Joint Public Safety Building

911 Dispatch / EOC / Fire Station

PRE-DESIGN REPORT

PREPARED FOR

OCTOBER 2020

PROJECT #R18-190345

PREPARED BY

OAC SERVICES, INC.

2200 1ST AVE S., SUITE 200, SEATTLE, WA 98134

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Acceptance Page

Brian Smith, Police Chief
City of Port Angeles Police Department

Bill Benedict, Sheriff
Clallam County Sheriff Department

Ken Dubuc, Fire Chief
City of Port Angeles Fire Department

Ron Cameron, Undersheriff
Clallam County Sheriff Department

OAC

Project Management
Structural Engineering

LINDBERG & SMITH ARCHITECTS

Architecture

HUNT Engineering Services Inc.

Mechanical
Electrical
Plumbing
Fire Protection

ZENOVIC & ASSOCIATES INCORPORATED

Civil Engineering

RØEN ASSOCIATES

Cost Estimating

Project Participants

STAKEHOLDERS / OWNERS

CITY OF PORT ANGELES

Chief Brian Smith - Police Department

Chief Ken Dubuc – Fire Department

Karl Hatton – PenCom

CLALLAM COUNTY

Undersheriff Ron Cameron- Sheriff Department

Dale Jackson – Sheriff Department

DESIGN TEAM

OAC SERVICES, INC. – Project Manager / Structural

Todd Thiel – Design Director

John Rupp – Project / Design Manager

LINDBERG ARCHITECTURE - Architect

Bill Lindberg - Architect

HUNT ENGINEERING – Mechanical / Electrical / Plumbing Engineer

John Hunt - Engineer

ZENOVIC & ASSOCIATES – Civil Engineer

Seth Rodman - Engineer

ROEN ASSOCIATES – Cost Estimating

Roger Roen – Principal

Matt Wiggins – Senior Cost Estimator

Table of Contents

Page

Figures

Tables

1. Introduction

Clallam County (County), located on the north end of the Olympic Peninsula in Washington State, is home to several local jurisdictions and a resident population of 77,331. The largest city within the county is the City of Port Angeles (City), located along the Strait of Juan de Fuca to the north. The county covers 1,738.33 square miles of land area. The City has a resident population of 20,229 and covers a land area of 10.7 square miles. The County seat is in Port Angeles along with the County Sheriff's Office, Emergency Management Division including the Emergency Operations Center (EOC). The regional 911 system, referred to as a Public Safety Answering Point (PSAP), is Peninsula Communications (PenCom), also seated in Port Angeles. The PenCom Center provides dispatch services from the city of Sequim to the far western reaches of the county. Both departments have outgrown their existing facilities and the facilities have also reached or are nearing the end of their useful service life. Additionally, the City's Fire Department is planning to construct a new fire station to provide service coverage to the growing population in the western end of the City.

The City and County authorized OAC services to develop a pre-design report for development of a new facility to collocate PenCom, EOC, and City Fire Department. The project was to re-envision 15,000 square feet of space located at the 1010/1050 Building, in a Port of Port Angeles (Port) owned industrial park, adjacent to Fairchild International Airport.

Following a round of design concepts and associated cost estimates, the project approach of an interior retrofit of the existing Port building was reevaluated. The OAC team was directed to consider additional properties, better suited for the needs of all 3 departments. Through a review process between the City, County, and Port, a parcel located at the northeast corner of 19th & O St., 2417 W. 19th St., was identified and subsequently approved as the new proposed site for development of the planned facility.

This report concludes the process of defining and selecting a preferred development concept, defines the building systems and systems basis of design, and the project's estimated order-of-magnitude (OM) construction costs. This document is intended to be used by the City and County's detailed design consultant as the basis of design, construction, and delivery of the project.

1.1. Document Organization

This Pre-Design Report is organized as follows:

Section 2 describes the City and County's purpose and objectives for the joint facility development project.

Section 3 presents the preferred development concept and a summary of the cost estimate.

Section 4 presents the basis of design, including space programming, existing site discussion, and preferred development requirements.

Section 5 presents the proposed implementation schedule for design and construction.

2. Project Purpose and Objectives

The purpose of this project is to ensure the long-term survivability and continuity of operations for the PenCom Center, the County EOC, and the fire station. Additionally, with many functions crossing over between departments during an emergency event, immediate proximity to each other will enhance critical communications and support across departments, permit shared resources, and offer greater flexibility in space utilization. By collocating and developing a facility with a more than 50-year lifespan and high degree of resilience to natural hazards, the building will naturally be sustainable, limiting impacts to the environment.

2.1. Project Objectives

- Increase space of EOC for enhanced efficiency and incorporation of additional regional partners.
- Increase space of 911 Dispatch to allow for future growth and integration of other regional partners.
- Employment of new technology.
- Decrease Fire Department response time to westside of City.
- Increase cross functional effectiveness of different emergency-oriented departments.
- Maximize shared space to minimize overlap and redundancy of spaces.
- Target facility Life Cycle Costs rather than initial project delivery costs.
- Develop 50-year building to minimize maintenance and equipment replacement costs.

2.2. Pre-Design Development Process

The design team held meetings with stakeholder groups to discuss design considerations and to develop the building program. Stakeholder workshops with members of the departments were conducted to review conceptual development plans and review the adjacencies and identify shared spaces.

Conceptual drawings were developed for the 1010/1050 building located at 2140 W. 18th Street.

Two building and two site options were developed for the originally planned site. Building Option One left the existing building as it was and constructed a building inside the perimeter walls, with the fire apparatus exists to the south of the building and east to ‘L’ Street.

Building Option Two was to remove the existing building and construct a new building in its place with fire apparatus exits north of the building directly onto 18th Street.

Project and construction sequencing were discussed and reviewed over the course of the conceptual development. As part of this project development phase, associated costs were developed. Following this cost analysis and further discussion with project stakeholders, including the Port of Port Angeles, an alternate site analysis was conducted by the stakeholders.

During discussions for a proposed alternate site, an idealized conceptual building plan was advanced under the premise that an alternate site would be selected, and this conceptual footprint would be adapted to fit the selected site. The idealized conceptual building plan adopts a “modular” based approach. With three distinct departments within the building, modularity in the design and layout produces many advantages including flexibility in arrangement of the

"modules" on the site, construction sequencing flexibility, and financial and budgeting flexibility. Depending on the final selected site, the three "modules" may be moved around or rearranged to best fit the final site accounting for site needs of each department in the building. Regarding construction sequencing and budgets, the "modular" approach permits flexibility in advancement of one, two or three "modules" under various timelines. Should department needs shift or require realignment the three "modules" have the ability to be separated with no reduction in function or capacity of each department.

The preferred project site was selected to be 2417 W. 19th St. on the northeast corner of the intersection of 19th St & 'O' St., approximately ¼ mile west of the originally planned site. With this new site identified, building siting and orientation discussions placed the facility on the identified parcels. An Updated conceptual site plan was developed along with conceptual project costs estimates.

The outcome of the pre-design process is to identify a preferred building concept situated on a preferred site based on rigorous analysis of space programming, cross functional operations, interoperability, and site conditions and constraints. The modular approach to the preferred concept provides for adaptability to a variety of alternate sites.

This report will support the decision making for the final building concept and final site selection.

2.3. Pre-Design

Prior to commencing the pre-design process for a new facility, the City and County had identified a space in the 1010/1050 Building, located at a Port of Port Angeles owned industrial business park on the north side of Fairchild International Airport. Based on the existing building layout, a space of 15,000 square feet was identified to meet the pre-identified needs of the City and County.

The existing building on the site is a pre-manufactured metal building constructed in the mid-1980s. The building was originally two separate buildings that had been combined years ago to create a single large building. The space identified by the City and County was the western most portion of the building with a plan configuration of 100 feet deep by 150 feet wide. The identified area was office space with restrooms and a mechanical loft area. The physical building is constructed with steel columns and beams for the vertical system and a combination of diagonal rod bracing and steel moment frames for the lateral system. Interior columns supported the roof beams. Interior walls separate the spaces with suspended tile ceiling systems throughout. Metal paneling made up the exterior roof and wall systems.

Access to the airport was located adjacent to the parking lot to the north of the building. Site parking was located in the main parking lot to the north of the building. To the south of the building was additional parking, accessed via L Street to the east. A large covered breezeway connecting the main entrance to various buildings on the property is located on the north side of the building. Adjacent the western wall of the building is the airport perimeter security fence.

A suitability analysis was undertaken focusing on three unique elements: building, site, and cost.

2.3.1. Suitability Analysis

2.3.1.1. Building

The building code identifies requirements for structures of specific types. Buildings, determined by their function, are categorized into four different groups as outlined in the American Society of Civil Engineers 7 – Minimum Design Standards for Buildings (ASCE 7). Each group has a level of risk assigned, increasing with criticality of the building. The baseline risk assigned to most buildings is Risk Category II, which is assigned a Risk Factor of 1.0.

The 1010/1050 building, functioning as an office space and manufacturing facility, falls under this baseline Risk Category. A facility housing 911 dispatch, an EOC, and a fire station fall under the highest risk level, Risk Category IV, with a Risk Factor of 1.5. This increased Risk Factor applied to design of the lateral force resisting system to resist wind and earthquake forces.

To facilitate constructing a 911 dispatch, EOC, and fire station in the existing building, a seismic upgrade would be required for the building to meet current code, which requires a 50% increase in seismic demand over what was originally constructed.

Additionally, knowledge of earthquakes and the way the ground moves during an earthquake has evolved significantly since the building was originally constructed. Based on the method of design for pre-manufactured metal buildings, there is often little capacity remaining in the existing system resulting in the need to add additional structural members.

Two options were considered, construct a building inside the existing building or tear down the existing building and reconstruct on the same general footprint. Analysis of the building-in-building concept led to the following conclusions:

1) The usable square footage of the new space would be reduced to accommodate necessary offsets from the existing to new building.
2) The inner building would need to be stronger than a standalone building to support the weight of the existing outer building should it collapse in an earthquake.
3) The inner building would require the same level of envelope design as a standalone building to ensure weather resistance should the existing outer building collapse.
4) Ingress and egress routes would require more extensive design to ensure safe passage should the outer building collapse.

5) Utility connections would require additional design and consideration to account for differential movement between the inner and outer building.

The cost to construct and reduced space available for required department functions showed this option to not be functionally feasible. Thus, the preferred concept at this site would to be a tear down and rebuild scenario. This scenario includes demolition of the existing building and rebuilding of the end wall for the adjacent space.

2.3.1.2. Site

The existing site naturally led to consideration of two scenarios for entering and existing the facility, particularly for needs required by PenCom and the fire department. PenCom required secured parking and access from this secured parking area directly into their dispatch floor area. The fire department require direct access to an adjacent surface street for responding to calls. Secured parking was identified in an area to the south of the existing building, adjacent the airport perimeter fence.

Option 1 considered a fire department apparatus bay along the south side with an egress route through the existing southern parking lot and out to 'L' Street. To avoid potential impacts with future tenants of the balance of the 1010/1050 building, a dedicated fire lane was provided along the airport perimeter fence, requiring a significant amount of added driving surface.

Option 2 provided for the apparatus bay to exit to the north, through the parking lot and out onto 18th Street. The fire department identified a pull through apparatus bay to be a highly desirable feature for the fire station. To facilitate this component, an access drive was provided along the west side of the proposed building to allow returning apparatus to circle around the back of the building and enter the apparatus bay. This feature served an additional benefit of allowing PenCom personal to use this access drive to enter the secured parking area in lieu of entering the property off of 'L' Street to enter the secured parking area. With fire department access directly to 18th Street, revisions to the existing parking lot, where other tenants park, would be required to provide a direct fire lane out to 18th Street. To facilitate the required fire lane, additional parking areas were required to offset spaces removed for the fire lane. Like Option 1, additional driving surfaces are required to construct this scenario.

Analysis of the two site concepts led to the following conclusions:

1) Apparatus exiting to 'L' Street had in increased response time over existing to 18th Street.
2) Use of a pull through apparatus bay was highly favorable over a back-in apparatus bay.

3) PenCom employee access from the main parking lot was highly favorable.
4) Site development and stormwater management for a dedicated fire lane and new parking lot were greater for the pull through apparatus configuration.

Applying the various aspects of each option for the site planning to a register, it was concluded Option 2 was the preferred option to consider for further refinement.

2.3.1.3. Cost

During the analysis of the 2 building concepts, it became evident the cost to develop a building-in-building concept far exceeded the costs to tear down the existing building and reconstruct a new facility. With the addition of the fire station to the project, the originally projected 15,000 square foot facility was undersized to meet the function needs of each department requiring an approximate additional 3,000 square feet. Considering the required costs of demolition of the existing, the reconstruction of walls on the existing building, additional site development costs to mitigate stormwater requirements, and lease costs associated with the building, a discussion regarding an alternate site naturally arose.

The 1010/1050 building was identified with a negotiated lease rate for renovating and occupying a previously developed building. Applying the planned square footage and site requirements to another site yielded several advantageous benefits:

1) Costs associated with demolishing the existing building and rebuilding an end wall to the remaining building were no longer applicable, to the OM cost of approximately $300,000.
2) Costs associated with enhanced stormwater management infrastructure were no longer applicable, to the OM cost of approximately $275,000.
3) Costs Associated with site improvements for new roadways and other required parking were no longer applicable, to the OM cost of approximately $175,000.
4) Lease rates of a site with no building compared to one with an existing building were in the order of 90% reduction in lease cost per square foot.

2.3.1.4. Suitability Analysis Conclusions

Taking into consideration all aspects of developing a new building on the existing pad, added site development efforts and potential cost savings of a reduced lease rate, an alternate site was pursued and identified at the corner of 19th Street and ‘O’ Street.

3. Preferred Development Concept

Throughout the conceptual planning and design process for the joint 911 Dispatch/EOC/Fire Station, several options were developed and reviewed by stakeholders from each of the three departments comprising the facility. The following is a brief description of the preferred conceptual plan that meets the project goals and objectives outlined in Section 2.1.

3.1. Preferred Concept Plans

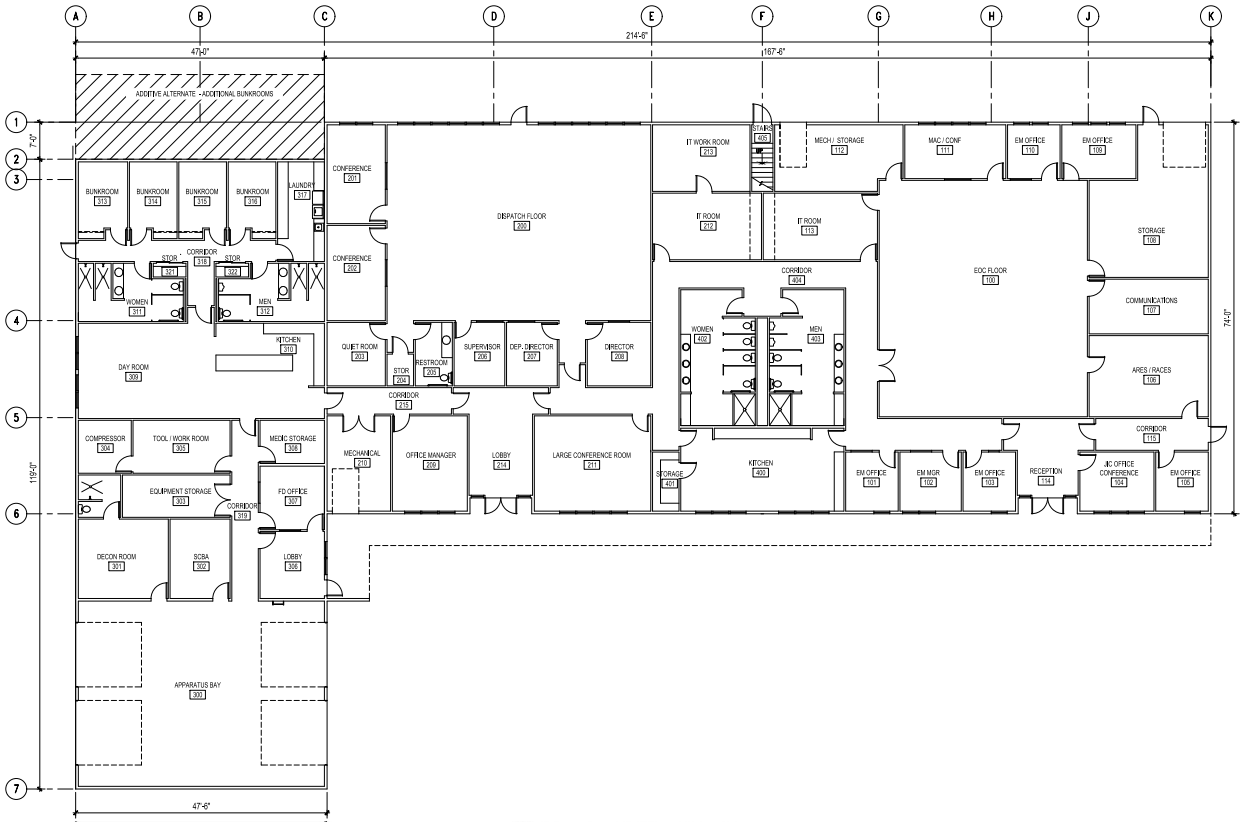


Figure 1 – Preferred Building Concept: Overall Floor Plan

The preferred conceptual plan consists of three “modules” supporting PenCom, EOC, and City Fire Department. The building encompasses approximately 19,970 gross square feet of emergency support functions between the three departments. This area accounts for all area within the building perimeter walls. Dedicated PenCom space is 4,952 square feet, dedicated EOC space is 5,107 square feet, dedicated City Fire Department space is 6,085 square feet, and there are 3,826 square feet of shared space between PenCom and the EOC. The entirety of the facility is on grade with two mechanical penthouse areas, one above PenCom and the EOC while the other is above the Fire Department Lobby and Office areas. Each mechanical area is accessed by a staircase or ladder system. The mechanical penthouse areas support building mechanical equipment associated with the heating and cooling needs. Additional detail associated with building areas can be found in Section 4.1.

