested or anticipated at this time.

Soft Costs: The following line items have been included as part of the overall budget for each project. These costs are enumerated on the overall capital facilities plan summary and represent reasonable budget allowances, usually estimated as a percentage of construction cost, for the following required items:

- *State Sales Tax:* Washington sales tax is required to be paid for all construction contracts as a reimbursement to the general contractor. The tax rate varies by project location and is always subject to change depending on voter or legislative action.
- *Architecture and Engineering Fees:* Costs associated with architectural and engineering design from schematic design through construction administration. Costs may vary depending on specific project scope and engineering requirements.
- *Project/Construction Management:* No costs are included at this time for third-party project management or construction management services. These project management related services do not replace the services provided by the architect, though in some cases they could be provided by the architect.
- *Construction Contingency:* Contingency funds are set aside to deal with issues that arise during facility construction. Common uses include: unforeseen conditions related to site or existing building construction; errors or omissions related to construction documents; changes requested by the owner; or changes requested by local jurisdiction having authority over the project.
- *Permits:* The permit budget is created to pay for all permits not paid for by the contractor during construction. Typical permits paid for by the owner will vary by specific project, but typically include: plan check and general building permit fees, site development or site accessory permits, and conditional use or other required land use permits.
- *Testing and Inspection:* These fees are typically paid to a third-party testing and inspection agency to cover materials testing and observation services required by the International Building Code (IBC) and local building departments. These testing lab services cover tasks such as concrete compression testing and welding observation and are not duplicative of any other consultant's work during the construction administration phase of the project.
- *Hazardous Materials Design Fees:* Necessary for any of the remodel projects or building demolition, these specialized consultant fees cover the documentation of existing hazardous materials as well as the planning for remediation and removal during construction. Observation and documentation of remediation during construction is also included in this fee.

- *Furnishings and Equipment:* This budgetary item covers furnishings, fixtures, and equipment not included in the construction contract or provided by the general contractor. This budget item may include office furniture as well as vendor supplied equipment such as extractors or bunker gear dryers. No vehicles or apparatus are included in this budget line item.
- *Builder's Risk:* Builder's risk insurance covers an incomplete project while it is under construction and un-occupied. It may be covered either by the owner or the general contractor as desired.
- *Legal Fees:* Miscellaneous costs for legal fees as may be needed over the course of the project.
- *Temporary Housing:* It is likely that Stations 113, 116, and 118 will not be partially or fully habitable given the scope of improvements at the remodel facilities. Therefore, funds have been budgeted to allow for creation or rental of temporary facilities.
- *Survey:* Boundary and topographic surveys will be needed for each project to show existing conditions, site grading, easements, and utilities.
- *Soils Report:* Geotechnical assessment and reporting will be needed for each site where an addition or new construction is scheduled to occur.
- *Utility Company Charges/Impact Fees:* Costs related to connection fees, impact fees, or municipal or utility service costs not related to either the contractor's usage during construction or the installation of utility infrastructure as part of the general contractor's work. While some of these costs can be paid by the contractor, it is typical for the owner to pay them directly to the agency in question so that the owner does not have to pay contractor markups and overhead costs.
- *Telephone System/IT Allowance:* This budget item covers information technology items typically installed by the owner, such as computers, telephone handsets, servers, and the like. In-wall wiring, network and phone jacks, and point of service connections are provided as part of the general construction contract.
- *Moving Costs:* Costs associated with owner move-in and delivery of existing furnishings and equipment.

Architectural and Engineering Assumptions

Materials, Finishes, Equipment, and Systems: Included in this Capital Facilities Plan are a preliminary selection of materials and finishes, identification of equipment needs, and confirmation of performance expectations for the fire station projects. This task was done to ensure that the construction cost estimate matched the level of quality expectations of the district. This also established a benchmark in quality that can be later adjusted, if necessary, to match the available funding or other financial limitations established by the district.

Anticipated Costs and Project Timeline:

Anticipated costs for each project are noted below. For purposes of cost estimating, the year 2020 was established as the starting point for the Phase 1 projects identified by the District as having the highest priority. Though projects have been grouped in phases to represent priority, the specific content of any part of a bond measure will be at the discretion of the district's staff and commissioners.

Phase 1 Projects

Station	*Project Cost (Escalated)*	*Target Bid Date*
Station 111	$21.2 M	January 2020
Station 118	$15.7 M	June 2020
Station 112	$13.7 M	January 2021
Station 114	$10.9 M	June 2021
Station 117	$10.1 M	January 2023

Phase 2 Projects

Station	*Project Cost (No Escalation)*	*Target Bid Date*
Station 113	$6.7 M	TBD
Station 115	$6.0 M	TBD
Station 116	$8.6 M	TBD
Station 124	$9.7 M	TBD

East Pierce Fire & Rescue

Capital Facilities Plan

Rev. 7/17/2018

RICE fergus MILLER

	PHASE 1					PHASE 2			
	111 REPLACE *Bonney Lake*	**118** REPLACE *Edgewood*	**112** REPLACE *Prairie Ridge*	**114** REPLACE *Lake Tapps - West*	**117** NEW *Tehaleh*	**113** REMODEL *Sumner*	**115** REMODEL *Lake Tapps - East*	**116** REMODEL *Foothills*	**124** NEW *Milton*
Target Bid Date	1/1/2020	6/1/2020	1/1/2021	6/1/2021	1/1/2023	*To be determined*	*To be determined*	*To be determined*	*To be determined*
Desired Capacity Sleep Rooms	12	12	9	7	7	9	6	9	7
Desired Capacity Apparatus Bay	4 at 80'	4 at 80'	4 at 80'	3 at 50'	3 at 50'	3 at 80'	3 at 50'	2 deep + 2 singles	3 at 50'
Building Area	31,675	16,873	16,100	9,400	9,400	12,018	8,147	13,927	9,400
Construction Costs									
Building	$ 10,681,406	$ 6,472,350	$ 6,184,210	$ 4,292,814	$ 4,292,814	$ 4,145,879	$ 3,604,622	$ 5,388,783	$ 4,292,814
Site Development	$ 1,673,282	$ 3,169,160	$ 1,500,000	$ 1,500,000	$ 1,599,827	$ 473,381	$ 645,050	$ 570,868	$ 1,500,000
Building Demolition and Abatement		$ 160,820							
The Robinson Company Estimate 5/15/2018	$ 12,354,687	$ 9,802,331	$ 7,684,210	$ 5,792,814	$ 5,892,641	$ 4,619,260	$ 4,249,672	$ 5,959,651	$ 5,792,814
Total Construction Costs	**$ 12,354,687**	**$ 9,802,331**	**$ 7,684,210**	**$ 5,792,814**	**$ 5,892,641**	**$ 4,619,260**	**$ 4,249,672**	**$ 5,959,651**	**$ 5,792,814**
Soft Costs									
State Sales Tax @ Varies per City/County	$ 1,148,986	$ 970,431	$ 714,632	$ 538,732	$ 465,519	$ 429,591	$ 395,220	$ 470,812	$ 573,489
Architecture and Engineering Fees @ 14%	$ 1,729,656	$ 1,372,326	$ 1,075,789	$ 810,994	$ 824,970	$ 646,696	$ 594,954	$ 834,351	$ 810,994
Construction & Project Contingency @ **10**%	$ 1,235,469	$ 980,233	$ 768,421	$ 579,281	$ 589,264	$ 461,926	$ 424,967	$ 595,965	$ 579,281
Permits @ 2%	$ 247,094	$ 196,047	$ 153,684	$ 115,856	$ 117,853	$ 92,385	$ 84,993	$ 119,193	$ 115,856
Testing and Inspection @ 1.5%	$ 185,320	$ 147,035	$ 115,263	$ 86,892	$ 88,390	$ 69,289	$ 63,745	$ 89,395	$ 86,892
Hazardous Material Design Fees	$ -	$ 10,000	$ -	$ -	$ -	$ 10,000	$ 10,000	$ 10,000	$ -
Furnishings and Equipment (no vehicles) @ **2**%	$ 247,094	$ 196,047	$ 153,684	$ 115,856	$ 117,853	$ 92,385	$ 84,993	$ 119,193	$ 115,856
Builders Risk Insurance @ 0.4%	$ 49,419	$ 39,209	$ 30,737	$ 23,171	$ 23,571	$ 18,477	$ 16,999	$ 23,839	$ 23,171
Legal Fees @ 0.3%	$ 37,064	$ 29,407	$ 23,053	$ 17,378	$ 17,678	$ 13,858	$ 12,749	$ 17,879	$ 17,378
Temporary Housing and/or Accomodations	$ -	$ 500,000	$ -	$ -	$ -	$ 150,000		$ 300,000	$ -
Survey	$ 25,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000
Soils Report	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000
Utility Company Charges/Impact Fees	$ 50,000	$ 45,000	$ 40,000	$ 35,000	$ 35,000	$ 45,000	$ 35,000	$ 40,000	$ 35,000
Telephone System/IT Allowance	$ 40,000	$ 35,000	$ 30,000	$ 25,000	$ 25,000	$ 35,000	$ 25,000	$ 30,000	$ 25,000
Moving Costs	$ 20,000	$ 5,000	$ 10,000	$ 10,000	$ 5,000	$ 10,000	$ 5,000	$ 10,000	$ 10,000
Total Soft Costs	**$ 5,025,102**	**$ 4,550,735**	**$ 3,140,263**	**$ 2,383,162**	**$ 2,335,096**	**$ 2,099,608**	**$ 1,778,621**	**$ 2,685,627**	**$ 2,417,918**
Construction Cost Escalation *5/10/2018 to Target Bid Date at 4.5% per year*	**$ 1,306,408**	**$ 1,364,375**	**$ 1,338,839**	**$ 1,180,085**	**$ 1,868,466**	**$ -**	**$ -**	**$ -**	**$ -**
Property Acquisition *Anticipated Property Acquisition Costs*	**$ 2,500,000**	**$ -**	**$ 1,500,000**	**$ 1,500,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 1,500,000**
TOTAL ANTICIPATED PROJECT BUDGET	**$ 21,186,196**	**$ 15,717,441**	**$ 13,663,312**	**$ 10,856,061**	**$ 10,096,203**	**$ 6,718,867**	**$ 6,028,293**	**$ 8,645,278**	**$ 9,710,733**
	Total PRIORITY 1 Projects: **$ 71,519,212**					***Total PRIORITY 2 Projects:*** **$ 31,103,170** *(without escalation)*			

Notes:

Station 112 Site has not been selected. Budget assumes 2 Acre Site at $750,000 per Acre.
Station 114 Site has not been selected. Budget assumes 2 Acre Site at $750,000 per Acre.
Station 124 Site has not been selected. Budget assumes 2 Acre Site at $750,000 per Acre.
Demolition and Abatement at Station 118 is for demo/abatement of existing facility
Selective demolition and abatement is included in the Station Renovation Estimates
State Tax Rates Highlighted need verification
Excludes demolition at Stations that are vacating to new sites

THE ROBINSON COMPANY

PROJECT: EAST PIERCE FIRE AND RESCUE - STATION 111 - HEADQUARTER STATION
LOCATION: SUMNER, WA
BLDG SF: 31,675
ESTIMATE: 2018072
EST TYPE: COST MODEL

DIVISION	DESCRIPTION		TOTAL	$/SF
A10	FOUNDATIONS		432,406	13.65
B10	SUPERSTRUCTURE		530,412	16.75
B20	EXTERIOR CLOSURE		1,251,641	39.52
B30	ROOFING		657,391	20.75
C10	INTERIOR CONSTRUCTION		609,744	19.25
C20	STAIRS		25,000	0.79
C30	INTERIOR FINISHES		519,082	16.39
D10	CONVEYING SYSTEMS		110,000	3.47
D20	PLUMBING		823,550	26.00
D30	HVAC		1,321,975	41.74
D40	FIRE PROTECTION		190,050	6.00
D50	ELECTRICAL		1,267,000	40.00
E10	EQUIPMENT		57,419	1.81
E20	FURNISHINGS		262,232	8.28
Z10	GENERAL REQUIREMENTS		975,000	30.78
	ESTIMATE SUBTOTAL		**9,032,901**	**285.17**
	DESIGN CONTINGENCY @	10.00%	903,290	
	SUBTOTAL		9,936,191	
	GENERAL CONTRACTOR'S OH & P @	7.50%	745,214	
	SUBTOTAL		10,681,406	
	ESCALATION-SEE SUMMARY SHEET TO (0.00%/YR) @			
	TOTAL		**10,681,406**	**337.22**

EXCLUSIONS:
SEE ESTIMATE SUMMARY

PROJECT: EAST PIERCE FIRE AND RESCUE - STATION 111 - HEADQUARTER STATION
LOCATION: SUMNER, WA
BLDG SF: 31,675
ESTIMATE: 2018072
EST TYPE: COST MODEL

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	$/SF
A10	**FOUNDATIONS**					
02315	FOUNDATION EXCAVATION/BACKFILL/HAUL	22,175	SFA	1.25	27,719	
02620	FOOTING DRAINS W/GRAVEL	850	LF	15.00	12,750	
03000	4" SLAB COMPLETE	16,090	SF	5.50	88,495	
03000	8" SLAB @ APPARATUS BAY	6,085	SF	8.35	50,810	
03000	ELEVATOR PIT	1	LS	12,500	12,500	
03100	FOUNDATIONS/STEMWALLS @ NEW	22,175	SFA	9.50	210,663	
07210	DRAINAGE @ BURIED WALL	2,800	SF	8.50	23,800	
07210	FOUNDATION PERIMETER INSUL/DAMPPROOFING	2,520	SF	2.25	5,670	
A10	**FOUNDATIONS**			**DIVISION TOTAL**	**432,406**	**13.65**
B10	**SUPERSTRUCTURE**					
06110	FLOOR STRUCTURE	9,500	SF	19.20	182,400	
06110	MEZZANINE ALLOWANCE	1,000	SF	25.00	25,000	
06110	ROOF STRUCTURE-WOOD	25,575	SF	12.63	323,012	
B10	**SUPERSTRUCTURE**			**DIVISION TOTAL**	**530,412**	**16.75**
B20	**EXTERIOR CLOSURE**					
04220	BURIED CONCRETE WALL	2,800	SF	36.00	100,800	
06110	EXTERIOR RAINSCREEN WALLS	12,381	SF	16.50	204,287	
06110	EXTERIOR SIDING/FINISH (CMU/METAL/FCB)	12,381	SF	29.05	359,668	
06110	FURR BELOW GRADE WALL	2,800	SF	9.75	27,300	
06110	MISC BLOCKING/BACKING/HEADERS/HARDWARE	18,076	SF	0.50	9,038	
07620	ADDITIONAL FRAME AT OPENINGS	5,695	SF	9.00	51,255	
07620	MISC FLASHING/CAULKING	18,076	SF	0.50	9,038	
07700	EXTERIOR SOFFIT FRAME/FINISH-ALLOW	3,400	SF	24.00	81,600	
08110	EXT. H.M. DOOR/FRM/HDWRE-SGL	5	EA	2,500	12,500	
08120	ALUMINUM STOREFRONT DOOR/SIDELITE	3	PR	5,000	15,000	
08360	OVERHEAD SECTIONAL DOORS	8	EA	9,500	76,000	
08410	ALUMINUM WINDOWS/STOREFRONT	4,127	SF	68.00	280,636	
08740	CARD KEY/KEYPAD ACCESS-ALLOW	1	LS	20,000	20,000	
09900	EXT. PAINTING/SEALING	18,076	SFA	0.25	4,519	
B20	**EXTERIOR CLOSURE**			**DIVISION TOTAL**	**1,251,641**	**39.52**
B30	**ROOFING**					
07410	METAL ROOFING SYSTEM/RIGID INSUL	24,393	SF	24.70	602,507	
07620	FLASHING/GUTTERS/DOWNSPOUTS	24,393	SFA	2.25	54,884	
B30	**ROOFING**			**DIVISION TOTAL**	**657,391**	**20.75**
C10	**INTERIOR CONSTRUCTION**					
06100	INTERIOR WALLS-COMPLETE	31,675	SFA	12.50	395,938	
08110	INTERIOR DOORS/GLAZING	31,675	SFA	4.75	150,456	

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	$/SF
10880	MISC SPECIALTIES	31,675	SFA	2.00	63,350	
C10	**INTERIOR CONSTRUCTION**			**DIVISION TOTAL**	**609,744**	**19.25**
C20	**STAIRS**					
05000	BUILDING STAIRS/RAILS	2	FLT	12,500	25,000	
C20	**STAIRS**			**DIVISION TOTAL**	**25,000**	**0.79**
C30	**INTERIOR FINISHES**					
01000	EXPOSED CEILING - NO FINISH	6,085	SF			
09000	WALL FINISHES	31,675	SFA	5.50	174,213	
09250	CEILING FINISHES	25,590	SFA	6.05	154,820	
09610	FLOOR FINISHES	31,675	SFA	6.00	190,050	
C30	**INTERIOR FINISHES**			**DIVISION TOTAL**	**519,082**	**16.39**
D10	**CONVEYING SYSTEMS**					
14200	ELEVATOR-2 STOP	1	LS	110,000	110,000	
D10	**CONVEYING SYSTEMS**			**DIVISION TOTAL**	**110,000**	**3.47**
D20	**PLUMBING**					
15410	PLUMBING	31,675	SFA	26.00	823,550	
D20	**PLUMBING**			**DIVISION TOTAL**	**823,550**	**26.00**
D30	**HVAC**					
15700	HVAC	31,675	SFA	37.00	1,171,975	
15700	VEHICLE EXHAUST SYSTEM (4 BAYS)	1	LS	150,000	150,000	
D30	**HVAC**			**DIVISION TOTAL**	**1,321,975**	**41.74**
D40	**FIRE PROTECTION**					
15300	FIRE PROTECTION	31,675	SFA	6.00	190,050	
D40	**FIRE PROTECTION**			**DIVISION TOTAL**	**190,050**	**6.00**
D50	**ELECTRICAL**					
16000	ELECTRICAL	31,675	SFA	40.00	1,267,000	
D50	**ELECTRICAL**			**DIVISION TOTAL**	**1,267,000**	**40.00**
E10	**EQUIPMENT**					
11370	MISC. EQUIPMENT-ALLOW	31,675	SFA	0.25	7,919	
11450	APPLIANCES	1	LS	34,500	34,500	
11500	EXTRACTOR AND BUNKER GEAR DRYER	1	EA	15,000	15,000	
E10	**EQUIPMENT**			**DIVISION TOTAL**	**57,419**	**1.81**
E20	**FURNISHINGS**					
12100	CASEWORK/BUILT-IN FURISHINGS	31,675	SFA	5.00	158,375	

ALLOW

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	$/SF
12300	SLEEP ROOM DESK, BED/FURNISHINGS					
	EXCLUDED- SEE SOFT COSTS					
12300	SLEEP ROOM LOCKERS	45	EA	1,250	56,250	
12320	FOOD LOCKERS-ALLOW	48	OPG	175	8,400	
12670	BLINDS	4,127	SF	9.50	39,207	
E20	**FURNISHINGS**			**DIVISION TOTAL**	**262,232**	**8.28**
Z10	**GENERAL REQUIREMENTS**					
01000	GENERAL CONDITIONS	15	MO	65,000	975,000	
01100	BUILDING AREA	31,675	SF			
Z10	**GENERAL REQUIREMENTS**			**DIVISION TOTAL**	**975,000**	**30.78**
				ESTIMATE SUBTOTAL	**9,032,901**	**285.17**

THE ROBINSON COMPANY

PROJECT: EAST PIERCE FIRE AND RESCUE - STATION 111 SITEWORK
LOCATION: SUMNER, WA
BLDG SF:
ESTIMATE: 2018072
EST TYPE: COST MODEL

DIVISION	DESCRIPTION		TOTAL	$/SF
G10	SITE PREPARATION		288,280	
G20	SITE IMPROVEMENTS		499,867	
G30	SITE CIVIL / MECHANICAL UTILITIES		383,491	
G40	SITE ELECTRICAL UTILITIES		113,400	
Z10	GENERAL REQUIREMENTS		130,000	
	ESTIMATE SUBTOTAL		**1,415,037**	
	DESIGN CONTINGENCY @	10.00%	141,504	
	SUBTOTAL		1,556,541	
	GENERAL CONTRACTOR'S OH & P @	7.50%	116,741	
	SUBTOTAL		1,673,282	
	ESCALATION-SEE SUMMARY SHEET TO (0.00%/YR) @			
	TOTAL		**1,673,282**	

