



Feasibility Study for Fire Protection Services to the Horne Lake Community in Electoral Area H

Prepared for:

Anita Sharma

Protective Services Coordinator

Regional District of Nanaimo

Prepared by:

Tim Pley & Associates Ltd.

Final:

28 October 2022

THIS PAGE INTENTIONALLY LEFT BLANK.

Table of Contents

- Table of Contents..... i
- Executive Summary 1
 - Project Background and Scope..... 2
- Project Methodology4
 - Phase One: Project Kick-off and Background Review 4
 - Phase Two: On-site Consultations 4
 - Phase Three: Development of Recommendations and Draft Report 5
 - Phase Four: Development of Final Report 5
- Summary of Recommendations6
- Request for Service Area Expansion.....8
- Bow Horn Bay Volunteer Fire Department Overview Summary..... 10
- Satellite Fire Hall Location Options 12
 - Fire Hall Locations 12
 - Location One: Horne Lake Road near Shayla Road..... 12
 - Location Two: Horne Lake Road and Marshland Road 16
 - Recommendations 17
- Infrastructure Requirements in Proposed Service Area..... 18
 - Water Sources in Expanded Service Area 18
 - Roads and Access in Expanded Service Area 20
 - Signage and Addresses 23
 - Recommendations 23
- Satellite Fire Hall Designs and Costs 24
 - Recommendations 30
- Project Budget 31
 - Apparatus 31
 - Equipment..... 31
 - Firefighters..... 32
 - Projected Project Costs..... 32
 - Site Costs 35
- Appendix 1: Resolution of the Owners, Strata Plan VIS5160 38
- Appendix 2: Map of Area..... 40

Appendix 3: Fire Department Review	41
Regulatory Matters.....	41
Service and Aid Agreements.....	43
Organizational Structure and Staffing.....	45
Recruitment and Retention	46
Fire Hall and Apparatus	47
Equipment.....	52
Water Supply	53
Training Facilities	53
Appendix 4: Satellite Fire Hall Considerations.....	55
Satellite Fire Halls and Storage Garages	55
Rented Facility Currently in Use.....	57
Appendix 5: Herold Engineering RDN Fire Hall Report Final.....	59
Appendix 6: Horne Lake Fire Hall Design and Cost Estimate (2018).....	67
Appendix 7: Consultant Backgrounds	76
Tim Pley.....	76
Dave Mitchell	76
Gordon Anderson.....	76
Jim Cook.....	76
Ian MacDonald.....	77

THIS PAGE INTENTIONALLY LEFT BLANK

Executive Summary

The Regional District of Nanaimo (the “RDN”) is the Authority Having Jurisdiction (the “AHJ”) over the Bow Horn Bay Volunteer Fire Department (the “Department” or “BHBVFD”), which is operated by the Bow Horn Bay Volunteer Fire Department Society (the “Society”). The RDN has retained Tim Pley & Associates (the “Consultants” or “TPA”) to conduct a feasibility study examining the potential to expand the Department’s service area in order to provide fire protection services to properties in the Horne Lake area within Electoral Area “H” and provide recommendations.

There has been considerable growth and development in the Spider Lake and Horne Lake areas. Where at one time strata-owned properties along the shores of Horne Lake featured cabins, many of those properties now support more substantial seasonal residences. Activity in the area has also increased, all of which has led to increased concern among property owners and visitors regarding fire safety and the cost of fire insurance.

The RDN received a request for expansion of the Bow Horn Bay Fire Protection Service Area to include the Horne Lake area, consisting of a large strata-owned property including approximately 400 lakefront or nearby properties, on which many seasonal homes have been constructed.

The Consultants undertook a broad document review, and engaged with RDN staff, the RDN Electoral Area “H” Director, the Society Board Chair, and the Department chief officers in order to develop a thorough understanding of the scope of the project, work already completed, and matters yet to be resolved. An extensive tour of the current and proposed service areas with the Department chief officers provided good insight into the Department’s current capabilities and challenges, as well as the potential impact on the Department if the service area is expanded and a new satellite fire hall required.

The document review revealed a desire on the part of the Horne Lake Strata that expansion of the fire protection service area be investigated. It was confirmed that, in order for an expanded service area to result in fire protection services adequate to meet Fire Underwriters criteria for a Dwelling Protection Grade (“DPG”) 3B (which would lead to insurers regarding the properties as being “semi-protected” and eligible for insurance premium reductions), a satellite fire hall would need to be constructed in the area. Fire Underwriters require that a property be within eight kilometers of a responding fire hall.

The site previously identified by RDN as a location for a satellite fire hall was investigated and found to not be ideally located with regard to the eight-kilometer travel distance criteria. An alternate location was identified that would be within an eight-kilometer travel distance of all Horne Lake properties. A satellite fire hall at the alternate location could result in a DPG of 3B for the Horne Lake area. Further, the Department’s Superior Tanker Shuttle Service (STSS) accreditation could potentially be extended to the satellite fire hall response area, resulting in a DPG of 3B(S), and further insurance premium reductions for properties in that area.

Supporting and managing the operation of a satellite fire hall will add administrative complexity and workload to the Department. The minimum number of firefighters the Department must maintain will increase. While this might not result in a significant impact immediately given the Department's strong staffing numbers, recruitment and retention of firefighters will become more critical going forward and the Department will experience more demands in those areas. The Department's current administration was found to be strong, with capacity and willingness to take on the challenges involved in expanding operations to include a satellite fire hall.

The nature of the Horne Lake area will present some operational challenges for the Department. Road configuration and maintenance, access and egress challenges, congestion during times of peak usage of seasonal homes, and access to tender refilling sites are among the matters that will become issues for the Department.

The Consultants observed that the Horne Lake property owners desire fire protection service. For that reason, a community engagement session for Horne Lake residents was not conducted for this study.

The Department is well situated and willing to provide that service. A satellite fire hall will be required to provide the service to the Horne Lake area. Some work has already been done in preparation for a service area boundary expansion and establishment of a satellite fire hall. Providing fire protection services in the Horne Lake area will involve overcoming some challenges related to the terrain, nature of current use and legacy issues related to the way that the area was developed. These challenges are not insurmountable.

Project Background and Scope

The RDN retained the Consultants to undertake the following scope of work:

- 1) Complete a feasibility study and analysis with developed recommendations and options on the requirements to extend fire protection services from the Bow Horn Bay Fire Protection Service Area. These requirements were to include (but not be limited to) options for:
 - a. the acquisition of land;
 - b. construction of a new fire hall;
 - c. purchase of apparatus; and
 - d. any potential upgrades required by the Strata to roads or infrastructure to facilitate access.

The Consultants were also to consider any additional operational costs, as well as Fire Underwriter requirements and water supply needs.

- 2) The Consultants were to conduct consultation sessions and/or work with:
 - a. RDN Emergency Services Department;
 - b. RDN Finance Department;
 - c. RDN GIS Department;
 - d. Bow Horn Bay Volunteer Fire Department Fire Chief & Officers;
 - e. Bow Horn Bay Volunteer Fire Department Society Board;

- f. Electoral Area H Director responsible for fire service area; and
- g. Horne Lake Strata Community Residents

Other stakeholder consultations were to be undertaken as recommended by the Consultants or RDN as the project moved forward.

- 3) The Consultants were to make two presentations on the findings, one to the Horne Lake Strata Community residents and the other to the RDN Electoral Area Services Committee.

The Horne Lake Strata and residents were not engaged by the Consultants as the Strata had already provided a letter of support outlining a Strata Council resolution in support of a review.

Project Methodology

The project included a four-phased approach:

Phase One: Project Kick-off and Background Review

Two preliminary meetings (April 26 and May 2) were held with the RDN Fire Services Coordinator to refine the scope of work and enable the Consultants to develop a deeper understanding of the project and community. On June 2, 2022, the Consultants met separately at the RDN offices with the RDN acting Director of Finance, Manager of Emergency Programs, Fire Services Coordinator, Chief Administrative Officer and with the Communications and Engagement Coordinators. This meeting provided background to the issues from the RDN's perspective and enabled review of issues related to scope, timing, and approach.

Supporting background documents and key sources of information in the study were provided by the RDN and the Bow Horn Bay Fire Department. These included:

- Bylaws and Agreements
 - RDN Bylaw No 1385 Fire Department Establishing Bylaw
 - Automatic Aid Response Agreement
 - Bow Horn Bay Fire Services Agreement
 - RDN Bylaw 1401 Bow Horn Bay Fire Department Rules for Conduct
- Fire Department Apparatus and Equipment Inventory
- Related Background Communications
- Maps provided by RDN
- Bow Horn Bay Capital and Operating Budgets
- Fire Underwriters Certificates of Accreditation and Recognition
- Community Wildfire Resiliency Plan
- Operational Guidelines
- Bow Horn Bay Fire Department Organizational Chart
- RDN 2021 Fire Services Year in Review Report
- Bow Horn Bay response data
- Bow Horn Bay training records

Phase Two: On-site Consultations

The first on-site visit and consultation was undertaken by Tim Pley and Gord Anderson on July 20, 2022 and consisted of a half-day meeting with Fire Chief and Electoral Area H Director to understand the history and issues related to the proposed fire service area and background documents reviewed. This was followed by a full day visit on July 28, 2022, to meet again with the Fire Chief, Deputy Chief and Society Board Chair, followed by a review of the fire hall, apparatus and equipment. The Fire Chief then provided a tour of the current fire protection service area and the proposed expansion area. The proposed location for a satellite fire hall was reviewed. A rented facility in the Spider Lake area was also reviewed. This site consists of

a privately-owned garage that is rented by the Department. The Department stages a rescue truck at this location, and some Department members respond to incidents from there.

Phase Three: Development of Recommendations and Draft Report

In the third phase of the project, the Consultants integrated information obtained from the background review, site visits and input gathered during consultations with the Department, the Society, and the RDN. Mapping work was undertaken to assess the location of the proposed satellite fire hall relative to the proposed area of response coverage. Other locations were explored for potential siting of a satellite fire hall.

Phase Four: Development of Final Report

The final report incorporates feedback received from the RDN regarding the October 12, 2022 draft report. The final report provides an assessment of the potential for providing fire protection services to the Horne Lake area through a service area expansion, the need to establish a satellite fire hall in the area if Fire Underwriters travel distance requirements are to be met, enabling insurance premium reductions, anticipated costs to construct and equip a satellite fire hall, and considerations for infrastructure improvements in the Horne Lake area to enable provision of fire services.

The Consultants' method of assessing the feasibility of options included:

- Review of the capacity of BHBVFD to staff and manage a satellite fire hall
- Review of Fire Underwriters' Certificates of Accreditation and Recognition related to BHBVFD
- Review of Fire Underwriters documented minimum requirements related to travel distance, staffing, training and apparatus for accreditation of fire services
- Review of mapping
- Review of satellite fire hall construction cost estimates
- Review of financial information to understand estimated costs of a service area expansion to affected property owners.

Summary of Recommendations

The following section summarizes the recommendations contained within the report. The more expansive discussion in the report contains details regarding each of these recommendations.

Recommendations	
Recommendation 1	The RDN should investigate the potential to acquire land for construction of a satellite fire hall in the area of the intersection of Horne Lake Road and Marshland Road.
Recommendation 2	Costs related to land acquisition, development costs and site preparation should be considered costs associated with the construction of a satellite fire hall to serve the expanded service area.
Recommendation 3	Horne Lake community members should be consulted on fire hall design and costs, and be afforded the opportunity to consider the addition of community amenities such as but not limited to, a multi-use meeting space that could be made available for use by community members.
Recommendation 4	If a new or expanded service area is created and a satellite fire hall constructed, the Department should station a water tender at that location and consider implementation of other measures in order to achieve a STSS accreditation in the Horne Lake area, enabling further reductions to insurance premiums.
Recommendation 5	If a new or expanded service area is established for Horne Lake, the RDN and the Society should provide notice to the other parties to the Mutual Aid Agreement and Automatic Aid Agreement that such service area is part of the Department's response area and to be considered included in the mutual aid and automatic aid arrangements. Updated mapping should accompany such notice.
Recommendation 6	The RDN should require, as a condition of expanding the service area, that the Horne Lake Strata undertake works identified by the BHBVFD Fire Chief as required to enable fire protection access and operations, including secured and improved access to water sources, improvements to private roads to enable fire apparatus access, and standardized road signage and property addressing.
Recommendation 7	An infrastructure plan should be developed to support installation of strategically located water storage facilities within the expanded service area adequate to support reasonably anticipated structure firefighting requirements.

Recommendations

Recommendation 8

It is recommended that the RDN establish a new service area covering the Horne Lake area, and all costs associated to the construction, equipping and staffing a satellite fire hall be borne by the new service area property owners.

Request for Service Area Expansion

In early 2021, the Strata management for the community of Horne Lake approached the RDN with a request that it explore the extension of fire protection services by the Department to the Horne Lake community. In response, the RDN requested that the Strata provide confirmation that a majority of property owners were in favour of being included in the fire protection area, in order to proceed with examining the feasibility and associated costs.

The RDN informed the Horne Lake Strata specifically that,

“If there is enough support for inclusion, the RDN in collaboration with the Bow Horn Bay Fire Department Society would initiate discussions and potentially look at a feasibility study with support from the RDN Board. Information from discussions and/or a feasibility study would be shared with the Community and if there is still majority support, the RDN could look at a formal petition process for inclusion.”¹

On April 24, 2021, the Horne Lake Strata passed a resolution at its annual general meeting confirming support by property owners for the request.² The Strata resolution can be viewed in Appendix 1.

RDN staff confirmed the willingness of the Department and the Society to provide fire protection services to the Horne Lake area and a feasibility study was authorized by the RDN, resulting in the retaining in 2022 of Tim Pley & Associates Ltd. to conduct the study. The proposed service area addition primarily involves the lands encompassed by the Horne Lake Strata Plan VIS5160, which comprises properties along the north, south and eastern shores of the lake.

¹ Resolution of the Owners, Strata Plan VIS5160, April 24, 2022.

² Resolution of the Owners, Strata Plan VIS5160, April 24, 2022.

