



BAINBRIDGE ISLAND  
FIRE - POLICE FACILITIES  
NEEDS ASSESSMENT

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# INTRODUCTION

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# PROJECT TEAM

## Bainbridge Island Fire Department

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Luke Carpenter - Assistant Chief  
Chris Schmit - Lieutenant  
Susan Cohen - Business Manager



## City of Bainbridge Island

Matt Hamner - Chief of Police  
Doug Schulze - City Manager  
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Barry Loveless - Director of Public Works



## Mackenzie

Rich Mitchell - Project Principal  
Jeff Humphreys - Project Manager  
Cathy Bowman - Architectural Designer  
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# PROJECT INTRODUCTION

Bainbridge Island Fire Department (BIFD) in collaboration with City of Bainbridge Island (COBI) evaluated their existing fire and police facilities and to determine what projects would be required to better meet the goals of the Fire and Police Department. The BIFD and COBI selected Mackenzie through a RFQ process to evaluate the current facilities. This evaluation is work to determine an anticipated building program and site requirements for facility replacement inclusive of potential growth anticipated over a 20 year study period. Included in the study was the development of a conceptual building and site design for a new station(s) with input received through Department staff as well as local community participation; an estimation of anticipated project costs, inclusive of construction, consultant and owner costs needed to fund the project for the Departments' consideration.

The finding of this report comprises Mackenzie's extensive experience with emergency response facilities and municipal facilities design and provides a detailed overview of Mackenzie's work with BIFD and COBI. All steps involved in this process have been documented; including recommendations for next steps, and are contained within the following sections of this report for the purpose of Bainbridge Island Fire Department's and City of Bainbridge Island's consideration.

## Project Background

Currently, Bainbridge Island Fire Department occupies three buildings strategically located throughout the island to provide an initial response to an incident as well as additional community resources. Originally formed in 1942, the Department has served the community for 72 years. The Department's focus on exploring cost-saving options has made the Department a leader in resource sharing and has guided the district in exploring staffing programs to meet the increasing demand for services.

Station 21 was built in 1978 and is staffed with a captain, a paramedic, and two firefighters with additional staffing provided by volunteers. The station serves as the headquarter station, and is centrally located and provides spaces for administration and air ambulance service from the helipad on site.

Station 22 anchors the southern end of the Island. The facility is the oldest station and is staffed with a lieutenant and firefighter with additional staffing provided by volunteers. Built in 1959 the facility houses the Department's vehicle maintenance facility.

Station 23 is the most recently completed facility, being built in 1995 and is located on the northern end of the Island. The site provides the location for the Department's training center which includes a four-story training tower and housing for volunteer firefighters.

Built in 1945, with an addition in 1969, and further renovation in 1982, the City of Bainbridge Island Police Department is located at the east end of downtown, just north of the Washington State Ferry Terminal.

These 4 buildings provided the basis for evaluating both the Fire Department and Police Department's existing facilities. The evaluations of the stations included observation of the facilities and grounds (and review for compliance with current Building Code, ADA accessibility, NFPA standards and WAC administrative code requirements) , review of reference drawings of the existing facilities, building inspection reports for each station completed by Building Inspection Services, Inc., and the Hazard Identification and Vulnerability Assessment prepared by Bainbridge Island Fire Department and Western Washington University, Huxley College-Peninsulas. Additionally, an ASCE 31 structural assessment was conducted on each of the existing facilities to evaluate the buildings deficiencies in terms of seismic performance. The assessment also included infrared imaging of the existing facilities to determine the deficiencies of the existing building envelope.

## Mackenzie

Established in 1960, Mackenzie is a firm focused on the NW with offices in Seattle, Washington, Vancouver Washington and Portland, Oregon. Mackenzie provides an integrated design approach to projects, including architecture, structural engineering, landscape architecture, civil engineering, land use planning, transportation planning and interior design. Mackenzie's Public Projects team specializes in emergency response and municipal facility design, space needs evaluations, and bond campaign assistance. In the past decade, Mackenzie has worked on publicly funded projects in Washington and Oregon for more than 50 counties and municipalities, providing design and engineering services for more than 40 fire facilities, 18 police facilities and 6 municipal office buildings.

# EXECUTIVE SUMMARY

Public Facility design, specifically projects related to Public Safety, are unique in that the building and all its functions are tools required to most effectively and efficiently enhance agency operations and safety. Public Facility design focuses on functionality and meeting the stringent requirements associated with protection of the building, its staff and the communities they serve. Jurisdictional, state and federal criteria for safety, security and operational procedures drive these requirements and impact design considerations. These criteria ensure that these facilities are able to improve operational efficiency on a day-to-day basis and be capable of evolving over the life of the building. Additionally the facility will be able to provide critical services for the citizens of Bainbridge Island, enhance the built environment of the surrounding area by creating a strong civic presence and encourage investment into the community.

With consideration of the criteria above, BIFD and COBI requested that Mackenzie evaluate the existing facilities and determine the needs for each Fire Station and Police Station, with a possible Combined Public Safety Building (in lieu of a separate Fire Station 21 and Police facility). The evaluation was comprised of following six tasks.

## Task 1 – Project Initiation and Confirmation of Scope and Goals

A kick-off meeting was held with the project team to clearly define the desired goals and outcomes for the project upon its completion. Through discussion, the schedule was refined to ensure the approach, critical meeting dates, and deliverables that met the needs and objectives of BIFD and COBI. This meeting established the framework from which information was gathered and shared between all parties, and how the findings derived from analysis was structured within the final report.

## Task 2 – Evaluation of Existing Facilities

Task 2 included a comprehensive review of all relevant background documents and supporting information (i.e. record drawings, past reports, repair logs etc.) to aid in the evaluations. The main effort of this task was to focus on touring each of the stations and observe the physical conditions of the building and grounds and to document the conditions. The review included the following:

- Review of BIFD Strategic Plan and comparison of operational goals and strategic actions with capacities and conditions at each station to identify and prioritize facility design criteria. BIFD provided Mackenzie with critical fire operations input unique to BIFD
- Compliance with Americans with Disabilities Act requirements
- Compliance with the 2012 IBC with Washington Amendments for Fire and Life Safety requirements
- A structural assessment of each building's seismic performance using the ASCE 31 National Standard (the ASCE 31 is a tool used throughout the country to evaluate existing buildings against a benchmark)



- Compliance with Washington Administrative Code (WAC) 296-305
- Compliance with the 2012 International Energy Conservation Code with Washington Amendments
- Evaluation and comparison to NFPA standards for fire station design (1221, 1500, 1581 and 1989). The performance of the building envelope and weather/thermal systems and condition assessment of existing building materials
- The condition of the existing heating and cooling, electrical, and plumbing systems and their anticipated life expectancies
- Site conditions, including any issues with apparatus access and circulation, staff and public parking, site drainage, lighting, landscaping, paving, etc.
- Review of functional issues related to size and/or configuration of spaces. Capacity for housing apparatus at each station, as well as space for storing station goods
- Conformance with City of Bainbridge Island zoning code regulations

Photographs of areas where deficiencies were observed and a description of why these areas were deemed unsuitable are included within the specific sections for each facility. The photographs and descriptions are a sample of the deficiencies observed.



The extent of the required renovations and expansions to address the identified deficiencies of fire stations 21, 22, and the Police Station were significant enough that it is more cost effective to remove the existing improvements (existing structure(s) and site work) and replace with new construction. Due to the age of the facility, station 22 is at the end of its useful life. The facility does not meet current or future needs as an essential facility for BIFD and it does not make sense to continue to make improvements to the existing facility. As a result, a ROM (Rough Order of Magnitude) was not calculated for retrofitting the existing structure. However, station 21 was expanded and remodeled in 2002 and the size of the facility meets some (not all) of the spatial needs and justified the evaluation of renovating and expanding the facility to extend its life for the next 20 plus years.



Comparing data on a recently completed (2010) remodel of an essential facility, the costs per square foot were as follows:

- Structural (seismic): \$20/sf
- Envelope (thermal and enclosure): \$15/sf
- MEP (mechanical/electrical/plumbing): \$58/sf

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These costs were associated with renovating the existing facility to comply with “essential facility” requirements. The costs total \$93/sf. Adjusting for inflation in construction since 2010, at a rate of 3% per year would yield approximately \$105/sf. Applying a 15% contingency (because the structural/envelope/MEP portion of the upgrade to the existing building is not designed), would yield \$120.75/sf.

Applying this total (\$120.75/sf) over the existing station (14,500sf), would yield approximately \$1,750,875. Calculating the costs for the expansion of 15,398 sf (to meet the design requirements) at \$250/sf yields \$3,849,500. Therefore, the construction cost for renovating and expansion of station 21 would be \$5,600,375. The construction cost of a new facility at \$250/sf would be \$7,469,167. Given the high cost of the remodel and limitations of the current configuration of the building and placement on site, it is in the best interest of BIFD to replace the structure instead of renovating the current facility. Comparing the two figures, renovating and expanding Station 21 (upgrade to the existing building, plus the expansion) appears to be approximately 75% of the cost of full replacement.

In regards to the police station, remodel and/or expansion at the current site is not feasible and does not warrant a ROM calculation for retrofitting the existing structure.

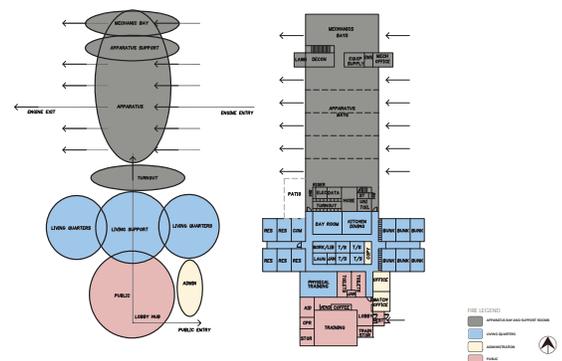
At the conclusion of this task, a public outreach meeting was held. The primary focus of this public meeting was to inform Island residents and stakeholders of the current state of conditions of the existing fire stations and to share rough cost opinions regarding remodel vs. replacement facility scenarios.

### Task 3 – Analysis of Current Fire and Police Department Programs and Delivery Service

Working with BIFD and COBI, Mackenzie participated in discussions regarding current deployment, service data and technology trends that may enhance Bainbridge Island’s delivery of services based on operations.

### Task 4 – Fire Station and Police Station Programming

In conjunction with BIFD and COBI, Mackenzie determined the space need requirements for each facility, projecting growth, identifying adjacencies, and equipment requirements to define a “program” for each facility. The program is an itemization of each room and space, defining quantities, sizes and total square footage anticipated being required for each of the facilities. These programs are inclusive of areas specifically dedicated to training activities, logistics, administration and emergency management; and how these elements might be integrated into the organization of the department (built into





## Task 6 – Project Cost Development

Based on the preferred concept designs developed in Task 5, Mackenzie compiled the information necessary to facilitate construction cost estimates for each facility. In conjunction with construction cost, cost forecasts for the entire project, such as consultant costs, including architectural/engineering fees, construction management fees, special inspection, arborist, geotechnical engineering, surveying, etc. were calculated. In addition, potential owner costs, including fixtures, furniture and equipment, lockers and shelving, moving costs, permit fees, TIF or SDC fees and Washington State sales tax.

## Recommendations

Upon conclusion of this study, it is apparent that none of the existing facilities meet the long term needs of BIFD. Our recommendation is for BIFD to move forward with replacement facilities for fire station 21 and 22 and remodel and expand fire station 23. The state of conditions for fire station 21 and 22 are extremely poor. The following are a summary of their deficiencies:

- Do not meet space needs of current operations or future growth needs
- Do not comply with current seismic code provisions for essential facilities
- Do not meet ADA accessibility requirements
- Do not meet all applicable NFPA standards for fire station design and operation
- Do not meet WAC requirements enforced by the state of Washington
- Do not meet current energy code requirements

Fire station 23 is relatively new and in good condition. Its service life can be extended by remodeling and expanding the facility.

Our recommendation is for BIFD to move forward with the replacement of station 21, 22 and remodel of station 23 promptly. Stations 21 and 22 were not constructed to meet essential facility requirements and the replacement of these structure(s) with facilities that meet current essential facility requirements will significantly increase their performance level and ability to not only remain standing after a natural disaster (such as wind or seismic event) but increase their ability to remain operational as well. The limits to station 23 are insufficient staff space and the size and quantity of emergency vehicles that can be located and deployed out of the facility.

Our recommendation is that BIFD secure funding for capital improvements of said projects within the year. Between bond campaigning, designing, permitting and completion of the facilities, the total duration of the process will take approximately 2 years after procurement of funds.

Our recommendation for COBI is to act swiftly as well. The existing police facility does not meet current operational requirements and the long term needs of the Department. Our recommendation is for COBI is to move forward with the development of a new police facility. The state of conditions for the existing facility is poor. The following are a summary of its deficiencies:

- Does not meet space needs of current operations or future growth needs
- Does not comply with current seismic code provisions for essential facilities

- Does not meet ADA accessibility requirements
- Does not meet current energy code requirements
- Is not located in suitable location to access and deploy from

The City needs to identify an appropriate location for the new police facility, and also decide if municipal court is co-located with police. In a separate study, several sites were evaluated for a stand-alone police/municipal court facility. COBI needs to decide if the police facility (with or without municipal court) is a stand-alone facility or if it is co-located with fire station 21 to be a new Public Safety Building.

The projected costs for a new police facility are included in Section 7, excluding land costs (and municipal court). There are significant total cost savings associated with a co-developed Public Safety Building in lieu of a separate fire station 21 and police facility.

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# STATION 21

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# STATION 21



## STATION SUMMARY

Based on Mackenzie's observations of Station 21, it appears that the facility is close to having lived its useful life. Due to the age of the facility, the capacity of the buildings existing structural system and condition of the existing buildings systems as described on the following pages, it appears that a major remodel and expansion of the facility or replacement of the station will be needed. It is feasible to develop a station that meets the current and long term needs of the Department on the existing site.

## STATION FACTS

<b>Location</b>	8895 Madison Avenue N. Bainbridge Island, WA 98110	<b>Zoning Classification</b>	R-2 Residential; Conditional Use
<b>Year Built</b>	1978	<b>Fire Sprinklers</b>	Yes
<b>Remodeled</b>	2002 (Addition & Remodel)	<b>Construction Type</b>	Wood / Cedar Boards
<b>Site Size</b>	3.9 Acres	<b>Staffing</b>	Career / Volunteer
<b>Building Size</b>	14,230 Sq.Ft.		
<b>Parking On-Site</b>	74 Spaces		
<b>Floors</b>	1 Floor + Mezzanine		

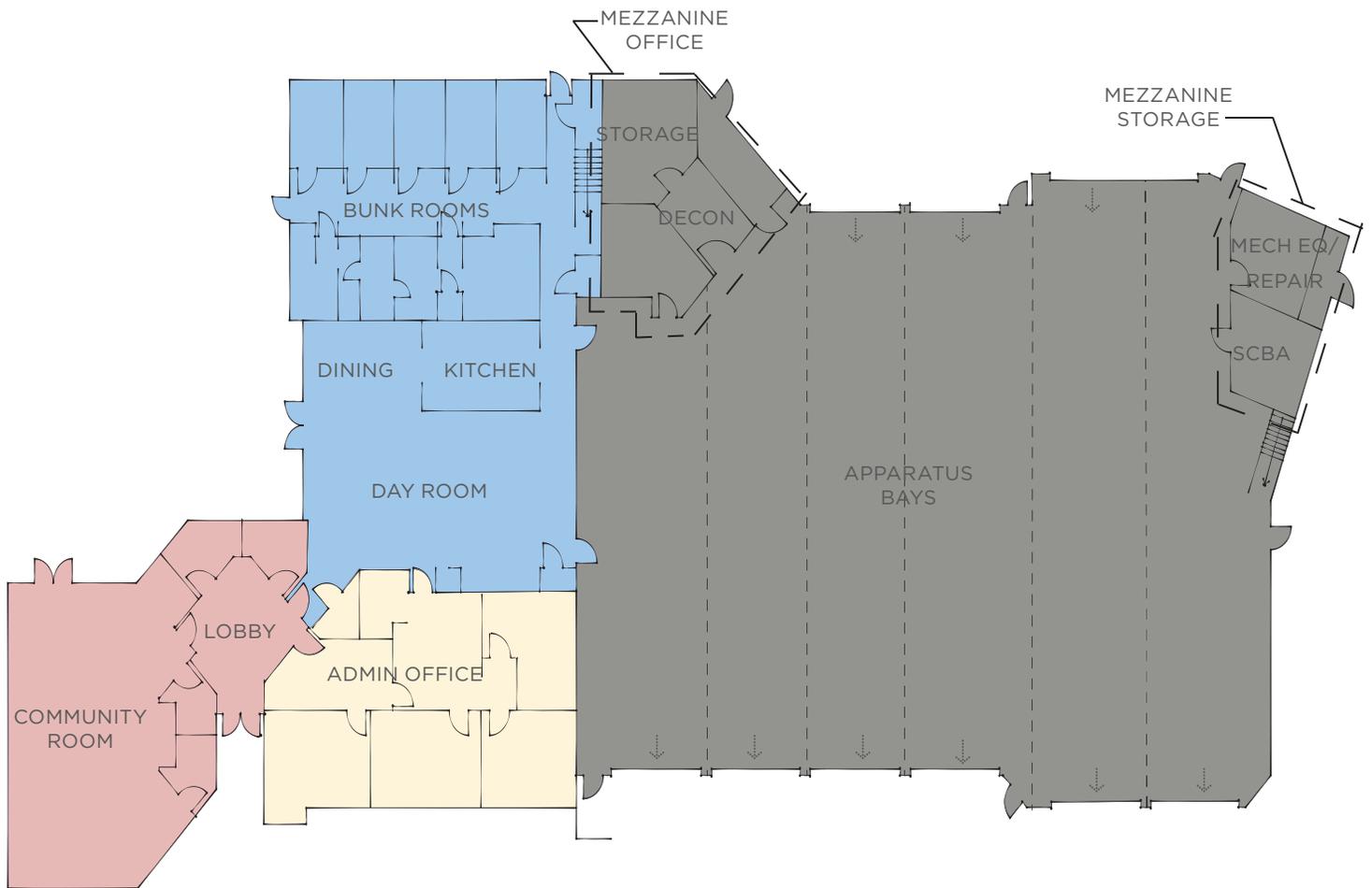


## SITE SUMMARY

The Station 21 property, located at 8895 Madison Avenue NE is the headquarter station for the Department. The site is located at the NW quadrant at the intersection of State Route 305 and Madison Ave NE. The site is approximately 169,884 sf (3.9 acres) and located in a largely rural environment with residential development to the North and West, a commercial development of rental storage units to the South and a church to the East. The site is developed with a main station, helipad, resident apartment buildings for volunteer firefighters and associated staff, and public parking.

### Station 21 - Site Context

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FIRE LEGEND	
	APPARATUS BAY AND SUPPORT
	FIRE LIVING QUARTERS
	FIRE ADMINISTRATION
	PUBLIC



NTS

Station 21 - Floor Plans

2130356.00

## **BUILDING SUMMARY**

Originally built in 1978 the structure had a significant addition added to it in 2002. At the time of the addition to the main structure, a resident building (with detached garage storage structure) for volunteer firefighters was constructed to the rear of the main station. Both the main structure and resident apartment building are constructed of wood framing with wood siding. The building appears to have wood framed interior partitions and shear walls. The main facility is composed of a low slope roof with a built-up bituminous roof membrane. The resident apartment building is composed of a pitched roof with composition asphalt shingles.

Due to the date of the original construction (and addition) for the facility, our observations of the structure and our review of drawings provided by BIFD, it appears that the existing facility structure is not sufficiently engineered to resist lateral forces as required for essential facilities. A major upgrade to the existing wood shear walls, as well as the connections from these shear walls to the floor and roof framing is required.

Though well maintained, the general condition of the facility is poor due to a number of factors, most notably of which is the age of the facility. Most spaces within the facility are inadequately sized to serve the needs of a modern fire facility.

The structure is inadequately insulated from the exterior environment. Energy code requirements have changed significantly since the structure was completed and the R-value of the exterior walls is not sufficient to maintain the temperatures of the interior in a cost effective manner. In addition to being under insulated, there are a number of thermal breaks around the exterior envelope of the building. These breaks were identified with our thermal imaging camera and serve as a conduit for the transmission of heat loss from the interior space to the outside during the winter and heat gain from the exterior to the interior space during the summer.

Due to the age of the facility, there are a number of areas that do not meet current building code requirements for ADA accessibility. New and remodeled Title II structures are required to meet ADA requirements. Fire Stations are classified as Title II structures. New construction is required to be in full compliance of ADA requirements, facilities that undergo additions or remodels must spend up to 25% of the total new construction cost to bring the project into compliance with current ADA accessibility requirements or closer to compliance by removing architectural barriers. Some of the areas that were observed as non-compliant consists of access from public way, accessible parking stall, loading zone and access to the building, stair and handrail construction, sink/counter height, faucet controls, clearances at kitchen, toilets, transaction counter, door hardware and floor level transitions.

## **STRUCTURAL SUMMARY**

Station 21 is a wood framed single story structure, built in 1978, with a small mezzanine. The floor is concrete slab on grade; six inches thick at the apparatus bay area, and four inches elsewhere. The roof is wood framed with glulam beams, open web wood joists, and sheathed with ½ inch plywood. All exterior walls are 2x6 and sheathed with ½ inch plywood. Partial height concrete retaining walls occur at various places around the building at earth berms. There is also a concrete masonry unity generator building on the site with a gang-nail truss and plywood roof. The following structural deficiencies, in accordance with ASCE 31, exist at Station 21:

### **Diaphragms**

For the immediate occupancy performance level, all unblocked wood structural panel diaphragms shall have horizontal spans of less than 30ft. Station 21 does not have a blocked roof diaphragm, yet horizontally spans 160ft.

### **Hold-down Anchors**

Hold downs are not shown in the existing drawings and likely do not exist at shear wall ends.

### **Narrow Wood Shear walls**

The wood shear walls at the apparatus bay doors exceed the height to width aspect ratio limits as defined in ASCE 31.

### **Wall Anchorage, Wood Ledgers, Transfer to Shear Walls**

The concrete masonry unit walls of the generator building are not tied into the roof diaphragm to meet the provisions of this requirement for in-plane and out-of-plane forces for strength and stiffness.

### **Attached Equipment**

No lateral bracing is provided on mechanical units hanging from the ceiling.

## **STANDARDS COMPLIANCE**

The following tables list compliance with standards set forth by the National Fire Protection Association (NFPA) and the Washington Administrative Code (WAC). The sections listed below are the relevant sections for this study.

### **NATIONAL FIRE PROTECTION ASSOCIATION STANDARDS**

<b>NFPA SECTION</b>	<b>DESCRIPTION</b>	<b>COMPLIANCE</b>
NFPA 1	Fire Suppression Sprinklers	Yes
NFPA 1221	Station Alerting Communication System	No
NFPA 1500	Smoke Detectors	No
	Carbon Monoxide Detectors	No
NFPA 1581	Minimum Sleeping Area	Yes
	PPE Cleaning Area	Yes
	EMS Decontamination Area	Yes
NFPA 1851	Turnout Gear Storage	
	UV Exposure	No
	Thermal Exposure	No
NFPA 1962	Fire Hose Storage and Maintenance	No

### **WASHINGTON ADMINISTRATIVE CODE**

<b>WAC SECTION</b>	<b>DESCRIPTION</b>	<b>COMPLIANCE</b>
296-305-06507	1 hour separation between Apparatus Bay and Living Quarters	Yes
296-305-06509	Apparatus Bay Configuration and Clearance	Yes
296-305-06515	Hose Tower Configuration	No
296-305-06511	Indoor Air Quality	Yes

### Lobby

The lobby is oddly shaped and not very useable. Access to the building is direct into this space with no visual screening of the public toilets. The space serves as a triage space for walk-in community members that may need medical attention or simply wanting their blood pressure taken as well as the access point into the training/community room/EOC (Emergency Operation Center) and does not provide enough space for the quantity of people the community room is sized for, thus is a source for congestion. This space is also the waiting area for speaking with fire staff or people visiting the administrative staff of the Fire Department.



### Community Room

This room serves as a multi-purpose room. It serves as the training room, a community room and Bainbridge Islands EOC. The space is a little small for the actual needs that it tries to serve as and is oddly shaped.



### Turnout Storage

Turnouts are stored inside the Apparatus Bay. They are exposed to detrimental environmental factors such as UV exposure and vehicle exhaust, as well as general wear and tear that happens within the confined space of the Apparatus Bay.



### Fitness Area

This is actually a make shift area within the apparatus bay. The inclusion of this equipment/use in the apparatus bay has two issues: It displaces emergency vehicles and equipment that should be located in the apparatus bay and it exposes the staff using the fitness equipment to diesel exhaust fumes that are carcinogenic and other contaminants that are present from the emergency vehicles.





### Hose Tower

The building includes a hose tower. Hose towers are not commonly constructed in modern fire station facilities any more but can provide a methodology for cleaning/drying hoses. The configuration of this hose tower does not meet the NFPA safety regulation requirements.



### Storage

The building is significantly deficient in storage throughout the entire facility. This area is on a small mezzanine off the apparatus bay. It is cramped and inadequate to keep materials and supplies, clean secure and organized.



### Exterior

The site has drainage issues. Standing water was observed along significant portions of the rear of the building as well as the presence of moisture damage to batt insulation installed within the crawl space of the resident apartment building. The building should have positive grading to promote drainage of water from the face of the building for surface water and foundation drainage to capture water below grade and transport it away from the building to eliminate damage of building materials and the promotion of harmful mold growth.



### Apparatus Bay

The apparatus bay is undersized/configured for the needs and space requirements for the apparatus stationed in it. The available space and environment does not meet the WAC 296-305-06509 standard for fire station apparatus bays.

## Station 21 - Existing Facility

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## Office

There is not enough office space for the functions within the building. There are temporary work stations that have been installed within the living quarters of the fire station to compensate for the needs. The stations are not adequately visually screened or acoustically separated from the living quarter components of the station making it challenging for users to occupy and effectively complete work while activities are occurring in the kitchen, day room, dining or rec area.



## Front Counter

The front desk is connected with the lobby area and is under sized and uninviting. The counter as a Dutch door does not meet ADA accessibility requirements. The open door does not provide visual or physical separation of fire staff and the public thus presenting a security risk.



## Day Room / Dining

There is no separation from the day room and dining area. The dining area also serves as a conference area and when used for this purpose does not enable use of day room as there is no visual or acoustical separation between the spaces.



## ADA Accessibility

There are a numerous transitions from one room to another and elevation changes throughout the building that have elevation changes or thresholds that exceed the maximum allowable heights for ADA regulations. The toilet rooms do not meet ADA requirements for fixture type/function, grab bar configurations, counter and sink top heights. The doors throughout the facility have knob type door handles that do not meet ADA requirements.





### Fuel

Station 21 has a permanent solution for a fuel station for the re-fueling of emergency vehicles. This installation is well protected from vehicles with bollards. The fuel station is well screened from view of the public by the building mass but is not secure in terms of the public's ability to drive around the building without any security restriction. Due to this, the fuel station is subject to vandalism, theft (of fuel) and possible terrorist target.



### Helipad

The helipad is a major functional requirement of the site. The Fire Department utilizes the helipad regularly to transport air lift patients from the island to a Seattle hospital. The helipad requires extensive space for the clearances required by the FAA around the landing pad itself.



### Roof

The roof is composed of a slope design. The structure and craftsmanship of the installation shows signs of settling, standing water and past signs of ongoing leaks.



### Roof

There are several elements that have failed due to damage or age. Some of the skylights are fogged and cracked showing signs of water infiltration and condensation build up. There are lifting seams at the roof membranes and failed electrical conduit fittings that have separated and are exposing the electrical wire to the elements as well as a possible source for water intrusion.

## Station 21 - Existing Facility

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### Exterior/Site

The asphalt paving is showing signs of buckling, fatigue and degradation. This will continue to worsen with time until complete failure of stressed areas.



### Infrared Imaging

Infrared camera investigation revealed numerous areas of the building envelop that illustrate poor thermally performing conditions. Thermal imaging can be used to help identify thermal breaks/bridging, water intrusion and such. This photo is a sample of several taken of the building envelop illustrating a large expanse of area susceptible to heat gain and loss as depicted in the brighter colored sections of the photo (yellow and orange range).



# PROGRAMMING SUMMARY

Beyond the building program requirements, there are important site elements and considerations that must be taken into account for a multi-use building. These program elements include public parking; secure parking for staff, department vehicles and equipment; emergency power; building threat protection; and access to and from the site. The most challenging consideration, for any site, stems from public and secure parking requirements. These are governed by jurisdictional requirements as well as department growth projections and space requirements for vehicles and equipment.

SPACE USE	SQUARE FEET
PUBLIC AREAS / TRAINING AREAS	2,394SF
ADMINISTRATION	3,280 SF
APPARATUS BAY AND SUPPORT	9,246 SF
LIVING QUARTERS	4,127 SF
BUILDING SUPPORT	248 SF
TOTAL BUILDING	19,340 SF
GENERAL CIRCULATION (20%)	3,868 SF
TOTAL SQUARE FOOTAGE	23,208 SF

# PROGRAM

Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Room Type	Total Required Square Footage			Comments	
	Exist	2016	2036	Exist	2016	2036	W	L	Area		Exist	2016	2036		
<b>Department: Bainbridge Island Fire Protection District Space Requirements Summary</b>															
Apparatus Bay and Support Rooms												9246	9246		
Living Quarters and Administration												7700	7700		
Community / Training Rooms												2394	2394		
												<i>Acres</i>			
<b>SUBTOTAL</b>												19340	19340		
<b>GENERAL CIRCULATION (20%)</b>												3868	3868		
<b>TOTAL BUILDING SQUARE FOOTAGE</b>												14474	23208	23208	0.53
<b>TOTAL EXTERIOR REQUIREMENTS</b>													17272	17272	0.40
<b>TOTAL SITE REQUIREMENTS</b>													40480	40480	0.93

Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Room Type	Total Required Square Footage			Comments
	Exist	2016	2036	Exist	2016	2036	W	L	Area		Exist	2016	2036	
<b>Department: Apparatus Bay and Support Rooms</b>														
<b>Apparatus Bay</b>														
Apparatus Bay				6	8	8	15	60	900		6000	7500	7500	8 Bay, 15'x60' Bays; Drive-through bays preferred, Possibly phased; 12' x 14' OH doors preferred w/ (2) sections of glazing,; possibly 4-fold doors Concrete floor, Trench drains
<i>Group Total</i>	0	0	0								6000	7500	7500	
<b>Apparatus Support Rooms</b>														
Turnouts				0	1	1	8	38	304		0	304	304	(60) Turnout Lockers min; Ready Rack type system, (2) doors - dedicated 'in' and 'out' doors; Light should not penetrate into room
Decontamination				1	1	1	12	18	216		120	216	216	Floor sink, Decon Shower (Private-Use), Eyewash, Stainless steel counter & sink, Extractor, Commercial tumble dryer - medical linen, turn dryer Hooks for drying w/ extra ventilation, detergent dispenser, (2) Hazard storage (3'x6')
Shop (Dirty Room)				1	1	1	12	14	168		150	168	168	
SCBA (Clean Room)				1	1	1	9	14	126		100	126	126	80 SF plus equipment size: 10' x 3'-6" system. work bench
SCBA Compressor				0	1	1	6	8	48		0	48	48	Compressor and compressed air tank
EMS Supply				1	1	1	20	20	400		250	400	400	Temperature controlled; long & narrow w/ shelves (1) refrigerator, work bench/counter space
Report Writing				0	4	4	6	8	48		0	192	192	Adjacent to Apparatus Bay Hand washing sink
Hose Storage				1	1	1	12	12	144		133	144	144	Built in rack / UV protected
Hose Drying				0	1	1	10	10	100		0	100	100	Built in rack / UV protected
Unisex Toilet				0	1	1	6	8	48		0	48	48	
Fire Riser				0	1	1	0	0	0		0	0	0	Open to apparatus bay
Storage				1	2	2	8	12	96		400	0	0	Above Support Rooms (Mezzanine); Equipment Supply Room; fixed shelving in one room
Public Education Storage				0	2	2	8	12	96		0	0	0	Mezzanine; fixed shelving in one room
Emergency Preparedness Supplies Room				0	2	2	8	12	96		0	0	0	Mezzanine (water, cots, MREs); fixed shelving in one room
CPR Equipment Storage				0	1	1	8	12	96		0	96	96	Move possibly to community room (face shields, mannequins, books)
PPE				0	2	2	8	12	96		0	0	0	Mezzanine; fixed shelving in one room
Ground Maintenance Equipment Storage				0	1	1	9	10	90		0	90	90	Lawn mower, weed eater, power washer, paint sprayer, Fuel/paint storage cabinets, Off Apparatus Bay; outside access
<i>Group Total</i>	0	0	0								1153	1746	1746	
<b>TOTAL SQUARE FOOTAGE (Apparatus Bay and Related Rooms)</b>											7153	9246	9246	

Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Room Type	Total Required Square Footage			Comments
	Exist	2016	2036	Exist	2016	2036	W	L	Area		Exist	2016	2036	
<b>Department: Living Quarters and Administration</b>														
<b>Living Quarters</b>														
Bunk Rooms				5	10	10	8	12	96		500	960	960	Bed, wardrobe for linen, phone for duty officers, desk
Personnel Storage Lockers				1	1	1	2	60	120		90	120	120	(40) 18x18 Full Height Lockers, possibly in corridors 4 lockers per room (20) 1/2 Height S-Lockers
Toilet/Shower				2	4	4	9	10	90		480	360	360	Unisex, upper cabinet and sink base
Kitchen				1	1	1	12	24	288		240	288	288	(1)Food Prep Sink, (1) Hand washing Sink, (4)Refrigerator, (1)Microwave, 6 burner stove.,(1) dishwasher, BBQ area screened and located off of Kitchen Across from FD dining - covered
Pantry				1	3	3	4	4	16		20	48	48	3 pantry closets in kitchen
Dining				1	1	1	16	24	384		1200	384	384	Farm Table with benches - Seating for 17 Kitchen and dining open to one another
Day Room				1	1	1	24	24	576		0	576	576	Seating for 10 Recliner
Firefighter Workstation				1	4	4	6	8	48		0	192	192	Work area for Duty crews/Volunteers
Radio/Supply				0	1	1	12	12	144		0	144	144	Volunteer mail boxes with file drawers
Library / Study Room				0	1	1	8	10	80		0	80	80	Enclosed, adjacent to day room
Physical Training				0	1	1	30	30	900		0	900	900	Treadmill, stair stepper, weights, universal machine
Laundry				0	1	1	10	12	120		0	120	120	Commercial washer and dryer, upper shelving
<b>Group Total</b>	<b>0</b>	<b>0</b>	<b>0</b>								<b>2530</b>	<b>4172</b>	<b>4172</b>	
<b>Administration</b>														
Office - Fire Chief				1	1	1	14	22	308	OFFICE	240	308	308	glass doors; wardrobe closet for uniforms
Office - Operations Chief				1	1	1	14	16	224	OFFICE	160	224	224	wardrobe closet for uniforms
Office - Fire Marshall				1	1	1	14	16	224	OFFICE	160	224	224	wardrobe closet for uniforms
Office - Plan Review Room				1	1	1	10	12	120	OFFICE	160	120	120	Adjacent to Fire Marshall
Office - Business Administrator				1	1	1	14	16	224	OFFICE	160	224	224	wardrobe closet for uniforms
Office - BC				0	1	1	12	16	192	OFFICE	0	192	192	single shared office for BC's
Office - Training Lieutenant				0	1	1	12	16	192	OFFICE	0	192	192	
Office - Training				0	1	1	12	16	192	OFFICE	0	192	192	
Office - MSO				1	1	1	12	16	192	OFFICE	160	192	192	
File Room				0	1	1	12	12	144		0	144	144	
Shared Open Office - Volunteers				0	1	1	16	16	256	OPEN	0	256	256	Volunteer Coordinators & Inspector (4 Positions Total)
Shared Open Office - Office Admin				0	1	1	10	16	160	OPEN	0	160	160	Office Admin / Assistant
Shared Open Office - Finance				0	1	1	14	18	252	OPEN	0	252	252	Finance Team (2 Stations), in-room secure file cabinets, 2'x12' cabinets - storage above printers
Copy Room / Work Area / Mail Room				0	1	1	12	20	240	OFFICE	0	240	240	Copy/fax machine; supply closet/ includes office supplies counter w/ upper and lower cabinets & work island
Medium Conference Room				0	1	1	12	20	240	OFFICE	0	240	240	8 people Wired for hand radios
Storage				0	1	1	10	12	120		0	120	120	
Personnel Storage Lockers				0	1	1	2	18	36		0	36	36	(12) Lockers possibly in corridors - 18x18 Full hgt lockers
<b>Group Total</b>	<b>0</b>	<b>0</b>	<b>0</b>								<b>1000</b>	<b>3280</b>	<b>3280</b>	

Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Room Type	Total Required Square Footage			Comments
	Exist	2016	2036	Exist	2016	2036	W	L	Area		Exist	2016	2036	
<b>Building Support</b>														
Electrical / Data				1	1	1	10	12	120		20	120	120	Includes server rack, add workstation in room
Janitor Closet				1	2	2	4	6	24		20	48	48	Toilet paper, paper towels, mops, sink, etc.
Uniform Storage				0	1	1	8	10	80		0	80	80	uniform inventory, close to admin
<i>Group Total</i>	0	0	0								40	248	248	
<b>TOTAL SQUARE FOOTAGE (Living Quarters and Administration)</b>											3570	7700	7700	

**Department: Community / Training Rooms**

<b>Community / Training Rooms</b>														
Space / Room Use	Exist	2016	2036	Exist	2016	2036	W	L	Area	Room Type	Exist	2016	2036	Comments
Community / Training / EOC / Conference				1	1	1	30	35	1050		900	1050	1050	(45-50) Occupants,
Break Room				1	1	1	12	12	144		20	144	144	In an alcove off of community room - (1) sink, (1) Microwave, (1) Refrigerator, (1) Dishwasher
1st Aid Station				0	1	1	10	12	120		0	120	120	Located within lobby/BP station/gurney
Public Restrooms				2	2	2	10	22	220		120	440	440	(3) Stalls, (2) Lavatories
Lobby				1	1	1	12	18	216		120	216	216	Emergency phone outside entry; With display cases, with Bulletin board for posting
EOC Storage Closet				1	1	1	10	20	200		20	200	200	Secure EOC storage, radio station
Pop Storage / Vending Machines				1	1	1	4	8	32		20	32	32	
Community / Training Storage				1	1	1	12	16	192		60	192	192	50% storage for table and chairs
<i>Group Total</i>	0	0	0								1260	2394	2394	
<b>TOTAL SQUARE FOOTAGE (Community / Training Rooms)</b>											1260	2394	2394	

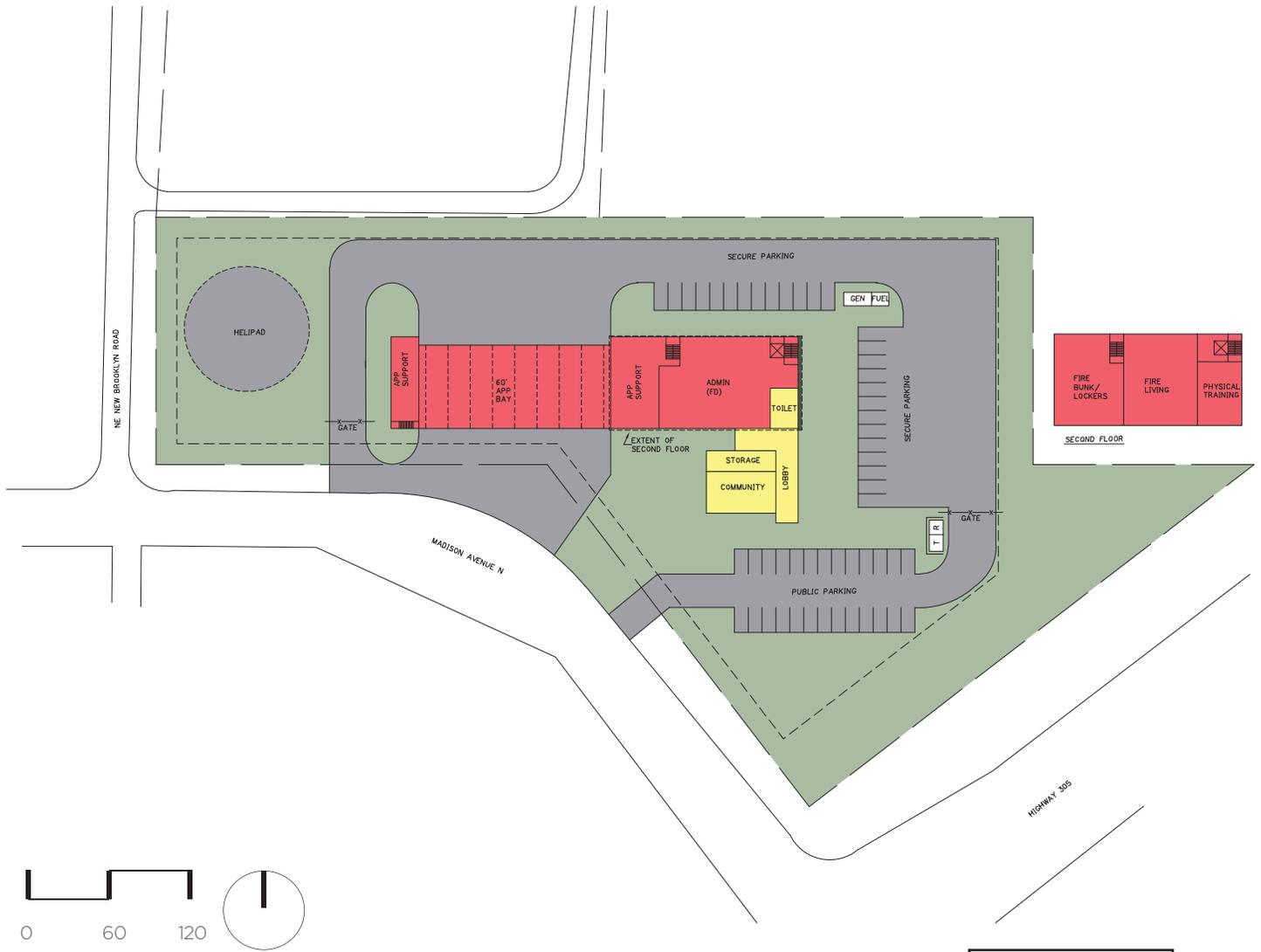
Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Room Type	Total Required Square Footage			Comments
	Exist	2016	2036	Exist	2016	2036	W	L	Area		Exist	2016	2036	

**Department: Exterior Requirements**

Parking														
Public Parking - Community Rm/Training				16	25	25	9	18	162		2592	4050	4050	25x Community / Training Room
Staff Parking				37	20	20	9	18	162		5994	3240	3240	(20) secure parking
Chief Parking				1	3	3	9	18	162		162	486	486	Included in Secure Parking - Electrical Hook-up
Resident Parking				2	4	4	9	18	162		324	648	648	
Bike Parking - Public				0	1	1	10	10	100		0	100	100	Included in Public Parking
Bike Parking - Staff				0	1	1	10	10	100		0	100	100	Off of covered BBQ area
<b>Group Total</b>						45					8748	7290	7290	

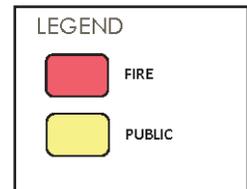
Site Elements														
Training Grounds				0	1	1	0	0	0		0	0	0	Open Area for Training in Parking Area
Storm Water Retention Pond				0	1	1	0	0	0		0	0	0	
Generator				0	1	1	8	12	96		0	96	96	Screened; Includes 4'-0" clearances, Concrete pad req'd
Trash / Recycling				0	1	1	10	20	200		0	200	200	Verify trash requirements w/ provider
Fuel Station				0	1	1	15	45	675		0	675	675	1000 gal. above ground tank
Vehicle Wash Area				0	1	1	15	45	675		0	0	0	Within App Bay
Patio				0	1	1	15	25	375		0	375	375	BBQ
Helipad				1	1	1	30	40	1200		1200	1200	1200	Existing Helipad - prefer to leave in current location
<b>Group Total</b>											1200	1346	1346	

<b>SUBTOTAL</b>											8636	8636		
<b>GENERAL CIRCULATION (100%)</b>											8636	8636		
<b>TOTAL SQUARE FOOTAGE (Exterior Requirements)</b>											17272	17272		



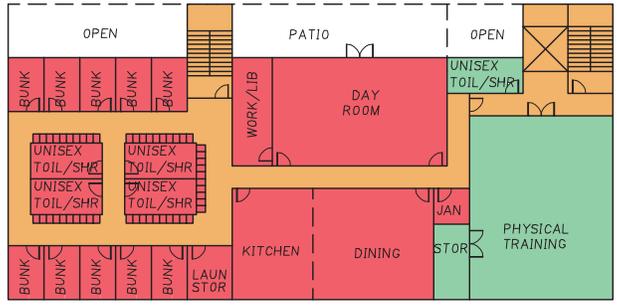
Site Total Area: 169,884 SF / 3.9 AC

Proposed Development Area: 128,374 SF / 2.9 AC

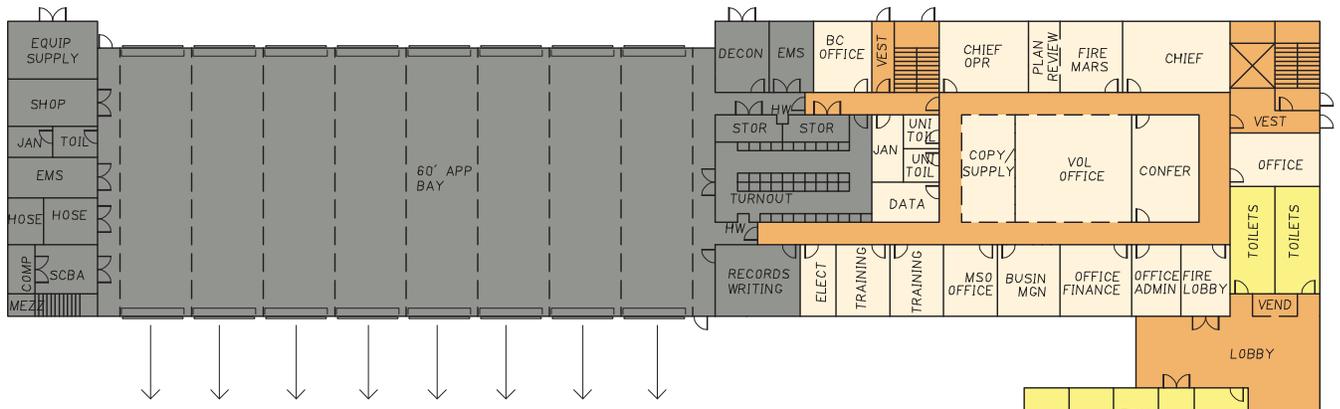


Total Building: 29,898 SF

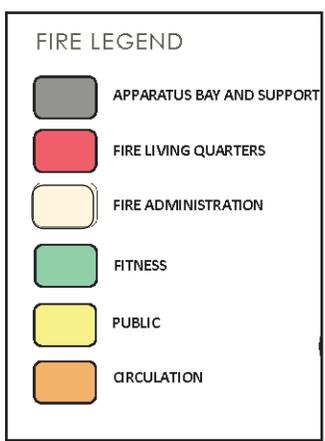
Total Parking: 25 Career and Volunteer Firefighters  
 20 Public  
 45 Total Spaces



**SECOND FLOOR**



**FIRST FLOOR**





Station 21 - Renderings

June 18, 2014

# COST FORECAST SUMMARY

For a more detailed break down of the cost forecast please see Section 7.

DIVISION OF COSTS	COST
CONSTRUCTION COST	\$7,469,167
CONSULTANT COST	\$1,116,404
OWNER COST	\$689,912
SUB TOTAL	\$9,275,484
WA SALES TAX (8.7%)	\$806,967
<b>PROJECT TOTAL</b>	<b>\$10,082,451</b>

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# STATION 22

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# STATION 22



## STATION SUMMARY

Based on Mackenzie's observations of Station 22, it appears that the facility is at the end of its useful life. Due to the age of the facility, the capacity of the buildings existing structural system and condition of the existing buildings systems as described on the following pages, it appears that a replacement of the station will be needed. It is feasible to develop a new station that meets the current and long term needs of the Department on the existing site.

## STATION FACTS

<b>Location</b>	7934 NE Bucklin Hill Road Bainbridge Island, WA 98110	<b>Zoning Classification</b>	R-1 Residential; Conditional Use
<b>Year Built</b>	1959	<b>Fire Sprinklers</b>	No
<b>Site Size</b>	3.11 Acres	<b>Construction Type</b>	Structural Masonry / Wood
<b>Building Size</b>	4,850 Sq.Ft.	<b>Staffing</b>	Career/Volunteer
<b>Parking On-Site</b>	27 Spaces		
<b>Floors</b>	2 Floors		

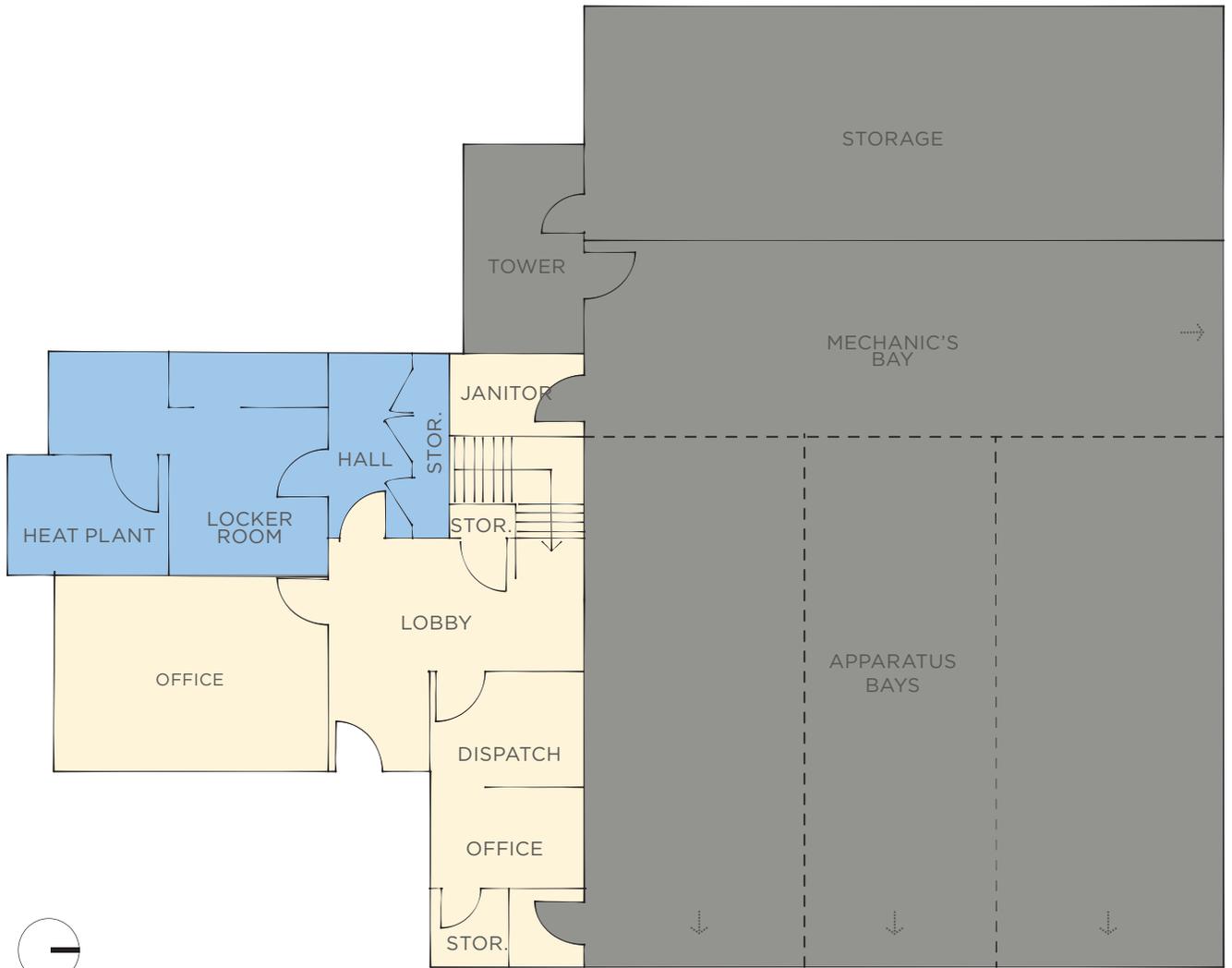
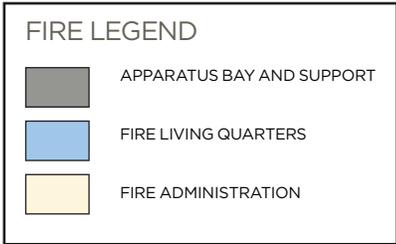
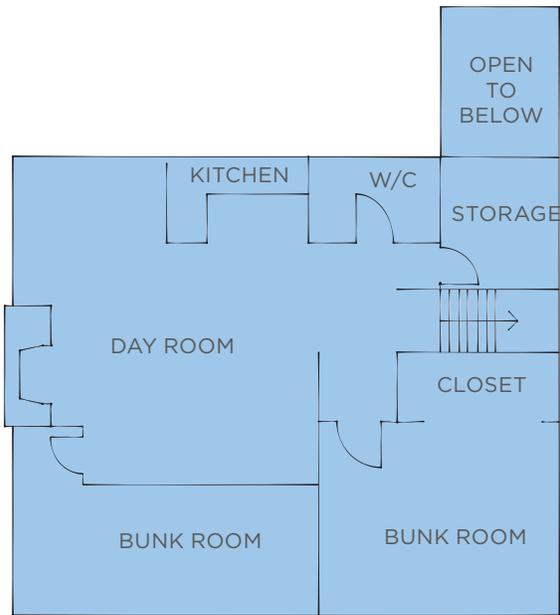


### SITE SUMMARY

The Station 22 property, located at 7934 NE Bucklin Hill Road is a south end fire station for the Department. The site is located near the intersection of NE Bucklin Hill Road and Old Woods Lane NE. The site is approximately 135,472 sf (3.11 acres) and located in a largely rural environment with residential uses surrounding it, with the exception of the American Legion meeting hall adjacent to the fire station site to the West. The site is developed with a station, a semi-attached make shift mechanics bay, large gravel lot to the rear partially used for storage of trailers and associated public parking.

### Station 22 - Site Context

June 18, 2014



Station 22 - Floor Plans

2130356.00

## **BUILDING SUMMARY**

Originally built in 1959, the structure is the oldest station for the Fire Department. The building appears to have masonry interior partitions and shear walls on the main floor. The facility is composed of a low slope roof with a built-up bituminous roof membrane. The mechanics bay is largely a tented, non-permanent enclosure with inadequate lighting and no heat source.

Due to the date of the original construction (and addition) for the facility, our observations of the structure and our review of drawings provided by BIFD, it appears that the existing facility structure is not sufficiently engineered to resist lateral forces as required for essential facilities. A major upgrade to the existing masonry shear walls, as well as the connections from these shear walls to the floor and roof framing is required.

Though well maintained, the general condition of the facility is poor due to a number of factors, most notably of which is the age of the facility. Most spaces within the facility are inadequately sized to serve the needs of a modern fire facility.

The structure is inadequately insulated from the exterior environment. Energy code requirements have changed significantly since the structure was completed and the R-value of the exterior walls is not sufficient to maintain the temperatures of the interior in a cost effective manner. In addition to being under insulated, there are a number of thermal breaks around the exterior envelope of the building. These breaks were identified with our thermal imaging camera and serve as a conduit for the transmission of heat loss from the interior space to the outside during the winter and heat gain from the exterior to the interior space during the summer.

Due to the age of the facility, there are a number of areas that do not meet current building code requirements for ADA accessibility. New and remodeled Title II structures are required to meet ADA requirements. Fire Stations are classified as Title II structures. New construction is required to be in full compliance of ADA requirements, facilities that undergo additions or remodels must spend up to 25% of the total new construction cost to bring the project into compliance with current ADA accessibility requirements or closer to compliance by removing architectural barriers. Some of the areas that were observed as non-compliant consist of access from public way, accessible parking stall, loading zone and access to the building, stair and handrail construction, sink/counter height, faucet controls, clearances at kitchen, toilets, transaction counter, door hardware and floor level transitions.

## **STRUCTURAL SUMMARY**

Station 22 is a masonry structure built in 1959 with a partial second floor that is wood framed. The ground floors are 5½ inch thick concrete slab on grade, and the second floor is solid sawn wood joists with glulam beams. The roof is wood framed with glulam beams and pre-manufactured 'Panelbild' roof panels. The following structural deficiencies, in accordance with ASCE 31, exist at Station 22:

### **Diaphragms**

All wood diaphragms with spans greater than twelve feet are required to consist of wood structural panels or diagonal sheathing. Station 22 has 'Panelbild' manufactured roof panels which do not meet this requirement. Furthermore, the "Panelbild" roof panels do not have code compliance records and may not function properly as a structural diaphragm.

### **Wall Anchorage, Wood Ledgers, Transfer to Shear Walls**

The concrete masonry unit walls are not tied into the roof diaphragm to meet the provisions of this requirement for in-plane and out-of-plane forces for strength and stiffness.

### **Geometry/Plan Irregularities**

Plan offsets and re-entrant corners exist in the building, and do not appear to have adequate diaphragm reinforcement.

### **Shear Stress**

Shear stresses in the exterior masonry walls exceed the maximums set forth in the ASCE 31.

### **Cross Ties**

Continuous cross ties meeting the intent of this provision do not exist in the diaphragm.

### **Hold-Down Anchors**

Hold-down anchors for the wood framed walls of the second floor are not shown in the existing drawings.

### **Narrow Wood Shear walls**

The wood shear walls at the apparatus bay doors exceed the height to width aspect ratio limits as defined in ASCE 31.

### **Deterioration of Wood**

Signs of water damage exist on some of the wood framing.

Damage/deterioration of Columns - Exterior steel columns at the apparatus bay area are damaged.

## STANDARDS COMPLIANCE

The following tables list compliance with standards set forth by the National Fire Protection Association (NFPA) and the Washington Administrative Code (WAC). The sections listed below are the relevant sections for this study.

### NATIONAL FIRE PROTECTION ASSOCIATION STANDARDS

NFPA SECTION	DESCRIPTION	COMPLIANCE
NFPA 1	Fire Suppression Sprinklers	No
NFPA 1221	Station Alerting Communication System	No
NFPA 1500	Smoke Detectors	No
	Carbon Monoxide Detectors	No
NFPA 1581	Minimum Sleeping Area	Yes
	PPE Cleaning Area	No
	EMS Decontamination Area	No
NFPA 1851	Turnout Gear Storage	
	UV Exposure	No
	Thermal Exposure	No
NFPA 1962	Fire Hose Storage and Maintenance	No

### WASHINGTON ADMINISTRATIVE CODE

WAC SECTION	DESCRIPTION	COMPLIANCE
296-305-06507	1 hour separation between Apparatus Bay and Living Quarters	No
296-305-06509	Apparatus Bay Configuration and Clearance	No
296-305-06515	Hose Tower Configuration	No
296-305-06511	Indoor Air Quality	No

### Entry

The reach range for the door handle exceeds that allowed for ADA accessibility requirements and floor clearances do not meet ADA accessibility requirements. Public entrance and parking conflict with emergency vehicle access.



### Reception/Lobby

There is no secure separation between the public and staff portion of station. Door knobs and door clearances do not meet ADA accessibility requirements.



### Office

The office is an inefficient allocation of space for the station and intended use.



### Office

The office is undersized and cramped for use with three work stations.



