HORNBY ISLAND FIRE HALL

OPTION ANALYSIS

Prepared for
Comox Valley Regional District
October, 2008

By
Fletcher Pettis Consultants Ltd

EXECUTIVE SUMMARY

In June 2008 the Comox Valley Regional Districted requested the services of Fletcher Pettis Consultants Ltd to assist in the formulation of a decision document regarding the Hornby Island Fire Hall. The objective of this document is to develop an option analysis report which evaluates the feasibility of continued retention of the existing fire hall and site against the construction of a new facility on a new site.

A large body of research and evaluation has been conducted on this project since 1999. Initial investigations ascertained that the existing fire hall had structural issues and plans were developed to bring the facility to a state "approaching" compliance. A subsequent report investigated alternatives and identified the 'build new' options. A thorough site option analysis was conducted to determine the optimal location should a new hall be constructed. The consulting firm CH2M Hill, as part of a wider community study, concluded that the existing fire hall did not meet 2006 BC Building Code for post-disaster structures nor meet the operational needs. Their report highlighted the deficiencies in the existing fire hall, suggested that replacement was the preferred option and identified a preferred site.

This report evaluates two options. The first considers retaining the existing facility and addressing structural and functional deficiencies. The second option considers the construction of a new fire hall on another site.

Pomeroy Consulting Engineers Ltd, an experienced structural engineering firm, was retained to conduct a structural seismic evaluation of the current fire hall. Their report observes that "*The Hornby Island Fire hall construction does not meet even the most basic requirements for post disaster structures due to the nature of its construction, materials systems and details.*" Other factors that are implicated with the retention option are examined; such as, issues related to the site, functional deficiencies that need to be constructed once the facility is made post disaster ready, and how to provide continuous fire protection services during renovations.

The site, being on two levels and only 1.12 acres, presents significant issues with respect to the location of the well, waste disposal field, training area, and additional accommodation to meet the identified functional deficiencies.

The construct new option was examined and assumed functional space allocation of 7,400 sq ft which had been identified in the 2004 Fire Hall Planning Report. The site reviewed was determined in previous analysis and is located in close proximity to the existing fire hall but is 2.5 acres and more amenable to development and the siting of water, waste and training area functions. A cost estimate was prepared by a contractor experienced in fire hall construction.

The cost comparison of the options is as follows.

ITEM	EXISTING FIRE HALL	ITEM	NEW FIRE HALL
Seismic Upgrade	$1,000,000	Construct 7,400 sq ft new	$ 1,700,000
Escalation to Nov 09	$ 105,000	Escalation to Nov 09	$ 178,500
Design fees seismic	$ 120,000	Design fee allowance	$ 170,000
Wastewater treatment	$ 40,000	Wastewater treatment	$ 40,000
Water supply and treatment	$ 20,000	Water treatment and supply	$ 20,000
Construct Ambulance Bay	$ 55,750		
Sub total upgrade existing	**$ 1,340,750**		
New functional space	$ 573,100		
Escalation to Nov 09	$ 60,200		
Design fees new construction	$ 57,300		
TOTAL ADD/REN EXISTING	**$ 2,031,350**	TOTAL NEW	**$ 2,108,500**

The seismic upgrade of the existing fire hall is just a precursor to meeting the required service level. On that basis the cost to renovate the fire hall and add on sufficient space to meet functional requirements is approximately equal to the construct new option.

Capital cost is just one factor in considering the problem. Numerous other issues related to the options are tabulated in a decision matrix to clearly identify problems and positives related to each option. Based on the factors affecting each option, the weight of the analysis indicates that there are more positive aspects related to the 'New Construction' option and that there are more negative aspects related to the 'Retain Existing' option.

The conclusion of this report is that the option to construct a new fire hall on the identified site best meets the long term requirements for fire protection on Hornby Island. The recommendation supporting that conclusion is that the Comox Valley Regional District staff takes appropriate action to gain approval and funding for a new fire hall.

CONTENTS

1.0 TERMS OF REFERENCE

In June 2008 the Comox Valley Regional Districted requested the services of Fletcher Pettis Consultants Ltd to assist in the formulation of a decision document with respect to the Hornby Island Fire Hall. The terms of reference for the document was to develop an option analysis report which evaluates the feasibility of continued retention of the existing fire hall against the construction of a new facility. In developing the analysis Fletcher Pettis Consultants were to identify, retain and co-ordinate various consultants whose specialized role was to provide independent evaluation and cost estimating services.

This report will review the background information comprised in several reports conducted related to the fire service function on Hornby Island. The report will evaluate the option of retaining the existing facility as the location of for fire protection service on Hornby Island against the option of constructing a new facility on a nearby site. Finally, and most importantly, the report is to make a recommendation to the Comox Valley Regional District with respect to the option that best meets the long term requirements for providing fire protection services on Hornby Island.

Fletcher Pettis Consultants Ltd was retained to provide an independent and impartial evaluate of the situation on an objective basis. No stakeholders were interviewed to solicit opinion, or consideration made with respect to the community history or of financing implications.

2.0 BACKGROUND

A large body of research and evaluation has been conducted on this project since 1999 and it is not the intention of this report to repeat the detail that has been recorded previously. However, it is necessary for the reader to be aware of the past documentation and the salient outcomes of each report.

A building inspection was conducted by the Comox Strathcona Regional District in 1999 and identified concerns with the existing fire hall and its ability to meet post disaster requirements for service.[1] The letter recommended a series of actions to be implemented.

In November 2000 Ron McMurtrie Associates completed an evaluation of the existing fire hall.[2] It concluded that it was not likely feasible to upgrade the existing fire hall to code. It suggested that the building could be improved but that this would not be to a post disaster standard. The report introduced the option to construct a new fire hall on either a new site or on the existing footprint.

[1] December 15, 1999, Regional District Comox Strathcona letter file no. 08603.010.
[2] November 7, 2000, Ron McMurtrie Associates, " Seismic Assessment of Fire Hall Building"

A subsequent report was commissioned to provide additional detail on remedial costs.[3] The conclusion of that report was that upgrades could be completed to levels "approaching compliance" with the current building code. The report noted the degree of uncertainty in the conclusion given that the unknown quality of the building materials used and that a greater degree of certainty would be achieved with new construction. The report received a peer review by Bates Engineering which "generally concur[red]" with the conclusions.

Preliminary investigation commenced in 2001 for alternative sites for a fire hall.

The Hornby Island Fire Department issued a comprehensive document in December 2004.[4] The report identified three options:

1. Do Nothing
2. Repair Existing Fire Hall
3. Construct New Fire Hall

Based on the third option the results of a Building Committee were outlined with the functional space requirements for a new fire hall. A Land Committee report was summarized. This Committee identified and evaluated eight sites against a series of criteria and developed a site plan and cost estimate for a preferred site near a Ministry of Transport gravel pit across the road from the existing fire hall.

The Fire Department report summarized the three options, introduced a fourth option to just add onto the existing facility and conducted an analysis of the pro and con aspects of each option. The report concluded with a recommendation that construction of a new fire hall would best meet the requirements of the community in terms of fire protection services over the next 25 to 50 years.

The consulting company CH2MHill submitted a Community Services Report in October 2007[5]. As part of that report the Hornby Island Fire Hall was commented on. The report summarized the need to upgrade or replace; that of the four options replacement is preferred; and that the MOT site was the most suitable. The report highlighted the deficiencies in the existing fire hall with respect to water supply and wastewater disposal. Legal issues with respect to land encroachments, and risks associated with water supply were discussed with the recommendation to obtain dedicated services regardless of the option selected. CH2MHill concluded that the existing fire hall did not meet 2006 BC Building Code for post-disaster structures nor meet the operational needs for vehicle storage, egress and access. CH2MHill recommended:

1. A detailed seismic assessment of the fire hall to define costs to upgrade the facility.
2. A new fire hall should include water and wastewater services, driveways, aprons, water storage tanks and training areas.

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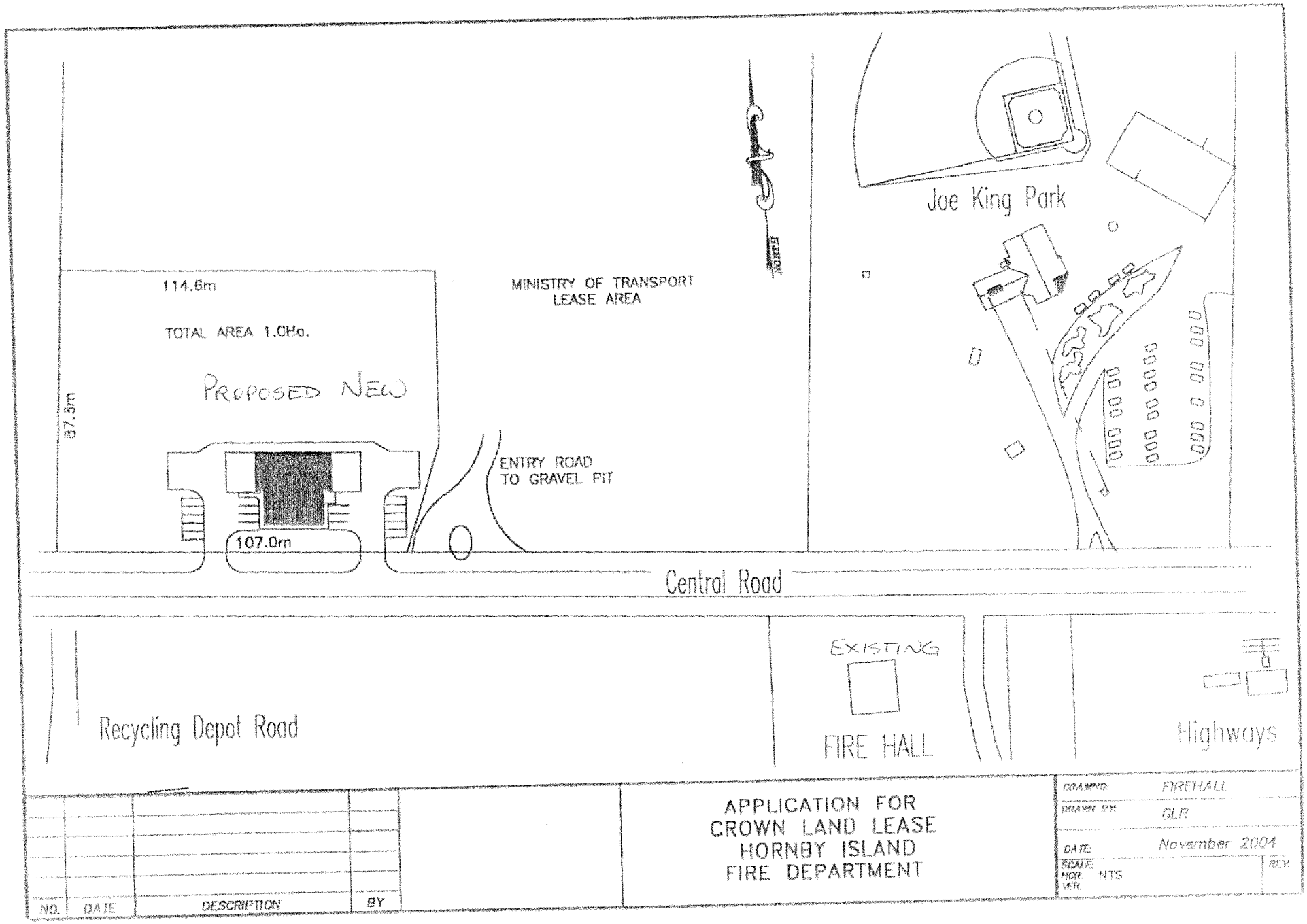
[3] May 2, 2001, Ron McMurtrie Associates, " Cost Analysis and Estimated Performance of Seismic Upgrading – Hornby Island Fire Hall Building".
[4] December 7, 2004, Hornby Island Fire Department, "Fire Hall Planning Report"
[5] 2008, CH2MHill, " Hornby Island Community Services Strategy"



NO.	DATE	DESCRIPTION	BY

APPLICATION FOR
CROWN LAND LEASE
HORNBY ISLAND
FIRE DEPARTMENT

DRAWING:	FIREHALL
DRAWN BY:	GLR
DATE:	November 2004
SCALE: HOR.	NTS
VER.	
REV.	

3. The best site is the BC MOT gravel pit on the north side of Central Road and that the CSRD should secure the property.
4. Future use of the old fire hall as a community facility would have to be determined by the Community groups who would negotiate a change with the property owner.

Based on the recognition of the structural deficiencies and inherent risks involved with the current 'agreements' for water supply and sewage treatment it is reasonable to form the opinion that the 'Do Nothing' option is untenable and exposes the Comox Valley Regional District to undue risk and liability exposure.

3.0 OPTION ANALYSIS

This report therefore concentrates on and provides information on two directions:

1. Retention of the existing Fire Hall and the actions and cost estimates associated with this option.
2. Construction of a new Fire Hall on the designated MOT site.

3.1 Retention of Existing Fire Hall

In this option the critical factors affecting retention of the building are:

1. Building does not meet post disaster structural requirements.
2. Building does not provide sufficient vehicle storage.
3. Building requires encroachment on adjacent property for access to bays from the north.
4. Building requires the development of dedicated services.
5. Building site is sloped and impacts future development.
6. Building requires renewal renovations to extend functional life.
7. Building has functional deficiencies.
8. Continuity of Operations

3.1.1 Post Disaster Structural Requirements.

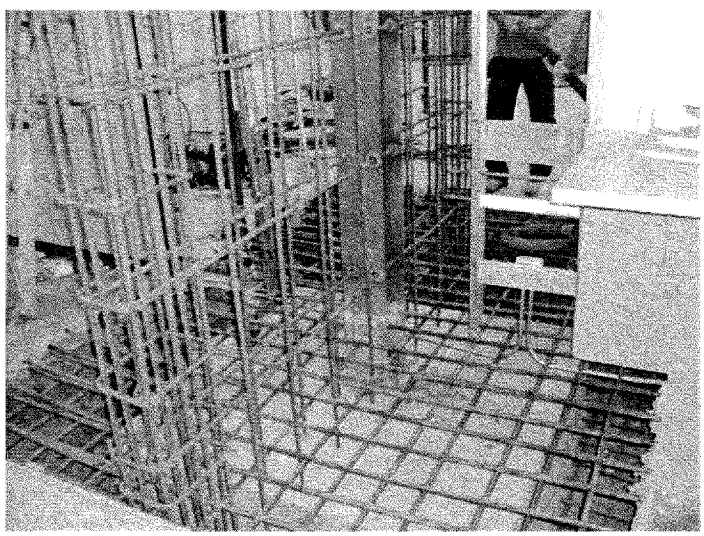
Based on recommendations in previous reports a structural engineering firm, in this case Pomeroy Consulting Engineers Ltd, was engaged to do a seismic evaluation of the existing facility. The firm is experienced in seismic evaluations being active in the numerous seismic upgrades to educational facilities. The Principal Mr. John Wallace sits on a Provincial Committee which develops policy and guidelines for seismic upgrading of public buildings.