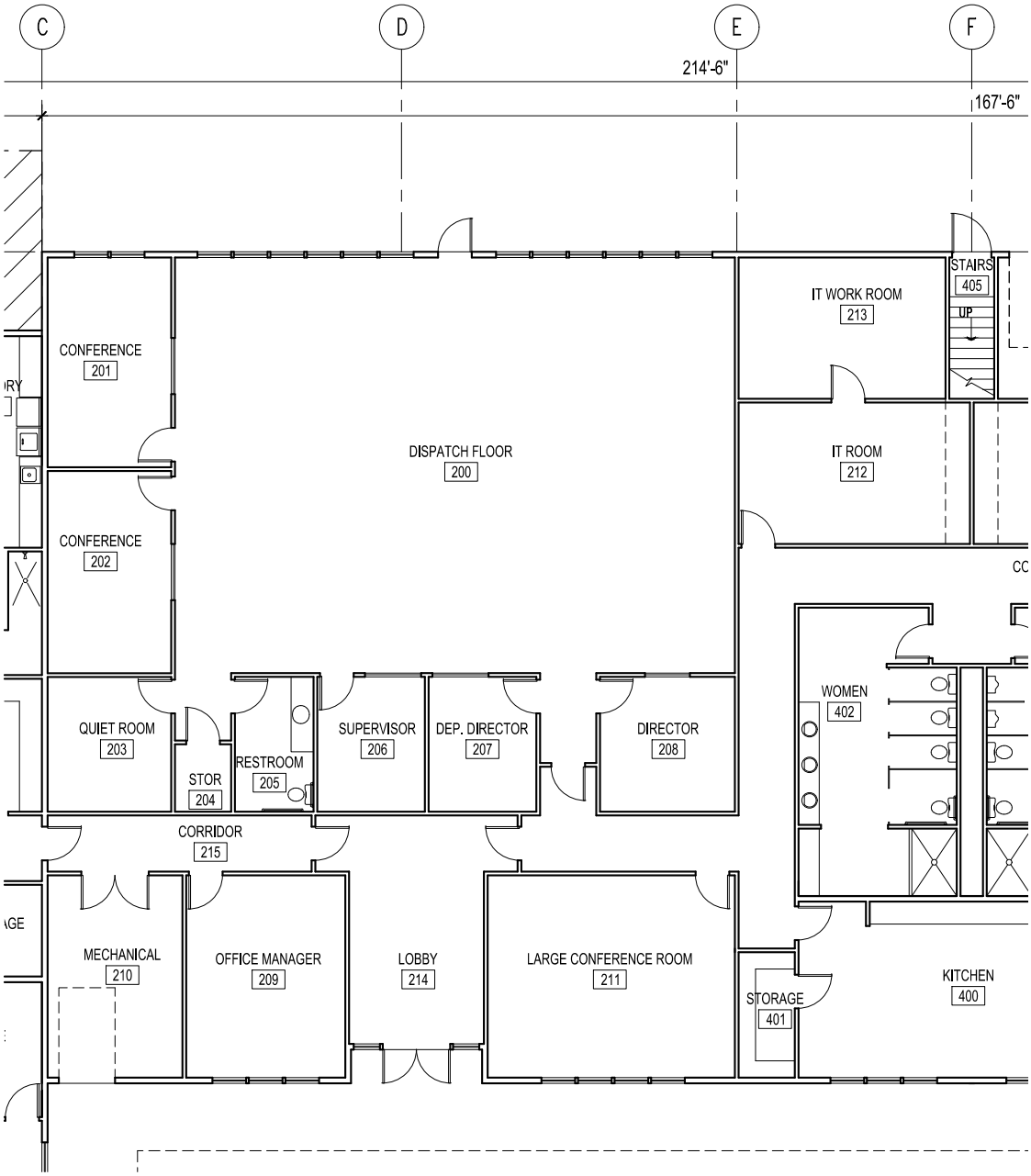


Figure 2 – Preferred Building Concept: PenCom Floor Plan

The PenCom “module” houses an open, centralized dispatch floor with immediate adjacent access to offices, a quiet room, and restroom. A corridor isolates secured and non-secured public areas. Access to the dispatch floor is via this corridor or through a secured parking area immediately adjacent the dispatch floor. The exterior wall of the PenCom “module,” and the interior walls of the dispatch floor are designed to resist munitions from handheld weapons, protecting internal occupants. The mechanical penthouse is located above non-critical programming areas. Access to the mechanical penthouse, with equipment supporting PenCom and the EOC, is via a secured exterior door between the PenCom and EOC “modules”.

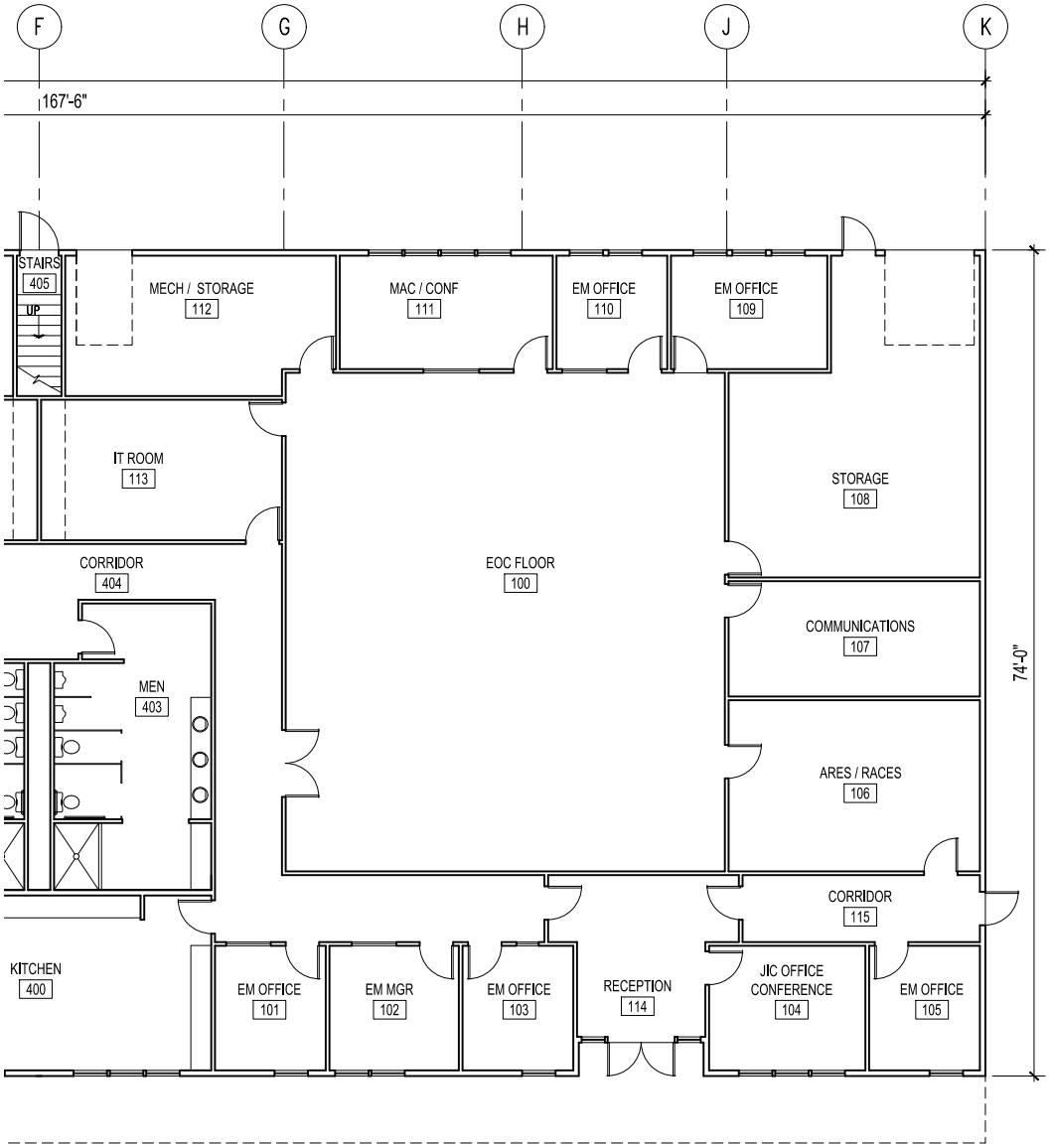


Figure 3 – Preferred Building Concept: EOC Floor Plan

Like PenCom, the EOC "module" houses an open, centralized EOC floor with immediate adjacent access to offices, conference rooms, storage areas, mechanical/electrical room, IT equipment, Radio equipment, and a Communications room. A corridor isolates secure and non-secured public areas. Access to the EOC is via this corridor. Ballistic protection will be provided for the EOC floor, IT Room and ARES/RACES Radio room. The mechanical penthouse is located above non-critical programming areas. Access to the mechanical penthouse, with equipment supporting PenCom and the EOC, is via a secured exterior door between the PenCom and EOC "modules".

City Fire Department "module" (Figure 4) is oriented to separate work activities from rest activities. The pull-through apparatus bay is located at the front of the building with Day Room and dormitory facilities at the rear of the building. A door is located adjacent the Day Room allowing access to the centralized corridor in the PenCom "module."

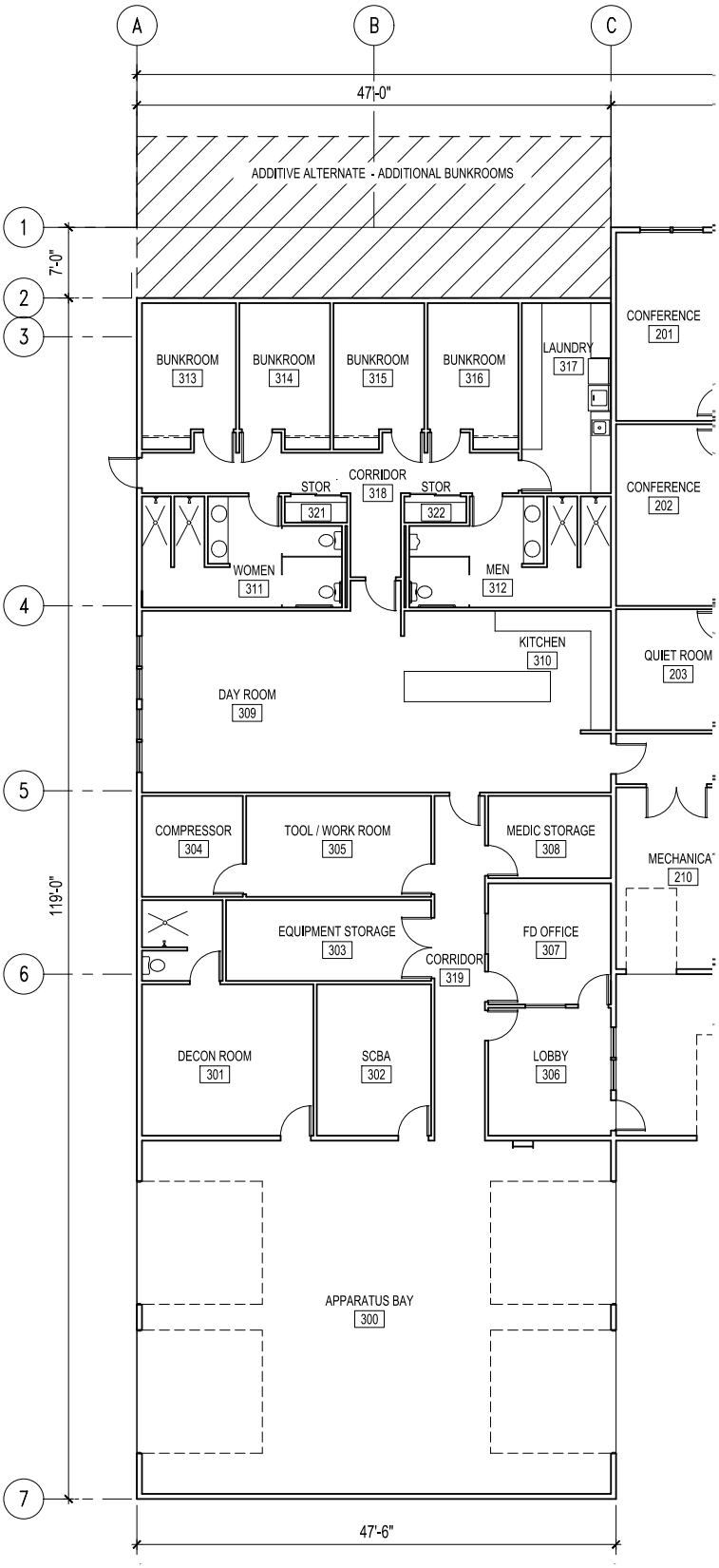


Figure 4 – Preferred Building Concept: Fire Department Floor Plan

3.2. Cost Estimate

The Conceptual Design construction cost estimate is based on this pre-design report, building floor plans, and site plan. The estimate is based upon construction of the entire facility on the site noted and does not include costs for property acquisition or leasing.

While design and construction are anticipated to be performed consecutively, an escalation rate has been provided to account for potential year over year cost differences. A rate of 4% has been included based on planned construction start in Quarter 4, 2021. The estimate does not include soft costs such as consultant detailed design, permitting or fixed furnishings and equipment.

Additional details of this cost estimate can be found in Appendix B including cost by department.

The construction cost estimate total is $10.36 Million, in 2021 dollars.

3.2.1. Operations & Maintenance

Approximated 50-year Operations & Maintenance Costs are noted in Table 1.

Table 1 – Projected Operations & Maintenance Costs

		2021	50-Year Total
1	**Utilities Total**	**$ 91,000**	**$ 6,446,327**
	Utilities - PenCom	$ 36,000	$ 2,589,073
	Utilities - EOC	$ 31,000	$ 2,131,206
	Utilities - Fire	$ 24,000	$ 1,726,049
2	**Building Maintenance**	**$ 31,000**	**$ 9,869,222**
	Maintenance - PenCom	$ 14,000	$ 4,710,571
	Maintenance - EOC	$ 12,000	$ 3,517,378
	Maintenance - Fire	$ 5,000	$ 1,641,274
3	Lease - Land	$ 44,738	$ 2,281,638
4	Lease - Building	$ 11,982	$ 611,082

Notes:	
1	Utilities include: Electric, Water, Propone and Garbage
2	Utilities based on staffing/occupancy today and adjusted to full staffing/occupancy after 15 years
3	Utilities have a 5% escalation in 5-year blocks
4	Building maintenance includes inspection & service of critical support systems and consumables
5	Estimates based on similar facility size
6	Lease based on $0.05/sq. ft. - preliminary

Not Included	
1	Costs paid to other agencies
2	Capital costs for apparatus, radio replacement, CAD system replacement/operations/maintenance, dispatch systems replacement, City/County Administration, Personel Administration, building system replacement

4. Basis of Design

The following sections provide a roadmap and envelope the design of the 911 Dispatch/EOC/Fire Station facility. Functional Building Space Program, Existing Site Analysis, and Building & System Requirements are documented and further detailed in the following three areas:

Section 4.1 Provides a detailed description of the preferred concept space programming and requirements for each of the three departments. This programming is based on information developed from workshops and engagement meetings with the stakeholders.