EXCLUSIONS:
SEE ESTIMATE SUMMARY

PROJECT: EAST PIERCE FIRE AND RESCUE - STATION 111 SITEWORK
LOCATION: SUMNER, WA
BLDG SF:
ESTIMATE: 2018072
EST TYPE: COST MODEL

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	$/SF
G10	**SITE PREPARATION**					
02000	SITE CLEARING	1	LS	32,256	32,256	
	ALLOWANCE PER A/E-ESCALATED					
02200	SITE PREP	1	LS	25,425	25,425	
	ALLOWANCE PER A/E-ESCALATED					
02220	SITE MOBILIZATION	1	LS	51,284	51,284	
	ALLOWANCE PER A/E-ESCALATED					
02300	EARTHWORK	1	LS	131,424	131,424	
	ALLOWANCE PER A/E-ESCALATED					
02370	EROSION CONTROL	1	LS	47,891	47,891	
	ALLOWANCE PER A/E-ESCALATED					
G10	**SITE PREPARATION**			**DIVISION TOTAL**	**288,280**	
G20	**SITE IMPROVEMENTS**					
02760	SITE SURFACING	1	LS	244,995	244,995	
	ALLOWANCE PER A/E-ESCALATED					
02800	MISC SITE IMPROVEMENTS	1	LS	32,000	32,000	
	ALLOWANCE PER A/E-ESCALATED					
02800	RETAINING WALLS	1	LS	79,872	79,872	
	ALLOWANCE PER A/E					
02800	SITE SIGN/CONCRETE BASE	1	LS	15,000	15,000	
02900	LANDSCAPING/IRRIGATION	1	LS	128,000	128,000	
	ALLOW					
G20	**SITE IMPROVEMENTS**			**DIVISION TOTAL**	**499,867**	
G30	**SITE CIVIL / MECHANICAL UTILITIES**					
02000	CIVIL SUB OVERHEAD & PROFIT	1	LS	90,604	90,604	
	ALLOWANCE PER A/E-ESCALATED					
02510	WATER SYSTEM	1	LS	92,557	92,557	
	ALLOWANCE PER A/E-ESCALATED					
02530	SANITARY	1	LS	20,631	20,631	
	ALLOWANCE PER A/E-ESCALATED					
02630	STORM DRAINAGE	1	LS	179,699	179,699	
	ALLOWANCE PER A/E-ESCALATED					
G30	**SITE CIVIL / MECHANICAL UTILITIES**			**DIVISION TOTAL**	**383,491**	
G40	**SITE ELECTRICAL UTILITIES**					
16000	GENERATOR/ATS	1	LS	75,000	75,000	
	ALLOWANCE PER A/E-ESCALATED					
16000	SITE ELECTRICAL	1	LS	38,400	38,400	
	ALLOWANCE PER A/E-ESCALATED					
G40	**SITE ELECTRICAL UTILITIES**			**DIVISION TOTAL**	**113,400**	

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	$/SF
Z10	**GENERAL REQUIREMENTS**					
01000	GENERAL CONDITIONS	2	MO	65,000	130,000	
Z10	**GENERAL REQUIREMENTS**			**DIVISION TOTAL**	**130,000**	
				ESTIMATE SUBTOTAL	**1,415,037**	

THE ROBINSON COMPANY

PROJECT: EAST PIERCE FIRE AND RESCUE - STATION 112 NEW BUILDING
LOCATION: SUMNER, WA
BLDG SF: 16,100
ESTIMATE: 2018072
EST TYPE: COST MODEL

DIVISION	DESCRIPTION		TOTAL	$/SF
A10	FOUNDATIONS		295,280	18.34
B10	SUPERSTRUCTURE		266,233	16.54
B20	EXTERIOR CLOSURE		847,598	52.65
B30	ROOFING		514,745	31.97
C10	INTERIOR CONSTRUCTION		309,925	19.25
C30	INTERIOR FINISHES		252,050	15.66
D20	PLUMBING		418,600	26.00
D30	HVAC		745,700	46.32
D40	FIRE PROTECTION		96,600	6.00
D50	ELECTRICAL		644,000	40.00
E10	EQUIPMENT		53,525	3.32
E20	FURNISHINGS		185,520	11.52
Z10	GENERAL REQUIREMENTS		600,000	37.27
	ESTIMATE SUBTOTAL		**5,229,776**	**324.83**
	DESIGN CONTINGENCY @	10.00%	522,978	
	SUBTOTAL		5,752,754	
	GENERAL CONTRACTOR'S OH & P @	7.50%	431,457	
	SUBTOTAL		6,184,210	
	ESCALATION-SEE SUMMARY SHEET TO (0.00%/YR) @			
	TOTAL		**6,184,210**	**384.11**

EXCLUSIONS:
SEE ESTIMATE SUMMARY

PROJECT: EAST PIERCE FIRE AND RESCUE - STATION 112 NEW BUILDING
LOCATION: SUMNER, WA
BLDG SF: 16,100
ESTIMATE: 2018072
EST TYPE: COST MODEL

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	$/SF
A10	**FOUNDATIONS**					
02315	FOUNDATION EXCAVATION/BACKFILL/HAUL	16,100	SFA	1.25	20,125	
02620	FOOTING DRAINS W/GRAVEL	750	LF	15.00	11,250	
03000	4" SLAB COMPLETE	10,015	SF	5.50	55,083	
03000	8" SLAB @ APPARATUS BAY	6,085	SF	8.35	50,810	
03100	FOUNDATIONS/STEMWALLS @ NEW	16,100	SFA	9.50	152,950	
07210	FOUNDATION PERIMETER INSUL/DAMPPROOFING	2,250	SF	2.25	5,063	
A10	**FOUNDATIONS**			**DIVISION TOTAL**	**295,280**	**18.34**
B10	**SUPERSTRUCTURE**					
06110	MEZZANINE ALLOWANCE	1,000	SF	25.00	25,000	
06110	ROOF STRUCTURE-WOOD	19,100	SF	12.63	241,233	
B10	**SUPERSTRUCTURE**			**DIVISION TOTAL**	**266,233**	**16.54**
B20	**EXTERIOR CLOSURE**					
06110	EXTERIOR RAINSCREEN WALLS	8,649	SF	16.50	142,709	
06110	EXTERIOR SIDING/FINISH (CMU/METAL/FCB)	8,649	SF	28.53	246,756	
06110	MISC BLOCKING/BACKING/HEADERS/HARDWARE	13,100	SF	0.50	6,550	
07620	ADDITIONAL FRAME AT OPENINGS	4,451	SF	9.00	40,059	
07620	MISC FLASHING/CAULKING	13,100	SF	0.50	6,550	
07700	EXTERIOR SOFFIT FRAME/FINISH-ALLOW	3,000	SF	24.00	72,000	
08110	EXT. H.M. DOOR/FRM/HDWRE-SGL	8	EA	2,500	20,000	
08120	ALUMINUM STOREFRONT DOOR/SIDELITE	2	PR	5,000	10,000	
08360	OVERHEAD SECTIONAL DOORS	6	EA	9,500	57,000	
08410	ALUMINUM WINDOWS/STOREFRONT	3,275	SF	68.00	222,700	
08740	CARD KEY/KEYPAD ACCESS-ALLOW	1	LS	20,000	20,000	
09900	EXT. PAINTING/SEALING	13,100	SFA	0.25	3,275	
B20	**EXTERIOR CLOSURE**			**DIVISION TOTAL**	**847,598**	**52.65**
B30	**ROOFING**					
07410	METAL ROOFING SYSTEM/RIGID INSUL	19,100	SF	24.70	471,770	
07620	FLASHING/GUTTERS/DOWNSPOUTS	19,100	SFA	2.25	42,975	
B30	**ROOFING**			**DIVISION TOTAL**	**514,745**	**31.97**
C10	**INTERIOR CONSTRUCTION**					
06100	INTERIOR WALLS-COMPLETE	16,100	SFA	12.50	201,250	
08110	INTERIOR DOORS/GLAZING	16,100	SFA	4.75	76,475	
10880	MISC SPECIALTIES	16,100	SFA	2.00	32,200	
C10	**INTERIOR CONSTRUCTION**			**DIVISION TOTAL**	**309,925**	**19.25**
C30	**INTERIOR FINISHES**					

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	$/SF
01000	EXPOSED CEILING - NO FINISH	6,085	SF			
09000	WALL FINISHES	16,100	SFA	5.50	88,550	
09250	CEILING FINISHES	10,015	SFA	6.68	66,900	
09610	FLOOR FINISHES	16,100	SFA	6.00	96,600	
C30	**INTERIOR FINISHES**			**DIVISION TOTAL**	**252,050**	**15.66**
D20	**PLUMBING**					
15410	PLUMBING	16,100	SFA	26.00	418,600	
D20	**PLUMBING**			**DIVISION TOTAL**	**418,600**	**26.00**
D30	**HVAC**					
15700	HVAC	16,100	SFA	37.00	595,700	
15700	VEHICLE EXHAUST SYSTEM (4 BAYS)	1	LS	150,000	150,000	
D30	**HVAC**			**DIVISION TOTAL**	**745,700**	**46.32**
D40	**FIRE PROTECTION**					
15300	FIRE PROTECTION	16,100	SFA	6.00	96,600	
D40	**FIRE PROTECTION**			**DIVISION TOTAL**	**96,600**	**6.00**
D50	**ELECTRICAL**					
16000	ELECTRICAL	16,100	SFA	40.00	644,000	
D50	**ELECTRICAL**			**DIVISION TOTAL**	**644,000**	**40.00**
E10	**EQUIPMENT**					
11370	MISC. EQUIPMENT-ALLOW	16,100	SFA	0.25	4,025	
11450	APPLIANCES	1	LS	34,500	34,500	
11500	EXTRACTOR AND BUNKER GEAR DRYER	1	EA	15,000	15,000	
E10	**EQUIPMENT**			**DIVISION TOTAL**	**53,525**	**3.32**
E20	**FURNISHINGS**					
12100	CASEWORK/BUILT-IN FURISHINGS	16,100	SFA	6.50	104,650	
	ALLOW					
12300	SLEEP ROOM DESK, BED/FURNISHINGS					
	EXCLUDED- SEE SOFT COSTS					
12300	SLEEP ROOM LOCKERS	37	EA	1,250	46,250	
12320	FOOD LOCKERS-ALLOW	36	OPG	175	6,300	
12670	BLINDS	2,981	SF	9.50	28,320	
E20	**FURNISHINGS**			**DIVISION TOTAL**	**185,520**	**11.52**
Z10	**GENERAL REQUIREMENTS**					
01000	GENERAL CONDITIONS	12	MO	50,000	600,000	
01100	BUILDING AREA	16,100	SF			
Z10	**GENERAL REQUIREMENTS**			**DIVISION TOTAL**	**600,000**	**37.27**
				ESTIMATE SUBTOTAL	**5,229,776**	**324.83**

THE ROBINSON COMPANY

PROJECT: EAST PIERCE FIRE AND RESCUE - STATION 113 BUILDING RENOVATION
LOCATION: SUMNER, WA
BLDG SF: 12,018
ESTIMATE: 2018072
EST TYPE: COST MODEL

DIVISION	DESCRIPTION		TOTAL	$/SF
A10	FOUNDATIONS		50,877	4.23
B10	SUPERSTRUCTURE		132,551	11.03
B20	EXTERIOR CLOSURE		449,712	37.42
B30	ROOFING		270,874	22.54
C10	INTERIOR CONSTRUCTION		266,912	22.21
C20	STAIRS		14,000	1.16
C30	INTERIOR FINISHES		195,348	16.25
D10	CONVEYING SYSTEMS			
D20	PLUMBING		360,540	30.00
D30	HVAC		480,720	40.00
D40	FIRE PROTECTION		33,507	2.79
D50	ELECTRICAL		420,630	35.00
E10	EQUIPMENT		28,005	2.33
E20	FURNISHINGS		126,909	10.56
F20	SELECTIVE BUILDING DEMOLITION		125,445	10.44
Z10	GENERAL REQUIREMENTS		550,000	45.76
	ESTIMATE SUBTOTAL		**3,506,029**	**291.73**
	DESIGN CONTINGENCY @	10.00%	350,603	
	SUBTOTAL		3,856,631	
	GENERAL CONTRACTOR'S OH & P @	7.50%	289,247	
	SUBTOTAL		4,145,879	
	ESCALATION-SEE SUMMARY SHEET TO (0.00%/YR) @			
	TOTAL		**4,145,879**	**344.97**

EXCLUSIONS:
SEE ESTIMATE SUMMARY

PROJECT: EAST PIERCE FIRE AND RESCUE - STATION 113 BUILDING RENOVATION
LOCATION: SUMNER, WA
BLDG SF: 12,018
ESTIMATE: 2018072
EST TYPE: COST MODEL

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	$/SF
A10	**FOUNDATIONS**					
02315	FOUNDATION EXCAVATION/BACKFILL/HAUL	989	SFA	1.50	1,484	
02620	FOOTING DRAINS W/GRAVEL	94	LF	15.00	1,410	
03000	4" SLAB COMPLETE	989	SF	6.55	6,478	
03000	SHEAR FOOTINGS/FDTNS @ EXST'G	105	LF	150	15,750	
03100	FOUNDATIONS/STEMWALLS @ NEW	94	LF	120	11,280	
03310	MISC SLAB INFILLS/PATCH/REPAIR	744	SFA	10.00	7,440	
03510	TIE TO EXST'G FOUNDATION	76	LF	80.00	6,080	
07210	FOUNDATION PERIMETER INSUL/DAMPPROOFING	294	SF	3.25	956	
A10	**FOUNDATIONS**			**DIVISION TOTAL**	**50,877**	**4.23**
B10	**SUPERSTRUCTURE**					
06000	MEZZANINE FLOOR STRUCTURE	989	SF	15.00	14,835	
06000	SEISMIC/STRUCTURAL UPGRADES AT FLOOR	3,587	SFA	7.50	26,903	
06000	SEISMIC/STRUCTURAL UPGRADES AT ROOF	7,442	SFA	7.50	55,815	
06110	MISC. ROUGH CARPENTRY/REWORK @ EXST'G MEZZ	3,570	SF	2.00	7,140	
06110	ROOF STRUCTURE-TJ'S/PLY/BLOCKING	989	SFA	15.00	14,835	
06140	CRICKETING ALLOWANCE	7,442	SFA	1.75	13,024	
B10	**SUPERSTRUCTURE**			**DIVISION TOTAL**	**132,551**	**11.03**
B20	**EXTERIOR CLOSURE**					
06110	MISC BLOCKING/BACKING/HEADERS/HARDWARE @ EXISTING	7,678	SFA	1.25	9,598	
07620	MISC FLASHING/CAULKING	7,678	SFA	1.25	9,598	
07700	EXTERIOR SOFFIT FRAME/FINISH-ALLOW	1,620	SF	9.50	15,390	
08110	EXT. H.M. DOOR/FRM/HDWRE-SGL	7	EA	2,500	17,500	
08350	APP BAY OVERHEAD DOORS-INSULATED/GLAZED	4	EA	9,500	38,000	
08410	ALUMINUM WINDOWS/STOREFRONT-ALLOW 20% EXT	1,799	SF	68.00	122,332	
08740	CARD KEY/KEYPAD ACCESS-ALLOW	1	LS	20,000	20,000	
09000	EXTERIOR RAINSCREEN WALLS AT ADDITION	1,316	SF	16.40	21,582	
09000	EXTERIOR SIDING/FINISH	1,316	SF	28.53	37,545	
09000	EXTERIOR WALL UPGRADES/SIDING/FINISH	7,678	SF	18.45	141,659	
09900	EXT. PAINTING/SEALING	7,678	SF	2.15	16,508	
B20	**EXTERIOR CLOSURE**			**DIVISION TOTAL**	**449,712**	**37.42**
B30	**ROOFING**					
07410	METAL ROOFING SYSTEM/RIGID INSUL	10,051	SF	24.70	248,260	
07620	FLASHING/GUTTERS/DOWNSPOUTS	10,051	SFA	2.25	22,615	
B30	**ROOFING**			**DIVISION TOTAL**	**270,874**	**22.54**
C10	**INTERIOR CONSTRUCTION**					
06110	INTERIOR PARTITIONS - COMPLETE	10,368	SF	11.35	117,677	

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	$/SF
06160	MISC BACKING/BLOCKING/HEADERS	10,368	SF	1.25	12,960	
06160	SHEAR WALL INT PLY SHEATHING/BLOCKING	3,492	SF	2.50	8,730	
08110	INT. DOOR/FRM/HDWRE-SGL	41	EA	1,700	69,700	
08710	MISC DOOR HDWRE/GLAZING/RATINGS	1	LS	5,000	5,000	
	ALLOW					
10000	MISC SPECIALTIES	12,018	SFA	2.50	30,045	
10400	BUILDING SIGNAGE-ALLOW	1	LS	12,000	12,000	
10810	TOILET ROOM ACCESSORIES	9	EA	1,200	10,800	
C10	**INTERIOR CONSTRUCTION**			**DIVISION TOTAL**	**266,912**	**22.21**
C20	**STAIRS**					
06100	UPGRADE EXISTING STAIRS	2	FLT	4,500	9,000	
06110	STAIRS @ ADDITION	1	FLT	5,000	5,000	
C20	**STAIRS**			**DIVISION TOTAL**	**14,000**	**1.16**
C30	**INTERIOR FINISHES**					
01000	EXPOSED CEILING - NO FINISH	3,200	SF			
09000	WALL FINISHES	12,018	SFA	5.50	66,099	
09250	CEILING FINISHES	8,818	SFA	6.48	57,141	
09610	FLOOR FINISHES	12,018	SFA	6.00	72,108	
C30	**INTERIOR FINISHES**			**DIVISION TOTAL**	**195,348**	**16.25**
D10	**CONVEYING SYSTEMS**					
14200	ELEVATOR-2 STOP - EXISTING NO WORK	1	EA	0.00		
D10	**CONVEYING SYSTEMS**			**DIVISION TOTAL**		
D20	**PLUMBING**					
15410	PLUMBING AND TRENCH DRAIN UPGRADES	12,018	SFA	30.00	360,540	
D20	**PLUMBING**			**DIVISION TOTAL**	**360,540**	**30.00**
D30	**HVAC**					
15700	HVAC	12,018	SFA	40.00	480,720	
15700	VEHICLE EXHAUST SYSTEM-EXCLUDED REUSE EXISTING	1	LS			
D30	**HVAC**			**DIVISION TOTAL**	**480,720**	**40.00**
D40	**FIRE PROTECTION**					
15300	FIRE PROTECTION AT ADDITION	989	SFA	6.00	5,934	
15300	FIRE PROTECTION MODIFICATIONS TO EXISTING	11,029	SFA	2.50	27,573	
D40	**FIRE PROTECTION**			**DIVISION TOTAL**	**33,507**	**2.79**
D50	**ELECTRICAL**					
16000	ELECTRICAL	12,018	SFA	35.00	420,630	
D50	**ELECTRICAL**			**DIVISION TOTAL**	**420,630**	**35.00**
E10	**EQUIPMENT**					

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	$/SF
11370	MISC. EQUIPMENT-ALLOW	12,018	SFA	0.25	3,005	
11400	APPLIANCES	1	LS	25,000	25,000	
E10	**EQUIPMENT**			**DIVISION TOTAL**	**28,005**	**2.33**
E20	**FURNISHINGS**					
12100	CASEWORK/BUILT-IN FURISHINGS	12,018	SFA	6.50	78,117	
	ALLOW					
12300	SLEEP ROOM DESK, BED/FURNISHINGS					
	EXCLUDED- SEE SOFT COSTS					
12300	SLEEP ROOM LOCKERS	24	EA	1,250	30,000	
12320	FOOD LOCKERS-ALLOW	24	OPG	175	4,200	
12490	WINDOW BLINDS	1,536	SF	9.50	14,592	
E20	**FURNISHINGS**			**DIVISION TOTAL**	**126,909**	**10.56**
F20	**SELECTIVE BUILDING DEMOLITION**					
02007	INTERIOR DEMOLITION/GUT	11,029	SFA	5.00	55,145	
02200	SAWCUT/DEMO SLAB FOR NEW WORK	1	LS	2,500	2,500	
02220	DEMO EXTERIOR WALL/ROOF SKINS	15,120	SF	2.50	37,800	
02820	HAZARDOUS MATERIAL ABATEMENT	1	LS	30,000	30,000	
	ALLOWANCE					
F20	**SELECTIVE BUILDING DEMOLITION**			**DIVISION TOTAL**	**125,445**	**10.44**
Z10	**GENERAL REQUIREMENTS**					
01000	GENERAL CONDITIONS	11	MO	50,000	550,000	
01100	ADDITION AREA	989	SF			
01100	EXISTING BUILDING AREA	11,029	SF			
Z10	**GENERAL REQUIREMENTS**			**DIVISION TOTAL**	**550,000**	**45.76**
				ESTIMATE SUBTOTAL	**3,506,029**	**291.73**