Station 22 - Existing Facility

2130356.00



### Locker Room

The counter height does not meet ADA accessibility requirements and is inadequately constructed (2x4 framing used to support corner of counter). Lighting provides poor illumination for grooming and hygiene. Sink waste and water supply lines do not meet ADA requirements.



### Toilet Room

Shower, urinal and overall shower do not meet ADA clearances.



### Day Room

Day room is small and access to one of the bunk rooms is restricted through the day room. Access to natural daylight is limited and artificial lighting is poor.



### Dining Room

The space is limited. Finishes are in fair condition. Door to patio does not meet ADA accessibility requirements.

## Station 22 - Existing Facility

June 18, 2014

### **Kitchen**

The kitchen is too small for the size of staff using the station. There is not enough layout space for food preparation. There are no dedicated pantries or refrigerator for each shift. The counters and sink do not meet ADA accessibility requirements.



### **Bunk Room**

There are inadequate bunk rooms for sleeping, limiting accommodations for gender separation of staff as well as quantity of staff.



### **Apparatus Bay**

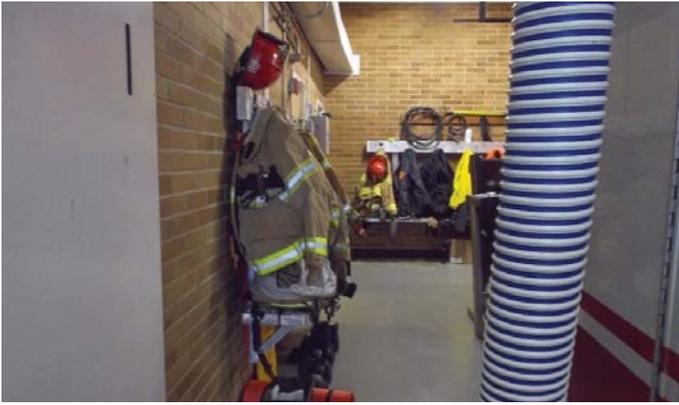
The apparatus bay does not have interior floor trench drains. It is inadequately sized for the apparatus housed within the bay and does not offer proper area to store support materials and equipment.



### **Mechanic's Shop**

The height of this space is limited and does not allow for enough clearances to lift rigs being serviced/maintained. It is oversized for its use as a shop.





### Apparatus Bay

Turn out gear is stored in the open environment of the apparatus bay. The gear is exposed to air borne contaminants and UV exposure reducing the life of the gear. This means turn out gear storage does not meet NFPA standards.



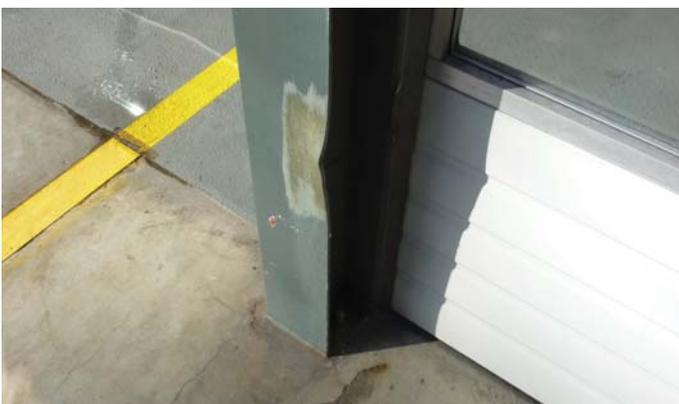
### Mechanical Bay

This Fire Department has created a temporary tented enclosure off the backside of the building to serve as the mechanics bay to compensate for the deficiencies of the Mechanics Shop. The room has inadequate lighting and temperature control.



### Exterior/Site

The exterior concrete apron at the front of the building is cracking and showing signs of settlement. The downspout at the east side of the apron is causing erosion that is undermining the concrete and worsening the conditions.



### Exterior/Site

A couple of the building structural columns at the jambs of the apparatus bay doors have been struck by a vehicle or other element. The damage is significant and should be repaired for continued long term use of the building.

## Station 22 - Existing Facility

June 18, 2014

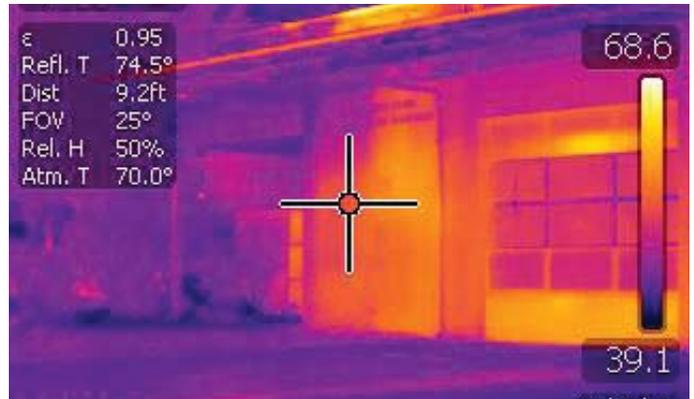
## Waste Oil Tank

The waste oil tank, service steps and lean-to structure are serving a temporary means but do not meet standards for a permanent solution for adequate disposal needs, protection of tank/ equipment and service of said elements.



## Infrared Imaging

Infrared camera investigation revealed numerous areas of the building envelop that illustrate poor thermally performing conditions. Thermal imaging can be used to help identify thermal breaks/bridging, water intrusion and such. This photo is a sample of several taken of the building envelop illustrating a large expanse of area susceptible to heat gain and loss as depicted in the brighter colored sections of the photo (yellow and orange range).



# PROGRAMMING SUMMARY

Beyond the building program requirements, there are important site elements and considerations that must be taken into account for a multi-use building. These program elements include public parking; secure parking for staff, department vehicles and equipment; emergency power; building threat protection; and access to and from the site. The most challenging consideration, for any site, stems from public and secure parking requirements. These are governed by jurisdictional requirements as well as department growth projections and space requirements for vehicles and equipment.

SPACE USE	SQUARE FEET
PUBLIC AREAS / TRAINING AREAS	1,716SF
ADMINISTRATION	672 SF
APPARATUS BAY AND SUPPORT	5,652 SF
LIVING QUARTERS	1,716SF
BUILDING SUPPORT	256 SF
TOTAL BUILDING	11,632 SF
GENERAL CIRCULATION (20%)	2,326 SF
TOTAL SQUARE FOOTAGE	13,958 SF

# PROGRAM

Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Room Type	Total Required Square Footage			Comments
	Exist	2016	2036	Exist	2016	2036	W	L	Area		Exist	2016	2036	
<b>Department: Bainbridge Island Fire Protection District Space Requirements Summary</b>														
Apparatus Bay and Support Rooms	0	0	0									5652	5652	
Living Quarters and Administration	0	0	0									3944	4264	
Community / Training Rooms	0	0	0									1716	1716	
<b>SUBTOTAL</b>	0	0	0									11312	11632	<i>Acres</i>
<b>GENERAL CIRCULATION (20%)</b>												2262	2326	
<b>TOTAL BUILDING SQUARE FOOTAGE</b>	0	0	0									4850	13574	13958
<b>TOTAL EXTERIOR REQUIREMENTS</b>													12460	12460
<b>TOTAL SITE REQUIREMENTS</b>													26034	26418

Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Room Type	Total Required Square Footage			Comments
	Exist	2016	2036	Exist	2016	2036	W	L	Area		Exist	2016	2036	
<b>Department: Apparatus Bay and Support Rooms</b>														
<b>Apparatus Bay</b>														
Apparatus Bay				4	5	5	15	45	675		2300	3375	3375	Drive-through bays preferred, Possibly phased; 12' x 14' OH doors preferred w/ (2) sections of glazing, Four Fold type add-alt; Concrete floor, Trench drains
App Bay Clearance @ First Bay				1	1	1	5	45	225		0	225	225	
Shop Bay				0	1	1	20	45	900		0	900	900	min 16'-0" high
Mechanic's Office				0	1	1	12	14	168		0	168	168	Adjacent to shop
<b>Group Total</b>	<b>0</b>	<b>0</b>	<b>0</b>								<b>2300</b>	<b>4668</b>	<b>4668</b>	
<b>Apparatus Support Rooms</b>														
Turnouts				0	1	1	8	16	128		0	128	128	(16) Turnout Lockers min; Ready Rack type system, (2) doors - dedicated 'in' and 'out' doors; Light should not penetrate into room
Decontamination				0	1	1	12	18	216		0	216	216	Floor sink, Decon Shower (Private-Use), Eyewash, Stainless steel counter& sink, Extractor, (2) Commercial grade dryer, hooks for drying w/ extra ventilation detergent dispenser, (2) hazard storage (3'x6')
Equipment Supply Rm (Dirty Room)				0	1	1	12	12	144		0	144	144	Truck cleaning supplies, flares, chains, etc. in cabinet
Firefighter Workstation				0	1	1	6	10	60		0	60	60	Extractor, Washer and Dryer, Detergent dispenser
EMS Supply				1	1	1	6	6	36		20	36	36	Hand Tools
Report Writing/Workstation				0	1	1	12	14	168		0	168	168	Lockable cabinets
Hose Storage				1	1	1	12	12	144		104	144	144	Built in rack / UV protected
Ladder Storage				0	1	1	1	20	20		0	20	20	
Unisex Toilet				1	1	1	6	8	48		36	48	48	
Fire Riser				0	1	1	1	20	20		0	20	20	Open to apparatus bay
Storage				0	1	1	0	0	0		0	0	0	Above Support Rooms (Mezzanine)
Ground Maintenance Equipment Storage				0	1	1	9	10	90		0	90	90	Lawn mower, weed eater, power washer, paint sprayer, Fuel/paint storage cabinets
<b>Group Total</b>	<b>0</b>	<b>0</b>	<b>0</b>								<b>160</b>	<b>984</b>	<b>984</b>	To be in shed
<b>TOTAL SQUARE FOOTAGE (Apparatus Bay and Related Rooms)</b>											<b>2460</b>	<b>5652</b>	<b>5652</b>	

Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Room Type	Total Required Square Footage			Comments
	Exist	2016	2036	Exist	2016	2036	W	L	Area		Exist	2016	2036	

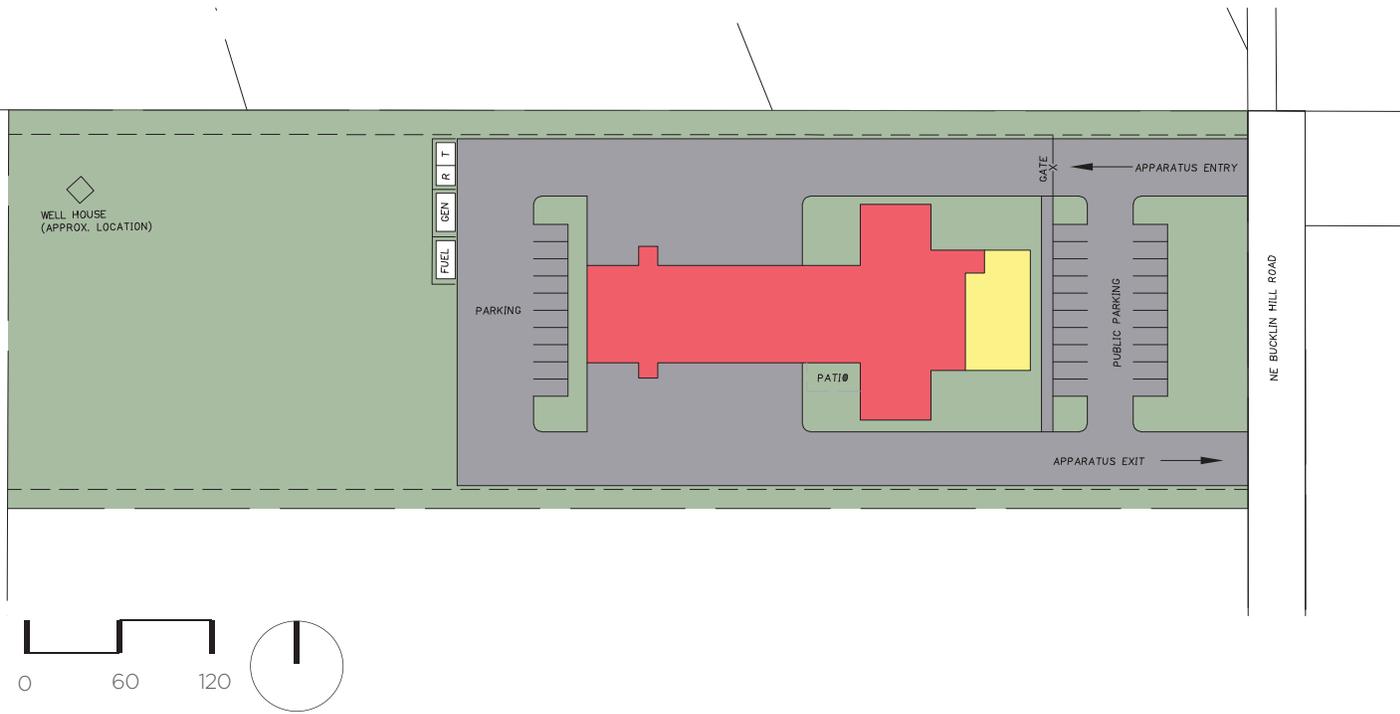
**Department: Living Quarters and Administration**

<b>Living Quarters</b>														
Bunk Rooms				3	4	6	10	16	160		360	640	960	(4) Sleeping spaces , 2 additional in future Bed, phone for duty officers, wardrobe, desk
Residence Rooms				0	5	5	10	16	160		0	800	800	Separate wing or floor, private, separate entry, a continuation of bunk rooms, separated by door
Residence - Common TV/Kitchenette				0	1	1	12	16	192		0	192	192	(1)Sink, (1)Refrigerator, (1)Microwave, cabinets
Storage Lockers				0	1	1	2	24	48		0	48	48	For personal items (16) 18x18 full height lockers, possibly in corridors, 4 lockers per room, (10) 1/2 height S-lockers
Unisex Toilet/Shower				1	4	4	10	10	100		210	400	400	
Dining / Kitchen				1	1	1	16	16	256		180	256	256	(1)Sink, (1)Refrigerator, (1)Microwave, 4 burner stove. (1) dishwasher, (1) pantry BBQ area screened and located off of Kitchen Across from dining
Day Room (Common)				1	1	1	16	16	256		160	256	256	Dayroom, Dining Room, Kitchen combined as one grand room; Seating for 8-10; (2) recliners and (2) sofas
Physical Training				0	1	1	20	20	400		0	400	400	Treadmill, stair stepper, weights, universal machine
Laundry				1	1	1	6	4	24		20	24	24	Commercial washer and dryer, upper shelving
<b>Group Total</b>	<b>0</b>	<b>0</b>	<b>0</b>								<b>930</b>	<b>3016</b>	<b>3336</b>	
<b>Administration</b>														
Offices				2	2	2	12	14	168	OFFICE	250	336	336	1x Facilities Manager, 1x Lieutenant
Small Conference Room				0	1	1	12	16	192		0	192	192	4 person table
Radio / Supply / Copy				1	1	1	12	12	144		40	144	144	Volunteer mail boxes, bulletin board for postings, Radio storage; Adjacent entry Copy/fax machine; supply cabinet
<b>Group Total</b>	<b>0</b>	<b>0</b>	<b>0</b>								<b>290</b>	<b>672</b>	<b>672</b>	
<b>Building Support</b>														
Electrical / Data				1	1	1	4	8	32		50	32	32	Includes server rack
Janitor Closet				1	1	1	4	6	24		40	24	24	mops, sink, etc.
Janitor Supply Storage				0	1	1	10	20	200		0	200	200	Supply storage
<b>Group Total</b>	<b>0</b>	<b>0</b>	<b>0</b>								<b>90</b>	<b>256</b>	<b>256</b>	
<b>TOTAL SQUARE FOOTAGE (Living Quarters and Administration)</b>											<b>1310</b>	<b>3944</b>	<b>4264</b>	

Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Room Type	Total Required Square Footage			Comments
	Exist	2016	2036	Exist	2016	2036	W	L	Area		Exist	2016	2036	

**Department: Community / Training Rooms**

Community / Training Rooms															
Community / Training / Conference				0	1	1	25	30	750			0	750	750	(30-40) Occupants
Break Room				0	1	1	12	12	144			0	144	144	An alcove near community room, (1) refrigerator, (1) sink (1) microwave, w/ vending area
1st Aid Station				0	1	1	10	12	120			0	120	120	Located within lobby
Public Restrooms				0	2	2	10	18	180			0	360	360	(2) Stalls, (1) Lavatories
Lobby				1	1	1	10	15	150			80	150	150	Emergency phone outside entry; Display Cabinets
Community / Training Storage				0	1	1	10	12	120			0	120	120	
CPR Storage				0	1	1	6	12	72			0	72	72	
<i>Group Total</i>	0	0	0									80	1716	1716	
<b>TOTAL SQUARE FOOTAGE (Community / Training Rooms)</b>											80	1716	1716		



**LEGEND**

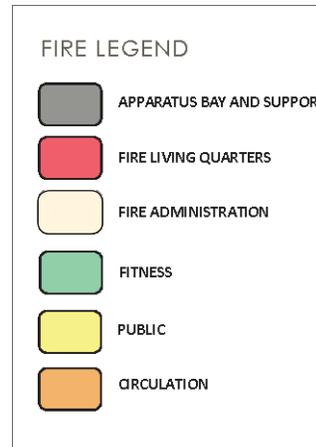
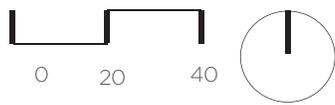
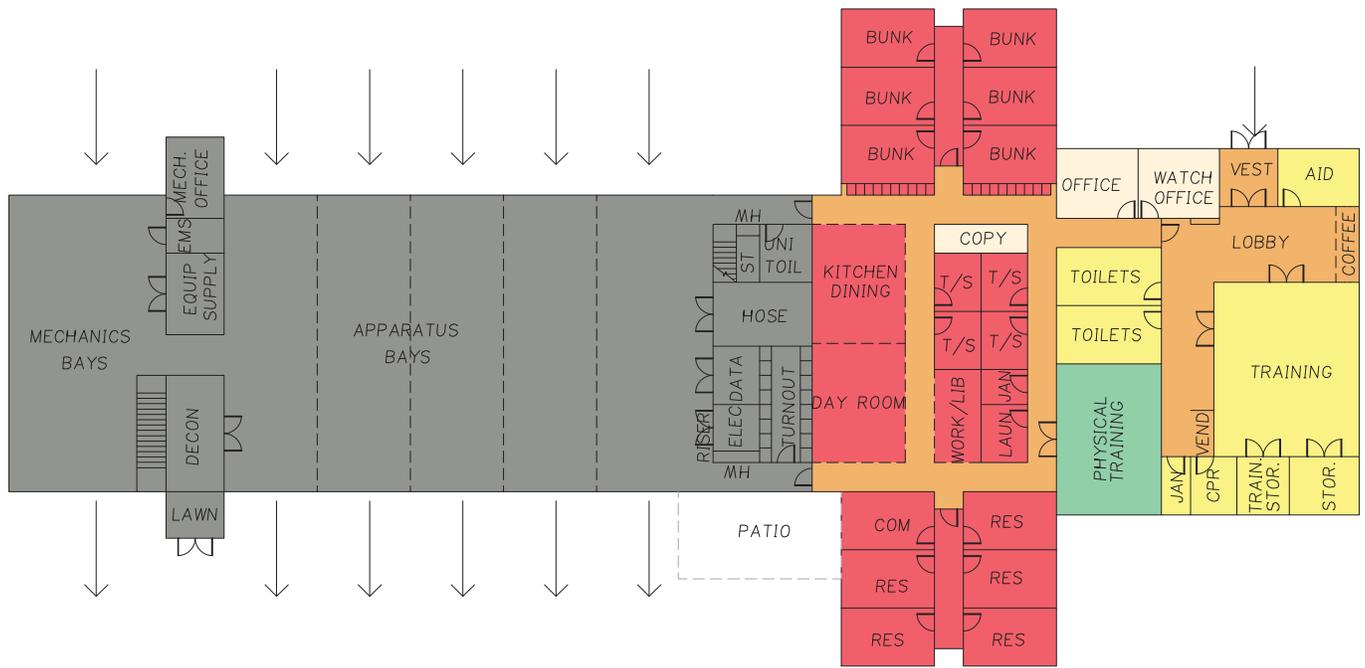
- FIRE
- PUBLIC

Site Total Area: 135,471 SF / 3.11 AC

Proposed Development Area: 84,152 SF / 1.9 AC

Total Building: 14,900 SF

Total Parking: 20 Career and Volunteer Firefighters  
10 Public  
 30 Total Spaces



Station 22 - Floor Plan

June 18, 2014



# COST FORECAST SUMMARY

For a more detailed break down of the cost forecast please see Section 7.

DIVISION OF COSTS	COST
CONSTRUCTION COST	\$4,264,143
CONSULTANT COST	\$721,699
OWNER COST	\$353,675
SUB TOTAL	\$5,339,517
WA SALES TAX (8.7%)	\$464,538
<b>PROJECT TOTAL</b>	<b>\$5,804,055</b>

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# STATION 23

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# STATION 23



## STATION SUMMARY

Based on Mackenzie's observations of Station 23, it appears that the building is in relatively good condition and with minor renovations it will enhance the functionality of the facility, extend the facility service life, and the growing needs of the Department.

## STATION FACTS

<b>Location</b>	12985 Phelps Road Bainbridge Island, WA 98110	<b>Zoning Classification</b>	R-0.4 Residential; Conditional Use
<b>Year Built</b>	1995	<b>Fire Sprinklers</b>	Yes
<b>Site Size</b>	3.24 Acres	<b>Construction Type</b>	Wood Structure w/ Siding
<b>Building Size</b>	14,171 Sq.Ft.	<b>Staffing</b>	Career/Volunteer
<b>Parking On-Site</b>	20 Spaces		
<b>Floors</b>	1 Floor + Mezzanine		

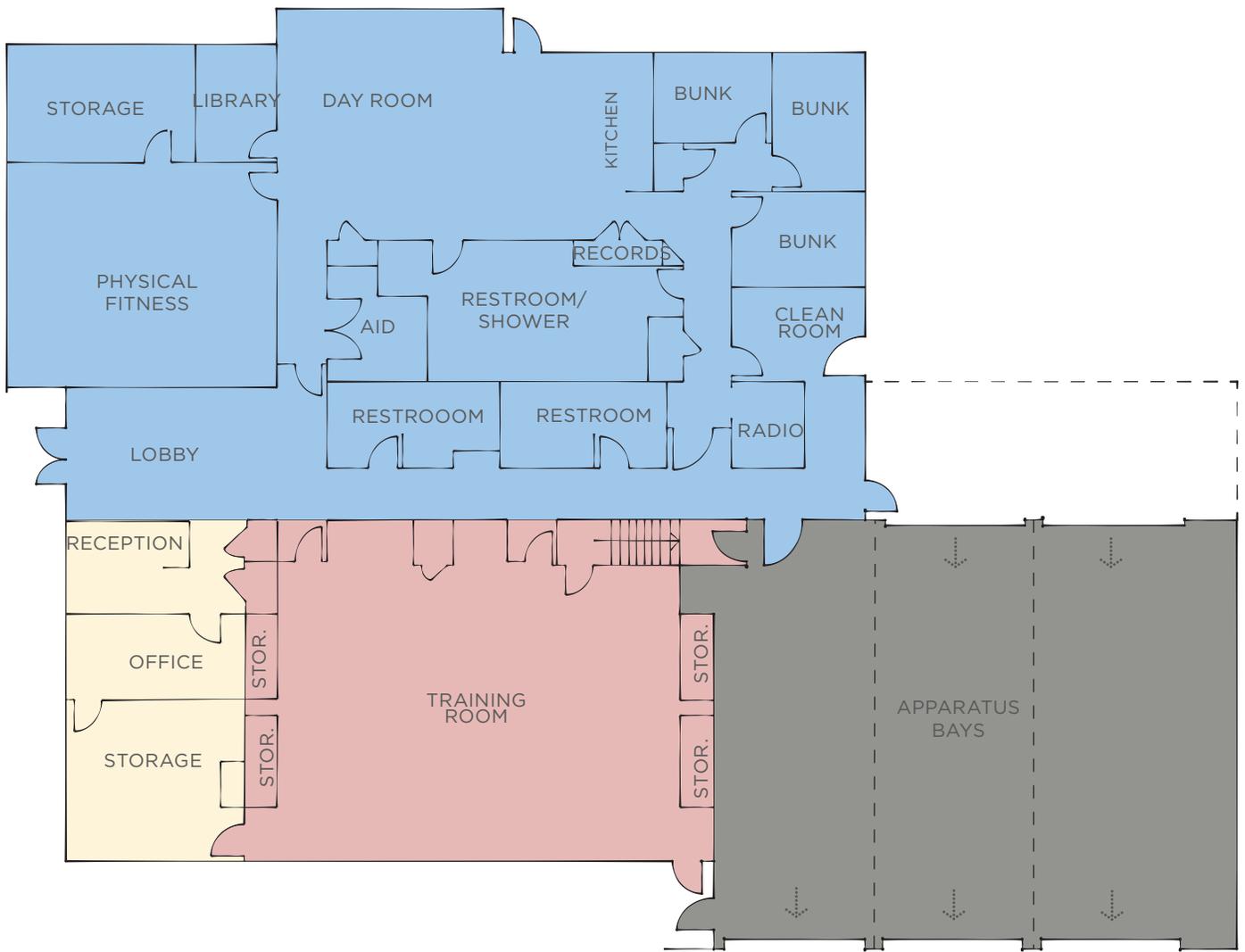


### SITE SUMMARY

The Station 23 property, located at 12985 Phelps Road is a north end fire station for the Department. The station is the newest station for the Department. The site is located at the NE quadrant at the intersection of State Route 305 and Phelps NE. The site is approximately 141,134 sf (3.24 acres) and located in a largely rural environment with residential uses to the North, East and South, a commercial development of rental storage units and a power sub-station to the West. The site is developed with the station, resident building, training tower and props associated staff and public parking.

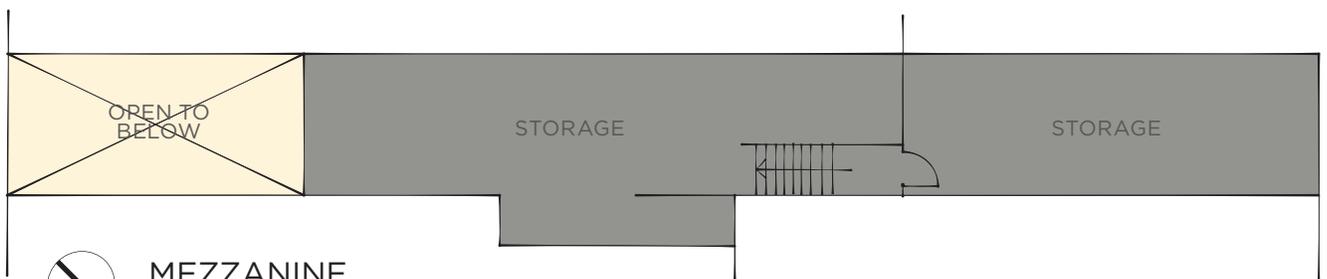
### Station 23 - Site Context

June 18, 2014



FIRST FLOOR

FIRE LEGEND	
	APPARATUS BAY AND SUPPORT
	FIRE LIVING QUARTERS
	FIRE ADMINISTRATION
	PUBLIC



MEZZANINE

NTS

## **BUILDING SUMMARY**

Originally built in 1995 both the main structure and resident apartment building are constructed of wood framing with wood siding. The building appears to have wood framed interior partitions and shear walls. The buildings are composed of a pitched roof with composition asphalt shingles. The site also has training props, including a training tower, while the subject of our observation is focused on the station we did notice that the training tower has cracking of the concrete and spalling in areas. The deficiencies for the training tower structure were noted in a building inspection report completed by ADI Structures 11/6/2013.

The general condition of the facility is very good but there are ADA accessibility issues and space need deficiencies. The current station is almost 20 years old and has limitations with quantity of staff sleeping rooms, inadequate size of the fitness room which leads to the misuse of the dayroom and quantity of apparatus bay.

Due to the age of the facility, there are a number of areas that do not meet current building code requirements for ADA accessibility. New and remodeled Title II structures are required to meet ADA requirements. Fire Stations are classified as Title II structures. New construction is required to be in full compliance of ADA requirements, facilities that undergo additions or remodels must spend up to 25% of the total new construction cost to bring the project into compliance with current ADA accessibility requirements or closer to compliance by removing architectural barriers. Some of the areas that were observed as non-compliant consist of stair and handrail construction, sink/counter height, faucet controls, clearances at kitchen, toilets, transaction counter, door hardware and floor level transitions.

## **STRUCTURAL SUMMARY**

Station 23 is a wood framed single story structure, built in 1995, with a small mezzanine. The floor is concrete slab on grade: 8 inches thick at the apparatus bay area, and 4 inches elsewhere. The roof is wood framed with gang-nail trusses, and sheathed with 5/8" plywood. All exterior walls are 2x6 and sheathed with 1/2" plywood.

### **Endwall/Truss Bracing**

There is inadequate endwall/truss bracing at the apparatus bay trusses.

### **Attached Equipment**

No lateral bracing is provided on mechanical units hanging from the ceiling.

## **STANDARDS COMPLIANCE**

The following tables list compliance with standards set forth by the National Fire Protection Association (NFPA) and the Washington Administrative Code (WAC). The sections listed below are the relevant sections for this study.

### **NATIONAL FIRE PROTECTION ASSOCIATION STANDARDS**

<b>NFPA SECTION</b>	<b>DESCRIPTION</b>	<b>COMPLIANCE</b>
NFPA 1	Fire Suppression Sprinklers	Yes
NFPA 1221	Station Alerting Communication System	Yes
NFPA 1500	Smoke Detectors	Yes
	Carbon Monoxide Detectors	No
NFPA 1581	Minimum Sleeping Area	Yes
	PPE Cleaning Area	Yes
	EMS Decontamination Area	Yes
NFPA 1851	Turnout Gear Storage	
	UV Exposure	No
	Thermal Exposure	No
NFPA 1962	Fire Hose Storage and Maintenance	Yes

### **WASHINGTON ADMINISTRATIVE CODE**

<b>WAC SECTION</b>	<b>DESCRIPTION</b>	<b>COMPLIANCE</b>
296-305-06507	1 hour separation between Apparatus Bay and Living Quarters	Yes
296-305-06509	Apparatus Bay Configuration and Clearance	Yes
296-305-06515	Hose Tower Configuration	N/A
296-305-06511	Indoor Air Quality	Yes

## Exterior

The exterior of the building is generally in very good condition. The conceptual design for the remodel would be limited to the rear of the building having a limited impact to the existing exterior façade.



## Fuel Tank

Station 23 has a fuel tank station for emergency generator and the training tower and prop. This installation has a permanent service platform; access ladder built into it and is well protected from vehicles with bollards. The fuel tank as well as the emergency generator and condenser farm are well screened from view of the public by the building mass but are not secure in terms of the public's ability to drive around the building without any security restriction. Due to this, the fuel tank is subject to vandalism, theft (of fuel) and possible terrorist target. It may be possible to configure the tank for fueling of emergency vehicles.



## Decontamination Room

The clean room is used to decontaminate PPE (personal protection equipment), backboards and the like. The room is reasonable in size for the needs of the station. This room will be slightly reconfigured to provide a hand washing sink (without compromising the function/use of this room) for use of staff transitioning from the apparatus bay back into the living quarters portion of the station. This change is intended to minimize the chances of spreading contaminants back into the living quarters.



## Mechanical Mezzanine

The mezzanine is largely a service area. It includes a storage area as well as a location for the HVAC units (constant air volume system) and water heater. The HVAC units were recently replaced and suspended from structure. Both the HVAC units and water heater will need to be seismically anchored to meet current building code requirements.



Station 23 - Existing Facility

2130356.00



### Day Room

The day room is adequately sized for crew but is filled with fitness equipment that will not fit in the Fitness Room. The day room is adjoining to the kitchen which is planned to be remodeled in an effort to make more room for the expansion of the bunk rooms.



### Fitness Room

The fitness room is under sized for the equipment in use and the equipment spills into the day room. The proposed remodel would eliminate an existing storage room that is under utilized (adjacent to the library) with exterior roll up section door and redevelop the space as part of the fitness room. This adjustment would enable all the equipment to be located in the fitness room.



### Training Tower

The site also has a training tower, some training props and a resident apartment building for up to 4 residents on the site. The general condition of the resident apartment building was fair and meets the current needs of the Fire Department. There are some stress cracks and spalling concrete on the training tower that should be addressed.



### Office/Lobby

There is no separation from fire staff and the public lobby, causing a security issue. The lobby and 'transaction' counter should be improved to create a physical separation of work space from the public accessible lobby space. The current counter does not meet ADA accessibility requirements and the remodel should incorporate a dual height counter to resolve this non-compliance issue.

## Station 23 - Existing Facility

June 18, 2014

## Bunk Room

The existing bunk rooms are oversized for the needs/use of the space and there are only three rooms where four should be provided for future needs. The remodel will reconfigure the bunk rooms and kitchen to make room for four individual bunk rooms. There are complaints by staff of sound and odor transmission from the kitchen and day room into the bunk area. The remodel incorporates a door providing a physical separation to address noise and odor concerns.



# PROGRAMMING SUMMARY

Beyond the building program requirements, there are important site elements and considerations that must be taken into account for a multi-use building. These program elements include public parking; secure parking for staff, city vehicles and equipment; emergency power; building threat protection; and access to and from the site. The most challenging consideration, for any site, stems from public and secure parking requirements. These are governed by jurisdictional requirements as well as department growth projections and space requirements for vehicles and equipment.

SPACE USE	SQUARE FEET
PUBLIC AREAS / TRAINING AREAS	2,354 SF
ADMINISTRATION	612 SF
APPARATUS BAY AND SUPPORT	4,180 SF
LIVING QUARTERS	2,721 SF
BUILDING SUPPORT	528 SF
TOTAL BUILDING	10,390 SF
GENERAL CIRCULATION (20%)	2,079 SF
TOTAL SQUARE FOOTAGE	12,474 SF
RENOVATION (INCLUDED IN SQ FT)	2,577 SF
ADDITION (INCLUDED IN SQ FT)	970 SF

# PROGRAM

Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Room Type	Total Required Square Footage			Comments
	Exist	2012	2032	Exist	2012	2032	W	L	Area		Exist	2012	2032	
<b>Department: Bainbridge Island Fire Protection District Space Requirements Summary</b>														
Apparatus Bay and Support Rooms	0	0	0									4180	4180	
Living Quarters and Administration	0	0	0									3861	3861	
Community / Training Rooms	0	0	0									2354	2354	
<b>SUBTOTAL</b>	0	0	0									10395	10395	
<b>GENERAL CIRCULATION (20%)</b>												2079	2079	
<b>TOTAL BUILDING SQUARE FOOTAGE</b>	0	0	0									9736	12474	12474
														0.29
<b>TOTAL EXTERIOR REQUIREMENTS</b>													17502	17502
														0.40
<b>TOTAL SITE REQUIREMENTS</b>													29976	29976
														0.69

Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Room Type	Total Required Square Footage			Comments	
	Exist	2012	2032	Exist	2012	2032	W	L	Area		Exist	2012	2032		
<b>Department: Apparatus Bay and Support Rooms</b>															
<b>Apparatus Bay</b>															
Apparatus Bay				3	5	5	15	45	675			1800	3375	3375	5 Bay, 15'x45' Bays; Drive-through bays preferred, 12' x 14' OH doors preferred w/ (2) sections of glazing Four Fold type add-alt; Concrete floor, Trench drains, Prefer to close in existing rear apron for additional two bays
<i>Group Total</i>	0	0	0									1800	3375	3375	
<b>Apparatus Support Rooms</b>															
Turnouts				0	1	1	8	38	304			0	304	304	(30) Turnout Lockers min; Ready Rack type system, (20) Half-racks for EMS;
Decontamination / Equipment Supply Rm				1	1	1	9	15	135			135	135	135	(2) doors - dedicated 'in' and 'out' doors; Light should not penetrate into room Floor sink, Decon Shower (Private Use), Eyewash, Stainless steel counter & sink, Extractor, (2) Commercial grade dryer, Hooks for drying w/ extra ventilation, Detergent Dispenser (2) Hazard Storage (3'x6')
EMS Supply				1	1	1	10	12	120			120	120	120	Lockable Storage
Report Writing				1	1	1	6	9	54			54	54	54	Located in apparatus bay
Hose Storage				0	1	1	12	12	144			0	144	144	Ready Rack type system. 3,000 LF of hose req'd. XXLF of 3". XXLF of 2".
Unisex Toilet				0	1	1	6	8	48			0	48	48	
Fire Riser				0	1	1	0	0	0			0	0	0	Open to apparatus bay
Storage				1	1	1	0	0	0			0	0	0	Above Support Rooms (Mezzanine)
Ground Maintenance Equipment Storage				0	1	1	9	10	90			0	90	90	Lawn mower, weed eater, power washer, paint sprayer, Fuel/paint storage cabinets To be in shed
<i>Group Total</i>	0	0	0									309	805	805	
<b>TOTAL SQUARE FOOTAGE (Apparatus Bay and Related Rooms)</b>											2109	4180	4180		

Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Room Type	Total Required Square Footage			Comments
	Exist	2012	2032	Exist	2012	2032	W	L	Area		Exist	2012	2032	
<b>Department: Living Quarters and Administration</b>														
<b>Living Quarters</b>														
Bunk Rooms				3	4	4	9	12	108		324	432	432	Bed, 3x lockers, wardrobe, desk
Storage Lockers				1	1	1	2	24	48		324	48	48	(10) 1/2 height S-lockers
Toilet/Shower				1	1	1	14	28	392		392	392	392	(2) toilet, (2) urinals, (2) shower, (3) lavatories
Library				1	1	1	8	11	88		88	88	88	with casework
Kitchen				1	1	1	8	18	144		144	144	144	(1)Sink, (1)Refrigerator, (1)Microwave, 4 burner stove. (1) dishwasher, (1) pantry BBQ area screened and located off of Kitchen Across from dining
Dining				1	1	1	12	20	240		240	240	240	
Day Room				1	1	1	23	23	529		529	529	529	Dayroom, Dining Room, Kitchen combined as one grand room; Seating for 6-8; (2) recliners and (2) sofas
Physical Training				1	1	1	20	27	540		540	540	540	Treadmill, stair stepper, weights, universal machine
Laundry / Closet				1	1	1	4	5	20		20	20	20	residential 1 washer/ 1 dryer, shelving above
Radio				1	1	1	16	18	288		288	288	288	Volunteer mail boxes, bulletin board for postings, Radio storage; Adjacent entry
<b>Group Total</b>	<b>0</b>	<b>0</b>	<b>0</b>								<b>2889</b>	<b>2721</b>	<b>2721</b>	
<b>Administration</b>														
Offices				1	1	1	9	18	162	OFFICE	162	162	162	1x Training Specialist
Shared Open Office				1	1	1	9	18	162	OPEN	162	162	162	w/ (2) closets
A/V Storage				1	1	1	16	18	288		288	288	288	Adjacent to Training Specialist Office and Training Room
<b>Group Total</b>	<b>0</b>	<b>0</b>	<b>0</b>								<b>612</b>	<b>612</b>	<b>612</b>	
<b>Building Support</b>														
Electrical / Data				1	1	1	16	18	288		288	288	288	Includes server rack
Janitor Closet				1	1	1	4	6	24		24	24	24	Toilet paper, paper towels, mops, sink, etc. Adjacent to Bunk Rooms
Training Storage				1	1	1	12	18	216		216	216	216	Access of exterior and adjacent to physical training
<b>Group Total</b>	<b>0</b>	<b>0</b>	<b>0</b>								<b>528</b>	<b>528</b>	<b>528</b>	
<b>TOTAL SQUARE FOOTAGE (Living Quarters and Administration)</b>											<b>4029</b>	<b>3861</b>	<b>3861</b>	

Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Room Type	Total Required Square Footage			Comments
	Exist	2012	2032	Exist	2012	2032	W	L	Area		Exist	2012	2032	
<b>Department: Community / Training Rooms</b>														
<b>Community / Training Rooms</b>														
Community / Training / Conference				1	1	1	35	42	1470		1470	1470	1470	(45-50) Occupants, Dividable into fourth;
1st Aid Staition				1	1	1	8	12	96		96	96	96	Located off of the lobby/corridor
Public Restrooms				2	2	2	10	16	160		320	320	320	(2) Stalls, (2) Lavatories
Lobby				1	1	1	12	18	216		216	216	216	Emergency phone outside entry;
Community / Training Storage				4	4	4	4	9	36		144	144	144	
Storage				1	1	1	6	18	108		108	108	108	Underneath stairs
<i>Group Total</i>	0	0	0								2354	2354	2354	
<b>TOTAL SQUARE FOOTAGE (Community / Training Rooms)</b>											2354	2354	2354	

Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Room Type	Total Required Square Footage			Comments
	Exist	2012	2032	Exist	2012	2032	W	L	Area		Exist	2012	2032	
<b>Department: Exterior Requirements</b>														
<b>Parking</b>														
Public Parking - Community Rm/Training				20	20	20	9	18	162		3240	3240	3240	20x Community / Training Room / Volunteer training
Staff Parking				10	10	10	9	18	162		1620	1620	1620	Included in Public Parking
<i>Group Total</i>						30					4860	4860	4860	
<b>Site Elements</b>														
Vehicle Wash Area				0	1	1	15	45	675		0	675	675	
Fuel Station				0	1	1	15	45	675		0	675	675	If Possible
Training Grounds				1	1	1	20	20	1870		0	1870	1870	Training Tower
Storm Water Retention Pond				0	1	1	0	0	0		0	0	0	
Generator				0	1	1	8	12	96		0	96	96	
Trash / Recycling				0	1	1	10	20	200		0	200	200	Verify trash requirements w/ provider
Patio				0	1	1	15	25	375		0	375	375	BBQ
<i>Group Total</i>											0	3891	3891	
<b>SUBTOTAL</b>											8751	8751		
<b>GENERAL CIRCULATION (100%)</b>											8751	8751		
<b>TOTAL SQUARE FOOTAGE (Exterior Requirements)</b>											17502	17502		



**LEGEND**

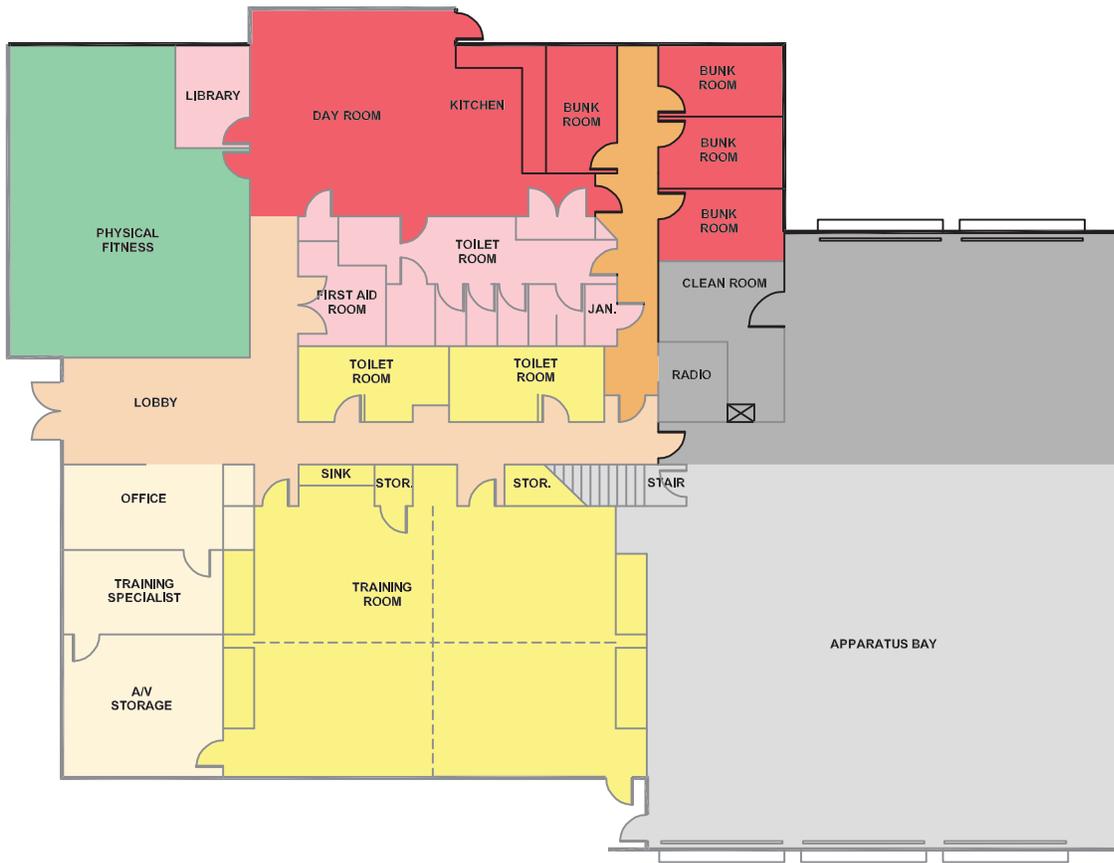
- EXISTING BUILDING
- ADDITION
- RENOVATION

Site Total Area: 141,134 SF / 3.24 AC

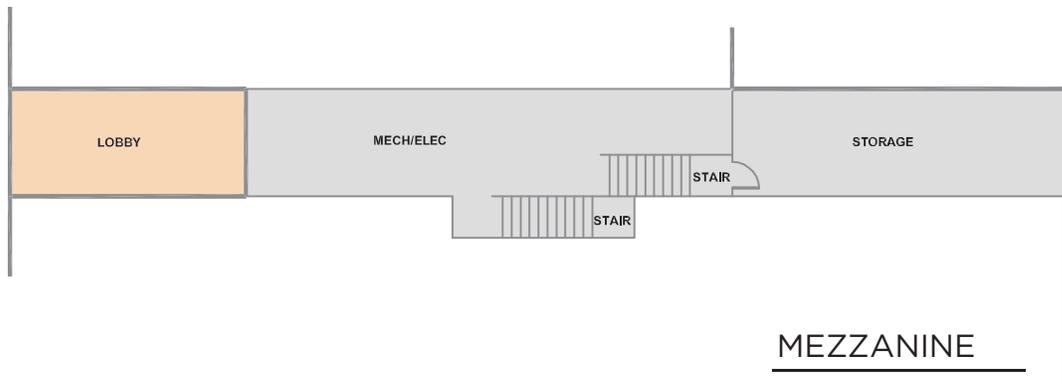
Proposed Development Area: 84,745 SF / 1.9 AC

Addition: 971 SF  
 Renovation: 2,075 SF  
 Total Building: 13,283 SF

Total Parking: 10 Career and Volunteer Firefighters  
20 Public  
 30 Total Spaces

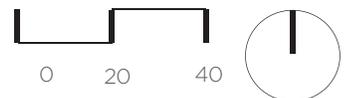


FIRST FLOOR



MEZZANINE

FIRE LEGEND			
	APPARATUS BAY AND SUPPORT		EXISTING APP. BAY AND SUPPORT
	FIRE LIVING QUARTERS		EXISTING FIRE LIVING QUARTERS
	FITNESS		EXISTING FIRE ADMIN.
	CIRCULATION		EXISTING PUBLIC
			EXISTING CIRCULATION



Station 23 - Floor Plan

June 18, 2014

# COST FORECAST SUMMARY

For a more detailed break down of the cost forecast please see Section 7.

DIVISION OF COSTS	COST
CONSTRUCTION COST	\$600,051
CONSULTANT COST	\$302,624
OWNER COST	\$117,368
SUB TOTAL	\$1,020,044
WA SALES TAX (8.7%)	\$88,743
<b>PROJECT TOTAL</b>	<b>\$1,108,787</b>

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# POLICE

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# POLICE

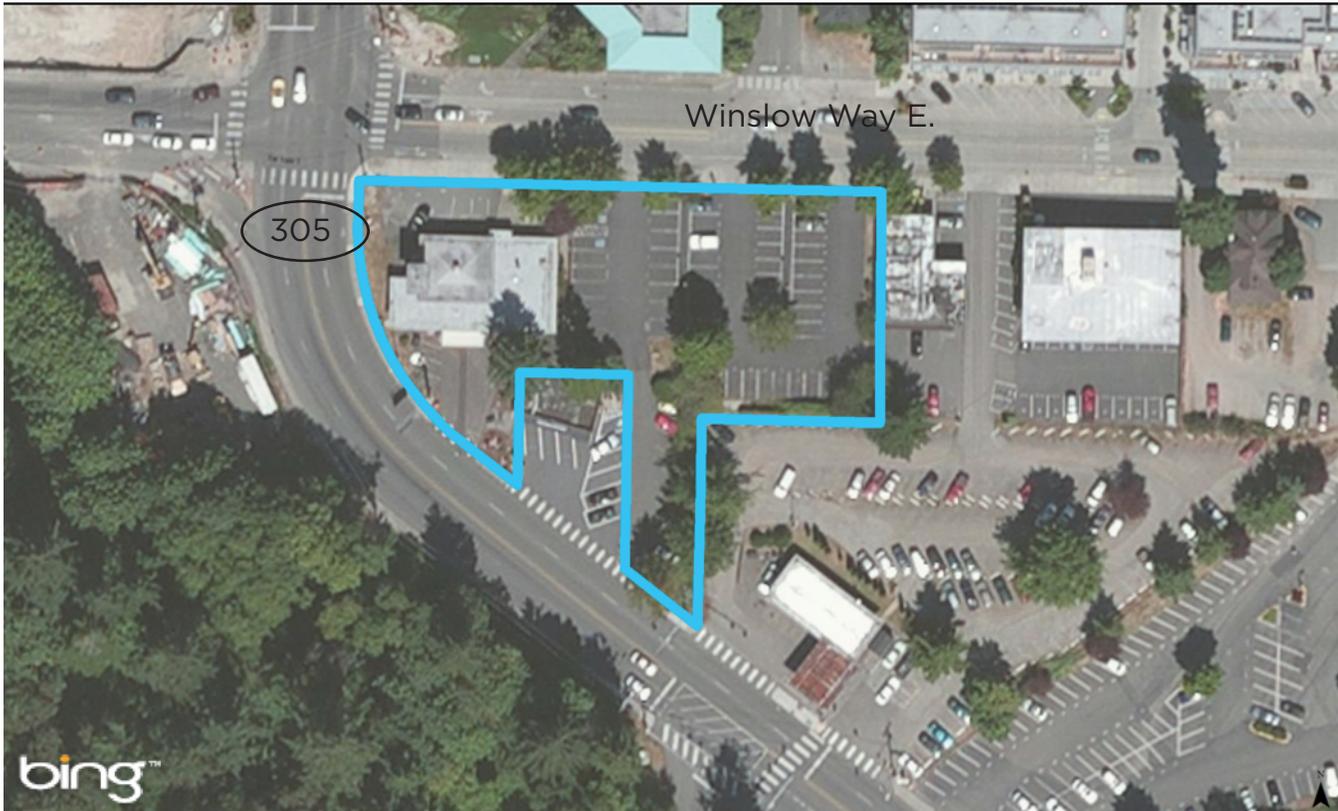


## STATION SUMMARY

Mackenzie's observation of the Police Department building has concluded that the facility is under-sized and out-dated for effective, modern law enforcement. A remodel or expansion of the facility at this location would not appear to meet the needs of the City of Bainbridge Island as the spatial constraints, structural inadequacies, and security deficiencies are numerous. Additionally, this building site is potentially severely affected by ferry traffic as the passengers to and from Seattle prepare for departure, causing significant delays in police response time and impedes public access to the facility.

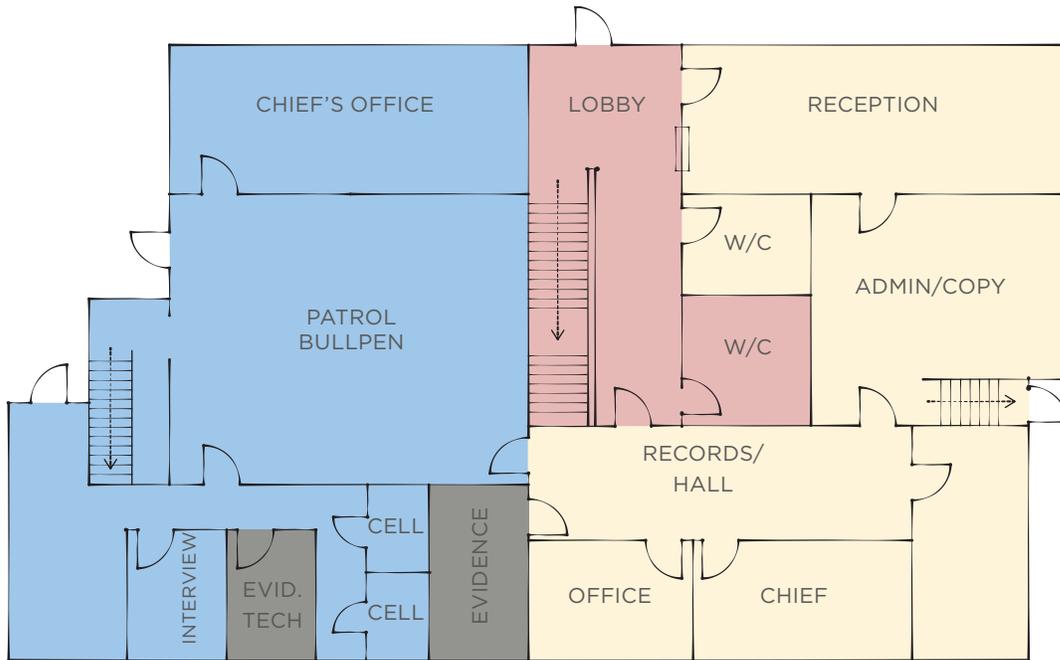
## STATION FACTS

<b>Location</b>	625 Winslow Way E, Bainbridge Island, WA 98110	<b>Zoning Classification</b>	Central Core Overlay (within Winslow Mixed Use Town Center)
<b>Year Built</b>	1945	<b>Fire Sprinklers</b>	No
<b>Remodeled</b>	1969 (Addition), 1982 (Remodel)	<b>Construction Type</b>	Structural Masonry / Wood
<b>Site Size</b>	38,768 Sq.Ft. (0.89 AC)	<b>Staffing</b>	Career
<b>Building Size</b>	6,374 Sq.Ft.		
<b>Parking On-Site</b>	64 Spaces		
<b>Floors</b>	1 above partial basement		

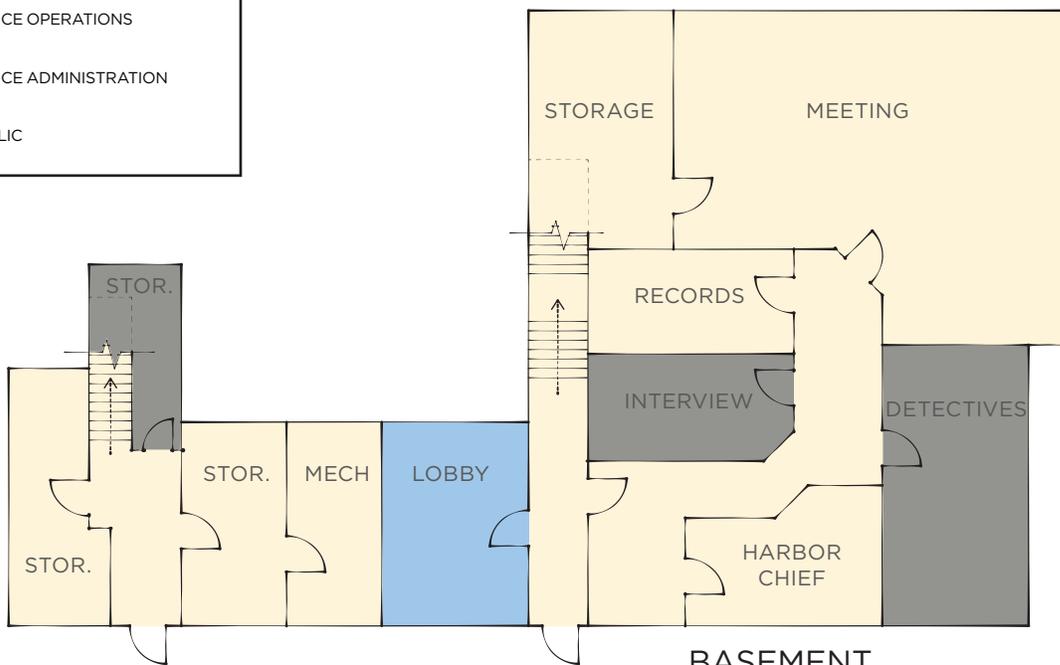
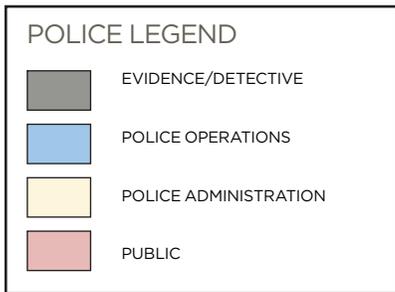


### SITE SUMMARY

The Police Facility property, located at 625 Winslow Way E, is situated on the east side of downtown Bainbridge Island between two existing commercial/industrial buildings. The site is approximately 38,000 sf (0.89 acres) in size and is fully built out to accommodate the existing building and parking areas. On-site parking appears to be suitable for current staffing loads, although the site lacks any security measures for officer or staff vehicles. Furthermore, there is no sallyport or secured opportunity to transport detainees between vehicles and the building and all transfers must be made in full view of the public. There is a small amount of growth potential on the site; however the steep slope and existing location pose particular issues, the largest of which is potential backup from the ferry commuters. Based on the current location adjacent to the downtown district, the property value may be high and sale of this property may facilitate the acquisition for a more functional location.



FIRST FLOOR



BASEMENT



## **BUILDING SUMMARY**

Originally built as a fire station in 1945, the building's design did not consider the security, storage, and spatial requirements for a law enforcement facility. Beyond the inadequacies of the facility, the Police Department lacks essential services such as locker rooms or showers, fitness facilities, secured parking, and laundry equipment on-site.

Security is a major concern of this facility. Upon arrival it is apparent that parking for the officers and staff is unsecured and open to the public. A secured and screened parking area has become a standard in law enforcement to protect the public servants and their vehicles from vandalism or assault. The offices that surround the perimeter of the facility are glazed with single-pane windows, which are ineffective against any type of blast or projectiles. The reception area as well as the Lieutenants' office are located adjacent to the main entrance and views into these spaces are quite accessible to the general public. It should also be noted that the only alarmed door in the facility is for the evidence storage room. If a break in or robbery were to occur it could easily go undetected for hours.

The lobby space is casual and unsecured, with only limited restrictions to prevent access to other areas of the facility. While bullet resistant, the transaction counter provides view into restricted space and is also flanked by a hollow metal door, which does not provide the required safety for the staff directly behind. Of the two restrooms located in the lobby—the only two in the facility—only one is handicap accessible, although it lacks a vertical grab bar as required by Washington State Code. Officers and staff must exit the secured areas to use these restrooms.

Generally, the office and workstation spaces are filled to capacity and cramped. Overall storage space is deficient and is particularly evident in the bullpen and offices. The spatial deficiency has led to the department records being housed in the staff hallway, which no longer meets proper protocol. The lack of space is exemplified by the evidence room, where the technician's desk is actually located within the storage space, putting the employee at risk by proximity to potentially hazardous materials. Until recently, drug storage filled a small closet below the secondary stair that was secured by a dead bolt. Bicycles and equipment are densely layered in dedicated storage rooms and overflow to hallways and the secondary interview room. This type of clutter and disorganization does not allow for the efficient operation of a law enforcement bureau, particularly in a time of need.