The final seismic report is included as Appendix A.

The Pomeroy report identifies the existing deficiencies to be extensive as follows:[6]

"*The Hornby Island Fire hall construction does not meet even the most basic requirements for post disaster structures due to the nature of its construction materials systems and details. Our preliminary analysis indicates the following major deficiencies in the Seismic Force Resisting Systems:*

1. *No vertical or horizontal reinforcing steel in truck bays #1, 2 & 3 masonry shear walls. No grout in the walls.*
2. *Inadequate foundations for masonry shear walls.*
3. *Partial height masonry walls in truck bays #3 & #4 with resulting out-of-plane instability.*
4. *Lack of any shear wall on the southeast elevation. This is a weak storey condition Type 6 irregularity in Table 4.1.8.6.*
5. *The roof/floor plywood sheathing does not have sufficient diaphragm capacity; lack of nailing, blocking, and perimeter ties.*
6. *The connections of the floor and roof diaphragms to the shear walls are unknown and are expected to require significant upgrading based on the nature of the existing construction.*
7. *The vertical stiffness irregularity between the 2nd storey plywood shear walls and the main floor masonry shear walls is not permitted. The masonry shear walls would be required to extend the full height of the building.*
8. *The southwest masonry retaining wall and foundation at the exterior of truck bay #4 is not adequate for seismic loading from the soil. "*

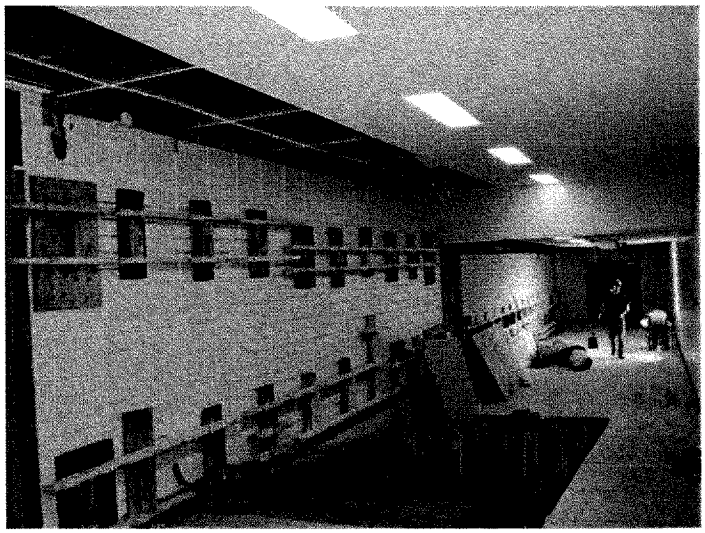


Example retrofit with installation of new foundation and steel reinforced shear wall.

The seismic report identifies two options for bringing the existing facility up to Post Disaster Building standards. Both upgrades would involve the construction of new

[6] 5 September 2008, "Hornby Island Fire Hall Preliminary Structural Seismic Assessment", Pomeroy Consulting Engineers Ltd.

foundations and upgrading the walls and roof structures of the truck bays. One variant proposes to remove the 2nd floor structure (1400 sq ft) and construct a separate building to house those functions. The second variant proposes to upgrade both the truck bays and the 2nd storey.



Example of block wall receiving steel reinforcing bars and grout

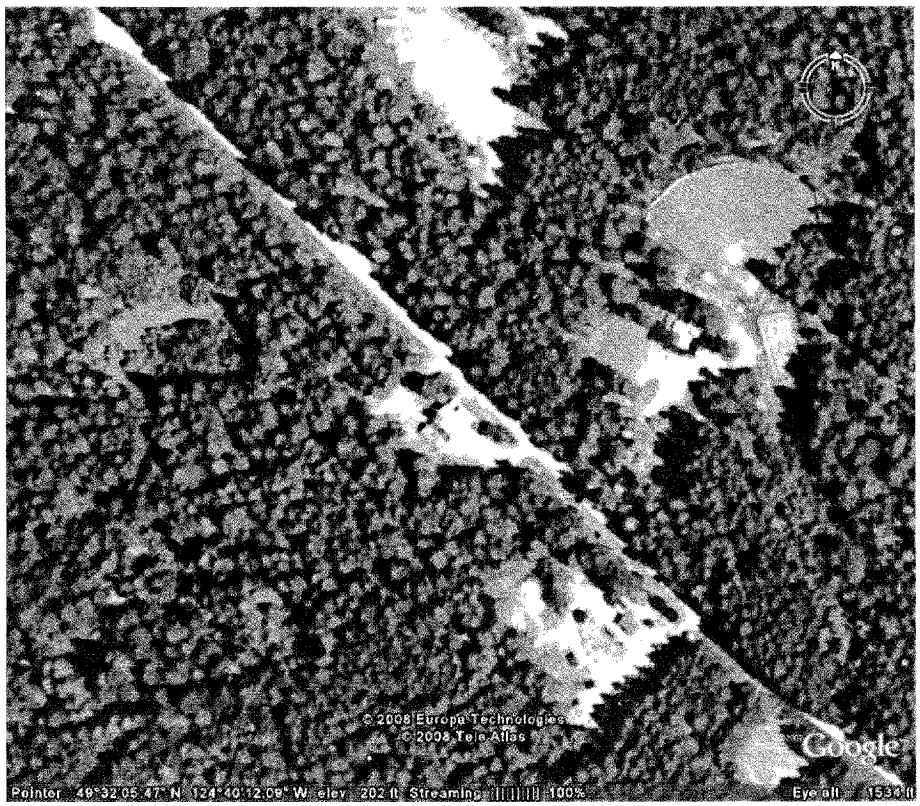
The proposal to replace the second storey has several challenges which make it less feasible than the proposal to renovate the 2nd floor in place. The site is restricted with the only available terrain being uphill of the existing hall. (A more complete discussion of the existing site is provided later.) Relocating the functions of the 2nd floor to a separate building uphill would have negative operational impacts for fire protection. As well, the report recommends that the soil formation up against the bay #4 wall be removed to alleviate seismic stresses that would be applied to that wall in the event of an earthquake. This denies the potential to construct on the bluff and to connect to the trucks and equipment. A new 'second floor' building would have to be connected to the trucks and equipment by a set of stairs down the hill to the lower level of the site. The cost to replace the 2nd floor functions makes the solution more expensive. Demolition of the 2nd floor option will not be considered in the comparison of renovate versus new construction.

3.1.2 Ambulance Bay

Through agreement with the CVRD the Volunteer Fire Department will provide support and operate an ambulance. This requires an additional vehicle bay to be constructed somewhere on the existing site. Due to the rise in elevation of the site the most logical location would require excavation of the sandstone formation adjacent to bay #4 and perpendicular to the line of bays. It would have to be a back-in/drive-out bay. Construction would be cognizant of the seismic forces that could be transmitted through the rock therefore over-excavation would be recommended.

3.1.3 Site Issues

The following air photo depicts the existing site. The site is partially cleared with the fire hall and access pavements located on the front half of the lot. At the rear of the fire hall is a rock face where the lot rises sharply approximately 12 feet. The lot continues to rise gently and this section of the lot remains un-cleared secondary growth. Main access off Central Road is on the SE side of the lot. The fire hall is configured with drive through bays. On the NW side of the hall the lot line is relatively close to the building such that the access/egress requires encroaching on the adjacent property. Access off Central Road on the NW side is onto adjacent property. This should be reconciled and additional property acquired if the hall is retained.



Air photo of Fire Hall and Joe King Park

No survey information was available or obtained for this study therefore lot lines were roughly taken off fencing on adjacent properties and IMap information . The site is approximately 1.12 acres in area with a 198 ft frontage and a 240 ft lot depth. The site must provide for space for a sewage treatment system and disposal field as well as water well. The only vacant space is uphill in the wooded area. The required distance between well and disposal fields is usually a minimum of 50 feet, but it is assumed that to get separation the well would have to go near the front of the lot and downhill from the disposal field. This may be an issue with respect to contamination.

A final issue identified on this site is adequate space for a training area. The training area has been identified as one concrete pad of 40' x 40' and another area of equal dimensions to conduct training for enclosed spaces which would utilize containers. Both areas would be equipped with containment and oil/water separators. The area behind the existing hall is approximately 155' x 198'. Into that area two training pads must be located as well as a septic field and reserve field, the necessary setbacks from property lines and combustible structures as well as roads that would allow vehicle access. The following picture shows how the site is stepped up from Central Road. The grade has been identified as an issue with getting trucks up to the training site.

The seismic report recommends that the slope abutting Bay 4 needs to be excavated to keep seismic forces from being transmitted into the structure. New space needs to be constructed to provide for functional deficiencies. As indicated previously, the lot is only about 198 feet wide. The only area for construction is therefore uphill in an area that likely cannot fit the services mentioned above. As well, Fire Department personnel indicate that the needed spaces must be contiguous to the existing hall and at the same level as the remainder of the hall.

3.1.4 Site Services

The existing fire hall currently acquires water services on an unofficial agreement from adjacent properties. Current health regulations intended to ensure public safety and to limit liabilities place stringent requirements on facility owners regarding control and operations of wells/water sources; regular testing and reporting; and monitoring. The current situation is in violation of this and presents the Comox Valley Regional District with an obligation for due diligence. Legal opinion may be sought to determine the liability exposure presented by the current situation.

Based on the above this report assumes that the current fire hall requires the installation of a water service. Information obtained from well drillers experienced in the area indicate that the costs of a well, subject to actual inspection of the site and depth that water is found, would be in the range of $14,000 to $20,000 (based on 100' drilling).

This would include the well, submersible pump, micron filter and UV disinfection. If a cistern is required than another $3,000 would be added.

The current fire hall sends its waste flows across the road to the Joe King Park disposal field. As for water supply, waste disposal has also been on a community unofficial agreement basis. The assumption of this report is that dedicated sewage treatment services will need to be installed. Determination of the costs of such a plant requires some geotechnical investigation (percolation and permeameter tests). This was beyond the scope of this study but would be done should the retention option be selected. As discussed above there are site issues that make this problematic. The tanks and plant could be placed on the lower level, but the effluent would have to be pumped up to a disposal field of some 'to be determined' dimensions located in the upper field that would be cleared. If insufficient soil is found to exist over the sandstone/clay layer than additional fill would be required. This report assumes that the highest degree of plant treatment would be required to minimize the disposal field area.

3.1.5 Building Renewal

If the retention option is to be considered equitably against the new construction option then it is reasonable to assume that the existing facility will need to serve Hornby Island residents for a life span that needs to extend a comparable time frame compared to new construction. The current facility will need a renewal of the exterior envelop (roof and cladding); electrical systems; mechanical systems and pavement structures to extend its life span at least fifty years.[7]

Hornby Fire Hall – inadequate gusset connection of column to beam supporting second floor.

[7] December 7, 2004, Hornby Island Fire Department, "Fire Hall Planning Report"

3.1.6 Functional Deficiencies

The existing fire hall is 2,900 sq ft of main floor and 1,400 sq ft of second floor space and 280 sq ft of attached storage. The Hornby Island Planning Report identified the requirements for a fire hall to meet the needs of the residents for a further fifty (50) years. Based on identified and detailed spatial requirements, the existing fire hall is deficient in approximately 2,820 sq ft of space. Examples of areas are: exercise room, storage, maintenance, compressor room, records storage, training and utility room. On the assumption that the planning document was accurate and was accepted, than any comparison of the two options would need to include the construction of the additional space to meet functional deficiencies.

3.1.7 Continuity of Operations

The renovations required to the existing fire hall are extremely intrusive and would require that that fire hall services be relocated for the duration of the upgrade. Consideration of alternate locations by the Hornby Island Fire Chief indicated no alternate sites would meet operational requirements. Available temporary sites considered were not central and presented unacceptable risk in the view of the Fire Chief. The opinion of the Underwriters on remote temporary sites was not sought but may be assumed to prefer centralization of fire protection services.

Hornby Is Fire Hall – soil to be removed from contact with wall and exterior buttresses to be constructed on exterior side.

3.2 Construct New Fire Hall on Adjacent MOT Site

The second option in this report is to construct a new fire hall on a site selected from past studies which is located on Ministry of Highways land across the road and in close proximity to the existing fire hall. The following sketch at Figure 2 depicts the proximity of the two sites. The functional space requirements were provided by the CVRD staff and are based on the Hornby Island Fire Hall Planning Report from 2004. A list of the requirements for costing are included as Appendix B and comprise approximately 7,400 sq ft of area. Amendments were provided to update the requirements such as the need to provide accommodation for an ambulance. Though any construction would be sustainable and follow many LEED principles, certification as a LEED building would not be sought. The form and character of a new fire hall was to be basic and functional to minimize costs.

Several criteria will be relevant in the consideration of this option:

1. Site conditions and siting.
2. Functional requirements of a new hall.
3. Life cycle considerations.
4. Transition to new facility.

3.2.1 Site Conditions and Siting

As depicted on the sketch in Figure 1 above the new site is 2.5 acres on the same road and north of the existing fire hall by approximately 300 feet. The proposed site is part of a Ministry of Highways lot which functions as a gravel yard. The area is described as having a minimum slope down from Central Road. The frontage is proposed to be 351 feet which provides for two access points and allows for bays accessed from both sides. The depth of the lot is approximately 285 feet which is sufficient for providing a training area as well as site services (disposal field).

No exposed bedrock was evident indicating a good potential for waste disposal but this remains to be proven. Spatial separation of water supply and wastewater disposal will likely not be a problem. Construction on this level site would allow for future expansion without the restrictions of grade or rock.

