

Excerpt – Pre-Design Report



EAI project no.
219115

etude architects inc.

Building Addition | Feasibility Study

McKee Public School

35 Church Ave., North York, ON

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1. Introduction

1.1. Objective

The objective of this report is to prepare a plan for future expansion at McKee Public School in consideration of a 3 Classroom Addition proposed at this site by TDSB. In doing so, the report will elucidate the most practical solutions for developing an approach to meeting the Board's requirements.

Etude Architects' site survey started on August 13th, 2019 in order to review the current conditions and gather the required information to prepare this report. The survey includes digital photographs and visual observations.

To assess the current Mechanical and Electrical conditions the site was surveyed by Suri and Associates Ltd. The Mechanical and Electrical design briefs can be found in appendix A of this report.

The Building & Site Condition Assessment Report provides a basis for decision making on additions and infrastructure system upgrades and a Rough Order of Magnitude for estimated expenditure required to construct the proposed addition.

1.2 Methodology

Visual survey was carried out on the interior and exterior of the school building. Testing or other invasive methods were not employed.

Assessments were focused on the existing site and building condition. Documents of previous assessments and available Archive drawings were provided by TDSB and are referenced in the preparation of this report.



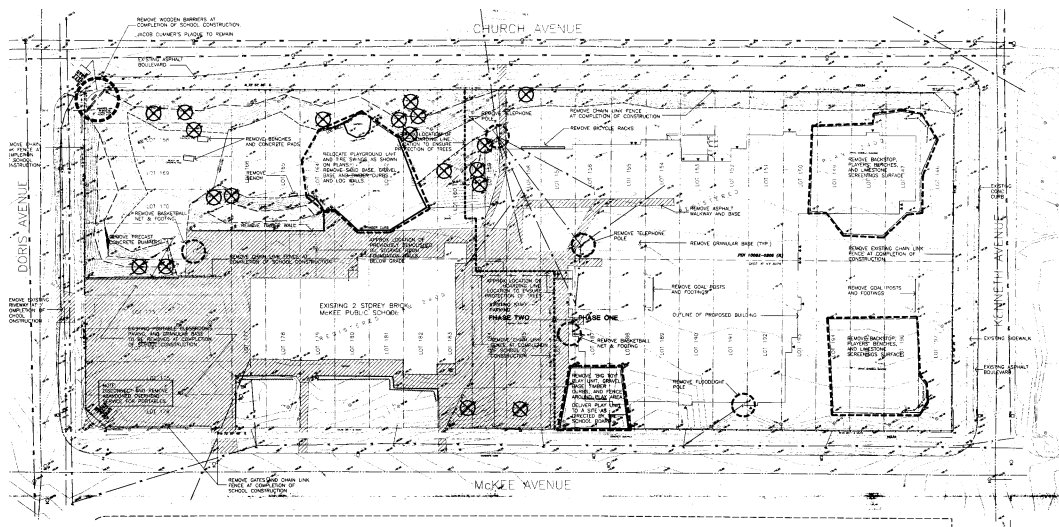
McKee Public School- Existing Building

All associated construction repair and replacement cost opinions are rough estimated based on similar projects values.



1.3 Building Description

The school is located at 35 Church Ave., North York, Ontario. McKee Public School is a two-story building with a total GFA of approximately 4515 m2. The school property is bounded by Kenneth Ave., Church Ave., McKee Ave., and Doris Ave. The school building is located to the East of the site with playground and parking to the West.



TDSB Archive Information- Original Bldg. Replaced with New- 1998

The original McKee Public School was built in 1927 and replaced with a new facility on the same site in 1998. The current school building serves over 750 students from JK to Grade 5 along the Yonge & Sheppard development corridor. The school received an addition in 2015, designed by Etude Architects Inc., to accommodate 2 new classrooms. During that addition work Etude also studied areas of the school for further future expansion. Adding a second story on top of the new classrooms was identified at that time as the most opportune candidate location for future expansion.

Photos of exterior elevations:



North- West Facade- Gymnasium & Parking Access



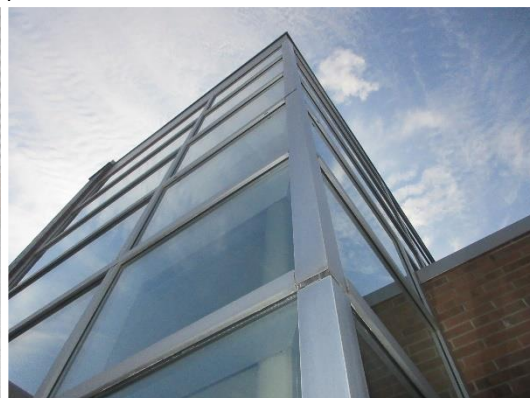
North Facade- Main Entrance & Pick up/ Drop off Loop



North Facade –Receiving doors & Fire route



North Façade- Fire Department Connection



Alum. Curtain Walls & Doors- Minor damages & gaps between pressure caps



North Façade- Child Care Classrooms



East Façade- Child Care Entrance



East Façade- Kindergarten play area





South façade- Child Care & Regular Classrooms



South-West corner- 2015 Addition area

2.0 Site Information

2.1. Zoning information

Existing zoning: Undefined as per City of Toronto By-Law 569-2013
Former City of North York By-Law No. 7625

2.2 Site and Site services

Site servicing was not evaluated as part of this study. HVAC Pumps, Natural Gas DWH Renewal, Emergency Lighting & Power, & PA system are indicated by TDSB Facility Condition Index Report as requiring Urgent repair/ renewal.

2.3 Vehicular/Pedestrian Access

The school is located just off of the Yonge Street corridor via Church Avenue. McKee Avenue to the South of the site does not continue through to Yonge and therefore acts as a traffic calming zone. Bus loading is established along McKee Ave. for this reason.



Bus loading zone signage along McKee Ave.

There is one vehicular access to the site from Church Ave. that establishes the parking lot as well as a pickup/ drop off loop. The pick-up and drop off loop are also the fire route complete with fire department connection next to the main entrance and receiving room.