Beyond these spatial issues, there are basic policing inadequacies to be noted. First and foremost is the aforementioned lack of alarmed exterior doors. Beyond this the interview rooms lack the proper recording equipment and basic notification lights which signal that the room is in use. Radios are hidden away and difficult to access. The server is currently located adjacent to a furnace, the records archive room was subject to a recent sewage leak that compromised some physical documents, and the facility lacks any fitness or locker room component, as well as on-site laundry. Lastly, electrical and communication utility lines are still above ground and casually run along the roof, allowing easy access for anyone wishing to tamper or vandalize as well as the danger from natural events.

Modern police departments must operate as essential facilities in times of disaster and these issues do not allow this current facility to operate as such. It is Mackenzie's recommendation that the Bainbridge Island Police Department seek out an opportunity to build a new facility on a site that is less impacted by commuter traffic, allowing for better accessibility for police operations, and more functional community interaction.

## **STRUCTURAL SUMMARY**

The police station is an unreinforced masonry building with a daylight basement that is slab on grade with concrete retaining walls. The floor and roof are wood framed. In 1969 the building was expanded to the east using the same structural system, increasing the basement and main floor spaces. Unreinforced masonry buildings like this one have proven to perform very poorly during seismic events. The following structural deficiencies exist at the Bainbridge Island police facility:

### **Lack of appropriate wall to diaphragm anchorage**

Exterior masonry walls need to be anchored for out-of-plane forces to the diaphragms (roof and main floors).

### **Force transfer to shearwalls**

Roof and floor diaphragms should be connected to the masonry walls in such a way that can transfer shear forces. Although access to view these connections was not available, it is unlikely that the masonry walls have adequate connections.

### **Continuous cross ties between diaphragm chords (for both roof and floor) are required for masonry buildings**

Access to view this was not available, but it is very unlikely that they exist based on the vintage of the structure and the other structural deficiencies encountered.

### **Wood diaphragms**

All wood diaphragms with spans greater than 12 feet are required to consist of wood structural panels or diagonal sheathing. The addition was observed to have structural panels, but the original portion of the building is likely wood decking and would not comply.



### Evidence Storage

The evidence technician's desk is located within the evidence storage room, exposing the employee to constant interaction with potentially dangerous substances. Further, the cramped room does not provide enough storage space for the department's evidence needs.



### Radio Storage

In a narrow storage space adjacent to the former training tower stairs lie the radio charging stations. The space is cramped and difficult to access posing challenges to any quick response situation.



### Vertical Circulation

Throughout the police department, vertical circulation is insecure and not in full compliance with current code. This image to the left shows the manually operated swing gate that divides public from police space in the lobby. Down the stairs lies evidence storage, the armory, and the detectives office.



### Utilities

Despite recently installed furnaces and heat pump units, the duct work seems to supply less than adequate heating and cooling to the building as a whole. This forces some areas, such as the detectives' office, to supplement the HVAC system with space heaters at an added utility cost.

### Training Classroom

The basement classroom, which is used for intra-departmental meetings and academy, does not meet the spatial requirements for the department as currently staffed. Furthermore, the Police Department uses an off-site meeting room if the entire staff is required to attend.



### Patrol

The Patrol officer bullpen is cluttered and filled with hazards for any quick response scenarios when officers are required to move quickly. A single stair - a very subtle but real tripping hazard - on the west end of the room could potentially endanger response time or briefly subdue an officer who is escorting a suspect in custody.



### Chief's Office

The Chief's office provides adequate space for working and meeting, yet the single-pane glazing allows for clear views and provides little protection.



### Records Archives

The archives room was the subject of a prior sewage leak, thankfully compromising only one bin of documents. The storage space is currently filled to capacity.





### Toilet Room

Neither of the two restrooms are fully ADA compliant, one meets the spatial requirements though it lacks the vertical grab bar necessary. Both are accessed through the public lobby and pose a security risk to officers and staff.



### Patrol Workstations

Workstations are filled to capacity for efficient operation. There is not sufficient space for the equipment needed in a modern police station.



### Technology/Server Room

Located within a mechanical room, the server and technology space is cluttered and patched together. A lack of air conditioning in the space could become a concern in warmer weather.



### Interview Rooms

The interview rooms lack the proper technology to effectively record meetings and provide security and privacy for the police, victims, and suspects.

### Exterior/Site

Parking is unsecured and accessible by all.



### Exterior/Site

Adjacent to the ferry terminal, access to the Department is subject to the ebb and flow of commuter traffic backups.



### Rooftop Utilities

Loose wiring for electricity and telecommunications rests on the rooftop and is easily subject to tampering or damage from the adjacent trees.



### Oversized Storage

To accommodate oversized evidence a storage shed on the south side of the building was recently built using light steel and chain link fence. The evidence lockers are secured with single pad locks and the roof slope forces water to drain against the building. Further, the location of the shed puts the evidence at risk of vehicle collision.



Police - Existing Facility

2130356.00



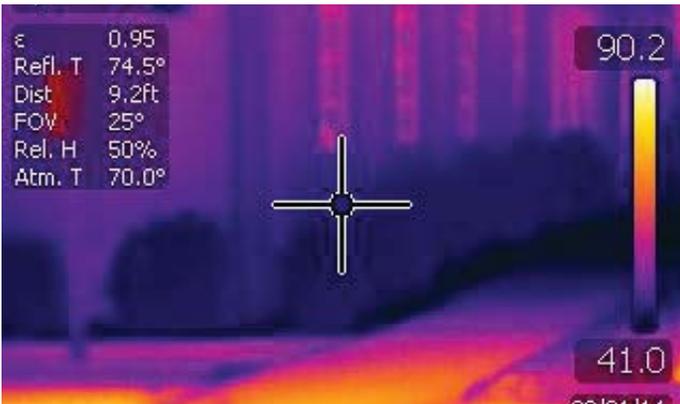
### Equipment Storage

Bicycles, SWAT gear and other equipment are layered into the equipment storage room, creating unorganized clutter that is difficult to access.



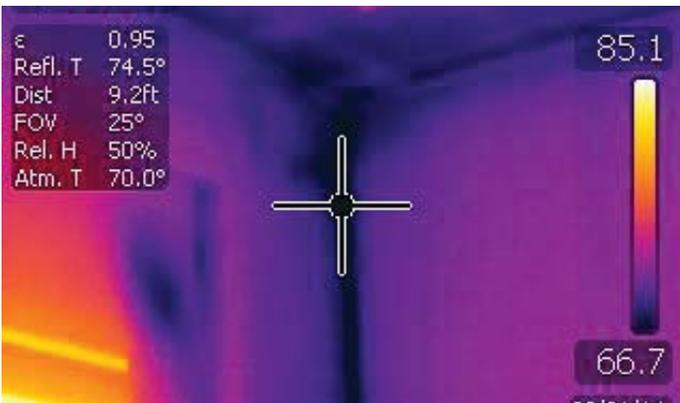
### Structural Connections

Floor diaphragm to masonry wall connections are inadequate for both in-plane and out-of-plane shear forces. The image to the left, which shows the existing condition, lacks the anchorage/strapping that is required by current seismic code.



### Infrared Imaging

The northeast corner of the building shows significant thermal loss through the window frames.



### Infrared Imaging

The Chief's office shows significant thermal loss at the exterior walls.

## Reception

Upon entering the compact lobby space, one immediately comes across the transaction counter. While bullet resistant glass is used, employees and computer screens are clearly visible for all. Further, the adjacent hollow metal door does not meet the necessary security requirements.



## Records Storage

Record files are stored in locked, yet unsecured file cabinets available to all employees.



# PROGRAMMING SUMMARY

Beyond the building program requirements, there are important site elements and considerations that must be taken into account for a multi-use building. These program elements include public parking; secure parking for staff, city vehicles and equipment; emergency power; building threat protection; and access to and from the site. The most challenging consideration, for any site, stems from public and secure parking requirements. These are governed by jurisdictional requirements as well as department growth projections and space requirements for vehicles and equipment.

SPACE USE	SQUARE FEET
PUBLIC FUNCTIONS & FACILITY CORE	4,105 SF
POLICE ADMINISTRATION	978 SF
POLICE RECORDS DIVISION	668 SF
POLICE OPERATIONS	3,910 SF
POLICE SUPPORT SERVICES	2,316 SF
POLICE SUPPORT FUNCTIONS	2,838 SF
TOTAL BUILDING	14,815 SF
GENERAL CIRCULATION (20%)	3,704 SF
TOTAL SQUARE FOOTAGE	18,519 SF

# PROGRAM

Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Total Required Square Footage			Comments
	Exist	2016	2036	Exist	2016	2036	W	L	Area	Exist	2016		

**Department: Bainbridge Island Police Department Space Requirements Summary**

<b>Public Functions &amp; Facility Core</b>	0	0	0							1714	5131	5131	
<b>Police Department</b>	26	30	36							4625	13388	13388	
<b>TOTAL BUILDING SQUARE FOOTAGE</b>	26	30	36							6339	18519	18519	

**Department: Bainbridge Island Police Department Site Requirements Summary**

<b>Public Functions &amp; Facility Core</b>	0	0	0							1714	5131	5131	
<b>Police Administration</b>	3	3	3							779	1223	1223	
<b>Police Records Division</b>	2	2	2							525	835	835	
<b>Police Operations</b>	18	22	26							1739	4888	4888	
<b>Police Support Services</b>	3	3	5							749	2895	2895	
<b>Police Support Functions</b>	0	0	0							833	3548	3548	
<b>TOTAL BUILDING SQUARE FOOTAGE</b>	26	30	36							6339	18519	18519	Existing on record: 6,374 SF
<b>TOTAL EXTERIOR REQUIREMENTS</b>										5490	20176	21936	
<b>TOTAL SITE REQUIREMENTS</b>										11829	38695	40455	

Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Total Required Square Footage			Comments
	Exist	2016	2036	Exist	2016	2036	W	L	Area	Exist	2016	2036	

**Department: Public Functions & Facility Core**

Public Lobby													
Entry Vestibule				1	1	1	8	10	80	60	80	80	PUBLIC 911 phone, lock down feature
Public Lobby Waiting Area				1	1	1	10	15	150	100	150	150	PUBLIC Open lobby for Police; 4-5 people
Community / Class / EOC / Training				1	1	1	30	40	1200	200	1200	1200	Seating for 55-60, Classroom Setting
EOC Storage				1	1	1	10	10	100	50	100	100	SECURE
Emergency Preparedness Storage				1	1	1	10	10	100	50	100	100	SECURE Emergency Preparedness Supply for 10 days
Training Storage				0	1	1	10	10	100	0	100	100	SECURE
Chair Storage				0	1	1	10	15	150	0	150	150	PUBLIC Seating for 50% of chairs and tables
AV Closet				0	1	1	5	5	25	0	25	25	
Lobby Information				0	1	1	2	10	20	0	20	20	PUBLIC Includes forms, info, translator
Display Area				0	1	1	2	10	20	0	20	20	PUBLIC Historical display space, PD to confirm contents
Report Taking Room / Sex Off. Process				0	2	2	10	12	120	0	240	240	PUBLIC Dual access from Police Reception Covert camera & microphone.
Juvenile Conf. / Evid. Display / Media Rm.				0	1	1	10	12	120	0	120	120	PUBLIC Dual access from Police Reception Covert camera & microphone.
Public Restrooms / Men's & Women's				2	2	2	10	25	250	200	500	500	PUBLIC
Vending Vestibule				0	1	1	8	10	80	0	80	80	PUBLIC Includes vending, drinking fountain, pay phone
<i>Group Total</i>	0	0	0							660	2885	2885	

Facility Core													
Janitor				1	2	2	6	6	36	36	72	72	
Stairway				2	2	2	12	20	240	480	480	480	
Elevator				0	1	1	6	8	48	0	48	48	
Elevator Equipment Room				0	1	1	5	6	30	0	30	30	Adjacent Elevator
Mechanical Shaft				0	1	1	5	10	50	0	50	50	
Electrical Room				2	2	2	10	15	150	150	300	300	1x per floor
Sprinkler Riser Room				0	1	1	6	7	42	0	42	42	
Central Server Room				1	1	1	10	15	150	80	150	150	Possibly combined with Fire
Storage				1	1	1	6	8	48	48	48	48	
<i>Group Total</i>	0	0	0							794	1220	1220	
<b>SUBTOTAL</b>	0	0	0							1454	4105	4105	
<b>GENERAL CIRCULATION (25%)</b>										260	1026	1026	
<b>TOTAL SQUARE FOOTAGE (Public Functions &amp; Facility Core)</b>										1714	5131	5131	

Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Total Required Square Footage			Comments
	Exist	2016	2036	Exist	2016	2036	W	L	Area	Exist	2016		
<b>Department: Police Administration</b>													
<b>Administration</b>													
Administrative Lobby / Waiting				0	1	1	4	8	32	0	32	32	Seating for up to 3x people, display
Chief of Police	1	1	1	1	1	1	14	22	308	200	308	308	L.OFFICE Includes room for 4x person conference table
Administrative Assistant	1	1	1	1	1	1	10	12	120	200	120	120	OFFICE Adjacent to Chief of Police - Reception
Deputy Chief / Admin. Lt.	1	1	1	1	1	1	10	18	180	120	180	180	OFFICE Adjacent to Chief of Police - Reception
Supply Room				0	1	1	6	8	48	0	48	48	
Secure File Room				0	1	1	10	12	120	0	120	120	SECURE
Coats / Coffee Alcove				0	1	1	4	5	20	0	20	20	Adjacent Conference room
Conference Room				0	1	1	10	15	150	0	150	150	Accessible by administrative staff; A/V Projection Sized for 6 people; Fixed seating
<i>Group Total</i>	3	3	3							520	978	978	
<b>SUBTOTAL</b>	3	3	3							520	978	978	
<b>GENERAL CIRCULATION (25%)</b>										259	245	245	
<b>TOTAL SQUARE FOOTAGE (Police Administration)</b>										779	1223	1223	

<b>Department: Police Records Division</b>													
<b>Records</b>													
Public Reception (Service Counter)				0	1	1	6	12	72	20	72	72	OPEN Secure w/ bullet resistant glazing & ADA counter
Records Clerk	2	2	2	1	3	3	8	8	64	80	192	192	OPEN Windows to observe records and front desk
Copy/Print/Mail Center/Work Room				0	1	1	10	10	100	0	100	100	
Records Storage - Active / Archive				0	1	1	12	20	240	100	240	240	Compact shelving - secure room 10x years storage
Supply Storage				1	1	1	8	8	64	66	64	64	Adjacent to Files, Copy and Reception.
<i>Group Total</i>	2	2	2							266	668	668	
<b>SUBTOTAL</b>	2	2	2							266	668	668	
<b>GENERAL CIRCULATION (25%)</b>										259	167	167	
<b>TOTAL SQUARE FOOTAGE (Police Records Division)</b>										525	835	835	

Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Total Required Square Footage			Comments
	Exist	2016	2036	Exist	2016	2036	W	L	Area	Exist	2016		
<b>Department: Police Operations</b>													
<b>Patrol</b>													
Patrol - Lieutenant	4	4	4	0	2	2	12	14	168	100	336	336	OFFICE - shared by 2x Lts. Locate off Patrol Sgt Bullpen Office
Patrol - Relief Supervisor				0	1	1	8	10	80	0	80	80	OPEN
Patrol Officers	12	16	20	0	0	0	0	0	0	0	0	0	OPEN - workstations located around the perimeter of the Squad/Briefing Rm
Harbormaster	1	1	1	0	1	1	8	8	64	80	64	64	OPEN Close to secure entrance
Parking Enforcement Officer	1	1	1	0	1	1	8	8	64	80	64	64	OPEN Dedicated space - Bullpen Office
Squad / Briefing Room				1	1	1	16	24	384	420	384	384	Equipped w/ audio/video equipment Room for 10x people + 4 comp stations, center of the room conference table
Report Writing Room				0	14	14	4	6	24	0	336	336	OPEN Work stations for each patrol officers & file cabinets
Patrol Equipment Storage				1	1	1	10	14	140	280	140	140	Portable Equipment Open to Report Writing Room
File Area				0	1	1	10	10	100	50	100	100	Adjacent Report Writing Room
JuInterview / JV Holding				0	1	1	10	10	100	0	100	100	
<b>Group Total</b>	<b>18</b>	<b>22</b>	<b>26</b>							<b>1010</b>	<b>1504</b>	<b>1504</b>	
<b>Inventory / Equipment</b>													
Armory/ammunition/weapons				1	1	1	10	15	150	50	150	150	SECURE Near exit to secure parking
Weapons Maintenance				0	1	1	6	8	48	0	0	0	SECURE Located within Armory
Uniform Storage				0	1	1	8	10	80	0	80	80	
Equipment Storage / Issuance				1	1	1	10	10	100	100	100	100	SECURE Radios, batteries, stun guns, etc. Single room adjacent to Armory
<b>Group Total</b>	<b>0</b>	<b>0</b>	<b>0</b>							<b>150</b>	<b>330</b>	<b>330</b>	
<b>Booking / Sally Port</b>													
Custody Processing (Intox) / Intake				1	1	1	10	15	150	66	150	150	
Temp Holding Cell				2	2	2	8	10	80	128	160	160	with toilets
Interview Room				1	1	1	8	10	80	66	80	80	AV requirements
Unisex Toilet				0	1	1	6	8	48	0	48	48	
Access Vestibule				0	1	1	6	8	48	0	48	48	Weapon lockup area
Sally Port - Vehicular				0	1	1	35	40	1400	0	1400	1400	Drive-in parking port, 2x cars wide
Police Bicycle Storage Racks				1	1	1	3	20	60	60	60	60	Within Sally Port, 12 racks, protected from vehicles
Temporary Animal Services Kennel				0	2	2	3	5	15	0	30	30	Water, drainage, hose bib
Sally Port Storage				0	1	1	10	10	100	0	100	100	
<b>Group Total</b>	<b>0</b>	<b>0</b>	<b>0</b>							<b>320</b>	<b>2076</b>	<b>2076</b>	
<b>SUBTOTAL</b>	<b>18</b>	<b>22</b>	<b>26</b>							<b>1480</b>	<b>3910</b>	<b>3910</b>	
<b>GENERAL CIRCULATION (25%)</b>										<b>259</b>	<b>978</b>	<b>978</b>	
<b>TOTAL SQUARE FOOTAGE (Police Operations)</b>										<b>1739</b>	<b>4888</b>	<b>4888</b>	

Police - Program

June 18, 2014

Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Total Required Square Footage			Comments
	Exist	2016	2036	Exist	2016	2036	W	L	Area	Exist	2016	2036	
<b>Department: Police Support Services</b>													
<b>Detectives</b>													
Detective - Lieutenant				0	1	1	8	8	64	0	64	64	OPEN Located within Detective's Bullpen Office
Detectives	2	2	4	1	1	1	16	20	320	200	320	320	OPEN Bullpen Office
Supplies / Equip Storage				0	1	1	10	10	100	0	100	100	
Interview Room				0	1	1	10	10	100	0	100	100	
<i>Group Total</i>	2	2	4							200	584	584	
<b>Property / Evidence</b>													
Evidence Technician - Office				0	1	1	10	15	150	0	150	150	OFFICE Open to work room w/ window to corridor & Processing
Evidence Processing - Officer	1	1	1	0	1	1	10	14	140	90	140	140	SECURE, 2 computers, emergency eye wash, Shower, cardkey access, evidence lockers A dedicated fingerprinting station area within room
Technician Work Room				0	1	1	10	15	150	0	150	150	SECURE Evidence Tech Processing area
Evidence Files - Active				0	1	1	0	0	0	0	0	0	SECURE In evidence tech's office
Evidence Storage - General				1	1	1	20	20	400	200	400	400	SECURE Accessible through Technician Work Room; Compact shelving
Evidence Storage - Drying Cabinet				0	1	1	6	6	36	0	36	36	SECURE Within Evidence Processing
Refrigerated Storage				0	1	1	4	4	16	0	16	16	SECURE Within Evidence Storage room; Separate refrigerator and freezer
Narcotics Storage				0	1	1	6	8	48	0	48	48	SECURE Off Evidence Storage room
Cash Storage				0	1	1	0	0	0	0	0	0	SECURE Vault - in weapons storage
Weapons Storage				0	1	1	6	8	48	0	48	48	SECURE Off Evidence Storage room
Supply Storage				0	1	1	8	8	64	0	64	64	SECURE
Evidence - Public Pickup & Viewing				0	1	1	8	10	80	0	80	80	SECURE In Public Area: Evidence staging, secure. Dual staged lockdown for evidence drop-off
Oversized Item Storage				0	1	1	0	0	0	0	0	0	SECURE Open shelving, within Evidence Storage room Exterior chained fence area
Hazardous Material / Temporary Storage				0	1	1	0	0	0	0	0	0	SECURE Chain link fence - exterior storage under patrol car parking
Vehicle Garage Impound				0	1	1	20	30	600	0	600	600	SECURE
Bicycle Storage - Impound				0	1	1	0	0	0	0	0	0	SECURE 10x Covered and secure, but not a conditioned space; chain link fence
<i>Group Total</i>	1	1	1							290	1732	1732	
<b>SUBTOTAL</b>	3	3	5							490	2316	2316	
<b>GENERAL CIRCULATION (25%)</b>										259	579	579	
<b>TOTAL SQUARE FOOTAGE (Police Support Services)</b>										749	2895	2895	

Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Total Required Square Footage			Comments
	Exist	2016	2036	Exist	2016	2036	W	L	Area	Exist	2016	2036	

**Department: Police Support Functions**

<b>Police Restrooms/Showers/Bunks</b>													
Men's Restroom				0	1	1	10	25	250	0	250	250	2x vanities, 2x urinals, 2x toilets
Men's Shower Room				0	1	1	10	6	60	0	60	60	2 Showers
Men's Locker Room				1	20	20	2	6	12	180	240	240	20 Lockers
Women's Restroom				0	1	1	10	25	250	0	250	250	2x vanities, 3x toilets
Women's Shower Room				0	1	1	10	6	60	0	60	60	2 Showers
Women's Locker Room				1	12	12	2	6	12	180	144	144	12 Lockers - Includes Records Staff lockers
First Aid Station				0	2	2	8	8	64	0	128	128	Located within each locker room
Boot Polish Station				0	2	2	4	6	24	0	48	48	Located within each locker room
Bunk Room				0	2	2	8	10	80	0	160	160	Adjacent locker rooms, unisex
Drying Closet				0	2	2	4	6	24	0	48	48	One per locker room
<b>Group Total</b>	<b>0</b>	<b>0</b>	<b>0</b>							<b>360</b>	<b>1388</b>	<b>1388</b>	

<b>Fitness</b>													
Training / Fitness / Cardio / Weights				0	1	1	20	30	600	0	600	600	Windows to exterior Drinking fountain
Fitness Storage				0	1	1	10	10	100	0	100	100	
Linen Storage				0	1	1	5	5	25	0	25	25	
Laundry				0	1	1	5	10	50	0	50	50	
<b>Group Total</b>	<b>0</b>	<b>0</b>	<b>0</b>							<b>0</b>	<b>775</b>	<b>775</b>	

<b>Shared</b>													
Mud Room Vestibule				0	1	1	8	15	120	0	120	120	Access from secured parking w/ auto slide doors Includes equipment storage cubbies, 30x
Supply Storage				0	1	1	5	5	25	0	25	25	
Break Room				0	1	1	10	15	150	0	150	150	Room for 6-8x people, various seating options
Kitchen / Food Prep / Vending				1	1	1	10	10	100	150	100	100	Full kitchen - gas stove, dishwasher, refrigerator microwave, BBQ patio
Wellness / Nursing Mothers				1	1	1	8	10	80	64	80	80	
Common Space				0	1	1	10	20	200	0	200	200	
<b>Group Total</b>	<b>0</b>	<b>0</b>	<b>0</b>							<b>214</b>	<b>675</b>	<b>675</b>	

<b>SUBTOTAL</b>	<b>0</b>	<b>0</b>	<b>0</b>							<b>574</b>	<b>2838</b>	<b>2838</b>	
<b>GENERAL CIRCULATION (25%)</b>										<b>259</b>	<b>710</b>	<b>710</b>	
<b>TOTAL SQUARE FOOTAGE (Police Support Functions)</b>										<b>833</b>	<b>3548</b>	<b>3548</b>	

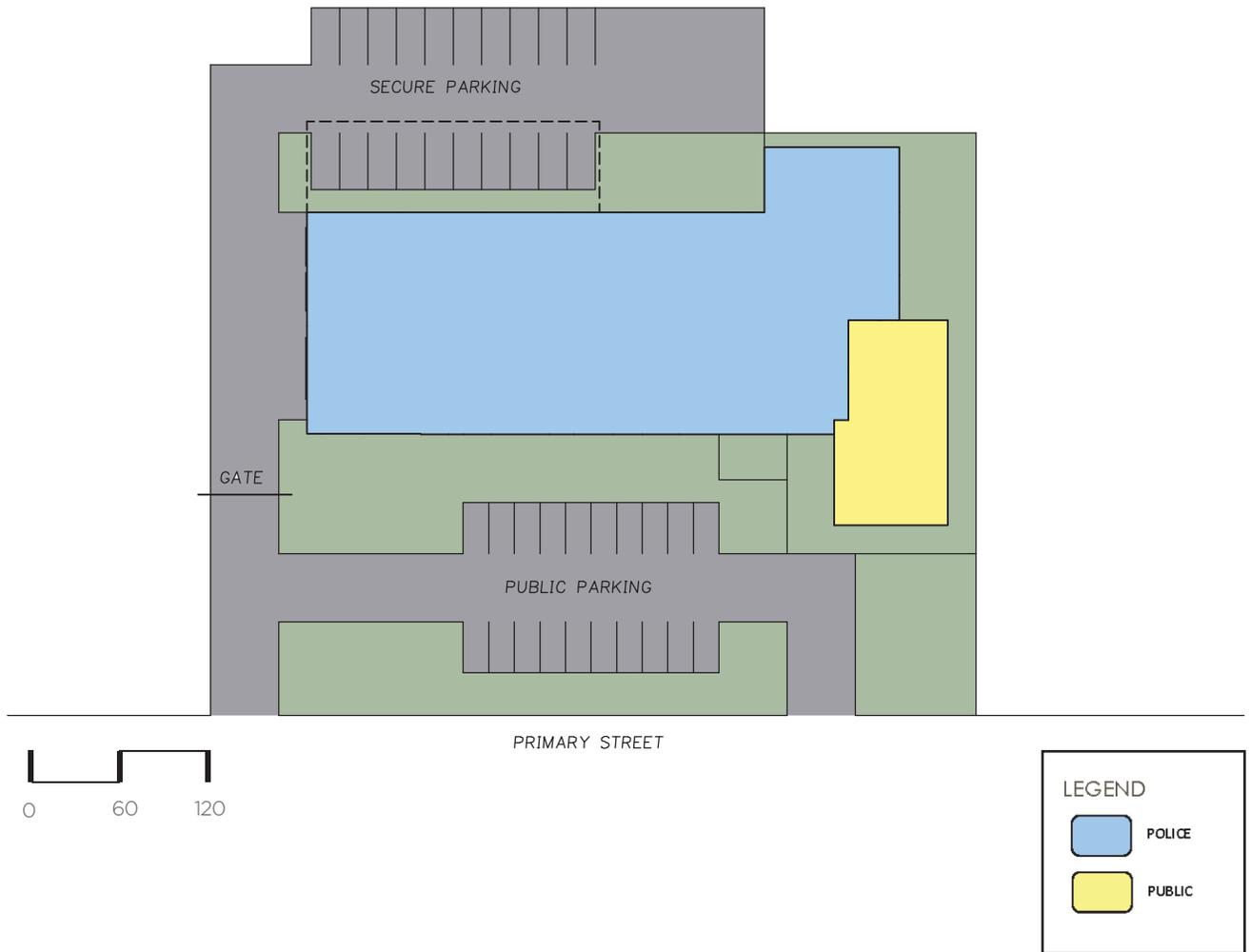
Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Total Required Square Footage			Comments
	Exist	2016	2036	Exist	2016	2036	W	L	Area	Exist	2016		

**Department: Police Exterior Requirements**

<b>Public Parking</b>													
Public Parking - Community Rm/Training				0	25	25	9	18	162	0	4050	4050	
Bicycle Parking				6	6	26	4	6	24	144	144	624	
<i>Group Total</i>						25				144	4194	4674	

<b>Secured Parking</b>													
Personal Vehicle Parking - Police				4	4	4	9	18	162	648	648	648	Squad Cars = personal cars
Squad Vehicle Parking				10	18	20	10	20	200	3600	3600	4000	Sheltered parking for 10x vehicles Power, WIFI required
Motorcycle Parking (covered)				0	0	2	0	0	0	0	0	0	Concrete pad under canopy, room for 3x motors
Trailer Boat Parking				0	1	1	12	36	432	0	432	432	
Trailer Parking				0	1	1	12	22	264	0	264	264	Power required
Emergency Generator				0	1	1	15	25	375	0	375	375	Includes 4'-0" clearances, concrete pad req'd
Trash/Recycling				0	1	1	10	20	200	0	200	200	Verify trash requirements w/ provider
Break Room Patio				0	1	1	15	25	375	0	375	375	Secure enclosed space off Break Room
<i>Group Total</i>						28				4248	5894	6294	

<b>SUBTOTAL</b>										4392	10088	10968	
<b>GENERAL CIRCULATION (100%)</b>										1098	10088	10968	
<b>TOTAL SQUARE FOOTAGE (Police Exterior Requirements)</b>										5490	20176	21936	

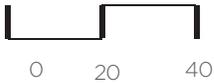


Site Total Area: Unknown; TBD

Proposed Development Area: 65,590 SF / 1.5 AC

Total Building: 19,270 SF

Total Parking: 20 Secure Staff/Squad  
25 Public  
 45 Total Spaces



POLICE LEGEND	
	BOOKING & SALLYPORT
	POLICE SUPPORT FUNCTIONS
	POLICE ADMINISTRATION
	DETECTIVE & EVIDENCE
	POLICE RECORDS
	POLICE PATROL
	PUBLIC
	CIRCULATION



Police - Renderings

June 18, 2014

# COST FORECAST SUMMARY

For a more detailed break down of the probable cost please see Section 7.

DIVISION OF COSTS	COST
CONSTRUCTION COST	\$5,730,065
CONSULTANT COST	\$889,022
OWNER COST	\$407,657
SUB TOTAL	\$7,026,744
WA SALES TAX (8.7%)	\$611,326
<b>PROJECT TOTAL *</b>	<b>\$7,638,071</b>

\*Land value not included in total project cost

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# COMBINED PUBLIC SAFETY



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# COMBINED PUBLIC SAFETY



## STATION SUMMARY

As part of the scope of this report, the strategy of developing a Public Safety Campus that would have both Bainbridge Island Fire Department and City of Bainbridge Island Police Department located together was investigated. A concept of having separate facilities on the site as well as the concept of developing one structure that had both functions was studied. In the end, due to shape of the site, access points to/from site, setbacks and developable area and a number of other elements, it became clear that the optimum strategy would be to develop one structure for both agencies and maximize the site layout.

## STATION FACTS

**Location** 8895 Madison Avenue N.  
Bainbridge Island, WA 98110

**Year Built** 1978

**Remodeled** 2002 (Addition & Remodel)

**Site Size** 3.9 Acres

**Building Size** 14,230 Sq.Ft.

**Parking On-Site** 74 Spaces

**Floors** 1 Floor + Mezzanine

**Zoning Classification** R-2 Residential;  
Conditional Use

**Fire Sprinklers** Yes

**Construction Type** Wood / Cedar Boards

**Staffing** Career / Volunteer



## SITE SUMMARY

The subject property, located at 8895 Madison Avenue NE is the headquarter station for the Department. The site is located at the NW quadrant at the intersection of State Route 305 and Madison Ave NE. The site is approximately 169,884 sf (3.9 acres) and located in a largely rural environment with residential development to the North and West, a commercial development of rental storage units to the South and a church to the East. The site is developed with a main station, helipad, resident apartment building and associated staff and public parking.

## CONCEPT SUMMARY

The concept would require the demolition of all of the existing site improvements and existing structures for the re-development of the new proposed public safety building (for additional information of the existing facilities at this site, see Station 21 section). There are advantages and disadvantages for the development of a public safety facility at this site. A combined facility would enable both agencies to capitalize on needs and share space requirements rather than developing separate identical room/functions at separate facilities/sites (i.e. Training Room, Fitness Room, Public Toilets, Parking, etc.). Sharing a site and building reduces the size of the overall facility in comparison to the size of individual police and fire facilities. As such, a combined public safety facility offers a cost savings. Additionally, the site can be developed to meet the long term needs of both agencies and serve the community without having to purchase additional land.

# PROGRAMMING SUMMARY

Beyond the building program requirements, there are important site elements and considerations that must be taken into account for a multi-use building. These program elements include public parking; secure parking for staff, city and department vehicles and equipment; emergency power; building threat protection; and access to and from the site. The most challenging consideration, for any site, stems from public and secure parking requirements. These are governed by jurisdictional requirements as well as department growth projections and space requirements for vehicles and equipment.

SPACE USE	SQUARE FEET
PUBLIC AREAS / TRAINING AREAS	5,705 SF
FIRE ADMINISTRATION	3,516 SF
APPARATUS BAY AND SUPPORT	9,432 SF
FIRE LIVING QUARTERS	3,272 SF
POLICE ADMINISTRATION	978 SF
POLICE RECORDS DIVISION	668 SF
POLICE OPERATIONS	4,010 SF
POLICE SUPPORT SERVICES	2,316 SF
POLICE SUPPORT FUNCTIONS	2,138 SF
TOTAL BUILDING	32,035 SF
GENERAL CIRCULATION (20%)	8,009 SF
TOTAL SQUARE FOOTAGE	40,044 SF

# PROGRAM

Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Total Required Square Footage			Comments
	Exist	2016	2036	Exist	2016	2036	W	L	Area	Exist	2016	2036	

Department: Bainbridge Island Fire Protection District Space Requirements Summary													
Apparatus Bay and Support Rooms	0	0	0								11790	11790	
Living Quarters and Administration	18	22	26								8485	8485	
<b>SUBTOTAL</b>	<b>18</b>	<b>22</b>	<b>26</b>								<b>20275</b>	<b>20275</b>	

Department: Bainbridge Island Shared Spaces Summary														
Community Room / Fitness / Facility Core	0	0	0								0	7131	7131	
<b>SUBTOTAL</b>	<b>0</b>	<b>0</b>	<b>0</b>								<b>0</b>	<b>7131</b>	<b>7131</b>	

Department: Bainbridge Island Police Department Site Requirements Summary														
Police Administration	3	3	3								0	1223	1223	
Police Records Division	2	2	2								0	835	835	
Police Operations	18	22	26								0	5013	5013	
Police Support Services	3	3	5								0	2895	2895	
Police Support Functions	0	0	0								0	2673	2673	
<b>SUBTOTAL</b>	<b>26</b>	<b>30</b>	<b>36</b>								<b>0</b>	<b>12638</b>	<b>12638</b>	

<b>TOTAL BUILDING SQUARE FOOTAGE</b>	<b>44</b>	<b>52</b>	<b>62</b>								<b>0</b>	<b>40044</b>	<b>40044</b>	
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<b>TOTAL EXTERIOR REQUIREMENTS</b>											<b>0</b>	<b>50216</b>	<b>54568</b>	
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<b>TOTAL SITE REQUIREMENTS</b>											<b>0</b>	<b>90260</b>	<b>94612</b>	
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Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Total Required Square Footage			Comments
	Exist	2016	2036	Exist	2016	2036	W	L	Area	Exist	2016	2036	
<b>Department: Apparatus Bay and Support Rooms</b>													
<b>Apparatus Bay</b>													
Apparatus Bay				0	6	6	15	85	1275	0	7500	7500	5 Bay, 15'x80' Bays; Drive-through bays preferred, Possibly phased; 12' x 14' OH doors preferred w/ (2) sections of glazing, Four Fold type (Front doors only); Concrete floor, Trench drains or 8 back in bays @ 15' x 55'
<i>Group Total</i>	0	0	0							0	7500	7500	
<b>Apparatus Support Rooms</b>													
Turnouts				0	1	1	8	38	304	0	304	304	(60) Turnout Lockers min; Ready Rack type system, (2) doors - dedicated 'in' and 'out' doors; Light should not penetrate into room
Decontamination				0	1	1	12	18	216	0	216	216	Floor sink, Decon Shower (Private-Use), Eyewash, Stainless steel counter & sink, Extractor, Commercial tumble dryer - medical linen, turn dryer, hooks for drying w/ extra ventilation, detergent dispenser, (2) Hazard storage (3'x6')
Shop (Dirty Room)				0	1	1	12	14	168	0	168	168	
SCBA (Clean Room)				0	1	1	9	14	126	0	126	126	80 SF plus equipment size: 10' x 3'-6" system. work bench
SCBA Compressor				0	1	1	6	8	48	0	48	48	Compressor and compressed air tank
EMS Supply				0	1	1	20	20	400	0	400	400	Temperature controlled; long & narrow w/ shelves (1) refrigerator, work bench/counter space
Report Writing				0	4	4	6	8	48	0	192	192	Adjacent to Apparatus Bay Hand washing sink
Hose Storage				0	1	1	12	12	144	0	144	144	Built in rack / UV protected
Hose Drying				0	1	1	10	10	100	0	100	100	Built in rack / UV protected
Unisex Toilet				0	1	1	6	8	48	0	48	48	
Fire Riser				0	1	1	0	0	0	0	0	0	Open to apparatus bay
Storage				0	2	2	8	12	96	0	0	0	Above Support Rooms (Mezzanine); Equipment Supply Room; fixed shelving in one room
Public Education Storage				0	2	2	8	12	96	0	0	0	Mezzanine; fixed shelving in one room
Emergency Preparedness Supplies Room				0	2	2	8	12	96	0	0	0	Mezzanine (water, cots, MREs); fixed shelving in one room
CPR Equipment Storage				0	1	1	8	12	96	0	96	96	Move possibly to community room (face shields, mannequins, books)
PPE				0	2	2	8	12	96	0	0	0	Mezzanine; fixed shelving in one room
Ground Maintenance Equipment Storage				0	1	1	9	10	90	0	90	90	Lawn mower, weed eater, power washer, paint sprayer, Fuel/paint storage cabinets, Off Apparatus Bay; outside access
<i>Group Total</i>	0	0	0							0	1932	1932	
<b>SUBTOTAL</b>	0	0	0							0	9432	9432	
<b>GENERAL CIRCULATION (25%)</b>											2358	2358	
<b>TOTAL SQUARE FOOTAGE (Apparatus Bay &amp; Support)</b>										0	11790	11790	

Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Total Required Square Footage			Comments
	Exist	2016	2036	Exist	2016	2036	W	L	Area	Exist	2016	2036	
<b>Department: Living Quarters and Administration</b>													
<b>Living Quarters</b>													
Bunk Rooms				0	10	10	8	12	96	0	960	960	Bed, wardrobe for linen, phone for duty officers, desk
Personnel Storage Lockers				0	1	1	2	60	120	0	120	120	(40) 18x18 Full Height Lockers, possibly in corridors, 4 lockers per room (20) 1/2 Height S-Lockers
Toilet/Shower				0	4	4	9	10	90	0	360	360	Unisex, upper cabinet and sink base
Kitchen				0	1	1	12	24	288	0	288	288	(1)Food Prep Sink, (1) Hand washing Sink, (4)Refrigerator, (1)Microwave, 6 burner stove, (1) dishwasher, BBQ area screened and located off of Kitchen & across from FD dining - covered
Pantry				0	3	3	4	4	16	0	48	48	3 pantry closets in kitchen
Dining				0	1	1	16	24	384	0	384	384	Farm Table with benches - Seating for 17
Day Room				0	1	1	24	24	576	0	576	576	Kitchen and dining open to one another Seating for 10 Recliner
Firefighter Workstation				0	4	4	6	8	48	0	192	192	Work area for Duty crews/Volunteers
Radio/Supply				0	1	1	12	12	144	0	144	144	Volunteer mail boxes with file drawers
Library / Study Room				0	1	1	8	10	80	0	80	80	Enclosed, adjacent to day room
Laundry				0	1	1	10	12	120	0	120	120	Commercial washer and dryer, upper shelving
<b>Group Total</b>				<b>0</b>	<b>0</b>	<b>0</b>				<b>0</b>	<b>3272</b>	<b>3272</b>	

Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Total Required Square Footage			Comments
	Exist	2016	2036	Exist	2016	2036	W	L	Area	Exist	2016	2036	
<b>Administration</b>													
Office - Fire Chief				0	1	1	14	22	308	0	308	308	glass doors; wardrobe closet for uniforms
Office - Operations Chief				0	1	1	14	16	224	0	224	224	wardrobe closet for uniforms
Office - Fire Marshall				0	1	1	14	16	224	0	224	224	wardrobe closet for uniforms
Office - Plan Review Room				0	1	1	10	12	120	0	120	120	Adjacent to Fire Marshall
Office - Business Administrator				0	1	1	14	16	224	0	224	224	wardrobe closet for uniforms
Office - BC				0	1	1	12	16	192	0	192	192	single shared office for BC's
Office - Training Lieutenant				0	1	1	12	16	192	0	192	192	
Office - Training				0	1	1	12	16	192	0	192	192	
Office - MSO				0	1	1	12	16	192	0	192	192	
File Room				0	1	1	12	12	144	0	144	144	
Shared Open Office - Volunteers				0	1	1	16	16	256	0	256	256	Volunteer Coordinators & Inspector (4 Positions Total)
Shared Open Office - Office Admin				0	1	1	10	16	160	0	160	160	Office Admin / Assistant
Shared Open Office - Finance				0	1	1	14	18	252	0	252	252	Finance Team (2 Stations), in-room secure file cabinets, 2'x12' cabinets - storage above printers
Copy Room / Work Area / Mail Room				0	1	1	12	20	240	0	240	240	Copy/fax machine; supply closet/ includes office supplies counter w/ upper and lower cabinets & work island
Medium Conference Room				0	1	1	12	20	240	0	240	240	8 people Wired for hand radios
Storage				0	1	1	10	12	120	0	120	120	
Personnel Storage Lockers				0	1	1	2	18	36	0	36	36	(12) Lockers possibly in corridors - 18x18 Full hgt lockers
Uniform Storage				0	1	1	8	10	80	0	80	80	uniform inventory, close to admin
Electrical / Data				0	1	1	10	12	120	0	120	120	Includes server rack, add workstation in room
<i>Group Total</i>	0	0	0							0	3516	3516	
<b>SUBTOTAL</b>	0	0	0							0	6788	6788	
<b>GENERAL CIRCULATION (25%)</b>										0	1697	1697	
<b>TOTAL SQUARE FOOTAGE (Living Quarters and Administration)</b>										0	8485	8485	

Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Total Required Square Footage			Comments
	Exist	2016	2036	Exist	2016	2036	W	L	Area	Exist	2016	2036	

**Department: Public Functions & Facility Core**

<b>Public Lobby</b>														
Entry Vestibule				0	1	1	8	10	80	0	80	80	PUBLIC	911 phone, lock down feature
Public Lobby Waiting Area				0	1	1	12	18	216	0	216	216	PUBLIC	Open lobby for Police; 4-5 people
Break Room				0	1	1	12	12	144	0	144	144		In an alcove off of community room - (1) sink, (1) Microwave, (1) Refrigerator, (1) Dishwasher
Community / Class / EOC / Training				0	1	1	30	40	1200	0	1200	1200		Seating for 55-60, Classroom Setting
1st Aid Station				0	1	1	10	12	120	0	120	120		Located within lobby/BP station/gurney
EOC Storage				0	1	1	10	20	200	0	200	200	SECURE	
Emergency Preparedness Storage				0	1	1	10	10	100	0	100	100	SECURE	Emergency Preparedness Supply for 10 days
Training Storage				0	1	1	10	10	100	0	100	100	SECURE	
Chair Storage				0	1	1	10	20	200	0	200	200	PUBLIC	Seating for 50% of chairs and tables
AV Closet				0	1	1	5	5	25	0	25	25		
Lobby Information				0	1	1	2	10	20	0	20	20	PUBLIC	Includes forms, info, translator
Display Area				0	1	1	2	10	20	0	20	20	PUBLIC	Historical display space, PD to confirm contents
Public Restrooms / Men's & Women's				0	2	2	10	25	250	0	500	500	PUBLIC	
Vending Vestibule				0	1	1	8	10	80	0	80	80	PUBLIC	Includes vending, drinking fountain, pay phone
<b>Group Total</b>	<b>0</b>	<b>0</b>	<b>0</b>							<b>0</b>	<b>3005</b>	<b>3005</b>		

<b>Fitness</b>														
Training / Fitness / Cardio / Weights				0	1	1	30	30	900	0	900	900		treadmill, stair stepper, weights, universal machines, windows to exterior, Drinking fountain
Fitness Storage				0	1	1	10	10	100	0	100	100		
<b>Group Total</b>	<b>0</b>	<b>0</b>	<b>0</b>							<b>0</b>	<b>1000</b>	<b>1000</b>		

<b>Facility Core</b>														
Janitor				0	2	2	6	6	36	0	72	72		
Stairway				0	4	4	12	20	240	0	960	960		2 per floor
Elevator				0	1	1	6	8	48	0	48	48		
Elevator Equipment Room				0	1	1	5	6	30	0	30	30		Adjacent Elevator
Mechanical Shaft				0	1	1	5	10	50	0	50	50		
Electrical Room				0	2	2	10	15	150	0	300	300		1x per floor
Sprinkler Riser Room				0	1	1	6	7	42	0	42	42		
Central Server Room				0	1	1	10	15	150	0	150	150		Possibly combined with Fire
Storage				0	1	1	6	8	48	0	48	48		
<b>Group Total</b>	<b>0</b>	<b>0</b>	<b>0</b>							<b>0</b>	<b>1700</b>	<b>1700</b>		

<b>SUBTOTAL</b>	<b>0</b>	<b>0</b>	<b>0</b>							<b>0</b>	<b>5705</b>	<b>5705</b>		
<b>GENERAL CIRCULATION (25%)</b>										<b>0</b>	<b>1426</b>	<b>1426</b>		
<b>TOTAL SQUARE FOOTAGE (Public Functions &amp; Facility Core)</b>										<b>0</b>	<b>7131</b>	<b>7131</b>		

Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Total Required Square Footage			Comments
	Exist	2016	2036	Exist	2016	2036	W	L	Area	Exist	2016	2036	

**Department: Police Administration**

Administration													
Administrative Lobby / Waiting				0	1	1	4	8	32	0	32	32	Seating for up to 3x people, display
Chief of Police	1	1	1	0	1	1	14	22	308	0	308	308	L.OFFICE Includes room for 4x person conference table
Administrative Assistant	1	1	1	0	1	1	10	12	120	0	120	120	OFFICE Adjacent to Chief of Police - Reception
Deputy Chief / Admin. Lt.	1	1	1	0	1	1	10	18	180	0	180	180	OFFICE Adjacent to Chief of Police - Reception
Supply Room				0	1	1	6	8	48	0	48	48	
Secure File Room				0	1	1	10	12	120	0	120	120	SECURE
Coats / Coffee Alcove				0	1	1	4	5	20	0	20	20	Adjacent Conference room
Conference Room				0	1	1	10	15	150	0	150	150	Accessible by administrative staff; A/V Projection Sized for 6 people; Fixed seating
<i>Group Total</i>	<b>3</b>	<b>3</b>	<b>3</b>							<b>0</b>	<b>978</b>	<b>978</b>	
<b>SUBTOTAL</b>	<b>3</b>	<b>3</b>	<b>3</b>							<b>0</b>	<b>978</b>	<b>978</b>	
<b>GENERAL CIRCULATION (25%)</b>										<b>0</b>	<b>245</b>	<b>245</b>	
<b>TOTAL SQUARE FOOTAGE (Police Administration)</b>										<b>0</b>	<b>1223</b>	<b>1223</b>	

**Department: Police Records Division**

Records													
Public Reception (Service Counter)				0	1	1	6	12	72	0	72	72	OPEN Secure w/ bullet resistant glazing & ADA counter
Records Clerk	2	2	2	0	3	3	8	8	64	0	192	192	OPEN Windows to observe records and front desk
Copy/Print/Mail Center/Work Room				0	1	1	10	10	100	0	100	100	
Records Storage - Active / Archive				0	1	1	12	20	240	0	240	240	Compact shelving - secure room 10x years storage
Supply Storage				0	1	1	8	8	64	0	64	64	Adjacent to Files, Copy and Reception.
Report Taking Room / Sex Off. Process				0	2	2	10	12	120	0	240	240	PUBLIC Dual access from Police Reception Covert camera & microphone.
Juvenile Conf. / Evid. Display / Media Rm.				0	1	1	10	12	120	0	120	120	PUBLIC Dual access from Police Reception Covert camera & microphone.
<i>Group Total</i>	<b>2</b>	<b>2</b>	<b>2</b>							<b>0</b>	<b>668</b>	<b>668</b>	
<b>SUBTOTAL</b>	<b>2</b>	<b>2</b>	<b>2</b>							<b>0</b>	<b>668</b>	<b>668</b>	
<b>GENERAL CIRCULATION (25%)</b>										<b>0</b>	<b>167</b>	<b>167</b>	
<b>TOTAL SQUARE FOOTAGE (Police Records Division)</b>										<b>0</b>	<b>835</b>	<b>835</b>	

Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Total Required Square Footage			Comments
	Exist	2016	2036	Exist	2016	2036	W	L	Area	Exist	2016	2036	

**Department: Police Operations**

<b>Patrol</b>													
Patrol - Lieutenant	4	4	4	0	2	2	12	14	168	0	336	336	OFFICE - shared by 2x Lts. Locate off Patrol Sgt Bullpen Office
Patrol - Relief Supervisor				0	1	1	8	10	80	0	80	80	OPEN
Patrol Officers	12	16	20	0	0	0	0	0	0	0	0	0	OPEN - workstations located around the perimeter of the Squad/Briefing Rm
Harbormaster	1	1	1	0	1	1	8	8	64	0	64	64	OPEN Close to secure entrance
Parking Enforcement Officer	1	1	1	0	1	1	8	8	64	0	64	64	OPEN Dedicated space - Bullpen Office
Squad / Briefing Room				0	1	1	16	24	384	0	384	384	Equipped w/ audio/video equipment Room for 10x people + 4 comp stations, center of the room conference table
Report Writing Room				0	14	14	4	6	24	0	336	336	OPEN Work stations for each patrol officers & file cabinets
Patrol Equipment Storage				0	1	1	10	14	140	0	140	140	Portable Equipment Open to Report Writing Room
File Area				0	1	1	10	10	100	0	100	100	Adjacent Report Writing Room
Jv Interview / JV Holding				0	1	1	10	10	100	0	100	100	
<b>Group Total</b>	<b>18</b>	<b>22</b>	<b>26</b>							<b>0</b>	<b>1604</b>	<b>1604</b>	

<b>Inventory / Equipment</b>													
Armory/ammunition/weapons				0	1	1	10	15	150	0	150	150	SECURE Near exit to secure parking
Weapons Maintenance				0	1	1	6	8	48	0	0	0	SECURE Located within Armory
Uniform Storage				0	1	1	8	10	80	0	80	80	
Equipment Storage / Issuance				0	1	1	10	10	100	0	100	100	SECURE Radios, batteries, stun guns, etc. Single room adjacent to Armory
<b>Group Total</b>	<b>0</b>	<b>0</b>	<b>0</b>							<b>0</b>	<b>330</b>	<b>330</b>	

<b>Booking / Sally Port</b>													
Custody Processing (Intox) / Intake				0	1	1	10	15	150	0	150	150	
Temp Holding Cell				0	2	2	8	10	80	0	160	160	with toilets
Interview Room				0	1	1	8	10	80	0	80	80	AV requirements
Unisex Toilet				0	1	1	6	8	48	0	48	48	
Access Vestibule				0	1	1	6	8	48	0	48	48	Weapon lockup area
Sally Port - Vehicular				0	1	1	35	40	1400	0	1400	1400	Drive-in parking port, 2x cars wide
Police Bicycle Storage Racks				0	1	1	3	20	60	0	60	60	Within Sally Port, 12 racks, protected from vehicles
Temporary Animal Services Kennel				0	2	2	3	5	15	0	30	30	Water, drainage, hose bib
Sally Port Storage				0	1	1	10	10	100	0	100	100	
<b>Group Total</b>	<b>0</b>	<b>0</b>	<b>0</b>							<b>0</b>	<b>2076</b>	<b>2076</b>	

<b>SUBTOTAL</b>	<b>18</b>	<b>22</b>	<b>26</b>							<b>0</b>	<b>4010</b>	<b>4010</b>	
<b>GENERAL CIRCULATION (25%)</b>										<b>0</b>	<b>1003</b>	<b>1003</b>	
<b>TOTAL SQUARE FOOTAGE (Police Operations)</b>										<b>0</b>	<b>5013</b>	<b>5013</b>	

Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Total Required Square Footage			Comments
	Exist	2016	2036	Exist	2016	2036	W	L	Area	Exist	2016	2036	

**Department: Police Support Services**

<b>Detectives</b>													
Detective - Lieutenant				0	1	1	8	8	64	0	64	64	OPEN Located within Detective's Bullpen Office
Detectives	2	2	4	0	1	1	16	20	320	0	320	320	OPEN Bullpen Office
Supplies / Equip Storage				0	1	1	10	10	100	0	100	100	
Interview Room				0	1	1	10	10	100	0	100	100	
<b>Group Total</b>	<b>2</b>	<b>2</b>	<b>4</b>							<b>0</b>	<b>584</b>	<b>584</b>	

<b>Property / Evidence</b>													
Evidence Technician - Office				0	1	1	10	15	150	0	150	150	OFFICE Open to work room w/ window to corridor & Processing
Evidence Processing - Officer	1	1	1	0	1	1	10	14	140	0	140	140	SECURE, 2 computers, emergency eye wash, Shower, cardkey access, evidence lockers A dedicated fingerprinting station area within room
Technician Work Room				0	1	1	10	15	150	0	150	150	SECURE Evidence Tech Processing area
Evidence Files - Active				0	1	1	0	0	0	0	0	0	SECURE In evidence tech's office
Evidence Storage - General				0	1	1	20	20	400	0	400	400	SECURE Accessible through Technician Work Room; Compact shelving
Evidence Storage - Drying Cabinet				0	1	1	6	6	36	0	36	36	SECURE Within Evidence Processing
Refrigerated Storage				0	1	1	4	4	16	0	16	16	SECURE Within Evidence Storage room; Separate refrigerator and freezer
Narcotics Storage				0	1	1	6	8	48	0	48	48	SECURE Off Evidence Storage room
Cash Storage				0	1	1	0	0	0	0	0	0	SECURE Vault - in weapons storage
Weapons Storage				0	1	1	6	8	48	0	48	48	SECURE Off Evidence Storage room
Supply Storage				0	1	1	8	8	64	0	64	64	SECURE
Evidence - Public Pickup & Viewing				0	1	1	8	10	80	0	80	80	SECURE In Public Area: Evidence staging, secure. Dual staged lockdown for evidence drop-off
Oversized Item Storage				0	1	1	0	0	0	0	0	0	SECURE Open shelving, within Evidence Storage room Exterior chained fence area
Hazardous Material / Temporary Storage				0	1	1	0	0	0	0	0	0	SECURE Chain link fence - exterior storage under patrol car parking
Vehicle Garage Impound				0	1	1	20	30	600	0	600	600	SECURE
Bicycle Storage - Impound				0	1	1	0	0	0	0	0	0	SECURE 10x Covered and secure, but not a conditioned space; chain link fence
<b>Group Total</b>	<b>1</b>	<b>1</b>	<b>1</b>							<b>0</b>	<b>1732</b>	<b>1732</b>	
<b>SUBTOTAL</b>	<b>3</b>	<b>3</b>	<b>5</b>							<b>0</b>	<b>2316</b>	<b>2316</b>	
<b>GENERAL CIRCULATION (25%)</b>										<b>0</b>	<b>579</b>	<b>579</b>	
<b>TOTAL SQUARE FOOTAGE (Police Support Services)</b>										<b>0</b>	<b>2895</b>	<b>2895</b>	

Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Total Required Square Footage			Comments
	Exist	2016	2036	Exist	2016	2036	W	L	Area	Exist	2016	2036	

**Department: Police Support Functions**

Police Restrooms/Shower/Bunks													
Men's Restroom				0	1	1	10	25	250	0	250	250	2x vanities, 2x urinals, 2x toilets
Men's Shower Room				0	1	1	10	6	60	0	60	60	2 Showers
Men's Locker Room				0	20	20	2	6	12	0	240	240	20 Lockers
Women's Restroom				0	1	1	10	25	250	0	250	250	2x vanities, 3x toilets
Women's Shower Room				0	1	1	10	6	60	0	60	60	2 Showers
Women's Locker Room				0	12	12	2	6	12	0	144	144	12 Lockers - Includes Records Staff lockers
First Aid Station				0	2	2	8	8	64	0	128	128	Located within each locker room
Boot Polish Station				0	2	2	4	6	24	0	48	48	Located within each locker room
Bunk Room				0	2	2	8	10	80	0	160	160	Adjacent locker rooms, unisex
Drying Closet				0	2	2	4	6	24	0	48	48	One per locker room
Linen Storage				0	1	1	5	5	25	0	25	25	
Laundry				0	1	1	5	10	50	0	50	50	
<b>Group Total</b>	<b>0</b>	<b>0</b>	<b>0</b>							<b>0</b>	<b>1463</b>	<b>1463</b>	

Police Living / Shared													
Mud Room Vestibule				0	1	1	8	15	120	0	120	120	Access from secured parking w/ auto slide doors Includes equipment storage cubbies, 30x
Supply Storage				0	1	1	5	5	25	0	25	25	
Break Room				0	1	1	10	15	150	0	150	150	Room for 6-8x people, various seating options
Kitchen / Food Prep / Vending				0	1	1	10	10	100	0	100	100	Full kitchen - gas stove, dishwasher, refrigerator microwave, BBQ patio
Wellness / Nursing Mothers				0	1	1	8	10	80	0	80	80	
Common Space				0	1	1	10	20	200	0	200	200	
<b>Group Total</b>	<b>0</b>	<b>0</b>	<b>0</b>							<b>0</b>	<b>675</b>	<b>675</b>	
<b>SUBTOTAL</b>	<b>0</b>	<b>0</b>	<b>0</b>							<b>0</b>	<b>2138</b>	<b>2138</b>	
<b>GENERAL CIRCULATION (25%)</b>										<b>259</b>	<b>535</b>	<b>535</b>	
<b>TOTAL SQUARE FOOTAGE (Police Support Functions)</b>										<b>259</b>	<b>2673</b>	<b>2673</b>	

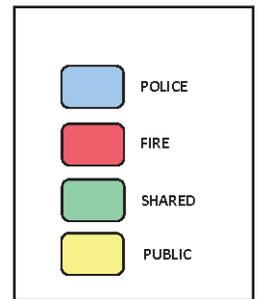
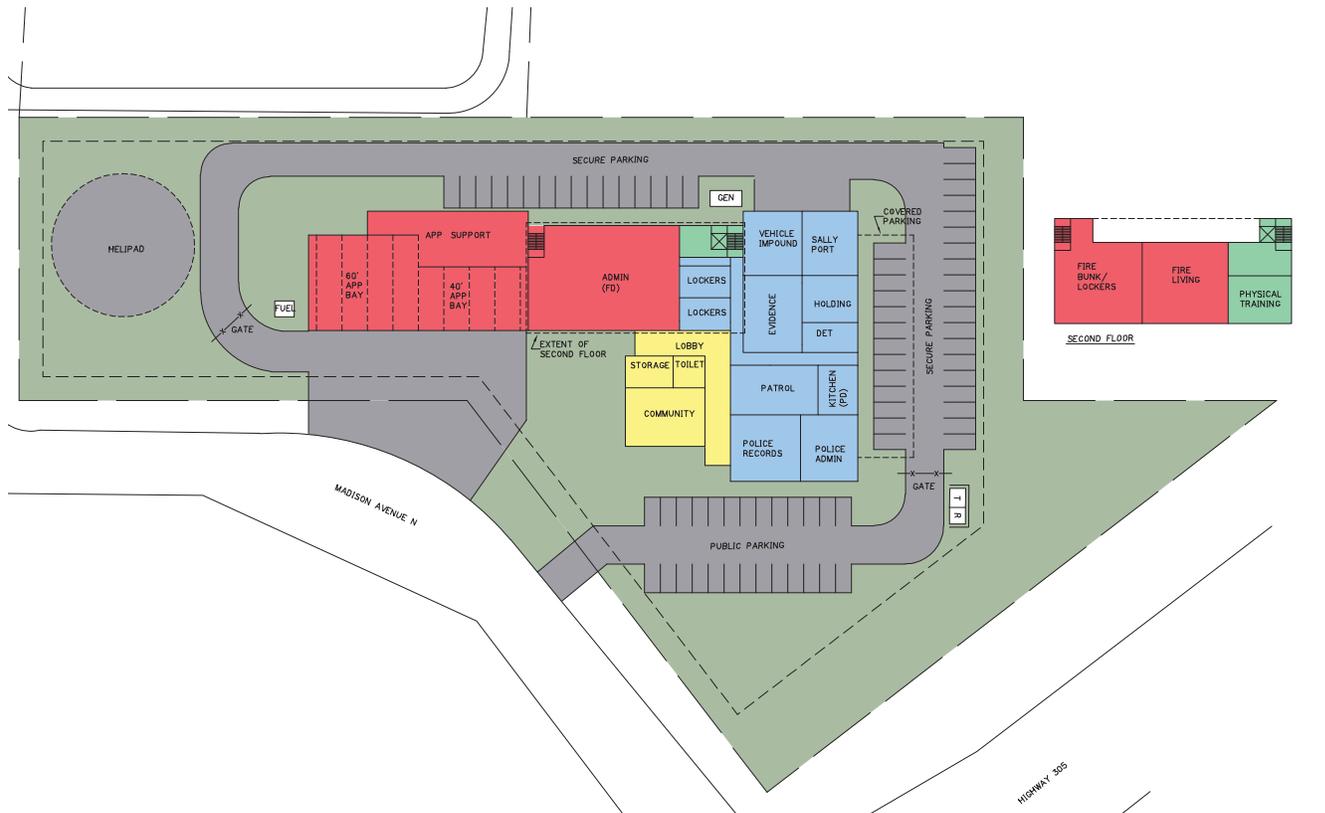
Space / Room Use	Staffing Requirements			Space Requirements			Space Size			Total Required Square Footage			Comments
	Exist	2016	2036	Exist	2016	2036	W	L	Area	Exist	2016	2036	

**Department: Exterior Requirements**

<b>Public Parking</b>													
Public Parking - Community Rm/Training				0	25	25	9	18	162	0	4050	4050	
Bicycle Parking				0	6	26	4	6	24	0	144	624	
Fire - Staff Parking				0	20	20	9	18	162	0	3240	3240	(20) secure parking
Fire - Chief Parking				0	3	3	9	18	162	0	486	486	Included in Secure Parking - Electrical Hook-up
Fire - Resident Parking				0	4	4	9	18	162	0	648	648	
Bike Parking - Public				0	1	1	10	10	100	0	100	100	Included in Public Parking
Bike Parking - Staff				0	1	1	10	10	100	0	100	100	Off of covered BBQ area
<i>Group Total</i>						25				0	8768	9248	

<b>Secured Parking</b>													
Personal Vehicle Parking - Police				0	12	20	9	18	162	0	1944	3240	Squad cars
Squad Vehicle Parking				0	18	20	10	20	200	0	3600	4000	Sheltered parking for 10x vehicles Power, WIFI required
Motorcycle Parking (covered)				0	0	2	0	0	0	0	0	0	Concrete pad under canopy, room for 3x motors
Police Trailer Boat Parking				0	1	1	12	36	432	0	432	432	
Police Trailer Parking				0	1	1	12	22	264	0	264	264	Power required
Emergency Generator				0	1	1	15	25	375	0	375	375	Includes 4'-0" clearances, concrete pad req'd
Trash/Recycling				0	1	1	10	20	200	0	200	200	Verify trash requirements w/ provider
Police - Break Room Patio				0	1	1	15	25	375	0	375	375	Secure enclosed space off Break Room
Fire - Training Grounds				0	1	1	0	0	0	0	0	0	Open Area for Training in Parking Area
Storm Water Retention Pond				0	1	1	0	0	0	0	0	0	
Fuel Station				0	1	1	15	45	675	0	675	675	1000 gal. above ground tank
Fire - Vehicle Wash Area				0	1	1	15	45	675	0	0	0	Within App Bay
Fire - Patio				0	1	1	15	25	375	0	375	375	BBQ
Helipad				0	1	1	90	90	8100	0	8100	8100	Existing Helipad - prefer to leave in current location
<i>Group Total</i>						44				0	16340	18036	

<b>SUBTOTAL</b>										0	25108	27284	
<b>GENERAL CIRCULATION (100%)</b>										0	25108	27284	
<b>TOTAL SQUARE FOOTAGE (Exterior Requirements)</b>										0	50216	54568	

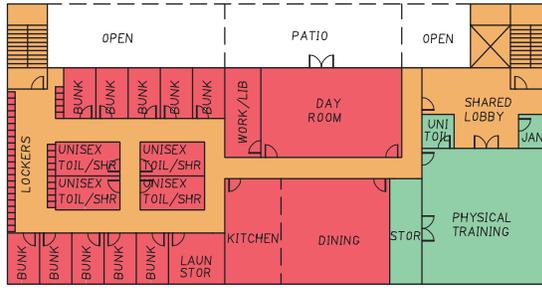


Site Total Area: 169,884 SF / 3.9 AC

Proposed Development Area: 128,374 SF / 2.9 AC

Total Building: 44,256 SF

Total Parking: 20 Fire Career and Volunteer Firefighters  
 20 Police Staff/Squad  
 25 Public  
 65 Total Spaces



**SECOND FLOOR**



**FIRST FLOOR**

**LEGEND**

	BOOKING & SALLYPORT		APPARATUS BAY AND SUPPORT
	POLICE SUPPORT FUNCTIONS		FIRE LIVING QUARTERS
	POLICE ADMINISTRATION		FIRE ADMINISTRATION
	DETECTIVE & EVIDENCE		FITNESS
	POLICE RECORDS		
	POLICE PATROL		
	PUBLIC		
	CIRCULATION		



**Combined Public Safety - Floor Plan**

June 18, 2014



# COST FORECAST SUMMARY

For a more detailed break down of the probable cost please see Section 7.

