REGINA MUNDI CATHOLIC COLLEGE

LONDON, ON | HERITAGE IMPACT ASSESSMENT
AUGUST 15, 2018; REVISED JULY 18, 2023

Project # 18-034-02

Prepared by AP/DE/CS/ZA

PREPARED BY:
ERA Architects Inc.
#600-625 Church Street
Toronto ON, M4Y 2G1
T: 416-963-4497

PREPARED FOR:
Nicholson Sheffield Architects Inc.
358 Talbot Street
London, Ontario N6A 2R6
T: 519-673-1190 ext. 121

Cover image: West elevation, Regina Mundi Catholic College (ERA, 2018).

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Appendix I: Regina Mundi College Building Renewal Study by Nicholson Sheffield Architects et al, dated September 25, 2013

Appendix II: Review of Exterior Masonry Cladding by Hastings & Aziz Ltd. Consulting Structural Engineers, dated December 9, 2014

Refer to the architectural package from Nicholson Sheffield Architects, dated June 20, 2023.

Original main entry and bell tower (demolished) (London District Catholic School Board, year unknown).

EXECUTIVE SUMMARY

Background

This Heritage Impact Assessment ("HIA") has been prepared by ERA Architects Inc. ("ERA") for the redevelopment of 5250 Wellington Road South (the "site"). The site contains the Regina Mundi Catholic College, originally constructed in 1963 as the Regina Mundi Junior Seminary. This HIA is an update to a previous HIA dated August 15, 2018 and subsequent HIA Addendum Letter, dated October 30, 2018. Updates to the text of this report are in red.

Proposed Development

The London Catholic District School Board intends to construct a new secondary school building on the site and then demolish the existing Regina Mundi Catholic College school building. The new school will be located on the portion of the site currently occupied by the main parking lot. Upon demolition, the footprint of the existing school building will be used for a parking lot, as well as landscaped open space.

Cultural Heritage Value

On the recommendation of the London Advisory Committee on Heritage ("LACH"), the site was added to the City of London's Register of Cultural Heritage Resources (formerly called the Inventory of Heritage Resources) on October 25, 2016. The site was originally listed as a "Priority 1" resource in the inventory, indicating the degree of change that should be allowed to a structure, however reference to Priority Listing classifications is no longer included in the in-force 2016 City of London Official Plan (replaced the repealed 1989 Official Plan on May 25, 2022) and subsequently are not included in the current Register of Cultural Heritage Resources.

ERA has evaluated the site using the criteria under Ontario Regulation 9/06 (Criteria for Determining Cultural Heritage Value or Interest) and found that although the site meets the Ontario Heritage Act ("OHA") criteria related to the site's association with the locally prominent firm of Watt & Tillmann Architects, it is not a candidate for designation under Part IV of the OHA. Bill 23, the More Homes Built Faster Act, went into effect on January 1, 2023, and amended the OHA to require that properties must meet two or more criteria under Ontario Regulation 9/06 to be eligible for designation under Part IV of the Act, whereas previously, properties were required to meet one or more criteria. Previously, the City of London Official Plan provided it's own criteria for property designation, however the in-force O–fficial Plan removes these additional criteria and now aligns with the criteria in Ontario Regulation 9/06.

As identified in this HIA, the heritage integrity of Regina Mundi College has been reduced by extensive physical deterioration of the building envelope, as documented in engineering studies and condition assessments, as well as later alterations such as the removal of the original bell tower element.

In light of the site having been found to meet only one criteria under Ontario Regulation 9/06, and its compromised integrity, the property is not a candidate for designation pursuant to the OHA. ERA recommends that the owner commit to the implementation of the Conservation Strategy as set out in this HIA, which provides for the commemoration and interpretation of the history of the site within the proposed development.

Impacts

The proposed development requires the removal of an identified heritage resource that has been listed on City of London's Register of Cultural Heritage Resources. The proposal will remove the 1963 Regina Mundi College in its entirety.

Mitigation Strategies

The impact of the proposed development can be mitigated by several commemorative and interpretive measures recommended for inclusion in the replacement secondary school building. These measures include:

- Documentation of existing conditions prior to removal;
- Preparation of a Heritage Interpretation Plan to identify strategies and implementation measures to assist in commemorating the cultural heritage value and history of the site to future occupants. This plan could be prepared in consultation with the Regina Mundi community and result in materials to be displayed in the new school;
- Reinstatement into the proposed development of salvaged elements will include the red granite surround and inscription flanking the original main entry, a representative example of painted glass panels from the chapel, and exterior stone panels in sufficiently good condition to merit salvage;
- The use of a folded plate roof structure in the new school building designed to evoke the original chapel. This motif could be deployed in a prominent common area of the new school; and
- Installation of a heritage plaque or marker in a prominent location on the site to commemorate the original Regina Mundi College building.

A commitment by the owner to a Conservation Strategy that includes the aforementioned measures will help to mitigate the impact of removing the original Regina Mundi College building and to ensure that the site's cultural heritage value is appropriately commemorated.

Conclusion

This HIA concludes that the proposed development for 5250 Wellington Street South, including the removal of the 1963 Regina Mundi College building and construction of a replacement secondary school incorporating the proposed mitigation measures, is justified and will not result in an unacceptable heritage impact.

1 INTRODUCTION

1.1 SCOPE OF THE REPORT

ERA Architects has been retained by Nicholson Sheffield Architects, on behalf of owner London Catholic District School Board, as the heritage architectural consultant to prepare this HIA for the redevelopment of 5250 Wellington Road South in the City of London. The redevelopment scope includes removal of the existing 1963 Regina Mundi College school building and the construction of a replacement secondary school building in a more northwesterly location on the site.

This Heritage Impact Assessment ("HIA") describes the historical development and evolution of the site and the impact of the proposed development on the site's identified heritage resource, namely the 1963 Regina Mundi College building, which is identified as a resource on the City of London's Register of Cultural Heritage Resources. This HIA is an update to a previous HIA dated August 15, 2018 and subsequent HIA Addendum Letter, dated October 30, 2018. Updates to the text of this report are in red.

The purpose of an HIA, as per the Ontario Heritage Toolkit published by the Ontario Ministry of Tourism, Culture & Sport, is to determine the impact of proposed development on heritage resources, conservation recommendations and mitigation measures.

Multiple sources of data have been collected, sorted and analyzed for this assessment. Both primary and secondary sources have been drawn from, including: historical maps, atlases, aerial photographs, archival materials from the London Public Library, London Catholic District School Board and the University of Western Ontario, related consultants' reports, and observations from a site visit.

1.2 PROJECT CONTACT

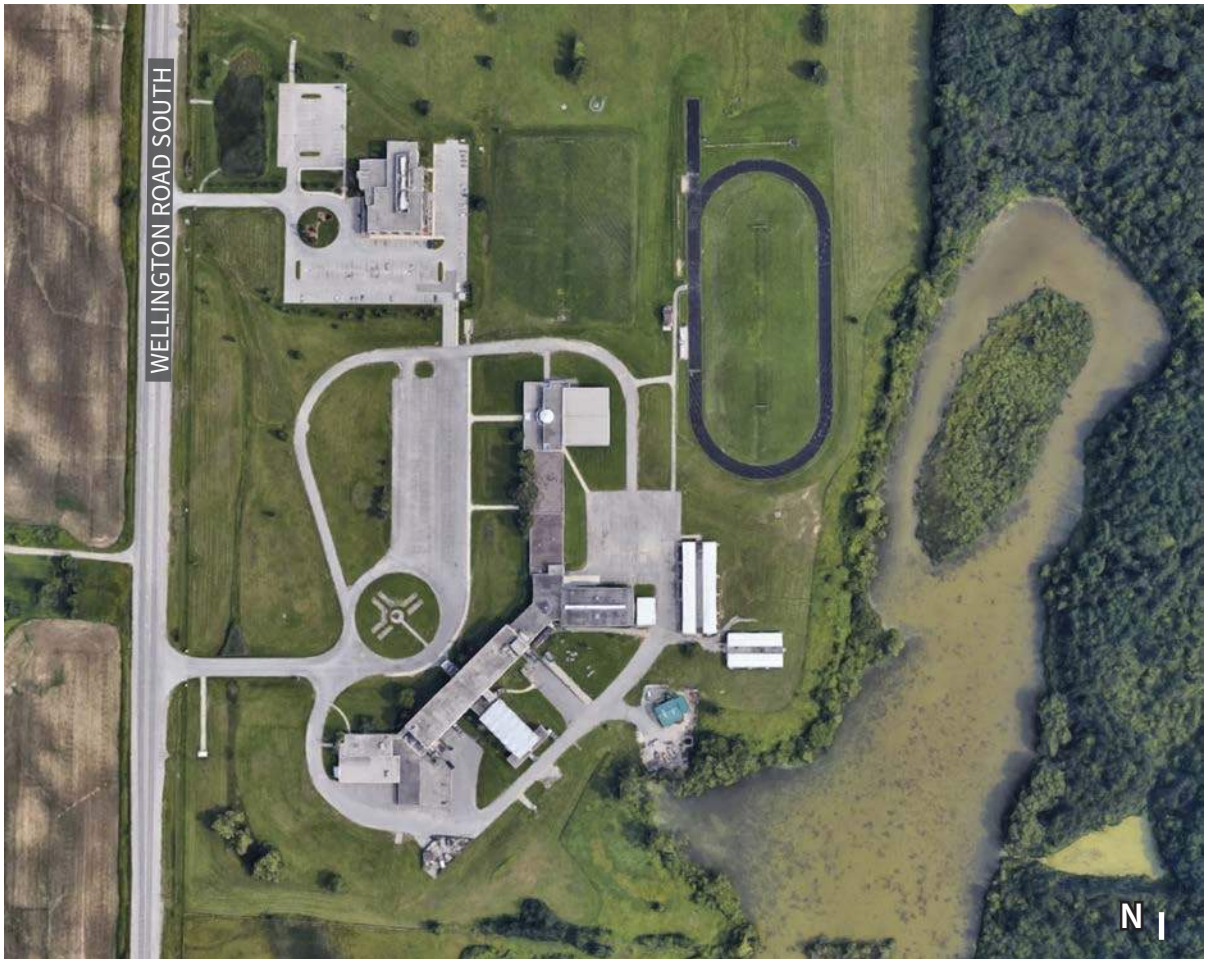
c/o Jim Sheffield, Nicholson Sheffield Architects Inc.
358 Talbot Street
London, Ontario N6A 2R6
T: 519-673-1190 ext. 121 | E: jsheffield@nicholsonsheffield.ca

1.3 SITE DESCRIPTION

The site is located at 5250 Wellington Road South, otherwise known as Part of Lot 15, Concession 5, Geographic Township of New Westminster, City of London, Middlesex County, Ontario. The site is approximately 17 hectares (42 acres) in size, and consists of the Regina Mundi Catholic Secondary School, as well as a separate building housing the headquarters of the London District Catholic School Board. The site contains two driveways off of Wellington Road South that provide access to an internal road network as well as surface parking lots. An outdoor running track and athletic facilities are located on the northeast part of the site.

To the east of the site is a provincially significant wetland that falls within the jurisdiction of the Upper Thames River Conservation and Kettle Creek Conservation Authorities. To the north and south of the site are large open fields. Across Wellington Road South, to the west, is a residential property with farm fields.

The site falls within an area of archaeological potential as determined by the City of London's Archaeological Master Plan. Stage 1 and 2 Archaeological Assessments (2018) for the site have been conducted by Timmins Martelle Heritage Consultants Inc.



Birds-eye view of the site and surrounding environs (Google Earth, 2018; annotation by ERA).

1.4 SITE PHOTOS

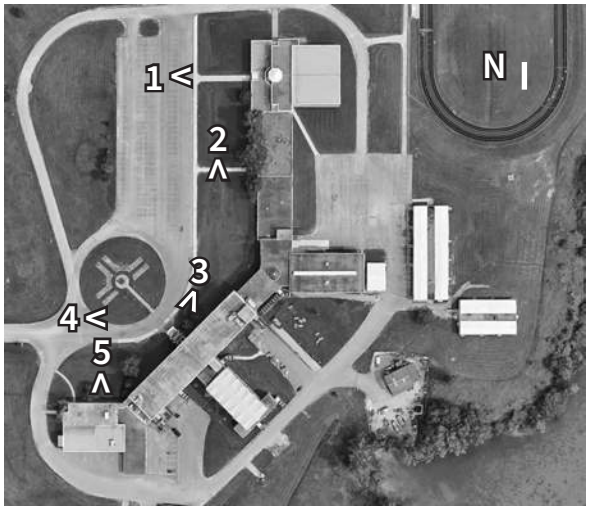
ERA conducted a site visit on March 14, 2018, accompanied by Nicholson Sheffield Architects. This section of the report includes interior and exterior photos of the 1963 Regina Mundi College building, as well as the later 1980s addition constructed to the north. For ease of reference, location keys are included on each page to provide the reader context for the location of each photo. All photos are by ERA.

Panoramic view of the front (west) elevation of the site (ERA, 2018).

Panoramic view of the rear (east) elevation of the site, viewed from southeast (ERA, 2018).

West (Front) Elevation

1987 north gymnasium addition (ERA, 2018).



Looking south towards the school (ERA, 2018).

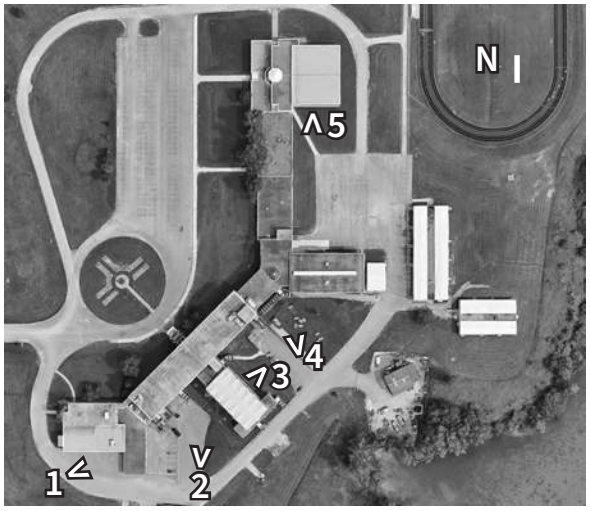
Main entrance and location of former bell tower (ERA, 2018).

Looking east towards the school (ERA, 2018).

Looking south towards the original convent wing, now the technology wing (ERA, 2018).

East (Rear) Elevation

Looking northeast towards 1987 technology wing addition (ERA, 2018).



Looking north towards rear elevation of school and chapel (ERA, 2018).

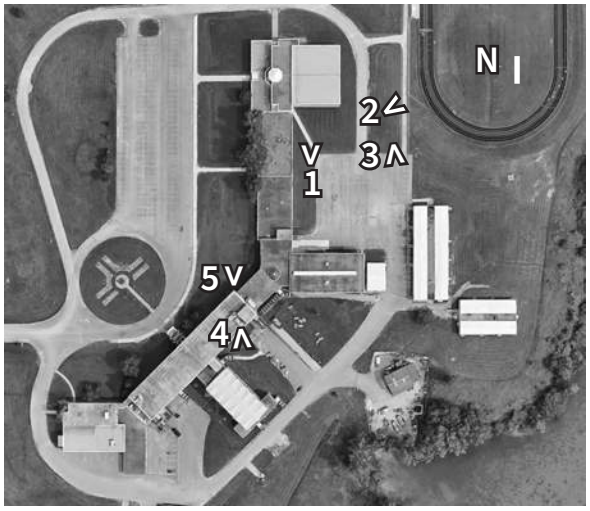
Looking southwest towards northeast elevation of chapel (ERA, 2018).

Looking north towards rear elevation of school and "gymtorium" wing (ERA, 2018).

Looking south towards "gymtorium" wing (ERA, 2018).

Additional Exterior Views

Looking north towards 1987 gymnasium addition (ERA, 2018).



Looking northeast towards running track (ERA, 2018).

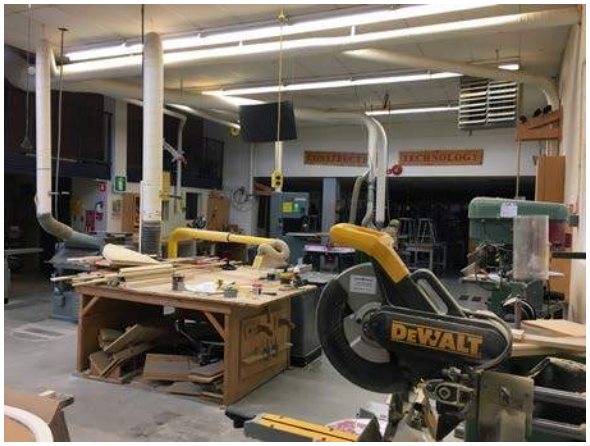
Looking south towards portable classrooms (ERA, 2018).

View out of second-floor window towards north elevation of the chapel (ERA, 2018).

View out of north window looking north across the property, LDCSB building in the background (ERA, 2018).

Interior Views

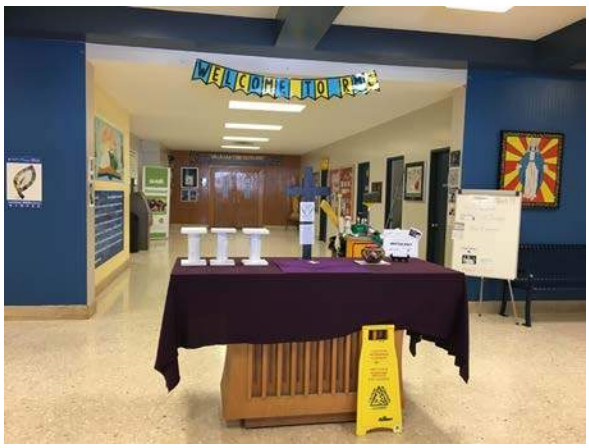
Cafeteria, located in the basement level below the chapel (ERA, 2018).



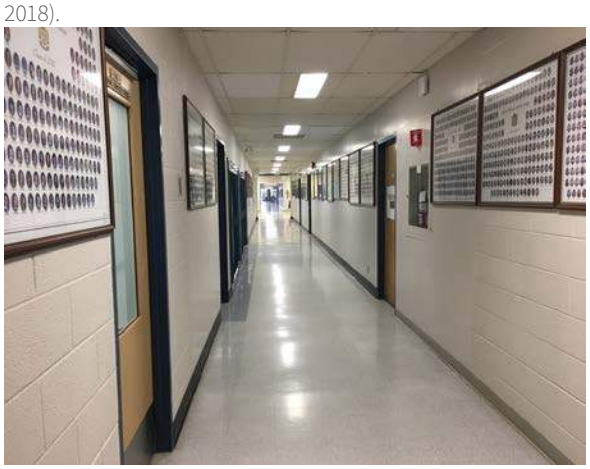
Workshop in the “technology wing” (ERA, 2018).

View of chapel, looking toward the chancel (ERA, 2018).

Reverse-view of chapel, showing nave and balcony (ERA, 2018).



Main school lobby on ground floor, doors to chapel beyond (ERA, 2018).



Typical interior hallway (ERA, 2018).

1.5 HERITAGE CONTEXT

At its meeting held October 25, 2016, London City Council listed the site on the City of London's Register of Cultural Heritage Resources (formerly called the Inventory of Heritage Resources), adopting the recommendation of the London Advisory Committee on Heritage ("LACH"). The site was originally classified a "Priority 1" resource at the time of it's listing in the inventory, however Priority classifications are no longer included in the current Register of Cultural Heritage Resources, therefore, the site is no longer a Priority 1 resource.

The listing description for the site is as follows:

> *Designed by: Watt and Tillman Architects 1962-1963.*
>
> *Regina Mundi Catholic College, which opened in 1963, operated as a Junior Seminary established by Bishop John Cody for the training of young men preparing for priesthood. Located on over 100 acres of land, the building cost $2 million to construct and contained ten classrooms, a science room, library, gymnasium and chapel. There were also four student activity rooms. Dormitories and semi-private rooms for boarding were located on the upper two floors. A small convent on the site housed the nuns who assisted in the housekeeping duties within the building. The (former) bell tower, located at the peak of the front entrance, was deconstructed in 2011 due to safety concerns.*
>
> *The school later became a boys boarding school and then in 1983 a co-ed secondary school within the former London and Middlesex Catholic School Board, now the London District Catholic School Board. Renovations and additions took place in 1988, and include a larger double gym, classrooms, and a technology wing (within the central section of the original building). The plan of the building remains simple, and linear in design.*
>
> *Regina Mundi Catholic College is now situated on a smaller parcel of land that includes a track, bus and vehicular parking, a pond and a forest to the east. The Catholic Education Centre (part of the London District Catholic School Board) is located to the north.*
>
> *The Chapel, located at Regina Mundi Catholic College is situated on the first floor of the central wing of Regina Mundi Catholic College. Dedicated to the Blessed Virgin Mary, the Chapel is visible upon entrance into the original part of the building. Having a seating capacity for 250 people with a small balcony at the rear, the proportions and design of the space are balanced, and it is the largest chapel of the Catholic Secondary Schools in the London District. The structure of the space is marked by a tapered-column frame, evidence within the finished walls and ceiling of the space. The exterior of the Chapel is clad by stone (like the rest of the original school) with interior wood finishes and marble accents. Key features include the painted glass windows (featuring the seven sacraments of the Catholic Church) with marble stools located below the window frames. Two rooms flank the rear of the chapel, and originally housed the priests living quarters. These rooms are now used by the Chaplaincy Team. The Chapel also features a memory wall displaying photos of former students and staff members who passed away during their time at Regina Mundi Catholic College.*
>
> *The chapel is considered to be of Mid-Century Modern design, and is believed to be of significant historical and spiritual value for its location, design, proportions and use of materials.*

2 HISTORICAL RESEARCH, SITE ANALYSIS & EVALUATION

2.1 SITE HISTORY

As summarized in the Stage 1 Archaeological Assessment prepared by Timmins Martelle Heritage Consultants for Regina Mundi College (2018), the area generally surrounding London was actively used for hunting and camping by Chippewa, Ottawa and Pottawatami people prior to the arrival of European settlers in the late 1700s. The first Indigenous populations to inhabit the London region arrived between 12,000 and 10,000 years ago, following the end of the last period of glaciation. At this time, the inhospitable local climate precluded the establishment of permanent settlements. Gradually, semi-permanent villages began to emerge in the region, approximately 1,000 years ago.

Europeans arrived in the area in the late 1700s. Lieutenant-Governor John Graves Simcoe visited the Thames River in 1793 and originally intended to establish the capital of Upper Canada in London. While Simcoe's vision never came to fruition, a wave of European settlers moved into the area in the 1800s.

The site is shown on the 1862 Tremaine's Map of the County of Middlesex, where it was located on Lot 15, Concession 5, split between two large properties owned by J. & G. Gould and Alex Kerr, as well as a third smaller property owned by John Munro. Wellington Road is depicted on the map on the west side of the property, with the London and Port Stanley Railway to the east (the rail corridor still exists today).

The site remained predominantly agricultural prior to the construction of the Regina Mundi Junior Seminary in 1963. A 1950 aerial photograph shows the property as a vast expanse of open space, with a house, driveway and several outbuildings.

Regina Mundi Junior Seminary, a Catholic secondary school, was established by John C. Cody, then Bishop of the London Diocese. Archbishop Sebastiano Baggio, apostolistic delegate to Canada, turned the first sod in May 1962, with Cody laying the cornerstone for the school on September 26, 1963.

At the time of construction, the school was situated on a 110-acre plot of land. The $2-million school included 10 classrooms, a science room, a library, a gymnasium and a chapel. The chapel, dedicated to the Blessed Virgin Mary, contains painted-glass windows depicting the Church's seven sacraments, and also includes a Casavant pipe organ from Quebec.

Originally established to provide training for boys intending to enter the priesthood, the school's admission policy was widened in 1965 to provide education for boys with other career goals and aspirations. At this time, the school was renamed Regina Mundi College, and became a residential Roman Catholic private secondary school for southwestern Ontario boys, with an intended maximum enrollment of 200 students.

By 1968, amidst concerns about under-enrollment, London Reverand J.J. Donohue called for the closure of Regina Mundi, claiming that the boarding school had cost the diocese $3,000,000 in five years ($2.5 million in construction cost and an annual deficit of $100,000). However, closure of the college was rejected by the local synod.

In 1971, Regina Mundi began offering a new program for non-resident classes. The tuition cost for day students was set at $500-600, compared to the $2,000 annual tuition for resident students.

Concerns about the financial sustainability of the college persisted, and in 1973, Reverand J.F. Hardy of London's St. Mary's Parish told the annual meeting of the diocesan council that the Regina Mundi was still a consistent money-loser. He complained "It is a rich man's school subsidized by the poor of the diocese, and none of the plans of the last six years have worked either to bring down the operating deficit or to increase enrolment" (London Free Press, May 14 1973).

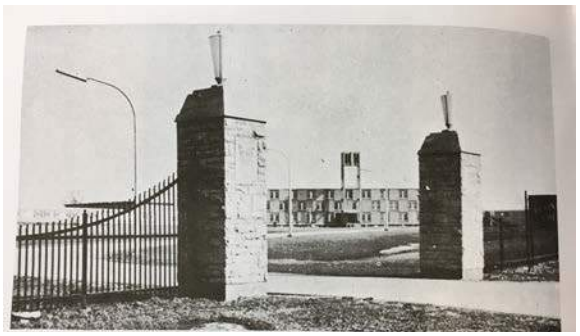
In 1983, Regina Mundi College became a co-educational secondary school of the London and Middlesex Catholic School Board, who hoped to alleviate severe overcrowding at other Catholic schools in the county. The school continued to mix fee-paying boarders with day students from London and Middlesex County.

By 1987, increasing costs led administrators to end Regina Mundi's boarding school. Principal Bernard Rooney explained to the local newspaper that "... to meet the expenses of every resident, we would have to charge about $12,000 [tuition, per student]. The school charges about $7,000 and families would not have been able to afford the increase" (London Free Press, April 11 1987).

Later in 1987, an expansion of the school was approved by the provincial Ministry of Education. The enrolment cap was increased to 1,200 day students.

A December 29, 1990 article published in the London Free Press described the expanded facilities: "The former priests' residence has been converted to much-needed classroom space. A prayer room with decorative glass windows adjacent to the chapel houses a computer lab. In fact, apart from the walls, chapel and two science labs, the entire interior has been gutted, rebuilt and expanded under a $7-million renovation project in 1987."

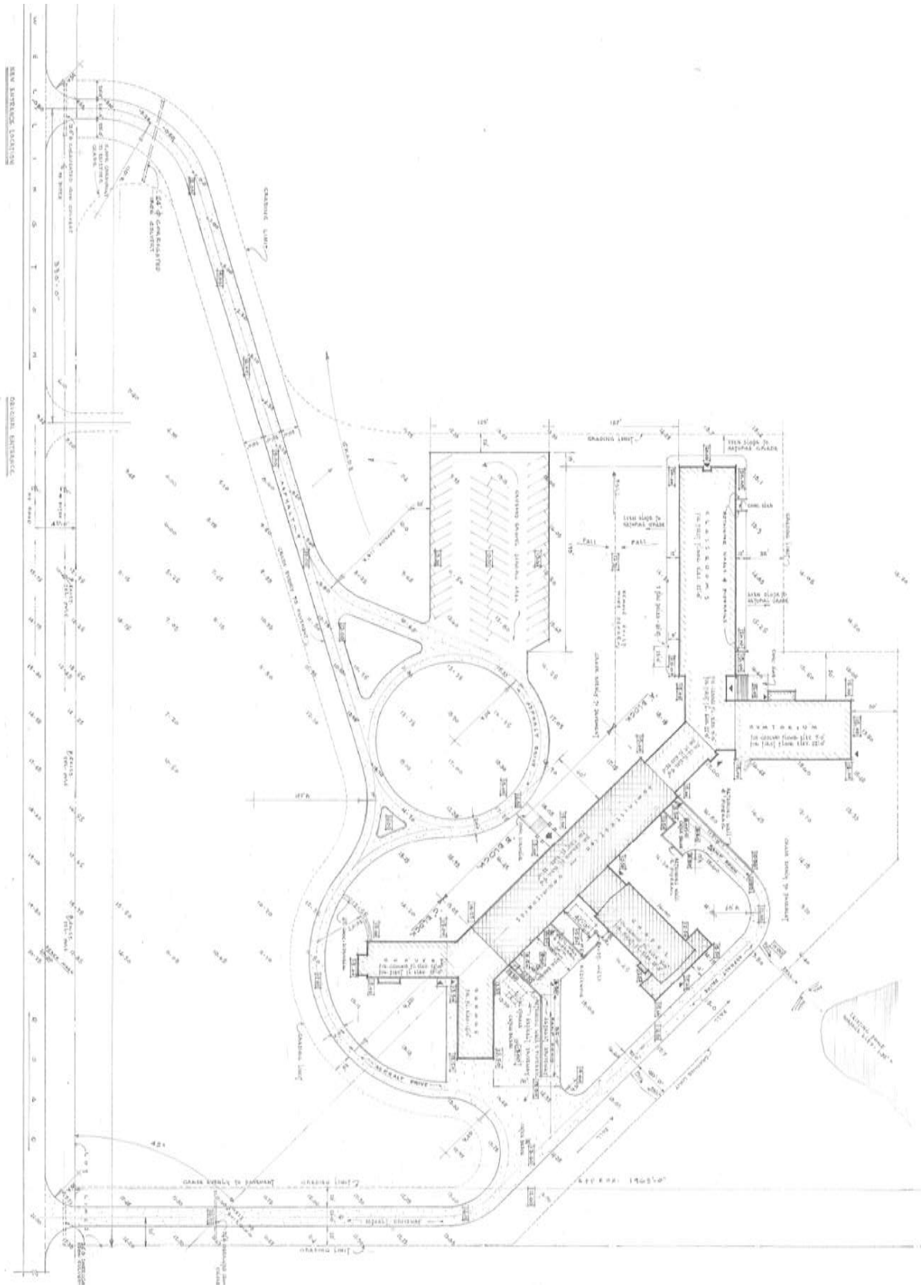
In 2005, the London Catholic Education Centre of the London District Catholic School Board opened its new headquarters on the property, to the north of Regina Mundi College.



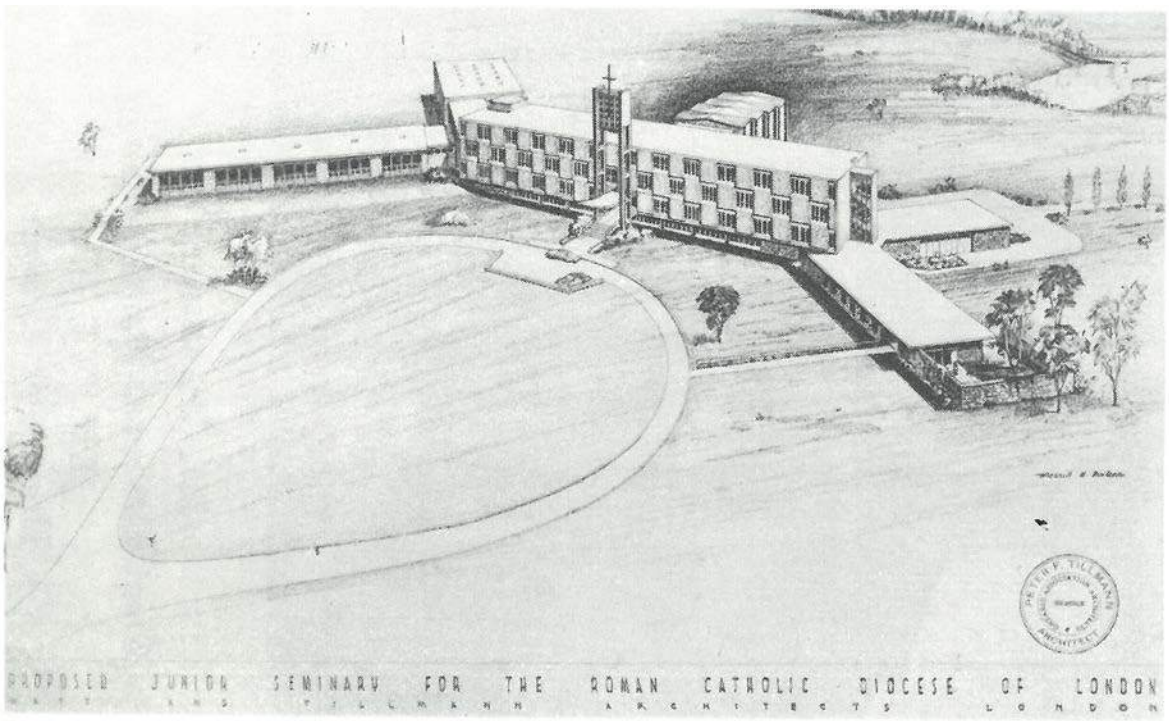
Images from 1970 Regina Mundi yearbook "Sentinel".

Left: Site (approximate location circled) as shown on the 1862 Tremaine's Map of the County of Middlesex. The site is bounded to the west by Wellington Road, and to the east by the London and Port Stanley Railway (From the holdings of Western Archives, Western University).

Below two: Aerial photographs of the site in 1950 (left image, prior to construction) and 1971 (right image, post-construction) (Western University Map & Data Centre).

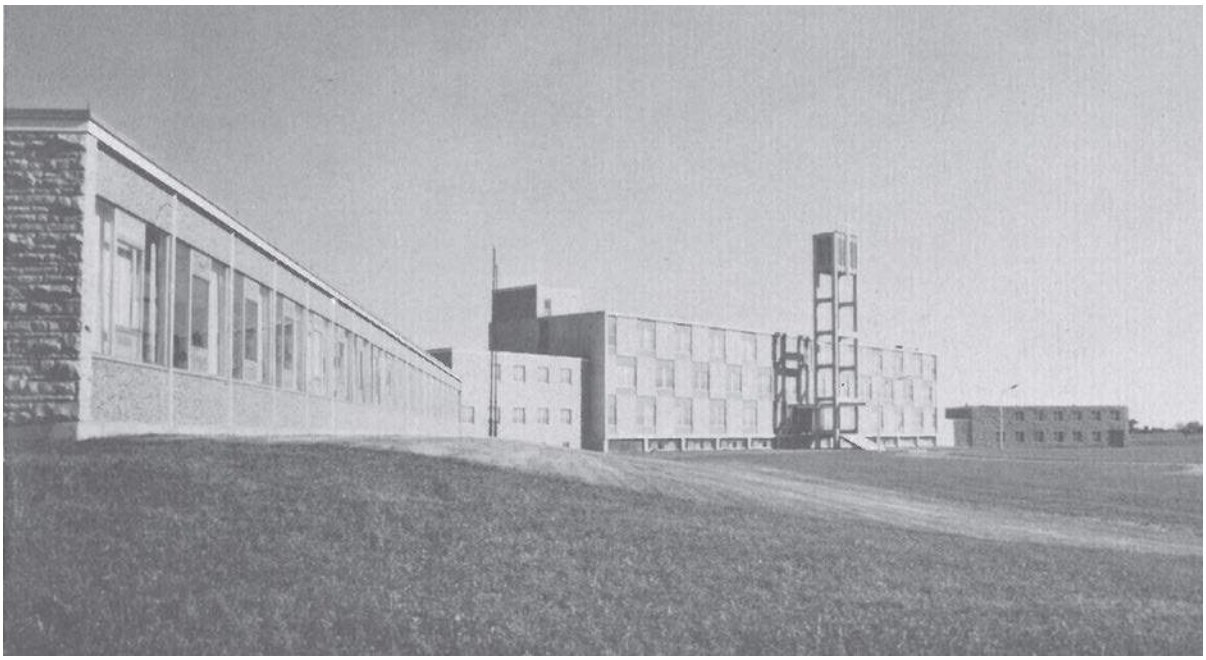


Original site plan (Watt & Tillmann Architects, 1962).



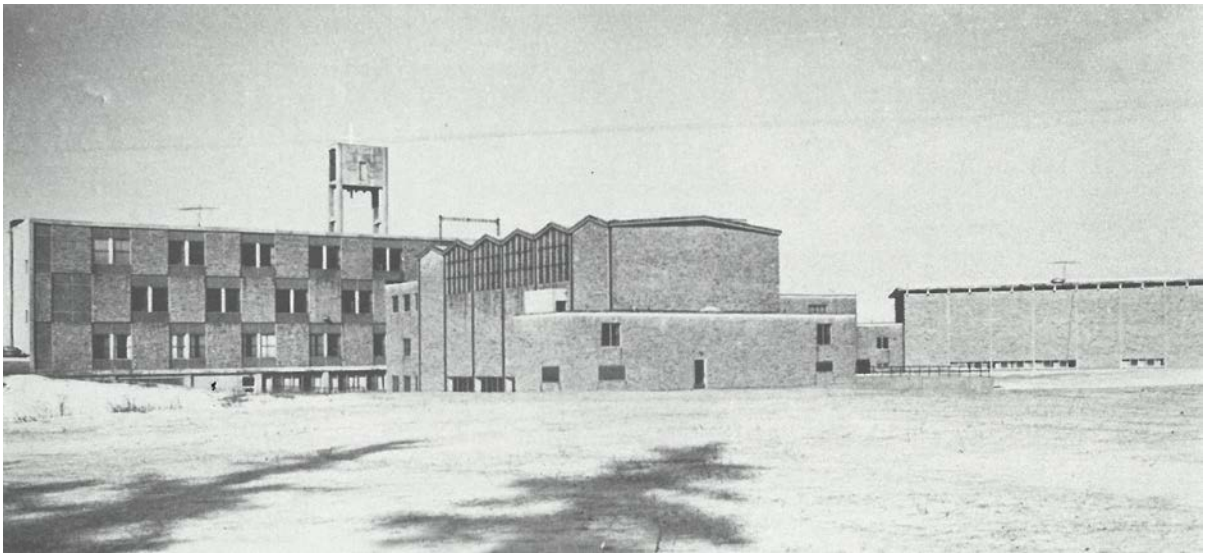
ARCHITECT'S SKETCH
REGINA MUNDI MINOR SEMINARY, LONDON, ONTARIO

Original architectural rendering for the Regina Mundi Junior Seminary (Peter F. Tillmann, 1962).



Regina Mundi viewed from the north (London District Catholic School Board, year unknown).

Regina Mundi College viewed from Wellington (London District Catholic School Board, year unknown).



West view of the school and chapel from the 1972 student yearbook (The Sentinel, 1972).

View of the school and original driveway approach (London District Catholic School Board, year unknown).

Original main entry and bell tower (demolished) (London District Catholic School Board, year unknown).

2.2 DESIGN

Regina Mundi College, originally Regina Mundi Junior Seminary, opened in 1963 as a seminary for boys wishing to enter the priesthood. The original school consists of a central three-storey block, flanked to the north and south with Y-shaped wings.

The centre block housed administration and dormitories. In the basement were the study hall, kitchen and refectory. On the ground floor level, there were offices, a library, and priests' offices and bedrooms. The second and third floors contained student dormitories, as well as a prayer room leading to a balcony overlooking the chapel. The chapel extended in a southeasterly direction from the centre block.

The south Y-shaped wing contained a convent for nuns that resided on-site, as well as a garage and storage rooms. The north Y-shaped wing contained a student lounge and recreation room, athletic facilities and lockers, a "gymtorium," which serves the functions of both a gymnasium and auditorium, classrooms and activity rooms.

The original Watt & Tillmann architectural plans, dated August, 1962, contain notations describing the exterior cladding. Typical walls consist of an alternating checkerboard pattern of precast insulated masonry panels, and "random stone" as annotated in the 1962 elevation drawing, with stone trim and copper flashing. The typical original windows were aluminum. The construction methods used by the original builder were unconventional and directly contributed to deterioration of the building envelope described later in this report.

The original building featured a prominent bell tower that extended high above the centre block roof level and terminated in a crown wrapped in aluminum grilles and mounted with a large metal cross.

The interiors of the school have been modified since the building's initial construction. In 1987 the building interior was extensively gutted and rebuilt to remove all vestiges of the residential facilities and to significantly increase the amount of classroom and learning spaces. The former dormitories on the second and third floors, as well as basement common spaces, were converted to classrooms or ancillary spaces.

An addition was built to the south Y-shaped wing of the original school, which now became the "technology wing" and contained a machine shop and garages. To the north of the three-storey original centre block, a second-floor library was built. North of the original north Y-shaped wing new gymnasiums were added.

The original 1962 Watt & Tillmann site plan shows that the site was accessed by two driveways from Wellington Road South. The original vehicular circulation route has been altered, and the surface parking area expanded.

The original front bell tower was demolished in 2011 due to concerns regarding its structural soundness, after a large stone fell off the tower.