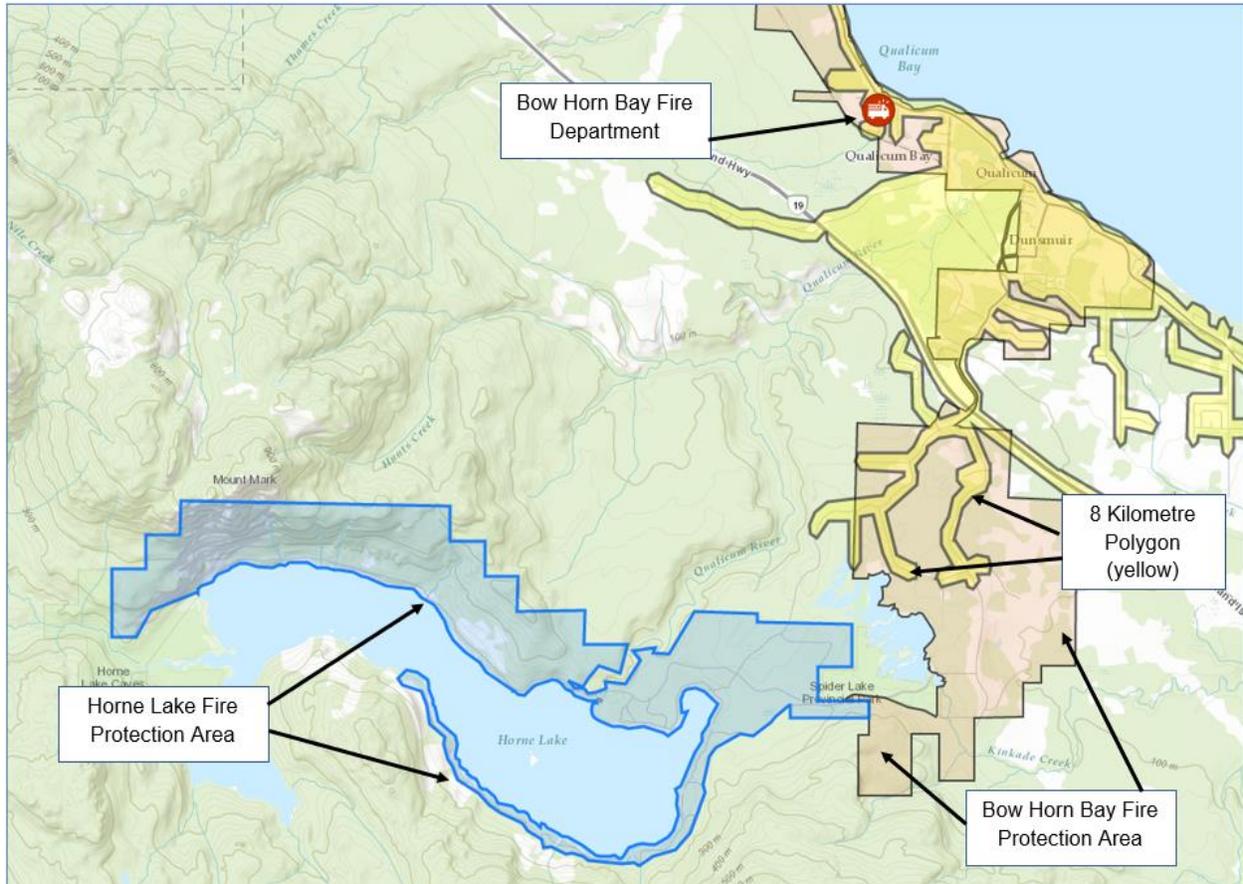


Figure 1: The Department's current Fire Protection Area (beige); proposed Fire Protection Area for Home Lake (blue) and the eight-kilometre response polygon (black outline with yellow infill) from the existing fire hall.

Bow Horn Bay Volunteer Fire Department Overview Summary

When investigating the impact of adding a second facility such as a satellite fire hall, it is important to review the operational and administrative capacities of the Department to understand the impact of operating a second facility. To that end, the Consultants undertook a high-level review of the Department, examining the following aspects:

- Governance;
- Fire hall;
- Staffing;
- Apparatus;
- Impact on DPG arising from a second facility;
- Aid and service agreements; and
- Regulatory matters.

A more in-depth analysis of the above-listed matters can be viewed in Appendix 3 of this report.

Table 1: Summary of BHBVFD

Summary of BHBVFD Review	
Governance	Operated by the Society. RDN is the AHJ
Oversight	Fire Chief reports to the Society
Service level	Interior operations level
Services	Fire protection, first medical responder, automobile extrication, high/low angle rope rescue
Apparatus	2 frontline rated engines under 20 years of age. Tenders and rescue truck older than 20 years
Facilities	Well maintained main fire hall, good training facilities, ample space for training scenarios. A rented facility in the Spider Lake area
Water supply	Some fire hydrants in service area. Water reservoirs strategically located where no hydrants available. Department is SSTS accredited (superior water shuttle)

The Department has been anticipating a service area expansion into the Horne Lake area for some time, and has been preparing to support a satellite fire hall in that area by stockpiling some equipment, staging a reserve apparatus in the area and developing a cadre of volunteer

firefighters in the Spider Lake area who could be based at the new hall in the future. The chief officers have been exercising prudent and considerate forward planning with the support of the Society.

Review of the current rented facility in the Spider Lake area and definitions of satellite fire halls and storage garages are considered in Appendix 4.

Satellite Fire Hall Location Options

Fire Hall Locations

Under the Fire Underwriters' rating system, one gating criterion that determines whether a property is considered protected, is the distance by road network from an accredited fire hall.

The Fire Underwriters utilize two different rating scales – the DPG rating covers residential properties, while for commercial and multi-family properties the Public Fire Protection Classification or “PFPC” rating is applied. For properties covered by the DPG rating, the maximum distance from a fire hall is eight kilometres by road network. The maximum distance for properties covered by the PFPC rating is five kilometres.

In some circumstances fire insurance providers will consider extending the benefits of the Fire Underwriters' eight-kilometer zone, providing some insurance cost reductions for properties out as far as 13 kilometres. It must be stressed, however, that the decision to provide such a reduction in insurance costs is entirely within the discretion of individual insurance underwriters: from the perspective of the Fire Underwriters' rating, properties more than eight kilometres from the proposed satellite hall will be rated as unprotected.

The existing fire hall is located at 220 Lions Way and can provide coverage within the eight kilometres response zone to all areas east of Highway 19 and approximately 50 percent of the current fire protection area around Spider Lake to the west of the highway.

The Department intends that the satellite fire hall be capable of storing two full size apparatus, plus room for the UTV and ancillary equipment storage. This configuration could be accomplished with a two-bay (back in configuration) fire hall with additional room at the rear of the bays for the UTV and equipment (members' bunker gear and personal protective equipment, spare hose, SCBA cylinders, small tools, etc.) or by a three bay fire hall.

As noted, the Department currently rents a facility (Location “A” in Figure 3) in the Spider Lake area which houses one Rescue truck. Some firefighters who reside in that area respond to emergency incidents with the apparatus from that location. The building is located on private property, and it is not feasible to transform it into a satellite fire hall that would meet BC Building Code and WorkSafe BC requirements, or meet Fire Underwriters standards for a satellite firehall.

Location One: Horne Lake Road near Shayla Road

The RDN owns property that is intended for use for a satellite fire hall to serve the expanded service area. The property is located on Horne Lake Road near the intersection with Shayla Road (shown as Location 1 in Figure 2). This site is well situated on a main road and appears to have sufficient room for a fire hall, and to provide on-site firefighter parking and support ancillary activities (e.g., training).

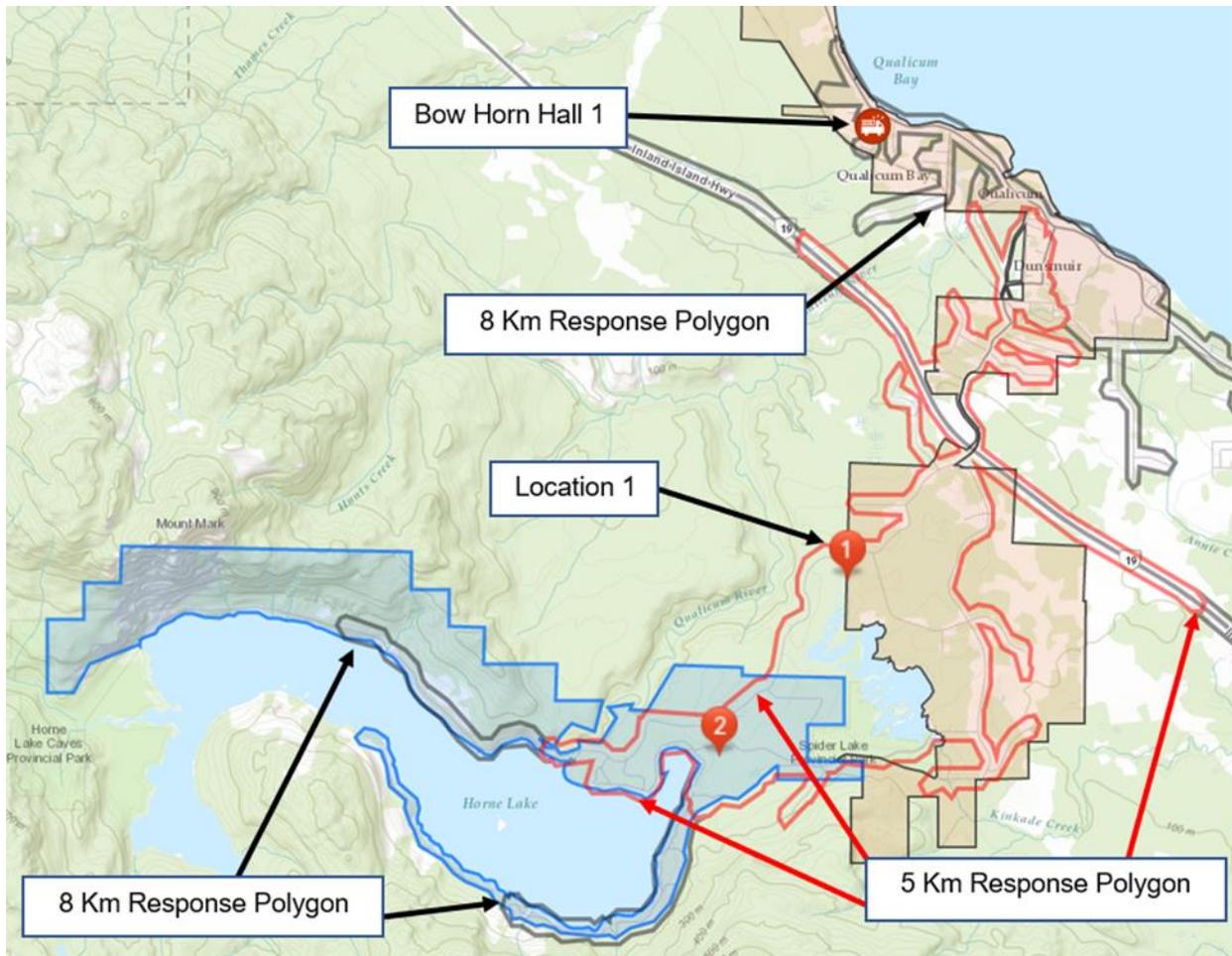


Figure 2: Fire Protection Areas for Bow Horn (beige) and Horne Lake (blue) Fire Underwriters response polygons from Horne Lake Proposed Location – 5 Km and 8 Km travel distances shown from Location One

Figure 2 demonstrates that some structures in the Horne Lake area would be greater than eight kilometers travel distance from a satellite fire hall located at Location One. As noted above, in some circumstances fire insurance providers will consider extending the benefits of the Fire Underwriters' eight-kilometer zone, providing some insurance cost reductions for properties out as far as 13 kilometres. If that occurred in this situation the beneficial insurance rates would extend to cover the entire proposed service area expansion area. (Figure 3). It must be stressed, however, that the decision to provide such a reduction in insurance costs is entirely within the discretion of individual insurance underwriters: from the perspective of the Fire Underwriters' rating, properties more than eight kilometres from the proposed satellite hall will be rated as unprotected.

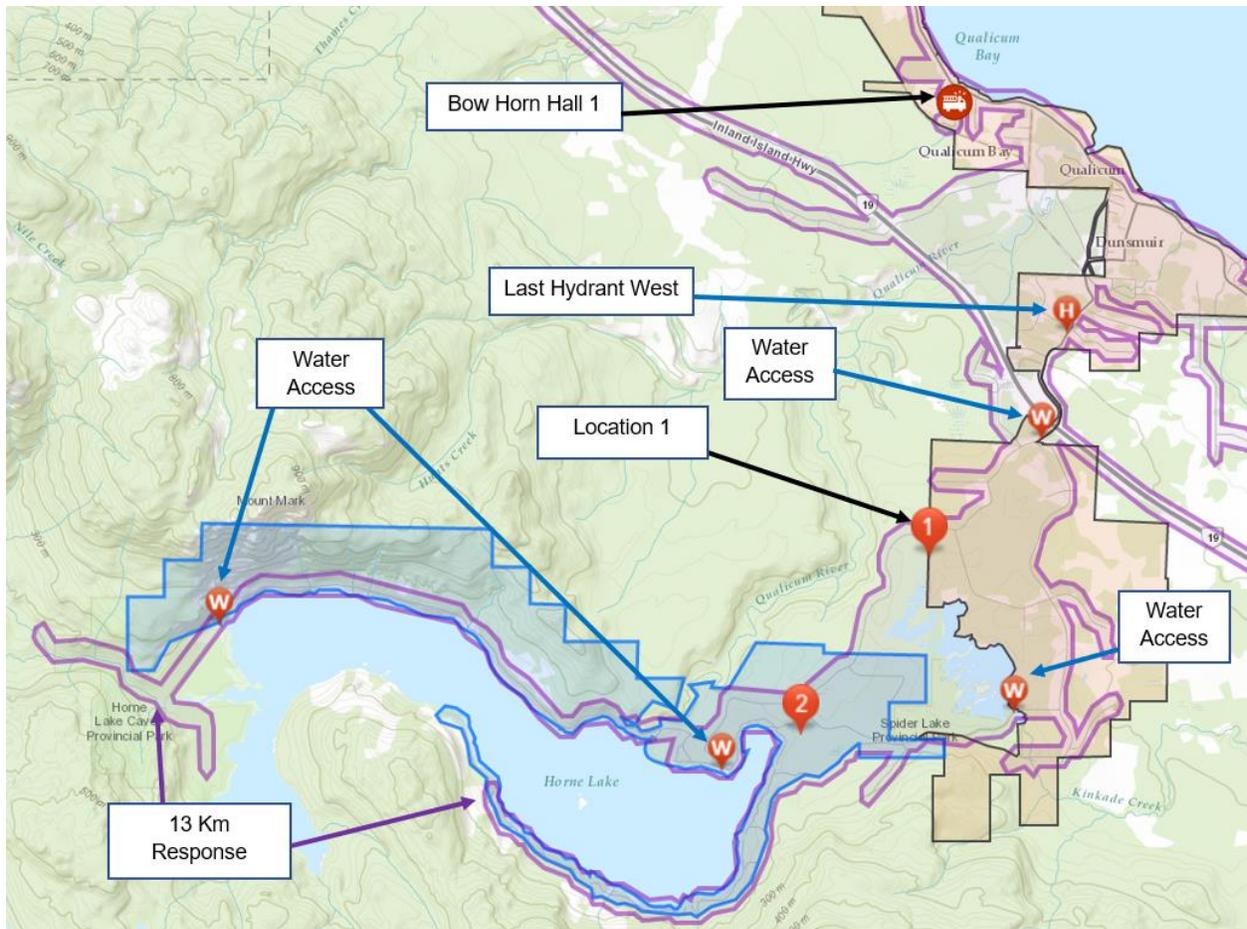


Figure 3: Fire Underwriters response polygons from Location One – 13 Km (purple polygon). Note: the 13 Km travel distance shown on the south side of Horne Lake is in fact less than 13 Km from Location One, Esri mapping software only shows existing roadways. The road ends at the point shown as 13 Km when in fact the travel distance from Location One to the end of the road on the south side is 11.2 Km.