DIVISION OF COSTS	COST
CONSTRUCTION COST	\$11,615,944
CONSULTANT COST	\$1,620,134
OWNER COST	\$914,815
SUB TOTAL	\$14,150,893
WA SALES TAX (8.7%)	\$1,231,127
<b>PROJECT TOTAL</b>	<b>\$15,382,021</b>

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# PROJECT COST FORECAST



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# EXPLANATION OF COSTS

The following pages are a projection of probable cost. The first few pages illustrate recently complete fire and police facilities to show cost comparisons of similar sized and function facilities to that of the costs be projected in this report. The construction costs tabulated are based on material and system take-offs and allowances developed from the site, floor plan and exterior renderings of each of the different facilities (sites).

Development costs of a project are not limited to construction costs alone and require consideration of other variables. These variables differ between new construction and renovation or expansion, and invariably change from one project to the next depending on site conditions, existing building conditions, building codes, seismic zones and the environment of the construction industry. While differences arise depending on the design approach taken, the construction costs, design and engineering costs, and owner costs for furniture, fixtures and equipment are constants. New construction can often differ substantially due to the single variable of land acquisition.

The costs are classified into three different categories: Construction Costs, Consultant Costs, and Owner Costs. The definition of each category is described as follows:

**Construction costs** reflect the raw costs incurred by a general contractor for overhead and profit, bonding and insurance, securing of materials and general construction of the site and building. In addition to the identified construction costs, a design contingency is recommended to ensure dollars are carried through construction for owner changes, design omissions, unforeseen conditions or jurisdictional requirements, among others.

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

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

The following project development cost estimate examines the construction values of the programmed design concept based on the anticipated Construction, Consultant and Owner Costs. Additionally, the current sales tax percentage has been factored into the cost of the project to reflect the total anticipated cost for the project. Detailed break-out of the anticipated construction costs and permit costs have been provided to describe elements proposed.

# FACILITY COST FORECAST

The following tables illustrate the total costs for each individual project (building/site) and cost to each agency (City of Bainbridge Police Department and Bainbridge Island Fire Department). These values are then totaled and compared to the costs of a combined public safety building to illustrate the cost savings and benefits of a shared facility over that of each agency building their own facility. There are advantages and disadvantages of a separate police station and fire station 21 compared to a combined public safety building. The most significant benefit is the cost savings but the strength of the location and shared resources should be weighed to determine the best course of action.

## BAINBRIDGE ISLAND FIRE DEPARTMENT

FACILITY	STATION 21	STATION 22	STATION 23	TOTAL
COST	\$10,082,451	\$5,804,055	\$1,108,787	<b>\$16,995,293</b>

## CITY OF BAINBRIDGE ISLAND

FACILITY	POLICE			TOTAL
COST	\$7,638,071*			<b>\$7,638,071*</b>

\* LAND VALUE NOT INCLUDED IN TOTAL PROJECT COST

## SEPARATE FIRE AND POLICE FACILITY

FACILITY	STATION 21	POLICE		TOTAL
COST	\$10,082,451	\$7,638,071*		<b>\$17,720,522*</b>

\* LAND VALUE NOT INCLUDED IN TOTAL PROJECT COST

## COMBINED PUBLIC SAFETY BUILDING

FACILITY	PUBLIC SAFETY			TOTAL
COST	\$15,382,021			<b>\$15,382,021</b>

### Cost Summary

June 18, 2014

# DIVISION OF COSTS

Considering the cost of a combined public safety building, the total project costs will be split between each agency (Bainbridge Island Fire Department and City of Bainbridge of Island Police Department.) At this point of the project development, the construction costs have been attributed to each agency based on the square footage of space dedicated to said agency and equally split between shared components (fitness room, lobby, community room, public toilet rooms etc). The following table itemizes the costs attributed to each agency. These projections are rough order of magnitude and can be refined as the project develops further.

AREA	SQ. FT.	COST/ SF	BIFD	COBI
FIRE	23,160 SF	\$262.47	\$6,078,805.20	
POLICE	13,356 SF	\$262.47		\$3,505,549.32
SHARED *	7,740 SF	\$262.47	\$1,015,758.90	\$1,015,758.90
<b>TOTAL CONSTRUCTION COST</b>			<b>\$7,094,564.10</b>	<b>\$4,521,308.22</b>
CONSULTANT COST *			\$810,067.15	\$810,067.15
OWNER COST **			\$487,407.67	\$427,407.67
PROJECT SUB TOTAL			\$8,392,038.92	\$5,758,783.04
WA TAX (8.7%)			\$730,107.39	\$483,737.78
<b>TOTAL PROJECT COST</b>			<b>\$9,122,146.31</b>	<b>\$6,242,520.82</b>

\* SHARED AREA COST AND CONSULTANT COST HAS BEEN EVENLY SPLIT BETWEEN BIFD AND COBI

\*\* OWNER COST HAS BEEN SPLIT EVENLY WITH THE EXCEPTION OF TEMPORARY FACILITIES COST FOR BIFD (60K). THE OWNER COST DOES NOT INCLUDE THE NEGOTIATED LEASING COST FOR COBI.

# COST SUMMARY COMPARISON



<u>PROJECT</u>	<u>BUCKLEY FIRE</u>	<u>CHERRY LANE</u>	<u>CITY OF OLYMPIA STATION 4</u>
LOCATION	Buckley, WA	Hillsboro, OR	OLYMPIA, WA
YEAR COMPLETE	2012	2012	2011
CONSTRUCTION TYPE	Wood & Metal Framing w/ Cement Board Siding and Brick Veneer	Structural Masonry	Steel Frame w/ Wood Framing, Partially CMU, Glu-lam Joist w/ Mtl Roof
BUILDING SIZE	19413 sf *	16,672 sf	13,900 sf
STORIES	SINGLE	SINGLE	SINGLE
BUILDING COST per sf of building	\$129.63 per sf	\$129.68 per sf	\$201.21 per sf
SITE COST per sf of site	\$3.52	\$1.36	Not Available
OFF-SITE COST per sf of building	\$0	\$18.61 per sf of building	\$0
<b>TOTAL CONSTRUCTION COST</b> per sf of building	<b>\$192.28</b> per sf of building	<b>\$180.82</b> per sf of building	<b>\$269.78</b> per sf of building
<b>FINAL CONSTRUCTION COST ESTIMATE</b> per sf of building	<b>\$185.97</b> per sf of building	<b>\$227.96</b> per sf of building	Not Available
<b>LOW BID (AVERAGE BID)</b> per sf of building	<b>\$160.32</b> <b>(\$181.18)</b> per sf of building	<b>\$226.33</b> <b>(\$244.17)</b> per sf of building	Not Available

## Fire - Cost Comparison

June 18, 2014



**AVERAGE  
BUILT COST**



CITY OF BURIEN  
STATION 28

STATION 21

STATION 22

Burine, WA

Bainbridge, WA

Bainbridge, WA

2012

Structural CMU, Precast  
Masonry Exterior Walls,  
Glu-lam Joist Roof

Wood Frame w/ Wood  
Framing, Partially CMU,  
Glu-lam Joist w/ Mtl Roof

Wood Frame w/ Wood  
Framing, Partially CMU

24,330 sf

29,898 sf

14,900 sf

TWO

TWO

SINGLE

\$231.36  
per sf

**\$172.97**

\$155.22  
per sf

\$170.10  
per sf

Not Available

\$6.67

\$7.15

\$0

\$0

\$0

**\$378.13**  
per sf of building

**\$230.25**

**\$249.82 †**  
per sf of building

**\$286.18 †**  
per sf of building

Not Available

**N/A**

**N/A**

Not Available

**N/A**

**N/A**

\* - Mezzanine not included

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

# COST SUMMARY COMPARISON



<u>PROJECT</u>	<u>WALLA WALLA</u>	<u>WEST LINN</u>	<u>CANBY POLICE</u>
LOCATION	Walla Walla, WA	West Linn, OR	Canby, OR
YEAR COMPLETE	2012	2013	2012
CONSTRUCTION TYPE	Steel Framing, Steel Partition Walls, Brick Veneer, Concrete	Structural Masonry	Structural Masonry
BUILDING SIZE	29,000 sf	20,024 sf	25,350 sf*
STORIES	SINGLE	SINGLE	SINGLE
BUILDING COST per sf	\$195.90 per sf	\$194.93 per sf	\$196.00 per sf
SITE COST per sf of site	Not Available	\$16.24	\$6.64
OFF-SITE COST per sf of building	\$0	\$0	\$0
<b>TOTAL CONSTRUCTION COST</b> per sf of building	<b>\$210.34</b> per sf of building	<b>\$262.19</b> per sf of building	<b>\$265.00</b> per sf of building
<b>FINAL CONSTRUCTION COST ESTIMATE</b> per sf of building	Not Available	<b>\$267.26</b> per sf of building	<b>\$219.76</b> per sf of building
<b>LOW BID (AVERAGE BID)</b> per sf of building	Not Available	<b>\$262.18 (CMGC)</b> per sf of building	<b>\$219.76 (CMGC)</b> per sf of building

## Police - Cost Comparison

June 18, 2014



AVERAGE  
BUILT COST



SEQUIM CITY HALL  
& POLICE STATION

STAND ALONE  
POLICE STATION

Sequim, WA

Bainbridge, WA

Projected 2015

Masonry Veneer,  
Concrete, Metal Siding,  
Metal Roof, Skylights

Wood Frame w/ Wood  
Framing, Partially CMU,  
Glu-lam Joist w/ Mtl Roof

34,000 sf

19,270 sf

TWO

SINGLE

Not Available

**\$195.61**

\$199.10  
per sf

Not Available

\$5.97

Not Available

\$0

**\$347.06**  
per sf of building

**\$271.14**

**\$297.36 †**  
per sf of building

Not Available

**N/A**

Not Available

**N/A**

\* - Excludes a 11,000 sf unfinished basement

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

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# Station 21

Project Cost Summary

5/27/2014

		Full Cost:	Comments:
<b>Construction Cost of Facility:</b>			
<b>General Contractor Construction Cost</b>		<b>\$7,469,167.00</b>	\$249.82 SF
General Conditions	0.00%	\$0.00	Included in Estimate (7%)
Bonds & Insurances	0.00%	\$0.00	Included in Estimate (1%)
Overhead & Profit	0.00%	\$0.00	Included in Estimate (5%)
Design Contingency	0.00%	\$0.00	Included in Estimate (20%)
Escalation Start of Construction - 1Q/2016	0.00%	\$0.00	Included in Estimate (3%)
<b>Sub Total GCC Costs (site/building/margins)</b>		<b>\$7,469,167.00</b>	\$249.82 SF
<b>Consultant Costs</b>			
A/E Design and Construction - Base		\$597,533.36	8% of GCC Cost
A/E LEED Design and Documentation		\$100,000.00	
Reimbursables		\$59,753.34	
<b>Sub Total</b>		<b>\$757,286.70</b>	
Owner's Project Manager		\$186,729.18	2.5% of GCC Cost
Marketing Materials		\$2,000.00	Allowance
Topo and Boundary Survey		\$7,500.00	Allowance
Special Inspections		\$20,000.00	Allowance
Geotechnical Services		\$15,000.00	Allowance
Environmental Services		\$0.00	Excluded
Hazardous Material Survey / Testing / Mitigation Specifications		\$15,000.00	Allowance
Commissioning		\$30,000.00	Allowance
Arborist		\$5,000.00	Allowance
<b>Sub Total</b>		<b>\$281,229.18</b>	
<b>Sub Total Consultants</b>		<b>\$1,038,515.87</b>	
Consultants Contingency		7.50%	
<b>Subtotal</b>		<b>\$77,888.69</b>	
<b>Sub Total - Consultants Costs</b>		<b>\$1,116,404.56</b>	
<b>Owner Cost</b>			
Land Acquisition		\$0.00	Rebuilding on Existing Site
Relocation of Over Head Power Lines to Underground		\$180,000.00	Allowance
Fixtures, Furniture & Equipment (FF&E)		\$138,000.00	Allowance
Lockers / Shelving		\$72,000.00	Allowance
Fitness Equipment		\$15,000.00	Allowance
Telephone/Data Equipment		\$30,000.00	Allowance
LEED Registration		\$3,000.00	USGBC assessed fee
<b>Sub Total</b>		<b>\$438,000.00</b>	
Moving Allowance		\$10,000.00	Allowance
Temporary Facilities		\$60,000.00	Allowance
Permit Fees		\$133,779.00	Allowance
<b>Sub Total</b>		<b>\$203,779.00</b>	
<b>Sub Total - Owner costs</b>		<b>\$641,779.00</b>	
Owner Contingency		7.50%	
<b>Sub Total</b>		<b>\$48,133.43</b>	
<b>Sub Total - Owner costs</b>		<b>\$689,912.43</b>	
<b>Project Sub-Total</b>		<b>\$9,275,483.99</b>	
Washington Sales Tax (8.7%)		\$806,967.11	
<b>Total Project Cost</b>		<b>\$10,082,451.09</b>	

**Building Size:** 29,898 SF

Scope: Includes demolition of existing buildings and construction of new facility and site improvements  
 FF&E: Includes Furniture (120K), Camera's/Security/CCTV (13k), Signage (5K)  
 Permits: Includes Building Permits, Site Development fees and SDC fees and signage permit  
 Exclusions: Environmental, Off-site improvements

FIRE STATION 21  
Statement of Probable Cost

1/4

LOC	ITEM	DESCRIPTION	QNTY	UNIT	\$/UNIT	TOTAL \$
<b>NEW BUILDING</b>						
Floor Gross Area			29,898	SF		
<b>Earthwork &amp; Concrete</b>						<b>280,289</b>
	Earthwork	excavation/grade	22,248	SF	1.15	25,585
	Earthwork	rock/backfill/finish	22,248	SF	2.00	44,496
	Slab: monolithic	f/s/pl/fin 4in	13,968	SF	5.70	79,618
	Slab: monolithic	f/s/pl/fin 6in	8,280	SF	8.00	66,240
	Slab on decking	f/s/pl/fin 4in	7,650	SF	4.00	30,600
	Pad footings	f/s/pl various sizes	45	EA	750.00	33,750
<b>Masonry</b>						<b>121,159</b>
	Masonry	CMU	7,127	SF	17.00	121,159
<b>Steel</b>						<b>295,386</b>
	Structural steel	fab & install	7,650	SF	24.00	183,600
	Slab edge angle	fab & install	224	LF	34.00	7,616
	Stairs-steel	stringers/tread/landing	3	SET	11,000.00	33,000
	Balcony		582	SF	35.00	20,370
	Canopy		400	SF	55.00	22,000
OH Door	Jamb wraps	fab & install	32	EA	900.00	28,800
<b>Rough Carpentry</b>						<b>275,960</b>
	Wall: exterior	2x6 framing/sheathing	17,816	SF	5.30	94,425
Grd Fl	Wall: interior	2x4 & 2x6 framing	26,921	SF	3.70	99,608
Grd Fl	Framing	col/beams/headers	279	LF	20.00	5,580
2nd Floor	Floor framing	16" TJI joists/shtg	7,650	SF	6.30	48,195
2nd Floor	Wall: interior	2x4 framing	8,798	SF	3.20	28,152
<b>Finish Carpentry</b>						<b>10,476</b>
	Finish carpentry	allowance	13,968	SF	0.75	10,476
<b>Cabinetry &amp; Counters</b>						<b>92,370</b>
	Lower cabinets	p-lam/melamine	233	LF	210.00	48,930
	Upper cabinets	p-lam/melamine	233	LF	132.00	30,756
	Transaction counter	framing/stl support	1	LS	1,500.00	1,500
	Counter tops	p-laminate	466	SF	24.00	11,184
<b>SIP and Insulation</b>						<b>298,294</b>
	SIP roof panels	8-1/4" overall	25,585	SF	9.75	249,454
Exterior	Thermal batt insulation	R-19 & vapor barrier	26,504	SF	1.35	35,780
Interior	Insulation @ walls	4" acoustic batt	23,746	SF	0.55	13,060
<b>Exterior Cladding</b>						<b>241,560</b>
	Siding	Nichiha panels	10,690	SF	20.00	213,800
	Exterior trim	Hardi trim	5,345	LF	4.50	24,053
	Flexible flashing	PermabARRIER_40 mil	713	LF	5.20	3,708
<b>Roofing &amp; Sheet Metal</b>						<b>275,075</b>
	Roofing	standing seam metal	25,085	SF	10.00	250,850
	Roofing	BUR	500	SF	4.00	2,000
	Gutters, continuous	"K"_seamless-5"_prepnt	487	LF	6.00	2,922
	Downspouts	pre-pnt_24ga	256	LF	5.50	1,408
	Flashings	24 ga Kynar	3,468	LF	5.16	17,895

ARCH: Mackenzie  
DWG DATE: May, 2014  
DESIGN LEVEL: Concept

CONSTRUCTION FOCUS, INC.  
541-686-2031  
EUGENE, OREGON

ESTIMATE DATE: May 29, 2014  
REVISION #: 2  
CONST. START: 1 QTR 2016

Station 21 - Cost Summary

June 18, 2014

FIRE STATION 21  
Statement of Probable Cost

2/4

LOC	ITEM	DESCRIPTION	QNTY	UNIT	\$/UNIT	TOTAL \$
<b>Sealants</b>						<b>2,672</b>
	Sealants	caulking	17,816	SF	0.15	2,672
<b>Doors/Frames/Hardware</b>						<b>292,400</b>
Exterior	Doors	frm-HM/dr-HM/hdwr	12	DR	1,500.00	18,000
Interior	Doors	frm-HM/dr-wd/hdwr	70	DR	1,200.00	84,000
	Apparatus door	overhead	8	EA	4,800.00	38,400
	Apparatus door	bi-fold doors	8	EA	19,000.00	152,000
<b>Glass &amp; Glazing</b>						<b>273,800</b>
	Glazing		5,301	SF	50.00	265,050
Interior	Relite	HM frame/glazing	9	EA	650.00	5,688
Recept	Pass-through window	alum frame/glazing	1	EA	310.00	310
	Mirrors	mirror_3/16"_std	160	SF	17.20	2,752
<b>Floor Coverings</b>						<b>76,887</b>
	Carpet tile	allowance	5,083	SF	3.50	17,791
	Rubber flooring	allowance	1,794	SF	5.90	10,585
	Sheet linoleum flrg	allowance	3,588	SF	4.20	15,070
	Sealer on concrete	allowance	19,434	SF	1.25	24,293
	Wall base	4" rubber	5,083	LF	1.80	9,149
<b>Ceilings/Gypbd</b>						<b>212,949</b>
	Suspended ceiling	grid/ac-tile	13,968	SF	3.52	49,167
Walls	Gypsum board	5/8" bd & LVL 5 finish	48,946	SF	3.00	146,838
	Wall paneling	FRP	3,560	SF	4.50	16,020
	Wall covering	p-laminate	168	SF	5.50	924
<b>Painting/Wall Coverings</b>						<b>62,786</b>
	Painting		29,898	SF	2.10	62,786
<b>Specialties &amp; Equipment</b>						<b>135,006</b>
Turnout	Turnout Locker		40	EA	450.00	18,000
Staff	Lockers	welded_18"x18"x72"	50	EA	250.00	12,500
	Toilet accessories	various types	50	TTL	105.00	5,250
	Louvers		19	EA	950.00	18,050
Exterior	Signage	allowance	1	LS	6,500.00	6,500
	Signage, interior	allowance	13,968	SF	0.17	2,375
	White boards, tackboards, projection screens		13,968	SF	1.00	13,968
	FEC	cabinet & ext	12	TTL	260.00	3,120
	Elevator	ThyssenKrupp_Endura MRL	1	EA	55,243.33	55,243
<b>Appliances</b>						<b>10,200</b>
	Refrigerator	Viking_36"_ss	1	EA	3,500.00	3,500
	Rangetop	Viking_open burner_gas	1	EA	4,500.00	4,500
	Dishwasher		1	EA	1,200.00	1,200
	Microwave		1	EA	700.00	700
	Washer and dryer	OFCI	2	EA	150.00	300
<b>Furnishings</b>						<b>23,855</b>
	Window blinds		5,301	SF	4.50	23,855
<b>Plumbing</b>						<b>280,946</b>
	Plumbing	fixtures	37	EA	1,400.00	51,800

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DWG DATE: May, 2014  
DESIGN LEVEL: Concept

CONSTRUCTION FOCUS, INC.  
541-686-2031  
EUGENE, OREGON

ESTIMATE DATE: May 29, 2014  
REVISION #: 2  
CONST. START: 1 QTR 2016

Station 21 - Cost Summary

2130356.00

FIRE STATION 21  
Statement of Probable Cost

3/4

LOC	ITEM	DESCRIPTION	QNTY	UNIT	\$/UNIT	TOTAL \$
	Plumbing	specialties	42	EA	455.00	19,110
	Trench drain	JS_poly_9931	120	LF	118.00	14,160
	Compressed air system	pipng/valves	630	LF	16.00	10,080
	Gas piping	pipng/valves	534	LF	12.00	6,408
	Plumbing	pipng: CW/vent/waste	29,898	SF	6.00	179,388
<b>Fire Protection</b>						<b>77,735</b>
	Fire protection	riser/mains/drops/heads	29,898	SF	2.60	77,735
<b>HVAC</b>						<b>478,368</b>
	HVAC	equip/ducting/TAB	29,898	SF	16.00	478,368
<b>Electrical</b>						<b>822,501</b>
	Electrical	power/lighting	29,898	SF	18.00	538,164
	Electrical	fire alarm	29,898	SF	1.50	44,847
	Electrical	generator	1	LS	90,000.00	90,000
	Electrical	telephone/data	29,898	SF	1.00	29,898
	Electrical	PV system	29,898	SF	4.00	119,592
<b>NEW BUILDING HARDCOST</b>						<b>4,640,673</b>
<b>SITWORK</b>						
Gross Project Area			128,374	SF		
<b>Demolition and Earthwork</b>						<b>246,959</b>
	Building demolition	x_wood frame/1-story	14,474	SF	4.00	57,896
	Asbestos abatement	allowance	1	LS	20,000.00	20,000
	Erosion control	bags & fence	128,374	SF	0.04	5,135
	Survey	set pins & stakes	128,374	SF	0.12	15,405
	Earthwork	excav/grade	106,126	SF	0.75	79,595
	Earthwork	rock/backfill/finish	62,662	SF	1.10	68,928
<b>Site Improvements</b>						<b>127,841</b>
	Striping	painting/symbols	62,662	SF	0.02	1,253
	Signage	monument signage	1	EA	8,000.00	8,000
	Signage	ADA parking	2	EA	120.00	240
	Wheel stops	allowance	5	EA	87.00	435
	Flagpole	allowance	2	EA	2,800.00	5,600
	Bollards	pipe & concrete base	32	EA	257.89	8,252
	Fencing	chain link/black vinyl	1,716	LF	35.00	60,060
	Trash enclosure		1	LS	10,000.00	10,000
	Fuel	fuel tank-500 gal/curb/pump	1	EA	12,000.00	12,000
	Vehicle access security gate	35'w, rolling	2	EA	11,000.00	22,000
<b>Landscaping</b>						<b>129,420</b>
	Landscaping	soil/lawn/trees/plants/irrig	43,140	SF	3.00	129,420
<b>Hardscapes</b>						<b>238,358</b>
	Site curb-full ht	f/s/pl/fin 0.63' Wx1.33' Ht	2,006	LF	18.00	36,108
	AC paving	place 3" ave thick	37,598	SF	1.90	71,436
	Concrete apron	f/s/pl/fin 6in	9,400	SF	7.25	68,150
	Sidewalk	f/s/pl/fin 4in	15,666	SF	4.00	62,664

ARCH: Mackenzie  
DWG DATE: May, 2014  
DESIGN LEVEL: Concept

CONSTRUCTION FOCUS, INC.  
541-686-2031  
EUGENE, OREGON

ESTIMATE DATE: May 29, 2014  
REVISION #: 2  
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Station 21 - Cost Summary

June 18, 2014

FIRE STATION 21  
Statement of Probable Cost

LOC	ITEM	DESCRIPTION	QNTY	UNIT	\$/UNIT	TOTAL \$
	<b>Site Utilities</b>					<b>113,842</b>
	Fire line	pipe:6-in /trench/bkfill	100	LF	48.00	4,800
	Fire service vault	vault & BFP	1	EA	9,500.00	9,500
	Water system piping	pipe:1.5-in /trench/bkfill	100	LF	35.01	3,501
	Storm piping	6" pipe/excav/bkfill	940	LF	24.00	22,560
	Fdn & rain piping	pvc_4"	1,156	LF	12.00	13,872
	Catch basin	allowance	11	EA	900.00	9,900
	Area drain	allowance	3	TTL	300.00	900
	Sanitary piping	4" pipe/excav/bkfill	100	LF	30.75	3,075
	Oil/water separator	allowance	1	EA	4,733.86	4,734
	Site electrical	lighting	11	EA	3,500.00	38,500
	Site electrical	underground	100	LF	25.00	2,500
<b>SITWORK HARDCOST</b>						<b>856,419</b>
<b>HARDCOST TOTAL</b>						<b>5,497,092</b>
<b>Markups to the hardcost:</b>						
		Inflation & Contingency:	20.0%			1,099,418
		General Conditions:	7.0%			461,756
		Profit & OH at:	5.0%			352,913
		Performance Bond:				57,987
<b>BASE BID TOTAL:</b>						<b>7,469,167</b>
<b>EXCLUSIONS</b>						
Design fees, permit fees, system development fees, utility hookup charges, testing, BOLI fee.						
Moving expenses, anti-graffiti coating, fireproofing, rock excavation.						

SCHEDULE OF FEES

**MACKENZIE.**

**Bainbridge Island Fire Station 21, Bainbridge Island, Washington**

Job Number 2130356.00

**PRELIMINARY GOVERNMENTAL AND JURISDICTIONAL FEES**

Date 6/2/2014

**City of Bainbridge Island**

Prepared By LEH

Please note: This preliminary estimate is provided as a convenience to our clients, and is not intended to duplicate the actual fees assessed by the governing jurisdiction(s). Every effort has been made to accurately estimate the fees that will be associated with this project. However this information is based solely on the information available on the date of this estimate, and actual fees may vary at the time of permit application or issuance. If information and/or assumptions about the project change, then we rely on our clients to notify us if a revision to this estimate is needed. In addition, please review the notes below.

**ASSUMPTIONS:**

Building Floor Area:		29,898 SF
Total Site Area:		174,937 SF
<b>A</b> Building Valuation:	Based on Construction Type II-B	\$4,783,680
Impervious Surface Area:		95,993 SF
Water Meter:		2 inch
<b>B</b> Equivalent Residential Units (ERU):	Based on Sewer Connection Analysis	13 ERU

**PERMIT FEE ESTIMATE:**

**Site Development**

Pre-application Fee:	Flat Fee	\$265
<b>C</b> SEPA Review:	No fee for Checklist	N/A
<b>D</b> Conditional Use Permit:	Assumes Major Conditional Use	\$10,494
<b>E</b> Site Plan Review:	Assumes Major Site Plan Review	\$8,586
<b>F</b> Clearing and Grading Permit:	Permit Fee	\$1,284
	Plan Review	\$500

**Building Permit**

<b>G</b> Building Permit Fees:	Permit Fee	\$19,419
	Plan Review	\$12,622
	Planning and Engineering Review	\$3,884
<b>H</b> Mechanical Permit Fees:	Permit Fees	\$5,680
	Issuance Fee	\$24
<b>I</b> Electrical Permit Fees:	Permit Fees	\$1,495
	Issuance Fees	\$24
<b>J</b> Plumbing Permit Fees:	Permit Fees	\$529
	Issuance Fees	\$24
<b>K</b> Fire Building Permit Fees:	Fire Marshal Plan Review	\$0
	Building Plan Review and Field Inspection	\$2,392
<b>L</b> Fire Sprinkler Permit Fees:	Permit Fee	\$838
	Plan Review	\$545
<b>M</b> Fire Alarm Systems Permit Fees:	Permit Fee	\$589
	Plan Review	\$383
<b>N</b> SBCC Building Fee:	Remitted to the State of Washington	\$5

**Signage**

<b>O</b> Sign Permit Fees:		\$132
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**System Development Charges**

<b>P</b> Water:	System Participation Fee	N/A
	Connection Fee	N/A
	Inspection Fee	N/A
<b>Q</b> Sewer:	System Participation Fee	\$66,087
	Connection Fee	N/A
	Inspection Fee	\$1,290
<b>R</b> Stormwater Impact Fee:	Fee per year	\$4,696
<b>S</b> Transportation Impact Fee:		N/A
<b>T</b> Drainage Impact Fee:		N/A

**TOTAL \$141,784**

## SCHEDULE OF FEES

### Notes:

**\* All fees are based on the City of Bainbridge Island Fee Schedule updated March 2014 unless otherwise noted.**

**A. Building Valuation:** For the purpose of this needs assessment, building valuation data was calculated using a II-B construction type and type B occupancy, which yields a higher construction cost than the actual cost.

**B. Equivalent Residential Units (ERU):** The ERU's are defined as each set of 20 fixture units as shown on the schedule of fixture units on file with the City Clerk and calculated using the Sewer Connection Analysis provided by the City of Bainbridge Island Public Works Department. For the purpose of this needs assessment it is assumed there will be approximately 258 total fixture units which is equal to 13 ERUs.

**C. SEPA Review:** Per Joshua Machen, City of Bainbridge Island Planning Manager, depending on the proposed changes to the site, a SEPA checklist may be required but no fee would be required for a separate SEPA review.

**D. Conditional Use Permit:** Conditional use of a governmental facility within a residential zoning district requires approval of a major conditional use. The fee for a minor conditional use is \$4,770.

**E. Site Plan Review:** For the purpose of this needs assessment, it is assumed that a major site plan review will be required. Per Joshua Machen, Planning Manager with the City of Bainbridge Island, the type of site plan review is depicted primarily by public comment.

**F. Clearing and Grading Permit:** The clearing and grading permit and plan review fees are calculated from the 1997 UAC (Uniform Administrative Code) Table 3-G and 3-H. For the purposes of this needs assessment, the clearing and grading permit and plan review fees have been estimated by the project team.

**G. Building Permit Fees:** The building permit fees are based on current building valuation data from the International Code Council (ICC) times a factor of 1.41 and calculated from the 1997 UAC (Uniform Administrative Code) Table 3-A. Permit fees calculated as \$5,608.75 for the first \$1,000,000 plus \$3.65 for each additional \$1,000 or fraction thereof. Plan review fees are 65 percent of the permit fees. Planning and engineering review of building permits is 20 percent of the building permit fee to cover engineering reviews for drainage analysis and planning reviews.

**H. Mechanical Permit Fees:** Mechanical permit fees are calculated using the 1997 UAC (Uniform Administrative Code) Table 3-C. For the purpose of this needs assessment, the mechanical permit fee has been estimated by the project team. The permit issuance fee is \$23.50.

**I. Electrical Permit Fees:** Electrical permit fees are calculated using the 1997 UAC (Uniform Administrative Code) Table 3-C. For the purpose of this needs assessment, the electrical permit fee has been estimated by the project team. The permit issuance fee is \$23.50.

**J. Plumbing Permit Fees:** Plumbing permit fees are calculated using the 1997 UAC (Uniform Administrative Code) Table 3-D. The permit fees are calculated as \$9.80 per fixture using 54 fixtures for the purpose of this needs assessment. The permit issuance fee is \$23.50.

**K. Fire Building Permit Fees:** Fire marshal plan review of planning applications are including in building and planning fee amounts. Building plan review and field inspections for buildings with a valuation of \$1,000,000 or greater are calculated as \$500 per million value or portion thereof.

**L. Fire Sprinkler Permit Fees:** Fire sprinkler permit fees are based on the fee schedule utilized for computing building permit fees, using the actual contract cost of the installation of the sprinkler system. For the purposes of this needs assessment, it is assumed that the valuation for fire sprinklers is \$77,735 and the permit fees are calculated as \$643.75 for the first \$50,000 plus \$7.00 for each additional \$1,000 or fraction thereof to and including \$100,000. Fire sprinkler plan review fees are equal to 65 percent of the permit fees.

**M. Fire Alarm Permit Fees:** Fire alarm permit fees are based on the fee schedule utilized for computing building permit fees, using the actual contract cost of the installation of the alarm system. For the purpose of this needs assessment, it is assumed that the valuation for the fire alarms is \$44,847 and the permit fees are calculated as \$391.75 for the first \$25,000 plus \$10.10 for each additional \$1,000 or fraction thereof to and including \$50,000. Fire alarm permit plan review fees are equal to 65 percent of the permit fees.

**N. SBCC Building Fee:** The building fee (SBCC) is remitted to the State of Washington and funds studies on building safety.

**O. Sign Permit Fees:** Sign permit fees are based on the valuation given by the applicant. For the purpose of this needs assessment, the sign valuation is assumed to be \$6,500. The sign permit fees are calculated as \$69.25 for the first \$2,000 plus \$14 for each additional \$1,000 or fraction thereof to and including \$25,000.

**P. Water SDC:** Per Aaron Claiborne, Utilities Project Coordinator with the City of Bainbridge Island Operations and Maintenance Department, the water system participation, connection, and inspection fees would not apply since there is already an existing water meter in place.

**Q. Sewer SDC:** Sewer participation fees are calculation by ERUs which is defined as a set of 20 fixture units. The fee per ERU is \$5,123. Per Aaron Claiborne, Utilities Project Coordinator with the City of Bainbridge Island Operations and Maintenance Department, sewer connection fees will not be charged for changing fixtures. Sewer inspection fees are calculated as \$100 per each set of 20 fixture units or portion thereof. The fee per 20 fixture units is \$100.

**R. Stormwater Impact Fees:** Storm and surface water rates are billed yearly on property taxes. For the purpose of this needs assessment, the stormwater rates are shown for one year. The rates are calculated per SFE (single family equivalent) which is the amount of impervious area divided by 3,000 square feet. The amount of SFE's times the base billing rate of \$12.23 is the monthly billing amount for stormwater. Per Joshua Machen, Planning Manager with the City of Bainbridge Island, fee adjustments may be made at the time of construction completion.

**S. Transportation Impact Fee:** Per Joshua Machen, Planning Manager at the City of Bainbridge Island, the City does not currently charge transportation impact fees.

**T. Drainage Impact Fees:** Per Joshua Machen, Planning Manager at the City of Bainbridge Island, drainage impact fees are historical fees and are no longer charged.

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# Station 22

Project Cost Summary

5/27/2014

		Full Cost:	Comments:
<b>Construction Cost of Facility:</b>			
<b>General Contractor Construction Cost</b>		<b>\$4,264,143.00</b>	\$286.18 SF
General Conditions	0.00%	\$0.00	Included in Estimate (7%)
Bonds & Insurances	0.00%	\$0.00	Included in Estimate (1%)
Overhead & Profit	0.00%	\$0.00	Included in Estimate (5%)
Design Contingency	0.00%	\$0.00	Included in Estimate (20%)
Escalation Start of Construction - 1Q/2016	0.00%	\$0.00	Included in Estimate (3%)
<b>Sub Total GCC Costs (site/building/margins)</b>		<b>\$4,264,143.00</b>	\$286.18 SF
<b>Consultant Costs</b>			
A/E Design and Construction - Base		\$341,131.44	8% of GCC Cost
A/E LEED Design and Documentation		\$100,000.00	
Reimbursables		\$34,113.14	
<b>Sub Total</b>		<b>\$475,244.58</b>	
Owner's Project Manager		\$106,603.58	2.5% of GCC Cost
Marketing Materials		\$2,000.00	Allowance
Topo and Boundary Survey		\$7,500.00	Allowance
Special Inspections		\$20,000.00	Allowance
Geotechnical Services		\$15,000.00	Allowance
Environmental Services		\$0.00	Excluded
Hazardous Material Survey / Testing / Mitigation Specifications		\$10,000.00	Allowance
Commissioning		\$30,000.00	Allowance
Arborist		\$5,000.00	Allowance
<b>Sub Total</b>		<b>\$196,103.58</b>	
<b>Sub Total Consultants</b>		<b>\$671,348.16</b>	
Consultants Contingency		7.50%	
<b>Subtotal</b>		<b>\$50,351.11</b>	
<b>Sub Total - Consultants Costs</b>		<b>\$721,699.27</b>	
<b>Owner Cost</b>			
Land Acquisition		\$0.00	Rebuilding on Existing Site
Fixtures, Furniture & Equipment (FF&E)		\$78,000.00	Allowance
Lockers / Shelving		\$40,000.00	Allowance
Fitness Equipment		\$15,000.00	Allowance
Telephone/Data Equipment		\$15,000.00	Allowance
LEED Registration		\$3,000.00	USGBC assessed fee
<b>Sub Total</b>		<b>\$151,000.00</b>	
Moving Allowance		\$10,000.00	Allowance
Temporary Facilities		\$60,000.00	Allowance
Permit Fees		\$108,000.00	Allowance
<b>Sub Total</b>		<b>\$178,000.00</b>	
<b>Sub Total - Owner costs</b>		<b>\$329,000.00</b>	
Owner Contingency		7.50%	
<b>Sub Total</b>		<b>\$24,675.00</b>	
<b>Sub Total - Owner costs</b>		<b>\$353,675.00</b>	
<b>Project Sub-Total</b>		<b>\$5,339,517.27</b>	
Washington Sales Tax (8.7%)		\$464,538.00	
<b>Total Project Cost</b>		<b>\$5,804,055.27</b>	

**Building Size:** 14,900 SF

Scope: Includes demolition of existing buildings and construction of new facility  
 FF&E: Includes Furniture (60K), Camera's/Security/CCTV (13k), Signage (5K)  
 Permits: Includes Building Permits, Site Development fees and SDC fees and signage permit  
 Exclusions: Commissioning, Environmental, Off-site improvements

FIRE STATION 22  
Statement of Probable Cost

1/4

LOC	ITEM	DESCRIPTION	QNTY	UNIT	\$/UNIT	TOTAL \$
<b>NEW BUILDING</b>						
		Floor Gross Area	14,900	SF		
	<b>Earthwork &amp; Concrete</b>					<b>159,185</b>
	Earthwork	excavation/grade	14,900	SF	1.15	17,135
	Earthwork	rock/backfill/finish	14,900	SF	2.00	29,800
	Slab: monolithic	f/s/pl/fin 4in	9,239	SF	5.70	52,662
	Slab: monolithic	f/s/pl/fin 6in	5,661	SF	8.00	45,288
	Pad footings	f/s/pl various sizes	22	EA	650.00	14,300
	<b>Masonry</b>					<b>72,369</b>
	Masonry	CMU	4,257	SF	17.00	72,369
	<b>Steel</b>					<b>98,812</b>
	Columns	fab & install	50	EA	550.00	27,500
	Slab edge angle	fab & install	168	LF	34.00	5,712
	Stairs-steel	stringers/tread/landing	2	SET	11,000.00	22,000
	Canopy		400	SF	55.00	22,000
OH Door	Jamb wraps	fab & install	24	EA	900.00	21,600
	<b>Rough Carpentry</b>					<b>126,850</b>
Grd Fl	Wall: exterior	2x6 framing/sheathing	10,642	SF	5.30	56,403
Grd Fl	Wall: interior	2x4 & 2x6 framing	18,029	SF	3.70	66,707
Grd Fl	Framing	col/beams/headers	187	LF	20.00	3,740
	<b>Finish Carpentry</b>					<b>6,929</b>
	Finish carpentry	allowance	9,239	SF	0.75	6,929
	<b>Cabinetry &amp; Counters</b>					<b>46,740</b>
	Lower cabinets	p-lam/melamine	116	LF	210.00	24,360
	Upper cabinets	p-lam/melamine	116	LF	132.00	15,312
	Transaction counter	framing/stl support	1	LS	1,500.00	1,500
	Counter tops	p-laminate	232	SF	24.00	5,568
	<b>SIP and Insulation</b>					<b>172,785</b>
Exterior	SIP roof panels	8-1/4" overall	14,565	SF	9.75	142,006
Interior	Thermal batt insulation	R-19 & vapor barrier	16,400	SF	1.35	22,140
Interior	Insulation @ walls	4" acoustic batt	15,707	SF	0.55	8,639
	<b>Exterior Cladding</b>					<b>139,516</b>
	Siding	Nichiha panels	6,386	SF	20.00	127,720
	Exterior trim	Hardi trim	2,129	LF	4.50	9,581
	Flexible flashing	PermabARRIER_40 mil	426	LF	5.20	2,215
	<b>Roofing &amp; Sheet Metal</b>					<b>157,946</b>
	Roofing	standing seam metal	14,565	SF	10.00	145,648
	Gutters, continuous	"K"_seamless-5"_preprnt	172	LF	6.00	1,032
	Downspouts	pre-pnt_24ga	172	LF	5.50	946
	Flashings	24 ga Kynar	2,000	LF	5.16	10,320
	<b>Sealants</b>					<b>1,596</b>
	Sealants	caulking	10,642	SF	0.15	1,596
	<b>Doors/Frames/Hardware</b>					<b>207,000</b>
Exterior	Doors	frm-HM/dr-HM/hdwr	6	DR	1,500.00	9,000

ARCH: Mackenzie  
DWG DATE: May, 2014  
DESIGN LEVEL: Concept

CONSTRUCTION FOCUS, INC.  
541-686-2031  
EUGENE, OREGON

ESTIMATE DATE: May 29, 2014  
REVISION #: 2  
CONST. START: 1 QTR 2016

Station 22 - Cost Summary

June 18, 2014

FIRE STATION 22  
Statement of Probable Cost

LOC	ITEM	DESCRIPTION	QNTY	UNIT	\$/UNIT	TOTAL \$
Interior	Doors	frm-HM/dr-wd/hdwr	46	DR	1,200.00	55,200
	Apparatus door	overhead	6	EA	4,800.00	28,800
	Apparatus door	bi-fold doors	6	EA	19,000.00	114,000
<b>Glass &amp; Glazing</b>						<b>170,637</b>
	Glazing		3,280	SF	50.00	164,000
Interior	Relite	HM frame/glazing	6	EA	650.00	3,575
Recept	Pass-through window	alum frame/glazing	1	EA	310.00	310
	Mirrors	mirror_3/16"_std	160	SF	17.20	2,752
<b>Floor Coverings</b>						<b>38,315</b>
	Carpet tile	allowance	2,533	SF	3.50	8,866
	Rubber flooring	allowance	894	SF	5.90	5,275
	Sheet linoleum flrg	allowance	1,788	SF	4.20	7,510
	Sealer on concrete	allowance	9,685	SF	1.25	12,106
	Wall base	4" rubber	2,533	LF	1.80	4,559
<b>Ceilings/Gypbd</b>						<b>142,200</b>
	Suspended ceiling	grid/ac-tile	9,239	SF	3.52	32,521
Walls	Gypsum board	5/8" bd & LVL 5 finish	32,780	SF	3.00	98,340
	Wall paneling	FRP	2,384	SF	4.50	10,728
	Wall covering	p-laminate	111	SF	5.50	611
<b>Painting/Wall Coverings</b>						<b>31,290</b>
	Painting		14,900	SF	2.10	31,290
<b>Specialties</b>						<b>46,145</b>
Turnout	Turnout Locker	P-lam switchback	16	EA	450.00	7,200
Staff	Lockers	welded_18"x18"x72"	20	EA	250.00	5,000
	Toilet accessories	various types	35	TTL	105.00	3,675
	Louvers		12	EA	950.00	11,400
Exterior	Signage	allowance	1	LS	6,500.00	6,500
	Signage, interior	allowance	9,239	SF	0.17	1,571
	White boards, tackboards, projection screens		9,239	SF	1.00	9,239
	FEC	cabinet & ext	6	TTL	260.00	1,560
<b>Appliances</b>						<b>10,200</b>
	Refrigerator	Viking_36"_ss	1	EA	3,500.00	3,500
	Rangetop	Viking_open burner_gas	1	EA	4,500.00	4,500
	Dishwasher		1	EA	1,200.00	1,200
	Microwave		1	EA	700.00	700
	Washer and dryer	OFCI	2	EA	150.00	300
<b>Furnishings</b>						<b>14,760</b>
	Window blinds		3,280	SF	4.50	14,760
<b>Plumbing</b>						<b>158,952</b>
	Plumbing	fixtures	25	EA	1,400.00	35,000
	Plumbing	specialties	28	EA	455.00	12,740
	Trench drain	JS_poly_9931	90	LF	118.00	10,620
	Compressed air system	piping/valves	431	LF	16.00	6,896
	Gas piping	piping/valves	358	LF	12.00	4,296
	Plumbing	piping: CW/vent/waste	14,900	SF	6.00	89,400

ARCH: Mackenzie  
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DESIGN LEVEL: Concept

CONSTRUCTION FOCUS, INC.  
541-686-2031  
EUGENE, OREGON

ESTIMATE DATE: May 29, 2014  
REVISION #: 2  
CONST. START: 1 QTR 2016

Station 22- Cost Summary

2130356.00

FIRE STATION 22  
Statement of Probable Cost

3/4

LOC	ITEM	DESCRIPTION	QNTY	UNIT	\$/UNIT	TOTAL \$
<b>Fire Protection</b>						<b>38,740</b>
	Fire protection	riser/mains/drops/heads	14,900	SF	2.60	38,740
<b>HVAC</b>						<b>238,400</b>
	HVAC	equip/ducting/TAB	14,900	SF	16.00	238,400
<b>Electrical</b>						<b>455,050</b>
	Electrical	power/lighting	14,900	SF	18.00	268,200
	Electrical	fire alarm	14,900	SF	1.50	22,350
	Electrical	generator	1	LS	90,000.00	90,000
	Electrical	telephone/data	14,900	SF	1.00	14,900
	Electrical	PV system	14,900	SF	4.00	59,600
<b>NEW BUILDING HARDCOST</b>						<b>2,534,417</b>
<b>SITWORK</b>						
	Gross Project Area		84,152	SF		
<b>Demolition and Earthwork</b>						<b>159,022</b>
	Building demolition	x_wood frame/1-story	4,850	SF	4.00	19,400
	Asbestos abatement	allowance	1	LS	20,000.00	20,000
	Erosion control	bags & fence	84,152	SF	0.04	3,366
	Survey	set pins & stakes	84,152	SF	0.12	10,098
	Earthwork	excav/grade	69,252	SF	0.75	51,939
	Earthwork	rock/backfill/finish	49,290	SF	1.10	54,219
<b>Site Improvements</b>						<b>97,045</b>
	Striping	painting/symbols	49,290	SF	0.02	986
	Signage	monument signage	1	EA	8,000.00	8,000
	Signage	ADA parking	2	EA	120.00	240
	Wheel stops	allowance	5	EA	87.00	435
	Flagpole	allowance	2	EA	2,800.00	5,600
	Bollards	pipe & concrete base	24	EA	257.89	6,189
	Fencing	chain link/black vinyl	1,217	LF	35.00	42,595
	Vehicle access security gate	35'w, rolling	1	EA	11,000.00	11,000
	Fuel	fuel tank-500 gal/curb/pump	1	EA	12,000.00	12,000
	Trash enclosure		1	LS	10,000.00	10,000
<b>Landscaping</b>						<b>59,886</b>
	Landscaping	soil/lawn/trees/plants/irrig	19,962	SF	3.00	59,886
<b>Hardscapes</b>						<b>187,493</b>
	Site curb-full ht	f/s/pl/fin 0.63' Wx1.33' Ht	1,578	LF	18.00	28,404
	AC paving	place 3" ave thick	29,574	SF	1.90	56,191
	Concrete apron	f/s/pl/fin 6in	7,394	SF	7.25	53,607
	Sidewalk	f/s/pl/fin 4in	12,323	SF	4.00	49,292
<b>Site Utilities</b>						<b>98,370</b>
	Fire line	pipe:6-in /trench/bkfill	100	LF	48.00	4,800
	Fire service vault	vault & BFP	1	EA	9,500.00	9,500
	Water system piping	pipe:1.5-in /trench/bkfill	100	LF	35.01	3,501
	Storm piping	6" pipe/excav/bkfill	740	LF	24.00	17,760

ARCH: Mackenzie  
DWG DATE: May, 2014  
DESIGN LEVEL: Concept

CONSTRUCTION FOCUS, INC.  
541-686-2031  
EUGENE, OREGON

ESTIMATE DATE: May 29, 2014  
REVISION #: 2  
CONST. START: 1 QTR 2016

Station 22 - Cost Summary

June 18, 2014

FIRE STATION 22  
Statement of Probable Cost

LOC	ITEM	DESCRIPTION	QNTY	UNIT	\$/UNIT	TOTAL \$
	Fdn & rain piping	pvc_4"	1,000	LF	12.00	12,000
	Catch basin	allowance	9	EA	900.00	8,100
	Area drain	allowance	3	TTL	300.00	900
	Sanitary piping	4" pipe/excav/bkfill	100	LF	30.75	3,075
	Oil/water separator	allowance	1	EA	4,733.86	4,734
	Site electrical	lighting	9	EA	3,500.00	31,500
	Site electrical	underground	100	LF	25.00	2,500
<b>SITWORK HARDCOST</b>						<b>601,816</b>
<b>HARDCOST TOTAL</b>						<b>3,136,233</b>
<b>Markups to the hardcost:</b>						
	Inflation & Contingency:	20.0%				627,247
	General Conditions:	7.0%				263,444
	Profit & OH at:	5.0%				201,346
	Perfomance Bond:					35,873
<b>BASE BID TOTAL:</b>						<b>4,264,143</b>
<b>EXCLUSIONS</b>						
Design fees, permit fees, system development fees, utility hookup charges, testing, BOLI fee.						
Moving expenses, anti-graffiti coating, fireproofing, rock excavation.						

## SCHEDULE OF FEES

# MACKENZIE.

**Bainbridge Island Fire Station 22, Bainbridge Island, Washington**

Job Number 2130356.00

**PRELIMINARY GOVERNMENTAL AND JURISDICTIONAL FEES**

Date 6/2/2014

**City of Bainbridge Island**

Prepared By LEH

Please note: This preliminary estimate is provided as a convenience to our clients, and is not intended to duplicate the actual fees assessed by the governing jurisdiction(s). Every effort has been made to accurately estimate the fees that will be associated with this project. However this information is based solely on the information available on the date of this estimate, and actual fees may vary at the time of permit application or issuance. If information and/or assumptions about the project change, then we rely on our clients to notify us if a revision to this estimate is needed. In addition, please review the notes below.

**ASSUMPTIONS:**

Building Floor Area:		14,900 SF
Total Site Area:		135,619 SF
<b>A</b> Building Valuation:	Based on Construction Type II-B	\$2,384,000
Impervious Surface Area:		60,583 SF
Water Meter:		2 inch
<b>B</b> Equivalent Residential Units (ERU):	Based on Sewer Connection Analysis	10 ERU

**PERMIT FEE ESTIMATE:**

**Site Development**

<b>C</b> Pre-application Fee:	Flat Fee	\$265
<b>C</b> SEPA Review:	No fee for Checklist	N/A
<b>D</b> Conditional Use Permit:	Assumes Major Conditional Use	\$10,494
<b>E</b> Site Plan Review:	Assumes Major Site Plan Review	\$8,586
<b>F</b> Clearing and Grading Permit:	Permit Fee	\$325
	Plan Review	\$270

**Building Permit**

<b>G</b> Building Permit Fees:	Permit Fee	\$10,660
	Plan Review	\$6,929
	Planning and Engineering Review	\$2,132
<b>H</b> Mechanical Permit Fees:	Permit Fees	\$5,680
	Issuance Fee	\$24
<b>I</b> Electrical Permit Fees:	Permit Fees	\$745
	Issuance Fees	\$24
<b>J</b> Plumbing Permit Fees:	Permit Fees	\$402
	Issuance Fees	\$24
<b>K</b> Fire Building Permit Fees:	Fire Marshal Plan Review	\$0
	Building Plan Review and Field Inspection	\$1,192
<b>L</b> Fire Sprinkler Permit Fees:	Permit Fee	\$531
	Plan Review	\$345
<b>M</b> Fire Alarm Systems Permit Fees:	Permit Fee	\$354
	Plan Review	\$230
<b>N</b> SBCC Building Fee:	Remitted to the State of Washington	\$5

**Signage**

<b>O</b> Sign Permit Fees:		\$132
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**System Development Charges**

<b>P</b> Water:	System Participation Fee	N/A
	Connection Fee	N/A
	Inspection Fee	N/A
<b>Q</b> Sewer:	System Participation Fee	\$51,230
	Connection Fee	N/A
	Inspection Fee	\$1,000
<b>R</b> Stormwater Impact Fee:	Fee per year	\$2,964
<b>S</b> Transportation Impact Fee:		N/A
<b>T</b> Drainage Impact Fee:		N/A

**TOTAL      \$104,541**

## SCHEDULE OF FEES

### Notes:

**\* All fees are based on the City of Bainbridge Island Fee Schedule updated March 2014 unless otherwise noted.**

**A. Building Valuation:** For the purpose of this needs assessment, building valuation data was calculated using a II-B construction type and type B occupancy, which yields a higher construction cost than the actual cost.

**B. Equivalent Residential Units (ERU):** The ERU's are defined as each set of 20 fixture units as shown on the schedule of fixture units on file with the City Clerk and calculated using the Sewer Connection Analysis provided by the City of Bainbridge Island Public Works Department. For the purpose of this needs assessment it is assumed there will be approximately 200 total fixture units which is equal to 10 ERUs.

**C. SEPA Review:** Per Joshua Machen, City of Bainbridge Island Planning Manager, depending on the proposed changes to the site, a SEPA checklist may be required but no fee would be required for a separate SEPA review.

**D. Conditional Use Permit:** Conditional use of a governmental facility within a residential zoning district requires approval of a major conditional use. The fee for a minor conditional use is \$4,770.

**E. Site Plan Review:** For the purpose of this needs assessment, it is assumed that a major site plan review will be required. Per Joshua Machen, Planning Manager with the City of Bainbridge Island, the type of site plan review is depicted primarily by public comment.