Section 4.2 Presents analysis of the existing site where the facility is to be located, addressing siting of the building, grading, and parking.

Section 4.3 Describes the architectural, structural, mechanical, electrical, fire protection, codes and standards and other elements that characterize the preferred building concept.

4.1. Building Space Program

The building space programming effort was targeted around three key focus areas, understanding the existing space constraints and issues, generating new space wants and needs, and tailoring the space programming to align with targeted project costs.

The first programming meeting was held in March of 2020. The meeting was held with PenCom, EOC, and City Fire Department. An initial survey was circulated to gather existing and future space programming information. The meeting involved review how the users would utilize the space, the number of persons planned to utilize the space and the organization of adjacencies for operational requirements. Working independently with each group, diagrammatic techniques were used to demonstrate relationships and the bubble diagrams were refined as requirements were further understood by the design team.

The second programming meeting was held in April of 2020. The combined programming information developed from the three stakeholder groups was presented as a complete facility. Stakeholder groups reviewed the inter-operational adjacencies and provided comment and guidance on the programming functionality. Adjacency corrections and room sizes were revised and adjusted following stakeholder input.

The OAC team continued to meet independently with each stakeholder group to revise and refine each department's specific programming requirements and sizes in parallel with estimated cost projections. A spreadsheet of programmed interior and exterior spaces was developed for the facility as a whole. Room areas are based on actual areas within each room. Gross square feet numbers are based on the extents of the building, measured to the exterior wall face, and account for all walls and other miscellaneous area. For this reason, the gross areas are larger than the combined areas of each room.

4.1.1. Occupants/Users and Activities

PenCom – PenCom operates the regional 911 system for a large portion of the Northern Olympic Peninsula. Future plans may integrate the 911 system in Jefferson County, Jefferson Communications (JeffCom).

The dispatch floor is intended to accommodate up to 15 workstations for dispatchers with an additional supervisor workstation. Other regular staff include the Director, Deputy Director, and office manager. With regular long shifts, staff members utilize a quiet room and an outdoor break area to refresh or recharge. Conference rooms for training or other gatherings and dedicated mechanical and IT rooms for equipment support. 911 systems utilize an array of technology such as VHF radio, Computer Aided Dispatch (CAD) monitors, computers and systems, logging recorder, station alerting systems, and others. The existing communication support equipment for dispatching and radio transmissions, located at the existing PenCom facility has not yet reached the end of its useful service life. Point-to-Point fiber optic systems will relay communications until the existing system and equipment are to be relocated.

EOC – The County EOC is regularly staffed by a small group of 3-4 and must have the capacity for more than 30 during a full center activation. The EOC facility is sized for planned incorporation of other regional response departments, such as the Lower Elwha Tribe. Conference rooms are for meetings with the City and other emergency response departments as well as have the ability to be utilized for additional EOC operations. Radio, IT, and Communication rooms are all located adjacent to the EOC for operational interdependency requirements. A large mechanical room and storage areas are included for back up facility support systems and community response needs. The EOC floor will be flexible to support trainings for groups of 35 persons. Video and distance learning along with business video conferencing activities will occur in this space. EOCs utilize various technology systems including Amateur Radio Emergency Service (ARES) and Radio Amateur Civil Emergency Services (RACES) radio communications, telephones, and internet. To support the emergency radio systems, associated antennas and infrastructure will be located at the site. Another technology element critical for EOC functionality is a large video wall with an array of TV monitors. With long hours anticipated during full activations, shower facilities are accounted for in the restroom areas.

Fire Department – The Fire Department is regularly staffed by a team of four on 24- or 48-hour shifts. Other administrative staff are active at the facility during traditional working hours. The department is intended to be functional for the growing community need. The apparatus bay is designed for two units, an engine truck and a medic unit, with adjacent tool room and work space, decontamination room, self-contained breathing apparatus (SCBA) room, equipment storage room, and medic storage room. A commercial grade kitchen adjacent the day room will support rest-time functions. The Fire Department “module” has four individual bedrooms and restroom facilities with showers.

The fire department is continuing to evaluate their department as it pertains to staff retention and recruitment. Part of this evaluation has been the consideration of a residency program where trainees would reside in quarters at the station. To accommodate this program, an additive alternate space for additional bunkrooms is included in the space programming.

Figure 5 – Preferred Building Concept: Function Areas

4.1.2. PenCom

Table 2 – PenCom Spatial Programming

			programmed			
		Room #	qty	net square feet	total	comment / adjacency
City of Port Angeles - PenCom						
1	**PenCom**					
1.1	Dispatch	200	1	1913	1913	9 Console initial build-out with space for additional 5-6 consoles. Staff mailboxes, lockers, shelving, wall mounted monitors, standard office equipment. Raise access floor at Supervisor console. Dedicate space for Records officer supporting file management, direct exit to secured parking and outdoor break area, dual-factor authentication for access, ballistic protection, privacy glass, maximize natural light, aggressive sound dampening
1.2	Conference Room 2	201	1	205	205	Support training of operators
1.3	Conference Room 1	202	1	198	198	Support training of operators
1.4	Quiet Room	203	1	132	132	Break area for personal care
1.5	Storage	204	1	30	30	
1.6	Dispatch Restroom	205	1	84	84	Single use, quick access for operators without traveling too far from work station.
1.7	Supervisor	206	1	115	115	1-2 work areas, direct access to supervisor console
1.8	Deputy Director	207	1	115	115	Work area and small 4-seat conference space, close proximity to Director office
1.9	Director	208	1	144	144	Work area and small 4-seat conference space, close proximity to Deputy Director office
1.10	Office Manager	209	1	255	255	Records storage areas, work space, access visually and via monitor to lobby area with access control capability, cashier window
2	**Dedicated Support Space**					
2.1	Mechanical	210	1	216	216	Mechanical and electrical equipment supporting PenCom
2.2	Large Conference Room	211	1	396	396	Hold training sessions for operators, sharable with EOC and Fire
2.3	IT	212	1	259	259	Houses all equipment supporting PenCom operations with 3 work areas, adjacency with IT Work Room, fully secured
2.4	IT Work Room	213	1	231	231	Work area electronics support - staging of computer, adjacency with IT Room, equipment, repairs and space for related meetings
2.5	Lobby	214	1	274	274	Public access point, secured from balance of facility
2.6	Corridor	215	1	117	117	Connectivity with various functions and cross over with EOC and Fire.
	sub total		16	4684	4684	
3	**Dedicated Outdoor Space**					
3.1	Outdoor Break Area	-	1	880	880	Covered sitting area, landscaping, adequate distance from building door
3.2	Secured Parking	-	16	160	2560	Access for PenCom staff only, automatic gate
	sub total		17	1040	3440	
	Total		33	5724	8124	
	Building Gross SF				4952	
	Exterior Gross SF				3440	

4.1.3. Emergency Operations Center

Table 3 – EOC Spatial Programming

			programmed			
		Room #	qty	net square feet	total	comment / adjacency
Clallam County Emergency Management						
4	**EOC**					
4.1	EOC Floor	100	1	1755	1755	Flexible work space for wide range of activation; Adaptable for training configuration; Video wall; use of wall space for information sharing, aggressive sound dampening, access floors or electrical raceways through floor, ballistic hardening, potential EMP hardening
4.2	Office Type 1	101, 103, 105, 110	4	110	440	Use for regular FTE position; Administrative office
4.3	Manager	102	1	130	130	Administrative office
4.4	JIC Office/Conference	104	1	156	156	Information sharing space with external partners; Press conferences
4.5	MAC/Conf	109	1	142	142	Administrative office
4.6	Office Type 2	111	1	194	194	Coordination space for multiple agencies
5	**Dedicated Support Space**					
5.1	ARES/RACES Radio	106	1	345	345	Radio operations; Emergency communications, ballistic hardening, potential EMP hardening
5.2	Communications	107	1	232	232	Message distribution
5.3	Storage	108	1	552	552	Gear and supply storage area for 30 days of EOC support
5.4	Mech/Stor	109	1	292	292	Supports mechanical and electrical equipment specific to the EOC
5.5	IT Room	113	1	272	272	Houses all equipment supporting the EOC operations, ballistic hardening, potential EMP hardening
5.6	Reception	114	1	200	200	Public access point, secured from balance of facility
5.7	Corridor	115	1	127	127	Connectivity with various functions and cross over with PenCom and Fire.
	sub total		16	4507	4837	
6	**Dedicated Outdoor Space**					
6.1	Unsecured Parking Stalls	-	16	160	2560	Primary use for EOC activations & trainings
	sub total		16	160	2560	
	Total		32	4667	7397	
	Building Gross SF				5107	
	Exterior Gross SF				2560	

Note:
Additional site parking desired for EOC. Revisit parking considerations as site and building orientation become more defined.

4.1.4. Fire Department

Table 4 – Fire Department Spatial Programming

			programmed			
		Room #	qty	net square feet	total	comment / adjacency
City of Port Angeles - Fire Department						
7	**Fire**					
7.1	Apparatus Bay	300	1	1627	1627	Support (1) Engine Apparatus and (1) Medic Unit, overhead vehicle exhaust system similar to other PA Fire stations
7.2	Decon	301	1	321	321	Shower area, Turnout Washer, gear drying racks, gear storage lockers
7.3	SCBA	302	1	170	170	storage and support of breathing apparatus systems
7.4	Equipment	303	1	162	162	Miscellaneous station and operator equipment storage
7.5	Compressor Room	304	1	100	100	Houses compressor suitable to support repairs to equipment and apparatus
7.6	Tool & Work Room	305	1	183	183	Miscellaneous repairs to equipment, work bench, tool storage system
7.7	Office	307	1	146	146	Administrative office
7.8	Medic Storage	308	1	99	99	Specific for medic unit, secured for storage of narcotics
7.9	Day Room	309	1	598	598	Rest area, recliners, wall mounted TV
7.10	Kitchen	310	1	242	242	Fridge for each shift + shared fridge, food storage and prep
7.11	Restroom/Shower	311, 312	2	200	400	Personal care
7.12	Bunkroom	313, 314, 315, 316	4	122	488	Storage lockers for alternate shifts
7.13	Laundry	317	1	166	166	Washer/dryer for station linens
7.14	Storage	321, 322	2	16	32	
8	**Dedicated Support Space**					
8.1	Lobby	306	1	154	154	Public access point
8.2	Corridor	318	1	224	224	Standard circulation
8.3	Corridor	319	1	170	170	Standard circulation
8.4	Mechanical Mezzanine	320	1	410	410	Mechanical HVAC equipment supporting PA Fire
	sub total		23	5110	5692	
9	Additive Alternate					
9.1	Bunkroom	-	1	893	893	Additional bunkrooms for residency program
	sub total		1	893	893	
	sub total w/ Add Alt.		24	6003	6585	
10	Dedicated Outdoor Space					
10.1	Truck Washdown Pad	-	1	1750	1750	Dedicated catch basin for cleaning apparatus
10.2	Parking Stalls	-	7	160	1120	Area specific for PA Fire staff parking
10.3	Above Ground Tank - Vehicle Fueling Pad	-	1	320	320	
	sub total		9	2230	3190	
	Building Gross SF				6085	
	Building Gross SF w/ Add Alt.				6978	
	Exterior Gross SF				3190	

4.1.5. Common/Shared Spaces

Shared spaces within the building are areas utilized by more than one department. For this building these areas include restrooms, kitchen, kitchen storage, corridors around restrooms/kitchen, stairs to mechanical penthouse, and the mechanical penthouse. All noted areas are split equally in support of PenCom and the EOC except shared corridor space which has a varied space break down and is detailed in Table 5. Corridors and lobbies not directly adjacent a shared room are considered dedicated department space.

Table 5 – Shared Areas Spatial Programming

			programmed			
		Room #	qty	net square feet	total	comment / adjacency
Building Support - Shared Space						
11	**PenCom & EOC**					
11.1	Kitchen	400	1	483	483	Shared space for PenCom & EOC, flexible furniture for added EOC breakout area
11.2	Storage	401	1	55	55	Pantry space for shared kitchen
11.3	Restrooms	402, 403	2	348	696	Shower area for long EOC activations or PenCom staff use during long shifts
11.4	Corridor	404	1	846	846	Standard Circulation: 394 sq. ft. @ PenCom module, 452 sq. ft. @ EOC module
11.5	Stairs	405	1	102	102	Access to mechanical penthouse
11.6	Mechanical Penthouse	406	1	1454	1454	Secured ventilation intake and air-handling equipment
	sub total		7	3288	3636	
12	**Outdoor Space**					
12.1	PenCom Emergency Power	-	1	900	900	Redundant emergency power with fuel storage
12.2	PenCom/EOC/Fire Emergency Power	-	1	1050	1050	Primary emergency power for facility
12.3	Visitor Parking Stalls	-	10	160	1600	Open for all visitors, trainings and other sessions
	sub total		12	2110	3550	
	Total Building Shared Space Gross SF				3826	
	Total Outdoor Shared Space Gross SF				3550	

4.1.6. Summary

The total building areas, not including outdoor areas, summarized by department are provided here. Values noted are based on gross square feet of space.

Table 6 –Spatial Programming Department Summary

A	**Pencom**	Building Area
A.1	PenCom	4952
A.2	Kitchen, Storage, Restrooms, Corridor, Stairs, Mech. Penthouse	1908
	sub total	6860
B	**EOC**	
B.1	EOC	5107
B.2	Kitchen, Storage, Restrooms, Corridor, Stairs, Mech. Penthouse	1918
	sub total	7025
C	**Fire**	
11.1	Fire	5637
11.2	Mechanical Mezzanine	448
	sub total	6085

4.2. EXISTING Site Development

The preferred development site is situated northeast of the corner of 19th and “O” Streets in Port Angeles on the north side of Fairchild International Airport. The project area is located on property zoned for Light Industrial use and is owned and managed by the Port of Port Angeles.

The site area has been previously developed and currently consists of a vacant lot (west half) and a lot (east half) being utilized as an equipment and material staging area for a local excavation contractor. The vacant lot contains a paved parking lot, footings/slab of a recently demolished building and a fenced storage yard with gravel surfacing. The equipment staging area is minimally developed with gravel surfacing over the majority of the lot. The site slopes down to the north at a slight slope of approximately 2%. The slope increases to 10-15% at the north border of the project area.

The adjacent streets have been primarily fully developed with paved travelled ways (approximately 30’ paved width), sidewalks on the project side of streets and sanitary sewer, potable water, storm water and power and communications utilities. Access to the site is from two existing concrete driveway aprons and from the end of 19th Street. Approximately 100 feet of the west end of 19th Street adjacent to the site has not been developed and is currently a graveled way.