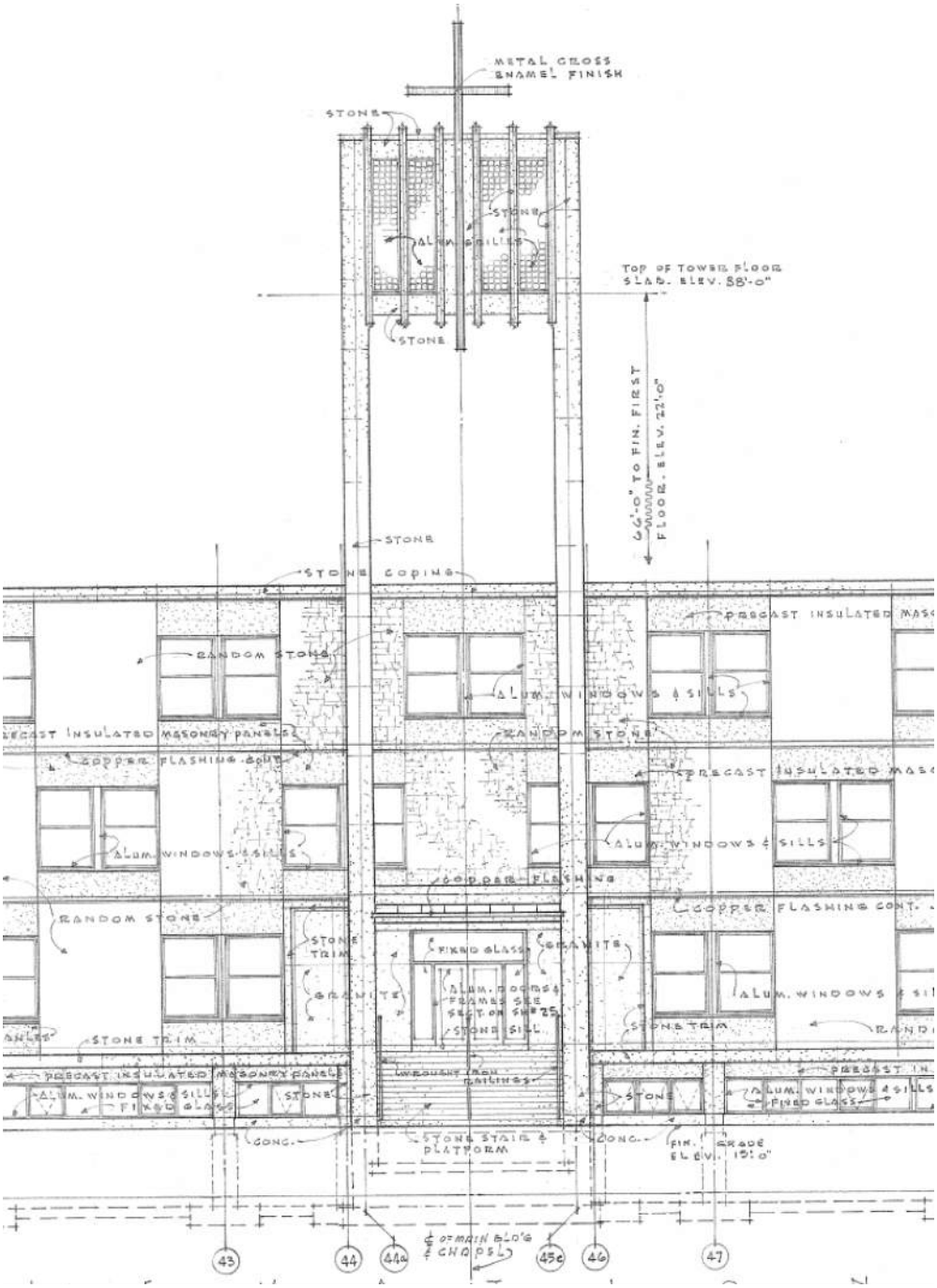
Building Evolution

Original 1963 building

1987 addition

2nd storey library addition over original 1963 building

Note: Temporary structures and ancillary buildings within the site are outside the scope of this report.



Bell Tower from original architectural drawings (Watt & Tillmann, 1962).

2.3 ARCHITECTS

Regina Mundi College was designed in 1962 by London-based Watt & Tillmann Architects, a partnership between John Macleod Watt (1885-1965) and Peter Francis Tillmann (1921-2002). Watt & Tillmann is part of a lineage of architectural firms that began in 1908 and continues today through the successor firm of architects Tillmann Ruth Robinson.

J.M. Watt began his career apprenticing with London architect Herbert E. Matthew, after which he obtained experience in the United States working for the architectural offices of Shepley, Rutan and Coolidge, as well as Harry J. Riel. In 1908, Watt entered into partnership with D. Howard Crane to form Watt & Crane. The firm had offices in Detroit and Windsor until it was dissolved.

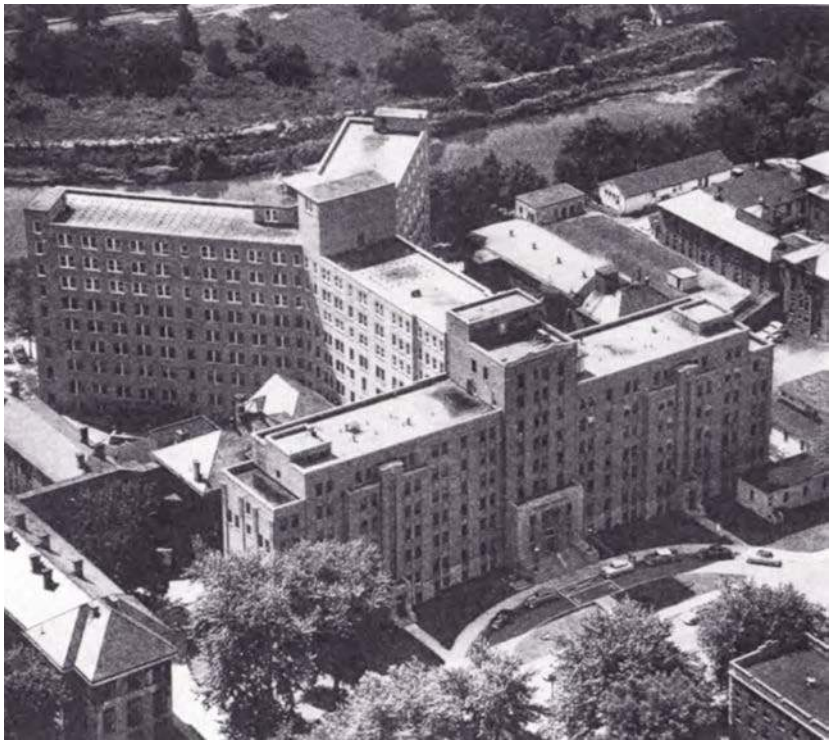
After the dissolution of Watt & Crane, Watt formed a new London-based partnership with Victor Blackwell. Watt & Blackwell designed numerous commercial, residential, institutional and ecclesiastical buildings in Southwest Ontario during a period between the 1910s and 1940s. In 1936, Watt & Blackwell, in association with O. Roy Moore, designed the Dominion Public Building, a prominent art deco landmark in downtown London, financed through the Public Works Construction Act of 1934.

By the late 1940s, Watt had entered into a new partnership with Peter Tillmann. The firm of Watt & Tillmann designed prolifically across the London region and beyond throughout the 1950s and 60s. Some of Watt & Tillmann's significant commissions included: Mount St. Joseph Academy for the Sisters of St. Joseph (1480-90 Richmond Street, London ON; 1954), the Crown Trust Building (200 Queens Avenue, London ON; 1957) and the Supertest Petroleum Company Office (245 Pall Mall Street, London ON; 1958). The firm is also credited with numerous additions and renovations to the Victoria Hospital and St. Joseph's Hospital, as well as a wide variety of commissions including schools, churches and chapels, private residences, factories, and even country clubs.

The firm evolved once again in the early 1970s when Peter Tillmann partnered with Wilfred (Wilf) Lamb to form Tillmann Lamb. Under this iteration, the firm is credited with the University Hospital (1972), a major expansion to the University of Western Ontario that combined teaching and research functions in a hospital setting.

During his career, Peter Tillmann served on the editorial board of the Royal Architectural Institute of Canada Journal, and was a representative of the Ontario Association of Architects to the RAIC.

The legacy of Watt & Tillmann continues today under the successor firm of architects Tillmann Ruth Robinson.



Victoria Hospital south wing addition (1954). Now demolished (Cultural Heritage Assessment for Buildings in the South Street Hospital Complex, Nancy Tausky Heritage Consultant, 2011).

Crown Trust Building (1957), 200 Queens Avenue, London. Robert Buist for Watt & Tillmann (ERA, 2018).

Mount St. Joseph Academy (1954), 1480-1490 Richmond Street, London. Watt & Tillmann. (Congregation of the Sisters of St. Joseph Archives).

This is a new section of the report to provide comparative analysis with similar buildings.

2.4 DESIGN CONTEXT

Post-war trends in the design of schools and churches influenced the development of Regina Mundi in the 1960s. The following provides some insights into the general design context at that time. It is worth bearing in mind that original construction of Regina Mundi was for the purpose of a seminary, which is different in nature as it provided dwelling spaces, and within a short period the building was adapted for a new use.

Modern School Design

In the post-World War II era, ideological shifts in pedagogy influenced how educational institutions were designed in Europe and North America. A modernist vocabulary that envisioned transparency and functionalism was seen as an answer to maintaining democratic citizenship in a postwar culture. The postwar period was considered to hold tremendous potential for societal change and architects designing schools recognized the need for a new approach to educational design.

Throughout the 1960s, secondary schools were created or expanded to accommodate a growing student population as the country's population boomed and the development of planned suburban communities proliferated. Schools were being built at a rapid rate and their design was the foci of various issues in Canadian architectural publications throughout the 1960s.

Modern Church Design

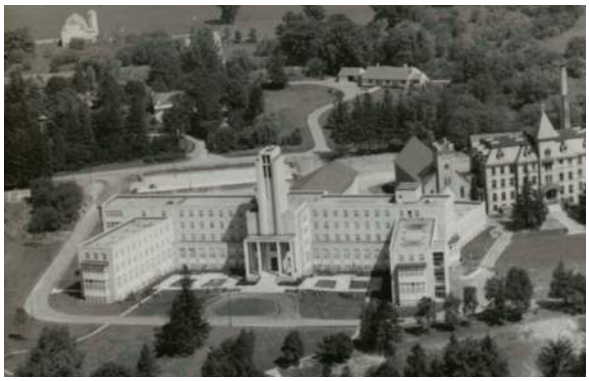
Examples of modern church design show a range of experimentation that was occurring in London, and the range of materials being used.

Church designs embraced Modernism in the post-World War II era. The period following World War II was an experimental period in ecclesiastical architecture in which expressions of massing and materials, the openness of form, the use of new building technology, and the abstraction of details and faith symbols were introduced to the design of places of worship. Churches designed in this period sought to be a part of the new modernist spirit of the postwar period. In November 1961, the Ontario Association of Architects held its first conference on church architecture. Issues raised by attending architects and delegates of religious communities included discussions on the theological aesthetics of interior spaces, the integration of original works of art with architectural design, and the need for collaboration between a congregation and the architect.

The move of congregations to newly established suburban developments following the Second World War provided architects with opportunities to experiment with new design concepts and building technologies in constructing new places of worship.

The following pages serve as a comparative analysis, which includes examples of Watt & Tillman's work on other buildings in the area, as well as examples of ecclesiastical buildings built in the same period.

The following provides an example with a further developed interior, more refined material palette and implementation of Watt & Tillman's work, also found in London.



Aerial photo of Mount St. Joseph (Congregation of the Sisters of St. Joseph in Canada Archives, 2014).

The chapel at Mount St. Joseph Academy (vircatholicus.blogspot.ca).

MODERN CHURCHES IN LONDON REGION

Mount St. Joseph (1486 Richmond Street North, London Ontario)

In 1954, the Mount St. Joseph Motherhouse and Novitiate was rebuilt for the Sisters of St. Joseph to the design of architects Watt & Tillman. Additional floors were added to the Novitiate wing in 1955. The Mount St. Joseph Academy moved to the building in 1958 and provided Catholic secondary school education for girls from across Canada and internationally. In 1968 a wing was opened as an infirmary and residence for senior sisters. The building was also used to house St. Joseph's School of Music, and as accommodation for guests from a nearby hospital. Interior elements include a chapel with marble

The following provides an example between the architect and an artist to further enhance the interior.

Interior photo of Philip Aziz artwork (Creative Commons).

Lady Chapel at St. Peter's Basilica (196 Dufferin Avenue, London, Ontario)

In 1958, a new chapel known as the Lady Chapel was added to St. Peter's Cathedral Basilica, which was constructed between 1880 and 1885. The construction of the chapel along with two new towers was supervised by architect Peter F. Tillmann. The addition included stained glass windows and interior artwork by local London artist Philip Aziz.

London Region

The London region includes various examples of educational institutions and religious buildings that experimented with a modernist vocabulary. Examples of modern ecclesiastical buildings in the London region are included on the following pages to illustrate the variety of experimentation during this period and level of design refinement found in the area.

The City's Significant London Modernist Buildings is a survey of building in constructed in this period in the London area. ERA reviewed the survey to find other ecclesiastical buildings in this era, some of which are included on the next pages. They indicate that there were various ways that built forms were developed, some with an emphasis on functionalism like the Unitarian Fellowship Hall, and others with design features to enhance the exteriors or interiors, like Mount Zion United Church.

Exterior (Forest City Modern).

Unitarian Fellowship Hall (29 Victoria Street, London, Ontario)

The Unitarian Fellowshop Hall was constructed in 1961 and designed by architect Philip Carter Johnson, a Massey Medal-winning architect. It was the first purpose-built hall for London's Unitarian community. The brick building features large windows.


Exterior (Forest City Modern).

Wortley Baptist Church (250 Commissioners Road East, London, Ontario)

The Wortley Baptist Church was constructed in 1961 and 1976, designed by architect Harold L. Hicks and Victor Marsh. The building features a folded plate cantilever canopy.

Top: Exterior, Bottom: Interior (Forest City Modern).

Church of the Transfiguration (33 Bromleigh Avenue, London, Ontario)

The Church of the Transfiguration was constructed in 1962 and designed by architect Philip Carter Johnson, a Massey Medal-winning architect. The building is made of concrete, with repeating rows of small pierced windows in coloured glass. There are custom-made mosaic doors.

Exterior (Courtesy of Nicholson Sheffield Architects)

Interior (Mount St. Zion Church).

Mount Zion United Church (417 Ridgewood Crescent, London, Ontario)

Mount Zion United Church was constructed in 1963 and designed by architect David C. Stevens. The building features a faceted roof and geometric windows in the chapel. Construction materials include brick, stone, and concrete.

3 HERITAGE POLICY REVIEW

The following were among the sources reviewed in preparing this HIA:

- Provincial Policy Statement (2020);
- The Ontario Heritage Act (R.S.O. 1990);
- City of London Official Plan (consolidated May 2022);
- City of London's Register of Cultural Heritage Resources;
- Parks Canada Standards and Guidelines for the Conservation of Historic Places in Canada;
- The Ontario Ministry of Tourism, Culture and Sport's Ontario Heritage Toolkit.

Provincial Policy Statement (2020)

The Provincial Policy Statement ("PPS") provides the policy direction for matters relating to land use planning and development in Ontario. On May 1, 2020, the updated PPS 2020 came into effect. With respect to cultural heritage, PPS 2020 continues the approach within provincial policy statements to conserve significant built heritage resources and significant cultural heritage landscapes.

Section 1.7 includes Long-Term Economic Prosperity policies.

Policy 1.7.1 states:

Long-term economic prosperity should be supported by:

> e) encouraging a sense of place, by promoting well-designed built form and cultural planning, and by conserving features that help define character, including built heritage resources and cultural heritage landscapes;

Section 2.6 of the PPS contains policies addressing Cultural Heritage and Archaeology, the most relevant of which include:

> 2.6.1 Significant built heritage resources and significant cultural heritage landscapes shall be conserved.
>
> 2.6.3 Planning authorities shall not permit development and site alteration on adjacent lands to protected heritage property except where the proposed development and site alteration has been evaluated and it has been demonstrated that the heritage attributes of the protected heritage property will be conserved.

The Ontario Heritage Act (R.S.O. 1990)

The Ontario Heritage Act is the statutory legal foundation for heritage conservation in Ontario. Part IV, Section 29 of the OHA authorizes municipalities to enact by-laws to designate properties to protect and conserve their cultural heritage value.

Ontario Regulation 9/06 was passed under the Ontario Heritage Act to identify provincially-mandated Criteria for Determining Cultural Heritage Value or Interest.

City of London Official Plan (consolidated May 2022)

On May 25, 2022, the Ontario Land Tribunal ("OLT") issued a decision repealing and replacing the 1989 Official Plan with the in-force 2016 Official Plan, bringing the policies of the City of London's Official Plan into full force and effect.

The City of London Official Plan contains City Building policies, which include Cultural Heritage policies.

Policy 557 states:

> In accordance with the Ontario Heritage Act, City Council, in consultation with the London Advisory Committee on Heritage (LACH), will prepare and maintain a Register listing properties of cultural heritage value or interest. The Register may also be known as The City of London Inventory of Heritage Resources. In addition to identifying properties designated under the Ontario Heritage Act, the Register may include properties that are not designated but that Council believes to be of cultural heritage value or interest.

Policy 565 states:

> New development, redevelopment, and all civic works and projects on and adjacent to heritage designated properties and properties listed on the Register will be designed to conserve the heritage attributes and character of those resources and to minimize visual and physical impact on these resources. A heritage impact assessment will be required for new development, redevelopment, and civic works and projects on, and adjacent to, heritage designated properties and properties listed on the Register to assess potential impacts and explore alternative development approaches and mitigation measures to address any impact to the cultural heritage resource and its heritage attributes.

Policy 573 states:

> City Council will consider one or more of the following criteria in the identification and designation of individual properties of cultural heritage value or interest:
>
> 1. The property has design or physical value because it:
>
> a. Is a rare, unique, representative or early example of a style, type, expression, material, or construction method.
>
> b. Displays a high degree of craftsmanship or artistic merit.
>
> c. Demonstrates a high degree of technical or scientific achievement.
>
> 2. The property has historic value or associative value because it:
>
> a. Has direct associations with a theme, event, belief, person, activity, organization, or institution that is significant to a community.
>
> b. Yields, or has the potential to yield, information that contributes to an understanding of a community or culture.
>
> c. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer, or theorist who is significant to a community.

3. The property has contextual value because it:

a. Is important in defining, maintaining, or supporting the character of an area.

b. Is physically, functionally, visually, or historically linked to its surroundings.

c. Is a landmark.

City of London's Register of Cultural Heritage Resources

The City of London's Register of Cultural Heritage Resources is a list of properties deemed to satisfy certain qualifying criteria with respect to architecture, history and/or context.

For any building or structure listed on the inventory, the following information is identified:

- Year built (if known)
- Predominant architectural style of building
- By-law number to show Designation under the Ontario Heritage Act, if applicable.

Under the provisions of the Ontario Heritage Act, listed properties cannot be demolished for at least 60 days following a written request for demolition from the owner.

Parks Canada Standards and Guidelines for the Conservation of Historic Places in Canada

The Parks Canada Standards and Guidelines for the Conservation of Historic Places in Canada, along with international charters and agreements, establish the guiding principles for the conservation of built heritage resources in Canada.

Ontario Heritage Toolkit

The Ontario Heritage Toolkit is a series of guides for municipal councils, municipal staff, Municipal Heritage Committees, land use planners, heritage professionals, heritage organizations, property owners and others, designed to help them understand the heritage conservation process in Ontario.

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4 ASSESSMENT OF CULTURAL HERITAGE VALUE

This section of the report includes one cultural heritage value assessment of the site. The assessment provides an evaluation of the site's cultural heritage value through the lens of Ontario Regulation 9/06 - Criteria for Determining Cultural Heritage Value or Interest.

The section concludes with an analysis of the site's integrity.

4.1 O. REG. 9/06

Ontario Regulation 9/06, passed under the *Ontario Heritage Act ("OHA"), R.S.O. 1990, c. O.18*, identifies the criteria for determining cultural heritage value or interest for the purpose of designation under Part IV, Section 29 of the OHA.

Bill 23, the More Homes Built Faster Act, went into effect on January 1, 2023, and amends the OHA to require that properties must meet two or more criteria under Ontario Regulation 9/06 to be eligible for designation under Part IV of the Act, whereas previously, properties were required to meet one or more criteria.

The analysis presented in this section indicates that the site meets one of the nine criteria under O. Reg. 9/06.

Design/Physical Value

We do not believe that the subject property possesses design/physical value. The existing school has a functional, utilitarian institutional form, consistent with many contemporaneous schools constructed throughout Ontario in the later mid-century era. The building has been altered; the school's prominent front bell tower was dismantled and removed in 2011 due to safety concerns. The building is not rare or unique; as illustrated in Section 2.4, there are a number of modern ecclesiastical buildings in the London region, including several with a similar overall layout. The building was originally designed as a seminary, and later adapted to be a school. The comparative analysis by ERA, working with the local architect who is familiar with the local context, examined examples of ecclesiastical building built in the same period. Based on the analysis in Section 2.4, the building is not a representative, unique or rare example of a mid-century modern ecclesiastical space in London as there are other examples of buildings of this type, including more intact examples, and there is not a consistency between these building types. The building is not an early example of a mid-century modern ecclesiastical space in London as similar buildings preceded it. Overall, the design of the building is insufficient to meet the criteria of a rare, unique, representative or early example of a style, type, expression, material or construction method.

Despite the architect's use of a somewhat varied material palette, as well as distinctive architectural detailing in the chapel area, the school does not display a sufficiently high degree of craftsmanship or artistic merit to trigger this criterion. As illustrated in Section 2.4, there are a number of mid-century modern ecclesiastical spaces in the London region with more refined designs and that illustrate a higher degree of craftsmanship. The site does not display a greater than normal quality as compared to other projects by Watt & Tillmann.

The school does not demonstrate a high degree of scientific or technical achievement. The construction methods used at the time of construction have not endured and have contributed to the building's deterioration.

Historical/Associative Value

We believe that the subject property possesses historical/associative value due to its association with the locally-prominent firm of Watt & Tillmann Architects. Since its genesis in 1908, the firm has designed and constructed a large body of work throughout the London region and beyond, and an evolved version of the firm continues to exist today. Regina Mundi College can be situated within Watt & Tillmann's broader oeuvre, with particularly strong stylistic and programmatic parallels to Mount St. Joseph Academy, constructed for the Sisters of St. Joseph in 1954.

The property does not have a sufficiently strong association to a theme, event, belief, person, activity, organization or institution that is significant to a community, in order to meet this criterion. Nor can it yield information that would contribute to an understanding of a community or culture.

The property's historical association with the Catholic Church and, later, the London District Catholic School Board, has been inconsistent. As a religious school, Regina Mundi lacks institutional longevity, having undergone a succession of major changes to its educational model since 1963 as a result of both internal factors (i.e. initial challenges meeting enrollment objectives, financial difficulties) and external forces (i.e. as a location to alleviate overcrowding elsewhere in the London Catholic school system).

Furthermore, while the school was originally designed as an intimate residential Junior Seminary, it no longer serves this purpose and has been adapted to function as a high-enrollment secondary school.

Contextual Value

We do not believe that the subject property possesses contextual value. The surrounding environs of Regina Mundi remain largely undeveloped and predominantly agricultural. While the school is a significant presence in the local landscape by virtue of its anomalous size, it is not a landmark, it is not important in defining, maintaining or supporting the character of the area, and it is not physically, functionally, visually or historically linked to its surroundings.

In conclusion, the evaluation does not meet two or more of the prescribed criteria under O. Reg. 9/06, and therefore the property is not a candidate for designation under the OHA.

Summary: Ontario Regulation 9/06 Evaluation

1) The property has design value or physical value because it is a rare, unique, representative or early example of a style, type, expression, material or construction method.	N/A
2) The property has design value or physical value because it displays a high degree of craftsmanship or artistic merit.	N/A
3) The property has design value or physical value because it demonstrates a high degree of scientific or technical achievement.	N/A
4) The property has historical value or associative value because it has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community.	N/A
5) The property has historical value or associative value because it yields, or has the potential to yield, information that contributes to an understanding of a community or culture.	N/A
6) The property has historical value or associative value because it demonstrates, or reflects the work or ideas of an architect, builder, designer or theorist who is significant to a community.	√
7) The property has contextual value because it is important in defining, maintaining or supporting the character of an area.	N/A
8) The property has contextual value because it is physically, functionally, visually or historically linked to its surroundings.	N/A
9) The property has contextual value because it is a landmark.	N/A

4.2 INTEGRITY ANALYSIS

Although O. Reg. 9/06 does not consider the integrity of the resource, or its physical condition, the Ministry of Tourism, Culture & Sport provides commentary on pages 26-27 of the *Heritage Property Evaluation (2006)* document of the Ontario Heritage Toolkit:

> *A cultural heritage property does not need to be in original condition. Few survive without alterations on the long journey between their date of origin and today. Integrity is a question of whether the surviving physical features (heritage attributes) continue to represent or support the cultural heritage value or interest of the property.*
>
> *Cultural heritage value or interest may be intertwined with location or an association with another structure or environment. If these have been removed, the integrity of the property may be seriously diminished. Similarly, removal of historically significant materials, or extensive reworking of the original craftsmanship, would warrant an assessment of the integrity.*
>
> *Physical condition is another difficult consideration. Some cultural heritage properties are found in a deteriorated state but may still maintain all or part of their cultural heritage value or interest. The ability of the structure to exist for the long term, and determining at what point repair and reconstruction erode the integrity of the heritage attributes, must be weighed against the cultural heritage value or interest held by the property.*

Evidence of the site's reduced integrity includes:

- The removal of the original bell tower over the front entrance in 2011 due to safety concerns. The bell tower was the primary architectural focal point of the building's front (west) elevation.
- A defective building envelope which has required interim protective measures to buffer the building occupants from falling exterior cladding and debris.
- Most of the pieces of glass in the decorative glass windows in the chapel have delaminated and are at risk of falling, due to the use of an experimental method of lamination.
- Later additions and alterations, including the expansion of the original convent/garage wing, construction of the second-storey library addition, conversion of the second and third-floor residential quarters to classroom spaces, and extensive interior alterations throughout. These alterations have taken place in tandem with a shift away from the school's original operating model as an intimate, residential Junior Seminary.

In summary, the site meets one of the criteria for determining cultural heritage value or interest under Ontario Regulation 9/06 as a result of its historical/associative value but does not meet the two or more criteria under Ontario Regulation 9/06 that would make it eligible for designation under Part IV of the Act. This finding, along with the site's reduced integrity, and the extent of widespread physical deterioration throughout the building, contributes to our assessment that the site should not be designated under Part IV of the Ontario Heritage Act, and that removal of the existing Regina Mundi College building is appropriately mitigated through the conservation strategy proposed in this HIA.

5 ASSESSMENT OF EXISTING CONDITION

The condition of Regina Mundi College has been assessed on several previous occasions. ERA has reviewed several condition reports prepared for the site, including:

- Asbestos Product Survey by Exp Services Inc., dated June 30, 2012.
- Regina Mundi College Building Renewal Study by Nicholson Sheffield Architects Inc. et al, dated September 25, 2013.
- Review of Exterior Masonry Cladding by Hastings & Aziz Ltd. Consulting Structural Engineers, dated December 9, 2014.

ERA visited the site on March 14, 2018 with Nicholson Sheffield Architects in order to review the interior and exterior areas of the school. We documented our visit with interior and exterior photographs as well as field notes.

This section provides an overview of the findings of previous condition assessments, supplemented with photos from ERA.

Asbestos Product Survey by Exp Services Inc., dated June 30, 2012

An investigation of asbestos-containing materials at Regina Mundi College was carried out by Exp Services. During this investigation, the surveyor inspected the building for construction materials found within or forming part of the building envelope suspected of containing asbestos. Samples of suspected asbestos-containing materials were sent to an independent National Voluntary Laboratory Accreditation Program-accredited laboratory.

Key findings of this investigation are summarized as follows:

- Textured ceiling finish containing 1.3% chrysotile asbestos is present as a ceiling finish in various locations throughout the school. All textured ceiling finish observed is in good condition.
- A tar coating has been applied over fiberglass insulation on several fittings throughout this facility. This tar coating contains approximately 1.7% chrysotile asbestos. Tar is considered a non-friable asbestos requiring Type 1 procedures for disturbances.
- One variant of ceiling tile present in the building contains 1.8% amosite asbestos.
- Vinyl floor tiles assumed to contain asbestos are present in various locations within the facility.
- Asbestos cement board or “transite” is present as a wall finish in the confession booth in the chapel. Transite observed was in good condition.
- The presence of asbestos is possible in the following materials: material components or insulation within electrical switchgear, motors, lights, etc.; mechanical packings and pipe gaskets; plastic laboratory benches; moulded chair seats or other plastic products; fire door cores; window putty or caulking.

Regina Mundi College Building Renewal Study by Nicholson Sheffield Architects Inc., dated September 25, 2013

A study by Nicholson Sheffield Architects ("Regina Mundi College Building Renewal Study"), in tandem with several sub-consultants, was conducted in 2013 to inform the London District Catholic School Board's Capital Plan. The study, which examined the architectural, mechanical and electrical building systems, provided information and associated costs on necessary improvements to Regina Mundi College to prolong the life of the building through refurbishment.

Key findings of this study are summarized as follows:

- Many Ontario Building Code standards are not met, including with regards to fire-rated separations and closures, building size and construction relative to occupancy, exits and egress, health requirements, and barrier-free accessibility.
- Mortar joints in the building's original stone veneer have deteriorated over time allowing water penetration. There are locations where the stone may be in danger of falling from the building. This has occurred previously and is the reason that the original bell tower was removed. Mortar joints of the 1987 addition also show signs of deterioration due to the failure of caulked joints, and the lack of or failure of metal flashings.
- The majority of the building's plumbing and fire protection systems, dating back to 1963 and now exceeding 50 years of age, require partial replacement or upgrade. Many of the building's ventilation systems are in very poor condition, do not function adequately, and are marginal for occupational health and safety.
- The majority of the building's electrical systems are in fairly good condition, with the exception of the fire alarm system.

The 2013 Building Renewal Study provided a summary of proposed costs related to refurbish Regina Mundi's architectural, mechanical and electrical systems. The cost breakdown presented in the report is as follows:

Building Code Upgrades (including fire separation upgrades)	$ 300,000
Removal of Designated Substances	$ 400,000
Barrier Free Accessibility Improvements	$ 250,000
Gymnasium Floor Replacement (1988 Addition)	$ 150,000
Building Envelope Improvements	
• Replacement of Exterior Caulking	$ 100,000
• Restoration of Exterior Stone	$ 1,700,000
• Replacement of Roof V (at Chapel)	$ 3,000
• Replace Library Skylight Glazing	$ 20,000
• Replace Acrylic Dome Skylight on Roof U	$ 3,000
• Remove existing Greenhouse from Gym roof and conversion to storage room	$ 25,000
• Window & Door Replacement	$ 500,000
Separate Greenhouse Structure	$ 50,000
Technology Wing Improvements – demolish existing, design and build new facilities	$ 2,800,000
Drama Classroom Addition & Improvements	$ 400,000
Family Studies / Nutrition Classroom Renovations	$ 150,000
Elevator Refurbishment	$ 130,000
Demolition and Removal of Existing Portables	$ 120,000
Fire Sprinkler System Installation	$ 450,000
Mechanical Ugrades	$ 4,500,000
Electrical Upgrades	$ 1,770,000
Updated Asbestos Product Survey	$ 4,500
Professional Consulting Fees for Renewal Project (6.1%)	$ 850,000
Fees & Permits (1%)	$ 140,000
Furniture & Equipment	$ 250,000
Contingency	$ 750,000
Total	**$ 15,915,500**

Summary of proposed costs from Regina Mundi College Building Renewal Study (Nicholson Sheffield Architects et al, 2013).

Review of Exterior Masonry Cladding by Hastings & Aziz Ltd. Consulting Structural Engineers, dated December 9, 2014

Hastings & Aziz was retained subsequent to the Nicholson Sheffield 2013 Building Renewal Study to review the condition of the exterior masonry cladding.

Destructive testing was performed on the original Regina Mundi College building, involving the removal of limestone panels on the east and west elevations to assess the condition of the wall assembly behind.

The review found that ties connecting the stone veneer to the building structure are of a thin gauge, were corroded, had insufficient embedment into the stone veneer, and were spaced greater than the Ontario Building Code allows.

Without the required ties, the review found, the stone is in danger of falling to the ground and endangering the safety of the public below. Consequently, it was recommended that interim protective fencing be placed around the areas of primary concern. This fencing remains in place.

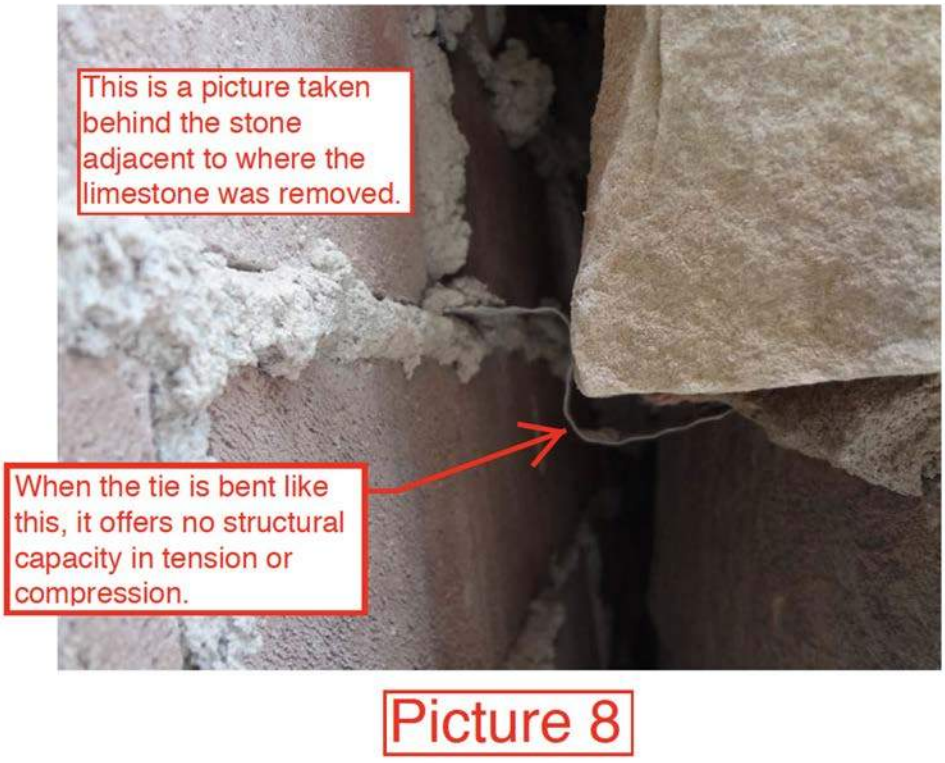
The reviewers were able to move one section of stone cladding, located at the southeast corner of the original three-storey block, laterally with their hand. This stone, which was bulging outward from the wall, has since been reinforced with a temporary steel bracing structure.

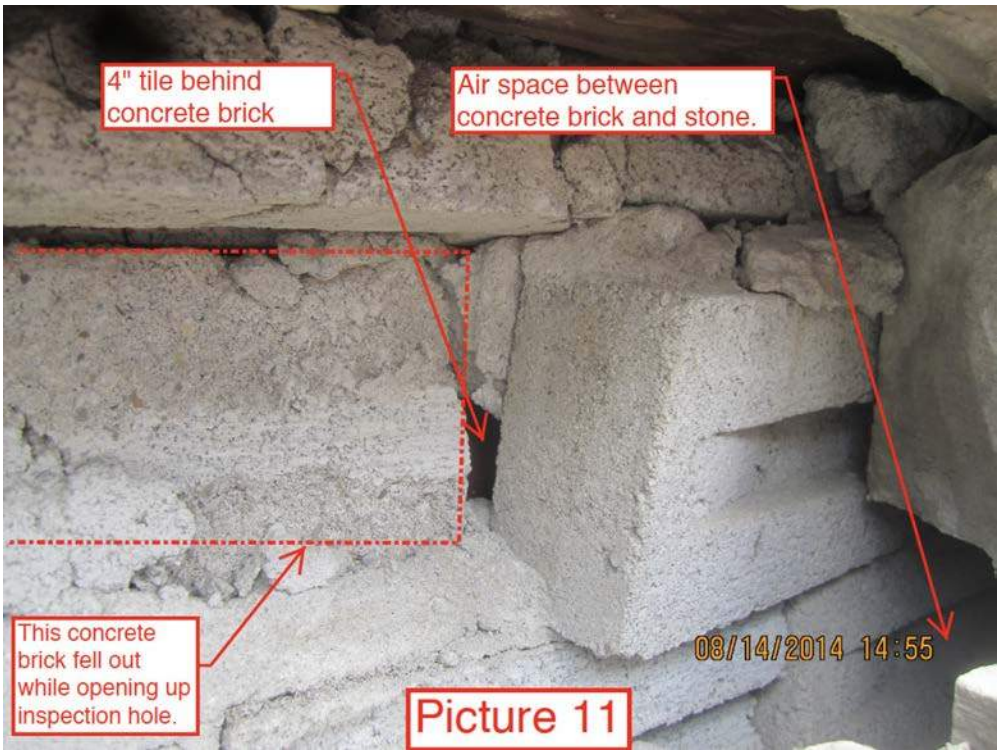
The review noted that to repair the defective ties, traditionally, stainless steel helical ties would be installed into the structural back-up to provide proper anchorage to the stone veneer. However, the structural back-up of the school was found to be insufficient to provide proper anchorage for the stone veneer.

The report gave two repair options. Option 1, a temporary solution designed to last 3-5 years, included the installation of a steel grillage to brace the stone veneer. A cost estimate of $2.87-million was provided for this option.

Option 2 would be to remove the concrete brick and clay tile and lay a proper concrete block wall to provide the adequate structural backup for the stone veneer. This would require a temporary bracing structure to support the stone veneer while the original concrete brick and speed tile are removed. Furthermore, all windows, mechanical and electrical systems in the wall would have to be removed and re-instated after the new block is placed. A cost estimate of between $7-10 million dollars was provided for this option.

Photo of bulging limestone panel at southeast corner of three-storey block (Hastings & Aziz, 2014).





Above 2 photos: destructive investigation to assess condition of wall assembly behind stone panels (Hastings & Aziz, 2014).

ERA Photos from March 14, 2018 site visit

Mortar loss below window on original south Y-shaped block, west elevation (ERA, 2018).

Mortar loss on wall, original south Y-shaped block, west elevation (ERA, 2018).

Failed caulking between precast insulated masonry panels and aluminium cover plate, east elevation of north Y-shaped wing (ERA, 2018).

Wall cavity exposed due to gap between precast insulated masonry panels and aluminium cover plate, east elevation of north Y-shaped wing (ERA, 2018).

Dislodged stone on pier, at east elevation of Technology Wing (ERA, 2018).

Steel bracing for loose panel, east elevation. Scaffolding installed over maintenance door and garage (ERA, 2018).

Scaffolding installed over door at east elevation, beside the “gymtorium” (ERA, 2018).

Staining and mortar loss on north chapel elevation (ERA, 2018).

Scaffolding installed over door at north chapel elevation (ERA, 2018).

6 DESCRIPTION OF PROPOSED DEVELOPMENT

The proposed development includes the removal of the 1963 Regina Mundi College building in its entirety after construction is complete for a replacement secondary school building in a more northwesterly location on the site.

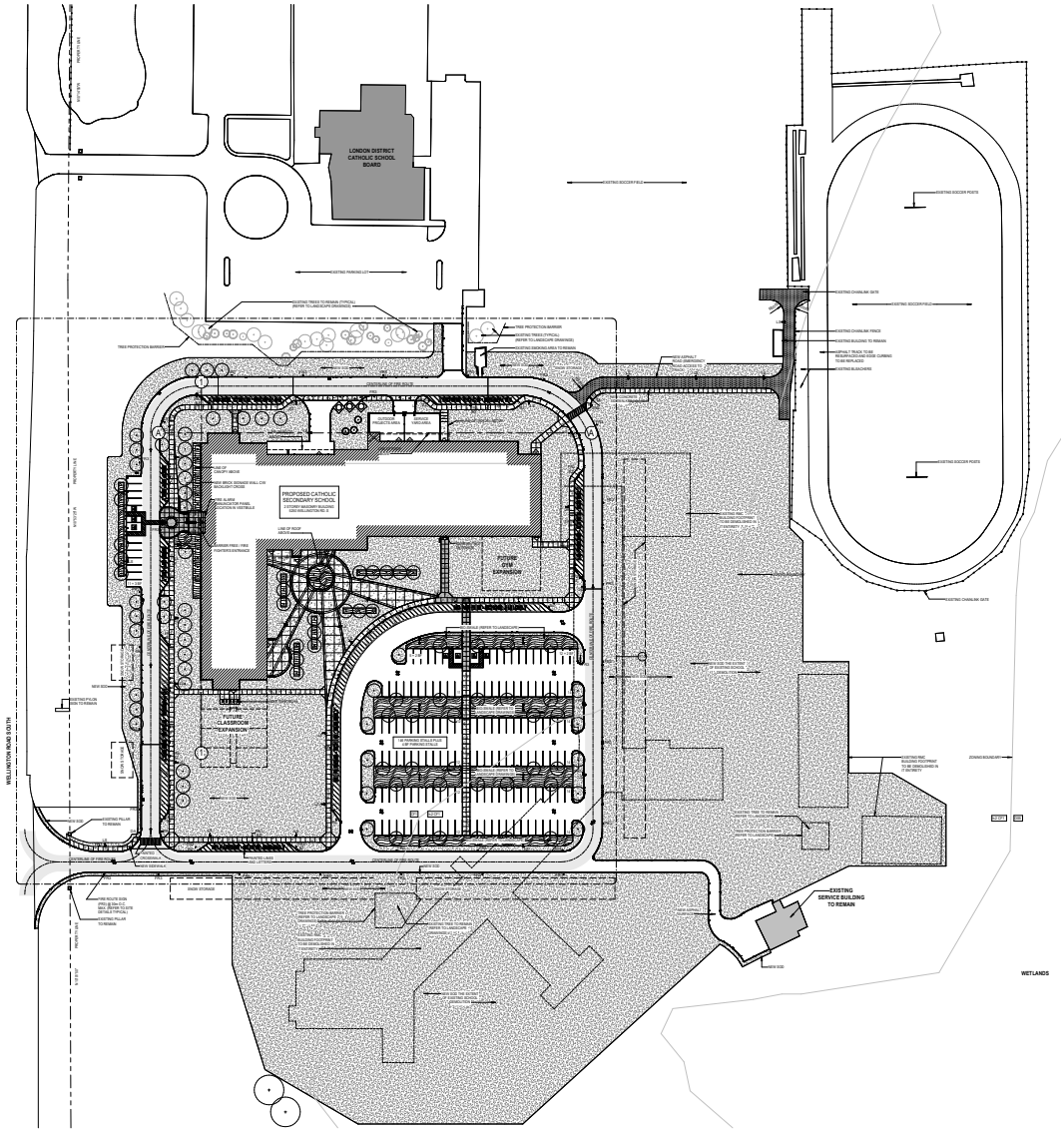
A surface parking lot will be located southeast of the new school building. Landscape improvements and bio-retention swales will be incorporated into the proposed site plan.