**F. Clearing and Grading Permit:** The clearing and grading permit and plan review fees are calculated from the 1997 UAC (Uniform Administrative Code) Table 3-G and 3-H. For the purposes of this needs assessment, the clearing and grading permit and plan review fees have been estimated by the project team.

**G. Building Permit Fees:** The building permit fees are based on current building valuation data from the International Code Council (ICC) times a factor of 1.41 and calculated from the 1997 UAC (Uniform Administrative Code) Table 3-A. Permit fees calculated as \$5,608.75 for the first \$1,000,000 plus \$3.65 for each additional \$1,000 or fraction thereof. Plan review fees are 65 percent of the permit fees. Planning and engineering review of building permits is 20 percent of the building permit fee to cover engineering reviews for drainage analysis and planning reviews.

**H. Mechanical Permit Fees:** Mechanical permit fees are calculated using the 1997 UAC (Uniform Administrative Code) Table 3-C. For the purpose of this needs assessment, the mechanical permit fee has been estimated by the project team. The permit issuance fee is \$23.50.

**I. Electrical Permit Fees:** Electrical permit fees are calculated using the 1997 UAC (Uniform Administrative Code) Table 3-C. For the purpose of this needs assessment, the electrical permit fee has been estimated by the project team. The permit issuance fee is \$23.50.

**J. Plumbing Permit Fees:** Plumbing permit fees are calculated using the 1997 UAC (Uniform Administrative Code) Table 3-D. The permit fees are calculated as \$9.80 per fixture using 41 fixtures for the purpose of this needs assessment. The permit issuance fee is \$23.50.

**K. Fire Building Permit Fees:** Fire marshal plan review of planning applications are including in building and planning fee amounts. Building plan review and field inspections for buildings with a valuation of \$1,000,000 or greater are calculated as \$500 per million value or portion thereof.

**L. Fire Sprinkler Permit Fees:** Fire sprinkler permit fees are based on the fee schedule utilized for computing building permit fees, using the actual contract cost of the installation of the sprinkler system. For the purposes of this needs assessment, it is assumed that the valuation for fire sprinklers is \$38,740 and the permit fees are calculated as \$391.75 for the first \$25,000 plus \$10.10 for each additional \$1,000 or fraction thereof to and including \$50,000. Fire sprinkler plan review fees are equal to 65 percent of the permit fees.

**M. Fire Alarm Permit Fees:** Fire alarm permit fees are based on the fee schedule utilized for computing building permit fees, using the actual contract cost of the installation of the alarm system. For the purpose of this needs assessment, it is assumed that the valuation for the fire alarms is \$22,350 and the permit fees are calculated as \$69.25 for the first \$2,000 plus \$14 for each additional \$1,000 or fraction thereof to and including \$25,000. Fire alarm permit plan review fees are equal to 65 percent of the permit fees.

**N. SBCC Building Fee:** The building fee (SBCC) is remitted to the State of Washington and funds studies on building safety.

**O. Sign Permit Fees:** Sign permit fees are based on the valuation given by the applicant. For the purpose of this needs assessment, the sign valuation is assumed to be \$6,500. The sign permit fees are calculated as \$69.25 for the first \$2,000 plus \$14 for each additional \$1,000 or fraction thereof to and including \$25,000.

**P. Water SDC:** Per Aaron Claiborne, Utilities Project Coordinator with the City of Bainbridge Island Operations and Maintenance Department, the water system participation, connection, and inspection fees would not apply since there is already an existing water meter in place.

**Q. Sewer SDC:** Sewer participation fees are calculation by ERUs which is defined as a set of 20 fixture units. The fee per ERU is \$5,123. Per Aaron Claiborne, Utilities Project Coordinator with the City of Bainbridge Island Operations and Maintenance Department, sewer connection fees will not be charged for changing fixtures. Sewer inspection fees are calculated as \$100 per each set of 20 fixture units or portion thereof. The fee per 20 fixture units is \$100.

**R. Stormwater Impact Fees:** Storm and surface water rates are billed yearly on property taxes. For the purpose of this needs assessment, the stormwater rates are shown for one year. The rates are calculated per SFE (single family equivalent) which is the amount of impervious area divided by 3,000 square feet. The amount of SFE's times the base billing rate of \$12.23 is the monthly billing amount for stormwater. Per Joshua Machen, Planning Manager with the City of Bainbridge Island, fee adjustments may be made at the time of construction completion.

**S. Transportation Impact Fee:** Per Joshua Machen, Planning Manager at the City of Bainbridge Island, the City does not currently charge transportation impact fees.

**T. Drainage Impact Fees:** Per Joshua Machen, Planning Manager at the City of Bainbridge Island, drainage impact fees are historical fees and are no longer charged.

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# Station 23

Project Cost Summary

5/27/2014

		Full Cost:	Comments:
<b>Construction Cost of Facility:</b>			
<b>General Contractor Construction Cost</b>		<b>\$600,051.00</b>	\$45.17 SF
General Conditions	0.00%	\$0.00	Included in Estimate (7%)
Bonds & Insurances	0.00%	\$0.00	Included in Estimate (1%)
Overhead & Profit	0.00%	\$0.00	Included in Estimate (5%)
Design Contingency	0.00%	\$0.00	Included in Estimate (20%)
Escalation Start of Construction - 1Q/2016	0.00%	\$0.00	Included in Estimate (3%)
<b>Sub Total GCC Costs (site/building/margins)</b>		<b>\$600,051.00</b>	\$45.17 SF
<b>Consultant Costs</b>			
A/E Design and Construction - Base		\$120,010.20	20% of GCC Cost
Reimbursables		\$12,001.02	
<b>Sub Total</b>		<b>\$132,011.22</b>	
Owner's Project Manager		\$60,000.00	Allowance
Marketing Materials		\$2,000.00	Allowance
Topo and Boundary Survey		\$7,500.00	Allowance
Special Inspections		\$20,000.00	Allowance
Geotechnical Services		\$15,000.00	Allowance
Environmental Services		\$0.00	Excluded
Hazardous Material Survey / Testing / Mitigation Specifications		\$10,000.00	Allowance
Commissioning		\$30,000.00	Allowance
Arborist		\$5,000.00	Allowance
<b>Sub Total</b>		<b>\$149,500.00</b>	
<b>Sub Total Consultants</b>		<b>\$281,511.22</b>	
Consultants Contingency		7.50%	
<b>Subtotal</b>		<b>\$21,113.34</b>	
<b>Sub Total - Consultants Costs</b>		<b>\$302,624.56</b>	
<b>Owner Cost</b>			
Land Acquisition		\$0.00	Addition/Remodel on Existing Site
Fixtures, Furniture & Equipment (FF&E)		\$28,000.00	Allowance
Lockers / Shelving		\$0.00	
Fitness Equipment		\$0.00	Allowance
Telephone/Data Equipment		\$0.00	Allowance
<b>Sub Total</b>		<b>\$28,000.00</b>	
Moving Allowance		\$0.00	Allowance
Temporary Facilities		\$0.00	Allowance
Permit Fees		\$81,180.00	Allowance
<b>Sub Total</b>		<b>\$81,180.00</b>	
<b>Sub Total - Owner costs</b>		<b>\$109,180.00</b>	
Owner Contingency		7.50%	
<b>Sub Total</b>		<b>\$8,188.50</b>	
<b>Sub Total - Owner costs</b>		<b>\$117,368.50</b>	
<b>Project Sub-Total</b>		<b>\$1,020,044.06</b>	
Washington Sales Tax (8.7%)		\$88,743.83	
<b>Total Project Cost</b>		<b>\$1,108,787.89</b>	

**Building Size:** 13,283 SF

Scope: Includes required demolition and addition/remodel of facility  
 FF&E: Includes Furniture (10K), Camera's/Security/CCTV (13k), Signage (5K)  
 Permits: Includes Building Permits, Site Development fees and SDC fees and signage permit  
 Exclusions: LEED, Hazardous Material Removal, Environmental, Off-site improvements

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FIRE STATION 23  
Statement of Probable Cost

1/1

LOC	ITEM	DESCRIPTION	QNTY	UNIT	\$/UNIT	TOTAL \$
<b>RENOVATIONS &amp; ADDITIONS</b>						
		Project Gross Area	98,028	SF		
		Site Net Area	84,745	SF		
		Building Footprint	13,283	SF		
	<b>Building</b>					<b>358,391</b>
	Building addition	apparatus bay	970	SF	110.00	106,700
	Building renovation		2,577	SF	75.00	193,275
	Existing building	minor repairs & finishes	9,736	SF	6.00	58,416
	<b>Site Development</b>					<b>40,350</b>
	AC paving	place 3" ave thick	4,000	SF	3.00	12,000
	Sidewalk	f/s/pl/fin 4in	1,000	SF	4.50	4,500
	Landscaping	topsoil/plants/lawn/irrig	1,500	SF	3.90	5,850
	Signage	allowance	1	LS	8,000.00	8,000
	Site lighting	base/pole/conduit	1	LS	10,000.00	10,000
		<b>HARDCOST TOTAL</b>				<b>398,741</b>
		<b>Markups to the hardcost:</b>				
		Inflation & Contingency:	25.0%			99,685
		General Conditions:	11.0%			54,827
		Profit & OH at:	7.0%			38,728
		Performance Bond:				8,070
		<b>BASE BID TOTAL:</b>				<b>600,051</b>
	<b>EXCLUSIONS</b>	Design fees, permit fees, system development fees, utility hookup charges, testing, BOLI fee. Moving expenses, anti-graffiti coating, fireproofing, rock excavation.				

ARCH: Mackenzie  
DWG DATE: May, 2014  
DESIGN LEVEL: Concept

CONSTRUCTION FOCUS, INC.  
541-686-2031  
EUGENE, OREGON

ESTIMATE DATE: May 29, 2014  
REVISION #: 2  
CONST. START: 1 QTR 2016

Station 23 - Cost Summary

2130356.00

## SCHEDULE OF FEES

# MACKENZIE.

**Bainbridge Island Fire Station 23, Bainbridge Island, Washington**

Job Number 2130356.00

**PRELIMINARY GOVERNMENTAL AND JURISDICTIONAL FEES**

Date 6/2/2014

**City of Bainbridge Island**

Prepared By LEH

Please note: This preliminary estimate is provided as a convenience to our clients, and is not intended to duplicate the actual fees assessed by the governing jurisdiction(s). Every effort has been made to accurately estimate the fees that will be associated with this project. However this information is based solely on the information available on the date of this estimate, and actual fees may vary at the time of permit application or issuance. If information and/or assumptions about the project change, then we rely on our clients to notify us if a revision to this estimate is needed. In addition, please review the notes below.

**ASSUMPTIONS:**

Building Floor Area:		13,283 SF
Total Site Area:		141,519 SF
<b>A</b> Building Valuation:	Based on Construction Type II-B	\$567,520
Impervious Surface Area:		57,977 SF
Water Meter:		2 inch
<b>B</b> Equivalent Residential Units (ERU):	Based on Sewer Connection Analysis	1 ERU

**PERMIT FEE ESTIMATE:**

**Site Development**

Pre-application Fee:	Flat Fee	\$265
<b>C</b> SEPA Review:	No fee for Checklist	N/A
<b>D</b> Conditional Use Permit:	Assumes Major Conditional Use	\$10,494
<b>E</b> Site Plan Review:	Assumes Major Site Plan Review	\$8,586
<b>F</b> Clearing and Grading Permit:	Permit Fee	\$209
	Plan Review	\$74

**Building Permit**

<b>G</b> Building Permit Fees:	Permit Fee	\$3,554
	Plan Review	\$2,310
	Planning and Engineering Review	\$711
<b>H</b> Mechanical Permit Fees:	Permit Fees	\$674
	Issuance Fee	\$24
<b>I</b> Electrical Permit Fees:	Permit Fees	\$177
	Issuance Fees	\$24
<b>J</b> Plumbing Permit Fees:	Permit Fees	\$20
	Issuance Fees	\$24
<b>K</b> Fire Building Permit Fees:	Fire Marshal Plan Review	\$0
	Building Plan Review and Field Inspection	\$400
<b>L</b> Fire Sprinkler Permit Fees:	Permit Fee	N/A
	Plan Review	N/A
<b>M</b> Fire Alarm Systems Permit Fees:	Permit Fee	N/A
	Plan Review	N/A
<b>N</b> SBCC Building Fee:	Remitted to the State of Washington	\$5

**Signage**

<b>O</b> Sign Permit Fees:		\$132
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**System Development Charges**

<b>P</b> Water:	System Participation Fee	N/A
	Connection Fee	N/A
	Inspection Fee	N/A
<b>Q</b> Sewer:	System Participation Fee	\$5,123
	Connection Fee	N/A
	Inspection Fee	\$100
<b>R</b> Stormwater Impact Fee:	Fee per year	\$2,836
<b>S</b> Transportation Impact Fee:		N/A
<b>T</b> Drainage Impact Fee:		N/A

**TOTAL      \$35,741**

## SCHEDULE OF FEES

### Notes:

\* All fees are based on the City of Bainbridge Island Fee Schedule updated March 2014 unless otherwise noted.

**A. Building Valuation:** For the purpose of this needs assessment, building valuation data was calculated using a II-B construction type and type B occupancy, which yields a higher construction cost than the actual cost. The building valuation shown for Fire Station 23 is based on the 3,547 square foot addition and renovation.

**B. Equivalent Residential Units (ERU):** The ERU's are defined as each set of 20 fixture units as shown on the schedule of fixture units on file with the City Clerk and calculated using the Sewer Connection Analysis provided by the City of Bainbridge Island Public Works Department. For the purpose of this needs assessment it is assumed there will be approximately 6 total fixture units which is equal to 1 ERUs.

**C. SEPA Review:** Per Joshua Machen, City of Bainbridge Island Planning Manager, depending on the proposed changes to the site, a SEPA checklist may be required but no fee would be required for a separate SEPA review.

**D. Conditional Use Permit:** Conditional use of a governmental facility within a residential zoning district requires approval of a major conditional use. The fee for a minor conditional use is \$4,770.

**E. Site Plan Review:** For the purpose of this needs assessment, it is assumed that a major site plan review will be required. Per Joshua Machen, Planning Manager with the City of Bainbridge Island, the type of site plan review is depicted primarily by public comment.

**F. Clearing and Grading Permit:** The clearing and grading permit and plan review fees are calculated from the 1997 UAC (Uniform Administrative Code) Table 3-G and 3-H. For the purposes of this needs assessment, the clearing and grading permit and plan review fees have been estimated by the project team.

**G. Building Permit Fees:** The building permit fees are based on current building valuation data from the International Code Council (ICC) times a factor of 1.41 and calculated from the 1997 UAC (Uniform Administrative Code) Table 3-A. Permit fees calculated as \$3,233.75 for the first \$500,000 plus \$4.75 for each additional \$1,000 or fraction thereof. Plan review fees are 65 percent of the permit fees. Planning and engineering review of building permits is 20 percent of the building permit fee to cover engineering reviews for drainage analysis and planning reviews.

**H. Mechanical Permit Fees:** Mechanical permit fees are calculated using the 1997 UAC (Uniform Administrative Code) Table 3-C. For the purpose of this needs assessment, the mechanical permit fee has been estimated by the project team. The permit issuance fee is \$23.50.

**I. Electrical Permit Fees:** Electrical permit fees are calculated using the 1997 UAC (Uniform Administrative Code) Table 3-C. For the purpose of this needs assessment, the electrical permit fee has been estimated by the project team. The permit issuance fee is \$23.50.

**J. Plumbing Permit Fees:** Plumbing permit fees are calculated using the 1997 UAC (Uniform Administrative Code) Table 3-D. The permit fees are calculated as \$9.80 per fixture using 2 fixtures for the purpose of this needs assessment. The permit issuance fee is \$23.50.

**K. Fire Building Permit Fees:** Fire marshal plan review of planning applications are including in building and planning fee amounts. Building plan review and field inspections for buildings with a valuation of \$500,000 to \$999,999 is \$400.

**L. Fire Sprinkler Permit Fees:** For the purpose of this needs assessment, it is estimated that the renovation of Fire Station 23 will not include adding or changing the fire sprinklers.

**M. Fire Alarm Permit Fees:** For the purpose of this needs assessment, it is estimated that the renovation of Fire Station 23 will not include adding or changing the fire alarms.

**N. SBCC Building Fee:** The building fee (SBCC) is remitted to the State of Washington and funds studies on building safety.

**O. Sign Permit Fees:** Sign permit fees are based on the valuation given by the applicant. For the purpose of this needs assessment, the sign valuation is assumed to be \$6,500. The sign permit fees are calculated as \$69.25 for the first \$2,000 plus \$14 for each additional \$1,000 or fraction thereof to and including \$25,000.

**P. Water SDC:** Per Aaron Claiborne, Utilities Project Coordinator with the City of Bainbridge Island Operations and Maintenance Department, the water system participation, connection, and inspection fees would not apply since there is already an existing water meter in place.

**Q. Sewer SDC:** Sewer participation fees are calculation by ERUs which is defined as a set of 20 fixture units. The fee per ERU is \$5,123. Per Aaron Claiborne, Utilities Project Coordinator with the City of Bainbridge Island Operations and Maintenance Department, sewer connection fees will not be charged for changing fixtures. Sewer inspection fees are calculated as \$100 per each set of 20 fixture units or portion there of. The fee per 20 fixture units is \$100.

**R. Stormwater Impact Fees:** Storm and surface water rates are billed yearly on property taxes. For the purpose of this needs assessment, the stormwater rates are shown for one year. The rates are calculated per SFE (single family equivalent) which is the amount of impervious area divided by 3,000 square feet. The amount of SFE's times the base billing rate of \$12.23 is the monthly billing amount for stormwater. Per Joshua Machen, Planning Manager with the City of Bainbridge Island, fee adjustments may be made at the time of construction completion.

**S. Transportation Impact Fee:** Per Joshua Machen, Planning Manager at the City of Bainbridge Island, the City does not currently charge transportation impact fees.

**T. Drainage Impact Fees:** Per Joshua Machen, Planning Manager at the City of Bainbridge Island, drainage impact fees are historical fees and are no longer charged.

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# Police Station

## Project Cost Summary

5/27/2014

		Full Cost:	Comments:
<b>Construction Cost of Facility:</b>			
<b>General Contractor Construction Cost</b>		<b>\$5,730,065.00</b>	\$297.36 SF
General Conditions	0.00%	\$0.00	Included in Estimate (7%)
Bonds & Insurances	0.00%	\$0.00	Included in Estimate (1%)
Overhead & Profit	0.00%	\$0.00	Included in Estimate (5%)
Design Contingency	0.00%	\$0.00	Included in Estimate (20%)
Escalation Start of Construction - 1Q/2016	0.00%	\$0.00	Included in Estimate (3%)
<b>Sub Total GCC Costs (site/building/margins)</b>		<b>\$5,730,065.00</b>	\$297.36 SF
<b>Consultant Costs</b>			
A/E Design and Construction - Base		\$458,405.20	8% of GCC Cost
A/E LEED Design and Documentation		\$100,000.00	
Reimbursables		\$45,840.52	
<b>Sub Total</b>		<b>\$604,245.72</b>	
Owner's Project Manager		\$143,251.63	2.5% of GCC Cost Allowance Allowance Allowance Allowance Excluded Allowance Allowance Allowance
Marketing Materials		\$2,000.00	
Topo and Boundary Survey		\$7,500.00	
Special Inspections		\$20,000.00	
Geotechnical Services		\$15,000.00	
Environmental Services		\$0.00	
Hazardous Material Survey / Testing / Mitigation Specifications		\$0.00	
Commissioning		\$30,000.00	
Arborist		\$5,000.00	
<b>Sub Total</b>		<b>\$222,751.63</b>	
<b>Sub Total Consultants</b>		<b>\$826,997.35</b>	
Consultants Contingency		7.50%	
<b>Subtotal</b>		<b>\$62,024.80</b>	
<b>Sub Total - Consultants Costs</b>		<b>\$889,022.15</b>	
<b>Owner Cost</b>			
Land Acquisition		\$0.00	To be determined
Fixtures, Furniture & Equipment (FF&E)		\$104,000.00	Allowance
Lockers / Shelving		\$130,000.00	Allowance
Fitness Equipment		\$15,000.00	Allowance
Telephone/Data Equipment		\$15,000.00	Allowance
LEED Registration		\$3,000.00	USGBC assessed fee
<b>Sub Total</b>		<b>\$267,000.00</b>	
Moving Allowance		\$10,000.00	Allowance
Permit Fees		\$102,216.00	Allowance
<b>Sub Total</b>		<b>\$112,216.00</b>	
<b>Sub Total - Owner costs</b>		<b>\$379,216.00</b>	
Owner Contingency		7.50%	
<b>Sub Total</b>		<b>\$28,441.20</b>	
<b>Sub Total - Owner costs</b>		<b>\$407,657.20</b>	
<b>Project Sub-Total</b>		<b>\$7,026,744.35</b>	
Washington Sales Tax (8.7%)		\$611,326.76	
<b>Total Project Cost</b>		<b>\$7,638,071.10</b>	

**Building Size:**

19,270 SF

Scope: Includes construction of new facility on hypothetical site  
 FF&E: Includes Furniture (86K), Camera's/Security/CCTV (13k), Signage (5K)  
 Permits: Includes Building Permits, Site Development fees and SDC fees and signage permit  
 Exclusions: Hazardous Material Removal, Environmental, Off-site improvements

**STAND ALONE POLICE STATION**  
Statement of Probable Cost

1/4

LOC	ITEM	DESCRIPTION	QNTY	UNIT	\$/UNIT	TOTAL \$
<b>NEW BUILDING</b>						
	Floor Gross Area		19,270	SF		
	<b>Earthwork &amp; Concrete</b>					<b>290,913</b>
	Earthwork	excavation/grade	19,270	SF	1.70	32,759
	Earthwork	rock/backfill/finish	19,270	SF	2.50	48,175
	Slab: monolithic	f/s/pl/fin 4in	19,270	SF	5.70	109,839
	Concrete	misc	19,270	SF	2.00	38,540
	Pad footings	f/s/pl various sizes	56	EA	1,100.00	61,600
	<b>Masonry</b>					<b>64,104</b>
	Masonry	CMU	2,712	SF	17.00	46,104
	Holding cells		3	EA	6,000.00	18,000
	<b>Steel</b>					<b>202,070</b>
	Structural steel	fab & install	23,317	SF	2.00	46,634
	Slab edge angle	fab & install	150	LF	34.00	5,100
OH Door	Jamb wraps	fab & install	6	EA	900.00	5,400
Carpport	Structural steel roof	ftg/columns/joists/st-dkg	3,294	SF	44.00	144,936
Grd Fl	<b>Rough Carpentry</b>					<b>137,627</b>
	Wall: exterior	2x6 framing/shtg	6,780	SF	5.30	35,934
	Wall: interior	2x4 & 2x6 framing	23,317	SF	3.70	86,273
	Framing	col/beams/headers	771	LF	20.00	15,420
	<b>Finish Carpentry</b>					<b>41,075</b>
	Finish carpentry	allowance	16,430	SF	2.50	41,075
	<b>Cabinetry &amp; Counters</b>					<b>128,352</b>
	Lower cabinets	p-lam/melamine	274	LF	210.00	57,540
	Upper cabinets	p-lam/melamine	235	LF	132.00	31,020
	Transaction counter	framing/stl support	1	LS	1,500.00	1,500
	Counter tops	p-laminate	548	SF	24.00	13,152
	Mailboxes	p-lam_48" high x 10" Deep	10	LF	200.00	4,000
	Reception		10	LF	390.00	5,460
	Cubbies		30	EA	140.00	15,680
	<b>SIP and Insulation</b>					<b>246,019</b>
Exterior	SIP roof panels	8-1/4" overall	22,195	SF	9.75	216,401
Interior	Thermal batt insulation	R-19 & vapor barrier	10,560	SF	1.35	14,256
	Insulation @ walls	4" acoustic batt	27,931	SF	0.55	15,362
	<b>Exterior Cladding</b>					<b>91,927</b>
	Siding	Nichiha panels	4,068	SF	20.00	81,360
	Exterior trim	Hardi trim	2,034	LF	4.50	9,153
	Flexible flashing	Permabarrier_40 mil	272	LF	5.20	1,414
	<b>Roofing &amp; Sheet Metal</b>					<b>210,595</b>
	Roofing	standing seam metal	17,195	SF	10.00	171,950
	Roofing	BUR	5,000	SF	4.00	20,000
	Gutters, continuous	"K"_seamless-5"_prepnt	422	LF	6.00	2,532
	Downspouts	pre-pnt_24ga	222	LF	5.50	1,221
	Flashings	24 ga Kynar	2,886	LF	5.16	14,892

ARCH: Mackenzie  
DWG DATE: May, 2014  
DESIGN LEVEL: Concept

CONSTRUCTION FOCUS, INC.  
541-686-2031  
EUGENE, OREGON

ESTIMATE DATE: May 29, 2014  
REVISION #: 2  
CONST. START: 1 QTR 2016

**Police - Cost Summary**

June 18, 2014

**STAND ALONE POLICE STATION**  
Statement of Probable Cost

LOC	ITEM	DESCRIPTION	QNTY	UNIT	\$/UNIT	TOTAL \$
	<b>Sealants</b>					<b>1,017</b>
	Sealants	caulking	6,780	SF	0.15	1,017
	<b>Doors/Frames/Hardware</b>					<b>190,200</b>
Exterior	Doors	frm-HM/dr-HM/hdwr	14	DR	1,500.00	21,000
Interior	Doors	frm-HM/dr-wd/hdwr	99	DR	1,200.00	118,800
Other	Sectional door		3	EA	16,800.00	50,400
	<b>Glass &amp; Glazing</b>					<b>269,021</b>
	Raised roof glazing area	framing & glazing	1,319	SF	35.00	46,165
	Glazing		2,112	SF	50.00	105,600
Interior	Relite	HM frame/glazing	9	EA	650.00	5,850
P-Receipt	Bullet proof glazing	transaction window	1	EA	6,350.00	6,350
Police	Bullet proof glazing		845	SF	120.00	101,376
Interior	Bullet-proof glazing	Armortex, TP 300	4	EA	120.00	480
	Mirrors	mirror_3/16"_std	160	SF	20.00	3,200
	<b>Floor Coverings</b>					<b>49,561</b>
	Carpet tile	allowance	3,276	SF	3.50	11,466
	Rubber flooring	allowance	1,157	SF	5.90	6,826
	Sheet linoleum flrg	allowance	2,313	SF	4.20	9,715
	Sealer on concrete	allowance	12,526	SF	1.25	15,658
	Wall base	4" rubber	3,276	LF	1.80	5,897
	<b>Ceilings, Gypbd</b>					<b>211,240</b>
	Suspended ceiling	grid/ac-tile	16,430	SF	3.52	57,834
Walls	Gypsum board	5/8" bd & LVL 5 finish	42,394	SF	3.00	127,182
	Security barrier	diamond lath	5,925	SF	1.90	11,258
	Wall paneling	FRP	3,084	SF	4.50	13,878
	Wall covering	p-laminate	198	SF	5.50	1,089
	<b>Painting, Wall Coverings</b>					<b>93,074</b>
	Painting		44,321	SF	2.10	93,074
	<b>Specialties</b>					<b>60,778</b>
Police	Lockers		31	EA	250.00	7,750
	Toilet accessories	various types	25	TTL	105.00	2,625
	Louvers		8	EA	950.00	7,600
Exterior	Signage	allowance	1	LS	6,500.00	6,500
	Signage, interior	allowance	16,430	SF	0.17	2,793
	FEC	cabinet & ext	8	TTL	260.00	2,080
	Walk-in refrigerator	4'x8'	1	EA	15,000.00	15,000
	White boards, tackboards, projection screens		16,430	SF	1.00	16,430
	<b>Appliances</b>					<b>10,200</b>
	Refrigerator	Viking_36"_ss	1	EA	3,500.00	3,500
	Rangetop	Viking_open burner_gas	1	EA	4,500.00	4,500
	Dishwasher		1	EA	1,200.00	1,200
	Microwave		1	EA	700.00	700
	Washer and dryer	OFCI	2	EA	150.00	300
	<b>Furnishings</b>					<b>9,504</b>
	Window blinds	louvered blinds	2,112	SF	4.50	9,504

**STAND ALONE POLICE STATION**  
Statement of Probable Cost

3/4

LOC	ITEM	DESCRIPTION	QNTY	UNIT	\$/UNIT	TOTAL \$
<b>Plumbing</b>						<b>204,126</b>
	Plumbing	fixtures	43	EA	1,400.00	60,200
	Plumbing	specialties	50	EA	455.00	22,750
	Gas piping	piping/valves	463	LF	12.00	5,556
	Plumbing	piping: CW/vent/waste	19,270	SF	6.00	115,620
<b>Fire Protection</b>						<b>50,102</b>
	Fire protection	riser/mains/drops/heads	19,270	SF	2.60	50,102
<b>HVAC</b>						<b>539,560</b>
	HVAC	equip/ducting/TAB	19,270	SF	28.00	539,560
<b>Electrical</b>						<b>735,545</b>
	Electrical	power/lighting	19,270	SF	27.00	520,290
	Electrical	fire alarm	19,270	SF	1.50	28,905
	Electrical	generator	1	LS	90,000.00	90,000
	Electrical	telephone/data	19,270	SF	1.00	19,270
	Electrical	PV system	19,270	SF	4.00	77,080
<b>NEW BUILDING HARDCOST</b>						<b>3,836,611</b>
<b>SITWORK</b>						
Gross Project Area			63,590	SF		
Net Project Area			44,320	SF		
Hardscape Area			28,809	SF		
Landscape Area			15,155	SF		
Building Footprint			19,270	SF		
Building Perimeter			962	LF		
<b>Demolition and Earthwork</b>						<b>75,104</b>
	Erosion control	bags & fence	63,590	SF	0.04	2,544
	Survey	set pins & stakes	63,590	SF	0.12	7,631
	Earthwork	excav/grade	44,320	SF	0.75	33,240
	Earthwork	rock/backfill/finish	28,809	SF	1.10	31,690
<b>Site Improvements</b>						<b>76,337</b>
	Striping	painting/symbols	28,809	SF	0.02	576
	Signage	monument signage	1	EA	8,000.00	8,000
	Signage	ADA parking	2	EA	120.00	240
	Wheel stops	allowance	5	EA	87.00	435
	Flagpole	allowance	2	EA	2,800.00	5,600
	Bollards	pipe & concrete base	16	EA	257.89	4,126
	Fencing	chain link/black vinyl	696	LF	35.00	24,360
	Trash enclosure		1	LS	10,000.00	10,000
	Fuel	fuel tank-500 gal/curb/pump	1	EA	12,000.00	12,000
	Vehicle access security gate	35'w, rolling	1	EA	11,000.00	11,000
<b>Landscaping</b>						<b>45,465</b>
	Landscaping	soil/lawn/trees/plants/irrig	15,155	SF	3.00	45,465
<b>Hardscapes</b>						<b>109,586</b>
	Site curb-full ht	f/s/pl/fin 0.63' Wx1.33' Ht	922	LF	18.00	16,596

ARCH: Mackenzie  
DWG DATE: May, 2014  
DESIGN LEVEL: Concept

CONSTRUCTION FOCUS, INC.  
541-686-2031  
EUGENE, OREGON

ESTIMATE DATE: May 29, 2014  
REVISION #: 2  
CONST. START: 1 QTR 2016

**Police - Cost Summary**

June 18, 2014

**STAND ALONE POLICE STATION**  
Statement of Probable Cost

LOC	ITEM	DESCRIPTION	QNTY	UNIT	\$/UNIT	TOTAL \$
	AC paving	place 3" ave thick	17,286	SF	1.90	32,843
	Concrete apron	f/s/pl/fin 6in	4,322	SF	7.25	31,335
	Sidewalk	f/s/pl/fin 4in	7,203	SF	4.00	28,812
<b>Site Utilities</b>						<b>72,946</b>
	Fire line	pipe:6-in /trench/bkfill	100	LF	48.00	4,800
	Fire service vault	vault & BFP	1	EA	9,500.00	9,500
	Water system piping	pipe:1.5-in /trench/bkfill	100	LF	35.01	3,501
	Storm piping	6" pipe/excav/bkfill	433	LF	24.00	10,392
	Fdn & rain piping	pvc_4"	962	LF	12.00	11,544
	Catch basin	allowance	5	EA	900.00	4,500
	Area drain	allowance	3	TTL	300.00	900
	Sanitary piping	4" pipe/excav/bkfill	100	LF	30.75	3,075
	Oil/water separator	allowance	1	EA	4,733.86	4,734
	Site electrical	lighting	5	EA	3,500.00	17,500
	Site electrical	underground	100	LF	25.00	2,500
<b>SITWORK HARDCOST</b>						<b>379,438</b>
<b>HARDCOST TOTAL</b>						<b>4,216,049</b>
<b>Markups to the hardcost:</b>						
	Inflation & Contingency:	20.0%				843,210
	General Conditions:	7.0%				354,148
	Profit & OH at:	5.0%				270,670
	Performance Bond:					45,988
<b>BASE BID TOTAL:</b>						<b>5,730,065</b>
<b>EXCLUSIONS</b>						
Design fees, permit fees, system development fees, utility hookup charges, testing, BOLI fee.						
Moving expenses, anti-graffiti coating, fireproofing, rock excavation.						

SCHEDULE OF FEES

**MACKENZIE.**

**Bainbridge Island Police Department, Bainbridge Island, Washington**

Job Number 2130356.00

**PRELIMINARY GOVERNMENTAL AND JURISDICTIONAL FEES**

Date 6/2/2014

**City of Bainbridge Island**

Prepared By LEH

Please note: This preliminary estimate is provided as a convenience to our clients, and is not intended to duplicate the actual fees assessed by the governing jurisdiction(s). Every effort has been made to accurately estimate the fees that will be associated with this project. However this information is based solely on the information available on the date of this estimate, and actual fees may vary at the time of permit application or issuance. If information and/or assumptions about the project change, then we rely on our clients to notify us if a revision to this estimate is needed. In addition, please review the notes below.

**ASSUMPTIONS:**

Building Floor Area:		19,270 SF
Total Site Area:		63,148 SF
<b>A</b> Building Valuation:	Based on Construction Type II-B	\$3,083,200
Impervious Surface Area:		43,740 SF
Water Meter:		2 inch
<b>B</b> Equivalent Residential Units (ERU):	Based on Sewer Connection Analysis	12 ERU

**PERMIT FEE ESTIMATE:**

**Site Development**

Pre-application Fee:	Flat Fee	\$265
<b>C</b> SEPA Review:	No fee for Checklist	N/A
<b>D</b> Conditional Use Permit:		N/A
<b>E</b> Site Plan Review:	Assumes Major Site Plan Review	\$8,586
<b>F</b> Clearing and Grading Permit:	Permit Fee	\$325
	Plan Review	\$270

**Building Permit**

<b>G</b> Building Permit Fees:	Permit Fee	\$13,212
	Plan Review	\$8,588
	Planning and Engineering Review	\$2,642
<b>H</b> Mechanical Permit Fees:	Permit Fees	\$3,661
	Issuance Fee	\$24
<b>I</b> Electrical Permit Fees:	Permit Fees	\$964
	Issuance Fees	\$24
<b>J</b> Plumbing Permit Fees:	Permit Fees	\$461
	Issuance Fees	\$24
<b>K</b> Fire Building Permit Fees:	Fire Marshal Plan Review	\$0
	Building Plan Review and Field Inspection	\$1,542
<b>L</b> Fire Sprinkler Permit Fees:	Permit Fee	\$644
	Plan Review	\$419
<b>M</b> Fire Alarm Systems Permit Fees:	Permit Fee	\$431
	Plan Review	\$280
<b>N</b> SBCC Building Fee:	Remitted to the State of Washington	\$5

**Signage**

<b>O</b> Sign Permit Fees:		\$132
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**System Development Charges**

<b>P</b> Water:	System Participation Fee	N/A
	Connection Fee	N/A
	Inspection Fee	N/A
<b>Q</b> Sewer:	System Participation Fee	\$62,501
	Connection Fee	N/A
	Inspection Fee	\$1,220
<b>R</b> Stormwater Impact Fee:	Fee per year	\$2,140
<b>S</b> Transportation Impact Fee:		N/A
<b>T</b> Drainage Impact Fee:		N/A

**TOTAL \$108,358**

## SCHEDULE OF FEES

### Notes:

**\* All fees are based on the City of Bainbridge Island Fee Schedule updated March 2014 unless otherwise noted.**

**A. Building Valuation:** For the purpose of this needs assessment, building valuation data was calculated using a II-B construction type and type B occupancy, which yields a higher construction cost than the actual cost.

**B. Equivalent Residential Units (ERU):** The ERU's are defined as each set of 20 fixture units as shown on the schedule of fixture units on file with the City Clerk and calculated using the Sewer Connection Analysis provided by the City of Bainbridge Island Public Works Department. For the purpose of this needs assessment it is assumed there will be approximately 244 total fixture units which is equal to 12 ERUs.

**C. SEPA Review:** Per Joshua Machen, City of Bainbridge Island Planning Manager, depending on the proposed changes to the site, a SEPA checklist may be required but no fee would be required for a separate SEPA review.

**D. Conditional Use Permit:** For the purpose of this needs assessment, it is assumed that the police station will be located within a zoning district that permits governmental facilities outright and a conditional use permit will not be required.

**E. Site Plan Review:** For the purpose of this needs assessment, it is assumed that a major site plan review will be required. Per Joshua Machen, Planning Manager with the City of Bainbridge Island, the type of site plan review is depicted primarily by public comment.

**F. Clearing and Grading Permit:** The clearing and grading permit and plan review fees are calculated from the 1997 UAC (Uniform Administrative Code) Table 3-G and 3-H. For the purposes of this needs assessment, the clearing and grading permit and plan review fees have been estimated by the project team.

**G. Building Permit Fees:** The building permit fees are based on current building valuation data from the International Code Council (ICC) times a factor of 1.41 and calculated from the 1997 UAC (Uniform Administrative Code) Table 3-A. Permit fees calculated as \$5,608.75 for the first \$1,000,000 plus \$3.65 for each additional \$1,000 or fraction thereof. Plan review fees are 65 percent of the permit fees. Planning and engineering review of building permits is 20 percent of the building permit fee to cover engineering reviews for drainage analysis and planning reviews.

**H. Mechanical Permit Fees:** Mechanical permit fees are calculated using the 1997 UAC (Uniform Administrative Code) Table 3-C. For the purpose of this needs assessment, the mechanical permit fee has been estimated by the project team. The permit issuance fee is \$23.50.

**I. Electrical Permit Fees:** Electrical permit fees are calculated using the 1997 UAC (Uniform Administrative Code) Table 3-C. For the purpose of this needs assessment, the electrical permit fee has been estimated by the project team. The permit issuance fee is \$23.50.

**J. Plumbing Permit Fees:** Plumbing permit fees are calculated using the 1997 UAC (Uniform Administrative Code) Table 3-D. The permit fees are calculated as \$9.80 per fixture using 41 fixtures for the purpose of this needs assessment. The permit issuance fee is \$23.50.

**K. Fire Building Permit Fees:** Fire marshal plan review of planning applications are including in building and planning fee amounts. Building plan review and field inspections for buildings with a valuation of \$1,000,000 or greater are calculated as \$500 per million value or portion thereof.

**L. Fire Sprinkler Permit Fees:** Fire sprinkler permit fees are based on the fee schedule utilized for computing building permit fees, using the actual contract cost of the installation of the sprinkler system. For the purposes of this needs assessment, it is assumed that the valuation for fire sprinklers is \$50,102 and the permit fees are calculated as \$643.75 for the first \$50,000 plus \$7 for each additional \$1,000 or fraction thereof to and including \$100,000. Fire sprinkler plan review fees are equal to 65 percent of the permit fees.

**M. Fire Alarm Permit Fees:** Fire alarm permit fees are based on the fee schedule utilized for computing building permit fees, using the actual contract cost of the installation of the alarm system. For the purpose of this needs assessment, it is assumed that the valuation for the fire alarms is \$28,905 and the permit fees are calculated as \$391.75 for the first \$25,000 plus \$10.10 for each additional \$1,000 or fraction thereof to and including \$50,000. Fire alarm permit plan review fees are equal to 65 percent of the permit fees.

**N. SBCC Building Fee:** The building fee (SBCC) is remitted to the State of Washington and funds studies on building safety.

**O. Sign Permit Fees:** Sign permit fees are based on the valuation given by the applicant. For the purpose of this needs assessment, the sign valuation is assumed to be \$6,500. The sign permit fees are calculated as \$69.25 for the first \$2,000 plus \$14 for each additional \$1,000 or fraction thereof to and including \$25,000.

**P. Water SDC:** Per Aaron Claiborne, Utilities Project Coordinator with the City of Bainbridge Island Operations and Maintenance Department, the water system participation, connection, and inspection fees would not apply since there is already an existing water meter in place.

**Q. Sewer SDC:** Sewer participation fees are calculation by ERUs which is defined as a set of 20 fixture units. The fee per ERU is \$5,123. Per Aaron Claiborne, Utilities Project Coordinator with the City of Bainbridge Island Operations and Maintenance Department, sewer connection fees will not be charged for changing fixtures. Sewer inspection fees are calculated as \$100 per each set of 20 fixture units or portion thereof. The fee per 20 fixture units is \$100.

**R. Stormwater Impact Fees:** Storm and surface water rates are billed yearly on property taxes. For the purpose of this needs assessment, the stormwater rates are shown for one year. The rates are calculated per SFE (single family equivalent) which is the amount of impervious area divided by 3,000 square feet. The amount of SFE's times the base billing rate of \$12.23 is the monthly billing amount for stormwater. Per Joshua Machen, Planning Manager with the City of Bainbridge Island, fee adjustments may be made at the time of construction completion.

**S. Transportation Impact Fee:** Per Joshua Machen, Planning Manager at the City of Bainbridge Island, the City does not currently charge transportation impact fees.

**T. Drainage Impact Fees:** Per Joshua Machen, Planning Manager at the City of Bainbridge Island, drainage impact fees are historical fees and are no longer charged.

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# Public Safety Building

Project Cost Summary

5/27/2014

		Full Cost:	Comments:
<b>Construction Cost of Facility:</b>			
<b>General Contractor Construction Cost</b>		<b>\$11,615,944.00</b>	\$262.47 SF
General Conditions	0.00%	\$0.00	Included in Estimate (7%)
Bonds & Insurances	0.00%	\$0.00	Included in Estimate (1%)
Overhead & Profit	0.00%	\$0.00	Included in Estimate (5%)
Design Contingency	0.00%	\$0.00	Included in Estimate (20%)
Escalation Start of Construction - 1Q/2016	0.00%	\$0.00	Included in Estimate (3%)
<b>Sub Total GCC Costs (site/building/margins)</b>		<b>\$11,615,944.00</b>	\$262.47 SF
<b>Consultant Costs</b>			
A/E Design and Construction - Base		\$929,275.52	8% of GCC Cost
A/E LEED Design and Documentation		\$100,000.00	
Reimbursables		\$92,927.55	
<b>Sub Total</b>		<b>\$1,122,203.07</b>	
Owner's Project Manager		\$290,398.60	2.5% of GCC Cost
Marketing Materials		\$2,000.00	Allowance
Topo and Boundary Survey		\$7,500.00	Allowance
Special Inspections		\$20,000.00	Allowance
Geotechnical Services		\$15,000.00	Allowance
Environmental Services		\$0.00	Excluded
Hazardous Material Survey / Testing / Mitigation Specifications		\$15,000.00	Allowance
Commissioning		\$30,000.00	Allowance
Arborist		\$5,000.00	Allowance
<b>Sub Total</b>		<b>\$384,898.60</b>	
<b>Sub Total Consultants</b>		<b>\$1,507,101.67</b>	
Consultants Contingency		7.50%	
<b>Subtotal</b>		<b>\$113,032.63</b>	
<b>Sub Total - Consultants Costs</b>		<b>\$1,620,134.30</b>	
<b>Owner Cost</b>			
Land Acquisition		\$0.00	Addition/Remodel on Existing Site
Relocation of Over Head Power Lines to Underground		\$180,000.00	Allowance
Fixtures, Furniture & Equipment (FF&E)		\$205,903.00	Allowance
Lockers / Shelving		\$170,000.00	Allowance
Fitness Equipment		\$15,000.00	Allowance
Telephone/Data Equipment		\$30,000.00	Allowance
LEED Registration		\$3,000.00	USGBC assessed fee
<b>Sub Total</b>		<b>\$603,903.00</b>	
Moving Allowance		\$20,000.00	Allowance
Temporary Facilities		\$60,000.00	Allowance
Permit Fees		\$167,088.00	Allowance
<b>Sub Total</b>		<b>\$247,088.00</b>	
<b>Sub Total - Owner costs</b>		<b>\$850,991.00</b>	
Owner Contingency		7.50%	
<b>Sub Total</b>		<b>\$63,824.33</b>	
<b>Sub Total - Owner costs</b>		<b>\$914,815.33</b>	
<b>Project Sub-Total</b>		<b>\$14,150,893.62</b>	
Washington Sales Tax (8.7%)		\$1,231,127.75	
<b>Total Project Cost</b>		<b>\$15,382,021.37</b>	

<b>Building Size:</b>	<b>44,256 SF</b>
Scope: Includes demolition of existing buildings and construction of new facility and site improvements	
FF&E: Includes Furniture (170K), Camera's/Security/CCTV (26k), Signage (5K)	
Permits: Includes Building Permits, Site Development fees and SDC fees and signage permit	
Exclusions: Environmental, Off-site improvements	

**FIRE AND POLICE COMBINED**  
**Statement of Probable Cost**

1/4

LOC	ITEM	DESCRIPTION	QNTY	UNIT	\$/UNIT	TOTAL \$
<b>NEW BUILDING</b>						
		<b>Floor Gross Area</b>	<b>44,256</b>	SF		
	<b>Earthwork &amp; Concrete</b>					<b>547,740</b>
	Earthwork	excavation/grade	36,921	SF	1.75	64,612
	Earthwork	rock/backfill/finish	36,921	SF	2.60	95,995
	Slab: monolithic	f/s/pl/fin 4in	27,073	SF	5.70	154,316
	Slab: monolithic	f/s/pl/fin 6in	6,968	SF	8.50	59,228
	Slab on decking	4"	7,335	SF	4.00	29,340
	Pad footings	f/s/pl various sizes	185	EA	750.00	138,750
	Elevator pit		1	EA	5,500.00	5,500
	<b>Masonry</b>					<b>161,429</b>
	Masonry	CMU	8,437	SF	17.00	143,429
	Holding cells		3	EA	6,000.00	18,000
	<b>Steel</b>					<b>500,937</b>
2nd Fl	Structural steel	fab & install	7,335	SF	25.00	183,375
	Columns	fab & install	49	EA	550.00	26,950
	Slab edge angle	fab & install	112	LF	34.00	3,808
	Stairs-steel	stringers/tread/landing	3	SET	11,000.00	33,000
OH Door	Jamb wraps	fab & install	16	EA	900.00	14,400
	Balcony		660.00	SF	35.00	23,100
	Canopy	metal	400.00	SF	55.00	22,000
Carport	Structural steel roof	ftg/columns/joists/st-dkg	4,416	SF	44.00	194,304
	<b>Rough Carpentry</b>					<b>355,496</b>
Grd Fl	Wall: exterior	2x6 framing/shtg	21,092	SF	5.30	111,785
	Wall: interior	2x4 & 2x6 framing	44,675	SF	3.70	165,298
	Framing	col/beams/headers	1,477	LF	20.00	29,540
2nd Floor	Wall: interior	2x4 framing	8,435	SF	3.70	31,210
Interior	Bullet proof panels	1/2" thick panels, 6' ht	1,200	SF	14.72	17,663
	<b>Finish Carpentry</b>					<b>67,683</b>
	Finish carpentry	allowance	27,073	SF	2.50	67,683
	<b>Cabinetry &amp; Counters</b>					<b>194,340</b>
	Lower cabinets	p-lam/melamine	452	LF	210.00	94,920
	Upper cabinets	p-lam/melamine	387	LF	132.00	51,084
	Transaction counter	framing/stl support	1	LS	1,500.00	1,500
	Counter tops	p-laminate	904	SF	24.00	21,696
	Mailboxes	p-lam_48" high x 10" Deep	20	LF	200.00	4,000
	Reception		20	LF	390.00	5,460
	Cubbies		60	EA	140.00	15,680
	<b>SIP and Insulation</b>					<b>478,033</b>
Exterior	SIP roof panels	8-1/4" overall	42,460	SF	9.75	413,985
Interior	Thermal batt insulation	R-19 & vapor barrier	28,692	SF	1.35	38,734
	Insulation @ walls	4" acoustic batt	46,025	SF	0.55	25,314
	<b>Exterior Cladding</b>					<b>285,965</b>
	Siding	Nichiha panels	12,655	SF	20.00	253,100
	Exterior trim	Hardi trim	6,328	LF	4.50	28,476

ARCH: Mackenzie  
DWG DATE: May, 2014  
DESIGN LEVEL: Concept

CONSTRUCTION FOCUS, INC.  
541-686-2031  
EUGENE, OREGON

ESTIMATE DATE: May 29, 2014  
REVISION #: 2  
CONST. START: 1 QTR 2016

**Combined Public Safety - Cost Summary**

June 18, 2014

FIRE AND POLICE COMBINED  
Statement of Probable Cost

LOC	ITEM	DESCRIPTION	QNTY	UNIT	\$/UNIT	TOTAL \$
	Flexible flashing	Permabarrier_40 mil	844	LF	5.20	4,389
<b>Roofing &amp; Sheet Metal</b>						<b>472,474</b>
	Roofing	standing seam metal	41,960	SF	10.00	419,600
	Roofing	BUR	500	SF	4.00	2,000
	Gutters, continuous	"K"_seamless-5"_preprt	807	LF	6.00	4,842
	Downspouts	pre-pnt_24ga	425	LF	5.50	2,338
	Flashings	24 ga Kynar	8,468	LF	5.16	43,695
<b>Sealants</b>						<b>3,164</b>
	Sealants	caulking	21,092	SF	0.15	3,164
<b>Doors/Frames/Hardware</b>						<b>283,000</b>
Exterior	Doors	frm-HM/dr-HM/hdwr	14	DR	1,500.00	21,000
Interior	Doors	frm-HM/dr-wd/hdwr	125	DR	1,200.00	150,000
	Apparatus door	overhead	4	EA	4,800.00	19,200
	Apparatus door	bi-fold	4	EA	19,000.00	76,000
Other	Sectional door		3	EA	5,600.00	16,800
<b>Glass &amp; Glazing</b>						<b>458,572</b>
Fire	Glazing		3,443	SF	50.00	172,170
Interior	Relite	HM frame/glazing	10	EA	35.00	350
F-Receipt	Pass-through window	alum frame/glazing	1	EA	310.00	310
P-Receipt	Bullet proof glazing	transaction window	1	EA	6,350.00	6,350
Police	Bullet proof glazing		2,296	SF	120.00	275,472
Interior	Bullet proof glazing	Armortex, TP 300	6	EA	120.00	720
	Mirrors	mirror_3/16"_std	160	SF	20.00	3,200
<b>Floor Coverings</b>						<b>113,813</b>
	Carpet tile	allowance	7,524	SF	3.50	26,334
	Rubber flooring	allowance	2,656	SF	5.90	15,670
	Sheet linoleum flrg	allowance	5,311	SF	4.20	22,306
	Sealer on concrete	allowance	28,767	SF	1.25	35,959
	Wall base	4" rubber	7,524	LF	1.80	13,543
<b>Ceilings, Gypbd</b>						<b>378,609</b>
	Suspended ceiling	grid/ac-tile	27,073	SF	3.52	95,297
Walls	Gypsum board	5/8" bd & LVL 5 finish	81,227	SF	3.00	243,681
Interior	Security barrier	diamond lath	5,925	SF	1.90	11,258
	Wall paneling	FRP	5,908	SF	4.50	26,586
	Wall covering	p-laminate	325	SF	5.50	1,788
<b>Painting, Wall Coverings</b>						<b>110,640</b>
	Painting		44,256	SF	2.50	110,640
<b>Specialties &amp; Equipment</b>						<b>170,974</b>
Turnout	Turnout Locker	P-lam switchback	36	EA	450.00	16,200
Fire Staff	Lockers		37	EA	250.00	9,250
Police	Lockers		31	EA	250.00	7,750
	Toilet accessories	various types	45	TTL	105.00	4,725
	Louvers		21	EA	950.00	19,950
Exterior	Signage	allowance	1	LS	6,500.00	6,500
	Signage, interior	allowance	27,073	SF	0.17	4,602
	FEC	cabinet & ext	18	TTL	260.00	4,680

ARCH: Mackenzie  
DWG DATE: May, 2014  
DESIGN LEVEL: Concept

CONSTRUCTION FOCUS, INC.  
541-686-2031  
EUGENE, OREGON

ESTIMATE DATE: May 29, 2014  
REVISION #: 2  
CONST. START: 1 QTR 2016

FIRE AND POLICE COMBINED  
Statement of Probable Cost

3/4

LOC	ITEM	DESCRIPTION	QNTY	UNIT	\$/UNIT	TOTAL \$
	Elevator	ThyssenKrupp_Endura MRL	1	EA	55,243.33	55,243
	Walk-in refrigerator	4'x8'	1	EA	15,000.00	15,000
	White boards, tackboards, projection screens		27,073	SF	1.00	27,073
	<b>Appliances</b>					<b>20,400</b>
	Refrigerator	Viking_36"__ss	2	EA	3,500.00	7,000
	Rangetop	Viking_open burner_gas	2	EA	4,500.00	9,000
	Dishwasher		2	EA	1,200.00	2,400
	Microwave		2	EA	700.00	1,400
	Washer and dryer	OFCI	4	EA	150.00	600
	<b>Furnishings</b>					<b>25,826</b>
	Window blinds	louvered blinds	5,739	SF	4.50	25,826
	<b>Plumbing</b>					<b>435,530</b>
	Plumbing	fixtures	71	EA	1,400.00	99,400
	Plumbing	specialties	82	EA	455.00	37,310
	Trench drain	JS_poly_9931	120	LF	118.00	14,160
	Compressed air system	pipng/valves	530	LF	16.00	8,480
	Gas piping	pipng/valves	887	LF	12.00	10,644
	Plumbing	pipng: CW/vent/waste	44,256	SF	6.00	265,536
	<b>Fire Protection</b>					<b>115,066</b>
	Fire protection	riser/mains/drops/heads	44,256	SF	2.60	115,066
	<b>HVAC</b>					<b>1,106,400</b>
	HVAC	equip/ducting/TAB	44,256	SF	25.00	1,106,400
	<b>Electrical</b>					<b>1,529,808</b>
	Electrical	power/lighting	44,256	SF	24.00	1,062,144
	Electrical	fire alarm	44,256	SF	1.50	66,384
Fire	Electrical	generator	1	LS	90,000.00	90,000
Police	Electrical	generator	1	LS	90,000.00	90,000
	Electrical	telephone/data	44,256	SF	1.00	44,256
	Electrical	PV system	44,256	SF	4.00	177,024
	<b>NEW BUILDING HARD COST</b>					<b>7,815,897</b>
<b>SITWORK</b>						
	Gross Project Area		128,374	SF		
	<b>Demolition and Earthwork</b>					<b>185,719</b>
	Building demolition	x_wood frame/1-story	14,474	SF	2.50	36,185
	Asbestos abatement	allowance	1	LS	4,500.00	4,500
	Erosion control	bags & fence	128,374	SF	0.04	5,135
	Survey	set pins & stakes	128,374	SF	0.12	15,405
	Earthwork	excav/grade	91,453	SF	0.75	68,590
	Earthwork	rock/backfill/finish	50,822	SF	1.10	55,904
	<b>Site Improvements</b>					<b>123,478</b>
	Striping	painting/symbols	50,822	SF	0.02	1,016
	Signage	monument signage	1	EA	8,000.00	8,000
	Signage	ADA parking	2	EA	120.00	240

ARCH: Mackenzie  
DWG DATE: May, 2014  
DESIGN LEVEL: Concept

CONSTRUCTION FOCUS, INC.  
541-686-2031  
EUGENE, OREGON

ESTIMATE DATE: May 29, 2014  
REVISION #: 2  
CONST. START: 1 QTR 2016

Combined Public Safety - Cost Summary

June 18, 2014

FIRE AND POLICE COMBINED  
Statement of Probable Cost

LOC	ITEM	DESCRIPTION	QNTY	UNIT	\$/UNIT	TOTAL \$
	Wheel stops	allowance	5	EA	87.00	435
	Flagpole	allowance	2	EA	2,800.00	5,600
	Bollards	pipe & concrete base	16	EA	257.89	4,126
	Fencing	chain link/black vinyl	1,716	LF	35.00	60,060
	Trash enclosure		1	LS	10,000.00	10,000
	Fuel	fuel tank-500 gal/curb/pump	1	EA	12,000.00	12,000
	Vehicle access security gate	35'w, rolling	2	EA	11,000.00	22,000
<b>Landscaping</b>						<b>120,915</b>
	Landscaping	soil/lawn/trees/plants/irrig	40,305	SF	3.00	120,915
<b>Hardscapes</b>						<b>193,323</b>
	Site curb-full ht	f/s/pl/fin 0.63' Wx1.33' Ht	1,627	LF	18.00	29,286
	AC paving	place 3" ave thick	30,494	SF	1.90	57,939
	Concrete apron	f/s/pl/fin 6in	7,624	SF	7.25	55,274
	Sidewalk	f/s/pl/fin 4in	12,706	SF	4.00	50,824
<b>Site Utilities</b>						<b>112,326</b>
	Fire line	pipe:6-in /trench/bkfill	100	LF	48.00	4,800
	Fire service vault	vault & BFP	1	EA	9,500.00	9,500
	Water system piping	pipe:1.5-in /trench/bkfill	100	LF	35.01	3,501
	Storm piping	6" pipe/excav/bkfill	763	LF	24.00	18,312
	Fdn & rain piping	pvc_4"	2,117	LF	12.00	25,404
	Catch basin	allowance	9	EA	900.00	8,100
	Area drain	allowance	3	TTL	300.00	900
	Sanitary piping	4" pipe/excav/bkfill	100	LF	30.75	3,075
	Oil/water separator	allowance	1	EA	4,733.86	4,734
	Site electrical	lighting	9	EA	3,500.00	31,500
	Site electrical	underground	100	LF	25.00	2,500
<b>SITWORK HARDCOST</b>						<b>735,760</b>
<b>HARDCOST TOTAL</b>						<b>8,551,657</b>
<b>Markups to the hardcost:</b>						
	Inflation & Contingency:	20.0%				1,710,331
	General Conditions:	7.0%				718,339
	Profit & OH at:	5.0%				549,016
	Performance Bond:					86,600
<b>BASE BID TOTAL:</b>						<b>11,615,944</b>
<b>EXCLUSIONS</b>						
Design fees, permit fees, system development fees, utility hookup charges, testing, BOLI fee.						
Moving expenses, anti-graffiti coating, fireproofing, rock excavation.						

SCHEDULE OF FEES

**MACKENZIE.**

**Bainbridge Island Public Safety Site Station 21, Bainbridge Island, Washington**  
**PRELIMINARY GOVERNMENTAL AND JURISDICTIONAL FEES**  
**City of Bainbridge Island**

Job Number 2130356.00  
 Date 6/2/2014  
 Prepared By LEH

Please note: This preliminary estimate is provided as a convenience to our clients, and is not intended to duplicate the actual fees assessed by the governing jurisdiction(s). Every effort has been made to accurately estimate the fees that will be associated with this project. However this information is based solely on the information available on the date of this estimate, and actual fees may vary at the time of permit application or issuance. If information and/or assumptions about the project change, then we rely on our clients to notify us if a revision to this estimate is needed. In addition, please review the notes below.