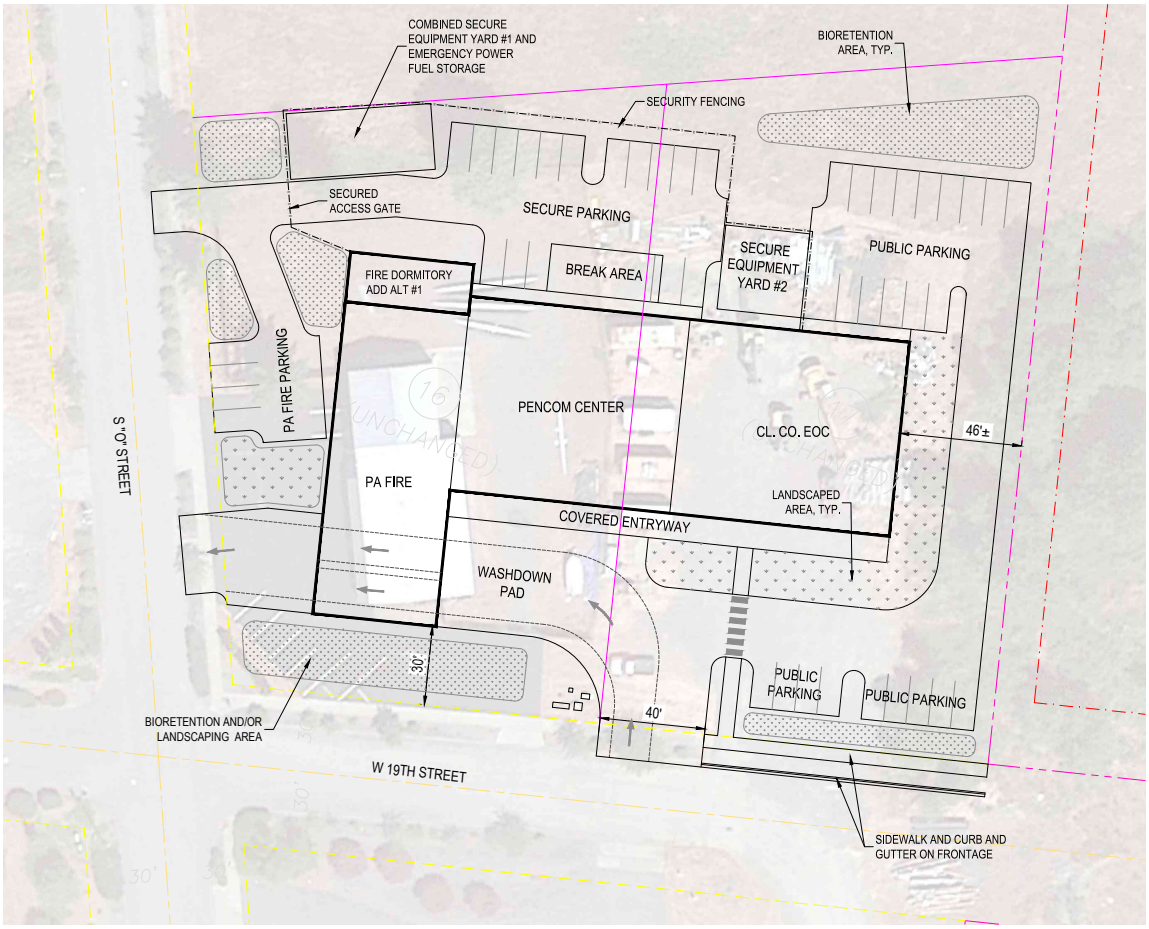


Figure 6 – Preferred Building Concept: Site Plan

4.2.1. Site Access & Parking

General and emergency vehicular access is available to the site along both the 19th Street and “O” Street roadways. Both 19th and “O” Streets have direct connection to 18th Street and subsequently into the rest of the Port Angeles roadway system. Access to Fairchild International Airport is available through a secured access gate at the south off the end of S. “O” Street approximately 600 feet to the south of the project site.

Access to the site is proposed as follows:

- Ingress/egress from east end of 19th street intended for use by EOC personnel and general public. This access is further intended for ingress by emergency fire apparatus. Separation of the access uses can be through either a physical barrier (landscaping, curbing, bollards, etc.) or through visual markings.
- Egress located on “O” Street near 19th Street intended for emergency fire apparatus.
- Ingress/Egress on “O” Street at the northwest corner of the project site intended for use by PenCom personnel and fire department personnel.

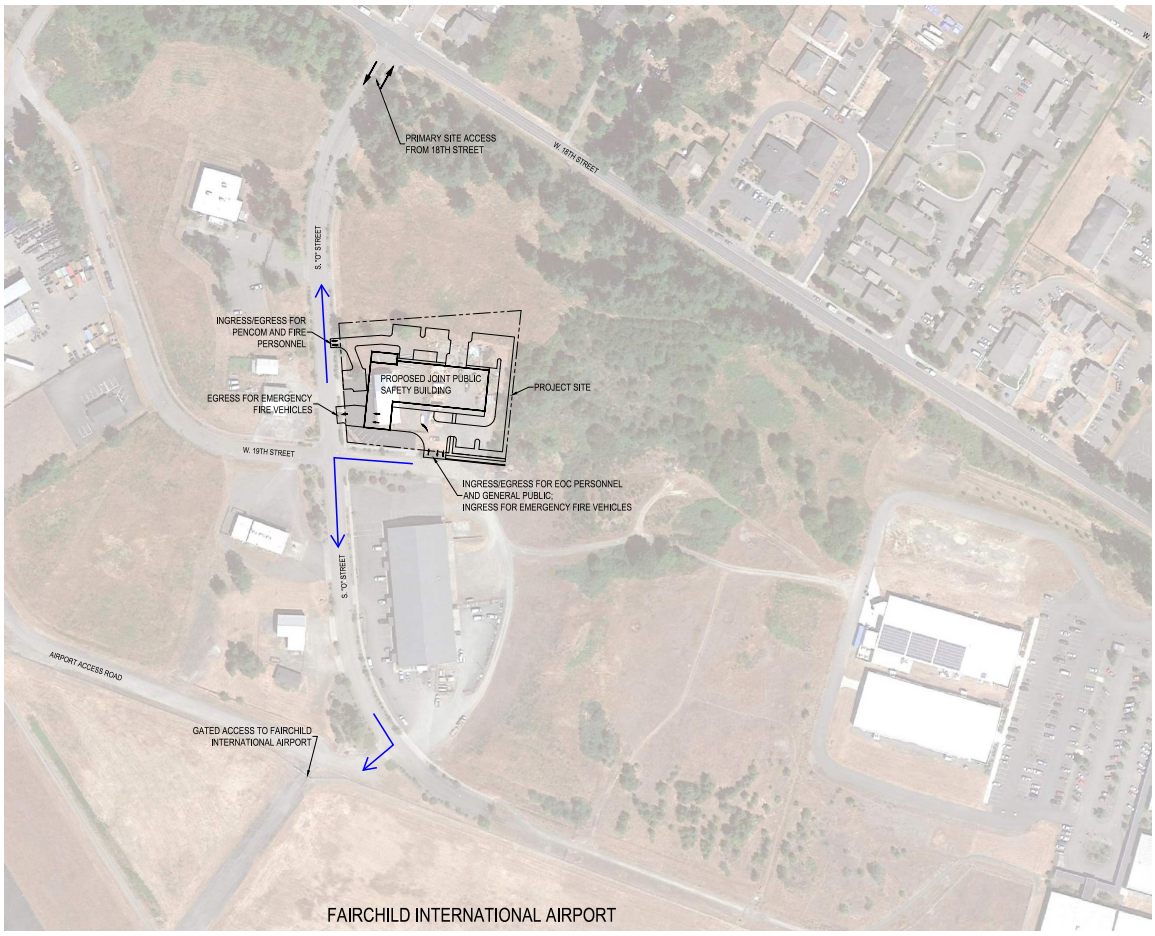


Figure 7 – Preferred Building Concept: Site Access Plan

Based on preliminary site plans there are 44 onsite parking spaces planned for the site. These spaces will be further broken down as follows: 16 secured spaces intended for use by PenCom personnel, 24 spaces intended for use by EOC personnel and general public, and 4 spaces intended for Port Angeles Fire Department personnel stationed onsite.

The majority of the site is anticipated to support primarily small passenger vehicle traffic. The structural roadway and parking section should include a minimum of 2” asphalt over 2” crushed surfacing top course over 8” of ballast material. The south and west ingress/egress from the site are anticipated to support heavy truck traffic (emergency fire vehicles) and those areas should have a structural roadway section with a minimum of 4” asphalt over 2” crushed surfacing top course over 8” of ballast material.

4.2.2. Site Utilities

Water, sanitary sewer, storm drain, and power infrastructure are provided by the City of Port Angeles and are adjacent to the site. There is no natural gas in Port Angeles. Communication infrastructure is also available at the site. Each utility is further evaluated below.

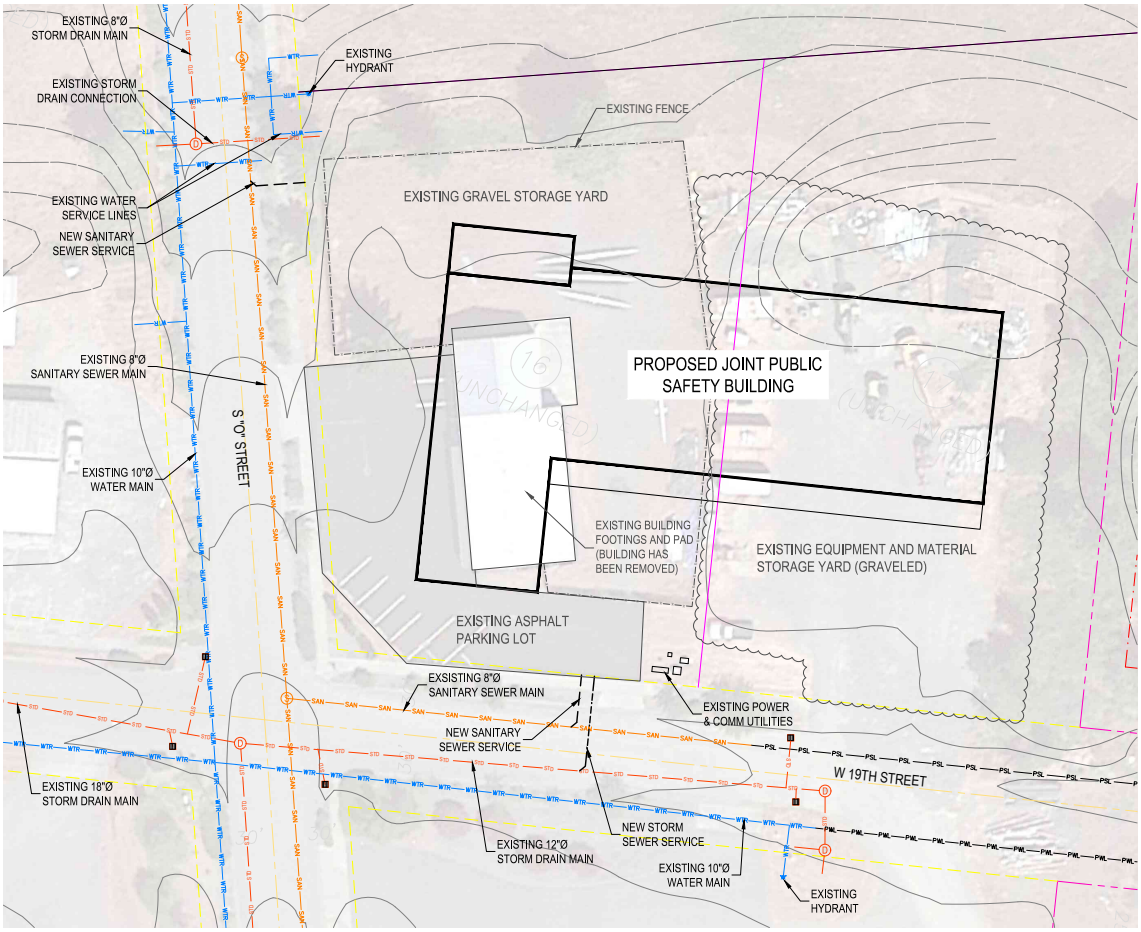


Figure 8 – Preferred Building Concept: Site Utility Plan

4.2.2.1. Domestic & Fire Suppression Water

10” asphalt concrete water lines run on the west side of “O” Street and on the south side of 19th Street both lines are part of the City’s primary distribution system.

Two (2) fire hydrants are found in close proximity to the site; at the northwest corner of the on the east side of “O” Street, and at the southeast corner of the site on the south side of 19th Street. Results of hydrant flow tests for these hydrants are as follows:

- Hydrant on “O” Street and north of 19th
  - Static Pressure: 72 psi
  - Residual Pressure: 61 psi
  - Measured Flow: 2717 GPM

- Hydrant at east end of 19th
  - Static Pressure: 72 psi
  - Residual Pressure: 55 psi
  - Measured Flow: 2740 GPM

Water connections (potable and fire suppression) to the site may be from either the 19th Street line or the “O” Street line. Either connections will require cutting and patching of the street surface and backfilling of the utility trench with controlled density fill. It is anticipated that the proposed facility will require two potable water service connections and one fire service connection with appropriate backflow prevention, post indicating valve and fire department connection. Based on City of Port Angeles records, there are two service connections to the site in the northwest corner of the site. However, the size and condition of those services is unknown at this time.

4.2.2.2. Sanitary Sewer

Gravity sewer lines are located 19th Street on the north side of street and “O” Street on the east side of the street. The lines are 8” diameter PVC gravity mains which are a portion of the City of Port Angeles sanitary sewer system. The gravity lines are quite deep (10-13 feet in “O” Street and 13 feet in 19th Street) and will allow gravity service from the project area.

It is anticipated that two sanitary sewer connections will be required. One connection will be for standard sanitary sewer service from building facilities and the second will be for discharge from a wash-down area for fire apparatus. The connection for the wash-down area will require an appropriately sized oil and water separator and valving to prevent stormwater discharge to the sanitary sewer system. Connections to the existing main will require cutting and patching of the street surface and backfilling the utility trench with controlled density fill.

4.2.2.3. Stormwater

Storm water discharge within the City of Port Angeles is regulated by the Department of Ecology under a NPDES Phase II permit. Discharge standards are significantly different depending on whether the site runoff flows to a stream or marine waters. The site is located in an area which discharges to the Strait of Juan de Fuca directly through a man-made conveyance system and thus control of flow rates from the project site is not required by Ecology permit requirements. However, the City of Port Angeles requires projects that are discharging to a conveyance system which is operating at or over capacity to provide control of runoff to match discharge durations to existing land cover condition (i.e. discharge rates must not increase over existing rates). Based on a cursory qualitative analysis of the downstream system, the stormwater system adjacent to the site is likely operating at or very near to its capacity and matching existing runoff rates will be required. The majority of the existing site is currently impervious (gravel, asphalt and concrete) and with careful design to ensure no net increase, it is anticipated that no dedicated flow control facilities will be required for this site. Basic treatment of runoff is appropriate for this site.

Storm drain infrastructure is located in both 19th street and “O” Streets. The storm drainage system in 19th Street consists of a 12” diameter corrugated metal pipe sloping to the west. Stormwater runoff is collected by type 1 catch basins, conveyed to type 2 catch basins then discharge to the aforementioned storm line. The storm drainage system in “O” Street consist of an 8” diameter corrugated metal pipe storm drain which ends at the northwest corner of the site and drains to the north. Based on City GIS mapping an 8” storm line was extended into the northwest corner of the site and will be one point of connection for the site.

It is anticipated that runoff from the roadway and parking areas of the site discharge to rain gardens located throughout the site to provide treatment of runoff as well as some infiltration into the existing subgrade. Furthermore, it is anticipated that roof runoff will be discharged to provide infiltration of runoff onsite to the maximum extent feasible. While the sizing of these facilities is highly dependent on the existing site soil conditions, a preliminary sizing of 10% of the contributing area is considered conservative. Additionally, it is recommended that the cost of installing underdrains be included due to the currently unknown nature of the subsurface soils.

Overflow from the rain gardens will be discharged to a piped conveyance system which will either discharge to the afore-mentioned storm connection in the northwest corner of the site or to a new connection to the existing storm main in 19th Street.

4.2.2.4. Power & Communication Infrastructure

Port Angeles Light Operations primary underground power runs along the south and west boundaries of the project site. An existing junction box, transformer and secondary pedestal are located on the south side of the site and are the preferred connection point. Three phase power in available at that location but upgrade of the existing transformer may be required.

Fiber and telecom utilities are available at the south end of the site on the north side of 19th Street.

4.2.3. Landscaping

As a goal of the project, the site is desired to have minimized operations and maintenance efforts. As part of this, consideration of the type and extent of landscaping was considered. There are several areas around the site where bioretention facilities, also referred to as rain gardens, will be installed to address overflow capacity for the stormwater management system. Vegetation for these areas is targeted for the ability to thrive in the desired function of surface stormwater retention. Native species will be identified for plantings within these rain gardens as they have proven to thrive in the local environment.

Other areas of the site with landscaping will have plantings and surface coverings of species and types suitable for the Port Angeles area climate appreciating the periods of rain and dry seasons. Additionally, site plantings will consider the proximity to Fairchild International Airport. Depending on the proximity, plantings should be selected to limit the attractiveness to local, regional and migratory birds as any unintentional increase may have an adverse effect on operations at the airport. Irrigation systems will provide necessary watering of the planting areas. An alternative for consideration during design is the installation of a rainwater collection cistern with a pump used to supply the irrigation system of the site plantings.

