VALUE MANAGEMENT ANALYSIS
GLENDALE ELEMENTARY SCHOOL
Edmonton, Alberta

EDMONTON PUBLIC SCHOOLS

N53 ARCHITECTURE INC

FILE: 1606 **AUGUST 21, 2016**

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1.0 INTRODUCTION

The Purpose of the Value Management (VM) Study is to create a deeper understanding of the current building condition for each of the existing school buildings.

We have assumed for this project that the building, regardless of the option chosen, will be brought to a condition to allow the building to function without additional major work for the next 40 years.

The VM study will provide a better understanding of the condition of the building than is available from existing building condition database, based on the provincial VFA (formerly RECAPP) system. The VFA system considers components of a building and determines the need for replacement based on condition, building code, and life cycle.

This VM study will not review the buildings for their ability to meet 21st century learning practices. A further review of the building with the stakeholders will be required to determine the best solutions to meet program and pedagogical requirements.

1.1 EXECUTIVE SUMMARY

N53 Architecture Inc. was requested to objectively review the existing condition of Glendale Elementary School, and identify upgrades that are necessary to bring the school to “as new or modern condition”, with an expected life of 40 years.

The scope of this evaluation includes a review of the available drawings, field review of the building condition, bylaw and zoning review and building code analysis.

Glendale Elementary School is comprised of an original building constructed in 1951 and additions constructed in 1956 and 1960. There is noticeable structural settlement along the east side of the building. The settlement does not appear to be a life-safety issue. It is recommended that the settlement is monitored. In addition, work is required architecturally, mechanically and electrically to meet the target life expectancy.

The building does not comply with the current edition of the Alberta Building Code (A.B.C.). At the time of original construction, the building most likely complied with the Alberta Building Code. The building is considered “grandfathered” under the previous code. In order to comply with the current building code, various aspects of the building must be altered for Barrier-Free access:

- Addition of an elevating device that provides access from the entrance level, to the main floor that is 1m below grade and to the second floor classrooms.
- Washrooms on both floors must include barrier-free stalls

An additional code requirement involves modifications to the existing exits:

- Exits must comply with the requirements of the A.B.C.
  - Service Room cannot exit into exit stairway
  - Travel distance through lobby cannot exceed 15m

Another code requirement involves Fire-fighter access:

- The building must face three streets. Fire-fighter access must be within 15m for 75% of the perimeter of the building. A new access to the west side of the building must be added.
- Access to the roof must be by an interior stairway.

The building has an abundance of windows along the west and east sides of the school that allows for natural light to enter all rooms.

The total cost of essential upgrades has been estimated at $3,350,553.00 (see Appendix H – Costs).

2.0 BUILDING ASSESSMENT AND UPGRADES

2.1 Building Components

Glendale Elementary School
9812 – 161 Street, Edmonton, AB.

1951 – Original Building
1956 – Addition
1960 - Addition

Areas:	1951 section:	1,752.6 sm
	1956 section:	92.0 sm
	1956 section:	83.6 sm
	Gross Area:	1,901.2 sm

Note: Areas taken from RECAPP Facility Evaluation Report.
Evaluation date: August 25, 2011.

School Capacity:	206 by Instructional Area Model (IAM)
2015 Enrollment:	150 (Total), 154 (Adjusted)

Refer to Appendix A for completed Facility Evaluation Templates, Bylaw and Zoning Review, Building Code Assessment, Floor Plan(s) of School, and Alberta Infrastructure Uniformat listing identifying theoretical life of building components.

2.2 General Description

The original school was constructed in 1951. In 1956 and 1960, additions were constructed. The building is two storeys, un-sprinklered, constructed with both combustible and non-combustible materials.

The main floor is located below grade (approximately 1000mm below grade), accessed by descending one of four flights of steps located at the four building entrances/exits. The building is not barrier-free accessible.

Glendale is a K-6 elementary school, comprised of seven classrooms and ancillary spaces, including: a Gymnasium, Science room, sensory Music room and Library, Administrative Offices, Washrooms, Infirmary, Staff Lounge, storage rooms, Boiler room and interior corridors.

Way-finding throughout the school is adequate due to the school's small size and two storey design.

The General Office and Administration area is located at the east Main Entrance. Access into the school is controlled via audio/visual communication and remote mechanics.

Classroom areas have abundant natural light: all classrooms are located on an exterior wall and feature glazing along the exterior wall from top of counter to underside of ceiling.

The finishes palette is varied, predominantly cool with some warm accents. The corridor flooring includes peripheral banding and circular accents. Few dated finishes remain.

Although natural building materials are present (select wood doors, frames and millwork) these components are predominantly painted. The building interior appearance is bright and clean.

The site is bounded by 99 Avenue to the north, 161 Street to the east, a laneway to the south and 162 Street to the West. The school is located at the south-east quarter of the site (approx.). The site appears to be relatively flat.

Site content includes: mixture of young and mature trees and shrubs around building and site periphery, sod field, soccer goal posts and baseball diamond, a parking lot is located north of the building.

2.3 Existing Condition Summary and Required Upgrades

Building General Summary:
Overall building condition is generally well maintained and operating adequately. However, due to the varying age of components, some remain serviceable while many others are worn-out, compromised, or well beyond their intended life cycle.

Building Site Summary:
The site is in adequate condition.

Structure:
The building is supported on concrete foundation walls over strip footings on the exterior perimeter and interior corridor walls. Main floor: concrete slab on grade. Second floor: wood floor structure supported on wood stud framing and columns. Roof: wood joists supported on wood framing. The main and second floors are sloping towards the east elevation. The slab has cracked through the Administration area and Principal's office; there is also a cracking along the length of the main-floor corridor. The gypsum board partitions are cracked throughout the west half of the building. There is significant cracking throughout the southern stair well. The structure is in marginal condition.

Building Envelope:
Roofing: 2 Ply SBS Modified Bituminous membrane roofing system, installed in 1998. Condition and thickness of vapour retarder and insulation is unknown. There is evidence of ponding, the top membrane layer has bubbled in various locations and the membrane has folds along the southwest corner parapet. Marginal condition.

Walls: load bearing wood framed walls with in-filled batt insulation and vapour barrier. Condition of vapour barrier and insulation unknown. Adequate condition.

Windows: aluminum windows with sealed glazing units, installed 1998. Adequate condition.

Entrance doors: painted insulated steel doors, pressed steel frames (with sidelights) at the exterior entrances. Adequate condition.

Utility doors: wood doors and frames. Marginal condition.

Special purpose: roof hatch accessed via roof ladder located in the second floor conference room. Adequate condition.

Building Interior:
Interior partitions: painted gypsum board over wood frame. Due to the building sloping, the gypsum board partitions are cracked throughout the west half of the building. There is significant cracking throughout the southern stairwell. Partitions are in adequate condition.

Carpet: located in the Library, a portion of the Administration area, Custodian's office, Library, Music room and a portion of each classroom. Carpet is past its expected lifespan. Marginal condition.

Resilient flooring: located in corridors, a portion of the Administration area and a portion of the classrooms. Resilient flooring is past its expected lifespan. The resilient flooring is damaged at the locations of the slab cracking. Marginal condition. Resilient flooring and VCT located in the storage rooms is original and beyond its life cycle. VCT may contain asbestos. Marginal condition.

Athletic wood flooring: located in Gymnasium. Adequate condition.

Ceilings: suspended acoustic T-bar and painted gypsum board. Adequate condition.

Interior Openings: approximately 13.45 sm of wire-glazing throughout school: 6 x 0.9 sm window, 6 x 0.55 sm door lite, 2 x 0.1 sm door lite, 2 x 0.9 sm door lite, 2 x 0.55 sm side lite, 3 x 0.55 sm window.

Casework: painted plywood open and closed shelving units with plastic laminate countertops are worn and damaged throughout. Marginal condition. WC vanities and staffroom cabinetry are in adequate condition.

Mechanical:
Mechanical Heating:
Heating Plant: Two RBI FUTERA III model MB0500, input 500,000Btu/hr high efficiency boilers installed in 2006. Each boiler fitted with Armstrong 1.5B, 2.71 l/s, ½ HP circulation pump. Adequate condition.

Terminal Heating Unit and Distribution System: hot water is distributed by inline pumps and piping to the finned tube radiation and heating units. Wall mounted fan coil units are located at the buildings entrances and unit heaters within the Mechanical room. Adequate condition.

Ventilation and Air Conditioning:
Air Handling Systems: two custom built units on the roof. One services the main building with one main fan and four Lennox 160/120 MBH duct furnaces; the other services the gym with one main fan and two Modine model WDG, 300SF, input 300,000 Btu/hr duct heat exchangers. Roof top units are custom with different components connected to one another. The connections have been a problem for water penetration and have been resealed over time. They are approaching the end of their lifespan and need to be replaced. Marginal condition.

Building Systems Controls: line voltage electric controls for the force flow heaters and unit heater. Pneumatic controls for the damper motors and valves. The compressor is a DeVilbiss simplex with ¾ HP motor. Adequate condition.

Plumbing Fixtures: Takagi model T-K2 tankless gas water heater installed in 2006. It has a 240 gals/hr capacity with an input of 185,000 Btu/hr and an inline circulation pump.

Adequate condition. Washroom lavatories, water closets, urinals, mop sinks, lavatories and drinking fountains are in adequate condition. Domestic water, sanitary and storm piping systems are in adequate condition. Domestic water and natural gas service is in adequate condition.

Fire Protection Systems: The building is not sprinklered. A fire hose cabinet located in the main floor corridor and in the second floor corridor. Adequate condition.

Electrical:
Electrical Power Distribution:
Service Entry: 600 amp, 120/240V, 1 phase obtained from a utility owned pad mounted transformer on the west side of the property. Underground feeders to a Square 'D' main distribution panel. 600A main breaker and feeder breaker distribution centre installed in 1998. A surge suppression system has been provided. Adequate condition.

Sub-panels, Conduit and Wireways: 120/240V branch circuit panels installed in service rooms. Approximately 80% full. Adequate condition.

Lighting:
Interior lighting: primarily fluorescent fixtures with T8 lamps and electronic ballasts. Installed in 1998. Adequate condition.
Exit/ Emergency Lighting: emergency battery packs with remote heads located throughout the building. Paths of egress are adequately covered. Adequate condition.

Emergency Systems:
Fire Alarm and Detection: Edwards System Technologies Quick Start fire alarm panel located in the server room. The remote annunciator panel is located at the main entrance. There are 9 zones in the building. Signal devices are bell/strobe units. Adequate condition.

Communications: security, telephone, LAN and PA system are in adequate condition. A

2.4 Code Review Summary and Upgrades

This Code Review provides a realistic assessment of changes required for the 'Essential' components of the study. It is not all-encompassing and a thorough Code review (and confirmation with an Authority Having Jurisdiction) needs to be undertaken before actual construction documents are produced.

The following summary items reflect aspects of the building that **do not comply** with the current edition of the Alberta Building Code 2014. Refer to **Appendix C** for the complete Building Code Assessment.

Summary

Major Occupancy: Group A Division 2 – Assembly (School)
Construction: combustible and non-combustible, unsprinklered.
Building Area: 1,220 sm (gross area: 1,901.2 sm)
Building Height: two storeys
Multiple Occupancies: No
Facing: 2 Streets

- The building does not conform to a classification within the current Alberta Building Code 2014. Under the classifications for Group A Division 2 unsprinklered buildings (3.2.2.25), a two storey building, facing 2 streets, can be a maximum of 1,000 sm. Facing 3 streets, the building can be a maximum of 1,200 sm. In order to comply (if acceptable to the COE Safety Codes Department), the building would have to add a firefighter access route to the west side of the building to achieve a 75% of building face within 15m of firefighter access.