3.2.2 Functional Requirements

In constructing a new fire hall the functional requirements identified in the Planning Report can be provided for. New construction allows for the potential to site adapt a previous, proven, fire hall design at a reduced royalty fee to the architect. The new construction option allows for the various spaces to be located in the proper and most effective spatial relationship relative to other spaces.

3.2.3 Life Cycle Considerations

Life cycle cost analysis entails consideration of discount rates, cyclical renewal costs, gas energy costs, electrical energy costs and maintenance costs. Such an analysis requires assumptions on consumption and energy values into the future. No analysis was conducted for this report.

Providing for the required functional needs of a current fire protection service with new construction is generally more cost effective than retrofitting and expanding on a current facility. New construction options are often favoured over renovations in that existing buildings, even if renewed, will not have the same functionality or the same overall life expectancy and will require greater maintenance and renewal costs over the remaining life.

3.2.4 Continuity of Operations

Fire protection services for Hornby Island can continue to be met out of the existing fire hall while a new fire hall is constructed on the adjacent site.

4.0 COST COMPARISON

4.1 Retain Existing Fire Hall

The structural seismic assessment report at Appendix A provides an analysis of what is required to make the existing facility a post disaster facility and provides cost estimates in the range of $800,000 to $1,000,000 for the structural work only. Approvals and securing funding for the project, as well as the design process will take an estimated 13 to 14 months. Escalation in labour and material has been as much as 1.5% per month as recently as a year ago and 1.0% per month as recently as six months ago. Indications are that it is falling and this report is using 0.75% per month escalation. Other costs not included in the seismic estimate are design fees and service costs for water and waste.

The existing fire hall has functional deficiencies as identified in the December 2004 report. The intent of the renovation would be to have a fire hall after a seismic event but also to provide appropriate fire protection services for the next twenty plus years. To achieve this, the functional deficiencies in space would have to be constructed.

The following table summarizes the costs.

ITEM	COST	REMARKS
Seismic Upgrade	$1,000,000	4,580 sq ft
Escalation to Nov 09	$ 105,000	0.75% per month
Design fees seismic	$ 120,000	12% structural renovation
Wastewater treatment	$ 40,000	Assume class III or better
Water supply and treatment	$ 20,000	
Construct Ambulance Bay	$ 55,750	250 sq ft @ $223/sq ft
Sub total upgrade existing	**$ 1,340,750**	
New functional space	$ 573,100	2570 sq ft @ $223/sq ft
Escalation to Nov 09	$ 60,200	
Design fees new construction	$ 57,300	10%
TOTAL ADD/REN EXISTING	**$ 2,031,350**	

4.2 Construct New Hornby Island Fire Hall

The Hornby Island Fire Hall Planning Report identified a requirement for 7,400 sq ft of new space. Site assumptions were based on the identified site across the road from the existing facility. The spatial requirements and the parameters of the estimate have been previously discussed. The cost estimate breakdown is attached as Appendix C. A period of time will be required to acquire the site, during which the approval and design process could be proceeding. A similar escalation rate and period will be assumed. Design fees for new construction will be less than renovation and the same 10% of construction value will be assumed. These estimates are prepared for comparative purposes only and are class D. They should not be used for capital planning purposes.

The following table summarizes the costs for new site development.

ITEM	COST	REMARKS
Construct 7,400 sq ft new	$ 1,700,000	$223/sq ft
Escalation to Nov 09	$ 178,500	Assumed 0.75% per month
Design fee allowance	$ 170,000	10% of construction value
Wastewater treatment	$ 40,000	Assume class III or better
Water treatment and supply	$ 20,000	
TOTAL NEW	**$ 2,108,500**	

4.3 Discussion of Costs

If the direction and objective is to provide appropriate fire protection services to Hornby Island then it is reasonable that the functional space requirements identified in the 2004 report are valid and need to be achieved regardless of whether the renewal or construct new option is selected. The seismic upgrade of the existing fire hall is just a precursor to meeting the required service level. On that basis the cost to renovate the fire hall and add on sufficient space to meet functional requirements is approximately equal to the construct new option.

If the direction and objective is to leave the current fire hall with the identified deficiencies and just add on a bay for the ambulance than the cost to do that is sixty four (64%) per cent of the construct new option. Normal life cycle renewal costs, such as a new roof, new envelop and new mechanical systems would increase that percentage to a point that would support the construct new option.

5.0 DECISION MATRIX AND ANALYSIS

To assist in reaching a conclusion as to what direction to take the following decision matrix gathers in the relative criteria that need consideration and that were discussed previously in this report.

CRITERIA	RETAIN EXISTING FIRE HALL	CONSTRUCT NEW FIRE HALL
Post Disaster Capability	• Does not meet • Requires upgrade	• Would meet
Ambulance Bay	• Does not have • Requires addition	• Would be incorporated
Site Issues	• Site is narrow, on 2 levels, 1.12 acres • Back of site requires clearing and grubbing • Encroachment requires land acquisition • Tile field may be uphill of water well. Site restrictions • Training area space needs competes with tile field • Likely unable to meet all space requirements	• Level lot of 2.5 acres requires acquisition • Clearing and grubbing included in cost. • Double sized of frontage • Rear of lot is gravel pit. Less likely to be affected by rear lot buffer issues for fire training area. • No bedrock evident.
Site Services	• Requires dedicated wastewater treatment and disposal field • Requires water well and supply/treatment system	• Requires wastewater treatment and disposal field • Requires water well and supply/treatment system
Renewal	• Future renewal investment required for roof and envelop • Electrical, mechanical system renewal will be required. Scope and cost not defined nor costed.	• All new construction, all systems to modern energy efficient codes. • 25 years before renewal required. 50 year life of building.
Functional Deficiencies	• Current hall is deficient in functional areas as determined by Dec 04 Planning Report.	• Will address all functional requirements.
Continuity of Operations	• Upgrading the fire hall would require displacement of operations for the duration. • Indications are that alternate accommodations are not available.	• Operations can continue during construction.
Life Cycle	• Existing buildings, even if renewed, will not have the same functionality or the same overall life expectancy and will require greater maintenance and renewal costs over the remaining life.	• New construction is generally more cost effective than retrofitting and expanding on a current facility.
Capital Costs	• $2, 031,350	• $2, 108,500

The terms of reference called for the comparative evaluation between retention of the existing fire hall and the construction of a new hall on a new site. The existing site has several limitations that affect it negatively in comparison with the new site. It is on two levels with bedrock shallow to the surface. This makes expansion of the fire hall to meet long term functional needs and wastewater treatment problematic. The existing site being half the size of the new site makes siting of a disposal field and training area more problematic.

The existing facility, while a commendable achievement of community volunteerism, requires an extensive and expensive renovation to rebuild it to meet post disaster status. Were that upgrade achieved, the facility would still require renewal of its electrical, mechanical and architectural systems. To meet the long term requirements of fire protection on Hornby Island, functional deficiencies need to be addressed through new construction. New construction at the existing fire hall would be difficult due to the site issues and would exacerbate other issues such as developing the training area.

Renovation of the existing fire hall would significantly affect the continuity of fire protection operations as the fire hall would have to relocate. The cost to achieve a long term fire protection service on the existing site would have comparable capital costs to new construction.

Both options require land acquisition, one for the new site and for the existing hall to remove the encroachment.

6.0 CONCLUSIONS AND RECOMMENDATION

The Hornby Island community has been conducting analysis and evaluation of the problems affecting the Fire Department and considering solutions to addressing deficiencies in the current facilities and operations since 1999. Each study has provided relevant information and investigated options; however, no clear decision was taken to move the Department forward and to secure a long term solution in providing fire protections services to the community.

This document has attempted to complete a comparative analysis of two options which would meet long term functionality for fire protection. Based on the factors affecting each option the weight of the analysis indicates that there are more positive aspects related to the selection of the 'New Construction' option and that there are more negative aspects related to the 'Retain Existing' option.

The conclusion of this report is that the option to construct a new fire hall on the identified site best meets the long term requirements for fire protection on Hornby Island. The recommendation supporting that conclusion is that the Comox Valley Regional District staff takes appropriate action to gain approval and funding for a new fire hall.

APPENDIX A: STRUCTURAL SEISMIC ASSESSMENT

1.0 INTRODUCTION

1.1 Scope of Preliminary Structural Seismic Assessment Report

Pomeroy Consulting Engineers Ltd. was retained by Fletcher Pettis Consultants Ltd to prepare a structural seismic assessment of the Hornby Island FireHall located on 3850 Central Rd, Hornby Island, BC. This report has been prepared by Richard Mastschuch, P. Eng. and reviewed by John Wallace, P.Eng, Struct. Eng. The purpose of the report is to assess whether an upgrade of the existing structure to a Post Disaster Building under BCBC 2006 is technically feasible and economically viable. Existing information on the Firehall was obtained at the site by Gordon Dunnet, P.Eng., a Principal in our firm.

This Structural Seismic Assessment Report has been carried out in accordance with Part 4 of British Columbia Building Code 2006. The scope of work of the report is as outlined below:

- Visit the site to obtain the structural state and geometry of existing firehall and minor on-site investigation into existing walls and ceilings.
- Prepare sketches including plans and sections of the existing building
- Identify deficiencies of the existing firehall structure in comparison to the structural requirements in BCBC 2006 for a Post-Disaster building.
- Prepare possible upgrade schemes.
- Provide a preliminary cost estimate for the construction work related to each upgrade scheme.

The conclusions of this report are based primarily on structural considerations for the seismic upgrade. They include allowances for the Architect, Mechanical & Electrical components of the work due to the structural retrofit work but do not include upgrade costs to the A, M & E systems. Detailed reports from A, M and E consultants have not been included in this report.

2.0 EXISTING CONDITIONS

2.1 Firehall Site

The fire hall is located at 3850 Central Road on Hornby Island, B.C. The Site is relatively flat except that it steps up at the South-west end of the building. The exterior southwest wall of truck bay #4 also acts as a retaining wall to support the higher soil.

2.2 Geotechnical Conditions

We understand from previous construction at the site, that sandstone is present across the entire site at a depth at about two feet below grade. The sandstone is closer to the surface under truck bay #4, which is the apparent reason for the raised slab.

2.3 Existing Construction

2.3.1. General Description

The existing building layout and construction material are shown on Sketches SK-1 to SK-5. The existing Firehall is a two storey building. The main floor plan includes 4 truck bays and an office room at the northeast end. Above truck bays #1 and 2 is a wood framed 2nd storey with meeting, kitchen and recreation rooms and bathrooms. Part of the second storey is a wood frame hose tower and an exterior steel truss communication tower is connected to the high roof. Truck bays #3 and 4 are one storey with flat roofs at different elevations. The structure includes a one storey wood framed storage and a 2nd storey wood framed office.

Approx. Floor Areas:	Main Floor	2900 sq.ft
	2nd Storey Floor	1400 sq.ft
	Attached Storage	280 sq.ft

2.3.2. Detailed Description of the Building

Structure was apparently built in 4 phases, as follows:

Phase 1: Truck Bays #1 & 2 & Main Floor Office

Truck bays #1 & #2 plus the office were constructed in 1968/69 as a 1 storey building. Type of construction: Thickened concrete slab, 12 ft high unreinforced 8" thick masonry walls, 2x8 roof joists at 16" o.c. and rough timber beams and columns; office unreinforced 8" thick masonry walls are 8 feet high.

The main floor slab appears to be 10" thick concrete. The masonry walls and centre columns are supported off the slab without separate footings. The slab was placed in 8.5ftx40ft strips. Floors have been patched (#2 especially) and now have been cracking at the rear wheel axle locations of the firetrucks and around the centre columns. Otherwise, only a few cracks were observed. It is not known if the slab is reinforced. No cracking was observed in the unreinforced masonry walls.

Phase 2: 2nd Floor Addition above Truck Bays #1 & 2 & above Office

The second floor and high roof area was added in 1984. Type of construction: 3/4" plywood over shiplap on the original roof, 2x6 wood studs and 3/8 exterior plywood on perimeter walls. The high roof is framed with pitched wood trusses at 24" o.c., spanning 28 ft.
Cracks were not apparent in room drywall finishes on the perimeter walls or in the ceiling. The roof trusses appear to be in good condition.

Phase 3: Truck Bay #3 Addition

Truck Bay #3 was added in 1990. The floor and roof construction appears similar to Truck Bays #1 & #2 except the southwest unreinforced masonry wall is only 4 ft high. The remainder of the southwest wall is 2x6 wood studs at 16" o.c built on top of the block wall. The masonry is in good condition- no cracks observed. There is no bond beam at the top of the masonry wall.

Phase 4: Truck Bay #4 Addition

Truck Bay #4 was added in 1996. The floor and roof construction appears similar to other bays except the southwest exterior masonry wall is 6'- 8" high and appears to be reinforced and solid grouted. This wall acts as a retaining wall and has 2x6 wood stud wall extension to roof. The main floor and roof are higher than at the other bays.

Truck Bays #1 & #2 were upgraded in about 1992, with 2x4 12 ft high wood studs added in front of the unreinforced masonry walls, sheathed with 3/8in plywood and gyproc panels. This 'upgrade' was only on one side on the northeast and northwest walls but on both sides of the wall between truck bays #2 & #3. Construction details were exposed to show no attachments to the masonry walls and only a nominal attachment at the floor. This upgrade would not be considered as an effective seismic upgrade.

3.0 STRUCTURAL SEISMIC UPGRADE

3.1 Seismic Criteria

Preliminary Seismic risk assessment and retrofit criteria are based on the *British Columbia Building Code 2006* with the Firehall required to be a Post Disaster Building. The BCBC 2006 requirements for Post Disaster Buildings include the following:

- Seismic loading forces are 50% higher than for normal buildings ($I_E = 1.5$).
- Lateral deflection and interstorey drift restricted to 0.01 times building height (50% of the drift for normal importance buildings)
- Minimum ductility requirements defined by R_d equal or higher than 2.0
- Restrictions on structural irregularities in the Seismic Force Resisting System (SFRS). These irregularities are listed in Table 4.1.8.6 of BCBC 2006 and include changes in shearwall stiffnesses, non-symmetric plan layouts and possible 'weak storeys'.
- Masonry structures must be designed and detailed with Moderately Ductile shearwalls with $R_d = 2.0$. This requires special detailing for reinforcing steel including staggered laps for vertical bar splicing and end hooks on horizontal bond beam reinforcing.

