SASAMAT VOLUNTEER FIRE DEPARTMENT (SVFD)
BOARD OF TRUSTEES MEETING

SPECIAL MEETING

Wednesday, November 5, 2025
7:00 P.M.
Anmore Community Hub
2697 Sunnyside Road

A G E N D A

1. ADOPTION OF THE AGENDA

1.1 November 5, 2025 Special Meeting Agenda
That the SVFD Board of Trustees adopt the agenda for its special meeting scheduled for November 5, 2025 as circulated.

2. ADOPTION OF THE MINUTES

2.1. September 11, 2025 Regular Meeting Minutes
That the SVFD Board of Trustees adopt the minutes for its regular meeting held September 11, 2025 as circulated.

3. REPORTS FROM COMMITTEE OR STAFF

3.1 SVFD Fire Hall Replacement – Village of Anmore and Village of Belcarra
That the Sasamat Volunteer Fire Department (SVFD) Board of Trustees approve a Design Build approach and budget to build two new fire halls as presented in the report "Fire Hall Replacement – Village of Anmore and Village of Belcarra" dated October 29, 2025.

4. OTHER BUSINESS

5. ADJOURNMENT/CONCLUSION
That the Sasamat Volunteer Fire Department (SVFD) Board of Trustees adjourn/conclude its special meeting of November 5, 2025.

Membership:

Penner, Darrell (C) - MV Board
Clark, Carolina - Village of Belcarra
McEwen, John - Village of Anmore
Ross, Jamie - Village of Belcarra
Trowbridge, Kim - Village of Anmore
Weverink, Paul - Village of Anmore
Wilder, Liisa - Village of Belcarra

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SASAMAT VOLUNTEER FIRE DEPARTMENT (SVFD)
BOARD OF TRUSTEES MEETING

Minutes of the Regular Meeting of the Sasamat Volunteer Fire Department (SVFD) Board of Trustees held at 7:00 p.m. on Thursday, September 11, 2025 in person.

MEMBERS PRESENT:
Chair, Councillor Darrell Penner, Port Coquitlam
Councillor Carolina Clark, Belcarra
Mayor John McEwen, Anmore
Mayor Jamie Ross, Belcarra
Councillor Paul Weverink, Anmore
Councillor Liisa Wilder, Belcarra
Councillor Kim Trowbridge, Anmore

STAFF PRESENT:
Jay Sharpe, Fire Chief, Sasamat Volunteer Fire Department, Metro Vancouver
Brant Arnold-Smith, Division Manager, Protective Services and Emergency Management, Metro Vancouver
Amie Hadley, Office Supervisor, Corporate Safety/Protective Services and Emergency Management, Metro Vancouver

1. ADOPTION OF THE AGENDA

1.1 September 11, 2025 Regular Meeting Agenda

It was MOVED and SECONDED
That the Sasamat Volunteer Fire Department (SVFD) Board of Trustees adopt the agenda for its regular meeting scheduled for September 11, 2025 as circulated.

CARRIED

2. ADOPTION OF THE MINUTES

2.1 June 5, 2025 Special Meeting Minutes

It was MOVED and SECONDED
That the Sasamat Volunteer Fire Department (SVFD) Board of Trustees adopt the minutes for its regular meeting held June 5, 2025 as circulated.

CARRIED

3. REPORTS FROM COMMITTEE OR STAFF

3.1 2026 Draf Budget and 2026 – 2030 Financial Plan – Sasamat Fire Protection Service

Brant Arnold-Smith provided an overview of the 2026 budget and the 2026 – 2030 Financial Plan.

The total operating budget in 2026 is proposed at $952,629, which is a $3,550 increase over 2025 largely due to inflationary adjustments.

The financial plan does not include the potential replacement of fire halls.

Discussion

Discussion followed over the amounts in the projected reserves under table 3.1 attachment 3. The Capital Facility Reserve currently projected to be $1,623,008 at close of 2025.

The contribution in 2026 will be $400k, should this stay the same or increase. Trustees discussed increasing contribution to all reserves by rate of inflation.

Trustees agreed that all four reserves should increase by inflation (3%).

It was MOVED and SECONDED

That the Sasamat Volunteer Fire Department (SVFD) Board of Trustees endorse the 2026 Budget and 2026 – 2030 Financial Plan with changes made at its regular meeting scheduled for September 11, 2025.

CARRIED

3.2 2025 SVFD Quarterly Work Plan Update

Brant Arnold-Smith presented the report to Trustees, the work plan in 2025 aligns with the Business Plans and budget for the SVFD function.

Jay Sharpe provided a work plan update.

Ahead of schedule. Fire fighter training is ongoing. Live fire training preparation on hold, it was delayed from last year. Waiting to see what the budget looks like at the end of the year.

Work on tender 2 for 2025 on hold.

Discussion

11 people on waitlist, 1 from Belcarra. Some applicants from Port Moody, right on border. Mandate to only train volunteers from Villages of Anmore and Belcarra, but if deficient, would consider taking.

It was MOVED and SECONDED

That the SVFD Board of Trustees receive for information the update to the Work

Plan as presented in the report dated September 5, 2025 titled "2025 SVFD Quarterly Work Plan Update".

CARRIED

3.3 Fire Chief's Report

Staffing Levels – Currently 33 responders.
Equipment – All vehicles completed CVIP and pump tests. Ladder 7 required work on valves, it was determined that the main intake valve had been wired incorrectly. Further work on tender 2 replacement has been put on hold pending Trustee direction.
Halls and Grounds – Looking for clarification on expectation of village staff to cut grass at fire halls. In the winter, it should be a priority of village staff to ensure snow plowing which is essential for ability of trucks to get out of the fire hall driveway.
Training – New recruit training class will start this October.
SVFD Association put on a fire safety talk which went well. A lot of interest in holding a CPR training day.
Reports and Information:
Radio system upgrade in Belcarra is now complete. Will now have three redundancies built into system.
Experiencing some issues with thieves stealing copper wire.
Call outs as of September 3rd include a total of 95 calls – 12 fire, 57 medical, 8 MVIs and 18 alarm and other.
New Business:
Applied for a BC Gaming grant for total of $67K with $41K to purchase of PPE cleaning machine.
The remaining $26K would be for battery operated extraction equipment. Currently only have 100 feet of hose, cannot always reach comfortably if car goes of bank etc.

It was MOVED and SECONDED
That the Sasamat Volunteer Fire Department (SVFD) Board of Trustees receive for information the report dated September 11, 2025, titled "SVFD Fire Chief's Report".

CARRIED

4. INFORMATION ITEMS

Fire Hall Funding
M.P. Royer will do what she can, however, there needs to be a formal design to make funding requests to the government and other organizations.
Question from Trustees on whether issues over capital costs should be resolved prior to moving forward. Could proceed with fire hall plans and tackle both at the same time.
Metro Vancouver staff will connect with MV Procurement about going to market with an

RFP.
Trustees voiced concerns over putting forward money without knowing how much the total cost will be. Have not agreed on certain details on what needs to be included. A few items were discussed including the level of public use of the new buildings and stipulating what building details are council directed and what are fire hall directed.
Village of Anmore has sent a funding proposal to Village of Belcarra. Belcarra council will be responding.
Metro Vancouver staff will bring back a report withing the next 30 days on suggested next steps and schedule a special meeting.
Buildings need to be resilient as they may serve as community refuge.
Trustees tasked the Fire Chief to put together a report on what temporary facilities would be required in each village.

It was MOVED and SECONDED
That the Sasamat Volunteer Fire Department (SVFD) Board of Trustees direct Metro Vancouver staff to draft a report on next steps looking at different options for building two fire halls.

CARRIED

5. OTHER BUSINESS

Command vehicle for Fire Chief
There may be a need for a command vehicle to supplement operations. The Fire Chief has been utilizing personal vehicle during responses to recent structure fires. Metro Vancouver has a 2024 Ford Escape Hybrid with the option for SVFD to take over the lease. This is a fully outfitted emergency vehicle which would meet those operational needs.

Response fleet currently includes a Ford F150 which served as the duty chief vehicle; however, its real value became apparent as an emergency response vehicle (speed, agility). As department gets busier and demands increase, not fair to expect members to use their personal vehicles.

It was MOVED and SECONDED
That the Sasamat Volunteer Fire Department (SVFD) Board of Trustees approve up to $1,500 a month for the lease of the Duty Chief vehicle.

CARRIED

6. ADJOURNMENT/CONCLUSION

It was MOVED and SECONDED
That the Sasamat Volunteer Fire Department (SVFD) Board of Trustees adjourn/conclude its regular meeting of September 11, 2025.

CARRIED
(Time: 7:54 p.m.)

metrovancouver
SERVICES AND SOLUTIONS FOR A LIVABLE REGION

To: Sasamat Volunteer Fire Department Board of Trustees

From: Brant Arnold-Smith, Division Manager - Protective Services & Emergency Management

Date: October 27, 2025 Meeting Date: November 5, 2025

Subject: **Fire Hall Replacement – Village of Anmore and Village of Belcarra**

RECOMMENDATION

That the Sasamat Volunteer Fire Department (SVFD) Board of Trustees approve a Design-Build method and proposed budget to replace the two fire halls in the Village of Anmore and Village of Belcarra and direct Metro Vancouver staff to prepare required borrowing bylaws to secure funding for the projects.

EXECUTIVE SUMMARY

The fire halls in the Village of Anmore and the Village of Belcarra have been assessed for their structural condition, operational capacity, and long-term suitability. Based on this review, replacement of both facilities is recommended to meet current and future emergency service needs, as well as health and safety of firefighters as per WorkSafe BC requirements. This report outlines a proposed timeline for the replacement process and provides an estimate of associated costs to be approved.

PURPOSE

The purpose of this report is to seek formal approval for the replacement of the two existing fire halls located in the Village of Anmore and the Village of Belcarra.

BACKGROUND

The current fire halls, built in 1977, have escalating maintenance needs, energy inefficiency, and inadequate space for modern operations. They do not meet post-disaster requirements, lack proper decontamination facilities, and cannot accommodate modern apparatus. These issues have become more pressing over time. The issues arising from the current condition of the two fire halls have been discussed with the Trustees, leading to this report outlining options for their replacement.

SASAMAT VOLUNTEER FIRE DEPARTMENT FIRE HALL REPLACEMENT

The fire halls were the subject of a report by Johnston Davidson Architecture in 2019 (the "JD Report").[1] The JD Report found the following:

- The two fire halls, each originally built in 1977, were at the end of their useful life and did not meet current Building Code post-disaster requirements for emergency response facilities.[2]
- The maintenance requirements for the fire halls were escalating, and they were energy inefficient.[3]

[1] Johnston Davidson Planning and Architecture Inc., *Anmore and Belcarra Firehalls: Condition and Needs Assessment* (April 2019).

[2] JD Report, Section 2.0

[3] JD Report, Section 2.0

- There were inadequate crew accommodations and insufficient operational space to support current and future Department operations. Among other issues noted: there is insufficient space for administration; the halls do not support proper decontamination processes (e.g., separation of gear from truck bays); the fire hall bays are too small for modern apparatus; and there is no extraction system for vehicle exhaust.[4]

The issues identified in the JD Report have become more pressing with the passage of time.

Fire Underwriters Survey Requirements

The Fire Underwriters Survey ("FUS") grading[5] includes the assessment of the fire halls in use. The assessment considers factors such as suitability for current and future requirements, post-disaster construction, ability to accommodate operational requirements and storage of apparatus and equipment, among other matters.

FUS reviews also examine fire hall locations and the ability of a department to respond in a timely fashion to incidents from those locations. Given the overall geographic footprint of the two communities, and the maximum permitted travel distances under the FUS rating system – where commercial properties must be within five kilometres of a fire hall to be considered "protected" and residential properties must be within eight kilometres – it would not be possible for the Department to operate from a single hall and protect the entire service area.

Health and Safety Issues

WorkSafe BC now recognizes 18 cancers as presumptively related to firefighting, in addition to heart disease and post-traumatic stress disorders.[6] WorkSafe requirements for the fire service include the need for proper contamination control, including diesel exhaust extraction systems, cleaning and proper storage of firefighter turnout equipment, and shower facilities for members to properly decontaminate following fire exposures. The current fire halls lack the space to support the necessary contamination control processes.

Fire Hall Replacement Options

When considering options for replacing the fire halls, several construction delivery methods are available, each with distinct advantages and challenges. The recommended approach is the Design-Build method, which consolidates both design and construction responsibilities under a single contract. This model streamlines communication and reduces administrative overhead, resulting in a shortened project timeline thanks to early contractor involvement. Design-Build also provides greater cost certainty, as the price is developed early in the process and the likelihood of change orders is minimized. Risk management is more collaborative, with single-point accountability for both design and construction, and the approach offers flexibility, making it easier to adjust the scope as the project progresses. Best practices for successful Design-Build projects include early collaboration among stakeholders, establishing clear goals, maintaining transparent communication, proactively managing

[4] JD Report, Section 3.0

[5] See: https://fireunderwriters.ca/

[6] These presumptions apply to career as well as volunteer and paid-on-call firefighters

risks, ensuring strong leadership, and fostering continuous improvement throughout the project lifecycle.

Alternatively, the Design-Bid-Build method separates the design and construction phases into distinct contracts. While this traditional approach allows for competitive bidding and potentially lower initial costs, it often results in a longer overall timeline due to the sequential nature of the process. Collaboration between designers and builders is limited, which can lead to misalignment and a higher risk of cost overruns and change orders. Accountability is fragmented, requiring the owner to mediate disputes between parties, and there is less flexibility to make adjustments once construction is underway.

A third option is Construction Management at Risk, which involves engaging a construction manager early in the process. This method features open-book accounting and collaborative planning, allowing for shared risk and enabling the owner to retain a higher degree of control over the project. Construction Management at Risk is particularly useful when the project scope or funding is still evolving, as it provides the flexibility to adapt to changing requirements while maintaining transparency and oversight.

ALTERNATIVES

An alternative could include a process to remediate the two fire halls rather than replacement. The caveat is that remediation may not result in structures that will address the regulatory requirements or meet the evolving service mandate. Alternatives are:

1. That the SVFD Board of Trustees approve a Design-Build method and proposed budget to replace the two fire halls in the Village of Anmore and Village of Belcarra and direct Metro Vancouver staff to prepare required borrowing bylaws to secure funding for the projects; or
2. That the SVFD Board of Trustees receive this report for information and provide alternate direction.

FINANCIAL IMPLICATIONS

Replacing the fire halls in Anmore and Belcarra represents a significant capital investment for the communities, requiring substantial upfront funding to ensure that new facilities meet current standards for emergency response and public safety. Among the available construction delivery methods, the Design-Build approach offers notable financial advantages. By consolidating design and construction under a single contract, Design-Build provides greater cost certainty, as project pricing is established early and the risk of unexpected change orders is minimized. This method also streamlines project management and can lead to potential savings compared to the traditional Design-Bid-Build model, which often experiences cost overruns due to fragmented accountability and limited collaboration between designers and builders. As a result, Design-Build is recommended not only for its efficiency and

risk management benefits, but also for its ability to help control costs and deliver better value for the investment**.** The estimated budget for both fire halls is $21,914,060.20.

Anmore Fire Hall Budget

Item	Cost
Project Estimate (construction, design, fees, insurance etc.)	**$13,445,543.98**
Additional Building Options	$441,000.00
Estimate + Options	$13,886,543.98

Belcarra Fire Hall Budget

Item	Cost
Project Estimate (construction, design, fees, insurance etc.)	**$7,658,516.23**
Additional Building Options	$369,000.00
Estimate + Options	$8,027,516.23

OTHER IMPLICATIONS

Beyond the financial considerations, replacing the fire halls in Anmore and Belcarra will have important implications for the health and safety of firefighters, the effectiveness of emergency response, and regulatory compliance. Modern facilities will provide improved contamination control, proper gear storage, and dedicated decontamination areas, directly supporting the well-being of fire service personnel and helping to mitigate risks associated with occupational hazards such as cancer and heart disease. Enhanced infrastructure will also strengthen the department's ability to respond quickly and effectively to emergencies, ensuring that both communities are better protected. Furthermore, new fire halls will be designed to meet current building codes and regulatory standards, including post-disaster requirements and Fire Underwriters Survey grading criteria, which are essential for maintaining public safety and insurance ratings. These improvements collectively support a safer work environment, more reliable emergency services, and ongoing compliance with evolving regulations.

CONCLUSION

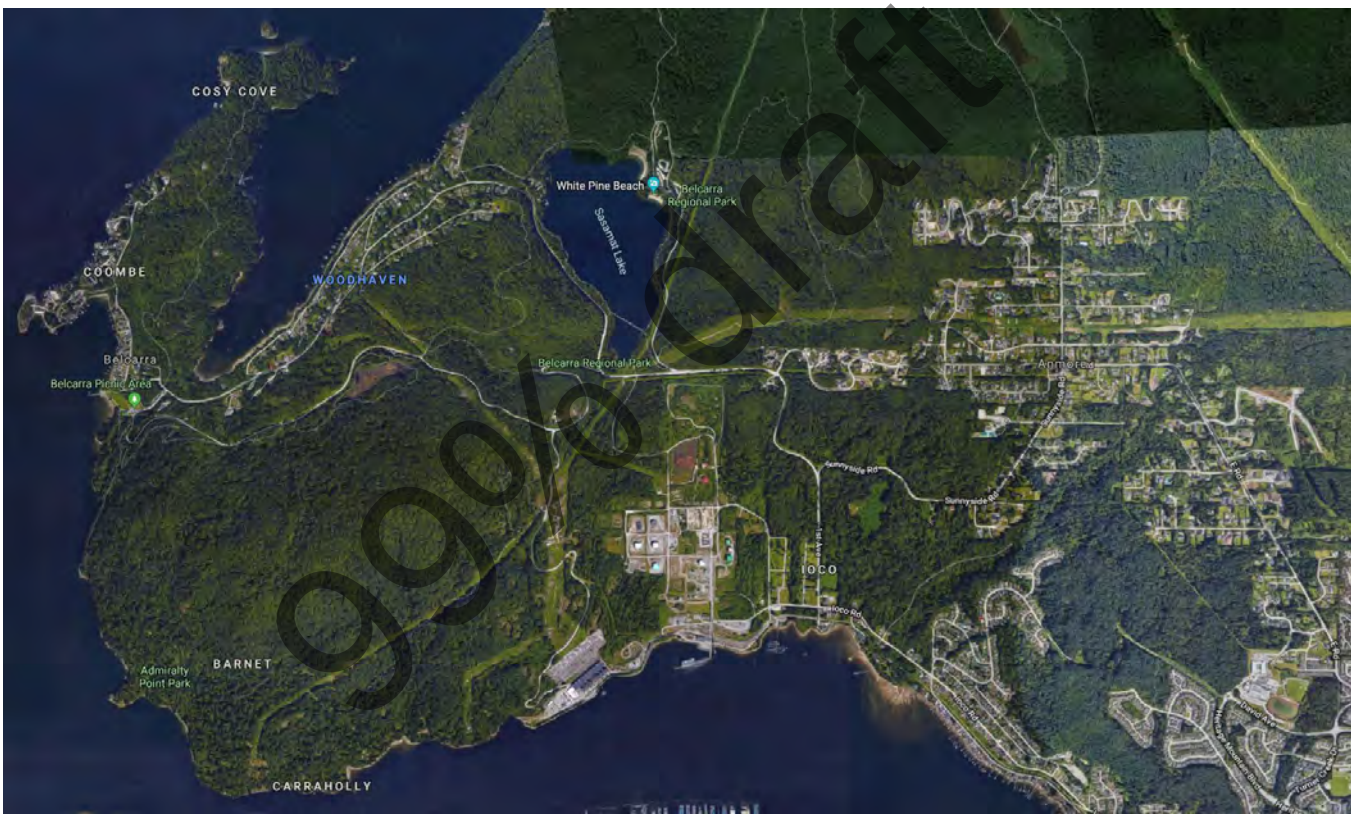
This report recommends approval of a process for replacing the Anmore and Belcarra fire halls with an estimated budget and construction procurement options

ATTACHMENTS

1. Johnston Davidson Planning and Architecture Inc., *Anmore and Belcarra Firehalls: Condition and Needs Assessment* (April 2019).

Anmore and Belcarra Firehalls

Sasamat Volunteer Fire Services Department
Village of Anmore + Village of Belcarra
Metro Vancouver



condition and needs assessment

issued: 2019-04-18

johnston davidson architecture + planning inc. suite 301 - 877 east hastings street, vancouver, bc V6A 3Y1 t. 604. 684. 3338 f. 604. 684. 3600 www.jdarch.ca

anmore and belcarra firehalls
condition and needs assessment

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anmore and belcarra firehalls
condition and needs assessment

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anmore and belcarra firehalls
condition and needs assessment

EXECUTIVE SUMMARY

1.0 executive summary

The Fire Rescue Services is an essential service for the safety and well being of any community. The Sasamat Volunteer Fire Department (SVFD) was established in 1977, before the incorporation of both Belcarra and Anmore, with a contingent of 100% volunteer members. Since that time, the Department has grown to include over 45 paid-on-call / volunteer members operating out of two firehalls - Anmore Firehall and Belcarra Firehall both of which were built in 1977. However, after over 41 years in service, the two firehall buildings are facing deteriorating conditions, non-compliance with post disaster standards, and significant programmatic deficiencies despite the best efforts of the SVFD. The spaces found in the both the Anmore and Belcarra Firehalls can no longer provide suitable crew accommodations, nor sufficient operational spaces to sustain the required level of service for the community now or into the future.

This needs assessment / feasibility study was commissioned to evaluate the current state of the firehall, create a comparison of the existing functionality with the current industry standards, and to provide siting options to accommodate the current and future needs of the Sasamat Volunteer Fire Department (SVFD). In short, this report identifies wideness of the "gap" between the existing conditions and required functional building spaces needed to maintain current industry standards. In addition, this report looks at the possibility of redevelopment options to renovate or rebuild a the firehall to accommodate the programmatic, BC Building Code and site needs.

existing conditions

As noted above, the existing firehall buildings have met the end of their respective service lives. Deficient building envelope performance (energy loss), low seismic design capacity, general ongoing operating costs (repairs to aged finishes, asbestos management, pest control, etc.) code deficiencies and a lack of key programmatic spaces are all present in both firehalls. This is outlined in more detail in **Section 2.0** of this report.

needs analysis - program / facilities

A needs analysis regarding the spatial programming of firehall functional spaces revealed several gaps between the existing facility and the needs of modern day firehalls. Unfortunately, both the Anmore Firehall and Belcarra Firehall have issues with lack of essential functional spaces to accommodate fire department administration, decontamination, gender neutrality and industry standard key operational spaces required to meet the need of current fire department industry standards, both for today and for the future. This is outlined in more detail in **Section 3.0** of this report.

siting studies

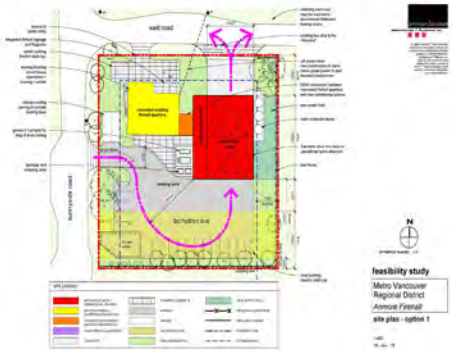
The last portion of this study examines the existing sites for potential redevelopment and narrows down the possibilities to 2 preferred options in more detail. This is outlined in more detail in **Section 4.0**. along with high level costing for each site and each site with potential housing development.

Please do not hesitate to contact us if there are any follow-up concerns regarding this report, as Johnston Davidson Architecture + Planning will be more than happy to discuss any issues in person or present to the Mayors, The SVFD Board and or Metro Vancouver if required.

Sincerely,

Kimberly Johnston, Architect AIBC, MRAIC, LEED AP
Principal

2.0 existing building / site conditions



2.0 existing building

"You can't manage what you don't measure."
W. Edwards Deming

the process

This report was created through discussions with the Sasamat Volunteer Fire Department and the Metro Vancouver Regional District to ensure that all concerns were addressed and reviewed. This included discussions and progress reviews which outlined the findings and assessment of the buildings and site conditions for each facility.

This section of the report outlines the collection of data regarding the current state of both the Anmore and Belcarra Firehalls run by the Sasamat Volunteer Fire Department. For this report, both buildings were assessed and reviewed under three main categories: site, spatial program, and code compliance.

introduction

The Fire Rescue Services is an essential service for the safety and well being of any community. The Sasamat Volunteer Fire Department (SVFD) was established in 1977, before the incorporation of both Belcarra and Anmore, with a contingent of 100% volunteer members. Since that time, the Department has grown to include over 45 paid-on-call / volunteer members operating out of two firehalls - Anmore Firehall and Belcarra Firehall both of which were built in 1977. However, after over 41 years in service, the two firehall buildings are facing deteriorating conditions, non-compliance with post disaster standards, and significant programmatic deficiencies despite the best efforts of the SVFD. The spaces found in the both the Anmore and Belcarra Firehalls can no longer provide suitable crew accommodations, nor sufficient operational spaces to sustain the required level of service for the community now or into the future.

The buildings that the SVFD currently resides in were originally designed in 1977 to serve the needs of the volunteer fire department. However, after over 41 years in service as the main Firehall, these buildings have met the end of its respective service lives and will need to be extensively upgraded or replaced in order to meet the demands on the fire service today and into the future. The buildings are suffering from physical deficiencies such as lack of an energy efficient building envelope, structural deficiencies in the roof structure and non compliance with BC Building Code requirements. In addition, the spaces found in both the Anmore and Belcarra Firehalls can no longer provide suitable accommodations, nor sufficient operational spaces to sustain the required level of service for the community. The following sections will outline these deficiencies in more detail.

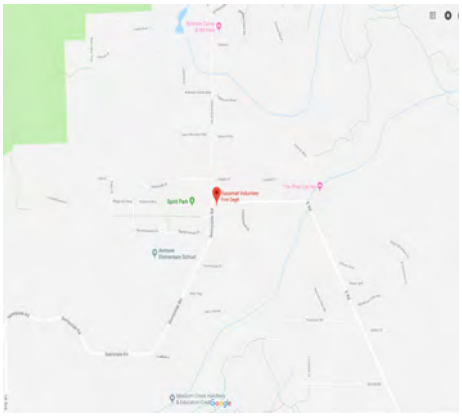
The Anmore Firehall houses the main suppression crew quarters and apparatus bays was renovated in 1997 to accommodate the growing needs to the department by increasing the numbers of bays and the size of the training rooms. The Belcarra Firehall has also has undergone an addition in 1997 which added the hose tower, SCBA and training rooms. It is important to note that no structural upgrades have been implemented to either firehall since the original designs in 1977.

The following is historical population data from the BC Government - Stats Municipal Census Data for both Anmore and Belcarra:

		Anmore	Belcarra
• 1991	Population census data	741	596
• 2001	Population census data	1,344	682
• 2006	Population census data	1,785	676
• 2011	Population census data	2,092	644

Given that the nature of the fire service has changed so drastically with the need to

address increased equipment sizes, technology, gender, inclusion, decontamination and an increase in population since the department's inception, it would be unreasonable to expect another 41 years of service from these firehalls. These facilities were appropriate for the era and population base of the time, however, they were never strategically built to allow for for the number of changes in the building code and the challenges facing the fire services today.



Over those past 41 years, the advancements in both fire fighting and the associated equipment have necessitated larger firehalls with increased functional requirements for items such as gender inclusivity, decontamination, Self-Contained Breathing Apparatus (SCBA) maintenance, Personal Protective Equipment (PPE) cleaning and storage, training, fitness and other programmatic requirements needed to meet current industry standards. Many of these items aiding in the containment of continual exposure to harmful contaminants and reducing the incidents of presumptive cancers in Firefighters.

In addition, the existing structure presents several physical concerns ranging from building code issues, seismic capacity limitations, snow load capacity and environmental performance with regards to energy efficiency and requirements of the bc building code.

facility statistics

Currently the Sasamat Volunteer Fire Department operates out of two firehalls and provides services for over an estimated 2,853 constituents (2016) and a larger population during the summertime. The two firehalls are located in the Village of Anmore and the Village of Belcarra respectively. The following is a brief overview of the existing building:

Anmore Firehall (Headquarters):

- Location: 2609 E Rd., Anmore, BC
- Built: Original Anmore firehall (1977).
  Addition and renovation: (1997)
- Building Size: Total Building = 4,245sf (395 sm)
- Site Size: 1.06 acre (4,306 sm / 46,350 sf)
- Construction: 1.5 + 2 storey structure comprised mostly of concrete block with wood / metal trusses, wood cladding (siding and shingles) + exposed concrete block around the apparatus bays.
- Function: suppression crews, fire department administration, office of the fire chief, fire prevention, training officers.
- Apparatus Bays: 2 bays - 12.5m (41'-0") long (single, non-drive through bays)
  1 bay - 8.85m (29'-4") long (single, non drive thru bays)
- Other: minimal on site training + parking area for 6-10 spots currently on site.
  water tanks stored on site.

Belcarra Firehall:

- Location: 4082 Bedwell Bay Road, Belcarra, BC
- Built: Original Firehall (1978).
  Addition and renovation: (1997).
- Building Size: Total Building = 2,386sf (221.69 sm)
- Site Size: .87 acre (3,509.93 sm / 37,780 sf)
- Construction: 1.5 + 2 storey structure comprised mostly of concrete block and metal cladding (non-combustible construction).
- Function: suppression crews, training, exercise facilities + scba / filling.

- Apparatus: 2 bays 12.5m (41'-0") long (single, non-drive through bays)

- Other:
  no training yard + parking area for 4 spots currently on site.

There is currently the following reports which have been complied for the project to date outside of this reports and drawings:

1. Anmore existing building drawings.
2. Belcarra existing building drawings.

A. site data

The existing Anmore Firehall Site is located at the civic address of 2609 E Rd., Anmore, BC at the corner of East Road and Sunnyside Road, two main arterial roads connecting the area with the Lower Mainland. This location is central to the local business district and local residential properties, with quick access to both and the surrounding residential neighborhoods.

The current firehall site is a small square piece of land which is bordered along the eastern and southern sides by multifamily residential / single family, and roadways to north and west. Vehicular access is currently provided along the north and west side with a substantial grade change running form the western side across the site to the east. East Road is a reasonable width for accommodating exiting emergency vehicles due to the some adjustments to the road width directly opposite the current location of the apparatus bays, while Sunnyside Road is narrower and has significant grade impediments making it less optimal for exiting emergency response. However, it could be suitable for access for slower returning vehicles if a drive through bay scenario was to be revisited in the planning section of this report. Street parking is permitted on a part of the eastern side of Sunnyside Road and for a portion of East Road - both for restricted SVFD use only. A bus stop is located on East Road along the southern side of the street directly to the east side of the site entrance. This is a fair distance from the existing apparatus bays, but is not an ideal situation for visibility for out going and incoming emergency vehicles. There is an additional bus stop located directly across from firehall site access on Sunnyside Road on the western side of this street.

The hall is currently located in a good position as it provides excellent service delivery coverage; however, it is directly adjacent residential neighborhoods and access can be impeded by traffic in peak visitor season. The overall site area is small but can be designed to accommodate parking for members during training and / or an emergency event so crews can use a good portion of the available street parking when these events are underway.

The site plan drawings, site analysis and site photographs are located within **Section 2.0** of this Report for further information.

The site measures approximately 1.06 of an acre (4,306 sm) with a large swath along the southern edge being identified as a BC Hydro R.OW. rendering it unusable for development for the SVFD. This reduces the overall usable site area to .533 (2,160sm) which by industry standards is a very small site. It has a significant grade change running west to east across the site with vehicular site access currently being established from two sides - along the western side of the site (Sunnyside Road) as well as along the northern side of the site along the East Road. Approximately 25% of the site is currently paved with a substantial portion of the site currently left as green space. There is no clear direction for visitors or traffic control for the hall currently. The majority of vehicular traffic enters the site from the western edge along Sunnyside Road with an large apron along the northern side to help accommodate returning and exiting emergency vehicles as they back into the apparatus bays.

An overhead service to the Firehall is provided from a power pole located on East Road. Substantial power lines and power poles are located against western side of Sunnyside Road directly along the Firehall site. This condition in combination with the narrowness of the street and the grade issue, renders emergency vehicle exiting access in this direction difficult, limiting SVFDs ability to deploy from tandem bays in two directions. The remainder of the site could be access for training opportunities.

Site servicing has not been analyzed in this needs assessment.

B. site analysis

The existing site currently houses a building footprint of 395sm (4,245sf) including the main floor, upper floor and apparatus bays. This compact facility is comprised of two main components within the tight building footprint- the first being the original apparatus bays containing two truck bays which run north south on the site and also house the SVFD gear storage, workshop, and storage. The second being the additional apparatus bay, administration quarters, training rooms, radio and storage located in an addition at the front of the bays and on the second floor. This component adds a second storey to the original building and re-clad the entire facility.