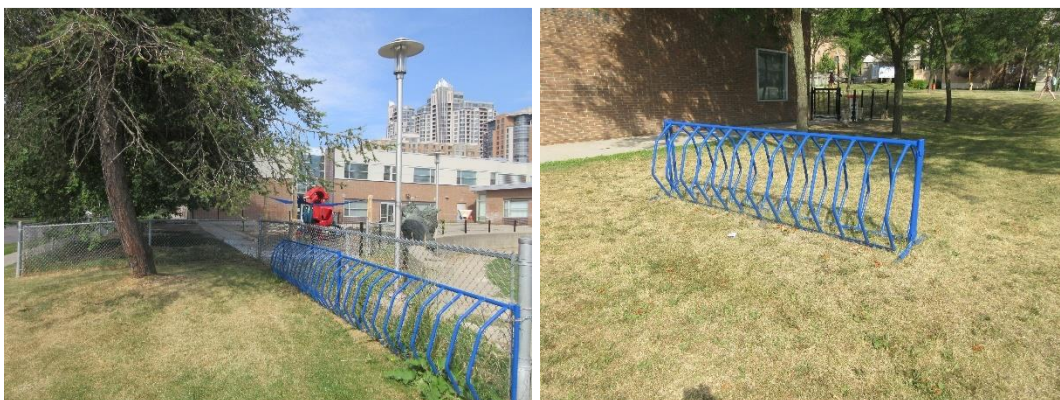
Parking lot and drop off loop off of Church Ave.

A number of portable classrooms currently reside in a large portion of the existing parking lot and garbage bins are left on an elevated curb area next to B.F. parking spaces.



4 Portables at West end of Parking lot- Church Ave.

The site is bordered by sidewalks at all boundaries with minimal grade changes throughout the site. Bike parking racks can be found in various locations around the site. Preliminary study of the site itself suggests that there is not a single main entry point for pedestrian traffic and that the site is accessed regularly from all sides. A recently renovated play field is covered in artificial grass with asphalt walkways connecting through the site. Play structure and bench areas utilize wood chip ground cover as an alternative soft surfacing material. The site appears to have undergone a large renovation within the last 5 years and is in good condition.



Bike racks noted near all pedestrian access points into the site

2.4 Perimeter fencing

The property is enclosed with chain link fence at all boundaries. In general, the fence is in a good condition. Child Care outdoor play areas are fenced with a black chain-link. A number of areas utilize large cut stone and/or cast-in-place concrete knee walls as interior barriers to delineate play areas.



Chain-link fencing utilized throughout site



Cut stone or Cast-in-place concrete knee walls within play areas

2.5 Fire Route:

There is currently no posted Fire Route signage at the school but the main Siamese connection is along the North (Church Ave.) façade of the building. Condition of the Asphalt for both existing parking lots and the existing paved play area is in good condition. There are multiple fire hydrants located along the school property and on adjacent streets:

- Church Ave.- 3 Hydrants along opposite side of road
- Kenneth Ave.- 0 Hydrants recorded
- McKee Ave.- 2 Hydrants on school property side
- Dorris Ave.- 1 Hydrant on school property side



Church Ave. hydrants



McKee Ave. hydrants



Dorris Ave. hydrant

2.6 Garbage Enclosure:

There is no Garbage bin Enclosure at the site. The 2 garbage bins are stored on an elevated curb in the existing parking lot next to the accessible parking spots. The garbage bins are visible from the street and located in close proximity to receiving room doors. A garbage bin enclosure may be required by City of Toronto as part of a SPA process.

2.7 Site Lighting

2 different types of wall mounted light sconces were noted to be mounted throughout the perimeter of the building. Some wall mounted sconces were noted to be damaged but most appear to be in good condition. Light standards line the perimeter of the Kindergarten play area and main parking lot leading up to the main entrance. City owned street lights also line all streets bounding the property. Etude's site visit was performed during the day and therefore cannot confirm if all sconces and light standards are in operation at the site.



2 different types of wall sconce fixtures found at the site



Light standards in Kindergarten play area and parking lot

2.8 Barrier free accessibility

The building is barrier free accessible. All exterior doors exit at grade onto a flat and level surface. There are no ramps or lifts at the exterior of the site due to the relatively uniform site grade. There is an existing elevator in the building that provides access to the 2nd floor.



Exterior doors exit at grade onto flat level pathways

Automatic door operators were noted at exit No.1, 5, & 8. Two Barrier free parking spaces are located in the West parking lot near the school's main entrance utilize curb cuts and low slope pathways to establish a barrier free path of travel to the main school doors (entrance No.1). The garbage bins being located directly next to barrier free parking space no.2 does not appear to hinder the space.



B.F. Parking spaces

Portables configured in the West parking lot are not barrier free accessible. A wood staircase is the main entry and access point into the portable area and the portables themselves are not accessible.



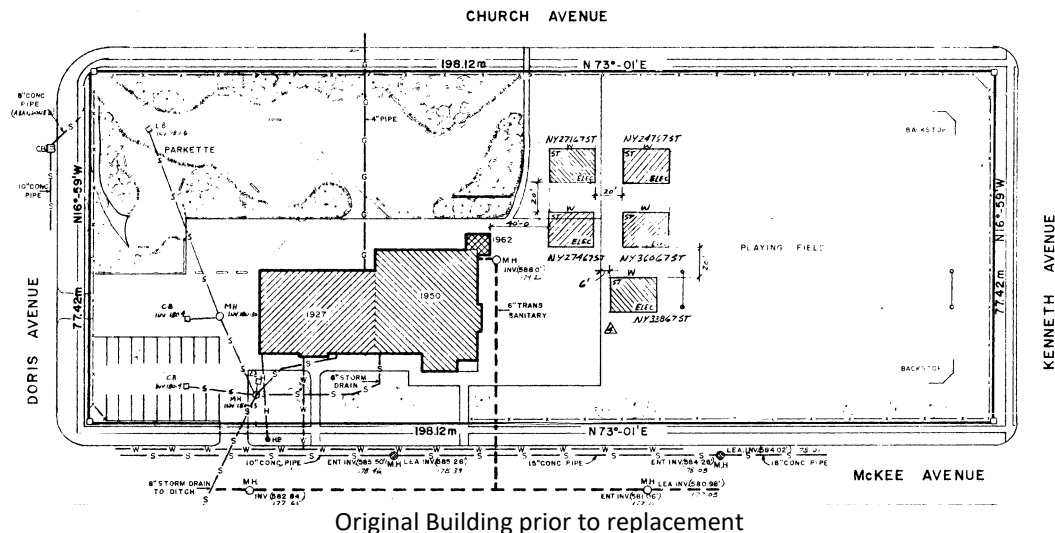
Portable Classrooms not accessible

3.0 Existing Building Conditions:

Visual survey was carried out for the existing condition of the interior and exterior of the facility. Invasive forms of investigation were not conducted, unless otherwise mentioned in the report.

3.1 Existing Building Composition:

The building on site is a replacement school opened in 1998 in place of the original 1927 facility. The existing building is a two-story masonry structure with no basement.



Given the age of the building, reliable archive information was made readily available for review of the building's construction type and detailing. The existing building utilizes load bearing concrete masonry units supporting metal roof deck with steel reinforcing for OWSJ, lintels, beams, and columns, where required. Brick masonry and stucco combined with aluminum doors, windows, and curtain walls in a rain screen assembly to develop the aesthetic & envelope of the building.