An existing roadway will be maintained and will loop around the new building, providing access to loading and servicing facilities located on the north side of the building. This roadway will connect to the existing London District Catholic School Board parking lot to the north. The outdoor athletic track and related facilities will be maintained in their existing location and resurfaced.

The proposed replacement school building is L-shaped in plan, and two floors in height. The building has been designed in a contemporary institutional style and will be clad with brick masonry and glazing.

The siting of the proposed replacement school and the surface parking area allows for an increased amount of landscaped open area on the property, as well as an increased setback from the adjacent provincially significant wetland.

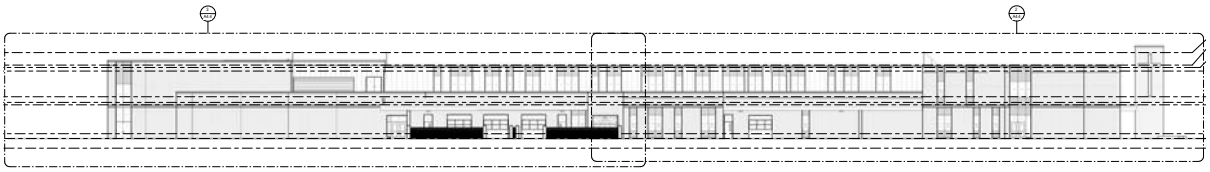
The existing London District Catholic School Board headquarters building will remain and is outside the scope of the Regina Mundi redevelopment.



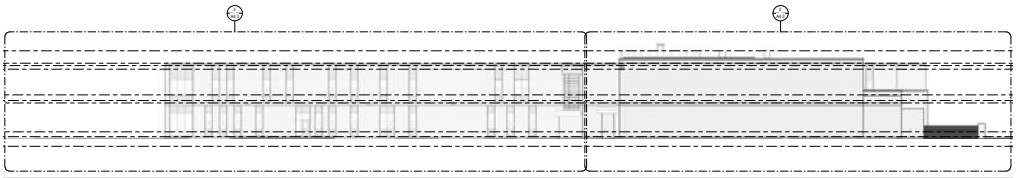
Proposed site plan overlaid with existing Regina Mundi College building footprint (Nicholson Sheffield Architects, 2023).

West view of main entry to proposed development (Nicholson Sheffield Architects, 2023).

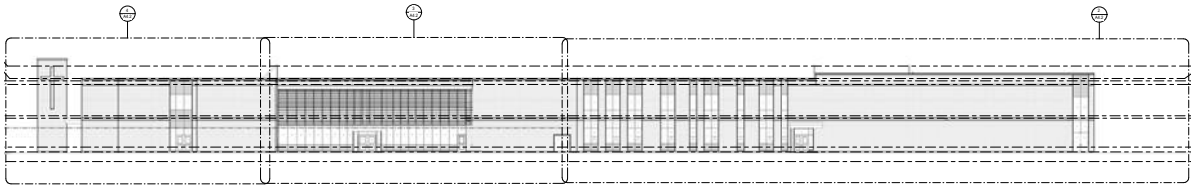
View of proposed development from south-east courtyard (Nicholson Sheffield Architects, 2023).



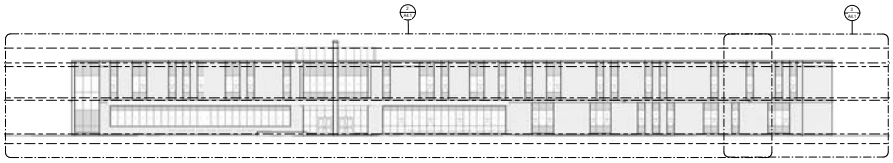
Proposed north elevation (Nicholson Sheffield Architects,2023).



Proposed east elevation (Nicholson Sheffield Architects,2023).



Proposed south elevation (Nicholson Sheffield Architects,2023).



Proposed west elevation (Nicholson Sheffield Architects,2023).

7 MEASUREMENT OF DEVELOPMENT IMPACT

7.1 DEVELOPMENT IMPACTS

This HIA has identified that the site meets one of the Provincially-defined criteria for determining cultural heritage value or interest, as a result of the site's association with the firm of Watt & Tillmann Architects. As a result of Bill 23 coming into effect in January 2023, properties must meet two or more criteria to be eligible for designation under Part IV of the Act. The evaluation does not meet two or more of the prescribed criteria under O. Reg. 9/06, and therefore the property is not a candidate for designation under the OHA.

The 1963 Regina Mundi College building is proposed to be removed in its entirety, with the exception of certain salvaged materials that will be integrated into the new building fabric to facilitate site commemoration and heritage interpretation.

This section reviews the impacts of the proposed development, using the various negative impacts listed in Infosheet #5 (Heritage Impact Assessments and Conservation Plans) for the Cultural Heritage and Archaeology Policies issued pursuant to Section 2.6 of the 2005 Provincial Policy Statement.

Potential Impact	*Comments*
(1) **Destruction** of any, or part of any, significant heritage attributes or features;	The proposed development will remove the original 1963 Regina Mundi College building in its entirety.
(2) **Alteration** that is not sympathetic, or is incompatible, with the historic fabric and appearance;	The proposed development does not contemplate alteration to the 1963 Regina Mundi College building - full removal is proposed, with the exception of salvaged materials that will be integrated into the new building fabric in a commemorative capacity.
(3) **Shadows** created that alter the appearance of a heritage attribute or change the viability of a natural feature or plantings, such as a garden;	The proposal is to remove the 1963 Regina Mundi College building, thus the question of shadowing is moot. Notwithstanding, the proposed replacement school is a low-rise building that will not result in significant shadowing.
(4) **Isolation** of a heritage attribute from its surrounding environment, context or a significant relationship;	The proposed development will remove the original 1963 Regina Mundi College building in its entirety.
(5) **Direct or indirect obstruction** of significant views or vistas within, from, or of built and natural features;	The proposed replacement school will open up new views across the property hitherto obstructed by the 1963 Regina Mundi College building, thus enhancing appreciation of the site's natural heritage features such as the woodland and provincially significant wetland areas.
(6) **A change in land use** such as rezoning a battlefield from open space to residential use, allowing new development or site alteration to fill in the formerly open spaces; and	No change in land use is proposed.
(7) **Land disturbances** such as a change in grade that alters soils, and drainage patterns that adversely affect an archaeological resource.	There will be no significant land disturbances as a result of the proposed development, with the exception of some re-grading on the north side of the new school to facilitate access to the loading and servicing entries.

8 CONSIDERATION OF ALTERNATIVES, MITIGATION AND CONSERVATION METHODS

8.1 CONSIDERED ALTERNATIVES

Full Retention and Rehabilitation

A study by Nicholson Sheffield Architects ("Regina Mundi College Building Renewal Study"), in tandem with several sub-consultants, was conducted in 2013 to inform the London District Catholic School Board's Capital Plan. The study provided information and associated costs on necessary improvements to Regina Mundi College to prolong the life of the building through refurbishment.

The 2013 study assessed all of the building's architectural, mechanical and electrical systems and concluded that a full building renewal would be cost prohibitive with an estimated cost of $16 million.

Partial Retention

City of London staff have expressed interest in the retention of the chapel element of the 1963 Regina Mundi College building. While the chapel itself is more architecturally refined than the remainder of the school and contains some interesting design elements, it is not viable to retain the chapel as a standalone element.

The chapel is physically integrated with Regina Mundi College, and relies on building systems currently supplied by facilities located elsewhere in the school. Retention of the chapel would require new systems to be constructed and installed to service the chapel.

Retention of just the chapel alone would require a new exterior west wall to be constructed, where the chapel currently connects to the east side of the school. In accordance with heritage conservation principles, the new wall would need to be distinguishable as a contemporary intervention, as a conjectural design to make the wall appear original would not constitute good heritage planning.

Furthermore, if the chapel were to be retained as a standalone building, this would result in a heritage attribute being divorced from its original context, being a part of a broader private boarding school that was purpose-built for boys intending to enter the priesthood. Isolation of a heritage attribute is a negative heritage impact that is discouraged under the Ontario Heritage Toolkit.

Another issue associated with partial retention of the chapel is defining a use. The chapel is a distinctive building form and use that may not be suitable for adaptation if it were to be isolated on the site. The chapel is also located west of a Provincially Significant Wetland.

Retention of the chapel as a standalone element would require the construction of new building systems, in addition to a new west wall where the chapel is currently attached to the school.

Summary

In light of the foregoing, in addition to the other factors identified in this HIA, neither full retention and rehabilitation nor partial retention of the chapel area were selected as these were not determined to be viable options for the school moving forward.

8.2 MITIGATION RECOMMENDATIONS AND CONSERVATION STRATEGY

The proposed development will result in heritage impacts related to the removal of the original Regina Mundi College building. This HIA identifies and recommends that the owner commit to a conservation strategy comprised of several measures to mitigate the impact of the proposed development. In totality, these mitigation measures will conserve the cultural heritage value of the site.

The recommended conservation strategy and mitigation measures include:

- Prior to demolition, the building should be extensively documented to preserve a fulsome archival record of its existing condition, including detailed architectural plans and elevations of current conditions and photographic documentation.
- The preparation of a Heritage Interpretation Plan to identify strategies and implementation measures that will help commemorate the cultural heritage value of the site to the future occupants. The Interpretation Plan could be developed in consultation with the Regina Mundi community and result in material for display in the new school. The Interpretation Plan will provide detailed information regarding the location, content and format of interpretive materials to be used.
- A selection of salvaged elements should be incorporated to support the future commemoration and interpretation of the site. This could potentially include, but is not limited to: the red granite surround and inscription flanking the main entry: a representative example of painted glass panels from the chapel, and; exterior stone panels in sufficiently good condition to merit salvage. Photos of these elements are included on the following pages.
- The use of a folded plate roof structure in the new school building designed to evoke the style and appearance of the original chapel. This box dormer motif could be used in a prominent common area of the new school.
- The installation of a heritage plaque or marker in a prominent location on the site to commemorate the original Regina Mundi College building and convey its historical significance.

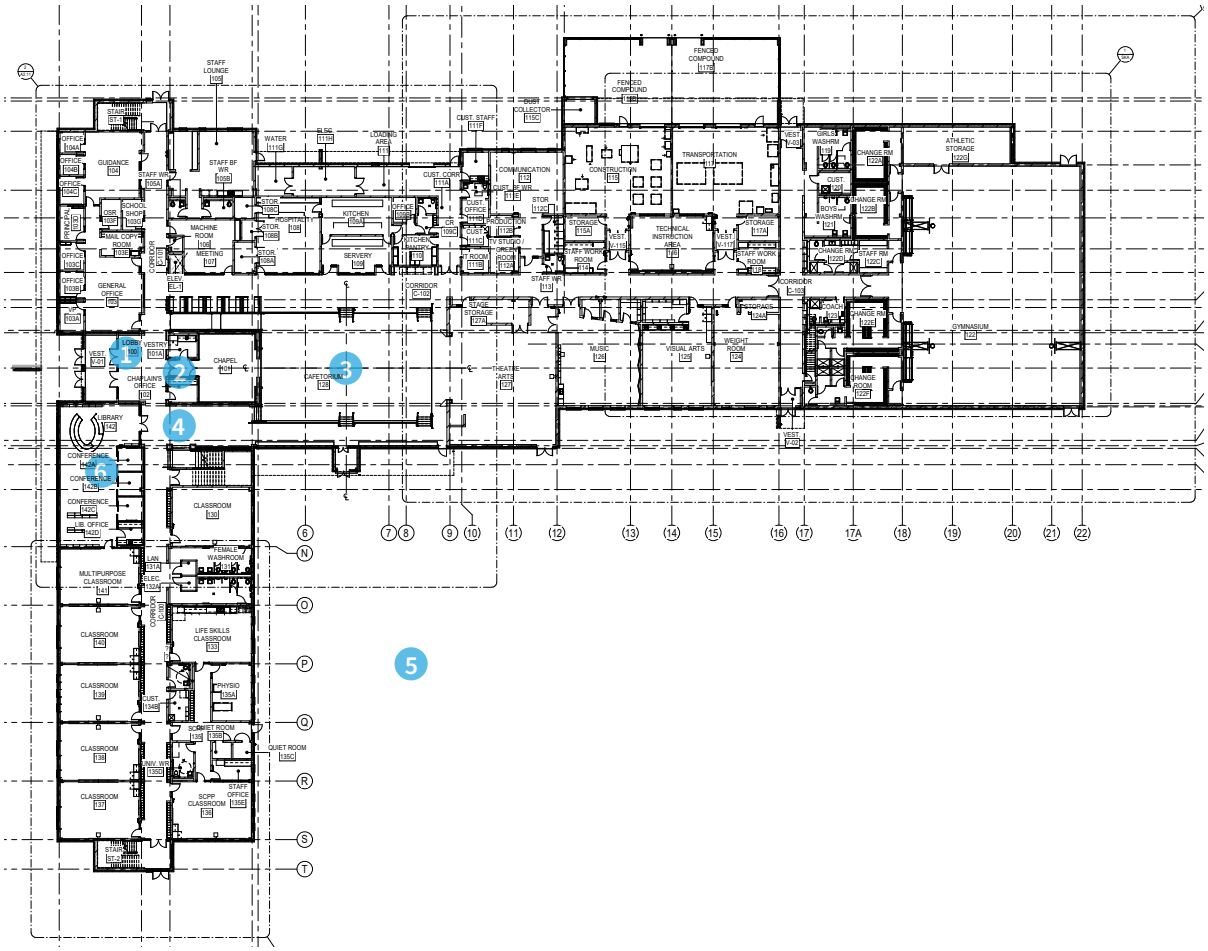
Taken together, these measures constitute an appropriate conservation strategy to accompany the proposed development and to mitigate the impact of removing the original Regina Mundi College building. The conservation of certain physical elements, as well as the documentation and the preparation of a interpretation plan will sustain the legacy of the 1963 school within the replacement school.

A table that itemizes the attributes as outlined in the listing description and includes the proposed impacts and mitigation measures is included on the following page.

Assessment of Impact and Mitigation - Itemized Heritage Attributes Identified in Listing Description

Attribute	*Impact*
The Chapel, located at RMCC is situated on the first floor of the central wing. Dedicated to the Blessed Virgin Mary, the Chapel is visible upon entrance into the original part of the building. Having a seating capacity for 250 people with a small balcony at the rear, the proportions and design of the space are balanced, and it is the largest chapel of the Catholic Secondary Schools in the London District.	**Removal.** The chapel is proposed to be removed along with the rest of the 1963 school building. **Mitigation:** A new chapel space will be provided in the replacement school, providing continuity of this use. The new chapel space is in approximately the same location of, and has the same relationship to the school entry as, the existing RMC chapel.
The structure of the space is marked by a tapered-column frame, evident within the finished walls and ceilings of the space.	**Removal and re-creation.** The structure of the space, marked by a tapered-column frame, is proposed to be removed. **Mitigation:** The folded plate roof structure as a design motif will be recreated in the Commons area of the replacement school, which the chapel will face, and can open onto.
The exterior of the Chapel is clad in stone (like the rest of the original school) with interior wood finishes and marble accents.	**Removal.** The exterior stone cladding, and interior wood finishes and marble accents, are proposed to be removed. As noted in structural assessments the exterior stone cladding on the chapel is in defective condition and has been surrounded by a protective buffer zone for years. The interior wood and marble finishes are relatively unremarkable and do not contribute strongly to the character of the space. **Mitigation:** Interpretation of interior finishes in the new school chapel and Commons areas.
Key features include the painted glass windows (featuring the seven sacraments of the Catholic Church) with marble stools located below the window frames.	**Removal and reinstatement of representative examples.** **Mitigation:** Within the chapel there are eight large painted glass windows, each made up of fifteen smaller panels. In the side-altar, there are two painted glass windows, each made up of three smaller panels. The painted glass windows are in poor to defective condition as the experimental fabrication method, used by artist Theo Lubbers in 1963, has failed and individual pieces of glass have begun to fall out of place. Recognizing the frail condition of the painted glass windows, a representative grouping of the windows will be repaired and stabilized in-situ, carefully removed, and re-instated in a prominent location of the new school. To the extent that they can be removed intact, a number of marble stools will be retained for salvage and reinstatement with windows.
Two rooms flank the rear of the chapel, and originally housed the priests living quarters.	**Removal.** ERA has viewed these rooms and observed that they do not contain any significant elements. **Mitigation:** None required.
The Chapel also features a memory wall displaying photos of former students and staff members who passed away during their time at RMCC.	**Removal and reinstatement.** Mitigation: The memory wall will be relocated in an area of the new school near the lobby and chapel.

The plan below includes the location of proposed salvaged components, photographs of the existing elements, and a table describing the proposed salvage and reinstatement approaches.



Locations for Reinstated Elements / Conservation Measures

#	Element/Measure	Location
1	Red granite surround and inscription	Main entry / lobby area
2	Representative example of painted glass windows	Entrance to the chapel
3	Folded plate roof structure	Commons
4	Memory Wall	Lobby area or adjacent to chapel
5	Heritage Plaque or Marker	Inside school or on grounds
6	Site Documentation Heritage Interpretation Plan	Library

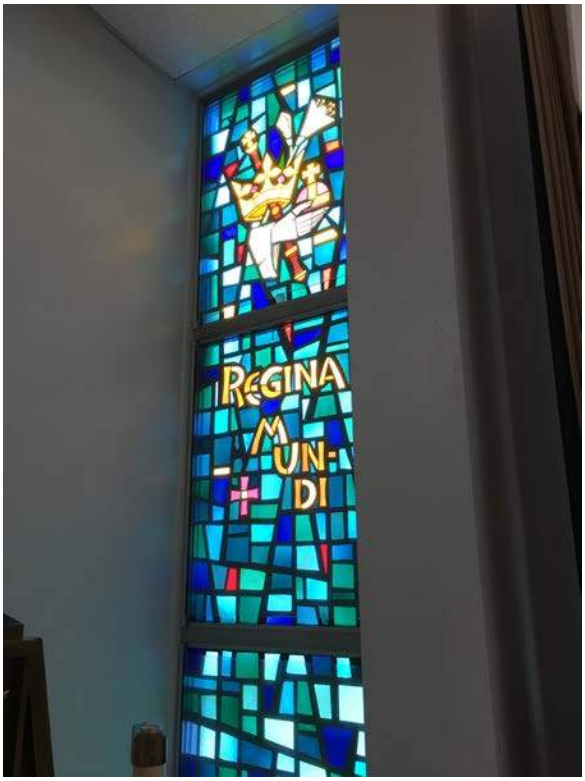
Proposed site plan (Nicholson Sheffield Architects, 2023; annotations by ERA).

Large stone panels cladding the ends of the three-storey building (ERA, 2018).

Red granite surround with inscription, flanking the front entry (ERA, 2018). Inscription reads:

VALEAM TIBI SERVIRE
HOC SEMINARIUM
B. MARIAE V. REGINA MUNDI
DICTATUM
JOANNES C. CODY. VII DIOC. LONDINENSIS E.
CONDIDIT
ATQUE HUNC LAPIDEM PRIMARIUM
FESTO B.V.M. NATIVITATIS A. MDCCCCLXIII
RITE LUSTRAVIT

Red granite surround flanking the front entry (ERA, 2018).



Painted glass windows in the side chapel (ERA, 2018).

Tapered columns and folded plate roof structure in the chapel (ERA, 2018).

Memory Wall, in the existing chapel (ERA, 2018).

Conservation Component	*Implementation Strategy*
(1) Red granite surround and inscription.	Carefully remove individual granite panels and store in a safe location during construction. Once construction is complete, panels to be re-mounted in the lobby. The inscribed panel will be prioritized, as well as a number of additional units to be determined by the available wall area and/or other constraints of the new space.
(2) Representative example of painted glass windows.	Due to the number of painted glass windows in the chapel, as well as their varying states of repair, ERA recommends that a representative sampling of the windows be salvaged and re-instated in the new chapel. The windows selected for retention will be carefully removed, safely stored during construction, and re-instated in their new positions. The salvaged decorative glass panels from the existing school will be prominently located to each side of the chapel entrance, which will be off the main lobby entrance to the school. Back-lighting will be used to illuminate the re-instated windows panels. Marble stools, to the extent that they can be removed intact, will be re-instated below the re-instated painted glass windows.
(3) Use of folded plate roof structure in the new school building.	To evoke the structural form of the existing chapel, which reflects the modern design sensibilities of the 1963 RMC school, ceiling design referencing a folded plate roof structure will be constructed in the Commons area of the new school. This will be achieved using drywall bulkheads, and will provide visual continuity to the former chapel structure. Interior renderings of this treatment are included on the following page.
(4) Incorporation of Memory Wall.	The individual photographs that comprise the Memory Wall, in the existing chapel, will be removed, stored during construction, and displayed in the new school in a location near the front lobby or adjacent to the new chapel.
(5) Installation of heritage plaque or marker.	A heritage plaque or marker will be installed in a prominent area of the site, potentially containing a combination of photographs and textual information related to the history of the site and RMC. The content of the plaque can be determined at a later date, and could be developed in consultation with the RMC community. The plaque can be installed either inside of the new school or on the grounds.
(6) Documentation of existing condition for archival purposes.	Prior to demolition, the building should be documented to preserve a fulsome archival record of its existing condition, including detailed architectural plans and elevations of current conditions and photographic documentation. Site documentation should be filed with a local archives such as the London Public Library or Western University, and could also be retained on-site in the new school's library.
(7) Preparation of a Heritage Interpretation Plan.	A Heritage Interpretation Plan will be prepared to identify the above-noted strategies to help commemorate the history and cultural heritage value of the site to future occupants. The Interpretation Plan should contain subject matter related to Watt & Tillmann Architects and their contribution to the City of London's architectural history. The Interpretation Plan should be developed in consultation with the RMC community and result in resources/materials to be displayed in the new school, e.g. in the school library.

Interior renderings of the entrance of the chapel (Nicholson Sheffield Architects, 2023).

Interior rendering of the proposed Commons area (Nicholson Sheffield Architects, 2023).

9 CONCLUSION

This HIA has considered the impact of the proposed development for 5250 Wellington Street South on Regina Mundi College, a building listed on the City of London's Register of Cultural Heritage Resources.

Evaluating the site under provincial criteria for identifying cultural heritage value or interest, we find that the site meets one of the criteria for designation under Part IV of the OHA by virtue of its association with the locally-prominent firm of Watt & Tillmann Architects, who contributed to mid-century architecture and design in the London Region, and thus the property is not a candidate for designation.

In light of extensive physical deterioration of the building envelope which poses an ongoing life safety risk, obsolete building systems and accessibility issues, later alterations such as the removal of the original bell tower element, and other factors identified in this HIA, we believe that removal of the resource is appropriate and justified.

The commitment of the owner to the conservation strategy contained in this HIA will mitigate the impact of removing the original Regina Mundi school in order to facilitate the construction of a replacement school building.

10 PROJECT PERSONNEL

ANDREW PRUSS

Andrew Pruss is a Principal with ERA. He has been involved in all aspects of architectural projects ranging from single-family residences and condominiums to institutional, commercial and hotel projects. He has previously been qualified by the Ontario Municipal Board, now continued as the Ontario Land Tribunal (the "OLT"), the Conservation Review Board, and the Toronto Local Appeal Body in the field of heritage planning and architecture.

DAN EYLON

Dan Eylon is a Senior Associate and Planner at ERA. He is a registered and active member of the CAHP. He received his Master of Arts in Planning from the University of Waterloo after completing a Bachelor of Fine Art at the Ontario College of Art & Design.

CLARA SHIPMAN

Clara Shipman is an Architect and Planner at ERA. She received her Master of Science in Planning from the University of Toronto after completing a Master of Architecture from McGill University. She is a candidate member of the OPPI.

ZEINA AHMED

Zeina Ahmed is a is a Planner at ERA. She received her Master of Science in Planning from the University of Toronto and her undergraduate degree in Urban and Environmental Planning from the University of Virginia. She is a candidate member of the OPPI.

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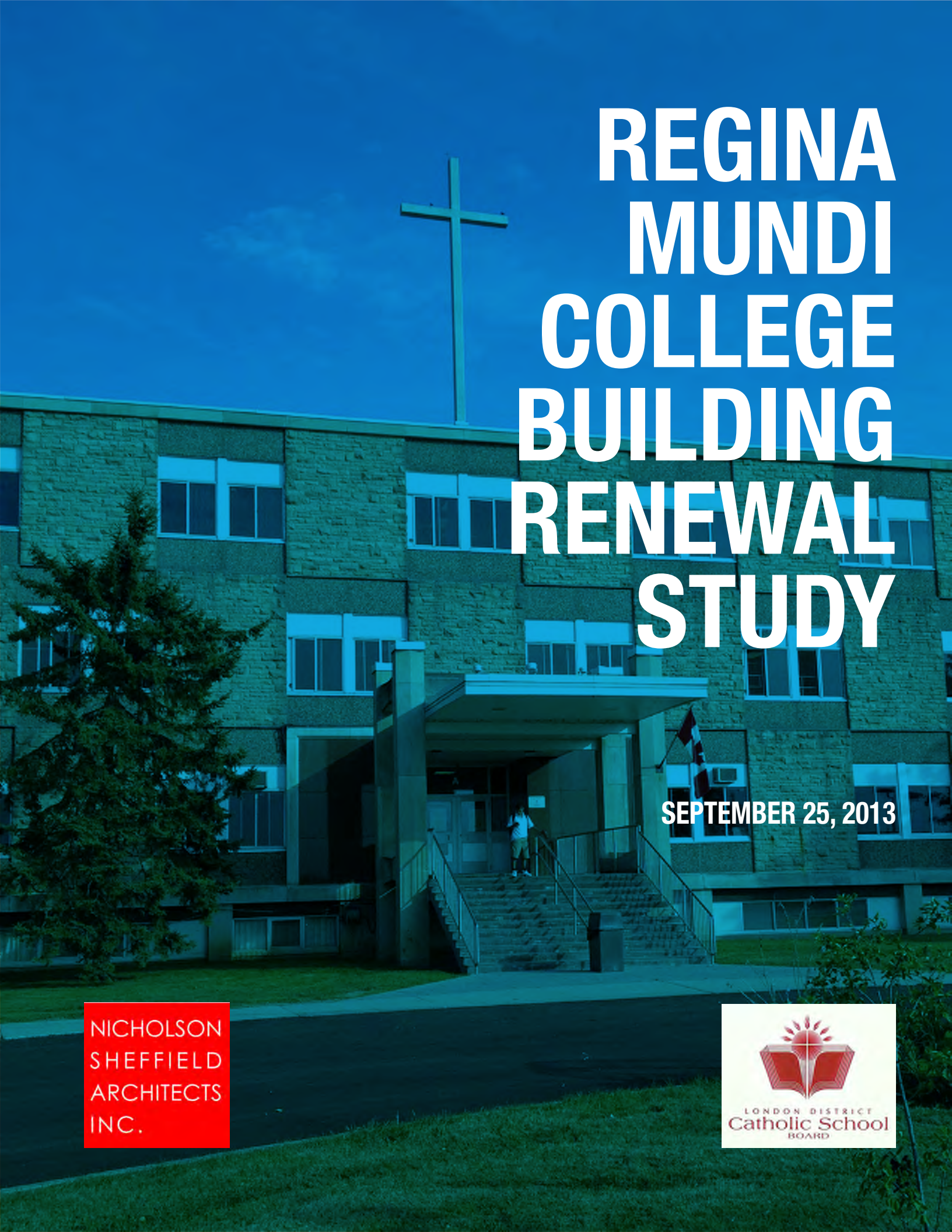
12 APPENDICES

Appendix I: Regina Mundi College Building Renewal Study by Nicholson Sheffield Architects et al, dated September 25, 2013



REGINA MUNDI COLLEGE BUILDING RENEWAL STUDY

SEPTEMBER 25, 2013

NICHOLSON SHEFFIELD ARCHITECTS INC.

LONDON DISTRICT Catholic School BOARD

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PRIMARY CONTACT
Jim Sheffield, Principal
jsheffield@nicholsonsheffield.ca

NICHOLSON SHEFFIELD ARCHITECTS INC.
358 Talbot Street, London, ON, N6A 2R6
P. (519) 673-1190
F. (519) 673-1490
nicholsonsheffield.ca

EXECUTIVE SUMMARY

Originally designed and constructed in 1962, Regina Mundi College (RMC) is one of the oldest secondary schools in the London District Catholic School Board's portfolio. The LDCSB has requested Nicholson Sheffield Architects Inc. (NSA) to prepare a report assessing the architectural, mechanical, and electrical systems at RMC to inform the Board's Capital Plan as it relates to improvements at RMC. This approach is consistent with Ministry objectives of providing a high standard of environment for students to learn.

A summary of the costs related to upgrades and refurbishment of RMC can be found at the end of this report.

METHODOLOGY

NSA conducted several visual examinations of the building interior and exterior in September 2013. No invasive disassembly and testing were conducted during examinations. We were joined by Chorley + Bisset Ltd. Consulting Engineers, who conducted similar inspections of the building's mechanical and electrical systems.

EXECUTIVE SUMMARY

The following personnel were involved in the site visits:

Prime Consultant: Jim Sheffield of Nicholson Sheffield Architects Inc.

Mechanical Engineer: Derek Vakaras of Chorley + Bisset Ltd. Consulting Engineers

Electrical Engineer: Bob Gordon of Chorley + Bisset Ltd. Consulting Engineers

Additionally, NSA held discussions with Denis Sykora of North American Roof Management Systems regarding previous and scheduled roof replacement projects at RMC, David Cook of exp Services Inc. regarding removal of designated substances, and Bill Robertson of Roberston Restoration regarding the condition of the exterior stone masonry.

LIMITATIONS

The information contained in this report is based, in part, on drawings and information provided by the London District Catholic School Board. We have relied on this documentation and information in providing the recommendations contained in this report.

The project and maintenance work identified in this report describe the work in general terms only. Individual work items will require more detailed documentation to fully establish the scope of work, in contract terms, prior to engaging contractors to execute the work.

The information and recommendations contained in this report reflect our best judgement based on observed conditions. We cannot guarantee that all building related problems have been encountered during preparation of the report, or that unreported building conditions will not develop after the report has been submitted. Use of the report content by a third party is the responsibility of such third party and we do not accept responsibility for damages resulting from third party use of the report.

The costs provided in this report are based on a general review of existing site conditions. The information used to determine costs are based on general assumptions and visual observations of existing conditions. Drawings and specifications were not provided to prepare a comprehensive costing. The actual quantities and associated costs may vary depending on the methods of repairs, design, site inspections during repairs and the time of year during which repairs are completed.

This report does not address structural issues.

This report presumes that regular ongoing maintenance would be continued by a responsible facility management team to sustain the life of the facility.

INTRODUCTION

Nicholson Sheffield Architects Inc. (NSA) have been commissioned by John Kononiuk, Manager of Capital Projects for the London District Catholic School Board, to conduct a study of Regina Mundi College (RMC) looking at the architectural, mechanical, and electrical building systems together with the following objectives:

- Review of RMC as it relates to the Ontario Building Code
- Review of the existing fire alarm system
- Review of removal of asbestos containing materials in the school
- Review of replacement of existing parquet flooring in the 1988 Gymnasium
- Review of the Technology wing including a review of the Construction Technology dust collection system
- Review of the existing building elevator
- Review of the building mechanical systems (HVAC)
- Review of the existing Drama teaching space currently housed in a double portable
- Review of the exterior building envelope

TERMS OF REFERENCE

Regina Mundi College is located at 5250 Wellington Road South in London. It was originally designed and constructed in 1962 as a Junior Seminary for the Roman Catholic Diocese of London. The original building housed both academic and dormitory spaces for students and faculty who resided at the facility. The Y-shaped south wings currently housing the technology classrooms appear to have been originally designed as a vehicle garage in the one-storey portion and a residence along with common spaces for sisters in the two-storey portion. The quarters containing the sister's living and sleeping accommodations also included a small chapel.

Two additions were built in 1988 – one expanding the technology wing of the school to the south and the other to the north, providing a new double gymnasium complete with storage, change rooms, and upper mezzanine containing a weight room and dance/aerobics room.

The intent of this report is to provide information and associated costs on necessary improvements to RMC that will provide an optimal learning environment for students, a safe working environment for staff, and to prolong the life of the building through refurbishment.

HEALTH & LIFE SAFETY

- The original ventilation and exhaust systems are nearing the end of their service life. They do not function adequately, are inefficient, and are marginal for occupant health and safety.

- Existing mechanical and electrical systems are not properly constructed (i.e. dampers) nor fire-stopped in all locations where they penetrate walls and floors required to have a fire-resistance rating.

- Fire rated separations throughout the building may not meet the current Ontario Building Code and would require upgrades as a result of changes to the buildings mechanical and electrical systems. During our visits to the school we looked above ceiling tiles in random locations to investigate the continuation of required fire separations. In a number of locations we found that the required fire separations are either not in place, not continuous, or have been compromised due to changes in the building over the years (i.e. addition of new services).

- There are several locations that do not have exit signage where required by the Ontario Building Code.

- The main floor ramp to the second floor of the technology wing does not comply with the Ontario Building Code

- There are hazardous building materials (asbestos) within the existing school that should be removed as part of the building renewal.

- There appears to be inadequate storage in the chemistry prep room. A review of the existing chemicals, acids, solvents, etc. in this space should be conducted to determine if these are being storage in a safe and compliant manner.

- Fire route signage is inadequate and does not comply with the City of London by-laws.

- The mortar joints in the building's stone veneer (1962) have deteriorated over time allowing water to enter. There are locations where stone may be in danger of falling from the building. We are advised that this occurred previously and was one of the main reasons that the original bell tower was removed.

- Guardrails throughout the school on both the interior and exterior of the building do not comply with the Ontario Building Code.

ONTARIO BUILDING CODE ANALYSIS

This report takes into consideration the requirements of the Ontario Building Code, 2006 Edition, as they relate to the existing building. It is worth noting that a new version of the Ontario Building Code (2012) will come into effect on January 1, 2014.

The extent of renewal and enhancements at RMC will cause this project to be categorized as a major renovation as outlined in Part 11 of the Ontario Building Code. This means that existing areas of the building subject to major renovation will be required to comply with other parts of the Building Code. This work will include upgrades such as the installation of an automatic sprinkler system, upgrades to fire separations, and barrier-free accessibility compliance.

Fire Separations and Closures
Existing walls, partitions and floor assemblies will need to be upgraded as new building systems are installed or because they have been removed over time from various installations without being restored.

Building Size and Construction Relative to Occupancy
The area of the existing building is approximately 165,000 ft^2. The current Ontario Building Code classification in Part 3 would have the school designated under Article 3.2.2.24 requiring non-combustible construction, sprinklers, and 1-hour fire separations for floors, mezzanines, and loadbearing walls, columns and arches.

Exits and Means of Egress
Our site investigations have uncovered a number of issues with respect to existing exits and means of egress such as concerns with existing ramps to the technology wing of the school, door swings at exits, etc. The timing and scope of this report do not allow us to cover all aspects. We therefore recommend that a more detailed analysis be conducted once the preparation of the project renewal and enhancements are underway to fully understand the areas that are impacted.

Health Requirements
The existing school has adequate quantities of plumbing fixtures based on current and project enrollment. The washrooms are, however, dated and require upgrades.

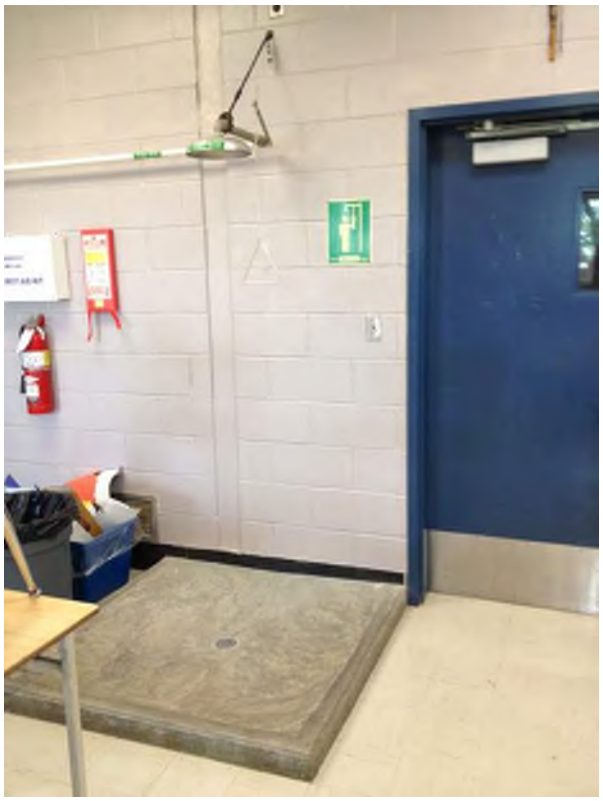
Barrier-free Accessibility
There are numerous areas at RMC that are not compliant with the Ontario Building Code. The original school was designed and constructed before Ontario had a building code. The 1988 additions and renovations have made some improvements, there remain may areas that need to be addressed to bring the school into compliance not only with the Ontario Building Code, but to ensure that it meets the Accessibility for Ontarians with Disabilities Act (2005).