Figure 4: Proposed satellite fire hall site Location One



Figure 5: Proposed satellite fire hall site at Location One

Location Two: Horne Lake Road and Marshland Road

In addition to the proposed Location One site, the Consultants reviewed the potential for constructing a satellite fire hall in a different location, one that may better meet the needs of the proposed service area. As noted above, not all Horne Lake properties would be within an eight-kilometer travel distance of the Location One site. It would be more than 10 kilometers from the Location One site to the end of the proposed service area expansion on the north side of Horne Lake.

The Consultants investigated the potential for an alternate location in the interests of reducing travel distances to the Horne Lake properties while still being within reasonable travel distance for firefighters travelling from their homes to the satellite fire hall, and not creating a coverage gap in terms of Fire Underwriters criteria relative to the existing main fire hall location.

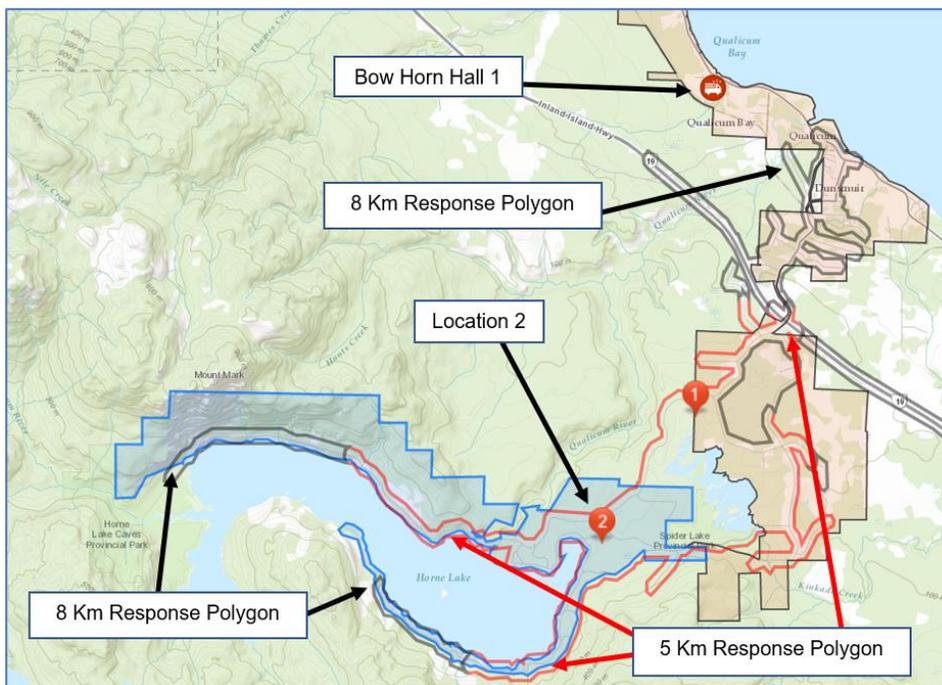


Figure 6: Fire Protection Areas for Bow Horn (beige) and Horne Lake (blue) Fire Underwriters response polygons from Horne Lake Proposed Location – 5 Km and 8 Km travel distances shown from Location Two

The area of the Horne Lake Road and Marshland Road intersection (Location Two), approximately 3 kilometers west of the Location One site, is a preferred alternate location for a satellite fire hall. If a satellite fire hall was located in this general area travel distances to all developed properties in the Horne Lake area would be less than eight-kilometers. Location Two is on the response route between year-round residences of volunteer firefighters and any incidents in the Horne Lake area. Therefore, responses to incidents in the Horne Lake area from a satellite fire hall at this location should not be impacted by longer response times. However, responses to incidents in the Spider Lake area would be longer from a fire hall at Location Two relative to Location One due to the requirement for volunteer firefighters to respond from their residences to the fire hall and then back into the Spider Lake area.

Location Two provides the best fire protection coverage from a Fire Underwriters perspective.

Recommendations

Recommendation	The RDN should investigate the potential to acquire land for construction of a satellite fire hall in the area of the intersection of Horne Lake Road and Marshland Road.
Recommendation	Costs related to land acquisition, development costs and site preparation should be considered costs associated with the construction of a satellite fire hall to serve the expanded service area.

Infrastructure Requirements in Proposed Service Area

It may be necessary for some infrastructure upgrades to be undertaken in the Horne Lake area to properly accommodate the provision of fire protection services. Those upgrades are outlined below.

Water Sources in Expanded Service Area

Given that there is no hydrant system in the Horne Lake area, it will be necessary for the Department to shuttle water to fire incident scenes using water tenders. The Department is resourced to undertake this work and firefighters are trained to execute the procedure. Water shuttling operations can be labour and apparatus intensive and are best undertaken in areas where tender filling locations are close at hand, level, and accessible. To that end, the Consultants, together with the Department's chief officers, have identified locations at Horne Lake and Spider Lake that can be used by the Department to draw (draft) water from those bodies of water. Drafting from a body of water can present challenges for the Department, complicated by slope of approach, quality of surfacing of the approach, changing water levels, access and truck turning space.

It is recommended that the Department's chief officers identify potential drafting sites in the proposed service expansion area, and that any necessary site improvements be arranged through the Strata management to facilitate the Department's access. Over the course of time, the Department, the Society, the RDN, and the Horne Lake Strata property owners should work together to maintain and improve drafting sites. A longer-term plan should be developed and implemented to install above-ground water storage tanks in strategically located areas. These tanks should be equipped either with pumps or installed at heights adequate that tender trucks can be quickly refilled. Above-ground water storage tanks should be equipped with automated refilling infrastructure to avoid the need for the Department to shuttle water to refill storage tanks. Siting such infrastructure would need to be developed in consultation with the Strata management.

With established water resupply locations and a tender stationed at the satellite fire hall, it may be possible for the Department to achieve STSS accreditation in the Horne Lake area, enabling a DPG improvement to 3B(S), and a corresponding further reduction in insurance premiums for affected property owners.



Figure 7: Potential drafting site at Spider Lake. Some improvements are required to establish a level and safe location for drafting fire apparatus, and improved footing to enable firefighters to safely access the water.



Figure 8: Potential drafting site at Horne Lake



Figure 9: Potential drafting site at Horne Lake. Challenges with slope, Department access and water level fluctuation are evident.

Roads and Access in Expanded Service Area

Roads within the current Department service area were observed to be either paved or surfaced with good quality and well-maintained gravel surfacing. By contrast, roads in the proposed service expansion area were observed to be narrow, rough (washboard and potholes), steep, and with tight turns. The location was observed during summer months when traffic levels were such that they could impact the Department's response and firefighter safety. It was reported to the Consultants that in winter the roads can be muddy, icy and snow-covered.

Many of the roads (and access driveways) in this area appeared to not have been designed with fire department access as a consideration. In some areas, lakefront structures cannot be accessed by fire apparatus. In those cases, fire suppression operations will be required to be undertaken at a distance from the apparatus, adding complication to firefighting efforts and resulting in potential for response delays, water supply issues and, consequently, potentially greater fire losses.

During periods of peak activity in the area, vehicle traffic and parked vehicles may hinder the Department response and access.

If expansion of the service area proceeds, the Department should develop pre-fire plans for the area, determining ahead of time for each localized area where apparatus will be staged and how structures will be accessed. A procedure should be developed, documented and practiced that involves undertaking structure firefighting at a distance from fire apparatus.

While initial fire responses into the Horne Lake area will likely come from the new satellite fire hall, and firefighters assigned there will have some familiarity with the area and roads, working fires will require second alarm responses from the main fire hall, and may also include mutual aid responses from other fire departments. A working fire will require the establishment of a water shuttle, requiring considerable movement of tender trucks back and forth in the area. All Department members should be given regular familiarization tours through the area, and any access or water supply issues (including drafting spots or fixed water supplies) clearly communicated in advance to mutual aid partners.

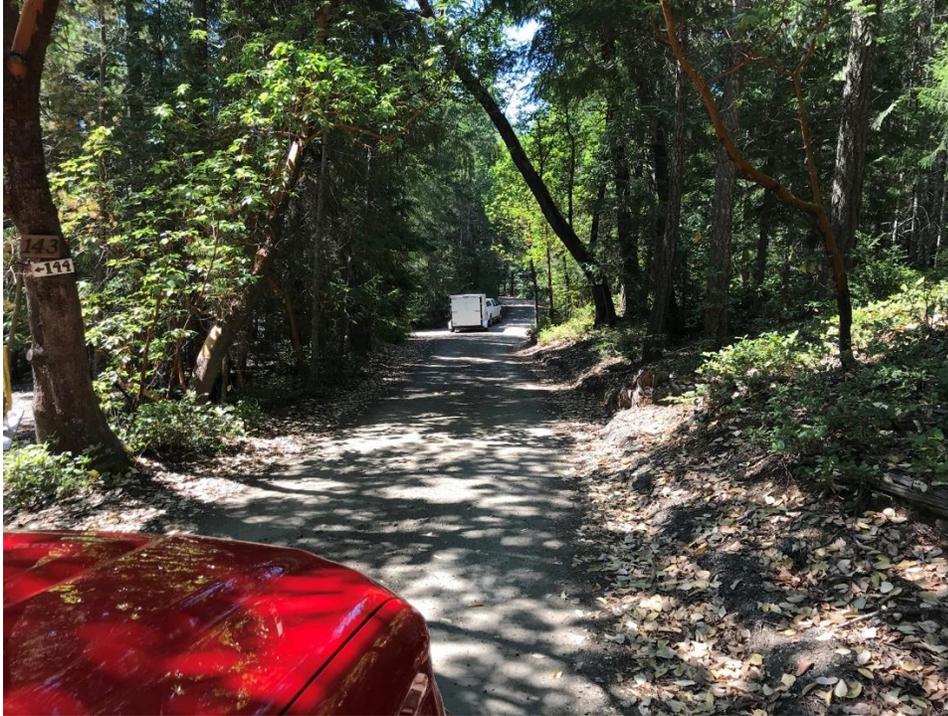


Figure 10: Access road, Horne Lake showing load overhead hazards, narrow roads that could be congested with vehicles at the time of a fire, and non-standard address signage



Figure 11: Horne Lake Regional Park. Vehicles travelling to this park and the nearby Horne Lake Provincial Park add considerable traffic in the area.

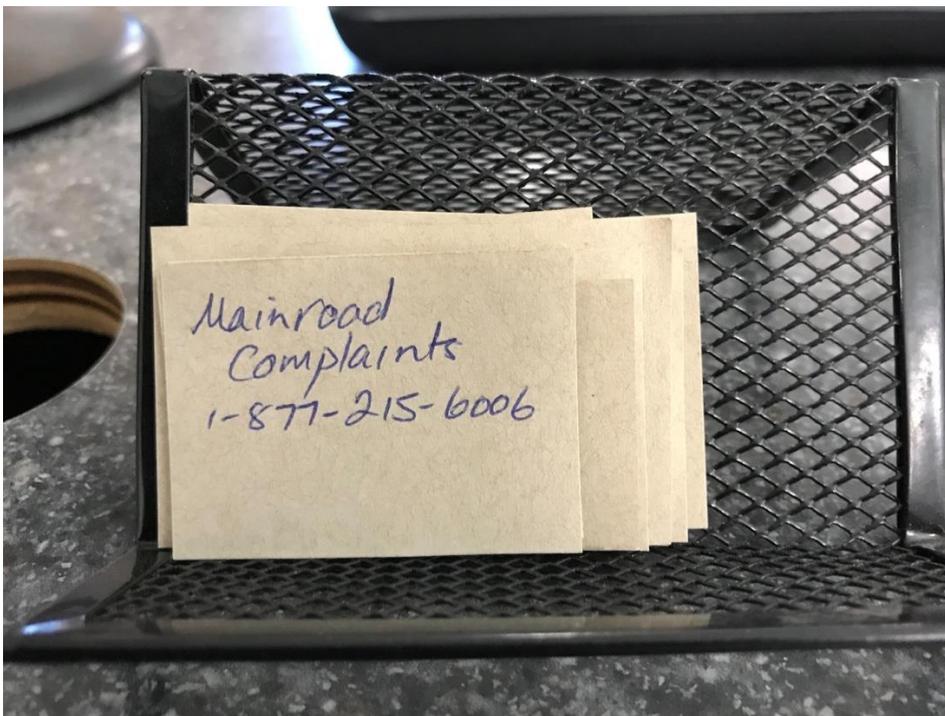


Figure 12: Road condition indicator, handmade cards for inquiries about road condition, Horne Lake Regional Park store

The Province contracts Mainroad to maintain public roads in the Horne Lake area. Private road maintenance, including snow removal, on Strata-owned land is the responsibility of the Strata. The RDN should ensure that the Strata remains responsible for road maintenance and responsive to expressions of concern from the Department.

Signage and Addresses

It is critical that responding fire apparatus not be delayed by lack of adequate signage and clear property addresses. Addressing in the area should be reviewed for consistency with standard practices in the current service area. North Island 911 should be consulted to verify that dispatch mapping is consistent with actual roads and addressing. When accessing 911 dispatch information and mapping on the Department’s (and mutual aid partners) onboard computers, it is critical that information be accurate.

Roads in the expanded service area should be marked with standard signage that is visible at night. Each property should be identified with clearly visible and legible address signage.