Exterior Finishes Conditions:

General Condition- The exterior building components that comprise the existing building were found to be generally in a good condition. A number of items are reaching the point where they may require remedial work performed.

- **Brick Masonry** finish is generally in a good condition. Etude did not find evidence of previous brick repair works being performed throughout the building facades. Areas where brick masonry meet or are close to grade are beginning to show signs of deterioration and spalling. Although deterioration noted was not found to be critical at this juncture this condition will progress over time. A number of masonry corners and joints were noted to be chipped and damaged which is accounted to normal wear and tear of the building over the course of its life. This deterioration was not noted to be critical or in need of action performed at the present time.
- **Stucco Finishes** are limited to areas high above grade under soffits. Etude was unable to closely review these finishes but from grade they appear to be in good overall condition. No visible damages or deterioration were noted.
- **Aluminum Doors & Frames** are beginning to discolor from the use of salt at grade but are otherwise in good condition. No noted damages or deterioration beyond some discoloration at grade.

- **Aluminum Punch Windows** are in good condition throughout the building. Caulking joints and sealant as well as aluminum sills and capping are all noted to be in good condition.
- **Aluminum Curtain Walls** are generally in a good condition although Etude did note a number of locations where aluminum pressure caps and trims have become separated with large gaps. These systems should be reviewed for potential maintenance and sealant.
- **Roof, Skylights, & Light wells** appear to be in a good condition. Etude was unable to access roof areas for more detailed review
- **Exposed Steel Beams & Columns** exposed steel beams and columns above windows and being utilized as window surrounds are in a good condition but have begun to cause some minor brick masonry spalling at edge locations. Sealant and flashing joints should be reviewed as a maintenance item to deter any further deteriorations at the site.

Interior Finishes Conditions:

General condition- The general overall condition of interior finishes at the school is good.

- **Walls & Ceilings-** CMU partition walls and a mix of gypsum board ceilings and T-bar acoustic ceilings appear to be in overall good condition.
- **Floors-** VCT flooring & Rubber base as well as rolled sheet flooring is in a good overall condition.
- **Millwork-** Millworks appear to be in a good overall condition.

Photos of Existing Building-Conditions:



Brick conditions- deterioration/ damage at grade



Brick conditions- chipping at corner joints



Concrete Walkways settled in a number of areas



Damage and gaps have developed in a number of locations throughout curtain wall areas



Staining/rust at grade- Aluminum doors & steel columns



Exposed steel columns & Beams as window surrounds



Damaged flashing at grade

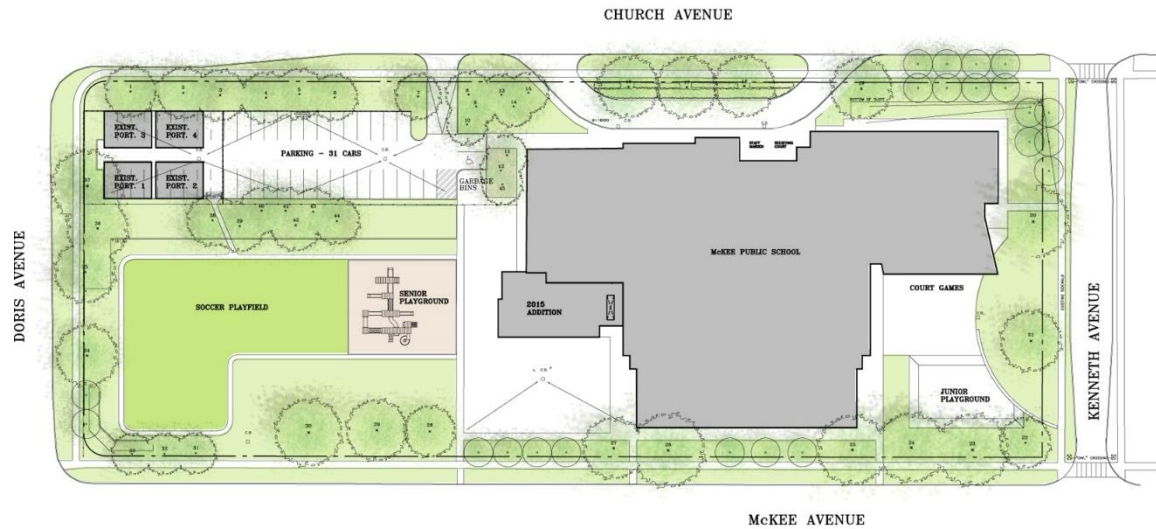


Stucco finishes at second floor in good condition



Aluminum windows in good condition

4.0 Locating the proposed Classroom addition



Existing Site Plan

4.1 3 Classroom Addition

The existing school is located at the East end of the site and spans from South setback to North setback with a very limited outdoor play area to the West end of the site. With the limited area of available outdoor soft and hard play surface a key consideration for the proposed addition is maintaining the existing outdoor play space. In 2013, Etude designed a 2-Classroom addition (completed 2014) at McKee PS with future expansion in mind. The roof of the addition is identified as one of the most advantageous locations for the proposed addition as impact on the site will be minimal. The 2013 addition complements the existing building and provides an opportunity to integrate the new 3 Classroom proposal with similar design language:

- Provide 3 additional classrooms to account for growth of student population
- Maintain as much of the existing outdoor play area as possible
- Minimize at grade land consumption
- Minimal impact to daily operation of the school
- Explore alternatives for tying the proposed addition into the existing school.
- Develop a design schematic that complements the character of the existing school