- **3.3.1.26 Storage Room Fire Separations**: The ratings of the storage room doors could not be verified. Required fire-resistance rating: not less than 1h.

- **3.3.2.6 (2) Corridors**: The corridor walls do not appear to be 45 minute fire separations. Required fire-resistance rating: not less than 45 minutes. In addition, the building does not comply due to: all second floor exits open onto two Lobbies, (only 1 is permitted) and the travel distance through a lobby is greater than the permitted 15m travel distance.

- **3.4.2.5 (1)(f) Travel Distance**: the distance from some classrooms to the exit is greater than the 30m maximum.

- **3.6.4.7 Roof Access**: roof is not accesses via an interior stairway.

- **3.8. Barrier-Free Design**: The main floor is approximately 1m below street level. No areas within the building are Barrier-Free.

2.5 Recommendations

Recommendations are based on project requirement for the evaluation teams to identify the upgrades to bring the school to “as new or modern condition” with an expected life of 40 years. Using Alberta Infrastructure Uniformat listing identifying theoretical life of building components, most building components are assumed to require replacement to meet the 40 year target.

See Appendix A for Alberta Infrastructure Uniformat listing identifying theoretical life of building components.

Life Safety/Building Code:
- Items identified in the Building Code Analysis should be implemented.

Structure: investigate the building settlement towards the east exterior wall. Repair as required.

Building Envelope:
- Roofing: replace 2 ply SBS Modified Bituminous membrane roofing with new SBS roofing system.
- Utility doors: replace exterior utility doors with new insulated metal doors and frames.

Building Interior:

- Partitions: repair damaged gypsum board walls caused by building sloping. West half of building and south stair.
- Flooring: replace all carpet with new. Patch/repair resilient flooring at locations of structural repair. Replace resilient flooring and VCT in storage rooms – test VCT for asbestos, remove accordingly.
- Interior Openings:
  - Wired glazing: replace wired glass with tempered glass. Fire-rated glass to be provided as required.
- Casework: replace the classroom painted plywood open and closed shelving units and plastic laminate countertops with new.

Mechanical:

- Mechanical Heating:
  - Ventilation and Air Conditioning: replace the two rooftop air conditioners with new.

2.6 Costing Summary

The total cost of essential upgrades has been estimated at $3,350,553.00 (see Appendix H – Costs).

The overall estimate summary amount is greater than the sum of the individual items because various project costs are added in order to generate a Total Project Cost (i.e. as if EPS were to include all the scope items into a single project and take it from the initial stages of design through construction completion).

For example:

- Contractor's General Conditions and Fee - to pay for site supervision, safety, office trailer, temporary power/heat, tools, etc. and to allow a fair and reasonable profit to the work.
- Contingencies:
  - Project Contingency (or Design Allowance) - An allowance for design changes during the development of the design. The allowance is to cover unforeseen items during the design phase that do not change the project scope. The allowance, which is included in the primary stages, is ultimately absorbed into the design and quantified work as more detailed information becomes available and is therefore normally reduced to zero at tender stage.
  - Construction Contingency - An allowance for changes to the contract price during construction. The allowance is to cover unforeseen items during the construction period which will result in change orders

- Phasing Contingency - An allowance for increased requirements for projects being executed in multiple phases. This restriction leads to increased costs due to increased temporary protection requirements, etc.

- Soft/Other Costs:

  - Project Admin - costs associated with EPS's administration of the project (could be an internal PM, etc.).

  - Design Fees - costs for design and contract administration of the project.

  - Furnishings & Equipment - typical allowance in order to furnish the modernized school with new Furnishings and Equipment.

  - Non-refundable GST - typically, school boards do not pay full amount of GST, so these costs are shown in order to illustrate the full cost of the project.

The reason each of these add-ons are not applied to each individual scope item is that particular approach isn't truly realistic for smaller individual scopes of work (i.e. a site trailer would not be brought on site to execute a minor scope item). But when all scopes are packed into a larger project and the timeline becomes longer term then economies of scale may be realized in terms of individual items' pricing with a slight offset in General conditions. In the long run, it should be cheaper and faster to do all the scopes in one large project rather than piece-meal.

For mathematical sake, it should also be noted that on the summary page the sum of the sections A. Demolition and B. Preservation/Modernization equals the sum of the individual items for all schools.

APPENDIX A

FACILITY EVALUATION TEMPLATE

FACILITY EVALUATION TEMPLATE

SITE NAME: Glendale Elementary School

BUILDING NAME: Glendale Elementary School

Evaluation Date: April 11, 2016

Evaluated By: N53 Architecture Inc.

Notes:

Four ratings are listed

- 1 = **Critical**: unsafe, high risk of injury or system failure.
- 2 = **Marginal**: operating at minimum capacity. Significant deficiencies. Above average operating maintenance costs.
- 3 = **Adequate**: reached end of life cycle. Still operating adequately.
- 4 = **Good**: as new, state of the art meets present and foreseeable requirements.

System	Description	Recommended Action Concerns	QTY/Area	Rating	-
Building General Summary	Glendale is a K-6 elementary school constructed in 1951 with an area of 1,725.6 square meters. The first addition of 92 square metres was built in 1956 and the second addition of 83.6 square metres was built in 1960. The total area of the school to 1,901.2 square metres. It is a two storey building, unsprinklered, constructed with both combustible and non-combustible materials.	The building is in an adequate condition with some minor repair work required for some items. Many items are past their expected lifespan but are still functioning properly.		3	

System	Description	Recommended Action Concerns	QTY/Area	Rating	-
Building Site Summary	The site faces three streets, 99th avenue to the North, 161st street on the East and 162nd street to the West. There is a service lane to the South. The site is a large grassed area with mature trees located on the North and west sides. There is an asphalt roadway along the north of the building from 161st connecting to the parking lot on the west side of the school. Sidewalks are concrete and located around the building.	The site is in adequate condition.		3	
Structure Summary	The building is supported on concrete foundation walls over strip footings on the exterior perimeter and interior corridor walls. The second floor structure is a wood floor structure supported on wood stud framing and columns. The roof is wood joists supported on wood framing. The main floor is a concrete slab on grade.	The structure is in marginal condition. The building main and second floor is sloping towards the exterior wall at the west side of the building. The slab has cracked through the admin area and principals office. There is also a crack running parallel down the entire length of the main floor corridor. The area has many walls cracking throughout. Recommend a further investigation into the structural sloping and repair the work as required.		2	
Building Envelope Summary	Exterior walls are finished with cement stucco with some brick veneer on the chimney stack above the roof. The wood framed exterior walls have infill batt insulation and vapour barrier. The roofing is a SBS system that was installed in 1998.	The building envelope is in adequate condition.		3	

System	Description	Recommended Action Concerns	QTY/Area	Rating	-
Roofing	2 Ply SBS Modified Bituminous membrane roofing was installed over the entire roof in 1998. Condition and thickness of vapour retarder and insulation is unknown.	There is evidence of ponding at numerous areas on the roof and the top membrane layer has bubbled in various places. The southwest corner membrane has folds along the parapet. Recommend replacing the roofing with a new SBS roofing system.	1,901.2 m2	2	
Walls	Exterior and walls are load bearing wood framed walls with in-filled batt insulation and vapour barrier. Condition of vapour barrier and insulation unknown. The exterior finish is cement stucco.			3	
Windows	The building has aluminum windows with sealed glazing units installed in 1998.			3	

System	Description	Recommended Action Concerns	QTY/Area	Rating	-
Exterior Doors & Openings	There are insulated steel framed storefront doors with sidelights and fixed glass panels at the entrances. The exterior utility doors are the original wood door and frame.	 The wood utility doors are worn out and are a potential security concern. Recommend to replace them with a new insulated metal door and frame.	13 doors 3 doors	3 2	
Special Purpose Doors	There is a roof hatch accessed from a roof ladder located in the second floor conference room.			3	
Special Features	The top of the exterior walls overhang around the perimeter of the building.			3	
Envelope - Other	There are prefinished metal soffits located at the overhang at the top of the exterior walls.			3	

System	Description	Recommended Action Concerns	QTY/Area	Rating	-
Building Interior Summary	The interior has painted gypsum board walls throughout. Flooring is comprised of carpet and vinyl sheet flooring in the classrooms and corridors with quarry tile flooring in the student washrooms. Ceilings are suspended T-Bar systems in classrooms, corridors and admin areas with painted gypsum board ceilings in the storage, janitor, washroom's and vestibules**.**	The building interior is in adequate condition.		3	
Partitions	The interior partitions are painted gypsum board over wood framed walls on the main and second floor. The mechanical room has concrete walls.	Repair the damage to gypsum board walls caused by building sloping to west side of building.		3 3	
Interior Finishes	All gypsum board walls and ceilings are painted throughout. There is ceramic wall tile installed in the washrooms. The gym has wood wall paneling.			3 3 3	

System	Description	Recommended Action Concerns	QTY/Area	Rating	-
Floors	The corridors, classrooms and partial administration areas have resilient sheet flooring. There is rubber sheet flooring in the vestibules and stairwells.	The resilient flooring is worn and faded. The slab cracking has damaged the flooring at specific locations. Recommend replacing the resilient flooring alongside structure repair work.	940 m2	2	
	There is carpet flooring in portions of the administration area, janitor's office, library, music room and partial small areas in each classroom.	The carpet flooring is dated and worn. Recommend replacing the carpet with new.	520m2	2	
	There is athletic wood strip flooring in the gym and stage area.		310m2	3	
	The student washroom's have quarry tile flooring		35m2	3	
	The storage rooms have original linoleum flooring and vinyl asbestos tile.	Recommend asbestos abatement to remove asbestos tile and replace with new.	30m2	2	
Walls	Painted gypsum board throughout.			3	
	Wood paneling installed in the gym walls.		110m2	3	
	The student washrooms have ceramic wall tiles.		30m2	3	
Ceilings	Vestibules, washrooms, janitor and storage rooms have painted gypsum board ceilings.			3	
	Classrooms, corridors and administration area have suspended T-Bar system with acoustic ceiling tiles.		1,275 m2	3	

System	Description	Recommended Action Concerns	QTY/Area	Rating	-
Interior Openings	The administration area has painted metal storefront frames with single panel glazing			3	
Furnishings & Equipment	Classrooms contain student desks, chairs, teacher desk and miscellaneous cabinets. The library contains desks, chairs and wood book storage shelves.			3	
Casework Items	The classrooms have painted plywood open and closed shelving units with plastic laminate countertops. There is a wood display case in the main floor corridor. Plastic laminate over plywood vanities are installed throughout the washrooms. Staff room has upper and lower kitchen cabinets with plastic laminate countertops.	The millwork throughout is original and is worn and damaged throughout. Recommend replacing the existing millwork and countertops with new.	Classroom 66 m Display 2m Vanities 5m Kitchen 10m	2 3 3 3	

System	Description	Recommended Action Concerns	QTY/Area	Rating	-
Equipment Items	Kitchen staff room has dishwasher, range, 2 fridges, and microwave ovens. There are stage curtains and tracks in in the gym stage area. The gym has wall mounted basketball nets, one of which is on a sliding track and miscellaneous athletic sporting equipment.			3 3 3	
Window Treatments	The windows throughout have vertical blinds installed.		137 blinds	3	
Interior - Other	The music room has wood framed tiered seating platforms covered in carpet.			3	

System	Description	Recommended Action Concerns	QTY/Area	Rating	-
Building Code	ABC Group A Division 2 – School. Refer to the building code analysis within this report for further details.				
Barrier free	There are no automatic door operators installed at the building. Corridors have appropriate width but no barrier free hardware. All main floor entrances have stairs down to the main floor. There is one barrier free washroom provided on the main floor.			2	
Hazardous Materials	Refer to HAZMAT review within this report.				