Recommendations

Recommendation	<p>The RDN should require, as a condition of expanding the service area, that the Horne Lake Strata undertake works identified by the BHBVFD Fire Chief as required to enable fire protection access and operations, including secured and improved access to water sources, improvements to private roads to enable fire apparatus access, and standardized road signage and property addressing.</p>
Recommendation	<p>An infrastructure plan should be developed to support installation of strategically located water storage facilities within the expanded service area adequate to support reasonably anticipated structure firefighting requirements.</p>

Satellite Fire Hall Designs and Costs

A design has not been approved for a satellite fire hall to service the Horne Lake area. The RDN did undertake design work for this project in 2018. Design and budget estimates from 2018 are attached as Appendix 6. The 2018 Horne Lake satellite fire hall design is reviewed below along with two other examples of recently constructed satellite fire halls in the mid-Island region.

This section summarizes three fire hall projects at varying stages of planning or completion, to provide a high-level view of potential construction costs of a satellite fire hall to serve the Horne Lake area. Each project involves a fire hall located (or planned) on Vancouver Island that appears to meet requirements for a satellite fire hall.³

Horne Lake Satellite Fire Hall (design)

In 2018, the RDN commissioned a satellite fire hall design for the Department, intended to serve a proposed service area expansion that would include the Horne Lake area. This design features an attractive exterior, two large drive through truck bays, and generous office, storage, and break room space. The fire hall design would fit well on the Proposed Site (Location One), which is already identified and owned by the RDN. However, a back-in configuration may be more conducive to minimizing the width of the building by allowing equipment storage at the rear of the apparatus bays and eliminating the extra space required to travel around the building to manoeuvre into the rear of the hall.



Figure 13: Bow Horn Bay (Horne Lake) Satellite Fire Hall

³ Meeting requirements of BC *Building Code*, WorkSafe BC requirements, and Fire Underwriters' standards.

Table 2: Horne Lake Fire Hall Costs

Horne Lake Satellite Fire Hall (design)	
Project Stage	Design phase in 2018
Cost	\$ 2,705,064 + GST projected in 2018 (Class C estimate)
BC Building Code Compliant	Yes
Truck Capacity	2 drive through bays
Turn Out Gear Storage (minimum 10)	Yes
Washroom/Shower Facilities	Yes x 2
Decontamination shower	Yes x 2
Laundry	Yes
Vehicle Exhaust Extraction Capability	Yes, not included
Equipment/hose Storage	Yes
Office	Yes
Workshop	Yes
Fitness Room	Yes
Break Room/Kitchen	Yes
Parking	Yes
Training Space (optional but recommended)	No
Community Use Space (optional)	No

A Class C estimate for construction of this facility in 2018 was in excess of \$2.7 million. Given that construction costs have escalated materially since 2018, this design is not recommended for further consideration.

Meadowood Satellite Fire Hall (1800 Galvin Place)

The Meadowood satellite fire hall is operated by the Dashwood Volunteer Fire Department. This pre-engineered satellite fire hall is constructed of metal structural components and cladding, making it a good candidate for the relatively rigorous BC Building Code seismic load calculations in the mid-Island area, and scoring well on the FireSmart public infrastructure assessment scale. The fire hall features generous meeting space, fitness area and offices that

meet the minimum requirements for a satellite hall. The Dashwood Fire Chief reports that the fire hall is low maintenance, and firefighters are happy to work out of this facility.



Figure 14: Meadowood Fire Hall

Table 3: Meadowood Satellite Fire Hall costs

Meadowood Satellite Fire Hall	
Project Stage	Constructed in 2008
Cost	\$2,359,287 + GST in 2022 (updated Class D estimate).
BC Building Code Compliant	Yes
Truck Capacity	3 (1 drive through double bay and 1 back-in bay)
Turn Out Gear Storage (minimum 10)	Yes
Washroom/Shower Facilities	Yes x 2
Decontamination shower	Yes
Laundry	Yes
Vehicle Exhaust Extraction Capability	Yes

Meadowood Satellite Fire Hall	
Equipment/hose Storage	Yes
Office	Yes
Workshop	Yes
Fitness Room	Yes
Break Room/Kitchen	Yes, with kitchen
Parking	Yes
Training Space (optional but recommended)	Yes
Community Use Space (optional)	No

Merville Satellite Fire Hall (7352 North Inland Island Highway)

In 2022, the Comox Valley Regional District (the “CVRD”) constructed a new satellite fire hall in the Merville area to serve the expanded service area. The Merville fire hall is a satellite to the Oyster River Volunteer Fire Department main fire hall. The Merville satellite fire hall features wood-framed construction, two generous back-in truck bays, an office, washroom and shower facilities, and a meeting room with full kitchen and separate entrance, enabling that space to be flexible between department and community use.



Figure 15: Merville Satellite Fire Hall

Table 4: Merville Satellite Fire Hall Costs

Merville Satellite Fire Hall	
Project Stage	Constructed in 2022
Cost	\$2,963,183 + GST in 2022 (updated Class D estimate) Construction costs in 2022 were \$1.3 million based on a 2021 Call for Tenders.
BC Building Code Compliant	Yes
Truck Capacity	2 back-in bays
Turn Out Gear Storage (minimum 10)	Yes
Washroom/Shower Facilities	Yes (2 washrooms, 1 shower)
Decontamination shower	No
Laundry	No, but space available for addition of laundry facilities
Vehicle Exhaust Extraction Capability	Yes, included
Equipment/hose Storage	Yes, modest
Office	Yes
Workshop	No, but space available for establishing
Fitness Room	Yes
Break Room/Kitchen	Yes, with kitchen
Parking	Yes
Training Space (optional but recommended)	Yes
Community Use Space (optional)	Yes, meeting room with separate entrance

Table 5 shows a side-by-side comparison.

Table 5: Side-by-side cost comparison

Criteria	Horne Lake	Meadowood	Merville	Merville Modified*
Project Stage	Design	Built/Operating	Built/Operating	Built/operating
Cost	\$ 2,705,064 + GST projected in 2018 (Class C estimate)	\$2,359,287 + GST in 2022 (Class D estimate)	\$2,963,183 + GST in 2022 (Class D estimate) Construction costs in 2022 were \$1.3 million	\$2,531,483 + GST in 2022 (Class D estimate)
BC Building Code Compliant	Yes	Yes	Yes	Yes
Truck Capacity	2 drive through bays	1 drive through double bay + 1 back in bay (3 total)	2 back-in bays	2 back-in bays
Turn Out Gear Storage (minimum 10)	Yes	Yes	Yes	Yes
Washroom/Shower Facilities	Yes x 2	Yes	Yes (2 washrooms, 1 shower)	Yes (2 washrooms, 1 shower)
Decontamination shower	Yes x 2	Yes	No	No
Laundry	Yes	Yes	No, but space available for addition of laundry facilities	No, but space available for addition of laundry facilities
Vehicle Exhaust Extraction Capability	Yes, not included	Yes	Yes	Yes
Equipment/hose Storage	Yes	Yes	Yes	Yes
Office	Yes	Yes	Yes	Yes

Criteria	Horne Lake	Meadowood	Merville	Merville Modified*
Workshop	Yes	Yes	No, but space available for establishing	No, but space available for establishing
Fitness Room	Yes	Yes	Yes	Yes
Break Room/Kitchen	Yes	Yes, with kitchen	Yes	No
Parking	Yes	Yes	Yes	Yes
Training Space (optional but recommended)	No	Yes	Yes	No
Community Use Space (optional)	No	No	Yes, meeting room with separate entrance	No

*Merville Modified: This column examines the potential replication of the Merville satellite fire hall without the break/room kitchen which could also serve as a multi-use community amenity.

Recommendations

Recommendation	Horne Lake Community members should be consulted on fire hall design and costs, and be afforded the opportunity to consider the addition of community amenities such as but not limited to, a multi-use meeting space that could be available for use by community members.
-----------------------	---

Project Budget

Construction costs (including site preparation) are the major budgetary component for construction and outfitting of a satellite fire hall. Other broad cost categories include:

- Apparatus;
- Equipment; and
- Firefighters.

Apparatus

In order for a satellite fire hall to be recognized by Fire Underwriters, it must include, at a minimum, a triple combination (water, hose, pump) fire engine that is less than 20 years old. As the apparatus (Rescue truck) currently stationed at the rented facility in the Spider Lake area does not have a rated pump and is now some 27 years of age, the Fire Underwriters would not recognize that unit as meeting the criteria to enable a DPG 3B rating.

Borrowing to purchase a new apparatus may represent a financial challenge for the community, however, doing so could provide the most reliable service for the longest period of time, and may provide the best value given that a new apparatus will have a 20-year working life span. A new satellite fire hall with new apparatus would likely be a point of pride for the community and the Department, and would be an asset in retaining current volunteer firefighters and attracting new ones.

Other options include the Department deploying one of its two front-line rated Engines to the satellite hall or acquiring a used Engine which would have a shorter lifespan than new apparatus. It may be possible for RDN to successfully petition Fire Underwriters to extend the recognized working life of existing apparatus. Extensions are possible for up to 25 years, based on the apparatus meeting various tests (e.g., pumping, braking acceleration), and in rare circumstances, even past 25 years. If used apparatus is considered, care needs to be taken to ensure that the cost actually reflects its reduced ratable lifespan.

Budget estimates below indicate no additional costs for apparatus, based on the assumption that BHBVFD would redeploy one of its two rated engine apparatus to the new satellite fire hall, resulting in no additional apparatus costs.

Equipment

Properly equipping the new satellite fire hall and apparatus will involve the acquisition of some additional equipment (e.g., hose, tools, nozzles, etc.). The Department has some equipment on hand that could be repurposed, has been stockpiling equipment anticipating a service area expansion, and the current apparatus staged at a rented facility in the Spider Lake area will have transferable equipment. There will be a need for additional equipment, such as onboard computers, office equipment, furniture, etc. The project budget should provide for these expenses.

Firefighters

Although the Department utilizes paid-on-call (POC)/volunteer firefighters, there are costs related to recruiting, training, equipping and retaining members. The Fire Underwriters require a minimum of 10 firefighters to be assigned to a satellite fire hall, and ideally there would be more than the minimum. The cost to maintain a trained and equipped cadre of firefighters at the satellite fire hall should not be overlooked.

Projected Project Costs

Project cost estimates used below are derived from an October 3, 2022, report to the RDN from Herold Engineering. The RDN retained Herold Engineering of Nanaimo BC to prepare current Class D estimates of probable construction costs of a fire hall to serve the Horne Lake area based on the following fire hall designs:

- Merville fire hall;
- Modified version of Merville fire hall (meeting room deleted); and
- Meadowood fire hall.

As noted above, given that the original 2018 Class C estimate for construction of a Horne Lake satellite fire hall exceeded \$2.7 million, and construction costs have escalated materially since then, that design is not recommended for further consideration.

The estimated costs for the three remaining options are shown in Tables 6, 7 and 8, below. In each case, as the Department may be able to deploy one of two rated engines (Engine 7-2) to the satellite fire hall, meeting Fire Underwriter standards for fire apparatus age, no immediate apparatus expense has been attributed to the expansion.

Table 6: Cost estimate to construct Merville fire hall at Horne Lake

Cost Estimate to Construct Merville Fire Hall at Horne Lake			
Expenditures		Revenue Sources	
Fire hall construction ⁴	\$1,489,950	Reserve Funds	\$0
Land purchase ⁵	\$0	Community Contributions ⁶	\$0
Site works	\$655,000	Borrowing	\$2,945,682
Consulting fee contingency (15%)	\$321,742		
Construction contingency (20%)	\$428,990		
Triple Combination Pumper	\$0		
Equipment	\$50,000		
Total	\$2,945,682	Total	\$2,945,682

⁴ Class D estimate provided to RDN on October 3, 2022.

⁵ No land purchase costs are factored into this costing estimate

⁶ Community members or the Horne Lake Strata may provide capital funding or in-kind contributions. The RDN currently holds \$5,000 in donated funds for the purpose of constructing a fire hall.

Table 7: Cost estimate to construct modified version of Merville fire hall at Horne Lake

Cost Estimate to Construct a Modified Version of Merville Fire Hall at Horne Lake			
Expenditures		Revenue Sources	
Fire hall construction	\$1,489,950	Reserve Funds	\$0
Land purchase ⁷	\$0	Community Contribution ⁸	\$0
Site works	\$655,000	Borrowing	2,513,982
Consulting fee contingency (15%)	\$321,742		
Construction contingency (20%)	\$428,990		
Total reduction related to deletion of meeting space	(\$431,700)		
Triple Combination Pumper	\$0		
Equipment	\$50,000		
Total	\$2,513,982	Total	\$2,513,982

⁷ No land purchase costs are factored into this costing estimate

⁸ Community members or the Horne Lake Strata may provide capital funding or in-kind contributions. The RDN currently holds \$5,000 in donated funds for the purpose of constructing a fire hall.

Table 8: Cost estimate to construct modified version of Merville fire hall at Horne Lake (without the meeting room that could be used by community members).

Cost Estimate to Construct a Meadowood Equivalent Fire Hall at Horne Lake			
Expenditures		Revenue Sources	
Fire hall construction	\$1,092,620	Reserve Funds	\$0
Land purchase ⁹	\$0	Community Contribution ¹⁰	\$0
Site works	\$655,000	Borrowing	\$2,409,287
Consulting fee contingency (15%)	\$262,143		
Construction contingency (20%)	\$349,524		
Triple Combination Pumper	\$0		
Equipment	\$50,000		
Total	\$2,409,287	Total	\$2,409,287

Several cost factors bear further review, and are analysed below.¹¹

Site Costs

The estimates in this report do not include land purchase costs. It is assumed that land will be provided by the Horne Lake Strata, or land purchase costs will be borne by property owners in the new service area, or the satellite fire hall will be constructed at Location One which is already in the possession of the RDN.

Cost estimates to construct a fire hall to serve the Horne Lake area are considerably higher than the costs that were experienced by CVRD when the Merville fire hall was constructed there (\$655,000 versus \$183,440). The considerably higher site cost projection is a result of a lack of

⁹ No land purchase costs are factored into this costing estimate

¹⁰ Community members or the Horne Lake Strata may provide capital funding or in-kind contributions. The RDN currently holds \$5,000 in donated funds for the purpose of constructing a fire hall.

¹¹ This section of the report relies on the October 3, 2022 report to RDN from Herold Engineering. The Herold report is attached as Appendix 5.

information available to the costing engineer at the time of this report. It may be possible to lower site costs through further investigation of site conditions.

Seismic Post-Disaster Requirements

The BC Building Code sets out required seismic load capacity for structures in different areas of the province. The seismic post disaster requirements for a fire hall in the Horne Lake area are 48 percent higher than in the Merville area, which adds to the construction costs compared to those experienced by the CVRD.

