SCHOOL DISTRICT No. 68

Nanaimo-Ladysmith

RUTHERFORD ELEMENTARY SCHOOL

BUILDING CONDITION ASSESSMENT

September 2016

KMBR ARCHITECTS PLANNERS INC

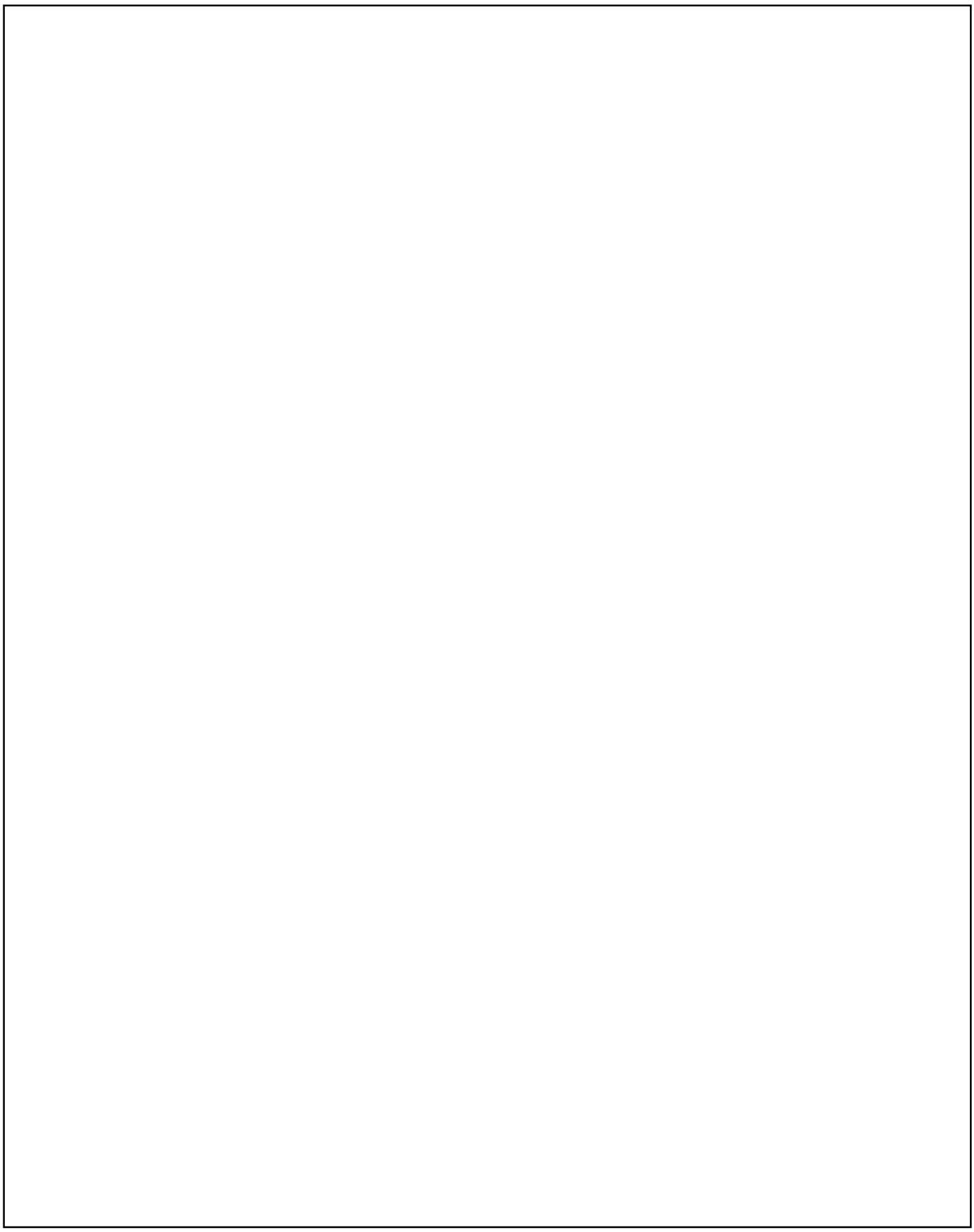

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Table of Contents

RUTHERFORD ELEMENTARY SCHOOL
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ARCHITECTURAL

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September 2016

Scope

KMBR Architects Planners were engaged by School District 68 (Nanaimo-Ladysmith) to complete a building condition assessment of Rutherford Elementary that would consider building renewal costs for up to 40 years. Members of the assessment team also included representatives from:

- Herold Engineering (structural)
- Rocky Point Engineering (mechanical)
- RB Engineering (electrical)

General Description

This 3,345m2 two storey elementary school, located on 5840 Hammond Bay Road in Nanaimo, was originally constructed in 1964 with subsequent additions in 1976, 1978, 1979, 1981, 1996, and 1998. Upgrades were also made to the school in approximately 1996 (accessibility), 2000 (sprinklers). 2006 (boiler), and 2009 (lighting).

Rutherford Elementary School

RUTHERFORD ELEMENTARY SCHOOL
BUILDING CONDITION ASSESSMENT
ARCHITECTURAL

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The 2015 VFA Facility Condition Report for Rutherford Elementary indicates:

- Average FCI: 0.35 (Building and Site)
- Building FCI: 0.40
- Site FCI: 0.03
- Total FCI Cost: $2,181,532 (Building and Site)
- Current Replacement Value: $6,250.044 (Building and Site)

VFA's assessment of the building highlights 9 architectural renewal items where significant expenditures (greater than $25,000) are required by 2018. These are:

Acoustic wall panels	$41,678
BU Roofing	$46,040
Concealed spline ACT	$25,229
Linoleum	$169,177
Wall paint	$64,586
SBS Roofing	$67,529
Suspended ACT	$157,158
Vinyl sheet flooring	$50,367
Wood wall shingles	$42,863
TOTAL	$664,627

The sprinklered school is a combination of combustible and non-combustible construction and is divided into 2 main building blocks by means of one firewall located between the 1964 block and 1998 block, and the other located at the junction between the two storey block and the 1981 gymnasium block.

1. **Building Exterior**

1. Roof Assembly, Penetrations, Projections

The 2010 Roof Survey (attached) shows that the roof of the school is divided into 12 distinct roof areas with an aggregate area of 2612m2. As of 2016, the roof areas range in age from 3 to 18 years, with an average age of 11.2 years. Roofing types are typically built-up tar and gravel roofing and 2 ply SBS. Continuous canopies on the west and north sides of the building are clad in prefinished metal. Roofing is generally in fair condition for its age.

The majority of the building has no overhangs. Where soffits and fascias exist, they are typically painted wood construction and in fair to poor condition, with remedial action needed to address problems with the coatings and decay.

Roof insulation levels are minimal by current standards, typically 2.7” of rigid polyisocyanurate insulation.

Condition Rating: Acceptable

Renewal: Lifecycle replacement of roofing; preventative maintenance and repair for wood fascias/soffits

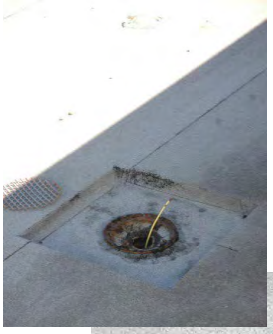
Roofscape at south end of building

RUTHERFORD ELEMENTARY SCHOOL
BUILDING CONDITION ASSESSMENT
ARCHITECTURAL

KMBR ARCHITECTS PLANNERS INC

September 2016

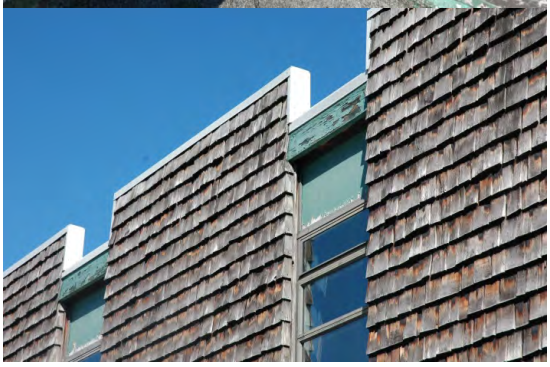
Roofscape at northwest corner of building



Several roof drains are missing strainers and strainers when present are flat and therefore prone to getting plugged with roof debris. Some roof drains are badly rusted, as shown in the photo far left.

Some areas of the roof show signs of ponding. The 1981 roof is shown left.

Low curb height is non-compliant with RCABC standards. Cap flashing finish is deteriorated in some locations.



Wood fascia on 1981 block is peeling and showing signs of decay.

Typical metal canopy with plywood soffit

Metal canopy support within open soffit is rusting

Painted plywood soffits are typical where there are overhangs.

2. Exterior Walls (incl. foundations)

The wood frame exterior walls of the building are typically clad with a painted face-sealed cementitious or acrylic stucco finish. The remaining walls are face-sealed and painted reinforced load-bearing concrete. The building envelope should have a rain screen cladding system.

Based on the February 2016 Asbestos Assessment Survey prepared by School District 68, exterior stucco may be asbestos containing.

Wall insulation levels shown on construction drawings are substandard, as follows:

1964 Block	No drawings available
1976 Block	1 ½" to 3 1/2" batt; 2" rigid on foundation walls
1979 Block	1 1/2" rigid

1981 Block	5 ½" batt in 2 x 6 frame walls; 1 ½" rigid on concrete walls
1996 Block	None
1998 Block	3 1/2" batt; 1 1/2" rigid to block walls

Condition Rating: Poor with potential building envelope failure (particularly the 1998 Block)

Renewal: Failure replacement of cracking face-sealed stucco, preventative maintenance of plywood cladding and concrete, life cycle replacement of wood shake siding, potential hazardous materials abatement.

View of walls at north end of building.

View of walls on west side of building.

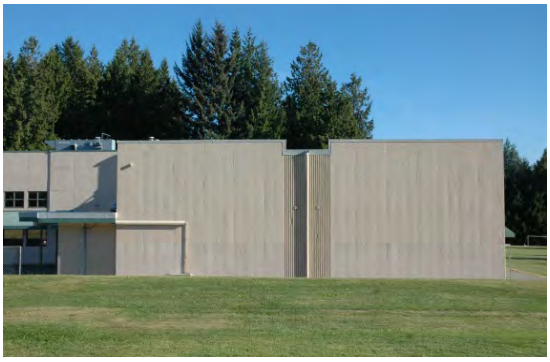
RUTHERFORD ELEMENTARY SCHOOL
BUILDING CONDITION ASSESSMENT

KMBR ARCHITECTS PLANNERS INC

ARCHITECTURAL

September 2016

View of walls in courtyard.



Painted concrete walls are in good condition.

View of mostly concrete walls on south end of building.

Second storey addition built in 1981 has wood shake and plywood cladding. Wood shake cladding is prone to wasp nesting.

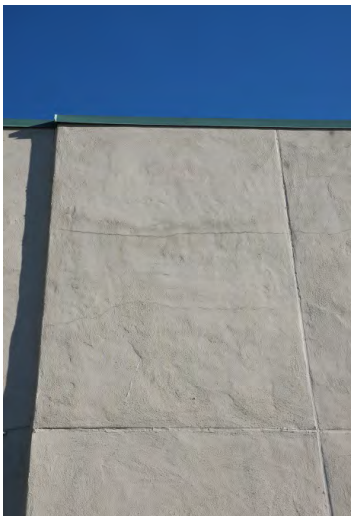
West facing plywood siding is peeling.

Stucco cracking and crumbling around window sill in 1998 block

RUTHERFORD ELEMENTARY SCHOOL
BUILDING CONDITION ASSESSMENT
ARCHITECTURAL

KMBR ARCHITECTS PLANNERS INC

September 2016



Face-sealed acrylic stucco in 1998 block shows signs of cracks and patching.

Stucco cracking and crumbling around canopy mounting bracket in 1998 block. Canopy support is rusting.

Stucco cracking and crumbling around wall base flashing in 1998 block

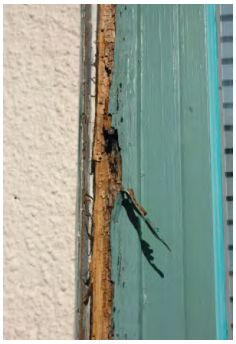
Extensive stucco cracking in 1998 block in courtyard.

Extensive staining of face-sealed stucco probably indicates building envelope failure.

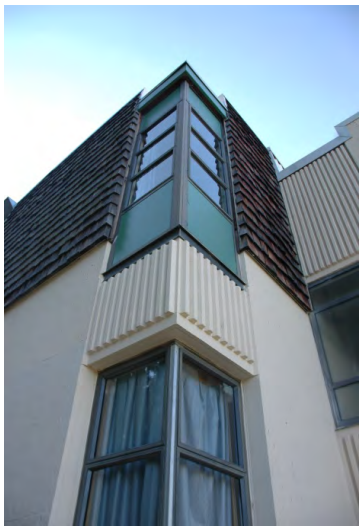
3. Exterior Windows, Doors and Skylights

Exterior doors are typically insulated metal in pressed steel frames. Windows are typically prefinished aluminum frames with single glazing. Frames are not thermally broken.

Condition Rating: Poor
Renewal: Life cycle replacement



Deterioration of wood window trim on 1976 Block



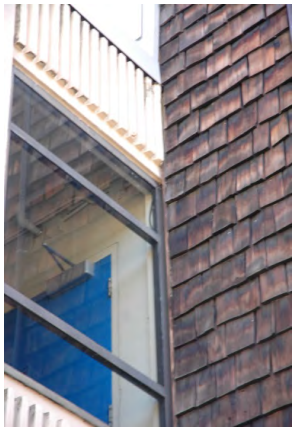
Typical corner window treatment in east block

Typical window is single glazed with prefinished aluminum frame and sill flashings.

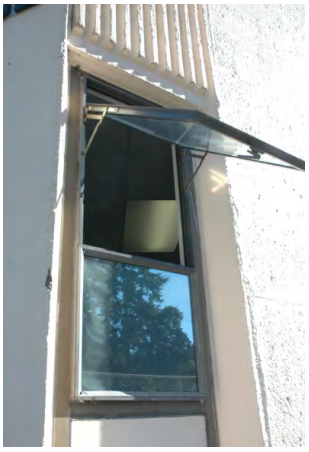
Window sills in east block are often not sloped to drain, which adds to risk of water ingress.

Aluminum finish has faded.

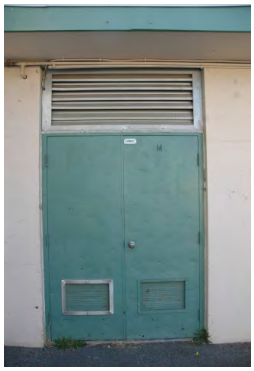
Some windows are visibly damaged and scratched. Lips added above opening vents indicate attempts to mitigate past leakage.



Window gasket failure visible in top right corner of window.