Site specific code requirements:

- Site Classification: Class C assumed.
- Allowable soil pressure under seismic loads: 200kPa (Assumed)
- Ground snow & rain load: S_s= 2.6 kPa & S_r = 0.4 kPa (for seismic mass calculations)
- Seismic spectral response: $S_a(0.2)$= 0.66 (Comox)

3.2 Existing Deficiencies

The Hornby Island Firehall construction does not meet even the most basic requirements for post disaster structures due to the nature of its construction materials systems and details. Our preliminary analysis indicates the following major deficiencies in the Seismic Force Resisting Systems:

1. No vertical or horizontal reinforcing steel in truck bays #1, 2 & 3 masonry shearwalls. No grout in the walls.

2. Inadequate foundations for masonry shearwalls.

3. Partial height masonry walls in truck bays #3 & #4 with resulting out-of-plane instability.

4. Lack of any shearwall on the southeast elevation. This is a weak storey condition- Type 6 irregularity in Table 4.1.8.6.

5. The roof/floor plywood sheathing does not have sufficient diaphragm capacity; lack of nailing, blocking, and perimeter ties.

6. The connections of the floor and roof diaphragms to the shearwalls are unknown and are expected to require significant upgrading based on the nature of the existing construction.

7. The vertical stiffness irregularity between the 2nd storey plywood shearwalls and the main floor masonry shearwalls is not permitted. The masonry shearwalls would be required to extend the full height of the building.

8. The southwest masonry retaining wall and foundation at the exterior of truck bay #4 is not adequate for seismic loading from the soil.

4.0 SEISMIC UPGRADE OPTIONS

Two options were developed to upgrade the existing Firehall up to a Post Disaster Building by eliminating the structural irregularities of the existing structure, and adding

reinforcing to diaphragms, walls and foundations. The options are identified as follows: (See the attached sketches listed below)

- **OPTION 1**: Upgraded Truck Bays & Removal of 2nd Storey
- **OPTION 2**: Upgraded Truck Bays & Upgraded 2nd Storey

4.1 OPTION 1: Upgraded Truck Bays & Removal of 2nd Storey

(Sketches SK-6 to SK-8)

Revised Area:	Main Floor	2900 sq.ft
	Storage Area	280 sq.ft

Construct separate building for office, meeting, washrooms and communication requirements. The cost of the separate building is not included in the Cost Estimates in section 5.

1. Demolish upper wood framing above the 2nd floor and the high roof structure. Retain the 2x8 joist framing for the 2nd floor (now the low roof).

2. Build a new adjacent but separate wood framed structure with the meeting room, office, communications and washrooms, etc. designed as a Post Disaster Building.

3. Build new foundations for all the truck bay masonry walls while shoring the existing roof framing and masonry walls. Build new foundations for the 4 timber columns in truck bays #1 and #2.

4. Upgrade all existing masonry walls to 'Moderately Ductile' shearwalls by adding vertical reinforcement with staggered laps in grouted cores and horizontal bond beams with hooked reinforcement. Work includes cutting out the face shells on one side for all grouted vertical cores and for horizontal bond beams, to install reinforcement. Additional shoring required for horizontal cuts for bond beams.

5. Extend partial height masonry walls in truck bays #3 & 4 as reinforced concrete block shearwalls up to the roof.

6. Build a new reinforced concrete or masonry shearwall at each end on the southeast elevation- to correct the weak storey condition due to the overhead truck door openings. Add new steel ties between the two new shearwalls and the existing roof framing.

7. Upgrade the roof joist and diaphragm connections at the top of the masonry walls.

8. Remove the existing roofing over truck bays #3 and #4 and re-nail existing plywood diaphragm to joists below and provide metal straps on top of plywood along long edges or provide blocking on flat below sheathing. Provide new 1/2in thick plywood sheathing where no plywood exists.

9. Remove existing plywood and ship-lap flooring on truck bays #1 and #2 (Current 2nd Floor framing) and add new 1/2in plywood sheathing with blocked edges nailed to existing joists. Reinforce the connections for the existing timber girder and timber columns in centre of bays 1 and 2.

10. Provide new roofing for truck bays #1 to #4 and over the main floor office & storage.

11. Construct a new fire hose tower.

12. Remove soil away from the southwest wall of truck bay #4.

OPTION 1A: ALTERNATE UPGRADE: (Sketch SK-9)

- Similar to Option 1 except remove a section of each masonry wall and construct cast-in-place foundations and 10in wide concrete shearwalls. The remaining masonry walls would be upgraded to carry vertical gravity loads and out-of-plane seismic loads only, rather than upgrading as shearwalls to the more costly 'Moderately Ductile' shearwall requirements.

4.2 OPTION 2: Upgrade 4 Truck Bays & Upgrade 2nd Storey

(Sketches SK-10 to SK-13)

Revised Area:	Main Floor	3185 sq.ft
	2nd Floor	2370 sq.ft

1. Provide the Option #1 Upgrades except for Items 4.1.1 and 4.1.2 and the following further requirements:
   a. Larger foundations required for the masonry shearwalls between the truck bays – larger than in Item 4.1.3. Only 3 foundations are required for the existing timber columns between truck bays #1 & #2.
   b. Revise Item 4.1.6 shearwalls on the southeast elevation as shown in Item 4.2.3 below.
   c. Revise plywood sheathing from 1/2in to 5/8in for new floor over truck bays #1 & #2- in Item 4.1.9.

2. Shore all roof and floor timber structures during construction, including the high roof. Remove the lower roof over the storage area and office floor and roof.

3. Construct new foundation and a two storey masonry shearwall on the southeast elevation in front of truck bay #1 and the existing office. See sketch SK-10. The footing is 43ft x 3ft x 24" deep and the wall is 28ft long. These changes require a revision to the overhead door/exit location for truck bay #1 to the northwest end.

4. Demolish part of the existing masonry wall on the northwest elevation (truck bays #1 & #2) and construct new foundation and two storey shearwall at the end of truck bay #2 and a new masonry wall at the existing storage area. Footing & wall sizes as southeast elevation.

5. Build new foundations, masonry shearwalls, stairs, main floor and 2nd floor offices and new roof, replacing & enlarging the existing offices and storage area.

6. Build 3 new 40 ft. long masonry shearwalls between the 2nd floor & high roof-walls for truck bays #1 & #2. Build new wood stud walls where shown.

7. Re-roof the building and add hose tower and provide lateral support for communications tower.

5.0 PRELIMINARY COST ESTIMATES

5.1 **OPTION 1 and 1A** – probable costs for work in 2008:

Shoring		$ 20,000-
Lower roof&floor	3000ft^2 x $100/ft^2	$ 300,000-
Re-roofing	3000ft^2 x $30/ft^2	$ 90,000-
Hose tower		$ 50,000-
Subtotal (Vancouver area)		$ 460,000-
Approx 40% Increase due to location		$ 185,000-
Total (Hornby Island)		$ 645,000-

Estimated range of cost: $600,000 to $800,000

5.2 **OPTION 2** – probable cost for work in 2008:

Upper roof	2000ft^2 x $60/ft^2	$ 120,000-
Extended masonry	1600ft^2 x $25/ft^2	$ 40,000-
Shoring		$ 20,000-
Lower roof&floor	3000ft^2 x $100/ft^2	$ 300,000-
Re-roofing	3000ft^2 x $30/ft^2	$ 90,000-
Hose tower		$ 50,000-
Subtotal (Vancouver area)		$ 620,000-

5.2 OPTION 2 – probable cost for work in 2008: (Cont)

Approx 40% Increase due to location	$ 250,000-
Total (Hornby Island)	$ 870,000-

Estimated range of cost: $800,000 to $1,000,000

6.0 SUMMARY

This report is focused on structural considerations for the seismic upgrade of the building. Elements of the structure supporting gravity loads only have not been assessed. The accuracy of the report is limited due to the lack of information available regarding original design and actual construction details. It is possible that the scope of work may increase in order to fully comply with BCBC 2006 requirements for Post Disaster Buildings.

Architectural, mechanical, electrical and building envelope work required for improvements to the building have not been included in this report. A cost allowance for the removal and reinstatement of materials to accommodate the seismic works has been included.

We have assumed construction would be in the Spring or Fall in order to avoid the busy Summer season for ferry transportation & accommodations for workers. No allowances have been provided for temporary facilities for the Firehall during seismic upgrade work.

We recommend further testing & inspection of the existing structure if either option is considered economically viable as the risk of unknown existing conditions is considerable. We then suggest further development of the design and costing by a Quantity Surveyor or a Construction Manager.

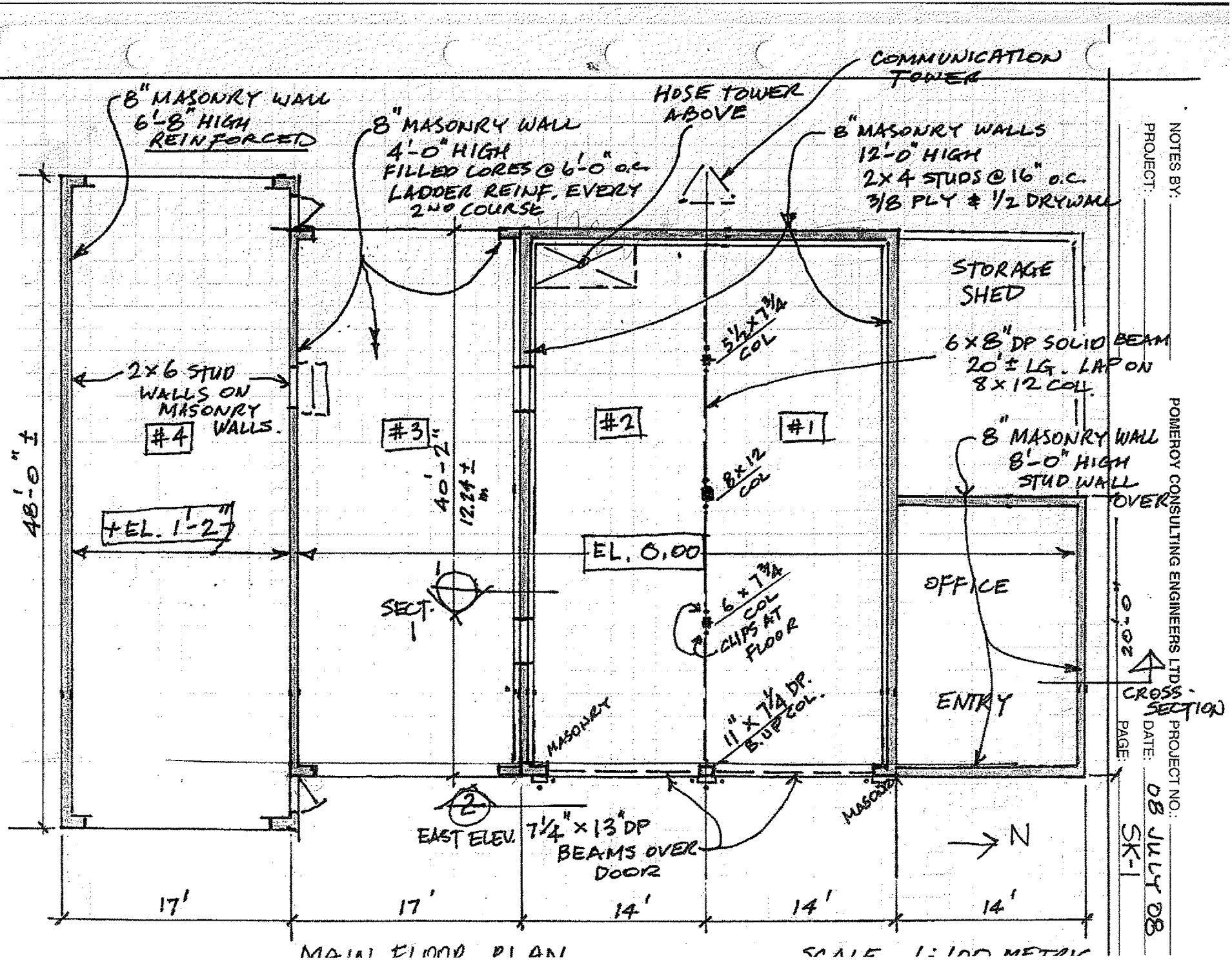
A new, smaller firehall can likely be constructed for approximately the same cost as the upgraded Option 2, assuming a new construction cost of around $300/ft^2.

Pomeroy Consulting Engineers Ltd.

Richard Mastschuch, P.Eng.

Reviewed by:

John Wallace, P. Eng., Struct. Eng.