SAFETY ISSUES

Drain culvert in grass

Drain culvert in grass

Drain pipe at west elevation



Deluge Shower - Science Classroom

Acid Storage Cabinet - Science Prep Room

Flammable Storage Cabinet - Science Prep Room

Chemical Storage - Science Prep Room

BUILDING CODE ISSUES

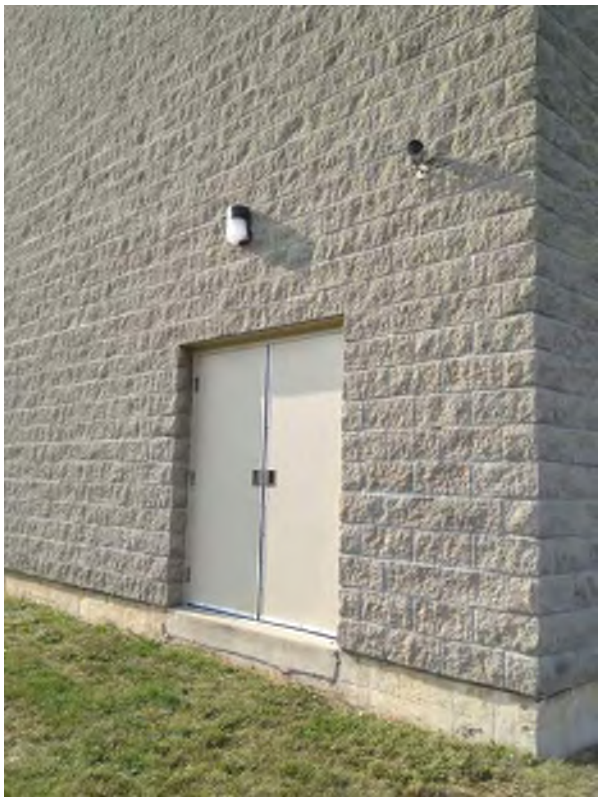
Exit P at southwest corner of technology wing does not meet current building code and does not provide barrier-free access

Entrance door from barrier-free parking spaces - concrete sidewalk had settled -does not meet current building code

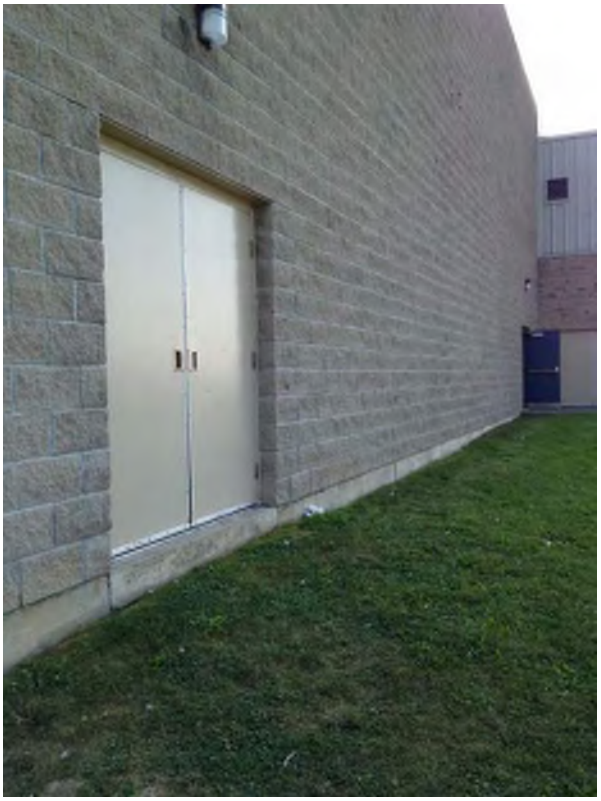
Construction and Installation of wood frames in chapel providing access to sanctuary do not meet current building code requirements for accessiibility

Door Theshold

Damaged Sidewalk at Tech Wing Exit



Step clearance at door - 1988 Gymnasium



Step clearance at door - 1988 Gymnasium

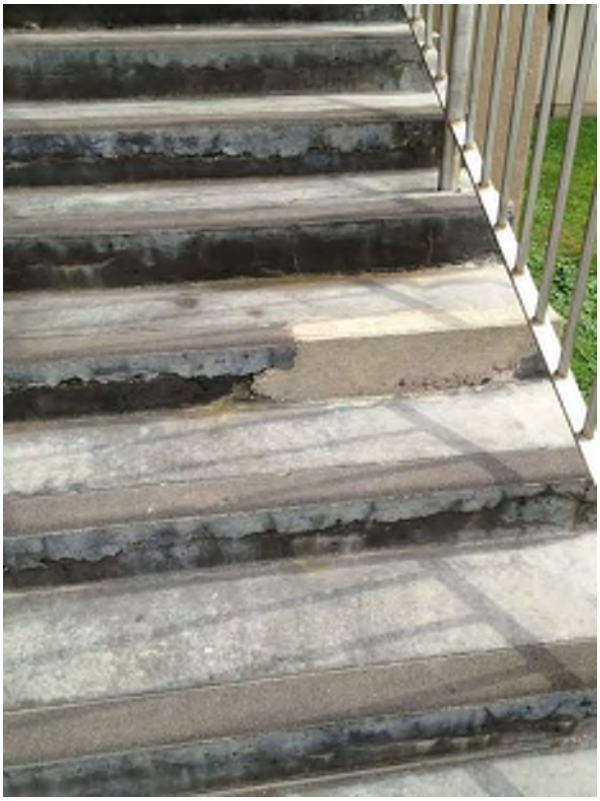
Wood ramp at chapel sanctuary

BUILDING CODE ISSUES

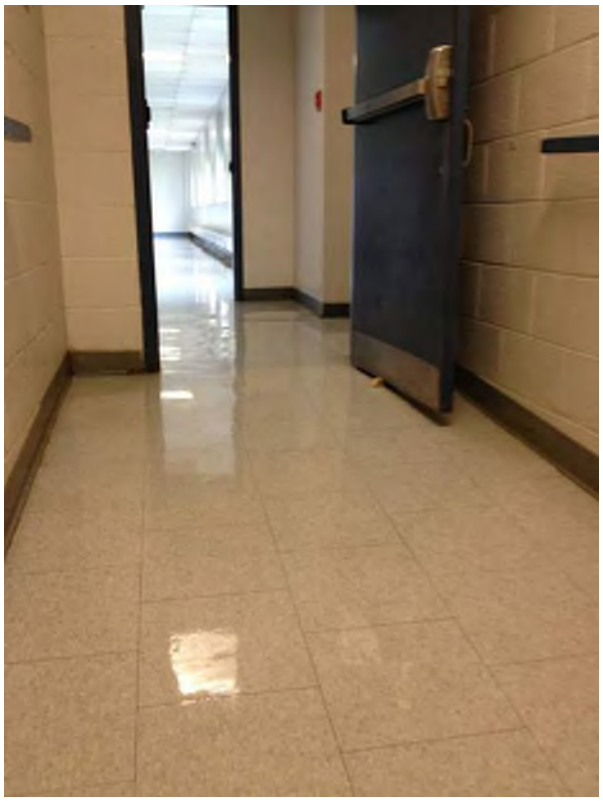
Existing front entry stairs and sidewalks have been replaced in the last decade, yet show signs of damage and wear. Intermediate handrail spacing does not comply with current building code

Front entry exterior stairs

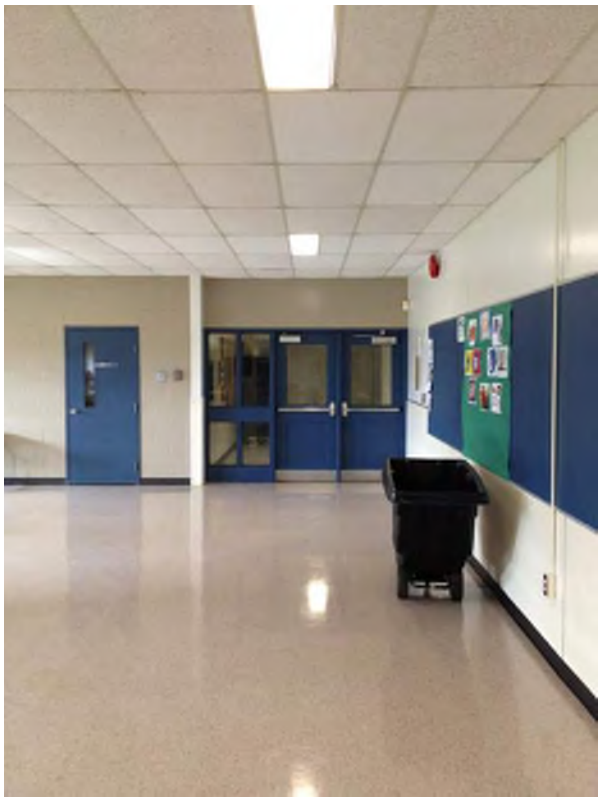
Cracked sidewalk at front entry exterior stairs



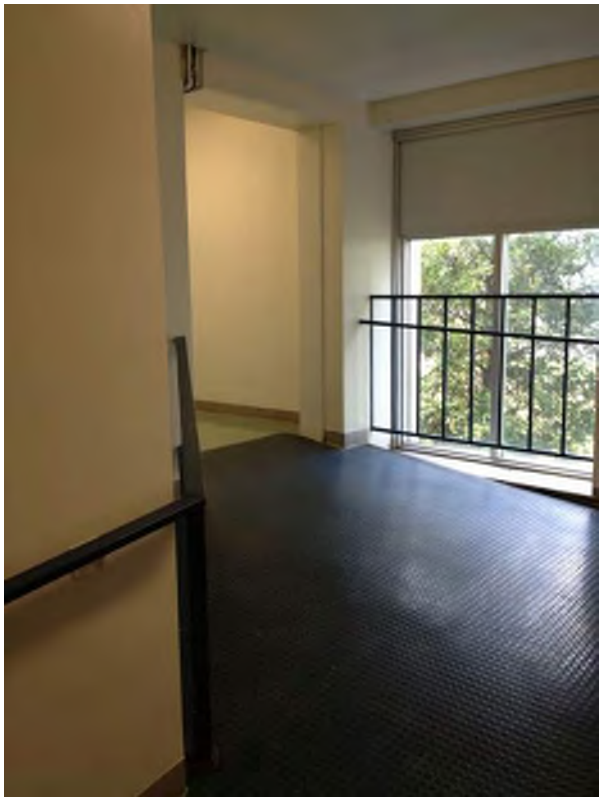
Front entry exterior stairs



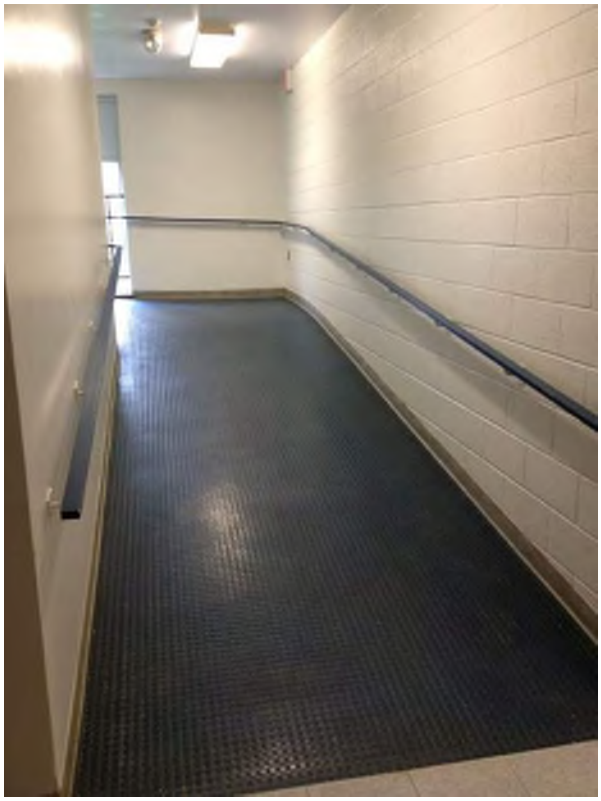
Door swinging over ramp



Fire exit sign missing in cafeteria



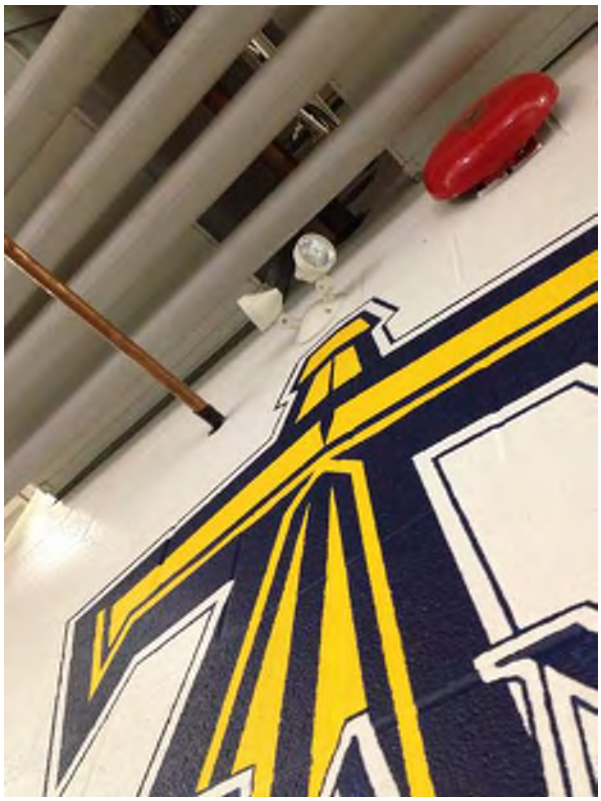
Ramp on main floor to tech wing



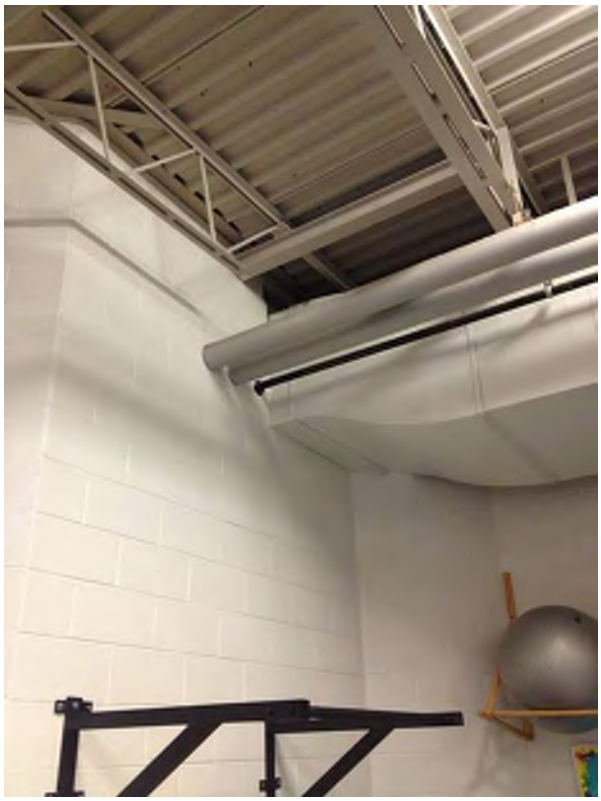
Ramp on main floor to tech wing

BUILDING CODE ISSUES

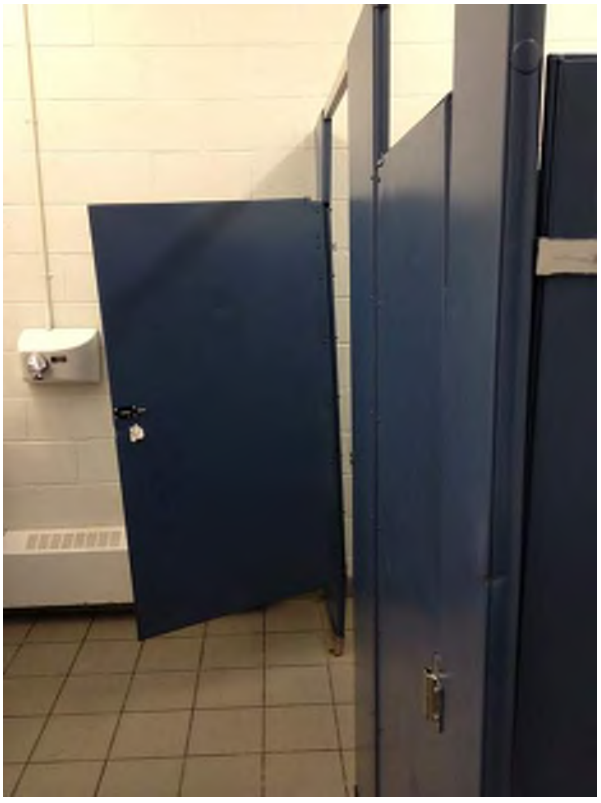
Firestopping missing at pipe penetration.


Firestopping missing at pipe penetration.

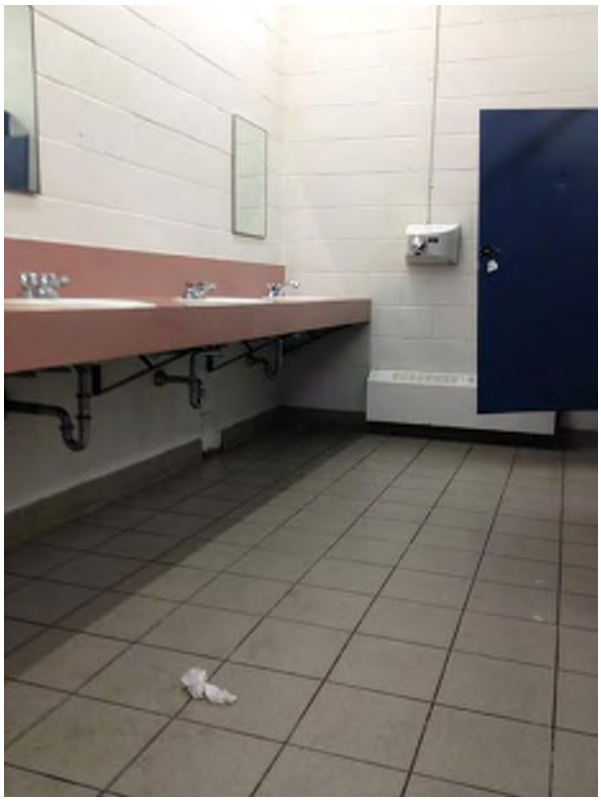
Duct penetration at firerated floor not firestopped; damper missing



Firestopping missing and fire separation incomplete.



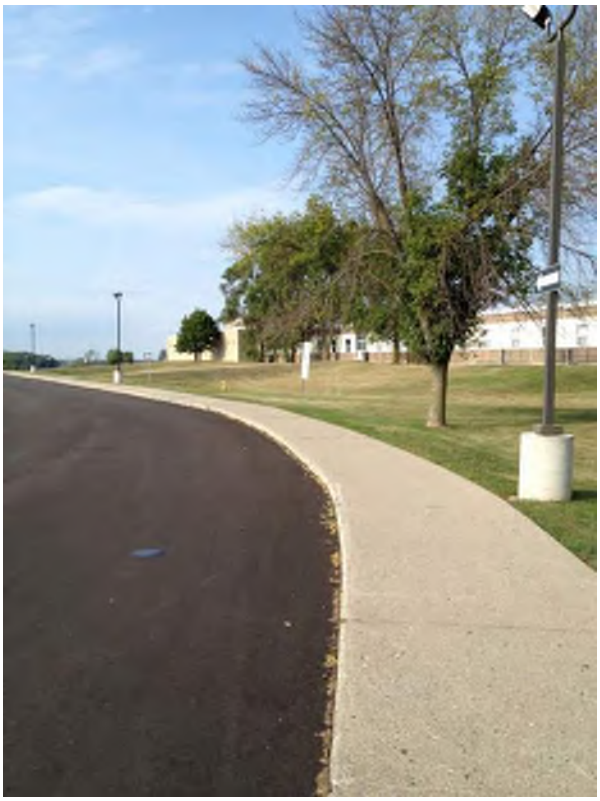
Toilet Partitions beginning to deteriorate



Washroom Vanity not compliant with barrier-free requirements.

BUILDING CODE ISSUES

Hole in fire separation



Front fire route signage missing

FIre exit sign missing from rear exit

Fire separation at elevator machine room

HAZARDOUS MATERIALS

An Asbestos Product Survey was conducted by exp Services Inc. dated June 30, 2012. A full copy of this report is contained in Appendix B. The conclusions of the survey are presented in Appendix B of this report.

The report has not conducted extensive testing of all materials but instead notes to the reader that they should “assume asbestos-containing materials” are present in the room-by-room Asbestos Status Report. The report also notes that no sprayed fireproofing was encountered during the survey of this site. However, when we visited the school the entire ceiling of the main boiler room was found to have a spray applied material, which we presume to be fireproofing. The room-by-room notes for this space however note this material as “non-asbestos fireproofing”.

Boiler Room Ceiling

It is our recommendation that an updated asbestos product report be undertaken for renewal of RMC that includes a detailed investigation including visible and concealed conditions to reveal all materials containing asbestos. This work should include some destructive testing to fully understand the extent of asbestos containing materials present in the existing building. The costs associated with the investigation and preparation of this report are noted in the cost summary found at the end of this document.

ASBESTOS

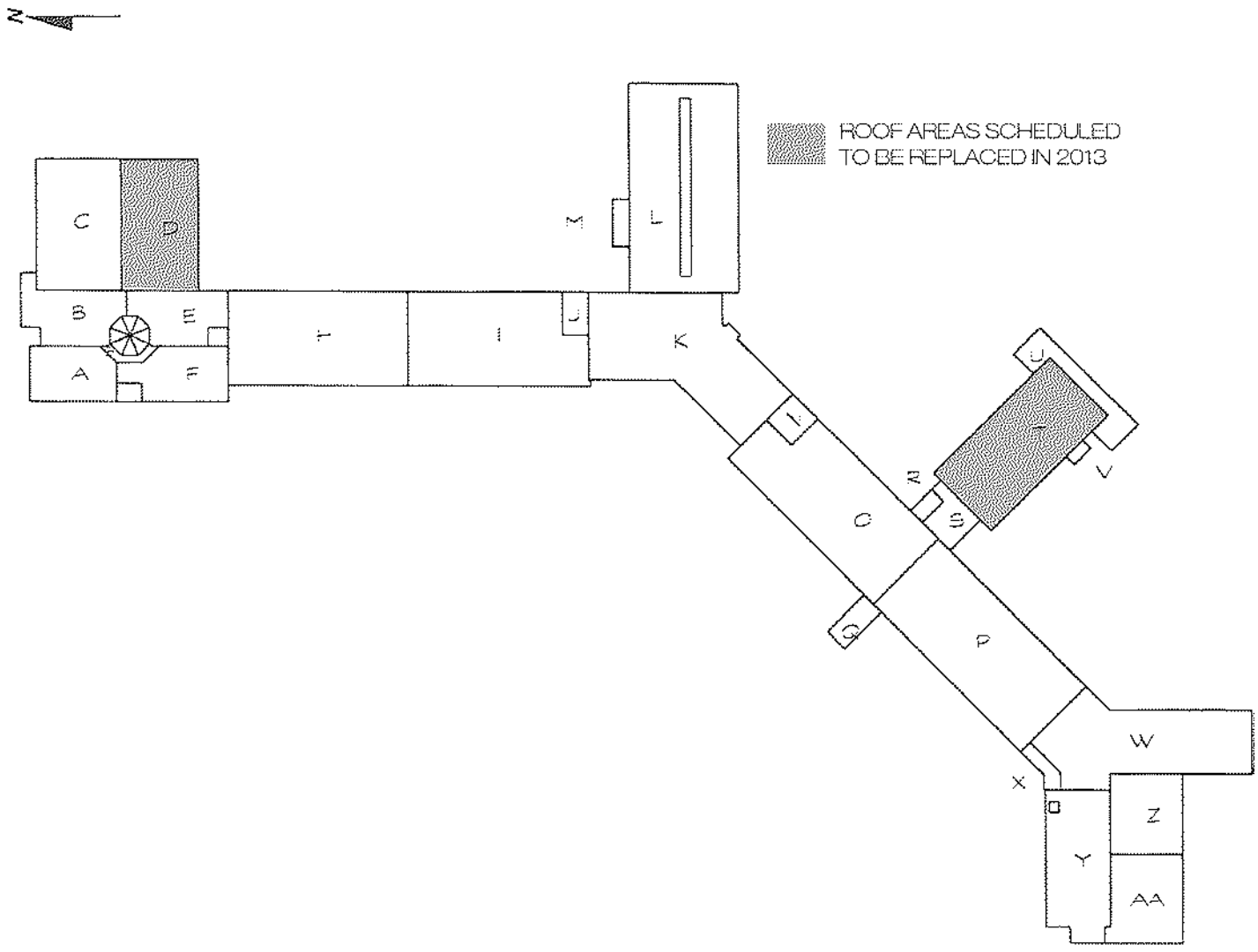
Asbestos containing materials are found throughout RMC in various building materials including, but not necessarily limited to floor tile, sheet vinyl flooring, mechanical insulation, textured plaster, wall and ceiling tiles.

Existing confessional in chapel showing asbestos containing tile.

Existing asbestos containing flooring in chapel.

ROOFING

The LDCSB has engaged the services of North American Roof Management Systems Ltd. (NARM) to monitor all roofs within their system. In discussion with Denis Sykora of NARM we have been informed that all roofs at RMC have been replaced except for Roof V located above the side altar of the chapel sanctuary. We are informed that replacement of Roof D (part of 1988 Gym addition) and Roof T (Chapel) are scheduled to be replaced this fall (2013).



ROOFING

There is considerable debris on Roof area H from adjacent trees that is not being maintained. Failure to remove this material on a semi-annual or annual basis reduces the life expectancy of the roofing material.

Overhanging trees at Roof H

Overhanging trees at Roof H

Debris at overhanging trees on Roof H

Debris at overhanging trees on Roof H

Debris at overhanging trees on Roof H

Debris at overhanging trees on Roof H

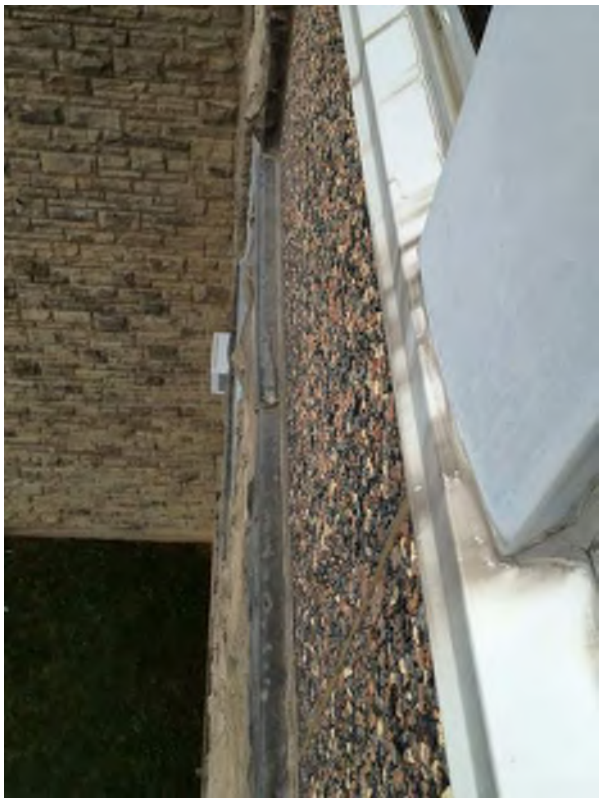
Metal flashing over ductwork above gymnasium beginning to rust - finish has deteriorated

Metal roof over north gymnasium showing rusting

Metal roof over north gymnasium showing rusting

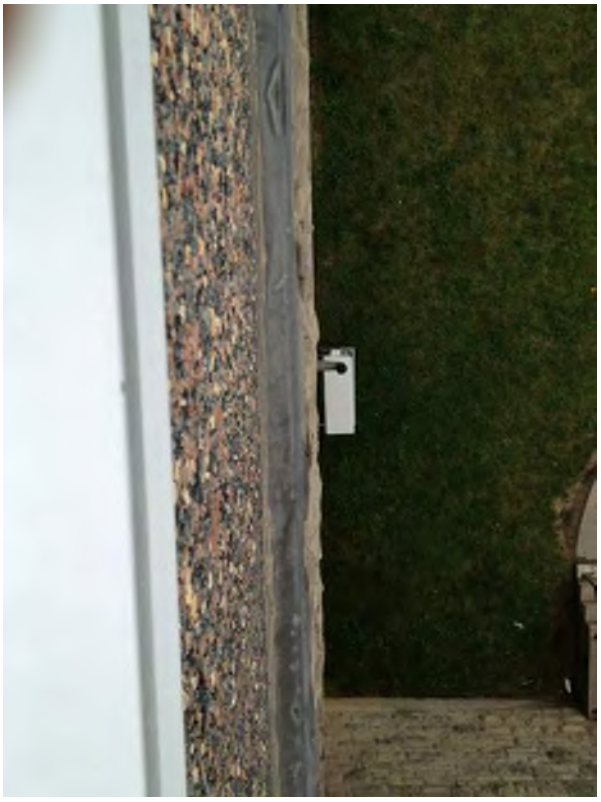
Sloped roof over exit without snow guards

METAL FLASHING AND ROOFING

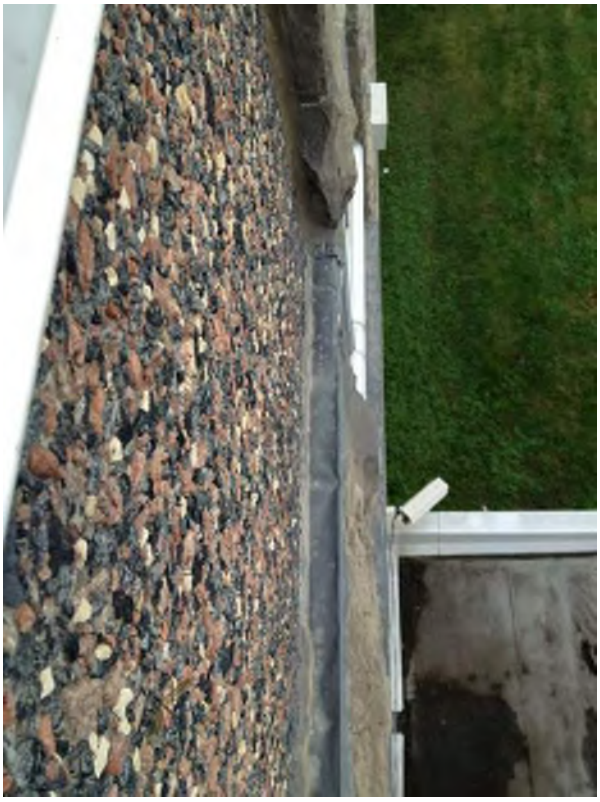


Exterior metal sill at precast panel - joints have failed and does not project past stone below causing staining and water to deteriorate mortar joints

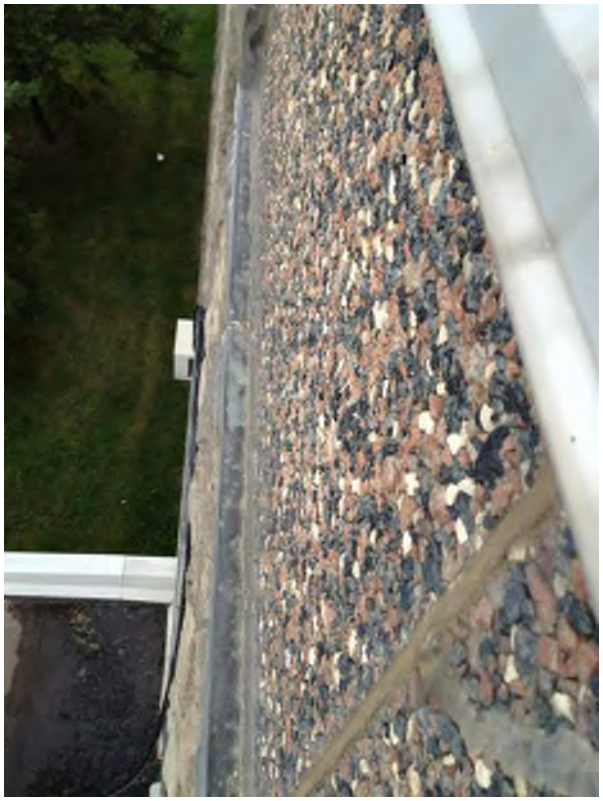
Exterior metal sill at precast panel - joints have failed and does not project past stone below causing staining and water to deteriorate mortar joints



Exterior metal sill at precast panel - joints have failed and does not project past stone below causing staining and water to deteriorate mortar joints

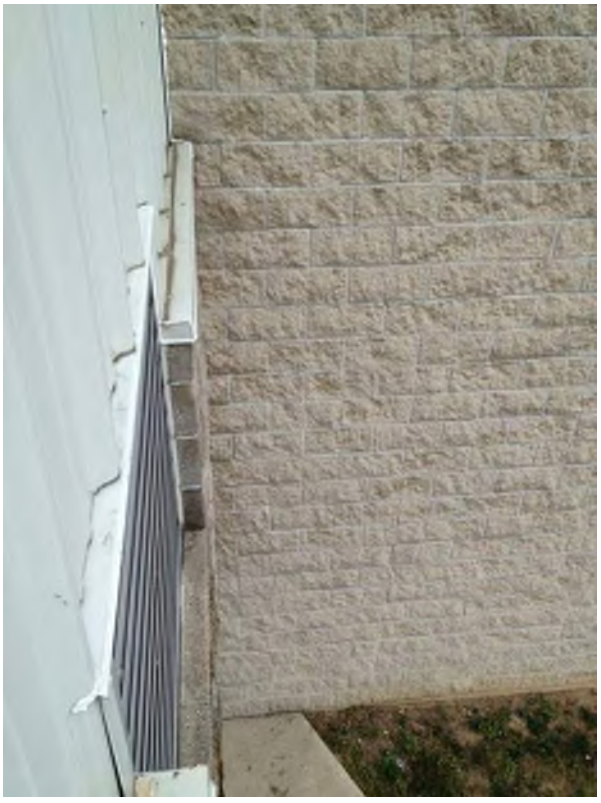


Exterior metal sill at precast panel - joints have failed and does not project past stone below causing staining and water to deteriorate mortar joints



Exterior metal sill at precast panel - joints have failed and does not project past stone below causing staining and water to deteriorate mortar joints

Exterior metal sill at precast panel - joints have failed and does not project past stone below causing staining and water to deteriorate mortar joints



Metal flashing and sill missing from bottom of louvre

Damage to concrete block masonry from missing metal flashing and sill.

ROOF ACCESS LADDERS

There are several ladders located on the exterior of the building that provide access from the various roof levels. These ladders do not appear to meet the legislative requirements for fixed access ladders required by the Ontario Ministry of Labour. They should be either removed and replaced or revised as part of the renewal project at RMC. There should also be precast concrete pavers over rigid insulation at the top and bottom of all roof access ladders and adjacent to any rooftop mechanical equipment for personnel to stand on while performing maintenance.

Roof Ladder at 1988 addition - height of bottom rung exceeds dimensions as per M.O.L. requirements; precast pavers over rigid insulation should be added.

Wood platform access stair does not comply with M.O.L. requirements and is a safety hazard.

ROOF ACCESS LADDERS

Roof ladder does not provide required clearance from wall.

Roof Ladder at 1988 addition - height of bottom rung too high above lower roof.

Roof Ladder at 1988 addition - height of bottom rung too high above lower roof.

Roof Ladder at 1988 addition - height of bottom rung too high above lower roof.

EXTERIOR TREES

The proximity of the existing trees to the building also presents a climbing point for access to the roof by unwanted guests. Furthermore, they have grown to a size that their location adjacent to the existing foundations may be reason for concern of damage to the existing building from the tree roots. We recommend that all trees adjacent to the building be removed and replaced with trees located well away so that when they reach maturity they will not pose a hazard to the building.

There are some trees that appear to have disease and as a result have limbs that are falling off, which presents a hazard to any staff or students that may be walking below. We recommend that a tree assessment be included as part of the project to renew the facility at RMC to remove those trees that present a hazard.

Fallen tree branch - Safety hazard

Tree at South Tech Wing beginning to deteriorate causing safety hazard to students

EXTERIOR TREES

Tree at West Elevation too close to building and branches beginning to decay and fall.

Tree at West Elevation Exit too close to building.

Tree showing signs of rot at West Elevation - danger of limb falling.

Trees at West Elevation too close to building.

Tree in close proximity to West building wall and notch susceptable to water intrusion and rot.

Trees at West elevation of 1988 addition - if not maintained properly will cause similar issues to those of the original building.

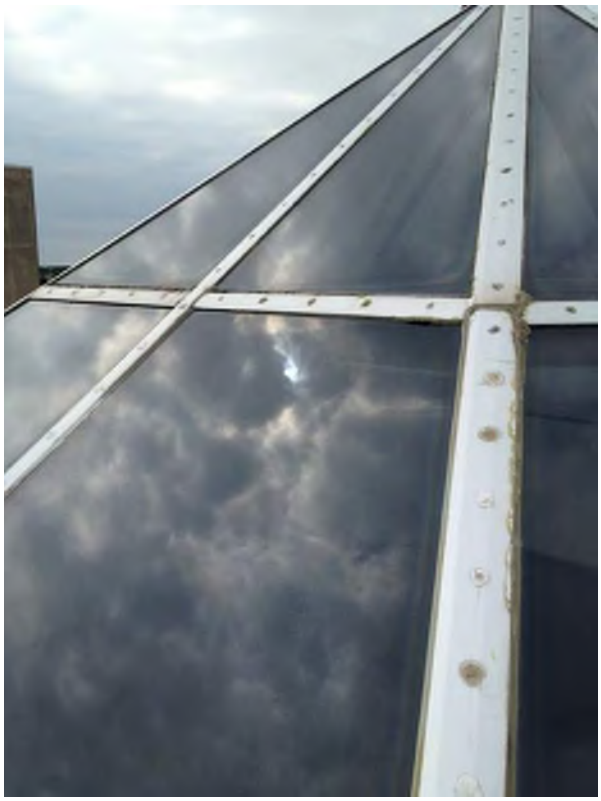
SKYLIGHTS AND GREENHOUSE

There are several skylights and a small greenhouse on the various roofs at RMC. The largest of the skylights is located above the Library Resource Centre, which formed part of the work performed in 1988. This skylight is now approaching 25 years in age and several of the insulated glass units have failed. It is our recommendation that all glazing units replaced with newer, high performing insulated glass units.

Overall image of library skylight exterior

SKYLIGHTS AND GREENHOUSE

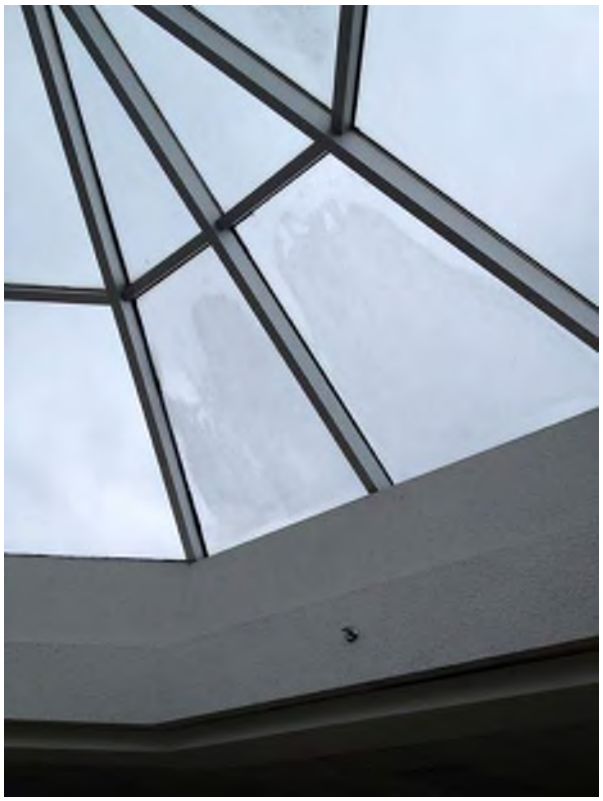
Library skylight exterior



Library skylight exterior

Library skylight exterior

Library skylight exterior



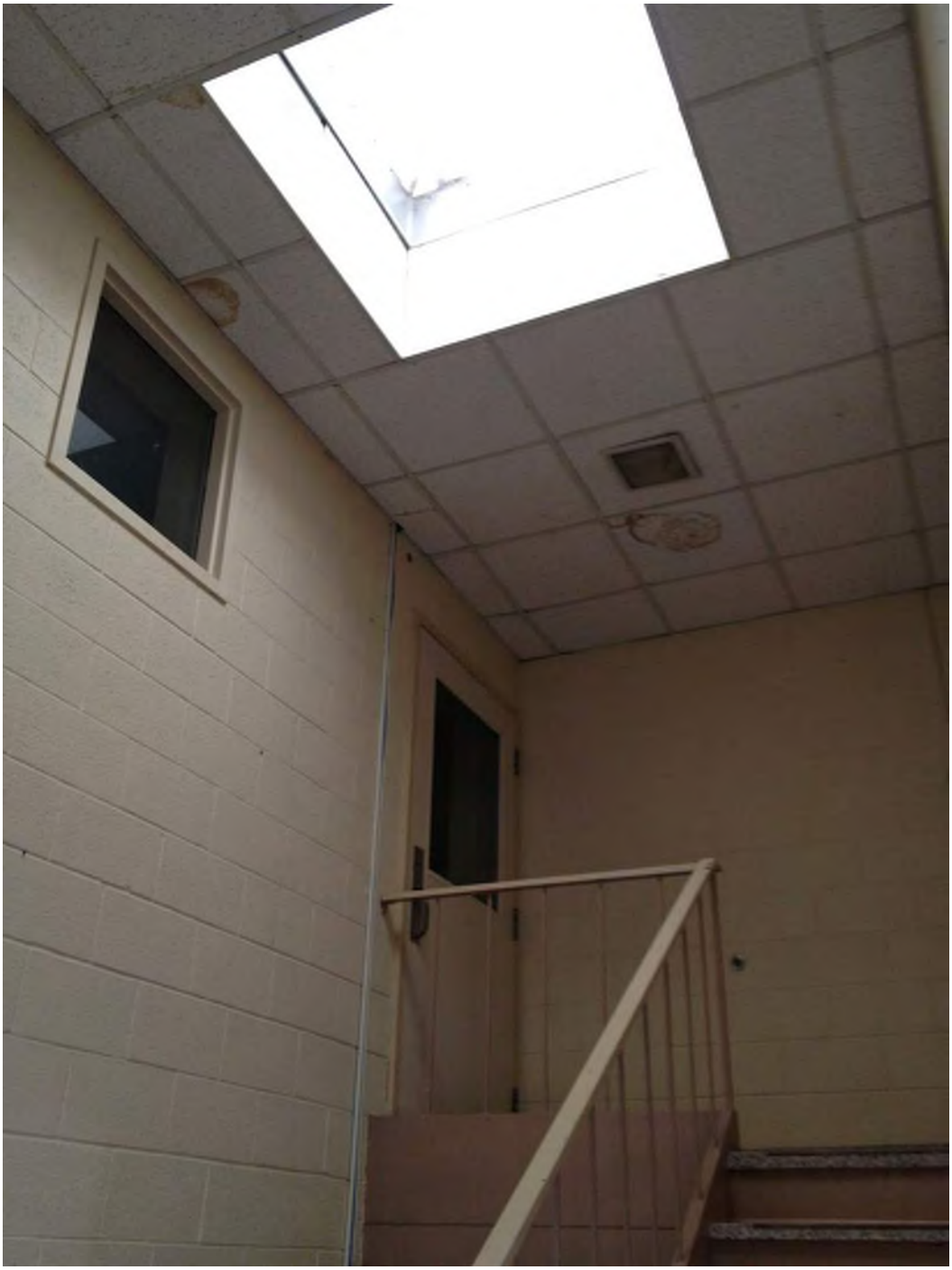
Library skylight interior showing failed glass units.

Library skylight interior showing failed glass units.

Library skylight interior showing failed glass units.

SKYLIGHTS AND GREENHOUSE

There is 1 acrylic dome skylight located on roof 'U' that appears to be part of the original construction of the school based on our review of the original architectural drawings and the condition of the skylight itself. The skylight does not have an insulated curb. We recommend replacement of this skylight with a new acrylic dome skylight complete with insulated curbs.



Acrylic Dome Skylight Interior

SKYLIGHTS AND GREENHOUSE

There is a small greenhouse structure accessible from the second floor mezzanine adjacent to the weight room / exercise area. It is unclear from our site visit that this space is being utilized. The greenhouse itself has poor ventilation and several of the glass units are either broken or have failed. Access to this room is difficult because it is only accessible by stairs and cutting through the weight room. We recommend converting this space to a storage room for the athletic department associated with the weight room and exercise area. If it is deemed that a greenhouse is required for science and horticulture / green technology programs, we recommend that a separate, stand-alone structure be built at an appropriate location to serve these programs. This is consistent with what is being done at other secondary schools in Ontario and our region in particular.

Overall exterior greenhouse structure

Greenhouse showing damaged and failed glazing units.

SKYLIGHTS AND GREENHOUSE

Greenhouse interior showing damaged and failed glazing unitrs

Greenhouse interface with adjacent wall.

Greenhouse interior showing damaged and failed glazing unitrs

Greenhouse sill provides inadequate slope to shed water onto roof below.