The positioning of the apparatus bays is ideal for exiting from this site directly onto a relatively low traffic street during non peak visitor season. However, traffic congestion can be an issue during the summer months and traffic control measures should be considered such as street marking to keep the bays clear. Staff parking is situated west of the apparatus bays. There is presently no physical separation of Public access from the Paid On Call (POC) members parking and site access which can cause a conflict / safety concerns when crews are arriving for a call.

The current layout of the Firehall occupies approximately 6% of the overall site area for the entire site and 11.7% of the developable site area. The apparatus bays are single, non drive-through bays with a reasonable front apron of 13.5m in depth which is utilized for positioning, trucks checks and backing vehicles into the apparatus bays. Consideration to future development of this site should address the following points:

The Anmore Firehall facility is located on a medium sized site overall based on industry standards, which is impacted by the location of the BC Hydro R.O.W rendering approximately 1,175sm or 27.2% of the site unusable. It currently does not share site access with any other colocated municipal user groups. In order to accommodate the current and future needs of the SVFD, redevelopment would require the following design considerations:

The following points identify the prime design concerns with the site:

- from an operational perspective, the concerns relate to the movement of emergency response vehicles and personnel when responding to a call.
    - emergency response vehicles must use the front apron to assist with backing into the apparatus bays without having to use the public street.
    - crews arrive at the site rapidly and need to get access to parking without conflict with emergency vehicles leaving the site. There is currently not enough parking to accommodate more than 20% of crew members on site. Parking for training or emergencies would need to be accommodated on the local streets.
    - public parking is currently undesignated and not required for operation of the hall. However, as a public building this normally would need to be provided to bring the building up to By-Law standards unless a relaxation was to be provided.
    - parking is located along the west side of the site using the same driveway that incoming crew may use when arriving on site. On this rare occasion, there could be conflict with emergency response vehicles leaving the site.
- the building currently sits inside the setbacks as shown on the site plan included in this report.
- in order to house the current number of vehicles, 6 tandem or single apparatus bays would be required to meet current industry standards. This footprint would occupy a larger portion of the building able area an likely increase the apron size along East Road.
- with the development of the new apparatus bays, access to the rear of the site, water storage and relocation of a generator would need to be assessed. Examples of possible layouts are shown on the siting option in **Section 4.0.**

- permitted site coverage under and require a variance as part of the future project depending on the further development in the next stages project.
- 6 tandem drive-through bays are recommended for any future redevelopment to allow for flexibility of deployment.

C. current space program

The Anmore Firehall is the main headquarters hall and has functioned reasonably as the home for the SVFD over the past 41 years. In order to understand the size and organization of this facility, please refer to the existing floor plan drawing following this Section. Space for decontamination,separation of PPE gear, inclusive washrooms to address gender issues, facilities to act as a first responder EOC are not allocated within the current design.

Due to the size and changing industry standards, this building no longer meets the current needs of the SVFD's for various reasons as outlined below. A comparison of the existing space program to that of the current needs of the Fire Services will be found in **Section 3.0** of this report.

A summary sheet of the current space program is attached to this Section which catalogues the current size and types of spaces found at the Firehall. Included on this chart are spaces which would be found in a typical firehall built in accordance with today's best practices and NFPA standards. Those spaces are currently not present in the Anmore Firehall. In addition to any missing programmatic spaces, many of the present spaces are undersized for the current services that the Fire Department provides and / or the changing operational requirements of the department.

D. space program - areas of concern

The description below summarizes the major spatial deficiencies found at the Anmore Firehall. (See the Space Program for future space program recommendations).

The current building program utilizes 4,245sf (403sm) of programmed space. The following is a summary of those spaces on the project and areas of concern related to the current layout.

- **Public Areas:**
  - there is currently a lack of space allocated for the public and separation of those areas from the operational and admin spaces.
  - there is no security at the current time separating Fire Rescue Services from incoming public. Once in the building, the public is are no longer physically separated from the operational / crew quarters of the Firehall. This may not be a major concern for the operation currently, but in the evaluation needs to be recognized.
  - the public access of the Firehall is located on the main level with a single access point, no handicapped door access buttons to the building or other accessible access is currently provided. It is acceptable to have the crew quarters unavailable from an accessible perspective with the BCBC; however, the remainder of the administration, and meetings rooms should be designed to meet the accessibility standards of the BC Building Code (BCBC).
  - there is no H/C washroom available for the Public, retired personnel or visiting groups.

- **Administration (Fire Chief, Assistant Chiefs, Training + Support Staff):**
  - current floor space is maximized.
  - there are no offices provided in this location for any administration officers or staff. There is currently a single desk offered in

administration side of the hall and another within the apparatus bays.
- medium size meeting space for public consultation and fire department training required to be separate from the office area and the crew quarters. Currently this space does not exist.
- office space required for crews should be added into the space program. There is currently only space designated to report writing within the educational area for crews such as an open work station area is located adjacent to the kitchen area.
- these areas are key in providing spaces for future development of the department and keeping volunteers separated from the dirty spaces of the hall.

- **FH Operational Areas:**
  - Apparatus Bays - two single 12.5m (41'-0") long bays - both non drive through and 4.5m (14.5')
    - the current bays themselves are too small to accommodate the current standard for emergency vehicle sizes with width and length of the bays being the most crucial deficiency.
    - typical firehall design in today's standards would create apparatus bays 27m (85'-90') in length for tandem and 13.7 (45') for single bays. Widths of 5.2. or 5.6 (17.25'- 18.25') clear inside space, with overhead doors being a minimum of 14' wide to accommodate larger vehicles and reduce the need for custom vehicles to be purchased.
    - this will also allow for vehicles to be seamless relocated between the two halls without restriction as requirements may change.
  - the apparatus bays can house up to 3 vehicles. Additional vehicles are stored outdoors or off-site which is undesirable, as it requires additional costs for maintenance and difficulties for access.
  - there is currently no bays allocated to store the archive vehicles.
  - radio room, gear storage, general storage, hose storage are all currently exposed to the general apparatus bays mixing clean and dirty spaces which allows for contaminates to spread from operational areas into living quarters and home with volunteers.
  - vehicle Exhaust Systems: there is no vehicle exhaust system located within the apparatus bays. This is major element which impacts Work Safe and the overall safety of the firefighter's gear within the hall and is now one of the mainstays of the current industry standards for the design of apparatus bays.
  - the current standards of best practice for decontamination are not able to be followed due to the current building design. BC Building Code Standards have changed since the design of the current firehall and these could be costly to address; in some cases, the issues are simply unable to be achieved with the current building design.
    - there is no definite separation of clean and dirty spaces - creating an approach which does not limit exposure to crews and all that visit the hall to contaminants.
    - there is no decontamination washroom located on the dirty side of the hall. This enables contaminants to stay out of the clean areas reducing the risk the spread of these carcinogens.
    - gear washing facilities- the current hall has no gear washing amenities.
    - the hall should also have residential washer and dryer facilities within the clean side of the hall.
    - turnout gear (Personal Protection Equipment = PPE) is currently stored within a the apparatus bays. This is

no longer industry standard as is exposes clean gear to contaminants and providing no proper drying area for the PPE equipment.

- **Hose / Training Tower:**
  - there is no hose drying / training tower which is usable. There was a hose tower provided as part of the addition in 1997, but it is not longer available for hose drying.
  - a hose tower provides the space for hose drying as well as training opportunities and is still used in many modern, multi-functional towers. Hose and Gear Dryers are available for small sites or buildings where necessary but this does not address the need for training off the hose tower.

- **Suppression Crew Quarters.**
  - there is direct access to the operational quarters through the rear of the bays and into the kitchen area creating a difficulty in managing the separation of the "clean" and "contaminated zones" within the hall.
  - there are two kitchen / kitchenette areas located within this hall. one on the main floor and the other on the upper level. both are relatively small.
  - there are currently no spaces allocated to temporary sleeping quarters.
  - there are not enough washrooms suitable for the number of staff and crews. Currently there is only one washroom with the hall. This washroom has a shower which is not completely operational at this time and is located on the clean side of the hall. A washroom on the apparatus bays side of the building creates an opportunity to reduce the spread of contaminants throughout the building.
  - there is no space available for decontamination washrooms and showers directly off of the bays. This again works to separate clean and dirty spaces and keep contaminants in the apparatus bay zone.
  - gender inclusive solutions are addressed in **Item D of Section 3.0.**

E. existing building

This section aims to compare existing conditions to best practices using three categories. This information is then used to assess the gaps between existing and new program outlined in **Section 3.0** to identify the gaps between current and spatial needs. The Anmore Firehall (AFH) was assessed under the following three categories:

1. building code issues
2. environmental concerns
3. building systems

E.1 building code issues

The building code requirement under the 2012 British Columbia Building Code (BCBC) and the new upcoming 2018 Building Code have different requirements from previous versions of the BC Building Code which have been upgraded over the past 41 years since the building was built in 1977. As a result, it is not unusual for buildings in this situation to not comply with current code nor is it always necessary that the existing building issues be upgraded. However, as part of this report we have outlined the current deficiencies in order to give a full picture of the gaps between existing conditions and current standards.

- Seismic Concerns: in British Columbia, firehalls are designated to be

constructed to meet post-disaster design standards which simply means that the buildings are designed to withstand 1.5 times the seismic force of conventional buildings during an earthquake. This is required so essential services maintain operations during these kinds of emergencies. In general, the building does not meet seismic standards of the current BC Building Code for the following general requirements:

- there are no structural headers installed above the overhead doors. The wall above the doors is concrete block with no structural header to hold up the wall, the doors and associated architectural elements. The result is that under a seismic event it is likely that this portion of the wall will crumble or fall to the ground blocking the entrance / exit from the apparatus bays and rendering emergency vehicles ineffective.
- the majority of the original firehall was designed in 1977. There have been 7 updates to the BCBC since the design was completed and built. The post disaster standards for structural systems have greatly changed since this time.
- concrete block supporting walls would need to be core filled with extensive horizontal bond beams and vertical rebar within the cavities of this structure. As per the original drawings - these items are extremely limited in the original design and would not meet current requirements.
- the mounting bracket and the top chord of the roof trusses for the apparatus bays are both undersized.

- BCBC Classification: the current Firehall is classified under BCBC 3.2.2.81, Group F, Division 3 up to 4 storeys - non sprinklered.
  - the building is 2 storeys, facing 2 streets allowing for a maximum building area of 1,000 sm.
  - the building is permitted to be non-sprinklered and built of non - combustible or combustible construction.
  - floor assemblies are required to have a fire separation of not less than 45 minutes.
  - load bearing walls must be rated to 45 minutes or built out of non combustible construction. Many of the walls in the original walls were built out of concrete block (non-combustible construction). The renovated portion of the hall was designed with wood frame construction (combustible construction) which appear to be the correct rating. However, a more detailed review of these existing walls was unable to be completed to determine the thickness of the gypsum wall board.

- BCBC 2012: fire separations between the living quarters and the apparatus bays / operation spaces are to be 1.5 hours meaning that spaces such as the SCBA / workshop /apparatus bays / gear storage should all be separated from the living / training / office areas by a 1.5 hour fire separation.
  - the AFH currently has a concrete block wall between the apparatus bays and some of the living quarters which should technically meet the 1.5 hour FRR requirement, but is not fire stopped around penetrations and there is limited core filling and rebar within the existing walls which do not meet the BCBC requirement.
  - the doors in this separation must be rated to 1.5 hours and all should be rated to this effect and have closers. Currently, this is not the case.
  - all fire stopping separation should be reviewed to meet the 1.5 hour rating of this wall.

- Handicapped accessibility: BCBC 2012 Section A3.8.1.1 “to make buildings accessible for persons with disabilities”. In protective services buildings, a reasonable case can be made that in order to perform as a firefighter one must be able bodied; therefore, much of building does not need to be accessible. This exception would not apply to areas such as

the public areas, administration, EOC, emergency programs or anywhere where persons with disabilities may work. As suppression crew areas would fall under this exception, accessibility in the firehalls would only be required for areas accessed by the Public.

- public reception is non existent.
- front entry does not have a handicapped door opener.
- entry itself would need to ensure that door widths and slopes in all cases met accessible requirements.
- handicapped accessible washroom will need to be made available.

- Exiting requirements: BCBC 3.4.2.1 for an F3 classification: the floor area break downs are as follows:
    - Main Floor - Apparatus Bays/Operational = 253sm (2,723sf)
    - Admin and Training = 141.31m (1521sf)
  - a building which is unsprinklere can have only one exit if the follow two items have been met under the F3 classification:
    - The floor area is not greater than 200sm.
    - travel distance to the exit is not greater than 15m
  - the main floor is greater than 200sm as a result needs more than 1 exit. There currently are two exits both throughthe apparatus bays. The exit in the original apparatus bays meets the requirement as the max travel distance is 13.5m. The second exit through apparatus bay addition does not meet the travel distance requirements at over 20m.
  - the original apparatus bays have 1 pedestrian exit directly to the exterior - BCBC requires that there must be at least 2 exits directly from the apparatus bays positioned 1/2 diagonal distance of the bays apart from each other in order to meet travel distance. This requirement has not been met under the current layout for either the original two bays or the additional single bay.
  - the upper floor administration / training areas of the hall:
    - size of the floor plate: on this basis the exiting requirements have been met as there are two stairs provided; however, the original stair does not meet exiting requirements as it does not exit directly outside or through a lobby and is not enclosed at the top or bottom. As a result it needs to be eliminated from the equation.
    - currently only 1 stair can be considered an exit from the upper floor. This is acceptable as the area of the upper floor is less than 200sm, however, the travel distance to an exit is over 23m which is not acceptable by BCBC. This is because the stair is not enclosed at the top and therefore the travel distance is measured by code to the exit door. (BCBC 3.4.2.4)

- Sprinklers: under BCBC 3.2.2.83 sprinklers are not required. The building is permitted to be non sprinklered and constructed of both/ either combustible and non-combustible construction.

- Washrooms: BCBC 3.1.17.1.
  - occupant load is calculated by area and type of building.
  - firehall occupant load for the updated building estimated at:
    - 165.71sm / 46 = 2.05 (apparatus bays)
    - 237.29sm / 9.6 = 24.71 (living quarters)
  - total occupant load = 2 (per gender) = 13.38 persons of each gender.
  - total washrooms required by code (BCBC 3.7.2.2.C) = 4 fixtures in total - 2 male and 2 female. If there are gender neutral or accessible individual washrooms, the total load can be reduced by 15, reducing further the overall requirement for only 2 washrooms

in total.
- current Firehall does not meet code as there are 2 fixtures in 2 individual washrooms - none of these existing washrooms are considered a single universal toilet.

E.2 environmental

The building code requirement under the 2012 British Columbia Building Code (BCBC) requires that the building meet new energy standards as outlined by ASHRAE 90.1 (2010) or NECB 2010. This requirement means that architectural, mechanical and electrical components of new buildings must meet the environmental energy performance as outlined in these standards. When identifying the gaps between existing and current best practices it needs to be recognized that this Firehall would **not** meet the current energy code requirements for following reasons. These building requirements are likely to increase with the acceptance of the new BCBC 2018 and the BC Energy Step Code.

1. Building Envelope: a high performance building envelope is to be designed to equal the R values as required by the BCBC and outlined below.
2. From review of the existing drawings only, it appears as if the building envelope has limited insulation in the walls and roof, leaving the building exterior with low energy performance. As a result, the building would not likely meet the R-values as summarized below.
    - R Value definition: the capacity of an insulating material to resist heat flow. The higher the R-value, the greater the insulating power.
    - each building material has an established insulating power and together the items which make up the roof, walls and floors must meet the following requirements as outlined be ASHREA 90.1 (2010).
    - walls = R11.4 - R16.8 (varies with construction type)
    - roofs = R20 + floors = R10 - R30 (varies with construction type)
    - slab on Grade (Heated) R-15.

3. Electrical: The revised ASHRAE standards will require that the electrical systems be approximately 27% more efficient than the previous Code requirements. This includes lighting and power. The current Firehall would not meet this code requirement.

E.3 building content

The space program of the Firehall has been reviewed under **Section 3.0** of this Appendix and outlines existing spaces as well as those which are missing from a typical contemporary Firehall. This section is an initial evaluation of the content of the project from a building stand point. The following points are general to the overall building and apply for most scenarios.

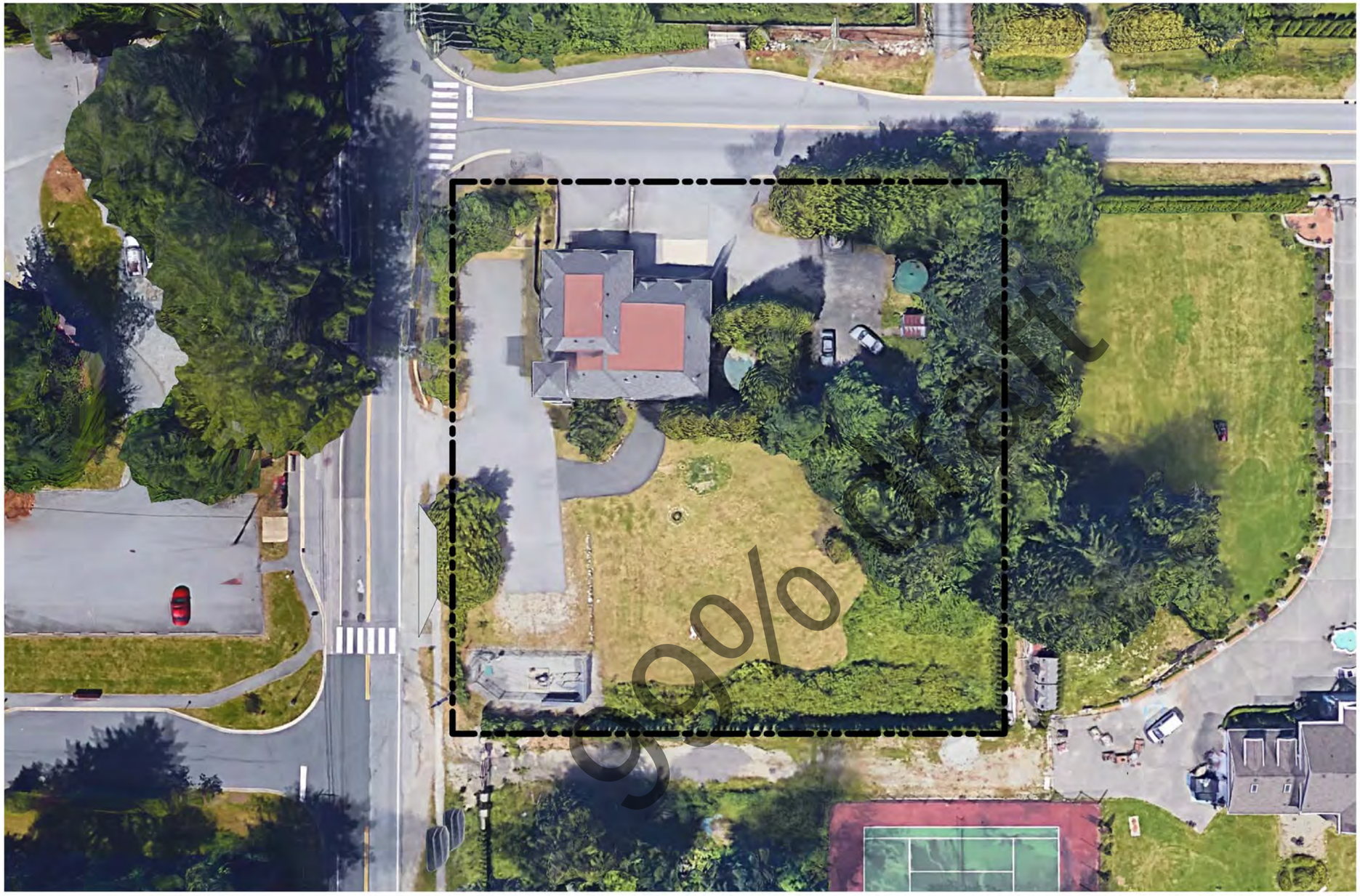
- Apparatus Bays:
    - the bays are seisimically unstable and there is no operational hose tower. There have been no structural improvements since 1977 and to do so at this stage would be increasingly expensive and disruptive to the operation of the fire department.

- Security:
    - currently there are no doors located between the front entry and the remainder of the hall to help keep visitors from accessing the hall beyond the front entry without permission. There should be engineered controls for administrative safety and security and or a small weather / security vestibule which could address these concerns.
    - proximity readers have not been installed on the exterior doors to the hall. Access is currently though key access only.
    - HQ offices are directly accessible from the main entry where there is a low level or security between the Public interface and these spaces.

- Personnel Flow:
  - flow from the operation quarters on the main floor is reasonably acceptable from space to space as there is a general circular circulation path. However, the PPE gear is located behind the trucks which creates a conflict in flow as crews need to shimmy past the vehicles, to get to their gear. This greatly limits the response time and creates a dysfunctional flow between crews and the equipment and vehicles.
  - the current NFPA 1710 + 1720 standards set separate benchmark times for Fire and EMS responses with the same compliance criteria for Turnout. Turnout time represents the elapsed time from the moment a call is dispatched, until the assigned Emergency Response Unit(s) is physically en route.
    - NFPA 1720 standard states:
      - 90% of all emergency responses to fire calls must turnout within 80 seconds or less.
      - 90% of all emergency responses to EMS calls must turnout within 60 seconds or less.
  - current firehall design standards would keep this access to PPE gear separate from any other rooms in order to provide an unimpeded route to the emergency vehicles improving response times.

- Equipment:
  - gear storage drying system, SCBA room and equipment in clean room, (fill station and compressor), separate radio or rip/run area, AV training systems are all areas of deficiency from a contemporary typical firehall design.
  - emergency genset is present but would need to be evaluated to assess how much of the building could be powered. Current best practice would be to power the entire building, minus any cooling systems for a minimum of 72 hours. This would require fuel storage to support this operation on site as well as the generator.

- Systems:
  - from an environmental perspective, low flow fixtures, LED lighting and a high efficiency mechanical system would be some of the usual areas where older buildings do not match current design and BCBC standards.
  - Traffic preemption control is not existing.



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N

project north 179°

feasibility study

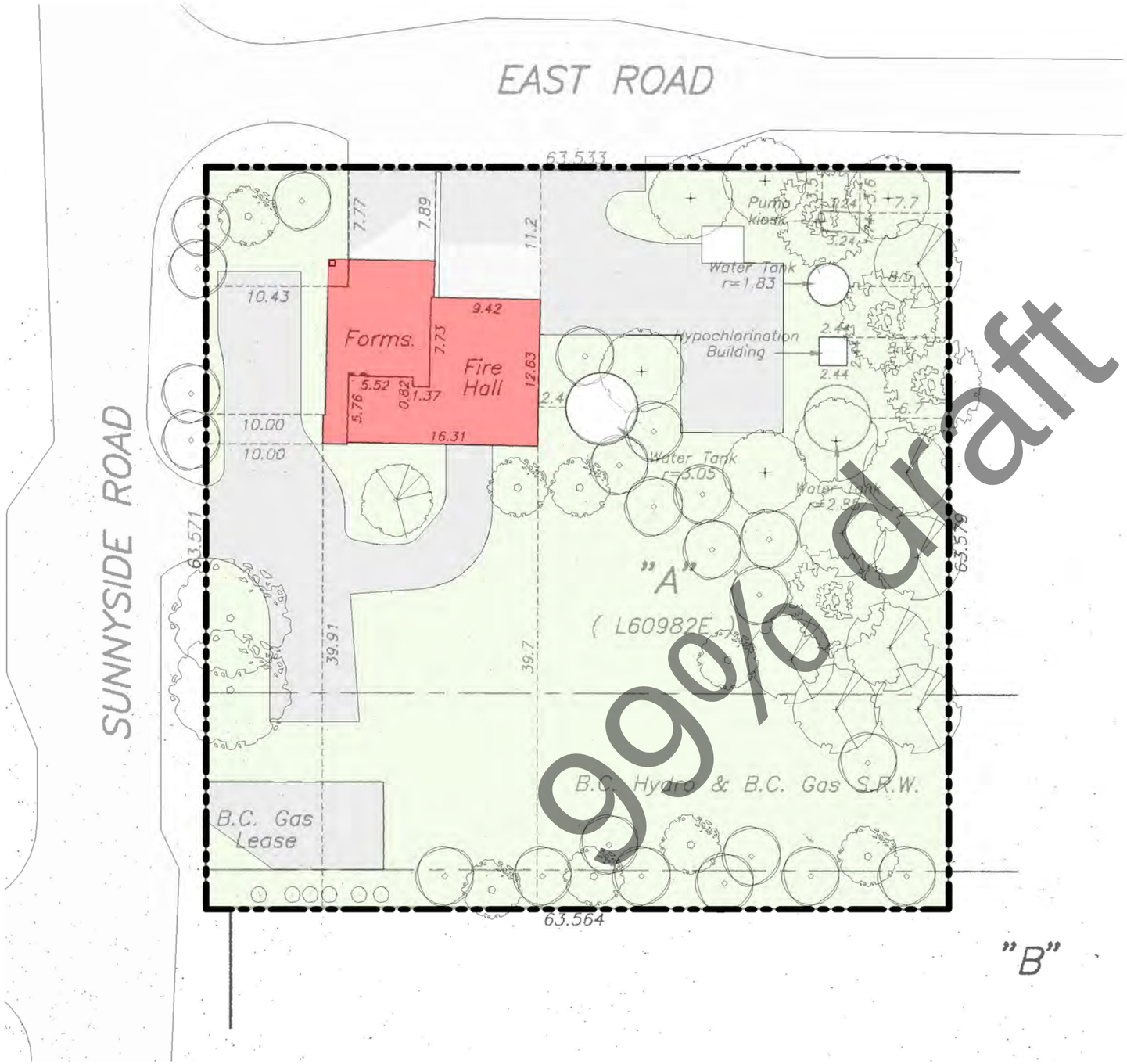
Metro Vancouver
Regional District

Anmore Firehall

aerial

1:500

18 - sept - 14



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project north 179°

feasibility study

Metro Vancouver Regional District
Anmore Firehall

site plan

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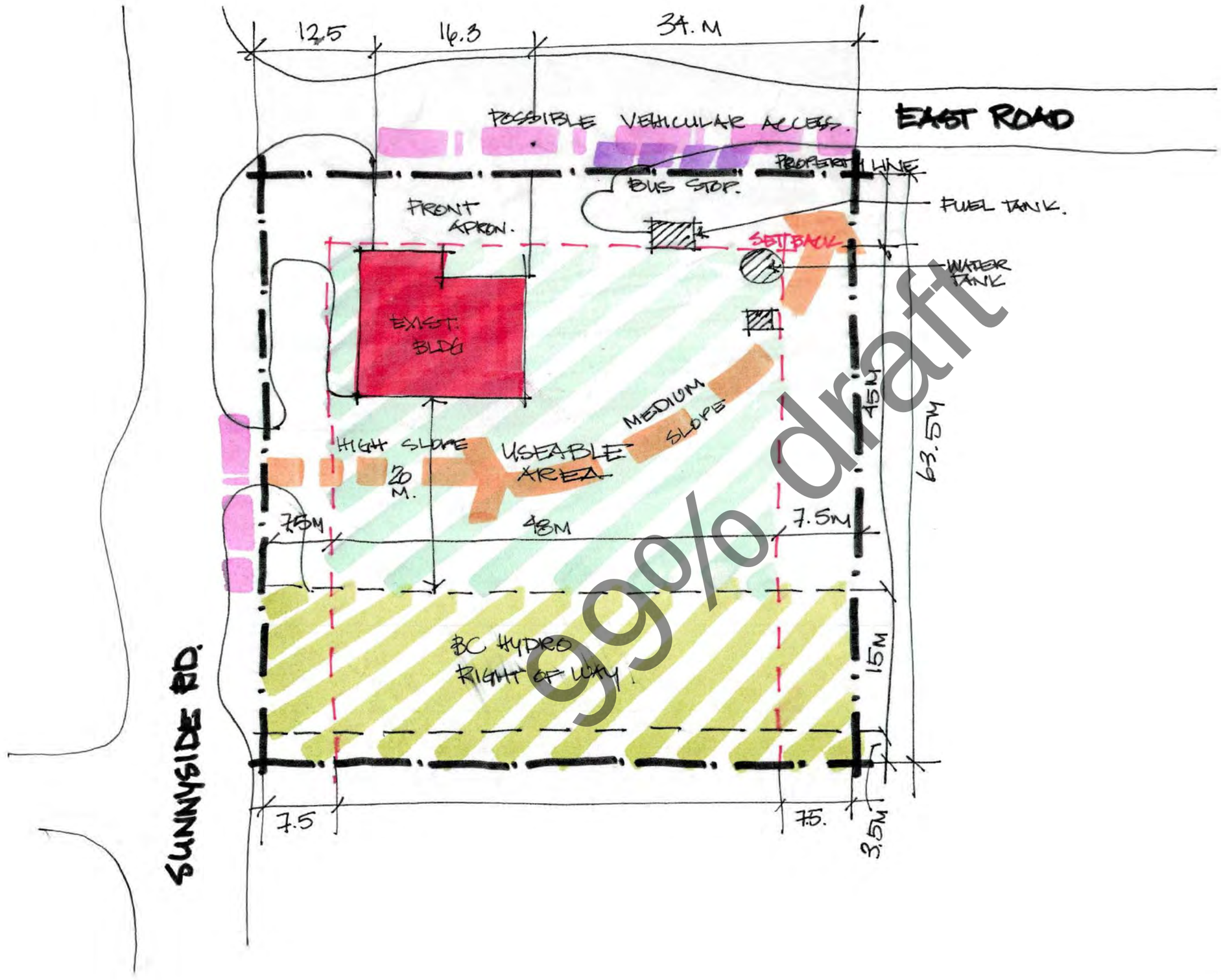

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feasibility study

Metro Vancouver
Regional District
Anmore Firehall

site analysis

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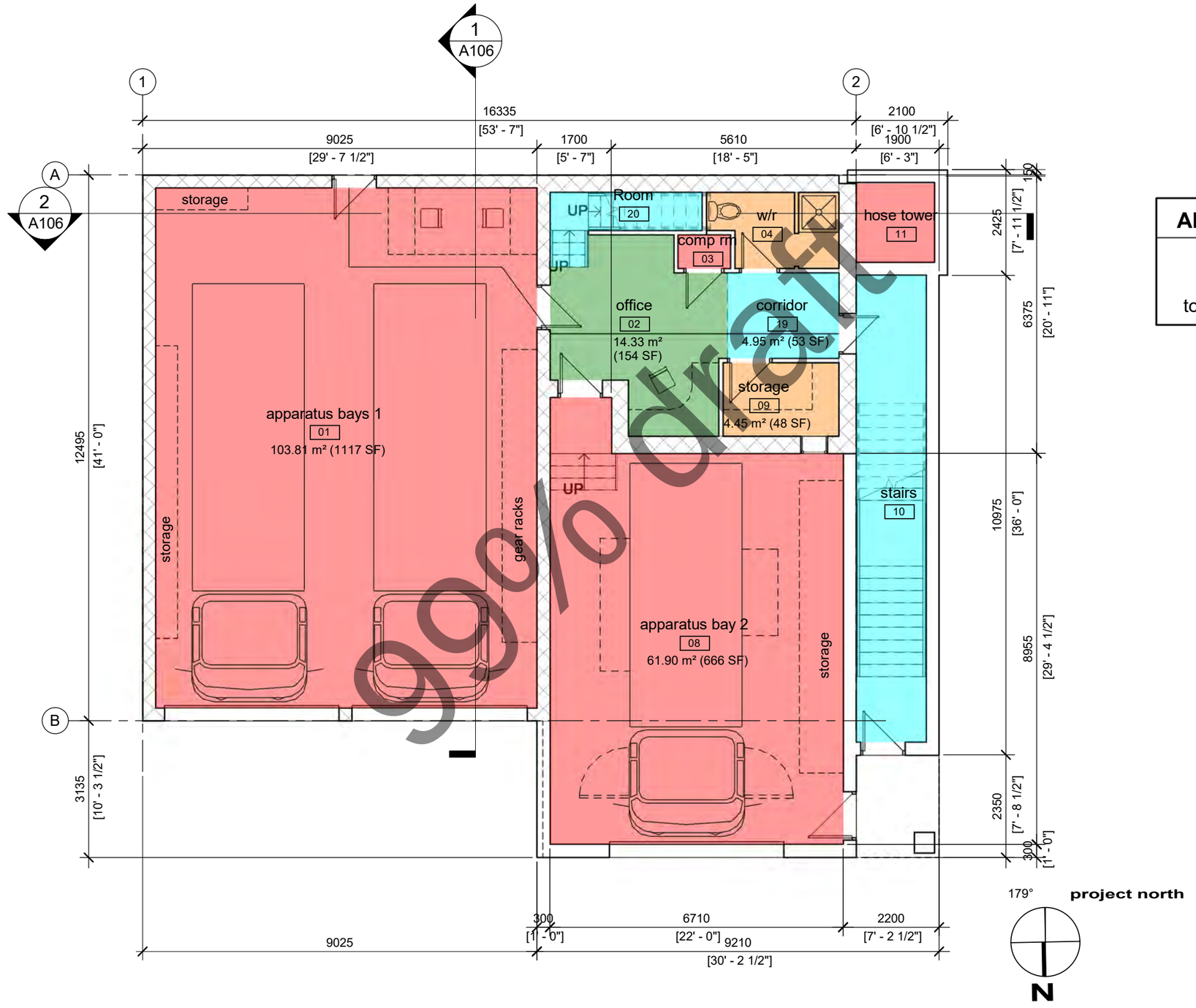