THE ROBINSON COMPANY

PROJECT: EAST PIERCE FIRE AND RESCUE - STATION 113 SITEWORK
LOCATION: SUMNER, WA
BLDG SF:
ESTIMATE: 2018072
EST TYPE: COST MODEL

DIVISION	DESCRIPTION		TOTAL	$/SF
G10	SITE PREPARATION		65,146	
G20	SITE IMPROVEMENTS		81,944	
G30	SITE CIVIL / MECHANICAL UTILITIES		138,233	
G40	SITE ELECTRICAL UTILITIES		15,000	
Z10	GENERAL REQUIREMENTS		100,000	
	ESTIMATE SUBTOTAL		**400,322**	
	DESIGN CONTINGENCY @	10.00%	40,032	
	SUBTOTAL		440,354	
	GENERAL CONTRACTOR'S OH & P @	7.50%	33,027	
	SUBTOTAL		473,381	
	ESCALATION-SEE SUMMARY SHEET TO (0.00%/YR) @			
	TOTAL		**473,381**	

EXCLUSIONS:
SEE ESTIMATE SUMMARY

PROJECT: EAST PIERCE FIRE AND RESCUE - STATION 113 SITEWORK
LOCATION: SUMNER, WA
BLDG SF:
ESTIMATE: 2018072
EST TYPE: COST MODEL

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	$/SF
G10	**SITE PREPARATION**					
02000	CIVIL SUB OVERHEAD & PROFIT	1	LS	7,976	7,976	
	ALLOWANCE PER A/E-ESCALATED					
02000	SITE CLEARING	1	LS	2,304	2,304	
	ALLOWANCE PER A/E-ESCALATED					
02000	SMALL PROJECT CIVIL MARKUP	1	LS	19,940	19,940	
	ALLOWANCE PER A/E-ESCALATED					
02200	SITE PREP	1	LS	5,559	5,559	
	ALLOWANCE PER A/E-ESCALATED					
02200	SITE PREPARATION	1	LS	2,888	2,888	
	ALLOWANCE PER A/E-ESCALATED					
02220	SITE DEMOLITION	1	LS	10,432	10,432	
	ALLOWANCE PER A/E-ESCALATED					
02220	SITE MOBILIZATION	1	LS	4,515	4,515	
	ALLOWANCE PER A/E-ESCALATED					
02300	EARTHWORK	1	LS	5,691	5,691	
	ALLOWANCE PER A/E-ESCALATED					
02370	EROSION CONTROL	1	LS	5,842	5,842	
	ALLOWANCE PER A/E-ESCALATED					
G10	**SITE PREPARATION**			**DIVISION TOTAL**	**65,146**	
G20	**SITE IMPROVEMENTS**					
02760	SITE SURFACING	1	LS	33,021	33,021	
	ALLOWANCE PER A/E-ESCALATED					
02800	MISC SITE IMPROVEMENTS	1	LS	19,200	19,200	
	ALLOWANCE PER A/E-ESCALATED					
02900	LANDSCAPING REPAIR	11,889	SFA	2.50	29,723	
	ALLOWANCE					
G20	**SITE IMPROVEMENTS**			**DIVISION TOTAL**	**81,944**	
G30	**SITE CIVIL / MECHANICAL UTILITIES**					
02530	SANITARY	1	LS	0.00		
	EXISTING					
02630	STORM DRAINAGE	18,431	SFA	7.50	138,233	
G30	**SITE CIVIL / MECHANICAL UTILITIES**			**DIVISION TOTAL**	**138,233**	
G40	**SITE ELECTRICAL UTILITIES**					
16000	GENERATOR/ATS WORK	1	LS	0.00		
	EXCLUDED					
16000	SITE ELECTRICAL	1	LS	15,000	15,000	
G40	**SITE ELECTRICAL UTILITIES**			**DIVISION TOTAL**	**15,000**	

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	$/SF
Z10	**GENERAL REQUIREMENTS**					
01000	GENERAL CONDITIONS	2	MO	50,000	100,000	
Z10	**GENERAL REQUIREMENTS**			**DIVISION TOTAL**	**100,000**	
				ESTIMATE SUBTOTAL	**400,322**	

THE ROBINSON COMPANY

PROJECT: EAST PIERCE FIRE AND RESCUE - NEW STATIONS 114 - 117 AND 124
LOCATION: SUMNER, WA
BLDG SF: 9,400
ESTIMATE: 2018072
EST TYPE: COST MODEL

DIVISION	DESCRIPTION		TOTAL	$/SF
A10	FOUNDATIONS		178,340	18.97
B10	SUPERSTRUCTURE		161,534	17.18
B20	EXTERIOR CLOSURE		753,595	80.17
B30	ROOFING		318,010	33.83
C10	INTERIOR CONSTRUCTION		180,950	19.25
C30	INTERIOR FINISHES		142,650	15.18
D20	PLUMBING		282,000	30.00
D30	HVAC		496,000	52.77
D40	FIRE PROTECTION		56,400	6.00
D50	ELECTRICAL		394,800	42.00
E10	EQUIPMENT		51,850	5.52
E20	FURNISHINGS		114,158	12.14
Z10	GENERAL REQUIREMENTS		500,000	53.19
	ESTIMATE SUBTOTAL		**3,630,287**	**386.20**
	DESIGN CONTINGENCY @	10.00%	363,029	
	SUBTOTAL		3,993,315	
	GENERAL CONTRACTOR'S OH & P @	7.50%	299,499	
	SUBTOTAL		4,292,814	
	ESCALATION-SEE SUMMARY SHEET TO (0.00%/YR) @			
	TOTAL		**4,292,814**	**456.68**

EXCLUSIONS:
SEE ESTIMATE SUMMARY

PROJECT: EAST PIERCE FIRE AND RESCUE - NEW STATIONS 114 - 117 AND 124
LOCATION: SUMNER, WA
BLDG SF: 9,400
ESTIMATE: 2018072
EST TYPE: COST MODEL

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	$/SF
A10	**FOUNDATIONS**					
02315	FOUNDATION EXCAVATION/BACKFILL/HAUL	9,400	SFA	1.25	11,750	
02620	FOOTING DRAINS W/GRAVEL	600	LF	15.00	9,000	
03000	4" SLAB COMPLETE	5,000	SF	5.50	27,500	
03000	8" SLAB @ APPARATUS BAY	4,400	SF	8.35	36,740	
03100	FOUNDATIONS/STEMWALLS @ NEW	9,400	SFA	9.50	89,300	
07210	FOUNDATION PERIMETER INSUL/DAMPPROOFING	1,800	SF	2.25	4,050	
A10	**FOUNDATIONS**			**DIVISION TOTAL**	**178,340**	**18.97**
B10	**SUPERSTRUCTURE**					
06110	MEZZANINE ALLOWANCE	500	SF	25.00	12,500	
06110	ROOF STRUCTURE-WOOD	11,800	SF	12.63	149,034	
B10	**SUPERSTRUCTURE**			**DIVISION TOTAL**	**161,534**	**17.18**
B20	**EXTERIOR CLOSURE**					
06110	EXTERIOR RAINSCREEN WALLS	7,675	SF	16.50	126,638	
06110	EXTERIOR SIDING/FINISH (CMU/METAL/FCB)	7,675	SF	28.53	218,968	
06110	MISC BLOCKING/BACKING/HEADERS/HARDWARE	11,540	SF	0.50	5,770	
07620	ADDITIONAL FRAME AT OPENINGS	3,865	SF	9.00	34,785	
07620	MISC FLASHING/CAULKING	11,540	SF	0.50	5,770	
07700	EXTERIOR SOFFIT FRAME/FINISH-ALLOW	2,400	SF	24.00	57,600	
08110	EXT. H.M. DOOR/FRM/HDWRE-SGL	11	EA	2,500	27,500	
08120	ALUMINUM STOREFRONT DOOR/SIDELITE	2	PR	5,000	10,000	
08360	OVERHEAD SECTIONAL DOORS	5	EA	9,500	47,500	
08410	ALUMINUM WINDOWS/STOREFRONT	2,885	SF	68.00	196,180	
08740	CARD KEY/KEYPAD ACCESS-ALLOW	1	LS	20,000	20,000	
09900	EXT. PAINTING/SEALING	11,540	SFA	0.25	2,885	
B20	**EXTERIOR CLOSURE**			**DIVISION TOTAL**	**753,595**	**80.17**
B30	**ROOFING**					
07410	METAL ROOFING SYSTEM/RIGID INSUL	11,800	SF	24.70	291,460	
07620	FLASHING/GUTTERS/DOWNSPOUTS	11,800	SFA	2.25	26,550	
B30	**ROOFING**			**DIVISION TOTAL**	**318,010**	**33.83**
C10	**INTERIOR CONSTRUCTION**					
06100	INTERIOR WALLS-COMPLETE	9,400	SFA	12.50	117,500	
08110	INTERIOR DOORS/GLAZING	9,400	SFA	4.75	44,650	
10880	MISC SPECIALTIES	9,400	SFA	2.00	18,800	
C10	**INTERIOR CONSTRUCTION**			**DIVISION TOTAL**	**180,950**	**19.25**
C30	**INTERIOR FINISHES**					

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	$/SF
01000	EXPOSED CEILING - NO FINISH	4,400	SF			
09000	WALL FINISHES	9,400	SFA	5.50	51,700	
09250	CEILING FINISHES	5,000	SFA	6.91	34,550	
09610	FLOOR FINISHES	9,400	SFA	6.00	56,400	
C30	**INTERIOR FINISHES**			**DIVISION TOTAL**	**142,650**	**15.18**
D20	**PLUMBING**					
15410	PLUMBING	9,400	SFA	30.00	282,000	
D20	**PLUMBING**			**DIVISION TOTAL**	**282,000**	**30.00**
D30	**HVAC**					
15700	HVAC	9,400	SFA	40.00	376,000	
15700	VEHICLE EXHAUST SYSTEM (3 BAYS)	1	LS	120,000	120,000	
D30	**HVAC**			**DIVISION TOTAL**	**496,000**	**52.77**
D40	**FIRE PROTECTION**					
15300	FIRE PROTECTION	9,400	SFA	6.00	56,400	
D40	**FIRE PROTECTION**			**DIVISION TOTAL**	**56,400**	**6.00**
D50	**ELECTRICAL**					
16000	ELECTRICAL	9,400	SFA	42.00	394,800	
D50	**ELECTRICAL**			**DIVISION TOTAL**	**394,800**	**42.00**
E10	**EQUIPMENT**					
11370	MISC. EQUIPMENT-ALLOW	9,400	SFA	0.25	2,350	
11450	APPLIANCES	1	LS	34,500	34,500	
11500	EXTRACTOR AND BUNKER GEAR DRYER	1	EA	15,000	15,000	
E10	**EQUIPMENT**			**DIVISION TOTAL**	**51,850**	**5.52**
E20	**FURNISHINGS**					
12100	CASEWORK/BUILT-IN FURISHINGS	9,400	SFA	6.50	61,100	
	ALLOW					
12300	SLEEP ROOM DESK, BED/FURNISHINGS					
	EXCLUDED- SEE SOFT COSTS					
12300	SLEEP ROOM LOCKERS	18	EA	1,250	22,500	
12320	FOOD LOCKERS-ALLOW	18	OPG	175	3,150	
12670	BLINDS	2,885	SF	9.50	27,408	
E20	**FURNISHINGS**			**DIVISION TOTAL**	**114,158**	**12.14**
Z10	**GENERAL REQUIREMENTS**					
01000	GENERAL CONDITIONS	10	MO	50,000	500,000	
01100	BUILDING AREA	9,400	SF			
Z10	**GENERAL REQUIREMENTS**			**DIVISION TOTAL**	**500,000**	**53.19**
				ESTIMATE SUBTOTAL	**3,630,287**	**386.20**

THE ROBINSON COMPANY

PROJECT: EAST PIERCE FIRE AND RESCUE - STATION 117 SITEWORK
LOCATION: SUMNER, WA
BLDG SF:
ESTIMATE: 2018072
EST TYPE: COST MODEL

DIVISION	DESCRIPTION		TOTAL	$/SF
G10	SITE PREPARATION		191,097	
G20	SITE IMPROVEMENTS		737,019	
G30	SITE CIVIL / MECHANICAL UTILITIES		217,804	
G40	SITE ELECTRICAL UTILITIES		107,000	
Z10	GENERAL REQUIREMENTS		100,000	
	ESTIMATE SUBTOTAL		**1,352,919**	
	DESIGN CONTINGENCY @	10.00%	135,292	
	SUBTOTAL		1,488,211	
	GENERAL CONTRACTOR'S OH & P @	7.50%	111,616	
	SUBTOTAL		1,599,827	
	ESCALATION-SEE SUMMARY SHEET TO (0.00%/YR) @			
	TOTAL		**1,599,827**	

EXCLUSIONS:
SEE ESTIMATE SUMMARY

PROJECT: EAST PIERCE FIRE AND RESCUE - STATION 117 SITEWORK
LOCATION: SUMNER, WA
BLDG SF:
ESTIMATE: 2018072
EST TYPE: COST MODEL

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	$/SF
G10	**SITE PREPARATION**					
02000	CIVIL MOBILIZATION	1	LS	30,071	30,071	
	ALLOWANCE PER A/E-ESCALATED					
02000	STAKING	1	LS	20,104	20,104	
	ALLOWANCE PER A/E-ESCALATED					
02220	SITE DEMOLITION-ALLOW	109,990	SFA	0.15	16,499	
	ALLOWANCE PER A/E-ESCALATED					
02230	SITE AREA (3 AC)	131,500	SFA			
02300	EARTHWORK/STRIP	1	LS	109,408	109,408	
	ALLOWANCE PER A/E-ESCALATED					
02370	EROSION CONTROL	1	EA	15,016	15,016	
	ALLOWANCE PER A/E-ESCALATED					
G10	**SITE PREPARATION**			**DIVISION TOTAL**	**191,097**	
G20	**SITE IMPROVEMENTS**					
02740	ASPHALT PAVING/BASE	6,035	SY	28.00	168,980	
02750	NEW CONCRETE DRIVE APRON	10,000	SF	14.00	140,000	
02760	PAVEMENT MARKINGS	1	LS	456	456	
	ALLOWANCE PER A/E-ESCALATED					
02770	CONCRETE PAVING/CURBS/WALKS	1	LS	33,883	33,883	
	ALLOWANCE PER A/E-ESCALATED					
02820	STEEL FENCE	628	LF	125	78,500	
02820	STEEL GATE	2	EA	3,500	7,000	
02900	LANDSCAPING-ALLOW	42,800	SFA	6.50	278,200	
02960	SITE FURNISHINGS-ALLOW	1	LS	15,000	15,000	
02960	SITE SIGN/BASE	1	LS	15,000	15,000	
G20	**SITE IMPROVEMENTS**			**DIVISION TOTAL**	**737,019**	
G30	**SITE CIVIL / MECHANICAL UTILITIES**					
02510	WATER SYSTEM	1	LS	113,294	113,294	
	ALLOWANCE PER A/E-ESCALATED					
02530	SANITARY SEWER SYSTEM	1	LS	21,993	21,993	
	ALLOWANCE PER A/E-ESCALATED					
02630	STORM DRAINAGE SYSTEM	1	LS	82,516	82,516	
	ALLOWANCE PER A/E-ESCALATED					
G30	**SITE CIVIL / MECHANICAL UTILITIES**			**DIVISION TOTAL**	**217,804**	
G40	**SITE ELECTRICAL UTILITIES**					
16000	GENERATOR & ATS	1	LS	75,000	75,000	
16000	SITE ELECTRICAL/LIGHTING	1	LS	32,000	32,000	
	ALLOWANCE PER A/E-ESCALATED					
G40	**SITE ELECTRICAL UTILITIES**			**DIVISION TOTAL**	**107,000**	

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	$/SF
Z10	**GENERAL REQUIREMENTS**					
01000	GENERAL CONDITIONS	2	MO	50,000	100,000	
Z10	**GENERAL REQUIREMENTS**			**DIVISION TOTAL**	**100,000**	
				ESTIMATE SUBTOTAL	**1,352,919**	

THE ROBINSON COMPANY

PROJECT: EAST PIERCE FIRE AND RESCUE - STATION 115 BUILDING RENOVATION
LOCATION: SUMNER, WA
BLDG SF: 8,147
ESTIMATE: 2018072
EST TYPE: COST MODEL

DIVISION	DESCRIPTION		TOTAL	$/SF
A10	FOUNDATIONS		82,672	10.15
B10	SUPERSTRUCTURE		83,428	10.24
B20	EXTERIOR CLOSURE		636,476	78.12
B30	ROOFING		277,262	34.03
C10	INTERIOR CONSTRUCTION		215,628	26.47
C30	INTERIOR FINISHES		125,241	15.37
D20	PLUMBING		244,410	30.00
D30	HVAC		325,880	40.00
D40	FIRE PROTECTION		48,882	6.00
D50	ELECTRICAL		285,145	35.00
E10	EQUIPMENT		27,037	3.32
E20	FURNISHINGS		96,789	11.88
F20	SELECTIVE BUILDING DEMOLITION		99,458	12.21
Z10	GENERAL REQUIREMENTS		500,000	61.37
	ESTIMATE SUBTOTAL		**3,048,306**	**374.16**
	DESIGN CONTINGENCY @	10.00%	304,831	
	SUBTOTAL		3,353,137	
	GENERAL CONTRACTOR'S OH & P @	7.50%	251,485	
	SUBTOTAL		3,604,622	
	ESCALATION-SEE SUMMARY SHEET TO (0.00%/YR) @			
	TOTAL		**3,604,622**	**442.45**

EXCLUSIONS:
SEE ESTIMATE SUMMARY

PROJECT: EAST PIERCE FIRE AND RESCUE - STATION 115 BUILDING RENOVATION
LOCATION: SUMNER, WA
BLDG SF: 8,147
ESTIMATE: 2018072
EST TYPE: COST MODEL

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	$/SF
A10	**FOUNDATIONS**					
02315	FOUNDATION EXCAVATION/BACKFILL/HAUL	2,297	SFA	1.50	3,446	
02620	FOOTING DRAINS W/GRAVEL	234	LF	15.00	3,510	
03000	4" SLAB COMPLETE	2,297	SF	6.55	15,045	
03000	SHEAR FOOTINGS/FDTNS @ EXST'G	130	LF	150	19,500	
03100	FOUNDATIONS/STEMWALLS @ NEW	234	LF	120	28,080	
03310	MISC SLAB INFILLS/PATCH/REPAIR	585	SF	10.00	5,850	
03510	TIE TO EXST'G FOUNDATION	62	LF	80.00	4,960	
07210	FOUNDATION PERIMETER INSUL/DAMPPROOFING	702	SF	3.25	2,282	
A10	**FOUNDATIONS**			**DIVISION TOTAL**	**82,672**	**10.15**
B10	**SUPERSTRUCTURE**					
05200	ROOF STRUCTURE-TJ'S/PLY/BLOCKING	2,405	SFA	15.00	36,075	
06000	SEISMIC UPGRADES/BLOCKING @ EXST'G	5,847	SFA	7.50	43,853	
06140	ROOF OVERFRAME/TIE-IN	350	SF	10.00	3,500	
B10	**SUPERSTRUCTURE**			**DIVISION TOTAL**	**83,428**	**10.24**
B20	**EXTERIOR CLOSURE**					
03310	SHOTCRETE CONC WALL TO EXST'G	1,794	SF	35.00	62,790	
07620	MISC FLASHING/CAULKING	9,574	SF	1.25	11,968	
07700	EXTERIOR SOFFIT FRAME/FINISH-ALLOW	2,144	SF	9.50	20,368	
08110	EXT. H.M. DOOR/FRM/HDWRE	15	LVS	2,500	37,500	
08350	APP BAY OVERHEAD DOORS-INSULATED/GLAZED	5	EA	9,500	47,500	
08520	EXTERIOR WINDOWS - NEW AND REPLACE	1,914	SF	68.00	130,152	
08740	CARD KEY/KEYPAD ACCESS-ALLOW	1	LS	20,000	20,000	
09000	ADDTN'L FRAME AT OPENINGS	2,895	SFA	9.00	26,055	
09000	EXTERIOR RAINSCREEN WALLS AT ADDITION	3,276	SF	16.40	53,726	
09000	EXTERIOR SIDING/FINISH	3,276	SF	28.53	93,464	
09000	EXTERIOR WALL UPGRADES/SIDING/FINISH @ EXISTING	6,298	SF	18.45	116,198	
09900	EXT. PAINTING/SEALING	9,574	SF	1.75	16,755	
B20	**EXTERIOR CLOSURE**			**DIVISION TOTAL**	**636,476**	**78.12**
B30	**ROOFING**					
07410	METAL ROOFING SYSTEM/RIGID INSUL	10,288	SF	24.70	254,114	
07620	FLASHING/GUTTERS/DOWNSPOUTS	10,288	SFA	2.25	23,148	
B30	**ROOFING**			**DIVISION TOTAL**	**277,262**	**34.03**
C10	**INTERIOR CONSTRUCTION**					
06000	FURR INTERIOR SHOTCRETE WALLS	1,794	SF	9.50	17,043	
06110	INTERIOR PARTITIONS - COMPLETE	8,590	SF	12.60	108,234	
06160	MISC BACKING/BLOCKING/HEADERS	8,147	SFA	1.25	10,184	
06160	SHEAR WALL INT PLY SHEATHING/BLOCKING	240	SF	2.50	600	