MAIN FLOOR PLAN

SCALE 1:100 METRIC

NOTES BY:

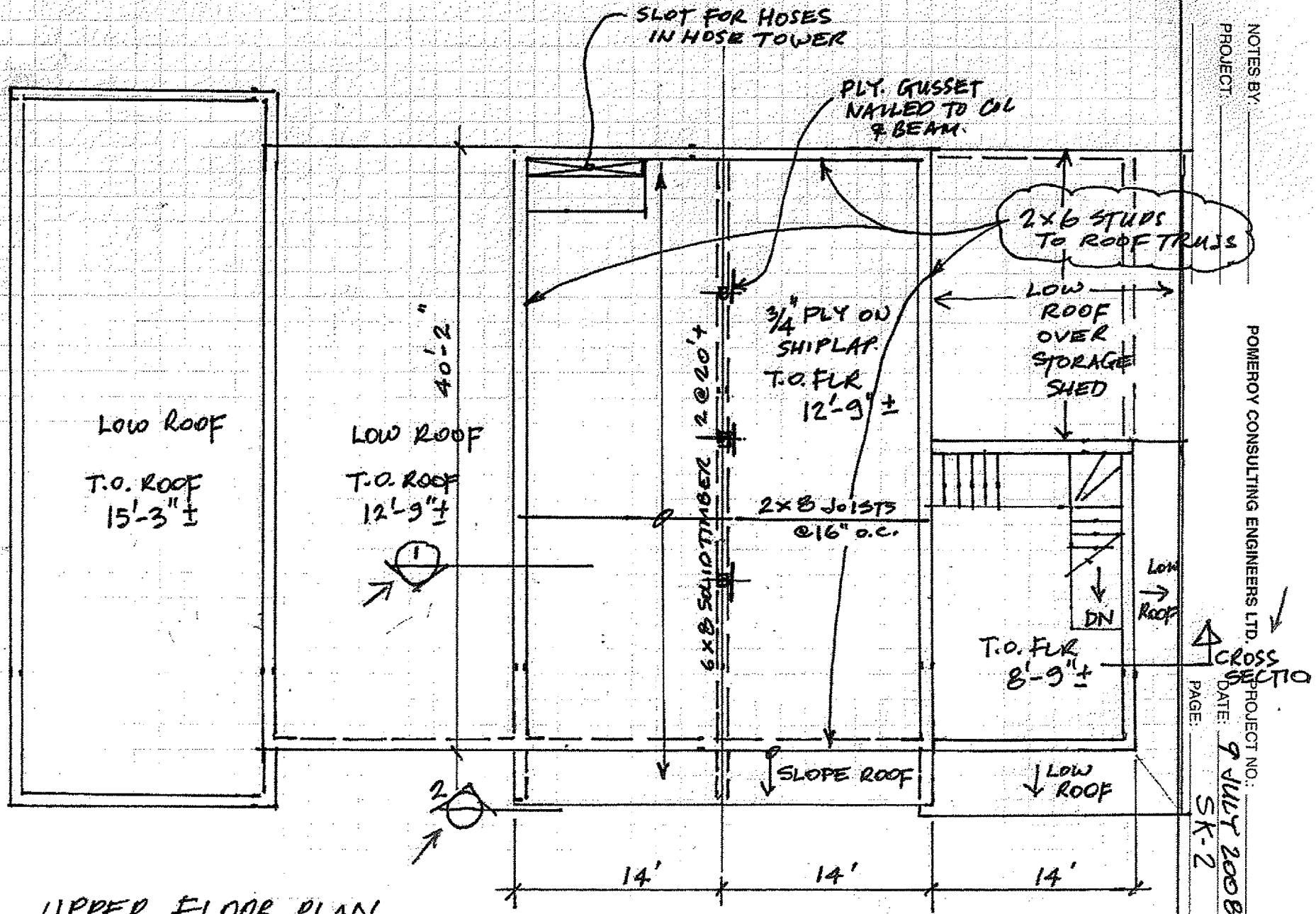
PROJECT:

POMEROY CONSULTING ENGINEERS LTD.

PROJECT NO.:

DATE: 08 JULY 08

PAGE: SK-1



UPPER FLOOR PLAN

NOTES BY:

PROJECT:

POMEROY CONSULTING ENGINEERS LTD.

CROSS SECTIO

PROJECT NO.:

DATE: 9 JULY 2008

PAGE: SK-2

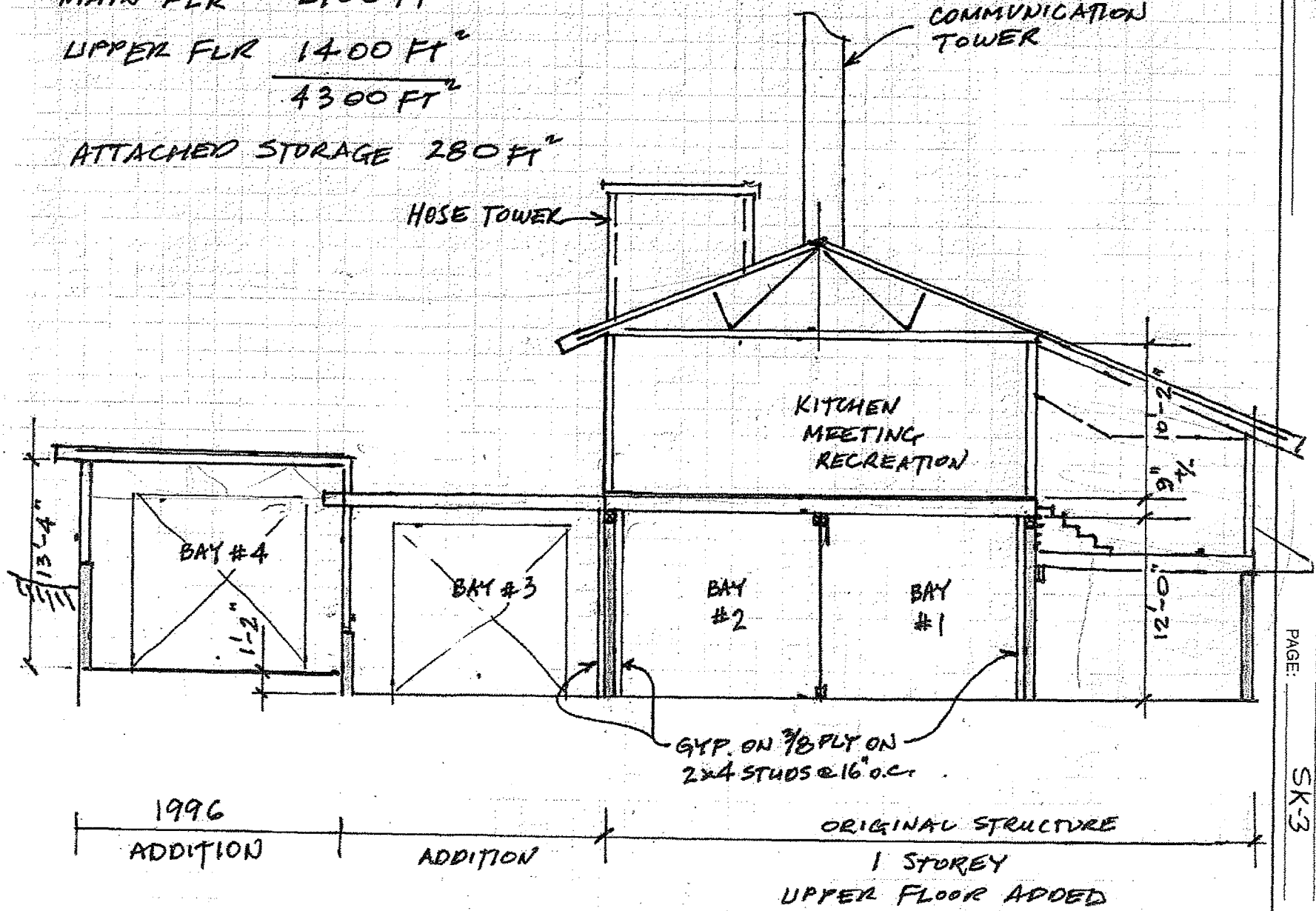
CROSS-SECTION
1:100 SCALE.

MAIN FLR 2900 FT²

UPPER FLR 1400 FT²

4300 FT²

ATTACHED STORAGE 280 FT²



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PROJECT:

POMEROY CONSULTING ENGINEERS LTD.

PROJECT NO.:

DATE: 08 JULY 08

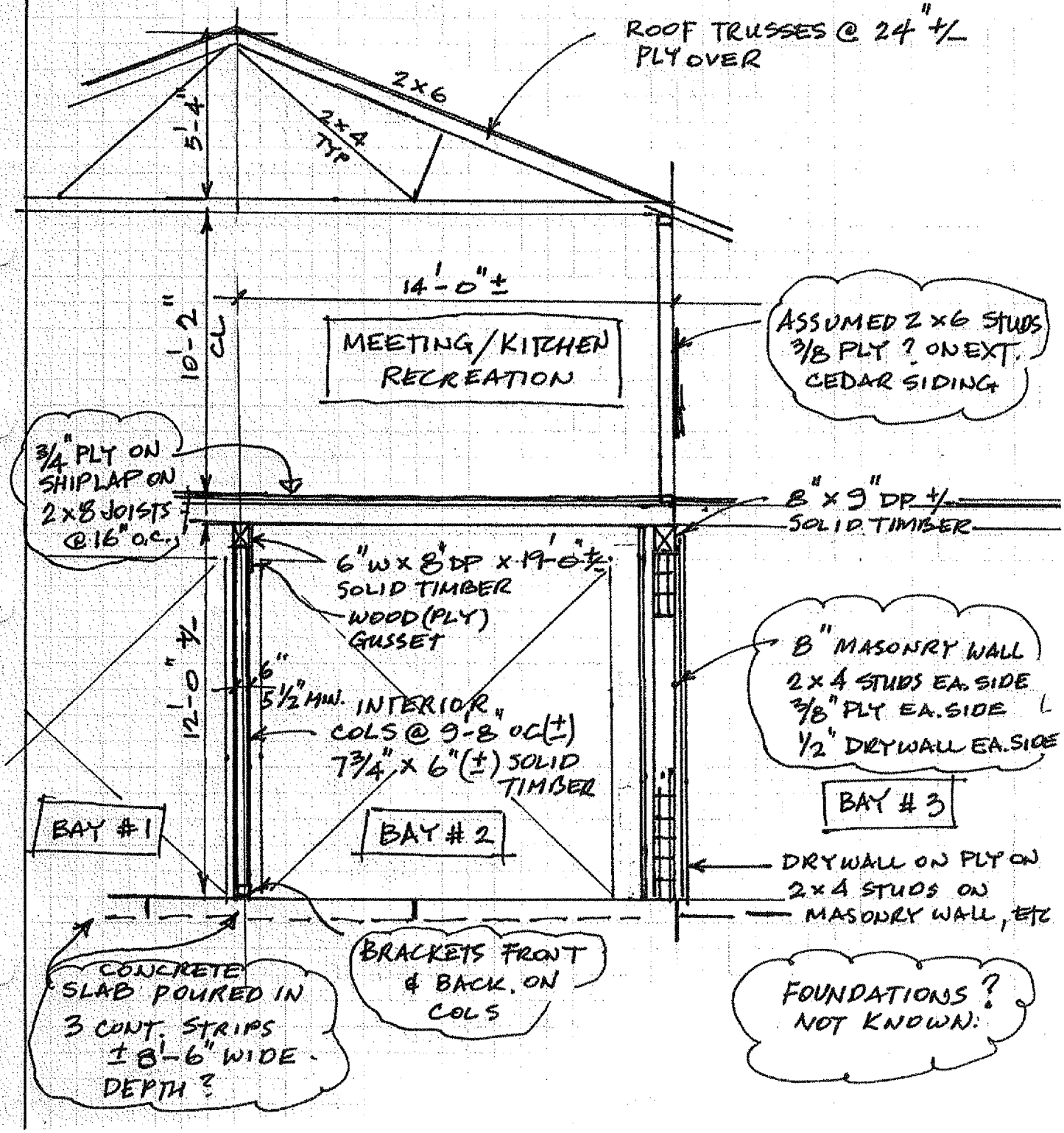
PAGE: SK-3

NOTES BY: G DUNNET | POMEROY CONSULTING ENGINEERS LTD. | PROJECT NO.:

PROJECT: HORNBY ISL. FIRE HALL | DATE: 08 JULY 2008

PAGE: SK-4

SECTION 1
1:50 SCALE



NOTES BY: GO
PROJECT: HORNBY IS. FIREHALL

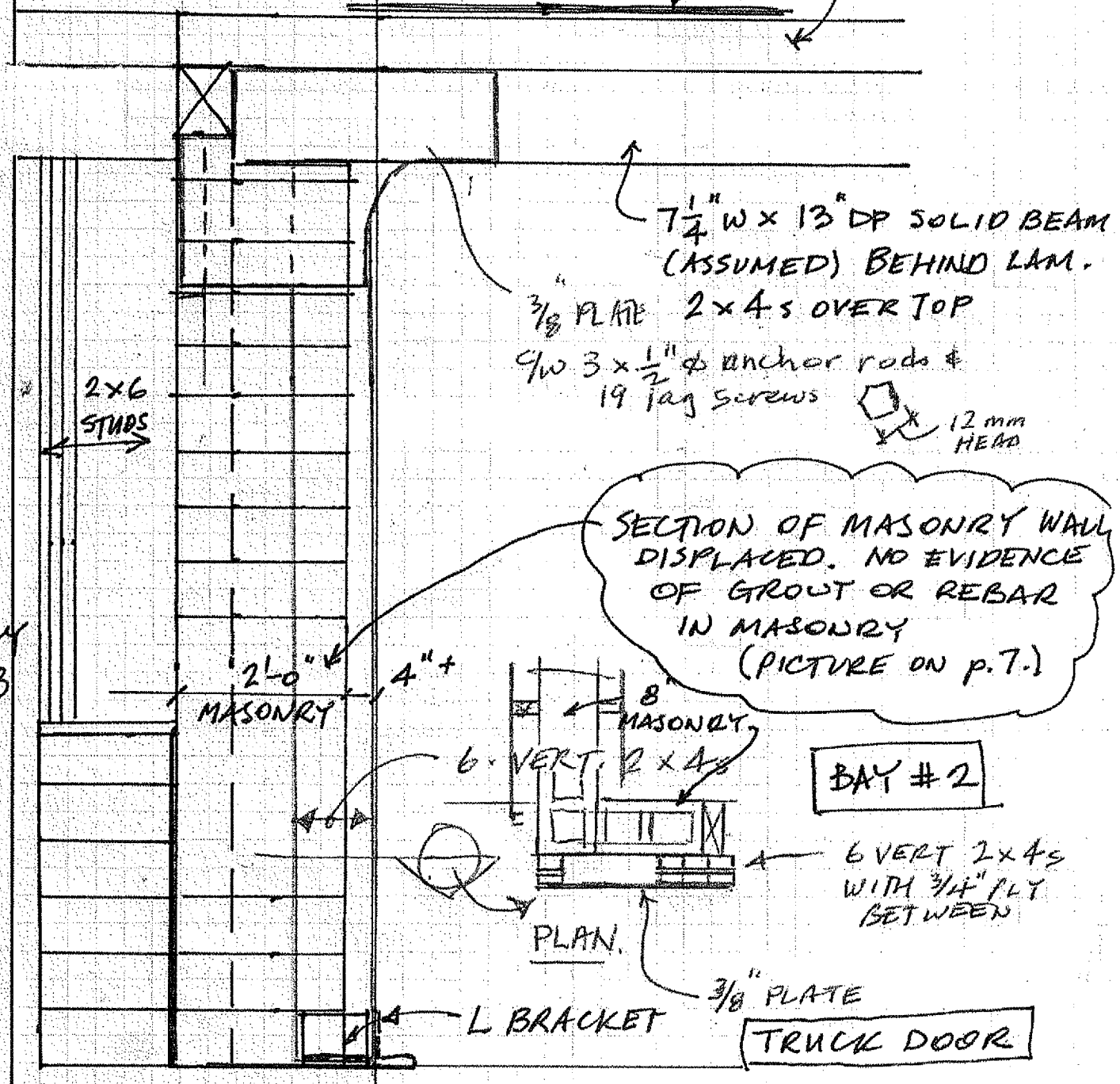
POMEROY CONSULTING ENGINEERS LTD.