Awning vent in aluminum frame window. Lack of insect screens prevents use of window vents in areas of the school where wasps are a problem.



Typical exterior door in poor condition.

4. Exterior Stairs/Ramps

Exterior stairs and ramps are generally in poor condition and non-compliant with the building code.

Condition Rating: Marginal

Renewal: Code repairs and preventative maintenance

Stair railings and landing are not code compliant

Railing embed into concrete is rusted and concrete is damaged.

Ramp to Life Skills Room.

.2 Building Interior – durability, condition, appearance, performance, maintainability

1. Ceilings

Ceiling finishes generally consist of painted or textured gypsum, or suspended t-bar and acoustic tile. The t-bar ceilings, which are used most extensively in the school, are generally in fair condition for their age but could use modernization..

Based on the February 2016 Asbestos Assessment Survey prepared School District 68, the following asbestos containing materials exist in the facility:

- Asbestos containing ceiling tile in the corridor and two classrooms of the 1964 Block

Asbestos may also be present in textured ceiling and wall applications, mastic for acoustic tiles, ceiling tiles in classrooms, wall tiles in gymnasium, and in wall panels under windows.

Condition Rating: Marginal

Renewal: Life cycle replacement, hazardous materials abatement, targeted repairs

T-bar ceiling in 1976 admin wing showing one new acoustic panel among the older panels.

Typical t-bar ceiling in 1998 wing.

Swelling in textured ceiling above sprinkler pipe in 1981 gymnasium block.

2. Flooring

Most of the building are concrete slab on grade. Only the 1964 Block has wood floor over crawl space. Sheet resilient flooring is most common with a variety of linoleum or vinyl products. There is a small amount of vinyl tile flooring. There is carpet in the Library and Administration area, which is in fair condition.

Many of the resilient floors are in very poor condition, with failure of the flooring material or irregularities in the substrate telegraphing anomalies through the floor finish. Other areas are worn and patched. Joints have spread leaving gaps in excess of 6mm, making proper cleaning and maintenance difficult.

The gymnasium has wood strip flooring. Service rooms have concrete floors, either painted or sealed. Washrooms typically have ceramic tile on both the floor and walls.

Based on the February 2016 Asbestos Assessment Survey prepared by School District No. 68 Nanaimo-Ladysmith, the following asbestos containing materials exist in the facility:

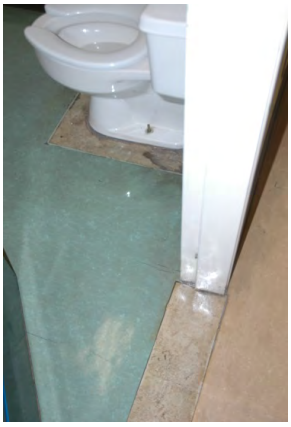
- Asbestos containing floor covering (sheet) is located in washrooms, custodial room, and a portion of the corridor of the 1964 Block, corridors of the 1976 Blocks, and corridor and classroom of the 1978 Block.

Condition Rating: Poor
Renewal: Life cycle and failure replacement, hazardous materials abatement

Old linoleum in corridors have large gaps where flooring has separated at joints.

Flooring lifting off substrate creates a tripping hazard and is impossible to clean.

Junction of one old flooring to another with buckling at the joint.



Evidence of patching at door and around toilet

Patching at exterior door has chipped where floor is lifting. Nails used to prevent further buckling.

Second floor of 1981 block has significant problem with lifting floors and substrate.

Second floor of 1981 block has significant problem with lifting floors and substrate. Nails are used to stitch up lifting seams.

3. Wall Finishes

Classrooms typically have painted gypsum wall finish, whereas corridors have a mixture of painted plywood and painted fiberglass cloth. Fibreglass cloth was also used in the gymnasium and because it is difficult to repair, it is in poor condition. Some areas lack wall protection where needed, such as the Multi-purpose Room, where the painted gypsum has become gauged and scuffed from the movement of furniture and equipment.

Based on the February 2016 Asbestos Assessment Survey prepared by School District No. 68 Nanaimo-Ladysmith, the following asbestos containing materials may be found in:

- exterior stucco
- wall tiles in gymnasium
- wall panels under windows.

Condition Rating: Poor

Renewal: Life cycle replacement, failure replacement of fiberglass cloth wall protection in gym, preventative maintenance, potential hazardous materials abatement.

Damage and swelling of the wall finish in the gymnasium exterior wall suggests water leakage has occurred in the past.

Fibreglass cloth wall protection is not adequate for gymnasium use, and difficult to repair.

Fibreglass cloth wall protection and wood base in 1964 block corridor is badly damaged.

Opening to gym foyer shows significant wall damage.

Painted gypsum wall in change room needs wall and/or corner protection.

4. Moveable Partitions

No movable partitions were observed.

5. Baseboards and Trim

Baseboards are typically vinyl, rubber, or wood and generally well beyond their service life. In several areas the baseboards are damaged and broken. Door and window trims are typically wood and prone to damage, including damage due to condensation from single glazed non-thermally broken aluminum frame windows.

Condition Rating: Poor

Renewal: Failure and life cycle replacement, targeted repairs.

Chipped vinyl base in 1981 corridor.

Damage to vinyl base, wall and door frame.

Evidence of condensation affecting wood window liner and sill.

6. Doors and Door Hardware

Interior doors are typically hollow metal or solid core wood construction, in pressed steel frames. Hardware is typically a knob type - lever handles, which are required for accessibility, are the exception.

In the two known firewall locations the ULC labels remain visible indicating fire rated door frames.

Condition Rating: Poor

Renewal: Life cycle replacement, code replacement

Two hallway door openings have labels for fire ratings.

Knob handles are the norm in the older blocks of the school, and do not meet current code for accessibility.

Typical exit hardware, kick plates and door threshold..

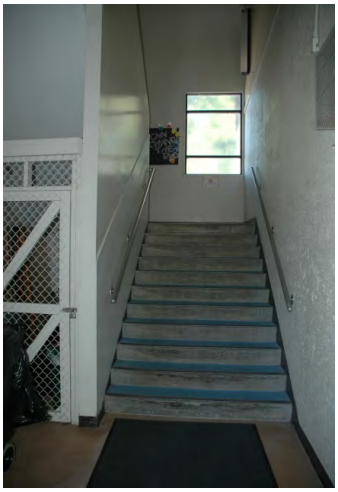
Door hardware is generally in fair to poor condition.

7. Stairs, Ramps, Landings, Elevator

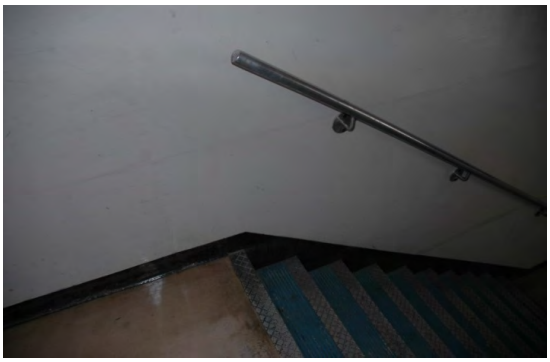
Stairs and landings are typically finished with vinyl or rubber treads and stringer, that are now in poor condition. Stair railings, lacking extensions, do not meet code. Tactile strips are not provided at the top of stairs. The elevator (circa 1996) would not meet current code for stretcher access.

Condition Rating: Poor

Renewal: Life cycle replacement, code repair/replacement



Stairs were added in 1981 for the second storey addition. Code compliance is lacking.



Stairs are typically non-compliant for railing extensions, tactile strip etc.

8. Fittings and Equipment

Millwork and fittings are generally reflective of the age of construction. The 1998 millwork and fittings are in better condition than the corresponding millwork/fittings in the older blocks.

Condition Rating: Poor

Renewal: Life cycle replacement, code repair/replacement

Pipe rail door stops beside gymnasium doors.

Washroom vanity faucet handles do not meet code for accessibility requirements. Metal toilet partitions used for non-accessible toilet stall. Urinal lacks code required grab bar and vanity mirror also doesn't meet code for accessibility.

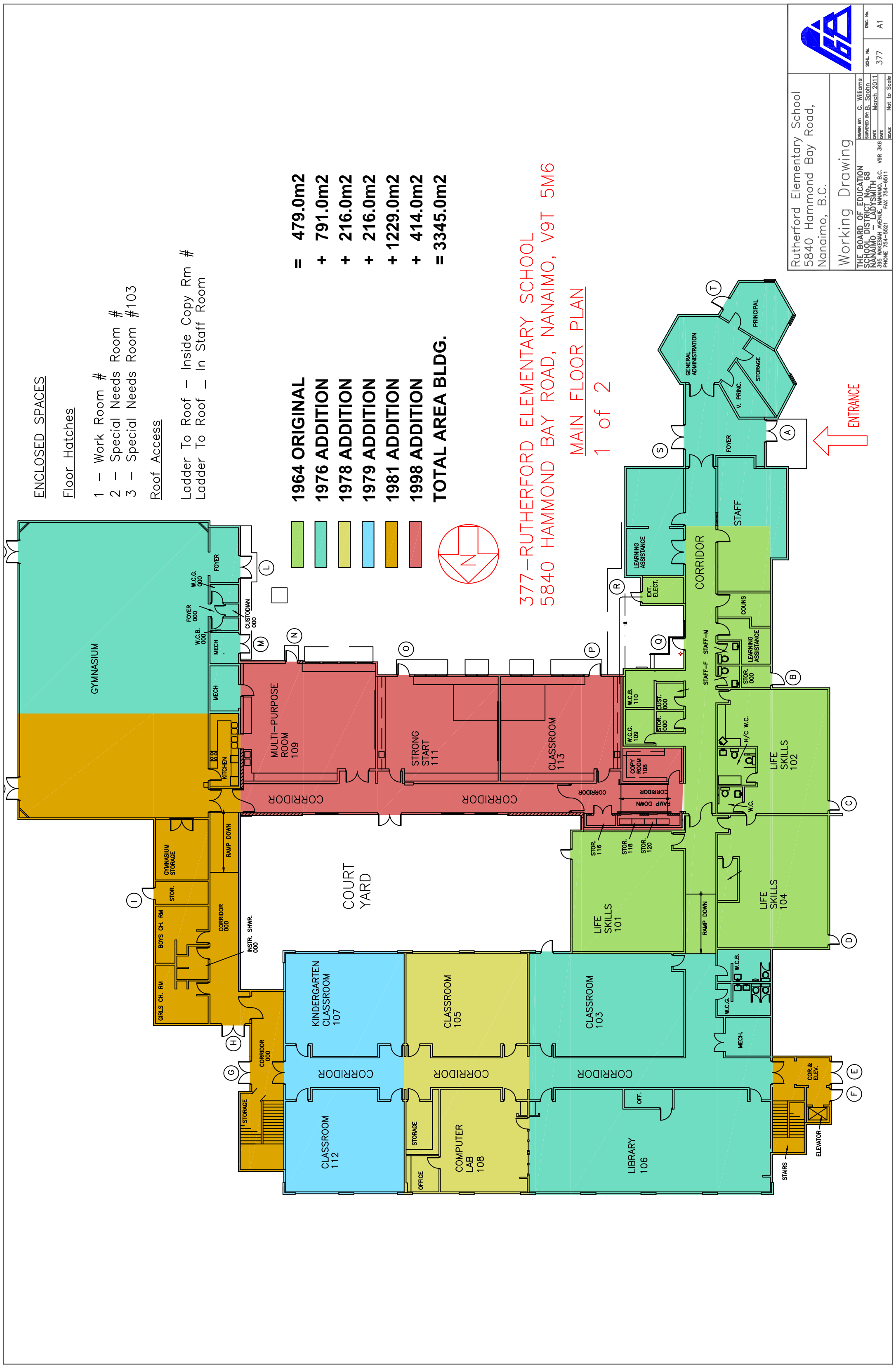
Servery connected to gym shows aging millwork.

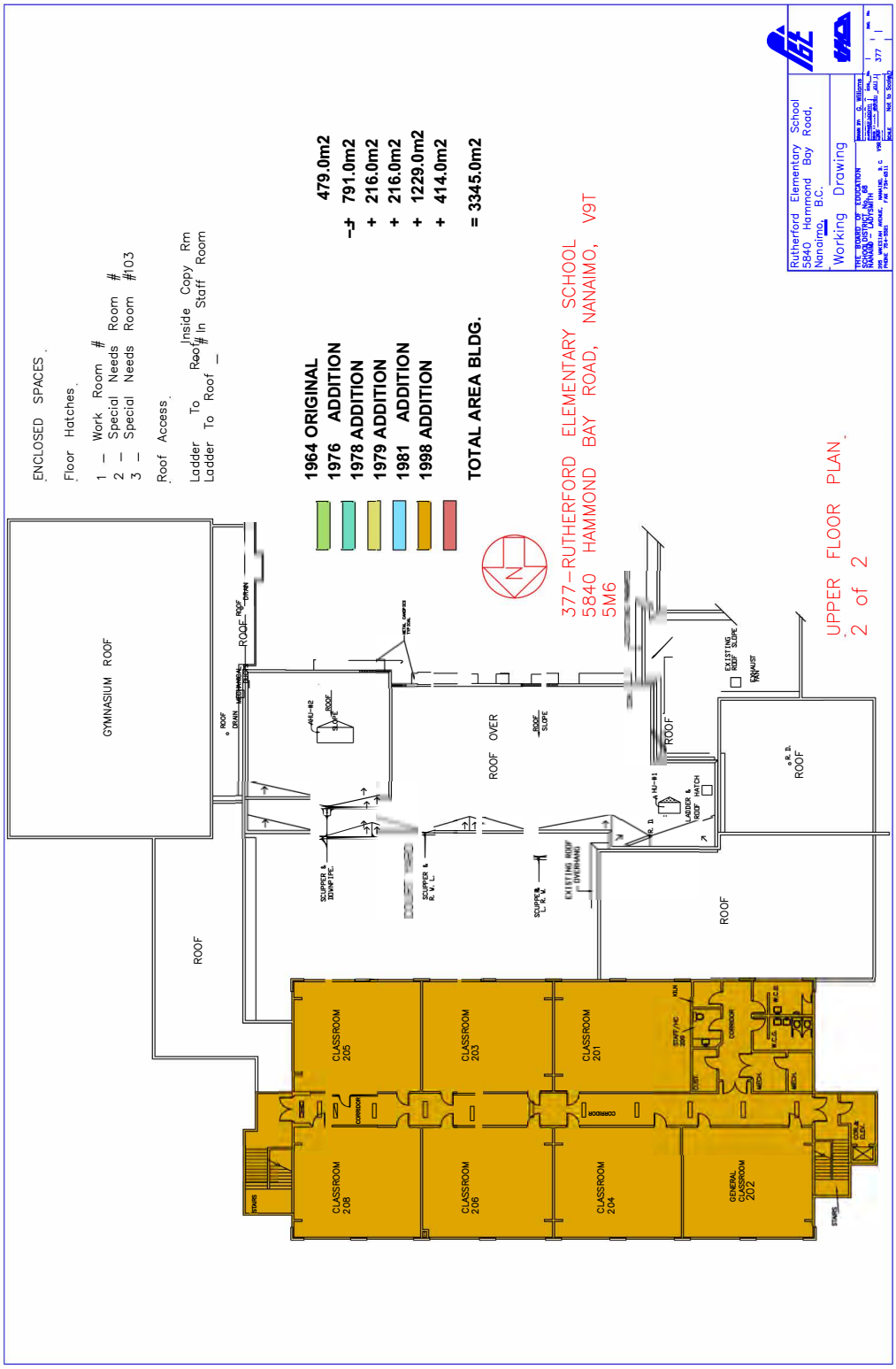
Millwork and fittings in 1998 block are superior to what is found in the rest of the school.