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	$/SF
08110	INT. DOOR/FRM/HDWRE-SGL	22	LVS	1,700	37,400	
08710	MISC DOOR HDWRE/GLAZING/RATINGS	1	LS	5,000	5,000	
	ALLOW					
10000	MISC SPECIALTIES	8,147	SFA	2.50	20,368	
10400	BUILDING SIGNAGE-ALLOW	1	LS	12,000	12,000	
10810	TOILET ROOM ACCESSORIES	4	EA	1,200	4,800	
C10	**INTERIOR CONSTRUCTION**			**DIVISION TOTAL**	**215,628**	**26.47**
C30	**INTERIOR FINISHES**					
01000	EXPOSED CEILING - NO FINISH	3,514	SF			
09000	WALL FINISHES	8,147	SFA	5.50	44,809	
09250	CEILING FINISHES	4,633	SFA	6.81	31,551	
09610	FLOOR FINISHES	8,147	SFA	6.00	48,882	
C30	**INTERIOR FINISHES**			**DIVISION TOTAL**	**125,241**	**15.37**
D20	**PLUMBING**					
15410	PLUMBING	8,147	SFA	30.00	244,410	
D20	**PLUMBING**			**DIVISION TOTAL**	**244,410**	**30.00**
D30	**HVAC**					
15700	HVAC	8,147	SFA	40.00	325,880	
15700	VEHICLE EXHAUST SYSTEM-EXCLUDED REUSE EXISTING	1	LS			
D30	**HVAC**			**DIVISION TOTAL**	**325,880**	**40.00**
D40	**FIRE PROTECTION**					
15300	FIRE PROTECTION	8,147	SFA	6.00	48,882	
	ALLOWANCE PER A/E-ESCALATED					
D40	**FIRE PROTECTION**			**DIVISION TOTAL**	**48,882**	**6.00**
D50	**ELECTRICAL**					
16000	ELECTRICAL	8,147	SFA	35.00	285,145	
D50	**ELECTRICAL**			**DIVISION TOTAL**	**285,145**	**35.00**
E10	**EQUIPMENT**					
11370	MISC. EQUIPMENT-ALLOW	8,147	SFA	0.25	2,037	
11400	APPLIANCES	1	LS	25,000	25,000	
E10	**EQUIPMENT**			**DIVISION TOTAL**	**27,037**	**3.32**
E20	**FURNISHINGS**					
12100	CASEWORK/BUILT-IN FURISHINGS	8,147	SFA	6.50	52,956	
	ALLOW					
12300	SLEEP ROOM DESK, BED/FURNISHINGS					
	EXCLUDED- SEE SOFT COSTS					
12300	SLEEP ROOM LOCKERS	18	EA	1,250	22,500	
12320	FOOD LOCKERS-ALLOW	18	OPG	175	3,150	
12490	WINDOW BLINDS	1,914	SF	9.50	18,183	

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	$/SF
E20	**FURNISHINGS**			**DIVISION TOTAL**	**96,789**	**11.88**
F20	**SELECTIVE BUILDING DEMOLITION**					
02007	INTERIOR DEMOLITION/GUT	5,847	SFA	5.00	29,235	
02200	SAWCUT/DEMO SLAB FOR NEW WORK	1	LS	2,500	2,500	
02220	DEMO EXTERIOR WALL/ROOF SKINS	15,089	SF	2.50	37,723	
02820	HAZARDOUS MATERIAL ABATEMENT	1	LS	30,000	30,000	
	ALLOWANCE					
F20	**SELECTIVE BUILDING DEMOLITION**			**DIVISION TOTAL**	**99,458**	**12.21**
Z10	**GENERAL REQUIREMENTS**					
01000	GENERAL CONDITIONS	10	MO	50,000	500,000	
01100	BUILDING AREA	8,147	SF			
Z10	**GENERAL REQUIREMENTS**			**DIVISION TOTAL**	**500,000**	**61.37**
				ESTIMATE SUBTOTAL	**3,048,306**	**374.16**

THE ROBINSON COMPANY

PROJECT: EAST PIERCE FIRE AND RESCUE - STATION 115 SITEWORK
LOCATION: SUMNER, WA
BLDG SF:
ESTIMATE: 2018072
EST TYPE: COST MODEL

DIVISION	DESCRIPTION		TOTAL	$/SF
G10	SITE PREPARATION		160,110	
G20	SITE IMPROVEMENTS		80,462	
G30	SITE CIVIL / MECHANICAL UTILITIES		170,605	
G40	SITE ELECTRICAL UTILITIES		34,320	
Z10	GENERAL REQUIREMENTS		100,000	
	ESTIMATE SUBTOTAL		**545,497**	
	DESIGN CONTINGENCY @	10.00%	54,550	
	SUBTOTAL		600,046	
	GENERAL CONTRACTOR'S OH & P @	7.50%	45,003	
	SUBTOTAL		645,050	
	ESCALATION-SEE SUMMARY SHEET TO (0.00%/YR) @			
	TOTAL		**645,050**	

EXCLUSIONS:
SEE ESTIMATE SUMMARY

PROJECT: EAST PIERCE FIRE AND RESCUE - STATION 115 SITEWORK
LOCATION: SUMNER, WA
BLDG SF:
ESTIMATE: 2018072
EST TYPE: COST MODEL

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	$/SF
G10	**SITE PREPARATION**					
02000	CIVIL SUB OVERHEAD & PROFIT	1	LS	26,588	26,588	
	ALLOWANCE PER A/E-ESCALATED					
02000	SITE CLEARING	1	LS	2,500	2,500	
	ALLOWANCE PER A/E-ESCALATED					
02000	SMALL PROJECT CIVIL MARKUP	1	LS	66,469	66,469	
	ALLOWANCE PER A/E-ESCALATED					
02200	SITE PREP	1	LS	5,270	5,270	
	ALLOWANCE PER A/E-ESCALATED					
02220	SITE DEMOLITION	1	LS	35,360	35,360	
	ALLOWANCE PER A/E-ESCALATED					
02220	SITE MOBILIZATION	1	LS	15,050	15,050	
	ALLOWANCE PER A/E-ESCALATED					
02300	EARTHWORK	1	LS	4,031	4,031	
	ALLOWANCE PER A/E-ESCALATED					
02370	EROSION CONTROL	1	LS	4,842	4,842	
	ALLOWANCE PER A/E-ESCALATED					
G10	**SITE PREPARATION**			**DIVISION TOTAL**	**160,110**	
G20	**SITE IMPROVEMENTS**					
02760	SITE SURFACING	1	LS	28,762	28,762	
	ALLOWANCE PER A/E-ESCALATED					
02800	MISC SITE IMPROVEMENTS	1	LS	19,200	19,200	
	ALLOWANCE PER A/E-ESCALATED					
02900	LANDSCAPING	5,000	SF	6.50	32,500	
	ALLOWANCE					
G20	**SITE IMPROVEMENTS**			**DIVISION TOTAL**	**80,462**	
G30	**SITE CIVIL / MECHANICAL UTILITIES**					
02510	WATER SYSTEM	1	LS	49,440	49,440	
	ALLOWANCE PER A/E-ESCALATED					
02530	SANITARY - SEPTIC SYSTEM UPGRADES/NEW	1	LS	61,375	61,375	
	ALLOWANCE PER A/E-ESCALATED					
02630	STORM DRAINAGE	1	LS	59,790	59,790	
	ALLOWANCE PER A/E-ESCALATED					
G30	**SITE CIVIL / MECHANICAL UTILITIES**			**DIVISION TOTAL**	**170,605**	
G40	**SITE ELECTRICAL UTILITIES**					
16000	RELOCATE EXISTING GENERATOR	1	LS	10,000	10,000	
	ALLOWANCE PER A/E-ESCALATED					
16000	SITE ELECTRICAL	1	LS	24,320	24,320	
	ALLOWANCE PER A/E-ESCALATED					
G40	**SITE ELECTRICAL UTILITIES**			**DIVISION TOTAL**	**34,320**	

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	$/SF
Z10	**GENERAL REQUIREMENTS**					
01000	GENERAL CONDITIONS	2	MO	50,000	100,000	
Z10	**GENERAL REQUIREMENTS**			**DIVISION TOTAL**	**100,000**	
				ESTIMATE SUBTOTAL	**545,497**	

THE ROBINSON COMPANY

PROJECT: EAST PIERCE FIRE AND RESCUE - STATON 116 BUILDING RENOVATION
LOCATION: SUMNER, WA
BLDG SF: 13,927
ESTIMATE: 2018072
EST TYPE: COST MODEL

DIVISION	DESCRIPTION		TOTAL	$/SF
A10	FOUNDATIONS		146,656	10.53
B10	SUPERSTRUCTURE		194,745	13.98
B20	EXTERIOR CLOSURE		839,532	60.28
B30	ROOFING		443,947	31.88
C10	INTERIOR CONSTRUCTION		291,723	20.95
C30	INTERIOR FINISHES		210,008	15.08
D20	PLUMBING		417,810	30.00
D30	HVAC		597,080	42.87
D40	FIRE PROTECTION		83,562	6.00
D50	ELECTRICAL		487,445	35.00
E10	EQUIPMENT		28,482	2.05
E20	FURNISHINGS		152,466	10.95
F20	SELECTIVE BUILDING DEMOLITION		113,655	8.16
Z10	GENERAL REQUIREMENTS		550,000	39.49
	ESTIMATE SUBTOTAL		**4,557,110**	**327.21**
	DESIGN CONTINGENCY @	10.00%	455,711	
	SUBTOTAL		5,012,821	
	GENERAL CONTRACTOR'S OH & P @	7.50%	375,962	
	SUBTOTAL		5,388,783	
	ESCALATION-SEE SUMMARY SHEET TO (0.00%/YR) @			
	TOTAL		**5,388,783**	**386.93**

EXCLUSIONS:
SEE ESTIMATE SUMMARY

PROJECT: EAST PIERCE FIRE AND RESCUE - STATON 116 BUILDING RENOVATION
LOCATION: SUMNER, WA
BLDG SF: 13,927
ESTIMATE: 2018072
EST TYPE: COST MODEL

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	$/SF
A10	**FOUNDATIONS**					
02315	FOUNDATION EXCAVATION/BACKFILL/HAUL	5,267	SFA	1.50	7,901	
02620	FOOTING DRAINS W/GRAVEL	372	LF	15.00	5,580	
03000	4" SLAB COMPLETE	3,267	SF	6.55	21,399	
03000	SHEAR FOOTINGS/FDTNS @ EXST'G	143	LF	150	21,450	
03100	FOUNDATIONS/STEMWALLS @ NEW	372	LF	120	44,640	
03310	8" SLAB ON GRADE W/REBAR	2,000	SF	9.50	19,000	
03310	MISC SLAB INFILLS/PATCH/REPAIR	866	SFA	10.00	8,660	
03510	TIE TO EXST'G FOUNDATION	180	LF	80.00	14,400	
07210	FOUNDATION PERIMETER INSUL/DAMPPROOFING	1,116	SF	3.25	3,627	
A10	**FOUNDATIONS**			**DIVISION TOTAL**	**146,656**	**10.53**
B10	**SUPERSTRUCTURE**					
06000	SEISMIC/STRUCTURAL UPGRADES AT ROOF	9,380	SFA	7.50	70,350	
06110	ROOF STRUCTURE-TJ'S/PLY/BLOCKING	7,093	SFA	15.00	106,395	
06140	ROOF OVERFRAME/TIE-IN	1,800	SFA	10.00	18,000	
B10	**SUPERSTRUCTURE**			**DIVISION TOTAL**	**194,745**	**13.98**
B20	**EXTERIOR CLOSURE**					
03370	SHOTCRETE WALLS TO EXISTING	2,040	SF	35.00	71,400	
07620	MISC FLASHING/CAULKING	12,350	SFA	1.25	15,438	
07700	EXTERIOR SOFFIT FRAME/FINISH-ALLOW	2,480	SF	9.50	23,560	
08110	EXT. H.M. DOOR/FRM/HDWRE	9	LVS	2,500	22,500	
08350	APP BAY OVERHEAD DOORS-INSULATED/GLAZED	6	EA	9,500	57,000	
08410	ALUMINUM WINDOWS/STOREFRONT-ALLOW 20% EXT	2,470	SF	68.00	167,960	
08740	CARD KEY/KEYPAD ACCESS-ALLOW	1	LS	20,000	20,000	
09000	ADDTN'L FRAME AT OPENINGS	3,646	SFA	9.00	32,814	
09000	EXTERIOR RAINSCREEN WALLS AT ADDITION	6,588	SF	16.40	108,043	
09000	EXTERIOR SIDING/FINISH	6,588	SF	28.53	187,956	
09000	EXTERIOR WALL UPGRADES/SIDING/FINISH @ EXISTING	5,762	SF	18.45	106,309	
09900	EXT. PAINTING/SEALING	12,350	SF	2.15	26,553	
B20	**EXTERIOR CLOSURE**			**DIVISION TOTAL**	**839,532**	**60.28**
B30	**ROOFING**					
07410	METAL ROOFING SYSTEM/RIGID INSUL	16,473	SF	24.70	406,883	
07620	FLASHING/GUTTERS/DOWNSPOUTS	16,473	SFA	2.25	37,064	
B30	**ROOFING**			**DIVISION TOTAL**	**443,947**	**31.88**
C10	**INTERIOR CONSTRUCTION**					
06110	INTERIOR PARTITIONS - COMPLETE	13,927	SFA	11.35	158,071	
06160	MISC BACKING/BLOCKING/HEADERS	13,927	SFA	1.25	17,409	
06160	SHEAR WALL INT PLY SHEATHING/BLOCKING	650	SF	2.50	1,625	

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	$/SF
08110	INT. DOOR/FRM/HDWRE-SGL	32	LVS	1,700	54,400	
08710	MISC DOOR HDWRE/GLAZING/RATINGS	1	LS	5,000	5,000	
	ALLOW					
10000	MISC SPECIALTIES	13,927	SFA	2.50	34,818	
10400	BUILDING SIGNAGE-ALLOW	1	LS	12,000	12,000	
10810	TOILET ROOM ACCESSORIES	7	EA	1,200	8,400	
C10	**INTERIOR CONSTRUCTION**			**DIVISION TOTAL**	**291,723**	**20.95**
C30	**INTERIOR FINISHES**					
01000	EXPOSED CEILING - NO FINISH	6,765	SF			
09000	WALL FINISHES	13,927	SFA	5.50	76,599	
09250	CEILING FINISHES	7,162	SFA	6.96	49,848	
09610	FLOOR FINISHES	13,927	SFA	6.00	83,562	
C30	**INTERIOR FINISHES**			**DIVISION TOTAL**	**210,008**	**15.08**
D20	**PLUMBING**					
15410	PLUMBING AND TRENCH DRAIN UPGRADES	13,927	SFA	30.00	417,810	
D20	**PLUMBING**			**DIVISION TOTAL**	**417,810**	**30.00**
D30	**HVAC**					
15700	HVAC	13,927	SFA	40.00	557,080	
15700	VEHICLE EXHAUST SYSTEM-EXISTING SYSTEM MODIFIY	1	LS	40,000	40,000	
D30	**HVAC**			**DIVISION TOTAL**	**597,080**	**42.87**
D40	**FIRE PROTECTION**					
15300	FIRE PROTECTION	13,927	SFA	6.00	83,562	
D40	**FIRE PROTECTION**			**DIVISION TOTAL**	**83,562**	**6.00**
D50	**ELECTRICAL**					
16000	ELECTRICAL	13,927	SFA	35.00	487,445	
D50	**ELECTRICAL**			**DIVISION TOTAL**	**487,445**	**35.00**
E10	**EQUIPMENT**					
11370	MISC. EQUIPMENT-ALLOW	13,927	SFA	0.25	3,482	
11400	APPLIANCES	1	LS	25,000	25,000	
E10	**EQUIPMENT**			**DIVISION TOTAL**	**28,482**	**2.05**
E20	**FURNISHINGS**					
12100	CASEWORK/BUILT-IN FURISHINGS	13,927	SFA	6.50	90,526	
	ALLOW					
12300	SLEEP ROOM DESK, BED/FURNISHINGS					
	EXCLUDED- SEE SOFT COSTS					
12300	SLEEP ROOM LOCKERS	27	EA	1,250	33,750	
12320	FOOD LOCKERS-ALLOW	27	OPG	175	4,725	
12490	WINDOW BLINDS	2,470	SF	9.50	23,465	
E20	**FURNISHINGS**			**DIVISION TOTAL**	**152,466**	**10.95**

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	$/SF
F20	**SELECTIVE BUILDING DEMOLITION**					
02007	INTERIOR DEMOLITION/GUT	8,660	SFA	5.00	43,300	
02200	SAWCUT/DEMO SLAB FOR NEW WORK	1	LS	2,500	2,500	
02220	DEMO EXTERIOR WALL/ROOF SKINS	15,142	SF	2.50	37,855	
02820	HAZARDOUS MATERIAL ABATEMENT	1	LS	30,000	30,000	
	ALLOWANCE					
F20	**SELECTIVE BUILDING DEMOLITION**			**DIVISION TOTAL**	**113,655**	**8.16**
Z10	**GENERAL REQUIREMENTS**					
01000	GENERAL CONDITIONS	11	MO	50,000	550,000	
01100	ADDITION AREA	5,267	SF			
01100	EXISTING BUILDING AREA	8,660	SF			
Z10	**GENERAL REQUIREMENTS**			**DIVISION TOTAL**	**550,000**	**39.49**
				ESTIMATE SUBTOTAL	**4,557,110**	**327.21**

THE ROBINSON COMPANY

PROJECT: EAST PIERCE FIRE AND RESCUE - STATION 116 SITEWORK
LOCATION: SUMNER, WA
BLDG SF:
ESTIMATE: 2018072
EST TYPE: COST MODEL

DIVISION	DESCRIPTION		TOTAL	$/SF
G10	SITE PREPARATION		97,773	
G20	SITE IMPROVEMENTS		73,030	
G30	SITE CIVIL / MECHANICAL UTILITIES		168,641	
G40	SITE ELECTRICAL UTILITIES		43,320	
Z10	GENERAL REQUIREMENTS		100,000	
	ESTIMATE SUBTOTAL		**482,764**	
	DESIGN CONTINGENCY @	10.00%	48,276	
	SUBTOTAL		531,040	
	GENERAL CONTRACTOR'S OH & P @	7.50%	39,828	
	SUBTOTAL		570,868	
	ESCALATION-SEE SUMMARY SHEET TO (0.00%/YR) @			
	TOTAL		**570,868**	

EXCLUSIONS:
SEE ESTIMATE SUMMARY

PROJECT: EAST PIERCE FIRE AND RESCUE - STATION 116 SITEWORK
LOCATION: SUMNER, WA
BLDG SF:
ESTIMATE: 2018072
EST TYPE: COST MODEL