Existing Construction Environment

While the Merville fire hall was constructed in 2022, the tenders for construction were received in 2021. Since that hall was tendered, there have been significant cost pressures in the construction market in British Columbia, which continue to be experienced. Herold Engineering estimates that construction costs have climbed 25 – 30 percent since the Merville fire hall was tendered some 18 months ago. This cost escalation is reflected in the cost estimate to construct the same or similar fire hall in the Horne Lake area.

Contingency

Construction cost estimates in this report include a consulting fee contingency (15 percent) and a construction cost contingency (20 percent). If the project proceeds and cost estimates are refined, it may be possible to lower one or both contingencies.

Community Contribution

There may be a willingness within the Horne Lake area to assist in construction of a satellite fire hall. This opportunity should be explored further. Community involvement in a project of this nature can reduce costs and help the community connect to the facility, which will be an asset to the Department as they seek to recruit new volunteers from the area.

There may also be a willingness on the part of the Horne Lake Strata to contribute land and capital funds to the project, thus lessening the required borrowing requirements and the resulting service fees paid in part to retire debt related to construction.

The RDN is in possession of \$5,000 in funds previously donated for the purpose of constructing a fire hall to serve the Horne Lake area. These funds are available to reduce borrowing for the project.

Calculated Impact of Borrowing

The RDN will need to borrow to fund the cost of constructing and equipping the new satellite fire hall. The cost of borrowing will need to be funded through taxation.

Table 9 below shows the estimated annual tax requisition required to retire the debt over a period of 20 years.

Table 9: Estimated service fee (taxes) impact related to borrowing

Estimated Annual Service Fees (Taxes) – Horne Lake Service Area	
Fire Hall Design	Parcel Tax*
Merville fire hall design	\$ 715.91
Modified Merville fire hall design	\$ 626.22
Meadowood fire hall design	\$ 604.46

*The parcel tax rates listed above are based on 405 properties

Appendix 1: Resolution of the Owners, Strata Plan VIS5160

RESOLUTION OF THE OWNERS, STRATA PLAN VIS5160

WHEREAS:

- A. Some Owners of Strata Plan VIS5160 have expressed interest in fire protection services being extended to include the Horne Lake Community.
- B. The Regional District of Nanaimo has expressed a willingness to commence the process to consider extending fire protection services to the Horne Lake Strata Community if there is majority support by the Horne Lake Strata owners.

NOW THEREFORE BE IT RESOLVED, BY A MAJORITY VOTE THAT:

- 1. The Strata Council will advise the RDN in writing that the Horne Lake Strata Community would like the RDN to commence the process to consider extending fire services to include the Horne Lake Strata Community.
- ~~2. The Strata Council will commence a process to investigate the logistics and costs to include the Horne Lake Community with fire protection services. An additional amount of \$5,000.00 will be added to the 2021-2022 Strata Corp. budget to provide for preliminary costs (e.g. consulting, legal, travel) as may be determined necessary during the 2021-2022 budget year. This will increase 2021-2022 strata fees by \$1.20 per month to a total of \$98.18 per month.~~
- 3. The Strata Council provide regular information updates to the Owners throughout 2021-22.
- ~~4. The Strata Council prepare information including the logistics of fire protection services for the Horne Lake Community and the anticipated increase in property taxes for such services for presentation at the Annual General Meeting in 2022.~~

BACKGROUND TO RESOLUTION

With more and more development coming to Horne Lake, some owners have expressed interest in fire protection services being extended to include the Horne Lake Community. Recent (late 2020/early 2021) conversation with new staff at the RDN indicate a willingness to look into this idea.

This entire process could take 5-7 years. Property taxes will increase. There is no certainty property insurance will decrease. At this point, Council does not have any estimate of total cost to the Horne Lake Community. The Strata may need to look at the cost of upgrades to our infrastructure for the equipment to be able to safely navigate our roads. Service area will be a

factor as cabins may still exceed acceptable distance from a firehall (e.g. 8 KM from closest firehall).

We understand the Spider Lake community has already started the process to be included in RDN fire protection services. This may be good timing to keep the costs manageable through potential coordination.

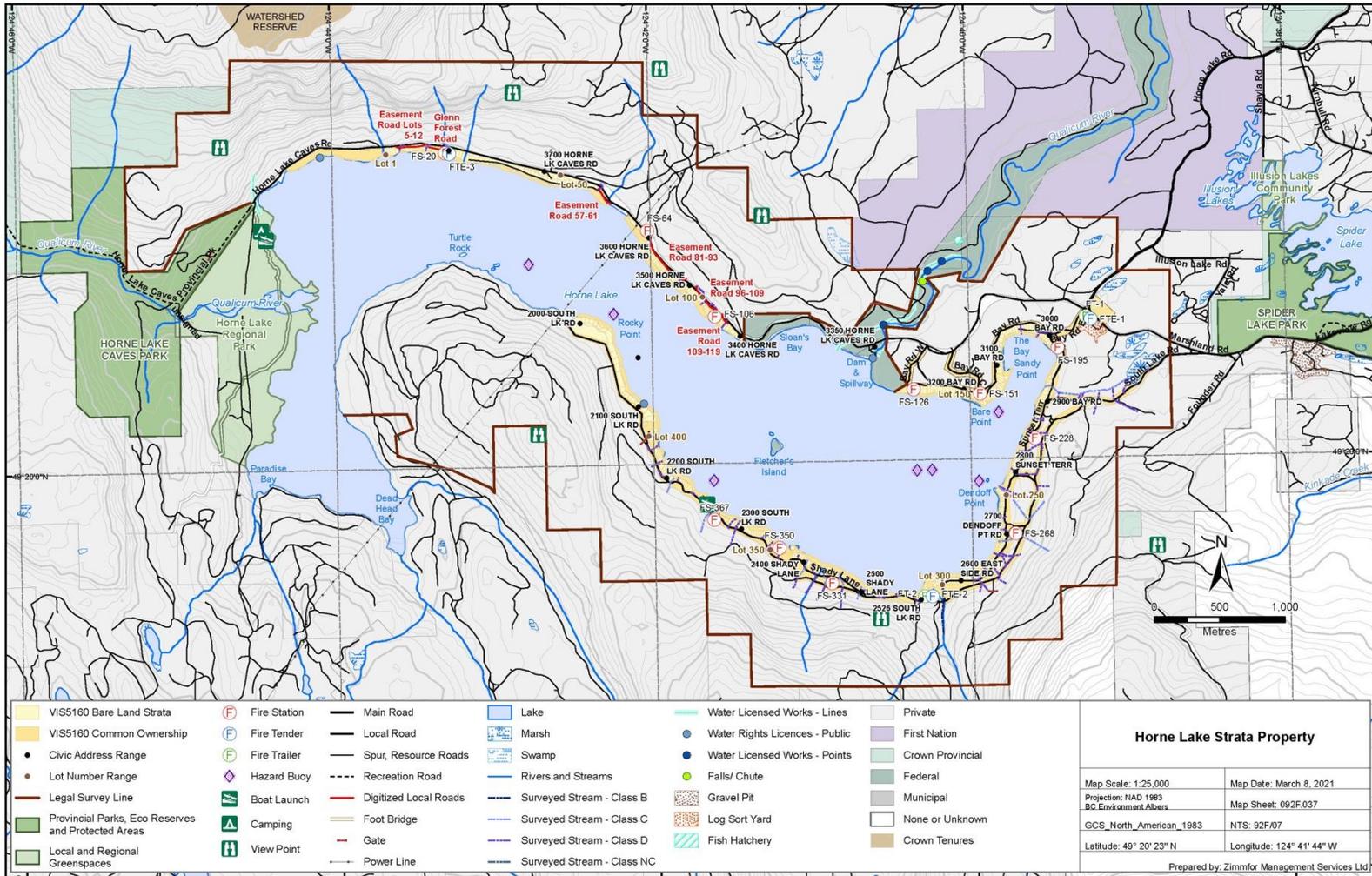
From the RDN, March 2021:

“There will be a significant amount of work involved in determining the feasibility and associated costs of including the Horne Lake Community to the Bow Horn Bay Fire Protection Service. Before the RDN and the Bow Horn Bay Fire Department Society undertake this effort, we would request confirmation that the majority of the properties are in favour of being included into the fire protection service. Note, that this doesn't commit any property owner, it simply provides the RDN with sufficient information identifying that there is support to look at initiating a discussion and potentially a feasibility study.

Current costs that may assist initial conversations. The 2021 rate for fire protection in the Bow Horn Bay Fire Protection Service area is \$0.751 per \$1,000 applied to the net taxable value of land and improvements in the service area (as an example if the property value is \$300,000, the annual rate for service would be \$225.30). In order to provide service to the Horne Lake Community, RDN would need to acquire land, construct a new fire hall, purchase apparatus and consider any additional operational costs which would be in addition to the current rate for service.

If there is enough support for inclusion, the RDN in collaboration with the Bow Horn Bay Fire Department Society would initiate discussions and potentially look at a feasibility study with support from the RDN Board. Information from discussions and/or a feasibility study would be shared with the Community and if there is still majority support, the RDN could look at a formal petition process for inclusion.

Appendix 2: Map of Area



Appendix 3: Fire Department Review

Regulatory Matters

As a starting point, it needs to be recognized that, for local governments, fire protection is an optional service. Unlike police and ambulance, which are established under and/or operate pursuant to provincial statutes and have a uniform range of powers across the province, a fire department only has the power and authority granted to it under the local bylaw which creates and defines its operations. Outside of its operating jurisdiction – which, in the case of a service established by a regional district, is the boundaries set in the service establishment bylaw – a fire department has no specific authority to act at or to respond to an incident. Care must be taken, therefore, to ensure that the Department has the full range of powers needed to respond effectively to incidents within its jurisdiction. Where it is responding outside of its ordinary jurisdiction, express consideration should be given to the source of the Department’s powers to respond to and operate at an incident – whether under a fire service contract, under a mutual or automatic aid agreement, or in support of another emergency response agency.

Similarly, there is no standard range of services defined for a fire department. A fire department is authorized to provide only those services which are stipulated in its service establishment and operational bylaws. Given that fire departments are the only “all hazards” response agency directly controlled by local government, we recommend that both the grant of powers and authorization to respond to incidents be very broadly cast, but that their exercise be made subject to training and the availability of necessary personnel and equipment.

The following section reviews the existing bylaw and service agreement structure governing that created and govern fire protection services in Bow Horn Bay. The Department is operated by a society (the “Society”), which provides services pursuant to a service agreement with the RDN. The following documents establish the Department’s regulatory framework:

- (a) there is a local service area bylaw, under which the RDN is authorized to provide fire suppression and other emergency response services, and operate, or contract for, a fire department: *Bow Horn Bay Fire Protection Service Establishment Bylaw No. 1385, 2004* (“Bylaw No. 1385”);
- (b) there is an operational bylaw which grants the Department the authority to respond to and manage incidents, and which addresses certain administrative matters: *Bow Horn Bay Volunteer Fire Department Operations Bylaw No. 1401, 2004* (“Bylaw No. 1401”);
- (c) there is a fire prevention bylaw (which is not typical for the RDN fire service areas) covering various matters such as open burning: *Bow Horn Bay Fire Protection Service Fire Regulation Bylaw No. 1402, 2004* (“Bylaw No. 1402”). Bylaw No. 1402 was not reviewed – however, the RDN, in consultation with the Department, should determine whether to extend this bylaw to cover the Horne Lake area; and

- (d) there are the separate constitutional documents under which the Society itself is incorporated and operates. The constitutional documents of the Society have not been reviewed.

Nothing in this report should be construed as legal advice. The RDN should review any recommendations or issues identified below, or elsewhere in this report, through its ordinary legal review processes.

Establishment Bylaw

Fire protection services were established under Bylaw No. 1385. Bylaw No. 1385 established a local service area, to be known as the “Bow Horn Bay Fire Protection,” within portions of Electoral Areas “F” and “H” of the RDN.¹² The RDN was authorized to provide (or cause to be provided) fire protection and emergency response services in the service area, and to acquire property, personnel and equipment in connection with same.¹³

The maximum amount that may be requisitioned was set at the greater of \$162,500 and \$1.076 per \$1,000 of assessed value of land and improvements.

One unusual feature of this bylaw is that the service authorization language in section 1 expressly refers to Electoral Area “H”, but not Electoral Area “F” (which is identified as a participating area for service in section 3). Section 1 reads as follows:

There is hereby established a service, to be known as the Bow Horn Bay Fire Protection, for the purposes of acquiring, improving, constructing or otherwise obtaining property, personnel and equipment to provide fire protection and emergency response to other classes of emergency, including but not limited to fighting fires, providing aid to or rescuing persons in distress and undertaking fire safety initiatives **within that portion of Electoral Area H** shown outlined on the attached Schedule ‘A’. [emphasis added]

This section should be reviewed, and revised to read “...within those portions of Electoral Areas “F” and “H”...”. The map attached to Bylaw No. 1385, which sets out the service area boundaries, does include some properties within Electoral Area “F”.

In section 5(b), the word “area” is missing in that sentence, which should read: “...within the service **area** by a property tax...”.

Extending the service to Horne Lake will require either an expansion of the Bow Horn Bay service area, or the establishment of a new service area. It is recommended that the RDN establish a new service area covering the Horne Lake area, and all costs associated to the construction, equipping and staffing a satellite fire hall be borne by the new service area property owners. In order to enable the BHBVFD to provide fire protection services in the Horne Lake area, the Bow Horn Bay fire protection service area should be expanded to include the new area. Service fees will be paid by Horne Lake property owners to both service areas until

¹² Bylaw No. 323, s. 3.

¹³ Bylaw No. 323, s. 1.

such time as the debt related to fire hall construction has been retired, and the Horne Lake fire protection service area can be discontinued.

It is possible that rather than expanding the Bow Horn Bay fire protection service area, fire protection service could be provided instead through a service agreement between Bow Horn Bay and Horne Lake. In that case, the service establishment bylaw should expressly contemplate that services will be provided under contract by the Department. At the same time, Bylaw No. 1385 can be updated to address the issues noted above.

Operational Bylaw

Bylaw No. 1401 sets out some of the Department's basic administrative structures, and establishes the Department's operational responsibilities and powers. This bylaw is nearly 20 years old. Various regulatory changes have occurred since it was first passed – such as the advent of the Provincial Training Standards – which are not reflected in its provisions. The bylaw will also have to be revised to address the expansion of the service area (or a matching operational powers bylaw created to any new Horne Lake service area). As such, it would be useful to plan for a replacement of this bylaw to coincide with the expansion of fire services to Horne Lake.

Service and Aid Agreements

The RDN has a service agreement with the Society, under which it has contracted for the provision of fire protection and emergency response services. Both the RDN and the Society are parties to mutual and automatic aid agreements, which create a useful, sub-regional emergency response structures. Both of these sets of arrangements will need some attention to address the establishment of a new service area around Horne Lake.