Millwork and fittings in the older blocks are generally of poor quality or condition.

Gym change rooms lack current code requirements for accessibility.

Signage is generally of poor quality and interior signage does not meet code for accessibility to the visually impaired.


ENCLOSED SPACES
Floor Hatches
1 - Work Room #
2 - Special Needs Room #
3 - Special Needs Room #103
Roof Access
Ladder To Roof - Inside Copy Rm #
Ladder To Roof - In Staff Room
1964 ORIGINAL = 479.0m2
1976 ADDITION + 791.0m2
1978 ADDITION + 216.0m2
1979 ADDITION + 216.0m2
1981 ADDITION + 1229.0m2
1998 ADDITION + 414.0m2
TOTAL AREA BLDG. = 3345.0m2
377-RUTHERFORD ELEMENTARY SCHOOL
5840 HAMMOND BAY ROAD, NANAIMO, V9T 5M6
MAIN FLOOR PLAN
1 of 2
Rutherford Elementary School
5840 Hammond Bay Road,
Nanaimo, B.C.
Working Drawing
GYMNASIUM
MULTI-PURPOSE ROOM 109
STRONG START 111
CLASSROOM 113
CORRIDOR
COURT YARD
KINDERGARTEN CLASSROOM 107
CLASSROOM 105
CLASSROOM 103
CLASSROOM 112
COMPUTER LAB 108
LIBRARY 106
LIFE SKILLS 101
LIFE SKILLS 102
LIFE SKILLS 104
STAFF
GENERAL ADMINISTRATION
PRINCIPAL
STORAGE
V. PRINC.
FOYER
LEARNING ASSISTANCE
COUNS
ENTRANCE
GYMNASIUM STORAGE
BOYS CH. RM
GIRLS CH. RM
KITCHEN
MECH
CUSTODIAN
ELEVATOR
STAIRS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377–RUTHERFORD ELEMENTARY SCHOOL
5840 HAMMOND BAY ROAD, NANAIMO, V9T 5M6
UPPER FLOOR PLAN
2 of 2
Rutherford Elementary School
5840 Hammond Bay Road,
Nanaimo B.C.
Working Drawing
GYMNASIUM ROOF
ROOF
ROOF OVER
EXISTING ROOF SLOPE
EXHAUST FAN
LADDER & ROOF HATCH
EXISTING ROOF OVERHANG
CLASSROOM 205
CLASSROOM 203
CLASSROOM 201
CLASSROOM 208
CLASSROOM 206
CLASSROOM 204
GENERAL CLASSROOM 202
CORRIDOR
STAFF/WC 209
KILN
STAIRS

Introduction

School District 68 (SD68) has commissioned a report to determine the operational and maintenance issues related to keeping Rutherford Elementary School operational for at least another ten years.

KMBR Architects Planners Inc. is lead for producing this report and each section summarises the findings related to the structural performance of the building.
It should be noted that conclusions and recommendations presented in this report must be viewed in light of the information available from original drawings and the limited visual examination performed on site on August 19th, 2016.

Building Description

Rutherford Elementary School is located at 5840 Hammond Bay Road in Nanaimo, BC. The building consists of four blocks of varying age and construction type. The arrangement of the blocks and their age is shown in Appendix A.

The use and construction of the blocks are summarized as follows:

BLOCK 1 – Gymnasium Block

- Built in 1976.
- Consisting of cast-in-place concrete wall construction with glulam roof beams supporting a T&G roof.

BLOCK 2 – Two Story Classroom Block

- Built in multiple phases dating from 1976,1978,1979 and 1981.
- Consisting of cast-in-place and pre-cast concrete construction with a second floor wood frame addition.

BLOCK 3 – Single Story Classroom Block

- Built in two phases 1964 and 1976
- Consisting of wood frame construction. The 1964 section has a crawlspace. The small 1976 section is constructed in cast-in-place concrete.

BLOCK 4 – Daycare Block

- Built in 1998.
- Likely wood frame construction. Framing hidden by stucco exterior and drywall interior finishes.

1. **Condition**

Assessing the structural condition of the building using a visual survey is limited by the amount of structure exposed for review. More invasive removal of finishes is required to make a more conclusive assessment.

In the case of exposed concrete walls, the condition of the concrete is fairly easy to determine, however the condition of the reinforcing within the concrete is difficult to comment on unless there is an obvious deficiency such as a cracking or rust staining.

In the case of wood frame construction, much of the structure is hidden behind finishes such as drywall and stucco. Condition of the structure can only be inferred by any deficiencies in those finishes or obvious issues such as excessive deflection.

Concerning Rutherford Elementary School, we would assess the general condition of the building structure as good and would make the following observations/comments:

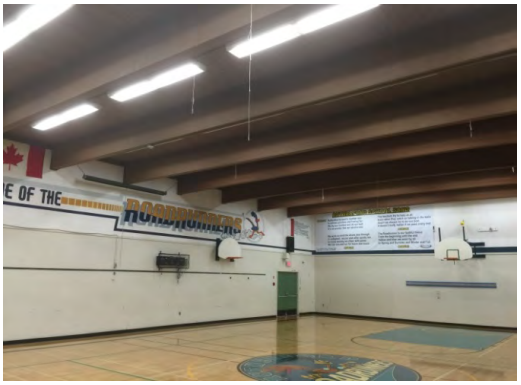
1.1. Block 1 – Gymnasium

- No obvious condition issues identified.

PHOTO A –

The concrete walls of the gymnasium showed no obvious signs of structural cracking.

PHOTO B-



The glulam and T&G roof system showed no signs of obvious condition issues.

1.2. Block 2 – Two Storey Class Room Block

- No obvious condition issues identified:

Photo A –
Exterior exposed concrete and cedar finishes did not indicate any obvious structural condition issues.

Photo B-
Sections of roof where Block 2 and 3 abut have been re-flashed. No reports of problems with framing were identified in these locations.

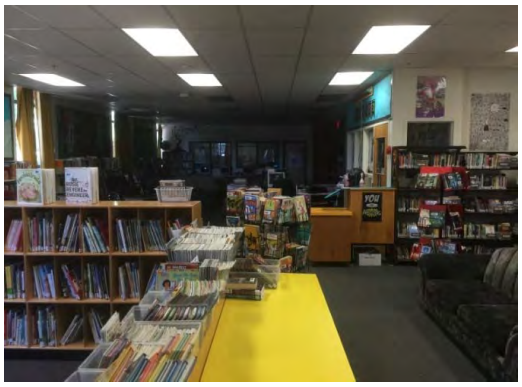


Photo C-
Typical interior view (in this case the ground floor library). Note T bar ceiling hides drywall ceiling above.

1.3. Block 3 – Single Storey Classroom Block

- No obvious condition issues identified:

Photo A –
View to rear of block. Note 1964 section in the foreground and 1976 concrete structure in the background.

Photo B –
View looking north towards school showing concrete 1976 section of Block 3.

1.4. Block 4 – Daycare Block

- No obvious condition issues identified however staining and crazing of the north side stucco may indicate envelope issues that could affect the wood frame structure behind:

Photo A –
Typical exterior view of southern exposure.

Photo B –
Interior view of activity room adjacent to Gymnasium.

Photo C –
Exterior view of north elevation of block.
(Note staining and crazing of stucco)

2. Seismic Performance

Note the following:

- Blocks 1, 2 and 3 have been seismically reviewed.
- In 2004 an initial assessment of seismic risk was performed followed by a desktop review of this risk in 2010. Due to an inconsistency in the 2004 data, a further review of Block 2 was performed in 2016.
- Block 4 has not been assessed as it was constructed in 1998 and is considered comparable with present day building codes.
- The seismic reviews of the Blocks are included in Appendix B and C. The changing risks

BLOCK	2004 Review	2010 Review	2016 Review
1	Low/Moderate	Low	-
2	Moderate	Moderate	H3
3	Moderate/High	Moderate	-
4	L	Low	-

for each block is summarized below:

* Only Block 2 was recently reviewed.

It is considered that the remaining 2010 risks reflect the present guidelines issued by the Ministry of Education and APEGBC for the Schools Seismic Mitigation Program. However these guidelines are set to change to reflect the recently released 2015 National Building Code. (See below)

In 2004 the program gave costs to make the necessary seismic upgrades necessary to improve the performance of the various Blocks. The scope of these upgrades are still relevant and so the costs of these upgrades and their escalation to 2016 dollars is given below (without softcosts).

Note that a 3% escalation figure is given and the figures and their escalation should be reviewed by a cost consultant to ensure their relevance to present construction costs:

BLOCK	Summary Scope of Upgrade	2004 Costs	2016 Costs
1	Upgrade Roof Diaphragm	$227,590.00	$325,455.00
2	Improve connectivity of Shear wall and diaphragm elements	$796,410.00	$1,138,867.00
3	Upgrade wood diaphragms and shear walls	$368,500.00	$526,955.00
4	None required	0	0

3. Impact Of Future Code Changes

With recent release of the 2015 National Building Code there has been a significant impact on the seismic design requirements for Vancouver Island. Simply put, with the data generated from the recent large subductive earthquakes that have occurred around the Pacific Rim, seismologists have upgraded the expected earthquake magnitude and durations for the Vancouver Island and Haida Gwaii seismic zones.

It is therefore likely that the risk ratings for the school blocks will increase by one or two levels. The School Seismic Program administered by APEGBC is currently assessing the impact of this new data and updating its systems to reflect the changes it has generated.
These new guidelines will be made available later this year. Once released it is recommended that Rapid Assessments be performed for both Blocks 1, 2 and 3 to confirm their risk rating.

4. Conclusions And Recommendations

4.1. Building Condition

The general condition of visible structural elements at Rutherford Elementary are considered good with no obvious major capital maintenance issues. Therefore, with regular preventative maintenance these areas of building structure should provide adequate service for the next forty years with nominal capital maintenance needs.

Possible hidden issues that are considered worth investigating further include:

- The condition of the structure behind the stained and cracked stucco on the north side of Block4
- The condition of the structure behind the aged cedar shakes on Block 2.

These envelope investigations are non-urgent structurally however may identify if there are any issues of rot early, mitigating future more costly repairs. Typical areas of potential concern relating to building envelope failure are rotten sill plates, plywood and studs.

6.2 Building Performance

Block 2 is rated as the High Risk Category H3. The remaining Blocks are considered either Low or Moderate Risk using the current methods of assessment under the Seismic Retrofit Program version 2.

With the changes to the 2015 National Building Code and the upcoming APEGBC Seismic Retrofit Guidelines version 3 (SRG) the risk levels of these blocks may increase. It is therefore considered prudent to maintain a construction allowance (soft costs not included) of $2 million for possible seismic upgrading.

Updates to the Seismic Retrofit Program (SRG version 3) are expected to be completed this year. Once complete it is therefore recommended that rapid assessments be performed using the updated data to determine if the risk ratings of the Blocks have changed. If the risks of some of the blocks do rise to the High Risk Category then costs should be verified using the Seismic Project Identification Report process for the Blocks concerned.

5. Closing Comments

We trust the information contained within this report satisfies your current requirements. Should you have any comments, questions or concerns, please do not hesitate to contact the undersigned.

Yours truly,

HEROLD ENGINEERING LIMITED

Prepared By:

Lee Rowley P.Eng.

BRITISH COLUMBIA

Seismic Assessment Report: Facility Summary

Ministry of Education

Facility Information

School District No. and Name
68 - Nanaimo-Ladysmith

Facility Name
Rutherford Community

Facility Code
6868077

Street Address
5840 Hammond Bay Rd, Nanaimo, BC

Postal Code
V9T 5M6

Date of Assessment
August 22, 2004

Assessment Firm
Herold Engineering Limited

Responsible Assessor (1)
Ted Sorensen, P.Eng.