Specific areas of planting around the site consider maintaining site lines for departing apparatus responding to calls. Plantings between the fire department parking area and the street must be low height species to not impact site lines for both departing apparatus and public traffic approaching the station to be able to see the departing apparatus.

Planting areas around the site will double as supporting the vehicular barrier system. Curbs, planter walls and other intentional grading of plantings areas will support stopping vehicular traffic from contacting the building.

4.3. Preferred Concept Building and Systems Requirements

4.3.1. Codes, Standards, and Reference Documents

Local Codes:

- International Building Code – 2018
- International Energy Conservation Code – 2018
- City of Port Angeles Municipal Code

Standards:

- National Fire Protection Association (NFPA) 1221 - Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems
- NFPA – Miscellaneous Standards
- Motorola R56 – Standards and Guidelines for Communication Sites
- National Emergency Numbers Association (NENA) Standards
- Federal Emergency Management Association (FEMA) 543 – Design Guide for Improving Critical Facility Safety from Flooding and High Winds

Reference Documents:

- Emergency Management Accreditation Program (EMAP)
- National Reliability and Interoperability Council (NRIC)
- National Incident Management Systems (NIMS)
- FEMA EOC Assessment Checklist
- FEMA – Miscellaneous Documents

4.3.2. Architecture

Early stages of building design take into consideration various elements including space programming and area massing. Area massing addresses the proportionality of different parts and areas of the building. For the joint public safety building, the building massing was driven from the space programming. The size and configuration of the spaces for these departments led to a single-story building with varying ceiling heights to support the space functions. PenCom and the EOC have very similar interior space requirements where the fire station has a higher apparatus bay and lower ceiling heights for living quarters. Based on the proximity to the airport, maximum height of the building was considered along with the selected parcels to meet FAA requirements.

4.3.2.1. Interior

Walls

Interior wall finishes to be painted gypboard over metal stud. Sound dampening materials shall be installed on all walls enclosing the PenCom dispatch floor and the EOC floor.

Ceilings

EOC	The EOC will have a suspended ceiling system at 12 feet above finished floor. Office and conference rooms will have suspended ceilings

	at 9 feet above finished floor. All suspended ceilings will have sound dampening elements to minimize local noise transmission. Exceptions to the suspended ceiling will be the mechanical room, storage room, restrooms, and kitchen. The Mechanical room and storage room will have hard lids to underside of structure, approximately 14 feet above finished floor. The restrooms and kitchen areas will have hard lids at 10 feet above finished floor. The lobby will have hard lids and corridors will have suspended ceilings at 12’ above finished floor.
PenCom	Like the EOC, all rooms will have suspended ceiling system at 12 feet above finished floor. Exceptions to the suspended ceiling will be the offices, quiet room, and conference rooms where suspended ceilings will 9 feet above finished floor. The single occupant restroom will have a hard lid at 8 feet above finished floor. The large conference room will have a suspended ceiling at 10 feet above finished floor. The mechanical room will have a hard lid at approximately 14 feet above finished floor.
Fire Station	The apparatus bay will have no ceiling and be open to the underside of structure. The Compressor, Tool, Decon, and SCBA rooms will have hard lids at 12 feet above finished floor. The Lobby will have a hard lid and fire department office will have suspended ceiling systems at 9 feet above finished floor. The Day room, kitchen, restrooms, laundry, and living quarters will have hard lids at 10 feet above finished floor.
Mechanical Penthouse	The mechanical penthouse will have a hard lid at the underside of structure to meet fire rating requirements.

Floors
All floors to have a Level 2 polished concrete finish. Exceptions to be the EOC floor and offices/rooms accessed immediately off the EOC floor where removeable carpet tile flooring finishes will be utilized.

Mechanical and storage rooms will remain polished concrete at the EOC. The PenCom floor, adjacent conference rooms, quiet room, offices immediately off the dispatch floor, and large conference room will have removeable carpet tile flooring finishes. The bedroom spaces within the Fire Department will have Luxury Vinyl Tile Flooring. The balance of the fire station will be polished concrete.

Fire Rating/Building Classification
Per the Building Code, the facility is planned to be Type II construction. The building will be fully sprinkled with gas suppression as noted in the mechanical narrative where required.

4.3.2.2. Acoustics

The acoustics of this building are essential based on the function and activities.

The PenCom dispatch floor has workstations supporting critical communications during an emergency event in the community. The ability for each operator to hear the caller and not be distracted or otherwise hear other operators is essential to their operational effectiveness. The ceiling tile system, wall coatings/mountings, office furnishings, and additional ceiling mounted sound absorbing panels will all be part of the sound isolation system. Soft absorbing materials and surfaces of these elements will be identified to minimize sound transmissivity throughout the space.

In the EOC, under a full activation, upwards of 50 people may be in and around the EOC floor all having independent and equally critical conversation. Similar to the dispatch floor in PenCom, acoustical ceiling tiles, sound absorbing wall panels, office furnishings, and others will be identified to minimize sound transmissivity throughout the space.

In the fire station, isolating sounds due to work in the apparatus bay from day room activities or sleeping quarters is also an essential element to ensuring the fire department staff are able to maximize their operational effectiveness. The primary wall separating the work areas from the living areas will be addressed with sound dampening and absorbing construction to minimize the transmissivity of sound.

4.3.3. Building Envelope

A building's enclosure is the first line of defense against the natural environment and interior comfort. The six sides to a building include the roof, walls and floor; all of which must be carefully thought-out and connected to provide optimal performance and occupant comfort. There are four primary elements that a building's enclosure must detail – air, water, thermal and vapor. Code restrictions and regulations are mandating buildings be more airtight, all the while optimal indoor environment and building performance typically include fresh air circulation, proper vapor transmission, thermal continuity, and water mitigation. A well-designed enclosure will reduce heating and cooling loads in the cold and summer months, respectively, and create a more productive and healthier indoor environment. In addition, proper enclosure design leads to lower maintenance costs long-term.

The design of the preferred concept will include these parameters while allowing the design of the envelope to be enduring, functional, and meet aesthetic needs of the surroundings. Integration of the building enclosure into a thorough design process is key for project success. Criteria will be registered against thermal performance calculations of all elements creating an integrated enclosure system. Results from the calculations will aid the design of mechanical and electrical systems to minimize life cycle operating costs.

4.3.3.1. Fenestration Systems

The effectiveness of the building envelope is inversely proportional to the number of openings or fenestrations that penetrate envelope. It is essential that an appropriate fenestration system is used to alleviate the transfer of thermal conductivity through and around the openings. The fenestration system is merely a part of the entirety of the building envelope and all parts must work in collectively for a fully functional, high-performing envelope system.

There are many systems on the market today which vary greatly in their ability to achieve a desired thermal performance, the amount of light passable, and the ability to resist impacts from firearms. The ideal system will maximum light transmission for users working long hours while minimizing glare for use of computer systems.

Several factors will be utilized as guidelines for thermal transmissivity regarding the selection of window systems for the preferred development concept:

1) U-factor - represents the rate of heat loss
2) Solar heat gain coefficient - represents the amount of heat that is transmitted through the glass. This is also related to emissivity
3) Visible light transmittance - the "sunglasses" effect
4) Air leakage - rated by air passing through a square foot of window area

5) Condensation resistance - measures the ability of the window to resist condensation on the inside of the glass

For the preferred development concept, we are recommending high-performance argon-filled windows with Energy Star triple-glazed panes, and low-e film for the window systems. The selected window system will be coordinated with the building mechanical system to ensure proper ventilation to address condensation related issues.

For door selections, we propose either insulated metal doors or aluminum storefront type doors with glass inserts for entry and exit visibility. Doors into PenCom's dispatch floor and the EOC floor will meet the same resistance to firearms as the balance of other adjacent fenestration or wall systems. These doors will also provide a thermal separation and acoustic suppression of outdoor noise. Main entry points will have full lite aluminum doors. Full lite doors are all glass with a metal frame surround. All entrance doors will have integrated, fully accessible operations.

4.3.3.2. Wall and Roofing Assemblies

Exterior wall cladding and roofing assemblies with service lives that match the expected service life of the facility with comparatively low maintenance costs are ideal. Cladding and roofing, combined with the air and vapor resistant components discussed in Section 4.3.3.3, combine to create complete assemblies that resist thermal, air and moisture loads.

For a critical use facility expected to last 50 years in the Pacific Northwest an appropriate cladding system is one that is resistant to wind-driven rain for several months of the year, relieved only by a short drying cycle in the summer. The cladding system should deflect most water and moisture back to the exterior and should be able to manage moisture that gets between cladding and exterior sheathing. Manage in this context means providing a channel for liquid water to drain back to the exterior and inorganic layers between sheathing and cladding that can safely "store" limited moisture and allow it to move to the exterior over time. Membranes and components described in Section 4.3.3.3 occur primarily at the face of exterior sheathing and their roles in water, air and moisture management are discussed below. Outboard of these components, OAC recommends 3-1/2 inches of semi-rigid mineral wool insulation - basis of design is Comfortboard 110 by Rockwool to meet the continuous insulation requirements of the Washington State Energy Code and to provide an approximate R-value of 19. Note that additional R-13 of fiberglass batt insulation will be required between metal studs to meet the prescriptive R-value requirements for the entire wall assembly.

We recommend installing a grid of light gauge steel, hot-dipped galvanized framing over the mineral wool to achieve a rainscreen

assembly. The grid is built by first installing vertical metal hat channels over mineral wool insulation attached to metal stud framing. Spacing of vertical hat channels is pre-determined by the spacing of metal framing. Horizontal hat channels are then installed over and attached to the vertical members. Finally, metal panel cladding and related trim is attached to the horizontal framing.

We recommend 22-gauge, pre-finished metal panels to best meet the service life and maintenance expectations of the building. Pre-finished metal panels are formed and coated in the factory and include proprietary trim, flashing, closures, fasteners, and clips to provide the client with a complete system. Colors and panel profiles can be mixed to provide limited aesthetic variety but are also entirely appropriate for a low-rise, mission critical facility. For the basis of design, we recommend an AEP Span exposed fastener system with Polyvinylidene fluoride (PVDF) coating and a 40-year color warranty. As an alternative for a concealed fastener system, we recommend AEP SPAN's – Flex Series 1.2 FX 10-12 with the same coating and color warranty.

For low slope roofing it is unrealistic to expect any membrane, fully exposed to weather, thermal cycling, environmental pollution, foot traffic (rooftop maintenance) and UV radiation to last 50 years. Instead we recommend installing a roof assembly with a 30-year service life expectancy and plan for one, roof replacement or roof re-cover if the building code still allows.

For improved hygrothermal performance (movement of heat and moisture) we recommend installing 100% of the code required roof insulation (approximately 7 inches or R-38) above the roof deck in the form of rigid polyisocyanurate (polyiso) insulation. Polyiso should be installed in two layers with staggered joints to mitigate the effects of vapor drive.

For cost savings and ease of construction we recommend mechanically attaching the first layer polyiso insulation. We recommend installing the second layer and all subsequent layers (tapered insulation and roof coverboard) in 2-part urethane adhesive to reduce the effects of thermal bridging and therefore lower the condensation potential of the roof assembly.

The building code and good roofing practice require positive slope to drain (not less than ¼:12 in the primary direction) which can be created with pre-manufactured tapered insulation. Drainage crickets, also built from tapered insulation, are provided around drains and obstructions with twice the slope of primary drainage including slope in valleys of not less than 1/8:12.

Install ¼ inch gypsum-based roofing coverboard – USG Securock or equivalent over rigid insulation. Coverboards improve the durability of low-slope roof assemblies and are now considered the industry standard.

80 mil Thermoplastic Polyolefin (TPO) is likely the least expensive membrane that can meet the service life requirements of the facility (with one planned re-roof at years 25-30). The durability of the membrane depends on several factors but most importantly the quality of the initial installation. We recommend fully adhering the membrane with solvent based adhesive and including all the manufacturer's accessories such as penetration flashings to provide a complete assembly that is warrantable for materials and workmanship for 30 years.

The low slope roof assembly will be tied into the cladding system with 24-gauge, pre-finished metal, standing seam coping with a finish to match the metal panels. Install high-temperature resistant, self-adhered flexible flashing underneath all metal copings. Metal copings and counter-flashings should be installed with a future re-roof in mind and provide adequate clearance for additional insulation and ease of removal.

4.3.3.3. Moisture Alleviation – Waterproof Membranes and Air/Vapor Barrier

The project is to be designed and constructed as an air barrier, per Section C402 of the 2015 Washington State Energy Code (WSEC).

The Architect and/or Building Enclosure Consultant shall address joints, changes in plane, and transitions between materials, products and assemblies forming the airtightness of the building enclosure. The air barrier system shall have the following characteristics:

- It must be continuous for all assemblies that are the thermal envelope of the building and across the joints and assemblies.
- It must be structurally supported to withstand positive and negative air pressures applied to the building enclosure.

Recommend that all connections made between the foundation and walls, walls and windows or doors, varying wall systems, wall penetrations, walls and roofs, seismic joints, and floor and roof penetrations to be detailed to achieve a continuous air barrier, and paths of air infiltration/exfiltration to be sealed.

OAC recommends a dedicated air barrier sheet showing typical building sections that depict the typical line of the air barrier and addresses typical details related to the continuity of the air seal.

The air and weather-resistive barrier (AWB) are integrated with the exterior sheathing (DensElement, or similar). All seams, fasteners, penetrations, and rough openings will be detailed with fluid-applied

penetration flashing (FAPF), and all glazing components will tie directly into the penetration flashing.

Fluid-applied flashing should be installed 12-15 wet mils.

At soffited conditions, FAPF should extend around roof structure to maintain air barrier continuity with the roof assembly. OAC recommends 2” minimum return around soffit.

At base of wall, FAPF should extend onto stem wall to maintain air barrier continuity. OAC recommends 2” min. overlap with foundation wall.

4.3.4. Structural System

The structural system was selected to work with the architectural layout of the facility. With flexibility being a major tenet of the programmed spaces, an open structural system with easily modifiable interior walls is ideal. To accommodate these requirements, a structural steel frame with steel braces is recommended for the facility.

Structural design of the preferred concept shall evaluate all potential loading applied to the building including gravity loads, live loads, snow loads, wind loads, and earthquake loads. All loading shall follow the ASCE 7-16 Minimum Design Loads and Associated Criteria for Buildings and Other Structures standard.

Seismic Load Parameters for determining demand:

- Risk Category IV with Importance Factors of 1.5 for seismic and 1.2 for snow loads.
- Site Class D.
- Short Period (0.2 seconds) design spectra value of Ss = 1.607 with Site Adjustment Factor of 1.2.
- Long Period (1.0 seconds) design spectra value of S1 = 0.628 with Site Adjustment Factor of 1.0.
- Seismic Design Category D
- Special Steel Buckling Restrained Brace Frame System:
  - Response Modification Factor, R = 8
  - Deflection Amplification Factor, Cd = 5
  - System Overstrength Factor Ω = 2.5

Seismic demands are permitted to be evaluated in two different methods, Equivalent Lateral Force (ELF) and the Model Response Spectrum Analysis (MRSA) procedures. Determination of the acceptable method is per ASCE 7-16, Section 12.6. Use of the ELF method is predicated on the building having no structural irregularities. Should one exist in accordance with the standard, the MRSA method is to be utilized. It should be noted, the more stringent MRSA method may be used in lieu of the ELF method.

4.3.4.1. Structural Framing

The preferred development concept will be constructed of structural steel with infill light gauge metal stud. The facility will have a nearly 17,945

square foot footprint and will have W10 steel columns at 30 feet on center in the east/west direction and 25 feet on center in the north south direction. 28LH open web steel joists will span between 32-inch deep open web steel joist girders. Roof framing will clear-span the PenCom dispatch floor and EOC floor to eliminate interior columns in these spaces.

Columns will sit on conventional spread footings with a conventional 4-inch slab on grade in all areas except the apparatus bay where a 9-inch slab will be placed. Within the EOC, slab thickness will be locally adjusted to account for required electrical connections and flexible furnishing configurations. The lateral system will consist of diagonal steel buckling restrained braced frames with 2 bays on each perimeter wall. Interior walls will be partitioned with light gauge metal stud.

A 1,512 gross square foot rooftop mechanical penthouse will be located over the restroom and kitchen areas of PenCom and the EOC and will be framed with 2-inch concrete over 1-1/2-inch metal deck (3-1/2-inch total thickness) over the roof framing joists.

An additional mechanical mezzanine will be located over the fire department lobby and office space to support mechanical equipment dedicated to the fire department “module”.