<b>ASSUMPTIONS:</b>		
	Building Floor Area:	44,256 SF
	Total Site Area:	174,937 SF
<b>A</b>	Building Valuation: Based on Construction Type II-B	\$7,080,960
	Impervious Surface Area:	96,558 SF
	Water Meter:	2 inch
<b>B</b>	Equivalent Residential Units (ERU): Based on Sewer Connection Analysis	23 ERU
<b>PERMIT FEE ESTIMATE:</b>		
<b>Site Development</b>		
	Pre-application Fee:	Flat Fee \$265
<b>C</b>	SEPA Review:	No fee for Checklist N/A
<b>D</b>	Conditional Use Permit:	Assumes Major Conditional Use \$10,494
<b>E</b>	Site Plan Review:	Assumes Major Site Plan Review \$8,586
<b>F</b>	Clearing and Grading Permit:	Permit Fee \$1,284
		Plan Review \$500
<b>Building Permit</b>		
<b>G</b>	Building Permit Fees:	Permit Fee \$27,804
		Plan Review \$18,073
		Planning and Engineering Review \$5,561
<b>H</b>	Mechanical Permit Fees:	Permit Fees \$8,408
		Issuance Fee \$24
<b>I</b>	Electrical Permit Fees:	Permit Fees \$2,212
		Issuance Fees \$24
<b>J</b>	Plumbing Permit Fees:	Permit Fees \$990
		Issuance Fees \$24
<b>K</b>	Fire Building Permit Fees:	Fire Marshal Plan Review \$0
		Building Plan Review and Field Inspection \$3,540
<b>L</b>	Fire Sprinkler Permit Fees:	Permit Fee \$1,078
		Plan Review \$701
<b>M</b>	Fire Alarm Systems Permit Fees:	Permit Fee \$758
		Plan Review \$493
<b>N</b>	SBCB Building Fee:	Remitted to the State of Washington \$5
<b>Signage</b>		
<b>O</b>	Sign Permit Fees:	\$132
<b>System Development Charges</b>		
<b>P</b>	Water:	System Participation Fee N/A
		Connection Fee N/A
		Inspection Fee N/A
<b>Q</b>	Sewer:	System Participation Fee \$119,366
		Connection Fee N/A
		Inspection Fee \$2,330
<b>R</b>	Stormwater Impact Fee:	Fee per year \$4,724
<b>S</b>	Transportation Impact Fee:	N/A
<b>T</b>	Drainage Impact Fee:	N/A
<b>TOTAL</b>		<b>\$217,374</b>

## SCHEDULE OF FEES

### Notes:

**\* All fees are based on the City of Bainbridge Island Fee Schedule updated March 2014 unless otherwise noted.**

**A. Building Valuation:** For the purpose of this needs assessment, building valuation data was calculated using a II-B construction type and type B occupancy, which yields a higher construction cost than the actual cost.

**B. Equivalent Residential Units (ERU):** The ERU's are defined as each set of 20 fixture units as shown on the schedule of fixture units on file with the City Clerk and calculated using the Sewer Connection Analysis provided by the City of Bainbridge Island Public Works Department. For the purpose of this needs assessment it is assumed there will be approximately 466 total fixture units which is equal to 23 ERUs.

**C. SEPA Review:** Per Joshua Machen, City of Bainbridge Island Planning Manager, depending on the proposed changes to the site, a SEPA checklist may be required but no fee would be required for a separate SEPA review.

**D. Conditional Use Permit:** Conditional use of a governmental facility within a residential zoning district requires approval of a major conditional use. The fee for a minor conditional use is \$4,770.

**E. Site Plan Review:** For the purpose of this needs assessment, it is assumed that a major site plan review will be required. Per Joshua Machen, Planning Manager with the City of Bainbridge Island, the type of site plan review is depicted primarily by public comment.

**F. Clearing and Grading Permit:** The clearing and grading permit and plan review fees are calculated from the 1997 UAC (Uniform Administrative Code) Table 3-G and 3-H. For the purpose of this needs assessment, the clearing and grading permit and plan review fees have been estimated by the project team.

**G. Building Permit Fees:** The building permit fees are based on current building valuation data from the International Code Council (ICC) times a factor of 1.41 and calculated from the 1997 UAC (Uniform Administrative Code) Table 3-A. Permit fees calculated as \$5,608.75 for the first \$1,000,000 plus \$3.65 for each additional \$1,000 or fraction thereof. Plan review fees are 65 percent of the permit fees. Planning and engineering review of building permits is 20 percent of the building permit fee to cover engineering reviews for drainage analysis and planning reviews.

**H. Mechanical Permit Fees:** Mechanical permit fees are calculated using the 1997 UAC (Uniform Administrative Code) Table 3-C. For the purpose of this needs assessment, the mechanical permit fee has been estimated by the project team. The permit issuance fee is \$23.50.

**I. Electrical Permit Fees:** Electrical permit fees are calculated using the 1997 UAC (Uniform Administrative Code) Table 3-C. For the purpose of this needs assessment, the electrical permit fee has been estimated by the project team. The permit issuance fee is \$23.50.

**J. Plumbing Permit Fees:** Plumbing permit fees are calculated using the 1997 UAC (Uniform Administrative Code) Table 3-D. The permit fees are calculated as \$9.80 per fixture using 101 fixtures for the purpose of this needs assessment. The permit issuance fee is \$23.50.

**K. Fire Building Permit Fees:** Fire marshal plan review of planning applications are including in building and planning fee amounts. Building plan review and field inspections for buildings with a valuation of \$1,000,000 or greater are calculated as \$500 per million value or portion thereof.

**L. Fire Sprinkler Permit Fees:** Fire sprinkler permit fees are based on the fee schedule utilized for computing building permit fees, using the actual contract cost of the installation of the sprinkler system. For the purposes of this needs assessment, it is assumed that the valuation for fire sprinklers is \$115,066 and the permit fees are calculated as \$993.75 for the first \$100,000 plus \$5.60 for each additional \$1,000 or fraction thereof to and including \$500,000. Fire sprinkler plan review fees are equal to 65 percent of the permit fees.

**M. Fire Alarm Permit Fees:** Fire alarm permit fees are based on the fee schedule utilized for computing building permit fees, using the actual contract cost of the installation of the alarm system. For the purpose of this needs assessment, it is assumed that the valuation for the fire alarms is \$66,384 and the permit fees are calculated as \$643.75 for the first \$50,000 plus \$7.00 for each additional \$1,000 or fraction thereof to and including \$100,000. Fire alarm permit plan review fees are equal to 65 percent of the permit fees.

**N. SBCC Building Fee:** The building fee (SBCC) is remitted to the State of Washington and funds studies on building safety.

**O. Sign Permit Fees:** Sign permit fees are based on the valuation given by the applicant. For the purpose of this needs assessment, the sign valuation is assumed to be \$6,500. The sign permit fees are calculated as \$69.25 for the first \$2,000 plus \$14 for each additional \$1,000 or fraction thereof to and including \$25,000.

**P. Water SDC:** Per Aaron Claiborne, Utilities Project Coordinator with the City of Bainbridge Island Operations and Maintenance Department, the water system participation, connection, and inspection fees would not apply since there is already an existing water meter in place.

**Q. Sewer SDC:** Sewer participation fees are calculation by ERUs which is defined as a set of 20 fixture units. The fee per ERU is \$5,123. Per Aaron Claiborne, Utilities Project Coordinator with the City of Bainbridge Island Operations and Maintenance Department, sewer connection fees will not be charged for changing fixtures. Sewer inspection fees are calculated as \$100 per each set of 20 fixture units or portion thereof. The fee per 20 fixture units is \$100.

**R. Stormwater Impact Fees:** Storm and surface water rates are billed yearly on property taxes. For the purpose of this needs assessment, the stormwater rates are shown for one year. The rates are calculated per SFE (single family equivalent) which is the amount of impervious area divided by 3,000 square feet. The amount of SFE's times the base billing rate of \$12.23 is the monthly billing amount for stormwater. Per Joshua Machen, Planning Manager with the City of Bainbridge Island, fee adjustments may be made at the time of construction completion.

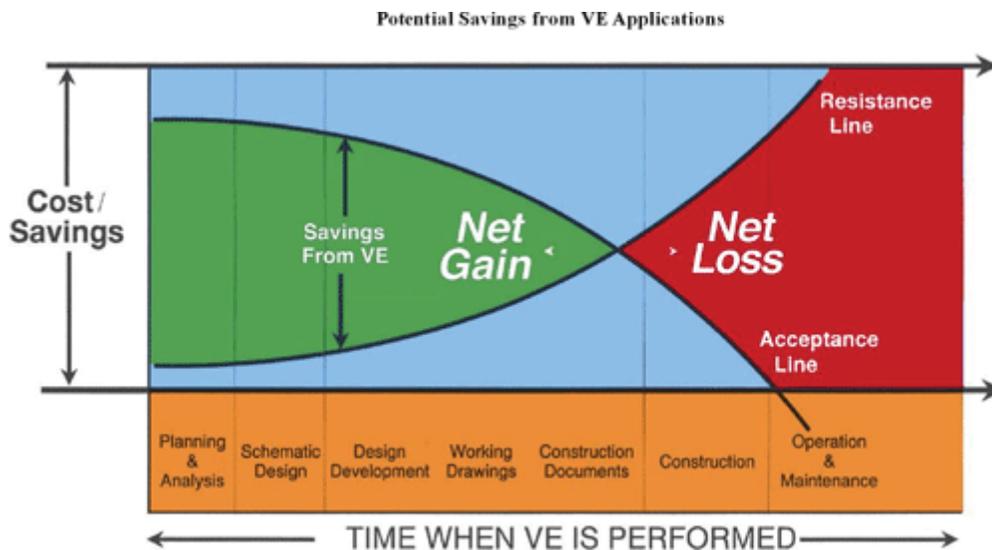
**S. Transportation Impact Fee:** Per Joshua Machen, Planning Manager at the City of Bainbridge Island, the City does not currently charge transportation impact fees.

**T. Drainage Impact Fees:** Per Joshua Machen, Planning Manager at the City of Bainbridge Island, drainage impact fees are historical fees and are no longer charged.

# VALUE ENGINEERING

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

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



Courtesy of : [http://www.wbdg.org/resources/value\\_engineering.php](http://www.wbdg.org/resources/value_engineering.php)

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

	Station 21	Station 22	Station 23	Police	PSB
Reduce building area by 10%	\$750,000	\$426,408	NA	\$573,012	\$1,161,429
Leave existing grade at helipad	\$242,676	NA	NA	NA	\$242,676
Leave existing overhead power lines	\$180,000	NA	NA	NA	\$180,000
Eliminate front clerestory	NA	\$150,000	NA	NA	NA
Change four fold doors to sectional door type at Apparatus Bay	\$153,155	\$114,866	NA	NA	\$153,155
Change metal roofing to composition shingles	\$152,188	\$88,364	NA	\$104,320	\$254,567
Eliminate paint/improvements at non-remodeled area	NA	NA	\$58,416	NA	NA
Have Design Team provide Owners Project Manager services	\$111,729	\$31,603	\$30,000	\$68,251	\$215,398
Eliminate security fence/gates	\$108,319	\$72,257	NA	\$47,672	\$110,633
Shadow LEED program	\$103,000	\$103,000	NA	\$103,000	\$103,000
Self perform landscape installation	\$58,161	\$26,912	\$2,000	\$20,432	\$54,339
Eliminate Apparatus bay doors and utilize back-in bays	\$51,770	NA	NA	NA	NA
Eliminate commissioning	\$30,000	\$30,000	\$30,000	\$30,000	\$30,000
Eliminate fueling station	NA	\$16,178	NA	NA	NA
Reduce building height by 1 foot	\$27,638	\$14,493	NA	\$20,593	\$34,042
Phase (reduce) furniture purchase	\$19,434	\$6,000	NA	\$8,580	\$26,682
Reduce extent of paved surfaces	\$9,631	\$7,574	NA	\$4,426	\$7,810
Reduce extent of concrete curbing	\$4,868	\$3,829	NA	\$2,237	\$3,985
<b>Sub-Total</b>	<b>\$2,002,569</b>	<b>\$1,091,484</b>	<b>\$120,416</b>	<b>\$982,523</b>	<b>\$2,577,716</b>
<b>Bainbridge Island Fire Department</b>	<b>\$2,002,569</b>	<b>\$1,091,484</b>	<b>\$120,416</b>		
<b>City of Bainbridge Island</b>				<b>\$982,523</b>	
<b>Combination Public Safety Building</b>					<b>\$2,577,716</b>

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# NEXT STEPS



# RECOMMENDATION OF NEXT STEPS

BIFD and COBI need to evaluate the advantages and disadvantages of co-developing these facilities and then make a decision if they are proceeding together or separately. The next steps and schedule for implementation will vary based on the approach of proceeding separately or together. Based on initial discussions, our understanding is that BIFD is interested in pursuing a November 2014 bond measure with design and development of facilities occurring soon after. Because COBI needs to select a site for the Police Department and finalize a decision on whether Municipal Court is co-located with Police or not, the City may require more time to finalize a direction for COBI. With this understanding we have developed two different schedules and next steps: One for BIFD (whether a single replacement structure for station 21 or a co-developed public safety building) and one for COBI.

## **BIFD TASK LIST**

- A. Make decision on if co-developing a public safety building with COBI
- B. Approve/decide on total dollar amount for bond measure
- C. Confirm election day for measure
- D. Organize bond community outreach and education

We have assumed BIFD will pursue a bond measure for funding of project improvements in November of 2014 and developed the following schedule based on this assumption. Typically, we recommend an approximately 12 month schedule for outreach of a bond measure. With the process of this assessment and public outreach and education the education has already started. The following schedule has been developed with the milestones between the start of this project and the November election day. BIFD should begin the process of presenting the message of the need for the project to the local community. This effort should entail community outreach meetings to allow attendees to observe the condition of the existing station, as well as presenting the findings of the Needs Assessment process. A process for outreach to local community organizations and private business with an interest in the project should be developed and executed. Provide consistent updates and feedback to the community to ensure that the message reaches as many people as possible.

**BIFD SCHEDULE**

**December 2013**

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

**June 2014**

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

Present to BIFD Commissioners

**January 2014**

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

**July 2014**

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Task A, B, C

A/E Notice to Proceed  
Task 1 : Kick-off Meeting

Task 2 : Confirm Existing Facility Components

Task 3 : Analysis of Current Programs and Services

Task 4 : Staff Interviews and Program Development

Task 5: Concept Design

Visioning Meeting 1

Visioning Meeting 2

Task 6 : Project Cost Development

**February 2014**

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	

**August 2014**

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

Deadline for Measure Filings

Submit for Voters Pamphlet

**TASK D  
BOND  
EDUCATION**

**March 2014**

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

**September 2014**

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

**April 2014**

S	M	T	W	T	F	S
						1
			2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

**October 2014**

S	M	T	W	T	F	S
						1
			2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

**May 2014**

S	M	T	W	T	F	S
						1
			2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

**November 2014**

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

Election Day

## **COBI TASK LIST**

- A. Conduct further site investigations on options for a separate police or Police/Municipal Court facility
- B. Make decision on co-developing a public safety building with BIFD
- C. Refine conceptual design based on selected site
- D. Update probable project cost
- E. Identify funding source(s) for project
- F. If pursuing bond measure,
  - Approve/decide on total dollar amount for bond measure
  - Confirm election day for measure
  - Organize bond campaign strategy (for community outreach and education)

**COBI SCHEDULE**

Present to  
City Council

**June 2014**

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

**December 2014**

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

Task A

**July 2014**

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

**January 2015**

S	M	T	W	T	F	S
			1	2	3	
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

**August 2014**

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

**February 2015**

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28

Task B

**September 2014**

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

**March 2015**

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

Task C

**October 2014**

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
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**April 2015**

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Task D

**November 2014**

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**May 2015**

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31						

Task E

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# APPENDIX A

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# ASCE 31 Tier 1 Assessments

Project Number 2130356

## PROJECT BACKGROUND

Seismic evaluations were conducted for three Bainbridge Island Fire Stations facilities located in Bainbridge Island, Washington. The stations were of varying construction type and vintages.

Significant changes to seismic provisions have occurred since these stations were originally designed, and the purpose of this report is to identify any potential seismic deficiencies.

## ASCE 31 ANALYSIS

The seismic evaluation was conducted using ASCE 31 *Seismic Evaluation of Existing Structures*. This document is not a code, but a nationally-recognized standard used by engineers to evaluate existing buildings. ASCE 31 incorporates a multi-tier methodology for evaluating existing structures. Tier 1, which was chosen for this analysis, is a preliminary screening phase which utilizes a checklist approach to identify potential seismic hazards. It should be noted that at this stage, any identified risks are preliminary and may or may not be justifiable using a higher tier analysis. Tier 2 and Tier 3 are the evaluation and detailed evaluation phases respectively, which were not conducted at this time. The analyses in these tiers further evaluate the flagged deficiencies identified during the Tier 1 screening phase. It should be noted that ASCE 31 identifies 'benchmark buildings' which have been designed under codes with adequate seismic provisions to ensure acceptable earthquake performance. These buildings are exempt from structural checklists under ASCE 31 methodology; however this facility does not meet the benchmark requirements.

After the seismic evaluation is completed a different document, ASCE 41 *Seismic Rehabilitation of Existing Buildings*, is used to complete the seismic retrofit design to address the issues identified in the evaluation stage. For this building, the ASCE 41 Performance Level would be Immediate Occupancy (1-B) at BSE-2 (2%/50 year).

ASCE 31 allows two performance levels to be targeted which can be correlated to the amount of post-earthquake damage expected. The Life Safety (LS) performance level is meant to ensure the safety of building occupants; however, the building will likely experience significant damage that may or may not be repaired or occupied after the earthquake. The Immediate Occupancy (IO) level is meant to limit building damage such that the building may be occupied and functional directly after the seismic event. As a fire station is an essential facility for post-disaster operation, the analysis conducted for this report utilized the IO performance level.

The Tier 1 analysis consists of visual surveys of each station which were conducted on February 14<sup>th</sup>, 2014. See Appendix C for selected site photographs. For each of the checklist items, an evaluation of Compliant (C), Noncompliant (NC), or Not Applicable (N/A) is marked. Again, NC does not necessarily mean that the issue cannot be justified with a higher tier evaluation phase. Various construction drawings for each of the stations were available for review.

## SCOPE AND LIMITATIONS

This Tier 1 analysis is based on site observations of only readily visible items. It should be understood that other deficiencies might exist that have not been identified by this screening phase and quick checks. In addition, no material or other testing was performed at this time for review.

## EVALUATION RESULTS

### *Evaluation Criteria*

The level of seismicity was determined at the site and compared to the ASCE 31 level definitions, see Table 2-1. For the Bainbridge Island Stations,  $S_{DS}=0.926$  and  $S_{D1}=0.547$ , therefore the site is considered to be in an area of high seismicity.

**Table 2-1. Levels of Seismicity Definitions**

Level of Seismicity <sup>1</sup>	$S_{DS}$	$S_{D1}$
Low	<0.167g	<0.067g
Moderate	≥0.167g <0.500g	≥0.067g <0.200g
High	≥0.500g	≥0.200g

<sup>1</sup>Sites with  $S_{DS}$  and  $S_{D1}$  values in different levels of seismicity shall be classified as moderate.

where:

$S_{DS}$  = Design short-period spectral response acceleration parameter (Sec. 3.5.2.3.1)

$S_{D1}$  = Design spectral response acceleration parameter at a one-second period (Sec. 3.5.2.3.1)

Based on this seismicity definition and an IO performance objective, the required checklists can be determined, see Table 3-2. The Basic and Supplemental Structural, Geologic and Foundation, as well as the Basic, Intermediate and Supplemental Nonstructural checklists are required.

**Table 3-2. Checklists Required for a Tier 1 Evaluation**

Level of Seismicity <sup>3</sup>	Level of Performance <sup>2</sup>	Required Checklists <sup>1</sup>						
		Level of Low Seismicity (Sec. 3.6)	Basic Structural (Sec. 3.7)	Supplemental Structural (Sec. 3.7)	Geologic Site Hazard and Foundation (Sec. 3.8)	Basic Nonstructural (Sec. 3.9.1)	Intermediate Nonstructural (Sec. 3.9.2)	Supplemental Nonstructural (Sec. 3.9.3)
Low	LS	▶						
	IO		▶		▶	▶		
Moderate	LS		▶		▶	▶		
	IO		▶	▶	▶	▶	▶	
High	LS		▶	▶	▶	▶	▶	
	IO		▶	▶	▶	▶	▶	▶

<sup>1</sup>A checkmark (▶) designates the checklist that must be completed for a Tier 1 Evaluation as a function of the level of seismicity and level of performance.

<sup>2</sup>LS = Life Safety; IO = Immediate Occupancy (defined in Section 2.4).

<sup>3</sup>Defined in Section 2.5.

ASCE 31 has different checklists depending on the building construction type. Appropriate checklists were used for each of the stations.

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# Bainbridge Island Fire Station #21

## ASCE 31 Tier 1 Assessment

### **BUILDING STRUCTURAL NARRATIVE**

Station 21 is a wood framed single story structure with a small mezzanine that was built in 1978. The floor is concrete slab on grade: 6 inches thick at the apparatus bay area, and 4 inches elsewhere. The roof is wood framed with glulam beams, open web wood joists, and sheathed with ½" plywood. All exterior walls are 2x6 and sheathed with ½" plywood. Partial height concrete retaining walls occur around the building at earth berms.

There is also a CMU generator building on the site with a gang-nail truss and plywood roof.

### **RESULTS OF ASCE 31 ANALYSIS**

The Tier 1 screening phase identified some structural and nonstructural items as non-compliant. Non-compliant issues require further evaluation in order to determine if the items are acceptable or not. A summary of the non-compliant issues is presented below. Copies of the Tier 1 checklists and calculations are attached to this report.

#### *STRUCTURAL NON-COMPLIANT ISSUES*

- **Unblocked diaphragms** – For the immediate occupancy performance level, all unblocked wood structural panel diaphragms shall have horizontal spans of less than 30ft. Station 21 does not have a blocked roof diaphragm, yet horizontally spans 160ft.
- **Hold-down Anchors** – Hold downs are not shown in the existing drawings and likely do not exist at shearwall ends.
- **Narrow Wood Shearwalls** – The wood shearwalls at the apparatus bay doors exceed the height to width aspect ratio limits.
- **Liquefaction** – Liquefaction susceptible soils are not to be present under the building. Although this is unknown at this time, it is not likely that this is the case.
- **Wall Anchorage, Wood Ledgers, Transfer to Shear Walls** – The CMU walls of the generator building are not tied into the roof diaphragm to meet the provisions of this requirement for in-plane and out-of-plane forces for strength and stiffness.

#### *NON-STRUCTURAL NON-COMPLIANT ISSUES*

- **Tall narrow contents** – Contents over 4ft with a height-to-depth or height-to-width ratio greater than 3-to-1 are required to be anchored to floor slab or wall. There are various cabinets in the apparatus bay that do not appear to meet this requirement.
- **Toxic substances** – Toxic and hazardous substances stored in breakable containers shall be restrained from falling by latched doors, shelf lips, or other methods. The storage cabinets in the apparatus bay area do not appear to meet this requirement.

- **Attached Equipment** – No lateral bracing is provided on mechanical units hanging from the ceiling.

## **CONCLUSIONS & RECOMMENDATIONS**

It is recommended that the non-compliant items listed above be addressed. This would include the following work:

- Install blocking at the roof diaphragm.
- Wood sill plate anchors and shearwall hold-downs may be required to be installed if found not to be present.
- Further analysis to determine if shearwall upgrades are required at the apparatus door shearwalls.
- Secure cabinets meeting the dimensional criteria stated above to either the slab or the walls.
- Install anchors, blocking, and strapping between the generator building roof and CMU walls. Cross ties would need to be continued across the diaphragms, by strapping the framing members where discontinuous at supports.

A complete analysis of the building and seismic force resisting system must be conducted to fully understand all the issues that would need to be repaired, which is beyond the scope of this investigation. Depending on the results of these investigations, there may be changes to the list of repairs above.

Upon securing funding for these fire stations, a seismic retrofit design using ASCE 41 can be conducted to address the deficient issues. The items that were unable to be confirmed during the site observation could be exposed with destructive or non-destructive testing or reconnaissance, or soils investigation.

**3.7.1 Basic Structural Checklist for Building Type W1: Wood Light Frames**

This Basic Structural Checklist shall be completed where required by Table 3-2.

Each of the evaluation statements on this checklist shall be marked Compliant (C), Non-compliant (NC), or Not Applicable (N/A) for a Tier 1 Evaluation. Compliant statements identify issues that are acceptable according to the criteria of this standard, while non-compliant statements identify issues that require further investigation. Certain statements may not apply to the buildings being evaluated. For non-compliant evaluation statements, the design professional may choose to conduct further investigation using the corresponding Tier 2 Evaluation procedure; corresponding section numbers are in parentheses following each evaluation statement.

**C3.7.1 Basic Structural Checklist for Building Type W1**

These buildings are single- or multiple-family dwellings of one or more stories in height. Building loads are light and the framing spans are short. Floor and roof framing consists of wood joists or rafters on wood studs spaced no more than 24 inches apart. The first floor framing is supported directly on the foundation, or is raised up on cripple studs and post-and-beam supports. The foundation consists of spread footings constructed on concrete, concrete masonry block, or brick masonry or even wood in older construction. Chimneys, where present, consist of solid brick masonry, masonry veneer, or wood frame with internal metal flues. Lateral forces are resisted by wood frame diaphragms and shear walls. Floor and roof diaphragms consist of straight or diagonal lumber sheathing, tongue-and-groove planks, oriented strand board, or plywood. Shear walls consist of straight or diagonal lumber sheathing, plank siding, plywood, oriented strand board, stucco, gypsum board, particle board, or fiberboard. Interior partitions are sheathed with plaster or gypsum board.

**Building System**

- |     |         |     |   |
|-----|---------|-----|---|
| (C) | NC      | N/A | LOAD PATH: The structure shall contain a minimum of one complete load path for Life Safety and Immediate Occupancy for seismic force effects from any horizontal direction that serves to transfer the inertial forces from the mass to the foundation. (Tier 2: Sec. 4.3.1.1)  |
| (C) | NC      | N/A | VERTICAL DISCONTINUITIES: All vertical elements in the lateral-force-resisting system shall be continuous to the foundation. (Tier 2: Sec. 4.3.2.4)   |
| (C) | NC      | N/A | DETERIORATION OF WOOD: There shall be no signs of decay, shrinkage, splitting, fire damage, or sagging in any of the wood members, and none of the metal connection hardware shall be deteriorated, broken, or loose. (Tier 2: Sec. 4.3.3.1)  |
| C   | NC      | N/A | WOOD STRUCTURAL PANEL SHEAR WALL FASTENERS: There shall be no more than 15 percent of inadequate fastening such as overdriven fasteners, omitted blocking, excessive fastening spacing, or inadequate edge distance. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.3.3.2) |
|     | UNKNOWN |     |   |

**Lateral-Force-Resisting System**

- |     |    |     |  |
|-----|----|-----|--|
| (C) | NC | N/A | REDUNDANCY: The number of lines of shear walls in each principal direction shall be greater than or equal to 2 for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.4.2.1.1) |
|-----|----|-----|--|

**Screening Phase (Tier 1)**

<p>(C) NC N/A SEE CALC'S</p>	<p><b>SHEAR STRESS CHECK:</b> The shear stress in the shear walls, calculated using the Quick Check procedure of Section 3.5.3.3, shall be less than the following values for Life Safety and Immediate Occupancy (Tier 2: Sec. 4.4.2.7.1):</p> <table border="0" style="margin-left: 40px;"> <tr> <td>Structural panel sheathing</td> <td>1,000 plf</td> </tr> <tr> <td>Diagonal sheathing</td> <td>700 plf</td> </tr> <tr> <td>Straight sheathing</td> <td>100 plf</td> </tr> <tr> <td>All other conditions</td> <td>100 plf</td> </tr> </table>	Structural panel sheathing	1,000 plf	Diagonal sheathing	700 plf	Straight sheathing	100 plf	All other conditions	100 plf
Structural panel sheathing	1,000 plf								
Diagonal sheathing	700 plf								
Straight sheathing	100 plf								
All other conditions	100 plf								
<p>C NC (N/A)</p>	<p><b>STUCCO (EXTERIOR PLASTER) SHEAR WALLS:</b> Multi-story buildings shall not rely on exterior stucco walls as the primary lateral-force-resisting system. (Tier 2: Sec. 4.4.2.7.2)</p>								
<p>(C) NC N/A</p>	<p><b>GYPSUM WALLBOARD OR PLASTER SHEAR WALLS:</b> Interior plaster or gypsum wallboard shall not be used as shear walls on buildings over one story in height with the exception of the uppermost level of a multi-story building. (Tier 2: Sec. 4.4.2.7.3)</p>								
<p>C (NC) N/A</p>	<p><b>NARROW WOOD SHEAR WALLS:</b> Narrow wood shear walls with an aspect ratio greater than 2-to-1 for Life Safety and 1.5-to-1 for Immediate Occupancy shall not be used to resist lateral forces developed in the building in levels of moderate and high seismicity. Narrow wood shear walls with an aspect ratio greater than 2-to-1 for Immediate Occupancy shall not be used to resist lateral forces developed in the building in levels of low seismicity. (Tier 2: Sec. 4.4.2.7.4)</p>								
<p>C NC (N/A)</p>	<p><b>WALLS CONNECTED THROUGH FLOORS:</b> Shear walls shall have interconnection between stories to transfer overturning and shear forces through the floor. (Tier 2: Sec. 4.4.2.7.5)</p>								
<p>C NC (N/A)</p>	<p><b>HILLSIDE SITE:</b> For structures that are taller on at least one side by more than one-half story due to a sloping site, all shear walls on the downhill slope shall have an aspect ratio less than 1-to-1 for Life Safety and 1 to 2 for Immediate Occupancy. (Tier 2: Sec. 4.4.2.7.6)</p>								
<p>C NC (N/A)</p>	<p><b>CRIPPLE WALLS:</b> Cripple walls below first-floor-level shear walls shall be braced to the foundation with wood structural panels. (Tier 2: Sec. 4.4.2.7.7)</p>								
<p>C (NC) N/A</p>	<p><b>OPENINGS:</b> Walls with openings greater than 80 percent of the length shall be braced with wood structural panel shear walls with aspect ratios of not more than 1.5-to-1 or shall be supported by adjacent construction through positive ties capable of transferring the lateral forces. (Tier 2: Sec. 4.4.2.7.8)</p>								
<b>Connections</b>									
<p>(C) NC N/A</p>	<p><b>WOOD POSTS:</b> There shall be a positive connection of wood posts to the foundation. (Tier 2: Sec. 4.6.3.3)</p>								
<p>C NC N/A UNKNOWN</p>	<p><b>WOOD SILLS:</b> All wood sills shall be bolted to the foundation. (Tier 2: Sec. 4.6.3.4)</p>								
<p>(C) NC N/A</p>	<p><b>GIRDER/COLUMN CONNECTION:</b> There shall be a positive connection utilizing plates, connection hardware, or straps between the girder and the column support. (Tier 2: Sec. 4.6.4.1)</p>								

### 3.7.1S Supplemental Structural Checklist for Building Type W1: Wood Light Frames

This Supplemental Structural Checklist shall be completed where required by Table 3-2. The Basic Structural Checklist shall be completed prior to completing this Supplemental Structural Checklist.

#### Lateral-Force-Resisting System

C NC N/A  
UNKNOWN HOLD-DOWN ANCHORS: All shear walls shall have hold-down anchors constructed per acceptable construction practices, attached to the end studs. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.4.2.7.9)

#### Diaphragms

(C) NC N/A DIAPHRAGM CONTINUITY: The diaphragms shall not be composed of split-level floors and shall not have expansion joints. (Tier 2: Sec. 4.5.1.1)

(C) NC N/A ROOF CHORD CONTINUITY: All chord elements shall be continuous, regardless of changes in roof elevation. (Tier 2: Sec. 4.5.1.3)

C NC N/A  
UNKNOWN PLAN IRREGULARITIES: There shall be tensile capacity to develop the strength of the diaphragm at re-entrant corners or other locations of plan irregularities. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.5.1.7)

(C) NC N/A DIAPHRAGM REINFORCEMENT AT OPENINGS: There shall be reinforcing around all diaphragm openings larger than 50 percent of the building width in either major plan dimension. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.5.1.8)

C NC (N/A) STRAIGHT SHEATHING: All straight sheathed diaphragms shall have aspect ratios less than 2-to-1 for Life Safety and 1-to-1 for Immediate Occupancy in the direction being considered. (Tier 2: Sec. 4.5.2.1)

(C) NC N/A SPANS: All wood diaphragms with spans greater than 24 feet for Life Safety and 12 feet for Immediate Occupancy shall consist of wood structural panels or diagonal sheathing. (Tier 2: Sec. 4.5.2.2)

C (NC) N/A UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms shall have horizontal spans less than 40 feet for Life Safety and 30 feet for Immediate Occupancy and shall have aspect ratios less than or equal to 4-to-1 for Life Safety and 3-to-1 for Immediate Occupancy. (Tier 2: Sec. 4.5.2.3)

(C) NC N/A OTHER DIAPHRAGMS: The diaphragm shall not consist of a system other than wood, metal deck, concrete, or horizontal bracing. (Tier 2: Sec. 4.5.7.1)

#### Connections

C NC N/A  
UNKNOWN WOOD SILL BOLTS: Sill bolts shall be spaced at 6 feet or less for Life Safety and 4 feet or less for Immediate Occupancy, with proper edge and end distance provided for wood and concrete. (Tier 2: Sec. 4.6.3.9)

**3.8 Geologic Site Hazards and Foundations Checklist**

This Geologic Site Hazards and Foundations Checklist shall be completed where required by Table 3-2.

Each of the evaluation statements on this checklist shall be marked Compliant (C), Non-compliant (NC), or Not Applicable (N/A) for a Tier 1 Evaluation. Compliant statements identify issues that are acceptable according to the criteria of this standard, while non-compliant statements identify issues that require further investigation. Certain statements may not apply to the buildings being evaluated. For non-compliant evaluation statements, the design professional may choose to conduct further investigation using the corresponding Tier 2 Evaluation procedure; corresponding section numbers are in parentheses following each evaluation statement.

**Geologic Site Hazards**

The following statements shall be completed for buildings in levels of high or moderate seismicity.

C NC N/A LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could jeopardize the building's seismic performance shall not exist in the foundation soils at depths within 50 feet under the building for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.7.1.1)  
 UNKNOWN

(C) NC N/A SLOPE FAILURE: The building site shall be sufficiently remote from potential earthquake-induced slope failures or rockfalls to be unaffected by such failures or shall be capable of accommodating any predicted movements without failure. (Tier 2: Sec. 4.7.1.2)

C NC N/A SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site is not anticipated. (Tier 2: Sec. 4.7.1.3)  
 UNKNOWN

**Condition of Foundations**

The following statement shall be completed for all Tier 1 building evaluations.

(C) NC N/A FOUNDATION PERFORMANCE: There shall be no evidence of excessive foundation movement such as settlement or heave that would affect the integrity or strength of the structure. (Tier 2: Sec. 4.7.2.1)

The following statement shall be completed for buildings in levels of high or moderate seismicity being evaluated to the Immediate Occupancy Performance Level.

(C) NC N/A DETERIORATION: There shall not be evidence that foundation elements have deteriorated due to corrosion, sulfate attack, material breakdown, or other reasons in a manner that would affect the integrity or strength of the structure. (Tier 2: Sec. 4.7.2.2)

**Capacity of Foundations**

The following statement shall be completed for all Tier 1 building evaluations.

C NC (N/A) POLE FOUNDATIONS: Pole foundations shall have a minimum embedment depth of 4 feet for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.7.3.1)

The following statements shall be completed for buildings in levels of moderate seismicity being evaluated to the Immediate Occupancy Performance Level and for buildings in levels of high seismicity.

(C) NC N/A OVERTURNING: The ratio of the horizontal dimension of the lateral-force-resisting system at the foundation level to the building height (base/height) shall be greater than  $0.6S_p$ . (Tier 2: Sec. 4.7.3.2)  
 SEE CALC'S

Screening Phase (Tier 1)

C	NC	(N/A)	TIES BETWEEN FOUNDATION ELEMENTS: The foundation shall have ties adequate to resist seismic forces where footings, piles, and piers are not restrained by beams, slabs, or soils classified as Class A, B, or C. (Section 3.5.2.3.1, Tier 2: Sec. 4.7.3.3)
C	NC	(N/A)	DEEP FOUNDATIONS: Piles and piers shall be capable of transferring the lateral forces between the structure and the soil. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.7.3.4)
(C)	NC	N/A	SLOPING SITES: The difference in foundation embedment depth from one side of the building to another shall not exceed one story in height. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.7.3.5)

**3.9.1 Basic Nonstructural Component Checklist**

This Basic Nonstructural Component Checklist shall be completed where required by Table 3-2.

Each of the evaluation statements on this checklist shall be marked Compliant (C), Non-compliant (NC), or Not Applicable (N/A) for a Tier 1 Evaluation. Compliant statements identify issues that are acceptable according to the criteria of this standard, while non-compliant statements identify issues that require further investigation. Certain statements may not apply to the buildings being evaluated. For non-compliant evaluation statements, the design professional may choose to conduct further investigation using the corresponding Tier 2 Evaluation procedure; corresponding section numbers are in parentheses following each evaluation statement.

**Partitions**

- C NC (N/A) UNREINFORCED MASONRY: Unreinforced masonry or hollow clay tile partitions shall be braced at a spacing equal to or less than 10 feet in levels of low or moderate seismicity and 6 feet in levels of high seismicity. (Tier 2: Sec. 4.8.1.1)

**Ceiling Systems**

- (C) NC N/A SUPPORT: The integrated suspended ceiling system shall not be used to laterally support the tops of gypsum board, masonry, or hollow clay tile partitions. Gypsum board partitions need not be evaluated where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.2.1)

**Light Fixtures**

- C NC (N/A) EMERGENCY LIGHTING: Emergency lighting shall be anchored or braced to prevent falling during an earthquake. (Tier 2: Sec. 4.8.3.1)

**Cladding and Glazing**

- C NC (N/A) CLADDING ANCHORS: Cladding components weighing more than 10 psf shall be mechanically anchored to the exterior wall framing at a spacing equal to or less than 4 feet. A spacing of up to 6 feet is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.4.1)
- C NC (N/A) DETERIORATION: There shall be no evidence of deterioration, damage or corrosion in any of the connection elements. (Tier 2: Sec. 4.8.4.2)
- C NC (N/A) CLADDING ISOLATION: For moment frame buildings of steel or concrete, panel connections shall be detailed to accommodate a story drift ratio of 0.02. Panel connection detailing for a story drift ratio of 0.01 is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.4.3)
- C NC (N/A) MULTI-STORY PANELS: For multi-story panels attached at each floor level, panel connections shall be detailed to accommodate a story drift ratio of 0.02. Panel connection detailing for a story drift ratio of 0.01 is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.4.4)
- C NC (N/A) BEARING CONNECTIONS: Where bearing connections are required, there shall be a minimum of two bearing connections for each wall panel. (Tier 2: Sec. 4.8.4.5)

### Screening Phase (Tier 1)

- C NC (N/A) INSERTS: Where inserts are used in concrete connections, the inserts shall be anchored to reinforcing steel or other positive anchorage. (Tier 2: Sec. 4.8.4.6)
- C NC (N/A) PANEL CONNECTIONS: Exterior cladding panels shall be anchored out-of-plane with a minimum of 4 connections for each wall panel. Two connections per wall panel are permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.4.7)

#### Masonry Veneer

- C NC (N/A) SHELF ANGLES: Masonry veneer shall be supported by shelf angles or other elements at each floor 30 feet or more above ground for Life Safety and at each floor above the first floor for Immediate Occupancy. (Tier 2: Sec. 4.8.5.1)
- C NC (N/A) TIES: Masonry veneer shall be connected to the back-up with corrosion-resistant ties. The ties shall have a spacing equal to or less than 24 inches with a minimum of one tie for every 2-2/3 square feet. A spacing of up to 36 inches is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.5.2)
- C NC (N/A) WEAKENED PLANES: Masonry veneer shall be anchored to the back-up adjacent to weakened planes, such as at the locations of flashing. (Tier 2: Sec. 4.8.5.3)
- C NC (N/A) DETERIORATION: There shall be no evidence of deterioration, damage, or corrosion in any of the connection elements. (Tier 2: Sec. 4.8.5.4)

#### Parapets, Cornices, Ornamentation, and Appendages

- C NC (N/A) URM PARAPETS: There shall be no laterally unsupported unreinforced masonry parapets or cornices with height-to-thickness ratios greater than 1.5. A height-to-thickness ratio of up to 2.5 is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.8.1)
- C NC (N/A) CANOPIES: Canopies located at building exits shall be anchored to the structural framing at a spacing of 6 feet or less. An anchorage spacing of up to 10 feet is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.8.2)

#### Masonry Chimneys

- C NC (N/A) URM CHIMNEYS: No unreinforced masonry chimney shall extend above the roof surface more than twice the least dimension of the chimney. A height above the roof surface of up to three times the least dimension of the chimney is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.9.1)

#### Stairs

- C NC (N/A) URM WALLS: Walls around stair enclosures shall not consist of unbraced hollow clay tile or unreinforced masonry with a height-to-thickness ratio greater than 12-to-1. A height-to-thickness ratio of up to 15-to-1 is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.10.1)
- C NC (N/A) STAIR DETAILS: In moment frame structures, the connection between the stairs and the structure shall not rely on shallow anchors in concrete. Alternatively, the stair details shall be capable of accommodating the drift calculated using the Quick Check procedure of Section 3.5.3.1 without including tension in the anchors. (Tier 2: Sec. 4.8.10.2)

## Screening Phase (Tier 1)

### Building Contents and Furnishing

C (NC) N/A

**TALL NARROW CONTENTS:** Contents over 4 feet in height with a height-to-depth or height-to-width ratio greater than 3-to-1 shall be anchored to the floor slab or adjacent structural walls. A height-to-depth or height-to-width ratio of up to 4-to-1 is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.11.1)

### Mechanical and Electrical Equipment

(C) NC N/A

**EMERGENCY POWER:** Equipment used as part of an emergency power system shall be mounted to maintain continued operation after an earthquake. (Tier 2: Sec. 4.8.12.1)

C NC (N/A)

**HAZARDOUS MATERIAL EQUIPMENT:** HVAC or other equipment containing hazardous material shall not have damaged supply lines or unbraced isolation supports. (Tier 2: Sec. 4.8.12.2)

(C) NC N/A

**DETERIORATION:** There shall be no evidence of deterioration, damage, or corrosion in any of the anchorage or supports of mechanical or electrical equipment. (Tier 2: Sec. 4.8.12.3)

(C) NC N/A

**ATTACHED EQUIPMENT:** Equipment weighing over 20 lb that is attached to ceilings, walls, or other supports 4 feet above the floor level shall be braced. (Tier 2: Sec. 4.8.12.4)

### Piping

(C) NC N/A

**FIRE SUPPRESSION PIPING:** Fire suppression piping shall be anchored and braced in accordance with NFPA-13 (NFPA, 1996). (Tier 2: Sec. 4.8.13.1)

(C) NC N/A

**FLEXIBLE COUPLINGS:** Fluid, gas, and fire suppression piping shall have flexible couplings. (Tier 2: Sec. 4.8.13.2)

### Hazardous Materials Storage and Distribution

C (NC) N/A

**TOXIC SUBSTANCES:** Toxic and hazardous substances stored in breakable containers shall be restrained from falling by latched doors, shelf lips, wires, or other methods. (Tier 2: Sec. 4.8.15.1)

**3.9.2 Intermediate Nonstructural Component Checklist**

This Intermediate Nonstructural Component Checklist shall be completed where required by Table 3-2. The Basic Nonstructural Component Checklist shall be completed prior to completing this Intermediate Nonstructural Component Checklist.

**Ceiling Systems**

- C NC (N/A) LAY-IN TILES: Lay-in tiles used in ceiling panels located at exits and corridors shall be secured with clips. (Tier 2: Sec. 4.8.2.2)
- (C) NC N/A INTEGRATED CEILINGS: Integrated suspended ceilings at exits and corridors or weighing more than 2 pounds per square foot shall be laterally restrained with a minimum of four diagonal wires or rigid members attached to the structure above at a spacing equal to or less than 12 feet. (Tier 2: Sec. 4.8.2.3)
- C NC (N/A) SUSPENDED LATH AND PLASTER: Ceilings consisting of suspended lath and plaster or gypsum board shall be attached to resist seismic forces for every 12 square feet of area. (Tier 2: Sec. 4.8.2.4)

**Light Fixtures**

- (C) NC N/A INDEPENDENT SUPPORT: Light fixtures in suspended grid ceilings shall be supported independently of the ceiling suspension system by a minimum of two wires at diagonally opposite corners of the fixtures. (Tier 2: Sec. 4.8.3.2)

**Cladding and Glazing**

- C NC (N/A) GLAZING: Glazing in curtain walls and individual panes over 16 square feet in area, located up to a height of 10 feet above an exterior walking surface, shall have safety glazing. Such glazing located over 10 feet above an exterior walking surface shall be laminated annealed or laminated heat-strengthened safety glass or other glazing system that will remain in the frame when glass is cracked. (Tier 2: Sec. 4.8.4.8)

**Parapets, Cornices, Ornamentation, and Appendages**

- C NC (N/A) CONCRETE PARAPETS: Concrete parapets with height-to-thickness ratios greater than 2.5 shall have vertical reinforcement. (Tier 2: Sec. 4.8.8.3)
- C NC (N/A) APPENDAGES: Cornices, parapets, signs, and other appendages that extend above the highest point of anchorage to the structure or cantilever from exterior wall faces and other exterior wall ornamentation shall be reinforced and anchored to the structural system at a spacing equal to or less than 10 feet for Life Safety and 6 feet for Immediate Occupancy. This requirement need not apply to parapets or cornices compliant with Section 4.8.8.1 or 4.8.8.3. (Tier 2: Sec. 4.8.8.4)

**Masonry Chimneys**

- C NC (N/A) ANCHORAGE: Masonry chimneys shall be anchored at each floor level and the roof. (Tier 2: Sec. 4.8.9.2)

Screening Phase (Tier 1)

**Mechanical and Electrical Equipment**

- C NC (N/A) VIBRATION ISOLATORS: Equipment mounted on vibration isolators shall be equipped with restraints or snubbers. (Tier 2: Sec. 4.8.12.5)

**Ducts**

- C NC (N/A) STAIR AND SMOKE DUCTS: Stair pressurization and smoke control ducts shall be braced and shall have flexible connections at seismic joints. (Tier 2: Sec. 4.8.14.1)

**3.9.3 Supplemental Nonstructural Component Checklist**

This Supplemental Nonstructural Component Checklist shall be completed where required by Table 3-2. The Basic and Intermediate Nonstructural Component Checklists shall be completed prior to completing this Supplemental Nonstructural Component Checklist.

**C3.9.3 Supplemental Nonstructural Component Checklist**

The statements in this checklist are intended to evaluate elements that may prevent or limit use of a building following an earthquake. While this checklist is required only for buildings in levels of high seismicity being evaluated to the Immediate Occupancy Performance Level, it may be used as a guide to evaluate potential disruption to building use following an earthquake.

**Partitions**

- C NC (N/A) DRIFT: Rigid cementitious partitions shall be detailed to accommodate a drift ratio of 0.02 in steel moment frame, concrete moment frame, and wood frame buildings. Rigid cementitious partitions shall be detailed to accommodate a drift ratio of 0.005 in other buildings. (Tier 2: Sec. 4.8.1.2)
- C NC (N/A) STRUCTURAL SEPARATIONS: Partitions at structural separations shall have seismic or control joints. (Tier 2: Sec. 4.8.1.3)
- (C) NC N/A TOPS: The tops of framed or panelized partitions that only extend to the ceiling line shall have lateral bracing to the building structure at a spacing equal to or less than 6 feet. (Tier 2: Sec. 4.8.1.4)

**Ceiling Systems**

- (C) NC N/A EDGES: The edges of integrated suspended ceilings shall be separated from enclosing walls by a minimum of 1/2 inch. (Tier 2: Sec. 4.8.2.5)
- C NC (N/A) SEISMIC JOINT: The ceiling system shall not extend continuously across any seismic joint. (Tier 2: Sec. 4.8.2.6)

**Light Fixtures**

- C NC (N/A) PENDANT SUPPORTS: Light fixtures on pendant supports shall be attached at a spacing equal to or less than 6 feet and, if rigidly supported, shall be free to move with the structure to which they are attached without damaging adjoining materials. (Tier 2: Sec. 4.8.3.3)
- C NC (N/A) LENS COVERS: Lens covers on light fixtures shall be attached or supplied with safety devices. (Tier 2: Sec. 4.8.3.4)

**Cladding and Glazing**

- C NC N/A UNKNOWN GLAZING: All exterior glazing shall be laminated, annealed or laminated heat-strengthened safety glass or other glazing system that will remain in the frame when glass is cracked. (Tier 2: Sec. 4.8.4.9)

## Screening Phase (Tier 1)

### Masonry Veneer

- C NC (N/A) MORTAR: The mortar in masonry veneer shall not be easily scraped away from the joints by hand with a metal tool, and there shall not be significant areas of eroded mortar. (Tier 2: Sec. 4.8.5.5)
- C NC (N/A) WEEP HOLES: In veneer braced by stud walls, functioning weep holes and base flashing shall be present. (Tier 2: Sec. 4.8.5.6)
- C NC (N/A) STONE CRACKS: There shall no be visible cracks or signs of visible distortion in the stone. (Tier 2: Sec. 4.8.5.7)

### Metal Stud Back-Up Systems

- C NC (N/A) STUD TRACKS: Stud tracks shall be fastened to structural framing at a spacing equal to or less than 24 inches on center. (Tier 2: Sec. 4.8.6.1)
- C NC (N/A) OPENINGS: Steel studs shall frame window and door openings. (Tier 2: Sec. 4.8.6.2)

### Concrete Block and Masonry Back-Up Systems

- C NC (N/A) ANCHORAGE: Back-up shall have a positive anchorage to the structural framing at a spacing equal to or less than 4 feet along the floors and roof. (Tier 2: Sec. 4.8.7.1)
- C NC (N/A) URM BACK-UP: There shall be no unreinforced masonry back-up. (Tier 2: Sec. 4.8.7.2)

### Building Contents and Furnishing

- C NC (N/A) FILE CABINETS: File cabinets arranged in groups shall be attached to one another. (Tier 2: Sec. 4.8.11.2)
- (C) NC N/A CABINET DOORS AND DRAWERS: Cabinet doors and drawers shall have latches to keep them closed during an earthquake. (Tier 2: Sec. 4.8.11.3)
- C NC (N/A) ACCESS FLOORS: Access floors over 9 inches in height shall be braced. (Tier 2: Sec. 4.8.11.4)
- C NC (N/A) EQUIPMENT ON ACCESS FLOORS: Equipment and computers supported on access floor systems shall be either attached to the structure or fastened to a laterally braced floor system. (Tier 2: Sec. 4.8.11.5)

### Mechanical and Electrical Equipment

- (C) NC N/A HEAVY EQUIPMENT: Equipment weighing over 100 pounds shall be anchored to the structure or foundation. (Tier 2: Sec. 4.8.12.6)
- C NC (N/A) ELECTRICAL EQUIPMENT: Electrical equipment and associated wiring shall be laterally braced to the structural system. (Tier 2: Sec. 4.8.12.7)
- C NC (N/A) DOORS: Mechanically operated doors shall be detailed to operate at a story drift ratio of 0.01. (Tier 2: Sec. 4.8.12.8)

### Piping

- C NC (N/A) FLUID AND GAS PIPING: Fluid and gas piping shall be anchored and braced to the structure to prevent breakage in piping. (Tier 2: Sec. 4.8.13.3)

### Screening Phase (Tier 1)

C NC (N/A) SHUT-OFF VALVES: Shut-off devices shall be present at building utility interfaces to shut off the flow of gas and high-temperature energy in the event of earthquake-induced failure. (Tier 2: Sec. 4.8.13.4)

(C) NC N/A C-CLAMPS: One-sided C-clamps that support piping greater than 2.5 inches in diameter shall be restrained. (Tier 2: Sec. 4.8.13.5)

#### Ducts

C NC (N/A) DUCT BRACING: Rectangular ductwork exceeding 6 square feet in cross-sectional area, and round ducts exceeding 28 inches in diameter, shall be braced. Maximum spacing of transverse bracing shall not exceed 30 feet. Maximum spacing of longitudinal bracing shall not exceed 60 feet. Intermediate supports shall not be considered part of the lateral-force-resisting system. (Tier 2: Sec. 4.8.14.2)

(C) NC N/A DUCT SUPPORT: Ducts shall not be supported by piping or electrical conduit. (Tier 2: Sec. 4.8.14.3)

#### Hazardous Materials Storage and Distribution

C (NC) N/A GAS CYLINDERS: Compressed gas cylinders shall be restrained. (Tier 2: Sec. 4.8.15.2)

C NC (N/A) HAZARDOUS MATERIALS: Piping containing hazardous materials shall have shut-off valves or other devices to prevent major spills or leaks. (Tier 2: Sec. 4.8.15.3)

#### Elevators

C NC (N/A) SUPPORT SYSTEM: All elements of the elevator system shall be anchored. (Tier 2: Sec. 4.8.16.1)

C NC (N/A) SEISMIC SWITCH: All elevators shall be equipped with seismic switches that will terminate operations when the ground motion exceeds 0.10g. (Tier 2: Sec. 4.8.16.2)

C NC (N/A) SHAFT WALLS: All elevator shaft walls shall be anchored and reinforced to prevent toppling into the shaft during strong shaking. (Tier 2: Sec. 4.8.16.3)

C NC (N/A) RETAINER GUARDS: Cable retainer guards on sheaves and drums shall be present to inhibit the displacement of cables. (Tier 2: Sec. 4.8.16.4)

C NC (N/A) RETAINER PLATE: A retainer plate shall be present at the top and bottom of both car and counterweight. (Tier 2: Sec. 4.8.16.5)

C NC (N/A) COUNTERWEIGHT RAILS: All counterweight rails and divider beams shall be sized in accordance with ASME A17.1. (Tier 2: Sec. 4.8.16.6)

C NC (N/A) BRACKETS: The brackets that tie the car rails and the counterweight rail to the building structure shall be sized in accordance with ASME A17.1. (Tier 2: Sec. 4.8.16.7)

C NC (N/A) SPREADER BRACKET: Spreader brackets shall not be used to resist seismic forces. (Tier 2: Sec. 4.8.16.8)

C NC (N/A) GO-SLOW ELEVATORS: The building shall have a go-slow elevator system. (Tier 2: Sec. 4.8.16.9)

## ASCE 31 EVALUATION - TIER 1

PROJECT NAME: Bainbridge Island Fire Station 21 PROJECT NO.: 2130356.00 DESIGNER: NKH

### ASCE 31 Tier 1 Evaluation - Station 21

**Building Location:**

8895 Madison Ave NE, Bainbridge Island, 98110

**Target Building Performance:**  
Immediate Occupancy (IO)

**Level of Seismicity:**  
High

**Table 2-1. Levels of Seismicity Definitions**

Level of Seismicity <sup>1</sup>	$S_{DS}$	$S_{D1}$
Low	<0.167g	<0.067g
Moderate	≥0.167g <0.500g	≥0.067g <0.200g
High	≥0.500g	≥0.200g

SC := "D"

Soil Site Class (assumed) - ASCE 31, 3.5.2.3.1, p.3-13

$S_S := 1.389$

0.2s, Short Period Maximum Considered Earthquake (MCE, 2%/50yr) Mapped Spectral Response Acceleration (SRA) Parameter (5% of critical damping)- USGS

$S_1 := 0.547$

1.0s Period MCE, 2%/50yr Mapped SRA Parameter (5% of critical damping) - USGS

$S_{DS} := 0.926$

0.2s, Short Period Design SRA (approx. 10%/50yr) - ASCE 31, 3.5.2.3.1, p.3-12

$S_{D1} := 0.547$

1.0s Period Design SRA (approx. 10%/50yr) - ASCE 31, 3.5.2.3.1, p.3-12

$C_t := 0.02$

Approximate Period Determination Coefficient - ASCE 31, 3.5.2.4, p.3-14

$\beta := 0.75$

Approximate Period Determination Coefficient - ASCE 31, 3.5.2.4, p.3-14

$h_n := 16\text{ft}$

Max Building Height

$$T := C_t \cdot \left( \frac{h_n}{\text{ft}} \right)^\beta = 0.16$$

Empirical Approximate Fundamental Period Equation - ASCE 31, 3.5.2.4, p.3-14

$$S_a := \min \left( S_{DS}, \frac{S_{D1}}{T} \right)$$

Spectral Response Acceleration - ASCE 31 3.5.2.3.1, p.3-12

$S_a = 0.926$

**Table 3-2. Checklists Required for a Tier 1 Evaluation**

Level of Seismicity <sup>3</sup>	Level of Performance <sup>2</sup>	Required Checklists <sup>1</sup>						
		Level of Low Seismicity (Sec. 3.6)	Basic Structural (Sec. 3.7)	Supplemental Structural (Sec. 3.7)	Geologic Site Hazard and Foundation (Sec. 3.8)	Basic Nonstructural (Sec. 3.9.1)	Intermediate Nonstructural (Sec. 3.9.2)	Supplemental Nonstructural (Sec. 3.9.3)
Low	LS	▶						
	IO		▶		▶	▶		
Moderate	LS		▶		▶	▶		
	IO		▶	▶	▶	▶	▶	
High	LS		▶	▶	▶	▶	▶	
	IO		▶	▶	▶	▶	▶	▶

<sup>1</sup>A checkmark (▶) designates the checklist that must be completed for a Tier 1 Evaluation as a function of the level of seismicity and level of performance.

<sup>2</sup>LS = Life Safety; IO = Immediate Occupancy (defined in Section 2.4).

<sup>3</sup>Defined in Section 2.5.

C := 1.3 Factor to Relate Expected Maximum Inelastic Displacements to Displacements Calculated for Linear Elastic Response - ASCE 31, Table 3-4, p.3-10

**Building Seismic Weight:**

DL := 15psf Dead Load

DL<sub>wall</sub> := 10psf Wood Framed Wall Weight

L := 68ft Building Length

W := 10.5ft Building Width

Area := L · W Building Area

h := 16ft Building Height

$W_{skin} := [(2L + 2W) \cdot DL_{wall}] \cdot \frac{h}{2}$  Skin Weight

$W_{skin} = 12.56 \cdot k$

$WT_{total} := W_{skin} + (Area \cdot DL)$  Total Weight

$WT_{total} = 23.27 \cdot k$

**Seismic Pseudo-Lateral Force (Seismic Base Shear):**

V := C · S<sub>a</sub> · WT<sub>total</sub> Pseudo-Lateral Force - ASCE 31, 3.5.2.1, p.3-9

V = 28.012 · k

- **Shearwall Stress Check - Tier 1 W1 Basic Structural Checklist**

**ASCE 31, 3.5.3.3, p.3-16 - Check North Wall:**

$$L_{\text{shearwall}} := 4(3.5\text{ft}) + 3.75\text{ft} + 6.5\text{ft}$$

Length of Shearwalls

$$m := 2$$

Component Modification Factor - ASCE 31,  
Table 3-7, p.3-17

$$v := \frac{1}{m} \cdot \frac{V}{L_{\text{shearwall}}}$$

Average Shear Stress - ASCE 31, 3.5.3.3, p.3-16

$$v = 289 \cdot \text{plf}$$

Max Shear Stress - ASCE 31, 3.5.3.3, p.3-16

Structural Panel Sheathing: 1000 plf

Diagonal Sheathing: 700 plf

All Other Conditions: 100 plf

***Sheathing is plywood (structural panel sheathing).  
Therefore, compliant!***

- **OT Ratio Check - Tier 1 Geologic Site Checklist**

Ratio\_Limit :=  $0.6 \cdot S_a$       Minimum Width to Height Ratio

Ratio\_Limit = 0.556

Ratio :=  $\frac{W}{h}$       Width to Height Ratio

Ratio = 0.656

flag := if(Ratio  $\geq$  Ratio\_Limit, "OK" , "NG!!!")      flag = "OK"

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# Bainbridge Island Fire Station #22

## ASCE 31 Tier 1 Assessment

### **BUILDING STRUCTURAL NARRATIVE**

Station 22 is a masonry structure built in 1959 with a partial second floor that is wood framed. The ground floors are 5½” concrete slab on grade, and the second floor is 2x joists with glulam beams. The roof is wood framed with glulam beams and pre-manufactured “Panelbild” roof panels.