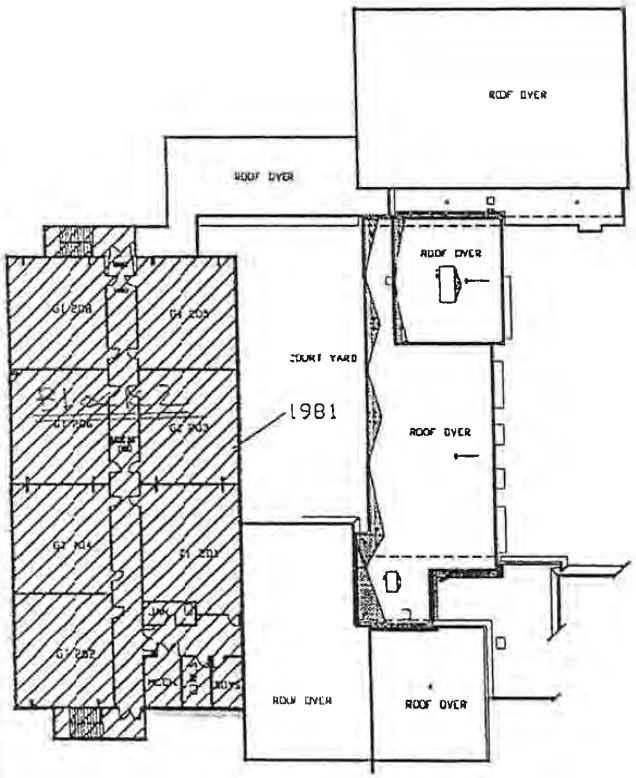
Nominal Capacity of Facility

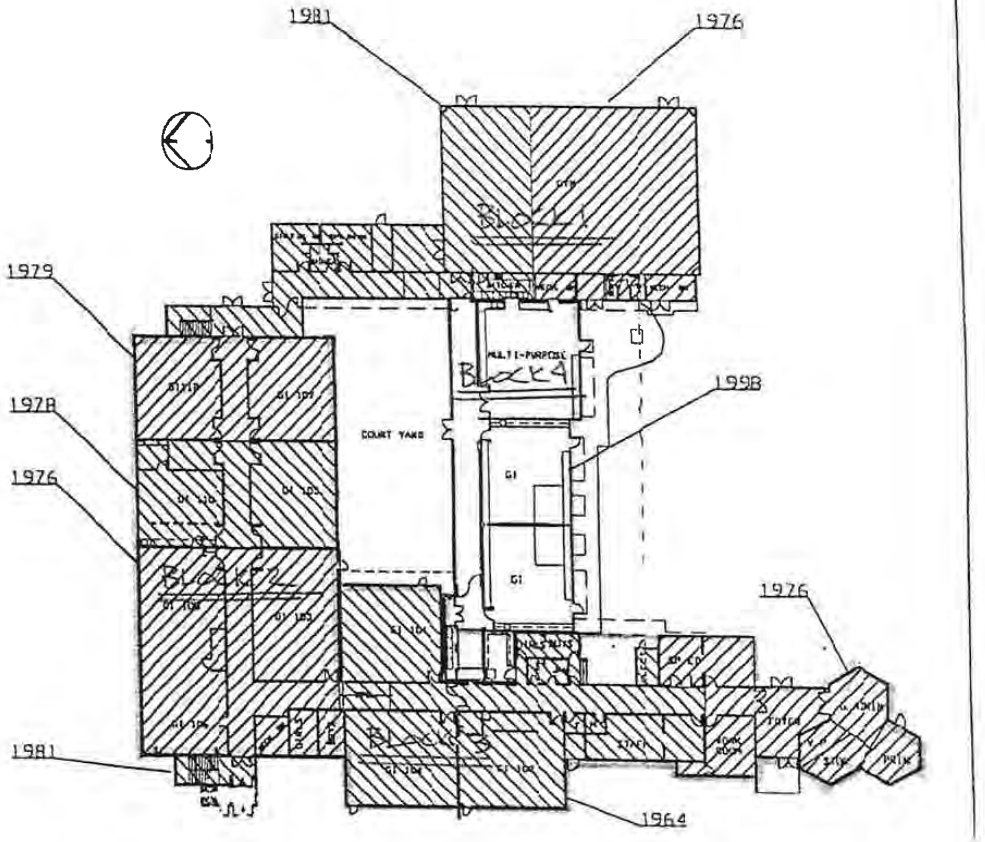
K	Elem. (gr. 1-7)	Sec. (gr. 8-12)
80	325	0

Block Information (2)

School Building Name	Block No.	Block Name	Assessed
6868077 Rutherford Community	1	Gymnasium	☑ yes ☐ no
6868077 Rutherford Community	2	Two Storey	☑ yes ☐ no
6868077 Rutherford Community	3	Single Storey Timber Frame	☑ yes ☐ no
6868077 Rutherford Community	4	Kindergarten and Multi-Purpose Room	☐ yes ☑ no
			☐ yes ☐ no
			☐ yes ☐ no
			☐ yes ☐ no
			☐ yes ☐ no
			☐ yes ☐ no
			☐ yes ☐ no

4 blocks: 3 assessed, 1 not assessed





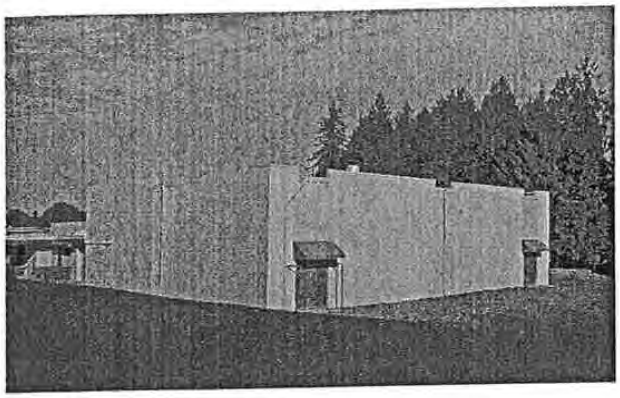
UPPER FLOOR PLAN

MAIN FLOOR PLAN

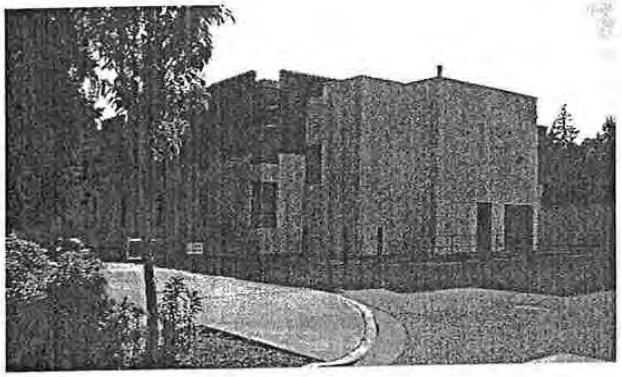
Original School	1964	= 479 sqm
Additions	1976	= 791 sqm
	1978	= 216 sqm
	1979	= 216 sqm
	1981	= 1229 sqm
	1998	= 414 sqm

TOTAL BLDG. AREA = 3345 SQM

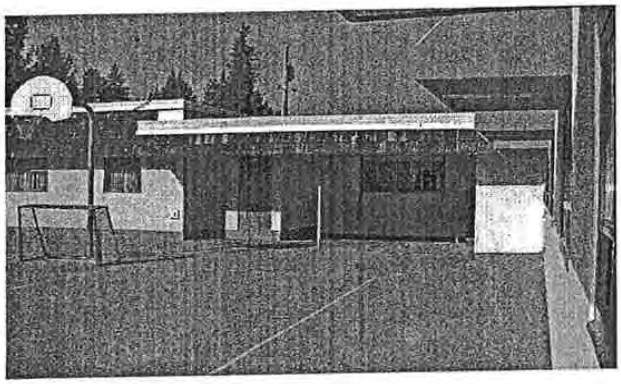
RUTHERFORD ELEM
KEY PLAN



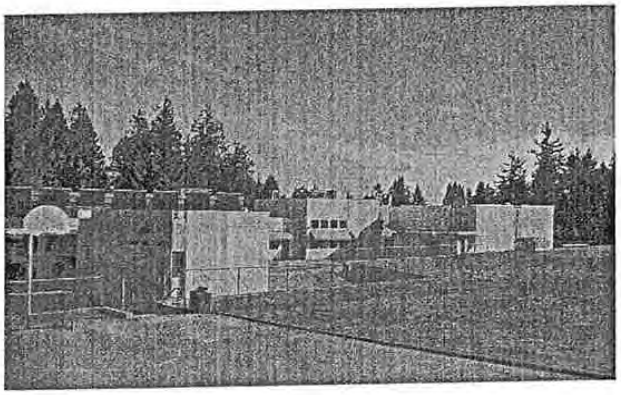
Rutherford Community
6868077 - Block 1



Rutherford Community
6868077 - Block 2



Rutherford Community
6868077 - Block 3



Rutherford Community
6868077 - Block 4

BRITISH COLUMBIA

Seismic Assessment Report: Building Block Summary

Ministry of Education

Building Block No. and Name

Building Block No. 1 - Gymnasium

Building Block Capacity (3)

K	Elem. (gr. 1-7)	Sec. (gr. 8-12)

Type of Occupancy	No. of Rooms
☐ Classroom(s)	
☑ Gymnasium(s)	1
☐ Multipurpose Room(s)	
☐ Cafeteria(s)	
☐ Auditorium(s)	
☐ Shop(s)	
☐ Administration	
☐ Other	

Year(s) of Construction

1976, 1981

No. of Storeys (4)

1

Gross Floor Area (m^2) (5)

427

Drawing(s) Available

☑ Yes - Location(s): SD68 Office

☐ No

Block Sketch (6)

Filename	6868077_keyplan.bmp

Block Photo (7)

Filename	6868077_block1.jpg
Elevation	

BRITISH COLUMBIA

Seismic Assessment Report: Building Block Summary

Ministry of Education

Block Construction (8)

Roof System	Suspended Floors	Walls (Load Bearing)	Foundations	Vertical Lateral Force Resisting System
☐ Wood Joists	☐ Wood Joists	☐ Wood Studs	☑ Spread Footings	☐ URM Brick Wall
☐ Shiplap	☐ Shiplap	☐ Post and Beam	☐ Piles - Wood	☐ Unreinforced HCB
☑ Plywood	☐ Plywood	☐ URM Brick	☐ Piles - Steel	☐ Lightly Reinforced HCB
☐ Drywall/Plaster	☐ Drywall/Plaster	☐ Unreinforced HCB	☐ Piles - Concrete	☐ Reinforced HCB
☑ Tongue and Groove Decking	☐ Tongue and Groove Decking	☐ Lightly Reinforced HCB	☐ Combination	☐ Plywood Wall
☐ Metal Decking	☐ Metal Decking	☐ Reinforced HCB	☐ Other	☐ Shiplap Wall
☐ Concrete Infilled Metal Decking	☐ Concrete Infilled Metal Decking	☑ Concrete		☐ Drywall/Plaster
☐ Concrete Slab	☐ Concrete Slab	☐ Steel		☑ Concrete Wall
☐ Precast Slab	☐ Precast Slab	☐ Other		☐ Cross Bracing
☑ Timber/Glulam Beams	☐ Timber/Glulam Beams			☐ Steel Moment Frame
☐ Steel Beams/Joists	☐ Steel Beams/Joists			☐ Concrete Moment Frame
☐ Concrete Beams	☐ Concrete Beams			☐ Other
☐ Other	☐ Other			

URM - Unreinforced Brick Masonry
HCB - Hollow Concrete Block or Giant Brick

BRITISH COLUMBIA

Seismic Assessment Report: Building Block Summary

Ministry of Education

Ground Floor Construction

- [x] Slab on Grade
- [ ] Crawl Space
- [ ] Basement
- [ ] Other

Historic Register

- [ ] Yes
- [x] No
- [ ] Unknown

Adjacency Issues (11)

Pounding
- [ ] Yes
- [x] No

Falling Objects
- [ ] Yes
- [x] No

- [ ] **Other**

Performance Objective I = 1.3* (12)

- [x] Yes
- [ ] No
- [ ] Other

Previous Seismic Upgrades (9)

- [ ] Yes
- [x] No
- [ ] Unknown

Potential Geological/Site Issues (10)

- [ ] Construction Near Edge of Slope
- [ ] Construction Near Upside Slope
- [ ] Liquefiable Soils
- [ ] Daylighting of Basement
- [ ] Other

Seismic Factors* (13)

Soil Site Class (est)	C
Fa	1
Rd	1.5
Ro	1.5
Spectral Acceleration	1
V	0.385 x W

*** Code: National Building Code of Canada (2005 Edition)**

BRITISH COLUMBIA

Seismic Assessment Report: Building Block Summary

Ministry of Education

Structural Deficiency (14)

		Capacity/Demand N/S	Capacity/Demand E/W	Comments
Roof	Diaphragm	M	MH	9.5mm plywood sheathing on 38mm decking
	Connections	L	L	
Floor	Diaphragm			
	Connections			
Vert. Lateral Load System		LM	LM	lack of end zone recinforcing
Walls - Out of Plane		L	L	
Foundations		L	L	
Anchorage to Foundations		L	L	
Retaining Walls (15)				

Weak or Soft Storey
- ☐ Yes
- ☑ No

High Torsion
- ☐ Yes
- ☑ No

Short Columns
- ☐ Yes
- ☑ No

Covered Play Area
- ☐ Yes
- ☑ No

Adequate Connection Between Adjacent Blocks
- ☑ Yes
- ☐ No

Comments - None

BRITISH COLUMBIA

Seismic Assessment Report: Building Block Summary

Ministry of Education

Identify up to 5 Major Deficiencies (16)

1	overstressed diaphragm
2	
3	
4	
5	

Building Component Deficiencies (17)

URM or HCT Partition Walls
- ☐ Yes
- ☑ No

Parapets or Gables
- ☐ Yes
- ☑ No

URM over Entrances
- ☐ Yes
- ☑ No

☐ **Other**

Estimated Seismic Risk (18)
- ☐ Low
- ☑ Low/Moderate
- ☐ Moderate
- ☐ Moderate/High
- ☐ High

Opportunities to Address Weak Components in the Short Term (19)
- ☑ Yes
- ☐ No

Other Comments (20)

11/4/2004
Form 5

SD 68 - Nanaimo-Ladysmith
Rutherford Community
Building Block No. 1 - Gymnasium

BRITISH COLUMBIA

Seismic Assessment Report: Building Block Summary

Ministry of Education

Construction Estimate (21)

Location	Factor
68 - Nanaimo-Ladysmith	1.057

No. of Construction Estimates
☐ 0 ☑ 1 ☐ 2 ☐ 3

Construction Estimate No. 1 (if necessary)

Occupancy Type
Assembly (Gym, MPR, Café)

Building Type	Unit Cost	Floor Area (m^2)	Estimated Cost
Wood frame, post & beam, T&G deck	$396	427	$169,090

Premium Cost Allowance	Unit Cost	Floor Area (m^2)	Estimated Cost
☐ Clay Tile Walls			
☑ Wood Frame Crawlspace	$137	427	$58,500
Subtotal Estimated Cost			$227,590
Adjustment for Previous Partial Seismic Upgrades (100% = No Adjustment)		100%	**$227,590**

BRITISH COLUMBIA

Seismic Assessment Report: Building Block Summary

Ministry of Education

Construction Estimate No. 2 (if necessary)

Occupancy Type				
Building Type		**Unit Cost**	**Floor Area (m^2)**	**Estimated Cost**
Premium Cost Allowance		**Unit Cost**	**Floor Area (m^2)**	**Estimated Cost**
☐ Clay Tile Walls				
☐ Wood Frame Crawlspace				
			Subtotal Estimated Cost	
Adjustment for Previous Partial Seismic Upgrades (100% = No Adjustment)		100%		

Construction Estimate No. 3 (if necessary)

Occupancy Type				
Building Type		**Unit Cost**	**Floor Area (m^2)**	**Estimated Cost**
Premium Cost Allowance		**Unit Cost**	**Floor Area (m^2)**	**Estimated Cost**
☐ Clay Tile Walls				
☐ Wood Frame Crawlspace				
			Subtotal Estimated Cost	
Adjustment for Previous Partial Seismic Upgrades (100% = No Adjustment)		100%		

Total Estimated Cost $227,590

BRITISH COLUMBIA

Seismic Assessment Report: Building Block Summary

Ministry of Education

Building Block No. and Name

Building Block No. 2 - Two Storey

Building Block Capacity (3)

K	Elem. (gr. 1-7)	Sec. (gr. 8-12)
	300	

Type of Occupancy	No. of Rooms
☑ Classroom(s)	12
☐ Gymnasium(s)	
☐ Multipurpose Room(s)	
☐ Cafeteria(s)	
☐ Auditorium(s)	
☐ Shop(s)	
☐ Administration	
☑ Other - Library	1

Year(s) of Construction

1976, 1978, 1979, 1981

No. of Storeys (4)