Service Agreement

There is a service agreement (the “Service Agreement”), dated as of 23 November 2004, between the RDN and the Society relating to the provision of fire and emergency response services by the Department.

The Service Agreement is in need of updating: it is now some 18 years old and lacks provisions that have become common in more recent forms of these types of agreement. The RDN plans to undertake this work in 2023.

The RDN will either need to amend the existing Service Agreement or strike a new one, to cover the addition of the Horne Lake area, if that area has its own, separate service area.¹⁴ It would be timely, therefore, to update the overall service arrangements with the Society.

¹⁴ Note: a single service agreement, properly crafted, can easily cover two service areas, if a separate service area is created for Horne Lake.

Mutual Aid Agreement

Mutual aid agreements are essential tools that enable fire departments to provide aid to one another when circumstances warrant. They permit departments to share resources and specialty services (e.g., specialty rescue or hazardous materials responses), and enable them to obtain critical support for major incidents or other situations where a department's resources are overwhelmed by events. Mutual aid agreements require a specific request for assistance from the requesting department before another department responds to the incident. Operationally, it usually means that a department arrives on scene, determines it will need assistance, and then makes a request through its dispatch provider for a mutual aid turn out. This process can result in a significant delay before assistance arrives.

Automatic aid agreements are a variant under which the participating departments agree that they will be automatically dispatched to assist neighbouring departments. Many of these types of agreements limit the call-outs to certain classes of calls, such as structure fires. Some automatic aid agreements further refine the approach by specifying particular areas covered (e.g., areas along each department's border), the nature of assistance provided (e.g., ladder trucks or tenders, motor vehicle incidents, etc.), the time of day (e.g., call-outs during work days when responses may be weak for volunteer or paid-on-call departments) and similar factors. Automatic aid agreements require close collaboration between the participating departments and with their dispatch providers. The principal benefit of automatic aid agreements is that they minimize the delay before additional resources begin responding from an assisting department, which enhances the safety residents and responders alike.

The Fire Underwriters grant partial staffing and apparatus credit to departments using aid agreements, with more credit generally being granted for automatic aid than mutual aid.

The RDN and the Society are parties to a sub-regional mutual aid agreement dated August 1, 2010 (the "Mutual Aid Agreement"), which has been supplemented by an automatic aid agreement dated 1 March 2018 (the "Automatic Aid Agreement"). The other parties to the two aid agreements are Parksville, Qualicum Beach, Errington Fire Department, Coomb/Hillier Fire Department, Dashwood Fire Department and Nanoose Bay Fire Department.¹⁵ Based on the version provided, the Automatic Aid Agreement does not currently cover any responses by the Department or into the Department's service area.

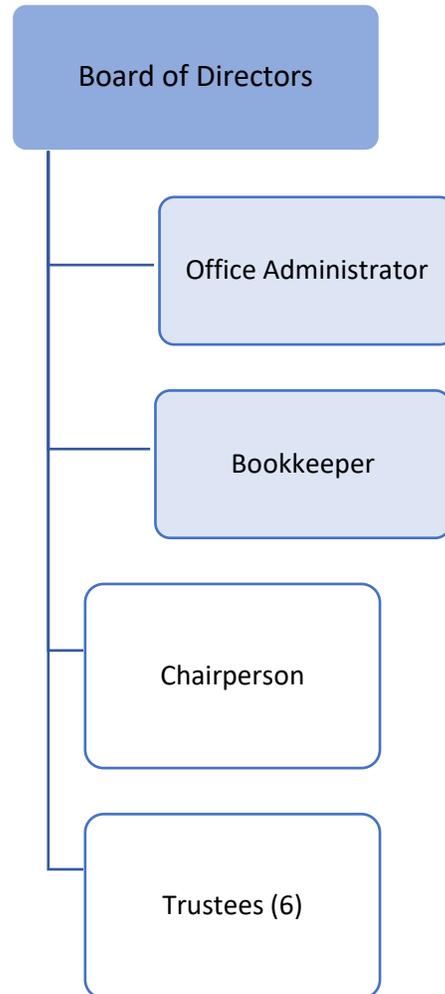
¹⁵ The 2010 Mutual Aid Agreement does not have the Society as a separate party to it. Rather, the RDN signed on behalf of all of its fire services. This issue is addressed in the Automatic Aid Agreement.

Organizational Structure and Staffing

Organizational Structure

The RDN contracts with the Bow Horn Bay Fire Society to provide fire protection services. The Society is governed by a Board of Directors that consists of six board members who are supported by two contracted administrative positions. The Fire Chief reports to the Society Board through the Society Chair.

The Board provides governance and oversight functions while Fire Chief manages the operations and administration of the Department. The Fire Chief manages the budget and Department expenditures within the established financial guidelines. The Board does not exercise any control over day-to-day operations of the Department.

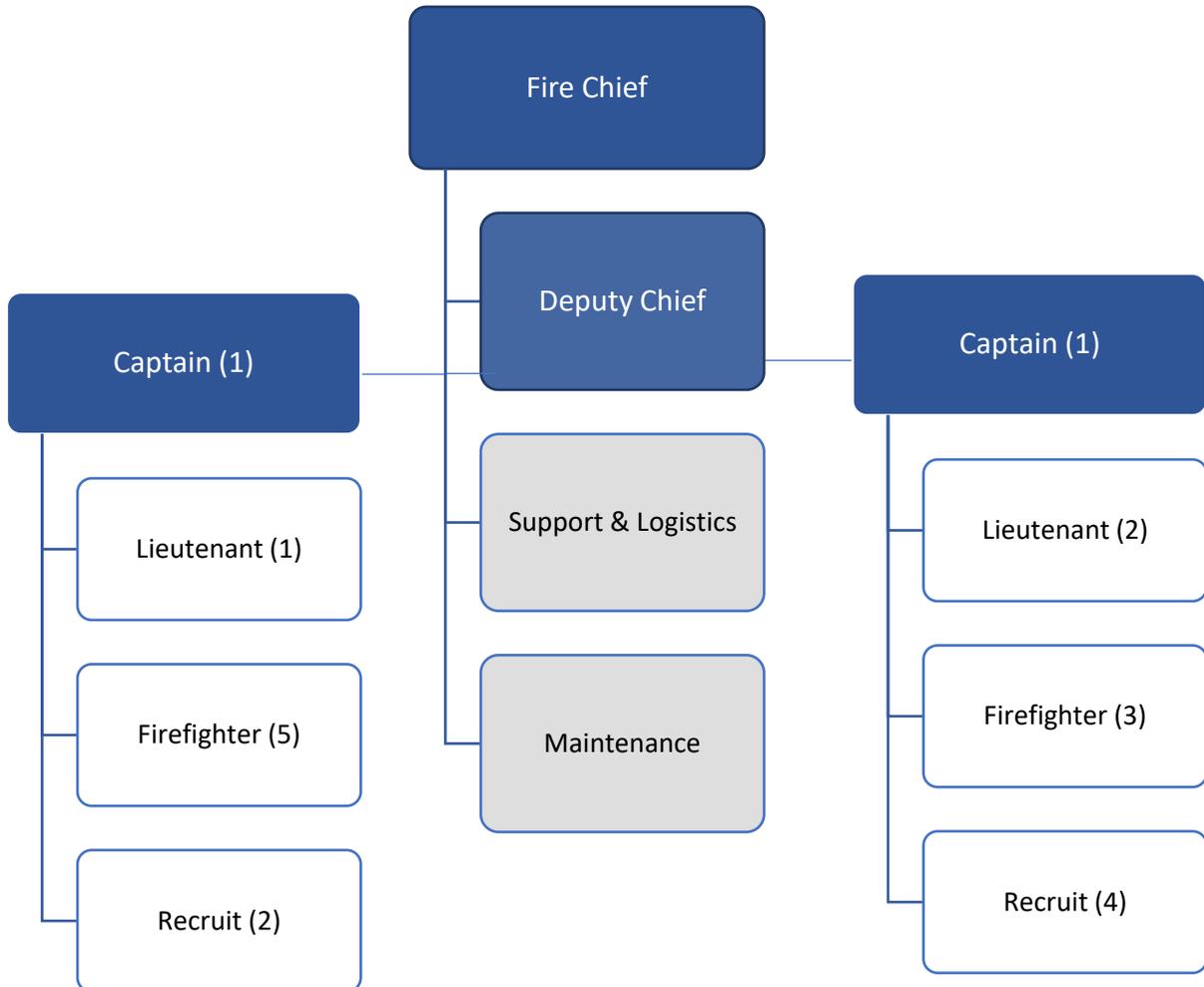


Staffing

The Bow Horn Bay Volunteer fire department comprises twenty-one suppression members including:

- Fire Chief
- Deputy Chief
- Captains (2)
- Lieutenants (3)
- Firefighters (8)
- Recruit firefighters (6)

There are two non-suppression auxiliary members who provide some administrative support to the Department in the areas of maintenance, logistics and general support.



Recruitment and Retention

The Department currently has 23 members, which includes two auxiliary members and the six recruit firefighters who are undergoing training. It has a target strength of 30. While recruitment has been challenging, the community has responded positively to its outreach efforts.

An expansion of the fire protection area around Horne Lake may provide some potential recruits once fire coverage is extended to that community. This expectation is tempered by the knowledge that the Horne Lake area primarily consists of seasonal properties with a limited number of full-time residents. Within the Department, there are seven firefighters (two are recruits) who reside near the proposed satellite hall location and three additional firefighters who would be equidistant to the existing and proposed satellite hall locations.

The addition of another fire hall in the Spider Lake area would increase the overall number of personnel needed to meet the minimum Fire Underwriters' requirements from 16 to 26 (a Chief Officer and 15 firefighters for the main fire hall and 10 firefighters responding from the satellite hall). Given the current staffing level and the likely location of a new satellite fire hall, the Department will need to work to ensure that enough volunteers are available to meet the overall needs of the expanded fire service.

The Department remunerates members for both regular training and call responses. Weekly training session compensation is two hours minimum, and the pay scale escalates from a recruit level of \$15.65/hr. to a Captain's rate of \$22.00/hr. Incident responses are paid on a per call basis at the same hourly rates and tracked in 15-minute increments.

Fire Hall and Apparatus

Fire Hall

The Department's existing fire hall is located at 220 Lions Way. It has two double-length drive-through bays and a single back-in bay. The hall is configured with a good-sized training/meeting room, kitchen facilities, washrooms and adequate equipment storage areas.



Figure 16: BHBVFD Fire Hall at Lions Way

The fire hall is situated on a large (2 acre) lot with a full-size training structure suitable for a variety of evolutions, including some limited live fire training. There is a large open space between the fire hall and training building as well as a separate fenced auto extrication training pad. Overall, the Department has more than adequate space and training props to support its required training. The fire hall has a standby generator providing back up power supply.

There is an additional storage bay attached to the rear of the fire hall that houses a UTV and other spare equipment.

Apparatus

The Department's current apparatus are listed in Table 10.

Table 10: BHBVFD Apparatus

Unit	Manufacturer	Seating	Year Built	Pump Capacity IGPM ¹⁶	Water Tank (Gallons)
Engine 7-6	Pierce Engine	6	2008	1250	975
Tender 7-4	Freightliner FL80	5	2000	Unrated	1500
Engine 7-2	Rosenbauer Pumper	5	2011	1050	1000
Tender 7-5	Freightliner FL80	3	1998	Portable	1500
Rescue 7-8	Freightliner FL60	3	1995	Unrated	500
C-700	Chevrolet Silverado	5	2021	n/a	n/a
C-702	Ford F150	5	2021	n/a	n/a
UTV					

The apparatus is aligned in the fire hall with the first-out apparatus being Engine 7-6 and Tender 7-4, with the single deep bay housing the Rescue Trailer.

¹⁶ Imperial Gallons per Minute.



Figure 17: Engine 7-6



Figure 18: Tender 7-4

Second out apparatus are Engine 7-2 and Tender 7-5.



Figure 19: Engine 7-2



Figure 20: Tender 7-5

The Department maintains a rented facility on private property in the Spider Lake area, which houses Rescue 7-8.



Figure 21: Rescue 7-8

Two Command vehicles are used by the Chief Officers for daily duties and direct responses. These vehicles are not stored at the fire hall (C-700 and C-702).¹⁷

The two Engines are still rated as First Line apparatus. It is recommended that the Department develop a long-term financial plan for the replacement of apparatus that takes into account the apparatus needs related to the addition of a satellite fire hall and the significant wildland urban interface risks of the fire protection area.

The Fire Underwriters have a general requirement for apparatus to be replaced after a certain number of years as shown in Figure 27 below.¹⁸ For a jurisdiction like Bow Horn Bay, engines should be replaced after 20 years. These vehicles can be retained as reserve units for up to 30 years based on a successful annual test, but their pumping capacity and availability are often not counted in the grading.

¹⁷ C-701 was replaced (and retired) in 2022 by C-702

¹⁸ Fire Underwriters Survey, Insurance Grading Recognition of Used or Rebuilt Fire Apparatus.pdf, p.2, <https://fireunderwriters.ca/Downloads>, accessed 28 May 2022.

Table 1 Service Schedule for Fire Apparatus For Fire Insurance Grading Purposes

Apparatus Age	Major Cities ³	Medium Sized Cities ⁴ or Communities Where Risk is Significant	Small Communities ⁵ and Rural Centres
0 – 15 Years	First Line	First Line	First Line
16 – 20 Years	Reserve	2 nd Line	First Line
20 – 25 Years ¹	No Credit in Grading	No Credit in Grading or Reserve ²	No Credit in Grading or 2 nd Line ²
26 – 29 Years ¹	No Credit in Grading	No Credit in Grading or Reserve ²	No Credit in Grading or Reserve ²
30 Years +	No Credit in Grading	No Credit in Grading	No Credit in Grading

¹ All listed fire apparatus 20 years of age and older are required to be service tested by recognized testing agency on an annual basis to be eligible for grading recognition. (NFPA 1071)

² Exceptions to age status may be considered in a small to medium sized communities and rural centres conditionally, when apparatus condition is acceptable and apparatus successfully passes required testing.

³ Major Cities are defined as an incorporated or unincorporated community that has:
 • a populated area (or multiple areas) with a density of at least 400 people per square kilometre; AND
 • a total population of 100,000 or greater.

⁴ Medium Communities are defined as an incorporated or unincorporated community that has:
 • a populated area (or multiple areas) with a density of at least 200 people per square kilometre; AND/OR
 • a total population of 1,000 or greater.