4.2 Building Expansion and Design Alternatives

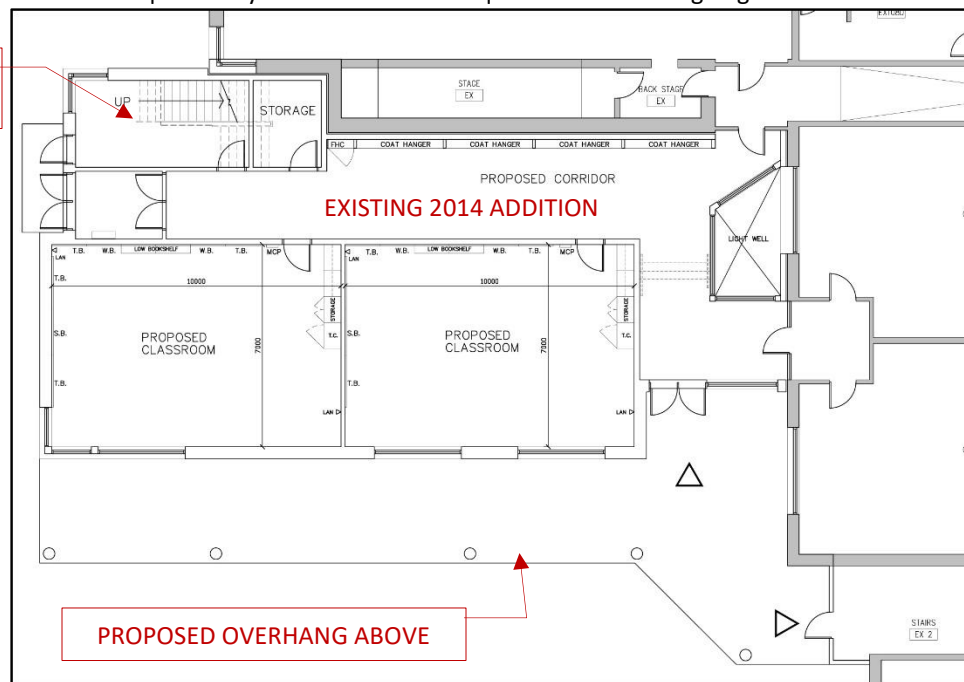
Two different layouts of the addition are studied with the main focal point being how the addition will tie into the existing building. Both options are located above the existing 2 Classroom addition from 2015. These 2 classrooms would likely be un-occupiable during construction potentially requiring 2 portable classrooms be temporarily located at the site during construction.

The first design option would connect through an existing exit staircase. This staircase would need to be reworked to facilitate the connection. The second option will be to connect through an existing services room. This room is densely populated with mechanical and electrical equipment that may require extensive reworking in order to facilitate the addition connection at this location.

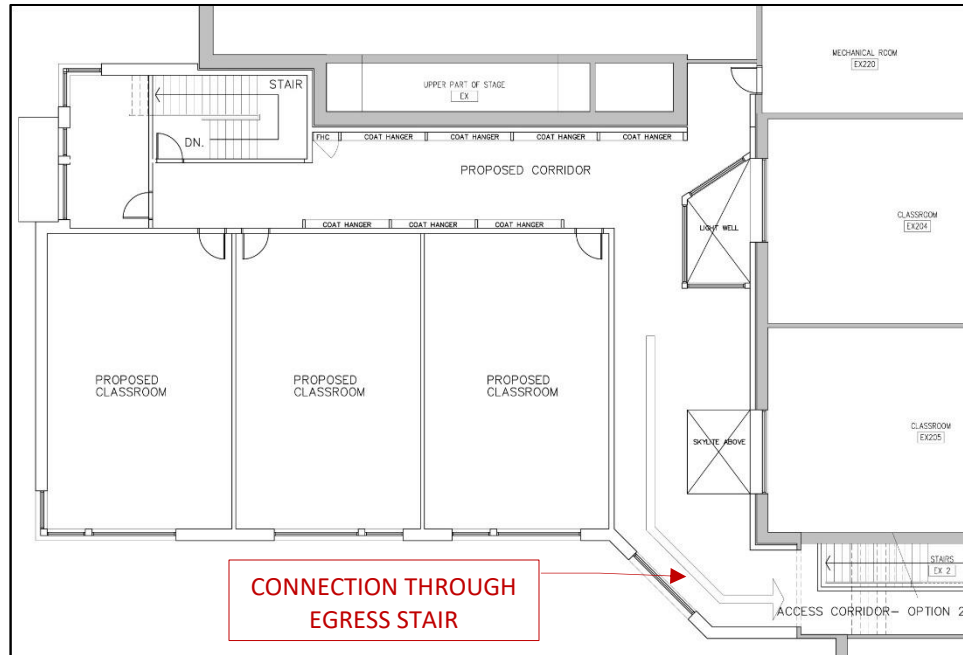
A second story 3 classroom addition will be constructed above the existing Classrooms 99 and 100. The cantilever of the Classrooms may require structural columns at grade. The proposed Classrooms are designed as per TDSB design guidelines and provincial bench-mark standards. A new corridor extends from the proposed classrooms to the existing 2nd floor corridor through an existing egress staircase. The expected modifications to the existing building are as follows:

-
- The site plan for McKee Public School shows the following features:
- Streets:** Church Avenue (top), McKee Avenue (bottom), Doris Avenue (left), and Kenneth Avenue (right).
 - Building:** McKee Public School building with a proposed end floor addition highlighted in yellow.
 - Parking:** A parking lot labeled "PARKING - 31 CARS" with four existing port areas (EXIST. PORT. 1, 2, 3, 4).
 - Playgrounds:** A soccer playfield, a senior playground, and a junior playground.
 - Courts:** Court games area.
 - Landscaping:** Numerous trees and green spaces surrounding the building and parking lot.
 - Other Features:** A "CLARKSON BENS" area near the parking lot and a "JUNIOR PLAYGROUND" near the court games area.

CONVERT TO
STAIRCASE



Alt 1 | Existing Ground Floor | + Columns and Overhang



Alt 1 | 2nd floor | Connection through Egress Stair



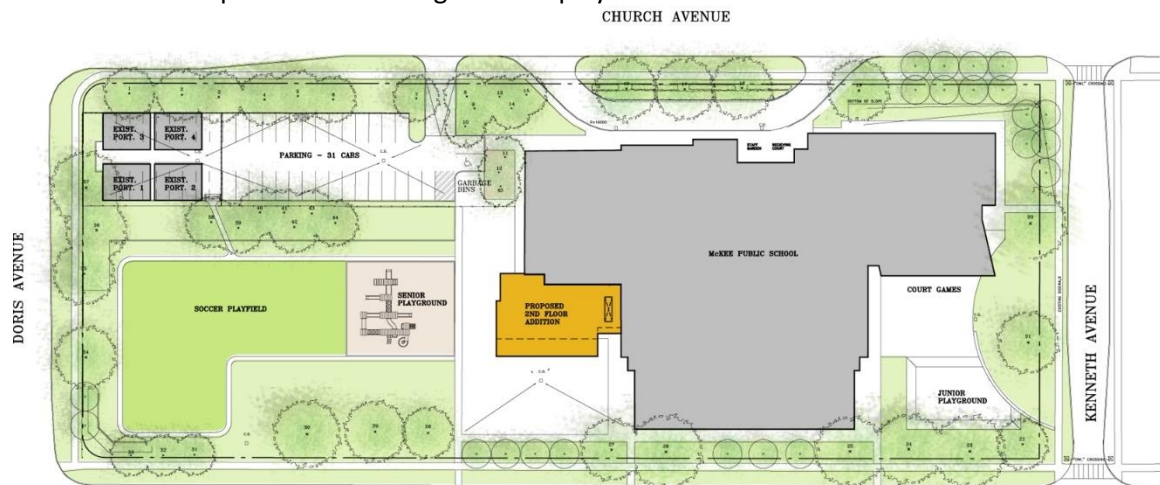
Alt 1 | Perspective sketch from McKee Ave.