2

Gross Floor Area (m^2) (5)

1596

Drawing(s) Available

☑ Yes - Location(s): SD68 Office

☐ No

Block Sketch (6)

Filename	6868077_keyplan.bmp

Block Photo (7)

Filename	6868077_block2.jpg
Elevation	

BRITISH COLUMBIA

Seismic Assessment Report: Building Block Summary

Ministry of Education

Block Construction (8)

Roof System	Suspended Floors	Walls (Load Bearing)	Foundations	Vertical Lateral Force Resisting System
☐ Wood Joists	☐ Wood Joists	☑ Wood Studs	☑ Spread Footings	☐ URM Brick Wall
☐ Shiplap	☐ Shiplap	☐ Post and Beam	☐ Piles - Wood	☐ Unreinforced HCB
☑ Plywood	☑ Plywood	☐ URM Brick	☐ Piles - Steel	☐ Lightly Reinforced HCB
☐ Drywall/Plaster	☐ Drywall/Plaster	☐ Unreinforced HCB	☐ Piles - Concrete	☐ Reinforced HCB
☐ Tongue and Groove Decking	☐ Tongue and Groove Decking	☐ Lightly Reinforced HCB	☐ Combination	☑ Plywood Wall
☐ Metal Decking	☐ Metal Decking	☐ Reinforced HCB	☐ Other	☐ Shiplap Wall
☐ Concrete Infilled Metal Decking	☐ Concrete Infilled Metal Decking	☐ Concrete		☑ Drywall/Plaster
☐ Concrete Slab	☐ Concrete Slab	☐ Steel		☑ Concrete Wall
☐ Precast Slab	☐ Precast Slab	☐ Other		☐ Cross Bracing
☑ Timber/Glulam Beams	☐ Timber/Glulam Beams			☐ Steel Moment Frame
☐ Steel Beams/Joists	☐ Steel Beams/Joists			☐ Concrete Moment Frame
☐ Concrete Beams	☐ Concrete Beams			☑ Other - tilt-up concrete wall panels
☑ Other - TJL	☑ Other - TJL			

URM - Unreinforced Brick Masonry
HCB - Hollow Concrete Block or Giant Brick

BRITISH COLUMBIA

Seismic Assessment Report: Building Block Summary

Ministry of Education

Ground Floor Construction

- [x] Slab on Grade
- [ ] Crawl Space
- [ ] Basement
- [ ] Other

Historic Register

- [ ] Yes
- [x] No
- [ ] Unknown

Adjacency Issues (11)

Pounding
- [ ] Yes
- [x] No

Falling Objects
- [ ] Yes
- [x] No

- [ ] **Other**

Performance Objective I = 1.3* (12)

- [x] Yes
- [ ] No
- [ ] Other

Previous Seismic Upgrades (9)

- [ ] Yes
- [x] No
- [ ] Unknown

Potential Geological/Site Issues (10)

- [ ] Construction Near Edge of Slope
- [ ] Construction Near Upside Slope
- [ ] Liquefiable Soils
- [ ] Daylighting of Basement
- [ ] Other

Seismic Factors* (13)

Soil Site Class (est)	C
Fa	1
Rd	1.5
Ro	1.5
Spectral Acceleration	1
V	0.385 x W

*** Code: National Building Code of Canada (2005 Edition)**

BRITISH COLUMBIA

Seismic Assessment Report: Building Block Summary

Ministry of Education

Structural Deficiency (14)

		Capacity/Demand N/S	Capacity/Demand E/W	Comments
Roof	Diaphragm	H	MH	
Roof	Connections	H	MH	assumed 2-1/2" nails @ 8" o/c
Floor	Diaphragm	M	L	
Floor	Connections	MH	L	assumed 2-1/2" nails @ 8" o/c
Vert. Lateral Load System		H	MH	did not use interior partitions for analysis in N/S direction
Walls - Out of Plane		MH	MH	lack of connection between timber frame and concrete walls
Foundations		L	L	nominally reinforced
Anchorage to Foundations		L	L	
Retaining Walls (15)				

Weak or Soft Storey
- ☐ Yes
- ☑ No

High Torsion
- ☐ Yes
- ☑ No

Short Columns
- ☐ Yes
- ☑ No

Covered Play Area
- ☐ Yes
- ☑ No

Adequate Connection Between Adjacent Blocks
- ☑ Yes
- ☐ No

Comments - None

BRITISH COLUMBIA

Seismic Assessment Report: Building Block Summary

Ministry of Education

Identify up to 5 Major Deficiencies (16)

1	lack of shear transfer from roof and floor diaph. to shearwalls
2	
3	
4	
5	

Building Component Deficiencies (17)

URM or HCT Partition Walls
- ☐ Yes
- ☑ No

Parapets or Gables
- ☐ Yes
- ☑ No

URM over Entrances
- ☐ Yes
- ☑ No

☐ **Other**

Estimated Seismic Risk (18)
- ☐ Low
- ☐ Low/Moderate
- ☑ Moderate
- ☐ Moderate/High
- ☐ High

Opportunities to Address Weak Components in the Short Term (19)
- ☑ Yes see below
- ☐ No

Other Comments (20)

- add framing clips to transfer diaphragm loads to shearwalls
- sheath 2nd floor corridor walls with plywood to N/S of roof

---

1. Lack of connection detail at diaphragm shearwall interface

10/4/2004
Form 5

SD 68 - Nanaimo-Ladysmith
Rutherford Community
Building Block No. 2 - Two Storey

BRITISH COLUMBIA

Seismic Assessment Report: Building Block Summary

Ministry of Education

Construction Estimate (21)

Location	Factor
68 - Nanaimo-Ladysmith	1.057

No. of Construction Estimates

☐ 0 ☑ 1 ☐ 2 ☐ 3

Construction Estimate No. 1 (if necessary)

Occupancy Type: 1-2 Storey Classroom(s)

	Unit Cost	Floor Area (m^2)	Estimated Cost
Building Type: Wood frame, post & beam, T&G deck	$433	1,596	$691,070
Premium Cost Allowance			
☐ Clay Tile Walls			
☑ Wood Frame Crawlspace	$132	798	$105,340
Subtotal Estimated Cost			$796,410
Adjustment for Previous Partial Seismic Upgrades (100% = No Adjustment)		100%	**$796,410**

BRITISH COLUMBIA

Seismic Assessment Report: Building Block Summary

Ministry of Education

Construction Estimate No. 2 (if necessary)

Occupancy Type				
Building Type		**Unit Cost**	**Floor Area (m^2)**	**Estimated Cost**
Premium Cost Allowance		**Unit Cost**	**Floor Area (m^2)**	**Estimated Cost**
☐ Clay Tile Walls				
☐ Wood Frame Crawlspace				
			Subtotal Estimated Cost	
Adjustment for Previous Partial Seismic Upgrades (100% = No Adjustment)			100%	

Construction Estimate No. 3 (if necessary)

Occupancy Type				
Building Type		**Unit Cost**	**Floor Area (m^2)**	**Estimated Cost**
Premium Cost Allowance		**Unit Cost**	**Floor Area (m^2)**	**Estimated Cost**
☐ Clay Tile Walls				
☐ Wood Frame Crawlspace				
			Subtotal Estimated Cost	
Adjustment for Previous Partial Seismic Upgrades (100% = No Adjustment)			100%	

Total Estimated Cost **$796,410**

BRITISH COLUMBIA

Seismic Assessment Report: Building Block Summary

Ministry of Education

Building Block No. and Name

Building Block No. 3

Building Block Capacity (3)

K	Elem. (gr. 1-7)	Sec. (gr. 8-12)
	75	

Type of Occupancy	No. of Rooms
☑ Classroom(s)	3
☐ Gymnasium(s)	
☐ Multipurpose Room(s)	
☐ Cafeteria(s)	
☐ Auditorium(s)	
☐ Shop(s)	
☑ Administration	
☐ Other	

Year(s) of Construction

1964, 1976

No. of Storeys (4)

1

Gross Floor Area (m^2) (5)

705

Drawing(s) Available

☐ Yes

☑ No

Block Sketch (6)

Filename	6868077_keyplan.bmp

Block Photo (7)

Filename	6868077_block3.jpg
Elevation	

BRITISH COLUMBIA

Seismic Assessment Report: Building Block Summary

Ministry of Education

Block Construction (8)

Roof System	Suspended Floors	Walls (Load Bearing)	Foundations	Vertical Lateral Force Resisting System
☑ Wood Joists	☐ Wood Joists	☑ Wood Studs	☑ Spread Footings	☐ URM Brick Wall
☑ Shiplap	☐ Shiplap	☑ Post and Beam	☐ Piles - Wood	☐ Unreinforced HCB
☐ Plywood	☐ Plywood	☐ URM Brick	☐ Piles - Steel	☐ Lightly Reinforced HCB
☐ Drywall/Plaster	☐ Drywall/Plaster	☐ Unreinforced HCB	☐ Piles - Concrete	☐ Reinforced HCB
☐ Tongue and Groove Decking	☐ Tongue and Groove Decking	☐ Lightly Reinforced HCB	☐ Combination	☐ Plywood Wall
☐ Metal Decking	☐ Metal Decking	☐ Reinforced HCB	☐ Other	☑ Shiplap Wall
☐ Concrete Infilled Metal Decking	☐ Concrete Infilled Metal Decking	☐ Concrete		☐ Drywall/Plaster
☐ Concrete Slab	☐ Concrete Slab	☐ Steel		☐ Concrete Wall
☐ Precast Slab	☐ Precast Slab	☐ Other		☐ Cross Bracing
☐ Timber/Glulam Beams	☐ Timber/Glulam Beams			☐ Steel Moment Frame
☐ Steel Beams/Joists	☐ Steel Beams/Joists			☐ Concrete Moment Frame
☐ Concrete Beams	☐ Concrete Beams			☐ Other
☐ Other	☐ Other			

URM - Unreinforced Brick Masonry
HCB - Hollow Concrete Block or Giant Brick

BRITISH COLUMBIA

Seismic Assessment Report: Building Block Summary

Ministry of Education

Ground Floor Construction

- ☐ Slab on Grade
- ☑ Crawl Space
- ☐ Basement
- ☐ Other

Historic Register

- ☐ Yes
- ☑ No
- ☐ Unknown

Adjacency Issues (11)

Pounding
- ☐ Yes
- ☑ No

Falling Objects
- ☐ Yes
- ☑ No

- ☐ **Other**

Performance Objective I = 1.3* (12)

- ☑ Yes
- ☐ No
- ☐ Other

Previous Seismic Upgrades (9)

- ☐ Yes
- ☑ No
- ☐ Unknown

Potential Geological/Site Issues (10)

- ☐ Construction Near Edge of Slope
- ☐ Construction Near Upside Slope
- ☐ Liquefiable Soils
- ☐ Daylighting of Basement
- ☐ Other

Seismic Factors* (13)

Soil Site Class (est)	C
Fa	1
Rd	1.5
Ro	1.5
Spectral Acceleration	1
V	0.578 x W

*** Code: National Building Code of Canada (2005 Edition)**

BRITISH COLUMBIA

Seismic Assessment Report: Building Block Summary

Ministry of Education

Structural Deficiency (14)

		Capacity/Demand N/S	Capacity/Demand E/W	Comments
Roof	Diaphragm	H	MH	
	Connections	H	MH	
Floor	Diaphragm			
	Connections			
Vert. Lateral Load System		H	MH	
Walls - Out of Plane		L	L	
Foundations		LM	LM	
Anchorage to Foundations		H	MH	
Retaining Walls (15)				

Weak or Soft Storey
☐ Yes
☑ No

High Torsion
☐ Yes
☑ No

Short Columns
☐ Yes
☑ No

Covered Play Area
☐ Yes
☑ No

Adequate Connection Between Adjacent Blocks
☑ Yes
☐ No

Comments - None

BRITISH COLUMBIA

Seismic Assessment Report: Building Block Summary

Ministry of Education

Identify up to 5 Major Deficiencies (16)

1	on majority of block sits on crawlspace
2	shiplap diaphragm
3	shiplap shearwalls
4	high number of openings in exterior walls
5	

Building Component Deficiencies (17)

URM or HCT Partition Walls
- ☐ Yes
- ☑ No

Parapets or Gables
- ☐ Yes
- ☑ No

URM over Entrances
- ☐ Yes
- ☑ No

☐ **Other**

Estimated Seismic Risk (18)
- ☐ Low
- ☐ Low/Moderate
- ☐ Moderate
- ☑ Moderate/High
- ☐ High

Opportunities to Address Weak Components in the Short Term (19)
- ☑ Yes upgrade roof diaphragm, upgrade corridor walls and
- ☐ No fdns. below

Other Comments (20)

1. Drawings not available

10/4/2004
Form 5

SD 68 - Nanaimo-Ladysmith
Rutherford Community
Building Block No. 3

BRITISH COLUMBIA

Seismic Assessment Report: Building Block Summary

Ministry of Education

Construction Estimate (21)

Location	Factor
68 - Nanaimo-Ladysmith	1.057

No. of Construction Estimates
☐ 0 ☑ 1 ☐ 2 ☐ 3

Construction Estimate No. 1 (if necessary)

Occupancy Type
1-2 Storey Classroom(s)

Building Type	Unit Cost	Floor Area (m^2)	Estimated Cost
Wood frame, post & beam, T&G deck	$433	705	$305,270

Premium Cost Allowance	Unit Cost	Floor Area (m^2)	Estimated Cost
☐ Clay Tile Walls			
☑ Wood Frame Crawlspace	$132	479	$63,230

Subtotal Estimated Cost		$368,500
Adjustment for Previous Partial Seismic Upgrades (100% = No Adjustment)	100%	**$368,500**

BRITISH COLUMBIA

Seismic Assessment Report: Building Block Summary

Ministry of Education

Construction Estimate No. 2 (if necessary)

Occupancy Type				
Building Type		**Unit Cost**	**Floor Area (m^2)**	**Estimated Cost**
Premium Cost Allowance		**Unit Cost**	**Floor Area (m^2)**	**Estimated Cost**
☐ Clay Tile Walls				
☐ Wood Frame Crawlspace				
			Subtotal Estimated Cost	
Adjustment for Previous Partial Seismic Upgrades (100% = No Adjustment)			100%	

Construction Estimate No. 3 (if necessary)

Occupancy Type				
Building Type		**Unit Cost**	**Floor Area (m^2)**	**Estimated Cost**
Premium Cost Allowance		**Unit Cost**	**Floor Area (m^2)**	**Estimated Cost**
☐ Clay Tile Walls				
☐ Wood Frame Crawlspace				
			Subtotal Estimated Cost	
Adjustment for Previous Partial Seismic Upgrades (100% = No Adjustment)			100%	

Total Estimated Cost $368,500

10/4/2004
Form 6

SD 68 - Nanaimo-Ladysmith
Rutherford Community
Building Block No. 3

Rapid Seismic Risk Assessment Report

Block Summary

Facility Name
Rutherford Elementary School

Date of Assessment
June 22nd 2016

Block Name
Two Storey Classroom

Assessment Firm
Herold Engineering Limited

Municipality
Nananimo

Facility Code #
6868077

Assessing Engineer
Lee Rowley

Block #
2

Site Class
C

Year(s) of Construction
1976,1978,1979,1981

No. of Storeys
2

Floor Area (m2)
1596

Previous Partial Seismic Upgrades

- [x] No
- [ ] Yes (Describe Below):

Ground Floor Construction

- [x] Slab on Grade
- [ ] Crawl Space
- [ ] Basement

Block Seimic Risk: **H3**

Non-structural Deficiences

- [ ] Parapets or Gables
- [ ] URM Chimneys
- [ ] Mechanical Equipment
- [ ] Other:

Risk Comments

Connectivity is a significant issue that is not fully captured in the assessment. Therefore a risk rating of H3 has been agreed in conjunction with the TRB steering committee.