EXTERIOR CAULKING

The application of sealant at critical locations in the building envelope is extremely important to the successful functioning of the wall envelope. Caulking is usually the first element to fail, lasting from one to 15 years. Sealant is usually applied at critical flashings at expansion joints, around window and door openings, and all types of wall penetrations. Failure of caulked joints permits moisture penetration directly into the building envelope that could result in detrimental and costly deterioration and damage to the building. The following photographs showing caulked joints (or lack thereof) are not intended to show every location but instead to illustrate the need for complete removal and replacement of all exterior sealant in the building envelope to help prolong the life of the building.

Caulked corner west elevation

Caulked expansion joint at 1988 addition

EXTERIOR CAULKING

Caulked expansion joint at tech wing addition

Caulked expansion joint at tech wing addition - base

Caulked joint failure on East Elevation

Caulked joint failure on East Elevation. Note projecting steel bars below present safety hazard.

Caulked joint failure on East Elevation

Caulked joint failure on East Elevation and corner of panel has deteriorated.

EXTERIOR CAULKING

Caulked joint failure on East Elevation.

Caulked joint failure at Tech Wing entry.

Caulked joint failure on West Elevation.

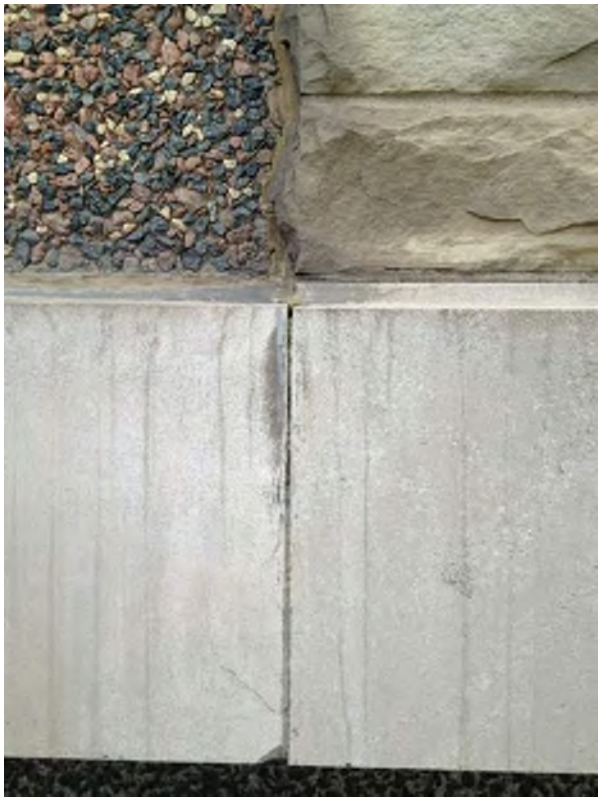
Caulked joint failure on West Elevation.

EXTERIOR CAULKING

Caulked joint failure on West Elevation - large gap present.

Caulked joint failure on West Elevation

Caulked joint failure on windows on 1988 addition



Caulked joint failure, mortar deteriorating from stone sill requires repair.

EXTERIOR CAULKING

Caulking joint missing at conduit penetration

Caulking missing at precast panels - East Elevation

Caulking missing at precast panels - East Elevation

Caulking deteriorated at smooth stone panel - investigation required to view condition of anchors.

Exit door missing caulking in Tech Wing - large gap allows moisture at penetration.

Upper caulking joint at Gymnasium - North Elevation

Window jamb and sill caulking - Tech Wing - sills should have end dams.

Caulking joint at Gymnasium Wall - South Elevation

EXTERIOR CAULKING

Caulked joint at Gymnasium wall - South Elevation

Caulked joint at Gymnasium wall - South Elevation

Caulked joint at Gymnasium wall window head - South Elevation.
Note deterioration of mortar joints

EXTERIOR BUILDING STONE

The original building constructed in 1962 is clad with both smooth and rough-faced exterior building stone together with precast insulated exposed aggregate panels. Two separate additions in 1988 to the technology wing and a new gymnasium utilized an artificial stone masonry and concrete block for the exterior finish.

The mortar joints of the original 1962 building stone (both smooth and rough faced) have been in a state of disrepair for some time, allowing water to enter. There is visible evidence of mortar joints that have developed significant cracking and/or have failed altogether as shown in photographs contained herein. The intrusion of water has caused significant damage to existing mortar joints in numerous locations, which cause concern that in some locations, the building stone may be in danger of dislodging and falling. There is also cause for concern that existing anchorage devices for the stone cladding may have become corroded due to the water penetration. We recommend that further investigation of the existing building stone be conducted immediately to determine the extent of the damage, but perhaps more importantly, to ensure the safety of the occupants. This investigation will include destructive testing to determine the condition of the building envelope and anchorage devices. The stone has also become dirty over time with weathering, which causes the stone to retain moisture. All of the building stone should all be cleaned in conjunction with repair and restoration (repointing) of the mortar joints.

Fallen Stone

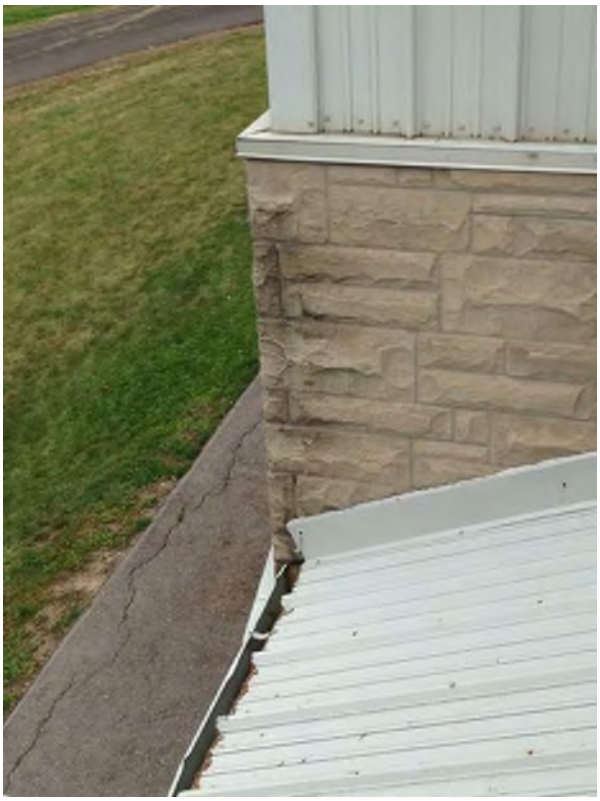
The condition of the insulated precast panels should also be investigated for damage due to failed caulking as outlined in the previous section.

The mortar joints of the 1988 addition also appear to be showing signs of wear that will continue to deteriorate for a structure that is only half the age of the original building. There are several locations where cracking of mortar joints has occurred and staining of the exterior stone or concrete block has occurred due to the failure of caulked joints, lack of metal flashing, or failure of metal flashings. The use of concrete block as an exterior building veneer, although economical, is not suitable for buildings with a long life expectancy due to their porosity and ability to absorb moisture. There are areas of the 1988 addition that have significant damage from moisture. We recommend that the existing concrete block on the 1988 addition (located at the double gymnasium) be removed and replaced with a more suitable, long lasting clay brick or natural stone. The investigation of alternatives can be explored to suit the budget and schedule as part of the renewal project.

Loose smooth stone panels above Tech Wing exit and deteriorated mortar joints.

EXTERIOR BUILDING STONE

Staining from flashing on concrete block at gymnasium (1988 addition)



Stone veneer stained from water and mortar joints beginning to fail.

Horizontal sills at panels do not project past rough failed stone causing staining and weathering of stone and mortar joints.

Deteriorated mortar joints and rusting steel lintel at window head.

Exterior stone at Elevator Machine Room - mortar joints beginning to crack and deteriorate.

Loose hose connection box at stone - 1988 addition

Rusting exterior window lintel and cracked mortar joints.

Loose hose connection box at stone - 1988 addition

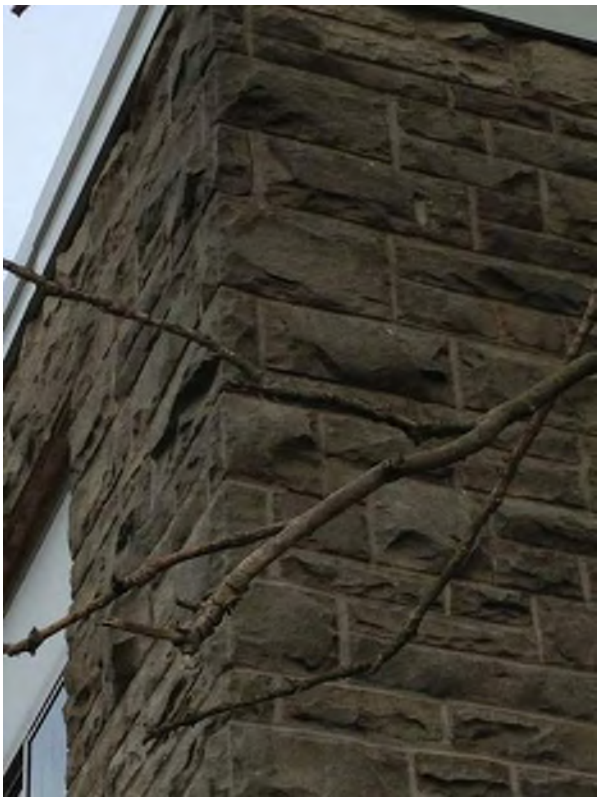
EXTERIOR BUILDING STONE

Exterior stone at Elevator Machine Room - weathered and showing signs of cracking to mortar joints.

Cracked mortar joints - East Elevation - 1988 addition

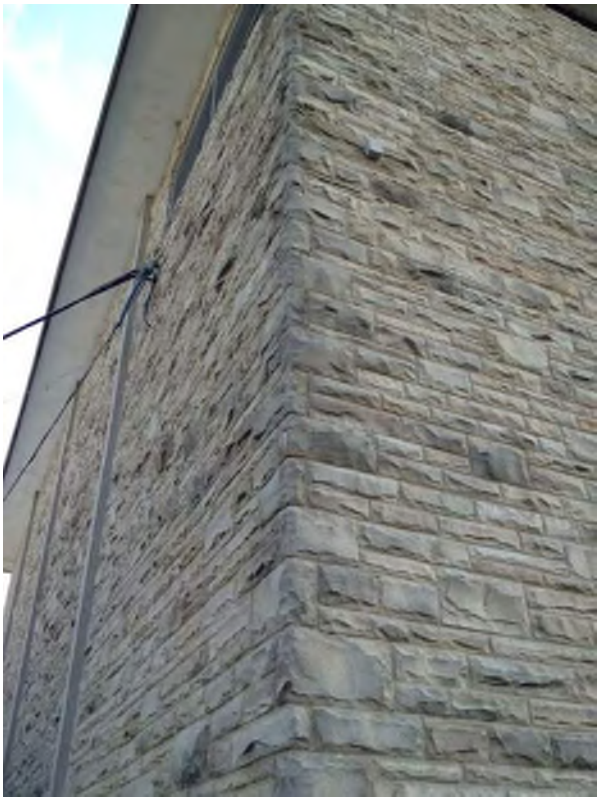
Cracked mortar joints at Tech Wing.

Loose mortar joints below window sill on second floor Tech Wing from water penetration.



Loose and cracked mortar joints - Tech Wing second floor

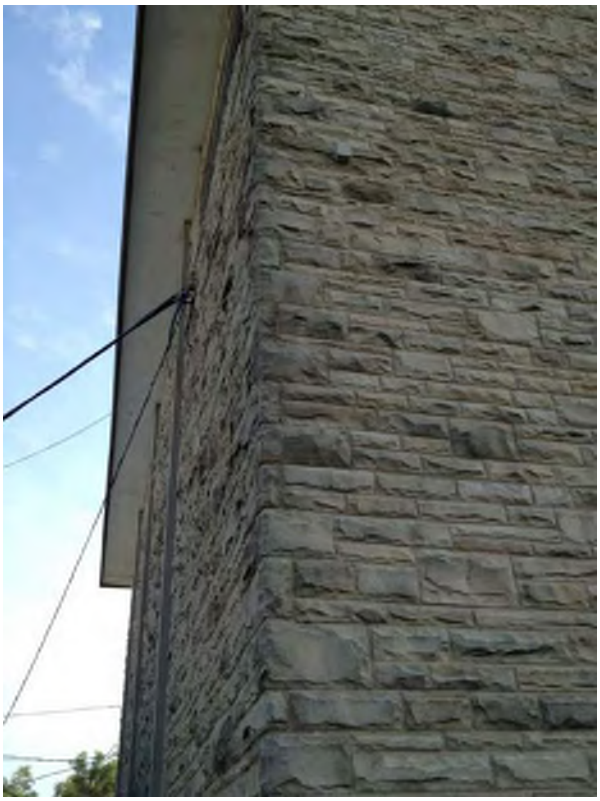
Cracked mortar joints at SW corner of Tech Wing exit.



Cracked mortar joints - Gymnasium East elevation

EXTERIOR BUILDING STONE

Deteriorated mortar joints below window sil in Tech Wing.



Deteriorated mortar joints - Gymnasium East Elevation

Deteriorated mortar joints and loose stones at West Elevation.

Missing brick vents - 1988 addition

Deteriorated mortar joints below window sill on West Elevation.

Deteriorated mortar joints below window sill on West Elevation.

Deteriorated mortar joints below window sill on West Elevation.

Deteriorated mortar joints below window sill on West Elevation.

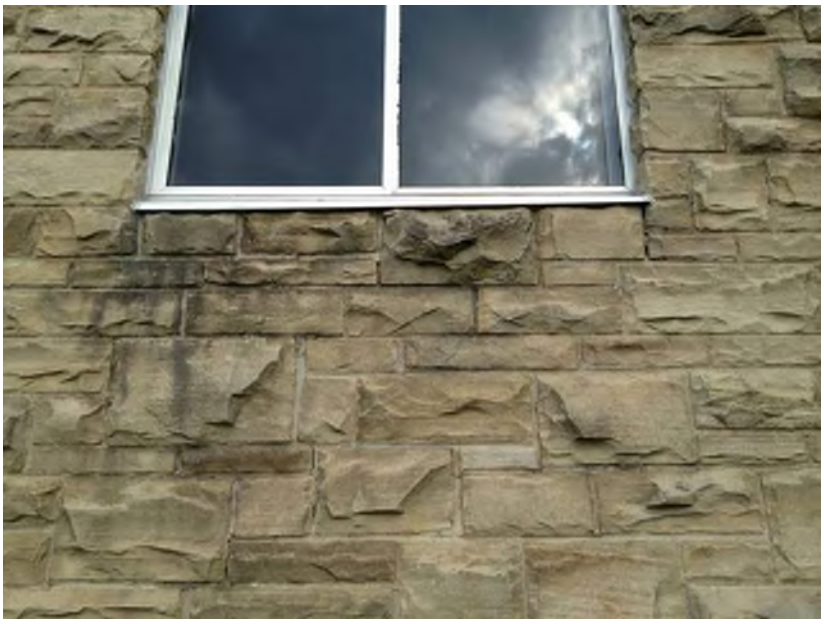
EXTERIOR BUILDING STONE

Deteriorated mortar joints below window sill on West Elevation.

Deteriorated mortar joints below window sill on West Elevation.

Deteriorated mortar joints below window sill on West Elevation.

Deteriorated mortar joints on rusting steel lintel at West Elevation.



Deteriorated mortar joints below window sill on West Elevation.

Deteriorated mortar joints on West Elevation.

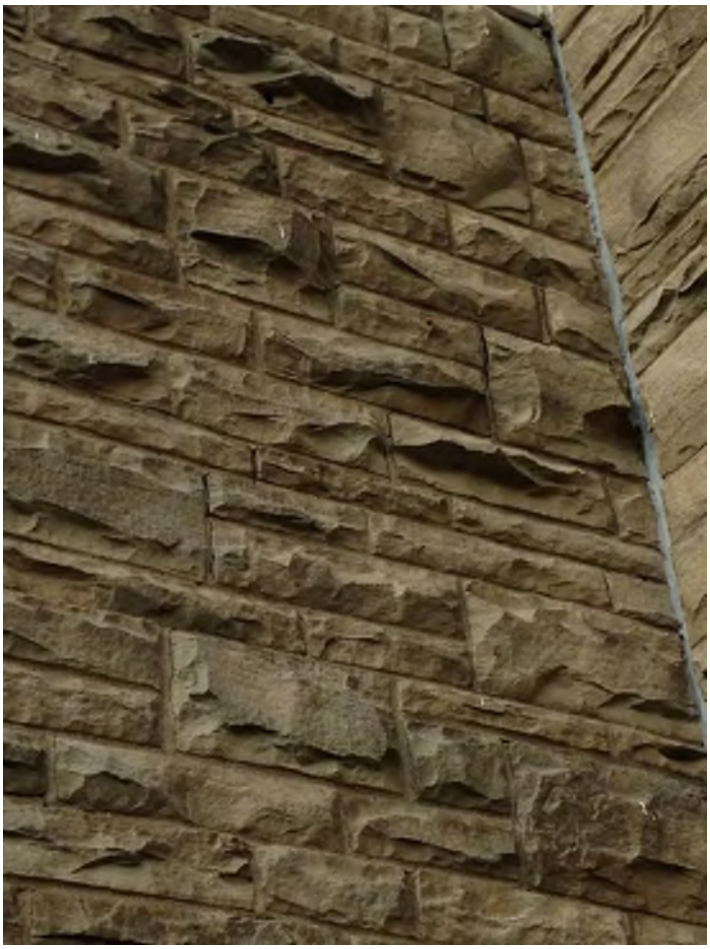
Missing metal sill and flashing at louvre on 1988 addition have caused moisture penetration damaging mortar joints and masonry veneer and growth of moss.

Moss growing on concrete block - 1988 addition

EXTERIOR BUILDING STONE

Partial West Elevation - area of deteriorated mortar joints below all window sills.

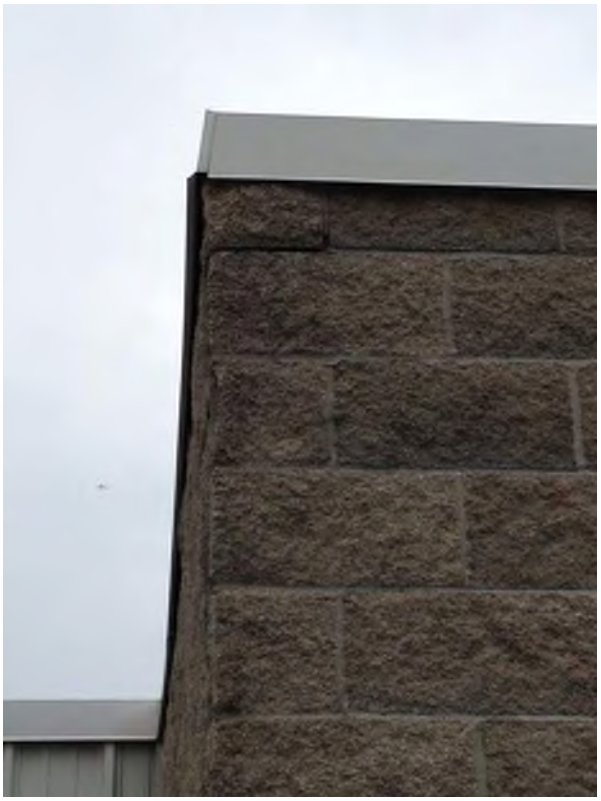
Deteriorated mortar joints on smooth stone sill. Moisture may have compromised anchors.



Deteriorated mortar joints - West Elevation

Staining on stone from metal flashing joint above - 1988 addition

Deteriorated mortar joints on South wall of Chapel.



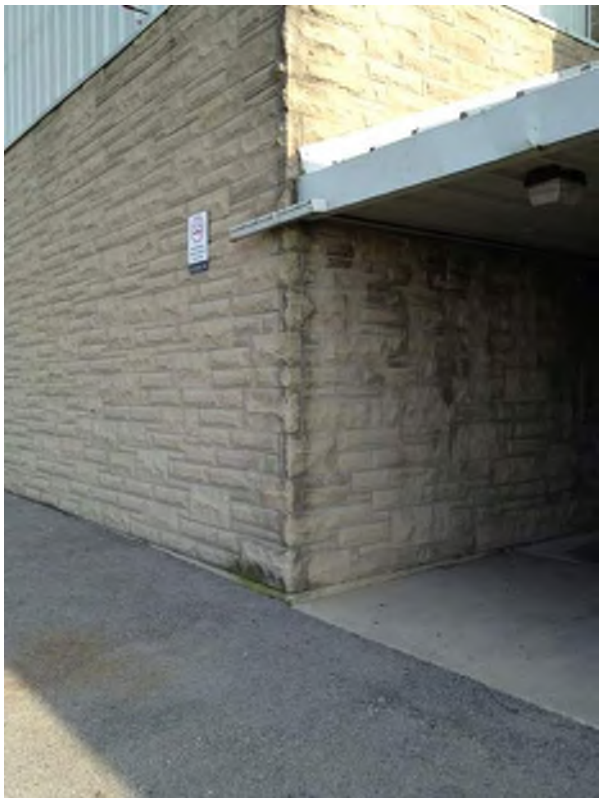
Deteriorated mortar joints at upper corner of 1988 Gymnasium addition.

Weathering and deterioration of joints in smooth stone panels on North Elevation.

EXTERIOR BUILDING STONE

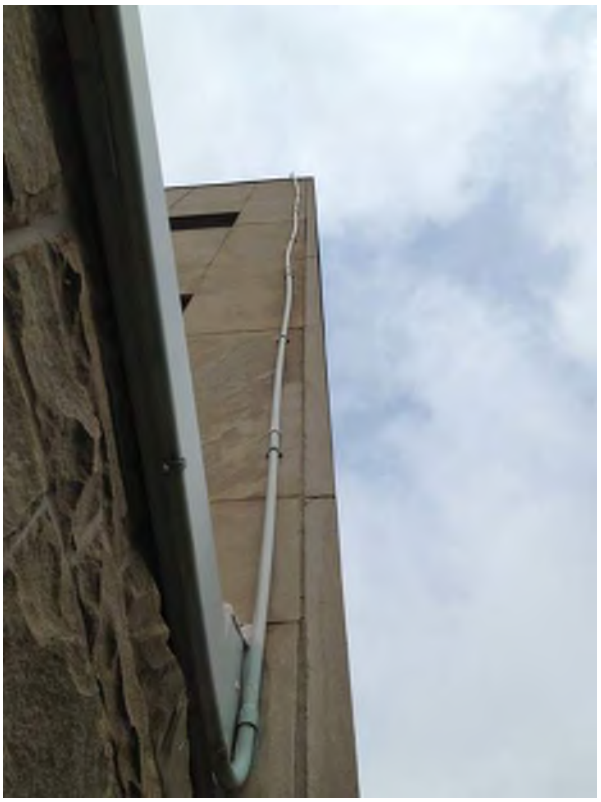
Deteriorated mortar joints at louvre - East upper wall of Gymnasium.

Deteriorated mortar joints at upper stone - Tech Wing



Water damage at eave causing deterioration of mortar joints and staining of stone veneer - 1988 addition

Water damage at eave causing deterioration of mortar joints and staining of stone veneer - 1988 addition



Deteriorated mortar joints at South Elevation

Water damage at soffit - East Elevation 1988 addition

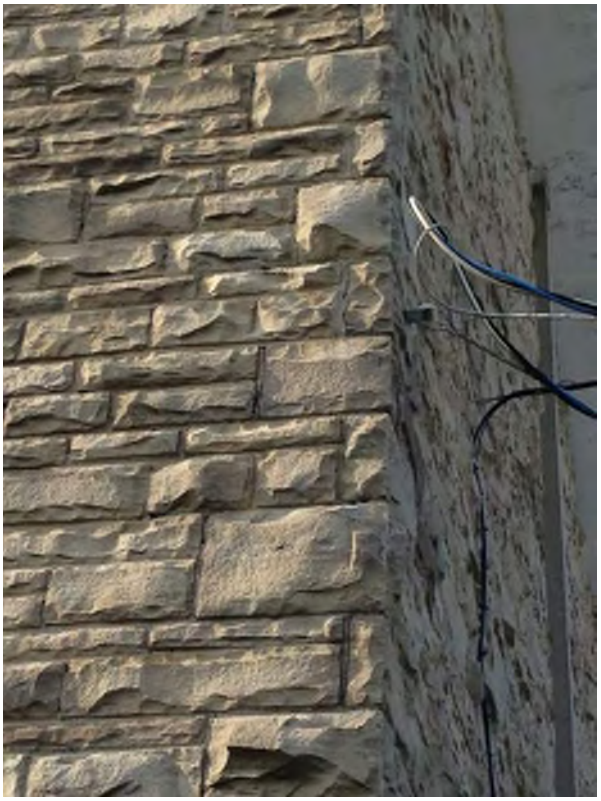
Water damage below soffit - North Elevation 1988 addition

Water damage at concrete block - Upper North Gymnasium Elevation

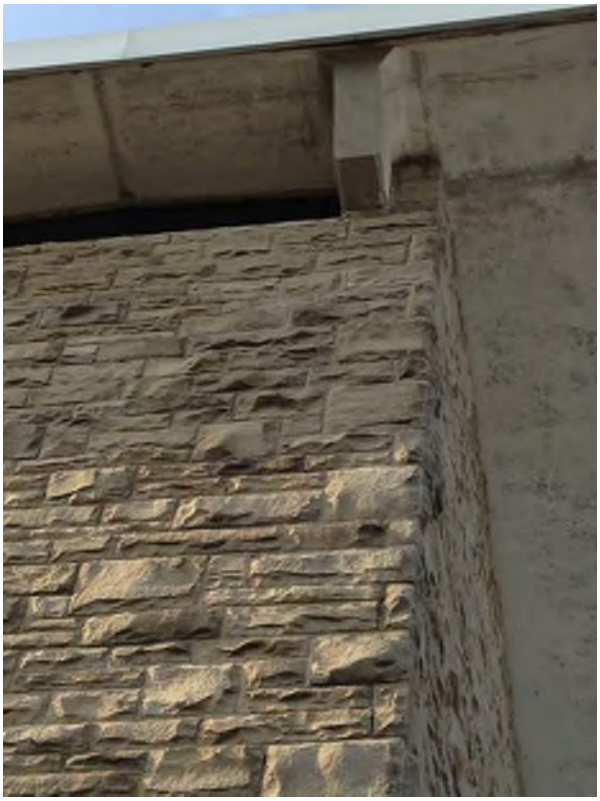
EXTERIOR BUILDING STONE

Water damage at concrete block causing deterioration or mortar joints - North Gymnasium Elevation

Water Stain from flashing - North Elevation 1988 addition



Deteriorated mortar joints - Southeast corner of Gymnasium



Deteriorated mortar joints - Southeast corner of Gymnasium (Upper)

Damage to stone of South Elevation of Gymnasium from moisture at penetration.

Deteriorated mortar joints - Southwest corner of Gymnasium

GYMNASIUM FLOORING

In 1988 an addition was designed and constructed at RMC that included a double gymnasium together with associated change rooms, storage, and upper mezzanine. The gymnasium flooring installed as part of this project is a parquet-type wood floor applied directly over the concrete slab that lacks the bounce and spring action desirable for a secondary school athletic floor. We recommend complete removal and replacement of the existing wood flooring with new resilient engineered wood flooring that meets or exceeds DIN certification standards for athletic flooring. The height of the new flooring above the existing concrete slab will require the removal of portions of flooring from adjacent spaces and installation of a tapered floor topping sloped up to meet the new wood gym flooring level. It is expected that existing doors and frames in the gym may also require some alterations to suit the new floor.

Gymnasium interior entrance - replacement of wood floor in Gymnasium with new will require alterations to door frames along with tapering flooring leading into Gymnasium.

TECHNOLOGY DEPARTMENT CLASSROOMS

Many secondary schools in the London region have undergone major renovations to their technology teaching spaces over the last several years. The rationale behind this may be in part due to aging facilities and the introduction of new or emerging technologies (i.e. Green Technology). The technology department at RMC was designed and constructed as part of the 1988 renovations and additions to the school. The original dormitory spaces together with the existing garage were renovated and added to becoming the technology department for RMC. Now almost 25-years later, these teaching areas lack the space and facilities found in recently renovated or newly construction secondary schools. Additionally there are numerous building code issues in these teaching spaces.

The technology department currently includes the following classrooms:

- Manufacturing Technology
- Transportation Technology
- Construction Technology
- Technological Design & Fabrication Room
- Communications Technology

The floor areas of the Manufacturing Technology and Transportation Technology classrooms are undersized when compared to the Ministry of Education's suggested room areas found in their facility space template. There is no direct access to the Manufacturing Technology classroom from a corridor. Instead, one must travel through the teaching space of the Transportation Technology area to gain access to this room.

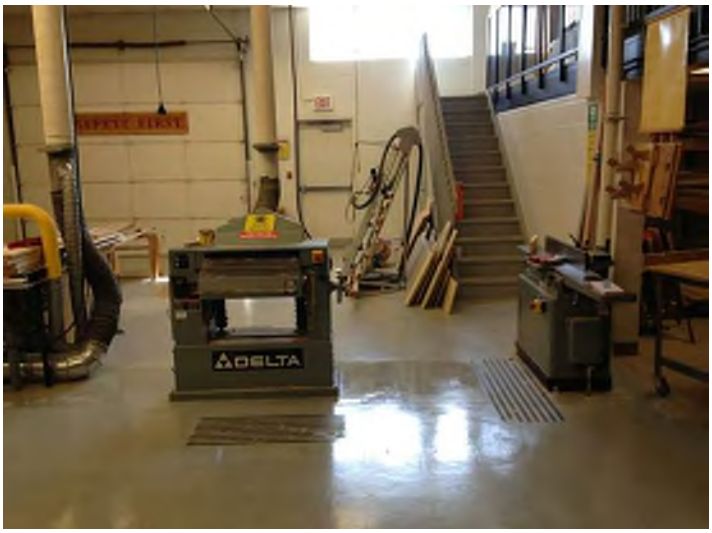
The development of the technology department as part of the 1988 additions and renovations has it segregated from the remainder of the school. Access to the technology classrooms is down a long, narrow corridor on the ground floor and by a non-compliant ramp followed by narrow corridor on the first floor. This is further exacerbated by the fact that the technology area contains no washroom facilities for students and staff who currently must travel back into the main part of the school.

We recommend that the Technology Classrooms at RMC be redeveloped – they have been poorly developed, have low ceilings, access is problematic, and the layouts are inefficient use of the space. The redevelopment of the Technology Classrooms should be give consideration to the types of programs that will be offered (i.e. newer technologies) and look at options for how this can be accomplished. A study of the options may include major renovations and addition or complete demolition and replacement of the Technology Classrooms with new state-of-the-art teaching spaces. The latter option could eliminate the segregation that currently exists, provide better access from the remainder of the school (i.e. elimination of the ramps), and provide washroom facilities for this area of the school.

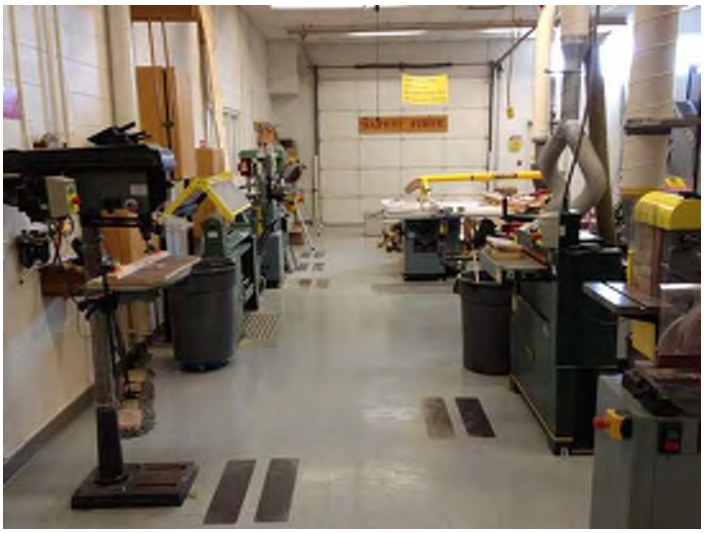
TECHNOLOGY DEPARTMENT CLASSROOMS

Construction Technology Classroom Equipment appears crowded - safe clearances required.

Construction Technology Classroom

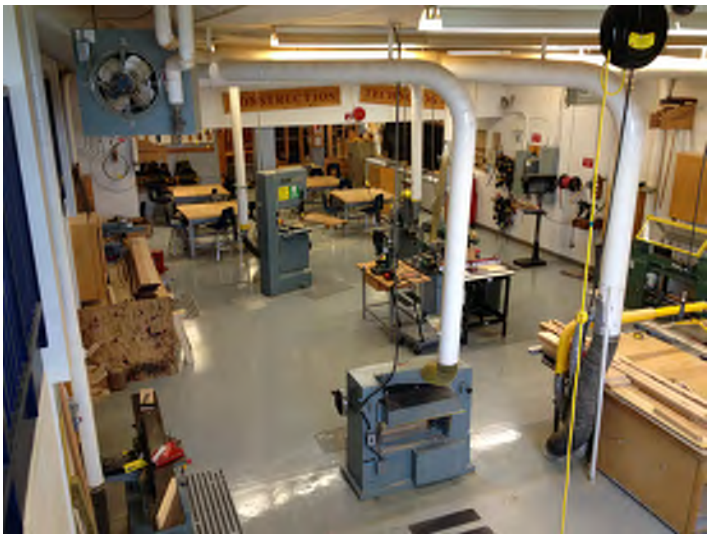


Construction Technology Classroom vinyl tile floor is slippery so strips have been added at equipment



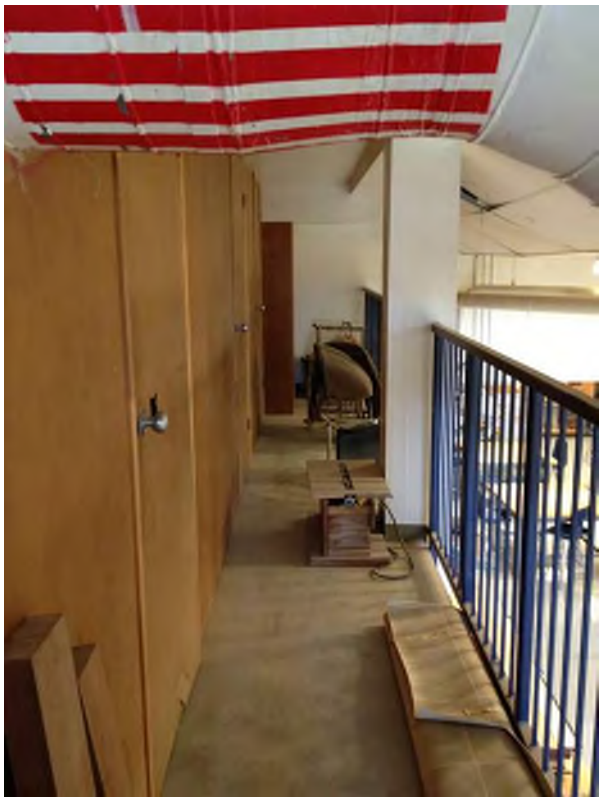
Construction Technology Classroom

Construction Technology Classroom

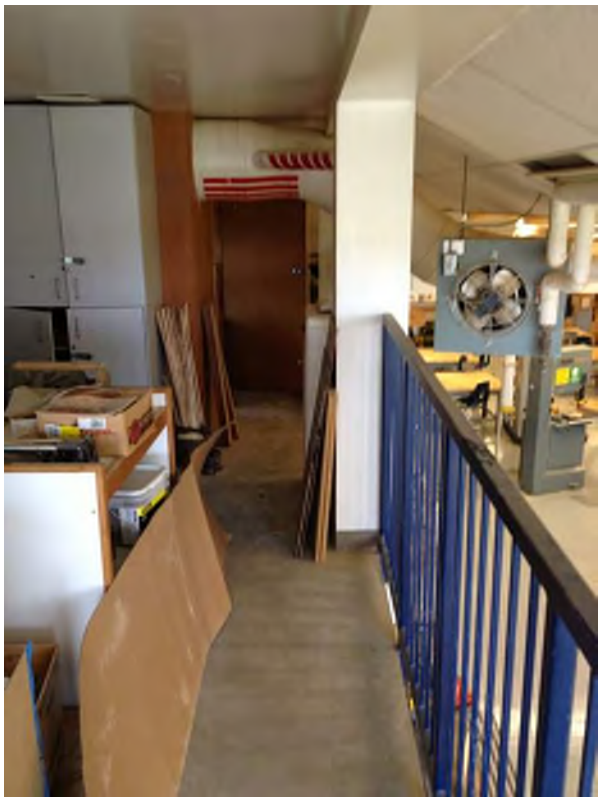


Construction Technology Classroom

TECHNOLOGY DEPARTMENT CLASSROOMS

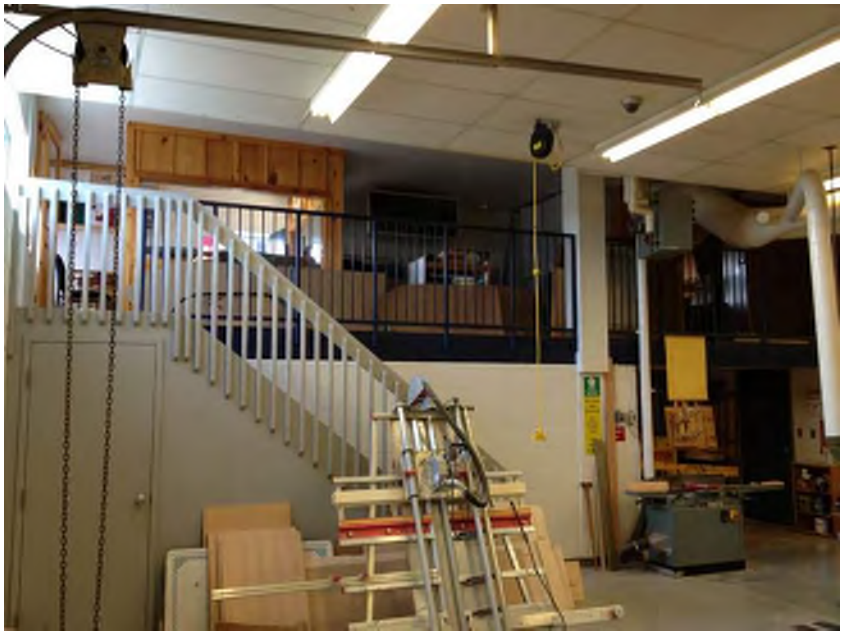


Construction Technology Classroom upper Mezzanine with low head clearance at ductwork



Construction Technology Classroom upper Mezzanine

Construction Technology Classroom handwash sink.



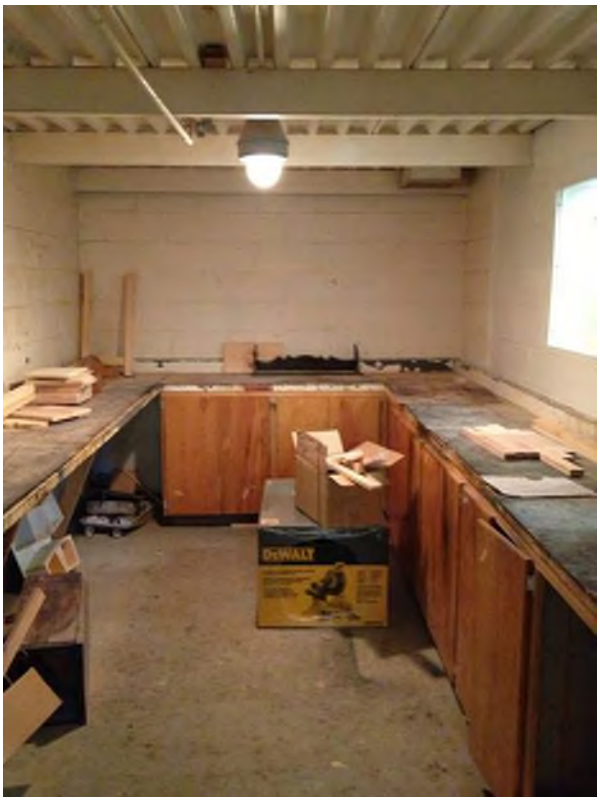
Construction Technology Classroom upper Mezzanine - Stairs are non-compliant because they are wood (combustible) construction.