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	$/SF
G10	**SITE PREPARATION**					
02000	CIVIL SUB OVERHEAD & PROFIT	1	LS	25,422	25,422	
	ALLOWANCE PER A/E-ESCALATED					
02000	SITE CLEARING (1.6 AC)	1	LS	1,500	1,500	
02200	SITE PREP	1	LS	6,921	6,921	
	ALLOWANCE PER A/E-ESCALATED					
02220	SITE DEMOLITION	1	LS	28,320	28,320	
	ALLOWANCE PER A/E-ESCALATED					
02220	SITE MOBILIZATION	1	LS	14,390	14,390	
	ALLOWANCE PER A/E-ESCALATED					
02300	EARTHWORK	5,288	SFA	2.50	13,220	
02370	EROSION CONTROL	1	LS	8,000	8,000	
G10	**SITE PREPARATION**			**DIVISION TOTAL**	**97,773**	
G20	**SITE IMPROVEMENTS**					
02760	SITE SURFACING	1	LS	25,530	25,530	
	ALLOWANCE PER A/E-ESCALATED					
02800	MISC SITE IMPROVEMENTS	1	LS	15,000	15,000	
	ALLOWANCE PER A/E					
02900	LANDSCAPING	5,000	SF	6.50	32,500	
	ALLOWANCE					
G20	**SITE IMPROVEMENTS**			**DIVISION TOTAL**	**73,030**	
G30	**SITE CIVIL / MECHANICAL UTILITIES**					
02510	WATER SYSTEM	1	LS	49,440	49,440	
	ALLOWANCE PER A/E-ESCALATED					
02530	SANITARY - SEPTIC SYSTEM	1	LS	66,085	66,085	
	ALLOWANCE PER A/E-ESCALATED					
02630	STORM DRAINAGE	1	LS	53,116	53,116	
	ALLOWANCE PER A/E-ESCALATED					
G30	**SITE CIVIL / MECHANICAL UTILITIES**			**DIVISION TOTAL**	**168,641**	
G40	**SITE ELECTRICAL UTILITIES**					
16000	EMERGENCY GENERATOR	1	LS	24,320	24,320	
16000	SITE ELECTRICAL	1	LS	19,000	19,000	
	ALLOWANCE PER A/E-ESCALATED					
G40	**SITE ELECTRICAL UTILITIES**			**DIVISION TOTAL**	**43,320**	
Z10	**GENERAL REQUIREMENTS**					
01000	GENERAL CONDITIONS	2	MO	50,000	100,000	
Z10	**GENERAL REQUIREMENTS**			**DIVISION TOTAL**	**100,000**	

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	$/SF
				ESTIMATE SUBTOTAL	482,764	

THE ROBINSON COMPANY

PROJECT: EAST PIERCE FIRE AND RESCUE - STATION 118 NEW BUILDING
LOCATION: SUMNER, WA
BLDG SF: 16,873
ESTIMATE: 2018072
EST TYPE: COST MODEL

DIVISION	DESCRIPTION		TOTAL	$/SF
A10	FOUNDATIONS		308,428	18.28
B10	SUPERSTRUCTURE		276,223	16.37
B20	EXTERIOR CLOSURE		875,689	51.90
B30	ROOFING		536,062	31.77
C10	INTERIOR CONSTRUCTION		324,805	19.25
C30	INTERIOR FINISHES		265,132	15.71
D20	PLUMBING		438,698	26.00
D30	HVAC		774,301	45.89
D40	FIRE PROTECTION		101,238	6.00
D50	ELECTRICAL		674,920	40.00
E10	EQUIPMENT		53,718	3.18
E20	FURNISHINGS		194,230	11.51
Z10	GENERAL REQUIREMENTS		650,000	38.52
	ESTIMATE SUBTOTAL		**5,473,446**	**324.39**
	DESIGN CONTINGENCY @	10.00%	547,345	
	SUBTOTAL		6,020,791	
	GENERAL CONTRACTOR'S OH & P @	7.50%	451,559	
	SUBTOTAL		6,472,350	
	ESCALATION-SEE SUMMARY SHEET TO (0.00%/YR) @			
	TOTAL		**6,472,350**	**383.59**

EXCLUSIONS:
SEE ESTIMATE SUMMARY

PROJECT: EAST PIERCE FIRE AND RESCUE - STATION 118 NEW BUILDING
LOCATION: SUMNER, WA
BLDG SF: 16,873
ESTIMATE: 2018072
EST TYPE: COST MODEL

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	$/SF
A10	**FOUNDATIONS**					
02315	FOUNDATION EXCAVATION/BACKFILL/HAUL	16,873	SFA	1.25	21,091	
02620	FOOTING DRAINS W/GRAVEL	777	LF	15.00	11,655	
03000	4" SLAB COMPLETE	10,788	SF	5.50	59,334	
03000	8" SLAB @ APPARATUS BAY	6,085	SF	8.35	50,810	
03100	FOUNDATIONS/STEMWALLS @ NEW	16,873	SFA	9.50	160,294	
07210	FOUNDATION PERIMETER INSUL/DAMPPROOFING	2,331	SF	2.25	5,245	
A10	**FOUNDATIONS**			**DIVISION TOTAL**	**308,428**	**18.28**
B10	**SUPERSTRUCTURE**					
06110	MEZZANINE ALLOWANCE	1,000	SF	25.00	25,000	
06110	ROOF STRUCTURE-WOOD	19,891	SF	12.63	251,223	
B10	**SUPERSTRUCTURE**			**DIVISION TOTAL**	**276,223**	**16.37**
B20	**EXTERIOR CLOSURE**					
06110	EXTERIOR RAINSCREEN WALLS	8,933	SF	16.50	147,395	
06110	EXTERIOR SIDING/FINISH (CMU/METAL/FCB)	8,933	SF	28.53	254,858	
06110	MISC BLOCKING/BACKING/HEADERS/HARDWARE	13,478	SF	0.50	6,739	
07620	ADDITIONAL FRAME AT OPENINGS	4,545	SF	9.00	40,905	
07620	MISC FLASHING/CAULKING	13,478	SF	0.50	6,739	
07700	EXTERIOR SOFFIT FRAME/FINISH-ALLOW	3,108	SF	24.00	74,592	
08110	EXT. H.M. DOOR/FRM/HDWRE-SGL	8	EA	2,500	20,000	
08120	ALUMINUM STOREFRONT DOOR/SIDELITE	2	PR	5,000	10,000	
08360	OVERHEAD SECTIONAL DOORS	6	EA	9,500	57,000	
08410	ALUMINUM WINDOWS/STOREFRONT	3,369	SF	68.00	229,092	
08740	CARD KEY/KEYPAD ACCESS-ALLOW	1	LS	20,000	20,000	
09900	EXT. PAINTING/SEALING	33,478	SFA	0.25	8,370	
B20	**EXTERIOR CLOSURE**			**DIVISION TOTAL**	**875,689**	**51.90**
B30	**ROOFING**					
07410	METAL ROOFING SYSTEM/RIGID INSUL	19,891	SF	24.70	491,308	
07620	FLASHING/GUTTERS/DOWNSPOUTS	19,891	SFA	2.25	44,755	
B30	**ROOFING**			**DIVISION TOTAL**	**536,062**	**31.77**
C10	**INTERIOR CONSTRUCTION**					
06100	INTERIOR WALLS-COMPLETE	16,873	SFA	12.50	210,913	
08110	INTERIOR DOORS/GLAZING	16,873	SFA	4.75	80,147	
10880	MISC SPECIALTIES	16,873	SFA	2.00	33,746	
C10	**INTERIOR CONSTRUCTION**			**DIVISION TOTAL**	**324,805**	**19.25**
C30	**INTERIOR FINISHES**					

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	$/SF
01000	EXPOSED CEILING - NO FINISH	6,085	SF			
09000	WALL FINISHES	16,873	SFA	5.50	92,802	
09250	CEILING FINISHES	10,788	SFA	6.59	71,093	
09610	FLOOR FINISHES	16,873	SFA	6.00	101,238	
C30	**INTERIOR FINISHES**			**DIVISION TOTAL**	**265,132**	**15.71**
D20	**PLUMBING**					
15410	PLUMBING	16,873	SFA	26.00	438,698	
D20	**PLUMBING**			**DIVISION TOTAL**	**438,698**	**26.00**
D30	**HVAC**					
15700	HVAC	16,873	SFA	37.00	624,301	
15700	VEHICLE EXHAUST SYSTEM (4 BAYS)	1	LS	150,000	150,000	
D30	**HVAC**			**DIVISION TOTAL**	**774,301**	**45.89**
D40	**FIRE PROTECTION**					
15300	FIRE PROTECTION	16,873	SFA	6.00	101,238	
D40	**FIRE PROTECTION**			**DIVISION TOTAL**	**101,238**	**6.00**
D50	**ELECTRICAL**					
16000	ELECTRICAL	16,873	SFA	40.00	674,920	
D50	**ELECTRICAL**			**DIVISION TOTAL**	**674,920**	**40.00**
E10	**EQUIPMENT**					
11370	MISC. EQUIPMENT-ALLOW	16,873	SFA	0.25	4,218	
11450	APPLIANCES	1	LS	34,500	34,500	
11500	EXTRACTOR AND BUNKER GEAR DRYER	1	EA	15,000	15,000	
E10	**EQUIPMENT**			**DIVISION TOTAL**	**53,718**	**3.18**
E20	**FURNISHINGS**					
12100	CASEWORK/BUILT-IN FURISHINGS	16,873	SFA	6.50	109,675	
	ALLOW					
12300	SLEEP ROOM DESK, BED/FURNISHINGS					
	EXCLUDED- SEE SOFT COSTS					
12300	SLEEP ROOM LOCKERS	37	EA	1,250	46,250	
12320	FOOD LOCKERS-ALLOW	36	OPG	175	6,300	
12670	BLINDS	3,369	SF	9.50	32,006	
E20	**FURNISHINGS**			**DIVISION TOTAL**	**194,230**	**11.51**
Z10	**GENERAL REQUIREMENTS**					
01000	GENERAL CONDITIONS	13	MO	50,000	650,000	
01100	BUILDING AREA	16,873	SF			
Z10	**GENERAL REQUIREMENTS**			**DIVISION TOTAL**	**650,000**	**38.52**
				ESTIMATE SUBTOTAL	**5,473,446**	**324.39**

THE ROBINSON COMPANY

PROJECT: EAST PIERCE FIRE AND RESCUE - STATION 118 SITEWORK
LOCATION: SUMNER, WA
BLDG SF:
ESTIMATE: 2018072
EST TYPE: COST MODEL

DIVISION	DESCRIPTION		TOTAL	$/SF
G10	SITE PREPARATION		677,356	
G20	SITE IMPROVEMENTS		343,670	
G30	SITE CIVIL / MECHANICAL UTILITIES		1,446,266	
G40	SITE ELECTRICAL UTILITIES		112,760	
Z10	GENERAL REQUIREMENTS		100,000	
	ESTIMATE SUBTOTAL		**2,680,051**	
	DESIGN CONTINGENCY @	10.00%	268,005	
	SUBTOTAL		2,948,056	
	GENERAL CONTRACTOR'S OH & P @	7.50%	221,104	
	SUBTOTAL		3,169,160	
	ESCALATION-SEE SUMMARY SHEET TO (0.00%/YR) @			
	TOTAL		**3,169,160**	

EXCLUSIONS:
SEE ESTIMATE SUMMARY

PROJECT: EAST PIERCE FIRE AND RESCUE - STATION 118 SITEWORK
LOCATION: SUMNER, WA
BLDG SF:
ESTIMATE: 2018072
EST TYPE: COST MODEL

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	$/SF
G10	**SITE PREPARATION**					
02000	SITE CLEARING	1	LS	11,520	11,520	
	ALLOWANCE PER A/E-ESCALATED					
02200	SITE PREP	1	LS	26,236	26,236	
	ALLOWANCE PER A/E-ESCALATED					
02220	SITE DEMOLITION	1	LS	224,102	224,102	
	ALLOWANCE PER A/E-ESCALATED					
02220	SITE MOBILIZATION	1	LS	118,729	118,729	
	ALLOWANCE PER A/E-ESCALATED					
02300	EARTHWORK	1	LS	245,856	245,856	
	ALLOWANCE PER A/E-ESCALATED					
02370	EROSION CONTROL	1	LS	50,912	50,912	
	ALLOWANCE PER A/E-ESCALATED					
G10	**SITE PREPARATION**			**DIVISION TOTAL**	**677,356**	
G20	**SITE IMPROVEMENTS**					
02760	SITE SURFACING	1	LS	183,670	183,670	
	ALLOWANCE PER A/E-ESCALATED					
02800	MISC SITE IMPROVEMENTS	1	LS	32,000	32,000	
	ALLOWANCE					
02900	LANDSCAPING	1	LS	128,000	128,000	
	ALLOWANCE					
G20	**SITE IMPROVEMENTS**			**DIVISION TOTAL**	**343,670**	
G30	**SITE CIVIL / MECHANICAL UTILITIES**					
02000	CIVIL SUB OVERHEAD & PROFIT	1	LS	209,754	209,754	
	ALLOWANCE PER A/E-ESCALATED					
02510	WATER SYSTEM	1	LS	62,835	62,835	
	ALLOWANCE PER A/E-ESCALATED					
02530	SANITARY	1	LS	38,400	38,400	
	ALLOWANCE PER A/E-ESCALATED					
02630	STORM DRAINAGE	1	LS	1,135,277	1,135,277	
	ALLOWANCE PER A/E-ESCALATED					
G30	**SITE CIVIL / MECHANICAL UTILITIES**			**DIVISION TOTAL**	**1,446,266**	
G40	**SITE ELECTRICAL UTILITIES**					
16000	GENERATOR/ATS	1	LS	75,000	75,000	
16000	SITE ELECTRICAL	1	LS	37,760	37,760	
	ALLOWANCE PER A/E-ESCALATED					
G40	**SITE ELECTRICAL UTILITIES**			**DIVISION TOTAL**	**112,760**	
Z10	**GENERAL REQUIREMENTS**					

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	$/SF
01000	GENERAL CONDITIONS	2	MO	50,000	100,000	
Z10	**GENERAL REQUIREMENTS**			**DIVISION TOTAL**	**100,000**	
				ESTIMATE SUBTOTAL	**2,680,051**	

THE ROBINSON COMPANY

PROJECT: EAST PIERCE FIRE AND RESCUE - STATION 118 DEMO AND ABATEMENT
LOCATION: SUMNER, WA
BLDG SF:
ESTIMATE: 2018072
EST TYPE: COST MODEL

DIVISION	DESCRIPTION		TOTAL	$/SF
F20	SELECTIVE BUILDING DEMOLITION		136,000	
	ESTIMATE SUBTOTAL		**136,000**	
	DESIGN CONTINGENCY @	10.00%	13,600	
	SUBTOTAL		149,600	
	GENERAL CONTRACTOR'S OH & P @	7.50%	11,220	
	SUBTOTAL		160,820	
	ESCALATION-SEE SUMMARY SHEET TO (0.00%/YR) @			
	TOTAL		**160,820**	

EXCLUSIONS:
SEE ESTIMATE SUMMARY

PROJECT: EAST PIERCE FIRE AND RESCUE - STATION 118 DEMO AND ABATEMENT
LOCATION: SUMNER, WA
BLDG SF:
ESTIMATE: 2018072
EST TYPE: COST MODEL

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	$/SF
F20	**SELECTIVE BUILDING DEMOLITION**					
02220	BUILDING DEMOLITION	13,250	SF	8.00	106,000	
02820	ASBESTOS ABATEMENT	1	LS	30,000	30,000	
	ALLOWANCE					
F20	**SELECTIVE BUILDING DEMOLITION**			**DIVISION TOTAL**	**136,000**	
				ESTIMATE SUBTOTAL	**136,000**	

OUTLINE SPECIFICATION

New and Replacement Fire Stations 111, 112, 114, 117, 118, and 124

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Division 00: Bidding Requirements and Conditions of the Contract

00030 CALL FOR BIDS

Public notice for open bidding.

00100 INSTRUCTIONS TO BIDDERS

Public bid using standard Instructions to Bidders.

Bid Bond required.

Addendum to be issued no less than 72 hours prior to bid.

Request for Product Substitutions to be submitted to the Architect no less than 10 calendar days prior to bid. Substitution requests that are approved will be incorporated and issued by Addendum.

Pre-Bid Meeting Time/Date/Location: Non-mandatory.

00130 PREVAILING WAGE RATES

Prevailing wage rates for Pierce County.

00140 FEDERAL, CITY AND STATE LAWS TO BE OBSERVED

EPF&R standard compliance requirements.

00200 INFORMATION AVAILABLE TO BIDDERS

Geotechnical Investigation.

Project Survey.

00300 BID FORM

EPF&R standard Bid Form for Lump Sum Bid.

Contract Time: The Owner anticipates executing a Contract for construction and issuing a Notice to Proceed for the Work on or about 30 days after Bids are due. The Contractor will complete the Work within 300 calendar days after the Notice to Proceed.

00700 GENERAL CONDITIONS OF THE CONTRACT

EPF&R Standard General Conditions.

Performance Bond: Required.

Builder's Risk Insurance: as required by EPF&R.

Permits, Fees and Inspections: Building Permit will be obtained and paid for by the Owner. All other permits, fees, bonds, and inspections to be obtained and paid for by the Contractor, unless specifically noted otherwise.

00800 SUPPLEMENTAL CONDITIONS OF THE CONTRACT

EPF&R Standard Supplemental Conditions.

Division 01: General Conditions

01010 SUMMARY OF THE WORK

Provide General Trades, Plumbing, Fire Protection, HVAC, Electrical and related Sitework for the following new and replacement Stations:

Headquarters Fire Station 111
Fire Station 112
Fire station 114
Fire Station 117
Fire Station 118
Fire Station 124

Work performed by Owner or by separate Contract:

1) Furnish and install items per the following table:

Item	By Owner	*FOIC	By Contractor	Comments
Fixed Toilet Accessories			X	Spec. per owner standard requirements
Exercise Equipment	X			RFM to coordinate elec. requirements
Kitchen & Laundry Appliances			X	RFM spec. and coordinate elec./plumb. requirements
Whiteboards			X	RFM to spec. blocking at desired locations
Interior Signage			Provide Code Minimum	RFM to spec. style/colors

Freestanding Furniture (new/exist.)	X			RFM to assist – level of service to be determined
Projection Equipment (screens, clg. mntd. units, etc.)			X	RFM to coordinate elec. requirements
Bunker Gear Lockers	X			
Bunker Gear Dryer	X			
Extractor	X			
Shelving in App Bay	X			
Shelving in Shop	X			
Cascade/Breathing Air System	X			

BLS Storage Shelving	X			

Other work performed on site by separate contract that will require Contractor coordination for site access:

1) To be determined.

Work to be completed by Owner prior to General Contractor taking site:

1) Removal of owner furnishings and equipment.

01019 CONTRACT CONSIDERATIONS

Form of Contract: See Division 00700.

Schedule of Values: Submit Schedule of Values on AIA Form G703 or form acceptable to EPF&R. Schedule of Values must be approved by Architect and Owner/Project Manager prior to first Application for Payment. Schedule of Values must include site mobilization, bonds and insurance, general conditions, overhead and profit, punchlist, de-mobilization, and project close-out as separate line items.

Application for Payment: Submit on AIA Form G702. Submit draft copy for Architect and Owner/Project Manager approval one week prior to submitting certified copies. Applications for Payment may project anticipated work to be completed forward only to the date that certified copies are submitted.

Change Procedures:

Supplemental Instructions: The Architect may issue Supplemental Instructions for minor changes in the work not involving adjustment to Contract Sum or Contract Time.

Proposal Requests: The Architect may issue Proposal Requests to the Contractor requesting pricing for proposed changes to the work that may involve adjustment to the Contract Sum or Contract Time. Contractor to submit pricing to the Owner in accordance with the change order pricing procedure in the General Conditions of the Contact.

Construction Change Directives: The Architect may issue Construction Change Directives signed by the Owner directing the Contractor to proceed with changes to the work that need immediate response by the Contractor. Construction Change Directives will be subsequently incorporated into a Change Order.

Change Orders: The Architect may prepare Change Orders for signatures of parties in accordance with the General Conditions of the Contract.

01030 ALTERNATES

To be determined.

01039 COORDINATION AND MEETINGS

Contractor is responsible to coordinate the scheduling, submittals, and Work of the various sections of the specifications.

Contractor Meetings:

Attend pre-construction meeting with the Jurisdiction Having Authority.
Attend pre-construction meeting with the Architect and Owner/Project Manager.
Schedule and Administer Construction Progress Meetings throughout the course of construction.
Contractor to administer the meeting and record the meeting minutes.

01050 FIELD ENGINEERING

Contractor to engage the services of a Licensed Land Surveyor for field engineering.

01300 SUBMITTALS

Construction Progress Schedule: Prepare a computer generated construction schedule using MS Project or Primavera Systems Inc. scheduling software, utilizing the critical path method. Schedule to be accepted by the Owner and Architect prior to the first Application for Payment. Contractor to submit updated schedule with each Application for Payment. If the monthly schedule update show any activities behind the previously approved schedule, Contractor to submit a supplemental Recovery Schedule prior to approval of the Application for Payment.