4.4 Alternative 2: New Egress Stair, Rework exist. M&E room, 3 Classrooms on 2nd floor

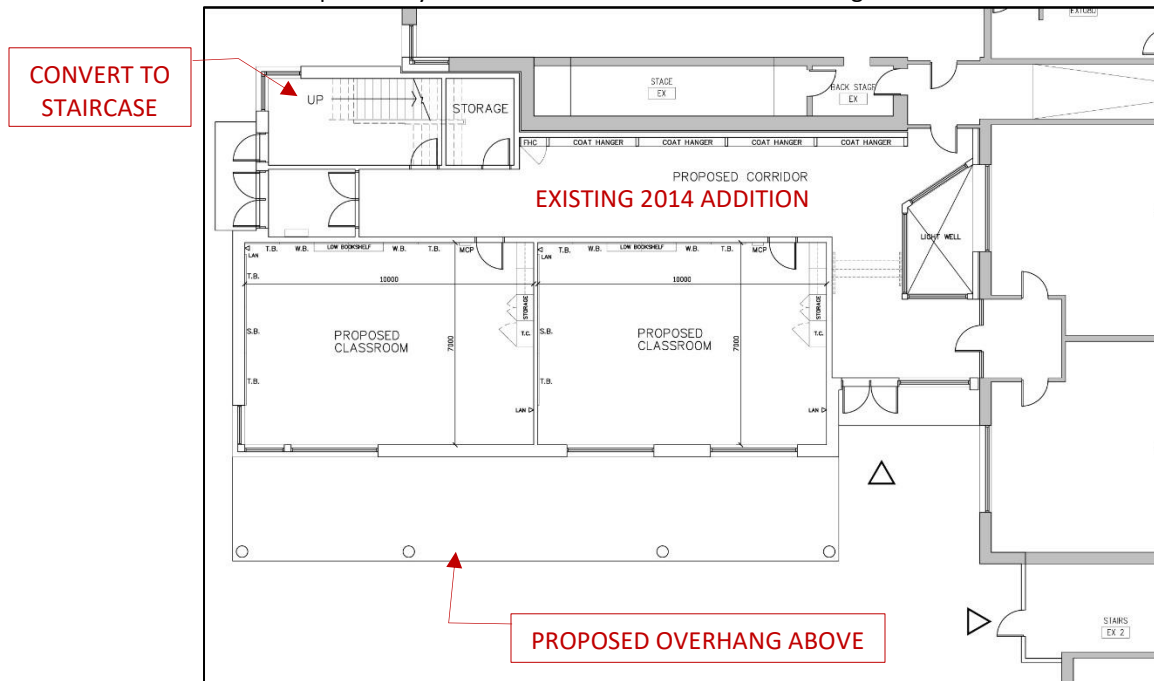
This alternative mirrors alternative No.1 in all aspects except for the connection to the existing building. Instead of connecting through the existing egress stairs, alternative No.2 connects through an existing mechanical/ electrical services room.

Mechanical Room adjacent to Classroom 204 will be re-worked to allow for a corridor passthrough to be carved out of the space and provide access to and from the proposed addition. The equipment housed in this mechanical room is extensive and space is already limited. Re-arranging equipment and services may be challenging. The expected modifications to the existing building are as follows:

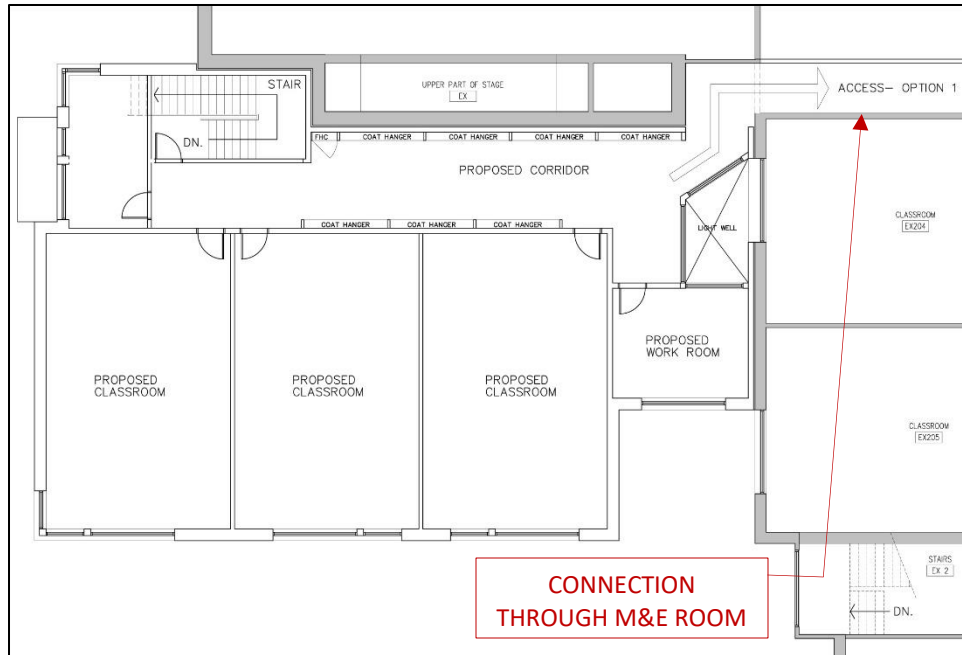
- 1 existing ESL room will be converted into an egress staircase
- 1 existing mechanical/ electrical service room will be modified to allow access to the addition- refer to M&E report
- Space is limited
- Potential modifications required to multiple services & equipment systems
- Minimal impact to the existing outdoor play areas



Alt 2 | 2nd Story Classroom Addition- Connection through Mechanical Room



Alt 2 | Existing Ground Floor | + Columns & Overhang



Alt 2 | 2nd Floor | Connection through Mechanical Room



Alt 2 | Perspective sketch from McKee Ave.

5.0 Rough Order of Magnitude Estimate of Construction Cost for Alternatives

Due to many unknown factors that will be studied and addressed during project design process, we were not able to prepare a construction cost estimate.

6.0 General requirements applicable to all alternatives

6.1 Ontario Building Code requirements

If the new addition is considered as an extension to the existing building, the addition and the existing building could be classified as **3.2.2.31. Group A, Division 2, up to 2 story, increased area, Sprinklered.**

The entire building in alternatives No.1 & 2 are to be sprinklered. The Fire Alarm system will be extended from the existing building to the proposed addition and updated as required.

6.2 Applicable zoning by-law requirements

Parking at the site is very limited. A number of portables consume valuable parking spaces that can be alleviated by the Classroom additions and removal of existing portables at the site.



