



## HAMILTON – WENTWORTH DISTRICT SCHOOL BOARD CONCEPT DESIGN AND FEASIBILITY STUDY

*March 30, 2016*

*Rev-01*

## SIR ALLAN MACNAB SECONDARY SCHOOL

145 MAGNOLIA DRIVE, HAMILTON



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**SECTION ONE – EXECUTIVE SUMMARY**

**1.1 Purpose**

The purpose of this study is to provide Hamilton Wentworth District school board (HWDSB) with the necessary information and a recommendation needed to proceed to the subsequent phases of design and construction. The HWDSB intends to revitalize and modernize the majority of it secondary schools and this new strategy approach will vary for each school. In this regard the following program areas have been examined for consideration of the new renovations and upgrades strategy.

This Study has examined the following areas at Sir Allan MacNab Secondary School:

**Instructional Spaces**

- Science Lab and Prep Room
- Family Studies [food]
- Library
- Cafeteria
- Change Rooms Area

**Operational Spaces**

- Kitchen/Servery
- Washrooms

**1.2 Methodology**

The design team included an experienced team of architects and engineers lead by Grguric Architects Incorporated and exp. both of whom have completed several similar studies in the past. The study provides a thorough review of the schools current enrollment, projected enrollment, educational suitability and adequacy of the current spaces. Our Team reviewed the current ability of the facility to provide a progressive and modern learning experience for its students along with a safe and comfortable learning environment.

Predesign meetings were conducted with the Principal to review the existing spaces to both determine the accuracy of floor plans with regards to room names and activities within these spaces. A review of each space was conducted referencing the HWDSB Tier 3 Programs & Specialty High Skills Major Programs (dated August 12, 2015).

In summary, the approach to the study we have conducted the following tasks:

- detailed review of key program spaces and identification of areas requiring upgrades and improvements
- review and implementation of the Tier 3 programs and specialized high skills programs as identified for the school.

- Interview with the principal and input feedback from the school staff.
- Review of the HWDSB vision for its secondary program strategy [June 2013] refer to Appendix D.

The following sections will review our methodology and approach, the Tier 3 programs in more detail and offer observations and recommendations for the proposed renovation. Based on these recommendations, our concept design studies will examine these renovation strategies.

The Facility Conditions Assessment report dated June 26, 2015 prepared by Grguric Architects Incorporated, is provided as a separate report (Appendix C) and is to be referenced in conjunction with this design study analysis.

**TIER 3 PROGRAM**

The new Tier 3 program and specialized intervention/support are intended for a few students at limited school sites. Programs and interventions/support within Tier 3 are those that require specialized facility, equipment or funding enhancements. These programs would be located in a few schools located strategically across the HWDSB. These programs lead to a specialized high skills major [SHSM] designation for students who are heading for either an apprenticeship, training, college, university or workplace. These programs allow grade 11 or 12 students to focus on a career path that motivate their skills of interest while meeting the requirements of the Ontario secondary school diploma [OSSD].

The following are the Tier 3 Programs identified in the Secondary Program Strategy for Sir Allan MacNab Secondary School.

**Tier 3 Programs**

- Artsmart

**Tier 3 Specialized High Skills Major Programs**

- Arts and Culture: arts
- Health and Wellness
- Hospitality and Tourism [food services]

**Tier 3 Intervention and Support Programs**

- Extended support program

**TIER 3 PROGRAMS**

**Artsmart**

Artsmart is a program delivered in partnership with Theater Ancaster. It is a one semester co-op program offered to senior students across the system.

**TIER 3 SPECIALTY HIGH SKILLS MAJOR PROGRAMS**

**Arts and Culture**

This program allows students to develop their artistic skills within a range of talents including visual arts for musical theater and explore their interest through connections with community, industry and institutions.

**Health and Wellness**

This program will prepare students for careers in healthcare, fitness as well as childcare and family services.

**Hospitality and Tourism [food services]**

Students learn about food preparation, hospitality services and tourism. Through experiential learning students will connect with hospitality employers and explore careers in the industry.

**TIER 3 INTERVENTION AND SUPPORT PROGRAMS**

**Extensive support program**

This program offers intensive continuous and individualized support for the students. The program includes collaboration with parents and community partners in order to provide appropriate programming and transition to community support.

**1.3 OVERVIEW**

Located on the West Mountain at 145 Magnolia Drive, Sir Allan MacNab Secondary School was originally built in 1967. This two-story school currently serves approximately 1,050 OTG students and has a capacity for up to 1,300 students.

We have made several assumptions in the program analysis and estimated costing during the development of this study. Our analysis is based on varied costs for demolition and construction dependent on the complexities of the spaces and the final intent of this space. For example, a cost per square foot analysis is significantly higher for a high tech or complex space such as Transportation verses a standard classroom space. It should be noted that both the program needs and the cost estimates will need to be refined during the schematic design phases as the project advances through design development.

**1.4 PROPOSED CONCEPT DESIGN**

The proposed facility renovations will provide the school with modernized and updated spaces for its Tier 3 programming needs. These renovations will also address the facility needs outlined in the Board’s Secondary Program Strategy Report. It should be noted that some spaces have already been renovated to address the current programming needs.

Some additional spaces have been identified during the interactive design sessions to require attention in order to meet the current Ministry of Education Standards with regards to program requirements.

Proposed existing/new program spaces are to be renovated:

- Art and Culture
- Health and Wellness
- Hospitality and Tourism
- Extended Support Program

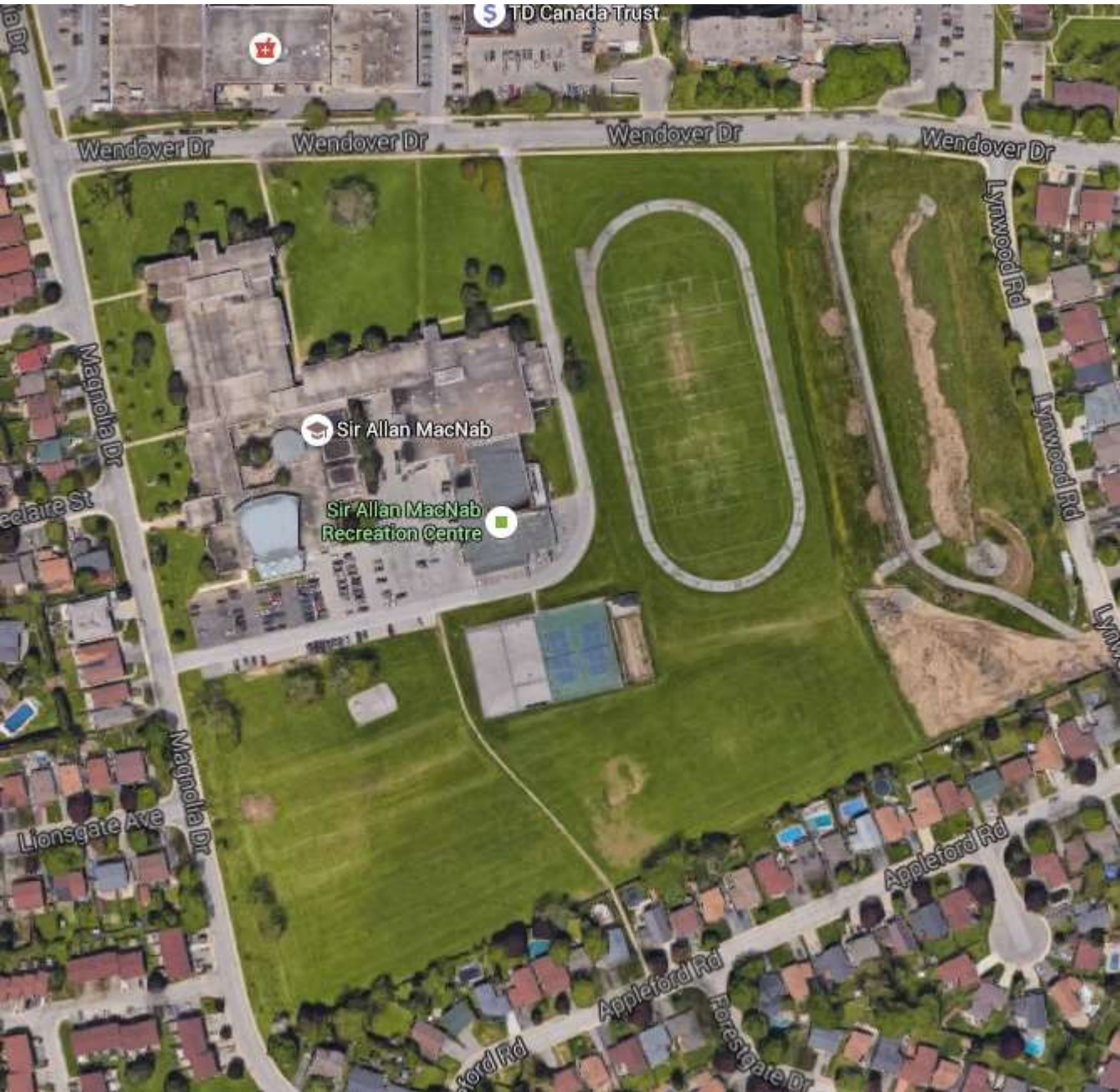
Proposed renovations to the following spaces:

- Science Labs
- Library
- Cafeteria/serverry
- Change rooms/showers
- Washrooms
- New Elevators



SECTION TWO – EXISTING CONDITIONS ASSESSMENT

A review of the existing facility was conducted by our Team in June 2015. The detailed report of the findings can be found in Appendix C, Facility Conditions Assessment Report dated June 26, 2015. In addition, the HWDSB commissioned its own consultants for a conditions assessment and a copy of this report is attached as Appendix D to this study.



SECTION THREE – SUMMARY OF CONCEPT DESIGNS

In this study we are proposing new phased renovations to provide the school with updated facilities to suit Tier 3 programming as well as address the needs of other areas requiring upgrades and improvements. The following is a summary of observations and recommendations related to the Tier 3 programs assigned to the school as well as other related programming needs specific to the school.

In this proposal, the Tier 3 classroom renovations are summarized as follows:

- Artsmart – replacement of the existing Auditorium stage floor system
- Art and Culture – one (computer) classroom renovation for digital art instruction
- Health and Wellness – one new classroom renovation for physical education instruction
- Hospitality and Tourism – extensive renovations to convert an existing Lab to food service instruction
- Extended Support Program –renovations to provide full Ortho Washroom facility

3.1 TIER 3 PROGRAMS

Artsmart

The school has recently undergone extensive renovations in 2014 that covered the existing auditorium and stage and included a new music room and dance studio. At present existing facilities meet the requirements for the Artsmart program.

The existing Auditorium stage floor is in an advanced state of wear and we are recommending the replacement of the existing floor with a new sprung hardwood stage floor system.

Currently the sole change room and makeup room used for Auditorium performances is in the adjacent room east of the Auditorium [room 1099 on the plan]. As a future consideration a second change room should be provided in this general area to alleviate the high number of performers in the change rooms during performances.

3.2 TIER 3 SPECIALTY HIGH SKILLS MAJOR PROGRAMS

Arts and Culture

This program is currently accommodated in the second floor East wing Classroom 261 [room 2055 on the plan]. Based on staff feedback it is recommended that an additional classroom equipped with computers be included in this program to offer arts students access to computers currently used in the industry.

Health and Wellness

This program currently has a nursing classroom located on the ground floor of the North wing in Classroom 137 [room 1047 on the plan]. Based on staff input it is recommended that one classroom be designated for physical education instruction and preferably located close to the gymnasium area. We are proposing the renovation of existing Classroom 1066 into the new Physical Education classroom. This existing classroom is located adjacent to existing north Gymnasium 1073.



### Hospitality and Tourism

There are currently no existing facilities to accommodate the hospitality and tourism food program. Ideally this program should be located close to the cafeteria kitchen, however for this school there is no space available in this area. Alternatively, it is recommended that the former Science Lab 260 [room 2066 on the plan] be designated for this new function. This classroom is located on the second floor East wing and has direct access to the roof above for equipment exhaust. The classroom is adequate in size [2250 sf] to accommodate the hospitality and tourism program.

### 3.3 TIER 3 INTERVENTION AND SUPPORT

#### Extended Support Program

This program is currently accommodated in a series of five classroom and their storage spaces grouped together and located in the first floor North wing [1032, 1033, 1037, 1041, and 1042]. These special education classrooms also include a special education music room. We are proposing new renovations to provide an Ortho Washroom accessed directly form the corridor. There is an existing barrier free shower located in Room 1036A and we are proposing new renovations expanding into the adjacent room 1036 to include barrier free washroom, adult change table and ceiling mounted hoist.

### 3.4 NON PROGRAM SPACE RENOVATIONS

In addition to the above we are recommending renovations to the following areas based on deteriorating existing conditions or limitations in functionality.

In this proposal, the Non Program space renovations are summarized as follows:

- Science Labs – complete demo and renovation of existing 6 lab classrooms
- Library - complete renovation with some minor demolition
- Cafeteria/servery – extension/expansion of server space and cafeteria renovations
- Change rooms/showers – extensive change room, shower & washroom renovations
- Washrooms – complete washroom renovations & upgrades to current standards
- New Elevators

#### Science Labs

There are currently six labs located on the first level of the school North wing. The original equipment and finishes of the existing labs are at an advanced state of wear and in need of new upgrades. All new equipment exhaust venting can be accommodated through the back storage rooms of the second floor classrooms located directly above. Extensive renovations are required to bring these spaces along with the support prep rooms to Board standards. Our proposed design concepts addresses these Board standards. New workstation islands will be equipped with gas/electricity and data to better facilitate program needs. New fume hoods will be double sided to allow access from prep room and science room.



### Library

The existing library layout configuration is not ideal to current Board standards. The central open space has small sub spaces located off the side of the main central space. The library also has more office spaces than is required.

The existing library space will remain in its present location. A downsizing in perimeter shelving has been identified to provide more space for built in learning cubbies and furniture. The introduction of a Learning Commons environment is achievable with refreshed furniture and finishes and by introducing a more modernized look to the space. It is important to include sufficient provisions for power devices to support communal learning environments. The use of whiteboards and Wi-Fi connections will help facilitate the students work individually or in a group setting.



### Cafeteria and Servery

The existing cafeteria and servery will remain in its present location. The existing servery is undersized for the existing size of this school and we recommend expansion to provide improved circulation flows, merchandise space and check out queuing. We are proposing a minor expansion with the immediate cafeteria space, along with associated renovations in this area including new ceiling and bulkheads. In addition we are proposing refreshing the existing finishes within the cafeteria space along with light fixture upgrades. A redesign of the interior cafeteria will place emphasis on generating smaller groups of tables rather than the long rows of tables as has been the norm. By breaking up the tables we can introduce better communication between groups and promote more of a student forum atmosphere within the cafeteria.



**Change Room Areas**

Due to the existing advanced state of wear and deterioration of the original finishes and equipment in the boys and girls change rooms and showers, we are recommending renovations and upgrades to bring these facilities up to current Board standards. As indicated on the plan, proposed scope of work includes male and female change rooms, showers, staff change room and washroom/showers and the adjacent washrooms. The existing adjacent staff office will be combined with the adjacent storage space to provide one large open staff office space. The design solutions will require further development, however, we indicate the related approximate estimated values in the cost summary.

**Washrooms**

The school underwent renovation upgrades to several of the student washroom groups. We are proposing renovations and upgrades for the remaining washroom facilities within the school. Refer to floor plans. A full review of the existing fixture counts as related to male and female users will need to be conducted in order to determine if any one group or both are deficient in washroom fixtures. Refer to the shaded washroom areas on the floor plans.

**New Elevators**

In order to provide accessibility to floor levels other than the ground level, including the split levels in the north wing, it is recommended that two new elevators be provided to facilitate greater accessible coverage. We recommend one elevator be located at Stair 1012 to allow access to the split floor levels. A second elevator could be provided in either Stair 1018 or 1045 to allow access to the third level and the split levels at the north end of the north wing. The design solutions will require further development, however, we indicate the related approximate estimated values in the cost summary.

**3.5 PHASING**

The proposed renovations at Sir Allan MacNab Secondary School are extensive and it is for this reason that these renovations must be phased to occur during the summer months to reduce disruption to school operations during the school year.

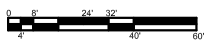
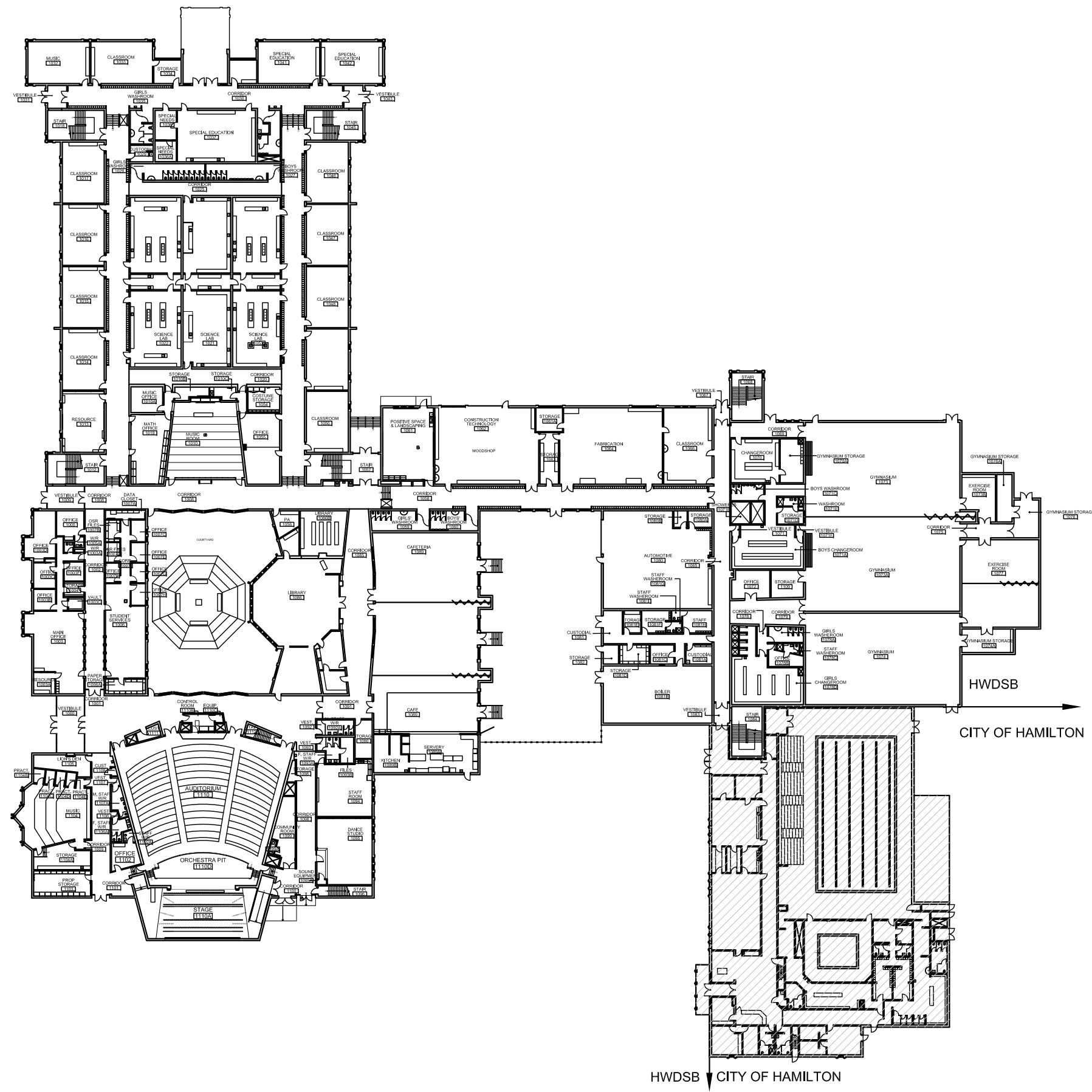
Proposed Phased Construction, as follows:

- Phase One: Summer 1 and fall as required - renovations to all Tier 3 Program spaces directly related to instructional spaces.
- Phase Two: Summer 2 – Science Rooms, Cafeteria and Library
- Phase Three: Summer 3 – Change Rooms/Showers and Washrooms
- Phase Four: Summer 4 – Elevators & Additional work as related for conditions assessment report

**3.6 DRAWINGS**

The following pages illustrate the existing floor plans and the subsequent Proposed Floor Plan for each level of the school.