Product Data, Shop Drawings, and Samples: Submit for products and systems as listed in technical specifications for approval by Architect and Owner. Allow minimum of ten working days for review. Submit five copies of product data and shop drawings: Architect (1), Engineer (1), Owner (1), Contractor (2). Additional copies of approved submittals desired by the Contractor, subcontractor's, or suppliers to be produced at the Contractor's expense. Submit two copies of samples: Architect (1), Contractor (1).

Product Test Reports, Certifications, and Installation Instructions: Submit for products and systems as listed in technical specifications for reference. Submit three copies: Architect (1), Engineer (1), Owner (1).

01400 QUALITY CONTROL:

Coordinate the Work and provide access to the Owner's independent construction inspection and testing agency.

01500 CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

Provide temporary utilities and pay for all temporary utility charges.

Provide temporary barriers, construction fence and protection of the Work.

Provide temporary construction facilities.

Provide progress cleaning and disposal of waste materials.

01600 MATERIAL AND EQUIPMENT

Provide all new materials unless specified otherwise.

Provide transportation, storage and protection for all materials.

Substitutions: Requests for Substitutions to be submitted per Division 00100. After the Contract date the Owner may, at its option, consider substitutions when a product becomes unavailable through no fault of the Contractor or when a substitution provides Owner betterment.

01700 PROJECT CLOSEOUT

Provide final cleaning, Record Documents, and Operating and Maintenance Manuals.

Provide Instruction of Owner Personnel for civil, landscape, architectural, mechanical and electrical systems per technical divisions.

Division 02: Sitework

02220 SELECTIVE DEMOLITION

Demolition and removal of curbs, pavement, walks, and fencing as indicated on the drawings.

Protection of existing utilities.

Protection of existing site improvements, appurtenances, and landscaping to remain.

02230 SITE CLEARING AND BUILDING DEMOLITION

Removal and clearing and grubbing materials from the designated work area.

02244 FENCING

Security Fence: Standard 2" galvanized steel chain link mesh and fence posts.

Screen Fence Gates at dumpster/generator enclosure: Chain ling swing gates with vinyl slats. Colors as selected.

Vehicle Gate Operators: Motor operated, chain drive operators to inter-tie with building security system for access control. Provide key access manual disconnect/override operation at motor operators. Provide ground loop detectors on both sides of gate. Provide infrared safety sensor across gate opening.

Vehicle gates: Aluminum cantilever with chain link fabric. Motor operated as above.

02300 EARTHWORK

Provide excavation, sub-grade preparation, fill, compaction and site grading for areas noted for new work on drawings.

02350 EXTERIOR SANITARY SEWER

Work includes replacement or reworking of septic systems as noted in civil narratives.

02370 EROSION AND SEDIMENT CONTROL AND ENVIRONMENTAL PROTECTION

Provide and maintain erosion and sediment control and environmental protection required to control pollution that develops during normal construction practice.

02510 WATER SYSTEM

Furnish and install the exterior water system to a point five feet outside the building, including but not limited to, connections to the existing system, mains, valves, tees, fire hydrants, meter, fire department connection, and such other appurtenances as shown on the plans and described in Civil Engineering Feasibility Study Narratives.

02630 STORM DRAINAGE SYSTEM

Furnish and install the storm drainage system including, but not limited to, storm drainage pipelines, catch basins, foundation drains, roof downspout drains, and appurtenances as shown on the plans and described in Civil Engineering Feasibility Study Narratives.

02740 ASPHALTIC CONCRETE PAVING

Prepare sub-grade to receive base material where indicated. Existing pavement to be maintained unless noted otherwise.

Stabilizing base course.

Asphaltic concrete paving at automobile parking lots: 3 inch.

Asphaltic concrete paving at drill yards and apparatus drives: 4 inches.

02766 PAVEMENT MARKING

Parking striping and curb painting. Provide new aphaltic emulsion coating and restriping at existing driveways and parking areas to remain.

Directional arrows and signage

02770 CONCRETE PAVING, CURBS, AND SIDEWALKS

Place and compact base course materials for concrete paving, curbs and sidewalks.

Exterior concrete paving, curb, and sidewalks: Typical concrete with broom finish.

02810 IRRIGATION SYSTEMS

Maintain existing systems and modify as needed for new additions.

Work to include drip irrigation pipe and control wires, installation of valves, emitters, control panel, backfilling and testing, adjustments, training, record drawings, complete and ready to operate.

02900 LANDSCAPING

Provide at new landscape areas only: Adjacent to the building the plant palette will consist of a mix of deciduous and evergreen trees, shrubs and groundcover. Native and non-native ornamental species will be used. The planting plan will provide seasonal interest and maintain sight lines.

Division 03: Concrete

03300 CAST IN PLACE CONCRETE

Footings: assume 3,000 psi cast in place concrete.

Slabs: assume 4,000 psi cast in place concrete. Integral waterproofing admixture.

Vapor Retarder: Reinforced high-density poly sheet.

03370 CONCRETE SEALANT AND DUSTPROOFING

Concrete Sealer Type 1: Apparatus Bay: Huls America Dynasylan BH-N Plus, or equal. Chemical resistant, with oleophobic additive to prevent oil stains.

Concrete Sealer Type 2: Combination cure/seal for all other exposed interior slabs. Sonneborn Kure-N-Seal or equal.

Division 04: Masonry

04200 UNIT MASONRY

Concrete Masonry Units: 6" x 8" x 16" and 8"x 8" x 16" nominal units 90% ground face and 10% split face (accent) with integral color. Assume 4 foot height around perimeter of building. Match existing texture at Station 15.

Veneer Anchors: Galvanized seismic anchors to wood structure.

Through-wall Flashing: Copper/asphalt laminated fabric. Plastic weeps.

Division 05: Metals

05100 STRUCTURAL STEEL

Standard wide flange, angle, channel, pipe and tube shapes.

Hot-dipped galvanized steel at exterior trim locations; primed at interior locations for field painting.

05400 LIGHT GAUGE METAL FRAMING

Manufacturer's standard framing components: tracks, Z-furring and purlins, hat channels, bridging, and clips for support of fiber cement siding panels. Galvanized steel minimum G-60 coating.

05500 METAL FABRICATIONS

Rough Hardware: As required for anchorage and support of countertops, casework, and specialty items.

Steel Lintels: Hot dipped galvanized steel angles

Bollards: 4" diameter steel pipe with concrete fill.

Division 06: Wood and Plastics

06100 ROUGH CARPENTRY

Structural grade lumbers and engineered wood members.

Interior non-load bearing partitions and furring: 2x wood studs as scheduled.

Wainscot in Apparatus Bay: ¾" A/CX plywood.

06200 FINISH CARPENTRY

AWI "Custom Grade". Field finish per Section 09900.

Standing and Running Trim: Location(s) and species to be determined.

Plastic Laminate Wainscot: Vertical grade plastic laminate adhered directly to walls where indicated. Metal top and joint trim. Pionite, Nevamar, Wilsonart, or Formica. Color/pattern to be determined. Locations: assume laundry rooms and resource room.

Interior Window Sills: Solid surface material: Corian, Wilsonart, Formica, or LG Hi-Macs. Color and pattern to be determined.

06400 CUSTOM CASEWORK

AWI "Premium Grade" custom casework. Flush overlay style with 3mm PVC edging.

Plastic laminate faced base cabinets and wall cabinets. Assume 3 different laminate patterns at casework: upper cabinets, lower cabinets, and countertops.

Countertops: solid surface at kitchens – assume (2) colors per finish legend on drawings; plastic laminate at bathrooms and all other areas.

Division 07: Thermal and Moisture Protection

07100 WATERPROOFING

Sheet membrane of rubberized asphalt bonded to polyethylene sheet, self-adhering, 0.06 inch nominal thickness. Provide at any below-grade locations.

07195 WATER RESISTANT MEMBRANE

Spun polyethylene fabric sheet weather resistant membrane air infiltration barrier for vertical exterior wall surfaces. Tyvek Commercial Wrap or equal.

07200 INSULATION

Exterior Walls: Fiberglass batt, R-19, un-faced.

Roof insulation at flat and pitched roof areas: Polyisocyanurate with glass fiber faces. Place in two layers with staggered joints. R-30 insulation value.

Plastic Sheet Vapor Retarder: Six mill polyethylene sheet. Interior face of exterior walls, concealed.

Acoustic Insulation: Fiberglass sound attenuation batts, unfaced, 2-1/2" thick. Owens Corning SAB or equal.

07460 SIDING

Pre-finished fiber cement or metal siding system with related trims and flashings.

07611 SHEET METAL ROOFING

Roofing: 24 ga. Zincalume base metal with Kynar finish. Standing seam profile.

07620 SHEET METAL FLASHING AND TRIM

Roof and Wall Flashings: Galvanized steel, PVF2 coating. 26 gauge, minimum.

07900 JOINT SEALANTS

Exterior Vertical Joints: High performance one part polyurethane, +/- 50% movement.

Exterior/Interior Horizontal Traffic Bearing Joints: High performance multi-part self-leveling urethane.

Exterior Thresholds: Non-hardening, exterior grade polyisobutylene mastic.

Interior Painted or Concealed Joints: Acrylic Latex.

Interior Wet and Damp Areas, Plumbing Fixtures, Countertops: Mildew resistant, one part silicone, white.

Acoustic Sealant: Non-hardening interior grade polyisobutylene mastic for concealed joints in acoustic partitions.

Division 08: Doors and Windows

08100 STANDARD STEEL DOORS AND WINDOWS

Hollow Metal Frames: Fully welded steel frames, 2" nominal face. Throat depth to match partition. Gauges: 16 gauge interior, 14 gauge for doors up to 3'0"; 14 gauge interior, 12 gauge exterior for doors over 3'-0". Wood stud anchors. Exterior frames galvanized.

Hollow Metal Doors (all exterior doors and all doors in Operations Support areas): Fully welded, seamless steel doors. Interior 18 gauge SID Level II Heavy Duty, Model 2. Exterior 16 gauge, galvanized, R-6 insulated core, SDI Level III Extra Heavy Duty, Model 2.

08200 WOOD DOORS

Flush Doors (all interior doors in Resident and Administration areas): AWI Premium grade, 1-3/4" thick, 5-ply, solid particle core wood doors. Wood stops at glazing.

Door Facing: Plastic Laminate. At Stations 13 and 15: Match existing finish.

08305 ACCESS DOORS

Wall and Ceiling Access Doors: Flush steel access doors with welded frame. Cam lock. Primed for field painting—paint to match surrounding wall paint.

08360 SECTIONAL OVERHEAD DOORS

Heavy duty aluminum with powder coat or anodized finish. Full glazing sections with ½" thick tempered insulated glazing units at upper 6 segments. Overhead Door Company 520 Series, or equal. Provide 3" tracks. Heavy-duty operators with trolley mount configuration and standard lift track.

08410 ALUMINUM ENTRANCES AND STOREFRONTS

Storefront System: Extruded aluminum frames. Thermally broken at exterior. Nominal 2"x4-1/2" frame with extruded head, jamb, and sill extensions where shown.

Storefront Doors: Extruded aluminum 1-3/4" doors with welded corners, wide stile design.

Finish: Anodized or fluoropolymer three coat finish.

08410 ALUMINUM WINDOWS

Commercial aluminum windows with sub-sill and associated flashings.

Finish: Anodized or fluoropolymer three coat finish.

08700 DOOR HARDWARE

Commercial grade hinges and finish hardware with security cores throughout.

Provide card-key access at all exterior doors and doors from apparatus bays to living spaces.

08800 GLAZING

Insulated glass units for vertical glazing, typical office windows and storefront areas: 1" sealed insulated units with ¼" clear outer pane, ½" air space, ¼" clear inner pane.

Safety insulating glass for vertical glazing: Same as above except use tempered glass for both panes. Locations as required per IBC.

Interior glazing: ¼" clear tempered glass.

Division 09: Finishes

09250 GYPSUM WALLBOARD SYSTEMS

Interior: 5/8" type "X" fire-resistant. Water resistant type "X" all wet walls. GA Finish Level 4 "smooth wall" all exposed surfaces. GA Finish Level 1 "fire tape" all surfaces not exposed to view. Provide abuse-resistant GWB at all hallway locations from finish floor to 4'-0" +/-.

Assume GWB ceilings at shower restrooms and 25% of living area.

09300 CERAMIC TILE

Typical Interior Floors: 12" x 12" size, ceramic floor tile. Grout: epoxy grout, color as selected.

Restroom and Bath Floors and Walls: 6" x 6" glazed ceramic tile. Grout: epoxy type throughout, color as selected.

Assume tile at: restrooms, kitchen, dining, living area hallways, locker areas.

09500 ACOUSTIC CEILING TILE

Acoustic Tile Suspension Systems: Standard 15/16 inch steel grid, white. Seismic brace to structure.

Acoustic Tile Type #1: 2 foot x 4 foot x ¾ inch suspended acoustic tile ceilings, fine fissured, scored to 2 foot x 2 foot, tegular edge, white. NRC 0.55-0.65. Locations: Watch office, dayroom, resource room, sleep rooms, laundry, hallways.

Acoustic Tile #2: 2 foot x 4 foot x ¾" acoustic tile ceiling with smooth, un-perforated vinyl facing. Locations: Decon room.

09650 RESILIENT FLOORING

Resilient Base: 4 inch rubber base, coved.

Transition Strips: Extruded vinyl transition strips at all floor material transitions.

09680 CARPET

Carpet: per finish legend on drawings - commercial grade carpet tile, pattern loop type, solution dyed/yard dyed, 20 oz/yd^2.

Provide at sleeping rooms, offices, conference and community rooms.

09720 WALL COVERINGS

4' high vinyl wallcovering winscot at hallways, and day room. Pattern and color per finish legend on drawings.

09986 FRP WALL PANELS

Fiberglass reinforced plastic wall panels: 0.09 inch thickness. Provide full height, floor to ceiling panels with matching trim and accessories. Color and texture as selected. Locations: Decon and maintenance shop walls.

09900 PAINTING

Exterior Surfaces, Alkyd: One coat primer, two coats semi-gloss alkyd enamel. All unfinished exterior surfaces.

Interior Surfaces, Latex: One coat primer, two coats latex. Gloss as scheduled. Interior walls and ceilings as scheduled. Low VOC.

Interior Surfaces, Alkyd: One coat primer, two coats interior alkyd enamel, semi-gloss. Interior hollow metal doors and frames. Low VOC.

Color Schedule: Final color schedule to be determined during construction after all finish materials are submitted. Assume (1) body color and (4) accent colors; locations as determined.

Division 10: Specialties

10200 LOUVERS

Extruded aluminum frame with fixed blades and bird screening. 4" depth. Kynar finish.

10260 CORNER GUARDS

Extruded aluminum, or clear acrylic. Surface mounted type; provide at wall corners in hallway locations.

10350 FLAGPOLES

New 30 foot high aluminum pole. Flag by owner.

10420 SIGNAGE

Interior Room Signage: 8 inch x 8 inch x 1/8 inch acrylic, with room name and number in raised letters and Braille. Toilet room signs to include raised male/female pictogram and accessibility symbol. Vinyl foam tape mounted. Provide at each restroom door.

Exterior Signage: Cast brass letters and numbers. Stud mounted. Fire Station numbers: 24 inch high; assume 2 locations each station. Provide 12" high building address numbers.

Font: Text font for signage to be selected.

10520 FIRE EXTINGUISHERS AND CABINETS

Portable fire extinguishers in fully recessed cabinets at finished areas, wall hooks in mechanical/electrical rooms. Fire extinguishers: multi-purpose dry chemical 4A-60B:C. Assume (6) multi-purpose. Assume cabinets at office and living areas; bracket mounted at operations and apparatus bay areas.

10650 OPERABLE PANEL PARTITIONS

Where indicated: flat panel system with paired panel configuration. Assume 8' height, manual operation. Assume custom fabric as specified by Architect.

10800 TOILET ACCESSORIES

Satin finish stainless steel accessories. Verify accessory types with EPF&R vendor supply requirements.

Towel/trash, recessed: One per toilet room.
Towel dispenser, surface mounted: One per kitchen sink and apparatus bay sink.
Soap dispenser, countertop mounted: One per lavatory.
Mirror, framed: One per lavatory at restrooms only.
Toilet tissue dispenser, surface mounted: One per water closet.
Toilet seat cover dispenser, surface mounted: One per water closet
Grab Bars: One set per handicapped water closet.
Robe hooks: 3 per shower room and 3 per sleep room.
Towel Shelf: 1 per shower room.
Utility Hooks: 1 unit at mop sink in laundry.

Division 11: Equipment

11000 STATION EQUIPMENT

Extractor/Dryers: Provide plumbing and electrical connections. Equipment furnished and installed by Owner.

Standby Generators: Provide new at all stations, sized for anticipated loads. Fuel: Diesel 1,000 gallon tank. See mechanical and electrical engineering narratives.

Exercise Equipment: By Owner. Electrical infrastructure by Contractor.

Video Conferencing Equipment: By Owner. Electrical infrastructure by Contractor.

Cascade and Compressor Systems: By Owner. Mechanical and electrical infrastructure by Contractor.

Station Compressed Air: See mechanical engineering narrative.

11450 RESIDENTIAL EQUIPMENT

Provide equipment and connections for the following:

(1) 3-door commercial refrigerator.
(1) single door commercial freezer
(1) Undercounter dishwasher, commercial grade, 24 inch width, with provisions for a 2nd future dishwasher .
(1) Over counter microwave, nominal 1.4 cubic feet, on shelf.
(1) 8 burner, 48" wide stove with 2 ovens, dual fuel.
(1) commercial grade range hood
(1) Insta-hot at sink.
(1) Coffee maker, plumbed.

Laundry Room: High-end residential washer and dryer appliances.

Bunker Gear Racks: Ready Rack, Gear Grid, etc. Furnished and installed by Owner.

Division 12: Furnishings

12500 WINDOW TREATMENTS

Louver Blinds: 1" metal horizontal blinds with fixed top and bottom extruded aluminum rails. Hunter Douglas, Levelor, or equal. Provide at all exterior windows except apparatus bay.

Division 13: Special Construction

No Requirements

Division 14: Conveying Systems

14200 ELEVATORS

Electric traction elevators: At Station 11, provide two-stop elevator with manufacturer's standard interior lighting and finishes. Elevator cab sized to accommodate gurney. Provide options as required by State of Washington.

Division 15: Mechanical Systems

See attached Outline Specification by Sider & Byers, Inc.

Division 16: Electrical Systems

See attached Electrical Systems Narrative by Sazan Engineers.

OUTLINE SPECIFICATION

Remodels and Additions for Fire Stations 113, 115, and 116

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Division 00: Bidding Requirements and Conditions of the Contract

00030 CALL FOR BIDS

Public notice for open bidding.

00100 INSTRUCTIONS TO BIDDERS

Public bid using standard Instructions to Bidders.

Bid Bond required.

Addendum to be issued no less than 72 hours prior to bid.

Request for Product Substitutions to be submitted to the Architect no less than 10 calendar days prior to bid. Substitution requests that are approved will be incorporated and issued by Addendum.

Pre-Bid Meeting Time/Date/Location: Non-mandatory.

00130 PREVAILING WAGE RATES

Prevailing wage rates for Pierce County.

00140 FEDERAL, CITY AND STATE LAWS TO BE OBSERVED

EPF&R standard compliance requirements.

00200 INFORMATION AVAILABLE TO BIDDERS

Geotechnical Investigation.

Project Survey.

00300 BID FORM

EPF&R standard Bid Form for Lump Sum Bid.

Contract Time: The Owner anticipates executing a Contract for construction and issuing a Notice to Proceed for the Work on or about 30 days after Bids are due. The Contractor will complete the Work within 300 calendar days after the Notice to Proceed.

00700 GENERAL CONDITIONS OF THE CONTRACT

EPF&R Standard General Conditions.

Performance Bond: Required.

Builder's Risk Insurance: as required by EPF&R.

Permits, Fees and Inspections: Building Permit will be obtained and paid for by the Owner. All other permits, fees, bonds, and inspections to be obtained and paid for by the Contractor, unless specifically noted otherwise.

00800 SUPPLEMENTAL CONDITIONS OF THE CONTRACT

EPF&R Standard Supplemental Conditions.

Division 01: General Conditions

01010 SUMMARY OF THE WORK

Provide General Trades, Plumbing, Fire Protection, HVAC, Electrical and related Sitework for the following:

Fire Station 13: a two-story, wood-framed building.