McKee Public School- Limited Parking Area Available

The school property is represented in City of Toronto Interactive Zoning Maps as being zoned under the former North York by-law 7625 in the Willowdale Ward (18).

As a second story addition the proposal will have minimal increase to the lot coverage. Therefore, at this time Etude does not consider lot coverage a critical issue for either of the proposed alternatives.

6.3 Archeological Study

A narrow sliver of the property along the West is indicated as the lands with Archeological potential in City of Toronto Interactive Maps. This distinction will not affect the proposed addition work.



City of Toronto- Interactive Maps- Archeological Area- No significant impact

6.4 TRCA requirements

A preliminary review of the City of Toronto interactive maps indicates that school property is not regulated by TRCA.



City of Toronto- Interactive Maps- Site not regulated by TRCA

7.0 Conclusion:

A general assessment of the existing facility is prepared and the future expansion alternatives are studied. Two alternatives are proposed considering the layout and location of the proposed expansion as well as opportunities to tie the addition into the existing building. A Rough Order of Magnitude is provided as a reference for each alternative's feasibility.

7.1 Design Principles:

The following principles are considered in preparing the layouts of all alternatives:

- Support community's educational requirements with a balanced increase to the built area on the school property.
- Adapt building to the existing landscape and minimize extreme changes to the topography.
- Create a safe, secure and accessible building.
- Develop and build upon the architectural character of the existing school building.
- Complement and enhance the outdoor play area spaces.
- Comply with the OBC and AODA, requirements.
- Minimize increase of the building footprint and lot coverage by forming the future expansion in proper relation with surrounding landscape and existing school building.
- Minimize disruption to the existing school operations during the construction.

7.2 Design Alternatives' Comparison:

Given the constraints of the site, Etude believes that the best option for additional Classrooms is at the second-floor level. The 2014 addition storage room was designed with the intention of being converted to an egress staircase in the event that a second story were ever to be required at the site. This provision affords a low impact point of integration in both alternatives presented above. The two alternatives portrayed in this report look at addressing the connection between proposed addition and existing building in different ways.

Alternative 1 will impact 1 existing egress staircase. Rebuilding the exit and staircase to allow a walkway through and egress out of the building. This is likely the least invasive option and creates an integrated spatial relationship between addition and existing school. The proposal reimagines one of the main access points to the school and looks to embolden its presence on the site while maintaining functionality and outdoor play space.

Alternative 2 requires alterations to various mechanical and electrical services and systems in order to create the pass-through corridor from addition to existing. These modifications are more challenging to assess in terms of extent and impact. This proposal does still create a meaningful impact on one of the school's main entrance points but is more subdued in nature. This alternative is meant to tuck into the existing building. Complimenting the existing and fully integrating with it.

7.3 Proposed roadmap:

The provided alternative design options are schematic in nature. It is Etude's opinion that the proposed location and two methods of tying the addition into the existing building are the feasible options at this site given the constraints listed above. The roadmap for this project is therefore to determine a methodology for connecting, finalize schematic designs, and pursue permits with the city which will likely include Site Plan Approval and Zoning Certificate application in addition to building permits.



**Appendix
Mechanical/
Electrical Report**

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**MCKEE PUBLIC SCHOOL
TORONTO DISTRICT SCHOOL BOARD**

CLASSROOM ADDITION

**35 CHURCH AVENUE
NORTH YORK, ONTARIO. M2N 6X6**

MECHANICAL & ELECTRICAL DESIGN BRIEF

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1.0 General

This design brief represents an evaluation of the existing mechanical and electrical systems at **McKee Public School** located at 35 Church Avenue in Toronto, Ontario and an assessment of their suitability to serve a new three Classroom Addition to the existing building. The School currently serves students from Junior Kindergarten to Grade 5. Additional information is presented to suggest new systems and equipment that will be required to accommodate the Addition.

The original building of the School was first opened around 1998. The building has since undergone one single storey, two classroom addition completed in 2014. The existing building (including the 2014 addition) has a GFA of approximately 7,543 m². Over the years, there have been various smaller renovations that have taken place that have made minor revisions to the original mechanical and electrical systems.

The evaluation presented herein is based on our general site investigation, interview with the Caretaking staff and a review of the available archive drawings. The evaluation was strictly visual; no tests or measurements were taken and no building services embedded in walls, slabs, located underground or otherwise concealed were examined. The intent of this design brief is to provide information to the Toronto District School Board to assist in developing a Business Case to the Ministry for funding request. The information reflected in this Brief is Suri's best judgment in light of the information available at the time of preparation. Any use which a third party makes of this report, or any reliance on decisions to be made based on it, are the responsibility of such third parties. Suri accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

2.0 Executive Summary

The design brief provides a high-level overview of what upgrades to existing mechanical and electrical building services and systems will be required to accommodate a new Classroom Addition, along with interior modifications to accommodate the addition, at McKee Public School.

Electrically, no major upgrades are anticipated to the existing electrical systems at the School to accommodate the addition. The additional load demand anticipated from the Addition can be sufficiently supported by the existing electrical service at the School. The public address system can accommodate the new zones for the addition. The fire alarm system will also be able to support the new addition.

Mechanically, no major upgrades are anticipated to the existing mechanical systems at the School to accommodate the addition. The new heating for the addition can be supported by the existing heating plant at the School. Ventilation and air conditioning for the new addition will be a new independent system serving just the new spaces. The existing plumbing, drainage, fire protection and BAS systems are to be extended to the new addition as required.

3.0 Description of Electrical Systems in the Existing School

3.1 Electrical Service & Systems

The School has an existing 1200A (trip set to 750A as per Archive Drawings), 347/600V, 3 Phase, 4 Wire main electrical service serving the entire School. There is a single electrical service at the School. The main switchboard of 'Siemens' make is located in the Main Electrical Room on the Second Floor. There is a hydro vault inside the school with a 600 KVA transformer serving the School.

Upon review of the available electrical data for the School, the peak demand KVA for the School for the last 60 months was 380.64 KVA.

There are electrical panels throughout the School serving the various lighting and power loads within the vicinity.

3.2 Emergency Power

The School is equipped with an inverter for emergency power. The inverter provides backup power for the emergency lighting throughout the School. The School has a few battery units and normally-off remote heads installed strategically located throughout the School to provide egress lighting for select areas (such as the Mechanical Room and the 2014 Addition) in the case of a power outage. The fire alarm system is equipped with backup power means.

3.3 Fire Alarm System

The School is served by a fire alarm system of Simplex 4100 make and model. The fire alarm panel system appears to be from the original construction. Fire alarm coverage throughout the School largely matches that of an older school construction compliant to old code requirements and is not as per current code requirements. For example, strobes are not located throughout. The fire alarm panel is located in the Main Electrical Room on the Second Floor.