Refer to the proposed floor plans for the extent of renovations, noted as a shaded area.

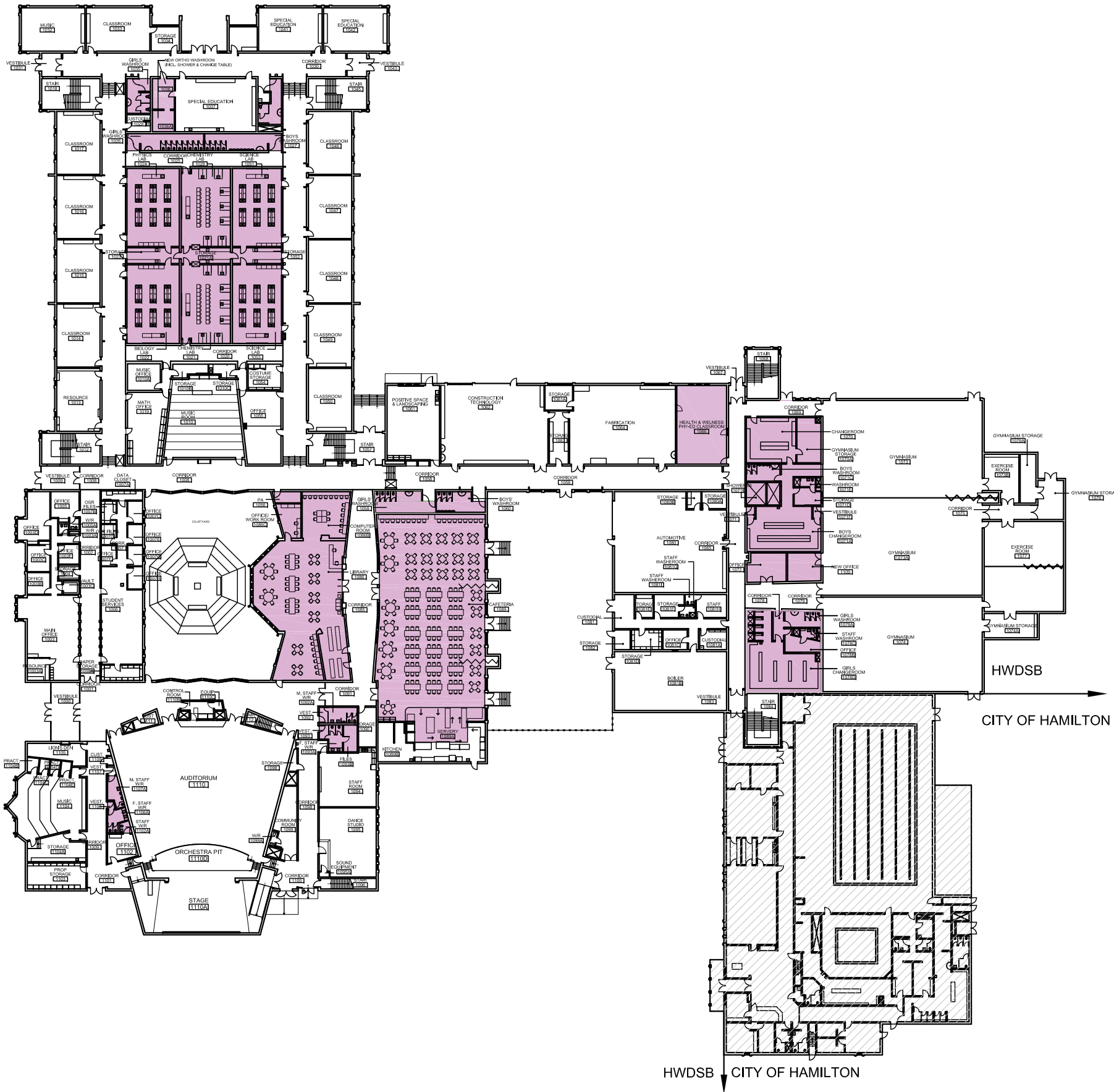




LEGEND

RENOVATION AREA

NEW WALL





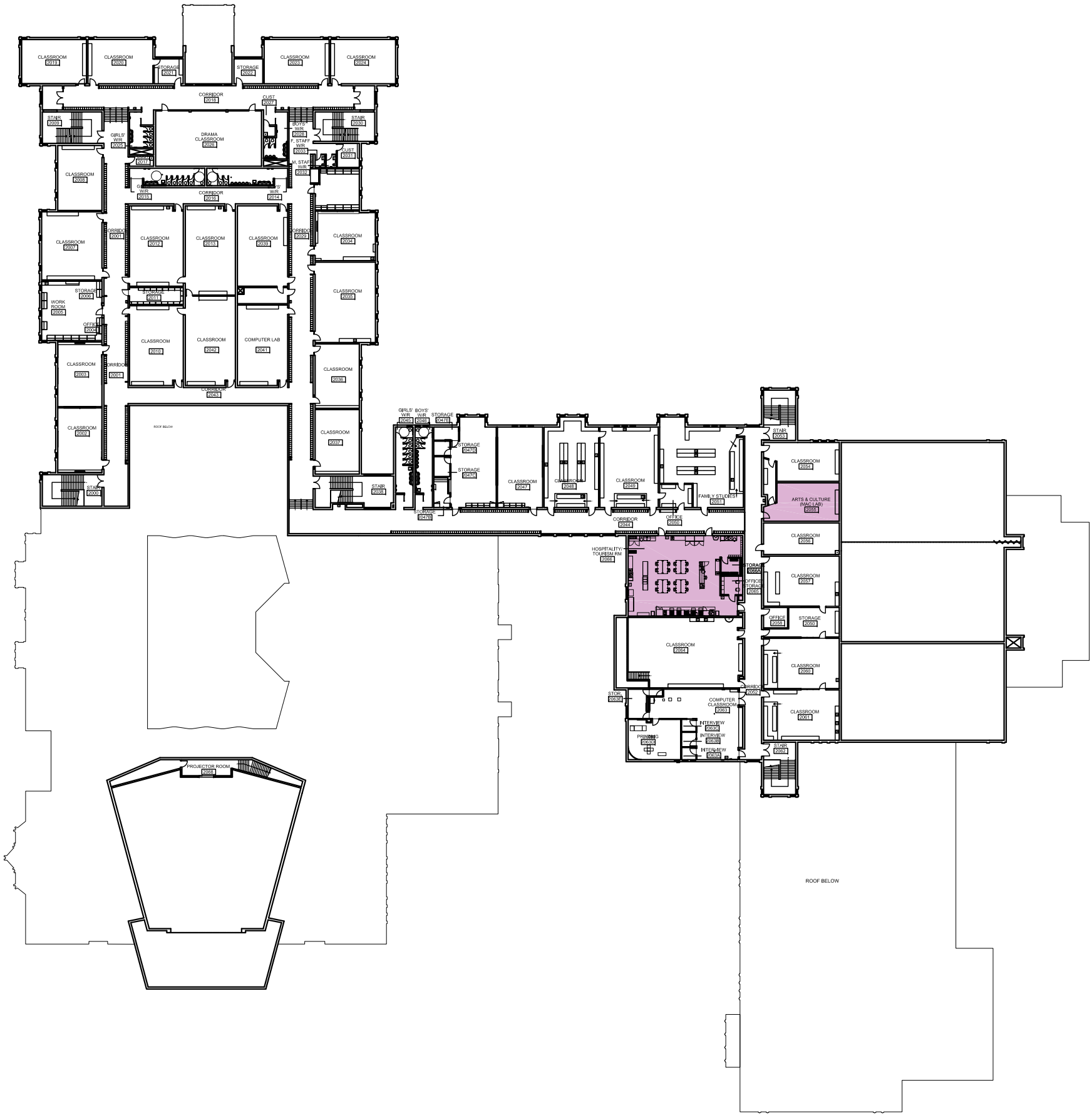
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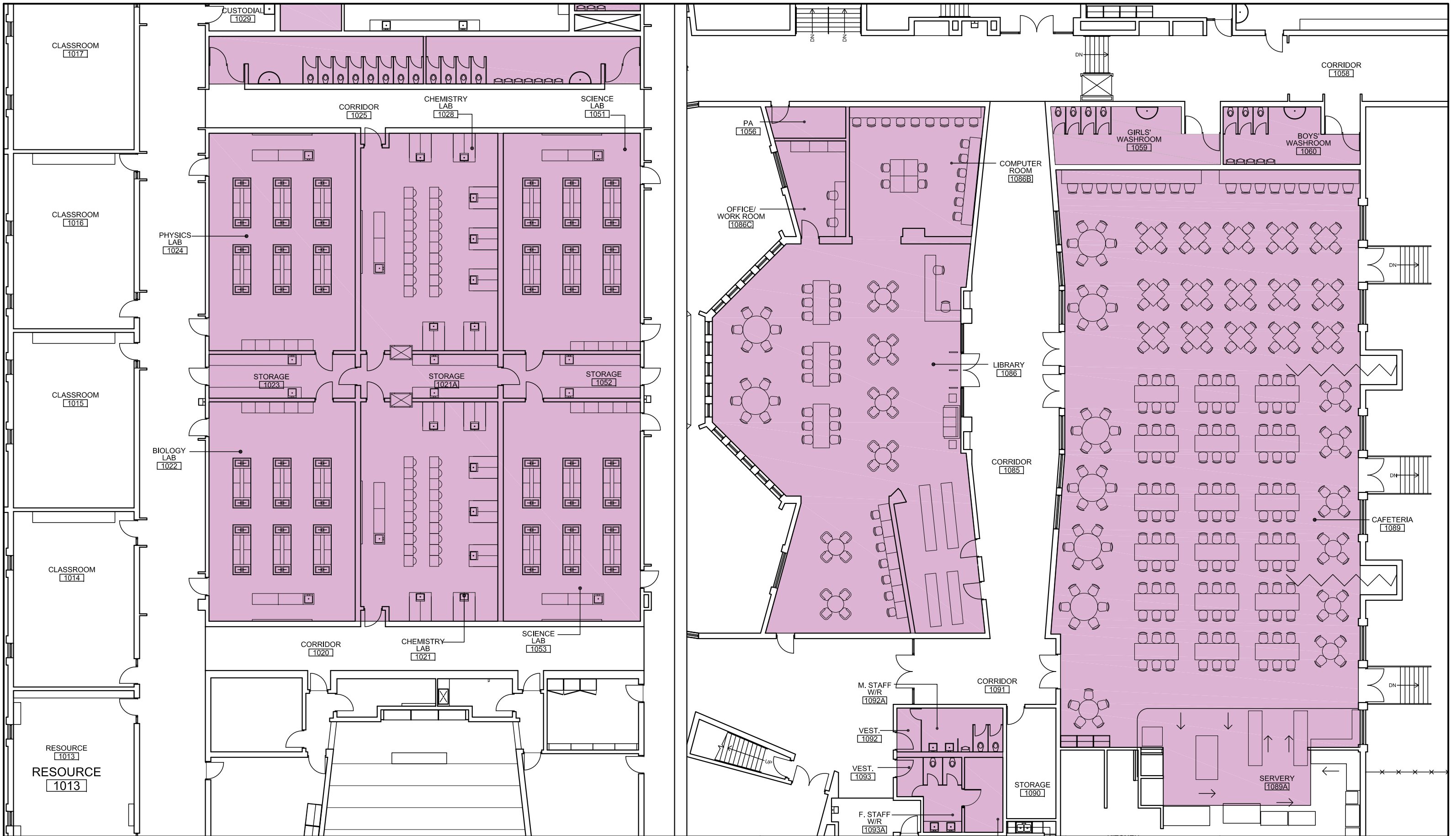
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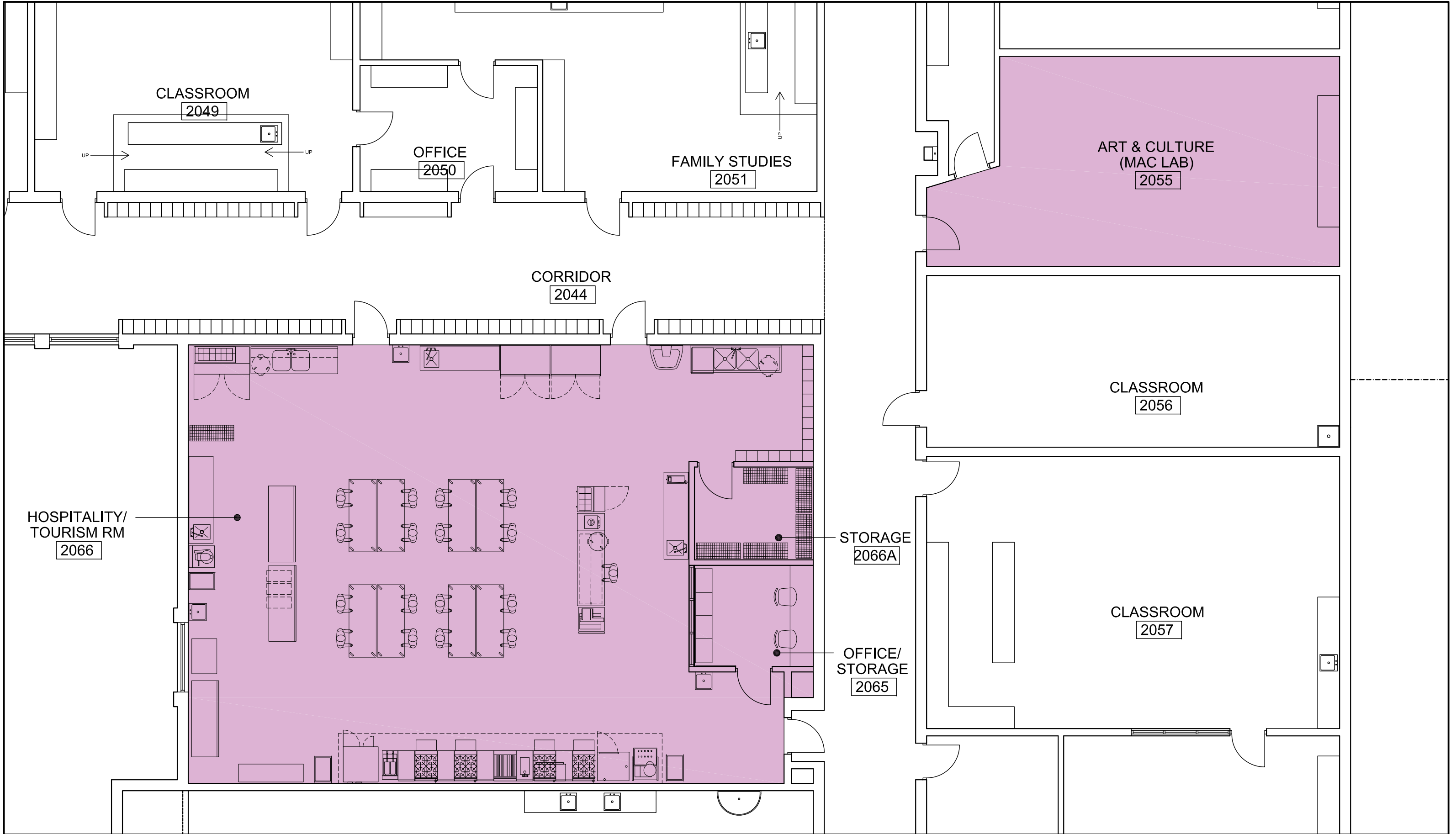
RENOVATION AREA

NEW WALL









# **APPENDIX A**

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- **Hamilton Wentworth District  
School Board**

**Sir Allan MacNab Secondary School**

**Mechanical Services Feasibility Study & Concept Design**

**Project Number**  
GR8-00016023-00

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Murray Wickham, P.Eng., LEED AP  
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**Date Submitted**  
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## **1.0 INTRODUCTION**

The existing Sir Allan MacNab Secondary School was opened in 1969 and is located at 145 Magnolia Drive in Hamilton, Ontario.

The Hamilton-Wentworth District School Board is proposing to renovate the existing Science Laboratories, Washrooms, Cafeteria, part Library, Boys Change Rooms and Girls Change Rooms and to create new Hospitality/Tourism, Arts/Culture Classrooms, and Health/Wellness Classroom by renovating existing space and building a new Addition.

Some of the information in this Design Brief related to existing conditions is based on information from a site review completed in March, 2016.

This report documents the feasibility and the proposed mechanical systems that are consistent with, and anticipated for, the proposed renovations.

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## **2.0 CODES, STANDARDS & GUIDELINES**

Guidelines and interpretations of the requirements of the latest editions of the following Codes, Standards will be addressed in the design of this project:

- Ontario Building Code (OBC)
- Ontario Fire Code (OFC)
- Ontario Gas Utilization Code
- ASHRAE 62.1, Ventilation for Acceptable Indoor Air Quality
- ASHRAE 90.1, Energy Efficient Design of New Buildings Except Low-Rise Residential Buildings
- NFPA 10, Portable Fire Extinguishers
- Hamilton-Wentworth District School Board Design Guidelines





### **3.0 DESCRIPTION OF SCOPE APPLICABLE TO ALL PROPOSED AREAS OF RENOVATION**

#### **3.1 Existing Mechanical Conditions**

- Plumbing fixtures (where indicated on Architectural Concept Design and Feasibility Study), emergency eyewash stations and Science Lab sinks complete with associated trim, isolation valves, hot/cold water and sanitary drain pipes serving areas of renovation are to be removed from the site
- Existing buried sanitary and storm pipes serving area of renovation to be power flushed after all construction at the site is complete
- Existing supply air diffusers and/or grilles and a portion of existing ductwork serving areas of renovation are to be removed from the site
- After all construction at the site is complete, existing interior supply, return and exhaust ductwork, approximately 4500 mm from diffusers/grilles is to be power vacuumed
- Existing local fan equipment serving the areas of renovation is to be removed from the site
- Redundant controls in areas of renovation are to be removed from site
- All existing heating equipment (unit heaters, cabinet heaters, heating coils) that are being reused are to be cleaned and lubricated
- New firestopping to be supplied and installed in gaps between existing pipes/ductwork and existing walls surrounding the renovated area
- Existing equipment being reused to be water and air balanced to match original design documents
- All existing fire extinguishers to be inspected and charged
- Existing wall radiation that is being reused shall be cleaned and enclosures replaced with similar style. New enclosures to be painted
- Existing Science Labs common exhaust system to be removed from the site.

Refer to Architectural Demolitions Plans for Rooms/Areas being renovated.