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AREA

main floor = 253.02 sm (2,723 sf)
upper floor = 141.31 sm (1,521 sf)
total floor area = 394.33 sm (4,245 sf)

space allocation legend

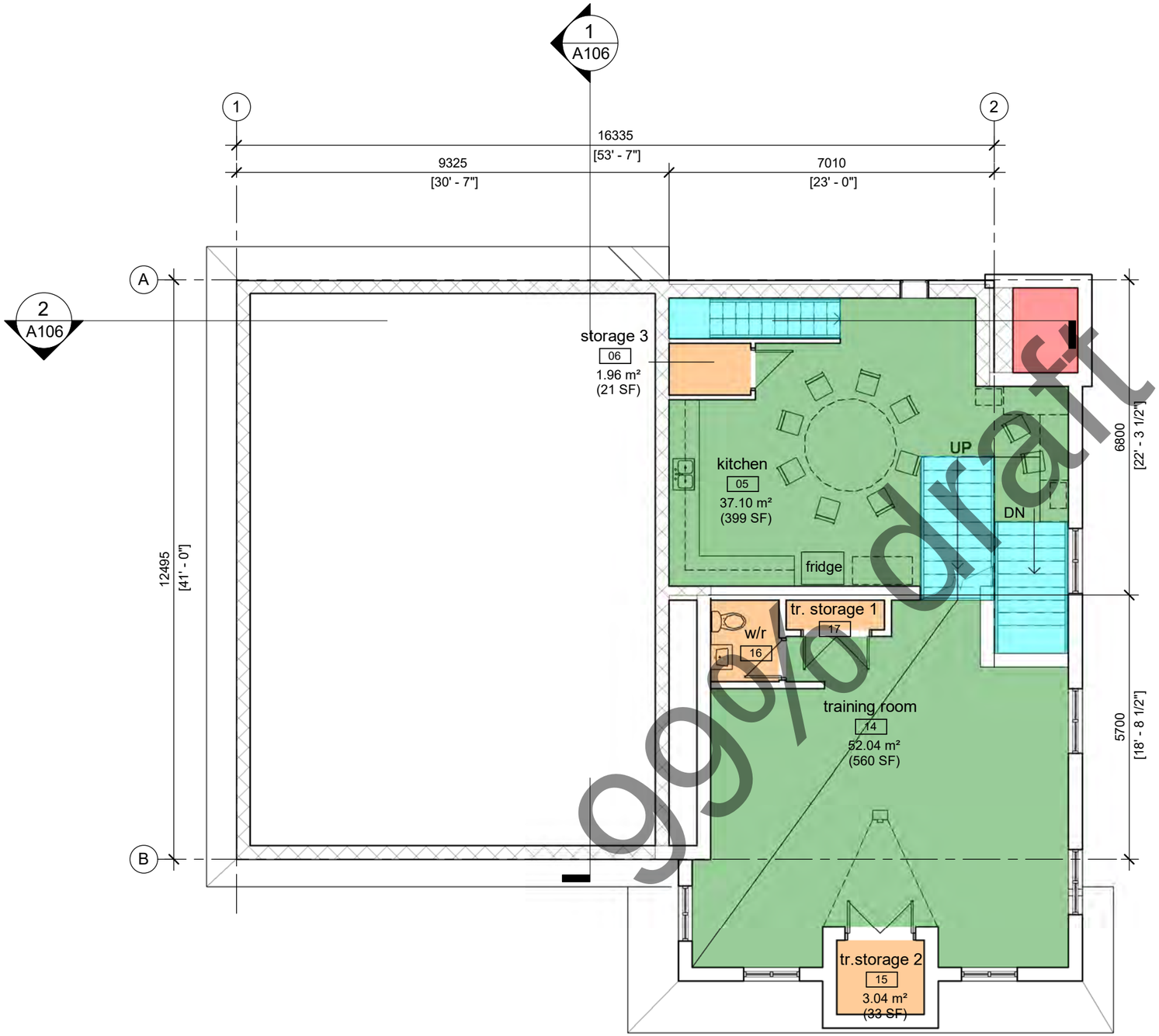
- operational
- admin
- crew quarters
- public spaces
- service spaces
- circulation

feasibility study

Metro Vancouver Regional District
Anmore Firehall

main floor plan

1:100
18 - sept - 14



Johnston Davidson
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AREA

main floor = 253.02 sm (2,723 sf)
upper floor = 141.31 sm (1,521 sf)
total floor area = 394.33 sm (4,245 sf)

space allocation legend

- operational
- admin
- crew quarters
- public spaces
- service spaces
- circulation

179° project north

N

feasibility study

Metro Vancouver Regional District
Anmore Firehall

second floor plan

1:100
18 - sept - 14

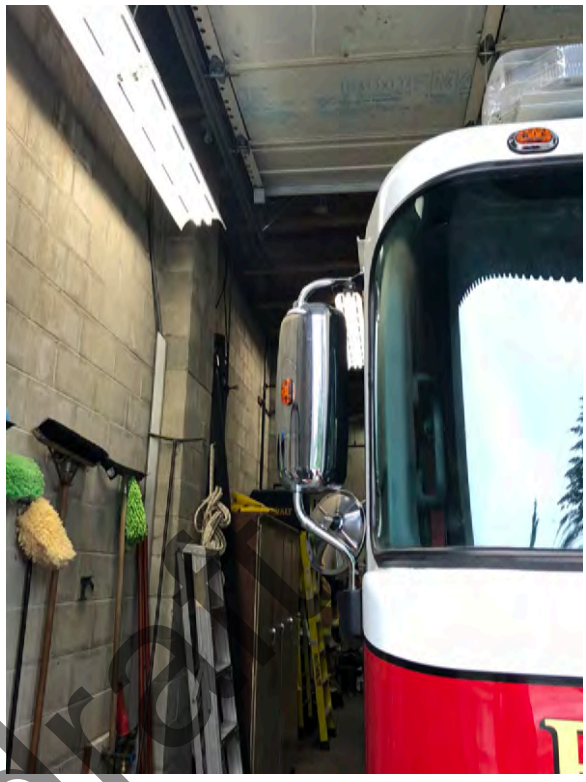
anmore firehall **existing building photos**

Exterior view of the Anmore Firehall from northeast corner of the site from E Road. This Firehall was constructed in 1977 and consists of 3 apparatus bays, training tower and reception.

Exterior view of the Anmore Firehall from western side of teh site along Sunnyside Road.

anmore firehall **existing building photos**

Apparatus bays with extremely limited space between vehicles and doors.



Equipment and materials stored between vehicles and wall space, making walkway narrow.

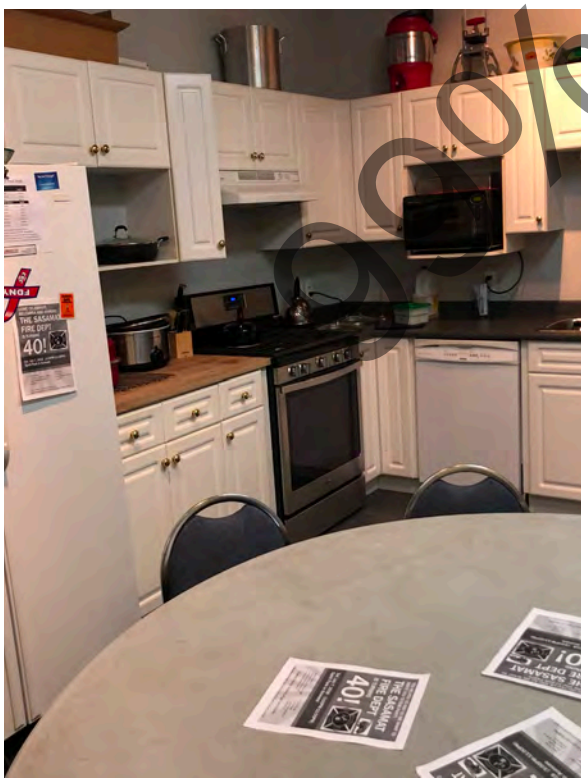
Less than 2 feet of space between apparatus and overhead door when closed.

Circulation space around vehicles is inadequate and compromises personnel safety when trying to access vehicles quickly during an emergency

anmore firehall **existing building photos**

Training Room has limited areas to store tables and chairs.

Day Room doubles as dining room, located on second floor of building.



Existing counter/kitchen space is limited for a department of this size, small food preparation and mealtime area.

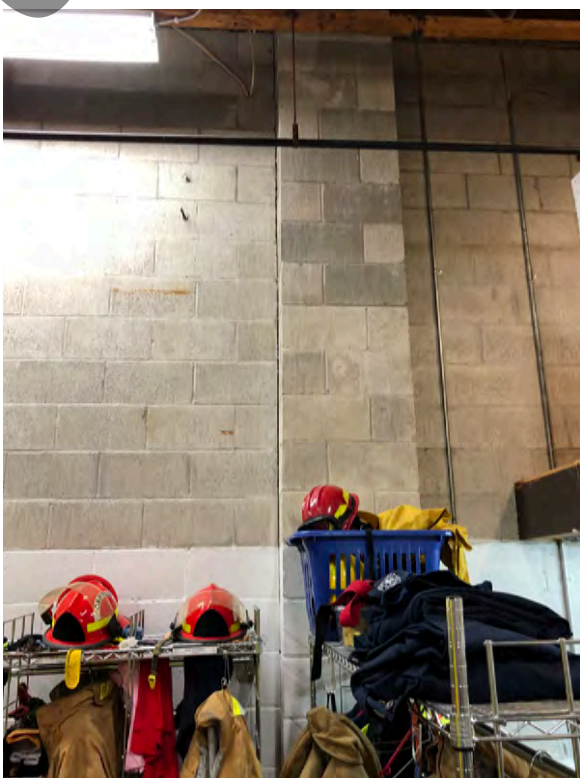
Limited area throughout kitchen/dining area, potential to be easily crowded.

anmore firehall **existing building photos**

Storage area for SCBA equipment - this is located on the clean side of the hall

Low-quality lighting in makeshift storage areas, options for storage include utilizing underused spaces.

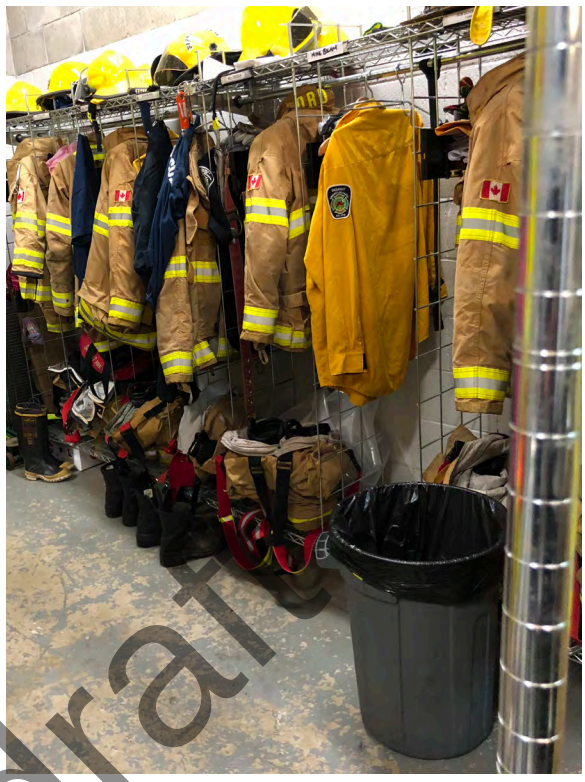
Storage of firefighting equipment narrow and difficult to utilize efficiently.



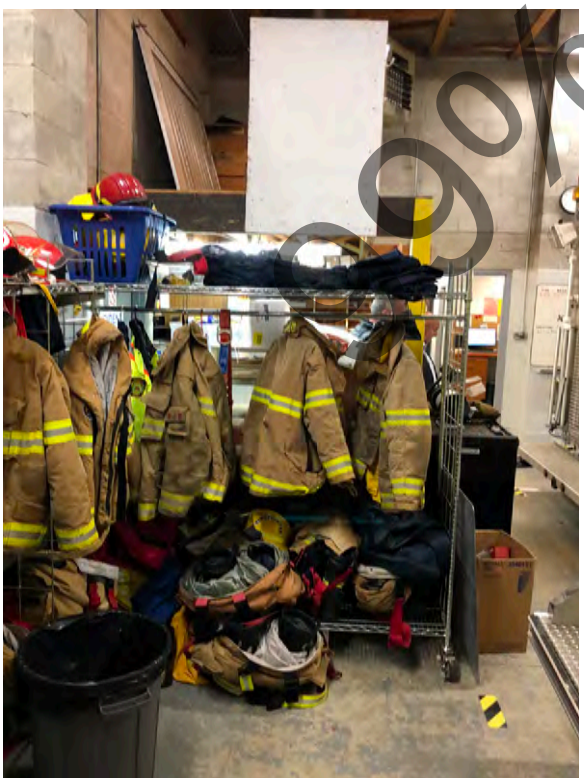
Limited structural capacity leading to cracks and structural deficiencies in walls.

anmore firehall **existing building photos**

Exposed ceiling structure requires fire-rated enclosure.



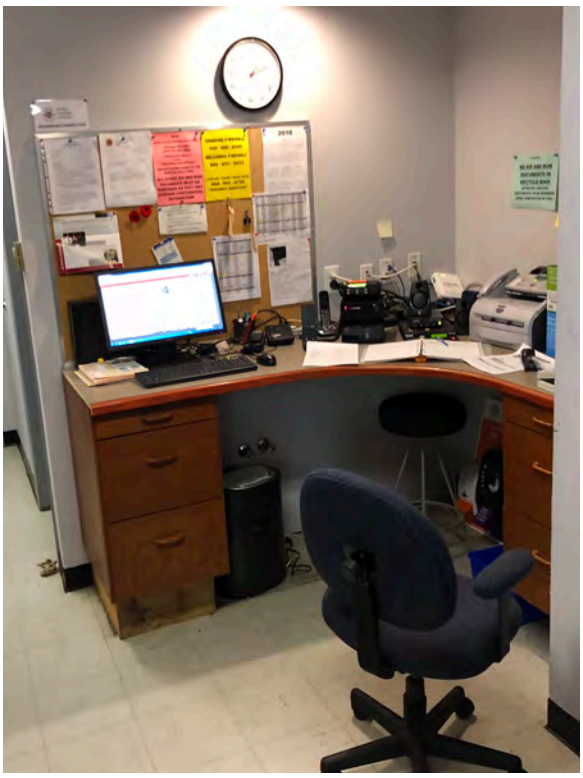
PPE area located within the apparatus bays instead of separate room. Limits movement around vehicles



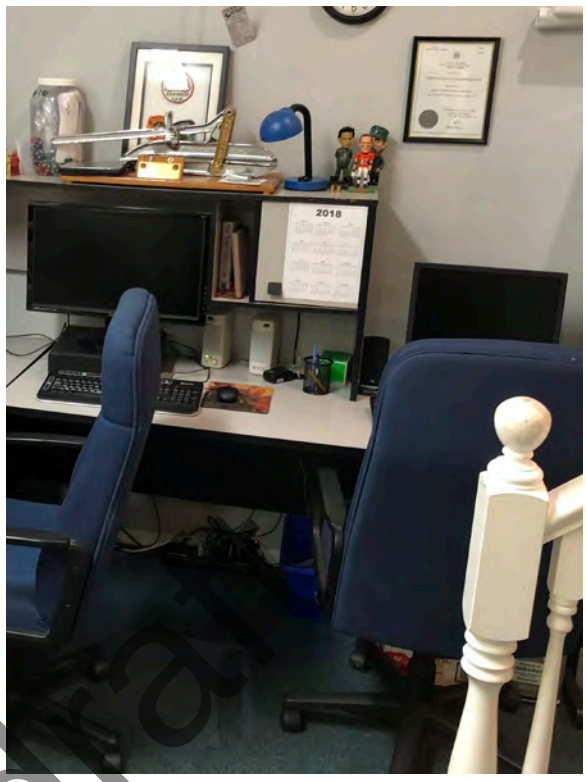
PPE hanging area is small for department size, also set to dry in apparatus bays and exposed to vehicle contaminants.

Makeshift storage located above filing area, not structural sound for post-disaster requirements.

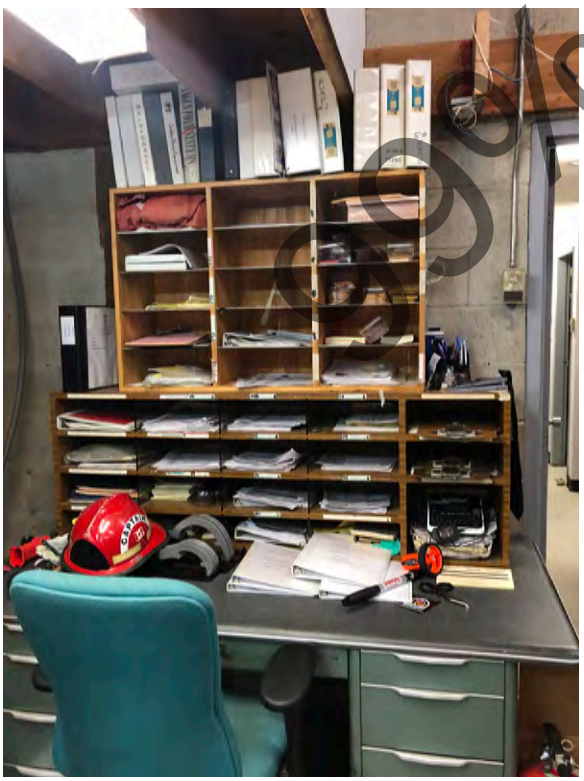
anmore firehall **existing building photos**



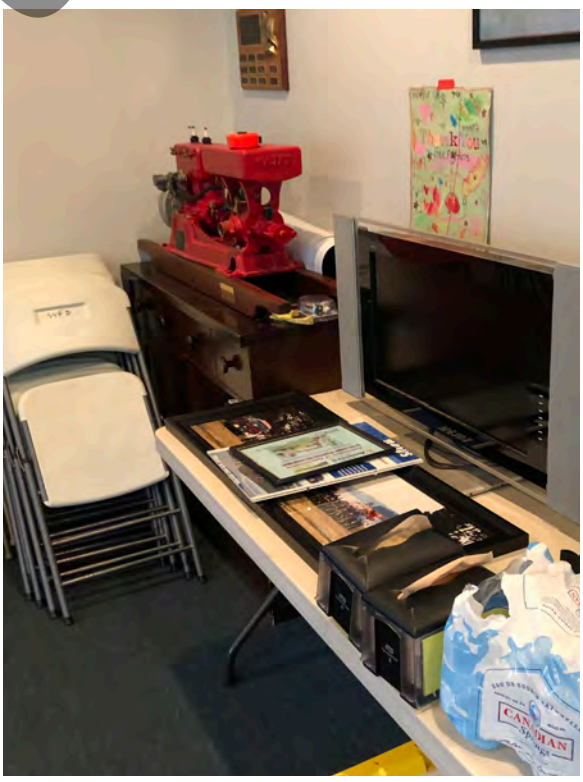
Limited office space adjacent to the apparatus bays - clean side.



Additional office space located at upper floors and limited to small area. Little area to display awards

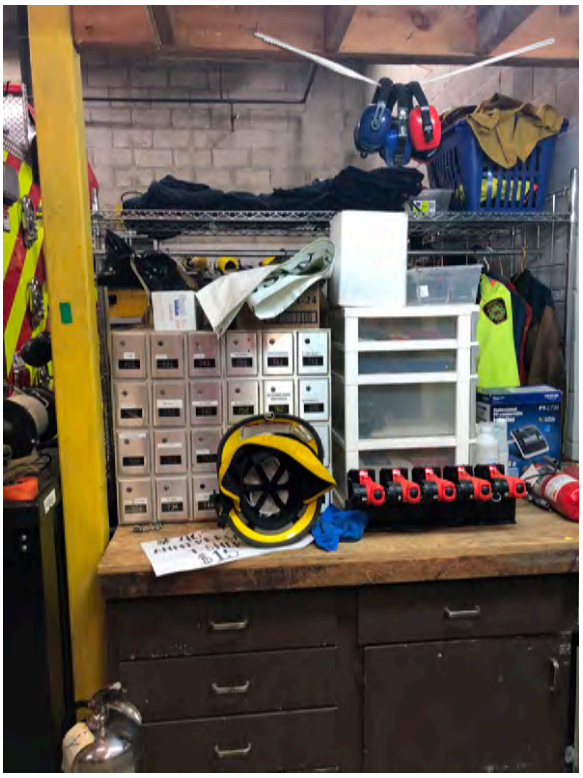


Filing / desk area located directly within apparatus bays with exposure to noise and contaminants.



AV storage within the training room.

anmore firehall **existing building photos**



Workspace and storage limited.

Circulation around fire trucks very limited, truck must back up against farthest wall to create space.

Training tower no longer usable for training, exterior wood panelling worn by elements.

Exterior wood panelling worn by elements.

A. site data

The existing Belcarra Firehall Site is located at the civic address of 2609 E Rd., Belcarra, BC adjacent to the Village of Belcarra Municipal Hall. This location is central to the main residential area of Belcarra and on the main route to local recreational areas.

The current firehall site is a relatively rectilinear shape which is bordered on the eastern side by single family residences, the west by the Municipal Hall and on the northern side by parkland. Vehicular access is currently provided in a single access along the northern side of the site with a substantial grade change from the road running south. Overall the grade drop accross the site is approximately 40' from the southern edge down to the road along the northern edge of the site. Bedwell Bay Road is a standard residential road with a relatively reasonable width for accommodating exiting emergency vehicles. Street parking is permitted on Bedwell Bay Rd immediately to the west of entrance apron for firefighters parking only.

There are no bus stops located within the vicinity and driveway access to residential properties on the northern side of the road are located to either side of the firehall apron but not directly across from the exit. The hall is currently located in a position to provide excellent service delivery coverage, however it is directly adjacent residential neighborhoods and the site grading does make the access to this property challenging. The overall site area is a reasonable for a satellite hall but is heavily treed and has limited parking and general use of the site to date.

There is no clear direction for visitors or traffic control for the hall currently. The majority of vehicular traffic enters the site from the western edge along Sunnyside Road with an large apron along the northern side to help accommodate returning and exiting emergency vehicles as they reverse into the apparatus bays.

An overhead service to the Firehall is provided from a power pole located on the north side of Bedwell Bay Road where the substantial power lines for the area also run.

Site servicing has not been analyzed in this needs assessment.

B. site analysis

The existing site currently houses a building footprint of 221.93sm (2,386sf) including the main floor, upper floor and apparatus bays. This compact facility is comprised of two main components within the tight building - the first being the original firehall containing two apparatus bays which also house the SVFD gear storage, workshop, and storage. An addition to increase space for training added a hose tower, SCBA facilities and additional training space was added to the second story in 1997. This component creates a two storeys in height with the training room and kitchen facilities on the second level.

The positioning of the apparatus bays is not ideal for exiting. This is because the bays are not positioned directly perpendicular to the road meaning that each time the trucks leave the bays they must navigate a right angle turn before they hit the main road. In addition, the emergency vehicles must navigate a slope of over 8.3% as they are leaving the site to respond to emergencies. Both conditions increase the wear and tear on the vehicles over time.

Traffic congestion can be an issue during the summer months and traffic control measures should be considered (such as street marking) to keep the bays clear. Staff parking is situated to the east of the apparatus bays and in front of the firehall administration area. however, parking on site is limited with a few additional spots being provided for crews along Bedwell Bay Rd. There is presently no physical separation of public site access

from the volunteer members parking and site access which can cause a conflict / safety concerns when crews are arriving for a call.

The current layout of the Firehall occupies approximately 4.9% of the overall site area for the entire site with approximately 40% (to be confirmed by topographical survey) of the developable site area being covered by relatively steep grade. The apparatus bays are single, non drive-through type bays with a reasonable front apron of 13.5m in depth which is utilized for positioning, truck checks and reversing vehicles into the apparatus bays. Consideration to future development of this site should address the following points:

The Belcarra Firehall facility is located on a small sized site overall by industry standards, which is also impacted by the steep grades which surround it and render much of the site expensive to redevelop in the same location at a larger size. It currently does not share site access with any other colocated municipal user groups - in order to accommodate the current and future needs of the SVFD, redevelopment would require the following design considerations:

The following points identify the prime design concerns with the site:

- from an operational perspective the concerns relate to the movement of emergency response vehicles and personnel when responding to a call.
    - emergency response vehicles must use the parking area to assist them in backing into the apparatus bays.
    - crews arrive at the site rapidly and need access to parking without conflict with emergency vehicles leaving the site - the combined single access point here creates conflict.
    - there is currently not enough parking to accommodate more than 20% of crew members on site. Parking for training or emergencies would need to be accommodated on the local streets.
    - public parking is currently undesignated and not required for operation of the hall. However, as a public building this normally would need to be provided to bring the building up to by-law standards unless a relaxation was to be provided.
- the building currently sits inside the setbacks as shown on the site plan included in this report.
- in order to house the current number of vehicles, 2 tandem or single apparatus bays would be required to meet current industry standards.
- with the development of the new apparatus bays, access to the rear of the site, water storage and relocation of a generator would need to be assessed.
- there would not be enough room to accommodate extensive crew parking on site.
- developing the new space program on the current site would require a site coverage of approximately 8%.

C. current space program

The Belcarra Firehall is a satellite firehall and has functioned reasonably for the Fire Service over the past 41 years. In order to understand the size and organization of this facility, please refer to the existing floor plan drawing following this Sections. Space for decontamination, separation of PPE gear, inclusive washrooms to address gender issues, facilities to act as a first responder EOC are not accomodated within the current design.

A comparison of the existing space program to that of the current needs of the Fire Services will be found in **Section 3.0** of this report. A summary sheet of the current space program is attached to this Section which catalogues the current size and types of spaces found at the Firehall. Included on this chart are spaces which would be found in a typical firehall built in accordance with today's best practices and NFPA standards. Those spaces are currently not present in the Belcarra Firehall. In addition to any missing programmatic spaces, many of the present spaces are undersized for the current services that the Fire Department provides and / or the changing operational requirements of the department. Due to the size and changing industry standards, this building no longer meets the current industry standards and needs of the SVFD's for various reasons which will be outlined below.

D. space program - areas of concern

The description below summarizes the major spatial deficiencies found at the Belcarra Firehall. (See the Space Program for future space program recommendations).

The current building program utilizes 2,386 sf (221.93sm) of programmed space. The following is a summary of those spaces on the project and areas of concern related to the current layout.

- **Public Areas:**
  - there is currently a lack of space allocated for the public and separation of those areas from the operational and admin spaces.
  - there is no security at the current time separating Fire Rescue Services from incoming public. Once in the building, people are no longer physically separated from the operational / crew quarters of the Firehall. This may not be a major concern for the operation currently, but in the evaluation needs to be recognized. This could be accomplished with a small security vestibule added to the overal program.
  - the public access of the Firehall is located on the main level with a single access point where there are no handicapped access buttons to the building, and no accessible access is currently provided. It is acceptable to have the crew quarters unavailable from an accessible perspective with the BCBC; however, it is important to question if this meets the intent of the BCBC in this case as a satellite firehall.
  - there is no H/C washroom available for the Public, retired or visiting groups.

- **Administration (Fire Chief, Assistant Chiefs, Training + Support Staff):**
  - current floor space is maximized.
  - there are no offices provided in this location for any administration officers or staff. There currently is a single desk offered in administration side of the hall and another within the apparatus bays.
  - as this is a satellite hall an additional meeting room could be considered as this hall is a fair distance from the Anmore hall but a medium meeting space for public consultation and fire department training may not be required.
  - office space required for crews should be added into the space program. The only space currently designated to writing report and educational area for crews such as an open work station area is located with the training room.
  - these areas are key in providing spaces for future development of the department and keeping volunteers separated from the dirty spaces of the hall.

- **FH Operational Areas:**
  - Apparatus Bays - two single 12.5m (41'-0") long bays - both non drive through and 4.5m (14.5')
    - the current bays themselves are too small to accommodate the current standard for emergency vehicle sizes. Width and length of the bays being the most crucial deficiency.
    - typical firehall design in today's standards would create apparatus bays 27m (85'-90') in length for tandem and 13.7 (45') for single bays. Widths of 5.2. or 5.6 (17.25'- 18.25') clear inside space, with overhead doors being a minimum of 14' wide to accommodate larger vehicles and reduce the need for custom vehicles to be purchased.
    - this will also allow for vehicles to be seamless relocated

between the two halls without restriction as requirements may change.

- the apparatus bays can house up to 2 vehicles. Additional vehicles are stored outdoors or off-site which is undesirable, as this requires additional costs for maintenance and difficulties for access.
- gear storage, exercise room, hose storage are all currently exposed to the general apparatus bays mixing clean and dirty spaces allowing for contaminates to spread from operational areas into living quarters and home with volunteers.
- vehicle Exhaust Systems: there is no standard vehicle exhaust system located within the apparatus bays. This is major element which impacts Work Safe and the overall safety of the firefighter's gear within the hall and is now one of the mainstays of the current industry standards for the design of apparatus bays.
- the current standards of best practice for decontamination are not able to be followed due to the current building design. BC Building Code standards have changed since the design of the current firehall and these could be costly to address, in some cases the issues are simply unable to be achieved with the current building design.
    - there is no definite separation of clean and dirty spaces - creating an approach which does not limit exposure to crews and all that visit the hall to contaminants.
    - gear washing facilities - the current hall has no gear washing available.
    - The hall should also have residential washer and dryer facilities within the clean side of the hall.
    - turnout gear (Personal Protection Equipment = PPE) is currently stored within a the apparatus bays. Great gear storage racks but the placement is no longer industry standard as is exposes clean gear to contaminants and no proper drying area for the PPE equipment.

- **Hose / Training Tower:**
    - there is no functional hose drying / training tower.
    - a hose tower provides the space for hose drying as well as training opportunities and is still used in many modern, multi-functional towers. Hose and gear dryers are available for small site or buildings where necessary but the need for training off the hose tower.

- **Suppression Crew Quarters.**
    - there is direct access to the operational quarters through the rear of the bays and into the kitchen area creating a difficulty in managing the separation of the "clean" and "contaminated zones" within the hall.
    - the kitchen is a good size and would be suitable to provide for an EOC or other similar emergency-type situation.
    - there are currently no spaces allocated to temporary sleeping quarters.
    - there are not enough washrooms suitable for the number of staff and crews.
    - there is no space available for decontamination washrooms and showers directly off of the bays. This again works to separate clean and dirty spaces and keep contaminants in the apparatus bay zone.
    - an exercise area is provided at this hall which is common practice fro all volunteer halls. However, is is currently located within the apparatus bays and as a result breaks downs the division between

dirty and clean spaces. The exercise room should be kept separate to avoid the spread of contaminants throughout the hall and to members personal gear / clothing.

- gender-neutrality solutions are addressed in **Item D of Section 3.0.**

E. existing building

This section aims to compare existing conditions to best practices using three categories. This information is then used to assess the gaps between existing and new program outlined in **Section 3.0** to identify the gaps between current and spatial needs. The Belcarra Firehall (BFH) was assessed under the following three categories:

1. building code issues
2. environmental concerns
3. building systems

E.1 building code issues

The building code requirement under the 2012 British Columbia Building Code (BCBC) and then new upcoming 2018 Building Code have different requirements from previous versions of the BC Building Code which have been upgraded over the past 41 years since the building was built in 1977. As a result, it is not unusual for buildings in this situation to not comply with current code nor is it always necessary that the existing building issues be upgraded. However, as part of this report we have outlined the current deficiencies in order to give a full picture of the gaps between existing conditions and current standards.

- Seismic Concerns: In British Columbia, firehalls are designated to be constructed to meet post-disaster design standards which simply means the buildings are designed to withstand 1.5 times the seismic force of conventional buildings during an earthquake. This is required in order for essential services maintain operations during these kinds of emergencies. In general, the building does not meet seismic standards of the current BC Building Code for the following general requirements:
  - a comprehensive seismic review of current codes has been completed as part of this review and is located in Appendix A.
    - there are no structural headers installed above the overhead doors. The wall above the doors is concrete block with no structural header to hold up the wall, the doors and associated architectural elements. The result is that under a seismic event it is likely that this portion of the wall will crumble or fall to the ground blocking the entrance / exit from the apparatus bays and rendering emergency vehicles ineffective.
    - the majority of the original firehall was design in 1977. There has been 7 updates to the BCBC since the design was completed and built. The post disaster standards for structural systems have greatly changed since this time.
    - concrete block supporting walls would need to be core filled with extensive horizontal bond beams and vertical rebar within the cavities of this structure. As per the original drawings - these items are extremely limited in the original design and would not meet current requirements.
    - the mounting bracket and the top chord of the roof trusses for the apparatus bays are both undersized.