### **RESULTS OF ASCE 31 ANALYSIS**

The Tier 1 screening phase identified some structural and nonstructural items as non-compliant. Non-compliant issues require further evaluation in order to determine if the items are acceptable or not. A summary of the non-compliant issues is presented below. Copies of the Tier 1 checklists and calculations are attached to this report.

#### *STRUCTURAL NON-COMPLIANT ISSUES*

- **Unblocked diaphragms** – For the immediate occupancy performance level, all unblocked wood structural panel diaphragms shall have horizontal spans of less than 30ft. Station 21 does not have a blocked roof diaphragm, yet horizontally spans 75ft. Furthermore, the “Panelbild” roof panels have no code compliance records and may not function properly as a structural diaphragm.
- **Wall Anchorage, Wood Ledgers, Transfer to Shear Walls** –The CMU walls are not tied into the roof diaphragm to meet the provisions of this requirement for in-plane and out-of-plane forces for strength and stiffness.
- **Geometry/Plan Irregularities** – Plan offsets and re-entrant corners exist in the building, and do not appear to have adequate diaphragm reinforcement.
- **Shear Stress** – The average shear stresses in the exterior masonry walls exceed the maximums set forth in the ASCE 31.
- **Cross Ties** – Continuous cross ties meeting the intent of this provision do not exist in the diaphragm.
- **Hold-Down Anchors** – Hold-down anchors for the wood framed walls of the second floor are not shown in the existing drawings.
- **Narrow Wood Shearwalls** – The wood shearwalls at the apparatus bay doors exceed the height to width aspect ratio limits.
- **Liquefaction** – Liquefaction susceptible soils are not to be present under the building. Although this is unknown at this time, it is not likely that this is the case.

#### *NON-STRUCTURAL NON-COMPLIANT ISSUES*

- **Tall narrow contents** – Contents over 4ft with a height-to-depth or height-to-width ratio greater than 3-to-1 are required to be anchored to floor slab or wall. There are various cabinets in the apparatus bay that do not appear to meet this requirement.

- **Deterioration of Wood** – Signs of water damage exist on some of the wood framing.
- **Damage/deterioration of Columns** – Exterior steel columns at the apparatus bay area are damaged.
- **Toxic substances** – Toxic and hazardous substances stored in breakable containers shall be restrained from falling by latched doors, shelf lips, or other methods. The storage cabinets in the apparatus bay area do not appear to meet this requirement.

## **CONCLUSIONS & RECOMMENDATIONS**

It is recommended that the non-compliant items listed above be addressed. This would include the following work:

- Upgrade the roof diaphragm by adding structural sheathing.
- At the masonry walls that are not adequately tied to the roof, anchors, blocking, and strapping would be required. Cross ties would need to be continued across the diaphragms, by strapping the framing members where discontinuous at supports
- Wood sill plate anchors and shearwall hold-downs may be required to be installed at the second floor if found not to be present.
- Install steel strongbacks on the inside face of masonry walls to provide stiffness to resist out-of-plane bending in the walls.
- Additional shearwalls and/or bracing of the existing masonry walls should be installed at areas where the shear stress exceeds maximum code levels.
- All damaged columns and deteriorated wood should be repaired/replaced.
- Secure cabinets meeting the dimensional criteria stated above to either the slab or the walls.

A complete analysis of the building and seismic force resisting system must be conducted to fully understand all the issues that would need to be repaired, which is beyond the scope of this investigation. Depending on the results of these investigations, there may be changes to the list of repairs above.

Upon securing funding for these fire stations, a seismic retrofit design using ASCE 41 can be conducted to address the deficient issues. The items that were unable to be confirmed during the site observation could be exposed with destructive or non-destructive testing or reconnaissance, or soils investigation.

**Screening Phase (Tier 1)**

**3.7.13 Basic Structural Checklist for Building Type RM1: Reinforced Masonry Bearing Walls with Flexible Diaphragms**

This Basic Structural Checklist shall be completed where required by Table 3-2.

Each of the evaluation statements on this checklist shall be marked Compliant (C), Non-compliant (NC), or Not Applicable (N/A) for a Tier 1 Evaluation. Compliant statements identify issues that are acceptable according to the criteria of this standard, while non-compliant statements identify issues that require further investigation. Certain statements may not apply to the buildings being evaluated. For non-compliant evaluation statements, the design professional may choose to conduct further investigation using the corresponding Tier 2 Evaluation procedure; corresponding section numbers are in parentheses following each evaluation statement.

**C3.7.13 Basic Structural Checklist for Building Type RM1**

These buildings have bearing walls that consist of reinforced brick or concrete block masonry. Wood floor and roof framing consists of wood joists, glulam beams, and wood posts or small steel columns. Steel floor and roof framing consists of steel beams or open web joists, steel girders, and steel columns. Lateral forces are resisted by the reinforced brick or concrete block masonry shear walls. Diaphragms consist of straight or diagonal wood sheathing, plywood, or untopped metal deck, and are flexible relative to the walls. Foundations consist of brick or concrete spread footings or deep foundations.

**Building System**

- |   |    |     |   |
|---|----|-----|---|
| C | NC | N/A | LOAD PATH: The structure shall contain a minimum of one complete load path for Life Safety and Immediate Occupancy for seismic force effects from any horizontal direction that serves to transfer the inertial forces from the mass to the foundation. (Tier 2: Sec. 4.3.1.1)  |
| C | NC | N/A | ADJACENT BUILDINGS: The clear distance between the building being evaluated and any adjacent building shall be greater than 4 percent of the height of the shorter building for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.3.1.2)   |
| C | NC | N/A | MEZZANINES: Interior mezzanine levels shall be braced independently from the main structure, or shall be anchored to the lateral-force-resisting elements of the main structure. (Tier 2: Sec. 4.3.1.3)   |
| C | NC | N/A | WEAK STORY: The strength of the lateral-force-resisting system in any story shall not be less than 80 percent of the strength in an adjacent story, above or below, for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.3.2.1)   |
| C | NC | N/A | SOFT STORY: The stiffness of the lateral-force-resisting system in any story shall not be less than 70 percent of the lateral-force-resisting system stiffness in an adjacent story above or below, or less than 80 percent of the average lateral-force-resisting system stiffness of the three stories above or below for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.3.2.2) |
| C | NC | N/A | GEOMETRY: There shall be no changes in horizontal dimension of the lateral-force-resisting system of more than 30 percent in a story relative to adjacent stories for Life Safety and Immediate Occupancy, excluding one-story penthouses and mezzanines. (Tier 2: Sec. 4.3.2.3)  |
| C | NC | N/A | VERTICAL DISCONTINUITIES: All vertical elements in the lateral-force-resisting system shall be continuous to the foundation. (Tier 2: Sec. 4.3.2.4)   |

### Screening Phase (Tier 1)

C	NC	N/A	MASS: There shall be no change in effective mass more than 50 percent from one story to the next for Life Safety and Immediate Occupancy. Light roofs, penthouses, and mezzanines need not be considered. (Tier 2: Sec. 4.3.2.5)
C	NC	N/A	DETERIORATION OF WOOD: There shall be no signs of decay, shrinkage, splitting, fire damage, or sagging in any of the wood members, and none of the metal connection hardware shall be deteriorated, broken, or loose. (Tier 2: Sec. 4.3.3.1)
C	NC	N/A	MASONRY UNITS: There shall be no visible deterioration of masonry units. (Tier 2: Sec. 4.3.3.7)
C	NC	N/A	MASONRY JOINTS: The mortar shall not be easily scraped away from the joints by hand with a metal tool, and there shall be no areas of eroded mortar. (Tier 2: Sec. 4.3.3.8)
C	NC	N/A	REINFORCED MASONRY WALL CRACKS: All existing diagonal cracks in wall elements shall be less than 1/8 inch for Life Safety and 1/16 inch for Immediate Occupancy, shall not be concentrated in one location, and shall not form an X pattern. (Tier 2: Sec. 4.3.3.10)
<b>Lateral-Force-Resisting System</b>			
C	NC	N/A	REDUNDANCY: The number of lines of shear walls in each principal direction shall be greater than or equal to 2 for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.4.2.1.1)
C	NC	N/A	SHEAR STRESS CHECK: The shear stress in the reinforced masonry shear walls, calculated using the Quick Check procedure of Section 3.5.3.3, shall be less than 70 psi for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.4.2.4.1)
	SEE CALC'S		
C	NC	N/A	REINFORCING STEEL: The total vertical and horizontal reinforcing steel ratio in reinforced masonry walls shall be greater than 0.002 for Life Safety and Immediate Occupancy of the wall with the minimum of 0.0007 for Life Safety and Immediate Occupancy in either of the two directions; the spacing of reinforcing steel shall be less than 48 inches for Life Safety and Immediate Occupancy; and all vertical bars shall extend to the top of the walls. (Tier 2: Sec. 4.4.2.4.2)
<b>Connections</b>			
C	NC	N/A	WALL ANCHORAGE: Exterior concrete or masonry walls that are dependent on the diaphragm for lateral support shall be anchored for out-of-plane forces at each diaphragm level with steel anchors, reinforcing dowels, or straps that are developed into the diaphragm. Connections shall have adequate strength to resist the connection force calculated in the Quick Check procedure of Section 3.5.3.7. (Tier 2: Sec. 4.6.1.1)
C	NC	N/A	WOOD LEDGERS: The connection between the wall panels and the diaphragm shall not induce cross-grain bending or tension in the wood ledgers. (Tier 2: Sec. 4.6.1.2)
C	NC	N/A	TRANSFER TO SHEAR WALLS: Diaphragms shall be connected for transfer of loads to the shear walls for Life Safety and the connections shall be able to develop the lesser of the shear strength of the walls or diaphragms for Immediate Occupancy. (Tier 2: Sec. 4.6.2.1)
C	NC	N/A	FOUNDATION DOWELS: Wall reinforcement shall be doweled into the foundation for Life Safety, and the dowels shall be able to develop the lesser of the strength of the walls or the uplift capacity of the foundation for Immediate Occupancy. (Tier 2: Sec. 4.6.3.5)
C	NC	N/A	GIRDER/COLUMN CONNECTION: There shall be a positive connection utilizing plates, connection hardware, or straps between the girder and the column support. (Tier 2: Sec. 4.6.4.1)

Screening Phase (Tier 1)

**3.7.13S Supplemental Structural Checklist for Building Type RM1: Reinforced Masonry Bearing Walls with Flexible Diaphragms**

This Supplemental Structural Checklist shall be completed where required by Table 3-2. The Basic Structural Checklist shall be completed prior to completing this Supplemental Structural Checklist.

**Lateral-Force-Resisting System**

- (C) NC N/A REINFORCING AT OPENINGS: All wall openings that interrupt rebar shall have trim reinforcing on all sides. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.4.2.4.3)
- (C) NC N/A PROPORTIONS: The height-to-thickness ratio of the shear walls at each story shall be less than 30. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.4.2.4.4)

**Diaphragms**

- C (NC) N/A CROSS TIES: There shall be continuous cross ties between diaphragm chords. (Tier 2: Sec. 4.5.1.2)
- C (NC) N/A OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls shall be less than 25 percent of the wall length for Life Safety and 15 percent of the wall length for Immediate Occupancy. (Tier 2: Sec. 4.5.1.4)
- (C) NC N/A OPENINGS AT EXTERIOR MASONRY SHEAR WALLS: Diaphragm openings immediately adjacent to exterior masonry shear walls shall not be greater than 8 feet long for Life Safety and 4 feet long for Immediate Occupancy. (Tier 2: Sec. 4.5.1.6)
- C (NC) N/A PLAN IRREGULARITIES: There shall be tensile capacity to develop the strength of the diaphragm at re-entrant corners or other locations of plan irregularities. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.5.1.7)
- C (NC) N/A DIAPHRAGM REINFORCEMENT AT OPENINGS: There shall be reinforcing around all diaphragm openings larger than 50 percent of the building width in either major plan dimension. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.5.1.8)
- (C) NC N/A STRAIGHT SHEATHING: All straight sheathed diaphragms shall have aspect ratios less than 2-to-1 for Life Safety and 1-to-1 for Immediate Occupancy in the direction being considered. (Tier 2: Sec. 4.5.2.1)
- C (NC) N/A SPANS: All wood diaphragms with spans greater than 24 feet for Life Safety and 12 feet for Immediate Occupancy shall consist of wood structural panels or diagonal sheathing. (Tier 2: Sec. 4.5.2.2)
- C NC (N/A) UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms shall have horizontal spans less than 40 feet for Life Safety and 30 feet for Immediate Occupancy and shall have aspect ratios less than or equal to 4-to-1 for Life Safety and 3-to-1 for Immediate Occupancy. (Tier 2: Sec. 4.5.2.3)
- C NC (N/A) NON-CONCRETE FILLED DIAPHRAGMS: Untopped metal deck diaphragms or metal deck diaphragms with fill other than concrete shall consist of horizontal spans of less than 40 feet and shall have span/depth ratios less than 4-to-1. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.5.3.1)

Screening Phase (Tier 1)

C **NC** N/A OTHER DIAPHRAGMS: The diaphragm shall not consist of a system other than wood, metal deck, concrete, or horizontal bracing. (Tier 2: Sec. 4.5.7.1)

**Connections**

C NC N/A  
UNKNOWN STIFFNESS OF WALL ANCHORS: Anchors of concrete or masonry walls to wood structural elements shall be installed taut and shall be stiff enough to limit the relative movement between the wall and the diaphragm to no greater than 1/8 inch prior to engagement of the anchors. (Tier 2: Sec. 4.6.1.4)

## Screening Phase (Tier 1)

### 3.8 Geologic Site Hazards and Foundations Checklist

This Geologic Site Hazards and Foundations Checklist shall be completed where required by Table 3-2.

Each of the evaluation statements on this checklist shall be marked Compliant (C), Non-compliant (NC), or Not Applicable (N/A) for a Tier 1 Evaluation. Compliant statements identify issues that are acceptable according to the criteria of this standard, while non-compliant statements identify issues that require further investigation. Certain statements may not apply to the buildings being evaluated. For non-compliant evaluation statements, the design professional may choose to conduct further investigation using the corresponding Tier 2 Evaluation procedure; corresponding section numbers are in parentheses following each evaluation statement.

#### Geologic Site Hazards

The following statements shall be completed for buildings in levels of high or moderate seismicity.

C  NC  N/A  UNKNOWN LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could jeopardize the building's seismic performance shall not exist in the foundation soils at depths within 50 feet under the building for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.7.1.1)

C  NC  N/A SLOPE FAILURE: The building site shall be sufficiently remote from potential earthquake-induced slope failures or rockfalls to be unaffected by such failures or shall be capable of accommodating any predicted movements without failure. (Tier 2: Sec. 4.7.1.2)

C  NC  N/A  UNKNOWN SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site is not anticipated. (Tier 2: Sec. 4.7.1.3)

#### Condition of Foundations

The following statement shall be completed for all Tier 1 building evaluations.

C  NC  N/A FOUNDATION PERFORMANCE: There shall be no evidence of excessive foundation movement such as settlement or heave that would affect the integrity or strength of the structure. (Tier 2: Sec. 4.7.2.1)

The following statement shall be completed for buildings in levels of high or moderate seismicity being evaluated to the Immediate Occupancy Performance Level.

C  NC  N/A DETERIORATION: There shall not be evidence that foundation elements have deteriorated due to corrosion, sulfate attack, material breakdown, or other reasons in a manner that would affect the integrity or strength of the structure. (Tier 2: Sec. 4.7.2.2)

#### Capacity of Foundations

The following statement shall be completed for all Tier 1 building evaluations.

C  NC  N/A POLE FOUNDATIONS: Pole foundations shall have a minimum embedment depth of 4 feet for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.7.3.1)

The following statements shall be completed for buildings in levels of moderate seismicity being evaluated to the Immediate Occupancy Performance Level and for buildings in levels of high seismicity.

C  NC  N/A  SEE CALC'S OVERTURNING: The ratio of the horizontal dimension of the lateral-force-resisting system at the foundation level to the building height (base/height) shall be greater than  $0.6S_p$ . (Tier 2: Sec. 4.7.3.2)

### Screening Phase (Tier 1)

- |   |    |       |  |
|---|----|-------|--|
| C | NC | (N/A) | TIES BETWEEN FOUNDATION ELEMENTS: The foundation shall have ties adequate to resist seismic forces where footings, piles, and piers are not restrained by beams, slabs, or soils classified as Class A, B, or C. (Section 3.5.2.3.1, Tier 2: Sec. 4.7.3.3) |
| C | NC | (N/A) | DEEP FOUNDATIONS: Piles and piers shall be capable of transferring the lateral forces between the structure and the soil. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.7.3.4)                             |
| C | NC | (N/A) | SLOPING SITES: The difference in foundation embedment depth from one side of the building to another shall not exceed one story in height. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.7.3.5)            |

**3.9.1 Basic Nonstructural Component Checklist**

This Basic Nonstructural Component Checklist shall be completed where required by Table 3-2.

Each of the evaluation statements on this checklist shall be marked Compliant (C), Non-compliant (NC), or Not Applicable (N/A) for a Tier 1 Evaluation. Compliant statements identify issues that are acceptable according to the criteria of this standard, while non-compliant statements identify issues that require further investigation. Certain statements may not apply to the buildings being evaluated. For non-compliant evaluation statements, the design professional may choose to conduct further investigation using the corresponding Tier 2 Evaluation procedure; corresponding section numbers are in parentheses following each evaluation statement.

**Partitions**

- C **(NC)** N/A UNREINFORCED MASONRY: Unreinforced masonry or hollow clay tile partitions shall be braced at a spacing equal to or less than 10 feet in levels of low or moderate seismicity and 6 feet in levels of high seismicity. (Tier 2: Sec. 4.8.1.1)

**Ceiling Systems**

- C NC **(N/A)** SUPPORT: The integrated suspended ceiling system shall not be used to laterally support the tops of gypsum board, masonry, or hollow clay tile partitions. Gypsum board partitions need not be evaluated where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.2.1)

**Light Fixtures**

- C NC **(N/A)** EMERGENCY LIGHTING: Emergency lighting shall be anchored or braced to prevent falling during an earthquake. (Tier 2: Sec. 4.8.3.1)

**Cladding and Glazing**

- C NC **(N/A)** CLADDING ANCHORS: Cladding components weighing more than 10 psf shall be mechanically anchored to the exterior wall framing at a spacing equal to or less than 4 feet. A spacing of up to 6 feet is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.4.1)
- C **(NC)** N/A DETERIORATION: There shall be no evidence of deterioration, damage or corrosion in any of the connection elements. (Tier 2: Sec. 4.8.4.2)
- C NC **(N/A)** CLADDING ISOLATION: For moment frame buildings of steel or concrete, panel connections shall be detailed to accommodate a story drift ratio of 0.02. Panel connection detailing for a story drift ratio of 0.01 is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.4.3)
- C NC **(N/A)** MULTI-STORY PANELS: For multi-story panels attached at each floor level, panel connections shall be detailed to accommodate a story drift ratio of 0.02. Panel connection detailing for a story drift ratio of 0.01 is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.4.4)
- C NC **(N/A)** BEARING CONNECTIONS: Where bearing connections are required, there shall be a minimum of two bearing connections for each wall panel. (Tier 2: Sec. 4.8.4.5)

### Screening Phase (Tier 1)

- C NC (N/A) INSERTS: Where inserts are used in concrete connections, the inserts shall be anchored to reinforcing steel or other positive anchorage. (Tier 2: Sec. 4.8.4.6)
- C NC (N/A) PANEL CONNECTIONS: Exterior cladding panels shall be anchored out-of-plane with a minimum of 4 connections for each wall panel. Two connections per wall panel are permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.4.7)

#### Masonry Veneer

- C NC (N/A) SHELF ANGLES: Masonry veneer shall be supported by shelf angles or other elements at each floor 30 feet or more above ground for Life Safety and at each floor above the first floor for Immediate Occupancy. (Tier 2: Sec. 4.8.5.1)
- C NC (N/A) TIES: Masonry veneer shall be connected to the back-up with corrosion-resistant ties. The ties shall have a spacing equal to or less than 24 inches with a minimum of one tie for every 2-2/3 square feet. A spacing of up to 36 inches is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.5.2)
- C NC (N/A) WEAKENED PLANES: Masonry veneer shall be anchored to the back-up adjacent to weakened planes, such as at the locations of flashing. (Tier 2: Sec. 4.8.5.3)
- C NC (N/A) DETERIORATION: There shall be no evidence of deterioration, damage, or corrosion in any of the connection elements. (Tier 2: Sec. 4.8.5.4)

#### Parapets, Cornices, Ornamentation, and Appendages

- C NC (N/A) URM PARAPETS: There shall be no laterally unsupported unreinforced masonry parapets or cornices with height-to-thickness ratios greater than 1.5. A height-to-thickness ratio of up to 2.5 is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.8.1)
- C NC (N/A) CANOPIES: Canopies located at building exits shall be anchored to the structural framing at a spacing of 6 feet or less. An anchorage spacing of up to 10 feet is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.8.2)

#### Masonry Chimneys

- (C) NC N/A URM CHIMNEYS: No unreinforced masonry chimney shall extend above the roof surface more than twice the least dimension of the chimney. A height above the roof surface of up to three times the least dimension of the chimney is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.9.1)

#### Stairs

- C NC (N/A) URM WALLS: Walls around stair enclosures shall not consist of unbraced hollow clay tile or unreinforced masonry with a height-to-thickness ratio greater than 12-to-1. A height-to-thickness ratio of up to 15-to-1 is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.10.1)
- C NC (N/A) STAIR DETAILS: In moment frame structures, the connection between the stairs and the structure shall not rely on shallow anchors in concrete. Alternatively, the stair details shall be capable of accommodating the drift calculated using the Quick Check procedure of Section 3.5.3.1 without including tension in the anchors. (Tier 2: Sec. 4.8.10.2)

## Screening Phase (Tier 1)

### Building Contents and Furnishing

- C **NC** N/A TALL NARROW CONTENTS: Contents over 4 feet in height with a height-to-depth or height-to-width ratio greater than 3-to-1 shall be anchored to the floor slab or adjacent structural walls. A height-to-depth or height-to-width ratio of up to 4-to-1 is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.11.1)

### Mechanical and Electrical Equipment

- C NC **N/A** EMERGENCY POWER: Equipment used as part of an emergency power system shall be mounted to maintain continued operation after an earthquake. (Tier 2: Sec. 4.8.12.1)
- C NC **N/A** HAZARDOUS MATERIAL EQUIPMENT: HVAC or other equipment containing hazardous material shall not have damaged supply lines or unbraced isolation supports. (Tier 2: Sec. 4.8.12.2)
- C** NC N/A DETERIORATION: There shall be no evidence of deterioration, damage, or corrosion in any of the anchorage or supports of mechanical or electrical equipment. (Tier 2: Sec. 4.8.12.3)
- C** NC N/A ATTACHED EQUIPMENT: Equipment weighing over 20 lb that is attached to ceilings, walls, or other supports 4 feet above the floor level shall be braced. (Tier 2: Sec. 4.8.12.4)

### Piping

- C NC **N/A** FIRE SUPPRESSION PIPING: Fire suppression piping shall be anchored and braced in accordance with NFPA-13 (NFPA, 1996). (Tier 2: Sec. 4.8.13.1)
- C NC **N/A** FLEXIBLE COUPLINGS: Fluid, gas, and fire suppression piping shall have flexible couplings. (Tier 2: Sec. 4.8.13.2)

### Hazardous Materials Storage and Distribution

- C **NC** N/A TOXIC SUBSTANCES: Toxic and hazardous substances stored in breakable containers shall be restrained from falling by latched doors, shelf lips, wires, or other methods. (Tier 2: Sec. 4.8.15.1)

## Screening Phase (Tier 1)

### 3.9.2 Intermediate Nonstructural Component Checklist

This Intermediate Nonstructural Component Checklist shall be completed where required by Table 3-2. The Basic Nonstructural Component Checklist shall be completed prior to completing this Intermediate Nonstructural Component Checklist.

#### Ceiling Systems

- C NC (N/A) LAY-IN TILES: Lay-in tiles used in ceiling panels located at exits and corridors shall be secured with clips. (Tier 2: Sec. 4.8.2.2)
- C NC (N/A) INTEGRATED CEILINGS: Integrated suspended ceilings at exits and corridors or weighing more than 2 pounds per square foot shall be laterally restrained with a minimum of four diagonal wires or rigid members attached to the structure above at a spacing equal to or less than 12 feet. (Tier 2: Sec. 4.8.2.3)
- C NC (N/A) SUSPENDED LATH AND PLASTER: Ceilings consisting of suspended lath and plaster or gypsum board shall be attached to resist seismic forces for every 12 square feet of area. (Tier 2: Sec. 4.8.2.4)

#### Light Fixtures

- C NC (N/A) INDEPENDENT SUPPORT: Light fixtures in suspended grid ceilings shall be supported independently of the ceiling suspension system by a minimum of two wires at diagonally opposite corners of the fixtures. (Tier 2: Sec. 4.8.3.2)

#### Cladding and Glazing

- C NC (N/A) GLAZING: Glazing in curtain walls and individual panes over 16 square feet in area, located up to a height of 10 feet above an exterior walking surface, shall have safety glazing. Such glazing located over 10 feet above an exterior walking surface shall be laminated annealed or laminated heat-strengthened safety glass or other glazing system that will remain in the frame when glass is cracked. (Tier 2: Sec. 4.8.4.8)

#### Parapets, Cornices, Ornamentation, and Appendages

- C NC (N/A) CONCRETE PARAPETS: Concrete parapets with height-to-thickness ratios greater than 2.5 shall have vertical reinforcement. (Tier 2: Sec. 4.8.8.3)
- C NC (N/A) APPENDAGES: Cornices, parapets, signs, and other appendages that extend above the highest point of anchorage to the structure or cantilever from exterior wall faces and other exterior wall ornamentation shall be reinforced and anchored to the structural system at a spacing equal to or less than 10 feet for Life Safety and 6 feet for Immediate Occupancy. This requirement need not apply to parapets or cornices compliant with Section 4.8.8.1 or 4.8.8.3. (Tier 2: Sec. 4.8.8.4)

#### Masonry Chimneys

- (C) NC N/A ANCHORAGE: Masonry chimneys shall be anchored at each floor level and the roof. (Tier 2: Sec. 4.8.9.2)

Screening Phase (Tier 1)

**Mechanical and Electrical Equipment**

C NC (N/A) VIBRATION ISOLATORS: Equipment mounted on vibration isolators shall be equipped with restraints or snubbers. (Tier 2: Sec. 4.8.12.5)

**Ducts**

C NC (N/A) STAIR AND SMOKE DUCTS: Stair pressurization and smoke control ducts shall be braced and shall have flexible connections at seismic joints. (Tier 2: Sec. 4.8.14.1)

## Screening Phase (Tier 1)

### 3.9.3 Supplemental Nonstructural Component Checklist

This Supplemental Nonstructural Component Checklist shall be completed where required by Table 3-2. The Basic and Intermediate Nonstructural Component Checklists shall be completed prior to completing this Supplemental Nonstructural Component Checklist.

#### C3.9.3 Supplemental Nonstructural Component Checklist

The statements in this checklist are intended to evaluate elements that may prevent or limit use of a building following an earthquake. While this checklist is required only for buildings in levels of high seismicity being evaluated to the Immediate Occupancy Performance Level, it may be used as a guide to evaluate potential disruption to building use following an earthquake.

#### Partitions

- C NC (N/A) DRIFT: Rigid cementitious partitions shall be detailed to accommodate a drift ratio of 0.02 in steel moment frame, concrete moment frame, and wood frame buildings. Rigid cementitious partitions shall be detailed to accommodate a drift ratio of 0.005 in other buildings. (Tier 2: Sec. 4.8.1.2)
- C NC (N/A) STRUCTURAL SEPARATIONS: Partitions at structural separations shall have seismic or control joints. (Tier 2: Sec. 4.8.1.3)
- C NC (N/A) TOPS: The tops of framed or panelized partitions that only extend to the ceiling line shall have lateral bracing to the building structure at a spacing equal to or less than 6 feet. (Tier 2: Sec. 4.8.1.4)

#### Ceiling Systems

- C NC (N/A) EDGES: The edges of integrated suspended ceilings shall be separated from enclosing walls by a minimum of 1/2 inch. (Tier 2: Sec. 4.8.2.5)
- C NC (N/A) SEISMIC JOINT: The ceiling system shall not extend continuously across any seismic joint. (Tier 2: Sec. 4.8.2.6)

#### Light Fixtures

- C NC (N/A) PENDANT SUPPORTS: Light fixtures on pendant supports shall be attached at a spacing equal to or less than 6 feet and, if rigidly supported, shall be free to move with the structure to which they are attached without damaging adjoining materials. (Tier 2: Sec. 4.8.3.3)
- C NC (N/A) LENS COVERS: Lens covers on light fixtures shall be attached or supplied with safety devices. (Tier 2: Sec. 4.8.3.4)

#### Cladding and Glazing

- C NC (N/A) GLAZING: All exterior glazing shall be laminated, annealed or laminated heat-strengthened safety glass or other glazing system that will remain in the frame when glass is cracked. (Tier 2: Sec. 4.8.4.9)

## Screening Phase (Tier 1)

### Masonry Veneer

- C NC (N/A) MORTAR: The mortar in masonry veneer shall not be easily scraped away from the joints by hand with a metal tool, and there shall not be significant areas of eroded mortar. (Tier 2: Sec. 4.8.5.5)
- C NC (N/A) WEEP HOLES: In veneer braced by stud walls, functioning weep holes and base flashing shall be present. (Tier 2: Sec. 4.8.5.6)
- C NC (N/A) STONE CRACKS: There shall no be visible cracks or signs of visible distortion in the stone. (Tier 2: Sec. 4.8.5.7)

### Metal Stud Back-Up Systems

- C NC (N/A) STUD TRACKS: Stud tracks shall be fastened to structural framing at a spacing equal to or less than 24 inches on center. (Tier 2: Sec. 4.8.6.1)
- C NC (N/A) OPENINGS: Steel studs shall frame window and door openings. (Tier 2: Sec. 4.8.6.2)

### Concrete Block and Masonry Back-Up Systems

- C NC (N/A) ANCHORAGE: Back-up shall have a positive anchorage to the structural framing at a spacing equal to or less than 4 feet along the floors and roof. (Tier 2: Sec. 4.8.7.1)
- C NC (N/A) URM BACK-UP: There shall be no unreinforced masonry back-up. (Tier 2: Sec. 4.8.7.2)

### Building Contents and Furnishing

- C NC (N/A) FILE CABINETS: File cabinets arranged in groups shall be attached to one another. (Tier 2: Sec. 4.8.11.2)
- C (NC) (N/A) CABINET DOORS AND DRAWERS: Cabinet doors and drawers shall have latches to keep them closed during an earthquake. (Tier 2: Sec. 4.8.11.3)
- C NC (N/A) ACCESS FLOORS: Access floors over 9 inches in height shall be braced. (Tier 2: Sec. 4.8.11.4)
- C NC (N/A) EQUIPMENT ON ACCESS FLOORS: Equipment and computers supported on access floor systems shall be either attached to the structure or fastened to a laterally braced floor system. (Tier 2: Sec. 4.8.11.5)

### Mechanical and Electrical Equipment

- (C) NC (N/A) HEAVY EQUIPMENT: Equipment weighing over 100 pounds shall be anchored to the structure or foundation. (Tier 2: Sec. 4.8.12.6)
- (C) NC (N/A) ELECTRICAL EQUIPMENT: Electrical equipment and associated wiring shall be laterally braced to the structural system. (Tier 2: Sec. 4.8.12.7)
- C NC (N/A) DOORS: Mechanically operated doors shall be detailed to operate at a story drift ratio of 0.01. (Tier 2: Sec. 4.8.12.8)

### Piping

- C NC (N/A) FLUID AND GAS PIPING: Fluid and gas piping shall be anchored and braced to the structure to prevent breakage in piping. (Tier 2: Sec. 4.8.13.3)

### Screening Phase (Tier 1)

C NC (N/A) SHUT-OFF VALVES: Shut-off devices shall be present at building utility interfaces to shut off the flow of gas and high-temperature energy in the event of earthquake-induced failure. (Tier 2: Sec. 4.8.13.4)

C NC (N/A) C-CLAMPS: One-sided C-clamps that support piping greater than 2.5 inches in diameter shall be restrained. (Tier 2: Sec. 4.8.13.5)

#### Ducts

C NC (N/A) DUCT BRACING: Rectangular ductwork exceeding 6 square feet in cross-sectional area, and round ducts exceeding 28 inches in diameter, shall be braced. Maximum spacing of transverse bracing shall not exceed 30 feet. Maximum spacing of longitudinal bracing shall not exceed 60 feet. Intermediate supports shall not be considered part of the lateral-force-resisting system. (Tier 2: Sec. 4.8.14.2)

C NC (N/A) DUCT SUPPORT: Ducts shall not be supported by piping or electrical conduit. (Tier 2: Sec. 4.8.14.3)

#### Hazardous Materials Storage and Distribution

C NC (N/A) GAS CYLINDERS: Compressed gas cylinders shall be restrained. (Tier 2: Sec. 4.8.15.2)

C NC (N/A) HAZARDOUS MATERIALS: Piping containing hazardous materials shall have shut-off valves or other devices to prevent major spills or leaks. (Tier 2: Sec. 4.8.15.3)

#### Elevators

C NC (N/A) SUPPORT SYSTEM: All elements of the elevator system shall be anchored. (Tier 2: Sec. 4.8.16.1)

C NC (N/A) SEISMIC SWITCH: All elevators shall be equipped with seismic switches that will terminate operations when the ground motion exceeds 0.10g. (Tier 2: Sec. 4.8.16.2)

C NC (N/A) SHAFT WALLS: All elevator shaft walls shall be anchored and reinforced to prevent toppling into the shaft during strong shaking. (Tier 2: Sec. 4.8.16.3)

C NC (N/A) RETAINER GUARDS: Cable retainer guards on sheaves and drums shall be present to inhibit the displacement of cables. (Tier 2: Sec. 4.8.16.4)

C NC (N/A) RETAINER PLATE: A retainer plate shall be present at the top and bottom of both car and counterweight. (Tier 2: Sec. 4.8.16.5)

C NC (N/A) COUNTERWEIGHT RAILS: All counterweight rails and divider beams shall be sized in accordance with ASME A17.1. (Tier 2: Sec. 4.8.16.6)

C NC (N/A) BRACKETS: The brackets that tie the car rails and the counterweight rail to the building structure shall be sized in accordance with ASME A17.1. (Tier 2: Sec. 4.8.16.7)

C NC (N/A) SPREADER BRACKET: Spreader brackets shall not be used to resist seismic forces. (Tier 2: Sec. 4.8.16.8)

C NC (N/A) GO-SLOW ELEVATORS: The building shall have a go-slow elevator system. (Tier 2: Sec. 4.8.16.9)

## ASCE 31 EVALUATION - TIER 1

PROJECT NAME: Bainbridge Island Fire

PROJECT NO.: 2130356.00 DESIGNER: NKH

### ASCE 31 Tier 1 Evaluation - Station 22

**Building Location:**

7934 NE Bucklin Hill Rd, Bainbridge Island, 98110

**Target Building Performance:**  
Immediate Occupancy (IO)

**Level of Seismicity:**  
High

**Table 2-1. Levels of Seismicity Definitions**

Level of Seismicity <sup>1</sup>	$S_{DS}$	$S_{D1}$
Low	<0.167g	<0.067g
Moderate	≥0.167g <0.500g	≥0.067g <0.200g
High	≥0.500g	≥0.200g

$SC := "D"$

Soil Site Class (assumed) - ASCE 31, 3.5.2.3.1, p.3-13

$S_S := 1.389$

0.2s, Short Period Maximum Considered Earthquake (MCE, 2%/50yr) Mapped Spectral Response Acceleration (SRA) Parameter (5% of critical damping)- USGS

$S_1 := 0.547$

1.0s Period MCE, 2%/50yr Mapped SRA Parameter (5% of critical damping) - USGS

$S_{DS} := 0.926$

0.2s, Short Period Design SRA (approx. 10%/50yr) - ASCE 31, 3.5.2.3.1, p.3-12

$S_{D1} := 0.547$

1.0s Period Design SRA (approx. 10%/50yr) - ASCE 31, 3.5.2.3.1, p.3-12

$C_t := 0.02$

Approximate Period Determination Coefficient - ASCE 31, 3.5.2.4, p.3-14

$\beta := 0.75$

Approximate Period Determination Coefficient - ASCE 31, 3.5.2.4, p.3-14

$h_n := 16\text{ft}$

Max Building Height

$$T := C_t \cdot \left( \frac{h_n}{\text{ft}} \right)^\beta = 0.16$$

Empirical Approximate Fundamental Period Equation - ASCE 31, 3.5.2.4, p.3-14

$$S_a := \min \left( S_{DS}, \frac{S_{D1}}{T} \right)$$

Spectral Response Acceleration - ASCE 31 3.5.2.3.1, p.3-12

$S_a = 0.926$

**Table 3-2. Checklists Required for a Tier 1 Evaluation**

Level of Seismicity <sup>3</sup>	Level of Performance <sup>2</sup>	Required Checklists <sup>1</sup>						
		Level of Low Seismicity (Sec. 3.6)	Basic Structural (Sec. 3.7)	Supplemental Structural (Sec. 3.7)	Geologic Site Hazard and Foundation (Sec. 3.8)	Basic Nonstructural (Sec. 3.9.1)	Intermediate Nonstructural (Sec. 3.9.2)	Supplemental Nonstructural (Sec. 3.9.3)
Low	LS	▶						
	IO		▶		▶	▶		
Moderate	LS		▶		▶	▶		
	IO		▶	▶	▶	▶	▶	
High	LS		▶	▶	▶	▶	▶	
	IO		▶	▶	▶	▶	▶	▶

<sup>1</sup>A checkmark (▶) designates the checklist that must be completed for a Tier 1 Evaluation as a function of the level of seismicity and level of performance.

<sup>2</sup>LS = Life Safety; IO = Immediate Occupancy (defined in Section 2.4).

<sup>3</sup>Defined in Section 2.5.

C := 1.3 Factor to Relate Expected Maximum Inelastic Displacements to Displacements Calculated for Linear Elastic Response - ASCE 31, Table 3-4, p.3-10

**Building Seismic Weight:**

DL<sub>rf</sub> := 15psf Roof Dead Load

DL<sub>cmu</sub> := 8in·120pcf CMU Wall Weight

DL<sub>cmu</sub> = 80·psf

L<sub>bld</sub> := 75ft Length of Portion of Building

W<sub>bld</sub> := 53ft Width of Portion of Building

A<sub>roof</sub> := L<sub>bld</sub>·W<sub>bld</sub> Area of Roof

h<sub>roof</sub> := 12ft Roof Height

W<sub>skin</sub> :=  $\left[ (2L_{bld} + 2W_{bld}) \cdot DL_{cmu} \right] \cdot \frac{h_{roof}}{2}$  Skin Weight

W<sub>skin</sub> = 122.88·k

WT<sub>total</sub> := W<sub>skin</sub> + (A<sub>roof</sub>·DL<sub>rf</sub>) Total Building Weight

WT<sub>total</sub> = 182.505·k

**Seismic Pseudo-Lateral Force (Seismic Base Shear):**

V := C·S<sub>a</sub>·WT<sub>total</sub> Pseudo-Lateral Force - ASCE 31, 3.5.2.1, p.3-9

V = 219.7·k

- **Shearwall Stress Check - Tier 1 RM1 Basic Structural Checklist**

ASCE 31, 3.5.3.3, p.3-16 - *Check wall in line w/ apparatus bays:*

$L_{\text{walls}} := 53\text{ft} \cdot 2$  Length of Walls Contributing to Seis Wt in Load Dir

$A_{\text{roof}} = 3975 \text{ft}^2$

$WT_{\text{NS}} := L_{\text{walls}} \cdot DL_{\text{cmu}} \cdot \frac{h_{\text{roof}}}{2} + A_{\text{roof}} \cdot DL_{\text{rf}}$

$WT_{\text{NS}} = 110.505 \cdot \text{k}$

$V_{\text{NS}} := WT_{\text{NS}} \cdot C \cdot S_a$

$V_{\text{NS}} = 133.026 \cdot \text{k}$

$L_{\text{shearwall}} := 10\text{ft}$  Length of Shearwall

$A_w := L_{\text{shearwall}} \cdot 6\text{in}$  Shear Area

$A_w = 5 \text{ft}^2$

$m := 2$  Component Modification Factor - ASCE 31, Table 3-7, p.3-17

$v := \frac{1}{m} \cdot \frac{V}{A_w}$  Average Shear Stress - ASCE 31, 3.5.3.3, p.3-16

$v = 76.285 \cdot \text{psi}$

$v_{\text{max}} := 70\text{psi}$  Max Shear Stress - ASCE 31, 3.5.3.3, p.3-16

$\text{flag} := \text{if}(v \leq v_{\text{max}}, \text{"OK"} , \text{"NG!!!"})$  flag = "NG!!!"

**Therefore, non-compliant!**

- **OT Ratio Check - Tier 1 Geologic Site Checklist**

Ratio\_Limit :=  $0.6 \cdot S_a$       Minimum Width to Height Ratio

Ratio\_Limit = 0.556

Ratio :=  $\frac{W_{\text{bld}}}{h_{\text{roof}}}$       Width to Height Ratio

Ratio = 4.417

flag := if(Ratio ≥ Ratio\_Limit, "OK" , "NG!!!")      flag = "OK"

***Therefore, compliant!***

- **Height-Thickness Check - Tier 1 URM1 Supp. Structural Checklist**

Ratio\_Limit := 30      Maximum Height to Thickness Ratio

Ratio :=  $\frac{h_{\text{roof}}}{8\text{in}}$       Height to Thickness Ratio

Ratio = 18

flag := if(Ratio ≤ Ratio\_Limit, "OK" , "NG!!!")      flag = "OK"

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# Bainbridge Island Fire Station #23

## ASCE 31 Tier 1 Assessment

### **BUILDING STRUCTURAL NARRATIVE**

Station 23 is a wood framed single story structure with a small mezzanine that was built in 1995. The floor is concrete slab on grade: 8 inches thick at the apparatus bay area, and 4 inches elsewhere. The roof is wood framed with gang-nail trusses, and sheathed with 5/8" plywood. All exterior walls are 2x6 and sheathed with 1/2" plywood.

### **RESULTS OF ASCE 31 ANALYSIS**

The Tier 1 screening phase identified some structural and nonstructural items as non-compliant. Non-compliant issues require further evaluation in order to determine if the items are acceptable or not. A summary of the non-compliant issues is presented below. Copies of the Tier 1 checklists and calculations are attached to this report.

#### *STRUCTURAL NON-COMPLIANT ISSUES*

- **Endwall/Truss Bracing** – There is inadequate endwall/truss bracing at the apparatus bay trusses.
- **Liquefaction** – Liquefaction susceptible soils are not to be present under the building. Although this is unknown at this time, it is not likely that this is the case.

#### *NON-STRUCTURAL NON-COMPLIANT ISSUES*

- **Attached Equipment** – No lateral bracing is provided on mechanical units hanging from the ceiling.

### **CONCLUSIONS & RECOMMENDATIONS**

It is recommended that the non-compliant items listed above be addressed. This would include the following work:

- Install truss bracing at endwall trusses in the apparatus bay area.
- Secure mechanical equipment mentioned above.

A complete analysis of the building and seismic force resisting system must be conducted to fully understand all the issues that would need to be repaired, which is beyond the scope of this investigation. Depending on the results of these investigations, there may be changes to the list of repairs above.

Upon securing funding for these fire stations, a seismic retrofit design using ASCE 41 can be conducted to address the deficient issues. The items that were unable to be confirmed during the site observation could be exposed with destructive or non-destructive testing or reconnaissance, or soils investigation.

**3.7.1 Basic Structural Checklist for Building Type W1: Wood Light Frames**

This Basic Structural Checklist shall be completed where required by Table 3-2.

Each of the evaluation statements on this checklist shall be marked Compliant (C), Non-compliant (NC), or Not Applicable (N/A) for a Tier 1 Evaluation. Compliant statements identify issues that are acceptable according to the criteria of this standard, while non-compliant statements identify issues that require further investigation. Certain statements may not apply to the buildings being evaluated. For non-compliant evaluation statements, the design professional may choose to conduct further investigation using the corresponding Tier 2 Evaluation procedure; corresponding section numbers are in parentheses following each evaluation statement.

**C3.7.1 Basic Structural Checklist for Building Type W1**

These buildings are single- or multiple-family dwellings of one or more stories in height. Building loads are light and the framing spans are short. Floor and roof framing consists of wood joists or rafters on wood studs spaced no more than 24 inches apart. The first floor framing is supported directly on the foundation, or is raised up on cripple studs and post-and-beam supports. The foundation consists of spread footings constructed on concrete, concrete masonry block, or brick masonry or even wood in older construction. Chimneys, where present, consist of solid brick masonry, masonry veneer, or wood frame with internal metal flues. Lateral forces are resisted by wood frame diaphragms and shear walls. Floor and roof diaphragms consist of straight or diagonal lumber sheathing, tongue-and-groove planks, oriented strand board, or plywood. Shear walls consist of straight or diagonal lumber sheathing, plank siding, plywood, oriented strand board, stucco, gypsum board, particle board, or fiberboard. Interior partitions are sheathed with plaster or gypsum board.

**Building System**

- C    NC    N/A    **LOAD PATH:** The structure shall contain a minimum of one complete load path for Life Safety and Immediate Occupancy for seismic force effects from any horizontal direction that serves to transfer the inertial forces from the mass to the foundation. (Tier 2: Sec. 4.3.1.1)
- C    NC    N/A    **VERTICAL DISCONTINUITIES:** All vertical elements in the lateral-force-resisting system shall be continuous to the foundation. (Tier 2: Sec. 4.3.2.4)
- C    NC    N/A    **DETERIORATION OF WOOD:** There shall be no signs of decay, shrinkage, splitting, fire damage, or sagging in any of the wood members, and none of the metal connection hardware shall be deteriorated, broken, or loose. (Tier 2: Sec. 4.3.3.1)
- C     NC     N/A    **WOOD STRUCTURAL PANEL SHEAR WALL FASTENERS:** There shall be no more than 15 percent of inadequate fastening such as overdriven fasteners, omitted blocking, excessive fastening spacing, or inadequate edge distance. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.3.3.2)

**Lateral-Force-Resisting System**

- C    NC    N/A    **REDUNDANCY:** The number of lines of shear walls in each principal direction shall be greater than or equal to 2 for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.4.2.1.1)

**Screening Phase (Tier 1)**

C (NC) N/A SHEAR STRESS CHECK: The shear stress in the shear walls, calculated using the Quick Check procedure of Section 3.5.3.3, shall be less than the following values for Life Safety and Immediate Occupancy (Tier 2: Sec. 4.4.2.7.1):

Structural panel sheathing	1,000 plf
Diagonal sheathing	700 plf
Straight sheathing	100 plf
All other conditions	100 plf

C NC (N/A) STUCCO (EXTERIOR PLASTER) SHEAR WALLS: Multi-story buildings shall not rely on exterior stucco walls as the primary lateral-force-resisting system. (Tier 2: Sec. 4.4.2.7.2)

(C) NC N/A GYPSUM WALLBOARD OR PLASTER SHEAR WALLS: Interior plaster or gypsum wallboard shall not be used as shear walls on buildings over one story in height with the exception of the uppermost level of a multi-story building. (Tier 2: Sec. 4.4.2.7.3)

(C) NC N/A NARROW WOOD SHEAR WALLS: Narrow wood shear walls with an aspect ratio greater than 2-to-1 for Life Safety and 1.5-to-1 for Immediate Occupancy shall not be used to resist lateral forces developed in the building in levels of moderate and high seismicity. Narrow wood shear walls with an aspect ratio greater than 2-to-1 for Immediate Occupancy shall not be used to resist lateral forces developed in the building in levels of low seismicity. (Tier 2: Sec. 4.4.2.7.4)

C NC (N/A) WALLS CONNECTED THROUGH FLOORS: Shear walls shall have interconnection between stories to transfer overturning and shear forces through the floor. (Tier 2: Sec. 4.4.2.7.5)

C NC (N/A) HILLSIDE SITE: For structures that are taller on at least one side by more than one-half story due to a sloping site, all shear walls on the downhill slope shall have an aspect ratio less than 1-to-1 for Life Safety and 1 to 2 for Immediate Occupancy. (Tier 2: Sec. 4.4.2.7.6)

C NC (N/A) CRIPPLE WALLS: Cripple walls below first-floor-level shear walls shall be braced to the foundation with wood structural panels. (Tier 2: Sec. 4.4.2.7.7)

(C) NC N/A OPENINGS: Walls with openings greater than 80 percent of the length shall be braced with wood structural panel shear walls with aspect ratios of not more than 1.5-to-1 or shall be supported by adjacent construction through positive ties capable of transferring the lateral forces. (Tier 2: Sec. 4.4.2.7.8)

**Connections**

(C) NC N/A WOOD POSTS: There shall be a positive connection of wood posts to the foundation. (Tier 2: Sec. 4.6.3.3)

(C) NC N/A WOOD SILLS: All wood sills shall be bolted to the foundation. (Tier 2: Sec. 4.6.3.4)

(C) NC N/A GIRDER/COLUMN CONNECTION: There shall be a positive connection utilizing plates, connection hardware, or straps between the girder and the column support. (Tier 2: Sec. 4.6.4.1)

### 3.7.1S Supplemental Structural Checklist for Building Type W1: Wood Light Frames

This Supplemental Structural Checklist shall be completed where required by Table 3-2. The Basic Structural Checklist shall be completed prior to completing this Supplemental Structural Checklist.

#### Lateral-Force-Resisting System

- (C) NC N/A HOLD-DOWN ANCHORS: All shear walls shall have hold-down anchors constructed per acceptable construction practices, attached to the end studs. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.4.2.7.9)

#### Diaphragms

- (C) NC N/A DIAPHRAGM CONTINUITY: The diaphragms shall not be composed of split-level floors and shall not have expansion joints. (Tier 2: Sec. 4.5.1.1)
- (C) NC N/A ROOF CHORD CONTINUITY: All chord elements shall be continuous, regardless of changes in roof elevation. (Tier 2: Sec. 4.5.1.3)
- (C) NC N/A PLAN IRREGULARITIES: There shall be tensile capacity to develop the strength of the diaphragm at re-entrant corners or other locations of plan irregularities. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.5.1.7)
- (C) NC N/A DIAPHRAGM REINFORCEMENT AT OPENINGS: There shall be reinforcing around all diaphragm openings larger than 50 percent of the building width in either major plan dimension. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.5.1.8)
- C NC (N/A) STRAIGHT SHEATHING: All straight sheathed diaphragms shall have aspect ratios less than 2-to-1 for Life Safety and 1-to-1 for Immediate Occupancy in the direction being considered. (Tier 2: Sec. 4.5.2.1)
- (C) NC N/A SPANS: All wood diaphragms with spans greater than 24 feet for Life Safety and 12 feet for Immediate Occupancy shall consist of wood structural panels or diagonal sheathing. (Tier 2: Sec. 4.5.2.2)
- (C) NC N/A UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms shall have horizontal spans less than 40 feet for Life Safety and 30 feet for Immediate Occupancy and shall have aspect ratios less than or equal to 4-to-1 for Life Safety and 3-to-1 for Immediate Occupancy. (Tier 2: Sec. 4.5.2.3)
- (C) NC N/A OTHER DIAPHRAGMS: The diaphragm shall not consist of a system other than wood, metal deck, concrete, or horizontal bracing. (Tier 2: Sec. 4.5.7.1)

#### Connections

- (C) NC N/A WOOD SILL BOLTS: Sill bolts shall be spaced at 6 feet or less for Life Safety and 4 feet or less for Immediate Occupancy, with proper edge and end distance provided for wood and concrete. (Tier 2: Sec. 4.6.3.9)

**3.8 Geologic Site Hazards and Foundations Checklist**

This Geologic Site Hazards and Foundations Checklist shall be completed where required by Table 3-2.

Each of the evaluation statements on this checklist shall be marked Compliant (C), Non-compliant (NC), or Not Applicable (N/A) for a Tier 1 Evaluation. Compliant statements identify issues that are acceptable according to the criteria of this standard, while non-compliant statements identify issues that require further investigation. Certain statements may not apply to the buildings being evaluated. For non-compliant evaluation statements, the design professional may choose to conduct further investigation using the corresponding Tier 2 Evaluation procedure; corresponding section numbers are in parentheses following each evaluation statement.

**Geologic Site Hazards**

The following statements shall be completed for buildings in levels of high or moderate seismicity.

C NC N/A LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could jeopardize the building's seismic performance shall not exist in the foundation soils at depths within 50 feet under the building for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.7.1.1)  
UNKNOWN

(C) NC N/A SLOPE FAILURE: The building site shall be sufficiently remote from potential earthquake-induced slope failures or rockfalls to be unaffected by such failures or shall be capable of accommodating any predicted movements without failure. (Tier 2: Sec. 4.7.1.2)

C NC N/A SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site is not anticipated. (Tier 2: Sec. 4.7.1.3)  
UNKNOWN

**Condition of Foundations**

The following statement shall be completed for all Tier 1 building evaluations.

(C) NC N/A FOUNDATION PERFORMANCE: There shall be no evidence of excessive foundation movement such as settlement or heave that would affect the integrity or strength of the structure. (Tier 2: Sec. 4.7.2.1)

The following statement shall be completed for buildings in levels of high or moderate seismicity being evaluated to the Immediate Occupancy Performance Level.

(C) NC N/A DETERIORATION: There shall not be evidence that foundation elements have deteriorated due to corrosion, sulfate attack, material breakdown, or other reasons in a manner that would affect the integrity or strength of the structure. (Tier 2: Sec. 4.7.2.2)

**Capacity of Foundations**

The following statement shall be completed for all Tier 1 building evaluations.

C NC (N/A) POLE FOUNDATIONS: Pole foundations shall have a minimum embedment depth of 4 feet for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.7.3.1)

The following statements shall be completed for buildings in levels of moderate seismicity being evaluated to the Immediate Occupancy Performance Level and for buildings in levels of high seismicity.

(C) NC N/A OVERTURNING: The ratio of the horizontal dimension of the lateral-force-resisting system at the foundation level to the building height (base/height) shall be greater than  $0.6S_p$ . (Tier 2: Sec. 4.7.3.2)  
SEE CALC'S

Screening Phase (Tier 1)

C	NC	(N/A)	TIES BETWEEN FOUNDATION ELEMENTS: The foundation shall have ties adequate to resist seismic forces where footings, piles, and piers are not restrained by beams, slabs, or soils classified as Class A, B, or C. (Section 3.5.2.3.1, Tier 2: Sec. 4.7.3.3)
C	NC	(N/A)	DEEP FOUNDATIONS: Piles and piers shall be capable of transferring the lateral forces between the structure and the soil. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.7.3.4)
(C)	NC	N/A	SLOPING SITES: The difference in foundation embedment depth from one side of the building to another shall not exceed one story in height. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.7.3.5)

**3.9.1 Basic Nonstructural Component Checklist**

This Basic Nonstructural Component Checklist shall be completed where required by Table 3-2.

Each of the evaluation statements on this checklist shall be marked Compliant (C), Non-compliant (NC), or Not Applicable (N/A) for a Tier 1 Evaluation. Compliant statements identify issues that are acceptable according to the criteria of this standard, while non-compliant statements identify issues that require further investigation. Certain statements may not apply to the buildings being evaluated. For non-compliant evaluation statements, the design professional may choose to conduct further investigation using the corresponding Tier 2 Evaluation procedure; corresponding section numbers are in parentheses following each evaluation statement.

**Partitions**

- C NC (N/A) UNREINFORCED MASONRY: Unreinforced masonry or hollow clay tile partitions shall be braced at a spacing equal to or less than 10 feet in levels of low or moderate seismicity and 6 feet in levels of high seismicity. (Tier 2: Sec. 4.8.1.1)

**Ceiling Systems**

- (C) NC N/A SUPPORT: The integrated suspended ceiling system shall not be used to laterally support the tops of gypsum board, masonry, or hollow clay tile partitions. Gypsum board partitions need not be evaluated where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.2.1)

**Light Fixtures**

- C NC (N/A) EMERGENCY LIGHTING: Emergency lighting shall be anchored or braced to prevent falling during an earthquake. (Tier 2: Sec. 4.8.3.1)

**Cladding and Glazing**

- C NC (N/A) CLADDING ANCHORS: Cladding components weighing more than 10 psf shall be mechanically anchored to the exterior wall framing at a spacing equal to or less than 4 feet. A spacing of up to 6 feet is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.4.1)
- C NC (N/A) DETERIORATION: There shall be no evidence of deterioration, damage or corrosion in any of the connection elements. (Tier 2: Sec. 4.8.4.2)
- C NC (N/A) CLADDING ISOLATION: For moment frame buildings of steel or concrete, panel connections shall be detailed to accommodate a story drift ratio of 0.02. Panel connection detailing for a story drift ratio of 0.01 is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.4.3)
- C NC (N/A) MULTI-STORY PANELS: For multi-story panels attached at each floor level, panel connections shall be detailed to accommodate a story drift ratio of 0.02. Panel connection detailing for a story drift ratio of 0.01 is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.4.4)
- C NC (N/A) BEARING CONNECTIONS: Where bearing connections are required, there shall be a minimum of two bearing connections for each wall panel. (Tier 2: Sec. 4.8.4.5)

## Screening Phase (Tier 1)

C NC (N/A) INSERTS: Where inserts are used in concrete connections, the inserts shall be anchored to reinforcing steel or other positive anchorage. (Tier 2: Sec. 4.8.4.6)

C NC (N/A) PANEL CONNECTIONS: Exterior cladding panels shall be anchored out-of-plane with a minimum of 4 connections for each wall panel. Two connections per wall panel are permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.4.7)

### Masonry Veneer

C NC (N/A) SHELF ANGLES: Masonry veneer shall be supported by shelf angles or other elements at each floor 30 feet or more above ground for Life Safety and at each floor above the first floor for Immediate Occupancy. (Tier 2: Sec. 4.8.5.1)

C NC (N/A) TIES: Masonry veneer shall be connected to the back-up with corrosion-resistant ties. The ties shall have a spacing equal to or less than 24 inches with a minimum of one tie for every 2-2/3 square feet. A spacing of up to 36 inches is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.5.2)

C NC (N/A) WEAKENED PLANES: Masonry veneer shall be anchored to the back-up adjacent to weakened planes, such as at the locations of flashing. (Tier 2: Sec. 4.8.5.3)

C NC (N/A) DETERIORATION: There shall be no evidence of deterioration, damage, or corrosion in any of the connection elements. (Tier 2: Sec. 4.8.5.4)

### Parapets, Cornices, Ornamentation, and Appendages

C NC (N/A) URM PARAPETS: There shall be no laterally unsupported unreinforced masonry parapets or cornices with height-to-thickness ratios greater than 1.5. A height-to-thickness ratio of up to 2.5 is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.8.1)

C NC (N/A) CANOPIES: Canopies located at building exits shall be anchored to the structural framing at a spacing of 6 feet or less. An anchorage spacing of up to 10 feet is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.8.2)

### Masonry Chimneys

C NC (N/A) URM CHIMNEYS: No unreinforced masonry chimney shall extend above the roof surface more than twice the least dimension of the chimney. A height above the roof surface of up to three times the least dimension of the chimney is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.9.1)

### Stairs

C NC (N/A) URM WALLS: Walls around stair enclosures shall not consist of unbraced hollow clay tile or unreinforced masonry with a height-to-thickness ratio greater than 12-to-1. A height-to-thickness ratio of up to 15-to-1 is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.10.1)

C NC (N/A) STAIR DETAILS: In moment frame structures, the connection between the stairs and the structure shall not rely on shallow anchors in concrete. Alternatively, the stair details shall be capable of accommodating the drift calculated using the Quick Check procedure of Section 3.5.3.1 without including tension in the anchors. (Tier 2: Sec. 4.8.10.2)

## Screening Phase (Tier 1)

### Building Contents and Furnishing

- (C) NC N/A TALL NARROW CONTENTS: Contents over 4 feet in height with a height-to-depth or height-to-width ratio greater than 3-to-1 shall be anchored to the floor slab or adjacent structural walls. A height-to-depth or height-to-width ratio of up to 4-to-1 is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.11.1)

### Mechanical and Electrical Equipment

- (C) NC N/A EMERGENCY POWER: Equipment used as part of an emergency power system shall be mounted to maintain continued operation after an earthquake. (Tier 2: Sec. 4.8.12.1)
- C NC (N/A) HAZARDOUS MATERIAL EQUIPMENT: HVAC or other equipment containing hazardous material shall not have damaged supply lines or unbraced isolation supports. (Tier 2: Sec. 4.8.12.2)
- (C) NC N/A DETERIORATION: There shall be no evidence of deterioration, damage, or corrosion in any of the anchorage or supports of mechanical or electrical equipment. (Tier 2: Sec. 4.8.12.3)
- (C) NC N/A ATTACHED EQUIPMENT: Equipment weighing over 20 lb that is attached to ceilings, walls, or other supports 4 feet above the floor level shall be braced. (Tier 2: Sec. 4.8.12.4)

### Piping

- (C) NC N/A FIRE SUPPRESSION PIPING: Fire suppression piping shall be anchored and braced in accordance with NFPA-13 (NFPA, 1996). (Tier 2: Sec. 4.8.13.1)
- (C) NC N/A FLEXIBLE COUPLINGS: Fluid, gas, and fire suppression piping shall have flexible couplings. (Tier 2: Sec. 4.8.13.2)

### Hazardous Materials Storage and Distribution

- (C) NC N/A TOXIC SUBSTANCES: Toxic and hazardous substances stored in breakable containers shall be restrained from falling by latched doors, shelf lips, wires, or other methods. (Tier 2: Sec. 4.8.15.1)

**3.9.2 Intermediate Nonstructural Component Checklist**

This Intermediate Nonstructural Component Checklist shall be completed where required by Table 3-2. The Basic Nonstructural Component Checklist shall be completed prior to completing this Intermediate Nonstructural Component Checklist.