#### **3.2 New Mechanical Requirements**

- Type L Copper pipe for new domestic water pipes
- Schedule 40 steel pipe for new heating pipes
- Schedule 40 steel pipe for new gas pipes
- PVC plastic pipe for new sanitary and storm pipes

- Type M Copper for new condensate pipes
- Type ACR copper for new refrigerant pipes
- DWV copper pipe for new vent pipes
- Borosilicate glass drain pipe for new Science Labs
- New double check valve backflow assembly in existing incoming domestic water and fire pipe
- New Washroom and Change Room supply, return and exhaust ducts are to be aluminum
- New supply, return and exhaust ductwork, unless otherwise noted, are to be galvanized steel fabricated to SMACNA Duct Construction Standards
- Extend existing supply, return and exhaust duct systems complete with new diffusers and grilles to suit the area of renovation, unless otherwise indicated
- Supply and install new diffusers and/or grilles serving areas of renovation
- Supply and install additional fire extinguishers to meet the latest Codes and Standards

### **3.3 Seismic Considerations**

All new mechanical systems will be seismically braced to comply with the OBC, should it be determined that seismic bracing is required for this site/building. If seismic restraint systems are required, they shall include lateral supports for all suspended systems and lateral seismic resistance for all vibration isolated and fixed mounted equipment.



#### **4.0 DESCRIPTION OF SCOPE APPLICABLE TO SPECIFIC ROOMS/AREAS OF RENOVATION**

##### **4.1 Washrooms - All Floors**

Where indicated on Architectural Concept Design and Feasibility Study:

- Existing exhaust system to be reused
- Install new plumbing fixtures as per Architectural Layout and School Board Standards
- Refer to General Scope Applicable to All Proposed Areas of Renovation - Existing and New Mechanical Requirements

##### **4.2 Cafeteria/Cafeteria Servery Renovation**

- Existing supply/return air handling units and duct system to be reused
- Supply and install a new gas-fired heating rooftop make-up air unit (2000 CFM) to serve existing cooking exhaust hood. New unit to be installed on Servery roof
- Refer to General Scope Applicable to All Proposed Areas of Renovation - Existing and New Mechanical Requirements

##### **4.3 Hospitality/Tourism**

- Demolish and remove from site all existing wall radiation
- Supply and install new perimeter heating building hot water heating pipes and heating equipment to suit new room layout. New pipes to be connected to the existing building heating system
- Supply and install new sanitary piping to serve new sinks. Connect piping to the existing building sanitary system
- Supply and install new domestic hot, cold and recirculation pipe distribution system to all commercial kitchen equipment. New pipes to be connected to the existing building systems complete with isolation valves and all accessories
- Supply and install a new 100 gallon (450 L) grease interceptor, to be located on the First Floor
- Reroute existing above grade storm sewer piping to suit new room layout
- Supply and install new cooking exhaust hood (6000 CFM) complete with roof exhaust fan and associated exhaust ductwork. New ductwork to be 16 gauge steel, fabricated and labelled to NFPA 96 complete with 2-hour rated non-combustible flexible fireproof wrap
- Supply and install cooking exhaust hood fire suppression system

- Supply and install a gas heating rooftop make-up air unit (5500 CFM) to serve the cooking exhaust hood
- Supply and install a 5-Ton cooling and gas heating rooftop unit (2000 CFM) complete with ductwork, grilles, diffusers and controls
- Supply and install refrigeration piping to serve new walk-in freezer unit
- Supply and install an automatic gas shut-off valve serving the commercial kitchen equipment to Close upon fire alarm activation
- Demolish and remove from the site two (2) existing control air boxes, supply and return air ductwork, grilles, diffusers and all accessories
- Demolish and remove from the site all exhaust fans, ducts and accessories
- Refer also to General Scope Applicable to All Proposed Areas of Renovation - Existing and New Mechanical Requirements

#### **4.4 Library**

- Existing supply and return air ductwork to remain
- Demolish and remove from the site existing sink and all accessories. Cap existing sanitary and domestic water pipes beyond finished wall
- Extend supply air ductwork to suit new room layout
- Refer to General Scope Applicable to All Proposed Areas of Renovation - New Mechanical Requirements

#### **4.5 Science Labs/Prep Rooms**

- Demolish and remove from site all existing sanitary, domestic water and natural gas piping serving the old Science Labs
- Demolish and remove from site all existing Instructor's Work Bench exhaust systems, exhaust fan and associated ductwork serving the old Science Labs
- Demolish and remove from site existing animal cabinet and exhaust duct system serving old Science Labs
- New Science Lab exhaust air extraction duct to be internally lined PVC coated, Class B negative pressure
- Supply and install new sanitary piping and connect to all new sinks, emergency eyewash, fume hoods, and floor drains. Sanitary pipe to be connect to new neutralizing tank located on the First Floor. New pipe to be connected to the existing building sanitary system

- Supply and install new domestic hot, cold and recirculation water and natural gas pipes to serve new Instructor's Work Benches complete with isolation and solenoid valves. Install solenoid valves on new cold water and natural gas pipes serving Student Work Benches. New pipes to be connected to the existing systems complete with isolation valves and all accessories. Solenoid valve to be controlled by a key switch located at the Instructor's Work Bench and to an emergency panic button located on the wall beside the door leaving the Room.
- Supply and install new two-sided fume hoods (800 CFM each) complete with roof mounted exhaust fans, exhaust ductwork and air proving switch to serve new Lab layout.
- Supply and install emergency exhaust system (1500 CFM) complete with outdoor exhaust fan, ductwork and exhaust grille. Fan to be manually operated
- Supply and install new dedicated Classroom Instructor's Work Bench exhaust system complete with roof exhaust fan and associated exhaust ductwork. Fan to be manually operated from Instructor's Work Bench
- New Instructor's Work Bench and fume hood exhaust air extraction duct to be internally lined PVC coated, Class B negative pressure
- Supply and install two (2) floor type neutralizing tanks (150 gallon capacity each) complete with limestone chips to serve new Chemistry Labs. Neutralizing tanks to be located on the First Floor
- Refer also to General Scope Applicable to All Proposed Areas of Renovation - Existing and New Mechanical Requirements

#### **4.6 Staff Washroom**

- Install new plumbing fixtures as per Architectural Layout and School Board Standards
- Supply and install new supply and return air ducts, diffusers/grilles and all accessories to serve new room layout. New ductwork to be connected to the existing building systems
- Refer also to General Scope Applicable to All Proposed Areas of Renovation - Existing and New Mechanical Requirements

#### **4.7 General Science**

- Demolish and remove from site all existing sanitary, domestic water and natural gas piping serving the old Lab
- Demolish and remove from site all existing exhaust systems, fans and associated ductwork serving the old Lab

- Supply and install new sanitary piping and connect to all new sinks and floor drains. New piping to be connected to the existing building sanitary system
- Supply and install new domestic hot, cold and recirculation water and natural gas pipes to serve Work Benches complete with isolation and solenoid valves. New pipes to be connected to the existing systems complete with isolation valves and all accessories. Solenoid valve to be controlled by a key switch located in the Work Bench and to an emergency panic button located on the wall beside the door leaving the Room
- Refer also to General Scope Applicable to All Proposed Areas of Renovation - Existing and New Mechanical Requirements

#### **4.8 Boys Change Rooms/Washrooms>Showers/Office**

- Existing supply/return air handling units, duct systems and reheat coils are to be reused
- Install new plumbing fixtures as per Architectural Layout and School Board Standards
- Refer also to General Scope Applicable to All Proposed Areas of Renovation - Existing and New Mechanical Requirements

#### **4.9 Girls Change Rooms/Washrooms>Showers/Office**

- Existing supply/return air handling units, duct systems and reheat coils are to be reused
- Install new plumbing fixtures as per Architectural Layout and School Board Standards
- Refer also to General Scope Applicable to All Proposed Areas of Renovation - Existing and New Mechanical Requirements

#### **4.10 Health and Wellness**

- Existing supply and return air ductwork to remain
- Refer also to General Scope Applicable to All Proposed Areas of Renovation - Existing and New Mechanical Requirements

#### **4.11 Office (Gymnasium Area)**

- Supply and install new supply air diffusers and connect to existing supply air duct system serving the area
- Relocate and extend associated ductwork for existing return air grilles to suit new office layout

- Relocate existing West Gymnasium return air ceiling grille located in old Storage Room, to wall dividing Gymnasium and Storage Room. Extend ductwork to suit return new air wall grille location
- Refer also to General Scope Applicable to All Proposed Areas of Renovation - Existing and New Mechanical Requirements

#### **4.12 Arts and Culture**

- Existing supply/return air systems are to be reused
- Supply and install a new specialized exhaust air system (800 CFM) complete with exhaust fan and associated ductwork to serve Owner supplied equipment
- Refer also to General Scope Applicable to All Proposed Areas of Renovation - Existing and New Mechanical Requirements

#### **4.13 Extended Support (Ortho Washroom)**

- Supply and install new sanitary sewer piping to serve new plumbing fixtures. Piping to be connected to the existing building sanitary system
- Install new plumbing fixtures as per Architectural Layout and School Board Standards
- Supply and install new domestic hot, cold and recirculation pipe distribution system to all new plumbing fixtures. New pipes to be connected to the existing building systems complete with isolation valves and all accessories
- Supply and install new indoor in-line exhaust fan (300 CFM), ductwork, grilles, outdoor wall louvre and all accessories to serve dedicated area Washrooms
- Refer also to General Scope Applicable to All Proposed Areas of Renovation - Existing and New Mechanical Requirements





# **APPENDIX B**

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- **Hamilton Wentworth District School Board**

**Sir Allan MacNab Secondary School**

Electrical Services Feasibility Study & Concept Design

**Project Number**  
GR8-00016023-00

**Prepared By:**  
Erick Korthuis

**Date Submitted**  
March 29, 2016 (Revision 1)

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## **1.0 INTRODUCTION**

The existing Sir Allan MacNab Secondary School was opened in 1969 and is located at 145 Magnolia Drive in Hamilton, Ontario.

The Hamilton-Wentworth District School Board is proposing to renovate the existing Science Laboratories, Washrooms, Cafeteria, part Library, Boys Change Rooms and Girls Change Rooms and to create new Hospitality/Tourism, Arts/Culture Classrooms, and Health/Wellness Classroom by renovating existing space and building a new Addition.

This report documents the feasibility and the proposed electrical systems that are consistent with and anticipated for, the proposed renovations.

This report, prepared by **exp** Services Inc., is intended for the exclusive use of Hamilton-Wentworth District School Board and Grguric Architects Inc. None of **exp** Services Inc., Hamilton-Wentworth District School Board and Grguric Architects Inc. assume any liability for the use of this report, or for the use of any information disclosed in the report, or for damages resulting from the use of this report, by other parties.



## **2.0 CODES, STANDARDS & GUIDELINES**

Interpretations of the requirements of the latest editions of the following Codes, Standards and Guidelines will be addressed in the design of this project:

- Ontario Building Code (OBC)
- Ontario Fire Code (OFC)
- Ontario Electrical Safety Code (OESC)
- IES Recommended Practices and Guidelines
- ASHRAE/IES 90.1, Energy Efficient Design of New Buildings Except Low-Rise Residential Buildings
- Hamilton-Wentworth District School Board Design Guidelines



### **3.0 GENERAL ELECTRICAL CONSTRUCTION SCOPE - ALL AREAS OF RENOVATIONS**

#### **3.1 Selective Demolition of Existing Electrical Systems**

Unless noted otherwise, all existing electrical systems in the areas of renovation will be disconnected and removed. This includes all power distribution equipment and cabling, branch circuit wiring/conduit, selected fire alarm system devices, public address system, lighting, lighting controls, receptacles, communication outlets, CCTV cameras, music, security systems and wiring for mechanical equipment.

Existing electrical systems that are to be demolished will be disconnected and removed back to source. Where the removed devices are deemed suitable, they will be relocated/re-used.

Refer to Architectural Demolitions Plans for Rooms/Areas being renovated.

#### **3.2 Electrical Power & Distribution**

##### **.1 Primary Power Supply**

The proposed renovations are not expected to result in any net electrical peak demand load growth and as a result, the existing incoming electrical service supply will remain as is.

##### **.2 Power Distribution**

Refer to the selective demolition section of this Report.

Unless indicated otherwise, existing 600/347V and 120/208V power distribution, lighting and receptacle panelboards will remain.

New electrical panelboards will be provided in all new General Science Rooms, Science Labs, Cafeteria and Part Library. Refer to Typical Room Specific Electrical Requirements section of this Report.

New panelboards will be fed from existing distribution panels.

All new panelboards will be complete with copper bus.

Conductors for all new feeders will be copper.

### **.3     *Branch Circuit Wiring***

Branch circuit wiring systems will be provided throughout all areas of renovation to all new loads as well as existing-to-remain loads as required. Conductors for all branch circuit wiring will be copper. Loads will typically be supplied with power from the nearest panelboard.

### **.4     *Receptacles***

Receptacles will be provided throughout the areas of renovation as required for equipment, housekeeping and convenience and also as required by Codes and Standards. Refer to the Typical Room-Specific Electrical Requirements section of this Report.

## **3.3     *Fire Alarm System***

Refer to Selective Demolition section of this Report.

The Building is equipped with an existing two-stage, non-addressable, Simplex fire alarm system complete with a Simplex 4100 Series control panel, initiating devices and audible signalling devices (bells).

The existing main Control Panel located in the existing Custodial Office on the First Floor will be upgraded to accept new devices.

Existing-to-remain fire detectors, pull stations, signalling devices, etc., outside of the renovated areas and not affected by the renovations will be reconnected to the new Control Panel. New devices (including strobe visual signalling devices) will be added as required in the areas of renovation, in order to ensure compliance with Codes, Standards and Guidelines, i.e.:

- Manual pull stations (2-stage) at all required exits
- Heat detectors in all Utility, Service and Storage Rooms
- Visual signal appliances (i.e. strobes) in all public areas and areas with high ambient sound levels
- The entire system will be tested and verified as per Code requirements



### **3.4 Lighting**

Refer to the Selective Demolition section of this Report.

Unless noted otherwise, all existing lighting systems outside the areas of renovation and not affected by the renovations will remain. New lighting systems and controls will be provided as required in the areas of renovation,

Existing luminaires that are to be removed will be disconnected and removed from site. Lighting ballasts containing PCBs, if found during the Demolition phase, will be disposed of in accordance with Ministry of Environment regulations.

#### **.1 New Lighting Systems - Interior**

All new lighting will utilize energy efficient dimmable LED lamp technology in order to provide daylight harvesting where required and for dimming of classrooms lighting during Audio Visual presentations. High colour rendering, warm and neutral white LED's will be specified as appropriate to suit each application.

Luminaires suitable for use with a 120V power supply will be used.

In general, new interior lighting systems will be provided for the areas of renovation. Lighting systems will be integrated with the building architecture as much as possible. Luminaires that cannot be concealed within an architectural element will be well shielded using either a frosted white or prismatic refracting lens.

Refer to Typical Room Specific Electrical Requirements section of this Report.

#### **.2 New Lighting Systems - Exterior**

Exterior lighting fixtures will be provided on the existing building to serve the new Cafeteria Patio area.

All new lighting will utilize energy efficient LED lamp technology with colour rendering of 70 or better and colour temperature tolerance of 4100 to 4300 K.

**.3     *Lighting Controls***

In general, lighting controls with multi-level control will be provided in accordance with the Codes, Standards and Guidelines.

Except for Washrooms, low voltage lighting control system comprised of switches, vacancy sensors and a dimmable daylight control strategy will be specified on all renovated Rooms/ Areas in accordance with ASHRAE/IES 90.1 Standards.

Washrooms will be equipped with occupancy sensors for automatic On/Off of the light fixtures.

**.4     *Emergency Lighting and Exit signs***

Emergency Lighting and Exit signs will be provided in the areas of renovation as required in order to satisfy the requirements of the Ontario Building Code. Emergency lighting systems will consist of battery units and remote heads as required to meet Code requirements.

Exit signs will be LED "green running man" pictogram type.

**3.5     *Miscellaneous Electrical Work***

**.1     *Communication Cabling (IT/Voice)***

Refer to the Selective Demolition section of this Report.

Existing Network/Voice incoming service (fibre optic [FO] cable) will remain.

The existing horizontal copper cabling distribution is comprised of one (1) Main IT Closet on the First Floor and Satellite Racks with Network switches and patch panels located in various rooms throughout the School. The Main IT Closet will remain however any Satellite Racks located within the areas of renovation will be relocated and upgraded as required to accommodate the renovations and the new cabling requirements. Refer to Typical Room Specific Electrical Requirements section of this Report.

Existing wireless (Wi-Fi) access point devices, currently located throughout the School, including in Classrooms, Labs, Shops, Library and Cafeteria, will remain and be reused.

New Cat. 6e cables will be run from the new outlets that are required in the areas of renovation, to the IT Closet or nearest existing satellite rack located on the same floor as the outlet.

## **.2 Clock Systems**

Refer to Selective Demolition section of this Report.

The building is currently equipped with an existing 120 VAC synchronous impulse type master clock system located in the First Floor Main Office that operates various 120V synchronous impulse type secondary clocks throughout the School Corridors. This system will remain and be reused.

The Building is also equipped with an existing 120V wireless clock system with receiver located in a Storage Room on the Second Floor and clocks in Classrooms, Shops and Labs. This system will remain, existing clocks will be reused and new clocks provided as required.

## **.3 Emergency Call Systems (Washrooms)**

In accordance with the School Board Design Guidelines, an emergency call system (tone/visual type) will be provided for all Staff Washrooms. An emergency call station located adjacent the toilet complete with corridor indicating light will be installed outside the Washroom. Calls will be annunciated at a new annunciator that will be located at the First Floor Main Office.

## **.4 Public Address and Program Bell System**

Refer to the Selective Demolition section of this Report.

The School is currently equipped with an existing P/A & Program Bell System complete with speakers throughout the School that will remain and be upgraded as required in order to accommodate the work associated with the proposed renovations

The main control console is located in the Main Office on the First Floor.

New speakers complete with integral call switch will be provided in all new Classrooms, Labs, Staff Lounge, Teacher's Workrooms and Shops.

**.5**     *Wiring For Mechanical Equipment*

Refer to the Selective Demolition section of this Report.

Motor starters, variable frequency drives, disconnect switches, power and control wiring will be provided for any new mechanical equipment that is required. Refer to the Mechanical Services Feasibility Study and Concept Design Brief, for information regarding such equipment.

**.6**     *Security System*

Refer to the Selective Demolition section of this Report.

The School is currently equipped with a security system comprised of a main control panel located in the Custodial Office on the First Floor, key pads and door status/monitoring contacts at exterior doors. This system will remain and be upgraded as required.

Unless noted otherwise, existing door status/monitoring contacts outside of areas of renovation and not affected the renovations will remain.

New door status/monitoring contacts will be added as required at Exterior Doors and Staff Rooms and connected to existing system.

**.7**     *Closed-Circuit Television System (Security Cameras)*

The School is currently equipped with a system comprised of existing head-end equipment located in the Main Office on the First Floor and cameras located in Corridors and Library. This system will remain as is and equipment will be reused.

**.8**     *Music System*

Existing music system in the Cafeteria will remain and be reused.

**.9      *Modular Control Panels***

New surface mounted panels will be provided near each Room main entrance door complete with duplex receptacles, data and telephone outlets, public address speaker, light switches, clock, telephone handset and thermostat in all of the renovated Classrooms, Labs, Technology Labs (Shops), Teacher's Workrooms, Learning Commons Areas, Hospitality Room, Cosmetology Room and Graduated Support/Special Education Areas.

**.10     *Seismic Restraint Systems***

All electrical systems will be seismically braced to comply with the OBC if it is determined that it is required for this site/building. If seismic restraint systems are required, they shall include lateral supports for all suspended systems and lateral seismic resistance for all vibration isolation and fixed mounted equipment.