Rapid Seismic Risk Assessment Report

Block Construction

Facility Code: 6868077
Block #: 2

Roof System	Suspended Floors	Vertical Load Bearing System	Foundations	Lateral Deformation Resisting System
☐ Wood Joists	☑ Wood Joists	☑ Wood Studs	☑ Spread Footings	☐ URM Brick Wall
☐ Shiplap	☐ Shiplap	☐ Post and Beam	☐ Piles - Woods	☐ URM HCB
☑ Plywood	☑ Plywood	☐ URM Clay Brick	☐ Piles - Steel	☐ Lightly Reinforced HCB
☐ Drywall/Plaster	☐ Drywall/Plaster	☐ URM HCB	☐ Piles - Concrete	☐ Reinforced HCB
☐ Tongue and Groove Decking	☑ Tongue and Groove Decking	☐ Lightly Reinforced HCB	☐ Combination	☐ Stack Bond HCB
☐ Metal Decking	☐ Metal Decking	☐ Reinforced HCB	☐ Other:	☑ Plywood Wall
☐ Concrete infilled Metal Decking	☐ Concrete infilled Metal Decking	☑ Concrete Walls	**Partition Walls**	☐ Shiplap Wall
☐ Concrete Slab	☐ Concrete Slab	☐ Concrete Columns	☑ Wood Stud	☐ Drywall/Plaster
☐ Precast Slab	☐ Precast Slab	☐ Steel Columns	☐ Steel Stud	☑ Concrete Wall
☐ Timber/Glulam Beams	☑ Timber/Glulam Beams	☑ Other: TJL Trusses	☐ URM HCB	☐ Concrete Moment Frame
☐ Steel Beams/Joists	☐ Steel Beams/Joists		☐ Reinforced HCB	☐ Tilt-up Wall
☐ Concrete Beams	☐ Concrete Beams		☐ HCT	☐ Steel Brace
☑ Other: TJL Trusses	☑ Other: TJL Trusses.		☐ Clay Brick	☐ Steel Moment Frame
			☐ Other:	☐ Other:

Rapid Seismic Risk Assessment Report

Risk Analysis of Existing Structure

Facility Code: 6868077

Block #: 2

Lateral Deformation Resisting System (LDRS)

#	PDE	Prototype	Capacity (%W)	Height (m)	Connection to Foundation Adequate?	Comments
1	4.3%	R1	27%	3.6	No	R1 Pier Prototype. Assumed 300kPa Ultimate Bearing.
2	0.5%	W2	28%	3.6	NA	Unblocked wood shear wall on top of concrete wall.

Out-of-Plane Walls

#	PDE	Prototype	Height (m)	Thickness (mm)	Surcharge (%Ww)	Comments
3						
4						

Diaphragms

#	PDE	Prototype	Capacity (%Wd)	Span (m)	Connection to LDRS Adequate?	Comments
5	4.9%	D3	4%	10	No	1976 second floor/roof section is T&G. Remaining sections are unblocked plywood.

Capacity (%W) – Resistance of LDRS as a percentage of the tributary weight

Capacity (%Wd) – Resistance of Diaphragm as a percentage of the tributary weight of the diaphragm and supported out-of-plane walls

Surcharge (%Ww) – Surcharge on the wall as a percentage of the self weight of the wall

– For confined walls list surcharge as 100%

Seismic Deficiences and Comments

1	Building constructed in several phases cumulating in a 1981 wood frame second floor addition. Connectivity between the concrete lower walls and wood frame upper walls is not detailed for the sections before 1979. In 1979 the lower section concrete walls had couplers built in for a future two room addition.
2	The concrete walls have in plane capacity to carry applied loads, however foundations are shallow and unable to mobilize enough of this capacity, resulting in rocking pier being the governing failure mechanism.
3	1976 concrete precast panels span onto 2' x 8' strip footings with nominal re-bar anchorage. If assumed bearing is lower than the 300kPa assumed then foundation failure further limits rocking capacity, thereby increasing risk.
4	Analysis done on 1976 section. Rocking pier model assumed with zero uplift capacity due to poor connectivity.
5	Connectivity is a significant issue that is not fully captured in the assessment. Therefore a risk rating of H3 has been agreed in conjunction with the TRB steering committee.

Rapid Seismic Risk Assessment Report

Retrofit Strategy

Facility Code: 6868077
Block #: 2

Construction of Existing Structure

Type of Construction

#14, #22

Comments on Type of Construction

1	The LDRS elements have reasonable capacity based SRG2. However the age of construction and multi-phased nature of construction gives concern regarding the connectivity of these elements.
2	Single story precast construction commenced in 1976 and continued in 1978 and 1979. In 1981 cast in place concrete stairs were added at each end of the block and a second floor wood frame structure added.
3	

Note - See SRG2 Volume 8 for List of Construction Types

Retrofit Methodology

#	Retrofit Option	Comments
1	WSW#4	Connect wood shear walls adequately to top of concrete walls.
2	WD#3	Upgrade connection of wood floor to concrete wall.
3	WD#1	Improve connectivity of roof diaphragm to second floor wood walls using metal straps.
4	CSW#3	Tie down concrete panels to new continuous grade beam and footing to develop shear capacity in panels rather than rocking. Work can be performed from the exterior.
5		

Note - See SRG2 Volume 7 for Retrofit Options

RUTHERFORD ELEMENTARY SCHOOL
BUILDING CONDITION ASSESSMENT
MECHANICAL

September 02, 2016

Scope

Rocky Point Engineering were engaged by School District 68 (Nanaimo-Ladysmith) to complete a mechanical system condition assessment of Rutherford Elementary that would consider building renewal costs for up to 40 years.

Purpose of the Report:

The intent of this report is to provide a study of the existing mechanical, plumbing, controls and fire protection systems in the school with respect to current condition and code compliance. The report will be used by the Quantity Surveyor to provide a budget estimate for proposed upgrades.

Summary of the Report:

The existing mechanical, plumbing and controls systems in the building in general have been well maintained, although in most cases have reached the end of their serviceable life. The systems are also old and generally in poor condition. The majority of the systems also do not provide adequate ventilation to meet current ASHRAE and BC Building Code guidelines.

The fire protection system was installed in 2000 for the full building and appears to be well maintained and in fair condition.

The plumbing fixtures throughout most of the building are in reasonable condition however, they do not meet current code for water consumption.

The domestic water piping distribution in all areas of the building, with the exception of the classroom addition in 1998, is beyond the standard useful service life and consideration should be made for full replacement.

If a building upgrade were to be considered instead of renewal, we would recommend the following mechanical system improvements:

- New high efficiency boiler plant (to serve entire school). (1,200 MBH Capacity)
- Provide new air-handling unit for the gymnasium, and packaged rooftop heat pump for the admin area.
- Provide new hydronic vertical style unit ventilators with ductwork distribution to ceiling mounted diffusers in all classrooms, library and multi-purpose room (19 units in total).
- Provide a new DDC system in the building for control, energy management and maintenance monitoring functions (to serve entire school).

Summary Review of 2015 VFA Facility Condition Report

From the recent 2015 VFA Facility Condition Report, the recommendations for renewal include:

- Current Renewal Value: $803,689 (Mechanical Only)
  - This total value includes short and long term priorities, recommendations for air quality improvements and non-structural seismic upgrades for mechanical, plumbing and controls systems.

VFA's assessment of the building includes 5 short-term mechanical renewal items where expenditures (greater than $5,000) are recommended immediately. These are:

Cabinet Unit Heaters - Electric	$10,977
Exhaust Systems - General	$19,922
Plumbing Fixtures - Restroom	$22,672
Water Heaters - Electric	$16,783
Air Handling Units	$108,649
TOTAL	$179,003

VFA's assessment also highlights 8 mechanical renewal items where significant expenditures (greater than $25,000) are required by 2019, excluding short-term items above. These are:

Classroom Sinks	$33,734
Ductwork Distribution	$122,324
Controls - Electric	$129,244
Furnaces – Gas-fired	$51,607
Hot Water Pipe	$37,247
Hydronic Fin Tube	$54,944
Make-up Air - Rooftop	$65,022
Water Distribution	$55,138
TOTAL	$549,260

MECHANICAL

September 02, 2016

1. **Existing Mechanical Systems:**

   The school's HVAC system consists of a mixture of natural gas furnaces for the original 1964 building and 1976 addition, indoor air handling unit for the second floor, 3x rooftop air handling units for the remaining classrooms and an indoor air handling unit for the gymnasium. Some areas of the school such as the administration, life skills 102, and staff room currently have no mechanical ventilation.

   The school has 3 mechanical rooms and 1 boiler room:

   1. Main Floor Mechanical Room 1964 Original Building

   - The original schools heating consists of two 150 MBH Comfortmaker RPJ II natural gas furnaces. The furnaces are beyond their serviceable life.
   - The furnaces are vented to a brick chimney. This chimney should be demolished and replaced with new breeching.
   - The furnaces supply warm air to some of the spaces in the 1964 original building.

   Condition Rating: Poor with all systems well beyond their expected useful service life.

   Renewal: Lifecycle replacement to meet current code compliance for improved ventilation.

Natural gas furnace (typ. of 2)

Chimney and existing breeching. Recommended to be demolished with venting replaced with new.

2. Main Floor Mechanical Room 1976 Addition

- The library and classroom 103 are served by two 150 MBH Armstrong Ultra SX 80 natural gas furnaces. The furnaces are beyond their serviceable life.
- The furnaces are vented up to the second floor roof.

Condition Rating: Poor with all systems well beyond their expected useful service life.

Renewal: Lifecycle replacement to meet current code compliance for improved ventilation

Armstrong Ultra SX 80 natural gas furnace
(typ. of 2)

3. **Second Floor Mechanical Room 1981 Addition**
   - The second floor classrooms are served by 5,700 CFM Engineered Air air handling unit located in the second floor mechanical room. The air handling unit includes a hydronic heating coil which is fed from the adjacent boiler room.

   Condition Rating: Poor with system well beyond their expected useful service life.

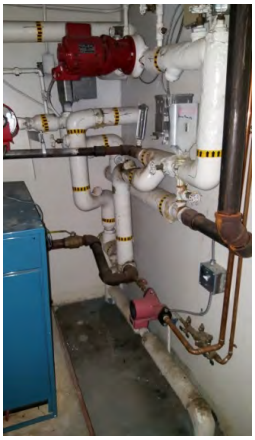
   Renewal: Lifecycle replacement to meet current code compliance for improved ventilation

Engineered Air model air handling unit. (rated for 5,700 CFM)

4. **Second Floor Boiler Room 1981 Addition**
   - The second floor is heated by a single 650,000 BTUH Burnham natural gas-fired boiler, which had been replaced 10 years ago.
   - The boiler is vented up through the roof.
   - Some hydronic piping in the boiler room is not insulated. It is recommended that this piping be replaced and insulated in accordance with ASHRAE standard 90.1 2010.
   - The secondary pump has recently been replaced and could potentially be reused if the existing boiler is to be removed and replaced.
   - In this boiler room there is a Giant 120 gallon electric hot water heater. This water heater is beyond its serviceable life. The water heating should be seismically restrained to meet current codes.

   Condition Rating: Fair condition. However, energy costs could be greatly improved with upgrade to higher efficiency heating system.

   Renewal: Life cycle component replacement and preventative maintenance for boiler.



Boiler and primary pump on the left. Hydronic piping and secondary pump on the right. Domestic water recirculation pump near the floor.

Natural Gas-fired boiler. Replaced 10 years ago.

2. Existing HVAC Systems

The school's HVAC system consists of a mixture of natural gas furnaces for the original 1964 building and 1976 addition, indoor air handling unit for the second floor, 3x rooftop air handling units for the remaining classrooms and an indoor air handling unit for the gymnasium. Some areas of the school such as the administration, life skills 102, and staff room currently have no mechanical ventilation. A summary of system includes:

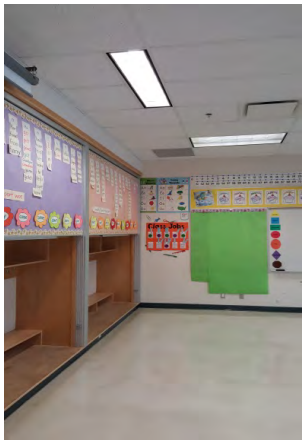
- Two gas-fired furnaces each rated 150 MBH are located in the mechanical furnace/ sprinkler room;
- Two gas-fired furnaces each rated 150 MBH located in the mechanical furnace room 109A;
- Two gas-fired furnaces each rated 150 MBH are located in the mech. furnace room M
- Two furnaces each rated 125 MBH are located in the mechanical furnace room B
- Two suspended air handling units are located in the ceiling space (hallways) and
- serve classrooms 107 & 112;
- An air handling AH1 is located in the mechanical fan room (upper floor);
- Three rooftop make-up air units AHU–1 (150 MBH/2500 CFM), AHU-2 (125 MBH/2000 CFM & AHU-3 (200 MBH/5000 CFM).

RUTHERFORD ELEMENTARY SCHOOL
BUILDING CONDITION ASSESSMENT
MECHANICAL

September 02, 2016

Gymnasium includes minimal ventilation. Recommend improved ventilation to meet current codes

Kitchen range exhaust system. Recommend life cycle replacement



1998 classroom wing classroom ventilation (typical)

Exhaust Fan (typical). All exhaust fans are in poor condition and should be replaced.

Condensing unit serving the computer lab. Appears in fair condition.

Rooftop gas-fired air handling unit. (typical of 3).

3. Gas Piping

Existing gas service is provided separately to different areas of the building.

- Original gas meter does not include a seismic shut-off valve. Recommend adding new seismic valve if service is to remain in use.
- Newer gas meter installed with 1998 upgrade includes seismic shut-off valve.

Condition Rating: Fair condition.

Renewal: Lifecycle replacement and preventative maintenance.