- Interior Work:
  - Remodel of living and administration areas. Partial remodel of operational support areas adjacent apparatus bay.
  - Addition: One-story storage addition at apparatus bay.
  - Mechanical and electrical improvements per attached narratives.
  - Structural improvements per attached narrative.
  - New flooring and ceiling finishes throughout living and admin spaces. Existing walls to remain where possible. New paint throughout.
- Exterior Work:
  - New metal roofing.
  - Repair of existing wood siding where needed.
  - Repair of existing windows and doors where needed.
  - Replacement of existing overhead apparatus bay doors.
  - Repair of existing asphalt parking and drive areas where needed.
  - Replacement of existing concrete aprons with new reinforced concrete where shown.
  - New exterior painting throughout.

Fire Station 15: a one story, wood frame structure with partial second story spaces.

- Interior Work:
  - Complete remodel of living and administration areas. Partial remodel of operational support areas adjacent apparatus bay.
  - Additions: sleep room and bunker gear storage rooms.
  - Mechanical and electrical improvements per attached narratives.
  - Structural improvements per attached narrative and sketch.
  - Replacement of apparatus bay roof batt insulation with new rigid roof insulation.
  - New flooring and ceiling finishes throughout living and admin spaces. Existing walls to remain where possible. New paint throughout.

- Exterior Work:
  - New metal roofing.
  - Replacement of existing wood siding with new fiber cement panels.
  - Repair of existing windows and doors where needed.
  - Replacement of existing overhead apparatus bay doors.
  - New additions to be cavity wall CMU to match existing with 2x framing.

Fire Station 16: a two-story, wood and masonry framed building.

- Interior Work:
  - Complete remodel of living and administration areas. Partial remodel of operational support areas adjacent apparatus bay.
  - Addition: New sleep rooms, apparatus bay and bunker gear storage.
  - Mechanical and electrical improvements per attached narratives.
  - Structural improvements per attached narrative and sketches.
  - New flooring and ceiling finishes throughout living and admin spaces. Existing walls to remain where possible. New paint throughout.
  - New furring and insulation at all existing CMU walls.

- Exterior Work:
  - New metal roofing and rigid insulation throughout.
  - Replacement of all existing wood siding and comp shingle siding with new fiber cement siding.
  - New fiber cement siding and furring over existing CMU walls.
  - Replacement of all existing windows and doors.
  - Replacement of existing overhead apparatus bay doors.
  - Repair of existing asphalt parking and drive areas as needed.
  - Site improvements as noted on site plan.

Work performed by Owner or by separate Contract:

1) Furnish and install items per the following table:

Item	**By Owner**	***FOIC**	**By Contractor**	**Comments**
Fixed Toilet Accessories			X	Spec. per owner standard requirements
Exercise Equipment	X			RFM to coordinate elec. requirements
Kitchen & Laundry Appliances			X	RFM spec. and coordinate elec./plumb. requirements
Whiteboards			X	RFM to spec. blocking at desired locations

Interior Signage			Provide Code Minimum	RFM to spec. style/colors
Freestanding Furniture (new/exist.)	X			RFM to assist – level of service to be determined
Projection Equipment (screens, clg. mntd. units, etc.)			X	RFM to coordinate elec. requirements
Bunker Gear Lockers	X			
Bunker Gear Dryer	X			
Extractor	X			
Shelving in App Bay	X			
Shelving in Shop	X			

Cascade/Breathing Air System	X			
BLS Storage Shelving	X			

Other work performed on site by separate contract that will require Contractor coordination for site access:

1) To be determined.

Work to be completed by Owner prior to General Contractor taking site:

1) Removal of owner furnishings and equipment.

01019 CONTRACT CONSIDERATIONS

Form of Contract: See Division 00700.

Schedule of Values: Submit Schedule of Values on AIA Form G703 or form acceptable to EPF&R. Schedule of Values must be approved by Architect and Owner/Project Manager prior to first Application for Payment. Schedule of Values must include site mobilization, bonds and insurance, general conditions, overhead and profit, punchlist, de-mobilization, and project close-out as separate line items.

Application for Payment: Submit on AIA Form G702. Submit draft copy for Architect and Owner/Project Manager approval one week prior to submitting certified copies. Applications for Payment may project anticipated work to be completed forward only to the date that certified copies are submitted.

Change Procedures:

Supplemental Instructions: The Architect may issue Supplemental Instructions for minor changes in the work not involving adjustment to Contract Sum or Contract Time.

Proposal Requests: The Architect may issue Proposal Requests to the Contractor requesting pricing for proposed changes to the work that may involve adjustment to the Contract Sum or Contract Time. Contractor to submit pricing to the Owner in accordance with the change order pricing procedure in the General Conditions of the Contact.

Construction Change Directives: The Architect may issue Construction Change Directives signed by the Owner directing the Contractor to proceed with changes to the work that need immediate response by the Contractor. Construction Change Directives will be subsequently incorporated into a Change Order.

Change Orders: The Architect may prepare Change Orders for signatures of parties in accordance with the General Conditions of the Contract.

01030 ALTERNATES

To be determined.

01039 COORDINATION AND MEETINGS

Contractor is responsible to coordinate the scheduling, submittals, and Work of the various sections of the specifications.

Contractor Meetings:

Attend pre-construction meeting with the Jurisdiction Having Authority.
Attend pre-construction meeting with the Architect and Owner/Project Manager.
Schedule and Administer Construction Progress Meetings throughout the course of construction.
Contractor to administer the meeting and record the meeting minutes.

01050 FIELD ENGINEERING

Contractor to engage the services of a Licensed Land Surveyor for field engineering.

01300 SUBMITTALS

Construction Progress Schedule: Prepare a computer generated construction schedule using MS Project or Primavera Systems Inc. scheduling software, utilizing the critical path method. Schedule to be accepted by the Owner and Architect prior to the first Application for Payment. Contractor to submit updated schedule with each Application for Payment. If the monthly schedule update show any activities behind the previously approved schedule, Contractor to submit a supplemental Recovery Schedule prior to approval of the Application for Payment.

Product Data, Shop Drawings, and Samples: Submit for products and systems as listed in technical specifications for approval by Architect and Owner. Allow minimum of ten working days for review. Submit five copies of product data and shop drawings: Architect (1), Engineer (1), Owner (1), Contractor (2). Additional copies of approved submittals desired by the Contractor, subcontractor's, or suppliers to be produced at the Contractor's expense. Submit two copies of samples: Architect (1), Contractor (1).

Product Test Reports, Certifications, and Installation Instructions: Submit for products and systems as listed in technical specifications for reference. Submit three copies: Architect (1), Engineer (1), Owner (1).

01400 QUALITY CONTROL:

Coordinate the Work and provide access to the Owner's independent construction inspection and testing agency.

01500 CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

Provide temporary utilities and pay for all temporary utility charges.

Provide temporary barriers, construction fence and protection of the Work.

Provide temporary construction facilities.

Provide progress cleaning and disposal of waste materials.

01600 MATERIAL AND EQUIPMENT

Provide all new materials unless specified otherwise.

Provide transportation, storage and protection for all materials.

Substitutions: Requests for Substitutions to be submitted per Division 00100. After the Contract date the Owner may, at its option, consider substitutions when a product becomes unavailable through no fault of the Contractor or when a substitution provides Owner betterment.

01700 PROJECT CLOSEOUT

Provide final cleaning, Record Documents, and Operating and Maintenance Manuals.

Provide Instruction of Owner Personnel for civil, landscape, architectural, mechanical and electrical systems per technical divisions.

Division 02: Sitework

02220 SELECTIVE DEMOLITION

Demolition and removal of curbs, pavement, walks, and fencing as indicated on the drawings.

Protection of existing utilities.

Protection of existing site improvements, appurtenances, and landscaping to remain.

02230 SITE CLEARING AND BUILDING DEMOLITION

Removal and clearing and grubbing materials from the designated work area.

02244 FENCING

Security Fence: Standard 2" galvanized steel chain link mesh and fence posts.

Screen Fence Gates at dumpster/generator enclosure: Chain ling swing gates with vinyl slats. Colors as selected.

Vehicle Gate Operators: Motor operated, chain drive operators to inter-tie with building security system for access control. Provide key access manual disconnect/override operation at motor operators. Provide ground loop detectors on both sides of gate. Provide infrared safety sensor across gate opening.

Vehicle gates: Aluminum cantilever with chain link fabric. Motor operated as above.

02300 EARTHWORK

Provide excavation, sub-grade preparation, fill, compaction and site grading for areas noted for new work on drawings.

02350 EXTERIOR SANITARY SEWER

Work includes replacement or reworking of septic systems as noted in civil narratives.

02370 EROSION AND SEDIMENT CONTROL AND ENVIRONMENTAL PROTECTION

Provide and maintain erosion and sediment control and environmental protection required to control pollution that develops during normal construction practice.

02510 WATER SYSTEM

Furnish and install the exterior water system to a point five feet outside the building, including but not limited to, connections to the existing system, mains, valves, tees, fire hydrants, meter, fire department connection, and such other appurtenances as shown on the plans and described in Civil Engineering Feasibility Study Narratives.

02630 STORM DRAINAGE SYSTEM

Furnish and install the storm drainage system including, but not limited to, storm drainage pipelines, catch basins, foundation drains, roof downspout drains, and appurtenances as shown on the plans and described in Civil Engineering Feasibility Study Narratives.

02740 ASPHALTIC CONCRETE PAVING

Prepare sub-grade to receive base material where indicated. Existing pavement to be maintained unless noted otherwise.

Stabilizing base course.

Asphaltic concrete paving at automobile parking lots: 3 inch.

Asphaltic concrete paving at drill yards and apparatus drives: 4 inches.

02766 PAVEMENT MARKING

Parking striping and curb painting. Provide new aphaltic emulsion coating and restriping at existing driveways and parking areas to remain.

Directional arrows and signage

02770 CONCRETE PAVING, CURBS, AND SIDEWALKS

Place and compact base course materials for concrete paving, curbs and sidewalks.

Exterior concrete paving, curb, and sidewalks: Typical concrete with broom finish.

02810 IRRIGATION SYSTEMS

Maintain existing systems and modify as needed for new additions.

Work to include drip irrigation pipe and control wires, installation of valves, emitters, control panel, backfilling and testing, adjustments, training, record drawings, complete and ready to operate.

02900 LANDSCAPING

Provide at new landscape areas only: Adjacent to the building the plant palette will consist of a mix of deciduous and evergreen trees, shrubs and groundcover. Native and non-native ornamental species will be used. The planting plan will provide seasonal interest and maintain sight lines.

Division 03: Concrete

03300 CAST IN PLACE CONCRETE

Footings: assume 3,000 psi cast in place concrete.

Slabs: assume 4,000 psi cast in place concrete. Integral waterproofing admixture.

Vapor Retarder: Reinforced high-density poly sheet.

03370 CONCRETE SEALANT AND DUSTPROOFING

Concrete Sealer Type 1: Apparatus Bay: Huls America Dynasylan BH-N Plus, or equal. Chemical resistant, with oleophobic additive to prevent oil stains.

Concrete Sealer Type 2: Combination cure/seal for all other exposed interior slabs. Sonneborn Kure-N-Seal or equal.

Division 04: Masonry

04200 UNIT MASONRY

Concrete Masonry Units: 6" x 8" x 16" and 8"x 8" x 16" nominal units 90% ground face and 10% split face (accent) with integral color. Assume 4 foot height around perimeter of building. Match existing texture at Station 15.

Veneer Anchors: Galvanized seismic anchors to wood structure.

Through-wall Flashing: Copper/asphalt laminated fabric. Plastic weeps.

Division 05: Metals

05100 STRUCTURAL STEEL

Standard wide flange, angle, channel, pipe and tube shapes.

Hot-dipped galvanized steel at exterior trim locations; primed at interior locations for field painting.

05400 LIGHT GAUGE METAL FRAMING

Manufacturer's standard framing components: tracks, Z-furring and purlins, hat channels, bridging, and clips for support of fiber cement siding panels. Galvanized steel minimum G-60 coating.

05500 METAL FABRICATIONS

Rough Hardware: As required for anchorage and support of countertops, casework, and specialty items.

Steel Lintels: Hot dipped galvanized steel angles

Bollards: 4" diameter steel pipe with concrete fill.

Division 06: Wood and Plastics

06100 ROUGH CARPENTRY

Structural grade lumbers and engineered wood members.

Interior non-load bearing partitions and furring: 2x wood studs as scheduled.

Wainscot in Apparatus Bay: ¾" A/CX plywood.

06200 FINISH CARPENTRY

AWI "Custom Grade". Field finish per Section 09900.

Standing and Running Trim: Location(s) and species to be determined.

Plastic Laminate Wainscot: Vertical grade plastic laminate adhered directly to walls where indicated. Metal top and joint trim. Pionite, Nevamar, Wilsonart, or Formica. Color/pattern to be determined. Locations: assume laundry rooms and resource room.

Interior Window Sills: Solid surface material: Corian, Wilsonart, Formica, or LG Hi-Macs. Color and pattern to be determined.

06400 CUSTOM CASEWORK

AWI "Premium Grade" custom casework. Flush overlay style with 3mm PVC edging.

Plastic laminate faced base cabinets and wall cabinets. Assume 3 different laminate patterns at casework: upper cabinets, lower cabinets, and countertops.

Countertops: solid surface at kitchens – assume (2) colors per finish legend on drawings; plastic laminate at bathrooms and all other areas.

Division 07: Thermal and Moisture Protection

07100 WATERPROOFING

Sheet membrane of rubberized asphalt bonded to polyethylene sheet, self-adhering, 0.06 inch nominal thickness. Provide at any below-grade locations.

07195 WATER RESISTANT MEMBRANE

Spun polyethylene fabric sheet weather resistant membrane air infiltration barrier for vertical exterior wall surfaces. Tyvek Commercial Wrap or equal.

07200 INSULATION

Exterior Walls: Fiberglass batt, R-19, un-faced.

Roof insulation at flat and pitched roof areas: Polyisocyanurate with glass fiber faces. Place in two layers with staggered joints. R-30 insulation value.

Plastic Sheet Vapor Retarder: Six mill polyethylene sheet. Interior face of exterior walls, concealed.

Acoustic Insulation: Fiberglass sound attenuation batts, unfaced, 2-1/2" thick. Owens Corning SAB or equal.

07460 FIBER CEMENT SIDING

Pre-finished fiber cement siding system with related trims and flashings. Assume Hardie-panel or Hardie plank systems.

07611 SHEET METAL ROOFING

Roofing: 24 ga. Zincalume base metal with Kynar finish. Standing seam profile.

07620 SHEET METAL FLASHING AND TRIM

Roof and Wall Flashings: Galvanized steel, PVF2 coating. 26 gauge, minimum.

07900 JOINT SEALANTS

Exterior Vertical Joints: High performance one part polyurethane, +/- 50% movement.

Exterior/Interior Horizontal Traffic Bearing Joints: High performance multi-part self-leveling urethane.

Exterior Thresholds: Non-hardening, exterior grade polyisobutylene mastic.

Interior Painted or Concealed Joints: Acrylic Latex.

Interior Wet and Damp Areas, Plumbing Fixtures, Countertops: Mildew resistant, one part silicone, white.

Acoustic Sealant: Non-hardening interior grade polyisobutylene mastic for concealed joints in acoustic partitions.

Division 08: Doors and Windows

08100 STANDARD STEEL DOORS AND WINDOWS

Hollow Metal Frames: Fully welded steel frames, 2" nominal face. Throat depth to match partition. Gauges: 16 gauge interior, 14 gauge for doors up to 3'0"; 14 gauge interior, 12 gauge exterior for doors over 3'-0". Wood stud anchors. Exterior frames galvanized.

Hollow Metal Doors (all exterior doors and all doors in Operations Support areas): Fully welded, seamless steel doors. Interior 18 gauge SID Level II Heavy Duty, Model 2. Exterior 16 gauge, galvanized, R-6 insulated core, SDI Level III Extra Heavy Duty, Model 2.

08200 WOOD DOORS

Flush Doors (all interior doors in Resident and Administration areas): AWI Premium grade, 1-3/4" thick, 5-ply, solid particle core wood doors. Wood stops at glazing.

Door Facing: Plastic Laminate. At Stations 13 and 15: Match existing finish.

08305 ACCESS DOORS

Wall and Ceiling Access Doors: Flush steel access doors with welded frame. Cam lock. Primed for field painting—paint to match surrounding wall paint.

08360 SECTIONAL OVERHEAD DOORS

Heavy duty aluminum with powder coat or anodized finish. Full glazing sections with ½" thick tempered insulated glazing units at upper 6 segments. Overhead Door Company 520 Series, or equal. Provide 3" tracks. Heavy-duty operators with trolley mount configuration and standard lift track.

08410 ALUMINUM ENTRANCES AND STOREFRONTS

Storefront System: Extruded aluminum frames. Thermally broken at exterior. Nominal 2"x4-1/2" frame with extruded head, jamb, and sill extensions where shown.

Storefront Doors: Extruded aluminum 1-3/4" doors with welded corners, wide stile design.

Finish: Anodized or fluoropolymer three coat finish.

08410 ALUMINUM WINDOWS

Commercial aluminum windows with sub-sill and associated flashings.

Finish: Anodized or fluoropolymer three coat finish.

08700 DOOR HARDWARE

Commercial grade hinges and finish hardware with security cores throughout.

Provide card-key access at all exterior doors and doors from apparatus bays to living spaces.

08800 GLAZING

Insulated glass units for vertical glazing, typical office windows and storefront areas: 1" sealed insulated units with ¼" clear outer pane, ½" air space, ¼" clear inner pane.

Safety insulating glass for vertical glazing: Same as above except use tempered glass for both panes. Locations as required per IBC.

Interior glazing: ¼" clear tempered glass.

Division 09: Finishes

09250 GYPSUM WALLBOARD SYSTEMS

Interior: 5/8" type "X" fire-resistant. Water resistant type "X" all wet walls. GA Finish Level 4 "smooth wall" all exposed surfaces. GA Finish Level 1 "fire tape" all surfaces not exposed to view. Provide abuse-resistant GWB at all hallway locations from finish floor to 4'-0" +/-.

Assume GWB ceilings at shower restrooms and 25% of living area.

09300 CERAMIC TILE

Typical Interior Floors: 12" x 12" size, ceramic floor tile. Grout: epoxy grout, color as selected.

Restroom and Bath Floors and Walls: 6" x 6" glazed ceramic tile. Grout: epoxy type throughout, color as selected.

Assume tile at: restrooms, kitchen, dining, living area hallways, locker areas.

09500 ACOUSTIC CEILING TILE

Acoustic Tile Suspension Systems: Standard 15/16 inch steel grid, white. Seismic brace to structure.

Acoustic Tile Type #1: 2 foot x 4 foot x ¾ inch suspended acoustic tile ceilings, fine fissured, scored to 2 foot x 2 foot, tegular edge, white. NRC 0.55-0.65. Locations: Watch office, dayroom, resource room, sleep rooms, laundry, hallways.

Acoustic Tile #2: 2 foot x 4 foot x ¾" acoustic tile ceiling with smooth, un-perforated vinyl facing. Locations: Decon room.

09650 RESILIENT FLOORING

Resilient Base: 4 inch rubber base, coved.

Transition Strips: Extruded vinyl transition strips at all floor material transitions.

09680 CARPET

Carpet: per finish legend on drawings - commercial grade carpet tile, pattern loop type, solution dyed/yard dyed, 20 oz/yd^2.

Provide at sleeping rooms, offices, conference and community rooms.

09720 WALL COVERINGS

4' high vinyl wallcovering winscot at hallways, and day room. Pattern and color per finish legend on drawings.

09986 FRP WALL PANELS

Fiberglass reinforced plastic wall panels: 0.09 inch thickness. Provide full height, floor to ceiling panels with matching trim and accessories. Color and texture as selected. Locations: Decon and maintenance shop walls.

09900 PAINTING

Exterior Surfaces, Alkyd: One coat primer, two coats semi-gloss alkyd enamel. All unfinished exterior surfaces.

Interior Surfaces, Latex: One coat primer, two coats latex. Gloss as scheduled. Interior walls and ceilings as scheduled. Low VOC.

Interior Surfaces, Alkyd: One coat primer, two coats interior alkyd enamel, semi-gloss. Interior hollow metal doors and frames. Low VOC.

Color Schedule: Final color schedule to be determined during construction after all finish materials are submitted. Assume (1) body color and (4) accent colors; locations as determined.

Division 10: Specialties

10200 LOUVERS

Extruded aluminum frame with fixed blades and bird screening. 4" depth. Kynar finish.

10260 CORNER GUARDS

Extruded aluminum, or clear acrylic. Surface mounted type; provide at wall corners in hallway locations.