**3.6     *Typical Room-Specific Electrical Requirements***

**.1      *Washrooms***

All renovated Washrooms to be complete with the following:

- Surface mounted lighting fixtures
- Ceiling mounted occupancy sensors for automatic On/Off of lighting
- Infrared hands-free sinks, toilets and urinals
- One (1) hand dryer per four (4) stalls

**.2      *Cafeteria***

- Surface mounted lighting fixtures
- Receptacles, power connections for equipment and communication outlets as required

**.3      *Cafeteria Servery***

- Surface mounted lighting fixtures
- Dedicated 120/208V-3Ø-4W electrical panel for new Servery/Kitchen equipment

- Receptacles, power connections for Server/Kitchen equipment and communication outlets as required
- Power connections for make-up air fan unit
- Power connection for fire suppression system and interlock with fire alarm system for gas supply shut-off

**.4      *Science Labs/Classrooms***

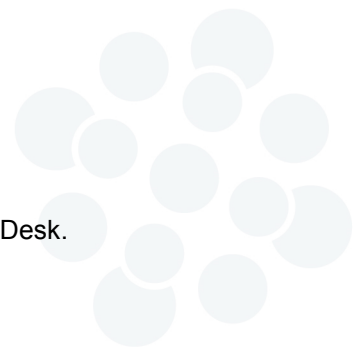
- Suspended direct/indirect light fixtures
- Dedicated 120/208V-3 phase-4 wire electrical panel complete with emergency Power-Off pushbuttons.
- Eight (8) receptacles and eight (8) data outlets along perimeter walls
- Ground Fault Interrupter receptacles at each Lab Station and Teacher Desk/Demo Station. Power to receptacles to be controlled from Teachers Desk
- Power to Gas Shut-Off valve with interlock to Fire Alarm System
- Receptacles and data outlets for the following:
  - Overhead Projector
  - Interactive Board
- Two (2) receptacles and two (2) data outlets at Teacher's Desk
- One (1) data outlet at each Lab Station

**.5      *General Science Rooms***

- Suspended direct/indirect linear lighting
- Eight (8) receptacles and eight (8) data outlets along perimeter walls
- Four (4) receptacles for Tablet charging
- Six (6) floor-mounted receptacles
- Receptacles and data outlets for the following:
  - Overhead Projector
  - Interactive Board/Monitor
- Two (2) receptacles and two (2) data outlets at Teacher's Desk.

**.6      *Hospitality/Tourism***

- Recessed lighting fixtures



- Dedicated 120/208V-3 phase-4 wire electrical panels complete with Emergency Power-Off pushbuttons for kitchen equipment
- Eight (8) receptacles and eight (8) communication outlets along perimeter walls for general/student use
- Three (3) 20A-1P receptacles at counter height at each Kitchen Demonstration Station
- Two (2) 15A-1P receptacles and two (2) communication outlets at each Kitchen Demonstration Station
- One (1) 15A-1P dedicated receptacle at each Kitchen Demonstration Station
- Receptacle for each Microwave
- Dedicated 125/250V receptacle for each kitchen range
- Dedicated power for Walk-In Freezer
- Dedicated power for Industrial Washer/Dryer
- Dedicated power for Range Hoods and other various Kitchen equipment
- Receptacles and communication outlets for the following
  - Overhead Projectors
  - Interactive Board/Monitor
- Wireless (Wi-Fi) Access Point
- Access control system (card reader)
- Cameras over desks for display

#### **.7 Library**

- Surface mounted lighting fixtures
- Receptacles and power connections for equipment and communication outlets as required
- Wall mounted surface raceway complete with receptacles and data outlets to accommodate thirty (30) computer stations
- Eight (8) receptacles and eight (8) communication outlets at Circulation Desk
- Receptacles required to accommodate fifteen (15) tablet/laptop charging stations
- Two (2) receptacles and two (2) communication outlets at each Student Kiosk
- Wireless (Wi-Fi) access points

**.8      *Staff Washrooms***

- Surface mounted lighting fixtures
- Ceiling mounted occupancy sensors for automatic On/Off of lighting
- Infrared, hands free sinks, toilets and urinals

**.9      *Boys Change Rooms/Washrooms>Showers/Office***

- Refer to Washrooms

**.10     *Girls Change Rooms/Washrooms>Showers/Office***

- Refer to Washrooms

**.11     *Heath and Wellness***

- Suspended direct/indirect linear lighting fixtures
- Eight (8) receptacles and eight (8) data outlets along perimeter walls
- Four (4) receptacles for tablet/laptop charging stations
- Receptacles and communication outlets for the following
  - Overhead Projectors
  - Interactive Board/Monitor
- Two (2) receptacles and two (2) data outlets at Teachers Desk
- Modular control panel

**.12     *Office (Gymnasium Area)***

- Recessed lighting fixtures
- Receptacles and communication outlets along perimeter walls for general use
- Two (2) receptacles and two (2) communication outlets at each Workstation
- Receptacles and communication outlets for the following
  - Overhead Projectors
  - Interactive Board/Monitor
- Wireless (Wi-Fi) access points



- Modular control panel

**.13**     *Arts and Culture*

- Recessed LED lighting fixtures and track lighting complete with multi-level switching
- Receptacles and communication outlets for the following
  - Overhead Projectors
  - Interactive Board/Monitor
- Ten (10) receptacles and ten (10) data outlets along perimeter walls
- Modular control panel
- Power and control requirements for motorized display screen



# **APPENDIX C**

Grguric Architects Incorporated  
Sir Allan MacNab High School  
Facility Conditions Assessment Report  
June 26, 2015



**GRGURIC  
ARCHITECTS  
INCORPORATED**

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# **FACILITY CONDITIONS ASSESSMENT**

OF

## **Sir Allan MacNab High School**

145 Magnolia Drive, Hamilton, Ontario L9C 5P4

PREPARED FOR

**Hamilton Wentworth District School Board**

**JUNE 26, 2015**

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## 1.0 ACCESSIBILITY REVIEW

The north wing and ground floor level has existing accessibility provisions to the split levels by means of stair lifts (see Photo 1.0.A) located at stair transitions between the split levels. The second floor of the north wing also has split floor levels, however, there are no stair lifts at the stair transitions as there is no elevator accessibility to any floors. The facility has three accessible entrance points with suitable walkway/ramp access and power door operators located at:

- 1) the main entrance at Vestibule 1000 (Photo 1.0.B and 1.0.C)
- 2) the north entrance off Corridor 1030 (Photo 1.0.D)
- 3) the south entrance east of the Auditorium to the south parking area



Photo 1.0.A – Corridor 1011



Photo 1.0.B



Photo 1.0.C



Photo 1.0.D

Currently the only barrier free washrooms on the ground level are located in the north wing:

- 1) Girls Washroom 1035
- 2) Boys Washroom 1038

There are no barrier free washrooms available for staff on the ground level.

The second level has barrier free washrooms in these following locations:

- 1) Girls Washroom 2015
- 2) Boys Washroom 2014
- 3) Girls Washroom 2045
- 4) Boys Washroom 2046

On the third level of the north wing there are barrier free washrooms at the following locations:

- 1) Girls Washroom 3010
- 2) Boys Washroom 3012

## 2.0 INTERIOR SPACES

### 2.1 Flooring

#### Vinyl Tiles (VAT)

The original vinyl asbestos tiles show signs of advanced wear. Common throughout the facility, damaged tiles have been randomly replaced with newer tiles of differing colour and pattern. In 2014 in the north wing second level some classrooms and parts of the corridors have received new tile replacements. The finish in these corridors lack continuity as illustrated by the breaks between newer and older tiles (Photo 2.1.F next page).

The following are some common observation of existing tile conditions, with illustrations.

- Random pattern of replacement tiles (Photo 2.1.A)
- Surface wear through scuffing and rubbing (Photo 2.1.B)
- Surface staining (Photo 2.1.C)
- Joint separation resulting in uneven joints (Photo 2.1.D)
- Delaminating, missing sections of rubber base (Photo 2.1.E next page)



Photo 2.1.A - Classroom 1014 (Room 113A)



Photo 2.1.B – Classroom 2064 (Room 262)



Photo 2.1.C - Classroom 2057 (Room 263)

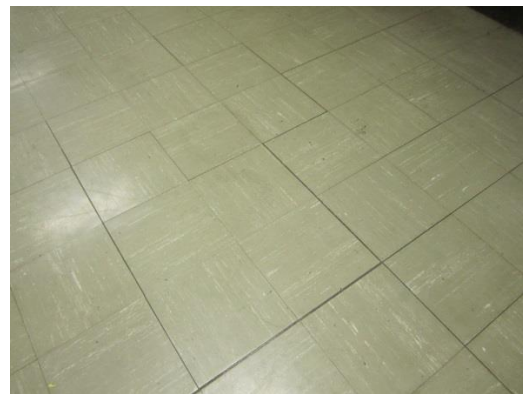


Photo 2.1.D – Corridor 2052





Photo 2.1.E – Classroom 1014 (Room 113A)



Photo 2.1.F – Corridor 2016

Other Flooring:

Both the Boys and Girls Change Rooms have a coloured hardener finished concrete floor. The finish is in an advanced state of wear exposing the original concrete subfloor below. (Photos 2.1.G and 2.1.H)



Photo 2.1.G – Boys Change Room 1071A



Photo 2.1.H – Girls Change Room 1078D

All circulation areas including corridors, stairs and vestibules have a terrazzo floor finish. The terrazzo has aged very well and continues to show good wear resistance.



## 2.2 Ceilings

### Acoustic Ceiling Tile

Common throughout the facility, classrooms were observed to have older type ceiling tiles with some newer replacement tiles. The result is a random pattern of differing tile types and age.

With the exception of some classrooms that have had entire ceiling replacements, the T-bar grids in the facility are original and exhibit signs of surface discoloration. In most classrooms where the acoustic tiles have been replaced, in whole or part, the ceilings still have the original T-bar grids.

The following are some common observations of existing ceiling conditions with illustrations.

- Partial tile replacement resulting in non-uniform ceiling finish (Photo 2.2.A)
- Tiles stained by insufficiently filtered diffuser air supply (Photo 2.2.B)
- Tiles stained from water source (Photo 2.2.C)
- Tiles sustaining surface impact related damage (Photo 2.2.D)



Photo 2.2.A - Classroom 2061 (Room 267)



Photo 2.2.B – Classroom 1047 (Room 133a)



Photo 2.2.C - Classroom 2035 (Room 233)



Photo 2.2.D – Stairs 2038

The Girls Change Room has a suspended acoustic tile ceiling with continuous taping along the T-bar grid sealing the tile perimeters together to the T-bar grid. The ceiling tiles including the taping are painted out. It appears this ceiling was taped to control moisture migration. The tape is delaminating in certain areas and there are signs of tile cracking due to pressure differential. (Photos 2.2.E and 2.2.F)



Photo 2.2.E – Girls Change Room 1078D



Photo 2.2.F – Girls Change Room 1078D

#### Other Ceilings

The gypsum board ceiling in the Boys Change Room is exhibiting signs of surface finish deterioration. The finish deterioration is predominately related to moisture environment and possibly inadequate ventilation. A segment of gypsum board ceiling located at the entrance to the showers has been replaced. (Photo 2.2.G)

The vestibule ceilings are typically finished in a 12x12 perforated metal tile. There are some areas where these tiles have sustained impact type damage resulting in warped tiles. (Photo 2.2.H)



Photo 2.2.G - Boys Change Room 1071A



Photo 2.2.H - Stairs 1045 and 2030

## 2.3 Other Interior Spaces

### Walls

Masonry walls and finishes generally remain in good condition. There are several areas with deteriorating finishes that require repair (Photo 2.3.A). The glazed block in the Boys Showers has water stains below the shower units. Gypsum board partition dividers between some classrooms generally remain in good condition, however, there are a few examples of surface damage or deterioration (Photo 2.3.B).



Photo 2.3.A – Classroom 2035 (Room 233)



Photo 2.3.B – Classroom 2036 (Room 235A)

### Interior Doors

The solid core wood doors, typical for this facility, generally remain in good condition. However, advanced surface wear of the stained veneer finish is common for most doors. Door frames are in need of repainting. (Photos 2.3.C and 2.3.D)



Photo 2.3.C – Classroom (Room 117A)

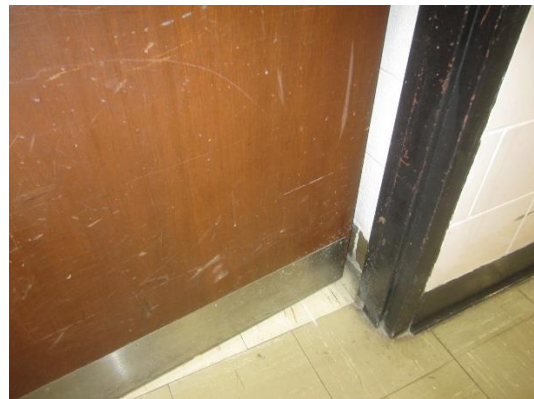


Photo 2.3.D – Classroom 2061 (Room 267)



### Washrooms

There have been recent washroom renovations to the north wing including the Girls and Boys main washrooms on the second level. All other existing washrooms in the facility are in similar need of updating to replace the existing aged Bradley's, toilet partitions and the older plumbing equipment with new efficient fixtures. (Photos 2.3.E and 2.3.F)



Photo 2.3.E – Boys Washroom 1027



Photo 2.3.F – Boys Washroom 1027

### Other Equipment

**Millwork:** The existing millwork in the facility remains in fair condition. There are examples of millwork that have sustained extensive surface wear or damage (Photo 2.3.G), however, for the most part the original millwork still has an ongoing serviceable lifespan.

**Lockers:** The existing lockers remain in fair serviceable condition. There are several examples of missing locker doors and lockers with dented and warped doors from impact damage. (Photo 2.3.H)



Photo 2.3.G - Science Lab 1024 (Room 118)



Photo 2.3.H

### 3.0 BUILDING ENVELOPE

#### 3.1 Exterior Walls

This building has a double wythe masonry wall construction comprised of an interior concreted block wall and interlocked clay brick cladding exterior. These walls do not have a cavity space with insulation. The exterior facades are accented with vertical precast concrete pilaster trims alongside the windows, joints, and precast concrete frieze design pattern as a continuous parapet band. The overall wall construction and cladding elements generally remain in good condition. There are some areas where deteriorated conditions were noted and the following is a summary of observations made:

- Water based stain related to blocked or improper flashing, inadequate venting and drainage out (Photos 3.1.A and 3.1.B)
- Brick cladding at base of wall has absorbed moisture. It appears that the potential source is external; ongoing monitoring would confirm this. (Photo 3.1.C)
- Water based stain due to improper roof drainage from accumulated vegetation debris (Photo 3.1.D)



Photo 3.1.A



Photo 3.1.B



Photo 3.1.C



Photo 3.1.D

- South elevation – there were a few areas of brick deterioration due to weathering (Photo 3.1.E)
- Rust spots on precast concrete frieze. Possible causes: exposed rebar or metallic component in aggregate. (Photo 3.1.F)
- Crack and separation in poured concrete foundation wall (Photo 3.1.G)
- Concrete surface finish discoloration (Photo 3.1.H)



Photo 3.1.E



Photo 3.1.F



Photo 3.1.G



Phot 3.1.H



### 3.2 Windows and Entrances

The windows in this facility are the original aluminum frame operable windows with single pane glazing. The glazing types are tinted glass and fixed translucent plastic panels. The existing windows are generally in an advanced state of wear and starting to deteriorate. The following are the observations made with illustrations outlining the various issues with the existing window system in place. Similar to windows, the original entrance doors and glazing exhibit advanced state of surface wear. The entrance doors operation remains in fair condition and still have ongoing service life.

- Some existing frames are showing signs of corrosion. Corrosion also visible at the spandrel panel edge joint. (Photo 3.2.A)
- Common throughout is the deterioration and delaminating perimeter caulking. In some areas large gaps have been exposed allowing water infiltration. (Photo 3.2.B)
- Hopper window operation is difficult and weatherstripping has deteriorated or is missing (Photo 3.2.C)
- Several windows found permanently closed and taped around hopper window (Photo 3.2.D)



Photo 3.2.A

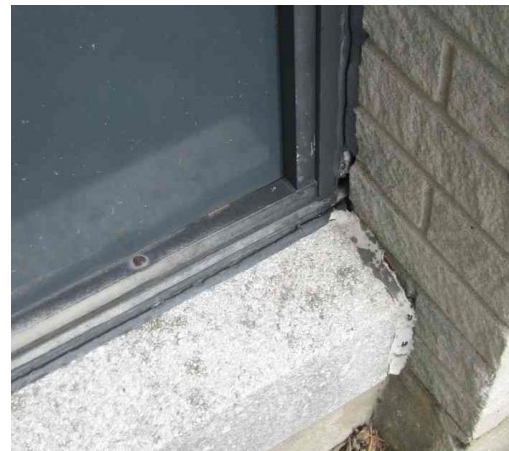


Photo 3.2.B

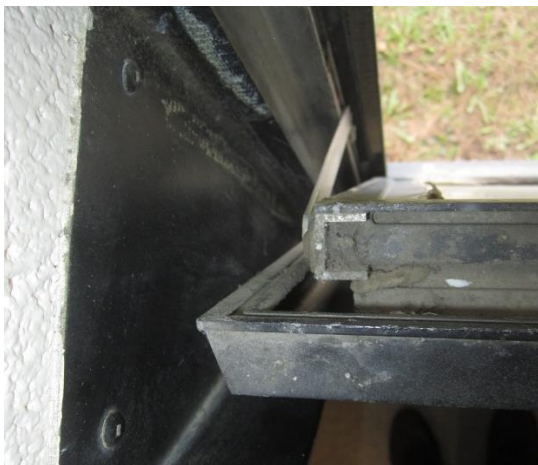


Photo 3.2.C - Classroom 1041 (Room 113A)



Photo 3.2.D – Classroom 1033 (Room 123)

- Aluminum finish showing surface wear (Photo 3.2.E)
- Several of the plastic window panes encountered were painted out, having an unsightly appearance (Photo 3.2.F)
- Spandrel panel finish in advance state of wear
- Music Room window bottom sill covered in soil and preventing proper drainage (Photo 3.2.G)
- Exterior entrance doors showing surface wear (Photo 3.2.H)



Photo 3.2.E – Classroom 1014 (Room 113A)



Photo 3.2.F – Stairs 1045 and 2030



Photo 3.2.G



Photo 3.2.H



## 4.0 SITE

The school is located on a large parcel of land with large frontage along the north boundary. The following are observations of some site related items noted:

- Sidewalk settlement along building perimeter poses a tripping hazard and watershed flows back toward building, north elevation of north wing (Photo 4.0.A)
- Concrete retaining wall feature exhibiting surface wear and staining. Existing guard rail is not to current code standards (Photo 4.0.B)
- Walkway continues over sod and exposed soil leading to erosion (Photo 4.0.C)
- Segments of depleted sod to be replaced (Photo 4.0.D)



Photo 4.0.A



Photo 4.0.B



Photo 4.0.C



Photo 4.0.D

## **5.0 RECOMMENDATIONS**

### **1.0 ACCESSIBILITY**

It is recommended that improved accessibility be provided throughout the facility. Given the lack of accessible access to the second floor and the existing split floor levels, two new elevators should be added to provide complete accessible coverage. We recommend one elevator be located in either Stair 1012 or Stair 1057 to allow access to the split floor levels. A second elevator shall be provided in either Stair 1018 or 1045 to allow access to the third level and the split levels at the north end of the north wing.

### **2.0 INTERIOR SPACES**

#### **2.1 Flooring**

The existing vinyl asbestos tile flooring is at the end of its visible life cycle and replacement is recommended. This undertaking would also remove an existing ACM component in the building.

#### **2.2 Ceilings**

The original acoustic ceiling tiles and suspended T-bar grid are near the end of their typical life cycle and replacement is recommended, especially coordinated with future lighting upgrades. Since these are components that are not exposed to direct contact wear, they can be kept in place in an extended lifespan and used to facilitate future phased in replacements.

It is recommended that the acoustic tile and T-bar grid ceiling in the Girls Change room be replaced with moisture resistant gypsum board ceiling. At the same time the damaged gypsum board ceiling in the Boys Change Room should be replaced.