- BCBC Classification: The current Firehall is classified under BCBC 3.2.2.83, Group F, Division 3 up to 2 storeys - non sprinklered.
  - The building is 2 storeys, facing 1 street which allows for a maximum building area of 860 sm.
  - The building is permitted to be non-sprinklered and built of non -

combustible or combustible construction.
    - Floor assemblies are required to have a fire separation of not less than 45 minutes.
    - Load bearing walls must be rated to 45 minutes or built out of non combustible construction. Many of the walls in the original construction were built out of concrete block (non-combustible construction). The renovated portion of the hall was designed with wood frame construction (combustible construction) and appear to be the correct rating. However, a more detailed review of these existing walls is required to determine the thickness of the gypsum wall board.

- BCBC 2012: fire separations between the living quarters and the apparatus bays / operation spaces are to be 1.5 hours meaning that spaces such as the SCBA / workshop / apparatus bays / gear storage should all be separated from the living / training / office areas by a 1.5 hour fire separation.
    - the BFH currently has a concrete block wall between the apparatus bays and some of the living quarters which should technically meet the 1.5 hour FRR requirement but is un fire stopped around penetrations and there is limited core filling and rebar within the existing walls which not meet the BCBC requirement.
    - the doors in this separation must be rated to 1.5 hours and all should have closers on them. This is currently not the case.
    - all fire stopping separation should be reviewed to meet the 1.5 hour rating of this wall.

- Handicapped accessibility: BCBC 2012 Section A3.8.1.1 "to make buildings accessible for persons with disabilities". In protective services buildings, a reasonable case can be made that in order to perform as a firefighter one must be able bodied, therefore much of building does not need to be accessible. This exception would not apply to areas such as the public areas, administration, EOC, emergency programs or anywhere where persons with disabilities may work. As suppression crew areas would fall under this exception, accessibility in the firehalls would only be required for areas accessed by the Public.
    - the Public reception is non existent and not required for this location.
    - the front entry does not have a handicapped door opener.
    - the entry itself would need to ensure that door widths and slopes in all cases meet accessible requirements.
    - there would need to be a handicapped accessible washroom available.

- Exiting requirements: BCBC 3.4.2.1 for an F3 classification: The floor area break downs are as follows:
        - Main Floor- Apparatus Bays/Operational = 165.90sm (2,1786sf)
        - Admin and Training = 55.79m (601sf)
    - a building which is unsprinklered, can have only one exit if the following two items have been met under the F3 classification:
        - The floor area is not greater than 200sm.
        - Travel distance to the exit is not greater than 15m
    - the main floor is not greater than 200sm as a result it only needs one exit as long as the travel distance requirements are met. There currently are two exits - one through the apparatus bays and the other through the front door. The travel distance from the farthest locations on the main floor just meets the travel distance requirements.
        - The exit in the apparatus bays meets the requirement as the max travel distance is 14.5m. The second exit through entry from the office area is well under 15m.
    - the upper floor administration / training areas of the hall:

- size of the floor plate: on this basis the exiting requirements have been met as there only needs to have one exit from the upper floor.
- the interior stair does meet exiting requirements from a travel distance perspective as one exit is permitted to exit through a lobby, however the stair is not enclosed at the top or the bottom, it creates an unrated vertical chase between floors which is a code deficiency.

- Sprinklers: under BCBC 3.2.2.83 sprinklers are not required. The building is permitted to be non sprinklered and constructed of both/either combustible and non-combustible construction.

- Washrooms: BCBC 3.1.17.1.
  - occupant load is calculated by area and type of building.
  - firehall occupant load for the updated building estimated at:
    - 103.81sm / 46 = 2.26 (apparatus bays)
    - 117.88 sm / 9.6 = 12.28 (living quarters)
  - total occupant load = /2 = 7.27 persons of each gender.
  - total Washrooms required by code (BCBC 3.7.2.2.C) = 1 fixture in total - 1 male and 1 female.
  - current Firehall has 1 fixtures in 1 individual washrooms - the existing washrooms are considered a single universal toilet and do not meet accessibility requirements.

E.2 environmental

The building code requirement under the 2012 British Columbia Building Code (BCBC) requires that the building meet new energy standards as outlined by ASHRAE 90.1 (2010) or NECB 2010. This requirement means that Architectural, Mechanical and Electrical components of new buildings must meet the environmental energy performance requirements as outlined in these standards. When identifying the gaps between existing and current best practices it needs to be recognized that this Firehall would **not** meet the current energy code requirements for following reasons. These building requirements are likely to increase with the acceptance of the new BCBC 2018 and the Energy Step Code.

1. Building Envelope: a high performance building envelope is to be designed to equal the R values as required by the BCBC and outlined below.
2. From review of the existing drawings only, it appears as if the building envelope has limited insulation in the walls and roof leaving the building exterior with low energy performance. As a result, the building would not likely meet the R-values as summarized below.
   - R Value definition: the capacity of an insulating material to resist heat flow. The higher the R-value, the greater the insulating power.
   - Each building material has an established insulating power and together the items which make up the roof, walls and floors must meet the following requirements as outlined be ASHREA 90.1 (2010).
   - Walls = R11.4 - R16.8 (varies with construction type)
   - Roofs = R20 + floors = R10 - R30 (varies with construction type)
   - Slab on Grade (Heated) R-15.

3. Electrical: The revised ASHRAE standards will require that the electrical systems be approximately 27% more efficient than the previous Code requirements. This includes lighting and power. The current Firehall would not meet this code requirement.

E.3 building content

The space program of the Firehall has been reviewed under **Section 3.0** of this Appendix and outlines existing spaces as well as those which are missing from a typical contemporary Firehall. This section is an initial evaluation of the content of the project from a building stand point. The following points are general to the overall building and apply for most scenarios.

- Apparatus Bays:
  - the bays are seisimically unstable and there is no hose tower. There have been no structural improvements since 1977 and to do so at this stage would be increasingly

- Security:
  - currently there are no doors located between the front entry and the remainder of the hall to help keep visitors from accessing the hall beyond the front entry without permission. There should be engineered controls for administrative safety and security and or a small weather / security vestibule which could address these concerns.
  - proximity readers have not been installed on the exterior doors to the hall. Access is currently though key access only.
  - HQ offices are directly accessible from the main entry where there is a low level or security between the Public interface and these spaces.

- Personnel Flow:
  - flow from the operation quarters on the main floor is reasonably acceptable from space to space as there is a general circular circulation path. However, the PPE gear is located beside the trucks which creates a conflict in flow as crews are getting dressed directly adjacent to the vehicles. This greatly limits the response time, a safety concern for moving vehicles and creates a dysfunctional flow between crews and vehicles.
  - the current NFPA 1710 + 1720 standards set separate benchmark times for Fire and EMS responses with the same compliance criteria for Turnout. Turnout time represents the elapsed time from the moment a call is dispatched, until the assigned Emergency Response Unit(s) is physically en route.
    - NFPA 1720 standard states:
      - 90% of all emergency responses to fire calls must turnout within 80 seconds or less.
      - 90% of all emergency responses to EMS calls must turnout within 60 seconds or less.
  - current firehall design standards would keep this access to PPE gear separate from any other rooms in order to provide an unimpeded route to the emergency vehicles improving response times.

- Equipment:
  - gear storage drying system, separate radio or rip/run area, AV training systems are all areas of deficiency from a contemporary typical firehall design.
  - fill station and compressor are provided within this hall but there should be an accompanying SCBA room and clean room separate from bays to complete the areas necessary for repairs or cleaning.
  - emergency genset is present but would need to be evaluated to assess how much of the building could be powered. Current best practice would be to power the entire building, minus any cooling systems for a minimum of 72 hours. This would require fuel storage to support this operation on site as well as the generator.

- Systems:
  - from an environmental perspective, low flow fixtures, LED lighting and a high efficiency mechanical system would be some of the usual areas where older buildings do not match current design and BCBC standards.
  - traffic preemption control is not existing.

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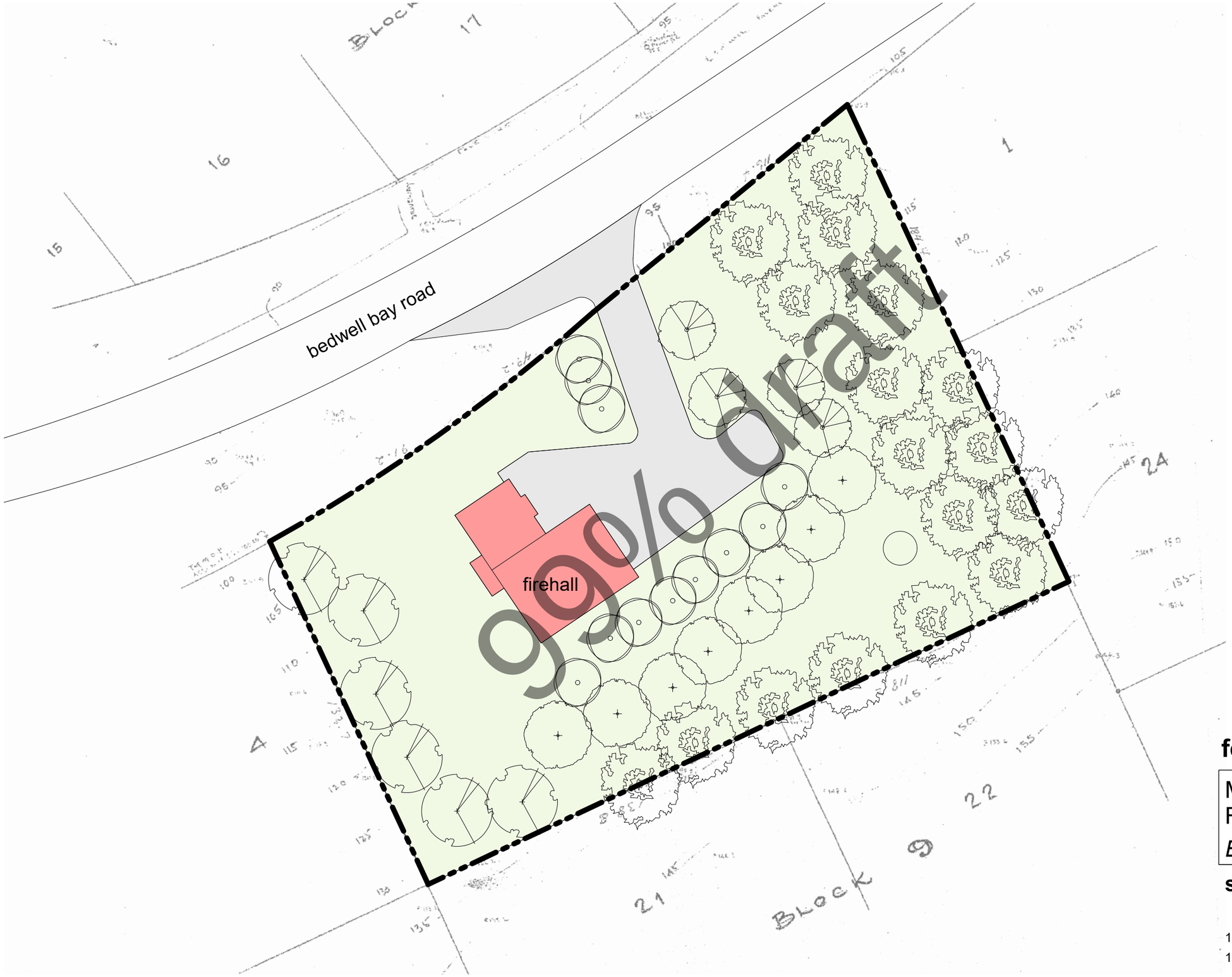
N
124° project north

feasibility study

Metro Vancouver
Regional District
Belcarra Firehall

aerial

1:500
18-sept-14



Johnston Davidson
ARCHITECTURE + PLANNING INC.

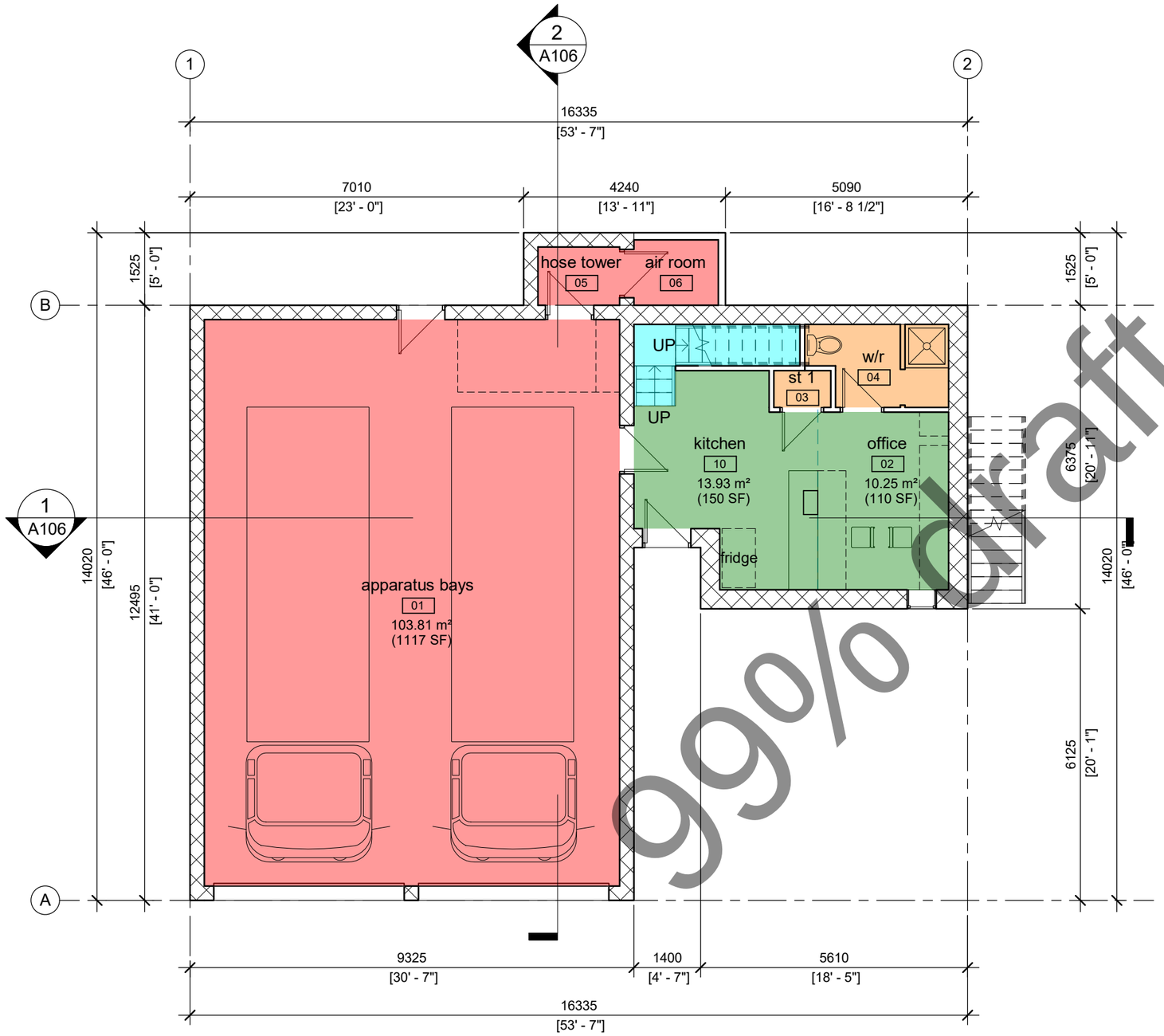
N
124° project north

feasibility study

Metro Vancouver
Regional District
Belcarra Firehall

site plan

1:400
18-sept-14



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AREA

main floor = 165.90 sm (1,786 sf)
upper floor = 55.79 sm (601 sf)
total floor area = 221.69 sm (2,386 sf)

space allocation legend

- operational
- admin
- crew quarters
- public spaces
- service spaces
- circulation

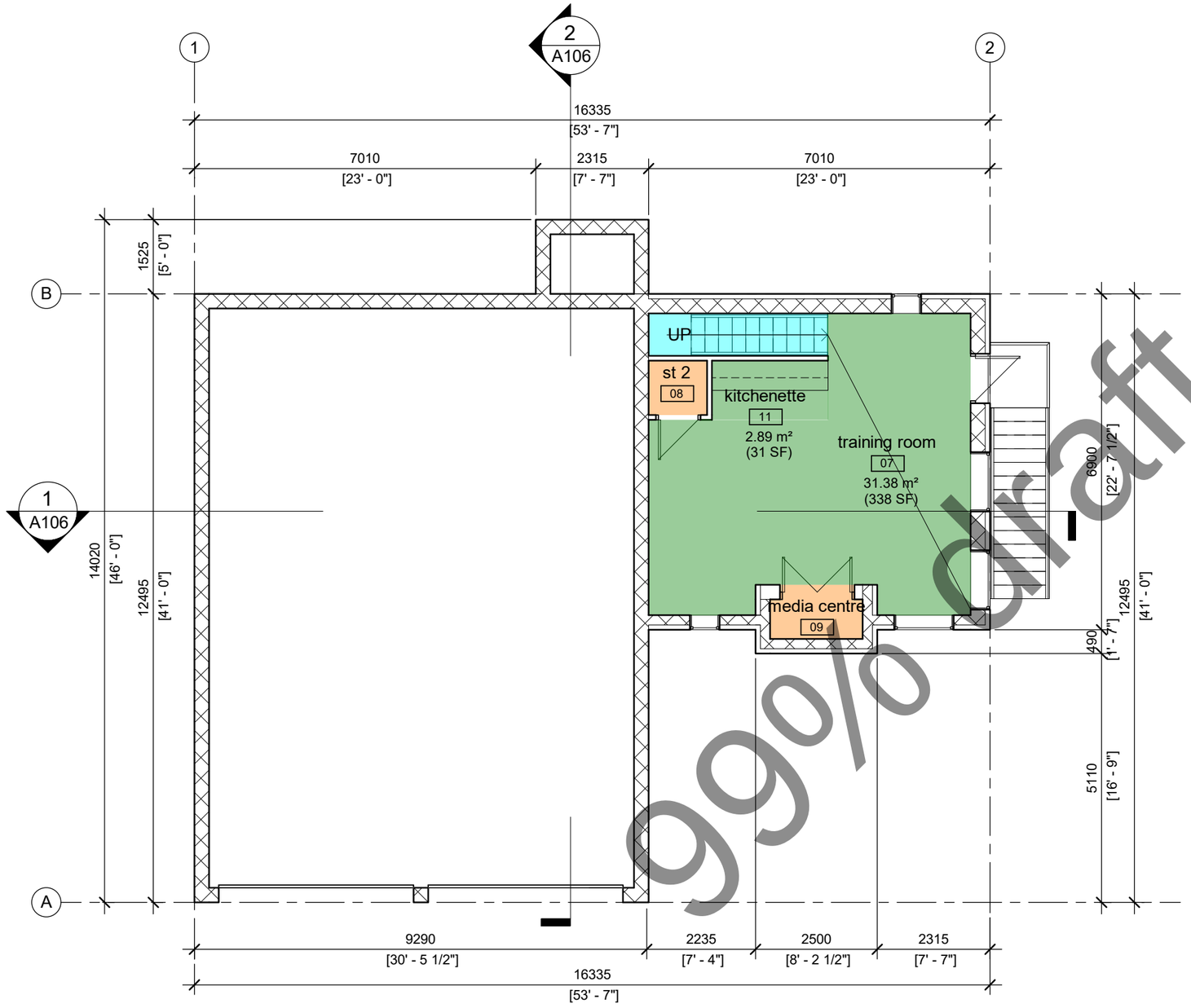
project north 124°

feasibility study

Metro Vancouver Regional District
Belcarra Firehall

main floor plan

1:100
18 - sept - 14



Johnston Davidson
ARCHITECTURE + PLANNING INC.

AREA

main floor = 165.90 sm (1,786 sf)
upper floor = 55.79 sm (601 sf)
total floor area = 221.69 sm (2,386 sf)

space allocation legend

- operational
- admin
- crew quarters
- public spaces
- service spaces
- circulation

project north 124°

feasibility study

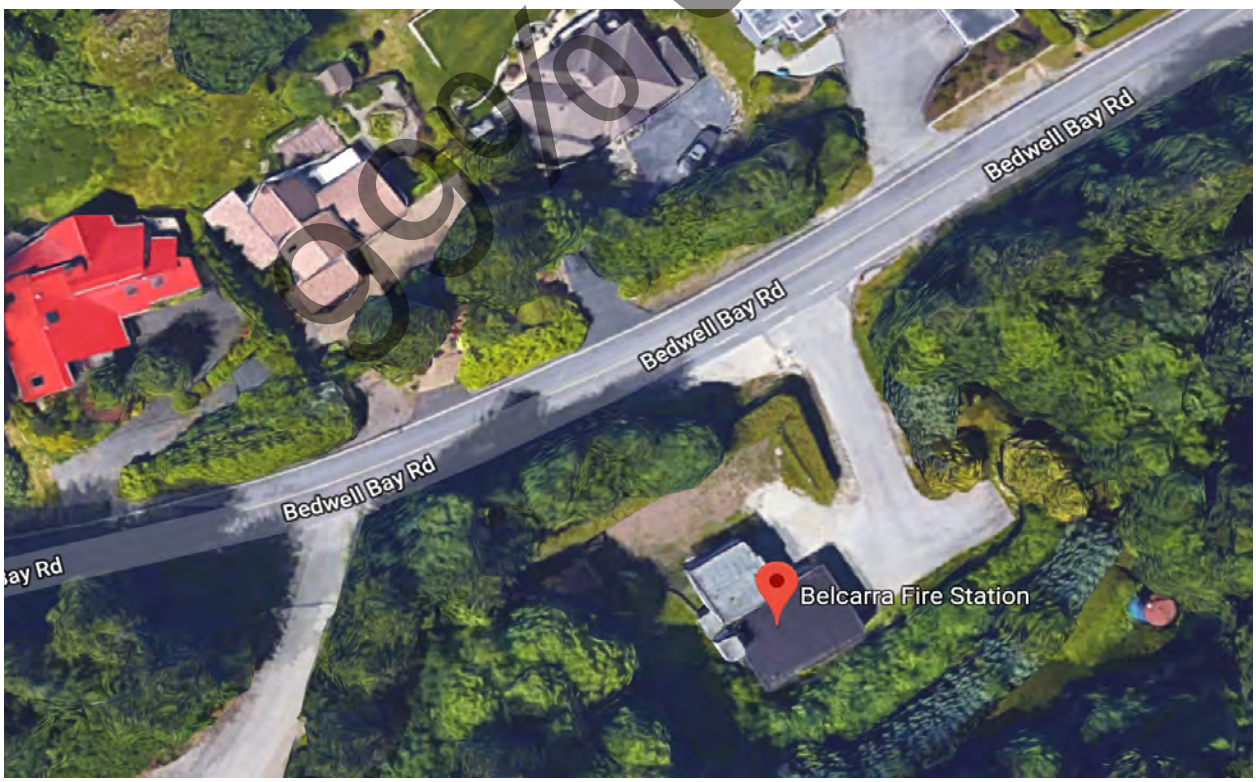
Metro Vancouver Regional District
Belcarra Firehall

second floor plan

1:100
18 - sept - 14

belcarra firehall **existing building photos**

Exterior view of the Belcarra Firehall facing southwest along Bedwell Bay Road. This Firehall was constructed in 1977 and consists of 2 apparatus bays.

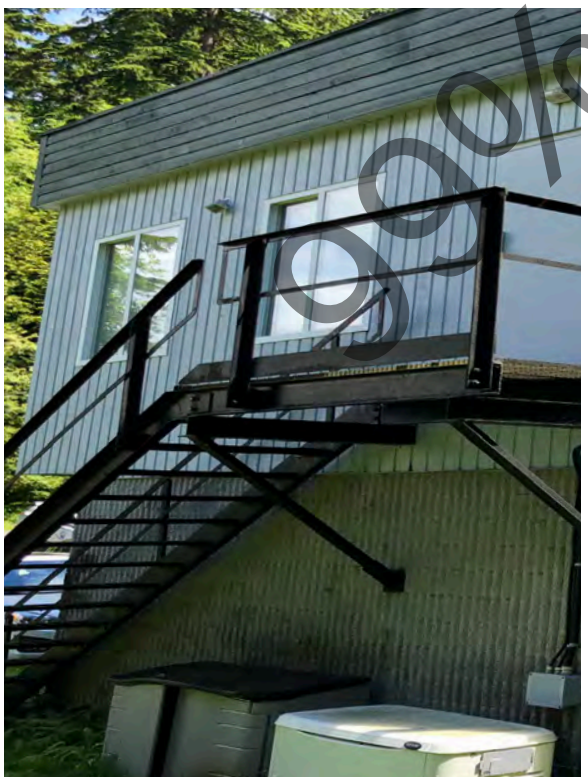


Aerial view of the Belcarra Firehall, fire trucks entering and exiting the premises encounter a sloped driveway from Bedwell Bay Road.

belcarra firehall **existing building photos**

Exterior of building has not been renovated since 1977.

Small training tower added in 1997 along with SCBA facilities.



Exterior metal stairs and entrance walkway.

Response equipment and storage space for memorabilia limited.

belcarra firehall **existing building photos**

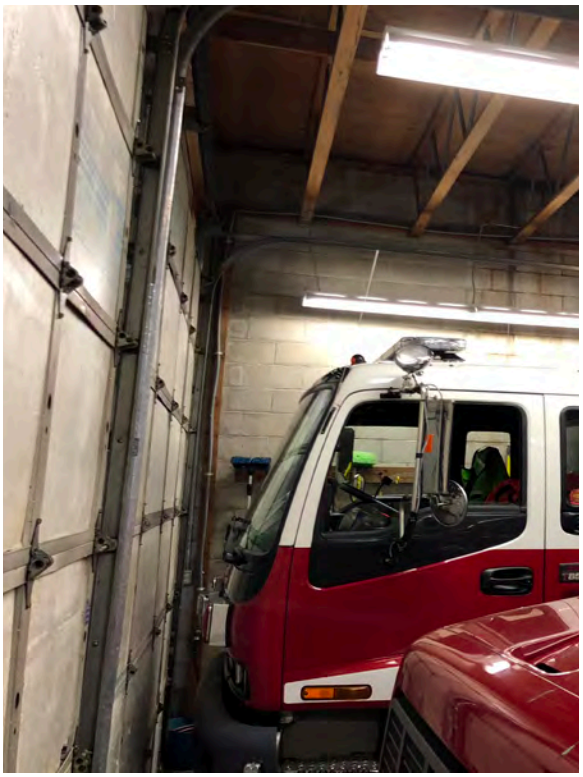
12’ apparatus bay doors with less than adequate space for fire trucks.

Sloped driveway with limited vision of traffic along Bedwell Bay Road - road approach at 8.3%

Firehall located against steep terrain with no retaining wall or slide protection.

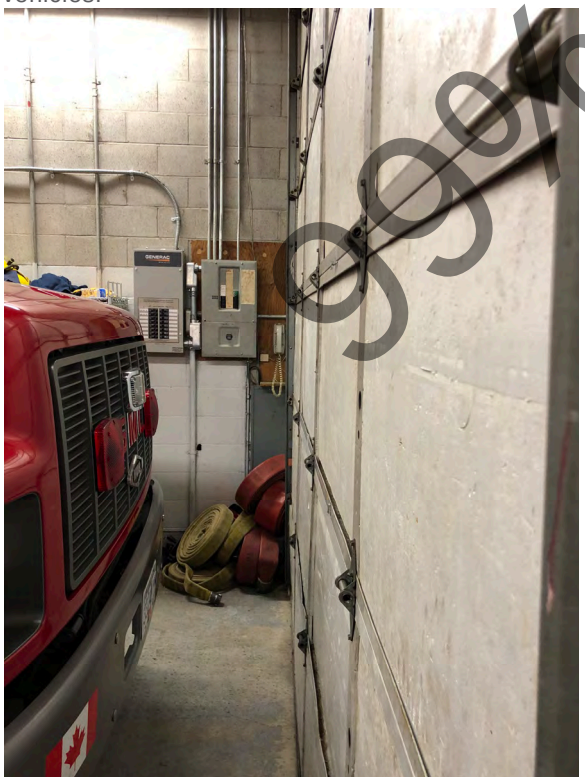
Steep slope and difficult turning radius for apparatus.

belcarra firehall **existing building photos**



Extremely narrow space between truck and apparatus doors - limiting crew flow to gear & vehicles.

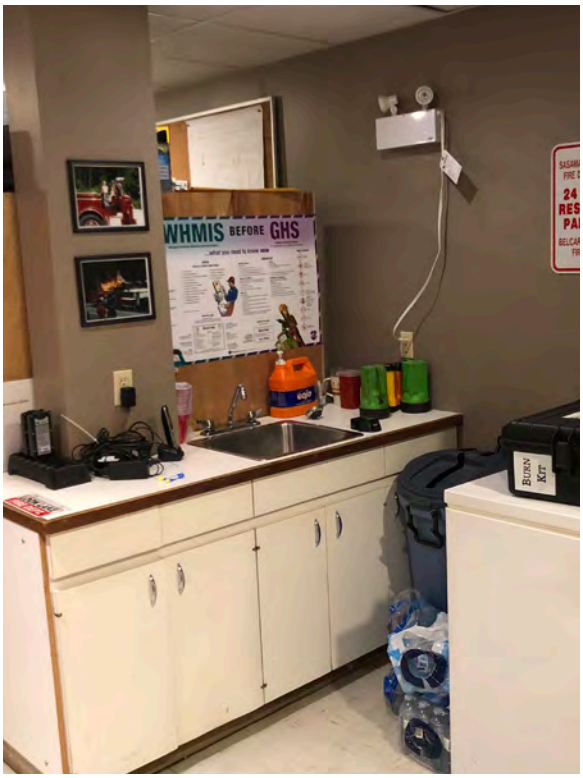
PPE hanging area is small for department size, also set to dry in apparatus bays and exposed to vehicle contaminants.



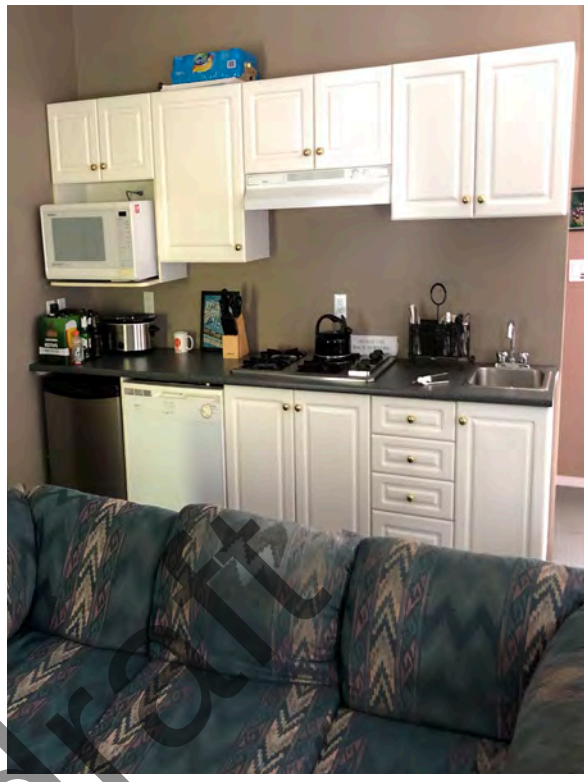
Circulation space around vehicles is inadequate and compromises personnel safety when trying to access vehicles quickly during an emergency.

PPE storage located with apparatus bays - limiting access to and around vehicles. this also places gear with the same space as the vehicles which exposes them to further contaminants once they have been cleaned and does not allow for them to dry effectively.

belcarra firehall **existing building photos**



Sink washing area limited and only located within the clean side of the hall.

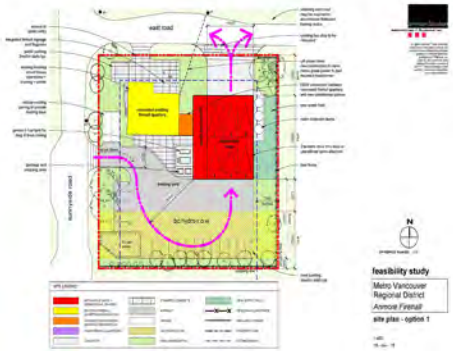


Day Room and kitchen within limited shared space.

Day Room and office area combined into a singular space.

Infrastructure is suffering from ongoing water ingress.