10350 FLAGPOLES

Existing to remain.

10420 SIGNAGE

Interior Room Signage: 8 inch x 8 inch x 1/8 inch acrylic, with room name and number in raised letters and Braille. Toilet room signs to include raised male/female pictogram and accessibility symbol. Vinyl foam tape mounted. Provide at each restroom door.

Exterior Signage: Cast brass letters and numbers. Stud mounted. Fire Station numbers: 24 inch high; assume 2 locations each station. Provide 12" high building address numbers.

Font: Text font for signage to be selected.

10520 FIRE EXTINGUISHERS AND CABINETS

Portable fire extinguishers in fully recessed cabinets at finished areas, wall hooks in mechanical/electrical rooms. Fire extinguishers: multi-purpose dry chemical 4A-60B:C. Assume (6) multi-purpose. Assume cabinets at office and living areas; bracket mounted at operations and apparatus bay areas.

10650 OPERABLE PANEL PARTITIONS

Where indicated: flat panel system with paired panel configuration. Assume 8' height, manual operation. Assume custom fabric as specified by Architect.

10800 TOILET ACCESSORIES

Satin finish stainless steel accessories. Verify accessory types with EPF&R vendor supply requirements.

Towel/trash, recessed: One per toilet room.
Towel dispenser, surface mounted: One per kitchen sink and apparatus bay sink.
Soap dispenser, countertop mounted: One per lavatory.
Mirror, framed: One per lavatory at restrooms only.
Toilet tissue dispenser, surface mounted: One per water closet.
Toilet seat cover dispenser, surface mounted: One per water closet
Grab Bars: One set per handicapped water closet.
Robe hooks: 3 per shower room and 3 per sleep room.

Towel Shelf: 1 per shower room.
Utility Hooks: 1 unit at mop sink in laundry.

Division 11: Equipment

11000 STATION EQUIPMENT

Extractor/Dryers: Provide plumbing and electrical connections. Equipment furnished and installed by Owner.

Standby Generators: Provide new at all stations, sized for anticipated loads. Fuel: Diesel 1,000 gallon tank. See mechanical and electrical engineering narratives.

Exercise Equipment: By Owner. Electrical infrastructure by Contractor.

Video Conferencing Equipment: By Owner. Electrical infrastructure by Contractor.

Cascade and Compressor Systems: By Owner. Mechanical and electrical infrastructure by Contractor.

Station Compressed Air: See mechanical engineering narrative.

11450 RESIDENTIAL EQUIPMENT

Provide equipment and connections for the following:

(1) 3-door commercial refrigerator.
(1) single door commercial freezer
(1) Undercounter dishwasher, commercial grade, 24 inch width, with provisions for a 2nd future dishwasher .
(1) Over counter microwave, nominal 1.4 cubic feet, on shelf.
(1) 8 burner, 48" wide stove with 2 ovens, dual fuel.
(1) commercial grade range hood
(1) Insta-hot at sink.
(1) Coffee maker, plumbed.

Laundry Room: High-end residential washer and dryer appliances.

Bunker Gear Racks: Ready Rack, Gear Grid, etc. Furnished and installed by Owner.

Division 12: Furnishings

12500 WINDOW TREATMENTS

Louver Blinds:

1" metal horizontal blinds with fixed top and bottom extruded aluminum rails. Hunter Douglas, Levelor, or equal. Provide at all exterior windows except apparatus bay.

Division 13: Special Construction

No Requirements

Division 14: Conveying Systems

14200 ELEVATORS

Electric traction elevators: At Station 13, provide a two-stop elevator with manufacturer's standard interior lighting and finishes. Provide options as required by State of Washington.

Division 15: Mechanical Systems

See attached Outline Specification by Sider & Byers, Inc.

Division 16: Electrical Systems

See attached Electrical Systems Narrative by Sazan Engineers.

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EAST PIERCE FIRE & RESCUE, NEW AND REMODELED STATIONS
Mechanical Systems Narrative

I. SITE WORK/UTILITIES

A. We assume that water pressure will be sufficient for standard plumbing and fire protection requirements.
B. We assume that building waste will discharge by gravity to sanitary sewer.
C. We assume that natural gas will be available.
D. We assume that three phase power will be available.

II. PLUMBING

A. Sustainable Components: The following items are included in the narrative but highlighted here for their sustainable value.
   1. Dual Flush Water Closets: 1.6gpf/1.1gpf in lieu of 1.6 gpf only to reduced water usage.
   2. Shower Heads: 2.0 gpm in lieu of 2.5 gpm to reduce water usage. (This head has been tested and is in use by several fire departments which report good performance.)
   3. Water Heater: High efficiency modulating gas with efficiency of 97% in lieu of standard 80% efficiency.

B. Plumbing Piping:
   1. Below grade water piping: Type 'K' copper, brazed.
   2. Above grade water piping: Type 'L' copper, solder.
   3. Below grade waste piping: Schedule 40 solid wall PVC, solvent cement.
   4. Above grade waste piping: Cast iron, no-hub with stainless steel clamp.
   5. Vent piping: Schedule 40 solid wall PVC, solvent cement.
   6. Gas piping: Schedule 40 black iron.
   7. Compressed Air Piping: Schedule 40 black iron.
   8. Pipe insulation: Preformed fiberglass with white laminated jacket. Molded PVC covers.

C. General Plumbing Fixtures:
   1. Faucets: Commercial quality, polished chrome plated, cast brass.
   2. Water Closets: Floor mount, vitreous china, manual water saving dual flush valves (1.6gpf/1.1gpf), with open seats.
   3. Lavatories: Countertop or wall hung units as indicated on drawings, vitreous china, with 1.5 gpm single handle mixing faucets which comply with ADA guidelines.
   4. Showers: Single piece fiberglass or acrylic stalls with single lever pressure & temperature balancing control valve, adjustable 2.0 gpm water saving spray head. ADA compliance where indicated with grab bars, seat and hand spray.
   5. Kitchen Sink: 18 ga. stainless steel, double bowl unit with 2.0 gpm single lever swing spout faucet, hose spray, 1 HP disposal and water station with “insta-hot” and filtered drinking water.
   6. Kitchen Prep Sink: 18 ga. stainless steel, single bowl with gooseneck faucet.
   7. Floor Service Sink: 24” x 24” floor mount with wall mount service type faucet, pail hook, edge guards, backsplash and hose.
   8. Decon Sink: Heavy duty, stainless steel scullery type with drain boards and back-splash, single bowl unit with blade handle faucet, swing spout and commercial style hand spray.
   9. Decon Shower: Deluge shower head with independent mixing controls. Hot and cold hose bibb with hose and spray.
   10. Water Coolers: Electric, ADA double fountain hi-lo units.

D. Domestic Hot Water: High efficiency, modulating gas-fired storage unit with expansion tank, recirculation piping loop and pump.

E. Natural Gas:
   1. Piping to water heater, apparatus bay heaters, air handler, kitchen appliances and kitchen hood makeup air unit.
   2. Exterior gas connection for BBQ in stainless steel wall box.
   3. Solenoid valves will separately shut off gas to the BBQ and kitchen appliances on station tone. Each valve will have a separate manual wall reset switch.

F. Plumbing Accessories:
   1. Hose bibbs (interior): Standard wheel handle, located in work areas and apparatus bay.
   2. Freeze-proof hose bibbs: Lockable wall boxes with loose key, spaced along the exterior of the building. Located for landscape watering and site wash down.

3. Floor drains: Cast iron body, round polished nickel bronze strainer with trap primers located in shower rooms, laundry, janitor, decon and sprinkler rooms.
4. Apparatus Bay trench drains: 6" wide, radius bottom, sloped length of drain to center outlet, extra heavy grate. H-25 rating. All apparatus bay drains will discharge through sand/oil/water separators.
5. Emergency eye wash: Wall mounted eye/face wash with stainless steel bowl and face spray ring and dust cover. Tempered water from application specific mixing valve.
6. Grease interceptor: Exterior below grade vault for drains from the kitchen sinks.
7. Dishwasher: Water connections and drain with air gap for under counter dishwasher.
8. Coffee/Ice makers: Water connections with shutoff cocks for coffee makers and ice makers in the refrigerators.
9. Clothes Washer: Wall laundry box for water connections and drain.
10. Bunker gear extractor: Water connections (double laundry boxes) and indirect waste floor trench drain.

G. Compressed Air System
   1. Size to provide air for vehicle exhaust system, power tools in shop and apparatus bay drops.
   2. Tank mounted 150 psi reciprocating type compressor with filters and air dryer.
   3. Quick connect air outlets in apparatus bay and shop areas.

III. FIRE PROTECTION

A. NFPA 13 wet sprinkler system.
B. Dry riser and heads where required.
C. Semi-recessed heads in ceilings. Exposed heads with guard covers.
D. Schedule 40 black steel or thinwall steel pipe. Threaded or grooved end fittings.

IV. HVAC

A. Sustainable Components: The following items are included in the narrative but highlighted here for their sustainable value.
   1. The VRFZ HVAC system provides a high efficiency heating and cooling system with zoning for occupant thermal comfort.

2. The DOAS (dedicated outside air system) provides high quality air filtration for good indoor quality.

B. Heating & Air Conditioning System: VRFZ (variable refrigerant flow zoning) multi-zone heat pump system using R-410A refrigerant. Commercial grade system with outdoor condensing unit(s) serving multiple indoor fan coil zones via manifolded refrigerant piping. This system provides simultaneous heating and cooling availability to all zones and internally recovers waste heat to conserve energy.

C. Zones (temperature control area): Heat and cooling for the building will be divided up into zones, each served by a fan coil controlled with a wall mounted temperature control (thermostat). Zoning will be each separate Sleep Room, Kitchen, Fitness, Training and Offices. The Apparatus Bay and associated adjacent spaces will be zoned with independent heat and vent only, which is not part of the VRFZ system.

D. Exhaust: Important for removal of contaminants, odors and moisture and aiding in the isolation of dirty areas from clean areas. Continuous exhaust operation in restrooms, janitor, decon, and bunker gear rooms.

E. Outside Air: Maintaining good indoor air quality is of high importance. Air is brought into the building from a single location which is free from exterior contaminants or odor by a DOAS (dedicated outside air system). This system provides tempering heat, high efficiency MERV 13 filtration and ducted fan distribution to each building zone.

F. Kitchen Range Hood
   1. Stainless steel commercial Type I with baffle grease filters, chemical fire suppression system and lights.
   2. Welded grease exhaust duct with cleanouts.
   3. Roof mounted up-blast exhaust fan with grease trap and clean-out.
   4. Compensating hood with gas-fired make-up air handling unit.

G. Controls
   1. Zone sensor controls with LCD display and space temperature adjustment.
   2. Central controller for system operation, scheduling, set point adjustment and web interface.

V. PROGRAM SPACES

A. Apparatus Bay
1. Heating only (no air conditioning): Minimum space temperature of 55 F. Suspended, natural gas, low intensity radiant tube heaters.
2. Circulation: 56" commercial ceiling paddle fans
3. General Ventilation: General exhaust at 1.5 CFM/Ft^2 controlled manually with a wall switch or automatically activated with CO/NO2 sensors. Alarm bell warning for high CO/NO2 levels. Louvers with motorized dampers for air intake when exhaust fan is operating.
4. Vehicle Exhaust: Application specific vehicle exhaust system with overhead rails, drop tubing and autostart controls.
5. Compressed air drops with quick release fittings.
6. Interior hose bibbs.
7. Trench drains center in each drive bay with floor sloped to drains.
8. Sink or disinfection station: Wall mounted stainless steel sink with gooseneck faucet and wrist blade handles.

B. Decon Room
1. Bunker gear drying cabinet with vent.
2. Bunker gear extractor with water connections and trench drain.
3. 14 Ga. stainless steel single bowl scullery sink with integral sloped drainboards. Service style faucet with stainless steel commercial hose sprayer on riser with spring guide.
4. Wash off shower: Constructed shower enclosure. Floor drain, shower valve and head. Institutional hot and cold hose bibb with hose and spray nozzle.
5. Floor drain.
6. Continuous exhaust.
7. Overhead electric IR heat.

C. Bunker Gear Room
1. Overhead electric radiant heat.
2. Continuous exhaust.

D. Sleep Room
1. Individual temperature control zone served by a wall mounted ductless fan coil.
2. Outside air supply.
3. Exhaust from lockers.

E. Laundry Room
   1. Laundry box for washer with water and drain connections.
   2. Dryer box for dryer with gas and vent connections.
   3. Floor drain.
   4. Continuous exhaust.

F. Shower Room
   1. Comfort heater on wall timer.
   2. Continuous exhaust.
   3. Floor drain.

James Whigham, PE

SÄZÄN
GROUP

EAST PIERCE FIRE & RESCUE, NEW AND REMODELED STATIONS

Electrical Systems Narrative

I. CODES AND STANDARDS

A. The materials and equipment required for construction of the fire stations will conform to the construction-oriented associations standards:

(1) National Electrical Code (NEC)

(2) National Electrical Manufacturers' Association (NEMA)

(3) American Society for Testing and Materials (ASTM)

(4) American National Standards Institute (ANSI)

(5) National Fire Protection Association (NFPA)

(6) Underwriters' Laboratory (UL)

B. Work will be installed in conformance with the latest editions of the following codes:

(1) Washington State Electrical and Energy Code

(2) International Building Code

(3) International Fire Code

(4) International Mechanical Code

(5) National Electrical Code, NFPA 70

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II. ELECTRICAL SITE WORK & UTILITIES

A. Sustainable Components: The following items are included in the narrative but highlighted here for their sustainable value.
   1. Outdoor site lighting LED lamped fixtures utilized where appropriate for the task and lighting level required.
   2. Photocells to operate light fixtures during hours of darkness and turn them off during daylight hours.
B. Service power from power utility. 208Y/120V three phase service from padmounted transformer underground to station service panel. Meter on outside of station.
C. Telephone service from telephone utility. Underground from interface point to terminal board in communications room.
D. Site Lighting. Energy efficient fixtures mounted on site lighting poles. Style compatible with facility. LED lamped fixtures when appropriate for the site and the lighting level desired.

III. NORMAL UTILITY POWER SYSTEM

A. Service Distribution Panel. Circuit breaker (CB) type, 208Y/120V, 3 phase four wire. SUSE label, Copper bus, fully rated for available fault current. CT enclosure for metering per utility standards. CB's to feed branch panelboards.
B. Branch Panelboards: Circuit breaker (CB) type, 208Y/120V, 3 phase four wire. Copper bus, fully rated for available fault current. CB's to feed station branch circuit power and lighting loads.
C. Seismic support and bracing. Per essential facility standards. Ip = 1.5 importance factor. Electrical equipment to be fully operational following a design level seismic event.
D. Raceways and Conductors:
   1. Below grade: Schedule 40 PVC raceway. XHHW insulation copper conductors.
   2. Above grade: Steel EMT raceway. THHN insulated copper conductors. MC cable allowed for vertical drops to switches, receptacles and light fixtures. Horizontal raceways and homeruns to be EMT.
E. Switches and Receptacles: UL listed. NEMA standard. General purpose rated 20A, 120V.
   1. Plates to be stainless steel 302.
   2. Device color to be as selected by Architect.

F. Special purpose receptacles as required by the load served to accommodate the amperage and voltage indicated on the equipment nameplate.
G. Voltage Drop. Will be limited to three percent for branch circuits and equipment feeders.
H. Fractional horsepower motors will be fed with single phase and generally will have manual type starters. Motors 1 HP and larger will be fed with 208V, 3-phase and have NEMA standard magnetic starters for automated start-stop control via the Mechanical Controls contractor.
I. Cooking equipment automatic off with station alarm.
J. Station Doors: Open/close/stop pushbutton stations to operate doors. Interlocks and automatic operation per District standards.

IV. EMERGENCY POWER SYSTEM

A. Emergency Generator. An outdoor diesel powered emergency generator to power the station emergency power, communications, lighting and life safety loads. Four (4) days of fuel will be via an underset diesel fuel oil tank. Set to be in a standard sound enclosure to keep sound levels within acceptable limits.
B. Automatic Transfer Switch. An automatic transfer switch (ATS) will upon loss of utility power, automatically start the generator and transfer the station emergency loads to generator power. Newly adopted electrical codes require the generator power system to separate into two separate branches the life safety loads and the station essential emergency loads. This can be via a second ATS or by battery backup to the life safety loads. These stations will have the life safety systems with battery backup so the separation of loads and two ATS's is not required.
C. Seismic support and bracing. Per essential facility standards. Ip = 1.5 importance factor. Electrical equipment to be fully operational following a design level seismic event. The generator will be supported via seismic spring isolators sized per above to keep the set operational after a seismic event.
D. Essential station loads to be connected to generator power. These loads include those needed for station operation and response for and extended period of 72 hours.

V. LIGHTING SYSTEMS

A. Sustainable Components: The following items are included in the narrative but highlighted here for their sustainable value.
   1. LED lamp fixtures utilized where appropriate for the task and lighting level required.
   2. Fluorescent lamps will be low mercury content such as Philips ALTO Technology type.
   3. Occupancy sensors to operate light fixtures when rooms and spaces are occupied.

B. Interior lighting will be fluorescent fixtures with high-efficiency T8 lamps and electronic ballasts. Lamps to be low mercury Philips Alto series.

C. Installed lighting wattage will not exceed that allowed by the Washington State Energy Code. To save energy the installed wattage will be 80-90% of the energy code limit.

D. Lighting levels to be per the IES guidelines which include offices and general areas at 40-50 fc and non-work areas at 25-30 fc and work areas at 50 to 70 fc.

E. UV filters on light fixtures in rooms with de-con gear.

F. Sleeping room lights automatic on with station alarm.

G. Occupancy sensors will be provided in office and utility areas. Ballasts in these areas will be programmed start ballasts.

H. Exit and emergency egress lighting will conform to National Fire Protection Association (NFPA) 101 requirements. Power will be via individual battery backup ballasts in the lighting fixtures. Exit signs will be battery backup type.

VI. LIFE SAFETY SYSTEMS

A. Fire Alarm. In a fully fire sprinklered station the fire alarm system will be a UL listed, addressable, class A system with manual pull stations at exit doors and audible horn/strobes throughout the occupied rooms. Sleeping rooms to have smoke detectors. System to report alarm and trouble to an approved monitoring station. System shall monitor the sprinkler system valves and flow switches. HVAC unit supply fans over 2000 cfm shall have duct smoke detectors and the fan to shutoff upon fire alarm. Battery backup shall power the system for 24 hours or as required by codes and the AHJ.

B. Kitchen Range Hood. Hood suppression control panel connected to fire alarm panel and to shutoff power to equipment under hood upon hood activation.
C. Exit and emergency egress lighting will conform to National Fire Protection Association (NFPA) 101 requirements. Power will be via individual battery backup ballasts in the lighting fixtures. Exit signs will be battery backup type.
D. In addition, station egress and essential lighting will be powered via the generator during a power outage.

VII. STATION ALARM and RESPONCE

A. Station alarm and response will be via District standard alarm and response equipment, receivers, audible devices and station interconnections.

VIII. COMMUNICATIONS

A. Public Address: Public address system will be via speakers interfaced with the station telephone system. Speakers with individual volume controls will be located throughout the occupied spaces. Volume controls for general offices, private offices, conference rooms and meeting rooms will be located next to the room light switches.
B. Telephone: District standard telephone system serving the station occupants.
C. Telecommunications/Data System: District standard telecommunications/Data system serving the station occupants.
    1. ANSI/TIA/EIA-568A standard
    2. Telecomm room with backboards, racks, ground bar and wire management ladders and cable trays.
    3. Cat 6 cabling.
    4. RJ-45 jacks. One voice, one data standard.

IX. PROGRAM SPACES

A. Apparatus Bay
   1. Lighting on with station alarm.
   2. Lighting fixtures with wire guards and UV filters when so required.
   3. Station doors open/close/stop controls. Interlocks per District standards.
   4. Generator power to apparatus bay loads.

B. Decon Room
   1. Lighting fixtures with gasketed lens and UV filters when so required.
   2. In wet and hosedown areas outlets GFCI type with wp covers.
   3. Power to overhead electric IR heat.

C. Bunker Gear Room
   1. Lighting fixtures with gasketed lens and UV filters when so required.
   2. In wet and hosedown areas outlets GFCI type with wp covers.
   3. Power to overhead electric IR heat.

D. Sleep Room
   1. Individual lighting control switch.
   2. Light fixtures on with station alarm.
   3. Fire alarm smoke detector.

E. Kitchen
   1. Cooking equipment to shutoff on station alarm.
   2. Generator power to kitchen loads.

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