FACILITY EVALUATION TEMPLATE

SITE NAME: Glendale Elementary School

BUILDING NAME: Glendale Elementary School

Evaluation Date: April 11, 2016

Evaluated By: N53 Architecture Inc.
Nowak Engineering Inc.

Notes:

Four ratings are listed

- 1 = **Critical**: unsafe, high risk of injury or system failure.
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- 3 = **Adequate:** reached end of life cycle. Still operating adequately.
- 4 = **Good:** as new, state of the art meets present and foreseeable requirements.

System	Description	Recommended Action Concerns	QTY/Area	Rating	-
MECHANICAL **HEATING** Heating Plant	Two RBI FUTERA III model MB0500, input 500,000Btu/hr high efficiency boilers installed in 2006. Each boiler fitted with Armstrong 1.5B, 2.71 l/s, ½ HP circulation pump.		2 boilers	3	

System	Description	Recommended Action Concerns	QTY/Area	Rating	-
Terminal Heating Units and Distribution Systems	Hot water is distributed by inline pumps and piping to the finned tube radiation and heating units. There are wall mounted fan coil units at the buildings entrances and unit heaters in the mechanical room.		4 fan coil units 1 unit heater	3	
VENTILATION AND AIR CONDITIONING Air Handling Units	There are two custom built air handling units on the roof. One services the main building with one main fan and four Lennox 160/120 MBH duct furnaces. The other services the gym with one main fan and two Modine model WDG, 300SF, input 300,000 Btu/hr duct heat exchangers.	The roof top units are custom with different components connected to one another. The connections have been a problem for water penetration and have been resealed over time. They are approaching the end of their lifespan and need to be replaced. Recommend replacing with two rooftop air conditioners as the classroom get a lot of sunshine making the teaching spaces uncomfortable.	2 units	2	
Exhaust Fans	The building has inline and roof mounted dome exhausters.		8	3	

System	Description	Recommended Action Concerns	QTY/Area	Rating	-
Duct Distribution, Grilles and Inlets/outlets	Low velocity galvanized ductwork connects the air handling units to bar grilles throughout the building.			3	
Humidification	There is no humidification provided within the building.				
Packaged Air Conditioning Units	There is no air conditioning units provided within the building.				

System	Description	Recommended Action Concerns	QTY/Area	Rating	-
BUILDING SYSTEM CONTROLS Energy Management Control Systems	Line voltage electric controls for the force flow heaters and unit heater. Pneumatic controls for the damper motors and valves. The compressor is a DeVilbiss simplex with ¾ HP motor.			3	
PLUMBING SYSTEMS Domestic Hot Water	Takagi model T-K2 tankless gas water heater installed in 2006. It has a 240 gals/hr capacity with an input of 185,000 Btu/hr and an inline circulation pump.		1	3	
Plumbing Fixtures	Washrooms have stainless steel lavatories with push type metering valves. One washroom has a lever faucet. Urinals are floor mounted, recessed with flush valves. Water closets are floor mounted flush tank. There are single compartment stainless steel sinks in the classrooms and double compartment stainless steel sink in the staff kitchen. Floor mounted mop sinks installed in the janitor's rooms. Non refrigerated vitreous china drinking fountain installed in the corridor.		10 4 11 12 3 1	3 3 3 3 3 3	

System	Description	Recommended Action Concerns	QTY/Area	Rating	-
Domestic Water Piping, Valves and Insulation	There is an insulated piping system with quarter turn ball isolation valves and gate valves that connect to various plumbing fixtures.		30 valves	3	
Sanitary and Vent Piping Systems	The piping is cast iron throughout and the vent piping is cast iron and copper.			3	
Storm Piping System	Conventional roof drains with cast iron dome strainers connect to cast iron roof drainage piping. The piping connects to the municipal mains below grade.			3	

System	Description	Recommended Action Concerns	QTY/Area	Rating	-
Domestic Water Service	The piping is copper with soldered fitting throughout. The domestic water service has a Watts reduced pressure backflow preventer. There is a Wilkins backflow preventer on the janitorial sink and an Ames backflow preventer on the fire system.			3	
Natural Gas Service	The natural gas meter is located outside at the mechanical room with schedule 40 steel gas piping to the mechanical appliances.			3	
FIRE PROTECTION SYSTEMS Wet Protection Systems	There is a fire hose cabinet located in the main floor corridor and in the second floor corridor. The building is not sprinklered.			3	
Fire Extinguishers and Cabinets	ABC fire extinguishers are installed on wall hooks and in fire house cabinets.			3	

FACILITY EVALUATION TEMPLATE

SITE NAME: Glendale Elementary School

BUILDING NAME: Glendale Elementary School

Evaluation Date: April 11, 2016

Evaluated By: KSJ Engineering Ltd.
N53 Architecture Inc.

Notes:

Four ratings are listed

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System	Description	Recommended Action Concerns	QTY/Area	Rating	-
Electrical **Power Distribution** Service Entry	Incoming service is 600 amp, 120/240V, 1 phase obtained from a utility owned pad mounted transformer on the west side of the property. Underground feeders to a Square 'D' main distribution panel. 600A main breaker and feeder breaker distribution centre. It was installed in 1998. A surge suppression system has been provided.		1	3	

System	Description	Recommended Action Concerns	QTY/Area	Rating	-
Sub-panels, Conduit and Wireways	120/240V branch circuit panels installed in service rooms. They are approx. 80% full. They were installed in 1998.		9 panels	3	
Appliances/Receptacles	Power receptacles installed throughout the building.			3	
Grounding and Static Control	Building Ground.			3	

System	Description	Recommended Action Concerns	QTY/Area	Rating	-
Lighting Building Exterior	There is exterior metal halide wall mounted fixtures installed along the perimeter of the building. They are on a photocell control.	.		3	
Building Interior	Interior fluorescent fixtures with T8 lamps and electronic ballasts. They were installed in 1998.		300	3	
Exit/Emergency Lighting	Emergency battery packs with remote heads throughout the building. Paths of egress are adequately illuminated.		8	3	

System	Description	Recommended Action Concerns	QTY/Area	Rating	-
Emergency Systems Fire Alarm and Detection	Edwards System Technologies Quick Start fire alarm panel in the server room. The remote annunciator panel is located at the main entrance. There are 9 zones in the building. The signal devices are bell/strobe units.		1,900m2	3	
Security	Magnum Alert 3000 security system with PIR motion sensors and door contacts.			3	
Telephone System	Nortel Networks Meridian telephone system. It is located in the server room.			3	
TV/Computer	Main network rack mounted patch panels and switches are located in the server room. Data outlets are provided in the administration area and each classroom with Cat 5 cable.			3	

System	Description	Recommended Action Concerns	QTY/Area	Rating	-
Intercom/Public Address	Bogen TPU 1008, 100 watt paging amplifier that is interfaced with the telephone system. Speakers are located throughout the school and telephone sets are provided in each classroom.			3	
Clock and Program System	120V and battery operated clocks			3	
Communications-other					

APPENDIX B

BYLAW AND ZONING REVIEW

BYLAW AND ZONING REVIEW – GLENDALE ELEMENTARY SCHOOL

An analysis that encompasses elements of the existing building configuration and anticipated changes are included below. The analysis is meant to establish a baseline of requirements for the purposes of verifying scope and potential variables that will need to be considered in future detailed design development. This information will therefore need to be reviewed in detail and verified over the course of further option development.

Edmonton Zoning Bylaw 12800, last revised March 2016, is the land use by law currently in force. The site is zoned **US Urban Services**. The general purpose of the US zoning category is stated as being "to provide for publicly and privately owned facilities of an institutional or community service nature", which aligns with the current and projected us of the site.

Zoning requires a minimum front setback of 6.0 m, a rear setback of 7.5 m, and side setbacks of 4.5 m. The maximum permitted building height is 10.0 m. For this Zone, the bylaw states that if "it is unreasonable for the development to comply" with setback and building height requirements, "the Development Officer may relax" these conditions.

Existing number of parking stalls: 22

Parking requirements: Minimum vehicular parking stall sizes are 2.6m wide x 5.5m long. However, up to 30% of the required number of parking stalls may, if signed and designated, be small vehicle parking stalls and their length may be reduced to 4.6m. Barrier free parking stalls shall be 3.7m wide. Minimum parking aisle widths must be 7.0m wide. The required number of parking stalls for the Glendale Elementary School is 16 calculated as follows:

1. For full build-out – 11 classrooms (10 currently, not including library spaces) x 1.4 stalls per classroom = 16 stalls

Bicycle storage requirements are: Minimum bicycle stall size is 0.6m wide x 1.8m long and must be located in a hard surfaced area adjacent to a walk with a minimum width of 1.5m. Bicycle parking must be in the form of rooms, lockers, racks or railings not more than 15m from the student entry locations. Quantity of stalls must be equal or greater than 10% of required vehicle parking requirements, which results in 2 bicycle stalls.

Loading requirements are: Loading spaces are required to be 3.0m wide and 9.0m long.
The required number of loading spaces is 1 calculated as follows:

1. 1 stall per the first 2,800 m^2 of total building area (total building area = 1,902 m^2) = 1 space

2. 1 stall for each 2,800 m^2 after (total building area of 1,902 – 2,800 m^2 = -898 m^2) = 0 space

Passenger drop off spaces (54.5 of the land use bylaw) located on school property (not overlapping with parking requirements), are to be provided for all new schools or existing schools where an expansion of 100 students or 20% of existing enrollment, whichever is less, is expected. The development officer has latitude to consider a variance should full application of bylaw requirements not be feasible given site constraints. The number of drop off spaces is to be calculated based on the ultimate school built-out capacity (ie: including any future contemplated portable classrooms) and must be designed for linear traffic flow with parallel parking to eliminate backing up or turning.

Passenger drop off space requirements for Elementary Schools (54.5, Schedule 4):

1. Offsite: 3 spaces per 100 students, but in no case less than 5 spaces (11 classrooms = 206 students / 100) = 9 spaces

2. Onsite: 1 space per 100 students, but in no case less than 5 spaces (11 classrooms = 206 students / 100) = 3 spaces

Use of setbacks are restricted. Among other restrictions, parking, loading, storage and trash collection are not permitted to be placed within, or encroach upon, setbacks.

Elements of regulations noted above, which may be deemed non-compliant with respect to the existing school's configuration, are most likely to be grandfathered by the City of Edmonton. New development option(s) will be required to strictly adhere to the cited bylaw regulations.

APPENDIX C

BUILDING CODE REVIEW AND DIAGRAMS

N53 ARCHITECTURE INC

Building Code Review

Glendale Elementary School
9812 161 Street, Edmonton, AB

Current Building Code in Force: ABC 2014.

1. **Major Occupancy:** Group A, Division 2

2. **Streets (3.2.2.10):** faces 2 street under the definition of the Alberta Building Code. Building Perimeter = 171m, Perimeter within 15m of street = 96m. Percentage within 15m of building face = 56%.

3. **Construction:** Combustible and Non-combustible, unsprinklered.

4. **Building Area**: 1,220 m^2 (Main Floor)

5. **Building Height:** Two storeys.