3.0 needs analysis - programming



3.0 needs analysis - program / facilities

All buildings are based on an initial architectural 'program' is a combination of client objectives and needs that the architect then interprets to create a feasible list or arrangement of spaces, ultimately becoming the pragmatic basis of the built structure.

A survey of the building programs for both buildings was conducted to primarily review function, size and relationship of spaces in order to establish whether the existing facilities are suitable to maintain effective fire and rescue services and meet current standards. In addition to evaluating the existing architectural programs, recommendations have been made to modify or add functional spaces to meet the current standards. In short, this report aims to identify the current needs of the SVFD as well those projected into the future. This is determined by staff interviews, industry standards and recommending programmatic spaces which not only typically required for modern firehalls but dictated by best practice methodologies, British Columbia building codes, and the National Fire Protection Association guidelines.

The following is a brief overview of the primary program for a replacement firehall for each site and is intended to lend context to the program scope. This hall focuses on providing suppression and rescue services and as such requires facilities which accommodate equipment and staff necessary to these functions. In addition, the building also needs to house supplementary suppression crew functions such as basic dorms, kitchen, day room, training and fitness for the crews. As a Headquarters hall, SVFD Anmore location needs to house a larger collection of functions, such as Administration, Training, and possible EOC.

Building Program:
The existing and proposed spatial program for both Belcarra and Anmore Firehalls has been compared in two key documents which have been organized into a matrix type chart for ease of use.

1. Proposed Space Program Chart
   (A full list of proposed programmatic spaces with associates area sizes in square metres and square feet).

2. Programming Spatial Diagram
   (Graphic representation of the space program and a comparison with the existing).

The first of these two documents compares the spatial program of the current hall and types of spaces with that of current and future needs of the Department. The second document compares these spaces graphically for an easy visual comparison.

Upon completion of the programming needs analysis, the next stage of the report tested the program on the existing sites - to examine if the new space program could fit in a variety of configurations to help provide the tools to move forward into the future. The report at this point examines the pros and cons of these siting options in **Section 4.0**.

A. Current Industry Standards

The current halls do not meet best practice industry standards in terms of flow, decontamination, security and building code. The SVFD has made the best of the situation; however, as technology, equipment and training needs of the Fire Services changes so do the requirements for facilities which house them. This issue pertains to those spaces which are considered to be standard practice for today's fire fighter.

Some examples are as follows:

- Fire fighters are exposed to micro carcinogenic particles during an event which need to be kept from contaminating other equipment or being dragged into the clean portions of the hall.

- Decontamination Washroom: a washroom should be positioned directly off the apparatus bays, or directly off a vestibule adjacent to the apparatus bays, to allow for the fire fighters to perform a first stage decontamination when returning from a fire. This room allows them to shower and bag their soiled uniforms before entering the remainder of the hall which limits the spread of contaminants which are potentially harmful.
    - Currently the existing hall does not have a decontamination washroom.

- Personal Protective Gear (Turnout Gear) is required to be worn by firefighters to every emergency. Currently the firehall has PPE Gear stored in the apparatus bays which is not ideal - a dedicated room should have the following considerations:
    - PPE is exposed to vehicle exhaust, grease, oil, fuel and other similar pollutants.
    - Cleaned and ready-to-wear PPE Gear which is stored in the apparatus bays are exposed to contaminants from other dirty gear + equipment. By storing this equipment located in a separate room meets today's standards.
    - There should be provisions for an on site official gear washer to ensure that gear is able to be cleaned to limit the spread and exposure of contaminants.
        - this is available in the FH currently but located on the clean side the hall.
    - A separate room for PPE also allows for the gear to dry effectively and in a timely manner; if located in a large, open space such as the bays, slow drying can deteriorates it over time and requires the storage of additional gear incase there is another call before the gear is dry.
    - The gear clutters the apparatus bays making quick access to vehicles slower and works against NFPA 1710 + 1720 standards.
    - Current industry standards dictate a dedicated and environmentally controlled room, designed to store and dry PPE Gear is required for a new firehall.

- SCBA room: industry standards for Firehall design requires a SCBA room which is limited to this function only. The SCBA area houses the filling station and usually located adjacent to the SCBA compressor to maintain the breathing apparatus and masks essential to fighting fires. This equipment should be washed, dried and maintained in a clean environment as this equipment plays a crucial role in protection of fire fighters in the field.
    - Currently the Belcarra Hall has a dedicated SCBA room for filling but not for cleaning. The Anmore Firehall has no dedicated SCBA cleaning facilities. Currently the compressor and filling station are located within a couple of rooms at the Belcarra site. The compressor should be located in its own room due to the noise and impact on crews when they would be working in the room.

- NFPA 1500 specifies the minimum requirements for an occupational safety and health program for fire departments or organizations that provide rescue, fire suppression, emergency medical services, hazardous materials mitigation, special operations, and other emergency services.

- WorkSafe BC has recognized 10 presumptive cancers associated with Firefighting. Under the Workers Compensation Act of BC, when a firefighter who was regularly exposed to the hazards of a fire scene contracts a prescribed occupational disease, the disease must be presumed to be due to the nature of the worker's employment as a firefighter. The Firefighters' Occupational Disease Regulation lists the following ten cancers as prescribed occupational diseases that are causally related to the occupation of firefighting:

    1. Primary leukemia
    2. Primary non-Hodgkin's lymphoma
    3. Primary site bladder cancer
    4. Primary site brain cancer
    5. Primary site colorectal cancer
    6. Primary site kidney cancer
    7. Primary site lung cancer
    8. Primary site testicular cancer
    9. Primary site ureter cancer
    10. Primary site esophageal cancer

- Provision of current industry standard Decontamination Washrooms, PPE Gear Washing and Storage Rooms and SCBA Rooms are required to comply with current the NFPA 1500 Standard and assist with the mitigation of presumptive cancers associated with firefighting.

B. Gender Neutrality or Inclusivity

The fire department "family" is a much different entity in 2019 compared to when the current firehalls were built 39 years ago. In the 1970's, departments were primarily made-up of male dominated crews who would work and live together in the firehall. Dorms and washrooms were designed in an open style, with beds or cots all contained within one large room and male only washrooms with gang-type shower facilities.

- As this hall was designed not to accommodate crew quarters, these facilities are relatively limited. The building was designed with limited washroom facilities which were focused on serving one gender and with limited privacy, as well as no separate locker areas.

Over the years, women firefighters on suppression crews have become more and more prevalent. In addition, privacy is equally important regardless of gender so the old days of group changing areas and washrooms are being quickly phased out.

The general approach today dictates that all Fire Department members be treated equally and with dignity. The simple fact before us is that the current buildings do not have enough or appropriate accommodations to address crew changes now or into the future. There is a need to provide the opportunity to accommodate women, men and transgender crew members under one roof as a unified team. These issues have a level complexity which flows between encouraging camaraderie, personal privacy, and cost. The SVFD has established a policy to address these issues first hand with the current layout of the hall, but due to lack of available space, this is clearly a deficiency which needs to be addressed with the next reiteration of facility.

C. Specialized Programmatic Needs

As the nature of the fire services has evolved, so has the scope of work for the firefighter. Additional services, such as Medical Response, Motor Vehicle Accidents, Search and Rescue and Hazardous Materials handling have firefighters expanding their skill sets well beyond the suppression of a traditional structure fire. Current training needs, both classroom and physical, require adequate classroom facilities with modern teaching aids. Physical training requires an outdoor yard with life-size props to simulate real life scenarios, which can also test and certify specific apparatus equipment. In addition to maintaining the training and certification levels of firefighters, specialized facilities are required to respond to current industry standards for PPE Gear Washing and Storage, SCBA and Mask Repair and Fleet Maintenance to keep moving the SVFD into the future.

- The establishment of training facilities and associated interior spaces at the Firehall is a necessary step to maintain required training and certification levels for the firefighters. A large, dedicated classroom-style training room(s) is necessary to allow for the frequency of training and expanded skill set requirements for today's firefighter. The classroom should be located with exterior access to the training yard and possess modern teaching aids and technology.
    - This space can be used effectively as the EOC space to create a multifunctional use of the training rooms.

- PPE Gear Washing and Storage Room will allow the SVFD to wash and maintain their own gear on site within a decontamination room on the dirty side of the hall, which reduces costs and provides quality control in order to meet current industry and NFPA standards. A dedicated Gear Storage Room will also allow the Service to meet current industry and NFPA standards for decontamination and preservation of PPE Gear.

- Specialized Suppression Crew Teams needs to have the ability for specialized training, storage of purpose-built vehicles and props.

- Emergency Operation Centre: The firehall is often one of the only post disaster buildings in a community which make it ideal to serve as the community's EOC. The intention for the Anmore Firehall could be to design the training rooms so that they are easily adaptable to become and EOC for what every Emergency arrises. This would include the ability to quickly set up in EOC mode and flexibility within the rooms to handle multiple desking situations. In addition, associated storage room would be provided within the near vicinity of the main EOC rooms.

anmore firehall

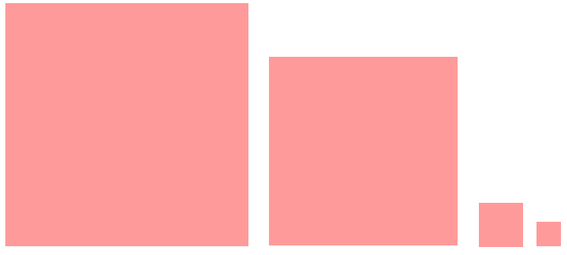
Space Program			EXISTING	EXISTING		PROPOSED	PROPOSED	
						AREA	*NET AREA*	
ITEM			SF	SM		SF	SM	
		PUBLIC AREAS						
1		VESTIBULE	0.00	0.00		53.80	5.00	
2		FRONT ENTRY	0.00	0.00		161.40	15.00	
3		PUBLIC WASHROOM (H/C	0.00	0.00		48.42	4.50	
		Sub Total	**0.00**	**0.00**		**263.62**	**24.50**	
		FH - ADMINISTRATION						
4		Office	154.19	14.33		161.40	15.00	
5		Storage 1	47.88	4.45		107.60	10.00	
6		Washroom w/ shower	49.82	4.63		43.04	4.00	No shower. Move shower into the Decon Washroom.
7		Training Room (30 members)	559.95	52.04		753.20	70.00	
8		Kitchen + Dining Room	399.20	37.10		408.88	38.00	
9		Staff Washroom 2	27.98	2.60		32.28	3.00	
10		Training Storage 1	14.90	1.39		107.60	10.00	
11		Training Storage 2	32.71	3.04		0.00	0.00	
12		Storage 3	21.09	1.96		0.00	0.00	
13		COPY ROOM + STORAGE	0.00	0.00		107.60	10.00	
14		GENERAL OFFICE	0.00	0.00		129.12	12.00	
		Sub Total	**1307.72**	**121.54**		**1850.72**	**172.00**	
		FH - OPERATIONAL AREAS						
15		Dispatch / Rip & Run / Radio Rm	0.00	0.00		64.56	6.00	EXIST: Included in office area
16		SCBA Storage	9.93	0.92		53.80	5.00	Cylinder storage but no clean room required.
17		Apparatus Bays 1 (single bays)	1,117.00	103.81		0.00	0.00	
		2 bays @ 12.5m(41')L x 4.5m(29.5') W						
18		Apparatus Bay 2 (single)	667.12	62.00		0.00	0.00	
		1 bay @ 8.95m(29.5')L x 5.6m(18.3') W						
19		Hose Tower	35.51	3.30		0.00	0.00	NEW - Hose tower required?
20		NEW APPARATUS BAY (tandem)	0.00	0.00		4,411.60	410.00	Inside clear dimensions
		1 bay @ 25m (82'L) x 5.2m (18')						
		2 bays @ 25m (82'L) x 5.6m (18')						
21		UTILITY ROOM + GEAR WASHER	0.00	0.00		107.60	10.00	NEW: Dirty Utility
22		GEAR STORAGE ROOM (40 units)	0.00	0.00		538.00	50.00	EXIST: Gear Storage is currently in the apparatus bays.
23		DECON W/R with SHOWER	0.00	0.00		80.70	7.50	
24		SECURE STORAGE	0.00	0.00		161.40	15.00	NEW: Storage which can be regulated for secure items.
25		FIRST AID STORAGE	0.00	0.00		21.52	2.00	Closet for First Aid Storage
26		HOSE STORAGE	0.00	0.00		129.12	12.00	EXIST: currently in the apparatus bays.
27		WORKSHOP	0.00	0.00		107.60	10.00	EXIST: located in apparatus bays.
28		EMERGENCY PROGRAM STORAGE	0.00	0.00		107.60	10.00	EXIST: located in apparatus bays.
29		HAM RADIO	0.00	0.00		0.00	0.00	
30		BIKE STORAGE	0.00	0.00		0.00	0.00	
31		INFRARED DETOX	0.00	0.00		0.00	0.00	
32		FIRE POLE	0.00	0.00		0.00	0.00	
		Sub Total	**1829.56**	**170.03**		**5783.50**	**537.50**	
		FH - QUARTERS						
33		EXERCISE ROOM	0.00	0.00		398.12	37.00	
34		LAUNDRY	0.00	0.00		161.40	15.00	Crew Laundry non gear laundry

anmore firehall									
Space Program				**EXISTING**	**EXISTING**		**PROPOSED**	**PROPOSED**	
							AREA	***NET AREA***	
ITEM				**SF**	**SM**		**SF**	**SM**	
35			LOCKERS (20 units)	0.00	0.00		215.20	20.00	Could be half size lockers but a place for staff to put their personal items.
36			JANITOR'S CLOSET	0.00	0.00		53.80	5.00	Clean Janitor's Room
			Sub Total	**0.00**	**0.00**		**828.52**	**77.00**	
			CIRCULATION						
37			Existing Corridor + Stair	365.84	34.00		0.00	0.00	NEW: Noted below in mark-up
38			NEW STAIR or STAIRS	0.00	0.00		344.32	32.00	
			Sub Total	**365.84**	**34.00**		**344.32**	**32.00**	
			SERVICE SPACES						
39			ELECTRICAL ROOM	0.00	0.00		107.60	10.00	
40			MECHANICAL ROOM	0.00	0.00		107.60	10.00	
41			VALVE ROOM	0.00	0.00		32.28	3.00	
42			BACK UP SERVER RM	0.00	0.00		0.00	0.00	
43			IT CLOSET	0.00	0.00		0.00	0.00	
			Sub Total	**0.00**	**0.00**		**247.48**	**23.00**	
			Building Total (Pre Mark-up) sm	**3,503.11**	**325.57**		**9,318.16**	**866.00**	
			Mark-up 1	715.83	68.74		1,863.63	173.20	Mark-up for EXIST = 31% NEW = 20%
			Mark-up 2	0.00	0.00		465.91	0.00	
			TOTAL FIREHALL	**4,218.95**	**394.31**		**11,647.70**	**1,039.20**	

existing

public spaces = none

administration



operational

crew quarters = none

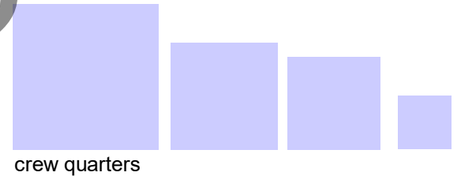
circulation

proposed

public spaces

administration

operational



crew quarters

circulation

service spaces

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feasibility study

Metro Vancouver
Regional District

Anmore Firehall

programmatic diagram

1:250

18 - sept - 14

belcarra firehall									
Space Program			**EXISTING**	**EXISTING**		**PROPOSED**	**PROPOSED**	
						AREA	***NET AREA***	
ITEM			**SF**	**SM**		**SF**	**SM**	
		PUBLIC AREAS						
1		VESTIBULE	0.00	0.00		53.80	5.00	
2		FRONT ENTRY	0.00	0.00		0.00	0.00	
3		PUBLIC WASHROOM (H/C	0.00	0.00		0.00	0.00	
		Sub Total	**0.00**	**0.00**		**53.80**	**5.00**	
		FH - ADMINISTRATION						
4		Office	110.29	10.25		161.40	15.00	
5		Washroom w/ shower	49.82	4.63		43.04	4.00	No shower. Move shower into the Decon Washroom.
6		Storage 1	10.76	1.00		53.80	5.00	
7		Kitchen	149.89	13.93		322.80	30.00	NEW : ADD small dining area
8		Day Room	337.65	31.38		322.80	30.00	
9		Kitchenette	31.10	2.89		0.00	0.00	
10		Storage 2	16.14	1.50		0.00	0.00	
11		Media Center	16.61	1.54		0.00	0.00	
12		STAFF WASHROOM 2	27.98	2.60		32.28	3.00	
13		COPY ROOM + STORAGE	0.00	0.00		0.00	0.00	Locate in office
14		GENERAL OFFICE	0.00	0.00		0.00	0.00	
		Sub Total	**750.23**	**69.72**		**936.12**	**87.00**	
		FH - OPERATIONAL AREAS						
15		Dispatch / Rip & Run / Radio Rm	0.00	0.00		64.56	6.00	EXIST: Included in office area
16		SCBA	26.15	2.43		107.60	10.00	Cylinder storage but no clean room required.
17		Apparatus Bays 1 (single bays)	1,117.00	103.81		0.00	0.00	
		2 bays @ 12.5m(41')L x 4.5m(29.5') W						
19		Hose Tower	21.52	2.00		0.00	0.00	No Hose Tower Required.
20		APPARATUS BAY	0.00	0.00		2,474.80	230.00	Inside clear dimensions
		2 bays @ 12.5m (41'L) x 5.6m (18')						
		1 bay @ 15.5m (50') x 5.6m (18')						
20		UTILITY ROOM + GEAR WASHER	0.00	0.00		107.60	10.00	Gear Washer
21		GEAR STORAGE ROOM (25 units)	0.00	0.00		269.00	25.00	EXIST: Gear Storage is currently in the apparatus bays.
22		DECON W/R with SHOWER	0.00	0.00		80.70	7.50	
24		SECURE STORAGE	0.00	0.00		161.40	15.00	Storage which can be regulated for secure items.
26		FIRST AID STORAGE	0.00	0.00		21.52	2.00	Closet for First Aid Storage
27		HOSE STORAGE	0.00	0.00		129.12	12.00	EXIST: currently in the apparatus bays.
28		WORKSHOP	0.00	0.00		107.60	10.00	EXIST: located in apparatus bays.
29		EMERGENCY PROGRAM STORAGE	0.00	0.00		107.60	10.00	EXIST: located in apparatus bays.
29		HAM RADIO	0.00	0.00		0.00	0.00	
30		BIKE STORAGE	0.00	0.00		0.00	0.00	
31		INFRARED DETOX	0.00	0.00		0.00	0.00	
32		FIRE POLE	0.00	0.00		0.00	0.00	
		Sub Total	**1164.66**	**108.24**		**3631.50**	**337.50**	
		FH - QUARTERS						
34		EXERCISE ROOM	0.00	0.00		430.40	40.00	EXIST: located in apparatus bays.
35		LAUNDRY	0.00	0.00		161.40	15.00	Crew Laundry non gear laundry
36		LOCKERS (PERSONAL)	0.00	0.00		161.40	15.00	Could be half size lockers but a place for staff to put their personal items.

belcarra firehall									
Space Program				**EXISTING**	**EXISTING**		**PROPOSED**	**PROPOSED**	
							AREA	***NET AREA***	
ITEM				**SF**	**SM**		**SF**	**SM**	
37			JANITOR'S CLOSET	0.00	0.00		53.80	5.00	Clean Janitor's Room
			Sub Total	**0.00**	**0.00**		**807.00**	**75.00**	
			CIRCULATION						
38			Existing Corridor + Stair	277.18	25.76		0.00	0.00	NEW: Noted below in mark-up
39			NEW STAIR or STAIRS	0.00	0.00		215.20	20.00	
			Sub Total	**277.18**	**25.76**		**215.20**	**20.00**	
			SERVICE SPACES						
40			ELECTRICAL ROOM	0.00	0.00		107.60	10.00	
41			MECHANICAL ROOM	0.00	0.00		107.60	10.00	
42			VALVE ROOM	0.00	0.00		32.28	3.00	
43			BACK UP SERVER RM	0.00	0.00		0.00	0.00	
44			IT CLOSET	0.00	0.00		0.00	0.00	
			Sub Total	**0.00**	**0.00**		**247.48**	**23.00**	
			Building Total (Pre Mark-up) sm	**2,192.07**	**203.72**		**5,891.10**	**547.50**	
			Mark-up 20%	193.51	17.98		1,178.22	109.50	
			Mark-up 10%	0.00	0.00		294.56	0.00	
			TOTAL FIREHALL	**2,385.58**	**221.71**		**7,363.88**	**657.00**	

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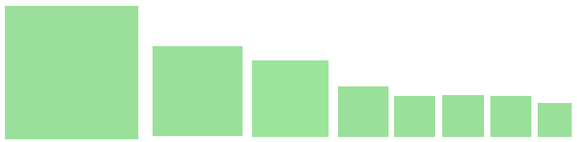
existing

public spaces = none



administration

operational

crew quarters = none

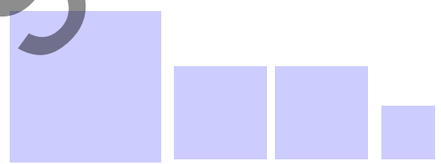
circulation

proposed

public spaces

administration

operational



crew quarters

circulation

service spaces

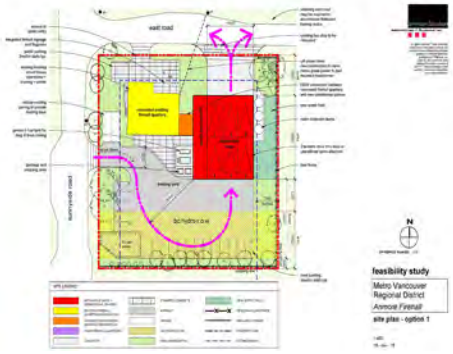
feasibility study

Metro Vancouver
Regional District
Belcarra Firehall

programmtic diagram

1:250
18 - sept - 14

4.0 siting options



1. fit tests

The siting studies for the Anmore Firehall began with the development of an elementary site analyses, defining general site characteristics, context influences and zoning impacts. As part of this report, the existing firehall site was examined to assess the feasibility of a variety of redevelopment options with the goal of all site development to use the existing site to the best possible advantage. In this case, the existing site has a number of challenges such as site shape, size, topography and the location of the existing building which impact the possible options.

Preliminary siting studies were completed by positioning the total space program onto the site and examining the positives / negatives for each option. Each study examined the possible orientation of the firehall on the site, potential for Public interface, the optimal layout for the apparatus bays, and the overall functionality for the Sasamat Voluntary Fire Department.

Upon completion of an initial site analysis of the existing site, the number of siting options were narrowed down to 4 potential development strategies. All associated drawings are at the end of this section.

general layout comments

The four siting options shown after this section will outline high level layouts for further discussion. The following is a list of concerns which need to be addressed for all options.

- One of the main objectives in siting the firehall is to position the apparatus bays as perpendicular to the road as possible so that the wear and tear on the vehicles is not extensive upon exiting – all layouts shown are based on this premise.
- programmatic zoning of the site in all layouts: current industry standards in a volunteer department for a separation of the vehicular traffic between the general public, exiting emergency vehicles and P.O.C staff. This is especially crucial as these groups converge on the Firehall, as emergency vehicles leave to address emergent events. Keeping these zones separate is key in protecting the safety of the surrounding public and the firefighters.
- The depth and the width of the ideal site are crucial in understanding optimum site selection. The minimum depth of the ideal site should be 60m and minimum width approximately 62-65m to accommodate the apparatus bays, return road, fire truck turning radii, and the firehall portion of the space program. This will ensure that the fire fighters have the room they need for training, completion of their regular duties and that site development will not create additional cost or maintenance over time.
- The ability to keep the existing firehall operational while the new building is being constructed was a key consideration in the overall approach to the new project and thus affects possible development for the new apparatus bays in particular.
- Traffic control as needed will be addressed in the next phases of the project where needed.

2. existing site summary

The existing site is located at the civic address of 2690 Anmore, BC. and measures approximately 1.0 acre (4,040sm), in overall size. The site a reasonable size by industry standards for a volunteer firehall, accommodating 25 volunteer firefighters. The the location of the site at the intersection of East Road and Sunnyside Road supports both a separate entry and exit route lending itself to the design of a firehall with drive-through bays even though there are elevation changes that could effect the vehicle access from Sunnyside Road. This is identified further in both the typical bay layout and the site analysis included at the end of this section.

The site grades rise to the south and there is a 15m BC Hydro R.O.W across the entire south end of the property which limits the south end of the site development to non building elements and functions. Future development should also ensure vehicle access is located to accommodate the rising grade along Sunnyside Road as it is preferred that the redeveloped site should have minimal slope and grade changes if possible as emergency vehicle exiting should try to be kept to a maximum of 5% slope. Set backs on the property are 7.5m on all sides except the south which is effected by the hydro R.O.W.

a. general pros / cons for all options

These pros and cons are common to all layouts as they relate to the the challenges with this particular site.

pros:

- Having a corner site is extremely advantageous as it permits the SVFD to use the adjacent streets as return access to the site which means that there is less drive aisle access required on site.

cons:

- Site size provides dimensions which are less than the ideal which creates a bit of a short fall in the apron area on the property; however, with the additional space between the property line and the edge of the road this should not be a huge effort.
- The 15m BC Hydro R.O.W. running the entire width of the south end of the property limits development as no building or parts of building can be erected within this right-of-way.
- Most options place paved spaces below the Hydro ROW which may require approval moving forward in the design process.

b. site plan - option 1

This option examines the possibility of renovating the existing firehall and adding new apparatus bays and operational spine. It would be possible to keep the existing firehall operational during construction, if phasing construction was carefully considered as part of the documents moving forward. The premise in this layout is to design new post disaster apparatus bays and operational spaces essential to the operation of the firehall to meet all current industry standards.

pros:

- Allows for the existing hall to remain operational during construction.
- Operational spine (gear storage, radio room, SCBA, workshop, utility etc.) are able to be located fairly adjacent to the crew parking providing quick access from the parking area to the key spaces for deployment.
- Uses an existing asset to the best advantage possible. it is proposed that the existing building would be used for non emergency functions with an upgrade to renovate the existing building to meet exiting, fire separations and washrooms code requirements but not to meet current post disaster standards.
- The Public does not use the same drive aisle as returning Emergency vehicles to access the site.

cons:

- The front apron was only able to be 12m in depth maximum in order to have enough room at the rear of the site to accommodate drive through bays. This overall dimension is measured to the property line, with approximately an additional 3m to the edge of the road, creating an overall length of 15m which is a good depth for the emergency vehicles to safely leave the building.
- Crews use the same drive aisle as returning emergency vehicles to access the training area and crew parking.
- The entire building will not meet the post disaster requirements as outlined by BCBC which could have an effect in the future if full time crew quarters were to be implemented in to the existing building.

c. site plan - option 2

This option examines the possibility renovating the existing firehall and providing drive-through apparatus bays in a single, side by side layout (not tandem). The footprint of the new building in this option would be smaller than in option 1 as the apparatus bays only contain space for 5 vehicles due to the width of the site only 5 bays could be positioned on site. In this option, because the bays use the majority of the width of the site, the firehall operations, training and administrative areas would have to be located in the existing hall.

pros:

- Operationally the site will be used in a similar fashion to Site Option 1 in that emergency vehicle entry will be from Sunnyside Road and exiting onto East Road.
- There is enough room for a 14m apron on site which provides more depth for a safer approach for emergency vehicles exiting the bays.
- Uses an existing asset to the best advantage possible. it is proposed that the existing building would be used for non emergency functions with an upgrade to renovate the existing building to meet exiting, fire separations and washrooms code requirements but not to meet current post disaster standards.
- Separation of public and crew entries which avoids conflict between exiting emergency vehicles and incoming crew members.
- Places the generator and fueling system close to the building which is cost effective.
- Good size training yard.

cons:

- Operational spine (gear storage, radio room, SCBA, workshop, utility etc.) would need to be located within the existing building which does not allow for them to be located within the new post disaster building and thus would not meet current building code.
- There is only room for 5 apparatus bays due to the width of the site. This reduces functionality and limits access for the future.
- The entire building will not meet the post disaster requirements as outlined by BCBC which could have an effect in the future if full time crew quarters were to be implemented in to the existing building.
- The project will require phasing to accommodate the continued operation of the facility. This will lengthen the time of construction.
- The 15m BC Hydro R.O.W. running the entire width of the south end of the property limits development as no building or parts of building can be erected within this right-of-way.
- Crews use the same drive aisle as returning emergency vehicles to access the training area and crew parking.

d. site plan - option 3

This option examines the possibility of demolishing the existing firehall and providing an entirely new single story facility with tandem drive-through apparatus bays. The footprint of the new building in this option be would be larger then Site Option 1 or 2 as the firehall operations, training and administration areas would all be contained in

a single storey. The premise in this layout is to design a new post disaster building which contains all functions related to a volunteer firehall.

pros:

- Operationally the site will be used in a similar fashion to Site Option 1 in that emergency vehicle entry will be from Sunnyside Road and exiting onto East Road.
- Operational spine (gear storage, radio room, SCBA, workshop, utility etc.)would be located within the new post disaster building.
- The entire project is located within a post disaster building designed to meet 2018 BCBC.
- Apparatus bay portion of building is sized to accommodate 6 emergency vehicles.
- Good size training yard

cons:

- The project will require demolition of the existing hall in its entirety. This means that the firehall will need to temporarily be relocated while the new hall is under construction or construction would need to be phased.
- This option is most expensive of the 4 presented.
- Apron at Apparatus Bays leading to East Road has been reduced to 12m + 3m approximately to the edge of the road. Longer emergency vehicles may extend beyond property line and onto sidewalk when fully outside of Apparatus Bays.
- Large single storey footprint which uses more of the overall site create more roof, and foundations.
- Limited access to public parking off of East Road due to the change in grade would require retaining walls in this location.

e. site plan - option 4

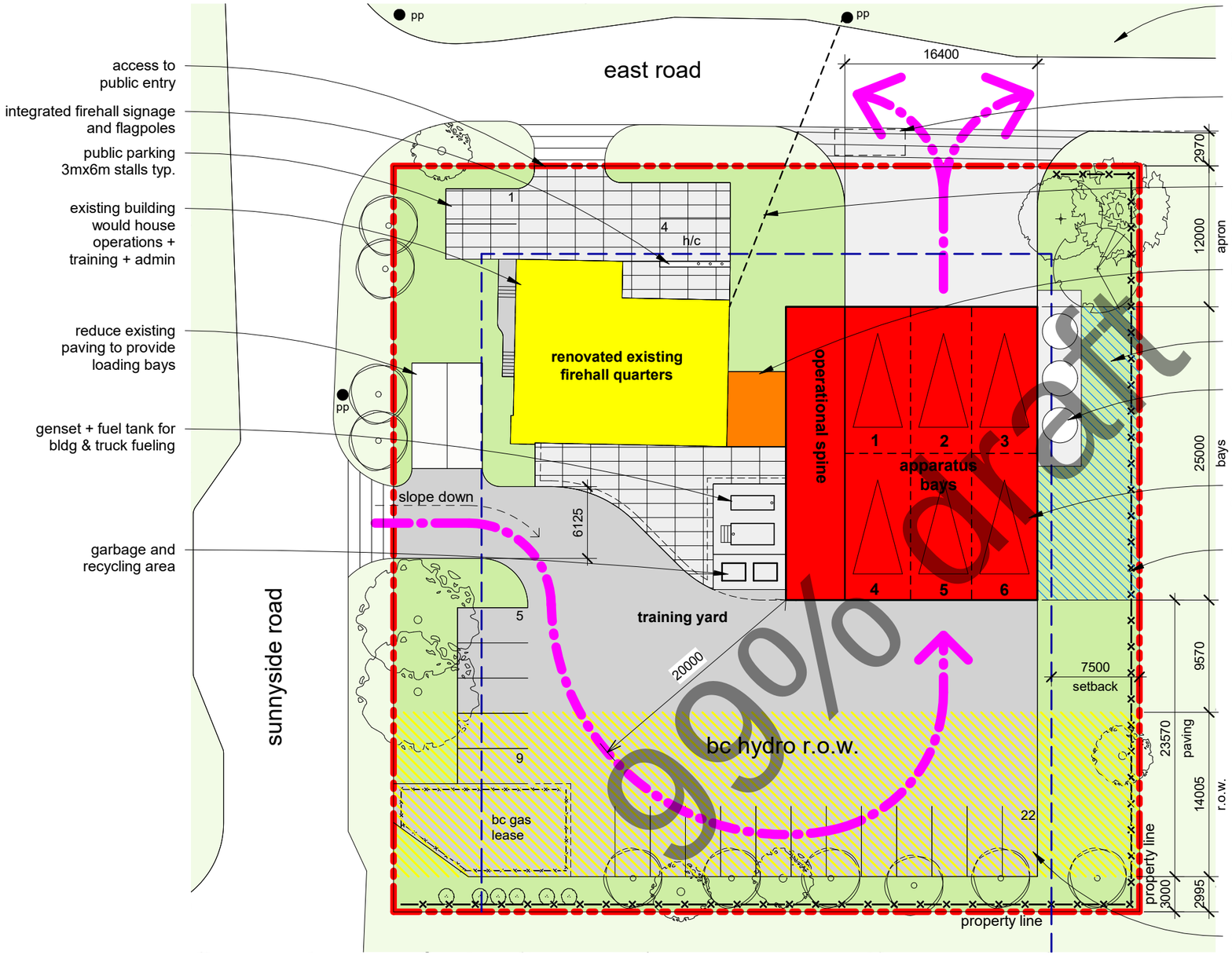
This option examines the possibility of demolishing the existing firehall and providing an entirely new two story facility with tandem drive-through apparatus bays. The footprint of the new building in this option be would be smaller than that of Site Option 3 as the operations spaces including training and administration spaces would be contained over two storeys. The premise in this layout is to design a new post disaster building which contains all functions related to a volunteer firehall.

pros:

- Operationally the site will be used in a similar fashion to all options in that emergency vehicle entry will be from Sunnyside Road and exiting onto East Road.
- Operational spine (gear storage, radio room, SCBA, workshop, utility etc.)would be located within the new post disaster building.
- Apparatus bay portion of building is sized to accommodate 6 emergency vehicles.
- Good size training yard.
- Builds up rather than out which is determined to be a more sustainable approach to the project overall and most often less costly.

cons:

- The project will require demolition of the existing hall in its entirety. This means that the firehall will need to temporarily be relocated while the new hall is under construction or construction would need to be phased.
- The 15m BC Hydro R.O.W. running the entire width of the south end of the property limits development as no building or parts of buildings can be erected within this right-of-way.
- Apron at Apparatus Bays leading to East Road has been reduced to 12m + 3m approximately to the edge of the road. Longer emergency vehicles may extend beyond property line and onto sidewalk when fully outside of Apparatus Bays.
- Limited access to public parking off of East Road due to the change in grade would require retaining walls in this location.