#### **2.3 Other Interior Spaces**

Interior Doors: Interior wood doors remain in serviceable condition and it is recommended that they are refinished to extend their lifespan. Existing door hardware should be inspected for operational deterioration and replaced where required. Hollow metal doors remain in good condition and only require repainting. Door hardware should also be inspected as part of ongoing maintenance and upkeep.

Washrooms: Other existing washrooms in the facility should be upgraded with new plumbing fixtures, toilet partitions, and related equipment. Upgrades should include barrier free design and provisions.

Other Equipment:

Millwork - The existing millwork in the facility remains in serviceable condition, however, it is recommended that any future renovations of rooms should include replacement of the existing millwork within the room.

Lockers - All repairs or replacement of damaged locker doors or related equipment to remain as part of ongoing maintenance program.

**3.0 BUILDING ENVELOPE**

**3.1 Exterior Walls**

Recommended external cladding repairs including cleaning and repointing at deteriorated brick and repairs of other items noted in the assessment.

**3.2 Windows and Entrances**

Due to the advanced state of wear and deterioration, the existing windows are at the end of their life cycle and full replacement is recommended. New windows will provide improved energy efficiency.

Due to the state of wear of the existing entrance doors it is recommended that they are included as part of the window replacement work. This would also ensure aesthetic continuity.

**4.0 SITE**

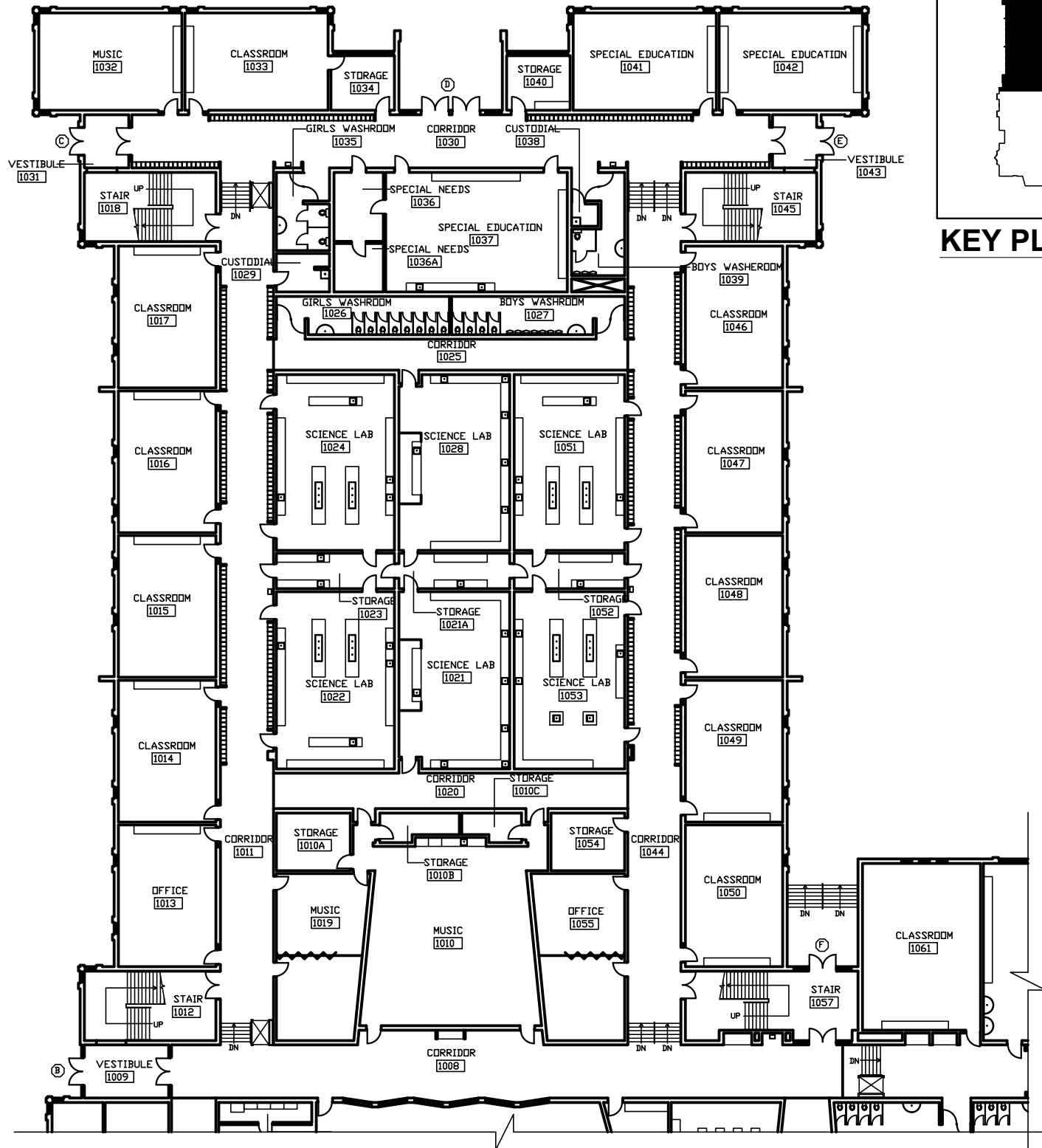
Recommended site improvements include upgrade of all guard railing to current code standards, repairs or replace sidewalks and eliminate potential surface erosion by re-sodding dead areas and introduce new walkways over travelled areas.

## 6.0 OPINION OF PROBABLE COST

The probable costs for each repair and/or replacement is detailed in the table below. The estimated costs in the table are divided into short-term and long-term categories. The costs for the mechanical and electrical recommended repairs for current needs and maintenance of integrity have been compiled as short-term costs. Improvements to M&E system functions have been compiled as long-term costs. The order of magnitude costs indicated are in 2015 values and is our opinion of probable construction cost to repair or replace the indicated component based on our experience.

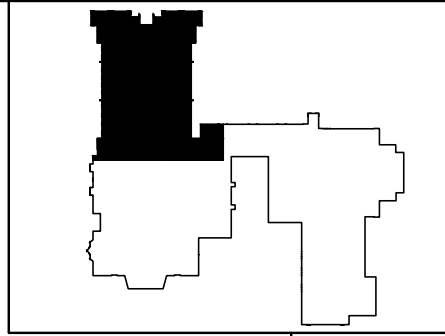
Description of Work	Estimated Costs		
	Short Term 1-5 yrs. (±)	Long Term 6-10+ yrs	Total
<b>Interior</b>			
Vinyl tile flooring replacement (costs phased)	180,000	180,000	
Ceilings – Drywall: change rooms & repairs	75,000		
Ceilings, long term ACT replacement (costs phased)	70,000	70,000	
Door & frame refinishing		40,000	
Repainting: classrooms		130,000	
Washroom upgrades		250,000	
Other general upgrades	20,000	50,000	
Door hardware repair or replacement	10,000	80,000	
Proposed new elevators (2)	300,000		
<b>Building Envelope</b>			
Window & entrances replacement		220,000	
Other exterior repairs (maintenance)	50,000	50,000	
Roofing: replacements & upgrades (refer to attached report)	95,000		
<b>Site</b>			
Short & long term needs, improvements (costs do not include proposed north parking lot)	50,000	50,000	
<b>Mechanical</b> (refer to attached report)			
Short & long term needs, improvements	2,070,000	3,310,000	
<b>Electrical</b> (refer to attached report)			
Short & long term needs, improvements (new lighting upgrade costs phased between short & long term)	390,000	705,000	
<b>Total</b>	<b>\$3,310,000</b>	<b>\$5,135,000</b>	<b>\$8,445,000</b>



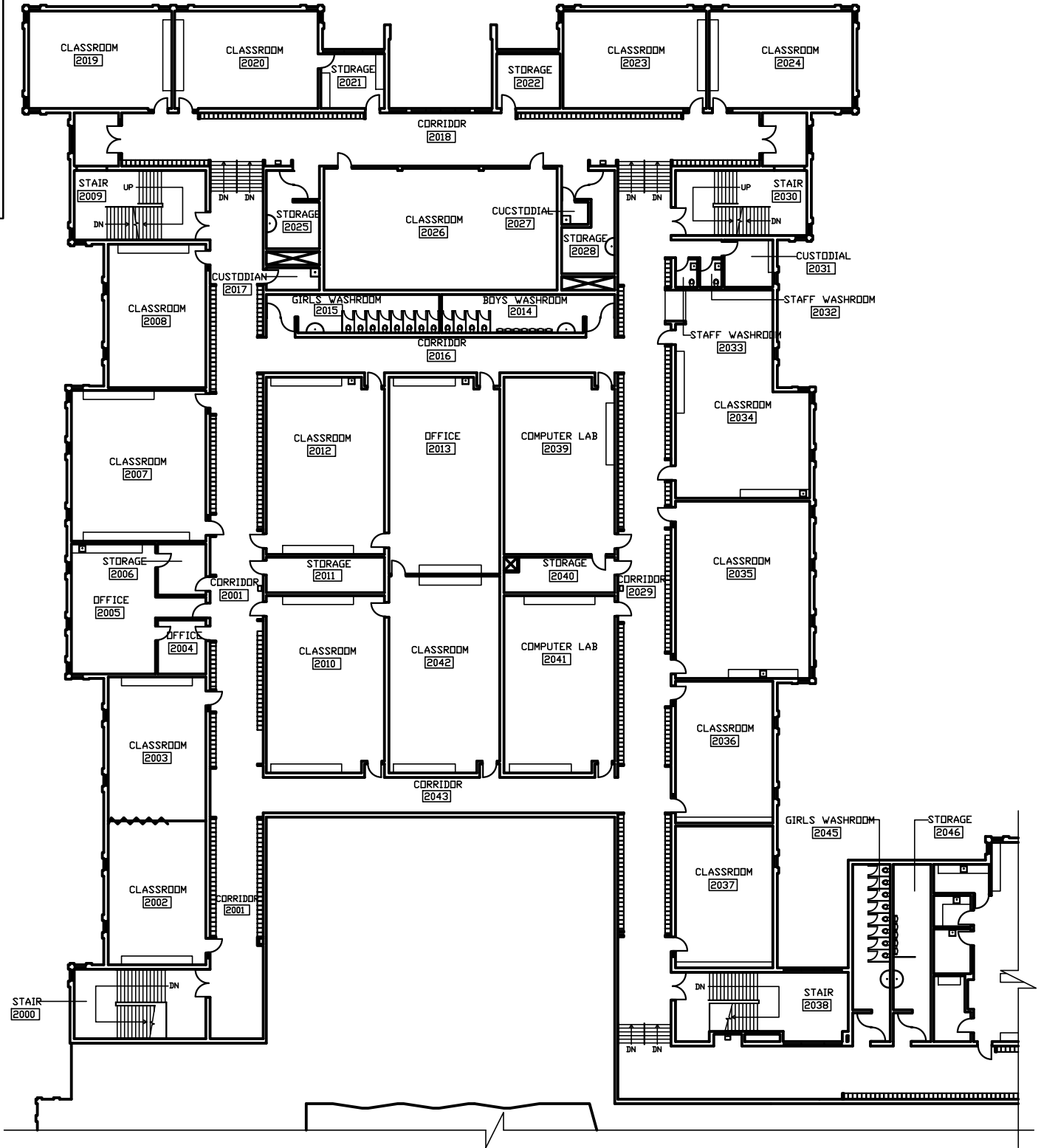


**NORTH WING - 1ST FLOOR**

NTS



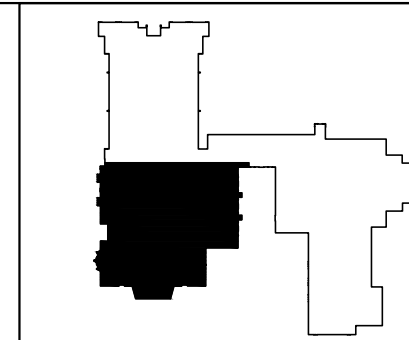
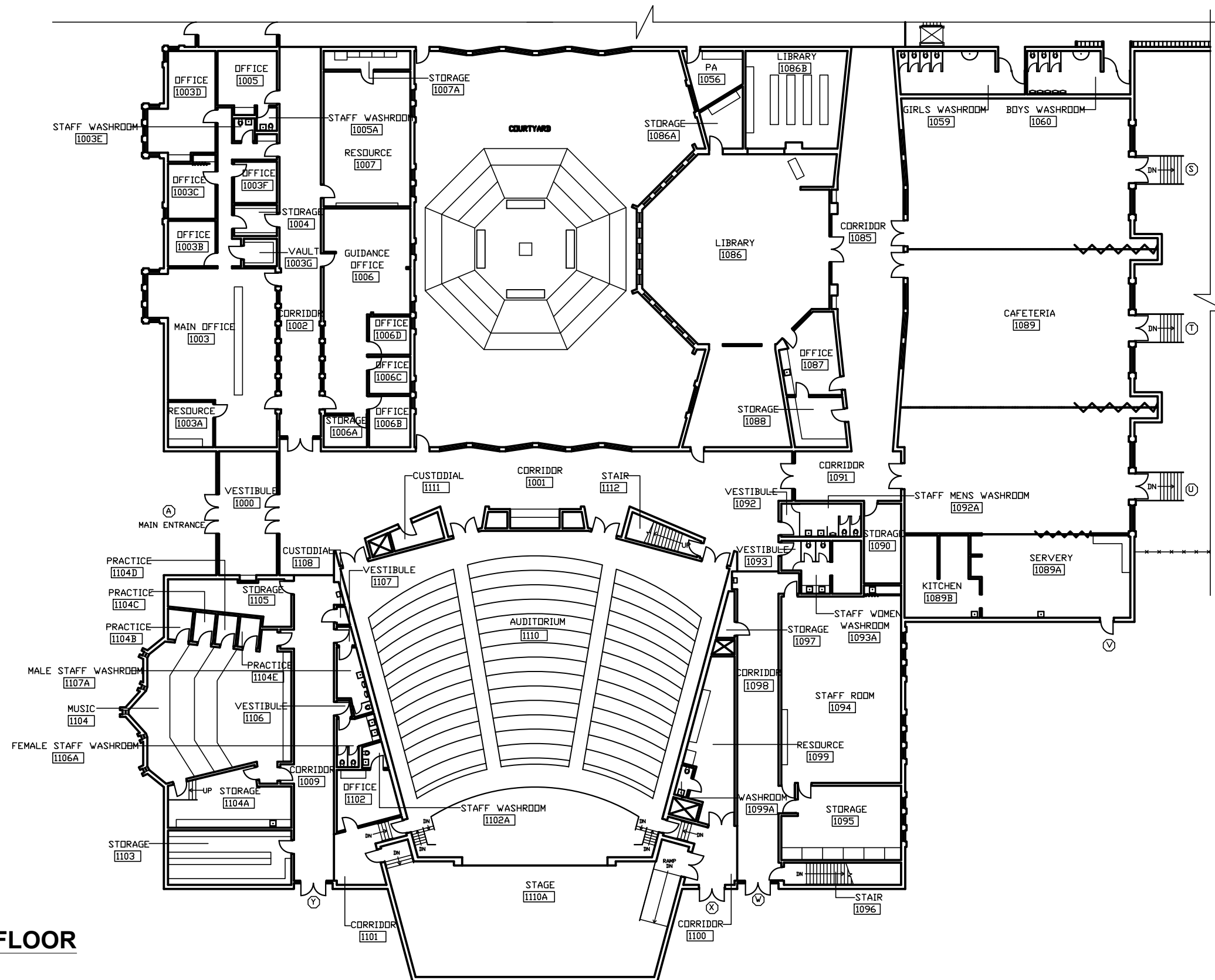
**KEY PLAN**