6. **3.1.3.1 Multiple Occupancies**: No.

7. **Occupant Load 3.1.17.1**: There are 7 classrooms and ancillary spaces that include a gymnasium, science room, sensory room, music room, and library. The net capacity established by EPSB is 206 students. Allowing for 12 staff, the occupant load is 218 persons.

8. **Alberta Building Code Classification:** The building does not conform to a classification within the current Alberta Building Code 2014. Under the classifications for Group A Division 2 unsprinklered buildings (**3.2.2.25**), a two storey building, facing 2 streets, can be a maximum of 1,000 sm. Facing 3 streets, the building can be a maximum of 1,200 sm.
   In order to comply (if acceptable to the COE Safety Codes Department), the building would have to add a firefighter access route to the west side of the building to achieve a 75% of building face within 15m of firefighter access. Additionally, the building must have:
   - non-combustible or combustible. *Building complies.*
   - floor assemblies shall be fire separations… *Could not determine whether building complies with firestopping, dampers, etc.*
   - mezzanines… *Building complies (no mezzanines).*
   - roof assemblies if of combustible construction shall have a fire-resistance rating not less tan 45 min. *Building complies.*
   - loadbearing walls, columns and arches shall have a fire-resistance of 45 min (does not apply – single story, no floor assemblies above). *Building complies.*

9. **3.2.3 Limiting Distance:** the building is considered as one fire-compartment, limiting distance is not an issue.

10. **3.2.4.1** A fire alarm system is required (and is in place) for a school with an occupant load of more than 40 persons. *Building complies.*

11. **3.2.4.2.(2)** A single fire alarm system is required to serve all major occupancies within a building. *Building complies.*

12. **3.2.4.3.(1)(d)** Fire alarm system may be single or two stage alarm. *Single Stage is in place.*

13. **3.2.4.8 Signals to Fire Department**:
    - control panel with integral annunciator and remote annunciator is in place. *Building complies.*

14. **3.2.4.9 Annunciator and Zone Indication**:
    - control panel with integral annunciator and remote annunciator is in place. *Building complies.*

15. **3.2.4.11 Fire and Smoke Detectors**: the building is not sprinklered, fire detectors are required in storage rooms, service rooms, janitor's rooms, rooms with hazardous substances. *Building complies.*

16. **3.2.5.1 Access to Above-grade Storeys:** For an unsprinklered building, direct access for firefighting shall be provided from the outdoors to every storey that is not sprinklered throughout and whose floor level is less than 25m above grader, by a least one unobstructed window or access panel for each 15m of wall in each wall required to face a street by Subsection 3.2.2. *Building complies.*

17. **3.2.5.9, 3.2.5.10, 3.2.5.11 Standpipes and hose connections**: the building is under the maximum area for a standpipe system. *Building complies.*

18. **3.2.5.16** Distance between building fire department connection and street hydrant cannot exceed 45 m of un-obstructed distance (clear of structures or parking in the hose path) and be located on the building no closer than 3m and no further than 15m from the principal entrance. *Building complies. The distance from the closest hydrant to the building is within 45m.*

19. **3.3.1.21 (1) Janitor Room Fire Separations:** since the building is not sprinklered, and the floor assembly must have a fire-resistance rating of 1 h, janitor's rooms shall be separated from the remainder of the building by a fire separation having a fire-resistance rating not less than 1 hour.

20. **3.3.1.26 Storage Room Fire Separations:** Storage Rooms are required to be a fire separation having a fire-resistance rating not less than 1 h. The ratings of the doors could not be verified. Some doors were labeled, other doors that should have labels were not labeled.

21. **3.3.2.6 (2) Corridors:** Corridors providing public access to exit are required to be fire separations rated for 45 minutes. The rating of the walls and doors could not be verified. It is doubtful whether they comply. Additionally, The building does not comply on the following
    - both second floor exits open onto two Lobbies, (only 1 is permitted)
    - travel distance through lobby is greater than the permitted 15 m travel distance

23. **3.4.2.5 Location of Exits**: Least distance between exits shall be one half the maximum diagonal distance of the floor area but no less than 9m apart. Where a floor area is divided by a fire separation (matching floor rating), with one exit on each side of the fire separation, where not less than 1/3 of the total area comprises one side, the above requirement is waived. *Building complies.*

24. **3.4.2.5 (1)(f)** Travel Distance: 30 m as building is unsprinklered. It is doubtful whether the corridors are considered rated assemblies. The distance from some classrooms to the exit is greater than 30m.

25. **3.4.3.2 Exit Width**: The building complies with the adequate exit widths.
    Gymnasium:

- Gym area = 257 sm
- Gymnasium occupant load (Table 3.1.17.1) is 0.4 sm per person = 257/0.4 = 643 persons
- Existing exit doors from Gymnasium = 5,400 mm cumulative width. 5,400mm/8mm (by means of stairs) = 675 persons can exit. *Building complies.*

School Corridor Exits:

- 3 exits @1800mm per exit + 1 exit @ 2700 per exit = 8,100 mm cumulative width. 8,100mm/8mm = 1,012 persons can exit.

26. **3.4.4.1 Fire Separation of Exits:** fire separations will be rated for 45 min. *Building complies.*

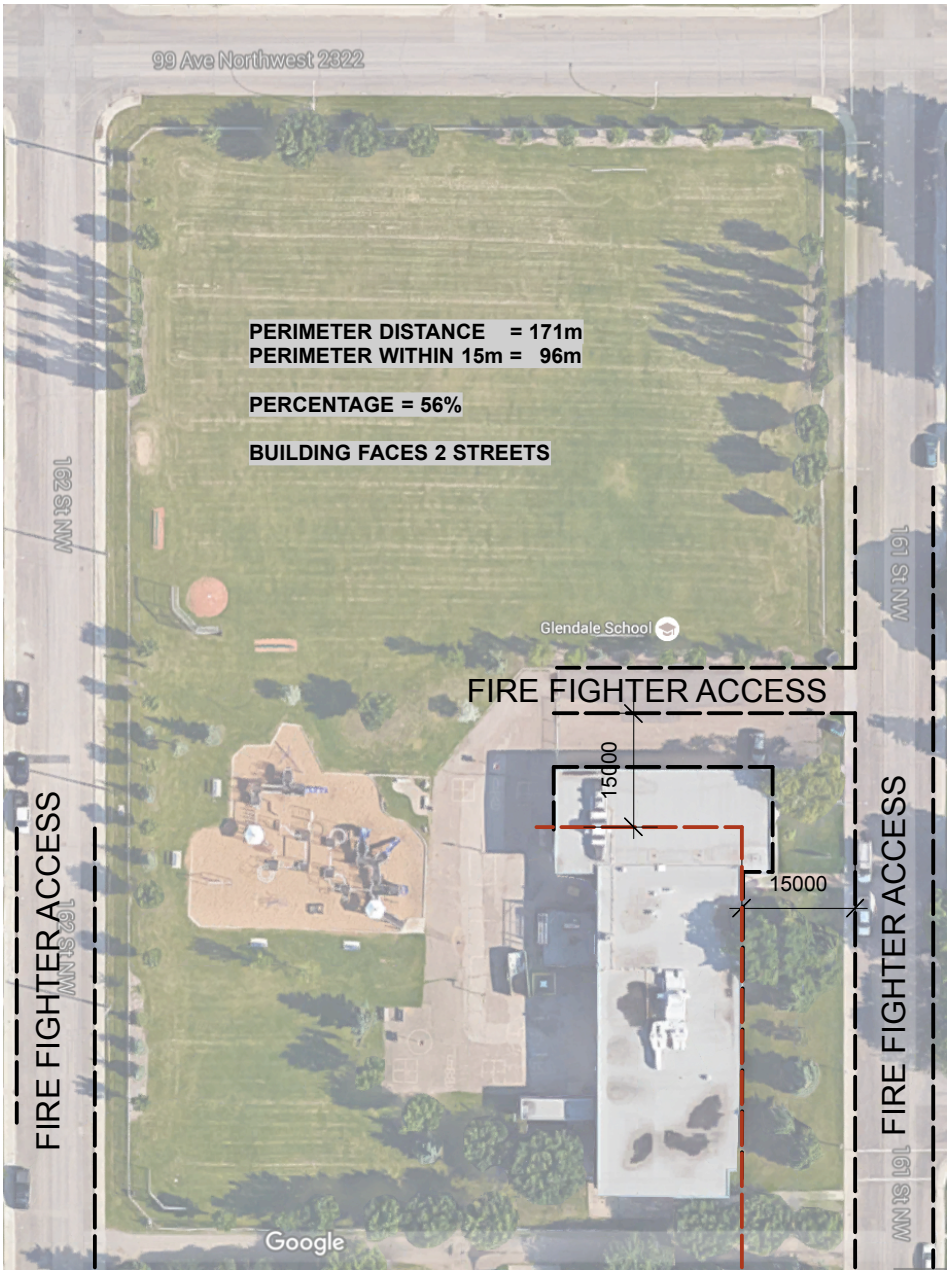
27. **3.6.2.1 (2) Service Rooms** containing fuel fired appliances require fire separations rated for 1 hour, 3.6.2.10 – this requirement does not apply to fuel fired roof top HVAC units. *Building complies.*

28. **3.6.2.1 (6) & (7) Electrical Rooms** containing equipment required to be in a service room by applicable electrical codes and standards, must be located in a room with a 1 hour rated fire separation. Other electrical equipment can be located in a room with no rating. *Building complies.*

29. **3.6.4.7 Roof Access:** There is HVAC equipment on the roof of the building. A building shall be provided with direct access to the roof by an interior stairway if the roof elevation is more than 4 m above grade. Access to the roof is by a fixed ladder and a roof hatch. Building does not comply.

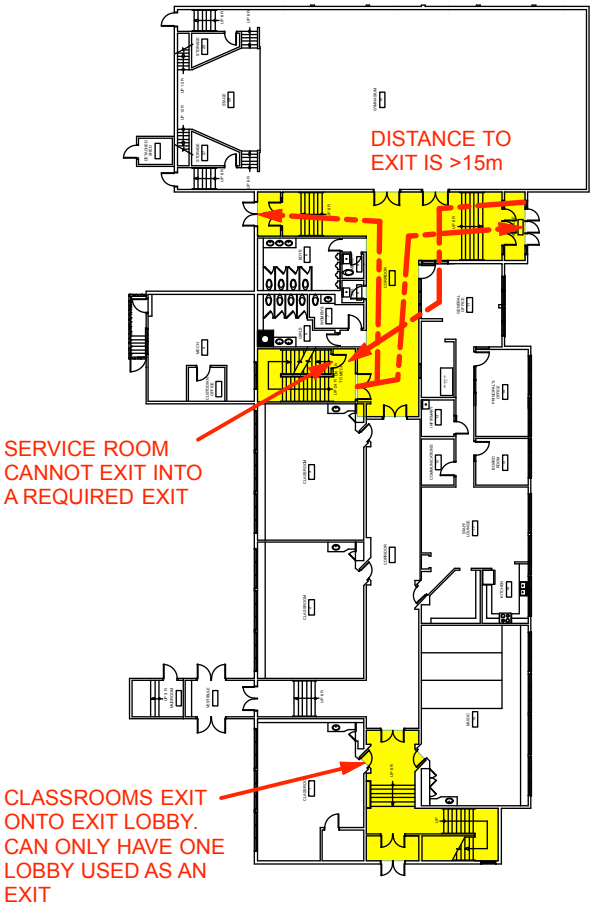
30. **3.7.2.2 A Water Closets counts:** For 218 persons (109 Males and 109 Females), the required water closet count is 3 male and 5 female. *Building complies.*

31. **3.8 Barrier-Free Design:** The main floor is approximately 1m below street level. No areas within the building are Barrier-Free.