Original gas meter. Seismic valve should be added in service line.

Newer gas meter installed with 1998 addition.

4. Plumbing

Plumbing fixtures and piping systems are generally in poor operating condition. Numerous piping leaks are dealt with on an ongoing basis.

Domestic hot water is provided by six electric water heaters, located in the mechanical boiler room, custodial room 000, mechanical furnace room 109A, custodial room J2 and the gymnasium storage room.

- Recommend replacement of all plumbing fixtures and associated domestic water piping installed prior to 1998.
- Recommend replacement of all domestic water heaters.

Condition Rating: Poor

Renewal: Life cycle replacement

Washroom Water Closet (typical)

Washroom Lavatory (typical)

5. Fire Protection

Fire Protection was added in 2000 and is in good condition.

- Recommend regular maintenance and system testing (yearly basis).

Condition Rating: Good

Renewal: Preventative maintenance.

Fire Protection system zone control valves and main distribution header

Main incoming fire service backflow preventer. Recommend yearly testing

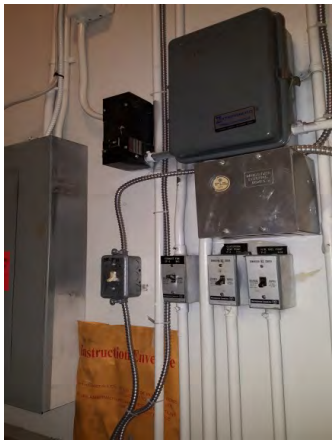
6. Controls

Existing control system is old and in poor condition, with most components well beyond their expected useful service life.

- Recommend replacing with new central electronic DDC system with remote monitoring capabilities. Improved control could be provided in coordination with future mechanical upgrades.

  Condition Rating: Poor

  Renewal: Lifecycle replacement and preventative maintenance.



Fan controls and starters in mechanical room

Thermostat for control of local heating system components

RUTHERFORD ELEMENTARY SCHOOL
BUILDING CONDITION ASSESSMENT

MECHANICAL

September 02, 2016

Condition Summary and Recommended Upgrade:

The condition, reliability, energy performance and ventilation capacity of the existing systems overall, with exception of only a few areas, are very poor. Furthermore, the majority of the mechanical systems are at, or well beyond the end of their serviceable life.

The majority of the systems are also not delivering adequate ventilation and are poorly controlled for comfort, air quality and energy performance.

We would recommend the following mechanical upgrades for this facility:

New Central Boiler Plant Upgrade:

- Provide 4 new IBC boilers with an input capacity of 1,600 mbh. Provide all new heating water piping in the boiler room complete with new primary and secondary pumps. The existing heating water piping throughout the school would be re-used. The delta T of the heating water system would be increased to 40 to ensure condensing boiler operation and reduced velocity in the existing piping system to prolong life.
- New isolation and balance valves along with new control valves would be installed at each of the terminal units.
- All piping in the mechanical room would be re-insulated and piping throughout the school would be re-insulated where damaged.

Ventilation Systems Upgrade:

Gymnasium:

- A new Central Station Air Handling unit complete with fan, filter, mixing box and hot water heating coil would be provided for the Gymnasium, including new ductwork distribution. New DDC controls would be provided. The existing exhaust ventilation in the change rooms would be upgraded.

Classrooms:

- Each of the classrooms (including the library and multi-purpose room) would be provided with a new vertical unit ventilator with new overhead ductwork distribution, new DDC system, CO2 and occupancy sensor. A new exterior intake air louvre would also be required for each classroom. There are a total of 19 unit ventilator systems required.

Exhaust Systems (Short Term renewal recommended):

- Replace existing building exhaust fan systems. (Cost to be confirmed by Quantity Surveyor)

Direct Digital Controls Upgrade:

- A new DDC Control and monitoring system to automatically operate the above described HVAC equipment, including time-of-day and occupancy based operation schedules, energy management and alarm generation would be provided.

- Each typical classroom and large volume space would be provided with CO2 and occupancy sensors for demand control ventilation. The gymnasium units would also be provided with variable speed drives for the supply fan during partial occupancy control at lower fan speed.

Plumbing System Upgrade (Short Term renewal recommended):

- Replace the existing plumbing fixtures with new to meet current standards for lower flow rates. (Cost to be confirmed by Quantity Surveyor)
- Replace the current domestic water piping distribution system. (Cost to be confirmed by Quantity Surveyor)
- Replace the current domestic water heating system. (Cost to be confirmed by Quantity Surveyor)

Fire Protection System:

- No upgrade of the fire protection system is recommended due to age and condition of the existing system.

BUDGET FOR THE RECOMMENDED MECHANICAL UPGRADES:

Based on our experience with recent school mechanical upgrades, our estimated budget for the recommended mechanical upgrades noted above, and not combined with any other system renewals or non-structural seismic upgrades, would be as follows;

Item	Description	Budget Cost
Boiler	New high efficiency boiler plant	$225,000.00
Gymnasium	New Gymnasium air-handling unit and upgrading of changing room exhaust systems	$125,000.00
Classrooms	New unit ventilators to existing classrooms	$475,000.00
DDC Controls	New DDC control system for all new mechanical equipment throughout the school	$180,000.00
Commissioning	Commissioning and balancing of all the new systems to be provided.	$45,000.00
Total	**Total Mechanical Upgrade Budget**	**$1050,000.00**

- Please note the cost estimates above are installation costs and do not include contingency, or soft costs for engineering fees, or GST. Please call to discuss any additional information or clarifications that may be required. Further review of cost estimates are recommended by Quantity Surveyor.

RUTHERFORD ELEMENTARY SCHOOL
BUILDING CONDITION ASSESSMENT

MECHANICAL

September 02, 2016

Disclaimer:

- The material in this report reflects our professional opinion based on information available to us and a site walk-through, visual observations of the mechanical systems/equipment and building operators comments. Any use which a third party makes of this report, or reliance on decisions made based on it, are the responsibilities of such third parties. Rocky Point Engineering Ltd. accepts no responsibility for damages, if any suffered by any third party as a result of decisions made or actions based on this report.
- A visual review has been carried out by Rocky Point Engineering Ltd. on readily accessible mechanical systems and equipment. No physical testing of systems/equipment capacities have been undertaken to ascertain the capacities to meet HVAC requirements or compliance with current code requirements.

RUTHERFORD ELEMENTARY SCHOOL
BUILDING CONDITION ASSESSMENT

ELECTRICAL

RB ENGINEERING LTD
ELECTRICAL CONSULTING ENGINEERS

September 21, 2016

Overview

RB Engineering Ltd. has been retained by School District 68 (Nanaimo-Ladysmith) to provide a report on the existing electrical infrastructure at Rutherford Elementary School in North Nanaimo. This report includes information on the following electrical systems:

- Power Distribution
- Lighting
- Emergency Lighting
- Fire Alarm
- Public Address
- Telephone
- Data Network

The following system descriptions are based on a site visit on August 19th, 2016. The report will take into account the following:

- Canadian Electrical Code (CEC)
- British Columbia Building Code (BCBC Part 3)
- Building Owners' and Managers' Association of BC (BOMA)
- Illuminating Engineers Society (IES)
- Telecommunications Industry Association (TIA/EIA)
- Visual inspection of existing conditions

1. Building Power Distribution

The building is serviced via a BC Hydro 600 amp, 120/240 volt, single phase underground feed from a power pole located near the front entrance to the school. Based on the BC Hydro records received from the School District, the school service peaked out at 76 kW, 70% of total capacity. The main electrical room is located on the opposite side of the original 1964 building and includes a main switchboard with breakers to feed the various sub-panels throughout the school. The main distribution appears to be of similar vintage as the original school building and has exceeded the BOMA recommended lifespan of 40 years for electrical distribution gear.

Distribution panels throughout the school are of varied manufacturers and include a range of vintages. All panels installed in areas constructed prior to the 1998 addition exceed the BOMA recommended

lifespan. All distribution panels, disconnect switches and feeders in the older sections should be replaced; the distribution panels, disconnect switches and feeders in the 1998 addition are 18 years into their life cycle and should be replaced within the next 12 years.

2. Lighting

The interior lighting fixtures in the school are T8 fluorescent fixtures with some metal halide fixtures in the gymnasium. The fixtures appear to have been replaced as part of a BC Hydro PowerSmart program, which places the age of these fixtures at approximately 10 years. BOMA recommends a lifespan of 20 years for light fixtures and all fixtures in the interior of the school should be replaced within the next 10 years.

Exterior lighting is comprised of metal halide wallpacks spread around the exterior of the building. These fixtures appear to be in disrepair and require replacement. The spacing of these fixtures is such that the lighting levels are insufficient and do not meet any recognizable standard level of lighting for parking areas and walkways. New and additional exterior lighting is required to meet IES standards and provide safe visibility around the structure.

3. Emergency Lighting

The existing emergency lighting is installed improperly and does not provide sufficient lighting of exit pathways in the event of an emergency. Figure 1 depicts an example of where an emergency light has been installed in an area where the light cannot provide illumination of the floor area. New and additional fixtures are required throughout the school to meet the requirements of BCBC.

Figure 1: Improper Emergency Light Installation

4. Fire Alarm

The Fire alarm system includes an Edwards Custom 6500 control panel, bells, pull stations and battery backup. The Edwards 6500 is an obsolete model that is no longer supported by the manufacturer and replacement parts are not readily available. The control panel exceeds the BOMA recommended lifespan of 15 years for fire alarm control panels and should be replaced.

Figure 2: Fire Alarm Batteries

Figure 2 shows the buildup of corrosion on the poles of the fire alarm system backup batteries. These batteries should be maintained frequently and replaced every 5 years.

Throughout the school, the fire alarm pull stations have been mounted at various heights that exceed the acceptable height as specified by BCBC. These pull stations should be moved to meet the current code requirements and should be replaced every 10 years to meet the BOMA recommended lifespan. The current bell placement within the school does not provide audibility levels sufficient to meet BCBC requirements. Additional bells are required in some areas to improve audibility. Fire doors that have hold open devices do not have the required smoke detectors as dictated by BCBC. A new fire alarm system, including control panel, fire detectors, pull stations, bells and wiring, is required throughout the school to meet the requirements of BCBC and BOMA.

5. Public Address

The PA system is a Dukane MCS350 head end unit and administrative phone connected to speakers throughout the school. Dukane is no longer in operation and their hardware is no longer supported, it is recommended that the system is replaced with new hardware. A new PA system, including head end equipment, administrative phone, call stations, speakers and wiring, to be installed throughout the school.

6. Telephone

The Telephone system consists of analog wiring from a Nortel Norstar controller to the individual handsets. Nortel hardware is no longer manufactured or supported and replacement parts for the system will not be available as maintenance cycles proceed. A new telephone system, including field wiring and handsets, to be installed throughout the school.

7. Data Network

The main server is installed in a wooden cabinet in the office immediately adjoining the computer lab. There is insufficient ventilation in the cabinet in particular and the office in total, which results in an increased temperature in the office. Horizontal data cabling installation does not meet the requirements

of TIA 568 standards. Server hardware appears to be in good condition and does not require immediate replacement. There is a single data outlet in each classroom which provides limited network access within the classroom. Modifications are required for the data network which include a new ventilated data rack, and new horizontal data cabling throughout the school.

The wireless network within the school includes access points in the hallways and some classroom or gymnasium areas. The wireless network appears to be new and the network quality was not included in this assessment.

8. Summary

All of the building systems evaluated as part of this building condition assessment require replacement or upgrades based on the current condition, lifespan and wear. The summary below describes the priority of replacement of each system based on time required before replacement.

***Priority 1** = replacement is recommended in 2 years or less*
***Priority 2** = replacement is recommended in 3 to 5 years*
***Priority 3** = replacement is recommended in 6 to 10 years*

System	Replacement Priority
Power Distribution	1998 Addition – Priority 3 Remainder – Priority 1
Lighting	Priority 3
Emergency Lighting	Priority 1
Fire Alarm	Priority 1
Public Address	Priority 1
Telephone	Priority 1
Data Network	Server Rack and horizontal cabling – Priority 1 Remainder – Priority 3

RUTHERFORD ELEMENTARY SCHOOL
BUILDING CONDITION ASSESSMENT

KMBR ARCHITECTS PLANNERS INC

September 2016

PRIORITY 1 — 1-2 YEARS

Architectural
- Wood fascia/siding/trim maintenance/painting
- Stucco investigation/repair
- Flooring replacement including rubber base

Mechanical
- Air Handling Unit replacement
- Make-up Air Unit replacement
- Furnace replacement
- Exhaust Systems replacement
- Water Heater (electric) replacement (pre-2010 install)
- Controls system (electric) upgrade
- Domestic Water Piping replacement
- Washroom Plumbing Fixture replacement (pre-1998 install)
- Electric Baseboard and Cabinet Unit Heater replacement

Electrical
- Power Distribution: Pre 1998
- Emergency Lighting
- Fire Alarm
- Public Address
- Telephone
- Data Network: Server Rack and horizontal cabling

PRIORITY 2 — 3-5 YEARS

Architectural
- Roofing replacement
- Wood shake siding replacement
- Window replacement including east block sill flashings
- Fibreglass cloth replacement
- Interior door hardware upgrade
- Signage upgrade

Mechanical
- Heating Water Piping replacement
- Hydronic Fin Tube Heater replacement
- Hydronic Cabinet Unit Heater replacement
- Ductwork Distribution replacement
- Classroom sink replacement (pre-1998 install)

Electrical
- none

PRIORITY 3 — 6-10 YEARS

Architectural
- Roofing replacement
- Energy retrofits
- Plywood siding replacement
- Stair railing and landing upgrades
- Exterior door replacement/ maintenance
- Selective millwork replacement
- Ceiling tile replacement

Mechanical
- Sanitary Drainage piping replacement (pre-1978 install)
- Natural gas piping replacement
- Condensing unit replacement
- Water Heater (electric) replacement (2010 install)

Electrical
- Power Distribution: 1998 Addition
- Data Network: wireless network and server hardware

RUTHERFORD ELEMENTARY SCHOOL
BUILDING CONDITION ASSESSMENT
for SCHOOL DISTRICT #68 (Ladysmith-Nanaimo)
Assessment Report prepared by: KMBR Architects & Planners