Manual pull stations are installed at exits from the building. Initiating devices, such as smoke detectors, are installed throughout the School. Audible signal devices (horns) are installed in corridors only and a few select rooms. There is an annunciator installed at the Main Entrance to the School.

3.4 Lighting Systems

The School has fluorescent fixtures with T8 lamps throughout. Fixture types, sizes and mounting configurations vary throughout the School. Lighting control is

achieved using wall-mounted light switches. No occupancy sensors were observed throughout the School. The exterior lighting consists of wall-mounted and pole-mounted light fixtures.

Exit signs are of red 'EXIT' type and are connected to the Inverter Set. Except in a few select areas where remote heads are installed strategically throughout egress paths to provide egress lighting and connected to the battery units, the inverter is providing backup power to select light fixtures throughout the egress routes for emergency lighting.

3.5 Public Address System

The School is currently served by a conventional, public address system with speakers and call switches located throughout the School. The main public address system rack is located within the Main Office and is of 'Dukane MCS350' make and model.

Typical classrooms and offices are equipped with speakers and call switches to permit two-way communication with the Main Office only. The School does not currently have handsets capable of room-to-room calling.

3.6 Data/Voice System

The Hub Room is located on the Ground Floor across from the Sprinkler Room. It provides the data terminations for all data drops throughout the School. Wireless access points have been added over the years to provide WiFi throughout the School.

3.7 Security System

The School has an existing Intrusion Alarm System and Door Access Control System complete with Control Panels and field devices installed throughout the School.

3.8 Clock System

There is no existing central master clock system serving the School. There are battery-operated clocks throughout the School.

4.0 Description of Mechanical Systems in Existing School

4.1 Ventilation System

The means of ventilation for the existing School consists of:

1. Five indoor air handling units serving the Original School.
2. Unit ventilators in the two classrooms added in the 2014 Addition.
3. Rooftop exhaust fans serving washrooms, change rooms and other spaces.

All of the existing ventilation systems and equipment appears to be from the original construction and in operation.

4.2 Heating/Cooling System

The existing School is equipped with three (3), hot water heating boilers (B-1, B-2 and B-3) of Patterson-Kelley Co. make. All three (3) boilers are located in the Second Floor Mechanical Room. Each boiler has a maximum input of 1,500 MBH and maximum output of 1,275 MBH. The piping configuration is that of a primary-secondary system. There are two primary pumps and four secondary pumps. One secondary loop provides hot water to all perimeter convectors and forced flow heaters throughout the school. There is a second secondary loop provide glycol to the heating coils in the air handling units and unit heaters. Heating throughout all spaces is via fin-tube convectors located within the respective rooms. All areas are equipped with local thermostats for local temperature control. Areas subject to large amounts of infiltration are equipped with forced flow heaters.

The existing school is equipped with a central rooftop, air-cooled chiller which provides chilled water to all five indoor air handling units. The chiller was replaced with 2014. The school is fully air-conditioned with terminal units in each zone to provide zone temperature control.

There is a humidification boiler (B-4) that is not longer in service.

4.3 Gas Service

There is a main incoming high-pressure gas line to the School from the street. The gas meter assembly is located adjacent to Entrance 2 leading to the corridor serving the Caretaker's Office. The existing gas meter has a capacity of 7,000 CFH. Downstream of the gas meter assembly, gas is distributed to the three heating boilers, one humidification boiler and the domestic hot water tank.

4.4 Fire Protection System

The existing School is fully sprinklered. There are no existing fire hose cabinets in the School. The main incoming fire line is 6" in size and stubs up through the floor in the Corridor outside the Caretaker's Office. The sprinkler tree is located in the Sprinkler Room by the Hydro Vault.

4.5 Plumbing & Drainage System

Based on archive information, the School has a 4" domestic cold water service which stubs up through the floor in the Corridor outside the Caretaker's Office. The water meter is located in the Sprinkler Room. There is a 6" sanitary main that serves the entire school and exits the building by Entrance 5A. The storm drainage serving the original school exits the building through Classroom 103. A separate storm line is serving the 2014 Addition.

There is one 76-US gallon, gas-fired domestic hot water tank serving the School located in the Second Floor Mechanical Room. The hot water tank is of 'Universal G79-200-1' make and model with a gas input of 199 MBH.

There are roof drains located throughout the roof for drainage.

There are an assortment of plumbing fixtures throughout the School, including water closets, lavatories, and countertop sinks.

4.6 Building Automation System

The existing School has a Building Automation System from 'Delta'. The existing BAS system has been upgraded to be on the Board's central system and visible through the internet.

The existing BAS system controls the following:

1. Heating plant.
2. Cooling plant.
3. Indoor air handling equipment.
4. Exhaust fans.
5. Domestic hot water system (recirculation pump only).

5.0 Description of Electrical Systems for the Proposed Addition

The proposed Addition will be designed to the latest codes, requirements of Authorities having Jurisdiction and TDSB Standards. Where feasible and compliant to the same, systems will mirror those present within the rest of the School for ease of maintenance, ongoing operation and consistency.

5.1 Electrical Service

The new addition will be equipped with a 42-circuit, 120/208V, 3 Phase, 4W electrical panel located in the Corridor space to provide power to all lighting and power circuits throughout the addition. The panel will be fed from a 120/208V distribution panel/switchboard of spare capacity. A 600V feed will be provided from the main switchboard to the new rooftop unit.

Power systems (receptacles, mechanical equipment power connections, etc.) will be installed to suit the User Group's requirements for the space. Tamper-resistant receptacles will be installed throughout the proposed Addition to meet current Electrical Code requirements.

5.2 Emergency Power

The only loads that are anticipated to be provided with emergency back-up power in the new Addition will be the emergency lighting.

5.3 Fire Alarm System

The existing fire alarm system can accommodate the needs of the new Addition. A new passive graphic will be required at the main entrance along with updates to the existing annunciator to reflect the additional zones from the Addition. Fire alarm horns in the Classrooms and Work Room and horn/strobes in the Corridor will be required to meet audibility requirements of OBC; horns will need to meet OBC requirements and match the tone of existing horns in the School. Smoke detectors will be required along the full length of the Corridor and at the top of the staircase. The new rooftop unit will require fan shutdown in the event of an alarm condition. Sprinkler zones will be required to reflect any new flow switches, supervised valves or any other components requiring supervision/alarm as a part of the fire protection design.

5.4 Lighting Systems

New general lighting installed throughout the proposed Addition will consist of LED light fixtures compliant with TDSB's current standards. Final fixture selection will be done in close coordination with the TDSB Design Team. Light

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fixtures will be installed to suit the architectural reflected ceiling plan and IESNA lighting recommendations.