TECHNOLOGY DEPARTMENT CLASSROOMS

Staff persons kitchen tucked below stairs

Bottom of door frame rusting/rotting

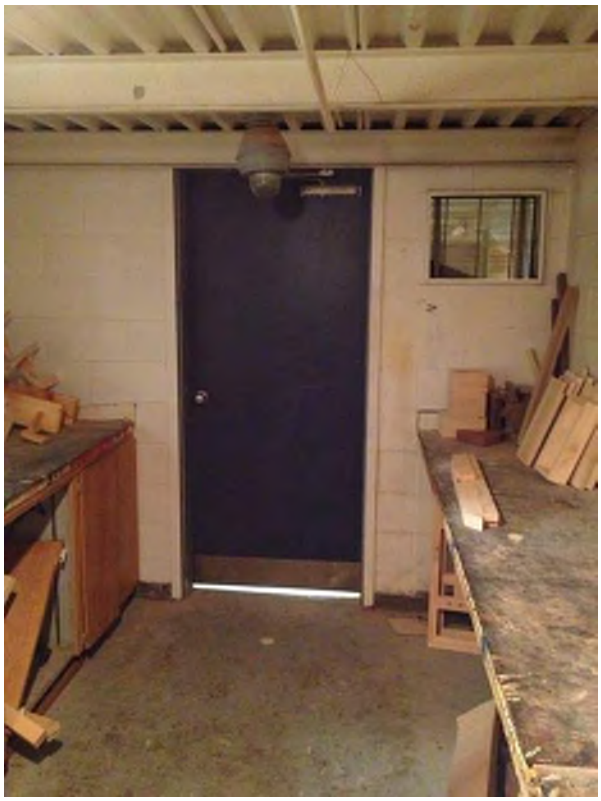
Panel saw located in path to exit



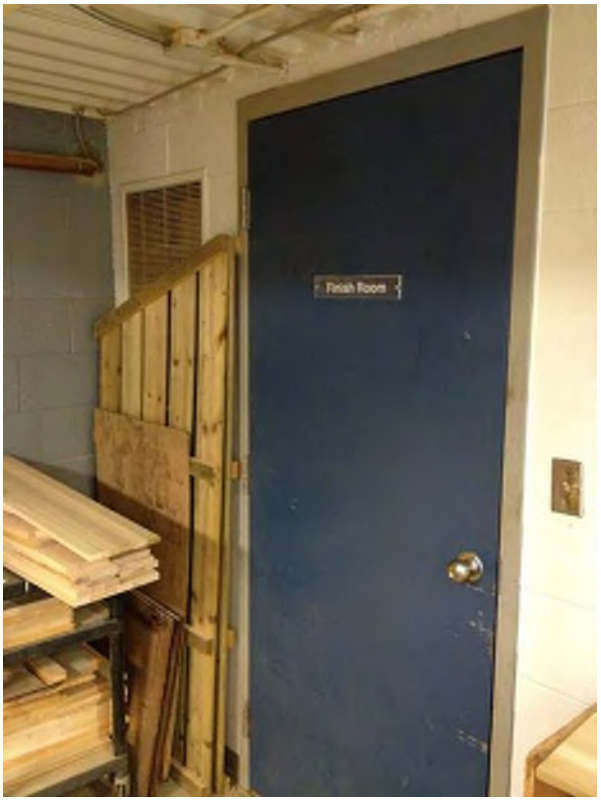
Construction Technology Classroom finishing shop

TECHNOLOGY DEPARTMENT CLASSROOMS

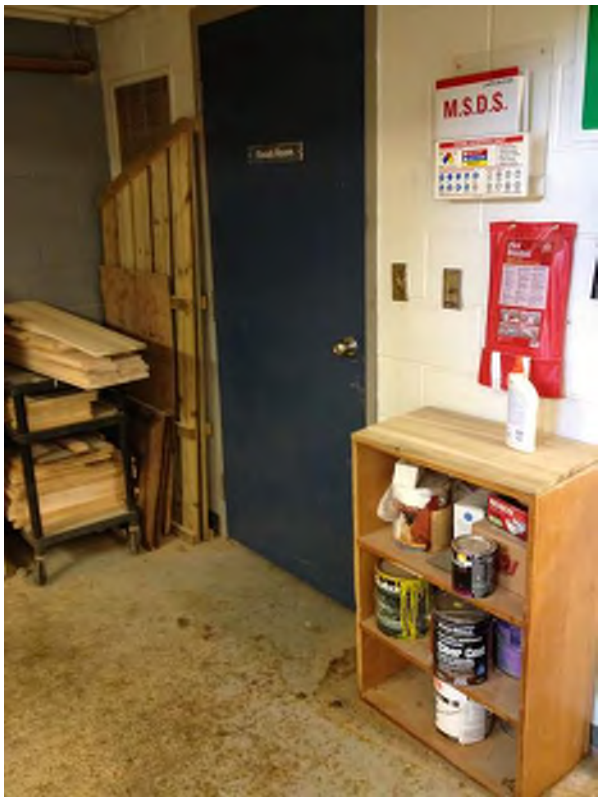
Construction Technology Classroom Finishing Room exhaust vent.



Construction Technology Classroom FInishing Room - entry doors and transfer grill,



Construction Technology Classroom FInishing Room - entry doors and transfer grill,

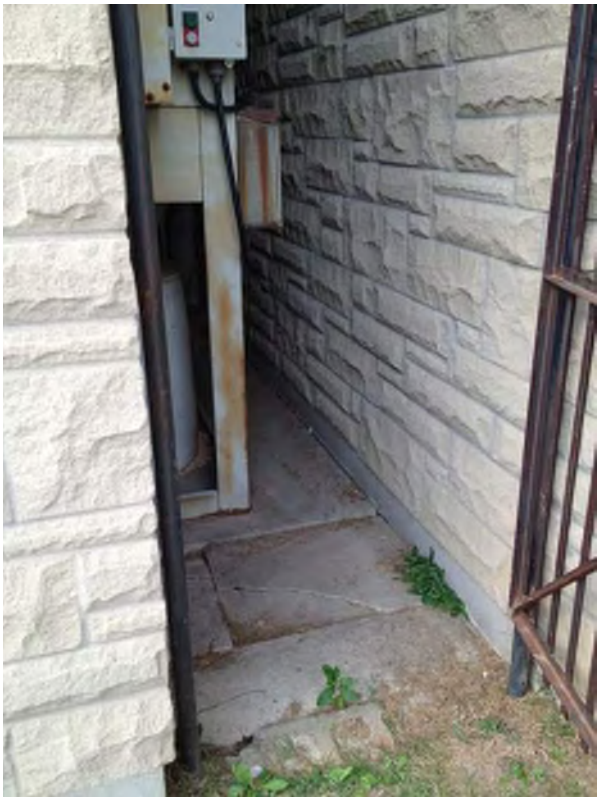


Construction Technology Classroom at FInishing Room - improper storage of combustible materials.

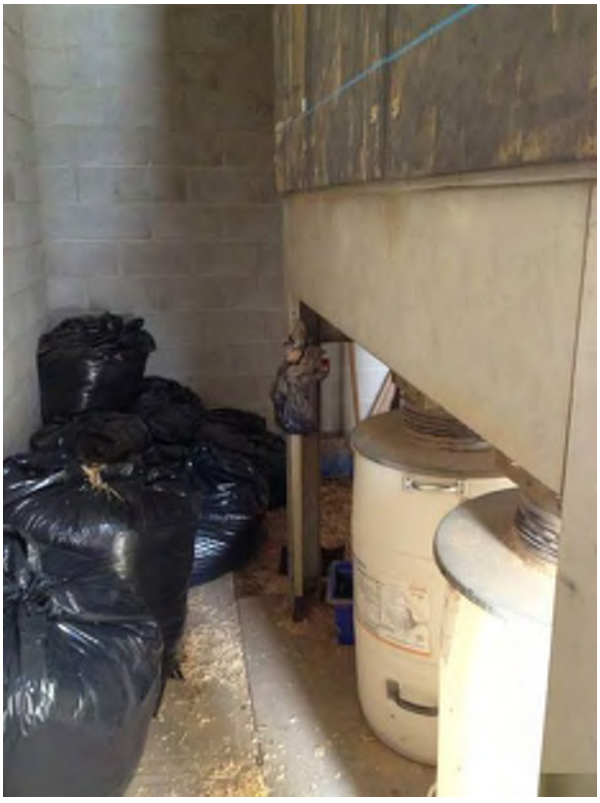
TECHNOLOGY DEPARTMENT CLASSROOMS

Dust collector enclosure

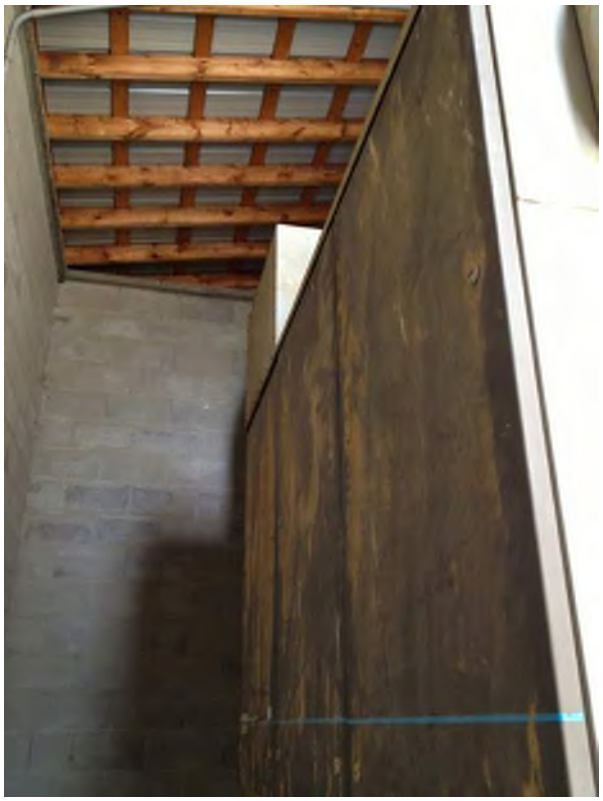
Dust collector enclosure



Dust collector enclosure accress.



Dust collector interior



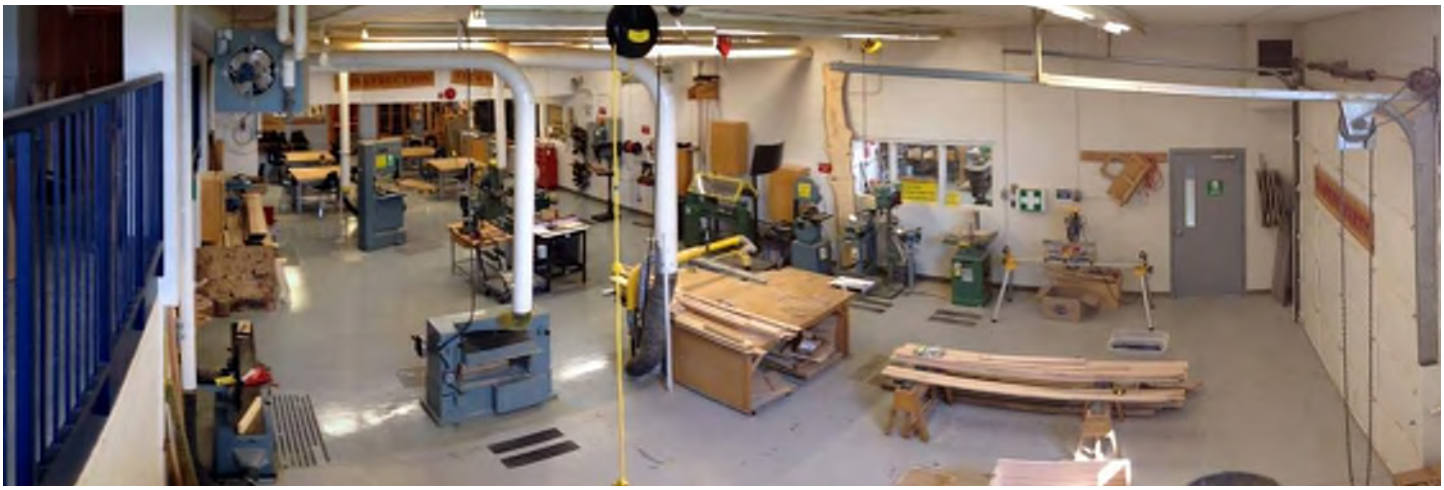
Dust collector enclosure roof - combustible roof construction - not compliant.

Dust collector enclosure

TECHNOLOGY DEPARTMENT CLASSROOMS

Portable air conditioner

Fabrication Room showing portable air conditioner exhausting into room.



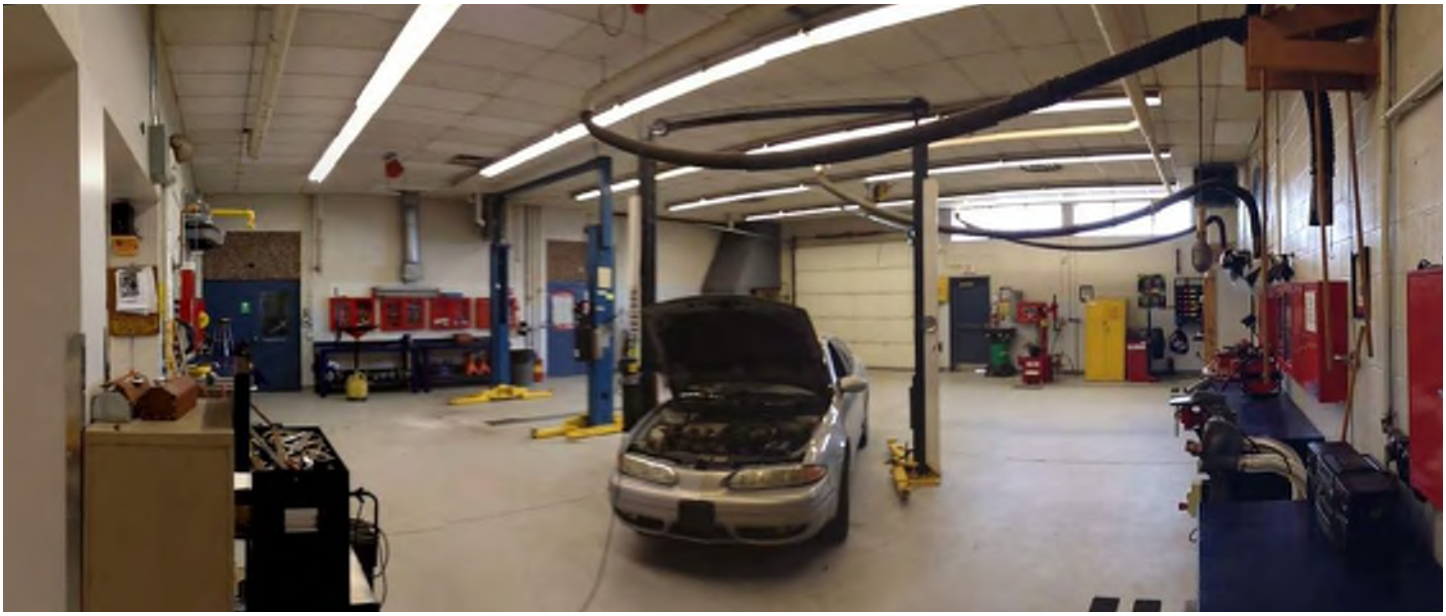
Overall view of Construction Technology Classroom

Manufacturing Technology Classroom

Manufacturing Technology Classroom - work tables not suitable for type of work being conducted; vinyl floor could be slippery

TECHNOLOGY DEPARTMENT CLASSROOMS

Transportation Technology Classroom view towards classroom space



Transportation Technology Classroom view towards exterior wall. Note only one overhead door for two vehicles.

Manufacturing Technology Shop overall view

Fabrication Room - equipment located too close to egress door from adjacent teaching space.

Manufacturing Technology Shop exterior door frame rotting/rusting.

TECHNOLOGY DEPARTMENT CLASSROOMS

Technological Design Classroom

Technological Design Classroom

EXISTING FAMILY STUDIES / NUTRITION CLASSROOM

The existing food preparation area of the family studies / nutrition classroom is showing signs of wear. Ranges have been added to the ends of the base cabinets at some point since the 1988 renovation. The location of these ranges in the aisle way reduces the safe passage of students. Futhermore, their location relative to each of the U-shaped food preparation areas presents a concern for safe exiting if there were to be a hazard at one of the ranges. No overhead exhaust or ventilation has been added to accommodate these ranges. We recommend renovations to the existing food preparation teaching space including removal and replacement of all existing millwork and finishes along with a reorganization of the layout to provide a safe and efficient teaching environment.

Family Studies / Nutrition Classroom food preparation area - note addition of ranges into aisle between cabinets and access to each space.

DRAMA DEPARTMENT CLASSROOMS

RMC has two separate teaching spaces as part of their drama department (Theatre Arts). The first of these is located on the lower ground floor level in Block B and the second located in a double portable.

Existing Drama Classroom housed in double portable.

DRAMA DEPARTMENT CLASSROOMS

Existing Lower Drama Classroom

Existing Lower Drama Classroom

DRAMA DEPARTMENT CLASSROOMS

The existing drama classroom located in the lower ground floor of Block B has a low ceiling, which is neither ideal for this type of teaching space nor consistent with those found in other secondary schools. The use of a double portable is also not suitable for this type of teaching space. We recommend removal of the portables temporarily housing part of the drama program following the design and construction of a permanent addition to the existing drama classroom. This work is likely to involve partial reorganization of the existing drama classroom

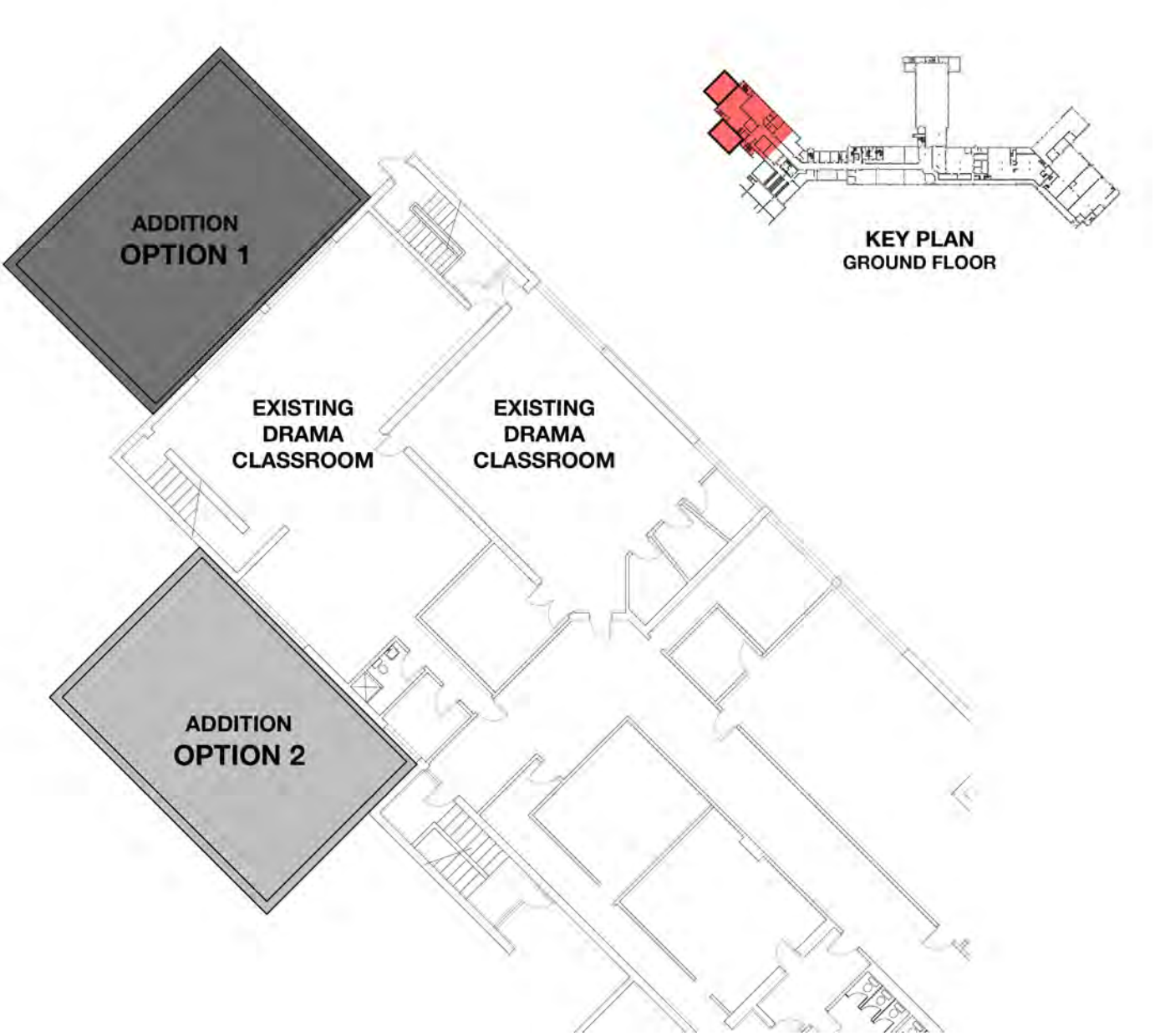
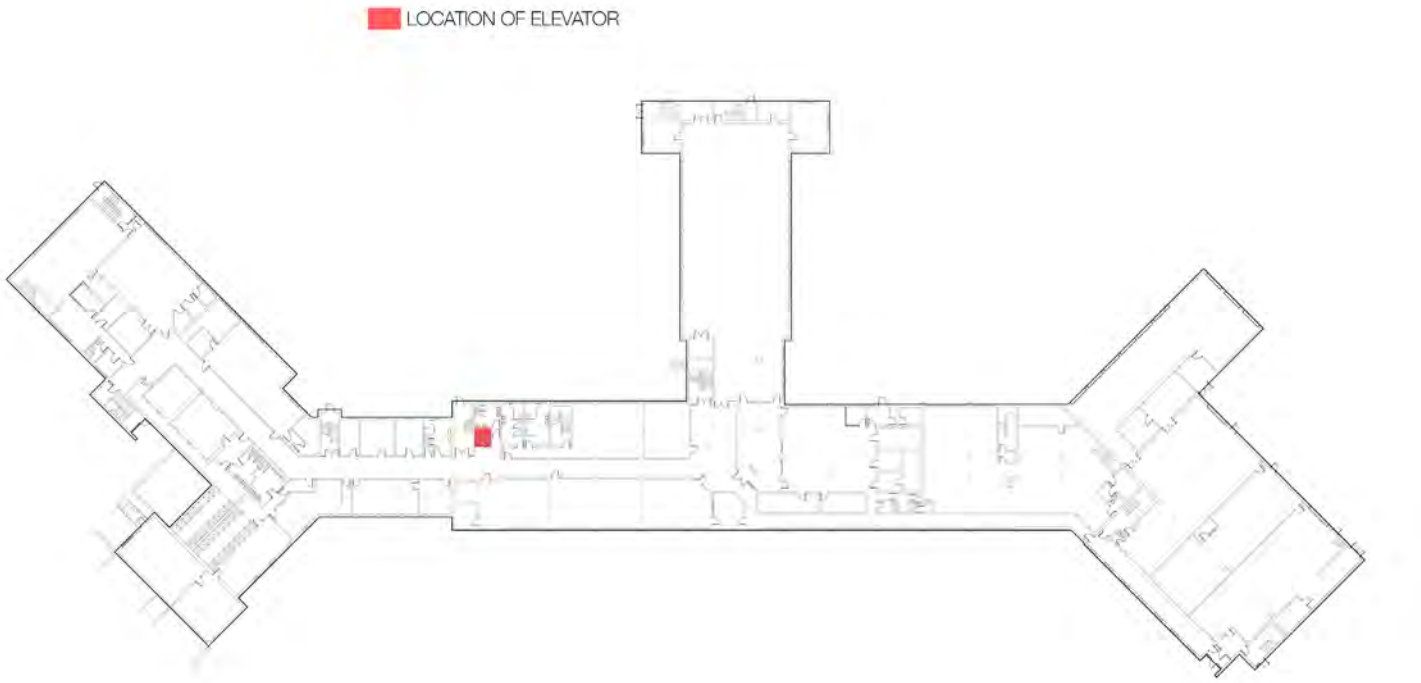


Figure B - Drama Classroom addition options

ELEVATOR

RMC has one elevator that was part of the original 1962 construction. It appears that no significant upgrades have been performed to the elevator and a recent flood has caused damage to the elevator. The elevator should be modernized including new controllers, new machines, refurbishment of the door operator and associated equipment, new wiring, new fixtures, and new cab finishes. We recommend that this work form part of the renewal project at RMC.



GROUND FLOOR PLAN

ELEVATOR

Elevator interior cab panel

Elevator interior

Elevator at Lower Floor

Elevator Machine Room Equipment

INTRODUCTION

Chorley + Bisset Ltd was retained by Nicholson Sheffield Architects to review the mechanical systems at Regina Mundi Catholic College at 5250 Wellington Road South in London.

This report is intended to provide guidance in renewal of the mechanical systems at this facility, and suggestions for addressing the code compliance, equipment condition, operational and comfort issues we encountered during our visits to the building. Preliminary budgets accompany the suggested modifications presented.

This report presents only the results of our brief review of the facility. The scope of the report was limited by the time made available to us. It does not include observations or data on actual system performance from the facility Owner.

This report is not intended to present the results of a comprehensive audit and inspection of all piping, equipment and systems in the facility. As an example, concealed systems, piping, ductwork and equipment located within walls, below floors or above ceiling spaces, etc, were not accessible for review. This report is also not intended to provide a performance guarantee that existing systems, piping, ductwork or equipment is fully operational, or will remain fully operational for the anticipated lifetime of the building.
The mechanical systems reviewed were:

- Plumbing Systems including sanitary and storm drainage, domestic cold and hot water, science classrooms, technology shops, natural gas, plumbing fixtures
- Fire Protection Systems including standpipe, kitchen (building is not sprinklered)
- Hydronic Heating Systems including perimeter radiation and boiler plants
- Ventilation and Cooling Systems including air handling systems, technology shops, chapel, gymnasia, miscellaneous exhaust fans and central cooling
- Automated Controls

MECHANICAL

EXECUTIVE SUMMARY

We found the majority of the building's plumbing and fire protection systems date back to 1962 and now exceed 50 years of age. Many of these systems require partial replacement or upgrade.

Many of the building ventilation systems were also installed in 1962 and are generally in very poor condition and due for replacement. A major renovation project in 1988 saw upgrade of many of those systems, but air conditioning was not provided. Many portable air conditioners are installed throughout the building. Although some of the 1988 central air systems are still in good working condition, not all are suited to the addition of cooling.

We recommend significant mechanical upgrades for the building, and suggest the following preliminary budgets for the work:

Plumbing Upgrades:	$ 550,000
Fire Protection Upgrades:	$ 200,000
Heating Upgrades:	$ 300,000
Ventilation and Cooling Upgrades:	$2,600,000
Automatic Controls Upgrades:	$ 400,000
Contingency	$ 450,000
Total	$4,500,000

PLUMBING SYSTEMS

The majority of the building's plumbing systems date back to its original 1962 construction. These systems are now 50 years of age, and increasing issues with piping leakage, blockage and deterioration can be expected in the future.

Sanitary Drainage System

Description

The 1962 sanitary drainage system serves Blocks B, C and D, and drains both the upper floor and the lowest level by gravity to a sanitary sump pit located below an exit stair at the intersection of Blocks C and D. The main to the sump pit is 8" size. From the sump pit, sewage was directed to an on site sewage treatment facility.

The sewage treatment facility was abandoned at some point within the last ten years. In 2012, the sanitary sump pit was infilled with concrete and the main was redirected to a new sump chamber located outside of the building. The new sump chamber includes two Flygt premium quality 3 hp submersible pumps that move wastewater to a below grade holding tank on the property. A second sump chamber with a second pair of Flygt submersible pumps directs the wastewater to the City forcemain on Wellington St.

The condition of the sanitary drainage piping within the building is not known. If there is a history of frequent blockages, or if there are plans to increase the occupancy load of the building, then a camera inspection of the piping mains should be undertaken. This was beyond the scope of the current report.

We noted there are two grease interceptors recessed in to the floor in the Kitchen. The interceptors appear to date back to the original construction. They are likely of galvanized steel construction, and susceptible to corrosion. We suggest they be opened, completely cleaned and the interior be visually inspected for deterioration and wear. It is likely that their condition is poor and they are due for replacement.

Recommended Upgrades and Allowance

We suggest the project budget include an allowance for camera inspection of the existing sanitary drainage system and replacement of the two grease interceptors in the Kitchen.

Allowance for Sanitary Drainage System Upgrades: $50,000

Storm Drainage System

Description

The 1962 storm drainage system serves Blocks B, C and D. It includes an 8" and 12" outlet leaving the South face of Block B and a 6" and 8" outlet leaving the South face of Block C. A 6" outlet leaves the East face of Block D. Stormwater for the site is routed to the pond East of the building.

Recommended Upgrades and Allowance

The condition of the storm drainage piping within the building is not known. However, we do not recommend any further action unless there are performance issues with the systems that we have not been informed of.

We noted the insulation has deteriorated and fallen off much of the horizontal stormwater piping which runs through the Block D Ground Floor Mechanical Room (Boiler Room). We suggest reinsulation of this piping.

Allowance for Storm Drainage System Upgrades: $5,000

Domestic Cold Water System

Description

The 1962 construction included a well system with booster pumps, softeners, and a very large surge tank to provide domestic water for the building. In 2006, the facility was changed over to the municipal system. A 6" service enters the building in the Block D Ground Floor Mechanical Room (Boiler Room) connected to the municipal line on Wellington St. Two 4" DCVA backflow preventers installed in parallel provide domestic water for the building, and a third 4" DCVA backflow preventer serves the Fire Protection Standpipe System.

The line pressure from the municipal system appears to be in the range of 35 psig upstream of the backflow preventers. This is not adequate to serve the building. The new water service was connected to the existing domestic water booster pumps. There are two pumps, one 5 hp and one 15hp. They are operated to charge the existing very large domestic water surge tank to 70

psig. Water is supplied to the building from this tank, which is pressurized with air at 50 psig. Once the water pressure drops to 50 psig, one of the booster pumps is started again to recharge the tank.

Construction details of the 1962 surge tank are not available to us, however, we suspect the materials the tank is constructed of would not comply with current OBC requirements for domestic water systems. We expect that after 50 years the tank is susceptible to leakage and suggest it is due for replacement. The tank is insulated with a canvas jacket and there is evidence of leakage and mold on the insulation. The tank is also much larger than required for this application, and has been since the building was switched over to municipal water.

The booster pumps are corroded and appear to be original. The smaller pump is an Armstrong 4280 series, size 3x1.5x6, designed to provide 100 USgpm at 35 psi. The larger pump is a split coupled base mounted pump with a 15 hp motor. Although there are two pumps for redundancy, both look susceptible to failure in the near future.

We also noted a few different piping materials used in this system, some of which are not permitted by OBC. Coated PVC piping has been used likely for repair at the booster pump inlet. The piping is combustible and not approved for use in this type of building. A small amount of galvanized steel piping was used upstream of the backflow preventer for the standpipe system. This is also not compliant.

Various curbs and corroded drains in this area of the Block D Ground Floor Mechanical Room (Boiler Room) remain in place even though the equipment has since been removed. These are redundant and in some cases trip hazards.

Recommended Upgrades and Allowance

We suggest installation of a new, modern booster pump set which includes three stainless steel vertical multistage pumps with variable speed drives and a much smaller, vertical surge tank. The new system would be suitable for domestic water, take up much less space, increase reliability and reduce energy use. Noncompliant piping materials should be removed and replaced as part of this work.

Redundant housekeeping pads and curbs should be hammered out and removed along with the deteriorated housekeeping pads for the old surge tank and booster pumps. The floor should then be repaired and epoxy painted to match existing.

Allowance for Domestic Cold Water System Upgrades: $150,000

Domestic Hot Water System

Description

The entire facility is served by the 1962 domestic hot water system. The system includes hot water recirculation, and the piping mains run through the Ground Floor Corridor ceiling spaces.

The domestic hot water heating plant is located in the Block D Ground Floor Mechanical Room (Boiler Room). It consists of a Weil McLain Model EGH-115 natural gas fired, atmospheric type boiler of 500 mbh input capacity and a Triangle Tube Model “Phase III” insulated, indirect fired, 120 US gallon domestic hot water heater/storage tank. We were unable to determine the installation

date, but the storage heater and the installation appear to be approximately 25 years old. The boiler may have been replaced since then.

The boiler combustion efficiency was measured at 85% earlier this year, however that doesn't include energy continually wasted through warm air traveling through the gas vent when the system is idle. We expect the actual operating efficiency of the unit is 65% to 70%.

The domestic water heat/storage tank is a unique product. It consists of a small stainless steel inner tank with a thermostat, and a larger stainless steel outer tank which is filled with the warmer boiler water. It appears to us that the limited heat exchange surface area and the limited storage volume of this arrangement would lead to a relatively slow response to changes in load. Either the facility demand is smaller than we would expect, or the hot water supply temperature would dip under peak load conditions.

The recirculation pump is an Armstrong Astro 250SS. The pump is relatively small for the size of the system. It appears the pump operates continuously.

Recommended Upgrades and Allowance

We suggest replacement of the domestic hot water heating plant with a more common and more efficient type of system. We also noted the boiler gas vent did not appear to meet current codes, and replacement of the system would address that issue as well. If the system is to remain, the vent may need replacement.

We suggest replacement of the recirculation pump and the addition of an aquastat or BAS control to shut off the pump when it isn't needed.

We noted much of the domestic hot water piping in the room is not insulated. We suggest it be insulated.

Allowance for Domestic Hot Water System Upgrades: $40,000

Science Classroom Plumbing Systems

Description

On the First Floor of Block B, there are six science classrooms which include teacher and student sinks and natural gas outlets. Classrooms 114 and 116 were renovated in 2001. We found no deficiencies in those classrooms. We found a number of non-compliance issues with current Code requirements in the remaining four classrooms and prep rooms.

Generally, all of the sanitary drainage systems for these classrooms and prep rooms use blue, acid resistant, coated pvc piping for drainage and vent piping. This material is combustible and is not approved under the OBC for use in buildings that are not completely sprinklered. It is not clear if this piping dates back to the 1962 installation (those drawings note the use of polyethylene piping, which would also not be compliant) or if the piping was installed later. Classrooms 114 and 116 are equipped with glass piping, which is the only approved material for this application in unsprinklered buildings.

We noted only one of these four classrooms included an emergency shutoff valve for the natural gas service.

We noted there is a master emergency gas shutoff valve for the science classrooms located in the Ground Floor Block B Mechanical Room. We are not sure if this valve is still in service, but it appears to be. This valve may remain, but the signage should be changed as this is not an appropriate location for an emergency shutoff valve. Removal of the valve should be considered.

None of the classrooms are equipped with barrier free student workstations.

Recommended Upgrades and Allowance

We suggest the blue coated pvc drainage and vent piping, where not concealed within block walls, be replaced with glass piping. A dilution tank system should be added to serve these classrooms. The system could be added to the Ground Floor Block B Mechanical Room.


Science Room - Deluge Shower

An emergency shutoff valve is required by the Gas Code in each room with gas outlets installed. We suggest these be added.

Classroom 124 is equipped with an emergency shower and below it is a raised concrete sump with a floor drain. We suggest the concrete sump be removed as it is not necessary, and is a trip hazard.

Generally we saw little access to emergency showers in the Science Classrooms. We suggest the locations be reviewed and showers be added as appropriate.

Generally, we saw faucet mounted eyewashes installed in the Science Classrooms. We also saw a hose type eyewash in one location. Those devices are no longer approved and should be replaced with bowl mounted eyewashes installed at the Teacher's desk.

Common, non-potable cold and hot water systems should be added to serve the science classrooms, as currently only Classrooms 114 and 116 are equipped with backflow protection. A small domestic hot water heater will be required for this system and could be electric. The backflow preventers and heater can be located in the Ground Floor Block B Mechanical Room.

A barrier free student workstation should be added to each Classroom.

Allowance for Science Classroom Plumbing System Upgrades: $150,000

Technology Shop Plumbing Systems

Description

Block D Technology Shops include Manufacturing, Transportation, Design and Construction.

Generally, we found the eyewash and emergency shower provisions in these shops to be inadequate. There did not appear to be sufficient fixtures, and the fixtures there were not provided with adequately sized piping to achieve the required flow rates.
Generally we found the service sinks in these rooms to be in poor condition, or inadequately sized.

We found plastic piping which is combustible and not approved for installation in a non-combustible building.

Recommended Upgrades and Allowance

We suggest a review of the area and provision of eyewash and emergency shower units as required. We suggest the addition of backflow prevention as required to meet current code, and replacement of the plastic piping. We suggest new service sinks be added to the Shops.

The condition of the oil interceptor in the Transportation Technology Shop should be reviewed and the unit should be replaced if it is corroded or leaky.

Allowance for Technology Classroom Plumbing System Upgrades: $40,000

Natural Gas System

Description

The natural gas meter for the building is located on the North Face of Block D. A 5 psi service runs in to the Boiler Room, where a single pressure reducing valve lowers the pressure supplied to the boiler plant and domestic hot water heating plant. The natural gas system serves various rooftop units, the science classrooms and other loads in the building.

Recommended Upgrades and Allowance

We have no recommended changes or upgrades for the Natural Gas system.

Allowance for Natural Gas System Upgrades: $0

Plumbing Fixtures

Description

We did not review all of the plumbing fixtures in the building. Some of the fixtures remain original to the 1962 construction, while some have been updated to lower flow fixtures complying with the standards of the 1990s. We noted at least a couple of washrooms in Block C have been completely updated with low flow fixtures. Other than those washrooms though, we generally found lavatory faucets which weren't electronic and didn't include metering, allowing the water to be left on.

Recommended Upgrades and Allowance

Generally, all fixtures in the building should be reviewed in detail, and metering faucets installed in all public areas. All of the 1962 plumbing fixtures should be replaced, and some of the 1990s fixtures should also be replaced.

Allowance for Plumbing Fixture Upgrades: $115,000

FIRE PROTECTION SYSTEMS

The building is equipped with a fire protection standpipe system which includes a fire pump. The

building is also equipped with fire extinguishers, but is not equipped with automatic sprinklers.

Fire Protection Standpipe System

Description

The 1962 standpipe system serves the entire building. The original drawings show a 4" standpipe with 2-1/2" branches for individual cabinets. A fire pump is used to boost the pressure of the system. The fire pump is an Armstrong Model 4380 vertical in line pump with a 10 hp motor, size 3x3x6, designed to provide 200 USgpm at 50 psi boost. The inlet pressure at the fire pump was less than 30 psig at the time of our visit. With the fire pump operating at design flows, a pressure of 80 psig can be expected at the pump outlet. The system is currently set to maintain a 100 psig static pressure.

For a building of larger than 40,000 sf that is not sprinklered, OBC currently requires a 2-1/2" hose connection at each cabinet for fire department use, in addition to the existing 1-1/2" hose connections. OBC also requires a fire protection standpipe system designed to provide a total of 500 USgpm at the two most remote fire hose cabinets, and a residual pressure of 65 psi at the highest cabinet. The installed fire pump cannot provide this required water supply.

The fire pump is required to meet NFPA 20. NFPA 20 currently requires the fire pump be installed in a dedicated fire rated room with direct access to outdoors. The fire pump is currently installed in the Block D Ground Floor Mechanical Room (Boiler Room) rather than in a dedicated room. NFPA 20 also requires the fire pump be supplied with emergency power. Currently it is fed from normal power.

It appears the fire hose cabinet coverage may not meet OBC travel distance requirements in some areas of the building.

Recommended Upgrades and Allowance

We recommend a review of the fire hose cabinet travel distances and the addition of new cabinets where required. We recommend replacement of the fire pump with a unit designed to meet current OBC requirements. A dedicated fire rated room should be constructed within the Boiler Room to house the new fire pump. Emergency power and a transfer switch should be provided. Fire hose cabinets and assemblies throughout the facility should be replaced and reworked to provide 2-1/2" hose connections. There are between 15 and 20 cabinets in the building. In some areas, pipe sizes may need to be increased in order to meet OBC flow rate requirements.

Allowance for Fire Protection Standpipe Upgrades: $200,000

Kitchen Grease Exhaust Hood Fire Suppression System

Description

The Kitchen on the Ground Floor of Block C has a large island style canopy exhaust hood over the cooking equipment. The hood is equipped with an automatic fire suppression system.

Recommended Upgrades and Allowance
We saw no issues with the fire suppression system. The system testing tags appeared to be up to date.

Allowance for Kitchen Fire Suppression System Upgrades: $0

HEATING SYSTEMS

The building is served by two hydronic boiler plants: a boiler plant located in a small mezzanine mechanical room in Block A serves only Block A, and the main boiler plant in the Ground Floor Block D Mechanical Room serves the rest of the building.

Block D Boiler Plant

Description

This plant was replaced in 2006. It now includes two natural gas fired DeDietrich GT-411 sectional cast iron boilers, non-condensing, 2560 mbh input each, with Weishaupt G5 low NOx power burners. The boilers themselves are in nearly new condition and we saw no deficiencies. We note the two boilers are vented together in to a common chimney and each boiler vent is equipped with a power burner. This type of installation is not as trouble free as separately vented boilers, but we have not been made aware of any issues with the current installation.

The primary circulating pumps were replaced with the boilers in 2006, and we saw no issues with those units. However, the main secondary circulating pumps were not replaced at that time. They appear to be original, dating back to the 1962 construction. Circulating pumps CP-1 and CP-2 are very heavily corroded and we were unable to determine the make of the pumps. They are 4x3 split coupled base mounted pumps with 7.5 hp standard efficiency motors and appear to have been designed for 200 USgpm at 35 ft head. We note that failure of either of these pumps would diminish the plant capacity by half, leaving the facility at risk of insufficient heating capacity.

Various other small circulating pumps in the ½ hp to 1 hp range are heavily corroded and appear to be original, due for replacement. These pumps serve individual zones. The valves and piping are all heavily corroded and this portion of the plant should be replaced in its entirety. There appears to be opportunity here for energy and maintenance savings through consolidation and reduction in the number of circulating pumps.

There is a hot water to hot water shell and tube heat exchanger and makeup pump assembly from 1962 that appears to have been intended to operate as a glycol system for air handling unit heating. It wasn't clear if this was in operation or not.

Recommended Upgrades and Allowance

The secondary circulating pumps, CP-1 and CP-2, and their accessories, should be replaced immediately. The small circulating pumps should be reworked and consolidated to a smaller number of pumps. All associated piping and valves should be replaced. The glycol makeup system for air handling unit heating should be replaced.

There is a large, abandoned expansion tank suspended from the structure above that should be removed.

The work in this Mechanical Room should also include insulation of uninsulated piping and replacement of damaged or moldy insulation.

Allowance for Block D Boiler Plant Upgrades: $250,000

Block A Boiler Plant

Description

This plant was replaced in 2010. It now includes two Patterson Kelley Mach 750 natural gas fired, aluminum condensing boilers. The plant is in new condition and we saw no deficiencies.

Recommended Upgrades and Allowance

We have no recommended changes or upgrades for the Block A Boiler Plant.