PROJECT NO.:
DATE: 08 JULY 2008
PAGE: SK-5

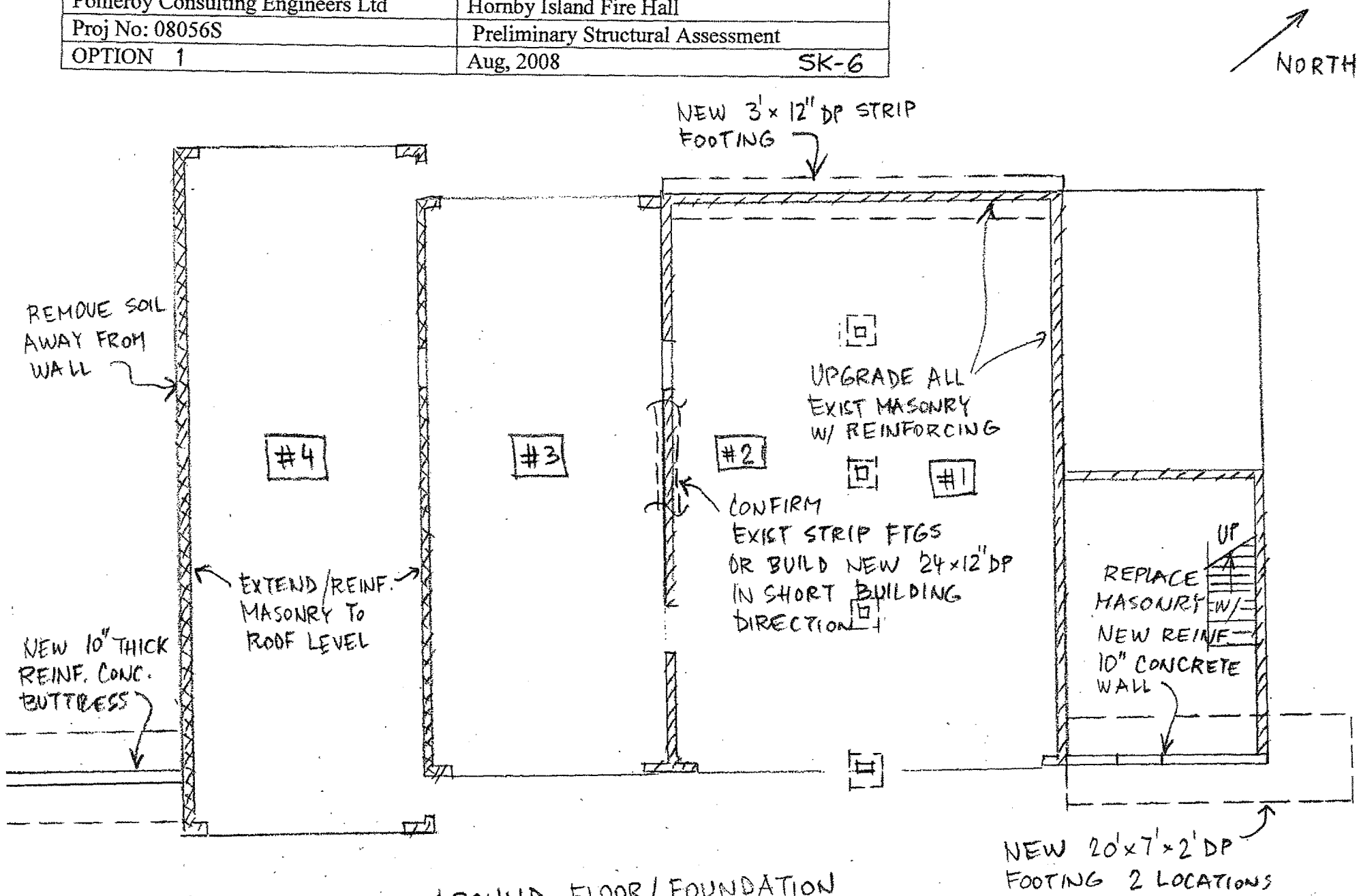
EAST ELEVATION (2)

1:20 SCALE

EARLY SEISMIC UPGRADE EAST END BAYS #1 & 2.

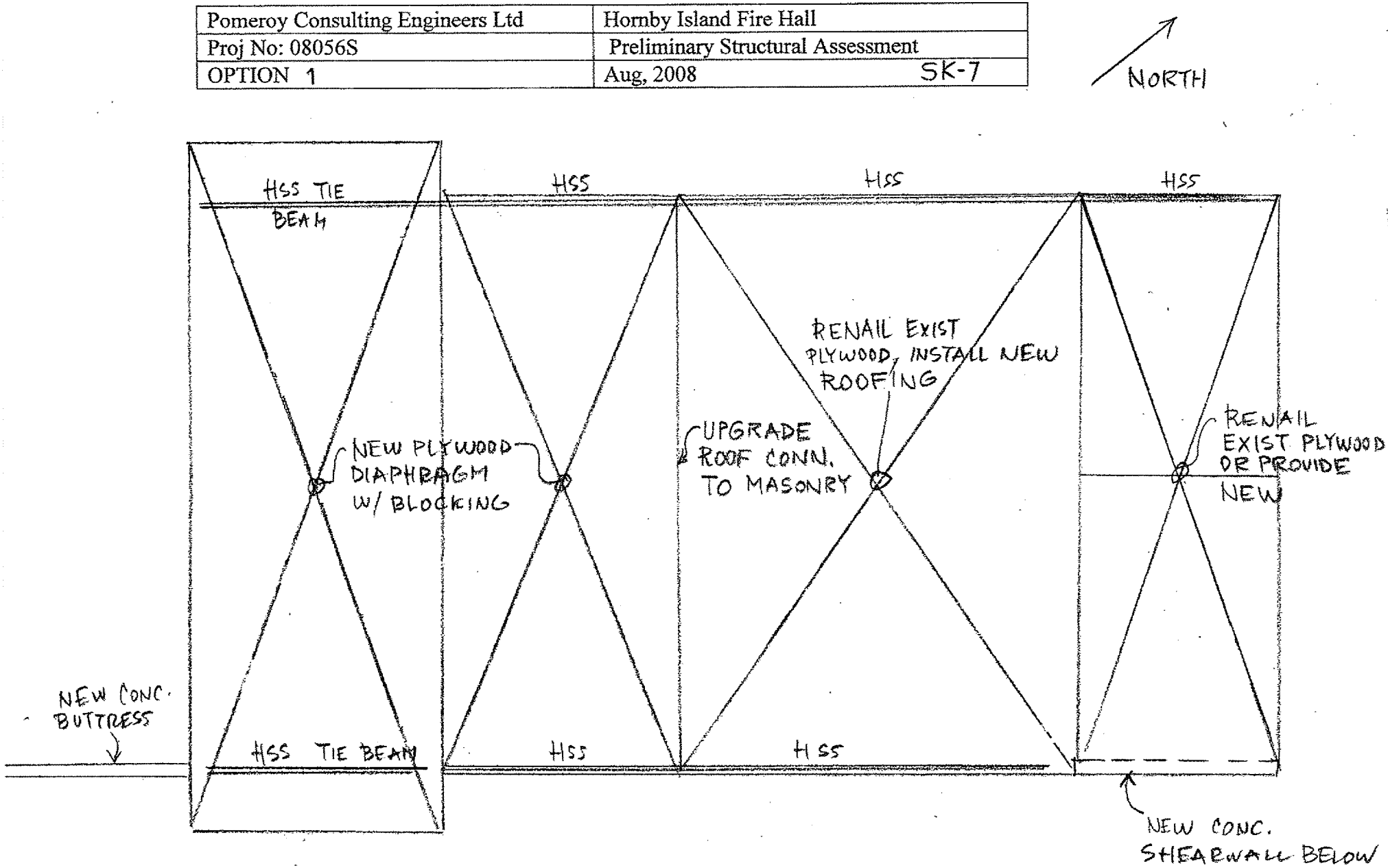


Pomeroy Consulting Engineers Ltd	Hornby Island Fire Hall
Proj No: 08056S	Preliminary Structural Assessment
OPTION 1	Aug, 2008 SK-6



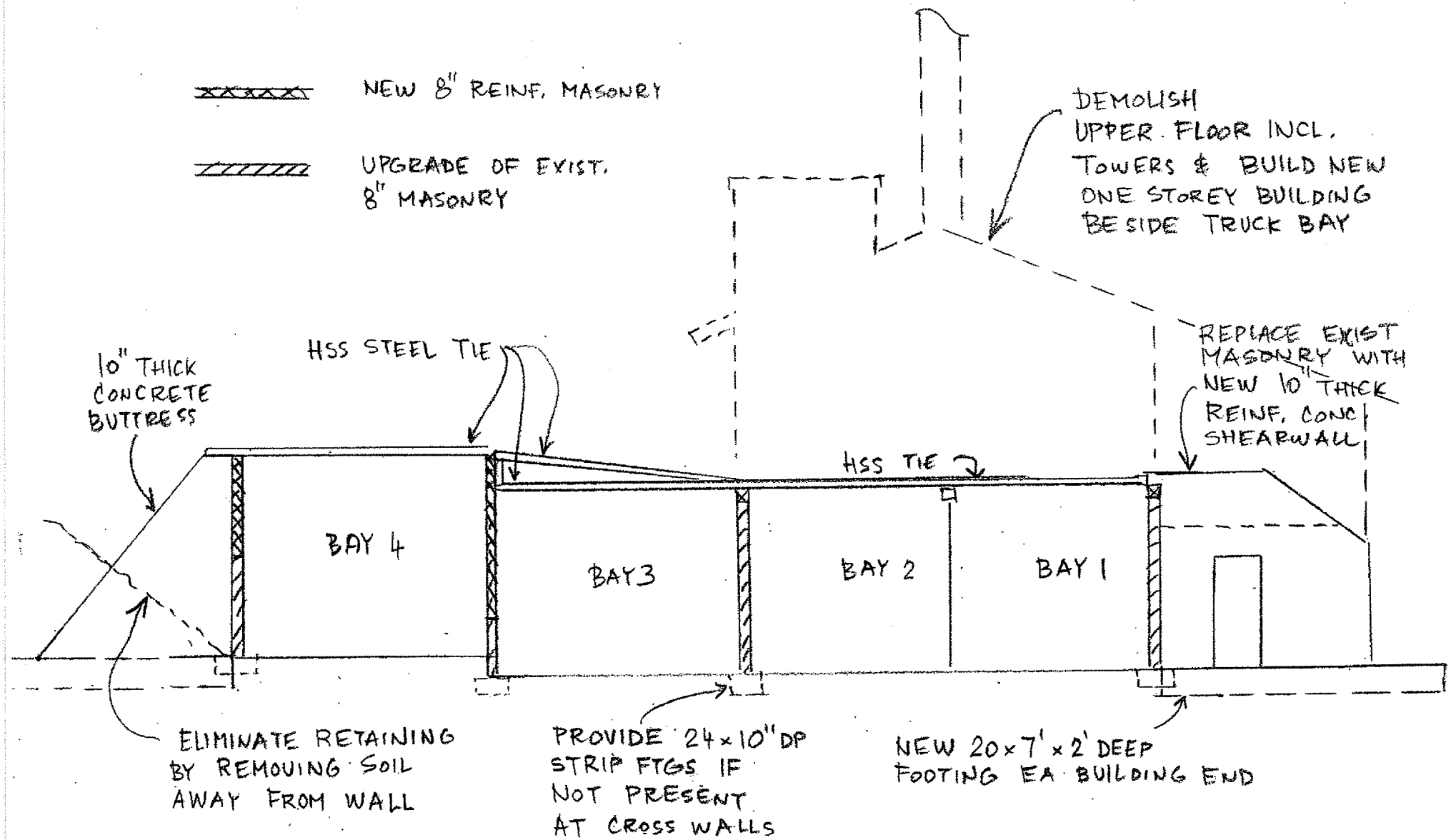
GROUND FLOOR / FOUNDATION UPGRADE PLAN

Pomeroy Consulting Engineers Ltd	Hornby Island Fire Hall
Proj No: 08056S	Preliminary Structural Assessment
OPTION 1	Aug, 2008 SK-7