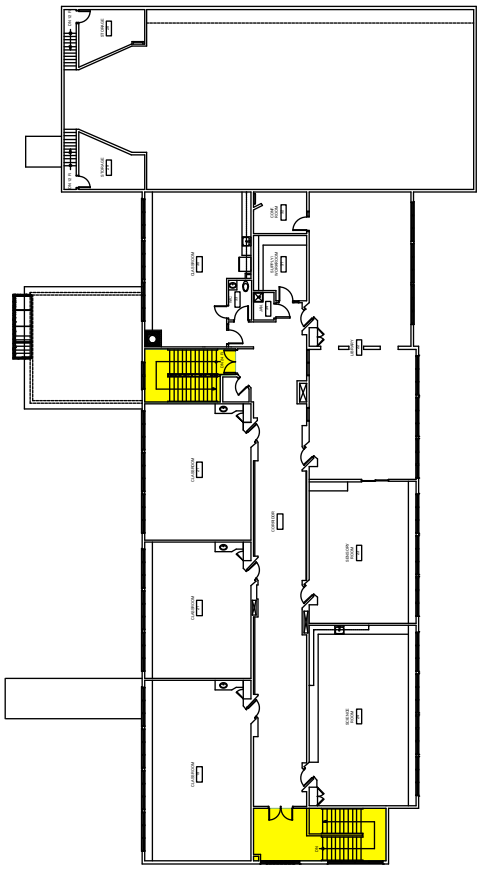


APPENDIX-C: Building Code Review

GLENDALE ELEMENTARY SCHOOL
FIRE FIGHTER ACCESS ROUTES



MAIN FLOOR



SECOND FLOOR

GLENDALE ELEMENTARY SCHOOL
TRAVEL DISTANCES

APPENDIX D

SITE AND FLOOR PLAN

VALUE MANAGEMENT ANALYSIS - GLENDALE ELEMENTARY SCHOOL

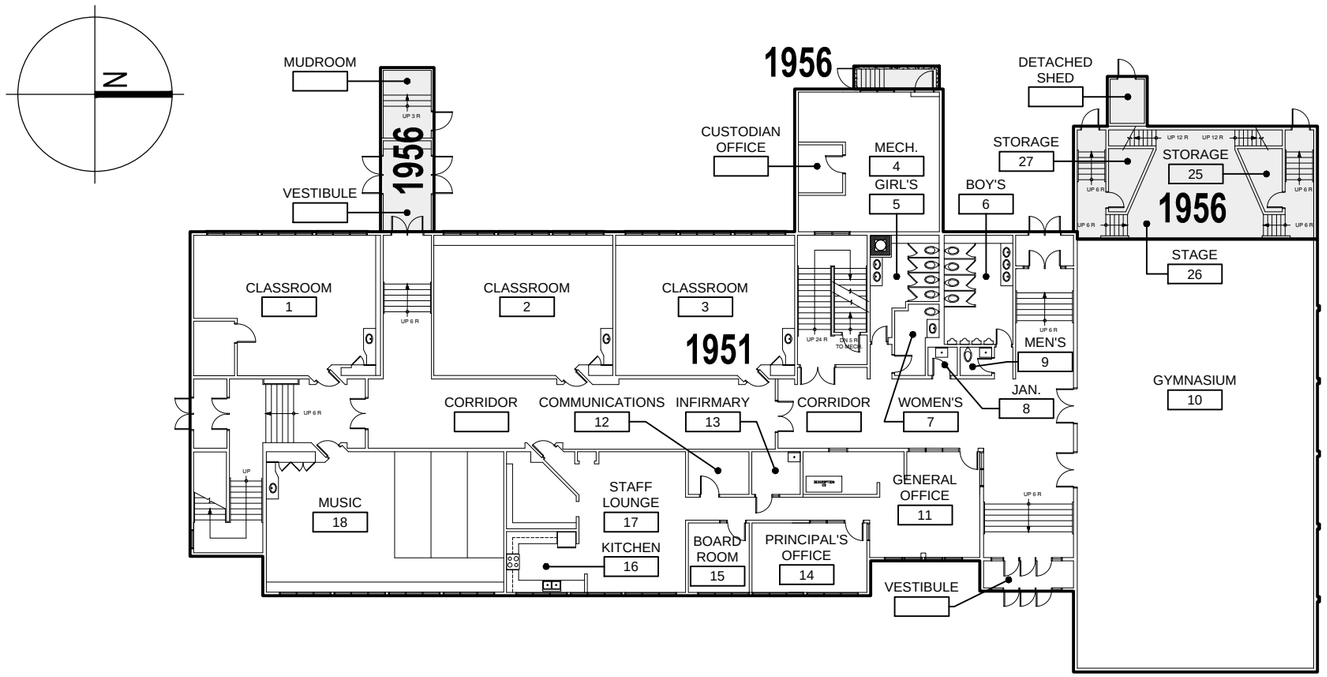
EDMONTON PUBLIC SCHOOLS

LEGEND

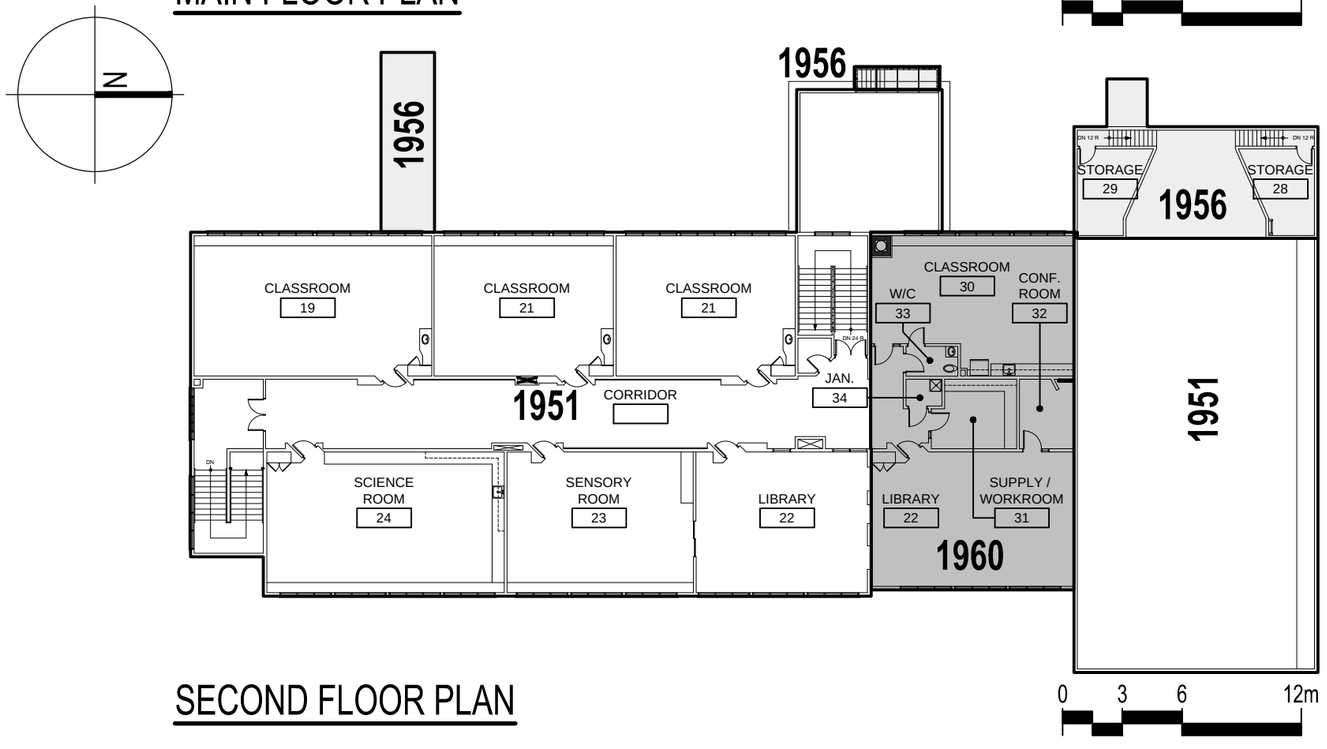
- BUILDING AREA 1951 WING - 1,725.6 m2
- BUILDING AREA 1956 WING - 92.0 m2
- BUILDING AREA 1960 WING - 183.6 m2