Allowance for Block A Boiler Plant Upgrades: $0

Hydronic Heating System

Description

The building is equipped with hydronic perimeter radiation throughout, installed in 1962. We do not know the condition of the 50 year old piping system, but it would not be unusual for this system to continue to operate in a satisfactory manner for many more years.

We did note that in some areas the vestibule force flow heaters or perimeter radiation units were heavily corroded, but for the most part the heaters looked to be in acceptable physical condition. Any renewal project at the facility should include steam cleaning of the existing radiation, and a new coat of paint.

These units are nearly all provided with pneumatic control valves, which will be discussed in the Automatic Controls section at the end of this report.

Recommended Upgrades and Allowance

We suggest an allowance be included for replacement of corroded vestibule force flow heaters and perimeter radiation units.

Allowance for Hydronic Heating Upgrades: $50,000

VENTILATION AND COOLING SYSTEMS

The building is provided with ventilation and cooling through a number of indoor air handling systems and also a few rooftop air handling systems. None of the central systems in the building are equipped with mechanical cooling or refrigeration systems, and so provide cooling only when it is cold outside.

Many of the central air handling units were installed in 1988. However, some of the original 1962 air systems remain and those are generally in poor condition.

Since the building is not air conditioned, many of the rooms in the building have portable air conditioners. A central cooling solution for each area would allow reduced energy use through increased efficiency and even control of temperatures throughout the building (not all of the rooms have portable air conditioners).

Block A Cooling and Ventilation System No. 1

Description

Air Handling Unit No. 1 serves the First Floor of Block A and is located in the South Mezzanine Mechanical Room. It is an indoor, constant volume, Engineered Air LM series unit with a 3 hp supply fan, hot water heating coil, filters and economizer dampers. It provides ventilation for the Change Rooms, Storage and Office spaces. It will provide cooling for these spaces only when it is cool outside. It was designed to provide 6,000 cfm of supply air.

The unit was installed in 1988 when Block A was constructed. It is served by an inline return fan suspended from the structure above. The unit and the return fan appear to be in good working condition. We noted the supply fan was not equipped with a belt guard.

Recommended Upgrades and Allowance

Cooling should be added to this area. The addition of dx cooling with a remote condensing unit to serve this system would not serve this purpose as the areas served include both interior and perimeter spaces and multiple zones of temperature control will be required. We suggest the addition of a water source heat pump system to cool this area. Each room would be provided with a horizontal heat pump located either within the room or in the ceiling space outside the room. The existing supply ductwork would be externally insulated and reused.

With this approach, a small energy recovery ventilation unit will also be required. That unit would replace Air Handling Unit No. 1 and be located within the existing Mezzanine Mechanical Room. The existing supply ductwork could then be reused to provide ventilation air to the heat pumps. That ductwork will not need to be insulated.

A belt guard should be added to the supply fan.

The existing supply and return duct penetrations between the Mechanical Room and the Exit Stair/Vestibule below are not equipped with fire dampers. Current OBC requirements would not allow installation of this ductwork within the Vestibule below. We suggest a fire rated ceiling be constructed in the Vestibule below, so that the ductwork may remain.

Allowance for Block A Cooling and Ventilation System No. 1 Upgrades: $120,000

Block A Cooling and Ventilation System No. 2

Description

Air Handling Unit No. 2 serves the double Gymnasia and Mezzanine of Block A and is located in the Centre Mezzanine Mechanical Room. It is an indoor, constant volume, Engineered Air LM series unit with a 7.5 hp supply fan, hot water heating coil, filters and economizer dampers. It provides ventilation for the Gymnasia, and Mezzanine Weight Room and Aerobics spaces. It will provide cooling for these spaces only when it is cool outside. It was designed to provide 20,000 cfm of supply air.

The unit was installed in 1988 when Block A was constructed. It is served by an inline return fan suspended from the structure above. The unit and the return fan appear to be in good working condition. We noted the supply fan was not equipped with a belt guard.

A natural gas fired humidification system was added to serve Air Handling Unit 2 in 1997, to prevent issues with the wood floor in the Gymnasium.

Recommended Upgrades and Allowance

This unit serves essentially a single zone as the two Gymnasia and the Mezzanine rooms are all open to one another as one large space. Because only one zone is served, a single zone of temperature control from the air handling unit should be adequate to maintain good temperature control. A DX cooling coil should be added to the air handling system, with a rooftop condensing unit. There is inadequate physical space within the Mechanical Room for a new coil and so two coils will need to be installed in the supply ductwork over the Mezzanine. Some of the ductwork will need to be externally insulated.

The humidifier gas vent material may not meet current Code requirements and should be reviewed and replaced if required.

A belt guard should be added to the supply fan.

Demand control ventilation should be added for the Gymnasia, using CO2 sensors.

Allowance for Block A Cooling and Ventilation System No. 2 Upgrades: $80,000

Block B Cooling and Ventilation System No. 3

Description

Air Handling Unit No. 3 serves the North facing and Interior rooms of the Ground Floor of the East Wing of Block B, as well as rooms on the Ground Floor of the South Wing of Block B. It is located in the Ground Floor Block B Mechanical Room. It is an indoor, constant volume, Engineered Air LM series unit with a 3 hp supply fan, hot water heating coil, filters and economizer dampers. It provides ventilation for various rooms including Change Rooms and Custodial spaces. It will provide cooling for these spaces only when it is cool outside. It was designed to provide 6,000 cfm of supply air.

The unit was installed in 1988. It is served by an inline return fan suspended from the structure above. The unit and the return fan appear to be in good working condition. We noted the supply fan was not equipped with a belt guard.

Recommended Upgrades and Allowance

Cooling should be added to this area. The addition of dx cooling with a remote condensing unit to serve this system would not serve this purpose as the areas served include both interior and perimeter spaces and multiple zones of temperature control will be required. We suggest the addition of a water source heat pump system to cool this area. Each room would be provided with a horizontal heat pump located either within the room or in the ceiling space outside the room. The existing supply ductwork would be externally insulated and reused.

With this approach, a small energy recovery ventilation unit will also be required. That unit would replace Air Handling Units No. 3 as well as the two other units located in the Ground Floor Block B Mechanical Room. The existing supply ductwork could then be reused to provide ventilation air to the heat pumps. That ductwork will not need to be insulated.

A belt guard should be added to the supply fan.

Allowance for Block B Cooling and Ventilation System No. 3 Upgrades: $120,000

Block B Cooling and Ventilation System No. HV-3

Description

Air Handling Unit No. HV-3 serves the First Floor of the North Wing of Block B. It is located in the Ground Floor Block B Mechanical Room. It is an indoor, constant volume, Canadian Blower series unit with a 3 hp supply fan, hot water heating coil, filters and economizer dampers. It provides ventilation for the Science Classrooms and Prep Rooms. It will provide cooling for these spaces only when it is cool outside. It was designed to provide 8,000 cfm of supply air.

The unit was installed in 1962. It is served by an inline return fan suspended from the structure above. The unit and the return fan are corroded and in poor condition. They are due for replacement.

We generally found ventilation levels to be poor in the Science Classrooms. We suspect the air volumes provided are far lower than shown on the 1988 Renovation drawings when the system was rebalanced. The supply grilles are generally much too small to provide the air volumes indicated without excessive noise, and we observed very little noise with the system.

The return grilles in the Science Classrooms are original and are heavily corroded. The supply grilles are much too small.

The exhaust systems appeared to be ineffective, and some did not operate when switched on. Strong odours were observed in a number of rooms.

Recommended Upgrades and Allowance

Cooling should be added to this area. The addition of dx cooling with a remote condensing unit to serve this system would not serve this purpose as multiple zones of temperature control will be required. We suggest the addition of a water source heat pump system to cool this area. Each room would be provided with a horizontal heat pump located either within the room or in the ceiling space outside the room. New supply ductwork would be provided within each classroom, generally exposed to view below the ceiling. The existing supply and return grilles would be removed and the wall openings patched. The exhaust ductwork located in the Crawlspace below this floor would be abandoned or removed.

With this approach, the new energy recovery ventilation unit cited under the Block B Cooling and Ventilation System No. 3 would also serve this Wing of the Building. The existing supply ductwork could then be reused to provide ventilation air to the heat pumps. That ductwork will not need to be insulated.

Air from the Science Classrooms will be recirculated within the classrooms, but will no longer be recirculated from one classroom to another, or from the Prep Rooms to the classrooms.

The exhaust systems for the Science Classrooms and Prep Rooms will be replaced.

Allowance for Block B Cooling and Ventilation System No. HV-3 Upgrades: $150,000

Block B Cooling and Ventilation System No. HV-4

Description

Air Handling Unit No. HV-4 serves the remaining rooms on the Ground Floor of the East Wing of Block B that aren't served by Unit No. 3. It is located in the Ground Floor Block B Mechanical Room. It is an indoor, constant volume, Canadian Blower series unit with a 3 hp supply fan, hot water heating coil, filters and economizer dampers. It provides ventilation for Theatre Arts and its associated Rehearsal and Change Room spaces, as well as Music and Arts. It will provide cooling for these spaces only when it is cool outside. It was designed to provide 3,500 cfm of supply air.

The unit was installed in 1962. It is served by an inline return fan suspended from the structure above. The unit and the return fan are corroded and in poor condition. They are due for replacement.

Recommended Upgrades and Allowance

Cooling should be added to this area. The addition of dx cooling with a remote condensing unit to serve this system would not serve this purpose as multiple zones of temperature control will be required. We suggest the addition of a water source heat pump system to cool this area. Each room would be provided with a horizontal heat pump located either within the room or in the ceiling space outside the room. The existing supply ductwork would be externally insulated and reused where possible.

With this approach, the new energy recovery ventilation unit cited under the Block B Cooling and Ventilation System No. 3 would also serve this Wing of the Building. The existing supply ductwork

could then be reused to provide ventilation air to the heat pumps. That ductwork will not need to be insulated.

Allowance for Block B Cooling and Ventilation System No. HV-4 Upgrades: $70,000

Block B Cooling and Ventilation System No. 11

Description

Rooftop Air Handling Unit No. 11 serves the Library and adjacent rooms on the Second Floor of Block B. It is located on the roof above one of the Seminar Rooms. It is a constant volume, Engineered Air DJ series unit with a 7.5 hp supply fan, natural gas fired heating, dx cooling, filters and economizer dampers. It was designed to provide 9,000 cfm of supply air. Heating capacity of the unit is 360 mbh input. Cooling capacity is a nominal 21 tons.

The unit was installed in 1988 and is now 25 years old, which is in excess of the expected service life of rooftop packaged HVAC units. The unit is heavily corroded and due for replacement.

Recommended Upgrades and Allowance

We suggest replacement of this rooftop unit with a similar unit. Structural upgrades may be required in order to accommodate OBC changes regarding roof loading. A roof curb adapter will likely allow reuse of the existing roof curb without additional roofing work.

This system will be controlled to maintain temperatures in the Library. The small Seminar Rooms and Work Room will require the addition of zone terminal units for temperature control.

Allowance for Block B Cooling and Ventilation System No. 11 Upgrades: $120,000

Block B Gymnasium Cooling and Ventilation System

Description

We were unable to access the Mezzanine Mechanical Room which houses the Block B Gymnasium Air Handling Unit. This unit was installed in 1962 and provides cooling and ventilation air for the Gymnasium. It is an indoor, constant volume, Canadian Blower series unit with a supply fan, hot water heating coil, filters and economizer dampers. It will provide cooling only when it is cool outside. It was designed to provide 14,000 cfm of supply air.

Based on the vintage of the unit and the condition of the other indoor 1962 air handling systems, we expect the unit is corroded and in poor condition. The system is due for replacement.

Recommended Upgrades and Allowance

Cooling should be added to this area. The mechanical room is small, and accessible only by a ladder and roof hatch. A replacement indoor air handling unit with cooling coil is not likely to physically fit within the room. We suggest installation of either a vertical water source heat pump with economizer dampers, a packaged rooftop HVAC unit located on the roof over the stage, or a replacement indoor unit with DX cooling coil and condensing unit located on the roof over the stage. The optimal solution would be determined at the project design stage. The existing supply

ductwork is concealed above a drywall ceiling and is unlikely to be insulated and suitable for reuse. New ductwork would be installed, exposed to view within the Gymnasium.

Allowance for Block B Cooling and Ventilation System No. HV-4 Upgrades: $150,000

Block C Cooling and Ventilation System No. 4

Description

Air Handling Unit No. 4 serves the Ground Floor of Block C and the North Wing of the First Floor of Block C. It is located in the Ground Floor Block D Mechanical Room (Boiler Room). It is an indoor, constant volume, Engineered Air LM series unit with a 10 hp supply fan, hot water heating coil, filters and economizer dampers. It provides ventilation for various rooms including Food Services, Family Studies, Staff Dining, Staff Lounge and the Office area. It will provide cooling for these spaces only when it is cool outside. It was designed to provide 12,500 cfm of supply air.

The unit was installed in 1988. It is served by an inline return fan suspended from the structure above. The unit and the return fan appear to be in good working condition. We noted the supply fan was not equipped with a belt guard.

Recommended Upgrades and Allowance

Cooling should be added to this area. The addition of dx cooling with a remote condensing unit to serve this system would not serve this purpose as the areas served include both interior and perimeter spaces and multiple zones of temperature control will be required. We suggest the addition of a water source heat pump system to cool this area. Each room would be provided with a horizontal heat pump located either within the room or in the ceiling space outside the room. The existing supply ductwork would be externally insulated and reused.

With this approach, a small energy recovery ventilation unit will also be required. That unit would replace Air Handling Unit No. 4 and would be located within the existing Boiler Room. The existing supply ductwork could then be reused to provide ventilation air to the heat pumps. That ductwork will not need to be insulated.

A belt guard should be added to the supply fan.

Allowance for Block C Cooling and Ventilation System No. 4 Upgrades: $240,000

Block C Cooling and Ventilation System No. 6

Description

Rooftop Air Handling Unit No. 6 serves the Second Floor of Block C. It is located at the North end of the roof over the Third Floor. It is a constant volume, Engineered Air DJ series unit with a 7.5 hp supply fan, natural gas fired heating, filters, economizer dampers and return fan. It provides ventilation for the Second Floor classrooms. It will provide cooling for these spaces only when it is cool outside. It was designed to provide 9,500 cfm of supply air. The heating capacity is 450 mbh input.

The unit was installed in 1988. The unit is heavily corroded and due for replacement.

Recommended Upgrades and Allowance

Cooling should be added to this area. Replacement of this unit with another packaged rooftop unit would not serve this purpose as the areas served will require multiple zones of temperature control. We suggest the addition of a water source heat pump system to cool this area. Each room would be provided with a horizontal heat pump located either within the room or in the ceiling space outside the room. The existing supply ductwork would be externally insulated and reused.

With this approach, a small energy recovery ventilation unit will also be required. That unit would replace Air Handling Units No. 6 and 7 and would be located on the Third Floor Roof. The existing supply ductwork could then be reused to provide ventilation air to the heat pumps. That ductwork will not need to be insulated.

Allowance for Block C Cooling and Ventilation System No. 6 Upgrades: $200,000

Block C Cooling and Ventilation System No. 7

Description

Rooftop Air Handling Unit No. 7 serves the Third Floor of Block C. It is located at the North end of the roof over the Third Floor. It is a constant volume, Engineered Air DJ series unit with a 7.5 hp supply fan, natural gas fired heating, filters, economizer dampers and return fan. It provides ventilation for the Third Floor classrooms. It will provide cooling for these spaces only when it is cool outside. It was designed to provide 8,500 cfm of supply air. The heating capacity is 450 mbh input.

The unit was installed in 1988. The unit is heavily corroded and due for replacement.

Recommended Upgrades and Allowance

Cooling should be added to this area. Replacement of this unit with another packaged rooftop unit would not serve this purpose as the areas served will require multiple zones of temperature control. We suggest the addition of a water source heat pump system to cool this area. Each room would be provided with a horizontal heat pump located either within the room or in the ceiling space outside the room. The existing supply ductwork would be externally insulated and reused.

With this approach, a small energy recovery ventilation unit will also be required. That unit would replace Air Handling Units No. 6 and 7 and would be located on the Third Floor Roof. The existing supply ductwork could then be reused to provide ventilation air to the heat pumps. That ductwork will not need to be insulated.

Allowance for Block C Cooling and Ventilation System No. 7 Upgrades: $180,000

Block C Chapel Cooling and Ventilation System HV-7

Description

Air Handling Unit No. HV-7 serves the First Floor Chapel in Block C. The unit is located in the North Ground Floor Block C Mechanical Room adjacent to the Cafeteria. It is an indoor, constant volume, Canadian Blower series unit with a 5 hp supply fan, hot water heating coil, filters and economizer dampers. It provides ventilation for the Chapel. It will provide cooling only when it is cool outside. It was designed to provide 7,500 cfm of supply air.

The unit was installed in 1962. It is served by an inline return fan suspended from the structure above. The unit and the return fan are corroded and in poor condition. They are due for replacement.

Recommended Upgrades and Allowance

Cooling should be added to the Chapel. We suggest installation of either a vertical water source heat pump with economizer dampers, or a replacement indoor air handling unit with DX cooling coil and condensing unit located outside on grade. The optimal solution would be determined at the project design stage. The existing supply ductwork is concealed above drywall ceilings and is unlikely to be insulated and suitable for reuse. The ceilings will need to be removed and the ductwork may need to be replaced as well as insulated.

Allowance for Block C Chapel Cooling and Ventilation System No. HV-7 Upgrades:
$100,000

Block C Cafeteria Cooling and Ventilation System HV-8

Description

Air Handling Unit No. HV-8 serves the Ground Floor Cafeteria in Block C. The unit is located in the South Ground Floor Block C Mechanical Room adjacent to the Cafeteria. It is an indoor, constant volume, Canadian Blower series unit with a 2 hp supply fan, hot water heating coil, filters and economizer dampers. It provides ventilation for the Cafeteria. It will provide cooling only when it is cool outside. It was designed to provide 3,500 cfm of supply air.

The unit was installed in 1962. It is served by an inline return fan suspended from the structure above. The unit and the return fan are corroded and in poor condition. They are due for replacement.

Recommended Upgrades and Allowance

Cooling should be added to the Cafeteria. We suggest installation of either a vertical water source heat pump with economizer dampers, or a replacement indoor air handling unit with DX cooling coil and condensing unit located outside on grade. The optimal solution would be determined at the project design stage. The existing supply ductwork is concealed above drywall ceilings and is unlikely to be insulated and suitable for reuse. The ceilings will need to be removed and the ductwork may need to be replaced as well as insulated.

Allowance for Block C Cafeteria Cooling and Ventilation System No. HV-8 Upgrades:
$100,000

Block C Cooling and Ventilation System No. 10

Description

Air Handling Unit No. 10 provides makeup air for the Kitchen located on the Ground Floor of Block C. The unit is located in the Ground Floor Block D Mechanical Room (Boiler Room). It is an indoor, constant volume, Engineered Air LM series unit with a 5 hp supply fan, glycol hot water heating coil and filters. It will provide cooling for the Kitchen only when it is cool outside. It was designed to provide 11,000 cfm of supply air.

The unit was installed in 1988. It is served by an inline return fan suspended from the structure above. The unit and the return fan appear to be in good working condition. We noted the supply fan was not equipped with a belt guard.

The Kitchen is equipped with a very large island style canopy exhaust hood. The hood appears to be an NFPA 96 compliant grease hood, although we could find no documentation on it. The grease exhaust system, however, is not compliant with NFPA 96. NFPA 96 requires carbon steel or stainless steel ductwork with continuously welded joints, and specific separation distances from combustible or semi-combustible materials. The existing ductwork is galvanized steel with flanged joints, and the required clearances are not maintained.

The exhaust fan for the grease hood is located on the roof of Block C, above the Third Floor. The fan installation is not compliant with NFPA 96, and the fan is due for replacement. It is likely that a taller exhaust stack will be required for the exhaust, to avoid reentrainment of odours in the building.

We found some of the smaller rooms adjacent to the Kitchen to be quite hot. These rooms contained larger refrigerators or freezers with large cooling loads, but no cooling in the rooms.

Recommended Upgrades and Allowance

This unit serves a single room and so a single zone of temperature control from the air handling unit should be adequate to maintain good temperature control. A DX cooling coil should be added to the air handling system, with a rooftop condensing unit. There is inadequate physical space within the air handling unit for a new coil and so the unit will need to be modified. The existing supply ductwork will need to be externally insulated.

A new grease exhaust system and fan should be provided that is compliant with NFPA 96 requirements.

Cooling should be provided for all of the storage rooms adjacent to the Kitchen which contain significant heat sources. Outdoor condensing units should be considered for the refrigerators and freezers where possible.

A belt guard should be added to the supply fan.

Allowance for Block C Cooling and Ventilation System No. 10 Upgrades:
$250,000

Block C Cooling and Ventilation System No. HV-1

Description

Rooftop Air Handling Unit No. HV1 serves the South Wing of the First Floor of Block C. It is located on the roof over the Ground Floor between Blocks C and D, and the ductwork enters the building through the wall directly in to the First Floor Corridor of the Block C South Wing. It is a constant volume, Engineered Air DJ series unit with a 3 hp supply fan, natural gas fired heating, filters, economizer dampers and return fan. It provides ventilation for the First Floor South Wing classrooms. It will provide cooling for these spaces only when it is cool outside. It was designed to provide 6,000 cfm of supply air. The heating capacity is 400 mbh input.

The unit was installed in 1988. The unit is heavily corroded and due for replacement.

Recommended Upgrades and Allowance

Cooling should be added to this area. Replacement of this unit with another packaged rooftop unit would not serve this purpose as the areas served will require multiple zones of temperature control. We suggest the addition of a water source heat pump system to cool this area. Each room would be provided with a horizontal heat pump located either within the room or in the ceiling space outside the room. The existing supply ductwork would be externally insulated and reused.

With this approach, ventilation air would be provided from the new energy recovery ventilation unit cited in the section on Block C Cooling and Ventilation System No. 4. New supply ductwork to this area will be required, in order to provide ventilation air to the heat pumps. Much of that ductwork can be routed through the Block D Mechanical Room below the area.

Allowance for Block C Cooling and Ventilation System No. HV-1 Upgrades: $120,000

Block D Cooling and Ventilation System No. 8

Description

Air Handling Unit No. 8 serves the East (two storey high) side of the First Floor Block D Transportation, Design and Construction Technology Shops. The unit is located on the Block D roof above Transportation Technology. It is a constant volume, Engineered Air DJ series unit with a 1.5 hp supply fan, natural gas fired heating, filters, economizer dampers and return fan. It provides ventilation for the Shops. It will provide cooling for these spaces only when it is cool outside. It was designed to provide 2,500 cfm of supply air. The heating capacity is 200 mbh input.

The unit was installed in 1988. The unit is heavily corroded and due for replacement.

Block D Cooling and Ventilation System No. 8

Recommended Upgrades and Allowance

Cooling is often not provided for Technical Shops. Typically these rooms are equipped with large overhead doors which are opened seasonally for cooling and ventilation. If cooling is not required

for this area, we recommend replacement of the unit with two new rooftops unit equipped with natural gas heating and with provisions for future dx cooling. Each unit should be equipped with the heating capacity required in order to provide makeup air for the shop it serves. One unit will serve the Transportation Technology Shop and the other the Construction Technology Shop. The shop exhaust systems are reviewed below.

Allowance for Block D Cooling and Ventilation System No. 8 Upgrades: $100,000

Block D Cooling and Ventilation System No. 9

Description

Air Handling Unit No. 9 serves three classrooms on the Second Floor of Block D, as well as the single storey portions of the Transportation, Design and Construction Technology Shops on the West side of the First Floor. The unit is located on the West side of the Block D roof above the Transportation Classroom. It is a constant volume, Engineered Air DJ series unit with a 1.5 hp supply fan, natural gas fired heating, filters, economizer dampers and return fan. It provides ventilation for the Shops. It will provide cooling for these spaces only when it is cool outside. It was designed to provide 2,500 cfm of supply air. The heating capacity is 200 mbh input.

The unit was installed in 1988. The unit is heavily corroded and due for replacement.

Recommended Upgrades and Allowance

Cooling should be added to this area. Replacement of this unit with another packaged rooftop unit would not serve this purpose as the areas served will require multiple zones of temperature control. We suggest the addition of a water source heat pump system to cool this area. Each room would be provided with a horizontal heat pump located either within the room. The existing supply ductwork would be externally insulated and reused where possible.

With this approach, ventilation air would be provided from the new energy recovery ventilation unit cited in the section on Block C Cooling and Ventilation System No. 4. New supply ductwork to this area will be required, in order to provide ventilation air to the heat pumps. Much of that ductwork can be routed through the Block D Mechanical Room below the area.

The First Floor West side portions of the Transportation, Design and Construction Technology Shops would no longer be served by this system.

Allowance for Block D Cooling and Ventilation System No. 9 Upgrades: $60,000

Construction Technology Ventilation System

Description

The Construction Technology shop includes approximately 10 major woodworking equipment items which require dust collection. They are currently served by a baghouse style dust collector located outside, adjacent to the building in a block wall enclosure. The unit was installed in 1988, and is a recirculating style unit. We were unable to access the enclosure to check whether the unit was equipped with a blowback damper and explosion vents. We are confident the unit will

not meet current code requirements with respect to explosion vents, or with respect to current Code requirements (spark arrest and suppression) for recirculating style dust collectors.

Recommended Upgrades and Allowance

The dust collection system, including the dust collector, should be replaced. We do not recommend recirculating type systems as they will recirculate the finest and potentially most harmful dust particles back to the room. We recommend instead an exhaust only type system without recirculation. Makeup air would be provided as described in Block D Cooling and Ventilation System No. 8 above.

The router table and panel saw should be connected to the new dust collection system, and provisions should be added for dust capture during hand sanding operations.

We note the “Finishing Room” should not be used for staining or painting operations as the room does not meet Ontario Fire Code requirements for these type of operations.

Allowance for Construction Technology Ventilation System Upgrades: $80,000

Transportation Technology Ventilation System

Description

The Transportation Technology Shop includes three snorkels to capture tailpipe fumes, connected to a small exhaust fan, EF-10 located on the roof above the Shop. The originally specified tailpipe clamps have been removed and we suspect the system is currently used for removal of fumes from welding and grinding. The system capacity is very small and it would be largely ineffective at doing so.

The Shop is not equipped with carbon monoxide detection as is required by current code.

The welding area does not appear to be equipped with fume or dust collection.

The grinders in the Shop and in the adjacent Manufacturing Technology room (formerly a garage) are not equipped with dust collection.

Recommended Upgrades and Allowance

Fume and dust collection systems should be added to serve any welding stations and all grinders. Makeup air would be provided as described in Block D Cooling and Ventilation System No. 8 above.

Carbon monoxide detection, interlocked with general exhaust systems, should be added.

Allowance for Transportation Technology Ventilation System Upgrades: $80,000

Miscellaneous Exhaust Systems

Description

Various rooftop exhaust fans serve the building. Many are now 50 years old and due for replacement.

Recommended Upgrades and Allowance

We recommend an allowance for replacement of approximately 10 rooftop exhaust fans that are now more than 50 years old.

Allowance for Exhaust Fan Replacements: $30,000

Central Cooling Systems

Description

The building is not equipped with a central cooling system such as a chiller and cooling tower, or a fluid cooler.

Recommended Upgrades and Allowance

We have recommended the installation of water source heat pumps for all areas of the building where multiple zone temperature control is required, as well as for large single zones where the existing central air handling system is due for replacement.

Heat rejection for the water source heat pump system will require installation of a closed circuit fluid cooler. The cooler will ideally be located indoors, in a new mechanical room on the East side of the building, with the cooler exhaust a reasonable distance away from any nearby air intakes.

Allowance for Central Cooling System Upgrades: $250,000

AUTOMATIC CONTROL SYSTEMS

Description

The building is equipped with a TA Canada Building Control System (BCS). However, not all of the mechanical equipment in the building is controlled by the system. We found many systems fully operating during our visit, when the rooms served were, and could be expected to be, unoccupied.

Recommended Upgrades and Allowance

Nearly all of the hydronic heating system controls in the building are pneumatic. In many areas, new water source heat pump systems will replace the hydronic heating systems. Where the heating systems are to remain, controls should be upgraded to electric control valves controlled

by the BCS.

All new equipment should be fully controlled by the BCS. Existing central equipment that is not fully controlled should be modified so that it is fully controlled.

Allowance for Automatic Control System Upgrades: $400,000

INTRODUCTION

Chorley + Bisset Ltd was retained by Nicholson Sheffield Architects to review the electrical systems at Regina Mundi Catholic College at 5250 Wellington Road South in London.

This report is intended to provide guidance in renewal of the electrical systems at this facility, and suggestions for addressing the code compliance, equipment condition and other issues we encountered during our visits to the building. Preliminary budgets accompany the suggested modifications presented.

This report presents only the results of our brief review of the facility. The scope of the report was limited by the time made available to us. It does not include observations or data on actual system performance from the facility Owner.

This report is not intended to present the results of a comprehensive audit and inspection of all equipment and systems in the facility. As an example, concealed systems, conduit, wiring and equipment located within walls, below floors or above ceiling spaces, etc, were not accessible for review. This report is also not intended to provide a performance guarantee that existing systems or equipment is fully operational, or will remain fully operational for the anticipated lifetime of the building.

The electrical systems reviewed were:

- Electrical service and distribution
- Electrical devices and wiring
- Lighting

ELECTRICAL

- Emergency and Exit Lighting
- Fire Alarm
- CCTV
- Access Control
- Cable TV (CATV)
- Voice / Data System
- Clock System
- PA / Intercom
- Gymnasium / Theatre / Chapel Sound and Lighting System
- Lightning Protection

EXECUTIVE SUMMARY

The majority of the electrical systems are in fairly good condition with the exception of the fire alarm system. Below is a list of recommended upgrades and preliminary budgets for the work:

Replace Electrical Panels:	$ 25,000
Add wiring for Mechanical Upgrades	$ 750,000
Replace Underground Feeders:	$ 35,000
Remove and reinstall ceiling devices	$ 300,000
Replace Lighting Fixtures:	$ 30,000
Add Additional Flood Lighting:	$ 3,000
Add Emergency Lights:	$ 1,000
New Fire Alarm System:	$ 450,000
Add Lightning Protection to Additions:	$ 15,000
Contingency	$ 161,000
Total	$1,770,000

Note that when all the ceilings are removed, it may be advisable to replace all of the light fixtures at that time. The associated cost for replacement of the lighting fixtures is $1,150,000 including contingency.

ELECTRICAL SERVICE AND DISTRIBUTION

Main Electrical Service

Description

The main electrical service was installed in 2008 and is a 1600 amp, 600 / 347 volt service. The 600 volt power is distributed to some mechanical loads and also powers two 225 kVA transformers which distributes power at 208/120 volt to the lighting and receptacles.

The main Electrical Room is located in the basement adjacent to the Boiler Room in the centre South Wing. The utility transformer is located approximately 20 ft. outside behind the school from the Electrical Room. The utility transformer is 500 kVA and is fed underground from a pole at the road near the South end of the property. The main service is in good condition and parts are still readily available. The peak load on the service appears to be approximately 305 amps so there is sufficient capacity for additional loads such as air conditioning or an Addition.

Recommended Upgrades and Allowance

No upgrades are required for the main service.

Panelboards

Description

Some of the panelboards throughout the facility have been replaced with new in areas that have been renovated but there are still approximately 15 panelboards that need to be retrofitted. As well, the distribution panel for the Kitchen needs to be replaced with new. Some of the shop panels are controlled by contactors as required but some of these panels should also be retrofitted. The mechanical equipment is connected to individual disconnects and starters or contactors. In some cases, these should be replaced and grouped into a motor control centre for maintenance purposes.

Recommended Upgrades and Allowance

We recommend that the older panels be replaced with new panels. Approximately 15 panels need to be replaced.

Allowance to replace electrical panels: $25,000
Wiring for Mechanical System Upgrades

Description

Mechanical systems are recommended to be upgraded and although power is available connection these units will be required

Recommended Upgrades and Allowance

Allowance to provide wiring to new mechanical equipment: $750,000

ELECTRICAL DEVICES AND WIRING

Description

In areas that have been renovated, the electrical devices (switches and receptacles) are acceptable and can remain. In the areas which are original, consideration should be given to replacing the switches and receptacles as they have outlived their useful life. Ground fault receptacles should be replaced with new as the typical life of a ground fault receptacle is in the range of 5 years. The wiring in the ceiling spaces was not reviewed but there is some wiring that is run underfloor and due to the age of the building does not contain a ground wire. This wiring is mostly within the kitchen area, although there are a few panel feeders that are also run underground. We would suggest that these feeders be replaced with a feeder that includes ground wire as the conduit is being used for ground and underground conduits eventually have a poor grounding connection. The electrical devices can probably wait until a renovation is completed and at that time they would be all replaced.
As part of the asbestos removal, all ceiling devices will need to be removed and reinstalled.

ELECTRICAL

Recommended Upgrades and Allowance

Allowance for new underground feeders to kitchen equipment and panelboards:
$35,000
Allowance for removal and reinstallation of ceiling devices for asbestos removal:
$300,000

LIGHTING

Interior Lighting

Description

The interior fluorescent light fixtures have all been retrofitted with T8 lamps. The lighting levels appear to be adequate throughout.

The kitchen light fixtures should be replaced as they are showing signs of rust and the lens type is not cleanable. The kitchen has 1' x 4' surface mounted fluorescent lights. The lighting level in the kitchen, however, is adequate for a food preparation area. Typical lighting in the classrooms is 2' x 4' lay-in fixtures. The lighting fixtures in the corridors are typically 1' x 4' fluorescent recessed light fixtures. The stairwells also have surface mounted light fixtures. The old Gymnasium has four lamp fluorescent fixtures with wire guards. The lighting fixtures in the North Gymnasium are also four lamp fluorescent fixtures with wire guards. There are also incandescent can lights controlled by dimmers in the North Gymnasium. The Weight Room has surface mounted fluorescent lights with a wrap around type lens. There are Computer Rooms on the Third Floor which have 1/2" x 1/2" silver egg crate lenses. These lenses are very inefficient and should be replaced. Cafeteria lights are also showing signs of deterioration. The Chapel has incandescent lamps that should be replaced with dimmable LED A-19 type lamps for energy savings. LED lamps are now available in warm white colour similar to incandescent lamps.

Recommended Upgrades and Allowance

There are a few incandescent light fixtures in storage rooms and rooms adjacent to the kitchen should be replaced with an LED type light fixture. Kitchen light fixtures should be replaced with new fixtures complete with cleanable lens. Computer Room and Cafeteria lights should be replaced. Chapel lamps should be replaced, fixtures to remain.

Allowance to replace light fixtures: $30,000

Outside Lighting

Description

Parking Lots are lit with LED pole lights. The poles appear to be in good condition. Each exit / entrance has high pressure sodium of metal halide lights controlled by photocells. There is a limited amount of outside lighting around the portables at the rear. Lighting levels appear to be adequate with the exception of the area around the portables. The area around outside behind the auto shop overhead doors could use additional outside lighting.

Recommended Upgrades and Allowance

Add flood light by portable and at auto shop doors: $3,000

EXIT AND EMERGENCY LIGHTING

Description

The exit lighting throughout the facility is LED type. The emergency lighting is battery packs with remote 9 watt Tungsten lamps. The stairwell behind the Chapel is missing an emergency light and the far North stairwell has a broken double remote head.

Recommended Upgrades and Allowance

The emergency lighting should be checked for operation and any units not working properly should be replaced. The broken unit should be replaced and an emergency remote head should be added in the stair behind the Chapel.

Allowance to replace units indicated above: $1,000

FIRE ALARM

Description

The existing fire alarm system is an Edwards 6500 Series which was manufactured in the 1980's and discontinued around 1990. It is very difficult to obtain parts for the headend equipment for the system. The existing bells are series wired type and cannot be properly monitored. As well, the FIRE ALARM – continued

wiring is not compatible with new horn / strobes or bells. The existing initiating devices (detectors and pull stations) are hard wire type without the ability to see status of individual devices. The main fire alarm panel is located just outside of the main Electrical Room. The battery cabinet for the fire alarm panel is located inside the Electrical Room. There are not any strobes throughout the facility which is a current requirement of the Ontario Building Code. There are no smoke detectors in any of the corridors or stairwells. The building has adequate coverage provided by heat detectors except for a few storage rooms and janitors rooms. There are approximately 20 zones and 14 supervisory zones for the standpipe system. There is a LED type annunciator at the main entrance of the school. A new system would have smoke detectors in the corridors and stairwells, utilize horn / strobes for signal devices and be fully addressable. Wiring would also be provided for elevator recall so that it is ready for a future elevator upgrade. The proposed new fire alarm panel can be located in the same location as the existing.

ELECTRICAL

Recommended Upgrades and Allowance

We recommend that a new fire alarm system be provided complete with new horn / strobes and addressable initiating devices throughout. Horn/ strobes would be located throughout all corridors and stairwells as well as in the Data Room. 24 hour rated batteries would be provided and the fire alarm would be monitored by a remote off-site ULC approved monitoring site.

Allowance for new fire alarm system: $450,000

CLOSED CIRCUIT TV (CCTV)

Description

A new CCTV system was installed in 2007 and provides full coverage across the facility. The existing system is an analog system with a digital video recorder and multiple camera display for live unit playback while recording. The system appears to provide adequate coverage. The system should be reviewed with the Owner and assess any areas that may not have adequate coverage.

Recommended Upgrades and Allowance

No upgrades are anticipated.

ACCESS CONTROL

Description

There is an existing DSC security system within the facility. The system consists of door contacts on the perimeter and motion sensors throughout the facility. The access control system appears to provide adequate coverage across the facility.

Recommended Upgrades and Allowance

No upgrades are recommended at this time.

CABLE TV (CATV)

Description

There is a large satellite dish outside the facility but does not appear to be in use. There is also a small satellite dish that is wired but it did not appear that the small satellite dish provides distribution throughout the facility.

Recommended Upgrades and Allowance

No upgrades are recommended at this time.

VOICE / DATA SYSTEM

Description

There is a data room in the central wing which serves as the central distribution point for the CAT 5e data cabling. There are numerous computer classrooms in the centre wing on the upper floors which are wired with CAT 5e cabling. The main incoming cabling to the facility is fibre optic cables from the London District Catholic School Board head office located on the same property. We were unable to gain access to the main data room so have not reviewed the equipment or equipment status.

Recommended Upgrades and Allowance

No upgrades appear to be required at this time except as required to suit any proposed renovations.

CLOCK SYSTEM

Description

The clocks throughout the facility are all battery powered with 120 volt.

Recommended Upgrades and Allowance

No upgrades are recommended at this time.

PA / INTERCOM SYSTEM

Description

There is a Telecor PA/Intercom system which provides paging and intercom throughout the facility. This system was installed in the last couple of years and appears to provide adequate coverage.

Recommended Upgrades and Allowance

No upgrades are recommended at this time.

GYMNASIUM / THEATRE / CHAPEL SOUND AND LIGHTING SYSTEMS

Description

The original Gymnasium has a stage lighting system which consists of approximately 15 spotlights in front of the Stage and approximately 20 spotlights and floodlights over the Stage. The light fixtures are a combination of incandescent and LED type light fixtures. There is a small sound system on Stage with a 6 channel mixer, VCR and amplifiers. There is also a lighting control board and a sound control board in the Control Room at the back of the Gymnasium. The lighting control board is an Elation Scene Setting 48 channel controller and the sound control board is a Yamaha MG 32.

The new Gymnasium at the North end of the school has a Control Room adjacent to the upper floor Library with three 12 channel dimming units. The lighting is installed when required with temporary cables. The lighting control board is a Colortran Innovator 24/48 which has a maximum capacity of 48 lighting control channels.

The Theatre Room has both a small lighting control system and an audio system. There is a small booth adjacent to the Theatre Room with a lighting control board and a sound control mixer.

The Chapel has a GE low voltage relay lighting control system and a public address system. The public address system is a 6 channel Bogen complete with equalizer.

Recommended Upgrades and Allowance

We have not interviewed staff with respect to the capabilities or deficiencies of these systems, therefore, at this time there are no upgrades considered.

LIGHTNING PROTECTION

Description

The original building centre section has adequate lightning protection on all roof sections. The South Addition and the North Gymnasium Addition do not have lightning protection.

Recommended Upgrades and Allowance

Lightning protection should be added to the North and South Additions.

Allowance to add lightning protection to the North and South Additions	:	$15,000

SUMMARY OF PROPOSED COSTS

Building Code Upgrades (including fire separation upgrades)	$ 300,000
Removal of Designated Substances	$ 400,000
Barrier Free Accessibility Improvements	$ 250,000
Gymnasium Floor Replacement (1988 Addition)	$ 150,000
Building Envelope Improvements	
• Replacement of Exterior Caulking	$ 100,000
• Restoration of Exterior Stone	$ 1,700,000
• Replacement of Roof V (at Chapel)	$ 3,000
• Replace Library Skylight Glazing	$ 20,000
• Replace Acrylic Dome Skylight on Roof U	$ 3,000
• Remove existing Greenhouse from Gym roof and conversion to storage room	$ 25,000
• Window & Door Replacement	$ 500,000
Separate Greenhouse Structure	$ 50,000
Technology Wing Improvements – demolish existing, design and build new facilities	$ 2,800,000
Drama Classroom Addition & Improvements	$ 400,000
Family Studies / Nutrition Classroom Renovations	$ 150,000
Elevator Refurbishment	$ 130,000
Demolition and Removal of Existing Portables	$ 120,000
Fire Sprinkler System Installation	$ 450,000
Mechanical Ugrades	$ 4,500,000
Electrical Upgrades	$ 1,770,000
Updated Asbestos Product Survey	$ 4,500
Professional Consulting Fees for Renewal Project (6.1%)	$ 850,000
Fees & Permits (1%)	$ 140,000
Furniture & Equipment	$ 250,000
Contingency	$ 750,000
Total	**$ 15,915,500**

APPENDIX A
EXISTING FLOOR PLANS

APPENDIX B

ASBESTOS PRODUCT SURVEY BY EXP SERVICES INC.