4.3.4.2. Non-Structural Elements

To complete the Designate Seismic System, bracing of non-structural elements is required for this type of facility. Non-structural elements include fire sprinklers, electrical chase-ways, mechanical ducting systems, equipment, communication racks, suspended ceilings, and furniture such as desks, filing cabinets, tables, etc. All of these systems require anchorage to ensure the survive-ability and continuity of operations for the facility. Connection types will be specific to furnishings and equipment whether stationary or moveable, such as workstations within the EOC floor.

4.3.5. Mechanical Systems

The mechanical systems are separate for each user, except for the generators and some electrical distribution. The building will be all electrical with diesel powered generators. Propane will supply cooking appliances. The separate areas are: PenCom, EOC, and the Fire Station. The kitchen and restroom common area is shared by EOC and PenCom. The design of the systems is based on a combination of characteristics including dependable operation, ease of service, code compliance, energy code compliance, and life cycle cost. The overall design theme is to select equipment that meets all the above requirements and is appropriate for this application for this facility.

HVAC systems identified have considered a variety of factors including energy code requirements, costs, and safety/security of circulated air. Multi-zone Variable Refrigerant

Flow (VFR) systems are recommended for this project based upon ability to meet less stringent requirements which in turn provide a more economic cost of install. Additionally, with separate air handling to various areas or rooms, there is less sharing of air resulting in limiting spread of potential airborne pathogens.

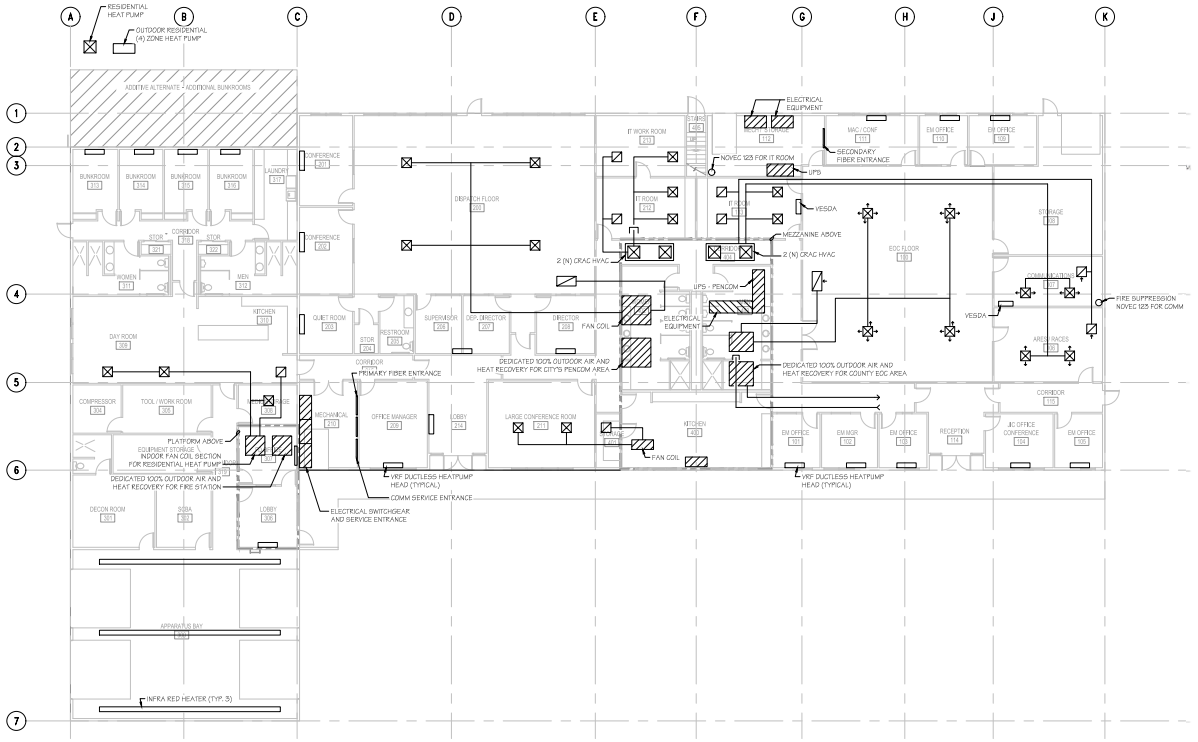


Figure 9 – Preferred Building Concept: Mechanical Plan

4.3.5.1. PenCom

The system types are as follows:
The general areas will be served by multizone ductless heatpumps with a separate dedicated outdoor air system and heat recovery for offices, fan coil units on the same VRF system for the open office PenCom area and conference room. A backup ventilation fan will be provided for the main dispatch floor room. Two N redundant emergency power will be provided.

Outside to the west will be a 25 x 55 equipment yard. The yard will contain the separately enclosed generator and above ground diesel fuel tank. The yard will also contain the outdoor cooling units for the fire station.

Above the common kitchen, restroom area is a shared mechanical mezzanine. The DOAS heat recovery unit will be located there along with the fan coil unit for the PenCom and conference room areas. Electrical gear and mechanical CRAC units for the IT equipment and electrical distribution equipment will also be located in this area.

The “Mechanical Room” just west of the Lobby, will be the primary “Electrical Room” for the facility. It will also be the main service for low voltage system and have one of the two fiber entrances to the building.

4.3.5.1.1. Information Technology
Redundant (2N) computer room air conditioning equipment (split system type) will be used. These redundant units will serve IT Equipment Room and adjacent Work Room. These rooms will also have a NOVEC 1230 gaseous fire suppression system and a VESDA smoke detection system. Power will be provided by a UPS unit. This equipment will be generally located in the mechanical penthouse located above the kitchen/restroom area.

4.3.5.2. County EOC

The general areas will be served by multizone ductless heatpumps with a separate dedicated outdoor air (DOAS) system and heat recovery for offices, fan coil units on the same VRF system for the open office EOC area. The DOAS systems on this project will all have separate 100% supply air and exhaust air, the air streams do not mix or bleed together in the heat exchanger. A ventilation fan will be provided for backup ventilation for the main EOC room. Two N redundant emergency power will be provided.

Outside to the east will be a 30 x 30 equipment yard. The yard will contain the outdoor condensing unit for the data room, separately enclosed generator and above ground diesel fuel tank.

Above the common kitchen, restroom area is a shared mechanical penthouse. The DOAS heat recovery unit will be located there along with the fan coil unit for the EOC area. The water heater and electrical gear will also be located in this area.

4.3.5.2.1. Information Technology
Redundant (2N) computer room air conditioning equipment (split system type) will be used. These redundant units will serve the “IT”, “ARES/RACES”, and “Communications Room”. These rooms will also have a NOVEC 1230 gaseous fire suppression system and a VESDA smoke detection system. Power will be provided by a UPS unit. This equipment will be generally located in the mech./storage room. This mechanical / storage room will also have one of the two fiber entrance connections from the outside into the building.

4.3.5.3. Fire Department

General mechanical systems for the fire department "module" are as follows:

- Sleeping rooms: residential heat pump wall mount cassettes, VRF unit with (4) heads, condenser located on the outside of the building, just opposite of the sleeping rooms.
- Apparatus Bay: infrared heaters and ventilation system.
- Men's and Women's and Laundry: heat recovery system and 100% ventilation (variable speed).
- Kitchen, Dayroom: residential style split system heatpump.
- Residential Range Hood in kitchen.
- We are also planning the following fire department systems:
  - Cooking shut off on station alarm.
  - Decontamination shower (adjacent the apparatus bay).
  - Air Compressor (adjacent the apparatus bay).
  - Breathing Air Compressor – if permissible
  - Magnaflow vehicle exhaust system, ceiling mount in equipment bay.
  - Turnout washer extractor (decontamination room).
  - Residential stacked washer/dryer.
  - Small refrigerator in locked room for narcotics storage.

4.3.5.4. Common Areas

Shared spaces between PenCom and County EOC will have general mechanical systems as follows:

- Ductless fan coil unit for the kitchen
- ERV unit for kitchen and restroom DOAS (100% outside air (OSA)).
- Residential range hood

4.3.6. Plumbing System

The plumbing system will be based on ABS or schedule 40 PVC waste and vent systems and PEX domestic water distribution. Water heating will be shared for PenCom and the EOC and the fire station will have their own system. Fuel piping with containment will exist between the fuel storage tanks and generators. Since the generators and fuel tanks are near each other for each of the two separate systems, the amount of fuel piping on the project will be limited to the outdoor secure equipment yards. Compressed air will be provided for the fire station as needed. Commercial use plumbing fixtures will be provided and in general, low flow shower and lavatory faucets will be used. Commercial, flush valve type toilets are planned. The fire station bay will also have an oil/water separator in-line with floor drains from the bay area.

4.3.6.1. Facility Requirements

- Domestic water systems are PEX for 1.25” and smaller, Copper for larger.
- Waste and Vent both below and above slab is schedule 40 PVC or ABS piping.
- Compressed air-utilitarian use is schedule 40 black steel.
- There will be a central water heater location with a recirculation line for EOC and PenCom, separate unit for the fire station.
- Oil/Water separator and sand trap for Apparatus Bay.
- Diesel piping will be schedule 40 black steel piping with fiberglass secondary containment piping.

4.3.7. Fire Protection Systems Program

The facility will have various protection systems in place for alarming and protection.

4.3.7.1. Automatic Fire Detection and Alarm

- Low voltage system that is analog based and fully addressable. Smoke detection along with CO and Propane in fire department area.
- VESDA-Aspirating smoke detection system for early detection will be provided in all areas with special fire protection systems.

4.3.7.2. Fire Protection

- In the Fire Station Area, the fire protection system will be a standard wet pipe and if needed, dry pipe system.
- In most other areas of the facility a pre-action system will be used, Gas system (previously Halon; now NOVEC 1230) will be used in the areas with sensitive equipment that is of critical nature.

4.3.8. Electrical Systems

The facility will be serviced by a single electrical service. This will be divided to the 3 main areas of operation (EOC, PenCom, and the Fire Station). All of these areas will operate under the Critical Operations Power System (COPS) as defined by the National Electrical Code (NEC). Automatic transfer switches will be used to isolate the generator power as required and to provide redundant generator power to the PenCom area. Copper conductors and copper bussing and windings will be required for the electrical gear for increased reliability. Lighting systems will be LED throughout the facility and dimmable indirect lighting will be used in key areas. Site lighting will be high-cut off fixtures. All site lighting may need to be confirmed with the airport to avoid any potential impacts to the adjacent runway operations. Fire alarm, video surveillance, controlled access and phone/data systems will be provided and are discussed in more detail in their specific sections.

4.3.8.1. Emergency Power Systems

As directed by the Stakeholders, the generators will all be outdoor units in weatherproof enclosures. There are two planned secure equipment yards. One unit will be located on the northeast of the building and the other on the northwest. They will each have a Convault above ground diesel fuel storage tank.

Both generators will carry the entire facility.

The generators will be diesel and will have 2-hour to 6-hour day tanks. Above ground tanks (AGT) will be sized for 7 to 10 days of operation. There will be a tank at each generator location with a fuel polishing system. All piping will have primary and secondary containment.

4.3.8.2. UPS Units

The UPS unit will be 2N Design. One A/B system will service the EOC; another totally separate system will provide 2N service A/B to PenCom.

4.3.8.3. Electrical Service

There will be a single 480-volt, 3-phase, 4-wire electrical service to the facility.

Counter pose grounding system (grounding electrode wire buried around the exterior perimeter connecting to ground rods) and a lighting protection system.

Site parking to have (2) Electric Vehicle charging stations in both the secured parking area and the visitor parking area.

4.3.8.4. Lighting

Lighting systems will be as follows:

- Lighting will be LED type throughout the facility
- Lighting for the EOC and Pen Com will be dimmable and zoned for small areas.
- Specifically for the EOC: A minimum of 5 zones on local and master dimmers. At least two walls need to be individually lighted with controls (low glare like can lights) for white boards or informational displays. Additionally, power and data to one wall of EOC to support operation of a minimum of 6 large (min 65" diagonal) LCD displays with capacity to increase display count in future.

4.3.8.5. Data Cabling

Data Cabling Station Cable will be CAT 6A

Number of computer cabinets in each IT/Data equipment room; allowance for (6) 24” wide x 48” deep cabinets with current layout.

4.3.9. Special Systems

4.3.9.1. Access Control

9-1-1 Only Phone located on the outside of the building adjacent to the fire department foyer.

Facility-wide controlled access will be as follows:

- Access System proximity card based with keypad pin where dual factor ID required. In only will be tracked and not in and out.
- All exterior doors proximity card, hard key also on front door (will also have programed time for “unlocked” if desired.)
- Secondary doors from foyer, card access and release button from reception, office manager and dispatch floor. The remote areas to have video/intercom for ID confirmation (standalone system like Aiphone (not part of video surveillance system)).
- Interior doors to sensitive areas (Servers, PenCom Dispatch Floor, dual factor
- Mechanical Rooms proximity card
- Outside mechanical area and gate to secure parking area both proximity card and pin pad (program to work on one or the other)
- Offices, mechanical cypher locks only (no card access)

4.3.9.2. Video Surveillance

Exterior of the building full coverage and Parking areas. No interior cameras to be where they can aim at any display monitors in the PenCom area.

4.3.9.3. Building Security

Exterior opening and key areas that are not 24/7 occupied. Provide dual tech devices or cross zone to reduced false alarms. Combination of contacts and motion sensors. Alarm is monitored at PenCom (no remote of alarm is required).

4.3.9.4. Preliminary Equipment Sizes

PenCom:
IT and IT workroom.

- (2) 5 Ton CRAC units.
- 12 kW UPS actual load. Size UPS units for 15 kW-Dual units.

- (These loads are estimated by Hunt Engineering and should be verified by the County prior to the start of design work and the equipment size can be increased or decreased as needed).

County EOC:
Combined load for IT Equipment, Communications, ARES/RACES.

- (2) 7.5 Ton CRAC units.
- 15 kW UPS actual load. Size UPS units for 20 kW- Dual units.

These loads are estimated and should be verified by the County prior to the start of design work and the equipment size can be increased or decreased as needed.

Generators:

- Gen #1 Large Generator 250 Kw, 400-gallon belly tank (19' x 10')
- Gen #2 Large Generator 250 Kw, 400-gallon belly tank (19' x 10')
- Above Ground Fuel Tank #1; 3,000 Gallons (12-3" x8')
- Above Ground Fuel Tank #2; 3,000 Gallons (11'-6" x8')
- Above Ground Fuel Tank #3; 2,000 Gallons (Fuel Station)

NOVEC 1230 Gaseous Fire Suppression:

- EOC: ARES/RACES, Communications, IT Equipment, Mech/Stor
- PenCom: Workroom, IT

Preaction Sprinkler System:

- Double interlock: EOC and PenCom

Fire Alarm/Detection:

- Dual VESDA Systems in areas of preaction and gaseous suppression

5. Implementation Schedule

The targeted construction completion date is October 2022. To achieve the target occupancy date, the following high-level design and construction schedule was developed. Various factors may accelerate or decelerate individual schedule components including design review periods, permitting durations, and desire to target an adequate contractor bid pool.