New low-voltage lighting control systems will be installed as per ASHRAE requirements (and those of other Authorities having Jurisdiction) and will most likely consist of local on/off controls, occupancy sensors, dimming capabilities (if requested) and possibly daylight harvesting (if required by code).

No new exterior light fixtures are required.

If the existing inverter system can accommodate the new load, the new emergency lighting will consist of select fixtures along the egress paths connected to the emergency lighting circuits (backed by the inverter set). Egress lighting levels will meet or exceed those required by local codes. If the load cannot be accommodated by the Inverter, battery units will be specified for the designed connected load and 25% spare capacity and remote heads will be used through the egress paths. Exit signs with low power consumption and long-life LED source will be used. All new exit signs will be of the green, pictogram type. Given the small size of the addition, it is anticipated that full replacement of all existing exit signs in the existing School will not be deemed as mandatory by the Building Official.

5.5 Public Address System

The existing PA system will be able to accommodate the new zones (three) required for the new addition. Each classroom and the Work Room will be equipped with a speaker and call switch to match the setup of other similar spaces in the School and the Board Standard. Dedicated, 2-pair zone wiring will be homerun from each room to the Main PA Rack.

The existing PA zone serving the Second Floor Corridor will be expanded to the new Corridor space to provide announcements in the event of an all-call page. No strobes are anticipated to be required for the proposed spaces.

5.6 Data/Voice System

New data outlets c/w Category 6 plenum rated cables (yellow in color) to new patch panels of spare capacity in the Hub Rack will be provided. Backboxes for data outlets with 21 mm empty conduits, terminating within the accessible ceiling space will be provided. Exact location and the number of outlets required will be confirmed with the User Group during detailed design. Wireless access points will be located throughout the new School Area only. Where required, additional patch panels will be supplied and installed by TDSB In-House forces in the existing Hub Rack to support the new data cabling. Final connection of cables will be done by TDSB In-House personnel only.

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5.7 Security System

The proposed Addition will be equipped motion detectors in the Corridors connected to the existing intrusion alarm system.

No other security systems or devices are anticipated as required for the addition.

5.8 Clock System

The new Addition will be equipped with plug-in, 120V (clock outlets), analog clocks with 12-hour time in black numerals within each Classroom and the Work Room.

6.0 Description of Mechanical Systems for the Proposed Addition

The proposed Addition will be designed to the latest codes, requirements of Authorities having Jurisdiction and TDSB Standards. Where feasible and compliant to the same, systems will mirror those present within the rest of the School for ease of maintenance, ongoing operation and consistency.

6.1 Ventilation System

The new ventilation system for the Addition will consist of a rooftop unit complete with gas heating, DX cooling and VFD control to serve the three new Classrooms, the Work Room and the Corridor. Each zone will be equipped with a terminal unit to provide temperature control in the respective space.

Diffusers and rigid ductwork (G-90 galvanized sheet metal) will be installed throughout the respective spaces for air distribution. All ductwork will be insulated and air balancing provisions will be made for optimal comfort in all areas. Exact location of the rooftop unit will be confirmed during detailed design based on requirements for setback requirements and ductwork distribution layouts.

No exhaust fans are anticipated to be required at this time.

6.2 Heating/Cooling System

Heating in the proposed Addition will consist of perimeter heaters in the three Classrooms, Work Room and the Corridor. 2-way control valves controlled by the BAS system will be installed to provide temperature control in each respective space.

The new Classrooms and Work Room will be fully air conditioned via the rooftop unit. The existing condensing units (serving the unit ventilators in the 2014 Addition) on the existing 1-story roof will be relocated to the new second storey roof.

6.3 Gas Service

The existing gas meter will not require upgrading to accommodate the new load from the rooftop unit. New gas piping will be installed from the gas meter to the new rooftop unit in compliance with the Gas Code.

6.4 Building Automation System

The new ventilation equipment (rooftop unit and terminal units) and convectors will be connected to the existing Building Automation System present within the School. BAS strategies as per current TDSB Standard will be used for the control of all mechanical equipment. New BAS panels will be added if required to suit the proposed scope of work.

6.5 Fire Protection System

The new Addition will be fully sprinklered as per NFPA 13 requirements. Detailed Fire Protection Design will be required to be undertaken by the Fire Protection Consultant to evaluate the exact requirements at the time of design.

6.6 Plumbing & Drainage System

New plumbing fixtures will be provided as per TDSB Design Guidelines throughout the Addition where required. The existing domestic cold water, hot water and sanitary services will be extended to the addition from the existing respective services in the existing building of spare capacity. The existing plumbing vent through the roof will be extended to the new roof.

New controlled flow roof drains will be installed on the roof to provide storm drainage. New storm drainage piping will be connected to the existing storm service installed as a part of the 2014 Addition. Any modifications required to the storm water management will be evaluated at the time of detailed design by a Civil Engineer.

7.0 Impacts of Alternative Building Connections to Existing Mechanical & Electrical Systems

7.1 Alternate #1 - Connection by Staircase #2

Connection of the new second-story addition via an area by Staircase #2 will have no major impact to the existing mechanical and electrical systems. Locally, the power and lighting in the area as well as HVAC and fire protection might require slight modification to suit the building connection.

7.2 Alternate #2 - Connection via a new corridor through the existing Mechanical Room

Based on the existing layout of the Mechanical Room, the creation of a new Corridor through the Mechanical Room will have significant impact to the existing mechanical and electrical systems in the existing School as well as significant cost implications and downtime of the existing mechanical systems. The extent of the proposed corridor through the Mechanical Room currently contains two (2) chilled water pumps serving the rooftop chiller, a BAS Panel, a Motor Control Centre (MCC) serving various mechanical equipment, a return fan serving Air Handling Unit #4 (which serves several Classrooms), ductwork, piping risers, a transformer and disconnect switch for the rooftop chiller and components associated with the chiller system (chemical treatment, etc.).

All of this equipment and systems will require relocation to suit the reduced size of the Mechanical Room. The chilled water pumps and piping risers will have to be relocated to an alternate location within the Mechanical Room. The BAS Panel, MCC, chiller transformer and disconnect switch will also have to be relocated; as a result, many of the existing feeders to the mechanical equipment will have to be replacement or extended to suit the relocation. The return fan (given the air volume it handles) will have to be replaced and located on the roof. As a result, the existing first floor and second floor return ductwork and silencers will have to be reworked and replaced. New shaft(s) will be required to extend the existing first floor return ductwork to the rooftop return fan. As a result of this work, it is anticipated that roofing, structural and architectural work will be required to accommodate these changes.

END OF MECHANICAL & ELECTRICAL DESIGN BRIEF