Appendix II: Review of Exterior Masonry Cladding by Hastings & Aziz Ltd. Consulting Structural Engineers, dated December 9, 2014

HASTINGS & AZIZ LTD
Consulting Structural
Engineers
303 Richmond Street, Suite 202
London, ON N6B 2H8

December 9, 2014

Mr. John Kononiuk
Manager of Capital Projects & Maintenance
London District Catholic School Board
5200 Wellington Road South,
London, ON N6E 3X8

Re: **Review of Exterior Masonry Cladding**
Regina Mundi Catholic College, London
Our File #9007

Dear Mr. Kononiuk,

As requested, attached is our report on the review of the exterior masonry cladding at Regina Mundi Catholic College in London. This report states our findings from our investigation that commenced in the summer of 2014. The end of the report states our recommendations for corrective measures that are required immediately.

If you have any questions or require any additional information, please do not hesitate to call.

Yours truly,
Hastings and Aziz Limited

Paul Shapton

Paul Shapton, P. Eng.

Encl. - Report on 'Review of Exterior Stone Veneer'
- Pictures 1 to 11
- Sketches SK1 & SK2
- Drawings S1 & S2
- Abbott Budget Quotation for Grillage Work
- Abbott Invoice for Fencing

HASTINGS & AZIZ LTD
Consulting Structural
Engineers
303 Richmond Street, Suite 202
London, ON N6B 2H8

December 9, 2014

Review of Exterior Stone Veneer
Regina Mundi Catholic School, London

Investigation

As requested, we have reviewed the condition of the exterior masonry cladding at the above school. The request is a result of a 'Renewal Study' report prepared by Nicholson Sheffield Architects Inc. in September, 2013. The report stated due to the deterioration of the mortar joints allowing water to penetrate, a further investigation is recommended to determine the condition of the anchorage devices for the exterior stone cladding.

From our walk-around visual inspection performed on July 25, 2014, the most severe deterioration was noticed around the chapel area of the original 1962 building. See the attached site plan for location. We noticed movement in the lower limestone panels at the corners of the original building on the east side, as shown on attached pictures 1 and 2. In addition, we saw severe deterioration of the mortar joints of the rough stone veneer of the same original building, as shown in attached pictures 3 & 4.

With the aid of Abbott Construction, the limestone panels were removed on the east side. See site plan for locations. Several of the Z-ties holding the panels in place were found to be either broken or missing, as shown in pictures 5 & 6. For this reason, the limestone panels with the similar detail on the west elevation were removed as well. A metal flashing will be installed to protect the building from the elements.

Inspection holes were made on the south side of the chapel. The stone cladding was tied to the backup with thin gauge residential brick ties as shown in picture 7. These were corroded and only penetrated into the stone by an inch. The Ontario Building Code stipulates they should be embedded into the stone veneer at least two inches. In addition, the spacing of the anchors we found were at a greater spacing than allowed by the code.

A similar tie on the east wall was visible where the smooth limestone was removed. See picture 8. The tie was not corroded, however, it was bent in a loop, which provides no structural capacity in tension or compression.

With our closer inspection with a manlift, we found one section of stone cladding that we were able to move laterally with our hand. This indicates the ties supporting the stone cladding are either completely corroded or inadequate to provide any lateral resistance. Without the required ties, **the stone is in danger of falling to the ground**, endangering the safety of the public below. Due to the nearness of school starting, it was decided to install a fence around the areas of primary concern. See attached pictures 9, 10, and sketch SK1 showing the extent of the fencing and scaffolding installed.

Inspection holes were made in the south wall of the original gymtorium. Only one brick tie was found in an area of 3' x 4', which exceeds the maximum 16" x 24" spacing specified in the building code. Corrosion had commenced on the tie, but was not as severe as found in the other areas of the building. There are no signs of deterioration in the mortar joints of the stone veneer. At this time, it was decided not to install a fence around the north and south ends of the 1962 addition, nor the north addition.

Findings

The ties connecting the stone veneer are of a **thin gauge**, **corroded**, had **insufficient embedment** into the stone veneer, and were **spaced greater than the code allows**. Traditionally, to repair this, stainless steel helical ties are installed into the structural back-up to provide proper anchorage to the stone veneer. Unfortunately, the structural back-up at this school was found to be 2 rows of concrete brick laid on its edge along with 4" clay tile. See picture 11. The attached sketch SK2 was copied from the original drawings. It indicates the stone veneer with 4" brick and 4" tile. However, as mentioned above, 2 rows of concrete brick were laid on its edge in lieu of the 4" brick. There is an air space between the concrete brick and stone. This is not acceptable as a structural backup, and for this reason we are unable to provide proper anchorage for the stone veneer.

One repair option is to construct a steel grillage on the outside of the stone veneer to provide adequate support to the stone veneer. See drawings S1 & S2 for preliminary details. It should be noted this option is only a temporary solution designed to last 3 to 5 years. Abbott Construction prepared a budget of $2,685,000.00, to perform the work shown on these drawings. In addition to the construction costs, we estimate the consultant fees to be approximately $185,000.00, for a total cost of **$2,870,000.00**. HST is not included in these budget prices.

A second option would be to remove the concrete brick and clay tile and lay a proper concrete block wall to provide the adequate structural backup for the stone veneer. The stainless steel helical ties can be inserted between this new concrete block and the stone veneer to provide the required support. Before the original concrete brick and speed tile can be removed, the stone veneer will have to be temporarily supported in a similar fashion to the steel grillage shown in the first option. In addition, all of the windows, mechanical and electrical services buried in the wall will have to be removed and re-instated after the new block is placed. It is difficult to access the cost for this work due to the unknown mechanical and electrical systems in the wall, however, we estimate it will be in the **7 to 10 million dollar range**. We estimate a construction time of 20 months to complete this work. It would require the students vacating the construction area and most likely relocating to another school while the construction work is completed. It is our opinion the cost of this option is not feasible considering the age of the school.

Recommendations

As previously stated, we have not installed a fence around all of the school. At this time, for the areas at the north and south ends of the school, it is our opinion with no deterioration noticed on the stone veneer, the stone veneer remains in a safe condition. However, a program is to be set up to monitor its condition on a regular basis, starting with every 6 months in the spring and fall of 2015.

The two options previously stated above range between **7 to 10 million dollars for permanent repair of replacing the masonry exterior walls** or **2.87 million dollars for the 3-5 year temporary fix**. Both of these options are expensive, especially when considered with the other items listed in the original Nicholson Sheffield report and the possible short life span of the school.

A third option is to leave the fence in place and to perform semi-annual inspections to regularly monitor the condition of the stone veneer. However, as previously stated, we found one section of **stone veneer we were able to move with our hands**. In addition, there are areas where the mortar has fully disintegrated, leaving loose stones **in danger of falling** and easy intrusion of water, which will **accelerate and expand the area of deterioration**. These areas will require immediate attention.

The section of stone veneer we were able to move by hand is located at the south end of the south-east elevation over the entrance to the mechanical room. See elevation 3 on the attached drawing S1. It is an area of approximately 11' wide by 13' high. We recommend installing the

two vertical steel members on the exterior as shown on the drawing.

There is an area approximately 6' high by 50' long on the south side of the chapel under the windows where the mortar joints have deteriorated. See attached elevation 2 on drawing S1 for location. The mortar joints, including the sealant used in a past repair, are to be removed and pointed with new mortar.

The costs to complete the above work is estimated to be **$56,000.00**, plus HST. This will include the engineering to provide design, drawings and field review to complete this work. As previously stated, **this work is to be completed in the near future.**

The rental charges for the fencing and scaffolding is $8,100.00 per 4 week period. These charges are based on a one year term. See attached invoice from Abbott Construction. An allowance of $500.00 should be provided to have the contractor monitor the fencing and scaffolding every three months to ensure it remains in satisfactory condition. The cost of the fence and its maintenance along with the semi-annual monitoring will be approximately **$119,000.00 per year**, plus HST.

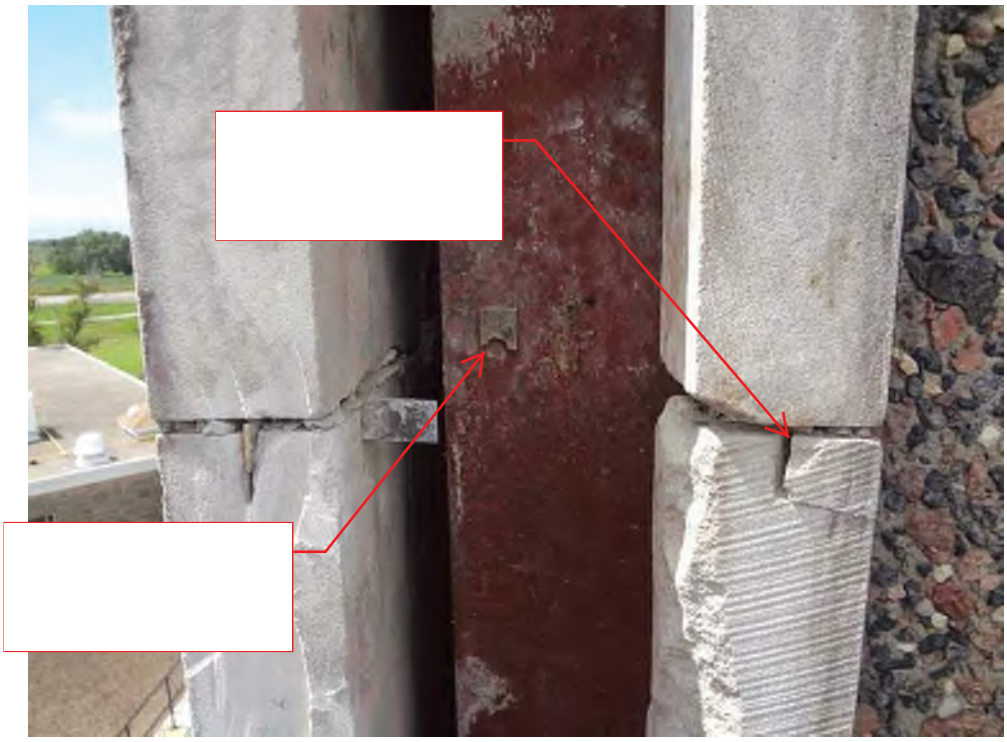
With this option, it should be noted additional repairs and costs may arise from the semi-annual inspections. It may be deemed necessary to install more fencing or perform additional repairs.

Picture 1

Picture 2

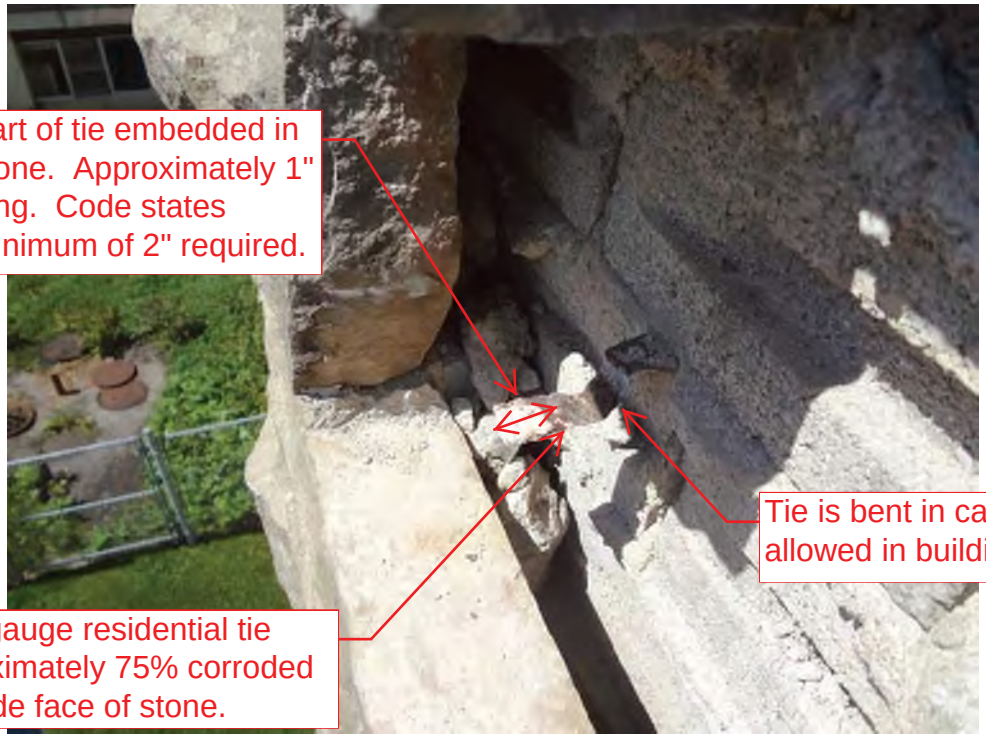
Picture 3

Picture 4

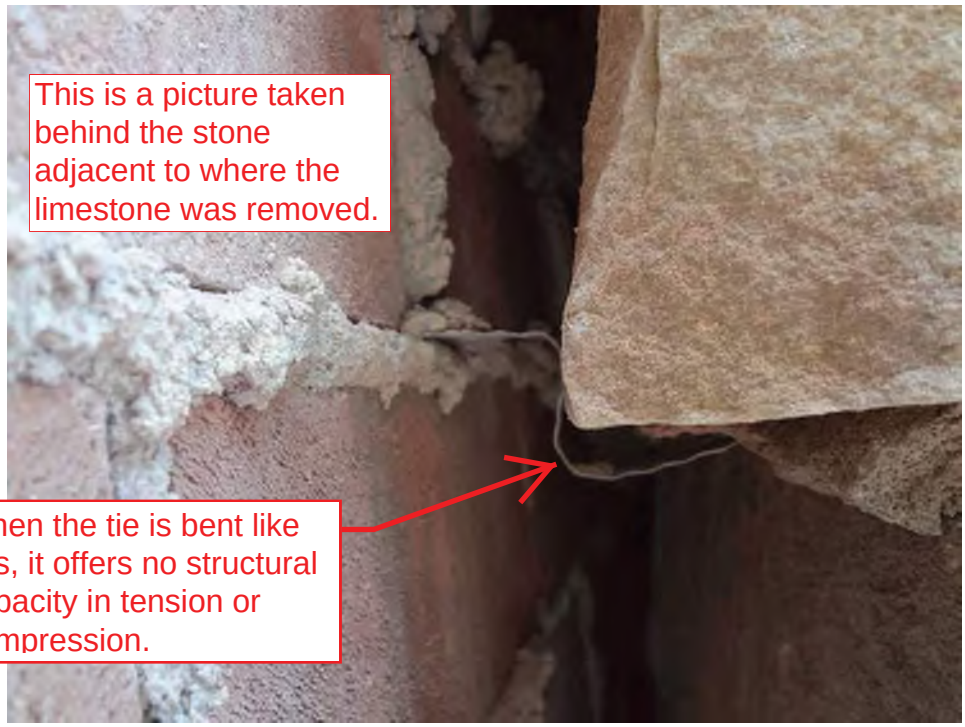


Picture 5

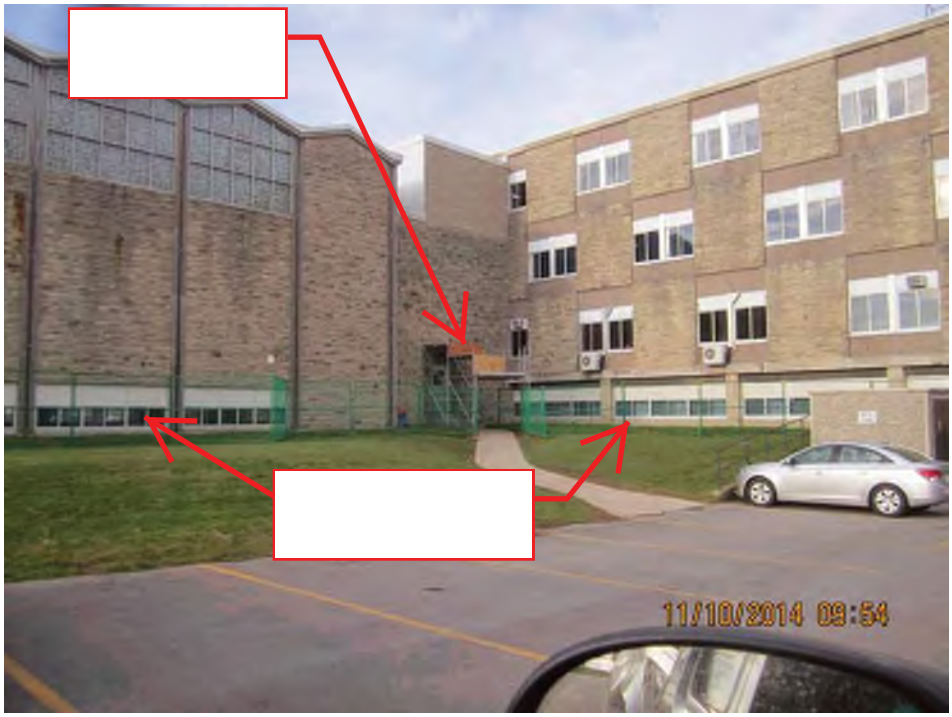
Picture 6



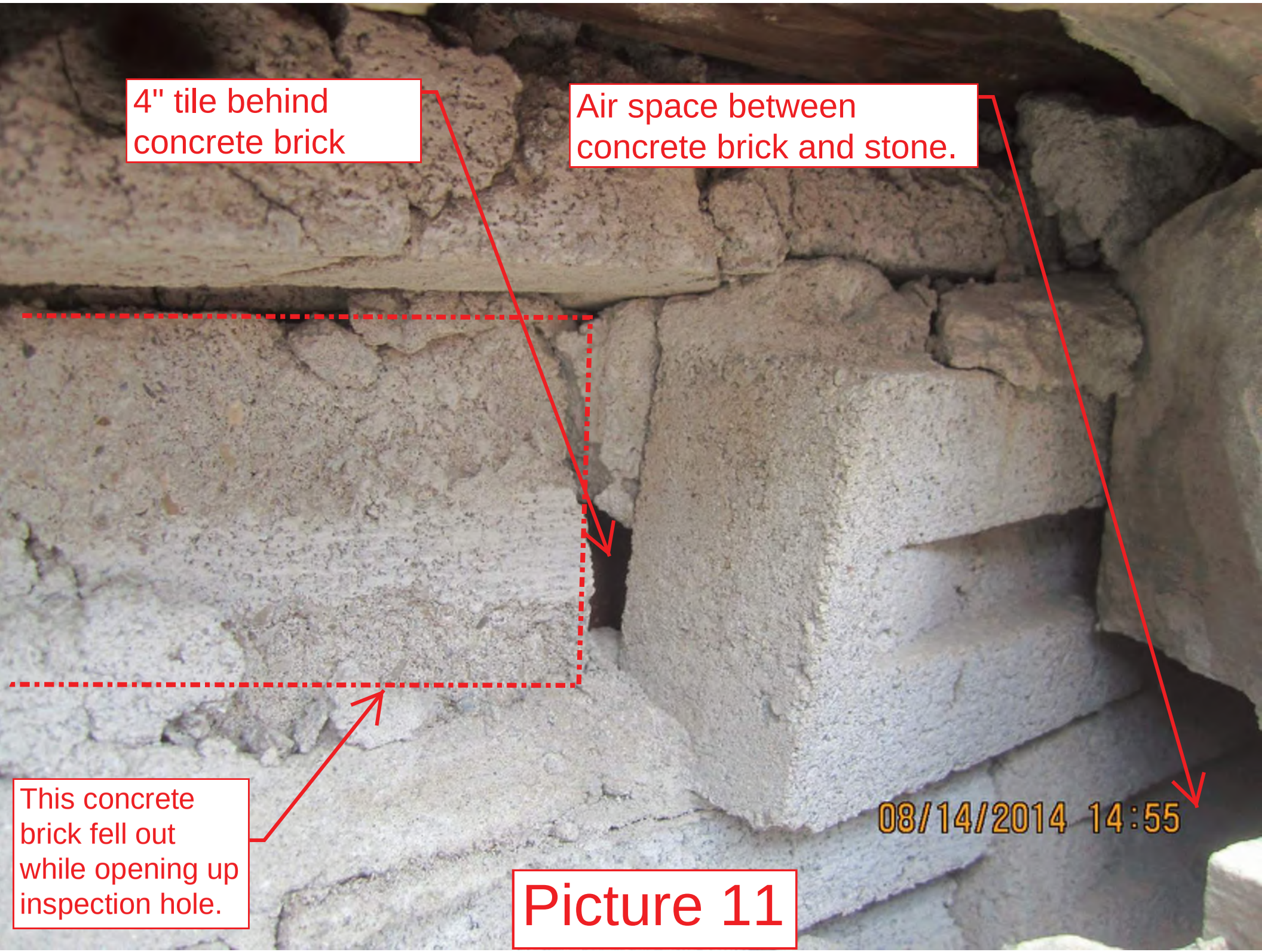
Picture 7



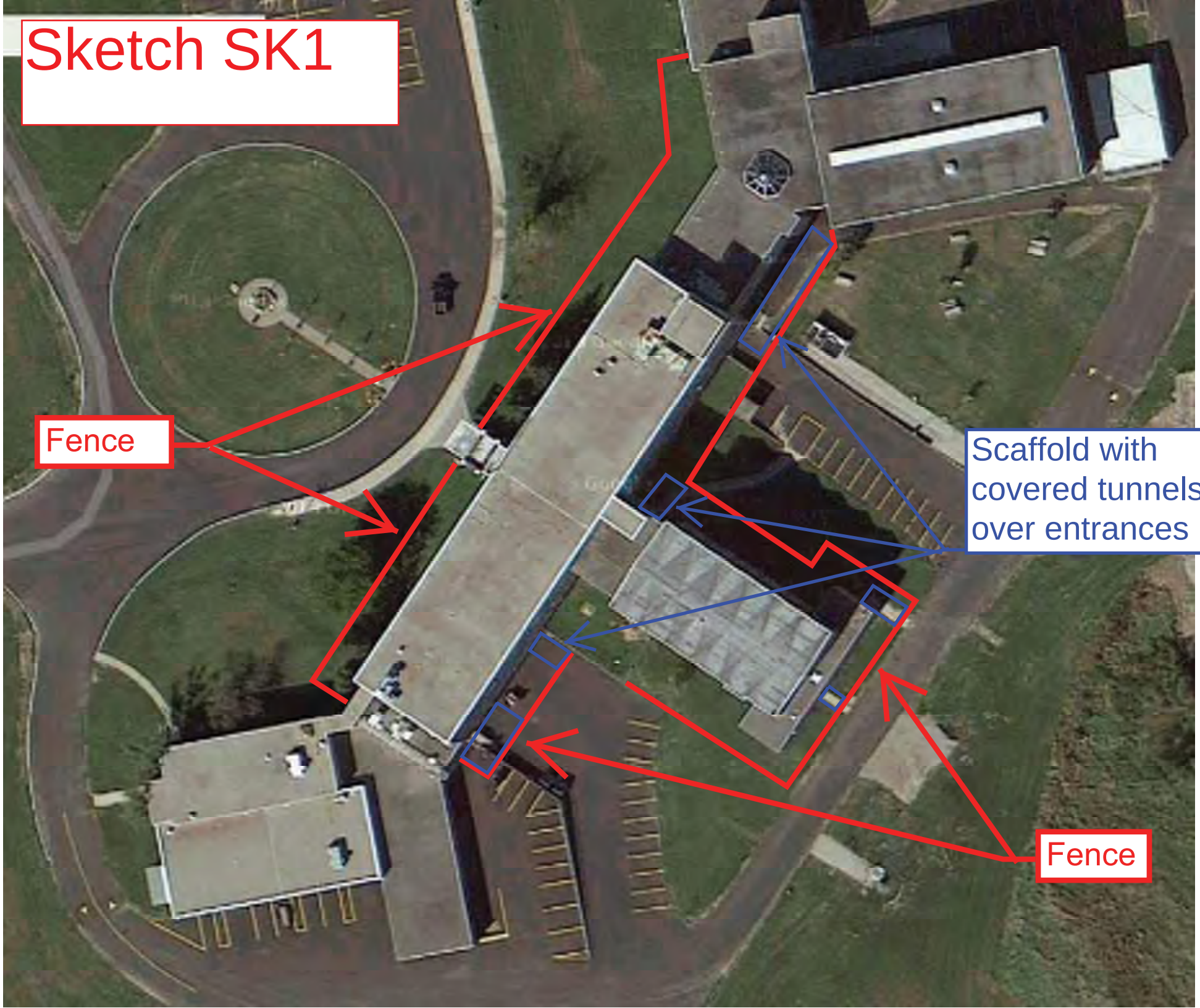
Picture 8



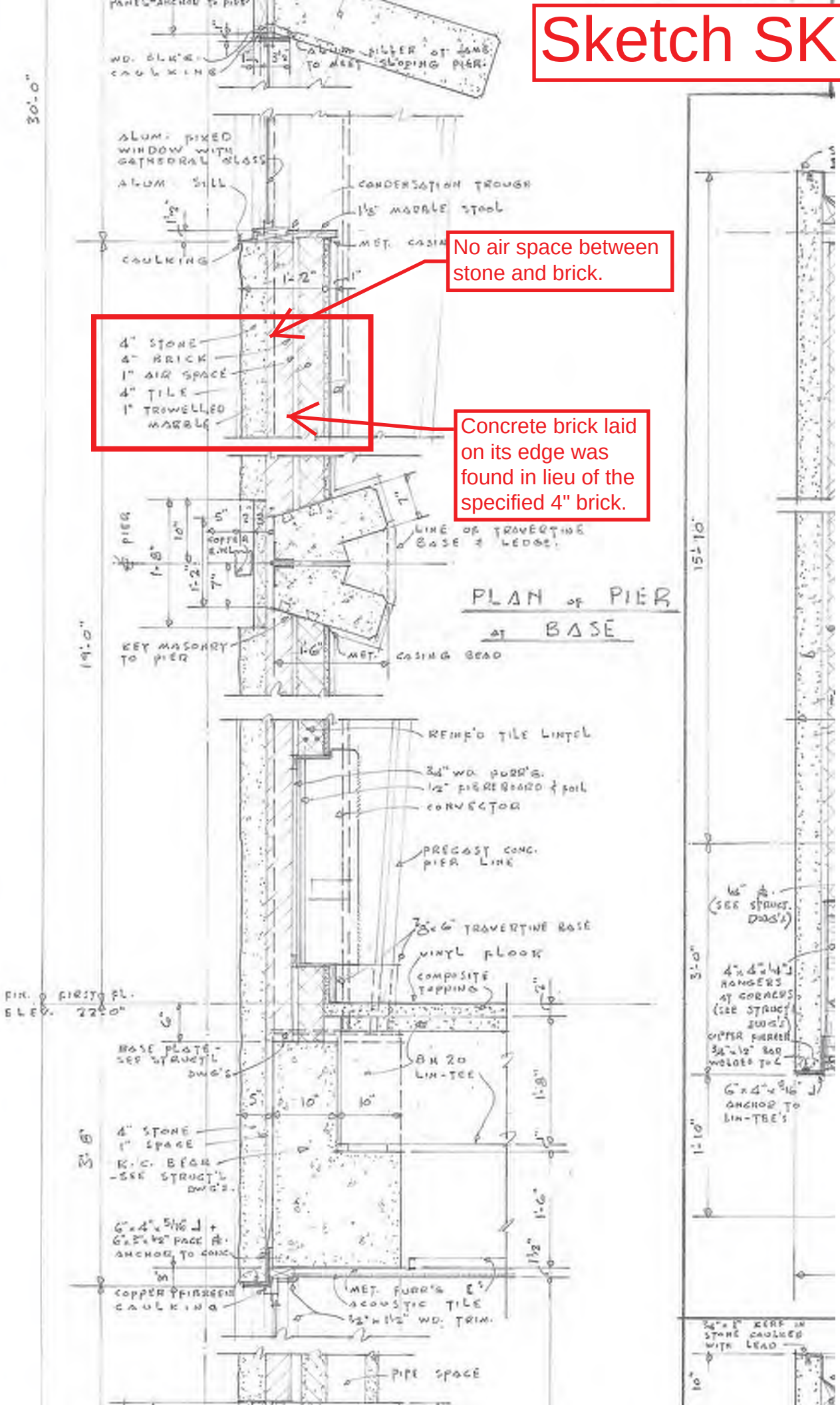
Picture 9

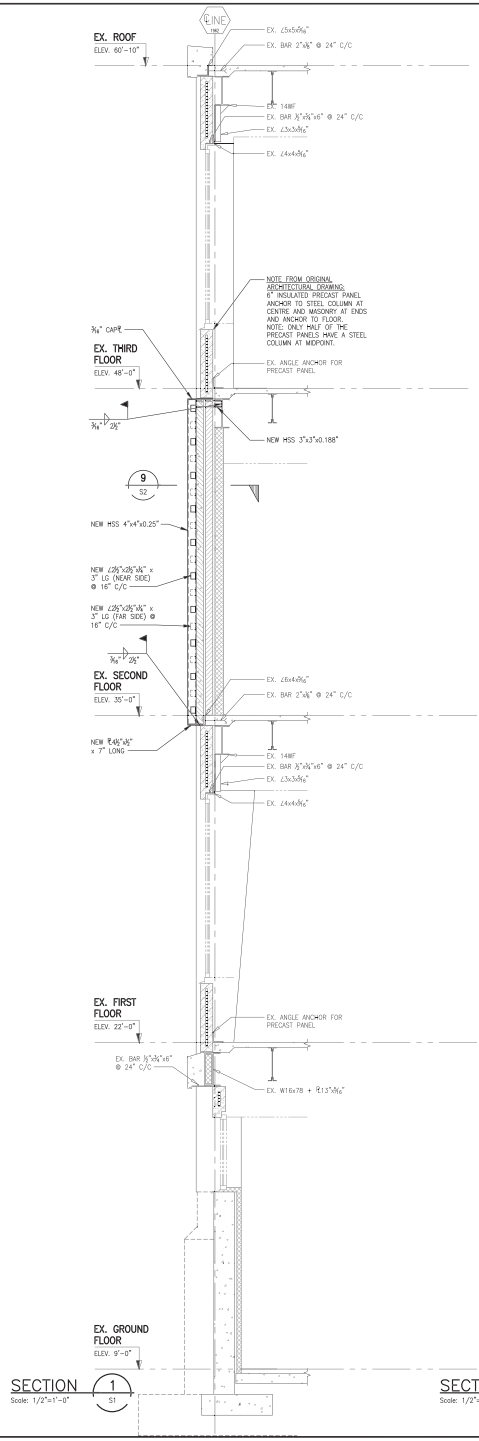

4" tile behind concrete brick
Air space between concrete brick and stone.
This concrete brick fell out while opening up inspection hole.
08/14/2014 14:55

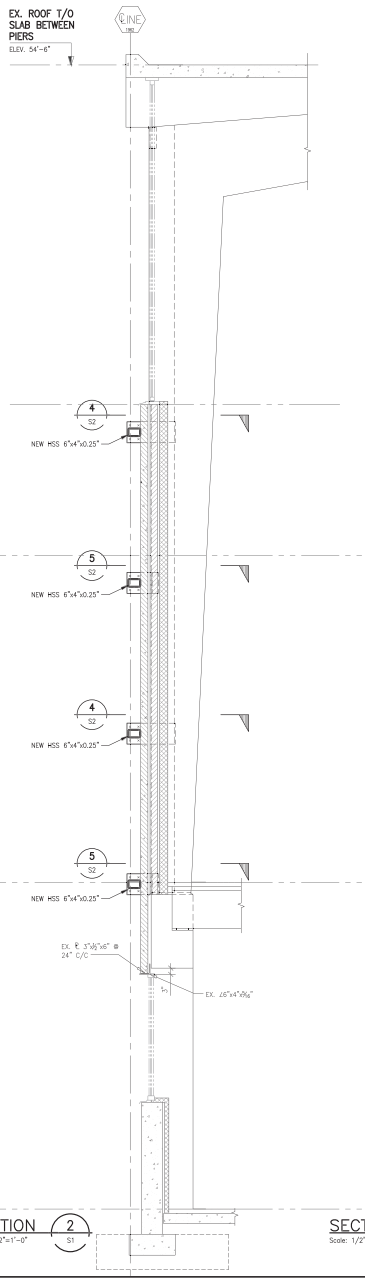
Picture 11

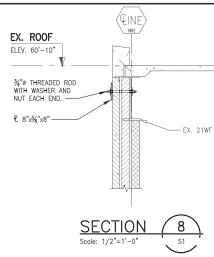

Sketch SK1
Fence
Scaffold with covered tunnels over entrances
Fence

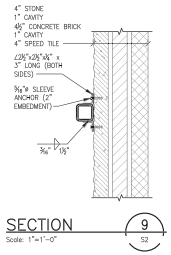
Sketch SK2

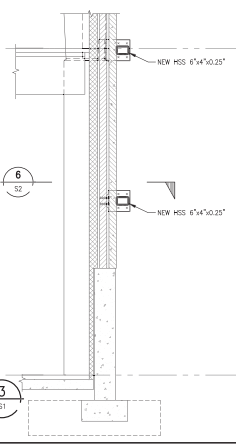

No air space between stone and brick.
Concrete brick laid on its edge was found in lieu of the specified 4" brick.
4" STONE
4" BRICK
1" AIR SPACE
4" TILE
1" TROWELLED MARBLE
PLAN of PIER at BASE
ALUM. FIXED WINDOW WITH CATHEDRAL GLASS
ALUM. SILL
CONDENSATION TROUGH
1½" MARBLE STOOL
CAULKING
KEY MASONRY TO PIER
LINE OF TRAVERTINE BASE & LEDGE
REINF'D TILE LINTEL
¾" WD. FURR'G.
½" FIBREBOARD & FOIL
CONVECTOR
PRECAST CONC. PIER LINE
3'-6" x 6" TRAVERTINE BASE
VINYL FLOOR
COMPOSITE TOPPING
FIN. FIRST FL. ELEV. 22'-0"
BASE PLATE - SEE STRUCT'L DWG'S
BR 20 LIN-TEE
4" STONE
1" SPACE
R.C. BEAM - SEE STRUCT'L DWG'S.
COPPER FIBREGLASS CAULKING
¾" FURR'G & ACOUSTIC TILE
½" x 1½" WD. TRIM
PIPE SPACE
WD. BLOCK CAULKING
ALUM. FILLER OF SAME SLOPING TO MEET SLOPING PIER
PIER
SOFFIT B.W.L.
MET. CASING BEAD
4"x4"x¼" ANGLES AT CORNERS (SEE STRUCT. DWG'S)
6"x4"x5/16" ANCHOR TO LIN-TEE'S
6"x4"x5/16" ANGLE + 6"x3½"x½" PLATE ANCHOR TO CONC.
¾"x1" KERF IN STONE CAULKED WITH LEAD
30'-0"
19'-0"
15'-10"
3'-0"
1'-10"

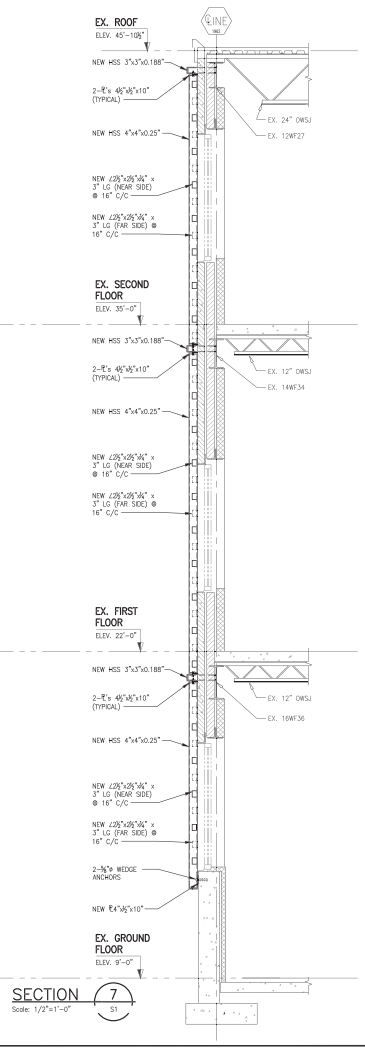


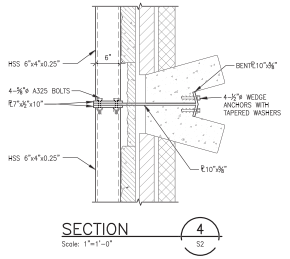


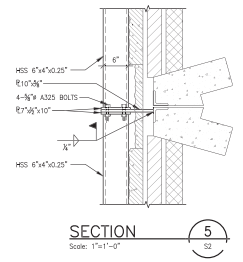


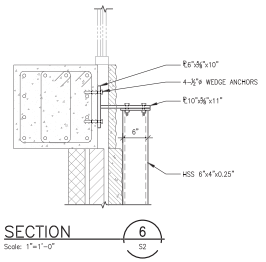












No.	Revisions	Date
1	ISSUED FOR PRICING	OCT 21, 2014

HASTINGS&AZIZ LTD.
Consulting Structural Engineers
303 Richmond St. Suite 202
London, Ontario

PRICING ONLY
NOT FOR CONSTRUCTION

Project
REGINA MUNDI
HIGH SCHOOL
VENEER STUDY

Drawing
SECTIONS
AND DETAILS

Project No.	9007
Scale	AS NOTED
Drawn By	KBW
Checked By	PWS
Date	DEC 9/2014

Dwg. No.
S2

AbbottConstruction
611 Industrial Road • London, ON • N5V 1V2
T: 519.453.0290 • F: 519.453.8111

Budget Quotation 14-1412

November 5, 2014

Paul Shapton, P.Eng
Hastings & Aziz Ltd
202-303 Richmond St.,
London, ON N6B 2H8

Re: LDCSB - Regina Mundi College

We are pleased to provide a budget quotation for temporary support of the exterior structural walls of various areas of Regina Mundi College as outlined in drawings S1 and S2, dated October 2, 2014 as provided by your office.

The scope of work included in this budget includes:

Initial and ongoing investigations are being performed under your direction to determine a more accurate assessment of the ability to effectively complete the outlined repairs.

- Supply preprimed steel grillage including all support brackets, anchors and bolts as outlined.
- Access areas of exterior work using man lifts as necessary.
- Temporarily remove existing limestone and stucco façade materials to access internal steel structural members.
- Field weld steel grillage supports to existing structural steel and touch up paint areas as required.
- Reinstall and restore limestone and stucco façade at openings for installation of grillage as required.
- Install steel grillage to prepositioned supports and anchor grillage brackets to limestone as required.
- Install anchors for precast limestone panels.
- Provide general field welding as required.
- Install non-shrink grout packing and/ or steel shims between grillage members and existing limestone façade.
- Restore interior ceiling tiles and localized drywall patches at various ceiling locations including spot painting of repaired areas as required.
- Provision has been included for minor areas of Type 1 only asbestos investigation or abatement if required.
- Make interior repairs to concrete columns within the chapel only.
- Reset limestone, tuck-point masonry joints and install building sealant at random locations within the areas of the building as outlined in drawings and as may be required to stabilize the exterior masonry façade of the building.
- Provide general site remediation including installation of topsoil, minor regarding and hydro-spray seeding of the immediate areas of work.
- Liaise with Hastings & Aziz Ltd for ongoing investigations, and control of temporary protection currently in use on the site.

OUR BUDGET ESTIMATE **$2,685,000.00 + HST**

AbbottConstruction
611 Industrial Road • London, ON • N5V 1V2
T: 519.453.0290 • F: 519.453.8111

Budget Quotation 14-1412

Terms

- **NOTE: This is strictly a BUDGET ONLY quotation and exact pricing must be determined after investigations, engineering, drawings and specifications have been completed.**
- **NOTE: Due to the extent of deterioration of the building façade in specific areas of the building, urgent repairs may require immediate remediation at the direction of Hastings & Aziz Ltd.**
- Steel grillage work and anchoring may be completed during winter months.
- All masonry work is subject to weather conditions.
- Various entrances to building will require temporary closure during repair procedures.
- Noisy work can be completed before and/or after school hours.
- HST is extra.
- Payment terms will be negotiated prior to signing an official contract for work.

We look forward to working with you on this project.

Kind regards,

John W. Thomas

Invoice

Date	Invoice #
10/29/2014	10101

Invoice To:

Hastings & Aziz
Consulting Structural Engineers
303 Richmond Street Suite 202
London, Ontario N6B 2H8
Canada

GST/HST No.	P.O. No.	TERMS	PROJECT NAME
102751328		upon receipt	Regina Mundi -

JOB DESCRIPTION	TOTALS
RE: LDCSB - REGINA MUNDI SECONDARY SCHOOL EMERGENCY ENCLOSURE AND OVERHEAD PROTECTION MONTHLY BILLING - AUG 27- SEPT 25	
Monthly rental charge for 6' barrier fencing to surround sections of school as per recommendation from Engineer Monthly rental charges for scaffolding for overhead protection a various exit doors as per recommendations from Engineer MONTHLY RENTAL - for 28 day period.	8,096.95
NOTE: - Based on 28 day rental agreement - Rental is set up on a 1 year rental term, any change to this term will result in additional rental charges. - Additional charges for dismantle and cartage will apply when project is demobilized	

Subtotal	CAD 8,096.95
GST/HST	CAD 1,052.60
Total	CAD 9,149.55

A DIVISION OF JWT HOLDINGS INC.
611 Industrial Road, London, Ontario N5V 1V2 (519) 453-0290 FAX: (519) 453-8111
email: accounts@abbottconstruction.ca