**NORTH WING - 2ND FLOOR**

NTS





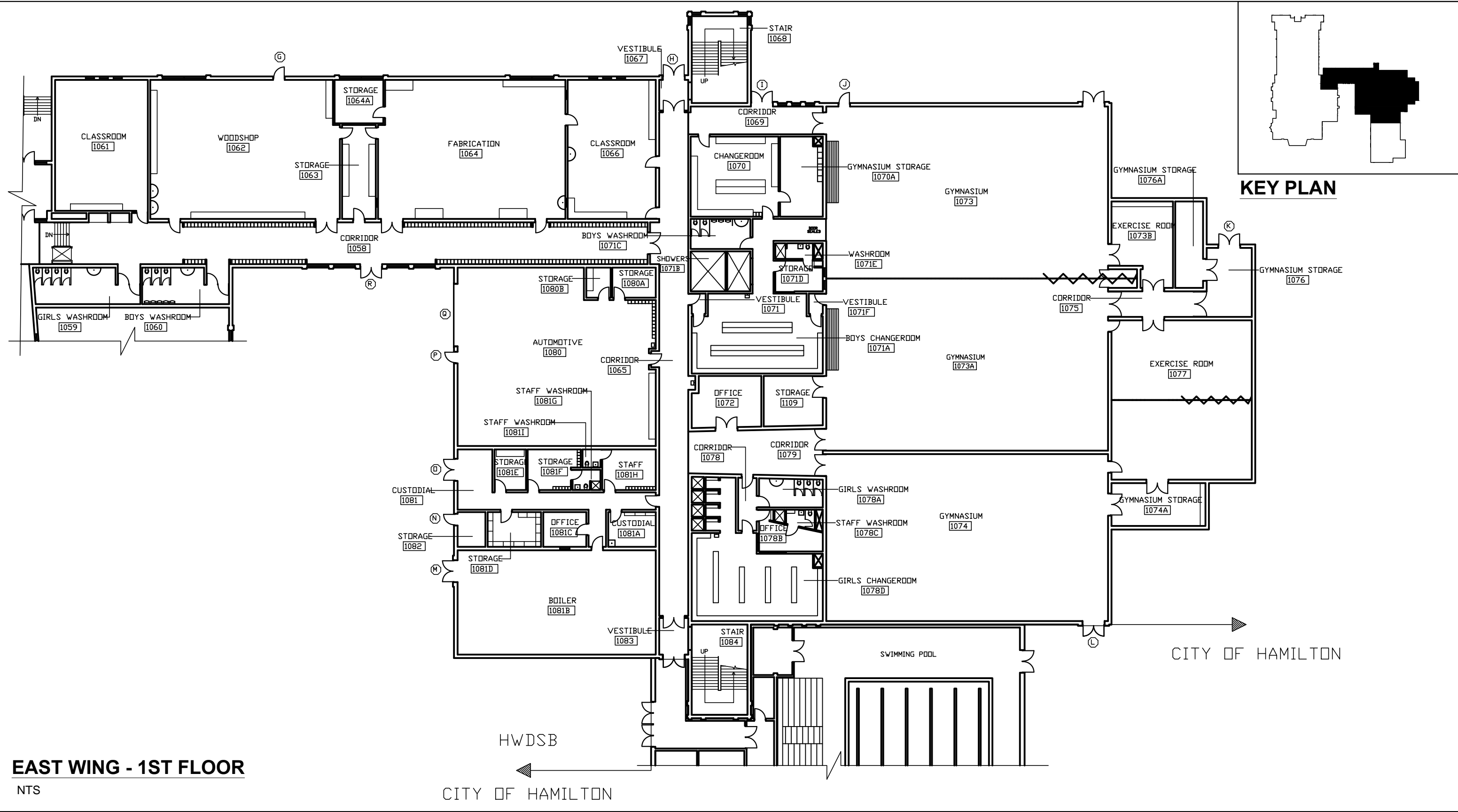
**KEY PLAN**

**SOUTH WING - 1ST FLOOR**

NTS



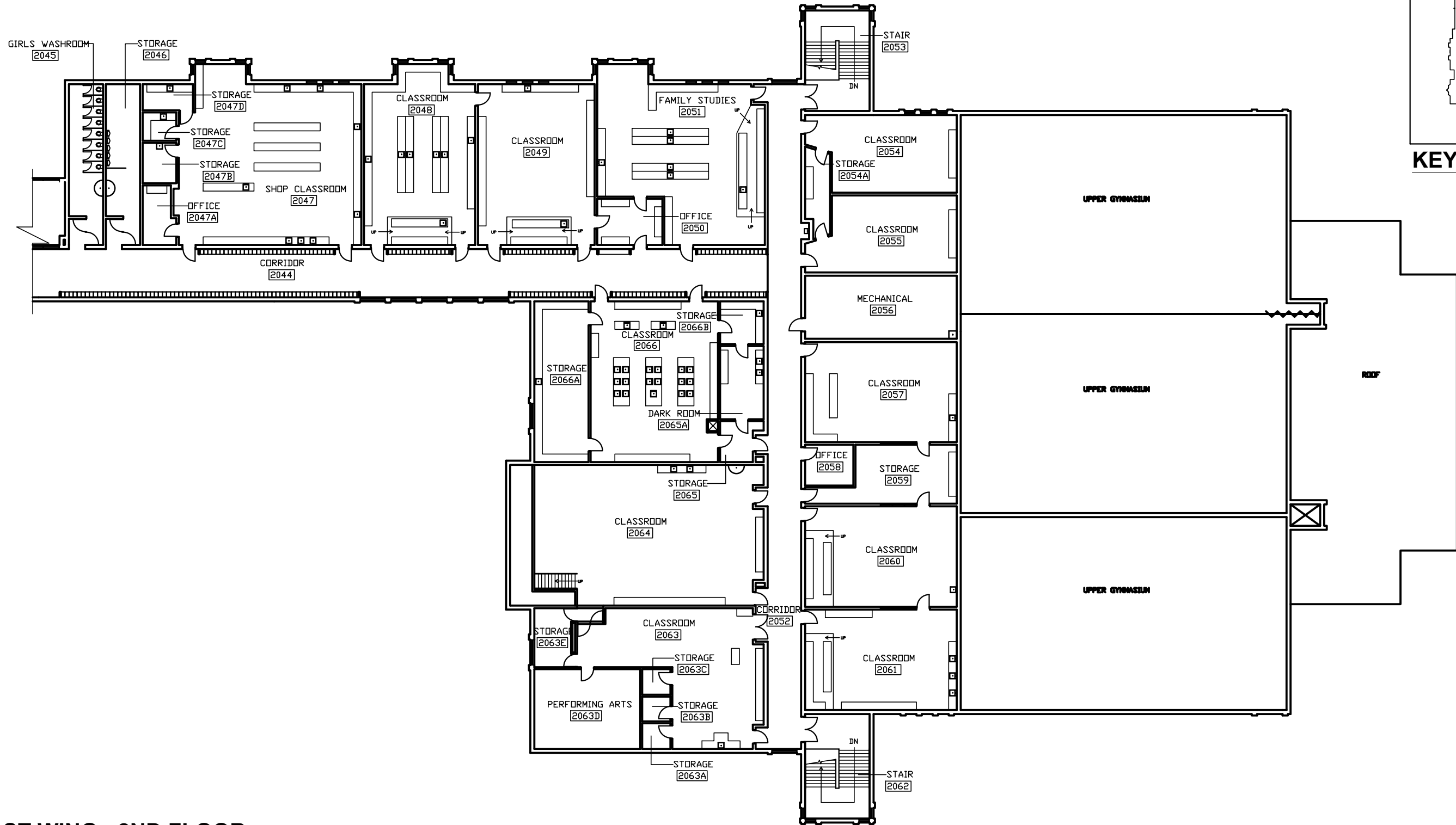




**EAST WING - 1ST FLOOR**

NTS





**KEY PLAN**

**EAST WING - 2ND FLOOR**

NTS



**GRGURIC**  
ARCHITECTS  
INCORPORATED



**SIR ALLAN MACNAB HIGH SCHOOL**  
**FACILITY CONDITIONS ASSESSMENT**  
145 MAGNOLIA DRIVE, HAMILTON, ONTARIO

DATE:  
MAY 14th, 2015



HAMILTON WENTWORTH  
DISTRICT SCHOOL BOARD

**A5**

**ROOF CONDITION ASSESSMENT  
SIR ALLAN MACNAB SECONDARY SCHOOL  
145 MAGNOLIA DRIVE  
HAMILTON, ONTARIO**



Prepared for:

Mr. Walter Paolone  
Grguric Architects Incorporated  
28 King Street, Unit B  
Stoney Creek, Ontario  
L8G 1J8

**ALSPEX Building Consultants Inc.**

66 Westlawn Drive, Hamilton, Ontario, L9B 2K9  
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## **Table of Contents**

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### **APPENDICES**

**Appendix A – Photographs (6 Pages)**

**Appendix B – Roof Plan, Drawing A1**

## 1.0 Introduction

Alspex Building Consultants Inc. (Alspex) was retained by Grguric Architects Incorporated to conduct a visual Roof Condition Assessment of the roof systems at Sir Allan MacNab Secondary School, located at 145 Magnolia Drive, Hamilton, Ontario.

Field review of this assessment was carried out on May 1, 2015 under ideal weather conditions.

**Appendix A - Photographs** contains overall and close-up views of the building, roof areas and typical deficiencies.

**Appendix B – Roof Plan, Drawing A1** is provided as a reference only in conjunction with this report, identifying the Roof Areas. Approximate size of each area is also provided.

## 2.0 Scope of Work

The purpose of this visual Roof Condition Assessment was to determine the 'as is' condition of the Built-Up Asphalt and Gravel Roof and Modified Bituminous Membrane roof systems and provide recommendations for repair or replacement.

Our observations and recommendations are itemized within this report under separate headings. Our observations, recommendations and opinions are based on our visual assessment and components exposed to view.

The scope of work for this roof assessment included the following:

1. Discussion with custodial staff
2. Visual review of roof surface to identify deficiencies.
3. Assessment of 'as is' roof system performance
4. Description and photographic documentation of deficiencies.
5. Written documentation outlining our observations and recommendations for repair or replacement.

### 3.0 Discussion

The subject facility, Sir Allan MacNab Secondary School, is a two-to-three storey high secondary school, with low slope roof systems and one steep slope roof, Area K1.

As per the custodial staff, there are no active 'roof leaks'.

The roof comprise of Built-Up Asphalt and Gravel Roof Systems (BUR) and two Modified Bituminous Membrane Roof (MB) areas. Total roof area is approximately **11,390 square metres** (122,605 sq. ft.).

Roof areas designations and approximate sizes are referenced in Appendix B – Roof Plan, Drawing A1.

The BUR areas are approximately 7-10 years old. The MB roof on Area G1 is less than one year old and the MB roof on Area K1 is between 15-20 years old.

The majority of the roof areas drain to an internal roof drainage system. Roof Areas D4, F1, H1, H2, H3, K1 drain to scuppers/downspouts to the lower roof areas,

General description of roof areas is as follows:

1. Area A1 – the mechanical penthouse, comprises of built-up asphalt and felt membrane with an asphalt flood coat and gravel surfacing.
2. Area B1 – comprises of built-up asphalt and felt membrane with an asphalt flood coat and gravel surfacing.
3. Areas C1, C2, C3, C4 – comprises of built-up asphalt and felt membrane with an asphalt flood coat and gravel surfacing.
4. Areas D1, D2, D3, D4, & D5 – comprises of built-up asphalt and felt membrane with an asphalt flood coat and gravel surfacing.
5. Areas E1 & E2 – comprises of built-up asphalt and felt membrane with an asphalt flood coat and gravel surfacing.
6. Area F1 – comprises of built-up asphalt and felt membrane with an asphalt flood coat and gravel surfacing.
7. Area G1 – comprises of a modified bituminous membrane, that is less than one year old
8. Areas H1, H2. & H3 – comprises of built-up asphalt and felt membrane with an asphalt flood coat and gravel surfacing.
9. Area J1 – comprises of built-up asphalt and felt membrane with an asphalt flood coat and gravel surfacing.
10. Area K1 – comprises of a modified bituminous membrane

During our roof review, we also noted deficiencies with the masonry and precast walls, window sealants and failing concrete at Area K1. These items should be reviewed under a building envelope assessment. Sample deficiencies are shown in Photograph# 31 to 36.

#### 4.0 Observations

Area	Roof System	Approximate Area	Condition
A1	Asphalt and Gravel	203 sq. m	Fair Drains clogged, wind scouring, cracked or loose bricks
B1	Asphalt and Gravel	808 sq. m	Fair Drains clogged, wind scouring, vegetation
C1	Asphalt and Gravel	425 sq. m	Fair Drains clogged, vegetation
C2	Asphalt and Gravel	425 sq. m	Fair Drains clogged, vegetation, membrane felt exposed
C3	Asphalt and Gravel	573 sq. m	Fair Drains clogged, membrane felt exposed, vegetation, damaged vent sleeves
C4	Asphalt and Gravel	573 sq. m	Fair Drains clogged, vegetation,
C5	Asphalt and Gravel	83 sq. m	Fair Drains clogged, vegetation
D1	Asphalt and Gravel	2443 sq. m	Fair Drains clogged, vegetation, conduits and goosenecks not sealed or cracked
D2	Asphalt and Gravel	998 sq. m	Fair Drains clogged, vegetation, conduits and goosenecks not sealed or cracked
D3	Asphalt and Gravel	118 sq. m	Fair Metal cap flashings blow off
D4	Asphalt and Gravel	75 sq. m	Fair Downspout repairs required
D5	Asphalt and Gravel	56 sq. m	Fair Drain clogged



## Observations (Cont'd)

Area No.	Roof System	Approximate Roof Area	Condition
E1	Asphalt and Gravel	245 sq. m	Fair Drains clogged, mortar control joint failure, east and west sides
E2	Asphalt and Gravel	2698 sq. m	Fair Drains clogged, vegetation, wind scouring, conduits not sealed, mastic cracked
F1	Asphalt and Gravel	106 sq. m	Fair Vegetation/debris on roof surface
G1	Modified Bituminous Membrane	813 sq. m	Good
H1	Asphalt and Gravel	88 sq. m	Fair
H2	Asphalt and Gravel	88 sq. m	Fair
H3	Asphalt and Gravel	88 sq. m	Fair
J1	Asphalt and Gravel	314 sq. m	Fair Drains clogged, vegetation, Masonry walls require review/repairs
K1	Modified Bituminous Membrane	169 sq. m	Fair-to-Poor Membrane weathered, alligating Scuppers clogged Concrete failing Metal soffit blow-off
Total Area		11,390 sq. m	

Our assessment and opinions are based on items, materials and systems exposed to view or accessible. Professional experience and judgment was applied in analyzing and interpreting the information obtained and in providing our recommendations and forming our conclusions. Any use, reliance or decisions made from this report by a third party is responsibility of such third party. Alspex does not accept any responsibility on decisions or actions made and based on this report by any third party.

## 5.0 Recommendations and Budgets

Based on our visual review and condition of existing roof systems, the following recommendations are provided.

Year	Recommendation	Area	Size	Scope of Work	Preliminary Budget
2015-2016	Roof Replacement (Does not include repairs to concrete)	K1	169 m <sup>2</sup>	Provide insulated 2-Ply Modified Bituminous Membrane	\$70,000.00 to \$80,000.00
2015	Repairs - Clean all drains and scuppers - Remove vegetation - Reinstall missing metal cap flashing - Spray foam and caulk all conduit sleeves and pitch-pans - apply cold adhesive and gravel at 'wind scoured corners' - repair membrane flashings - repair damaged downspout - apply cold adhesive, membrane felt and gravel, where felt is exposed - replace damaged vent sleeves	All Areas and where noted		Cash Allowance	\$8,000.00 to \$12,000.00

Preliminary budgets have been provided as a guideline only. Actual costs will depend on final design considerations, time of tendering, restrictions imposed on contractor regarding schedule, insurance requirements, etc.

## **6.0 Conclusions**

Based on our visual assessment and observations, it is our opinion that only Area K1 is failing and requires replacement within the next 6-12 months.

All other areas should provide another 10-15 years of service life, but remedial work is required and an annual maintenance program will be required to clean drain/scupper areas and remove vegetation and debris.

Although not part of our roof assessments, we noted failing masonry units/walls, precast wall joints, sealant joints and metal panels. These deficiencies should be addressed.

We trust that we have completed this assignment within our terms of reference and have provided you with the required information.

Should you have any questions, please do not hesitate to contact the undersigned.

Sincerely,



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Spyros Aplidgiotis, C.E.T., RRO  
Managing Director  
Alspex Building Consultants Inc.

Encl.: Appendix A – Photographs, 6 pages  
Appendix B – Roof Plan, 1 Page

**Client:** Grguric Architects  
**Service:** Roof Condition Assessment  
**Project:** Sir Allan MacNab Secondary School  
**Location:** 145 Magnolia Drive, Hamilton, Ontario

---



**GHR15-028B**  
**May 12, 2015**

## Appendix A Photographs



**Photograph 1** – West elevation of school  
**Orange arrow** – Areas C4  
**Yellow arrow** – Area E2



**Photograph 2** – S/E view from north-west corner of Area B1  
**Orange arrow** – Area A1, **Blue arrow** – Area B1  
**Red arrows** – masonry failure requires remedial work



**Photograph 3** – N-W view of Area B1  
**Red arrows** – vegetation/debris on roof surface



**Photograph 4** – S-W corner on Area A1  
**Red arrow** – view of gravel scoured corner exposing bitumen/felt



**Photograph 5** – S/E view from area C2  
**Yellow arrow** – Area C1, **Blue arrow** – Area C2  
**Orange arrow** – Area C3, **Green arrow** – Area C4  
**Red arrow** – vegetation



**Photograph 6** – N/W view from Area C3  
**Yellow arrow** – drain area with debris  
**Purple arrow** – exposed membrane felt  
**Red arrow** – damaged vent sleeves





**Photograph 7** – Close-up view of drain area in Photo# 6 from Area C3  
**Purple arrow** - exposed membrane felt at transition to sump



**Photograph 8** – View at north side Area C3  
**Red arrows** – damaged vent sleeves



**Photograph 9** – View of north perimeter Area D3  
**Red arrows** – metal cap flashing blow-off / damaged/missing



**Photograph 10** – East view from area D3  
**Yellow arrow** – Area D3, **Blue arrow** – Area D2  
**Red arrow** – metal flashing blow-off



**Photograph 11** – West view of Area D2  
**Yellow arrow** – vegetation  
**Red arrows** – conduit sleeves not sealed or mastic cracked



**Photograph 12** – Close-up view of typical conduit sleeve on Area D2  
**Red arrow** – no sealant, open to moisture  
**Orange arrow** – sealant cracked





**Photograph 13** – N/W view of Area D1  
**Yellow arrow** – vegetation  
**Orange arrow** – abandoned curbs



**Photograph 14** – View at S/W corner of Area D1  
**Red arrow** – excessive gravel scouring and exposed bituminous felt  
**Orange arrow** – masonry chimney required repairs



**Photograph 15** – View at south side of Area D1  
**Red arrow** – conduit sleeve open to moisture infiltration



**Photograph 16** – S/E view of Area D1  
**Orange arrow** – membrane flashings required repairs at seams  
**Red arrow** – abandoned unit  
**Yellow arrow** – mastic in pitch-pan failing



**Photograph 17** – N/W view of Area D4  
**Red arrow** – damaged downspout



**Photograph 18** – N/W view of area D4, in fair-to-good condition





**Photograph 19** – North-east view of Area D5  
 Roof system in fair-to-good-condition



**Photograph 20** – North view of Area J1  
**Red arrow** – minor vegetation/debris  
**Yellow arrow** – evidence of water ponding



**Photograph 21** – N/W view from Area D3  
**Orange arrow** – Area E2, **Yellow arrow**– Area E1  
**Red arrow** – joint failure, also on east wall  
**Blue arrow** – Area C5



**Photograph 22**–South view, Area E2, west section  
**Orange arrow** – Area E2, **Yellow arrow**– Area F1  
**Red arrow** – vegetation



**Photograph 23** – View at east perimeter Area F1  
**Orange arrow** – water discharge from Area F1 washing out gravel on Area E2



**Photograph 24** – S/W view of Area F1  
 Roof system in fair condition  
**Orange arrow** – vegetation/debris to bed removed





**Photograph 25** – S/E view Area E2, east section  
**Red arrow** – sealant at conduit penetration failing



**Photograph 26** – N/W view Area E2, east section  
**Red arrow** – conduit penetration not sealed



**Photograph 27** – South-west view from Area D2  
**Orange arrow** – Area H1, **Blue arrow** – Area H2  
**Yellow arrow** – Area H3, **Green arrow** – Area G1  
**Purple arrow** – Area K1, membrane weathered  
**Red arrow** – extensive vegetation/debris



**Photograph 28** – S/W view of area G1  
 Roof system in good condition



**Photograph 29** – View at north side Area K1  
**Red arrows** - damaged soffit, metal cap  
**Yellow arrow** – vegetation in scupper



**Photograph 30** – N/W view of Area K1  
**Red arrows** – mod. bit. membrane weathered, with 'alligating' n bitumen surface





**Photograph 31** – View at scuppers locations on Area K1  
**Red arrow** - concrete spalling at several locations and will require repairs



**Photograph 32** – North-west corner of Area A1  
**Orange arrows** - cracked mortar joints and dislodged masonry units



**Photograph 33** – View of typical drain clogged with vegetation



**Photograph 34** – View of failed joint on east wall between Area E1 & E2  
**Orange arrows** - cracked mortar joints  
**Red arrows** – failed sealant joints