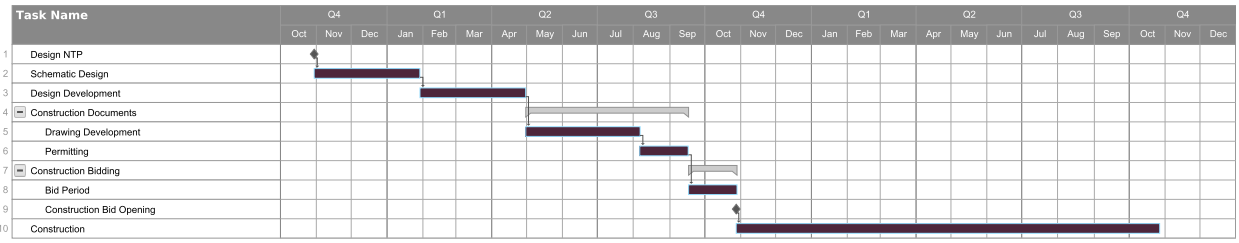
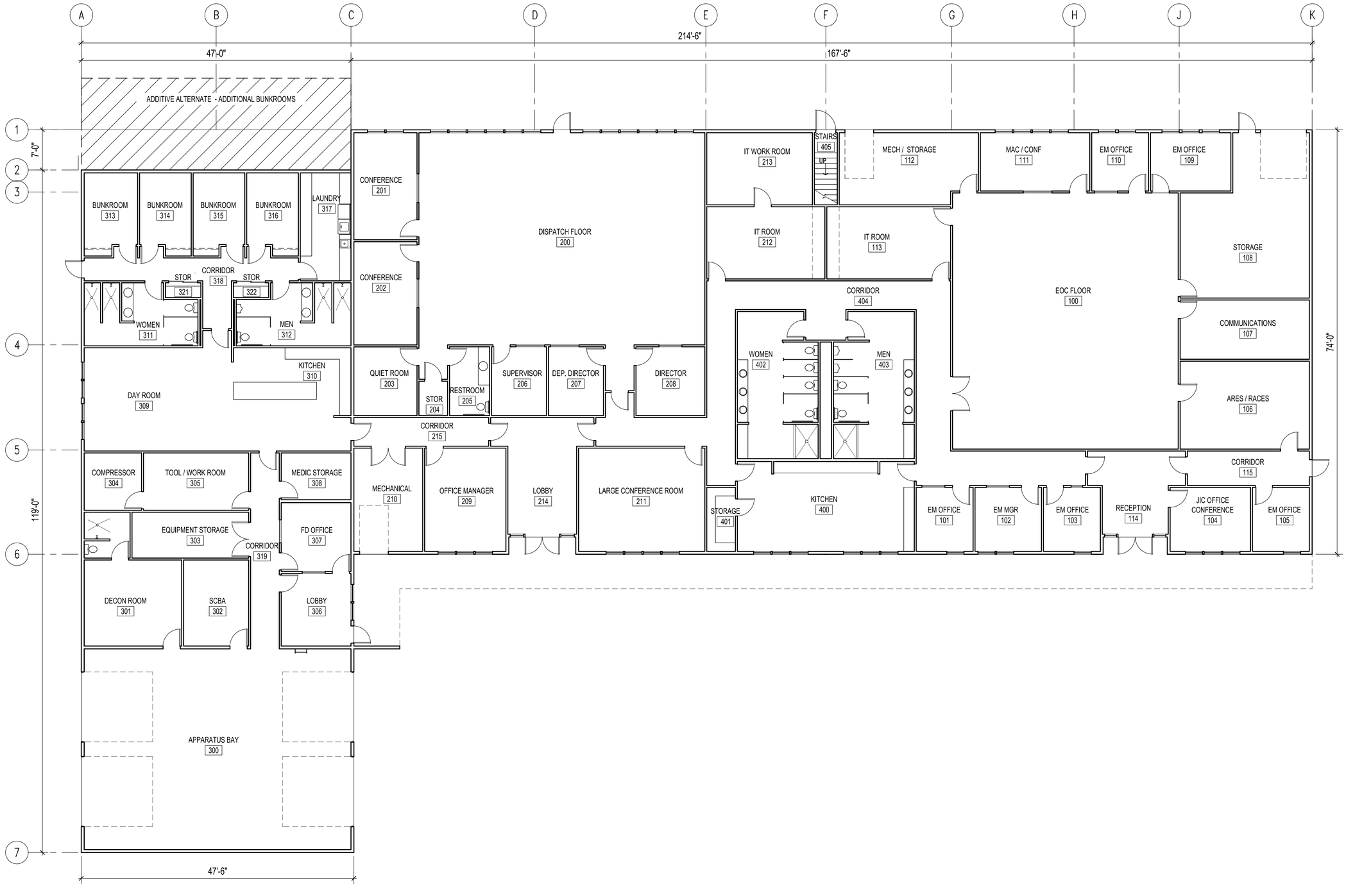


Figure 10 – Implementation Schedule

Appendix A – Preferred Conceptual Floor Plan



1 PREFERRED BUILDING CONCEPT - FLOOR PLAN

OAC
2200 1st Ave South, Ste 200, Seattle, WA 98134
206.285.4300 | oacsvcs.com

STAMP:

PROJECT TITLE:
JOINT PUBLIC SAFETY BUILDING
2417 W. 19TH ST. PORT ANGELES, WA 98363

DATE:

DESCRIPTION:

ISSUE NO.:

PROJECT NO.: R18-190345

SHEET TITLE:
CONCEPTUAL FLOOR PLAN

DATE: 10/06/2020 SCALE: 1/8" = 1'-0"

DRAWN BY: BG CHECKED BY: BL

Appendix B – Detailed Cost Estimate

Construction Cost Summary

Owner: **Clallam County / City of Port Angeles**

Project: **Joint Public Safety Building**

October 6, 2020

ESTIMATED COSTS SUMMARY

Item	Description	QTY	UOM	$ / UOM	Cost
1	Joint Public Safety Building	19,970	BGSF	$412.31	$8,233,816
2	Sitework	80,000	SGA	$14.84	$1,187,418
3	General Conditions & Support Services	12	MO	$45,000	$540,000
Total Estimated Construction Cost (Today's Dollars)					**$9,961,234**
4	Escalation to Midpoint (Q4, 2021 @ 4% / Year)	4%	on	$9,961,234	$398,449
Total Estimated Construction Cost (Escalated)					**$10,359,683**

ADD ALTERNATES

Additional Dorm Rooms **$291,941**

COMMENTS:

Design, Bid, Build delivery method is assumed

Assumes a Q2, 2021 start and a 12 month schedule

Off Site Improvements are EXCLUDED

Project Owner:	**Clallam County / City of Port Angeles**	Architect:	OAC
Project Name:	**Joint Public Safety Building**	Project Duration:	12 MO
Project Location:	Port Angeles, WA	Building GSF:	19,970
Project Start Date:	Q2, 2021	Site GSF:	80,000
Estimate Date:	October 6, 2020		

ESTIMATE SUMMARY					
No.	Description	Quantity	Unit of Measure	Unit Cost	Total Estimated Cost
A10	Foundations	19,970	BGSF	$21.76	$434,635
A20	Basement Construction	19,970	BGSF	$0.00	$0
B10	Superstructure	19,970	BGSF	$41.47	$828,130
B20	Exterior Enclosure	19,970	BGSF	$52.04	$1,039,179
B30	Roofing	19,970	BGSF	$21.07	$420,725
C10	Interior Construction	19,970	BGSF	$55.96	$1,117,528
C20	Stairs	19,970	BGSF	$0.88	$17,500
C30	Interior Finishes	19,970	BGSF	$20.00	$399,400
D10	Conveying Systems	19,970	BGSF	$0.00	$0
D20	Plumbing	19,970	BGSF	$18.00	$359,460
D30	HVAC	19,970	BGSF	$42.50	$848,800
D40	Fire Protection	19,970	BGSF	$6.84	$136,665
D50	Electrical	19,970	BGSF	$60.02	$1,198,575
E10	Equipment	19,970	BGSF	$4.46	$89,000
E20	Casework & Furnishings	19,970	BGSF	$5.31	$106,000
F10	Special Construction	19,970	BGSF	$0.00	$0
F20	Selective Demolition	19,970	BGSF	$0.00	$0
	Building Construction Subtotal				**$6,995,596**
	Design Contingency			10.00%	$699,560
	Subtotal				$7,695,156
	Contractor Mark Up (Overhead, Profit, Insurance, Bonds, B&O Tax)			7.00%	$538,661
	Subtotal				$8,233,816
	Escalation to Mid-Point - See Summary				$0
	BUILDING GRAND TOTAL	19,970	BGSF	$412.31	**$8,233,816**

Estimate excludes soft costs such as design fees, permits, testing / inspections, construction change order contingencies, loose fixtures / furnishings and sales tax.

No.	DETAILED ESTIMATE Description	Quantity	Unit of Measure	Unit Cost	Total Estimated Cost
A10	**FOUNDATIONS**				
	Foundations Earthwork and Footings				
	Allowance (assumes standard spread footings)	19,970	BGSF	$ 13.00	$259,610
	Deep Foundations - EXCLUDED			$ -	$0
	Slab-on-Grade				
	4" Slab on Grade (inc reinforcing, base course and vapor barrier)	14,565	sf	$ 9.00	$131,085
	Truck Bay 9" SoG (inc reinforcing, base course and vapor barrier)	3,380	sf	$ 13.00	$43,940
	SUBTOTAL FOUNDATIONS	**19,970**	**BGSF**	**$21.76**	**$434,635**
A20	**BASEMENT CONSTRUCTION**				
	Basement Excavation				
	Basement Walls				
	Waterproofing				
	SUBTOTAL BASEMENT CONSTRUCTION	**19,970**	**BGSF**	**$0.00**	**$0**
B10	**SUPERSTRUCTURE**				
	Structural Concrete				
	Horizontal Structure				
	Topping Slabs w/ Reinforcing	1,571	sf	7.00	$10,997
	Structural Steel				
	Penthouse Structure (15 lbs / sf)	20,625	lbs	$ 2.50	$51,563
	Roof Structure (15 lbs / sf)	271,125	lbs	$ 2.50	$677,813
	Shear Elements - Included above			$ -	$0
	Metal Decking				
	Floor Deck	1,571	sf	$ 3.50	$5,499
	Roof Decking	18,075	sf	$ 3.00	$54,225
	Misc. Metals - Allowance	19,970	gsf	$ 1.00	$19,970
	Structural Gauge Framing				
	Mechanical Loft Framing	448	sf	$ 15.00	$6,720
	T&G Sheathing	448	sf	$ 3.00	$1,344
	Fireproofing				
	Structural Steel Fireproofing - Not Required				$0
	Firestopping - See Interior Partitions				
	SUBTOTAL SUPERSTRUCTURE	**19,970**	**BGSF**	**$41.47**	**$828,130**

DETAILED ESTIMATE					
No.	Description	Quantity	Unit of Measure	Unit Cost	Total Estimated Cost
B20	**EXTERIOR ENCLOSURE**				
	Exterior Wall Construction				
	Exterior Wall Assembly (int. GWB - Finished, vapor barrier, mtl studs, R-13 batt insul, sheathing, rigid insul and Z's, WRB)	15,578	sf	$ 25.00	$389,450
	Ballistic Rated Protection Level 4 @ PenCom North Elevation Only (7' Height)	355	sf	$ 185.00	$65,675
	Ballistic Rated Protection Level 4 @ Ares / Races East Elevation Only (7' Height)	112	sf	$ 185.00	$20,720
	Exterior Wall Finish				
	Metal Siding, Concealed Fastener (based on AEP Span Flex)	15,578	sf	$ 15.00	$233,670
	Exterior Soffits and Canopies (includes framing)				
	Canopies (incl. exposed structure, paint, roofing, fire sprinklers)	1,145	sf	$ 75.00	$85,875
	Exterior Windows				
	Storefront / Windows	970	sf	$ 85.00	$82,450
	Premium for Ballistic Rated Protection Level 4 @ PenCom	205	sf	$ 100.00	$20,500
	Exterior Doors				
	Storefront Entry Doors, HW, per leaf	4	ea	$ 5,500.00	$22,000
	Push Button ADA Auto Operators	2	ea	$ 4,000.00	$8,000
	Standard Grade HM Dr, HM Frame, HW, per leaf	6	ea	$ 2,000.00	$12,000
	Overhead Doors (includes Fire Station Accessories)	4	ea	$ 15,000	$60,000
	Overhead Doors	2	ea	$ 7,500	$15,000
	Exterior Paint & Sealants				
	Paint to HM Doors and Frames	6	ea	$ 175.00	$1,050
	Caulking and Joint Sealants	15,578	sf	$ 0.50	$7,789
	Building Graphics				
	Allowance	1	ls	$ 15,000	$15,000
	SUBTOTAL EXTERIOR ENCLOSURE	**19,970**	**BGSF**	**$52.04**	**$1,039,179**
B30	**ROOFING**				
	Roof Coverings				
	Membrane Roofing System w/ Rigid Insulation	18,075	sf	$ 20.00	$361,500
	Canopy Roofing - Included above w/ Ext. Enclosure				$0
	Flashing and Sheet Metal				
	Gutters, Copings, Fascia, Misc. Roof Flashing & Wood Blocking	15%	on	$361,500	$54,225
	Skylights				
	None			$ -	$0
	Roof Accessories				
	Misc.	1	ls	$ 5,000.00	$5,000
	SUBTOTAL ROOFING	**19,970**	**BGSF**	**$21.07**	**$420,725**

No.	DETAILED ESTIMATE Description	Quantity	Unit of Measure	Unit Cost	Total Estimated Cost
C10	**INTERIOR CONSTRUCTION**				
	Partitions				
	GWB Partition (GWB - Finish 2 Sides, mtl studs, sound batts)	29,755	sf	$ 15.00	$446,325
	GWB Partition (GWB - Finish 1 Side, mtl studs, sound batts)	1,275	sf	$ 11.00	$14,025
	Ballistic Rated Protection Level 3 @ PenCom Perimeter at Corridors Only (7' Height)	665	sf	$ 185.00	$123,025
	Ballistic Rated Protection Level 3 @ EOC (7' Height)	1,701	sf	$ 185.00	$314,685
	Misc. Carpentry, Sealants & Firestopping - Allowance	19,970	gsf	$ 1.50	$29,955
	Interior Glazing				
	HM Relites - Allowance	500	sf	$ 35.00	$17,500
	Interior Doors, Frames, Hardware				
	HM / SCW Dr, HM Frame, HW, Complete - per leaf	53	ea	$ 1,850.00	$98,050
	Fittings / Specialties				
	Toilet Accessories				
	Group Restrooms / Showers	4	ea	$ 10,000	$40,000
	Single Restroom	1	ea	$ 3,000.00	$3,000
	Janitorial Accessories	1	ea	$ 1,000.00	$1,000
	Visual Display Specialties				
	Marker Boards / Tack Boards	1	ls	$ 5,000.00	$5,000
	Signage (Code and Wayfinding)	19,970	gsf	$ 0.75	$14,978
	Misc. Specialties Allowance (FECs, Corner Guards, etc...)	19,970	gsf	$ 0.50	$9,985
	SUBTOTAL INTERIOR CONSTRUCTION	**19,970**	**BGSF**	**$55.96**	**$1,117,528**
C20	**STAIRS**				
	Stair Construction (inc. concrete, finishes & guard / hand rails)				
	Pre-Engineered Metal Stair w/ Panfil Treads	1	ea	$ 15,000	$15,000
	Ladder to Fire Mech Loft	1	ea	$ 2,500	$2,500
	SUBTOTAL STAIRS	**19,970**	**BGSF**	**$0.88**	**$17,500**
C30	**INTERIOR FINISHES**				
	Wall, Floor and Ceiling Finishes				
	Allowance (based on architectural narrative)	19,970	gsf	$ 20.00	$399,400
	SUBTOTAL INTERIOR FINISHES	**19,970**	**BGSF**	**$20.00**	**$399,400**
D10	**CONVEYING SYSTEMS**				
	Elevators & Lifts				
	None			$ -	$0
	SUBTOTAL CONVEYING SYSTEMS	**19,970**	**BGSF**	**$0.00**	**$0**

No.	DETAILED ESTIMATE Description	Quantity	Unit of Measure	Unit Cost	Total Estimated Cost
D20	**PLUMBING**				
	Plumbing				
	System Complete	19,970	gsf	$ 18.00	$359,460
	SUBTOTAL PLUMBING	**19,970**	**BGSF**	**$18.00**	**$359,460**
D30	**HVAC**				
	HVAC				
	System Complete	19,970	gsf	$ 40.00	$798,800
	Truck Bay Exhaust System	1	ls	$ 50,000	$50,000
	SUBTOTAL HVAC	**19,970**	**BGSF**	**$42.50**	**$848,800**
D40	**FIRE PROTECTION**				
	Fire Protection				
	Sprinkler System per Program Requirements	19,970	gsf	$ 4.50	$89,865
	Premium for Novec 1230 system, Rms 113, 212, 213, 106, 107	1,560	sf	$ 30.00	$46,800
	SUBTOTAL FIRE PROTECTION	**19,970**	**BGSF**	**$6.84**	**$136,665**
D50	**ELECTRICAL**				
	Electrical				
	Electrical, Telecom., FA System, Alerting System	19,970	gsf	$ 35.00	$698,950
	EOC & Pen. Com Requirements	19,970	gsf	$ 7.50	$149,775
	Access Control & Security	19,970	gsf	$ 5.00	$99,850
	Two Generators & Transfer Equipment	1	ls	$ 250,000	$250,000
	AV Equipment, By Owner - EXCLUDED			$ -	$0
	SUBTOTAL ELECTRICAL	**19,970**	**BGSF**	**$60.02**	**$1,198,575**
E10	**EQUIPMENT**				
	Storage Equipment				
	Shelving Systems, Bottle Rack Storage, Etc... - By Owner, EXCLUDED			$ -	$0
	Gear Racks	10	ea	$ 1,600.00	$16,000
	Commercial Equipment				
	Washer / Extractor & Hose / Turnout Gear Dryer	1	ls	$ 35,000	$35,000
	Residential Equipment				
	Dayroom Kitchen Equipment	1	ls	$ 20,000	$20,000
	Pen Com. / EOC Breakroom Kitchen Equipment	1	ls	$ 15,000	$15,000
	Laundry Equipment	1	ls	$ 3,000.00	$3,000
	SUBTOTAL EQUIPMENT	**19,970**	**BGSF**	**$4.46**	**$89,000**