TOTAL BUILDING AREA - 1,901.2 m2

AERIAL VIEW



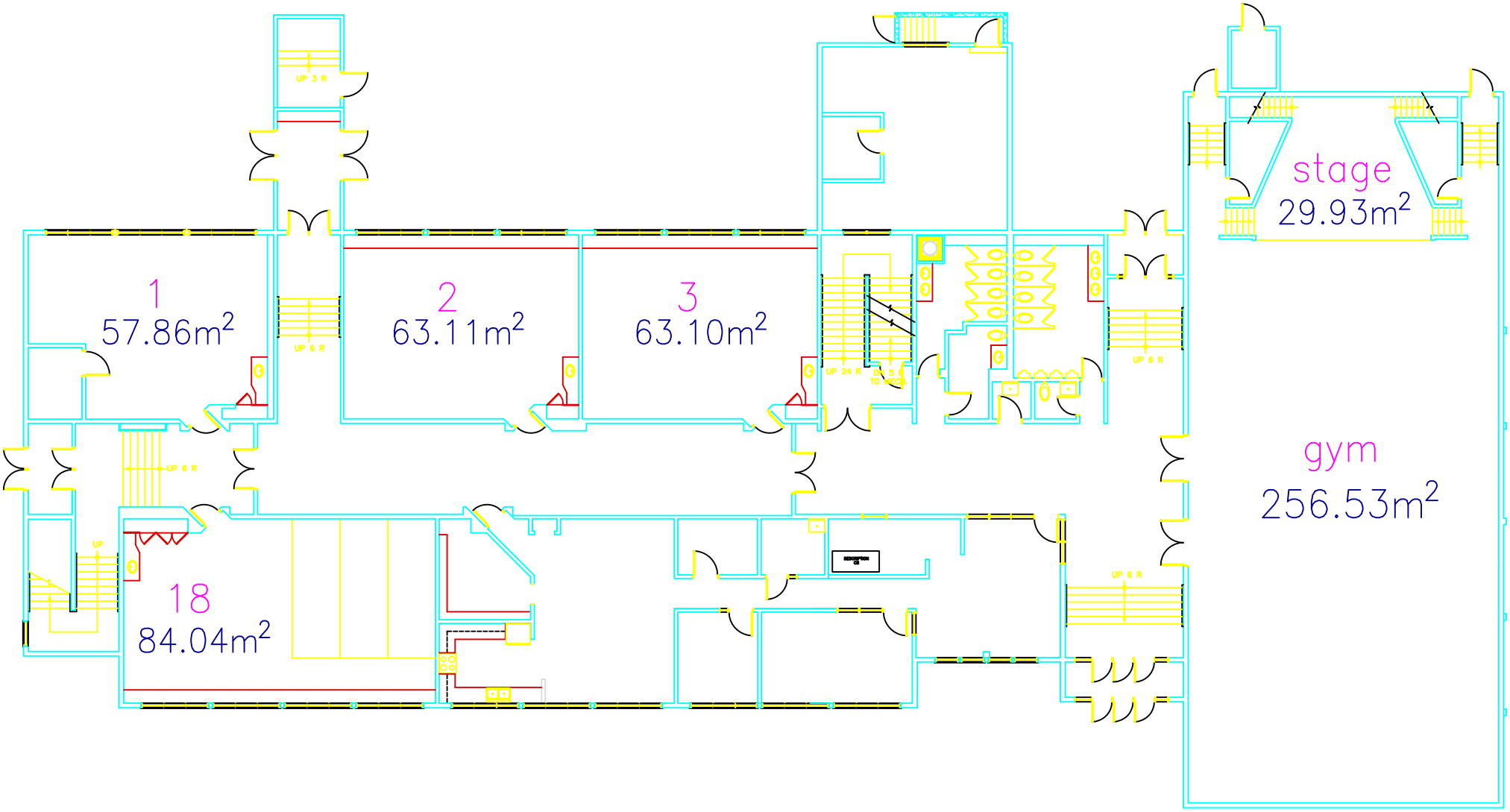
MAIN FLOOR PLAN



SECOND FLOOR PLAN

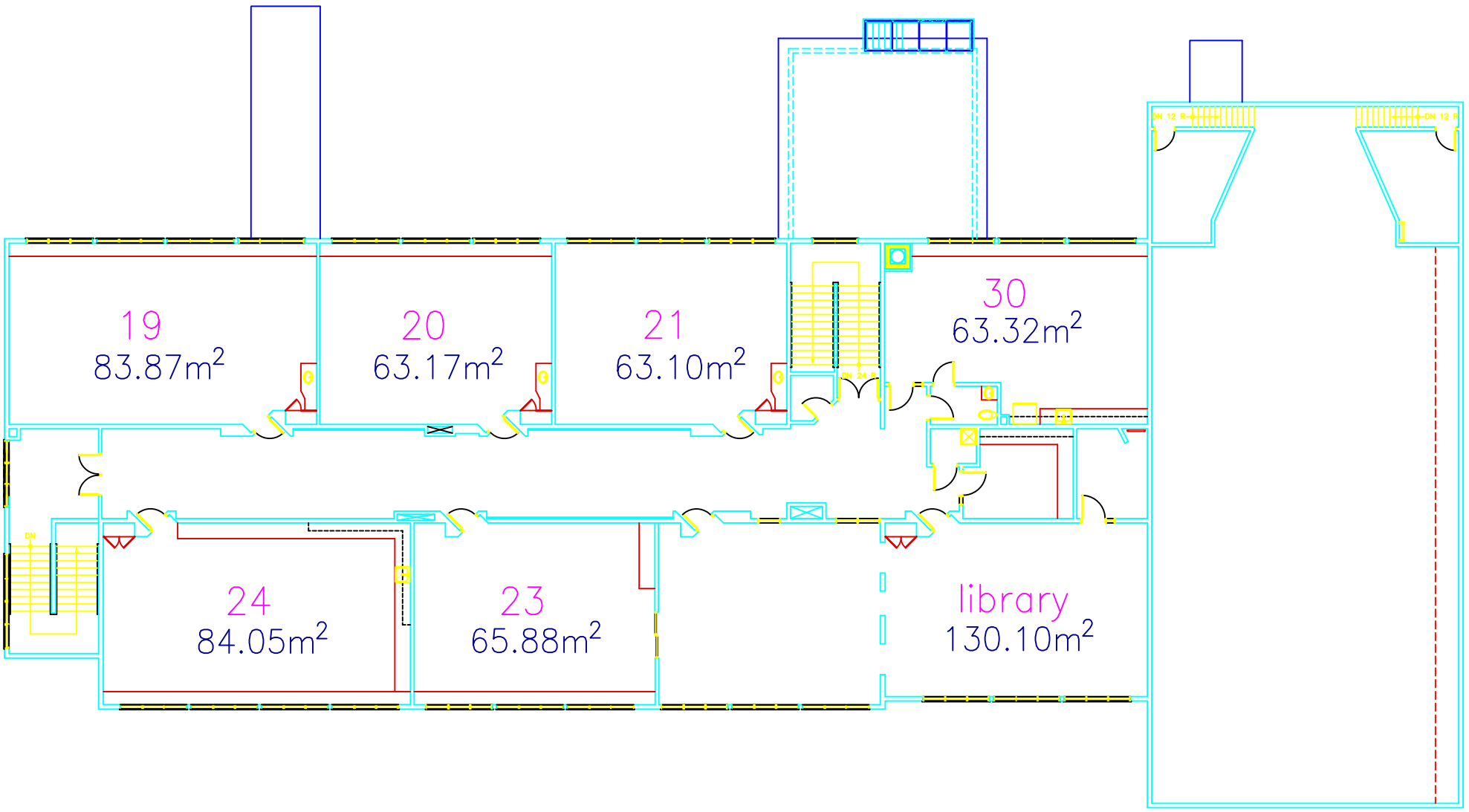
APPENDIX E

AREA ID



GLENDALE

MAIN FLOOR



GLENDALE

SECOND FLOOR

APPENDIX F

ASBESTOS ABATEMENT COSTS

Glendale Asbestos Abatement Estimated Cost

Item	Square Footage	Cost per		Total removal cost	
Duct Insulation	88 ft	$ 15.00	/ ft	$ 1,320.00	
Pipe Fittings	24 units	$ 45.00	/ unit	$ 1,080.00	
Floor Tile	75 sq ft	$ 2.50	/ sq ft	$ 187.50	
				$ 2,587.50	**:Total**

Item	Removal type
Asbestos Cement Board (Transite)	low risk work
Boiler Insulation	high risk work/scafolding
Boiler Breaching - Parging	high risk work/scafolding
Boiler Door Gasket	glovebag
Ceiling Tile	high risk
Drywall Joint Compound	high risk
Duct Insulation - Parging	high risk
Duct Insulation	high risk
Floor Tile	low risk
Floor Leveling Compound	highrisk/includes floor tile
Mud Parging	high risk
Pipe Fittings	glovebag
Pipe Parging	glovebag
Pipe Insulation - Boiler Pipe	glovebag; under 8"
Rain Water Pipe	gloveag
Sheet Flooring	highrisk; $4 more on wood
Spray Texture	highrisk
Straight Run	glovebag
Vessel Insulation - Parging	high risk work/scafolding

APPENDIX G

ALBERTA INFRASTRUCTURE UNIFORMAT
LISTING IDENTIFYING THEORETICAL LIFE OF BUILDING COMPONENTS

Uniformat Listing	Theoretical Life
B2010.01.06.03 Metal Siding**	40
B2010.01.06.04 Wood Siding**	40
B2010.01.06.05 Vinyl Siding**	30
B2010.01.11 Joint Sealers (caulking): Ext. Wall**	20
B2010.01.13 Paints (& Stains): Exterior Wall**	15
B2020.01.01.01 Steel Windows (Glass & Frame)**	40
B2020.01.01.02 Aluminum Windows (Glass & Frame)**	40
B2020.01.01.05 Wood Windows (Glass & Frame)**	35
B2020.01.01.06 Vinyl, Fibreglass &Plastic Windows**	40
B2020.02 Storefronts: Windows**	40
B2020.03 Glazed Curtain Wall**	40
B2030.01.01 Aluminum-Framed Storefronts: Doors**	30
B2030.01.02 Steel-Framed Storefronts: Doors**	30
B2030.01.05 All Glass Entrances and Storefronts: Doors**	30
B2030.01.06 Automatic Entrance Doors**	30
B2030.01.10 Wood Entrance Door**	30
B2030.02 Exterior Utility Doors**	40
B3010.02.01.01 Asphalt Shingles**	25
B3010.02.01.07 Wood Shingles**	30
B3010.02.01.08 Wood Shakes**	30
B3010.02.02 Roofing Tiles**	30
B3010.04.01 Built-up Bituminous Roofing (Asphalt & Gravel)**	25
B3010.04.02 Cold-Applied Bituminous Roofing**	25
B3010.04.03 Roll Roofing**	25
B3010.04.04 Modified Bituminous Membrane Roofing (SBS)**	25
B3010.04.05 Membrane Roofing (Single Ply, EPDM, PVC, TPO)**	25
B3010.04.06 Fluid-Applied Roofing**	25
B3010.04.07 Coated Foamed Roofing**	25
B3010.04.08 Membrane Roofing (Inverted/ Protected)**	30
B3010.05 Traffic Coatings: Exterior**	15
B3010.07 Sheet Metal Roofing**	40
B3010.08.02 Metal Gutters and Downspouts**	30
B3020.01 Skylights**	25
C1010.03 Interior Operable Folding Panel Partitions**	30
C1030.01 Visual Display Boards**	20
C1030.02 Fabricated Compartments(Toilets/Showers)**	30
C1030.10 Lockers**	30
C2020.05 Resilient Stair Finishes**	20
C2020.06 Carpet Stair Finishes**	10
C3010.02 Wall Paneling**	30
C3010.06 Tile Wall Finishes**	40
C3010.09 Acoustical Wall Treatment**	20
C3020.02 Tile Floor Finishes**	50
C3020.04 Wood Flooring**	30
C3020.07 Resilient Flooring**	20
C3020.08 Carpet Flooring**	15
C3020.09 Access Flooring**	25
C3020.13 Traffic Coating: Interior**	25
C3030.06 Acoustic Ceiling Treatment (Susp.T-Bar)**	25
D1010.01.01 Electric Traction Passenger Elevators**	30
D1010.01.02 Hydraulic Passenger Elevators**	30

Uniformat Listing	Theoretical Life
D1010.01.03 Electric Traction Freight Elevators**	30
D1010.01.04 Hydraulic Freight Elevators**	30
D1010.02 Lifts**	25
D1020 Escalators and Moving Walks**	25
D2010.04 Sinks**	30
D2010.05 Showers**	30
D2010.06 Bathtubs**	30
D2010.08 Drinking Fountains / Coolers**	35
D2010.10 Washroom Fixtures (WC, Lav, Urnl)**	35
D2020.01.02 Valves: Domestic Water**	40
D2020.01.03 Piping Specialties (Backflow Preventors)**	20
D2020.02.02 Plumbing Pumps: Domestic Water**	20
D2020.02.03 Water Storage Tanks**	30
D2020.02.04 Domestic Water Conditioning Equipment**	20
D2020.02.06 Domestic Water Heaters**	20
D2090.01 Compressed Air Systems (Non Controls)**	30
D2090.02 Deionized Water Systems**	30
D2090.03 Distilled Water Systems**	30
D2090.10 Nitrous Oxide Gas Systems**	30
D2090.11 Oxygen Gas Systems**	30
D2090.12 Reverse Osmosis Systems**	30
D2090.13 Vacuum Systems (Medical)**	30
D2090.14 Acid Waste Systems**	30
D2090.15 Pool & Fountain Equipment**	20
D3020.01.01 Heating Boilers & Accessories: Steam**	35
D3020.01.03 Chimneys (&Comb. Air) : Steam Boilers**	35
D3020.02.01 Heating Boilers and Accessories: H.W.**	35
D3020.02.02 Chimneys (&Comb. Air): H.W. Boiler**	35
D3020.03.01 Furnaces**	25
D3020.04.01 Fuel-Fired Duct Heaters**	30
D3020.04.02 Fuel-Fired Radiant Heaters**	30
D3020.04.03 Fuel-Fired Unit Heaters**	30
D3030.01 Absorption Water Chillers**	25
D3030.02 Centrifugal Water Chillers**	25
D3030.03 Reciprocating Water Chillers**	25
D3030.04 Rotary-Screw Water Chillers**	25
D3030.05 Cooling Towers**	25
D3030.06.01 Refrigeration Compressors**	25
D3030.06.02 Refrigerant Condensing Units**	25
D3030.07 Heat Pumps**	15
D3040.01.01 Air Handling Units: Air Distribution**	30
D3040.01.06 Air Terminal Units: Air Distribution (VAV Box)**	30
D3040.02 Steam Distribution Systems: Piping/Pumps**	40
D3040.03.01 Hot Water Distribution Systems**	40
D3040.03.02 Chilled Water Distribution Systems**	40
D3040.04.01 Fans: Exhaust**	30
D3040.05 Heat Exchangers**	30
D3050.01.01 Computer Room Air Conditioning Units**	30
D3050.01.02 Packaged Rooftop Air Conditioning Units (& Heating Units)**	30
D3050.01.04 Unit Air Conditioners**	30
D3050.02 Air Coils**	30