SITE LEGEND:

APPARATUS BAYS + OPERATIONAL SPACES	STAMPED CONCRETE	NEW SEPTIC FIELD
EXISTING FIREHALL QUARTERS RENOVATION	ASPHALT	NEW CHAIN LINK FENCE
CONNECTION BETWEEN NEW AND RENOVATION	GRAVEL	NEW ARCH. FENCE
NEW FIREHALL QUARTERS	BC HYDRO R.O.W.	PROPERTY LINE
CONCRETE	NEW LANDSCAPING	SETBACK (6.0m)

Johnston Davidson
ARCHITECTURE + PLANNING INC.

N
project north 179°

feasibility study

Metro Vancouver Regional District
Anmore Firehall

site plan - option 1

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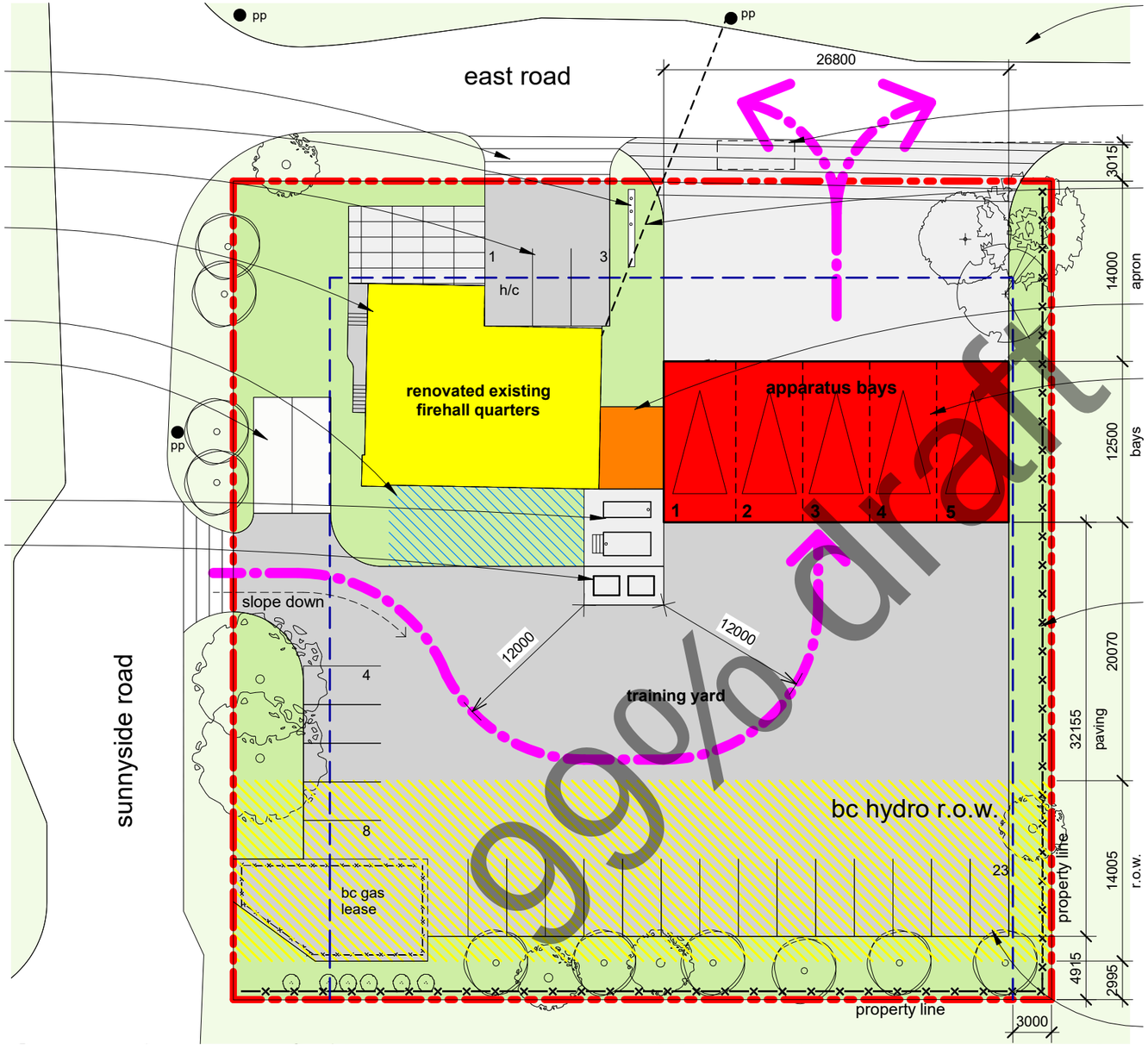
18 - nov - 18



access to public entry

integrated firehall signage and flagpoles

public parking 3mx6m stalls typ.

existing building would house operations + training + admin

new septic field

reduce existing paving to provide loading bays

genset + fuel tank for bldg & truck fueling

garbage and recycling area

widening east road may be required to accomodate firetrucks turning radius

existing bus stop to be relocated

o/h power lines new construction to have below grade power to pad mounted transformer

NEW connection between renovated firehall quarters and new operational spaces

5 drive thru bays

new fence

crew parking 3mx6m stalls typ.

SITE LEGEND:

APPARATUS BAYS + OPERATIONAL SPACES	STAMPED CONCRETE	NEW SEPTIC FIELD
EXISTING FIREHALL QUARTERS RENOVATION	ASPHALT	NEW CHAIN LINK FENCE
CONNECTION BETWEEN NEW AND RENOVATION	GRAVEL	NEW ARCH. FENCE
NEW FIREHALL QUARTERS	BC HYDRO R.O.W.	PROPERTY LINE
CONCRETE	NEW LANDSCAPING	SETBACK (6.0m)

Johnston Davidson
ARCHITECTURE + PLANNING INC.

N

project north 179°

feasibility study

Metro Vancouver Regional District

Anmore Firehall

site plan - option 2

1:400

18 - nov - 18

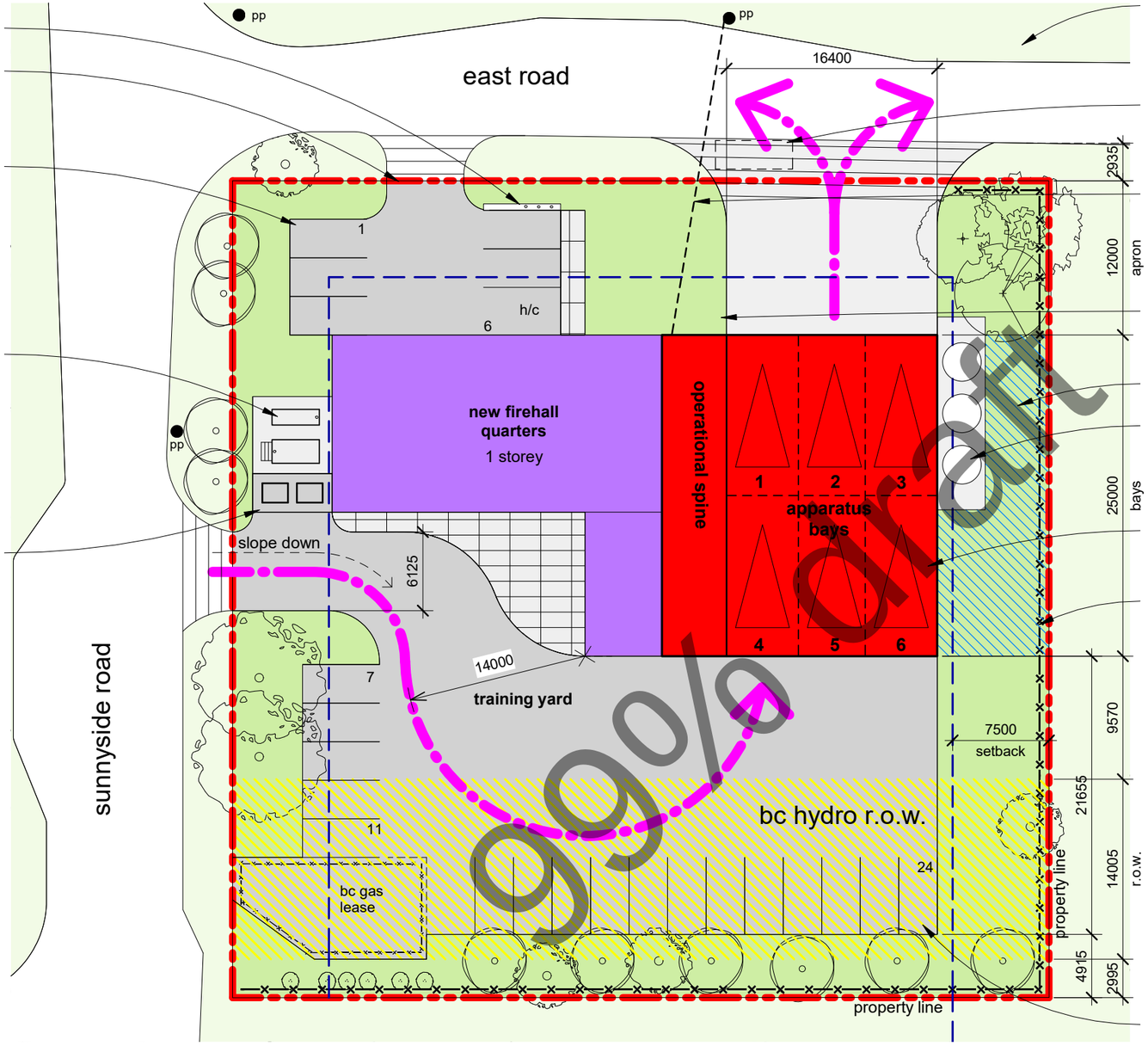
integrated firehall signage and flagpoles

access to public entry

public parking 3mx6m stalls typ.

genset + fuel tank for bldg & truck fueling

garbage and recycling area



widening east road may be required to accomodate firetrucks turning radius

existing bus stop to be relocated

o/h power lines new construction to have below grade power to pad mounted transformer

NEW firehall quarters (one storey) and new operational spaces

new septic field

water collection tanks

3 tandem drive thru bays w/ operational spine attached

new fence

crew parking 3mx6m stalls typ.

SITE LEGEND:

APPARATUS BAYS + OPERATIONAL SPACES	STAMPED CONCRETE	NEW SEPTIC FIELD
EXISTING FIREHALL QUARTERS RENOVATION	ASPHALT	NEW CHAIN LINK FENCE
CONNECTION BETWEEN NEW AND RENOVATION	GRAVEL	NEW ARCH. FENCE
NEW FIREHALL QUARTERS	BC HYDRO R.O.W.	PROPERTY LINE
CONCRETE	NEW LANDSCAPING	SETBACK (6.0m)

Johnston Davidson
ARCHITECTURE + PLANNING INC.

N

project north 179°

feasibility study

Metro Vancouver Regional District

Anmore Firehall

site plan - option 3

1:400

18 - nov - 18

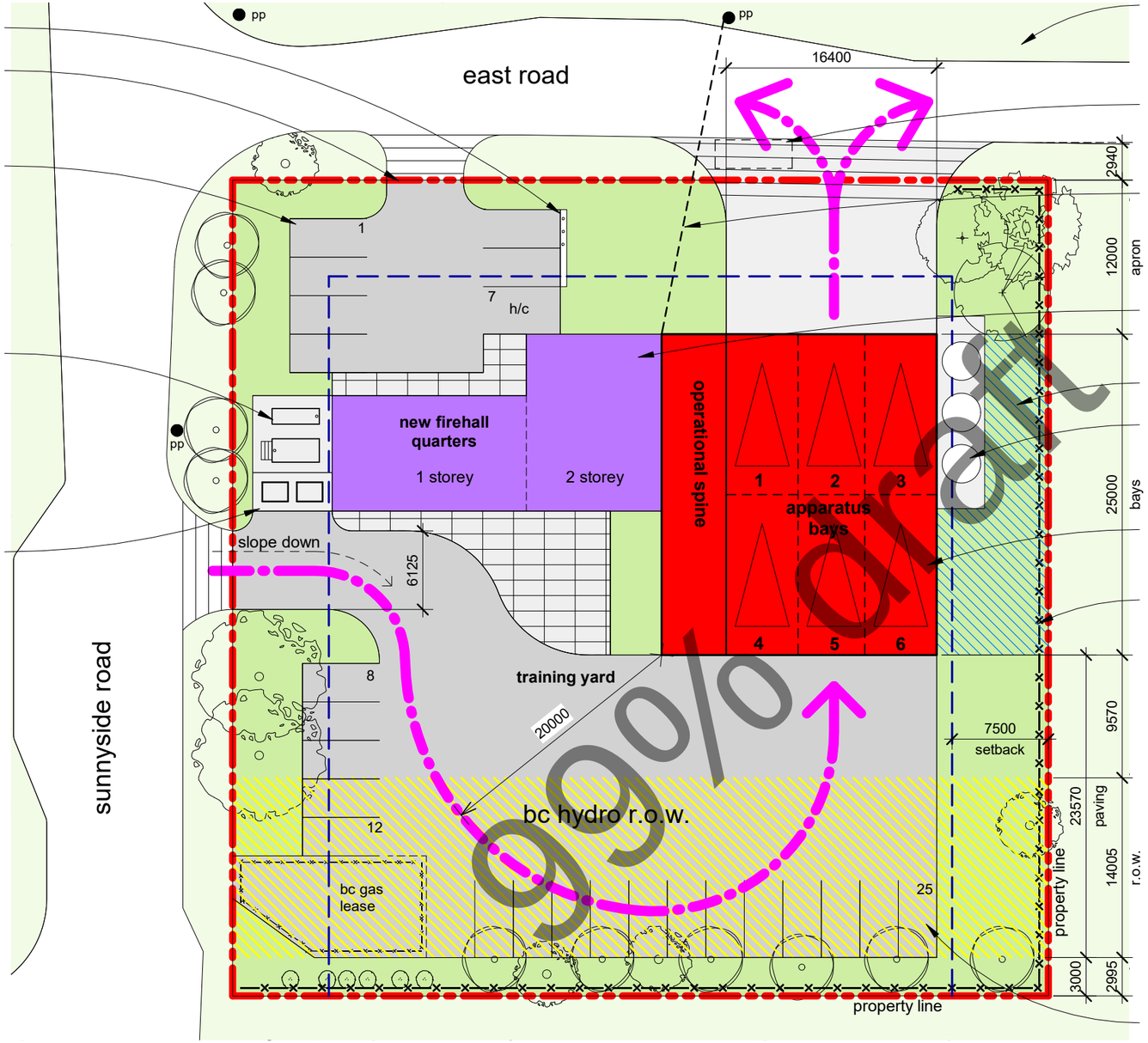
integrated firehall signage and flagpoles

access to public entry

public parking 3mx6m stalls typ.

genset + fuel tank for bldg & truck fueling

garbage and recycling area



SITE LEGEND:

	APPARATUS BAYS + OPERATIONAL SPACES		STAMPED CONCRETE		NEW SEPTIC FIELD
	EXISTING FIREHALL QUARTERS RENOVATION		ASPHALT		NEW CHAIN LINK FENCE
	CONNECTION BETWEEN NEW AND RENOVATION		GRAVEL		NEW ARCH. FENCE
	NEW FIREHALL QUARTERS		BC HYDRO R.O.W.		PROPERTY LINE
	CONCRETE		NEW LANDSCAPING		SETBACK (6.0m)

Johnston Davidson
ARCHITECTURE + PLANNING INC.

N

project north 179°

feasibility study

Metro Vancouver Regional District

Anmore Firehall

site plan - option 4

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18 - nov - 18

1. fit tests

The siting studies for the Belcarra Firehall began with the development of an elementary site analyses, defining general site characteristics, context influences and zoning impacts. The existing firehall site was examined for feasibility options for redevelopment as part of this report. The goal of all site development is to use the existing site to the best possible advantage. In this case the existing site has a number of challenges in examining redevelopment which impact the various option such as site shape, dimension, grade change and the location of the existing building.

Preliminary fit test studies were completed by positioning the space program onto the site for further study. Each study examined the possible orientation of the firehall on the site, potential for Public interface, functionality for the Sasamat Voluntary Fire Department, parking on site and site access.

Upon completion of an initial site analysis of the existing site, the number of options were narrowed down to 2 potential development strategies which will be outlined in this Section of the report. All associated drawings are at the end of this section.

general layout comments

Two siting options shown after this written portion titled the “site option 1 and site option 2” will outline high level layouts for discussion. The following is a list of concerns which need to be addressed for all options.

- One of the main objectives in siting the firehall is to position the apparatus bays as perpendicular to the road as possible so that the wear and tear on the vehicles is not extensive upon exiting – site option 1 accommodates this recommended layout.

- programmatic zoning of the site in all layouts: current industry standards in a volunteer department requires a separation of the vehicular traffic between the general public, exiting emergency vehicles and P.O.C. staff. This is especially crucial as these groups converge on the Firehall and as vehicles leave to address emergent events. Keeping these zones separate is key in protecting the safety of the surrounding public and the Fire Fighters.

- The depth and the width of the ideal site are crucial in the site selection. The minimum depth of the site should be 60m and minimum width needs to be 62-65m to accommodate the apparatus bays, return road, fire truck turning radii, and the firehall portion of the space program. This will ensure that the fire fighters have the room they need for training, completion of their regular duties and that site development will not create additional cost or maintenance over time.

- The ability to keep the existing firehall operational while the new building is being constructed was a key consideration in the overall approach to the new project and thus affects possible development for the new apparatus bays in particular.

- Traffic control as needed will be addressed in the next phases of the project where needed.

2. existing site summary

The existing site is located at the civic address of 4082 Bedwell Bay Road, Belcarra BC and is in the heart of a residential neighborhood.

The site measures approximately 0.87acre (3,510sm), in overall size, which is on the small side, but is still an acceptable size for a site in terms of industry standards for a volunteer firehall accommodating 25 volunteer firefighters. The shape of the site somewhat limits the options for redevelopment for the Firehall. This is identified further in both the typical bay layout and the site analysis included at the end of this section.

The site grades are complicated as the site rises significantly to the south and east, which limits the available area for use as it is preferred that the redeveloped site should have minimal slope and grade changes if possible as emergency vehicle exiting should try to be kept to a maximum of 5% slope. Set backs on the property are 7.5m on all sides except the side facing Bedwell Bay Road therefore reducing the available developable area. Site access is also currently limited to a single access point for vehicles unless an additional route is provided for returning vehicles. The lengthy frontage on Bedwell Bay Road lends itself to the addition of a second access point for entry/exit of volunteer staff and for returning emergency vehicles. Alternately, this can be provided with another access point from the adjacent municipal property to the west.

a. general pros / cons for all options

These pros and cons are common to all layouts as they relate to the challenges with particular site.

pros:

- Site size permits drive through apparatus bays.
- Places the generator and fueling system close to the building and to emergency vehicle traffic so both are ideally located for use in an economic way.
- The Public uses the same drive aisle as returning Emergency vehicles to access the site. Because the vehicles are returning at a slower rate this is usually not an issue.

cons:

- Due to the lower elevation of Bedwell Bay Road, vehicle entry and exit from the site will contend with sloped drive aisles and apron.

b. site option 1 - site plan

This option examines the possibility of keeping the existing firehall operational during construction. The premise in this layout is to design a new set of apparatus bays and operational spaces essential to the operation of the firehall in a new post disaster building which meets all current industry standards. The old firehall would remain operational until new facility is completed. This option would require a secondary access from Bedwell Bay Road which would be aligned with the apparatus bays and would serve as the exit for emergency vehicles. The existing driveway would be maintained but would serve only for returning emergency vehicles and staff entry/exit.

pros:

- Allows for the existing hall to remain operational during construction.
- Site size has enough area and the right amount of depth to house both apparatus bays and provide parking on site for both public and crews.
- Uses the deepest part of the site for the addition of the new building training yard.
- Enough room for a 19m apron which provides a safe generous approach for emergency vehicles exiting the Bays and allows for vehicles to fully exit the Bays before entering the street.
- Operational spine (gear storage, radio room, SCBA, workshop, utility etc.) are located directly adjacent to the crew parking providing quick access from the parking area to the key spaces for deployment.

- Good size training yard.

cons:
- Due to the lower elevation of the street, vehicle entry and exit from the site will contend with sloped drive aisles and apron.
- Retaining walls at south and east sides of the site will be required to accommodate needed vehicle circulation area at rear of site.

c. site option 2 - site plan

This option examines the possibility positioning the new firehall in a similar location to the existing firehall and maintaining a single access to the site. The premise in this layout is to design a new post disaster firehall building which meets all current industry standards. The old firehall would be demolished prior to construction of the new facility and the SVFD would be required to temporarily relocate to an alternate site or provide temporary facilities on site during the construction of the new facility.

pros:
- Site size meets area requirements and depth to house the new firehall and provide parking on site for both public and crews.
- Operationally the site will be used in a similar fashion. Note that the existing site entry/exit to Bedwell Rd. will be maintained.
- Operational spine (gear storage, radio room, SCBA, workshop, utility etc.)are located directly adjacent to the crew parking providing quick access from the parking area to the key spaces for deployment.
- Enough room for a 16m apron which provides a safe approach for emergency vehicles exiting the Bays and allows for vehicles to fully exit the Bays before entering the street.
- Places the generator and fueling system close to the building which is cost effective.
- Good size training yard.
- Start with new program and none of the complications when dealing with a renovation.

cons:
- Unless the second access is provided from the adjacent City Hall property there will only be a single access to the site.
- Apparatus bays are not perpendicular to Bedwell Bay Road therefore emergency response vehicles will have to turn 90 degrees then turn again left or right when entering onto Bedwell Bay Road.
- Apparatus bays will not be drive-through without the secondary access from the adjacent City Hall property.
- The building and training yard positions are limited by setbacks.
- The property is sloped with significant elevation changes to the south and to the north which will likely require the construction of retaining walls.
- Crews use the same drive aisle as exiting Emergency vehicles.
- Temporary housing of crews will be required either on or off site.

SITE LEGEND:

	APPARATUS BAYS + OPERATIONAL SPACES		STAMPED CONCRETE		NEW SEPTIC FEILD
	EXISTING FIREHALL QUARTERS RENOVATION		ASPHALT		NEW CHAIN LINK FENCE
	CONNECTION BETWEEN NEW AND RENOVATION		GRAVEL		NEW ARCH. FENCE
	NEW FIREHALL QUARTERS		AUTO EX ZONE		PROPERTY LINE
	CONCRETE		NEW LANDSCAPING		SETBACK (6.0m)

Johnston Davidson
ARCHITECTURE + PLANNING INC.

N
124° project north

feasibility study

Metro Vancouver Regional District
Belcarra Firehall

site option 1

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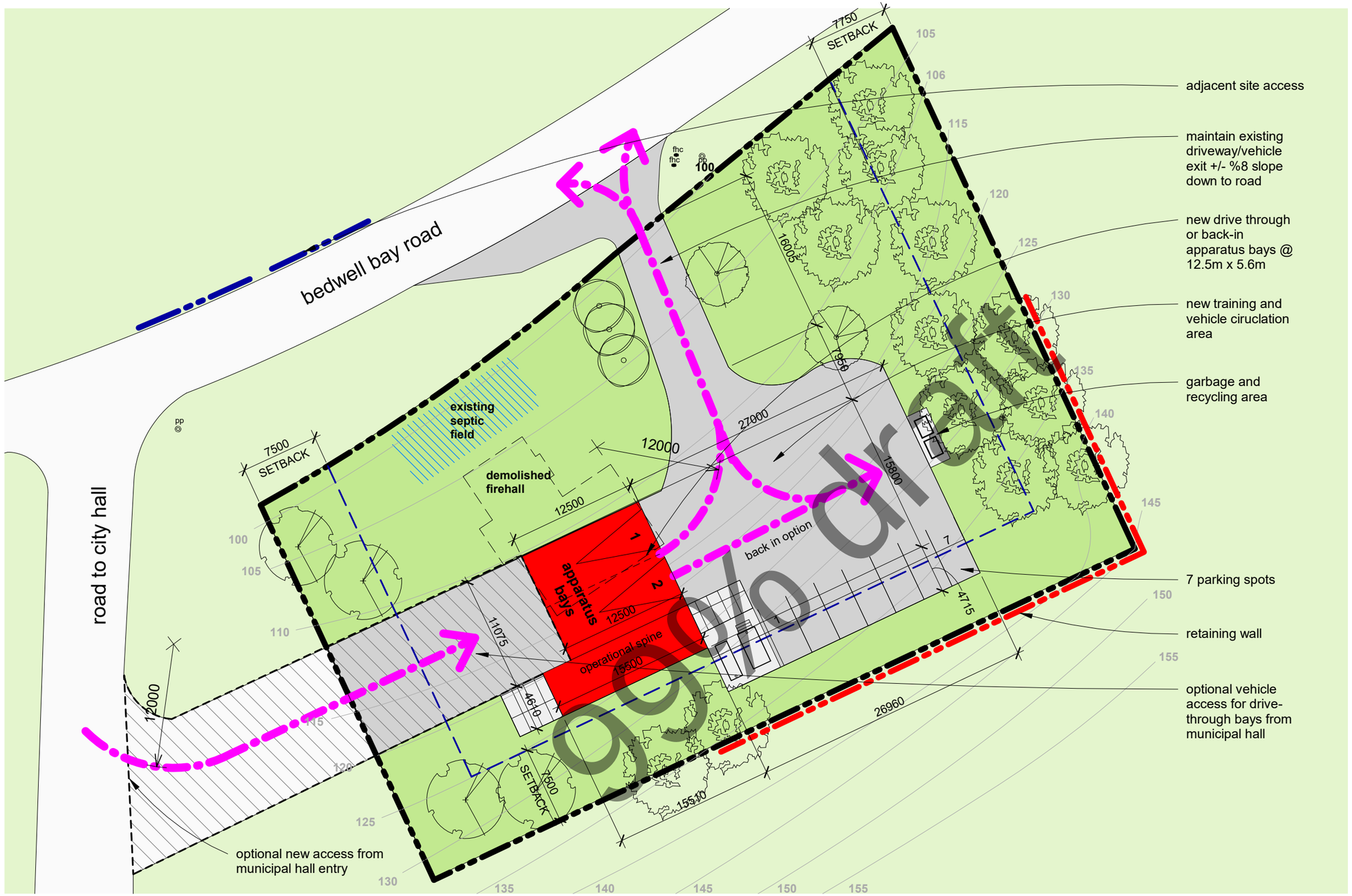
18 - dec - 03



SITE LEGEND:

	APPARATUS BAYS + OPERATIONAL SPACES		STAMPED CONCRETE		NEW SEPTIC FEILD
	EXISTING FIREHALL QUARTERS RENOVATION		ASPHALT		NEW CHAIN LINK FENCE
	CONNECTION BETWEEN NEW AND RENOVATION		GRAVEL		NEW ARCH. FENCE
	NEW FIREHALL QUARTERS		AUTO EX ZONE		PROPERTY LINE
	CONCRETE		NEW LANDSCAPING		SETBACK (6.0m)

Johnston Davidson
ARCHITECTURE + PLANNING INC.

N
124° project north

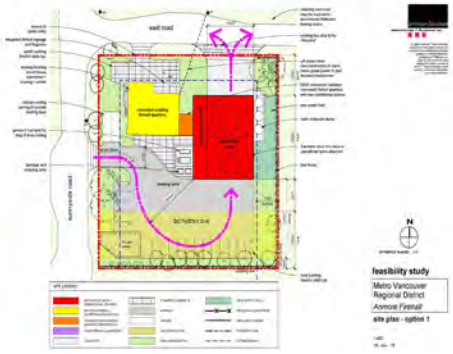
feasibility study

Metro Vancouver Regional District
Belcarra Firehall

site option 2

1:400
18 - dec - 03

5.0 costing



A. high level costing

The following information has been provided at the very high level in order to provide some context to the Options 1, 2 and 3 for the Anmore Firehall replacement as shown in the above sections of the report. The costs listed below are construction related costs only and do not provide include soft costs such as Consultants, Land, Permitting etc.

These costs do not include a rate of escalation which is projected to be within 5-6% for 2019 and 2020. due to the effects of the tariffs on construction. This information is from Hanscomb Cost Consultants.

a. **Option 1: existing site / renovation of existing building / new addition with tandem apparatus bays: $ 4,260,000**
   - Renovation costs: $250.00 / sf @ 4,240sf = $1,060,000.00
   - New addition costs: $500.00 / sf @ 6,100sf = $3,050,000.00
   - Hazardous Materials removal: $50,000.00
   - Additional high level structural upgrade to meet basic BC Code Compliance: $ 100,000.00

* This option would create post disaster apparatus bays and operational spine but the existing hall would not be upgraded to post disaster standards. There separation of these two spaces is shown on the drawings.

* There has not been an environmental report completed on the Anmore project so a budget of $ 25,000 is recommended to address hazardous materials removal.

* The additional structural costs noted above address any minor structural improvements needed to bring the project up to a basic BCBC level but not to the level of post disaster. A budget of $25.00 / sq foot is added above to address this concern.

a. **Option 2: existing site / renovation of existing building / new addition with single apparatus bays: $ 3,185,000**
   - Renovation costs: $250.00 / sf @ 4,240sf = $1,060,000.00
   - New addition costs: $500.00 / sf @ 3,950sf = $1,975,000.00
   - Hazardous Materials removal: $50,000.00
   - Additional structural upgrade to meet basic BC Code Compliance: $ 100,000.00.

* This option would create post disaster apparatus bays and operational spine but the existing hall would not be upgraded to post disaster standards. There separation of these two spaces is shown on the drawings.

* There has not been an environmental report completed on the Anmore project so a budget of $ 25,000 is recommended to address hazardous materials removal.

* The additional structural costs noted above address any minor structural improvements needed to bring the project up to a basic BCBC level but not to the level of post disaster. A budget of $25.00 / sq foot is added above to address this concerns.

* This option only has room for 5 vehicles as opposed to Option 1 and 3 which house 6 vehicles.

b. Options 3 + 4 : existing site / new building with tandem apparatus bays: $ 5,480,000.00

- Demolition costs: $100,000.00
- Hazardous Materials removal: $50,000.00
- New Building costs: $500.00 / sf @ 10,300sf = $5, 150,000.00
- Relocation Costs: $ 7,500 - $10,000 / per month for approximately 18 months. = $135,000 - $180,000

* It is anticipated that the work for this firehall would not need to **exceed 12 - 14 months of construction;** however the relocation costs have been extended to 18 months to ensure that there would be a seamless transition for the the Fire Department as construction starts and finishes.

* Relocation costs include the relocation costs associated with radio, 911 antenna and a temporary generator.

* This information is based on construction costs based on the 2018 BCBC changes and is an high level estimate only.

A. high level costing

The following information has been provided at the very high level in order to provide some context to the Options 1 and 2 for the Belcarra Firehall replacement as shown in the above sections of the report. The costs listed below are construction related costs only and do not provide include soft costs such as Consultants, Land, Permitting etc.