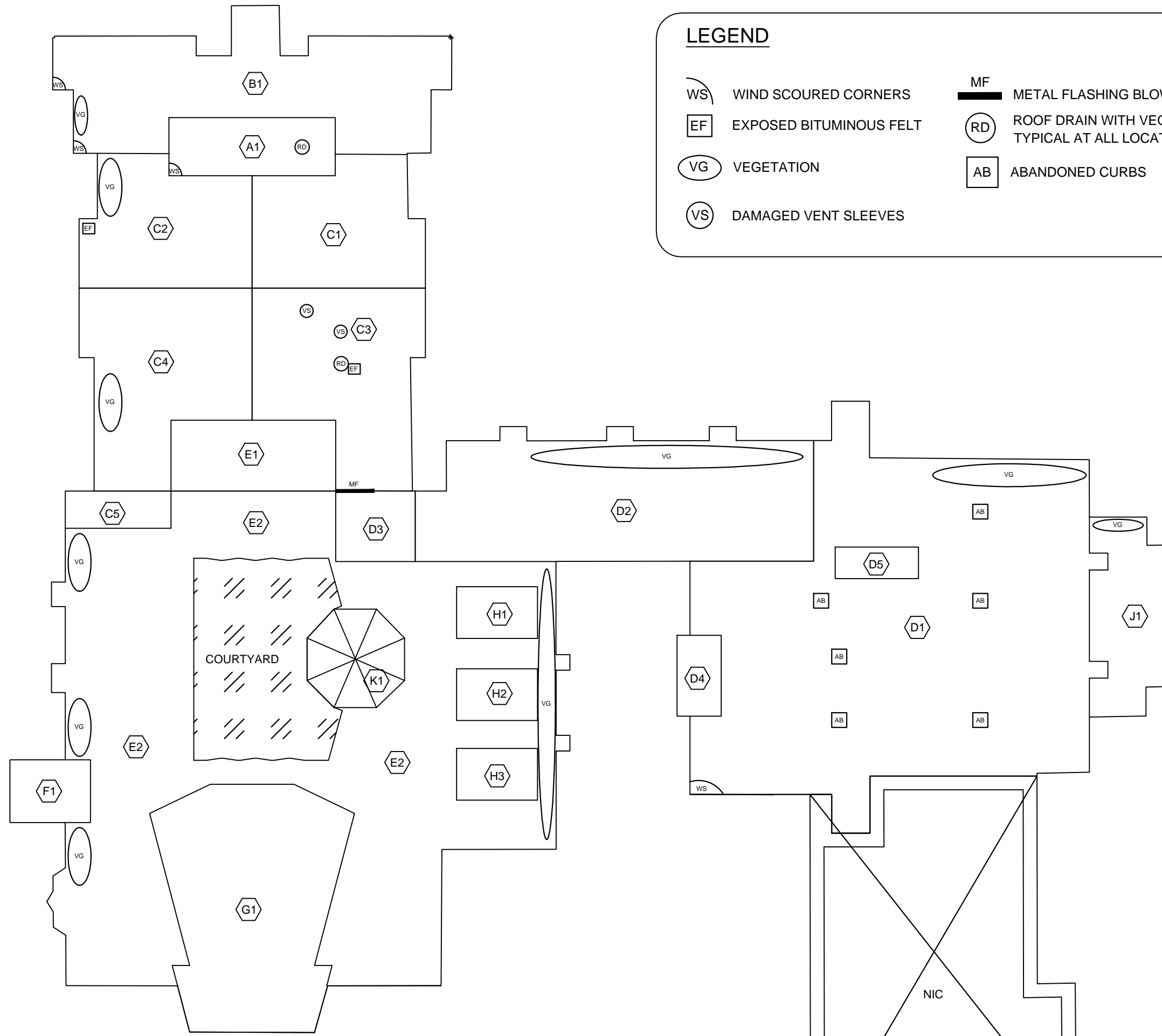


**Photograph 35** – Sealant failure at windows above Area E1



**Photograph 36** – Penetration through precast walls not sealed

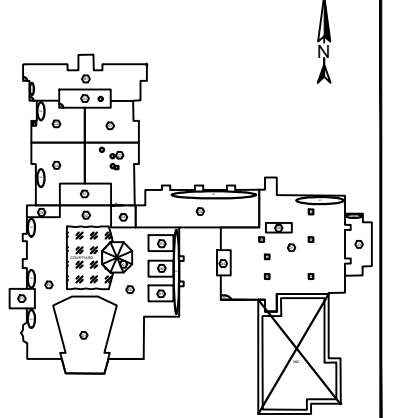
Appendix B  
Roof Plan – Drawing A1



## LEGEND

- WS WIND SCOURED CORNERS  
EF EXPOSED BITUMINOUS FELT  
VG VEGETATION  
VS DAMAGED VENT SLEEVES  
MF METAL FLASHING BLOW-OFF  
RD ROOF DRAIN WITH VEGETATION  
TYPICAL AT ALL LOCATIONS  
AB ABANDONED CURBS

## KEY PLAN




## LEGEND

ROOF	AREA (m <sup>2</sup> )
A1	203
B1	808
C1	425
C2	425
C3	573
C4	573
C5	83
D1	2443
D2	998
D3	118
D4	75
D5	56
E1	245
E2	2698
F1	106
G1	813
H1	88
H2	88
H3	88
J1	314
K1	169
TOTALS	11,390

2		
1	ISSUED WITH REPORT	05/12/2015
NO.	REVISION / ISSUE	DATE




CONSULTANT	
ALSPEX BUILDING CONSULTANTS INC.	
66 WESTLAWN DRIVE HAMILTON, ONTARIO, L9B 2K9 Tel: 905-575-0038 Fax: 905-575-0038 e-mail: info@alspex.ca	

CLIENT	
GRGURIC ARCHITECTS INCORPORATED 28 KING STREET, UNIT B HAMILTON, ONTARIO L8G 1J8	




PROJECT	ROOF CONDITION ASSESSMENT SIR ALLAN MACNAB SECONDARY SCHOOL 145 MAGNOLIA DRIVE HAMILTON, ONTARIO
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THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING AND VERIFYING EXISTING ASSEMBLIES, SITE CONDITIONS AND ALL DIMENSIONS. THIS DRAWING IS THE PROPERTY OF ALSPEX BUILDING CONSULTANTS INC. UNAUTHORIZED REPRODUCTION IS STRICTLY PROHIBITED WITHOUT THE WRITTEN CONSENT OF ALSPEX BUILDING CONSULTANTS INC. THE DESIGN INTENT IS SPECIFIC TO THIS PROJECT ONLY.



PROJECT NO. GHR15-028B	DRAWING TITLE KEY PLAN
DRAWN BY S. APLIDGIOTIS	DRAWING NO. A1
DATE MAY 2015	
SCALE NOT TO SCALE	


NO.	DESCRIPTION	PHOTOGRAPH	EXISTING CONDITIONS	SUITABILITY FOR LONG TERM USE	SYSTEM LIFE (YRS)	ESTIMATED REMAINING SERVICE LIFE (YRS)	CODE	BUDGET REPLACEMENT COST (\$)
M1	DRAINAGE SYSTEMS							
M1.1	STORM DRAINAGE		<p>The existing sewer is a separate from the Administration Wing and the Gym Wing as 15" storm sewers running out to the North East Municipal sewers. The sewers have not been recently traced and videoed and all of the original rain water leaders are piped to this original sewer. The sewers are original vintage 1967 interior cast iron and exterior vitreous clay tile. Storm sewers within the building are run down the centre of the ground floor corridors. Rain water leaders are piped in vertical chases to roof drains. Roof drains were changed with the last roof replacement.</p>	<p>In the future, the under ground sewer system should be lined or replaced completely. Lining of the larger sized pipe will be more economical than replacement. The sewer should be reconditioned out to the city sewer(s). During any renovations to the building, it should be planned to replace the storm sewers. This would necessitate saw cutting the ground floor with significant excavation outdoors.</p>	60	12	2	\$800,000
M1.2	SANITARY DRAINAGE		<p>The existing interior above grade sanitary drainage material is cast iron with leaded joints. Buried sanitary sewers are indicated as cast iron on the original building drawings. Sanitary sewer mains run down the centre of the corridors and out to the municipal sewer. The sewers have not been recently traced and videoed and all of the original sanitary risers are piped to this original sewer. The sewers are original vintage 1967 interior cast iron and exterior vitreous clay tile.</p>	<p>In the future, the under ground sewer system should be lined or replaced completely. The sewer should be reconditioned out to the city sewer(s). During any renovations to the building, it should be planned to replace the sanitary sewers. This would necessitate saw cutting the ground floor with significant excavation indoors and outdoors.</p>	60	12	2	\$1,100,000
M1.3	PLUMBING FIXTURES AND TRIM		<p>Washrooms on the Third floor have been renovated within the past 2 years. These washrooms were inactive for years prior to the 2014 renovations. After the renovations there were drainage leaks due to the poor condition of the drainage piping. These leaks are typical of older cast iron systems that have not been used regularly.</p> <p>The plumbing fixtures are generally original within the main washrooms. Condition is average with some new washfountains and WCs.</p>	<p>Many of the original plumbing fixtures are in good condition and could be retained however cosmetically, the washroom require upgrading. On the ground floor north washrooms, the fixtures are original and should be replaced.</p>	50	2	4	\$250,000








NO.	DESCRIPTION	PHOTOGRAPH	EXISTING CONDITIONS	SUITABILITY FOR LONG TERM USE	SYSTEM LIFE (YRS)	ESTIMATED REMAINING SERVICE LIFE (YRS)	CODE	BUDGET REPLACEMENT COST (\$)
M2	DOMESTIC HOT AND COLD WATER PIPING							
M2.1	INCOMING WATER SERVICE		<p>The 4" main city / fire water service enters from the North via a buried meter chamber into the Ground floor Custodians room at the North end of the Admin Wing. A main 4" supply runs in the corridor system from there to the Boiler room. The 4" potable meter and water service is original and a new 4" Watts St.St. 757 double check assembly backflow preventer has been installed in the Boiler Room on the potable water system.</p> <p>It is assumed that the 4" incoming water main is ductile iron.</p> <p>The Recreation centre has a separate 6" municipal water supply that comes onto the site from the South of the High School.</p>	<p>The potable water piping systems are copper pipe and fittings. The plumbing mains passing through the ground floor ceiling space appear to be original piping dating from 1967. For existing piping greater than 25 years old, there is likely a component of leaded solder on the joints and fittings. Any sections of main cold water supply that are more than 25 years old should be replaced. Annual testing of the backflow preventer is required by Code. The incoming water service should be pressure tested since the meter is remote from the building and any leakage is being charged to the Board.</p>	60	12	3	\$80,000
M2.2	PIPING		<p>The existing hot and cold water piping in some parts of the original piping systems may have some galvanized steel with screwed fittings. This should be confirmed. This piping is over 48 years old at this time and is due for replacement. The galvanizing on the internal water surfaces can be eroded away and may cause rust coloured water in some situations. Piping over drywall or sprayed textured ceilings was not replaced in 1996. Piping branch valves installed in 1967 are not operable and cannot be used to isolate sections of the School.</p>	<p>The original remaining piping systems have exceeded their expected lifespan. High city water pressure may cause unpredictable piping failures. Any galvanized potable water piping systems should be replaced with copper piping and lead free soldered joints. All new potable mains should be insulated with over-sized hangers and vapour barriers and new isolation ball valves installed at each riser set. Sectional isolation valves are recommended.</p>	50	2	2	\$500,000
M2.3	INSULATION		<p>Domestic piping insulation on corridor mains is fiberglass insulation dating from the original year 1967. Original fiberglass insulation with tar vapour barrier is used in the corridors. Services and directions of flow are not well marked. asbestos will still be on some piping located in inaccessible locations such as plaster ceilings.</p>	<p>Asbestos insulation within the Boiler room has been removed by an asbestos abatement firm. Any new piping will require new mineral fibre insulation and complete vapour barrier protection.</p>	60	12	2	\$150,000
M2.4	WATER HEATING SYSTEMS		<p>Domestic water is heated in the Boiler room via 6 gas fired instantaneous copper tube style water heaters with no conventional storage tank. The water heater is a forced draft venting system to the South exterior wall of the Boiler room. The domestic hot water is piped into the lower level corridor ceiling space system of the School and distributed to the washrooms and main Kitchen. There is a recirculation loop on the water mains to the boiler room. A main thermostatic mixing valve sets the maximum hot water temperature leaving the heating system.</p>	<p>The existing water heating system is acceptable and is recently installed. Demand is met by the systems with minimal standby losses. No changes are foreseen for 5 years. The sequencing panel set up should be checked annually to ensure the proper set points are active.</p>	15	10	2	\$50,000



NO.	DESCRIPTION	PHOTOGRAPH	EXISTING CONDITIONS	SUITABILITY FOR LONG TERM USE	SYSTEM LIFE (YRS)	ESTIMATED REMAINING SERVICE LIFE (YRS)	CODE	BUDGET REPLACEMENT COST (\$)
M3	HYDRONIC HEATING							
M3.1	PIPING AND ELEMENTS		<p>The School contains a average amount of hydronic heating and relies on the Ground floor ceiling space of the corridors for the main distribution piping loops for the heating energy. Entrance heaters at the stairwells and main entrances do contain hydronic heaters and these units should be repiped with new piping.The hydronic heating piping appears to be original 1967 vintage piping material and is steel with screwed joints. The piping has exceeded it's service life and requires replacement.</p>	<p>Replacement of the hydronic piping and horizontal mains in ceiling spaces to the Boiler Room will be expensive. Architectural finishes and pipe routing will dictate the routing of the heating mains and the reheat coils. In the Administration wing, the VAV boxes and the reheat coils were replaced in 2007 and should be servicable for another 20 years. Direct buried piping for the Auditorium wing runs from the Boiler room. 6" steel piping dates from 1967 , is buried in a 24" tile and is due for replacement.</p>	60	5	2	\$850,000
M3.2	PUMPS		<p>In-line and base mounted Heating pumps are located in the Boiler mechanical room. The pumps were new in 2007 as part of the heating plant.</p>	<p>Pumps are acceptable and may be replaced on an as needed basis.Variable speed drives can be added although most pumping loops appear to be constant volume loops.</p>	25	5	2	\$50,000
M3.3	INSULATION		<p>Heating piping thermal insulation in most cases is fiberglass material. All corridor piping systems that we reviewed on-site appeared to be fiberglas type insulation with foil vapour barrier or tar based paper vapour barrier. All Boiler room piping is insulated with fiberglass material and is in a suitable condition to continue to provide service for at least 25 years.</p>	<p>Any asbestos insulation in the School should be removed by an asbestos abatement company. New piping will require new mineral fibre insulation and complete vapour barrier protection.</p>	40	20	2	\$200,000

NO.	DESCRIPTION	PHOTOGRAPH	EXISTING CONDITIONS	SUITABILITY FOR LONG TERM USE	SYSTEM LIFE (YRS)	ESTIMATED REMAINING SERVICE LIFE (YRS)	CODE	BUDGET REPLACEMENT COST (\$)
M3.4	BOILERS		The heating boilers located in the School Boiler Room provide the primary heating of the hydronic heating loop for the School. One PK Mach 3000 Boiler was installed in 2014 and has not been operated yet. Three Thermal Solutions Boilers were installed in 2007 and provide light load operation with the 1000 input boilers and winter load with the 3000 input boiler. The four boilers vent to the original vertical masonry chimney through a gas liner.	The three Thermal Solutions Boilers date from 2007. The boilers have a service life of 20 to 25 years and will be servicable for another 15 years. Major changes to the School may consider alternate heating piping systems and routes but the central boiler plant should remain for reasons of efficiency and maintenance. Replacement of any of the boilers in the future is a simple task given the existing layout and modular heating plant approach.	25	5	2	\$300,000
M4	FIRE PROTECTION							
M4.1	SPRINKLERS		There are currently no fire protection sprinklers in the School.	We recommend the addition of extra fire extinguishers on each floor for protection.				\$20,000
M4.2	STANDPIPE		There is no standpipe system in the School.					

NO.	DESCRIPTION	PHOTOGRAPH	EXISTING CONDITIONS	SUITABILITY FOR LONG TERM USE	SYSTEM LIFE (YRS)	ESTIMATED REMAINING SERVICE LIFE (YRS)	CODE	BUDGET REPLACEMENT COST (\$)
M5	HVAC							
M5.1	VENTILATION		Local aluminum roof type exhaust fans provide washroom ventilation. The Central ventilation systems provides the ventilation air and free cooling for the School.	The exhaust fans are suitable for long term use. Fan capacities are adjustable if required. Most of the low pressure fans are 120 volt, single phase power supplies and are BAS controlled for occupied / unoccupied cycles.	30	10	2	
M5.2	COOLING SYSTEMS		In 2007, a roof mounted liquid chiller was installed on the Third Floor roof replacing the original split, air cooled chiller. The packaged chiller has unit mounted pumps and circulates glycol into the Third floor AHUS. AHU cooling coils were replaced in 2007 in the original AHUs. The Administration area is cooled via a Trane 12 ton RTU installed in 2007.	The existing chiller system is fully operational. The Administration cooling system is functional. The remaining operational lifespans are estimated at 10 to 15 years.	20	12	3	\$400,000
M5.3	AIR HANDLERS		The original 1967 Air Handling Units remain and are in fair condition. Cooling coils for the three Third Floor AHUS were replaced in 2007. The balance of the coils, fans and casings are original and may remain servicable for the next 10 years.	Replacement of fan belts, bearing s and replacing failed coils is a viable maintenance approach for the central AHUS. The fans have variable speed drives installed in 2007. The AHUS can be replaced with modular sectional AHUS if required however, the most economical approach is to maintain the fans and to repalce the coils as required.	60	10	3	\$350,000



NO.	DESCRIPTION	PHOTOGRAPH	EXISTING CONDITIONS	SUITABILITY FOR LONG TERM USE	SYSTEM LIFE (YRS)	ESTIMATED REMAINING SERVICE LIFE (YRS)	CODE	BUDGET REPLACEMENT COST (\$)
M5.4	DUCTWORK		The original supply and return ductwork is still installed in the corridor ceiling spaces. The ductwork can be cleaned and repaired as required and only minor modifications are forseen in the next 20 years. The VAV boxes and the hot water reheat coils were replaced in 2007 and will be servicable for another 20 years.The supply ventilation air ductwork from the AHUs is insulated with 1" thick flexible fiberglass insulation covered with foil vapour barrier membrane.	The concealed air distribution ductwork within the corridor ceiling spaces supplies and returns air from the teaching rooms to the Third Floor AHUS. The supply air ductwork is thermally insulated in the ceiling spaces of the Ground and Second floor and is suitable for medium pressure supply air up to 2" WG.	35	20	3	\$50,000
M5.5	EXHAUST FANS		Aluminum exhaust fans serve washroom areas, are curb mounted and were new in within the past 10 years. Likely replaced when the roof was replaced.Belt drives are servicable for many years. Small exhaust blowers for the Science room exhausts apear to have been replaced within the past 10 years when the roof was replaced. These fans will be servicavble for another 10 years.	Suitable for long term use. Fan capacities are adjustable if required.	30	10	3	\$30,000



SIR ALLAN MACNAB SECONDARY SCHOOL

BUILDING ASSESSMENT REPORT

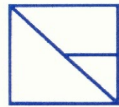
May 16,2015

NO.	DESCRIPTION	PHOTOGRAPH	EXISTING CONDITIONS	SUITABILITY FOR LONG TERM USE	SYSTEM LIFE (YRS)	ESTIMATED REMAINING SERVICE LIFE (YRS)	CODE	BUDGET REPLACEMENT COST (\$)	
M5.6	FIRE DAMPERS		Fire dampers are required in the ductwork that passes through floor or wall fire separations. Existing fire dampers were mostly installed in 1967 during the rough-in phase for the distribution ductwork and the grilles.	Fire dampers require annual inspection and testing throughout the life span of the dampers. There are frequently missed during regular maintenance and service calls. A schedule and location for all fire dampers is recommended to allow for orderly checking of condition and operation.	40	20	1	\$50,000	
M6	CONTROLS								
M6.1	CONTROLS		The existing Heating and cooling control system is a Johnson Direct Digital Controls (DDC) system which controls the Cooling controls, the Boilers, pumps, the ventilation dampers and the supply fans.	This DDC BAS control system has been installed and functional. All major mechanical equipment is connected and controlled by the BAS system. Replacement of terminal controllers when failures occur is the usual method of gradually upgrading the BAS system to newer hardware.	25	5	2	\$150,000	
				TOTAL ESTIMATED BUDGET COST:					\$5,380,000

'Categories: 1. Code and Regulatory Compliance 2. Capital Replacement 3.Maintenance 4. Building System Upgrades

Equipment List

	Year	Quantity
Roof mounted Glycol Chiller -Carrier 150 tons	2007	1
Third Floor West AHU - CB&F indoor unit	1967	1
Third Floor Central AHU - CB&F indoor unit	1967	1
Third Floor East AHU - CB&F indoor unit	1967	1
BPK Mach 3000 Boiler	2014	1
Thermal Solutions B1 1000 Boiler	2007	1
Thermal Solutions B1 1000 Boiler	2007	1
Thermal Solutions B1 3000 Boiler	2007	1
Boiler Room AHU for Tech Shop - CB&F indoor unit	1967	1
Control Air Compressor	1967	1
Control Air Compressor	1980	1
Split Cooling CU 3 ton- Carrier	2010	1
Administration HVAC Trane 12 ton	2007	1
Pumps- SA.Armstrong	2007	7
Roof Exhaust fans	Varies	15
Tech Wing AHU - CB&F unit	1967	1
Tech Wing AHU - CB&F unit	1967	1






**NRG Consultants Inc.**  
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**Hamilton Wentworth District School Board**  
**Sir Allan MacNab Secondary School**  
**Building Review - Electrical**



2015-05-15



Rev B



No.	Description	Photograph	Existing Condition	Proposed Changes/Recommendations	Budget Costs	Est. Remaining Service Life (Years)
1.0	<b>HYDRO SERVICE</b>					
1.1	Incoming HV Cables		Underground 15kV single circuit, 3-phase cables in conduit to Electrical Room then free-air to main switchboard. Likely owned by Horizon Utilities. Cables appear to have been replaced in the last 10 years.	Recommend power shut-down to megger test each conductor. Perform thermal inspection testing of HV terminations.	\$10,000.00	5 years
1.2	Main Switchboard		Westinghouse 13.8kV, 3-phase with two main utility 13.8kV, 600A, 40kA Fault Interruptor switches tied to a common bus (one is locked out with no incoming feed cables). Two main Owner 13.8kV, 600A 40kA Fault Interruptor switches each feeding a 1000kVA, 13.8kV/600V transformer (north & south switchboard sections). North transformer feeds a 1000A fused switch to various 600V load switches & a 1000A fused tie-switch to the south section. South transformer feeds a 1000A fused switch to a 500kVA, 600V/120-208V transformer & a 1000A fused tie-switch to the north section. The North section has four 600V load breakers & a 600V distribution panel board. The South section has two 120/208V distribution panel boards. Switchboard is original from 1969.	Recommend power shut-down to clean entire switchboard, inspect and torque all bus-bar connections. Perform megger testing of each transformer. Test and replace as necessary all fuses. Perform thermal inspection testing of all connections, disconnects, breakers and panel boards.	\$35,000.00	Subject to test results.