⁵ Small Communities are defined as an incorporated or unincorporated community that has:
 • no populated areas with densities that exceed 200 people per square kilometre; AND
 • does not have a total population in excess of 1,000.

Figure 22: Fire Underwriters’ Apparatus Replacement Schedule

The cost of any new or additional apparatus required to extend the service area to Horne Lake will need to be factored into the RDN’s medium to long term budgeting.

Equipment

The personal protective equipment (“PPE”) (firefighter turnout gear) is stowed in ventilated stalls and there is a dedicated washing machine and PPE drying rack.

The bays are equipped with a Neiderman exhaust extraction system.



Figure 23: Personal Protective Equipment Storage

Fit testing is done in-house on an annual basis using an electronic testing unit. SCBA and related equipment maintenance is provided by a third party.

The Department recently replaced all of its SCBA units with Scott 4.5 equipment. There are 24 packs and 44 cylinders.

Hose testing is done annually through in-house procedures. Ladder and fire pump testing is performed annually by ProFire. There are maintenance records for all of the described testing.

Water Supply

There are fire hydrants located throughout most of the current fire protection area east of Highway #19, with the exception of the northern-most section. There is a large railway tank car that serves as a water source located in this area, however it is not considered a reliable source given ongoing issues with tampering.

There are no hydrants west of the highway, but there are static water sources suitable for drafting located at Horne and Spider Lakes, along with a firefighting water storage tank (300,000 litres) that is included as part of a construction project for a gas station located on Horne Lake Road west of the highway.

The Department has achieved Super Shuttle Tanker Service accreditation from Fire Underwriters for the current fire protection area. The Department has indicated its intention to seek accreditation for the proposed expansion area once a satellite fire hall is operational, which would further improve the fire insurance rates for residential properties in the new area within eight kilometers of the satellite fire hall.

The STSS rating means that areas which lack hydrants, are treated as being equivalent to hydrant-protected zones (i.e., moving from a DPG 3B rating to the equivalent of DPG 3B(S)).

In addition to fire suppression, the Department also provides the following emergency response services:

- First Medical Responder;
- Haz-Mat – Awareness level;
- Auto Extrication – Operations level;
- High/low angle rope rescue – Operations level;
- Water Rescue – Awareness level; and
- Wildland WSPP-WFF1 (basic) and WSPP 115 (interface structural protection).

Training Facilities

There is a large and well-equipped classroom which is used in conjunction with a large outdoor training facility and grounds. Attached to this area is a two-level structure that was previously used for live burn training but is now primarily used as a smoke house and for various skills training within the structure.



Figure 24: Rear paved training area and training structure



Figure 25: Vehicle extrication training compound

Appendix 4: Satellite Fire Hall Considerations

Satellite Fire Halls and Storage Garages

For the purposes of this review and the consideration of constructing a satellite fire hall versus continued use of the rented facility in the Spider Lake area, it is helpful to understand fundamental factors affecting emergency response facilities:

1. **BC Building Code:** The BC Building Code sets out the standard of construction of buildings in the Province of BC. The BC Building Code classification and subsequent Code requirements are derived from the intended use of a building. If a building is intended to be used as a structure that houses emergency response equipment and from which firefighters will respond to incidents, then the Code requires that the building be constructed to meet fire hall standards, including, but not limited to, post-disaster requirements.

If a building is intended to be used as a storage garage where equipment or apparatus will be stored but not intended for emergency response, then the Code requires less rigor, and a structure that meets the needs for such storage can be used.

2. **Workers Compensation Act and Regulations:** WorkSafe BC regards volunteer firefighters as employees, and therefore the Act and Regulations apply. Some of the amenities related to the workplace would include the need for washrooms, shower facilities, decontamination of turnout gear, vehicle exhaust management along with appropriate measures for the drying and stowage of turnout gear.¹⁹
3. **Fire Underwriters:** The Fire Underwriters assign their ratings based on their own standards. The fire hall has to be suitably constructed and adequate for emergency response purposes.²⁰

“All stations should be of substantial construction, suitable for the service, and located and arranged for ease and quickness of response. Proper safeguards against internal hazards should be provided. Construction of fire stations should be substantial, non-combustible, preferably fire resistive and protected from exposures, with internal and external hazards minimized.”

A satellite fire hall must meet these construction standards to qualify for rating by the Fire Underwriters. The Fire Underwriters regard any facility not meeting their minimum standard for a satellite fire hall as being a “storage garage”, for which the Fire Underwriters assign no credit.

¹⁹ Exhaust management and turnout gear decontamination and cleaning are related to the increased risk of cancer for firefighters that is derived from exposure to cancer causing elements. This risk has been recognized as part of the WorkSafeBC cancer presumptions for firefighters.

²⁰ This description is extracted from a 2013 Fire Underwriters report.

For the purposes of this review, three types of fire department facilities are considered.

1. **Fire Hall (Main):** A main fire hall, as the name denotes, functions not only as a fire hall from which firefighters respond to emergencies, but also serves as the location at which a department's administrative functions are undertaken. A main fire hall is often the location for department meetings, classroom training sessions, equipment storage and apparatus maintenance. In a multi-station department, the main fire hall is often the largest, most complex facility, where more apparatus are staged than is common at satellite fire halls or storage garages.

Main fire halls are often located centrally within a community, near the most densely developed area. Smaller communities may have only one fire hall, and that serves as the main fire hall.

The Department's existing fire hall at 220 Lions Way would be considered to be a main fire hall.

2. **Satellite Fire Hall:** In communities that cover areas too large for one central (main) fire hall to provide adequate response coverage, it is common to establish satellite fire halls in the outlying areas to improve response times. Satellite fire halls improve localized response times and, if recognized by the Fire Underwriters, can result in improved ratings in the five- and eight-kilometre zones around such hall.

Satellite fire halls are usually smaller than main fire halls, given that various administrative and similar functions performed at the main fire hall do not need to be replicated at a satellite fire hall. Satellite fire halls commonly feature space adequate for one or two apparatus, space and amenities to support the firefighters who respond to emergencies from that location, and any equipment or apparatus that is required for specific risks in the area (for example: a Horne Lake satellite fire hall might house the Department's boat and water rescue equipment).

3. **Storage Garage:** A storage garage is a fire department facility constructed for the purpose of storing department apparatus or equipment. A storage garage might be co-located with a main or satellite fire hall. By definition, a storage garage is not intended to provide the amenities necessary to support firefighters, and should not be intended to support regular emergency response operations. The Fire Underwriters will not grant any rating credit to such a facility, which means that the coverage zone for the Department will not be expanded through use of such facility.

Construction of a satellite fire hall in the Horne Lake area would require that building design and construction comply with the applicable BC Building Code provisions for a fire hall. Design and operation of that building would be required to adhere to WorkSafe BC requirements. By assigning 10 properly trained, regularly responding members at such hall, with appropriate apparatus and equipment, it will qualify the hall to be included in the Fire Underwriters' rating and extend the Department's protected coverage zone accordingly.

Rented Facility Currently in Use

The Department currently stages a reserve rescue apparatus (with some fire suppression capabilities) in the Spider Lake area. The Department rents a bay in a detached garage on a private property to house this vehicle.



Figure 26: Facility at Spider Lake



Figure 27: Department Rescue apparatus staged at private facility in Spider Lake area

While the staging of apparatus in the Spider Lake area improves emergency response times in the immediate area, this approach should be considered to be an interim measure, as the facility is inadequate to support an expansion of the service area to include Horne Lake. The current use of the rented facility may not be compliant with the occupancy permit that would have been granted at the time the building was constructed, and the current use should be reviewed relative to WorkSafe BC requirements. As noted, it also will not meet Fire Underwriters' requirements for rating purposes. As such, it would only be suitable as an interim solution while a satellite hall is constructed.

If this site is to continue to be operated by the Department on an interim basis, that should be supported by creation of operational guidelines addressing various risks associated with its use, a formalized lease agreement with

the property owner, and secured access and egress. The Society and the RDN could both be involved in such arrangements.

Appendix 5: Herold Engineering RDN Fire Hall Report Final



October 3, 2022

0837-099

Regional District of Nanaimo
6300 Hammond Bay Road
Nanaimo, BC
V9T 6N2

Attn: Anita Sharma, Fire Services Coordinator, Emergency Services

**Re: Construction Costing Services
Home Lake and Nanaimo River
Satellite Fire Halls**

Dear Anita:

Further to our proposal letter of September 28, 2022 regarding the above, please find attached our high level Estimate of Probable Cost report on the above based on current 2022 dollars.

Please contact the undersigned if you have any questions regarding our report.

Yours truly,

HEROLD ENGINEERING LIMITED

Mike Herold, P.Eng., Struct.Eng., M.I.Struct.E., LEED AP



Enclosure

3701 Shenton Road, Nanaimo, BC V9T 2H1 Telephone: 250-751-8558 email: mail@heroldengineering.com



CONSTRUCTION COSTING SERVICES

Satellite Fire Halls

Mike Herold, P.Eng., Struct.Eng., M.I.Struct.E., LEED AP

Table of Contents

1.0	Executive Summary	1
2.0	Consultant Scope of Services	1
3.0	Documents Reviewed	1
4.0	Estimate of Probable Cost	2
5.0	Comparable Fire Hall Areas	3
6.0	Seismic Post Disaster Requirements.....	3
7.0	Existing Construction Climate	4
8.0	Estimate of Probable Cost Details	4
8.1	4
8.2	4
8.3	5
8.4	5



3701 Shenton Rd. Nanaimo, BC V9T 2H1
mail@heroldengineering.com
(250)751-8558

1.0 **Executive Summary**

The associated Estimate of Probable Cost in current 2022 dollars for the full size Satellite Fire Halls at Home Lake and Nanaimo River based on the Fire Hall design for Merville are as follows. The values include a 15% allowance for consulting fees and a 20% contingency allowance.

Home Lake Fire Hall (243m ²)	\$2,895,700.00
Nanaimo River Fire Hall (243m ²)	\$2,963,200.00
Meadowood Fire Hall (404m ²)	\$2,359,300.00

2.0 **Consultant Scope of Services**

Herold Engineering Limited was retained by the Regional District of Nanaimo (RDN) to prepare a current Estimate of Probable Cost (EPC) for Fire Halls at both Home Lake and Nanaimo River sites that are owned by the RDN.

Herold's scope of work was to provide a current high level (Class D) EPC for each site based on the Merville Auxiliary Fire Hall that was designed by Herold Engineering for the Comox Valley Regional District (CVRD), and constructed in 2021 by Kinetic Construction.

Herold Engineering was also requested to provide a current high level EPC for the Meadowood Fire Hall that was constructed in 2008 for the Regional District of Nanaimo. Herold Engineering was the structural sub-consultant on that project.

3.0 **Documents Reviewed**

As part of our costing exercise, the following documents were used to calculate our Estimate of Probable Cost for each of the Halls.

- Merville Auxiliary Fire Hall drawings prepared by Herold Engineering.
- Meadowood Fire Hall construction cost prepared by the Contractor Kinetic Construction, June 20, 2021, including approved extras to the Contract.
- Regional District of Nanaimo site and location drawings of Home Lake Fire Hall and Nanaimo River Fire Hall.
- Meadowood Fire Hall architectural and structural drawings, January 2009 and November 2008.



3701 Shenton Rd. Nanaimo, BC V9T 2H1
mail@heroldengineering.com
(250)751-8558

- Bow Horne Bay Satellite Fire Hall preliminary architectural drawings SKA-01, SKA-02, and SKA-03 prepared by Zeidler/Praxis Architects dated November, 16, 2018.
- Bow Horne Bay Satellite Fire Hall Class C Construction Cost Estimate prepared by Advicas Group Consultants Inc. dated January 30, 2019.

4.0 Estimate of Probable Cost

The EPC for each of the two sites in the RDN was based on an upgraded estimate of construction costs compared to the Merville Auxiliary Fire Hall, completed in 2021, as reflected by the Kinetic Construction cost estimate for the Merville Hall and upgraded to suit the current construction market.

While this is a reasonable approach to the current cost of the building since the Kinetic Construction cost is known and fairly new (2021), the site-related costs for Merville and the two RDN sites are likely very different.

It is noted that the Advicas Construction Cost Estimate for the Bow Horne Bay Fire Hall on Horne Lake Road, which we assume is the same site as the site for the current proposed Fire Hall, included a site cost of \$655,000.00.

The cost estimate for the Merville Hall as prepared by Kinetic Construction, had site costs of \$183,440.00, so a significant difference in site costs, due to a difference in needed services.

For the purpose of our EPC we have assumed a site cost of \$655,000.00 for the Horne Lake Hall, as well as the Nanaimo River Hall due to a lack of detailed site servicing information at each site.

For our Estimate of Probable Cost for similar Fire Halls to the Merville Hall, we have allowed for a 15% contingency for consulting fees and a 20% construction contingency, on top of a 30% increase in construction costs between the Merville Tender and today.

For comparison purposes, we also completed an EPC for a pre-engineered steel option as per the 2008 Meadowood Fire Hall design in current 2022 dollars, again adding a 15% contingency for consulting fees and a 20% construction contingency.

As requested, we have also included an EPC for new Fire Halls at each of the two RDN sites, deleting the Meeting Room area of 52.16m².



3701 Shenton Rd. Nanaimo, BC V9T 2H1
mail@heroldengineering.com
(250)751-8558

5.0 Comparable Fire Hall Areas

The following gross areas were used in our EPC for the Home Lake and Nanaimo River Fire Halls based on the Merville design.

Merville FH

Main Floor.....	190.88m ²
Meeting Room.....	52.16m ²
Total.....	243.04m²

Meadowood FH

Main Floor.....	319.80m ²
Upper Floor.....	84.24m ²
Total.....	404.04m²

6.0 Seismic Post Disaster Requirements

According to the British Columbia Building Code, Fire Halls must be designed as Post Disaster Structures in order for these emergency buildings to remain in operation subsequent to an expected major seismic event.

The value of the seismic energy during a seismic event is based on numerous values including the expected seismic energy at specific sites across the Province.

Specific site seismic data is available in the Building Code, and the 5% Damped Horizontal Spectral Acceleration values given in the code have a direct impact on the seismic base shears that a building must be designed for. These values are indicated below to represent values used in design for the Halls at Merville, Home Lake, and Nanaimo River.

Location	S_a(0.2)	S_a(0.5)
Merville (Courtenay)	0.653	0.636
Home Lake (Qualicum)	0.888	0.838
Nanaimo River (Nanaimo)	1.02	0.942

For the seismic design of the Halls, the values listed under S_a(0.5) would govern the design and the higher the value is directly proportional to the higher expected seismic base shear for design.