These costs do not include a rate of escalation which is projected to be within 5-6% per year for 2019 and 2020. due to the effects of the tarrifs on construction. This information is from Hanscomb Cost Consultants.

a. Option 1: existing site / new building: $ 1,750,000

- Demolition Costs: $75,000.00
- Hazardous Materials Removal: $25,000.00
- New Building costs: $550.00 / sf @ 3,000sf (increased square footage costs due to extensive retaining wall requirements) = $1,650,000.00
- No relocation costs - existing fire hall would be operational until new-build is complete.

b. Option 2: existing site / new building: $ 1,848,000

- Demolition Costs: $75,000
- Hazardous Material Removal: $25,000.00
- New Building costs: $500.00 / sf @ 3,000sf
- Relocation Costs: $ 5,000 - $7,000 / per month for approximately 14 months. = $70,000 - $98,000.00

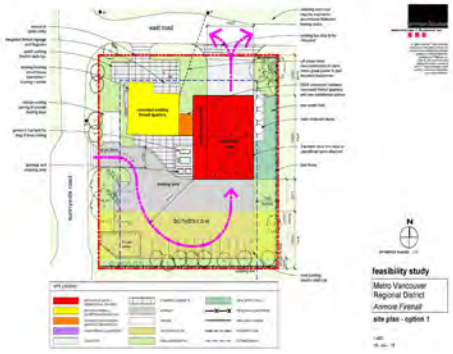
* Cost of the new road to the rear of the site for Option 2 has not been included in this pricing at this time. More information would be needed about the grading in the location and any stream relocation / remediation that would be required as a result of this new construction.

* It is anticipated that the work for this firehall would not need to **exceed 12 months of construction;** however the relocation costs have been extended to 14 months to ensure that there would be a seamless transition for the the Fire Department as construction starts and finishes.

* Relocation costs could be reduced if the rental of temporary quarters could be kept to one vehicle and one site trailer. This also includes the relocation costs associated with radio, 911 antenna and a temporary generator.

* This information is based on construction costs based on the 2018 BCBC changes and is an high level estimate only.

6.0 appendix



metro vancouver anmore firehall **feasibility study project summary**

September 14, 2018

A. Project Data:

General

1. Goals: to update the design for the Anmore Firehall by renovating and possibly adding to the existing building as needed to accommodate 5-6 vehicles in post disaster apparatus bays and essential operational facilities. Building upgrades to include renovating the existing building to improve functionality, energy efficiency and structural integrity
   a. Building will NOT house a backup City Server.
   b. EOC: The building will not function as an EOC.
   c. Client requests include the following to be reviewed/added:
      i. Apparatus bay size
      ii. Gear Storage location
      iii. Decontamination
      iv. Drive through truck bays
      v. New hose tower to be incorporated into project (for training only)
      vi. Confined space and ladder training
      vii. Relocated/add hydrant to training area
      viii. Caretakers suite incorporated
      ix. Three offices with additional two work stations for crew
      x. Workbench area
      xi. Overflow parking is across the street.
      xii. Current generator is natural gas
      xiii. Diesel tank is on site
2. Client and Building Authority is Metro Vancouver
3. Anmore Firehall:
   i. Volunteer firehall with operational quarters to accommodate 50 volunteer firefighters (currently 35).
   ii. Civic Address: 2690 East Road, Anmore, BC
   iii. Legal Address: Plan Showing Position of Forms on Lot “A” (L60982E) Lot 21, Section 20, Township 39, New Westminster District, Plan 3350
   iv. Site Size: 4,040m². (current legal survey required)
   v. Regulatory:
      - Current Zoning:
   vi. Site services:
      - Gas: existing gas service to site
      - Sanitary: to be confirmed – currently septic field
      - Hydro Service: above ground service at pole location to be confirmed Pa Mounted Transformer will be incorporated into this project.
      - Water: exiting municipal water service to site
   vii. Project Size: 394.3m² (4,245 ft²) measured to outside face of cladding.
      - New Apparatus Bays (main floor) : to be determined/confirmed
      - New Apparatus Bays (mezzanine) : to be determined/confirmed
      - Renovation Area: to be determined/confirmed
   viii. Sustainable Design Goals:
      - Active approach
         - Geothermal
         - Photovoltaic
         - Solar Thermal
      - Passive Approach
         - Storm water management
         - Regional and recycled materials.
         - Low flow fixtures
         - Low VOC materials.
   ix. Geotechnical: Geotechnical report/information to be provided by client.
4. Building SPRINKLERING: Not required by BCBC. Building will not be SPRINKLERED.

5. The project will be designed to meet the Post Disaster Standards and the energy requirements as required by new BC Building Code (2018).

Building:

1. See Space Program for detailed breakdown.

Note: *This document should be considered a work in progress and will be altered and changed to reflect decisions and information provided at all design meetings. The items shown in yellow are intended for the client group to provide a response, or discussion. This document should be read in conjunction with the space program.*

metro vancouver belcarra firehall **feasibility study project summary**

September 14, 2018

A. Project Data:

General

1. Goals: to update the design for Belcarra Firehall by renovating and possibly adding to the existing building as needed to accommodate 3 vehicles in post disaster apparatus bays and essential operational facilities.
   a. Building upgrades to include renovating the existing building to improve functionality, energy efficiency and structural integrity. Potential for drive through bays to be explored.
   b. New training room to accommodate up to 25 people.
   c. Building will NOT house a backup City Server.
   d. EOC: The building will not function as an EOC.
2. Client and Building Authority is Metro Vancouver
3. Belcarra Firehall:
   i. Volunteer firehall with operational quarters to accommodate 25 volunteer firefighters.
   ii. Civic Address: 4082 Bedwell Bay Road, Belcarra, BC
   iii. Legal Address: to be confirmed
   iv. Site Size: 4,040m². (current legal survey required)
   v. Regulatory:
      - Current Zoning:
   vi. Site services:
      - Gas: to be confirmed
      - Sanitary: to be confirmed
      - Hydro Service: above ground service at pole location to be confirmed. Pad Mounted Transformer will be incorporated into this project.
      - Water: existing municipal water service to site
   vii. Project:
      - New Apparatus Bays (main floor) : to be determined/confirmed – note that new bay is to accommodate 37'-8" ladder truck
      - New Apparatus Bays (mezzanine) : to be determined/confirmed
      - Renovation Area: to be determined/confirmed
   viii. Sustainable Design Goals:
      - Active approach
        - Geothermal
        - Photovoltaic
        - Solar Thermal
      - Passive Approach
        - Storm water management
        - Regional and recycled materials.
        - Low flow fixtures
        - Low VOC materials.
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4. Building SPRINKLERING: Not required by BCBC. Building will not be SPRINKLERED.
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Building:

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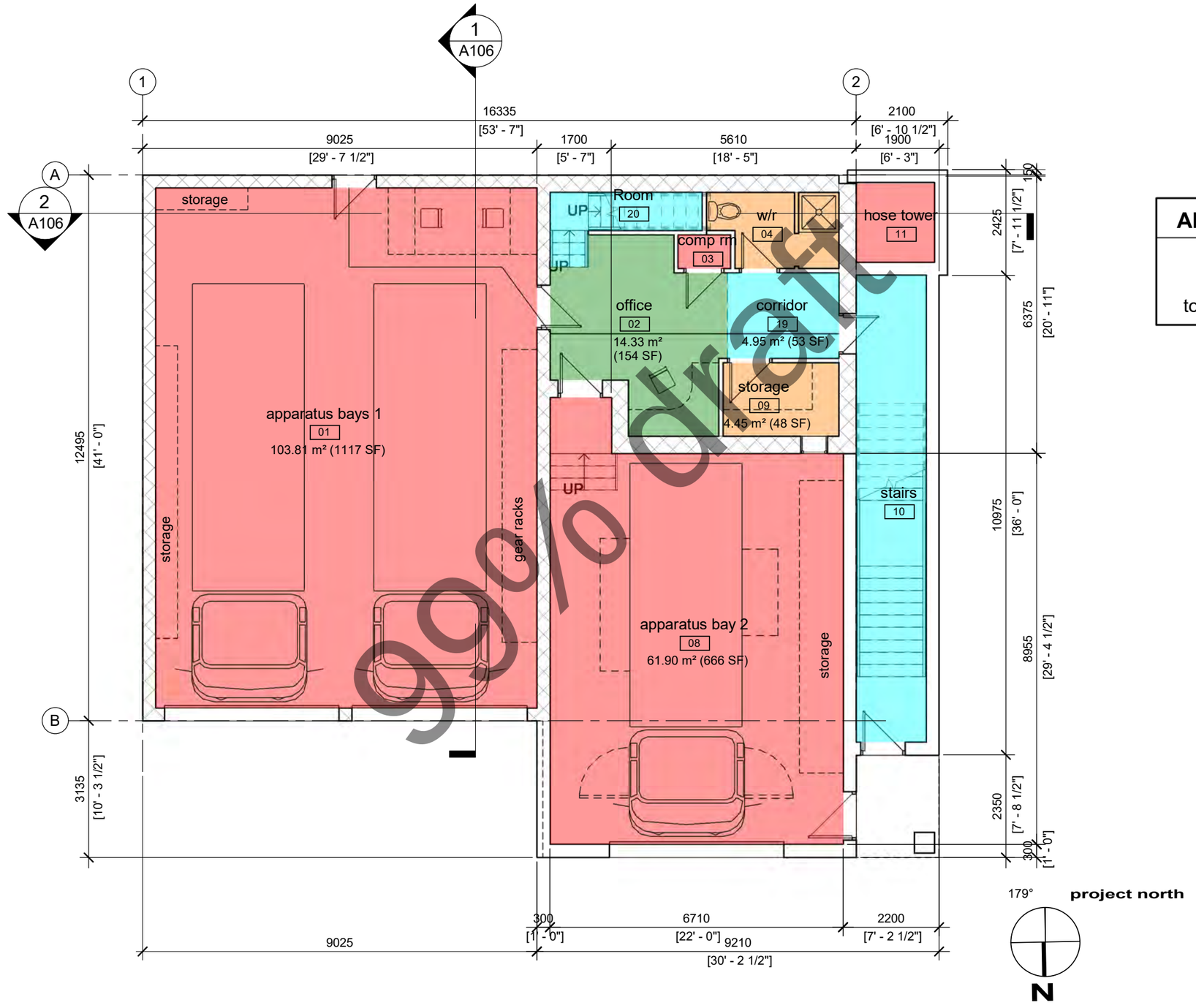


Johnston Davidson
ARCHITECTURE + PLANNING INC.

AREA

main floor = 253.02 sm (2,723 sf)
upper floor = 141.31 sm (1,521 sf)
total floor area = 394.33 sm (4,245 sf)

space allocation legend

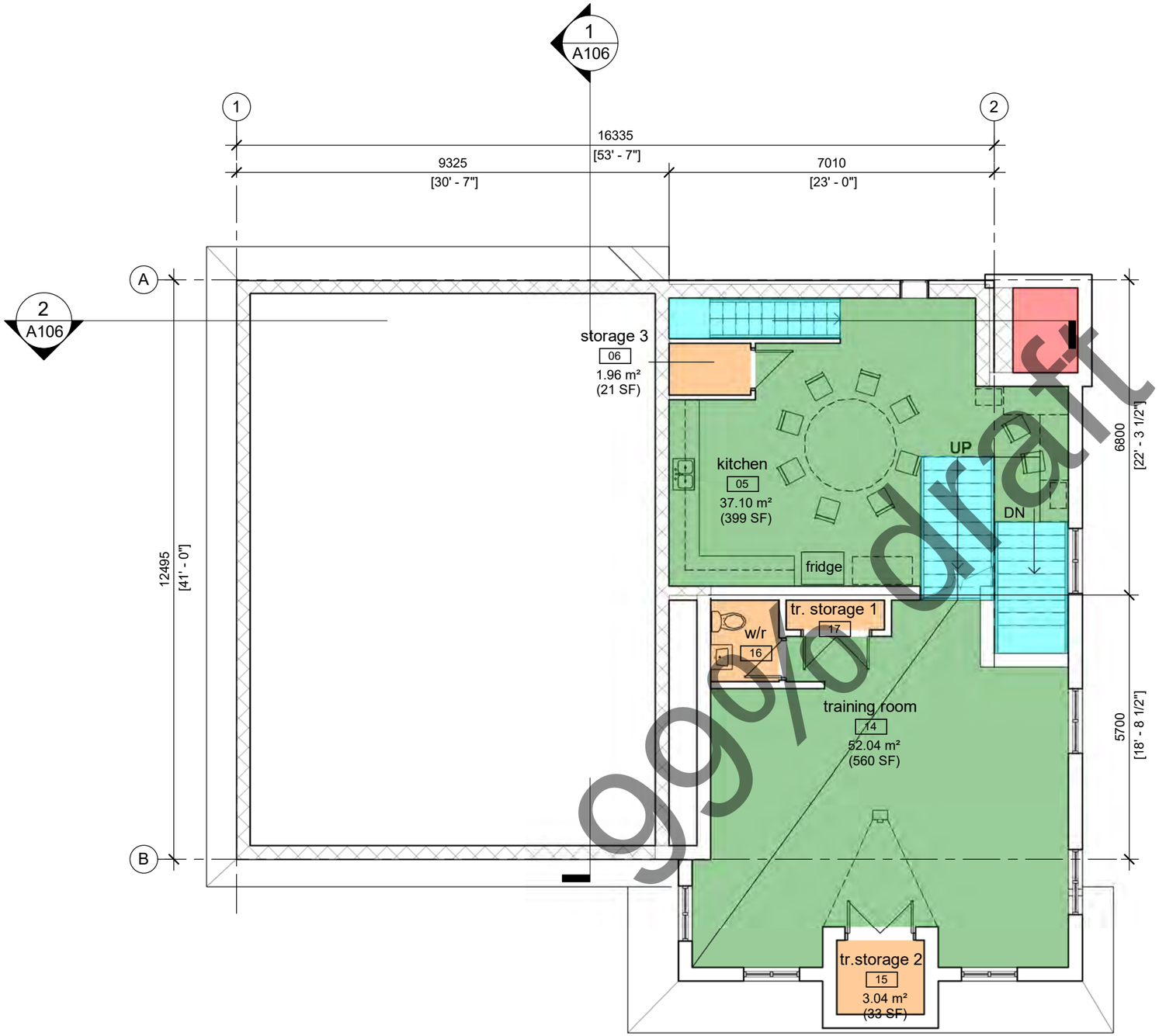
- operational
- admin
- crew quarters
- public spaces
- service spaces
- circulation

feasibility study

Metro Vancouver Regional District
Anmore Firehall

main floor plan

1:100
18 - sept - 14



Johnston Davidson
ARCHITECTURE + PLANNING INC.

AREA

main floor = 253.02 sm (2,723 sf)
upper floor = 141.31 sm (1,521 sf)
total floor area = 394.33 sm (4,245 sf)

space allocation legend

- operational
- admin
- crew quarters
- public spaces
- service spaces
- circulation

179° project north

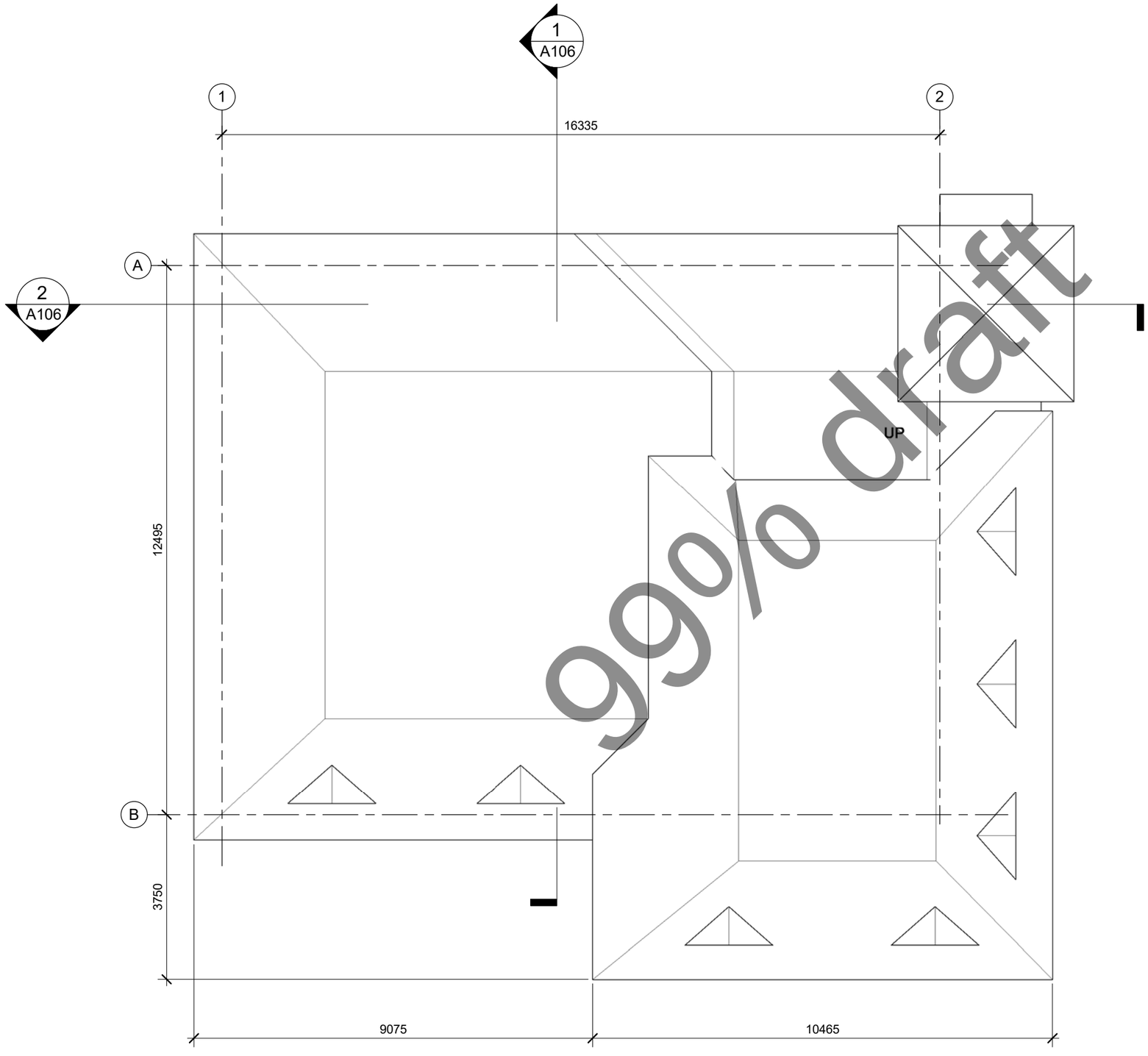
N

feasibility study

Metro Vancouver Regional District
Anmore Firehall

second floor plan

1:100
18 - sept - 14



Johnston Davidson
ARCHITECTURE + PLANNING INC.

179° project north

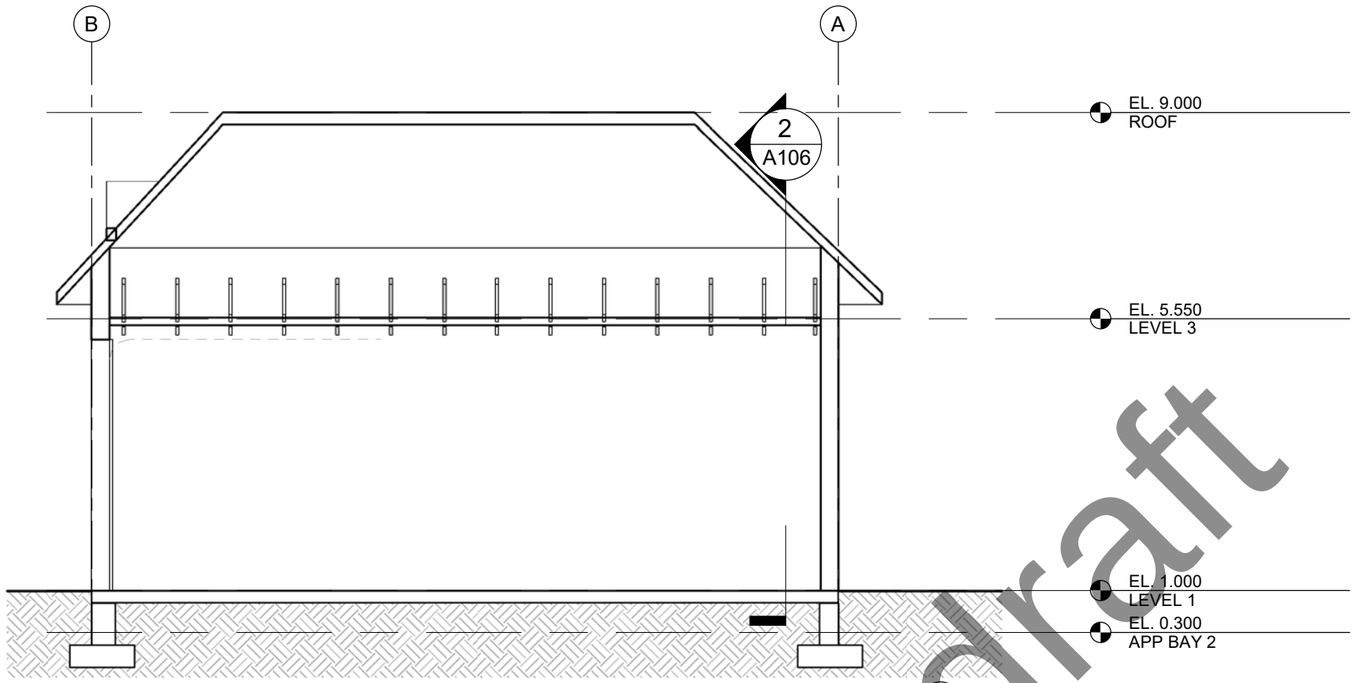
N

feasibility study

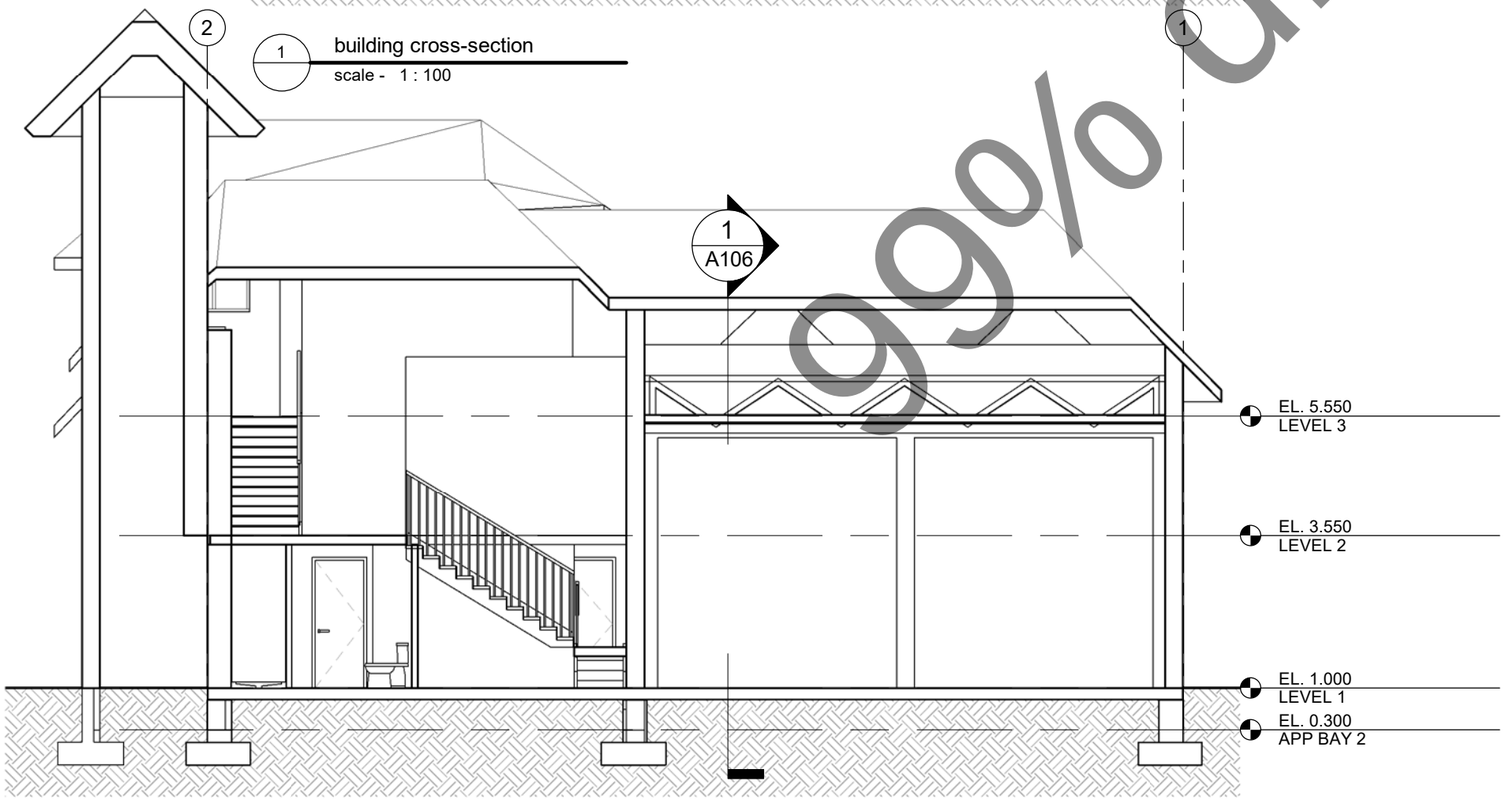
Metro Vancouver
Regional District
Anmore Firehall

roof plan

1:100
18 - sept - 14



1 building cross-section
scale - 1 : 100



2 longitudinal building section
scale - 1 : 100

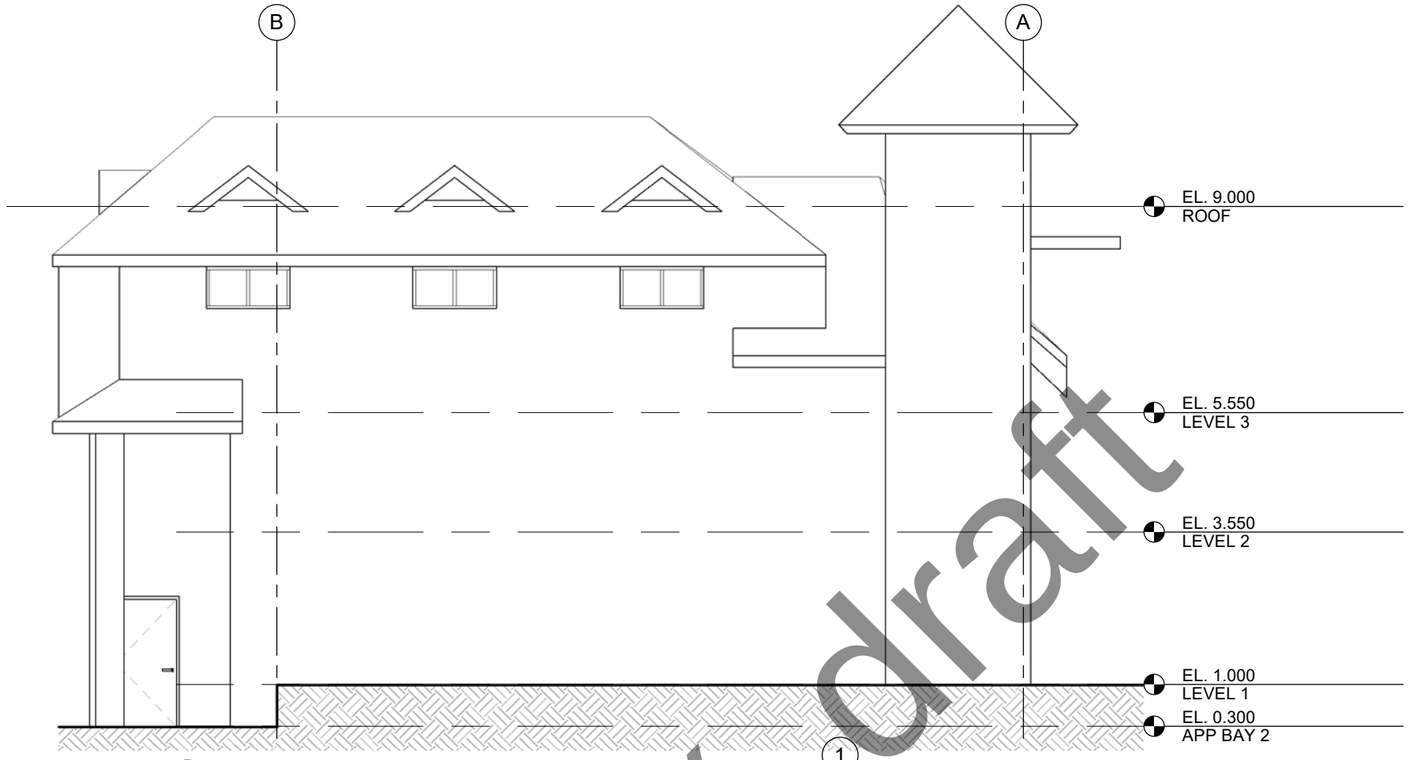
Johnston Davidson
ARCHITECTURE + PLANNING INC.