Uniformat Listing	Theoretical Life
D3050.03 Humidifiers**	25
D3050.05.01 Convectors**	40
D3050.05.02 Fan Coil Units**	30
D3050.05.03 Finned Tube Radiation**	40
D3050.05.04 Induction Units**	30
D3050.05.06 Unit Heaters**	30
D3050.05.07 Unit Ventilators**	30
D3050.05.08 Radiant Heating (Ceiling & Floor)**	35
D3060.02.01 Electric and Electronic Controls**	30
D3060.02.02 Pneumatic Controls**	40
D3060.02.05 Building Systems Controls (BMCS, EMCS)**	20
D4090.02 Carbon Dioxide Fire Extinguishing Systems**	40
D4090.03 Clean Agent Extinguishing Systems**	40
D4090.04 Dry Chemical Fire Extinguishing Systems (Kitchen Hood)**	40
D4090.05 Halon Extinguishing Systems**	40
D4090.06 Smoke Protection & Exhaust Fans**	40
D5010.01 Main Electrical Transformers**	40
D5010.02 Secondary Electrical Transformers (Interior)**	40
D5010.03 Main Electrical Switchboards (Main Distribution)**	40
D5010.05 Electrical Branch Circuit Panelboards (Secondary Distribution)**	30
D5010.07.01 Switchboards, Panelboards, and (Motor) Control Centers**	30
D5010.07.02 Motor Starters and Accessories**	30
D5010.07.03 Variable Frequency Drives**	30
D5020.02.02.02 Interior Florescent Fixtures**	30
D5020.02.03.02 Emergency Lighting Battery Packs**	20
D5030.01 Detection and Fire Alarm**	25
D5030.02.02 Intrusion Detection**	25
D5030.02.03 Security Access**	25
D5030.02.04 Video Surveillance**	25
D5030.04.03 Call Systems**	25
D5030.05 Public Address and Music Systems**	20
D5090.01 Uninterruptible Power Supply Systems**	30
D5090.02 Packaged Engine Generator Systems (Emergency Power System)**	35
E2010.02 Fixed Casework**	35
E2010.03.01 Blinds**	30
E2010.03.06 Curtains and Drapes**	30
E2010.05 Fixed Multiple Seating**	35
F1010.02.04 Portable and Mobile Buildings**	30
F1010.02.05 Grandstands and Bleachers**	30
G2010.02.02 Flexible Pavement Roadway (Asphalt)**	25
G2010.04 Rigid Roadway Pavement (Concrete)**	25
G2020.02.02 Flexible Paving Parking Lots(Asphalt)**	25
G2020.04 Rigid Parking Lot Pavement (Concrete)**	25
G2030.02.02 Asphalt Pedestrain Pavement**	20
G2030.03 Pedestrian Unit Pavers**	20
G2030.04 Rigid Pedestrian Pavement (Concrete)**	25
G2040.02.05 Wood Fences and Gates**	30
G2040.03 Athletic and Recreational Surfaces**	25

APPENDIX H

COSTS

PROGRAM AREA (m²)	A Demolition	B Preservation	C New	D Modulars	E Other	Total (B+C+D+E)
Architectural	0	1,901	0	0	0	1,901
Mechanical	0	1,901	0	0	0	1,901
Electrical	0	1,901	0	0	0	1,901
Civil / Site	0	1,901	0	0	0	1,901
Modulars	0	0	0	0	0	0
Demo - Selective	1,901	0	0	0	0	0
TOTAL :	**1,901**	**1,901**	**0**	**0**	**0**	**1,901**

CAPITAL COST

A Demolition					
Demo - Selective	1,901 m²	$75.00		$142,575	
Hazmat - Selective	1,901 m²	$50.00		$95,050	
		A Demolition Net :		**$237,625**	
B Preservation/Modernization					
Architectural	1,901 m²	$671.86		$1,277,204	
Mechanical	1,901 m²	$333.94		$634,827	Mechanical comments indicate very little scope required
Electrical	1,901 m²	$0.00		$0	Electrical comments indicate no scope is required
Civil / Site	1,901 m²	$0.00		$0	Civil comments not provided
		B Preservation/Modernization Net :		**$1,912,031**	
C New/Expansion					
New Construction	0 m²	$0.00		$0	
		C New/Expansion Net :		**$0**	
D Modular's					
Construction	0 m²	$0.00		$0	
		D Modular's Net :		**$0**	
E Other				$2,149,656	
GC's & Fee		15.0%		$322,448	
		Other Net :		**$322,448**	
Z Contingencies				$2,472,105	
Project		5.0%		$123,605	
Construction		7.0%		$173,047	
Phasing		3.0%		$74,163	
		Z Contingencies Net :		**$370,816**	
		(A+B+C+D+E+Z) Construction Net :		**$2,842,921**	
Soft/Other Costs					
Project Admin		2.0%		$56,858	
Design Fees		10.0%		$284,292	
Furnishings & Equipment		4.0%		$113,717	
		Soft/Other Net :		**$454,867**	
SUB-TOTAL				**$3,297,788**	
Non-refundable GST		1.60%		$52,765	
CAPITAL COST TOTAL (April 2016 $)				**$3,350,553**	
Escalation				$0	
CAPITAL COST TOTAL				**$3,350,553**	

SITE NAME: Glendale Elementary School Site

BUILDING NAME: Glendale Elementary School

BUILDING AREA (m2): 1,901

System	Description	Recommended Action Concerns	QTY/Area	Rating	Upgrade Replacement Cost	TCCL Assumed Scope	QTY	Unit	Rate	Sub-Total Construction
ARCHITECURAL										
BUILDING GENERAL SUMMARY	Glendale is a K-6 elementary school constructed in 1951 with an area of 1,725.6 square meters. The first addition of 92 square metres was built in 1956 and the second addition of 83.6 square metres was built in 1960. The total area of the school to 1,901.2 square metres. It is a two storey building, unsprinklered, constructed with both combustible and non-combustible materials.	The building is in an adequate condition with some minor repair work required for some items. Many items are past their expected lifespan but are still functioning properly.		3		See details below				
BUILDING SITE SUMMARY	The site faces three streets, 99th avenue to the North, 161st street on the East and 162nd street to the West. There is a service lane to the South. The site is a large grassed area with mature trees located on the North and west sides. There is an asphalt roadway along the north of the building from 161st connecting to the parking lot on the west side of the school. Sidewalks are concrete and located around the building.	The site is in adequate condition.		3		No other Civil details provided				
STRUCTURE SUMMARY	The building is supported on concrete foundation walls over strip footings on the exterior perimeter and interior corridor walls. The second floor structure is a wood floor structure supported on wood stud framing and columns. The roof is wood joists supported on wood framing. The main floor is a concrete slab on grade.	The structure is in marginal condition. The building main and second floor is sloping towards the exterior wall at the west side of the building. The slab has cracked through the admin area and principals office. There is also a crack running parallel down the entire length of the main floor corridor. The area has many walls cracking throughout. Recommend a further investigation into the structural sloping and repair the work as required.		2	$472,200	Repair SOG (allowance)	951	m2	$497	$472,161
BUILDING ENVELOPE SUMMARY										
Building Envelope	Exterior walls are finished with cement stucco with some brick veneer on the chimney stack above the roof. The wood framed exterior walls have infill batt insulation and vapour barrier. The roofing is a SBS system that was installed in 1998.	The building envelope is in adequate condition.		3		See details below				
Roofing	2 Ply SBS Modified Bituminous membrane roofing was installed over the entire roof in 1998. Condition and thickness of vapour retarder and insulation is unknown.	There is evidence of ponding at numerous areas on the roof and the top membrane layer has bubbled in various places. The southwest corner membrane has folds along the parapet. Recommend replacing the roofing with a new SBS roofing system.		2	$231,900	Re-Roof	1,196	m2 GFA	$194	$231,875
Walls	Exterior and walls are load bearing wood framed walls with in-filled batt insulation and vapour barrier. Condition of vapour barrier and insulation unknown. The exterior finish is cement stucco.			3	$62,000	Selective repairs (allow 10% GFA)	190	m2 GFA	$328	$62,320
Windows	The building has aluminum windows with sealed glazing units installed in 1998.			3	$0	No scope required	1,901	m2 GFA	$0	$0
Exterior Doors/Openings	There are insulated steel framed storefront doors with sidelights and fixed glass panels at the entrances. The exterior utility doors are the original wood door and frame.	The wood utility doors are worn out and are a potential security concern. Recommend to replace them with a new insulated metal door and frame.	13 doors 3 doors	3 2	$24,000	Replace exterior doors	16	ea	$1,500	$24,000
Special Purpose Doors	There is a roof hatch accessed from a roof ladder located in the mechanical boiler room.			3	$0	No scope required	1,901	m2 GFA	$0	$0
Special Features	The top of the exterior walls overhang around the perimeter of the building.			3	$0	No scope required	1,901	m2 GFA	$0	$0
Envelope - Other	There are prefinished metal soffits located at the overhang at the top of the exterior walls.			3	$0	No scope required	1,901	m2 GFA	$0	$0