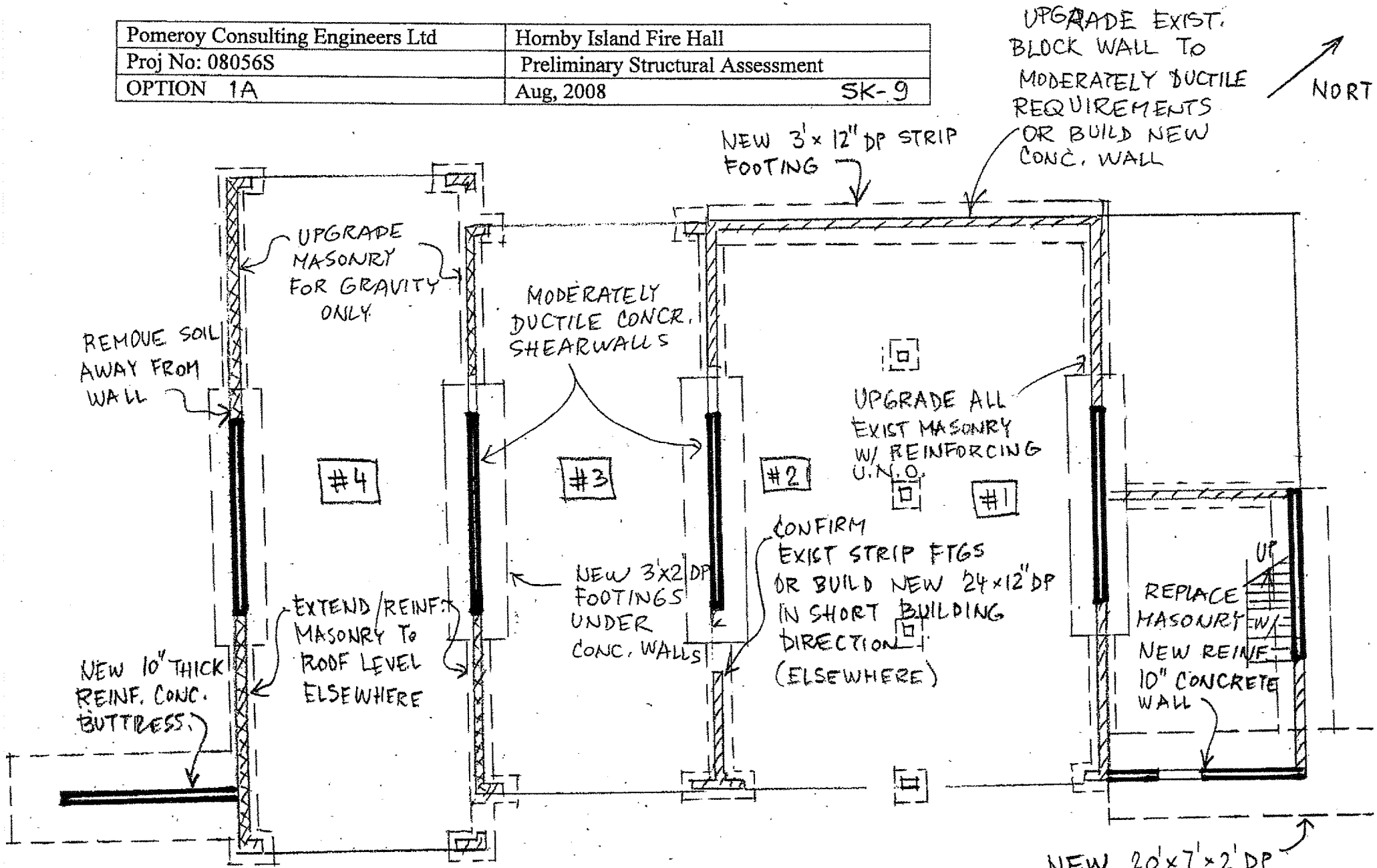
ROOF UPGRADE PLAN
(2ND STOREY DEMOLISHED)

Pomeroy Consulting Engineers Ltd	Hornby Island Fire Hall
Proj No: 08056S	Preliminary Structural Assessment
OPTION 1	Aug, 2008 SK-8



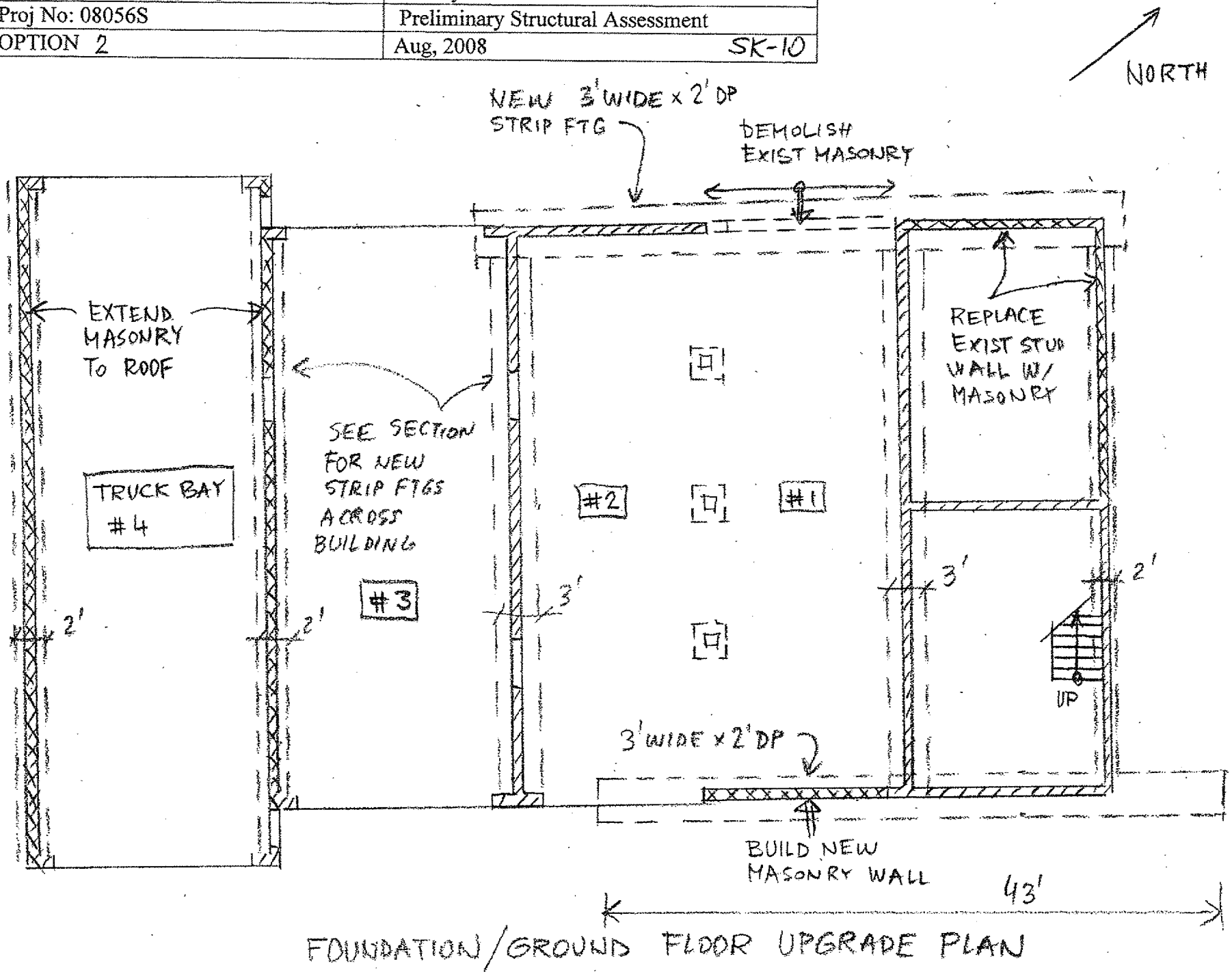
ELEVATION LOOKING WEST

Pomeroy Consulting Engineers Ltd	Hornby Island Fire Hall
Proj No: 08056S	Preliminary Structural Assessment
OPTION 1A	Aug, 2008 SK-9



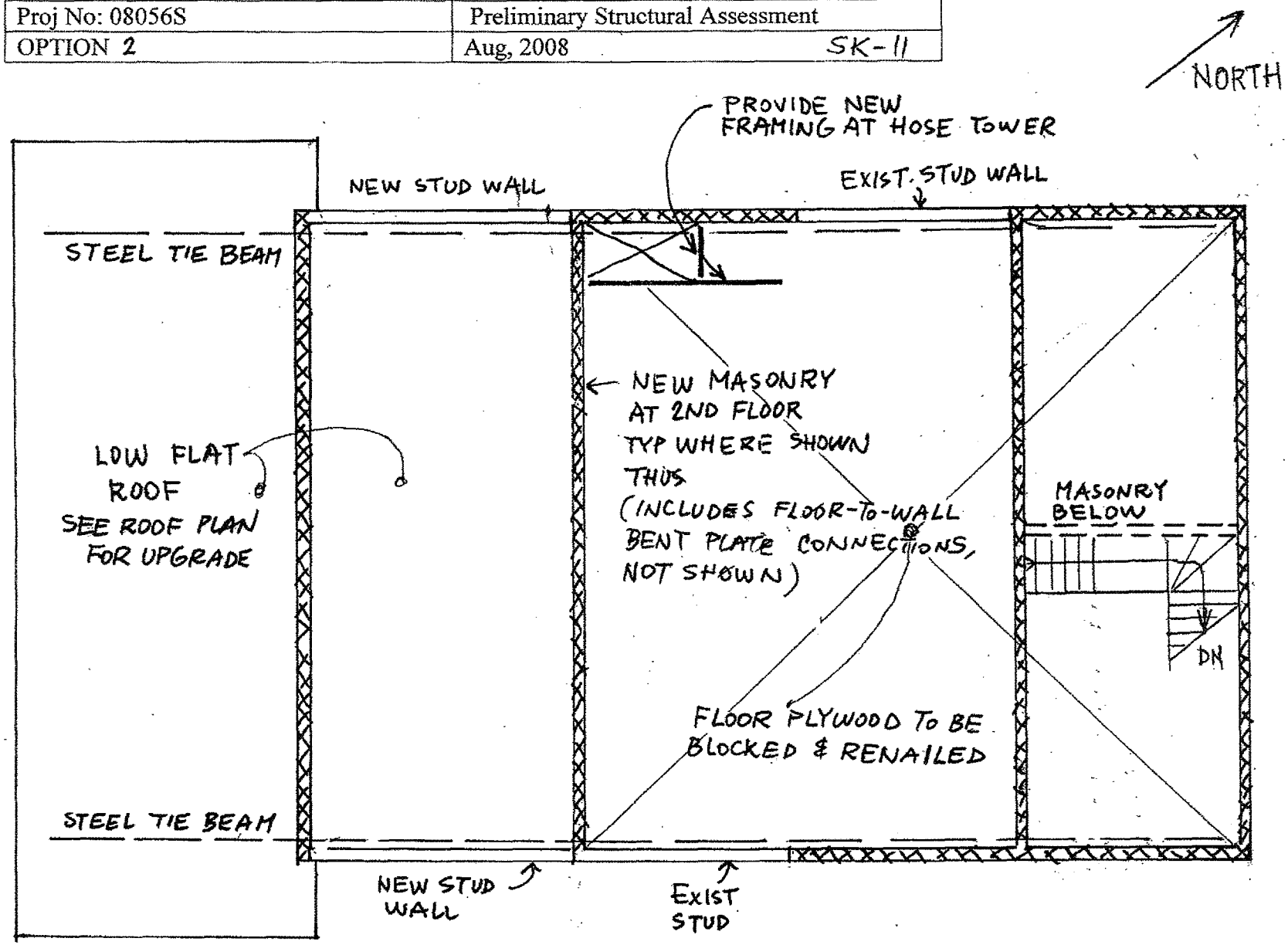
GROUND FLOOR / FOUNDATION UPGRADE PLAN

Pomeroy Consulting Engineers Ltd	Hornby Island Fire Hall
Proj No: 08056S	Preliminary Structural Assessment
OPTION 2	Aug, 2008 SK-10



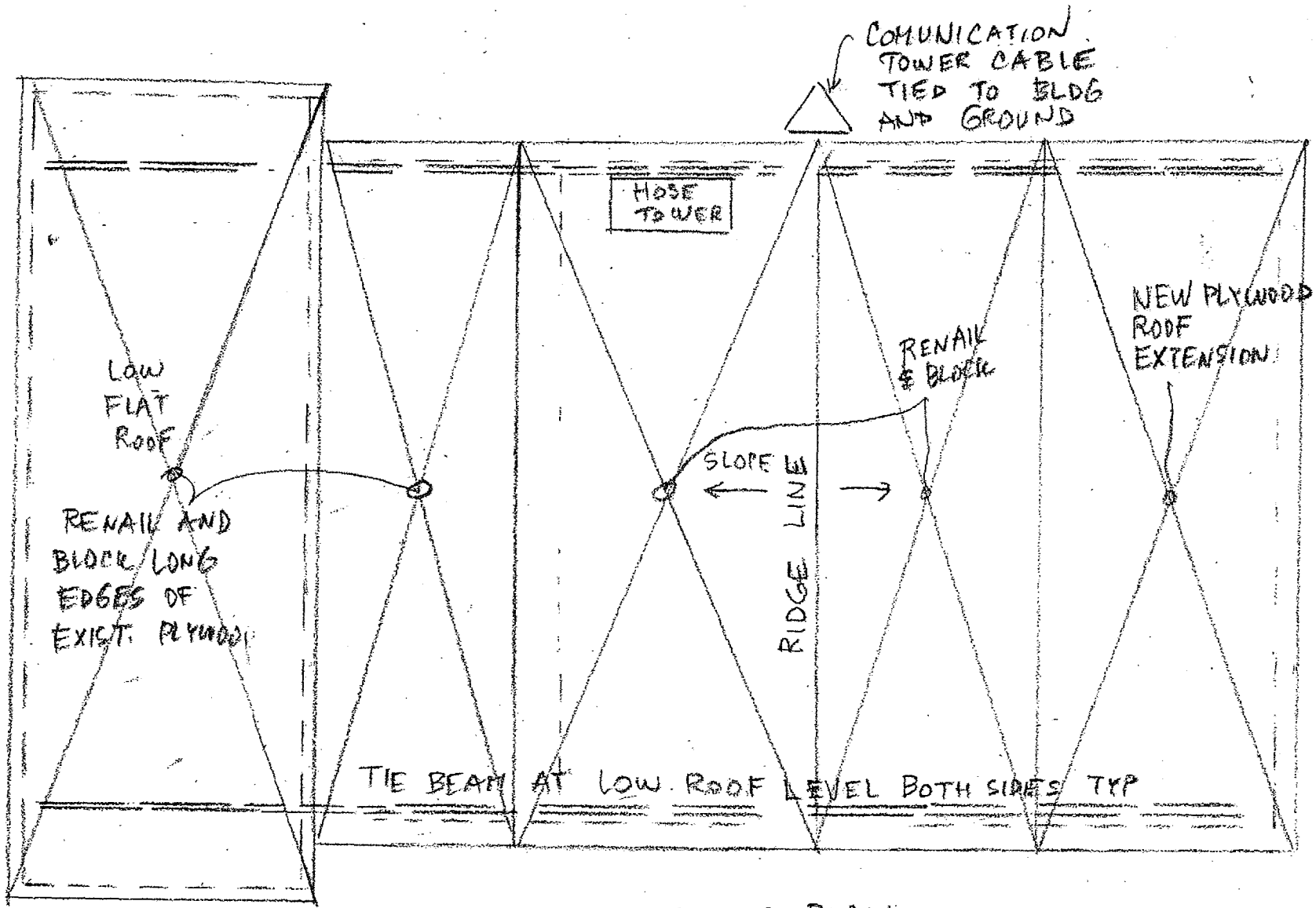
FOUNDATION/GROUND FLOOR UPGRADE PLAN

Pomeroy Consulting Engineers Ltd	Hornby Island Fire Hall
Proj No: 08056S	Preliminary Structural Assessment
OPTION 2	Aug, 2008 SK-11