feasibility study

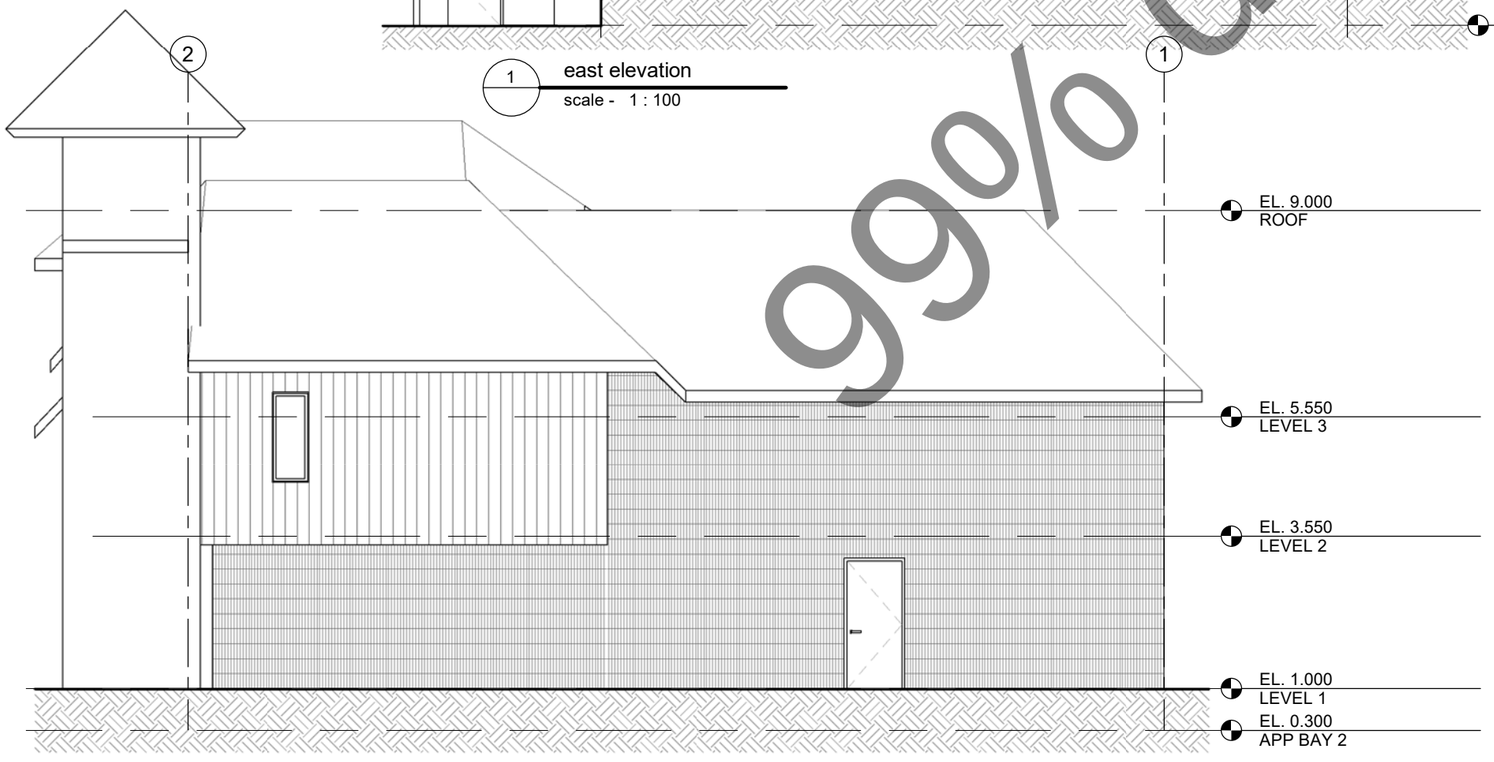
Metro Vancouver
Regional District
Anmore Firehall

sections

1:100
18 - sept - 14



1 east elevation
scale - 1 : 100



2 north elevation
scale - 1 : 100

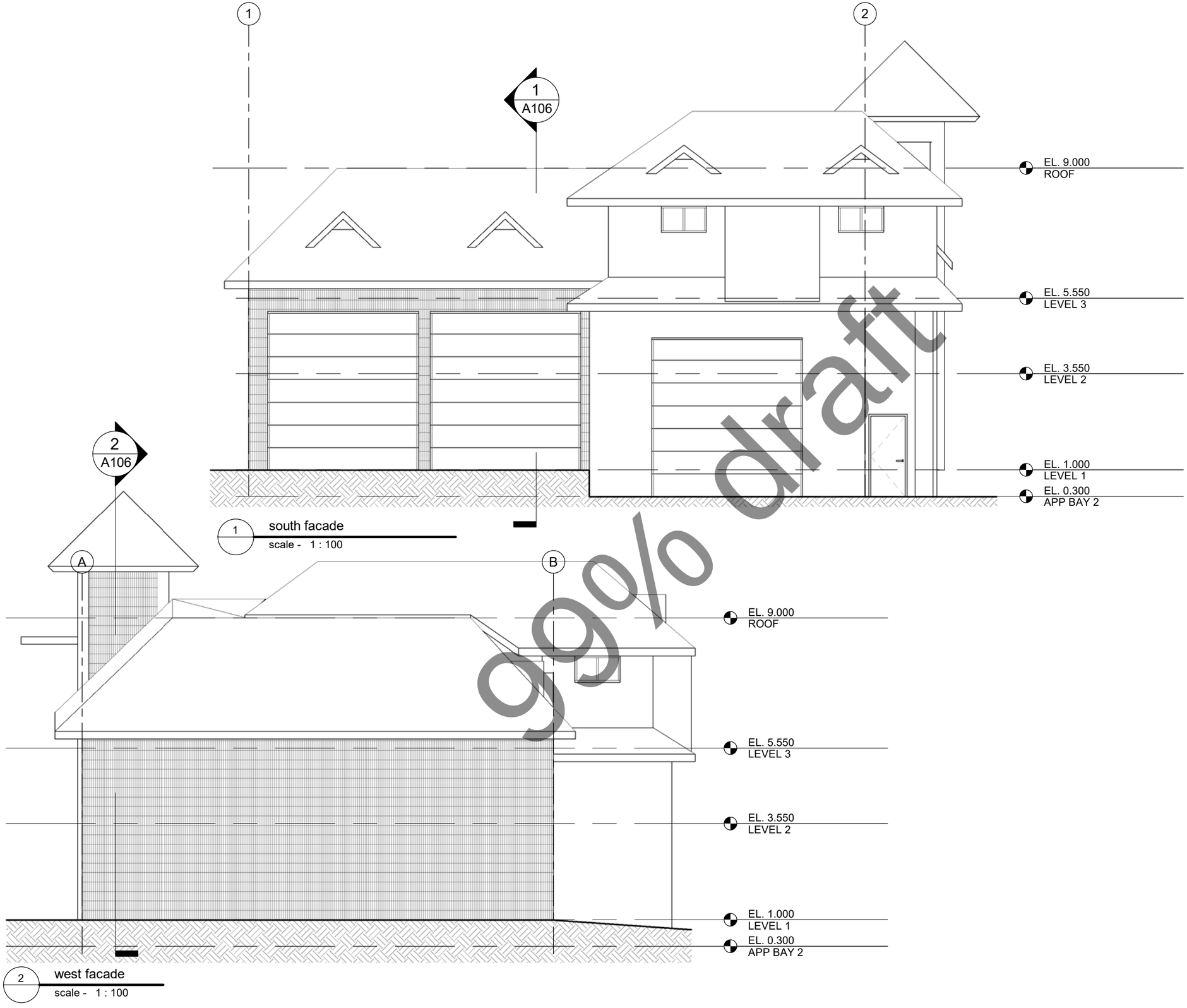
Johnston Davidson
ARCHITECTURE + PLANNING INC.

feasibility study

Metro Vancouver
Regional District
Anmore Firehall

elevations

1:100
18 - sept - 14



1 south facade
scale - 1 : 100

2 west facade
scale - 1 : 100

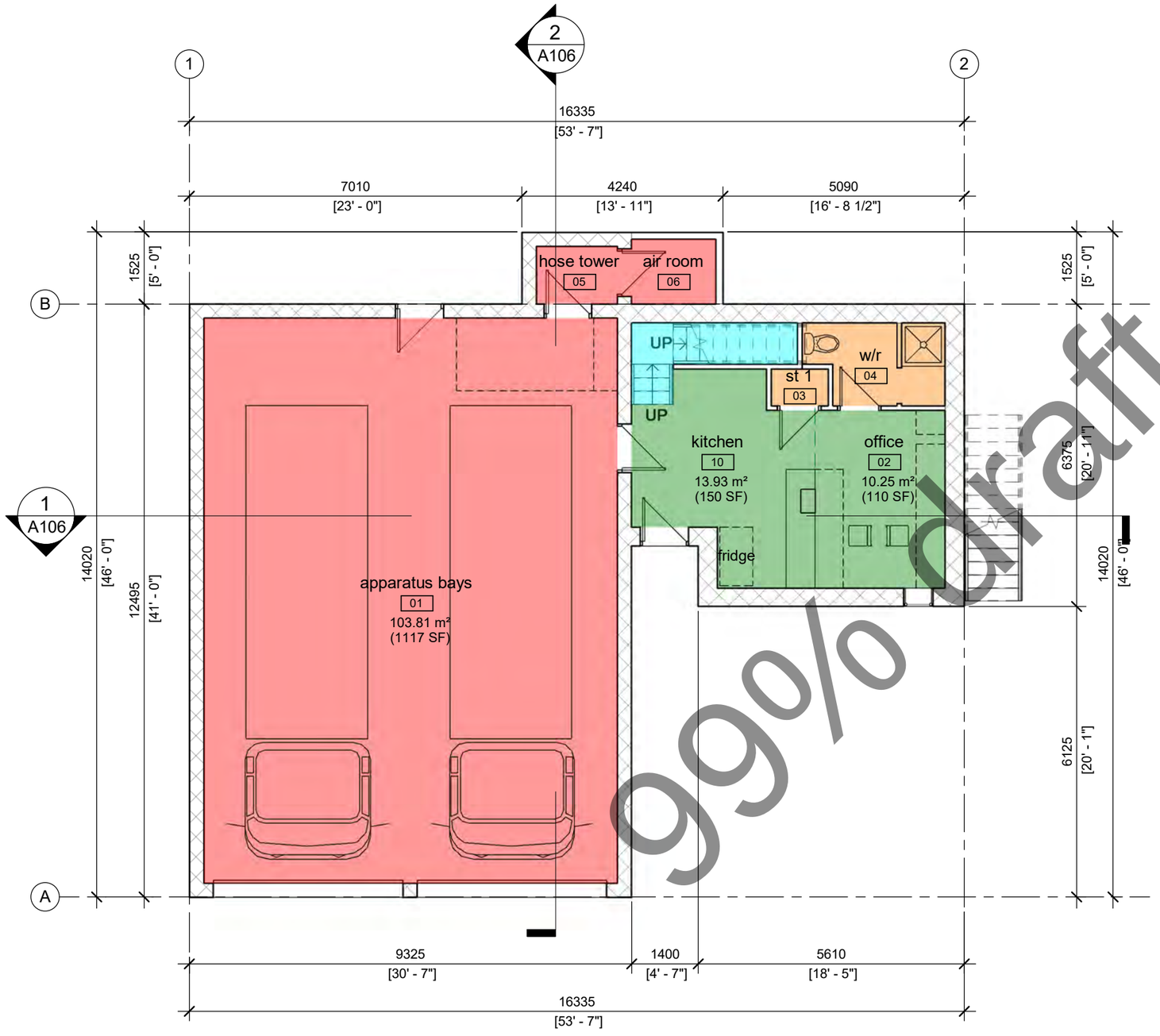
Johnston Davidson
ARCHITECTURE + PLANNING INC.

feasibility study

Metro Vancouver
Regional District
Anmore Firehall

elevations

1:100
18 - sept - 14



Johnston Davidson
ARCHITECTURE + PLANNING INC.

AREA

main floor = 165.90 sm (1,786 sf)
upper floor = 55.79 sm (601 sf)
total floor area = 221.69 sm (2,386 sf)

space allocation legend

- operational
- admin
- crew quarters
- public spaces
- service spaces
- circulation

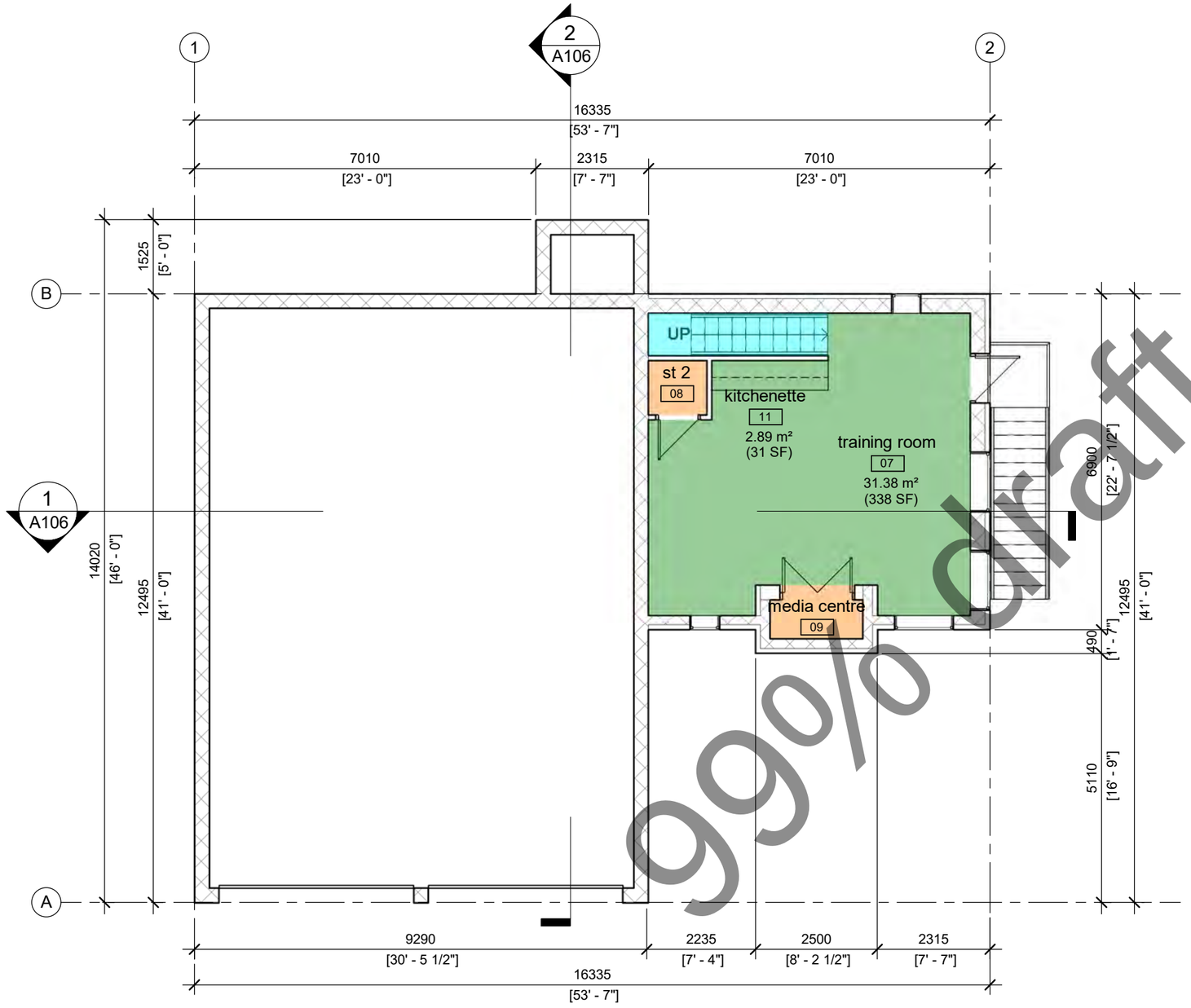
project north 124°

feasibility study

Metro Vancouver Regional District
Belcarra Firehall

main floor plan

1:100
18 - sept - 14



Johnston Davidson
ARCHITECTURE + PLANNING INC.

AREA

main floor = 165.90 sm (1,786 sf)
upper floor = 55.79 sm (601 sf)
total floor area = 221.69 sm (2,386 sf)

space allocation legend

- operational
- admin
- crew quarters
- public spaces
- service spaces
- circulation

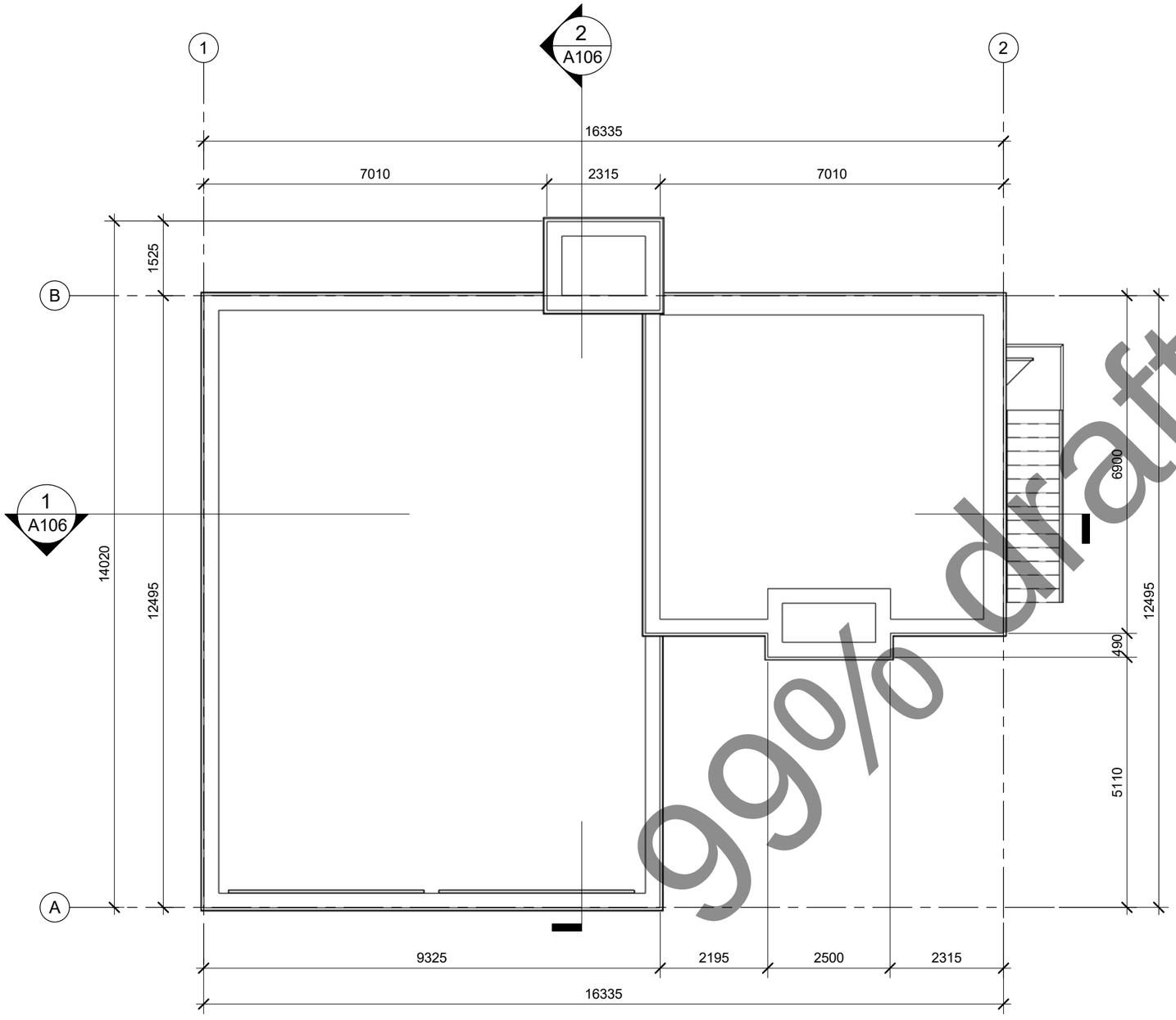
project north 124°

feasibility study

Metro Vancouver Regional District
Belcarra Firehall

second floor plan

1:100
18 - sept - 14



Johnston Davidson
ARCHITECTURE + PLANNING INC.

project north 124°

N

feasibility study

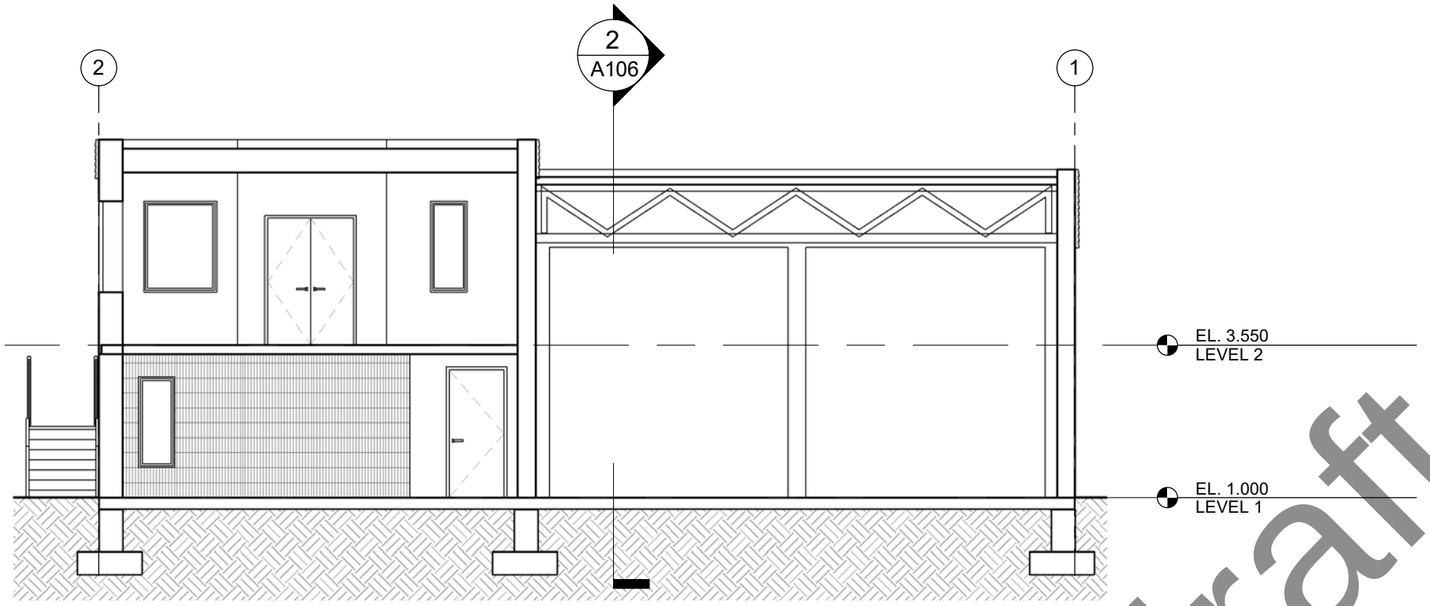
Metro Vancouver Regional District

Belcarra Firehall

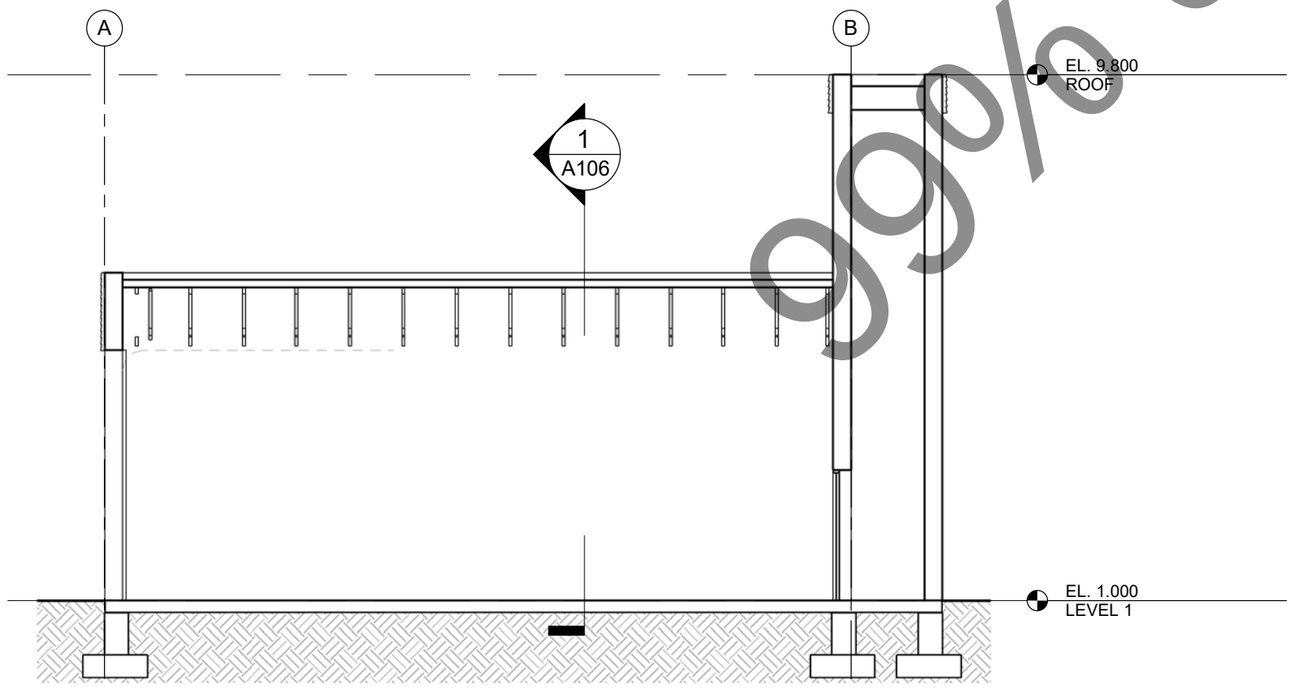
roof plan

1:100

18 - sept - 14



1 longitudinal building section
scale - 1 : 100



2 building cross-section
scale - 1 : 100

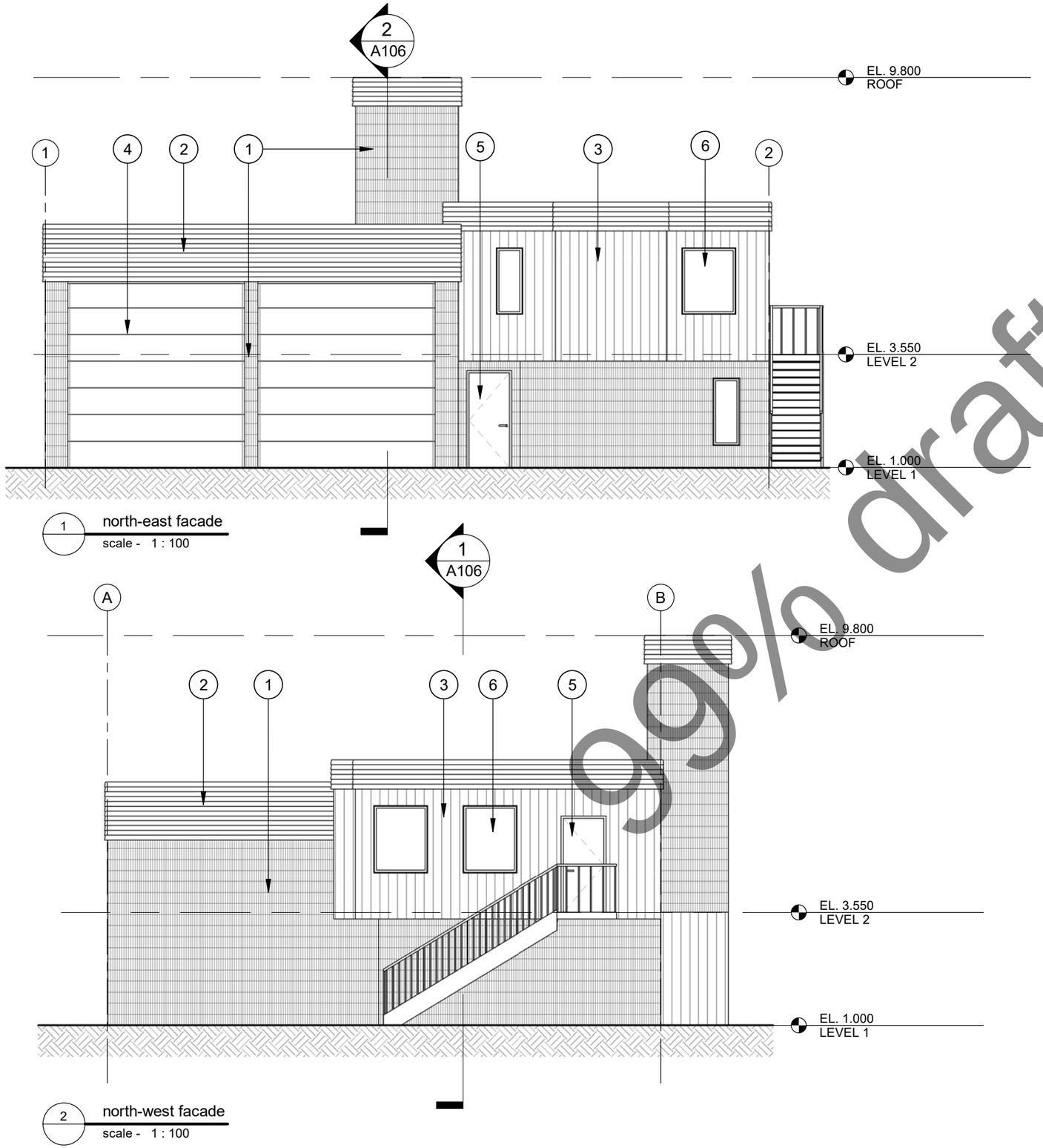
Johnston Davidson
ARCHITECTURE + PLANNING INC.

feasibility study

Metro Vancouver
Regional District
Belcarra Firehall

building sections

1:100
18 - sept - 14



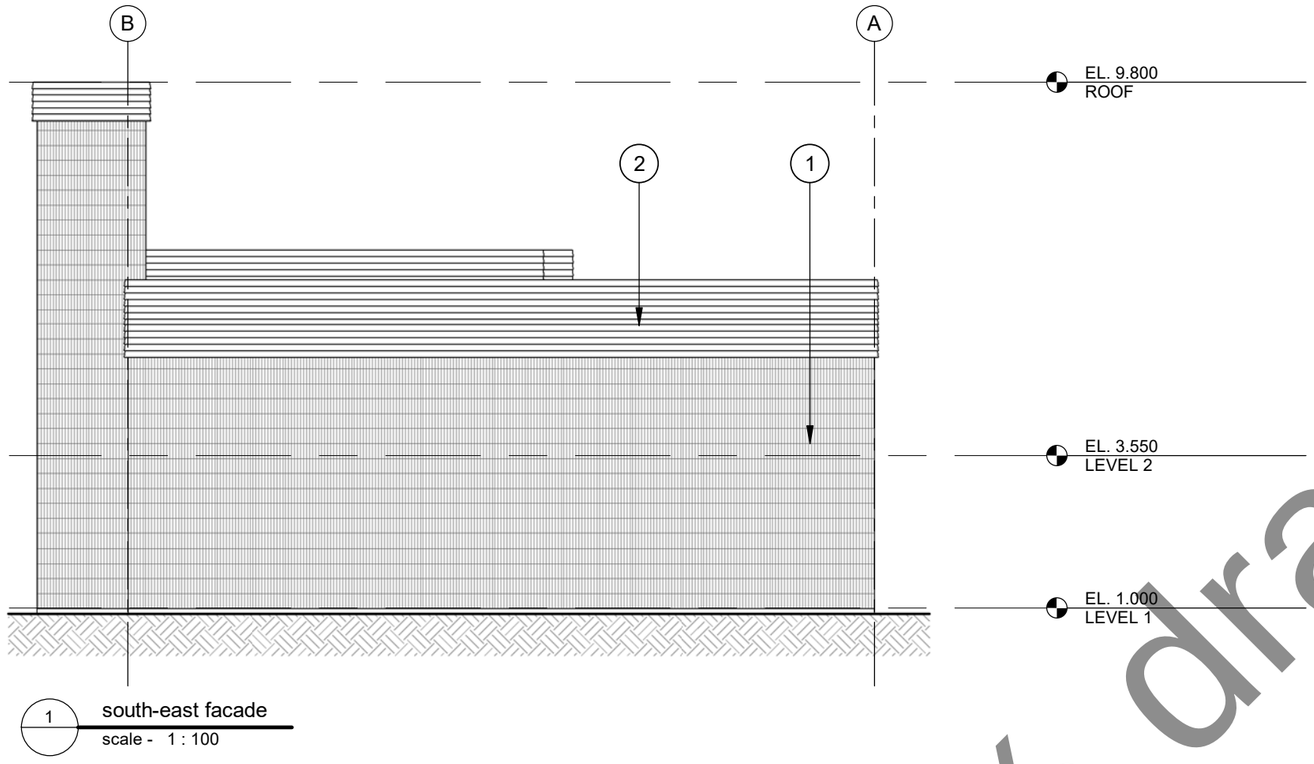
Johnston Davidson
ARCHITECTURE + PLANNING INC.

feasibility study

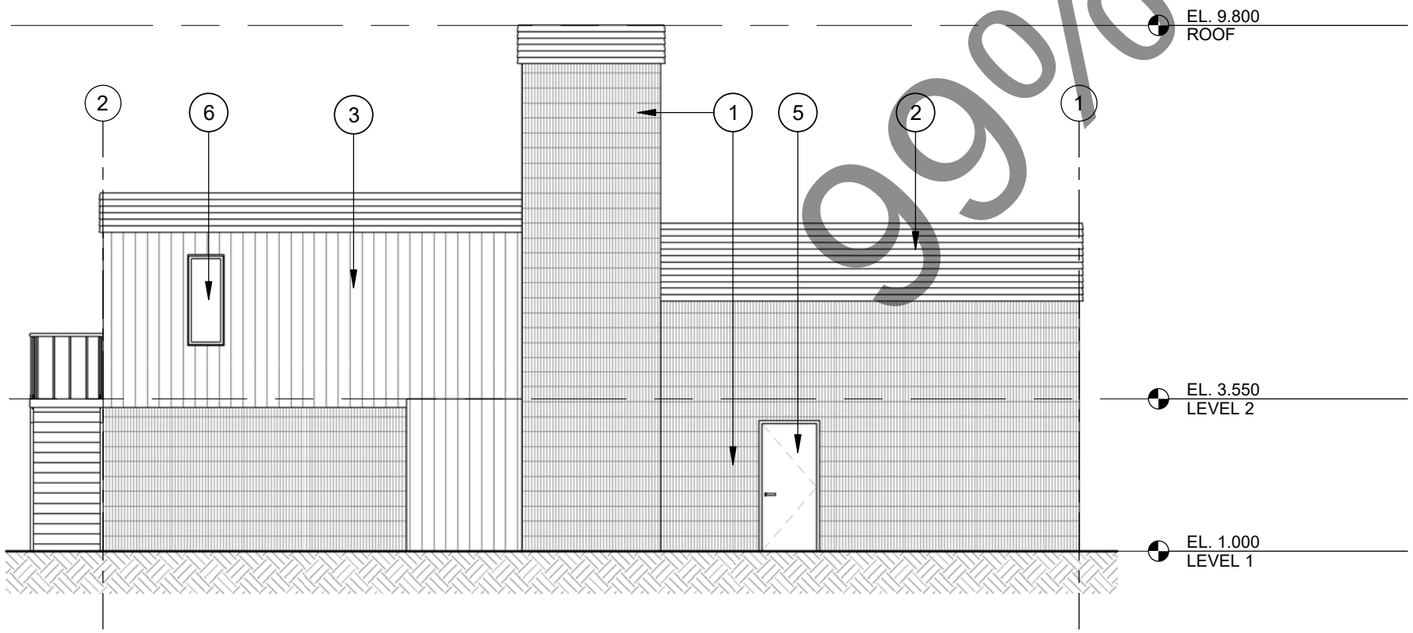
Metro Vancouver
Regional District
Belcarra Firehall

elevations

1:100
18 - sept - 14



1 south-east facade
scale - 1 : 100



2 south-west facade
scale - 1 : 100

Johnston Davidson
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MATERIALS LEGEND

	DESCRIPTION
1	CONCRETE BLOCK
2	WOODEN SIDING
3	METAL SIDING
4	O/H DOOR
5	METAL DOOR
6	WINDOW - CLEAR GLAS

feasibility study

Metro Vancouver Regional District

Belcarra Firehall

elevations

1:100

18 - sept - 14