**Ceiling Systems**

- C NC (N/A) LAY-IN TILES: Lay-in tiles used in ceiling panels located at exits and corridors shall be secured with clips. (Tier 2: Sec. 4.8.2.2)
- (C) NC N/A INTEGRATED CEILINGS: Integrated suspended ceilings at exits and corridors or weighing more than 2 pounds per square foot shall be laterally restrained with a minimum of four diagonal wires or rigid members attached to the structure above at a spacing equal to or less than 12 feet. (Tier 2: Sec. 4.8.2.3)
- C NC (N/A) SUSPENDED LATH AND PLASTER: Ceilings consisting of suspended lath and plaster or gypsum board shall be attached to resist seismic forces for every 12 square feet of area. (Tier 2: Sec. 4.8.2.4)

**Light Fixtures**

- (C) NC N/A INDEPENDENT SUPPORT: Light fixtures in suspended grid ceilings shall be supported independently of the ceiling suspension system by a minimum of two wires at diagonally opposite corners of the fixtures. (Tier 2: Sec. 4.8.3.2)

**Cladding and Glazing**

- C NC (N/A) GLAZING: Glazing in curtain walls and individual panes over 16 square feet in area, located up to a height of 10 feet above an exterior walking surface, shall have safety glazing. Such glazing located over 10 feet above an exterior walking surface shall be laminated annealed or laminated heat-strengthened safety glass or other glazing system that will remain in the frame when glass is cracked. (Tier 2: Sec. 4.8.4.8)

**Parapets, Cornices, Ornamentation, and Appendages**

- C NC (N/A) CONCRETE PARAPETS: Concrete parapets with height-to-thickness ratios greater than 2.5 shall have vertical reinforcement. (Tier 2: Sec. 4.8.8.3)
- C NC (N/A) APPENDAGES: Cornices, parapets, signs, and other appendages that extend above the highest point of anchorage to the structure or cantilever from exterior wall faces and other exterior wall ornamentation shall be reinforced and anchored to the structural system at a spacing equal to or less than 10 feet for Life Safety and 6 feet for Immediate Occupancy. This requirement need not apply to parapets or cornices compliant with Section 4.8.8.1 or 4.8.8.3. (Tier 2: Sec. 4.8.8.4)

**Masonry Chimneys**

- C NC (N/A) ANCHORAGE: Masonry chimneys shall be anchored at each floor level and the roof. (Tier 2: Sec. 4.8.9.2)

Screening Phase (Tier 1)

**Mechanical and Electrical Equipment**

C NC (N/A) VIBRATION ISOLATORS: Equipment mounted on vibration isolators shall be equipped with restraints or snubbers. (Tier 2: Sec. 4.8.12.5)

**Ducts**

C NC (N/A) STAIR AND SMOKE DUCTS: Stair pressurization and smoke control ducts shall be braced and shall have flexible connections at seismic joints. (Tier 2: Sec. 4.8.14.1)

**3.9.3 Supplemental Nonstructural Component Checklist**

This Supplemental Nonstructural Component Checklist shall be completed where required by Table 3-2. The Basic and Intermediate Nonstructural Component Checklists shall be completed prior to completing this Supplemental Nonstructural Component Checklist.

**C3.9.3 Supplemental Nonstructural Component Checklist**

The statements in this checklist are intended to evaluate elements that may prevent or limit use of a building following an earthquake. While this checklist is required only for buildings in levels of high seismicity being evaluated to the Immediate Occupancy Performance Level, it may be used as a guide to evaluate potential disruption to building use following an earthquake.

**Partitions**

- C NC (N/A) DRIFT: Rigid cementitious partitions shall be detailed to accommodate a drift ratio of 0.02 in steel moment frame, concrete moment frame, and wood frame buildings. Rigid cementitious partitions shall be detailed to accommodate a drift ratio of 0.005 in other buildings. (Tier 2: Sec. 4.8.1.2)
- C NC (N/A) STRUCTURAL SEPARATIONS: Partitions at structural separations shall have seismic or control joints. (Tier 2: Sec. 4.8.1.3)
- (C) NC N/A TOPS: The tops of framed or panelized partitions that only extend to the ceiling line shall have lateral bracing to the building structure at a spacing equal to or less than 6 feet. (Tier 2: Sec. 4.8.1.4)

**Ceiling Systems**

- (C) NC N/A EDGES: The edges of integrated suspended ceilings shall be separated from enclosing walls by a minimum of 1/2 inch. (Tier 2: Sec. 4.8.2.5)
- C NC (N/A) SEISMIC JOINT: The ceiling system shall not extend continuously across any seismic joint. (Tier 2: Sec. 4.8.2.6)

**Light Fixtures**

- C NC (N/A) PENDANT SUPPORTS: Light fixtures on pendant supports shall be attached at a spacing equal to or less than 6 feet and, if rigidly supported, shall be free to move with the structure to which they are attached without damaging adjoining materials. (Tier 2: Sec. 4.8.3.3)
- C NC (N/A) LENS COVERS: Lens covers on light fixtures shall be attached or supplied with safety devices. (Tier 2: Sec. 4.8.3.4)

**Cladding and Glazing**

- (C) NC N/A GLAZING: All exterior glazing shall be laminated, annealed or laminated heat-strengthened safety glass or other glazing system that will remain in the frame when glass is cracked. (Tier 2: Sec. 4.8.4.9)

## Screening Phase (Tier 1)

### Masonry Veneer

- C NC (N/A) MORTAR: The mortar in masonry veneer shall not be easily scraped away from the joints by hand with a metal tool, and there shall not be significant areas of eroded mortar. (Tier 2: Sec. 4.8.5.5)
- C NC (N/A) WEEP HOLES: In veneer braced by stud walls, functioning weep holes and base flashing shall be present. (Tier 2: Sec. 4.8.5.6)
- C NC (N/A) STONE CRACKS: There shall no be visible cracks or signs of visible distortion in the stone. (Tier 2: Sec. 4.8.5.7)

### Metal Stud Back-Up Systems

- C NC (N/A) STUD TRACKS: Stud tracks shall be fastened to structural framing at a spacing equal to or less than 24 inches on center. (Tier 2: Sec. 4.8.6.1)
- C NC (N/A) OPENINGS: Steel studs shall frame window and door openings. (Tier 2: Sec. 4.8.6.2)

### Concrete Block and Masonry Back-Up Systems

- C NC (N/A) ANCHORAGE: Back-up shall have a positive anchorage to the structural framing at a spacing equal to or less than 4 feet along the floors and roof. (Tier 2: Sec. 4.8.7.1)
- C NC (N/A) URM BACK-UP: There shall be no unreinforced masonry back-up. (Tier 2: Sec. 4.8.7.2)

### Building Contents and Furnishing

- C NC (N/A) FILE CABINETS: File cabinets arranged in groups shall be attached to one another. (Tier 2: Sec. 4.8.11.2)
- (C) NC N/A CABINET DOORS AND DRAWERS: Cabinet doors and drawers shall have latches to keep them closed during an earthquake. (Tier 2: Sec. 4.8.11.3)
- C NC (N/A) ACCESS FLOORS: Access floors over 9 inches in height shall be braced. (Tier 2: Sec. 4.8.11.4)
- C NC (N/A) EQUIPMENT ON ACCESS FLOORS: Equipment and computers supported on access floor systems shall be either attached to the structure or fastened to a laterally braced floor system. (Tier 2: Sec. 4.8.11.5)

### Mechanical and Electrical Equipment

- (C) NC N/A HEAVY EQUIPMENT: Equipment weighing over 100 pounds shall be anchored to the structure or foundation. (Tier 2: Sec. 4.8.12.6)
- C NC (N/A) ELECTRICAL EQUIPMENT: Electrical equipment and associated wiring shall be laterally braced to the structural system. (Tier 2: Sec. 4.8.12.7)
- C NC (N/A) DOORS: Mechanically operated doors shall be detailed to operate at a story drift ratio of 0.01. (Tier 2: Sec. 4.8.12.8)

### Piping

- C NC (N/A) FLUID AND GAS PIPING: Fluid and gas piping shall be anchored and braced to the structure to prevent breakage in piping. (Tier 2: Sec. 4.8.13.3)

### Screening Phase (Tier 1)

C NC (N/A) SHUT-OFF VALVES: Shut-off devices shall be present at building utility interfaces to shut off the flow of gas and high-temperature energy in the event of earthquake-induced failure. (Tier 2: Sec. 4.8.13.4)

(C) NC N/A C-CLAMPS: One-sided C-clamps that support piping greater than 2.5 inches in diameter shall be restrained. (Tier 2: Sec. 4.8.13.5)

#### Ducts

C NC (N/A) DUCT BRACING: Rectangular ductwork exceeding 6 square feet in cross-sectional area, and round ducts exceeding 28 inches in diameter, shall be braced. Maximum spacing of transverse bracing shall not exceed 30 feet. Maximum spacing of longitudinal bracing shall not exceed 60 feet. Intermediate supports shall not be considered part of the lateral-force-resisting system. (Tier 2: Sec. 4.8.14.2)

(C) NC N/A DUCT SUPPORT: Ducts shall not be supported by piping or electrical conduit. (Tier 2: Sec. 4.8.14.3)

#### Hazardous Materials Storage and Distribution

(C) NC N/A GAS CYLINDERS: Compressed gas cylinders shall be restrained. (Tier 2: Sec. 4.8.15.2)

C NC (N/A) HAZARDOUS MATERIALS: Piping containing hazardous materials shall have shut-off valves or other devices to prevent major spills or leaks. (Tier 2: Sec. 4.8.15.3)

#### Elevators

C NC (N/A) SUPPORT SYSTEM: All elements of the elevator system shall be anchored. (Tier 2: Sec. 4.8.16.1)

C NC (N/A) SEISMIC SWITCH: All elevators shall be equipped with seismic switches that will terminate operations when the ground motion exceeds 0.10g. (Tier 2: Sec. 4.8.16.2)

C NC (N/A) SHAFT WALLS: All elevator shaft walls shall be anchored and reinforced to prevent toppling into the shaft during strong shaking. (Tier 2: Sec. 4.8.16.3)

C NC (N/A) RETAINER GUARDS: Cable retainer guards on sheaves and drums shall be present to inhibit the displacement of cables. (Tier 2: Sec. 4.8.16.4)

C NC (N/A) RETAINER PLATE: A retainer plate shall be present at the top and bottom of both car and counterweight. (Tier 2: Sec. 4.8.16.5)

C NC (N/A) COUNTERWEIGHT RAILS: All counterweight rails and divider beams shall be sized in accordance with ASME A17.1. (Tier 2: Sec. 4.8.16.6)

C NC (N/A) BRACKETS: The brackets that tie the car rails and the counterweight rail to the building structure shall be sized in accordance with ASME A17.1. (Tier 2: Sec. 4.8.16.7)

C NC (N/A) SPREADER BRACKET: Spreader brackets shall not be used to resist seismic forces. (Tier 2: Sec. 4.8.16.8)

C NC (N/A) GO-SLOW ELEVATORS: The building shall have a go-slow elevator system. (Tier 2: Sec. 4.8.16.9)

## ASCE 31 EVALUATION - TIER 1

PROJECT NAME: Bainbridge Island Fire Station 23 PROJECT NO.: 2130356.00 DESIGNER: NKH

### ASCE 31 Tier 1 Evaluation - Station 23

**Building Location:**

12985 Phelps Rd, Bainbridge Island, 98110

**Target Building Performance:**  
Immediate Occupancy (IO)

**Level of Seismicity:**  
High

**Table 2-1. Levels of Seismicity Definitions**

Level of Seismicity <sup>1</sup>	$S_{DS}$	$S_{D1}$
Low	<0.167g	<0.067g
Moderate	≥0.167g <0.500g	≥0.067g <0.200g
High	≥0.500g	≥0.200g

SC := "D"

Soil Site Class (assumed) - ASCE 31, 3.5.2.3.1, p.3-13

$S_S := 1.389$

0.2s, Short Period Maximum Considered Earthquake (MCE, 2%/50yr) Mapped Spectral Response Acceleration (SRA) Parameter (5% of critical damping)- USGS

$S_1 := 0.547$

1.0s Period MCE, 2%/50yr Mapped SRA Parameter (5% of critical damping) - USGS

$S_{DS} := 0.926$

0.2s, Short Period Design SRA (approx. 10%/50yr) - ASCE 31, 3.5.2.3.1, p.3-12

$S_{D1} := 0.547$

1.0s Period Design SRA (approx. 10%/50yr) - ASCE 31, 3.5.2.3.1, p.3-12

$C_t := 0.02$

Approximate Period Determination Coefficient - ASCE 31, 3.5.2.4, p.3-14

$\beta := 0.75$

Approximate Period Determination Coefficient - ASCE 31, 3.5.2.4, p.3-14

$h_n := 16\text{ft}$

Max Building Height

$$T := C_t \cdot \left( \frac{h_n}{\text{ft}} \right)^\beta = 0.16$$

Empirical Approximate Fundamental Period Equation - ASCE 31, 3.5.2.4, p.3-14

$$S_a := \min \left( S_{DS}, \frac{S_{D1}}{T} \right)$$

Spectral Response Acceleration - ASCE 31 3.5.2.3.1, p.3-12

$S_a = 0.926$

**Table 3-2. Checklists Required for a Tier 1 Evaluation**

Level of Seismicity <sup>3</sup>	Level of Performance <sup>2</sup>	Required Checklists <sup>1</sup>						
		Level of Low Seismicity (Sec. 3.6)	Basic Structural (Sec. 3.7)	Supplemental Structural (Sec. 3.7)	Geologic Site Hazard and Foundation (Sec. 3.8)	Basic Nonstructural (Sec. 3.9.1)	Intermediate Nonstructural (Sec. 3.9.2)	Supplemental Nonstructural (Sec. 3.9.3)
Low	LS	▶						
	IO		▶		▶	▶		
Moderate	LS		▶		▶	▶		
	IO		▶	▶	▶	▶	▶	
High	LS		▶	▶	▶	▶	▶	
	IO		▶	▶	▶	▶	▶	▶

<sup>1</sup>A checkmark (▶) designates the checklist that must be completed for a Tier 1 Evaluation as a function of the level of seismicity and level of performance.

<sup>2</sup>LS = Life Safety; IO = Immediate Occupancy (defined in Section 2.4).

<sup>3</sup>Defined in Section 2.5.

C := 1.3 Factor to Relate Expected Maximum Inelastic Displacements to Displacements Calculated for Linear Elastic Response - ASCE 31, Table 3-4, p.3-10

**Building Seismic Weight:**

DL := 15psf Dead Load

DL<sub>wall</sub> := 10psf Wood Framed Wall Weight

L := 136ft Building Length

W := 90ft Building Width

Area := L · W Building Area

h := 10ft Building Height

$W_{skin} := [(2L + 2W) \cdot DL_{wall}] \cdot \frac{h}{2}$  Skin Weight

$W_{skin} = 22.6 \cdot k$

$WT_{total} := W_{skin} + (Area \cdot DL)$  Total Weight

$WT_{total} = 206.2 \cdot k$

**Seismic Pseudo-Lateral Force (Seismic Base Shear):**

V := C · S<sub>a</sub> · WT<sub>total</sub> Pseudo-Lateral Force - ASCE 31, 3.5.2.1, p.3-9

V = 248.224 · k

- **Shearwall Stress Check - Tier 1 W1 Basic Structural Checklist**

ASCE 31, 3.5.3.3, p.3-16 - *Check South Wall:*

$L_{\text{shearwall}} := 21\text{ft} + 5\text{ft} + 4\text{ft} + 6\text{ft} + 6\text{ft}$                       Length of Shearwalls

$m := 2$     Component Modification Factor - ASCE 31,  
Table 3-7, p.3-17

$v := \frac{1}{m} \cdot \frac{V}{L_{\text{shearwall}}}$     Average Shear Stress - ASCE 31, 3.5.3.3, p.3-16

$v = 1478 \cdot \text{plf}$

Max Shear Stress - ASCE 31, 3.5.3.3, p.3-16

Structural Panel Sheathing: 1000 plf

Diagonal Sheathing: 700 plf

All Other Conditions: 100 plf

***Sheathing is plywood (structural panel sheathing).***

- **OT Ratio Check - Tier 1 Geologic Site Checklist**

Ratio\_Limit := 0.6 · S<sub>a</sub>      Minimum Width to Height Ratio

Ratio\_Limit = 0.556

Ratio :=  $\frac{W}{h}$       Width to Height Ratio

Ratio = 9

flag := if(Ratio ≥ Ratio\_Limit, "OK" , "NG!!!")      flag = "OK"

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# Bainbridge Island Police Station

## ASCE 31 Tier 1 Assessment

### **BUILDING STRUCTURAL NARRATIVE**

The police station is an unreinforced masonry building with a daylight basement built sometime in the 1940's. The basement is slab on grade with concrete retaining walls. The floor and roof are wood framed. In 1969 the building was added to on the east side with the same construction, increasing the basement and main floor spaces.

### **RESULTS OF ASCE 31 ANALYSIS**

The Tier 1 screening phase identified some structural and nonstructural items as non-compliant. Non-compliant issues require further evaluation in order to determine if the items are acceptable or not. A summary of the non-compliant issues is presented below. Copies of the Tier 1 checklists and calculations are attached to this report.

#### *STRUCTURAL NON-COMPLIANT ISSUES*

- **Unblocked diaphragms** – For the immediate occupancy performance level, all unblocked wood structural panel diaphragms shall have horizontal spans of less than 30ft. Station 21 does not have a blocked roof diaphragm, yet horizontally spans 85ft.
- **Wall Anchorage, Wood Ledgers, Transfer to Shear Walls** –The CMU walls are not tied into the roof diaphragm to meet the provisions of this requirement for in-plane and out-of-plane forces for strength and stiffness.
- **Shear Stress** – The average shear stresses in the exterior masonry walls exceed the maximums set forth in the ASCE 31.
- **Cross Ties** – Continuous cross ties meeting the intent of this provision do not exist in the diaphragms.
- **Liquefaction** – Liquefaction susceptible soils are not to be present under the building. Although this is unknown at this time, it is not likely that this is the case.

### **CONCLUSIONS & RECOMMENDATIONS**

It is recommended that the non-compliant items listed above be addressed. This would include the following work:

- Install blocking at the roof and floor diaphragm.
- At the masonry walls that are not adequately tied to the roof, anchors, blocking, and strapping would be required. Cross ties would need to be continued across the diaphragms, by strapping the framing members where discontinuous at supports.

- Install steel strongbacks on the inside face of masonry walls to provide stiffness to resist out-of-plane bending in the walls.
- Additional shearwalls and/or bracing of the existing masonry walls should be installed at areas where the shear stress exceeds maximum code levels.

A complete analysis of the building and seismic force resisting system must be conducted to fully understand all the issues that would need to be repaired, which is beyond the scope of this investigation. Depending on the results of these investigations, there may be changes to the list of repairs above.

Upon securing funding for these fire stations, a seismic retrofit design using ASCE 41 can be conducted to address the deficient issues. The items that were unable to be confirmed during the site observation could be exposed with destructive or non-destructive testing or reconnaissance, or soils investigation.

**Screening Phase (Tier 1)**

**3.7.15 Basic Structural Checklist for Building Type URM: Unreinforced Masonry Bearing Walls with Flexible Diaphragms**

This Basic Structural Checklist shall be completed where required by Table 3-2.

Each of the evaluation statements on this checklist shall be marked Compliant (C), Non-compliant (NC), or Not Applicable (N/A) for a Tier 1 Evaluation. Compliant statements identify issues that are acceptable according to the criteria of this standard, while non-compliant statements identify issues that require further investigation. Certain statements may not apply to the buildings being evaluated. For non-compliant evaluation statements, the design professional may choose to conduct further investigation using the Tier 2 Special Procedure for Unreinforced Masonry or the Tier 3 Evaluation Procedure.

**C3.7.15 Basic Structural Checklist for Building Type URM**

These buildings have bearing walls that consist of unreinforced (or lightly reinforced) brick, stone, or concrete block masonry. Wood floor and roof framing consists of wood joists, glulam beams, and wood posts or small steel columns. Steel floor and roof framing consists of steel beams or open web joists, steel girders, and steel columns. Lateral forces are resisted by the brick or concrete block masonry shear walls. Diaphragms consist of straight or diagonal lumber sheathing, structural wood panels, or untopped metal deck, and are flexible relative to the walls. Foundations consist of brick or concrete spread footings or deep foundations.

**Building System**

- |     |    |       |   |
|-----|----|-------|---|
| (C) | NC | N/A   | LOAD PATH: The structure shall contain a minimum of one complete load path for Life Safety and Immediate Occupancy for seismic force effects from any horizontal direction that serves to transfer the inertial forces from the mass to the foundation. (Tier 2: Sec. 4.3.1.1)  |
| (C) | NC | N/A   | ADJACENT BUILDINGS: The clear distance between the building being evaluated and any adjacent building shall be greater than 4 percent of the height of the shorter building for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.3.1.2)   |
| C   | NC | (N/A) | MEZZANINES: Interior mezzanine levels shall be braced independently from the main structure, or shall be anchored to the lateral-force-resisting elements of the main structure. (Tier 2: Sec. 4.3.1.3)   |
| C   | NC | (N/A) | WEAK STORY: The strength of the lateral-force-resisting system in any story shall not be less than 80 percent of the strength in an adjacent story, above or below, for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.3.2.1)   |
| C   | NC | (N/A) | SOFT STORY: The stiffness of the lateral-force-resisting system in any story shall not be less than 70 percent of the lateral-force-resisting system stiffness in an adjacent story above or below, or less than 80 percent of the average lateral-force-resisting system stiffness of the three stories above or below for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.3.2.2) |
| (C) | NC | N/A   | GEOMETRY: There shall be no changes in horizontal dimension of the lateral-force-resisting system of more than 30 percent in a story relative to adjacent stories for Life Safety and Immediate Occupancy, excluding one-story penthouses and mezzanines. (Tier 2: Sec. 4.3.2.3)  |
| C   | NC | (N/A) | VERTICAL DISCONTINUITIES: All vertical elements in the lateral-force-resisting system shall be continuous to the foundation. (Tier 2: Sec. 4.3.2.4)   |

### Screening Phase (Tier 1)

- |   |    |     |   |
|---|----|-----|---|
| C | NC | N/A | MASS: There shall be no change in effective mass more than 50 percent from one story to the next for Life Safety and Immediate Occupancy. Light roofs, penthouses, and mezzanines need not be considered. (Tier 2: Sec. 4.3.2.5)  |
| C | NC | N/A | DETERIORATION OF WOOD: There shall be no signs of decay, shrinkage, splitting, fire damage, or sagging in any of the wood members, and none of the metal connection hardware shall be deteriorated, broken, or loose. (Tier 2: Sec. 4.3.3.1)  |
| C | NC | N/A | MASONRY UNITS: There shall be no visible deterioration of masonry units. (Tier 2: Sec. 4.3.3.7)   |
| C | NC | N/A | MASONRY JOINTS: The mortar shall not be easily scraped away from the joints by hand with a metal tool, and there shall be no areas of eroded mortar. (Tier 2: Sec. 4.3.3.8)   |
| C | NC | N/A | UNREINFORCED MASONRY WALL CRACKS: There shall be no existing diagonal cracks in the wall elements greater than 1/8 inch for Life Safety and 1/16 inch for Immediate Occupancy, or out-of-plane offsets in the bed joint greater than 1/8 inch for Life Safety and 1/16 inch for Immediate Occupancy, and shall not form an X pattern. (Tier 2: Sec. 4.3.3.11) |

### Lateral-Force-Resisting System

- |   |    |     |   |
|---|----|-----|---|
| C | NC | N/A | REDUNDANCY: The number of lines of shear walls in each principal direction shall be greater than or equal to 2 for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.4.2.1.1)  |
| C | NC | N/A | SHEAR STRESS CHECK: The shear stress in the unreinforced masonry shear walls, calculated using the Quick Check procedure of Section 3.5.3.3, shall be less than 30 psi for clay units and 70 psi for concrete units for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.4.2.5.1) |
- SEE CALC'S

### Connections

- |   |    |     |  |
|---|----|-----|--|
| C | NC | N/A | WALL ANCHORAGE: Exterior concrete or masonry walls that are dependent on the diaphragm for lateral support shall be anchored for out-of-plane forces at each diaphragm level with steel anchors, reinforcing dowels, or straps that are developed into the diaphragm. Connections shall have adequate strength to resist the connection force calculated in the Quick Check procedure of Section 3.5.3.7. (Tier 2: Sec. 4.6.1.1) |
| C | NC | N/A | WOOD LEDGERS: The connection between the wall panels and the diaphragm shall not induce cross-grain bending or tension in the wood ledgers. (Tier 2: Sec. 4.6.1.2)   |
| C | NC | N/A | TRANSFER TO SHEAR WALLS: Diaphragms shall be connected for transfer of loads to the shear walls for Life Safety and the connections shall be able to develop the lesser of the shear strength of the walls or diaphragms for Immediate Occupancy. (Tier 2 Sec. 4.6.2.1)  |
| C | NC | N/A | GIRDER/COLUMN CONNECTION: There shall be a positive connection utilizing plates, connection hardware, or straps between the girder and the column support. (Tier 2: Sec. 4.6.4.1)  |

Screening Phase (Tier 1)

**3.7.15S Supplemental Structural Checklist for Building Type URM: Unreinforced Masonry Bearing Walls with Flexible Diaphragms**

This Supplemental Structural Checklist shall be completed where required by Table 3-2. The Basic Structural Checklist shall be completed prior to completing this Supplemental Structural Checklist.

**Lateral-Force-Resisting System**

C **NC** N/A PROPORTIONS: The height-to-thickness ratio of the shear walls at each story shall be less than the following for Life Safety and Immediate Occupancy (Tier 2: Sec. 4.4.2.5.2):

Top story of multi-story building	9
First story of multi-story building	15
All other conditions	13

C NC N/A MASONRY LAY-UP: Filled collar joints of multi-wythe masonry walls shall have negligible voids. (Tier 2: Sec. 4.4.2.5.3)  
UNKNOWN

**Diaphragms**

C **NC** N/A CROSS TIES: There shall be continuous cross ties between diaphragm chords. (Tier 2: Sec. 4.5.1.2)

**C** NC N/A OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls shall be less than 25 percent of the wall length for Life Safety and 15 percent of the wall length for Immediate Occupancy. (Tier 2: Sec. 4.5.1.4)

**C** NC N/A OPENINGS AT EXTERIOR MASONRY SHEAR WALLS: Diaphragm openings immediately adjacent to exterior masonry shear walls shall not be greater than 8 feet long for Life Safety and 4 feet long for Immediate Occupancy. (Tier 2: Sec. 4.5.1.6)

C **NC** N/A PLAN IRREGULARITIES: There shall be tensile capacity to develop the strength of the diaphragm at re-entrant corners or other locations of plan irregularities. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.5.1.7)

C **NC** N/A DIAPHRAGM REINFORCEMENT AT OPENINGS: There shall be reinforcing around all diaphragm openings larger than 50 percent of the building width in either major plan dimension. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.5.1.8)

**C** NC N/A STRAIGHT SHEATHING: All straight sheathed diaphragms shall have aspect ratios less than 2-to-1 for Life Safety and 1-to-1 for Immediate Occupancy in the direction being considered. (Tier 2: Sec. 4.5.2.1)

C **NC** N/A SPANS: All wood diaphragms with spans greater than 24 feet for Life Safety and 12 feet for Immediate Occupancy shall consist of wood structural panels or diagonal sheathing (Tier 2: Sec. 4.5.2.2)

C **NC** N/A UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms shall have horizontal spans less than 40 feet for Life Safety and 30 feet for Immediate Occupancy and shall have aspect ratios less than or equal to 4-to-1 for Life Safety and 3-to-1 for Immediate Occupancy. (Tier 2: Sec. 4.5.2.3)

C NC **N/A** NON-CONCRETE FILLED DIAPHRAGMS: Untopped metal deck diaphragms or metal deck diaphragms with fill other than concrete shall consist of horizontal spans of less than 40 feet and shall have span/depth ratios less than 4-to-1. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.5.3.1)

**Screening Phase (Tier 1)**

C	NC	N/A	OTHER DIAPHRAGMS: The diaphragm shall not consist of a system other than wood, metal deck, concrete, or horizontal bracing. (Tier 2: Sec. 4.5.7.1)
<b>Connections</b>			
C	NC	N/A	STIFFNESS OF WALL ANCHORS: Anchors of concrete or masonry walls to wood structural elements shall be installed taut and shall be stiff enough to limit the relative movement between the wall and the diaphragm to no greater than 1/8 inch prior to engagement of the anchors. (Tier 2: Sec. 4.6.1.4)
UNKNOWN			
C	NC	N/A	BEAM, GIRDER, AND TRUSS SUPPORTS: Beams, girders, and trusses supported by unreinforced masonry walls or pilasters shall have independent secondary columns for support of vertical loads. (Tier 2: Sec. 4.6.4.5)
UNKNOWN			

## Screening Phase (Tier 1)

### 3.8 Geologic Site Hazards and Foundations Checklist

This Geologic Site Hazards and Foundations Checklist shall be completed where required by Table 3-2.

Each of the evaluation statements on this checklist shall be marked Compliant (C), Non-compliant (NC), or Not Applicable (N/A) for a Tier 1 Evaluation. Compliant statements identify issues that are acceptable according to the criteria of this standard, while non-compliant statements identify issues that require further investigation. Certain statements may not apply to the buildings being evaluated. For non-compliant evaluation statements, the design professional may choose to conduct further investigation using the corresponding Tier 2 Evaluation procedure; corresponding section numbers are in parentheses following each evaluation statement.

#### Geologic Site Hazards

The following statements shall be completed for buildings in levels of high or moderate seismicity.

C  NC  N/A  UNKNOWN LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could jeopardize the building's seismic performance shall not exist in the foundation soils at depths within 50 feet under the building for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.7.1.1)

C  NC  N/A SLOPE FAILURE: The building site shall be sufficiently remote from potential earthquake-induced slope failures or rockfalls to be unaffected by such failures or shall be capable of accommodating any predicted movements without failure. (Tier 2: Sec. 4.7.1.2)

C  NC  N/A  UNKNOWN SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site is not anticipated. (Tier 2: Sec. 4.7.1.3)

#### Condition of Foundations

The following statement shall be completed for all Tier 1 building evaluations.

C  NC  N/A FOUNDATION PERFORMANCE: There shall be no evidence of excessive foundation movement such as settlement or heave that would affect the integrity or strength of the structure. (Tier 2: Sec. 4.7.2.1)

The following statement shall be completed for buildings in levels of high or moderate seismicity being evaluated to the Immediate Occupancy Performance Level.

C  NC  N/A DETERIORATION: There shall not be evidence that foundation elements have deteriorated due to corrosion, sulfate attack, material breakdown, or other reasons in a manner that would affect the integrity or strength of the structure. (Tier 2: Sec. 4.7.2.2)

#### Capacity of Foundations

The following statement shall be completed for all Tier 1 building evaluations.

C  NC  N/A POLE FOUNDATIONS: Pole foundations shall have a minimum embedment depth of 4 feet for Life Safety and Immediate Occupancy. (Tier 2: Sec. 4.7.3.1)

The following statements shall be completed for buildings in levels of moderate seismicity being evaluated to the Immediate Occupancy Performance Level and for buildings in levels of high seismicity.

C  NC  N/A OVERTURNING: The ratio of the horizontal dimension of the lateral-force-resisting system at the foundation level to the building height (base/height) shall be greater than  $0.6S_p$ . (Tier 2: Sec. 4.7.3.2)

**Screening Phase (Tier 1)**

- C NC (N/A) TIES BETWEEN FOUNDATION ELEMENTS: The foundation shall have ties adequate to resist seismic forces where footings, piles, and piers are not restrained by beams, slabs, or soils classified as Class A, B, or C. (Section 3.5.2.3.1, Tier 2: Sec. 4.7.3.3)
- C NC (N/A) DEEP FOUNDATIONS: Piles and piers shall be capable of transferring the lateral forces between the structure and the soil. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.7.3.4)
- C NC (N/A) SLOPING SITES: The difference in foundation embedment depth from one side of the building to another shall not exceed one story in height. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec. 4.7.3.5)

**3.9.1 Basic Nonstructural Component Checklist**

This Basic Nonstructural Component Checklist shall be completed where required by Table 3-2.

Each of the evaluation statements on this checklist shall be marked Compliant (C), Non-compliant (NC), or Not Applicable (N/A) for a Tier 1 Evaluation. Compliant statements identify issues that are acceptable according to the criteria of this standard, while non-compliant statements identify issues that require further investigation. Certain statements may not apply to the buildings being evaluated. For non-compliant evaluation statements, the design professional may choose to conduct further investigation using the corresponding Tier 2 Evaluation procedure; corresponding section numbers are in parentheses following each evaluation statement.

**Partitions**

- C  NC  N/A  UNREINFORCED MASONRY: Unreinforced masonry or hollow clay tile partitions shall be braced at a spacing equal to or less than 10 feet in levels of low or moderate seismicity and 6 feet in levels of high seismicity. (Tier 2: Sec. 4.8.1.1)

**Ceiling Systems**

- C  NC  N/A  SUPPORT: The integrated suspended ceiling system shall not be used to laterally support the tops of gypsum board, masonry, or hollow clay tile partitions. Gypsum board partitions need not be evaluated where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.2.1)

**Light Fixtures**

- C  NC  N/A  EMERGENCY LIGHTING: Emergency lighting shall be anchored or braced to prevent falling during an earthquake. (Tier 2: Sec. 4.8.3.1)

**Cladding and Glazing**

- C  NC  N/A  CLADDING ANCHORS: Cladding components weighing more than 10 psf shall be mechanically anchored to the exterior wall framing at a spacing equal to or less than 4 feet. A spacing of up to 6 feet is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.4.1)
- C  NC  N/A  DETERIORATION: There shall be no evidence of deterioration, damage or corrosion in any of the connection elements. (Tier 2: Sec. 4.8.4.2)
- C  NC  N/A  CLADDING ISOLATION: For moment frame buildings of steel or concrete, panel connections shall be detailed to accommodate a story drift ratio of 0.02. Panel connection detailing for a story drift ratio of 0.01 is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.4.3)
- C  NC  N/A  MULTI-STORY PANELS: For multi-story panels attached at each floor level, panel connections shall be detailed to accommodate a story drift ratio of 0.02. Panel connection detailing for a story drift ratio of 0.01 is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.4.4)
- C  NC  N/A  BEARING CONNECTIONS: Where bearing connections are required, there shall be a minimum of two bearing connections for each wall panel. (Tier 2: Sec. 4.8.4.5)

### Screening Phase (Tier 1)

C NC (N/A) INSERTS: Where inserts are used in concrete connections, the inserts shall be anchored to reinforcing steel or other positive anchorage. (Tier 2: Sec. 4.8.4.6)

C NC (N/A) PANEL CONNECTIONS: Exterior cladding panels shall be anchored out-of-plane with a minimum of 4 connections for each wall panel. Two connections per wall panel are permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.4.7)

#### Masonry Veneer

C NC (N/A) SHELF ANGLES: Masonry veneer shall be supported by shelf angles or other elements at each floor 30 feet or more above ground for Life Safety and at each floor above the first floor for Immediate Occupancy. (Tier 2: Sec. 4.8.5.1)

C NC (N/A) TIES: Masonry veneer shall be connected to the back-up with corrosion-resistant ties. The ties shall have a spacing equal to or less than 24 inches with a minimum of one tie for every 2-2/3 square feet. A spacing of up to 36 inches is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.5.2)

C NC (N/A) WEAKENED PLANES: Masonry veneer shall be anchored to the back-up adjacent to weakened planes, such as at the locations of flashing. (Tier 2: Sec. 4.8.5.3)

C NC (N/A) DETERIORATION: There shall be no evidence of deterioration, damage, or corrosion in any of the connection elements. (Tier 2: Sec. 4.8.5.4)

#### Parapets, Cornices, Ornamentation, and Appendages

C NC (N/A) URM PARAPETS: There shall be no laterally unsupported unreinforced masonry parapets or cornices with height-to-thickness ratios greater than 1.5. A height-to-thickness ratio of up to 2.5 is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.8.1)

C NC (N/A) CANOPIES: Canopies located at building exits shall be anchored to the structural framing at a spacing of 6 feet or less. An anchorage spacing of up to 10 feet is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.8.2)

#### Masonry Chimneys

C NC (N/A) URM CHIMNEYS: No unreinforced masonry chimney shall extend above the roof surface more than twice the least dimension of the chimney. A height above the roof surface of up to three times the least dimension of the chimney is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.9.1)

#### Stairs

C (NC) N/A URM WALLS: Walls around stair enclosures shall not consist of unbraced hollow clay tile or unreinforced masonry with a height-to-thickness ratio greater than 12-to-1. A height-to-thickness ratio of up to 15-to-1 is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.10.1)

C NC (N/A) STAIR DETAILS: In moment frame structures, the connection between the stairs and the structure shall not rely on shallow anchors in concrete. Alternatively, the stair details shall be capable of accommodating the drift calculated using the Quick Check procedure of Section 3.5.3.1 without including tension in the anchors. (Tier 2: Sec. 4.8.10.2)

## Screening Phase (Tier 1)

### Building Contents and Furnishing

- (C) NC N/A TALL NARROW CONTENTS: Contents over 4 feet in height with a height-to-depth or height-to-width ratio greater than 3-to-1 shall be anchored to the floor slab or adjacent structural walls. A height-to-depth or height-to-width ratio of up to 4-to-1 is permitted where only the Basic Nonstructural Component Checklist is required by Table 3-2. (Tier 2: Sec. 4.8.11.1)

### Mechanical and Electrical Equipment

- C NC (N/A) EMERGENCY POWER: Equipment used as part of an emergency power system shall be mounted to maintain continued operation after an earthquake. (Tier 2: Sec. 4.8.12.1)
- C NC (N/A) HAZARDOUS MATERIAL EQUIPMENT: HVAC or other equipment containing hazardous material shall not have damaged supply lines or unbraced isolation supports. (Tier 2: Sec. 4.8.12.2)
- (C) NC N/A DETERIORATION: There shall be no evidence of deterioration, damage, or corrosion in any of the anchorage or supports of mechanical or electrical equipment. (Tier 2: Sec. 4.8.12.3)
- (C) NC N/A ATTACHED EQUIPMENT: Equipment weighing over 20 lb that is attached to ceilings, walls, or other supports 4 feet above the floor level shall be braced. (Tier 2: Sec. 4.8.12.4)

### Piping

- C NC (N/A) FIRE SUPPRESSION PIPING: Fire suppression piping shall be anchored and braced in accordance with NFPA-13 (NFPA, 1996). (Tier 2: Sec. 4.8.13.1)
- C NC (N/A) FLEXIBLE COUPLINGS: Fluid, gas, and fire suppression piping shall have flexible couplings. (Tier 2: Sec. 4.8.13.2)

### Hazardous Materials Storage and Distribution

- (C) NC N/A TOXIC SUBSTANCES: Toxic and hazardous substances stored in breakable containers shall be restrained from falling by latched doors, shelf lips, wires, or other methods. (Tier 2: Sec. 4.8.15.1)

## Screening Phase (Tier 1)

### 3.9.2 Intermediate Nonstructural Component Checklist

This Intermediate Nonstructural Component Checklist shall be completed where required by Table 3-2. The Basic Nonstructural Component Checklist shall be completed prior to completing this Intermediate Nonstructural Component Checklist.

#### Ceiling Systems

- C NC (N/A) LAY-IN TILES: Lay-in tiles used in ceiling panels located at exits and corridors shall be secured with clips. (Tier 2: Sec. 4.8.2.2)
- C NC (N/A) INTEGRATED CEILINGS: Integrated suspended ceilings at exits and corridors or weighing more than 2 pounds per square foot shall be laterally restrained with a minimum of four diagonal wires or rigid members attached to the structure above at a spacing equal to or less than 12 feet. (Tier 2: Sec. 4.8.2.3)
- C NC (N/A) SUSPENDED LATH AND PLASTER: Ceilings consisting of suspended lath and plaster or gypsum board shall be attached to resist seismic forces for every 12 square feet of area. (Tier 2: Sec. 4.8.2.4)

#### Light Fixtures

- C NC (N/A) INDEPENDENT SUPPORT: Light fixtures in suspended grid ceilings shall be supported independently of the ceiling suspension system by a minimum of two wires at diagonally opposite corners of the fixtures. (Tier 2: Sec. 4.8.3.2)

#### Cladding and Glazing

- C NC (N/A) GLAZING: Glazing in curtain walls and individual panes over 16 square feet in area, located up to a height of 10 feet above an exterior walking surface, shall have safety glazing. Such glazing located over 10 feet above an exterior walking surface shall be laminated annealed or laminated heat-strengthened safety glass or other glazing system that will remain in the frame when glass is cracked. (Tier 2: Sec. 4.8.4.8)

#### Parapets, Cornices, Ornamentation, and Appendages

- C NC (N/A) CONCRETE PARAPETS: Concrete parapets with height-to-thickness ratios greater than 2.5 shall have vertical reinforcement. (Tier 2: Sec. 4.8.8.3)
- C NC (N/A) APPENDAGES: Cornices, parapets, signs, and other appendages that extend above the highest point of anchorage to the structure or cantilever from exterior wall faces and other exterior wall ornamentation shall be reinforced and anchored to the structural system at a spacing equal to or less than 10 feet for Life Safety and 6 feet for Immediate Occupancy. This requirement need not apply to parapets or cornices compliant with Section 4.8.8.1 or 4.8.8.3. (Tier 2: Sec. 4.8.8.4)

#### Masonry Chimneys

- (C) NC N/A ANCHORAGE: Masonry chimneys shall be anchored at each floor level and the roof. (Tier 2: Sec. 4.8.9.2)

Screening Phase (Tier 1)

**Mechanical and Electrical Equipment**

C NC (N/A) VIBRATION ISOLATORS: Equipment mounted on vibration isolators shall be equipped with restraints or snubbers. (Tier 2: Sec. 4.8.12.5)

**Ducts**

C NC (N/A) STAIR AND SMOKE DUCTS: Stair pressurization and smoke control ducts shall be braced and shall have flexible connections at seismic joints. (Tier 2: Sec. 4.8.14.1)

## Screening Phase (Tier 1)

### 3.9.3 Supplemental Nonstructural Component Checklist

This Supplemental Nonstructural Component Checklist shall be completed where required by Table 3-2. The Basic and Intermediate Nonstructural Component Checklists shall be completed prior to completing this Supplemental Nonstructural Component Checklist.

#### C3.9.3 Supplemental Nonstructural Component Checklist

The statements in this checklist are intended to evaluate elements that may prevent or limit use of a building following an earthquake. While this checklist is required only for buildings in levels of high seismicity being evaluated to the Immediate Occupancy Performance Level, it may be used as a guide to evaluate potential disruption to building use following an earthquake.

#### Partitions

- C NC (N/A) DRIFT: Rigid cementitious partitions shall be detailed to accommodate a drift ratio of 0.02 in steel moment frame, concrete moment frame, and wood frame buildings. Rigid cementitious partitions shall be detailed to accommodate a drift ratio of 0.005 in other buildings. (Tier 2: Sec. 4.8.1.2)
- C NC (N/A) STRUCTURAL SEPARATIONS: Partitions at structural separations shall have seismic or control joints. (Tier 2: Sec. 4.8.1.3)
- C NC (N/A) TOPS: The tops of framed or panelized partitions that only extend to the ceiling line shall have lateral bracing to the building structure at a spacing equal to or less than 6 feet. (Tier 2: Sec. 4.8.1.4)

#### Ceiling Systems

- C NC (N/A) EDGES: The edges of integrated suspended ceilings shall be separated from enclosing walls by a minimum of 1/2 inch. (Tier 2: Sec. 4.8.2.5)
- C NC (N/A) SEISMIC JOINT: The ceiling system shall not extend continuously across any seismic joint. (Tier 2: Sec. 4.8.2.6)

#### Light Fixtures

- C NC (N/A) PENDANT SUPPORTS: Light fixtures on pendant supports shall be attached at a spacing equal to or less than 6 feet and, if rigidly supported, shall be free to move with the structure to which they are attached without damaging adjoining materials. (Tier 2: Sec. 4.8.3.3)
- C NC (N/A) LENS COVERS: Lens covers on light fixtures shall be attached or supplied with safety devices. (Tier 2: Sec. 4.8.3.4)

#### Cladding and Glazing

- C NC (N/A) GLAZING: All exterior glazing shall be laminated, annealed or laminated heat-strengthened safety glass or other glazing system that will remain in the frame when glass is cracked. (Tier 2: Sec. 4.8.4.9)

## Screening Phase (Tier 1)

### Masonry Veneer

- C NC (N/A) MORTAR: The mortar in masonry veneer shall not be easily scraped away from the joints by hand with a metal tool, and there shall not be significant areas of eroded mortar. (Tier 2: Sec. 4.8.5.5)
- C NC (N/A) WEEP HOLES: In veneer braced by stud walls, functioning weep holes and base flashing shall be present. (Tier 2: Sec. 4.8.5.6)
- C NC (N/A) STONE CRACKS: There shall no be visible cracks or signs of visible distortion in the stone. (Tier 2: Sec. 4.8.5.7)

### Metal Stud Back-Up Systems

- C NC (N/A) STUD TRACKS: Stud tracks shall be fastened to structural framing at a spacing equal to or less than 24 inches on center. (Tier 2: Sec. 4.8.6.1)
- C NC (N/A) OPENINGS: Steel studs shall frame window and door openings. (Tier 2: Sec. 4.8.6.2)

### Concrete Block and Masonry Back-Up Systems

- C NC (N/A) ANCHORAGE: Back-up shall have a positive anchorage to the structural framing at a spacing equal to or less than 4 feet along the floors and roof. (Tier 2: Sec. 4.8.7.1)
- C NC (N/A) URM BACK-UP: There shall be no unreinforced masonry back-up. (Tier 2: Sec. 4.8.7.2)

### Building Contents and Furnishing

- (C) NC N/A FILE CABINETS: File cabinets arranged in groups shall be attached to one another. (Tier 2: Sec. 4.8.11.2)
- (C) NC N/A CABINET DOORS AND DRAWERS: Cabinet doors and drawers shall have latches to keep them closed during an earthquake. (Tier 2: Sec. 4.8.11.3)
- C NC (N/A) ACCESS FLOORS: Access floors over 9 inches in height shall be braced. (Tier 2: Sec. 4.8.11.4)
- C NC (N/A) EQUIPMENT ON ACCESS FLOORS: Equipment and computers supported on access floor systems shall be either attached to the structure or fastened to a laterally braced floor system. (Tier 2: Sec. 4.8.11.5)

### Mechanical and Electrical Equipment

- (C) NC N/A HEAVY EQUIPMENT: Equipment weighing over 100 pounds shall be anchored to the structure or foundation. (Tier 2: Sec. 4.8.12.6)
- (C) NC N/A ELECTRICAL EQUIPMENT: Electrical equipment and associated wiring shall be laterally braced to the structural system. (Tier 2: Sec. 4.8.12.7)
- C NC (N/A) DOORS: Mechanically operated doors shall be detailed to operate at a story drift ratio of 0.01. (Tier 2: Sec. 4.8.12.8)

### Piping

- C NC (N/A) FLUID AND GAS PIPING: Fluid and gas piping shall be anchored and braced to the structure to prevent breakage in piping. (Tier 2: Sec. 4.8.13.3)

### Screening Phase (Tier 1)

C NC (N/A) SHUT-OFF VALVES: Shut-off devices shall be present at building utility interfaces to shut off the flow of gas and high-temperature energy in the event of earthquake-induced failure. (Tier 2: Sec. 4.8.13.4)

C NC (N/A) C-CLAMPS: One-sided C-clamps that support piping greater than 2.5 inches in diameter shall be restrained. (Tier 2: Sec. 4.8.13.5)

#### Ducts

C NC (N/A) DUCT BRACING: Rectangular ductwork exceeding 6 square feet in cross-sectional area, and round ducts exceeding 28 inches in diameter, shall be braced. Maximum spacing of transverse bracing shall not exceed 30 feet. Maximum spacing of longitudinal bracing shall not exceed 60 feet. Intermediate supports shall not be considered part of the lateral-force-resisting system. (Tier 2: Sec. 4.8.14.2)

C NC (N/A) DUCT SUPPORT: Ducts shall not be supported by piping or electrical conduit. (Tier 2: Sec. 4.8.14.3)

#### Hazardous Materials Storage and Distribution

C NC (N/A) GAS CYLINDERS: Compressed gas cylinders shall be restrained. (Tier 2: Sec. 4.8.15.2)

C NC (N/A) HAZARDOUS MATERIALS: Piping containing hazardous materials shall have shut-off valves or other devices to prevent major spills or leaks. (Tier 2: Sec. 4.8.15.3)

#### Elevators

C NC (N/A) SUPPORT SYSTEM: All elements of the elevator system shall be anchored. (Tier 2: Sec. 4.8.16.1)

C NC (N/A) SEISMIC SWITCH: All elevators shall be equipped with seismic switches that will terminate operations when the ground motion exceeds 0.10g. (Tier 2: Sec. 4.8.16.2)

C NC (N/A) SHAFT WALLS: All elevator shaft walls shall be anchored and reinforced to prevent toppling into the shaft during strong shaking. (Tier 2: Sec. 4.8.16.3)

C NC (N/A) RETAINER GUARDS: Cable retainer guards on sheaves and drums shall be present to inhibit the displacement of cables. (Tier 2: Sec. 4.8.16.4)

C NC (N/A) RETAINER PLATE: A retainer plate shall be present at the top and bottom of both car and counterweight. (Tier 2: Sec. 4.8.16.5)

C NC (N/A) COUNTERWEIGHT RAILS: All counterweight rails and divider beams shall be sized in accordance with ASME A17.1. (Tier 2: Sec. 4.8.16.6)

C NC (N/A) BRACKETS: The brackets that tie the car rails and the counterweight rail to the building structure shall be sized in accordance with ASME A17.1. (Tier 2: Sec. 4.8.16.7)

C NC (N/A) SPREADER BRACKET: Spreader brackets shall not be used to resist seismic forces. (Tier 2: Sec. 4.8.16.8)

C NC (N/A) GO-SLOW ELEVATORS: The building shall have a go-slow elevator system. (Tier 2: Sec. 4.8.16.9)

## ASCE 31 EVALUATION - TIER 1

PROJECT NAME: Bainbridge Island Police

PROJECT NO.: 2130356.00 DESIGNER: NKH

### ASCE 31 Tier 1 Evaluation - Police Station

**Building Location:**

625 Winslow Way E, Bainbridge Island, 98110

**Target Building Performance:**  
Immediate Occupancy (IO)

**Level of Seismicity:**  
High

**Table 2-1. Levels of Seismicity Definitions**

Level of Seismicity <sup>1</sup>	S <sub>DS</sub>	S <sub>D1</sub>
Low	<0.167g	<0.067g
Moderate	≥0.167g <0.500g	≥0.067g <0.200g
High	≥0.500g	≥0.200g

SC := "D"

Soil Site Class (assumed) - ASCE 31, 3.5.2.3.1, p.3-13

S<sub>S</sub> := 1.389

0.2s, Short Period Maximum Considered Earthquake (MCE, 2%/50yr) Mapped Spectral Response Acceleration (SRA) Parameter (5% of critical damping)- USGS

S<sub>1</sub> := 0.547

1.0s Period MCE, 2%/50yr Mapped SRA Parameter (5% of critical damping) - USGS

S<sub>DS</sub> := 0.926

0.2s, Short Period Design SRA (approx. 10%/50yr) - ASCE 31, 3.5.2.3.1, p.3-12

S<sub>D1</sub> := 0.547

1.0s Period Design SRA (approx. 10%/50yr) - ASCE 31, 3.5.2.3.1, p.3-12

C<sub>t</sub> := 0.02

Approximate Period Determination Coefficient - ASCE 31, 3.5.2.4, p.3-14

β := 0.75

Approximate Period Determination Coefficient - ASCE 31, 3.5.2.4, p.3-14

h<sub>n</sub> := 16ft

Max Building Height

$$T := C_t \cdot \left( \frac{h_n}{ft} \right)^\beta = 0.16$$

Empirical Approximate Fundamental Period Equation - ASCE 31, 3.5.2.4, p.3-14

$$S_a := \min \left( S_{DS}, \frac{S_{D1}}{T} \right)$$

Spectral Response Acceleration - ASCE 31 3.5.2.3.1, p.3-12

S<sub>a</sub> = 0.926

**Table 3-2. Checklists Required for a Tier 1 Evaluation**

Level of Seismicity <sup>3</sup>	Level of Performance <sup>2</sup>	Required Checklists <sup>1</sup>						
		Level of Low Seismicity (Sec. 3.6)	Basic Structural (Sec. 3.7)	Supplemental Structural (Sec. 3.7)	Geologic Site Hazard and Foundation (Sec. 3.8)	Basic Nonstructural (Sec. 3.9.1)	Intermediate Nonstructural (Sec. 3.9.2)	Supplemental Nonstructural (Sec. 3.9.3)
Low	LS	▶						
	IO		▶		▶	▶		
Moderate	LS		▶		▶	▶		
	IO		▶	▶	▶	▶	▶	
High	LS		▶	▶	▶	▶	▶	
	IO		▶	▶	▶	▶	▶	▶

<sup>1</sup>A checkmark (▶) designates the checklist that must be completed for a Tier 1 Evaluation as a function of the level of seismicity and level of performance.

<sup>2</sup>LS = Life Safety; IO = Immediate Occupancy (defined in Section 2.4).

<sup>3</sup>Defined in Section 2.5.

C := 1.3 Factor to Relate Expected Maximum Inelastic Displacements to Displacements Calculated for Linear Elastic Response - ASCE 31, Table 3-4, p.3-10

**Building Seismic Weight:**

$DL_{rf} := 15\text{psf}$  Roof Dead Load

$DL_{cmu} := 8\text{in} \cdot 120\text{pcf}$  CMU Wall Weight

$DL_{cmu} = 80 \cdot \text{psf}$

$L_{bld} := 85\text{ft}$  Length of Portion of Building

$W_{bld} := 54\text{ft}$  Width of Portion of Building

$A_{roof} := L_{bld} \cdot W_{bld}$  Area of Roof

$h_{roof} := 14.5\text{ft}$  Roof Height

$W_{skin} := \left[ (2L_{bld} + 2W_{bld}) \cdot DL_{cmu} \right] \cdot \frac{h_{roof}}{2}$  Skin Weight

$W_{skin} = 161.24 \cdot k$

$WT_{total} := W_{skin} + (A_{roof} \cdot DL_{rf})$  Total Building Weight

$WT_{total} = 230.09 \cdot k$

**Seismic Pseudo-Lateral Force (Seismic Base Shear):**

$V := C \cdot S_a \cdot WT_{total}$  Pseudo-Lateral Force - ASCE 31, 3.5.2.1, p.3-9

$V = 276.982 \cdot k$

- **Shearwall Stress Check - Tier 1 URM1 Basic Structural Checklist**

ASCE 31, 3.5.3.3, p.3-16 - *Check wall in line at front of building:*

$L_{\text{walls}} := 54\text{ft} \cdot 2$  Length of Walls Contributing to Seis Wt in Load Dir

$A_{\text{roof}} = 4590\text{ft}^2$

$WT_{\text{NS}} := L_{\text{walls}} \cdot DL_{\text{cmu}} \cdot \frac{h_{\text{roof}}}{2} + A_{\text{roof}} \cdot DL_{\text{rf}}$

$WT_{\text{NS}} = 131.49 \cdot \text{k}$

$V_{\text{NS}} := WT_{\text{NS}} \cdot C \cdot S_a$

$V_{\text{NS}} = 158.288 \cdot \text{k}$

$L_{\text{shearwall}} := 12\text{ft}$  Length of Shearwall

$A_w := L_{\text{shearwall}} \cdot 6\text{in}$  Shear Area

$A_w = 6\text{ft}^2$

$m := 2$  Component Modification Factor - ASCE 31, Table 3-7, p.3-17

$v := \frac{1}{m} \cdot \frac{V}{A_w}$  Average Shear Stress - ASCE 31, 3.5.3.3, p.3-16

$v = 80.145 \cdot \text{psi}$

$v_{\text{max}} := 70\text{psi}$  Max Shear Stress - ASCE 31, 3.5.3.3, p.3-16

$\text{flag} := \text{if}(v \leq v_{\text{max}}, \text{"OK"}, \text{"NG!!!"})$  flag = "NG!!!"

**Therefore, non-compliant!**

- **OT Ratio Check - Tier 1 Geologic Site Checklist**

Ratio\_Limit :=  $0.6 \cdot S_a$       Minimum Width to Height Ratio

Ratio\_Limit = 0.556

Ratio :=  $\frac{W_{\text{bld}}}{h_{\text{roof}}}$       Width to Height Ratio

Ratio = 3.724

flag := if(Ratio ≥ Ratio\_Limit, "OK" , "NG!!!")      flag = "OK"

***Therefore, compliant!***

- **Height-Thickness Check - Tier 1 URM1 Supp. Structural Checklist**

Ratio\_Limit := 13      Maximum Height to Thickness Ratio

Ratio :=  $\frac{h_{\text{roof}}}{8\text{in}}$       Height to Thickness Ratio

Ratio = 21.75

flag := if(Ratio ≤ Ratio\_Limit, "OK" , "NG!!!")      flag = "NG!!!"

***Therefore, non-compliant!***

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