3701 Shenton Rd. Nanaimo, BC V9T 2H1
 mail@heroldengineering.com
 (250)751-8558

In other words, the Nanaimo River Hall would be seismically designed for a $0.942/0.636 = 1.48$ or 48% higher base shear than the Hall at Merville. Both Home Lake and Nanaimo River Halls would be designed for a higher seismic load than the Merville Hall which would have an increased structural cost compared to Merville, but not to the extent of 48% for Nanaimo as an example.

It is our understanding that one option for the RDN is to store the Apparatus in a Storage Garage in order to not design a building for Post Disaster requirements.

It is the writer's opinion that if you are storing Fire Apparatus in any building, it should be designed as a Post Disaster Structure in order to be able to use the equipment in a major seismic event.

7.0 Existing Construction Climate

Over the past two years, the construction industry in British Columbia including Vancouver Island, has witnessed substantial cost fluctuations in both materials and labor due to supply chain issues in both areas.

While construction costs are tending to slowly come down for materials and labor due to higher interest rates having an effect on construction activities, it is still our opinion that construction costs have climbed in the last 18 months by 25-30% since the Merville Fire Hall was Tendered and this value has been reflected in our Estimate of Probable Costs for repeat Merville Halls at the two proposed RDN sites.

8.0 Estimate of Probable Cost Details

8.1 Home Lake Fire Hall (Full Size Building)

Building.....	\$1,489,950.00
Site Works.....	\$655,000.00
Total.....	\$2,144,950.00

Fees 15% Contingency	\$321,742.00
Construction 20% Contingency	\$428,990.00
Total	\$2,895,682.00 (\$2,895,700.00)

8.2 Nanaimo River Fire Hall (Full Size Building)

Building..... (increase for higher seismic)	\$1,539,950.00
Site Works.....	\$655,000.00
Total.....	\$2,194,950.00



3701 Shenton Rd, Nanaimo, BC V9T 2H1
mail@heroldengineering.com
(250)751-8558

Fees 15% Contingency	\$329,243.00
Construction 20% Contingency	\$438,990.00
Total	\$2,963,183.00 (2,963,200.00)

8.3 Meadowood Equivalent

Building	\$1,092,620.00
Site Works	\$655,000.00
Total.....	\$1,747,620.00

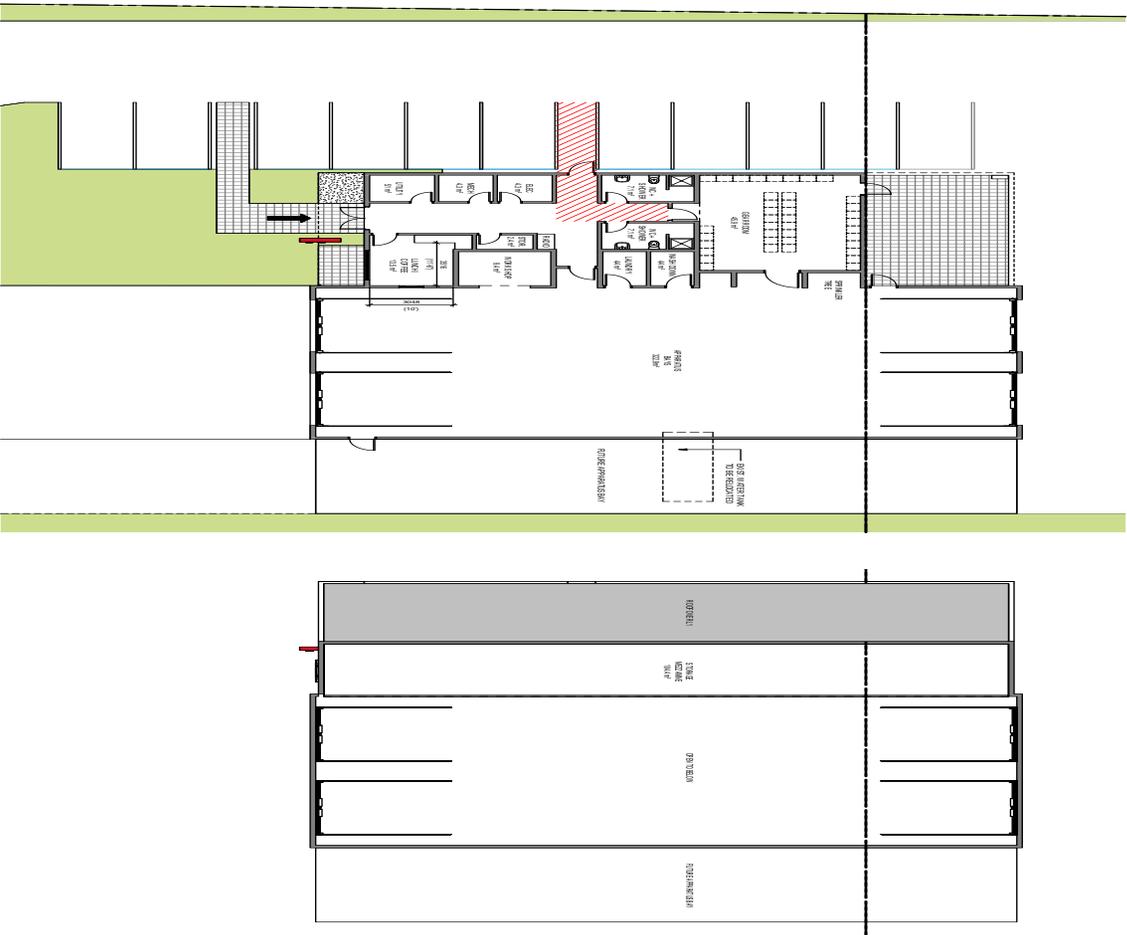
Fees 15% Contingency	\$262,143.00
Construction 20% Contingency	\$349,524.00
Total	\$2,359,287.00 (\$2,359,300.00)

8.4 Merville Fire Hall Reduced Area

If the RDN decides to use the Merville Fire Hall design less the Meeting Room space, then a reduction in building construction would be approximately \$319,800.00 with a total reduction in cost of \$431,700.00, including the 15% consulting fee contingency and the 20% construction cost contingency.



3701 Sherton Rd. Nanaimo, BC V9T 2H1
mail@heroldengineering.com
(250) 751-8558



1 LEVEL 1 PLAN
SCALE: 1/8" = 1'-0"

2 LEVEL 2 PLAN
SCALE: 1/8" = 1'-0"

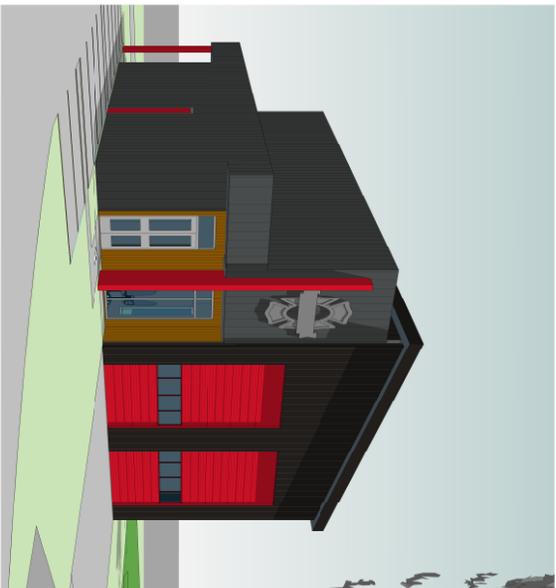


SKA-02

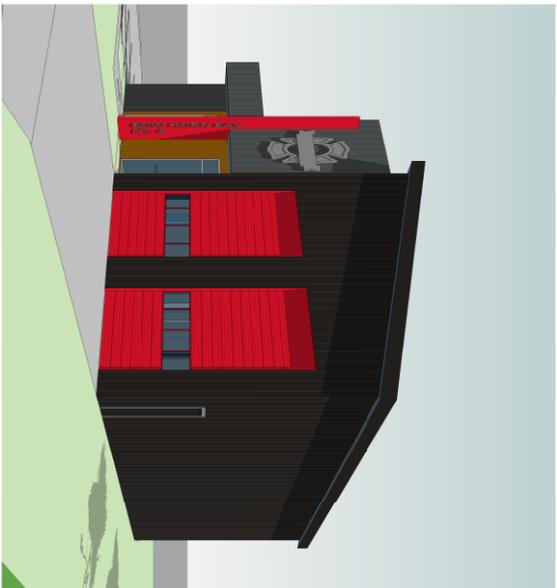
FLOOR PLANS

Bow Horn Bay Sentinel Fire Hall Home Lake Road

DATE: 2018.11.15
 PROJECT NO: 2018.05
 SCALE: 1:100



View from SW



View from SE

3D VIEWS

Bow Horn Bay Satellite Fire Hall Home Lake Road

SKA
Project
000

2018
2018
2018



SKA-03





CLASS C ESTIMATE

BOW HORN BAY SATELLITE FIRE HALL

QUALICUM BEACH, B.C.

January 30, 2019

TABLE OF CONTENTS

SECTION	PAGE
INTRODUCTION	1
Project Description.....	1
Gross Floor Area	1
ESTIMATE COSTS	1
Escalation	1
Separate Prices.....	2
Canadian/US Tariffs	2
BASIS OF THE ESTIMATE	2
Taxes.....	2
Contingency Reserves	3
Documentation	3
Exclusions	4

APPENDICES

- A ELEMENTAL COST ANALYSIS
- B ESTIMATE BACKUP SHEETS

per: Advicas Group Consultants Inc.

Prepared by Callum Galligos
Junior Quantity Surveyor
(250) 995-5425 cgalligos@advicas.com

Reviewed by Francis Yong, BSc, PQS
Senior Quantity Surveyor
(250) 995-5428 fyong@advicas.com



•
•



Separate Prices

The following separate prices are not included in the above estimate:

Canadian/US Tariffs

The current trade tariffs between Canada and the United States, promulgated July 01, 2018, will result in a premium on material and equipment, sourced across the border. This will also impact corresponding Canadian sourced items which will increase to uphold the pricing margin between themselves and US competition. Suppliers are still coming to terms with the full pricing implication of the tariffs, and how it impacts their bottom line price. At this juncture, we have included a provisional premium allowance of 5% added to the construction costs to cover the expected overall increase.

BASIS OF THE ESTIMATE

We have assumed that the work will be tendered competitively in one contract.

In all cases the estimates are based upon our assessment of fair value for the work to be carried out. We define fair value as the amount a prudent contractor, taking into account all aspects of the project, would quote for the work. We expect our estimate to be in the middle of the bid range to ensure that funding for the work remains adequate for the duration of the project.

It should be noted that Advicas Group Consultants Inc. does not have control over the cost of labour, materials, or equipment, over the Contractor's methods of determining bid prices, or over competitive market conditions. We define competitive conditions in the project as attracting a minimum of three general contractors' bids with a minimum of two sub-trade tenders, and suppliers' tenders, within each of the sub-trade categories. Accordingly, Advicas Group Consultants Inc. cannot and does not warrant or represent that bids will not vary from the estimate.

The current construction market is extremely active, bringing with it a volatility in tender price levels. We have seen tenders exceeding budget where there has been a single general contractor bid, or suspected single sub-trade, or supplier bid. Whilst we endeavor to gauge the developing market conditions, it is not always possible to predict industry interest in this project, and the potential for a poor, uncompetitive, response.

Taxes

GST is excluded from the estimate.

PST at 7% is included in the estimate.



- -
-



Appendix 7: Consultant Backgrounds

Tim Pley

Tim was in the municipal fire service for 26 years, followed by six years as a municipal chief administrative officer overseeing a team of 230 employees providing a wide range of services. While President of the Fire Chiefs' Association of BC Tim was instrumental in the provincial government's adoption of a new minimum training standard for structural firefighters and helped draft a new Fire Safety Act which may be adopted in 2022. Tim holds Fire Officer IV and Fire Inspector I designations, was a qualified Technical Rescue Technician in confined space, rope rescue, and tower crane rescue, and has extensive fire ground command and fire prevention inspection experience.

Dave Mitchell

Dave retired as Division Chief, Communications in 1998 from Vancouver Fire & Rescue Services following a career spanning 32 years. In 1998, Dave was hired by E-Comm 9-1-1, Emergency Communications for BC (E-Comm) as its first Director of Operations. He left E-Comm in June 2000 to work as a consultant, and since that time has managed the development of fire service reviews for more than 100 departments in BC, Alberta, Manitoba and Ontario as well as the Yukon and Northwest Territory.

Dave holds a Bachelor of Arts Degree (Geography) from Simon Fraser University in addition to a diploma from their Executive Management Development Program. He is currently a Director and Board Chair of the Justice Institute of British Columbia Foundation and is a past Director and current member of the Fire Chiefs' Association of British Columbia.

Gordon Anderson

Gordon has 29 years of fire service experience having retired in 2019 after spending his last five years as the BC Fire Commissioner (and acting Assistant Deputy Minister of EMBC periodically). At the municipal level he progressed through the ranks and served six years as Deputy Fire Chief and Training Officer with extensive operational experience that includes fire suppression, emergency scene management, fire inspections, pre-incident planning, and fire department administration. He holds NFPA Fire Officer IV certification and a Bachelor of Public Safety Administration and is a Fellow of the Institution of Fire Engineers (U.K.). As a consultant he has worked on Fire Master Plans, risk assessments and fire service needs assessments.

Jim Cook

Jim Cook is an experienced professional with over 38 years of experience in the fire service. He has extensive knowledge and experience with budgets, labour relations, fire operations, strategic planning, executive leadership, occupational health and safety programs, project management, community engagement, and organizational change. Jim began his career in the New Westminster Fire Department. He was promoted to the position of Deputy Chief in 2001

which he held until 2008 when he was appointed as the fire chief in West Vancouver. As chief officer, his responsibilities included administration, development of annual operating and capital budgets, communications, human resources, emergency operations, training and facility maintenance including the planning and oversight of the transfer of personnel and equipment to the new main fire hall. Since 2019, Jim has been working as a consultant and has been engaged in several projects that have included the review and analysis of operational guidelines, safe work procedures and the development of compliance programs for health and safety.

Ian MacDonald

Ian MacDonald is a former lawyer who practised international corporate law in Canada and the United Kingdom. Ian retired as a lawyer in January 2004 and since 2005, has worked extensively on fire and emergency service matters for local, regional and provincial governments. This work includes statutory and regulatory reviews, governance and administrative reviews, bylaw reviews, and occupational health and safety reviews. He has assisted clients with the development of new operational, establishment and fire prevention bylaws including ensuring that both Fire Services Act and Fire Code matters are properly addressed. He has developed a number of multi-party mutual and automatic aid agreements in consultation with fire service clients.