2ND FLOOR UPGRADE PLAN

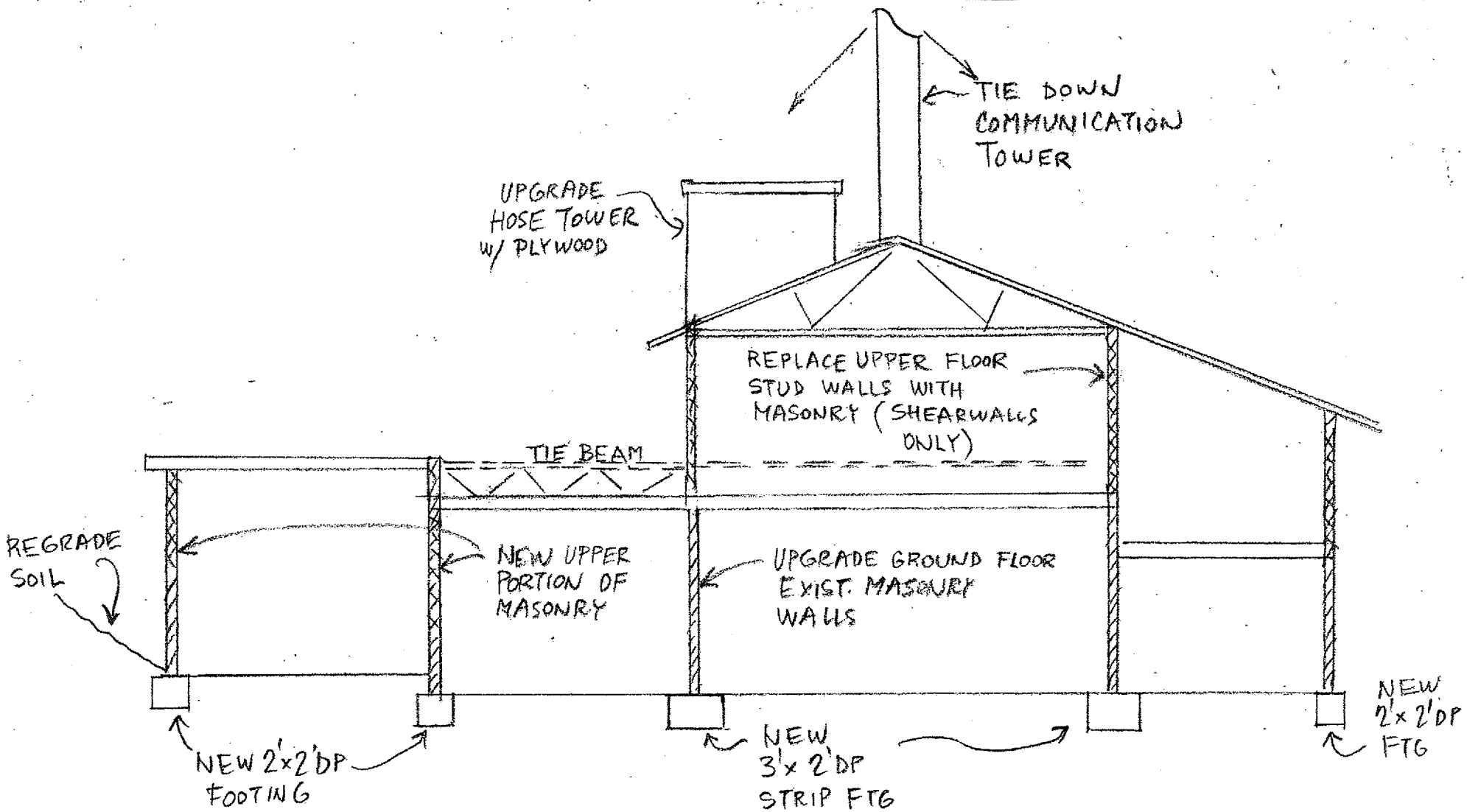
Pomeroy Consulting Engineers Ltd	Hornby Island Fire Hall
Proj No: 08056S	Preliminary Structural Assessment
OPTION 2	Aug, 2008 SK-12



ROOF UPGRADE PLAN

NOTE : WALL-TO-ROOF CONNECTIONS NOT SHOWN

Pomeroy Consulting Engineers Ltd	Hornby Island Fire Hall
Proj No: 08056S	Preliminary Structural Assessment
OPTION 2	Aug, 2008 SK-13



SECTION LOOKING WEST

APPENDIX B: COST ESTIMATE PARAMETERS

14 August 2008

Mr. Brian Waslyk
Ketza Pacific Construction Ltd
PO Box 594
Campbell River, B.C.
V9W 5T9

Dear Mr. Waslyk

Request for Proposal to Conduct Class D Estimate

As we have discussed recently the Regional District of Comox Valley have a project on Hornby Island involving the Fire Hall. Fletcher Pettis Consultants Ltd has been retained to develop a business case analysis which will allow their organization to determine a course of action: either renovate and add on to the existing or construct new.

Ketza Pacific Construction bid the Oyster River Fire Hall and you have successfully bid and constructed a fire hall south of Nanaimo. Based on this and your ability to provide a construction estimate I have recommended to the CVRD to work with your firm.

The scope of work is to provide a detailed cost estimate for construction of the fire hall based on today's construction costs. I will provide to you references which detail the background information; however, in essence, the intent is to construct to a conservative, cost effective design using materials that are efficient from a life cycle cost and maintenance perspective. The estimate is to include the cost of clearing and grubbing of a treed site on Hornby Island. Basic assumptions can be made on site development and access off the road and I am able to work with you on any questions you have. I will concurrently be obtaining estimates for sewage treatment and water supply. Attached to this letter is a list of the functional space requirements that I have received from the CVRD.

A previous report on the Fire Hall is available at:

http://www.hifd.org/res/files/FireHall_Planning_report_full.pdf

It contains a great deal of information, some of which we are repeating. The conceptual designs guidelines we have been given are for a basic structure. Enclosed with this letter are copies of a conceptual layout and a site plan of the proposed site that is to be

developed. Our direction is that the building will not be constructed to LEED certification.

Please review the information that we have provided and contact with me with any questions that you may have in preparing your proposal. If acceptable to the CVRD they will issue a PO and we can complete this part of the analysis.

Yours truly,

Blair Pettis, P.Eng
Project Manager

Enclosures: 3

Cc: James Bast, Manager of Protective Services, CVRD

HORNBY ISLAND FIRE HALL – PROPOSED REPLACEMENT

Functional space requirement

- Truck bays 4 at 750 sq ft – total 3,000 sq ft
- Ambulance bay 1 at 250 sq ft
- Offices - 165 sq ft
- Radio room – 70 sq ft
- Training/Records 200 sq ft
- SCBA room – 56 sq ft
- Kitchen – 200 sq ft
- Compressor rm – 56 sq ft
- Janitor – 40 sq ft
- Maintenance – 200 sq ft
- General room 1,300 sq ft
- Gear room – 250 sq ft
- Upstairs toilet – 63 sq ft
- Foyer – 150 sq ft
- Toilets – 302 sq ft
- Storage – 150 sq ft
- Utility room – 30 sq ft
- Exercise room – 220 sq ft.
- Hallways, stairwells – 700 sq ft

APPENDIX C: NEW CONSTRUCTION COST ESTIMATE

KETZA PACIFIC CONSTRUCTION (1993) LTD
2990 ISLAND HIGHWAY
CAMPBELL RIVER, B.C.
V9W 2H5
Phone 250-850-2002
Fax 250-850-2003

Pettis Consultants Ltd
1456 Wilkinson Road
Comox, B.C.
V9M 4B3

Sept. 23, 2008

Attn: Blair Pettis

Re Hornby Island Fire Hall Class D Estimate

Sir
Please see attached spread sheet costing for the Hornby Island Fire Hall as requested. The printed information of August 14 and website documents were used as the base parameters of the estimate. Our experience and job costing compiled in the construction of the North Cedar Fire Hall and consulting with Westbay Mechanical, Houle Electric, Tayco Paving and others will I trust provide some budget certainty to the project.

Note that GST, Architectural and Engineering Fees, Site Improvements other than Paving, Overhead Door Aprons, basic walkways and a $5,000 Landscaping Allowance, and Soils and Materials Testing Costs have not been included in the estimate.

Thank you for the opportunity to prepare this estimate and please call if you have any questions or concerns. I can be reached in Whitehorse at 867-668-5997.

Sincerely

Jon Schmidt

HORNBY ISLAND FIRE HALL				
FRONT SHEET				
	LABOUR	MATERIALS	EQUIP	SUBS
SPECIFIED CASH ALLOWANCES	$ -	$ -	$ -	$ -
SOFT COSTS	$ 65,900.00	$ 78,900.00	$ 20,300.00	$ 2,000.00
CLEAR & GRUB	$ -	$ -	$ -	$ 14,500.00
EXCAVATION AND FILLS	$ 3,600.00	$ -	$ -	$ 32,000.00
PAVING	$ -	$ -	$ -	$ 11,000.00
CONCRETE WALKS	$ 600.00	$ 5,630.00	$ -	$ -
LANDSCAPING	$ -	$ -	$ -	$ 5,000.00
CONCRETE SUPPLY	$ -	$ 37,100.00	$ -	$ -
FORMWORK	$ 17,800.00	$ 9,200.00	$ -	$ -
REINFORCING	$ -	$ -	$ -	$ 14,500.00
CONCRETE HANDLING & ACCS	$ 4,700.00	$ 13,200.00	$ -	$ -
STRUCTURAL STEEL	$ 1,200.00	$ 6,000.00	$ -	$ -
MISC STEEL	$ 1,800.00	$ 6,500.00	$ -	$ -
ROUGH CARPENTRY	$ 83,200.00	$ 127,250.00	$ -	$ -
FINISH CARPENTRY	$ 2,500.00	$ 2,000.00	$ -	$ -
MILLWORK	$ 1,900.00	$ 22,800.00	$ -	$ -
INSULATION & VAPOUR BARRIER	$ 1,600.00	$ 17,700.00	$ -	$ -
ROOFING	$ -	$ -	$ -	$ 75,000.00
SIDING	$ 13,500.00	$ 16,800.00	$ -	$ -
FLASHING, S.A.M. ETC	$ 1,900.00	$ 3,600.00	$ -	$ -
CAULKING, SMOKE SEAL	$ 350.00	$ 400.00	$ -	$ -
STEEL & WOOD DOORS, FRAMES & HRDWR	$ 6,500.00	$ 25,200.00	$ -	$ -
WINDOWS	$ 1,800.00	$ 7,500.00	$ -	$ -
OVERHEAD DOORS	$ -	$ -	$ -	$ 37,400.00
MISC GLASS	$ 400.00	$ 900.00	$ -	$ -
DRYWALL AND ACOUSTICS	$ -	$ -	$ -	$ 72,600.00
RESILIENT SHEET FLOORING	$ -	$ -	$ -	$ 28,500.00
PAINTING	$ -	$ -	$ -	$ 40,000.00
WHITEBOARDS, TACKBOARDS	$ 400.00	$ 1,600.00	$ -	$ -
TOILET PARTITIONS	$ 800.00	$ 6,000.00	$ -	$ -
TOILET ACCESSORIES	$ 400.00	$ 3,000.00	$ -	$ -
LOCKERS	$ 800.00	$ 3,000.00	$ -	$ -
MECHANICAL	$ -	$ -	$ -	$ 253,500.00
ELECTRICAL	$ -	$ -	$ -	$ 189,800.00
	$ 211,650.00	$ 394,280.00	$ 20,300.00	$ 775,800.00
8% OVERTIME BURDEN	$ 16,932.00			
SUB TOTAL	$ 228,582.00			
25% LABOUR BURDEN	$ 57,146.00			
TOTAL LABOUR	$ 285,728.00			
TOTAL MATERIALS	$ 394,280.00			
TOTAL EQUIPMENT	$ 20,300.00			
TOTAL SUBS	$ 775,800.00			
TOTAL JOB COSTS	$ 1,476,108.00			

CONTRACTOR'S FEE	$ 145,000.00			
ESTIMATED JOB COSTS	**$ 1,621,108.00**			
PROJECT CONTINGENCY	$ 80,000.00			
TOTAL CONSTRUCTION ONLY BUDGET	**$ 1,700,000.00**			
SOFT COSTS				
BOND		$ 12,000.00		
PERMIT		$ 10,000.00		
INSURANCE		$ 7,000.00		
TEMP OFFICE			$ 4,000.00	
TEMP SHEDS			$ 1,500.00	
TEMP POWER		$ 1,000.00		
TEMP PHONE		$ 1,000.00		
TEMP HOARDING	$ 2,000.00	$ 2,000.00		
TEMP HEAT		$ 3,000.00		
TEMP TOILETS		$ 1,000.00		
SAFETY	$ 6,500.00	$ 1,500.00		
CLEAN UP	$ 3,500.00	$ 500.00		
DUMPSTER FEES		$ 2,000.00		
FREIGHT		$ 3,000.00		
VEHICLES			$ 4,800.00	
FUEL			$ 3,500.00	
HOISTING			$ 4,500.00	
SUPERVISION	$ 27,000.00			
MANAGEMENT	$ 16,000.00			
MATERIALS HANDLING	$ 2,500.00			
TOOLS		$ 4,000.00		
LAYOUT				$ 2,000.00
TRAVEL	$ 5,000.00	$ 2,500.00		
ROOM AND BOARD		$ 25,000.00		
MOB AND DEMOB	$ 2,500.00	$ 2,000.00	$ 2,000.00	
SHOP DWGS & COURIER		$ 500.00		
AS-BUILTS		$ 500.00		
MANUALS	$ 300.00	$ 400.00		
CLOSE OUT	$ 600.00			
TOTAL SOFT COSTS	$ 65,900.00	$ 78,900.00	$ 20,300.00	$ 2,000.00