						TCCL				
System	**Description**	**Recommended Action Concerns**	**QTY/Area**	**Rating**	**Upgrade Replacement Cost**	Assumed Scope	QTY	Unit	Rate	Sub-Total Construction
BUILDING INTERIOR SUMMARY										
BUILDING INTERIOR SUMMARY	The interior has painted gypsum board walls throughout. Flooring is comprised of carpet and vinyl sheet flooring in the classrooms and corridors with quarry tile flooring in the student washrooms. Ceilings are suspended T-Bar systems in classrooms, corridors and admin areas with painted gypsum board ceilings in the storage, janitor, washroom's and vestibules.	The building interior is in adequate condition.		3		See details below				
Partitions	The interior partitions are painted gypsum board over wood framed walls on the main and second floor. The mechanical room has concrete walls.	Repair the damage to gypsum board walls caused by building sloping to west side of building.		3	$0	No scope required	1,901	m2 GFA	$0	$0
Interior Finshes	All gypsum board walls and ceilings are painted throughout. There is ceramic wall tile installed in the washrooms. The gym has wood wall paneling.			3 3 3		See details below				
Floors	The corridors, classrooms and partial administration areas have resilient sheet flooring. There is rubber sheet flooring in the vestibules and stairwells.	The resilient flooring is worn and faded. The slab cracking has damaged the flooring at specific locations. Recommend replacing the resilient flooring alongside structure repair work.	940 m2	2	$61,000	Replace Sheet Flooring	940	m2 GFA	$65	$61,100
	There is carpet flooring in portions of the administration area, janitor's office, library, music room and partial small areas in each classroom.	The carpet flooring is dated and worn. Recommend replacing the carpet with new.	520m2	2	$34,000	Replace Carpet Flooring	520	m2 GFA	$65	$33,800
	There is athletic wood strip flooring in the gym and stage area.		310m2	3	$54,000	Replace Gym Flooring	310	m2 GFA	$175	$54,250
	The student washroom's have quarry tile flooring		35m2	3	$4,000	Replace Tile Flooring	35	m2 GFA	$115	$4,025
	The storage rooms have original linoleum flooring and vinyl asbestos tile.	Recommend asbestos abatement to remove asbestos tile and replace with new.	30m2	2	$2,000	Replace Tile Flooring	30	m2 GFA	$65	$1,950
Walls	Painted gypsum board throughout.			3	$58,000	Replace all wall finishes (less finishes noted below)	1,901	m2 GFA	$30.63	$58,229
	Wood paneling installed in the gym walls.		110m2	3	$17,000	Replace Wood Paneling	110	m2 GFA	$150	$16,500
	The student washrooms have ceramic wall tiles.		30m2	3	$3,000	Replace Tile Flooring	30	m2 GFA	$115	$3,450
Ceilings	Vestibules, washrooms, janitor and storage rooms have painted gypsum board ceilings. Classrooms, corridors and administration area have suspended T-Bar system with acoustic ceiling tiles.		1275 m2	3 3	$96,000	Replace ceiling finishes in all areas	1,901	m2 GFA	$51	$96,048
Interior Opening	The administration area has painted metal storefront frames with single panel glazing			3	$60,000	Replace interior doors	1,901	m2 GFA	$32	$60,309
Furnishings & Equipment	Classrooms contain student desks, chairs, teacher desk and miscellaneous cabinets. The library contains desks, chairs and wood book storage shelves.			3	$0	Equipment funded separately Bookshelves included in Casework below				
Casework Items	The classrooms have painted plywood open and closed shelving units with plastic laminate countertops.	The millwork throughout is original and is worn and damaged throughout. Recommend replacing the existing millwork and countertops with new.	Classroom 66 m	2	$78,000	Millwork removal and replacement - Selective (allow 50% GFA)	951	m2 GFA	$82	$78,179
	There is a wood display case in the main floor corridor.		Display 2m	3						
	Plastic laminate over plywood vanities are installed throughout the washrooms.		Vanities 5m	3						
	Staff room has upper and lower kitchen cabinets with plastic laminate countertops.		Kitchen 10m	3						

System	Description	Recommended Action Concerns	QTY/Area	Rating	Upgrade Replacement Cost	TCCL Assumed Scope	QTY	Unit	Rate	Sub-Total Construction
Equipment items	Kitchen staff room has dishwasher, range, 2 fridges, and microwave ovens. There are stage curtains and tracks in in the gym stage area. The gym has wall mounted basketball nets, one of which is on a sliding track and miscellaneous athletic sporting equipment.			3 3 3	$0	Equipment funded separately				
Window treatments	The windows throughout have vertical blinds installed.			3	$0	No scope required				
Interior - Other	The music room has wood framed tiered seating platforms covered in carpet.			3	$0	No scope required				
BUILDING CODE	ABC Group A Division 2 – School. Refer to the building code analysis within this report for further details.				$0	Items noted throughout report				
BARRIER FREE					$19,000	Barrier Free Allowance	1,901	m2 GFA	$10	$19,010
DEMOLITION					$143,000	Demolition - Selective	1,901	m2 GFA	$75	$142,575
HAZARDOUS MATERIALS	Refer to HAZMAT review within this report.				$95,000	Hazmat (Allowance)	1,901	m2 GFA	$50	$95,050
									Sub-Total =	$1,514,829
MECHANICAL										
HEATING										
Heating Plant	Two RBI FUTERA III model MB0500, input 500,000Btu/hr high efficiency boilers installed in 2006. Each boiler fitted with Armstrong 1.5B, 2.71 l/s, ½ HP circulation pump.		2 boilers	3	$0	No scope required	1,901	m2 GFA	$0	$0
Terminal Heating Units and Distribution System	Hot water is distributed by inline pumps and piping to the finned tube radiation and heating units. There are wall mounted fan coil units at the buildings entrances and unit heaters in the mechanical room.		4 fan coil units 1 unit heater	3	$0	Included below	1,901	m2 GFA	$0	$0
VENTILATION AND AIR CONDITIONING										
Air Handling Units	There are two custom built air handling units on the roof. One services the main building with one main fan and four Lennox 160/120 MBH duct furnaces. The other services the gym with one main fan and two Modine model WDG, 300SF, input 300,000 Btu/hr duct heat exchangers.	The roof top units are custom with different components connected to one another. The connections have been a problem for water penetration and have been resealed over time. They are approaching the end of their lifespan and need to be replaced. Recommend replacing with two rooftop air conditioners as the classroom get a lot of sunshine making the teaching spaces uncomfortable.	2 units	2	$212,000	Terminal & Packaged Units	1,901	m2 GFA	$112	$212,199
Exhaust Fans	The building has inline and roof mounted dome exhausters.		8	3	$4,000	Exhaust Fans	8	ea	$450	$3,600
Duct Distribution, Grilles and Inlet/Outlets	Low velocity galvanized ductwork connects the air handling units to bar grilles throughout the building.			3	$0	No scope required	1,901	m2 GFA	$0	$0
Humidification	There is no humidification provided within the building.				$0	Included above	1,901	m2 GFA	$0	$0
Packaged Air Conditioning Units	There is no air conditioning units provided within the building.				$0	Included above	1,901	m2 GFA	$0	$0
BUILDING SYSTEM CONTROLS										
Energy Management Control Systems (EMCS)	Line voltage electric controls for the force flow heaters and unit heater. Pneumatic controls for the damper motors and valves. The compressor is a DeVilbiss simplex with ¾ HP motor.			3	$89,000	Instrumentataion & Controls Testing & Balancing	1,901	m2 GFA	$47	$89,347
PLUMBING SYSTEMS										
Domestic Hot Water	Takagi model T-K2 tankless gas water heater installed in 2006. It has a 240 gals/hr capacity with an input of 185,000 Btu/hr and an inline circulation pump.		1	3	$0	No scope required	1,901	m2 GFA	$0	$0

System	Description	Recommended Action Concerns	QTY/Area	Rating	Upgrade Replacement Cost	TCCL Assumed Scope	TCCL QTY	TCCL Unit	TCCL Rate	TCCL Sub-Total Construction
Plumbing Fixtures	Washrooms have stainless steel lavatories with push type metering valves. One washroom has a lever faucet. Urinals are floor mounted, recessed with flush valves. Water closets are floor mounted flush tank. There are single compartment stainless steel sinks in the classrooms and double compartment stainless steel sink in the staff kitchen. Floor mounted mop sinks installed in the janitor's rooms. Non refrigerated vitreous china drinking fountain installed in the corridor.		10 4 11 12 3 1	3 3 3 3 3 3	$63,000	Fixtures	1,901	m2 GFA	$33	$62,543
Domestic Water Piping, Valves and Insulation	There is an insulated piping system with quarter turn ball isolation valves and gate valves that connect to various plumbing fixtures.		30 valves	3	$34,000	Domestic Water Distribution	1,901	m2 GFA	$18	$33,505
Sanitary and Vent Piping Systems	The piping is cast iron throughout and the vent piping is cast iron and copper.			3	$34,000	Sanitary and Vent Piping Systems	1,901	m2 GFA	$18	$33,505
Storm Piping System	Conventional roof drains with cast iron dome strainers connect to cast iron roof drainage piping. The piping connects to the municipal mains below grade.			3	$29,000	Storm Piping System	1,901	m2 GFA	$15	$29,038
Domestic Water Service	The piping is copper with soldered fitting throughout. The domestic water service has a Watts reduced pressure backflow preventer. There is a Wilkins backflow preventer on the janitorial sink and an Ames backflow preventer on the fire system.			3	$0	No scope required				
Natural Gas Service	The natural gas meter is located outside at the mechanical room with schedule 40 steel gas piping to the mechanical appliances.			3	$0	No scope required				
FIRE PROTECTION SYSTEMS										
Wet Protection Systems	There is a fire hose cabinet located in the main floor corridor and in the second floor corridor. The building is not sprinklered.			3	$0 $171,000	No scope required Sprinklers (if required)	1,901 1,901	m2 GFA m2 GFA	$0 $90	$0 $171,090
Fire Extinguishers and Cabinets	ABC fire extinguishers are installed on wall hooks and in fire house cabinets.			3	$0	No scope required	0	ea	$750	$0
									Sub-Total =	$634,827

ELECTRICAL										
BUILDING ELECTRICAL POWER DISTRIBUTION										
Service Entry	Incoming service is 600 amp, 120/240V, 1 phase obtained from a utility owned pad mounted transformer on the west side of the property. Underground feeders to a Square 'D' main distribution panel. 600A main breaker and feeder breaker distribution centre. It was installed in 1998. A surge suppression system has been provided.		1	3	$0	No scope required	1,901	m2 GFA	$0	$0
Sub- panels, Conduit and Wireways	120/240V branch circuit panels installed in service rooms. They are approx. 80% full. They were installed in 1998.		9 panels	3						
Appliances / Receptacles	Power receptacles installed throughout the building.			3						
Gounding and Static Control	Building Ground.			3						

System	Description	Recommended Action Concerns	QTY/Area	Rating	Upgrade Replacement Cost	TCCL Assumed Scope	TCCL QTY	TCCL Unit	TCCL Rate	TCCL Sub-Total Construction
LIGHTING										
Building Exterior	There is exterior metal halide wall mounted fixtures installed along the perimeter of the building. They are on a photocell control.			3	$0	No scope required	0	ea	$250	$0
Building Interior	Interior fluorescent fixtures with T8 lamps and electronic ballasts. They were installed in 1998.		300	3	$0	No scope required	1,901	m2 GFA	$0	$0
Exit/Emergency Lighting	Emergency battery packs with remote heads throughout the building. Paths of egress are adequately illuminated.		8	3	$0	No scope required	1,901	m2 GFA	$0	$0
EMERGENCY SYSTEMS										
Detection and Fire Alarm	Edwards System Technologies Quick Start fire alarm panel in the server room. The remote annunciator panel is located at the main entrance. There are 9 zones in the building. The signal devices are bell/strobe units.		1901m2	3	$0	No scope required	1,901	m2 GFA	$0	$0
Security	Magnum Alert 3000 security system with PIR motion sensors and door contacts.			3	$0	No scope required	1,901	m2 GFA	$0	$0
COMMUNICATIONS										
Telephone Systems	Nortel Networks Meridian telephone system. It is located in the server room.			3	$0	No scope required	1,901	m2 GFA	$0	$0
TV/Computer (LAN)	Main network rack mounted patch panels and switches are located in the server room. Data outlets are provided in the administration area and each classroom with Cat 5 cable.			3	$0	No scope required	1,901	m2 GFA	$0	$0
Intercom/Public Address (PA)	Bogen TPU 1008, 100 watt paging amplifier that is interfaced with the telephone system. Speakers are located throughout the school and telephone sets are provided in each classroom.			3	$0	No scope required	1,901	m2 GFA	$0	$0
Clock and Program Systems	120V and battery operated clocks			3	$0	No scope required	1,901	m2 GFA	$0	$0
Communications - other					$0	No scope required	1,901	m2 GFA	$0	$0
									Sub-Total =	$0

CIVIL	
SITE GRADING AND PAVEMENT STRUCTURES - NO COMMENTS PROVIDED	
	Sub-Total = $0

$2,150,000					$2,150,000