September 15, 2016

FACILITY 6868077

Schedule A - PROJECT BUDGET ESTIMATE

		EXISTING BUILDING RENEWAL
Allowable Building Area (m2)		
	Total Allowable Area	
	Less: Previously Existing Space	3,345
	Add: Area to be Demolished	
	Area of NEW Space	
	Allowable Area of Renovation	**3,345.0**
Unit Rate for Construction ($/m2)		
	New	
	Renovations (RENEWAL-UPGRADE)	**$2,915.78**
Ministry Location Factor:	3rd QTR 2015 (Oct 2015)	**1.234**
Maximum Allowable Budget		
1	Offsite Costs	Not Required
2	Site Development	$75,000
3	Supplementary Site	
4	Construction - NEW BUILDING	
5.1	Renovation for Tie-In (Table 1(c))	
5.2	Renovation - SPIR SEISMIC UPGRADE	$3,490,800
5.3	Renovation - Non Structural Seismic	$168,100
5.4	Renovation - Accessibility & Code	$217,500
5.5	Renovations	$5,876,900
6	Supplementary Building	$428,800
7	BUILDING DEMOLITION	N/A
8	Green Building LEED Design (3%)	N/A
9	PORTABLES	$2,267,000
	Sub-total CONSTRUCTION	**$12,524,100**
10	Site Acquisition / Sale	
11	Development Cost Charges	$115,800
12	Fees	$2,003,856
13	Contingency - Construction	$620,415
14	Equipment	$0
15	Project Management	$125,241
16	Insurance	$0
17	FEASIBILITY COMPLETION	$50,000
18	Payable Taxes (4.4%)	$679,334
	TOTAL PROJECT COST - Current September 2016 Dollars	**$16,118,746**
	RESERVES:	
19	EXISTING BUILDING RENOV (15%)	$1,527,315
20	NEW BUILDING - SOILS/OFFSITE (10%)	n/a
21	LEED CERTIFICATION	n/a
22	POST CONSTRUCTION AUDIT	$40,000
23	ESCALATION TO START OF CONSTRUCTION (4%pa/18mth 6%)	$843,893
	TOTAL RESERVES	**$2,411,208**
	TOTAL PROJECT COST - Spring 2018 Construction	**$18,529,955**

RUTHERFORD ELEMENTARY SCHOOL

September 15, 2016

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CONSTRUCTION COST ESTIMATE

1	**Offsite Costs**					**Not Required**
2	**Site Development**					**$75,000**
	Site Development - Allowance to upgrade pavings at building etc.			75,000		
3	**Supplementary Site Costs**					**$0**
	Additional Parking			Not Included		
	Upgrade Footing Drains / Storm			Not Included		
	Stormwater Infiltration 50m3 storage capacity - City Reqmnt			Not Included		
	Electrical Site Lighting Parking/Sidewalks			Not Included		
4	**NEW BUILDING ADDITION**			$2,178.01		**$0**
	Based on MinEd. Unit Rate Costs			**0**	**m2**	
				$1,765.00	Base Unit Rate	
				1.0000	Size Factor	
	CURRENT MIN ED. UNIT RATE COST BASE			1.2340	Location / Economic	
5	**RENOVATIONS & UPGRADES TO EXISTING**			$2,915.78		**$9,753,300**
				3,345.0	**m2**	
5.1	Renovations for Tie-In for New Addition				N/A	
	(based on Min. Ed. Allowance calculated per Table 1c)					
5.2	SPIR (Seismic Upgrade)	3,345 m2		$1,043.59	3,490,800	
	(based on APEG Unit rate for construction type x location factor - 2015)					
	BLOCK 1 (1976 Gymnasium)	427 m2	$1,264.85	540,100	#31	
	BLOCK 2 (1976-1981 2 Storey Classrooms)	1,596 m2	$1,357.40	2,166,400	#14, #22 Construction	
	BLOCK 3 (1964 & 1976 1 Storey Classroom)	908 m2	$863.80	784,300	#22	
	BLOCK 4 (1998 Daycare)	414 m2		0	Low Risk, Not Upgraded	
5.3	NON-STRUCTURAL SEISMIC UPGRADE	3,345 m2		$50.25	168,100	
	(based on unit rate for similar building types)					
	BLOCK 1 (1976 Gymnasium)	427 m2	$65.00	27,800		
	BLOCK 2 (1976-1981 2 Storey Classrooms)	1,596 m2	$48.00	76,600		
	BLOCK 3 (1964 & 1976 1 Storey Classroom)	908 m2	$45.00	40,900		
	BLOCK 4 (1998 Daycare)	414 m2	$55.00	22,800		
5.4	RENOVATIONS - ACCESSIBILITY & CODE	3,345 m2			217,500	
	Accessibility & Exiting Upgrades (CODE)				**$202,500**	
	Accessible Washrooms - Upgrade Lav/faucet, Vanity, Mirror, Accessories		Item	45,000		
	Door Hardware to Accessible Lever type	50 Lvs	$450.00	22,500		
	Stairs - upgrade handrails/guardrails, tactile		2 Flt	15,000		
	Elevator - replace with larger unit with stretcher access, incl. modify shaft			120,000		
	General Upgrades & CODE Upgrades (not included in Seismic Work)				**$15,000**	
	Fire Separations, Stuffing voids, holes uncovered during seismic work			15,000		

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BUILDING CONDITION ASSESSMENT
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CONSTRUCTION COST ESTIMATE

5.5	RENOVATIONS - Building Renewal	3,345	m2	$1,756.92		5,876,900
	Functional Renovations					**Not Included**
	Exterior Envelope - Wall / Window Upgrade	3,345	m2	$444.72		**$1,487,600**
	Exterior Wall remedial work, rot repair, painting	1,686	m2	$120.00	202,300	
	Exterior Wall - Face Seal Stucco replacement 1998 BLk	288	m2	$380.00	109,400	
	Exterior Wall - Cedar Siding Replacement	284	m2	$475.00	134,900	
	Roofing Replacement - Included with seismic where require	1,306	m2	$228.00	297,800	Assume 50%
	Window Replacement - upgrade to double glazed	677	m2	$935.00	633,200	
	Exit, Entrance Doors Replacement/upgrade, Auto Opener			Item	60,000	
	Miscellaneous - door stops, flashings, caulking, make good			Item	50,000	
	Architectural Building Interiors	3,345	m2	$379.25		**$1,268,600**
	Ceilings - ACT Replacement	2,649	m2	$68.00	180,100	
	Ceilings - Drywall ceilings remedial work/replacement	361	m2	$121.00	43,700	
	Flooring - Lino/VCT/Carpet Replacement	2,514	m2	$78.00	196,100	
	Flooring - Wood Gym Floor Replacement	390	m2	$175.00	68,300	
	Flooring - Tile in Washrooms	107	m2	$125.00	13,400	
	Flooring - Rubber base replacement	1,500	m	$5.00	7,500	
	Wall Finishes - Replace fibreglass cloth - Corridors, replace	1,320	m2	$85.00	112,200	
	Wall Finishes - Replace fibreglass cloth GYM - new tectum/M	384	m2	$140.00	53,800	
	Wall Finishes - MPR Room new tectum/MDF Panel	220	m2	$140.00	30,800	
	Wall Finishes - Re-painting	2,277	m2	$23.00	52,400	
	Wall Finishes - Washroom replace tile	225	m2	$125.00	28,100	
	Stair Finishes - replace rubber treads/risers	2	Flt	$4,500.00	9,000	
	Millwork - replacement	2,504	m2	$155.00	388,100	
	Specialties - WC Accessories, WC Ptns, Change Room	2,504	m2	$24.00	60,100	
	Signage, wayfinding - replacement				25,000	
	Electrical Upgrades:	3,345	m2	$238.98		**$799,400**
	Main Service Upgrade				n/a	
	MDC & Distribution Panel & Feeder replacement	3,345	m2	$42.00	140,500	
	Lighting Fixutre Replacement - LED	3,345	m2	$98.00	327,800	
	Emergency Lighting/Battery Pack Replacement, LED Exit			Item	40,000	
	Fire Alarm Panel - New Annunciator Panel etc			Item	35,000	
	Fire Alarm System replacement throughout	3,345	m2	$23.00	76,900	
	Relocate Data/Tel Server Room, extend/reconnect extg wiring			Item	25,000	
	Increase number of data outlets in Classrooms etc.	120	Otl	$700.00	84,000	
	Upgrade Systems - PA, Security	3,345	m2	$21.00	70,200	
	Mechanical Upgrades	3,345	m2	$305.95		**$1,023,400**
	Replace domestic water piping prior to 1998	2,931	m2	$45.00	131,900	
	Replace Plumbing Fixtures	36	Fxt	$1,950.00	70,200	
	Sprinklers				No Work	
	HVAC Replacement - GYM	414	m2	$375.00	155,300	
	HVAC Replacement - Classrooms (new Unit ventilator)	19	Rms	$24,000.00	456,000	incl. ductwork
	Exhaust Systems Replacement (washroom/kitchen)	10	No.	$4,500.00	45,000	
	Data Closet Cooling			Item	15,000	
	DDC Controls Replacement	2,277	m2	$65.88	150,000	
	General Contractor	220	m2	$3,037.27		**$668,200**
	GC Work for Mechanical/Electrical Replacements				50,000	
	GC Overheads & Supervision				618,200	
	Design Contingency & Existing Building Contingency				12%	**$629,700**

RUTHERFORD ELEMENTARY SCHOOL

September 15, 2016

BUILDING CONDITION ASSESSMENT
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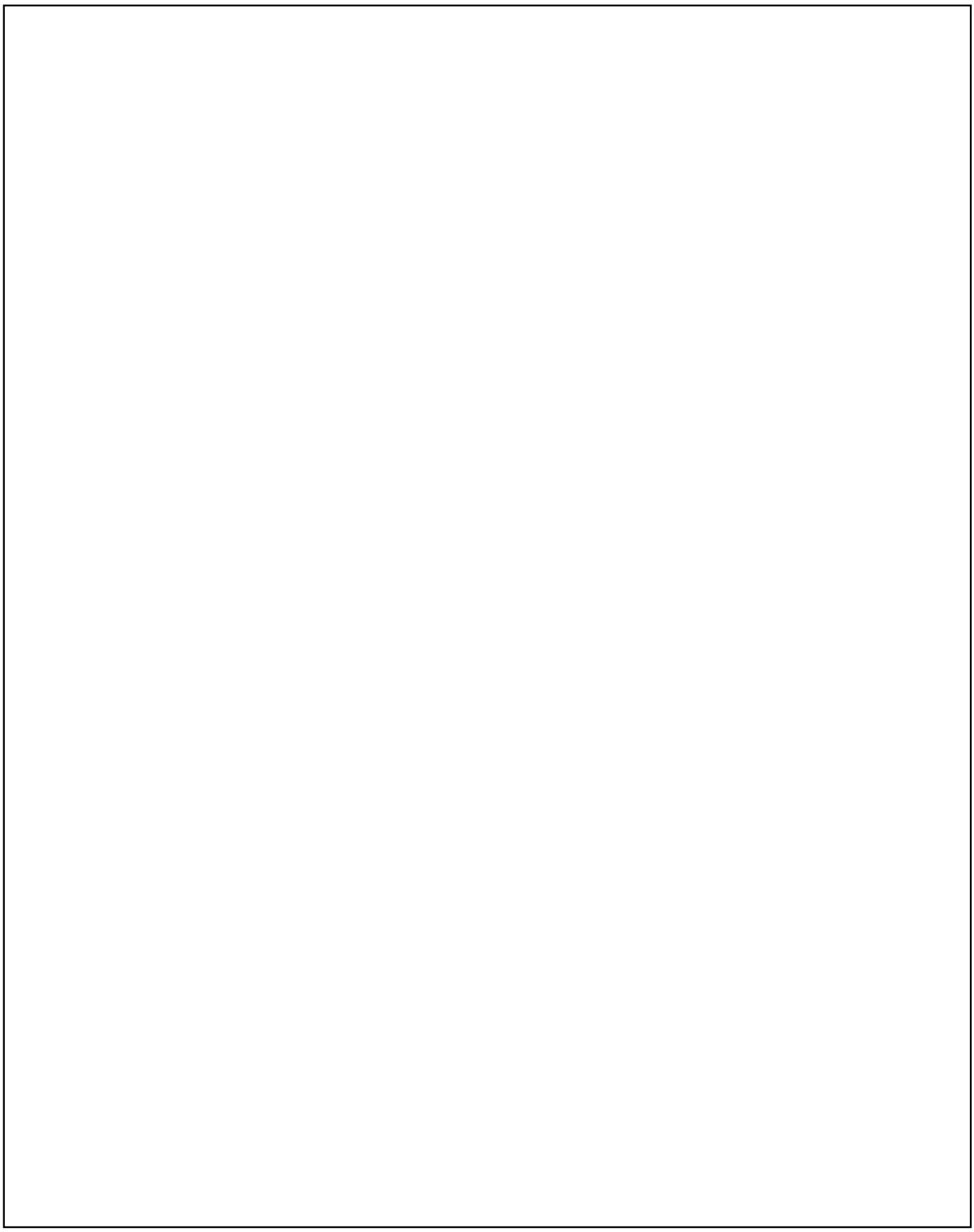
CONSTRUCTION COST ESTIMATE

6	**Supplementary Building Costs**					**$428,800**
	Phased BUILDING Construction / Staging	2,277	m2	$79.93	**$182,000**	
	• Phase 1	681	m2	first project	0	
	• Phase 2	1,596	m2	12months	182,000	
	Temporary works for Phasing & Interim Occupancy During Seismic			2 Phases	**$100,000**	
	Moving costs	2,277	m2	$22.49	**$51,200**	
	• Phase 1	681	m2	$14,300		
	• Phase 2	1,596	m2	$36,900		
	Asbestos Removal	2,277	m2	$42.00	**$95,600**	
	Ceilings			incl		
	Flooring (1964, 1976 & 1978 Corridors, 1978 Clrm)			incl		
	Wall tiles in Gym & Under windows			incl		
	Mechanical			incl		
7	**BUILDING DEMOLITION**					**N/A**
8	**LEED GOLD DESIGN INITIATIVES**					**N/A**
9	**PORTABLES**					**$2,267,000**
	Portables for Phasing	10	No.	1,900,000		
	Washroom Module incl. service connections			280,000		
	Sprinkler Portables incl. fire water main			87,000		
	Fitout/Renovation for Specialty Uses			0		
SUB-TOTAL CONSTRUCTION (excluding GST)				$3,744.13		**$12,524,100**
10	**Site Acquisition**					**$0**
11	**Development Cost Charges & City Permits**					**$115,800**
	DCC's $31.55/m2 Floor Area Increase, BP $7.00/$1000 Construction plus 15% inspections					
12	**Design Fees** (calc on total constr less offsite - 10% on NEW Bldg, 16% Renov)					**$2,003,856**
13	**Contingency** (calc on total constr less offsite - 3% on NEW Bldg, 5% Renov)					**$620,415**
14	**Equipment**					**$0**
15	**Project Management** (1%)					**$125,241**
16	**Insurance** (for Projects >$20.m - $11/$1000 Constr)					**$0**
17	**Feasibility Completion**					**$50,000**
18	**Payable GST/PST (4.4%)**					**$679,334**
TOTAL PROJECT COST (Including 4.4% Payable GST/PST)						**$16,118,746**



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RUTHERFORD ELEMENTARY SCHOOL BUILDING CONDITION ASSESSMENT