No.	DETAILED ESTIMATE Description	Quantity	Unit of Measure	Unit Cost	Total Estimated Cost
E20	**CASEWORK & FURNISHINGS**				
	Fixed Millwork / Casework				
	Dayroom Kitchen	1	ls	$ 20,000	$20,000
	Laundry	1	ls	$ 7,500	$7,500
	Dorm Bedrooms (closet shelving)	4	ea	$ 750.00	$3,000
	Decon Room (stainless steel countertops)	1	ls	$ 10,000	$10,000
	Conference Rooms	4	ea	$ 5,000	$20,000
	Pen Com. / EOC Breakroom Kitchen	1	ls	$ 20,000	$20,000
	Restroom Counters	55	lf	$ 250.00	$13,750
	Window Treatment				
	Roller Shades - Exterior Windows	1,175	sf	$ 10.00	$11,750
	Moveable Furnishings				
	EXCLUDED			$ -	$0
	SUBTOTAL FURNISHINGS	**19,970**	**BGSF**	**$5.31**	**$106,000**
F10	**SPECIAL CONSTRUCTION**				
	Special Facilities				
					$0
	SUBTOTAL SPECIAL CONSTRUCTION	**19,970**	**BGSF**	**$0.00**	**$0**
F20	**SELECTIVE BUILDING DEMOLITION**				
	Building Structural Demolition				
	See Separate Estimate			$ -	$0
	SUBTOTAL SELECTIVE BUILDING DEMOLITION	**19,970**	**BGSF**	**$0.00**	**$0**
Z10	**GENERAL REQUIREMENTS**				
	General Conditions				
	See Summary			$ -	$0
	SUBTOTAL GENERAL REQUIREMENTS	**19,970**	**BGSF**	**$0.00**	**$0**

Project Owner:	**Clallam County / City of Port Angeles**	Architect:	OAC
Project Name:	**Joint Public Safety Building**	Project Duration:	12 MO
Project Location:	Port Angeles, WA	Building GSF:	19,970
Start Date:	Q2, 2021	Site Gross Area:	80,000
Estimate Date:	October 6, 2020		

ESTIMATE SUMMARY					
No.	Description	Quantity	Unit of Measure	Unit Cost	Total Estimated Cost
G10	Site Preparation	80,000	sga	$2.92	$233,600
G20	Site Improvements	80,000	sga	$4.43	$354,680
G30	Site Civil / Mech Utilities	80,000	sga	$2.64	$211,500
G40	Site Electrical Utilities	80,000	sga	$1.56	$125,000
G50	Other Site Construction	80,000	sga	$0.00	$0
	Sitework Subtotal				**$924,780**
	Design Contingency			20.00%	$184,956
	Subtotal				$1,109,736
	Contractor Mark Up (Overhead, Profit, Insurance, Bonds, B&O Tax)			7.00%	$77,682
	Subtotal				$1,187,418
	Escalation to Mid-Point - See Summary				$0
	SITE GRAND TOTAL	80,000	SGA	$14.84	**$1,187,418**

Estimate excludes soft costs such as design fees, permits, testing / inspections, construction change order contingencies, loose fixtures / furnishings and sales tax.

No.	DETAILED ESTIMATE Description	Quantity	Unit of Measure	Unit Cost	Total Estimated Cost
G10	**SITE PREPARATON**				
	Mobilization	1	ls	50,000.00	$50,000
	Site Demolition & Relocation				
	Building SoG and Footings Demolition	1	ls	16,000.00	$16,000
	Remove Asphalt	8,500	sf	1.50	$12,750
	Remove Sidewalk	450	sf	3.00	$1,350
	Remove Curb and Gutter	100	lf	5.00	$500
	Remove Fencing	500	lf	2.00	$1,000
	Misc. Site Clearing & Grubbing	80,000	sga	0.15	$12,000
	Site Earthwork				
	TESC (includes maintenance)	80,000	sga	0.25	$20,000
	Grading & Excavation - Civil Engineer Allowance	80,000	sga	0.75	$60,000
	Export Unsuitable / Imported Fill - Civil Engineer Allowance	1,000.00	cy	40.00	$40,000
	Hazardous Waste Remediation				
	Allowance	1	ls	20,000.00	$20,000
	SUBTOTAL SITE PREPARATON	**80,000**	**SGA**	**$2.92**	**$233,600**
G20	**SITE IMPROVEMENTS**				
	Site Paving / Concrete Work (Base Courses Included)				
	South & East Entry / Parking				
	Concrete Curb Cut / Driveway	420	sf	12.00	$5,040
	Asphalt Entry / Parking	16,800	sf	4.50	$75,600
	Concrete Walk	1,900	sf	7.00	$13,300
	West Entry / Parking				
	Concrete Curb Cut / Driveway	420	sf	12.00	$5,040
	Asphalt Entry / Parking	3,500	sf	4.50	$15,750
	Secure Parking				
	Parking Lot	7,500	sf	4.00	$30,000
	Concrete Walk	450	sf	7.00	$3,150
	Equipment Yards and Generator Pad				
	Concrete Paving	2,400	sf	12.00	$28,800
	Site Development				
	Secure Parking Perimeter Fencing	420	lf	150.00	$63,000
	Secure Access Gate w/ Controls	1	ls	10,000.00	$10,000
	Civil Engineer Allowance for Site Development TBD - Break Area, Handrails, Striping, Signage, Site Furnishings	1	ls	30,000.00	$30,000
	Landscaping				
	Allowance	1	ls	75,000.00	$75,000
	SUBTOTAL SITE IMPROVEMENTS	**80,000**	**SGA**	**$4.43**	**$354,680**

No.	***DETAILED ESTIMATE*** Description	Quantity	Unit of Measure	Unit Cost	Total Estimated Cost
G30	**SITE CIVIL / MECHANICAL UTILITIES**				
	Water Service				
	Water Service Connection (Potable)	1	ls	$ 25,000.00	$25,000
	Water Service Connection (Fire)	1	ls	$ 25,000.00	$25,000
	Sanitary Sewer Systems				
	Gravity Sanitary Sewer Connection - Civil Engineer Allowance	2	ea	$ 10,000.00	$20,000
	Storm Sewer Systems				
	Rain Garden / Bio Retention	4,300	sf	$ 15.00	$64,500
	Type 1 Catch Basin	8	ea	$ 2,500.00	$20,000
	Conveyance Piping	600	lf	$ 45.00	$27,000
	Remediation of Impervious Areas	10,000	sf	$ 3.00	$30,000
	Other Civil / Mechanical Utilities				
	Gas - None			$ -	$0
	SUBTOTAL SITE CIVIL / MECHANICAL UTILITIES	**80,000**	**SGA**	**$2.64**	**$211,500**
G40	**SITE ELECTRICAL UTILITIES**				
	Electrical and Telecom Utilities				
	Allowance	1	ls	$ 50,000.00	$50,000
	Exterior Lighting				
	Allowance	1	ls	$ 50,000.00	$50,000
	Site Security				
	Allowance	1	ls	$ 25,000.00	$25,000
	SUBTOTAL SITE ELECTRICAL UTILITIES	**80,000**	**SGA**	**$1.56**	**$125,000**
G50	**OTHER SITE CONSTRUCTION**				
					$0
	SUBTOTAL OTHER SITE CONSTRUCTION	**80,000**	**SGA**	**$0.00**	**$0**
Z10	**GENERAL REQUIREMENTS**				
	General Conditions				
	See Summary				
	SUBTOTAL GENERAL REQUIREMENTS	**80,000**	**SGA**	**$0.00**	**$0**

Alt No.	PROJECT COST BREAKOUTS Description	Quantity	Unit of Measure	Unit Cost	Total Estimated Cost
1	**Additional Dorm Rooms (5)**				
	Foundations Earthwork and Footings				
	Allowance (assumes standard spread footings)	905	sf	$ 14.00	$12,670
	Slab-on-Grade				
	4" Slab on Grade (inc reinforcing, base course and vapor barrier)	905	sf	$ 9.00	$8,145
	Structural Steel				
	Roof Structure (15 lbs / sf)	13,575	lbs	$ 2.50	$33,938
	Roof Decking	905	sf	$ 3.00	$2,715
	Misc. Metals - Allowance	905	sf	$ 1.00	$905
	Exterior Wall Construction				
	Exterior Wall Assembly (int. GWB - Finished, vapor barrier, mtl studs, sheathing, rigid insul, WRB)	456	sf	$ 25.00	$11,400
	Ballistic Rated Protection Level 4 @ PenCom North Elevation Only (7' Height)	(133)	sf	$ 185.00	($24,605)
	Exterior Wall Finish				
	Metal Siding, Concealed Fastener (based on AEP Span Flex)	456	sf	$ 30.00	$13,680
	Roof Coverings				
	Membrane Roofing System w/ Rigid Insulation	905	sf	$ 20.00	$18,100
	Roof Membrane Up Parapets/Walls, 2' Height	80	sf	$ 11.00	$880
	Flashing and Sheet Metal				
	Gutters, Copings, Fascia, Misc. Roof Flashing & Wood Blocking	20%	on	$18,980	$3,796
	Partitions				
	GWB Partition (GWB - Finish 2 Sides, mtl studs, sound batts)	1,992	sf	$ 15.00	$29,880
	Misc. Carpentry, Sealants & Firestopping - Allowance	905	gsf	$ 1.50	$1,358
	Interior Doors, Frames, Hardware				
	HM / SCW Dr, HM Frame, HW, Complete - per leaf	5	ea	$ 1,850.00	$9,250
	Wall, Floor and Ceiling Finishes				
	Allowance (based on architectural narrative)	905	gsf	$ 20.00	$18,100
	Plumbing				
	Roof Drains	905	gsf	$ 3.00	$2,715
	HVAC				
	System Complete	905	gsf	$ 40.00	$36,200
	Fire Protection				
	Sprinkler System per Program Requirements	905	gsf	$ 4.50	$4,073
	Electrical				
	Electrical, Telecom., FA System, Alerting System	905	gsf	$ 35.00	$31,675
	Fixed Millwork / Casework				
	Dorm Bedrooms (closet shelving)	5	ea	$ 750.00	$3,750
	SUBTOTAL				**$218,624**
	Contingency			20.00%	$43,725
	Markups (Insurance, Bond, OH & P, B&O Tax)			7.00%	$18,364
	Escalation to Midpoint (Q4, 2021 @ 4% / Year)			4.00%	$11,229
	TOTAL ESTIMATED CONSTRUCTION COSTS				**$291,941**

Roen Associates
500 Union Street, Suite 927
Seattle, WA 98101

Clallam County and City of Port Angeles
Joint Public Safety Building
Conceptual Estimate ROM Breakdown

Project Owner:	**Clallam County / City of Port Angeles**	Architect:	OAC
Project Name:	**Joint Public Safety Building**	Project Duration:	12 MO
Project Location:	Port Angeles, WA	Building GSF:	19,970
Project Start Date:	Q2, 2021	Site GSF:	80,000
Estimate Date:	October 6, 2020		

BUILDING COMPONENTS ESTIMATE SUMMARY		**FIRE STATION COMPONTENT**			**PENCOM COMPONENT**			**EOC COMPONENT**			**TOTAL BUILDING**		
No.	Description	BGSF Quantity	Unit Cost	Total Estimated Cost	BGSF Quantity	Unit Cost	Total Estimated Cost	BGSF Quantity	Unit Cost	Total Estimated Cost	BGSF Quantity	Unit Cost	Total Estimated Cost
A10	Foundations	6,085	$23.56	$143,367	6,860	$20.96	$143,819	7,025	$20.99	$147,449	19,970	$21.76	$434,635
A20	Basement Construction	6,085	$0.00	$0	6,860	$0.00	$0	7,025	$0.00	$0	19,970	$0.00	$0
B10	Superstructure	6,085	$38.98	$237,206	6,860	$42.62	$292,355	7,025	$42.50	$298,568	19,970	$41.47	$828,130
B20	Exterior Enclosure	6,085	$52.79	$321,220	6,860	$56.58	$388,165	7,025	$46.95	$329,793	19,970	$52.04	$1,039,179
B30	Roofing	6,085	$21.07	$128,198	6,860	$21.07	$144,525	7,025	$21.07	$148,002	19,970	$21.07	$420,725
C10	Interior Construction	6,085	$34.04	$207,145	6,860	$51.98	$356,553	7,025	$78.84	$553,830	19,970	$55.96	$1,117,528
C20	Stairs	6,085	$0.41	$2,500	6,860	$1.09	$7,500	7,025	$1.07	$7,500	19,970	$0.88	$17,500
C30	Interior Finishes	6,085	$20.00	$121,700	6,860	$20.00	$137,200	7,025	$20.00	$140,500	19,970	$20.00	$399,400
D10	Conveying Systems	6,085	$0.00	$0	6,860	$0.00	$0	7,025	$0.00	$0	19,970	$0.00	$0
D20	Plumbing	6,085	$18.00	$109,530	6,860	$18.00	$123,480	7,025	$18.00	$126,450	19,970	$18.00	$359,460
D30	HVAC	6,085	$48.22	$293,400	6,860	$40.00	$274,400	7,025	$40.00	$281,000	19,970	$42.50	$848,800
D40	Fire Protection	6,085	$4.50	$27,383	6,860	$7.91	$54,270	7,025	$7.83	$55,013	19,970	$6.84	$136,665
D50	Electrical	6,085	$60.54	$368,400	6,860	$60.03	$411,788	7,025	$59.56	$418,388	19,970	$60.02	$1,198,575
E10	Equipment	6,085	$12.16	$74,000	6,860	$1.09	$7,500	7,025	$1.07	$7,500	19,970	$4.46	$89,000
E20	Casework & Furnishings	6,085	$7.65	$46,580	6,860	$4.32	$29,661	7,025	$4.24	$29,758	19,970	$5.31	$106,000
F10	Special Construction	6,085	$0.00	$0	6,860	$0.00	$0	7,025	$0.00	$0	19,970	$0.00	$0
F20	Selective Demolition	6,085	$0.00	$0	6,860	$0.00	$0	7,025	$0.00	$0	19,970	$0.00	$0
-	Contingency & Mark Up			$368,271			$419,705			$450,244			$1,238,220
Building Construction Costs Subtotal		**6,085**	**$402.45**	**$2,448,901**	**6,860**	**$406.84**	**$2,790,921**	**7,025**	**$426.19**	**$2,993,994**	**19,970**	**$412.31**	**$8,233,816**
	Sitework	6,085	$59.46	$361,815	6,860	$59.46	$407,896	7,025	$59.46	$417,707	19,970	$59.46	$1,187,418
Construction Costs Total		**6,085**	**$461.91**	**$2,810,715**	**6,860**	**$466.30**	**$3,198,817**	**7,025**	**$485.65**	**$3,411,701**	**19,970**	**$471.77**	**$9,421,234**
	General Conditions	6,085	$27.04	$164,542	6,860	$27.04	$185,498	7,025	$27.04	$189,960	19,970	$27.04	$540,000
Construction Contract Total (Today's Dollars)		**6,085**	**$488.95**	**$2,975,257**	**6,860**	**$493.34**	**$3,384,316**	**7,025**	**$512.69**	**$3,601,661**	**19,970**	**$498.81**	**$9,961,234**
	Escalation			$119,010			$135,373			$144,066			$398,449
Construction Contract Total (Escalated)		**6,085**	**$508.51**	**$3,094,267**	**6,860**	**$513.07**	**$3,519,688**	**7,025**	**$533.20**	**$3,745,728**	**19,970**	**$518.76**	**$10,359,683**

Estimate excludes soft costs such as design fees, permits, testing / inspections, construction change order contingencies, loose fixtures / furnishings and sales tax.