No.	Description	Photograph	Existing Condition	Proposed Changes/Recommendations	Budget Costs	Est. Remaining Service Life (Years)
2.0	<b>POWER DISTRIBUTION</b>					
2.1	Panel Boards		Numerous Westinghouse 100A & 200A, 120/208V 3-phase panel boards throughout (original from 1969). Several newer panel boards of various manufacturers from several building renovations of various ages up to 2014 (Auditorium).	Recommend thermal inspection testing of all original panel boards, visual inspection of all newer panel boards & updating of panel board index cards.	\$20,000.00 (for original panel boards) + \$5,000.00 (for newer panel boards)	Subject to test results for original panel boards (5 years for newer panel boards).








No.	Description	Photograph	Existing Condition	Proposed Changes/Recommendations	Budget Costs	Est. Remaining Service Life (Years)
2.0	<b>POWER DISTRIBUTION (continued)</b>					
2.2	Motor Control Centres (MCC's) (Basement Fan Room, Boiler Room, 2nd Floor Fan Room, 3rd Floor Fan Room)		Four Westinghouse 600V, 3-phase MCC's located in Mechanical Rooms. Original from 1969.	Recommend thermal inspection testing of each MCC.	\$8,000.00	Subject to test results.
2.3	Receptacles		Numerous original grounded receptacles throughout. Recessed, surface mounted and wireway mounted. Numerous new grounded receptacles throughout. Recessed, surface mounted and wireway mounted.	Recommend visual inspections & testing in areas of concern or high use.	\$5,000.00	Subject to test results.




No.	Description	Photograph	Existing Condition	Proposed Changes/Recommendations	Budget Costs	Est. Remaining Service Life (Years)
3.0	<b>LIGHTING</b>					
3.1	Exterior Lighting:					
3.1.1	Building Fixtures		Some original mercury vapour wall pack fixtures. Some original incandescent down light fixtures in canopies. Some older high pressure sodium wall pack fixtures. Several new LED wall pack fixtures.	Recommend replacing all fixtures with new LED wall pack fixtures and down light fixtures. Recommend new exterior lighting control system.	\$70,000.00	Original fixtures have reached service life.
3.1.2	Parking Lot / Roadway Fixtures		No original parking lot or roadway pole light fixtures. LED pole light fixtures in new rear parking area (and to come in new front parking lot).	Recommend review of need for pole lighting in existing parking lot and roadway areas.	\$5,000.00	New

No.	Description	Photograph	Existing Condition	Proposed Changes/Recommendations	Budget Costs	Est. Remaining Service Life (Years)
3.2	Interior Lighting:					
3.2.1	Classroom / Office Fixtures		<p>Most classrooms have original 1x4 Troffer fixtures upgraded to T8 lamps 20 years ago. 10% of classrooms have new 1x4 LED Troffer fixtures installed in the last couple of years. Most office areas have original 1x4 &amp; 2x4 Troffer fixtures upgraded to T8 lamps 20 years ago. 5% of offices have new LED Troffer fixtures installed in the last couple of years.</p>	<p>Recommend replacing all original fixtures with new LED equivalents. Existing new LED fixtures to remain. Occupancy sensors should be provided.</p>	\$250,000.00	Original fixtures have reached service life.
3.2.2	Corridor Fixtures		<p>Original 1x4 &amp; 2x4 Troffer fixtures upgraded to T8 lamps 20 years ago.</p>	<p>Recommend replacing all original fixtures with new LED equivalents. Occupancy sensors should be provided.</p>	\$100,000.00	Original fixtures have reached service life.




No.	Description	Photograph	Existing Condition	Proposed Changes/Recommendations	Budget Costs	Est. Remaining Service Life (Years)
3.2	Interior Lighting (continued):					
3.2.3	Gymnasium Fixtures		Newer 3x4 surface T8 caged gymnasium fixtures. Installed in 2009.	Recommend replacing all fixtures with new LED 2-level gymnasium fixtures. Controls & occupancy sensors should be provided.	\$150,000.00	Original fixtures have reached service life.
3.2.4	Auditorium Fixtures		Existing incandescent ceiling down light fixtures & sconce fixtures were upgraded to LED in 2014.	No action required.	\$0.00	New
3.2.5	Theatrical Lighting		Existing fixtures, dimmers & controls were upgraded in 2014.	No action required.	\$0.00	New


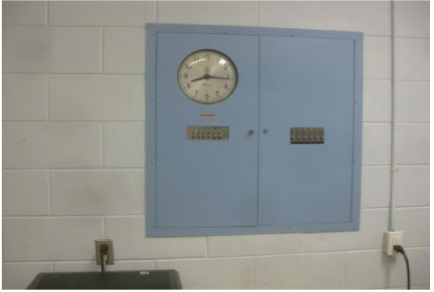

No.	Description	Photograph	Existing Condition	Proposed Changes/Recommendations	Budget Costs	Est. Remaining Service Life (Years)
3.2	Interior Lighting (continued):					
3.2.6	Cafeteria Fixtures		Original 1x4 Troffer & surface box fixtures upgraded to T8 lamps. Original incandescent down light & decorative cube fixtures.	Recommend replacing all original fixtures with new LED equivalents. Occupancy sensors should be provided.	\$50,000.00	Original fixtures have reached service life.
3.2.7	Shop Classroom & Service Area Fixtures		Original 4 ft. industrial & strip fixtures upgraded to T8 lamps.	Recommend replacing all original fixtures with new LED equivalents. Occupancy sensors should be provided.	\$20,000.00	Original fixtures have reached service life.


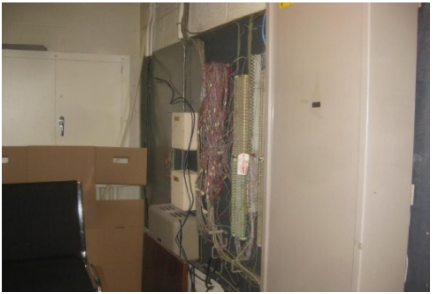
No.	Description	Photograph	Existing Condition	Proposed Changes/Recommendations	Budget Costs	Est. Remaining Service Life (Years)
4.0	<b>LIFE SAFETY SYSTEMS</b>					
4.1	Fire Alarm System:					
4.1.1	Main Fire Alarm Panel		Newer Edwards EST QuickStart addressable panel located in Basement Electrical Room. Installed in 2001.	Recommend panel to be inspected & tested by equipment manufacturer.	\$1,000.00	5 years
4.1.2	Fire Alarm Annunciators		Newer Edwards EST QuickStart units located in Front Vestibule, Main Office & Caretaker's Office. Installed in 2001.	Recommend units to be inspected & tested by equipment manufacturer.	\$2,000.00	5 years
4.1.3	Fire Alarm Devices		Newer Edwards devices. Installed in 2001.	Recommend units to be inspected & tested by equipment manufacturer.	\$8,000.00	5 years



No.	Description	Photograph	Existing Condition	Proposed Changes/Recommendations	Budget Costs	Est. Remaining Service Life (Years)
4.2	Emergency / Exit Lighting:					
4.2.1	Exit Signs		Newer Lumacell self-powered LED exit & combination emergency/exit lighting units. Installed in 2001.	Recommend units to be inspected & tested.	\$5,000.00	5 years
4.2.2	Emergency Battery Units		Newer Lumacell self-powered double-head emergency lighting battery units. Installed in 2001.	Recommend units to be inspected & tested.	\$5,000.00	5 years
4.2.3	Inverter Units		Original inverter battery units located in Basement Electrical Room.	Units have been previously disconnected. Recommend removal.	\$5,000.00	Abandoned



No.	Description	Photograph	Existing Condition	Proposed Changes/Recommendations	Budget Costs	Est. Remaining Service Life (Years)
5.0	<b>COMMUNICATIONS SYSTEMS</b>					
5.1	P/A and Clock System:					
5.1.1	Main P/A Console		Newer Multicomm-2000 unit located in Main Office. Problems reported by staff. Installed in 2012.	Recommend unit to be inspected, tested & repaired by equipment manufacturer.	\$2,000.00	10 years
5.1.2	Administrative Units		Two newer Bogen units located on secretary desks in Main Office. Installed in 2012.	Recommend providing four additional units for Principal, Vice-Principal, Guidance & one other.	\$4,000.00	New
5.1.3	Classroom Units		Numerous original Electrovox speaker/call stations throughout.	Recommend replacing all units & related wiring with new.	\$70,000.00	Original units have reached service life.

No.	Description	Photograph	Existing Condition	Proposed Changes/Recommendations	Budget Costs	Est. Remaining Service Life (Years)
5.1	P/A and Clock System (continued):					
5.1.4	Corridor Speakers		Numerous original Electrovox speakers.	Recommend replacing all units & related wiring with new.	\$20,000.00	Original units have reached service life.
5.1.5	Master Clocks		Original Simplex Master clock control located in Main Office. Most original slave clocks throughout. System abandoned.	Recommend removing all original clock equipment & related wiring and providing new digital clock system throughout.	\$60,000.00	Abandoned
5.1.6	Modular Control Panels (MCP's)		Some new MCP's have been installed in recently renovated areas.	Recommend supplying new units in all classrooms & office areas.	\$90,000.00	New


No.	Description	Photograph	Existing Condition	Proposed Changes/Recommendations	Budget Costs	Est. Remaining Service Life (Years)
5.2	Data and Telephone Wiring:					
5.2.1	Fibre D-Mark		Existing Cogeco/Atria Fibre D-mark is located in Basement Electrical Room.	No action required.	\$0.00	10 years
5.2.2	Bell D-Mark		Existing Bell Canada multi-pair cable D-mark is located in Server Closet in Guidance Area.	No action required.	\$0.00	10 years

No.	Description	Photograph	Existing Condition	Proposed Changes/Recommendations	Budget Costs	Est. Remaining Service Life (Years)
5.2	Data and Telephone Wiring (continued):					
5.2.3	Main Server		Existing main Data Server equipment is located in Server Closet in Guidance Area. Numerous remote DAP's throughout building. Some new DPA's installed in 2014 renovations.	Recommend reviewing all data wiring within building and upgrading as required.	\$40,000.00	5 years
5.2.4	Data / Telephone Outlets		Numerous data outlets throughout building. Some upgraded in 2014 renovations.	Recommend reviewing all data outlets within building and upgrading as required.	\$30,000.00	5 years

No.	Description	Photograph	Existing Condition	Proposed Changes/Recommendations	Budget Costs	Est. Remaining Service Life (Years)
6.0	<b>SECURITY SYSTEMS</b>					
6.1	Intrusion Security System:					
6.1.1	Security Panel		Existing	Proposed		
6.1.2	Keypads, Sirens, Motion Detectors, Door Bugs, Fob Readers		Existing	Proposed		

No.	Description	Photograph	Existing Condition	Proposed Changes/Recommendations	Budget Costs	Est. Remaining Service Life (Years)
6.2	CCTV Surveillance System:					
6.2.1	Video Recorder		Existing	Proposed		
6.2.2	Cameras / TV Monitors		Existing	Proposed		
6.3	Access Control System:					
6.3.1	Video Intercom / Access Control Units		Existing	Proposed		



No.	Description	Photograph	Existing Condition	Proposed Changes/Recommendations	Budget Costs	Est. Remaining Service Life (Years)
7.0	<b>MISCELLANEOUS SYSTEMS</b>					
7.1	Emergency Generator		Original small natural gas emergency generator & related transfer switch located in Boiler Room. Provides back-up power for sump pumps only.	Recommend replacing all related equipment with new.	\$25,000.00	Original equipment has reached service life.

# **APPENDIX D**

HWDSB Condition Assessment  
Sir Allan MacNab SS, Building ID 9145-1

Hamilton-Wentworth District School Board

Condition Assessment

Sir Allan MacNab SS, Building ID 9145-1



Facility Name (SFIS)	Sir Allan MacNab SS
Ministry Building Number	9145-1
GFA (m2)	17617
Year Built by Original/Additions	1969
Replacement Value - OTG	\$34,858,300
Official FCI (%)	11.81
Comparable FCI (%)	24.43
Asset Address	145 Magnolia Drive
Asset City	Hamilton
Asset Postal Code	L9C 5P4

-- ACCESSIBILITY CHECKLIST --

Designated parking space	No
Path of travel to the main entrance door.	No
Designated entrances	No
Path of travel to all floors/elevations.	No
Elevator	No
Instructional spaces entrance doors.	No
Fire policy and fire safety plan	No
Fire alarm system with strobe and audible signals	No
Communal washrooms	No
Designated washroom	No

-- ENERGY CHECKLIST --

Energy efficient boiler	Yes
Energy audit report	Yes
Energy efficient domestic hot water heater	Yes
Energy efficient recovery system	No
Energy efficient HVAC pumps and fan motors	Yes
Energy efficient interior lighting	Yes
Building Automation System	Yes
Energy efficient faucets	No
Energy efficient urinals and toilets	No
Architectural and Site Assessor	Ramin Saeedi
Mechanical and Electrical Assessor	Mark Pantchevski



## **How to read the final report**

The Final Report contains assessment information for 5 years for this facility.

Asset details reported are either populated from the SFIS system (e.g. GFA, year built etc) or calculated based on Ministry's criteria (e.g. Replacement Value – OTG, Official FCI, Comparable FCI etc).

Accessibility and Energy assessment lists are provided in a yes/no format. For a full description of accessibility/energy definitions please check the TCPS database, Asset Narratives, under the Narratives Tab.

Asset Narratives include the following:

- Architectural & Structural Summary –a brief summary of the asset including construction dates and areas of the original and additions. A brief description of the structure, the exterior wall system, the roof assembly system and the building interiors.
- Mechanical Summary – a brief summary of the mechanical systems.
- Electrical Summary – a brief summary of the Electrical systems.
- Site Summary – a brief summary of the Site systems.
- Limitations – a summary of the scope of work and the Tactical Planning Window.

Building Elements listed are only the ones that require replacement in the next 5 years; their condition is Critical if failed or risk of imminent failure is observed, or Poor if it is not functioning as intended with significant repairs within the next two (2) years, or Fair if normal deterioration and minor distress is observed requiring repairs within three (3) to five (5) years.

2011-2015 Cost and Year information is a snapshot from the assessment and cannot be edited in TCPS.

2011-2015 Priority is the value of the Event priority calculated when the assessment data was imported in TCPS and stored in this read-only field.

Estimated Cost and Fiscal Year are values that can be edited at any time by end users.

Event Priority is a field populated with labels like Urgent, High, Medium and Low based on the Event Priority Value. This value is calculated based on the Element Type and Element Condition.

Photos are provided at the event level: old photos are suffixed with the word "Old", new photos are suffixed with the date of assessment.

A copy of this report in PDF format is saved in the TCPS database. You can access it by selecting the Asset Instance in Data Manager and opening this report in PDF format from the Document Tab.

## **1. Architectural & Structural Executive Summary**

Sir Allen MacNab SS Building ID-9145-1 was assessed on April 23, 2013 by VFA, is located at 145 Magnolia Drive, Hamilton, Ontario. The original facility is a three story structure of block construction without basement. The building is constructed in 1969.

The total size of the both building is 17,616 square meters. Where visible, mainly in the GYM, workshops, and Cafeteria, the structure of the school are of Metal roof decking, steel trusses, steel joists and load bearing masonry. It was indicated that the roof coverings has been done in 2007.

The interior finishes consist of mainly vinyl composite tiles, ceramic tiles, hard wood flooring, painted masonry and gypsum board walls and, gypsum board acoustic ceilings.

The exterior walls of the school are brick veneer and Pre-cast concrete finished assembly.



The site size is 12.27 Hectares.

Typical spaces in the school include auto shops, wood shop, library/resource center, music room, theater art class, gymnasiums, weight room, computer rooms, science labs, administration office, and mechanical service space and general instructional classrooms.

## **2. Mechanical Executive Summary**

2013 - Overall, the mechanical equipment is in fair condition.

Heating for Sir Allan MacNab Secondary School is provided by four gas fired hot water boilers, updated in 2008. The boilers provide hot water to perimeter fin tube radiators, force flow heaters, fan coils and the heating coils of the AHUs. There are 11 central air handlers which supplies heating, cooling and ventilation throughout the school. Cooling is provided by a rooftop condenser and chiller system. The remaining ventilation is provided by rooftop exhaust fans and various internal exhaust fans.

Domestic hot water is provided by six instantaneous hot water heaters installed in 2013.

The building HVAC system is controlled by a building automation system with Direct Digital Controls updated in 2007.

The school has three stair wheelchair lifts which are in good condition.

Fire protection for the school is provided by fire extinguishers.

Comments on exceptions: Based on age of components and observed site conditions the following mechanical equipment has exceeded their theoretical useful life and will require replacement within the tactical planning window.

- Plumbing fixtures are aged and in fair condition.
- Domestic water distribution is in fair condition and a study is recommended.
- The central air handlers are original and in fair condition.
- Fire extinguishers are aged and in poor condition.
- The dust collector is age and in poor condition.

## **3. Electrical Executive Summary**

2013 - Electrically Sir Allan MacNab Secondary School is in fair condition.

The main switchgear is original to 1969. The fire alarm panels and end devices are in good condition.

Emergency lighting is provided by wall and ceiling hard wired fixtures and central battery bank. The interior lighting within the building is in good condition with CFLs, T8 lamps and electronic ballasts. Exterior lighting is provided by fluorescent, HID and LED fixtures and light standards for the parking area. Exit lighting is in good condition.

Security system includes a panel, motion detectors, sensors, CCTV and keypads.

The information technology system is in good condition.

Comments on exceptions: Based on age of components and observed site conditions the following electrical equipment has exceeded their theoretical useful life and will require replacement within the tactical planning window.

- The main switchboard is aged and in fair condition.
- The motor control centre is aged and in fair condition.
- Branch wiring is original in fair condition and a study is recommended.
- Exterior lighting is aged and in fair condition.
- The emergency power system is aged and in poor condition.

#### **4. Site Summary**

2013-The site at Sir Allen Mac Nab SS is bounded by play field on the west and, south , residential to the south and, west Sides, on the north the building bounded to Wendover Drive.

Typical walkways service the site, with asphalt concrete landing or stairs at most building entrances.

A six foot high chain link fence marks the perimeter of the site; there is a wall mounted sign on top of the main entrance facing west of the building which displays school name; the building access off of Magnolia drive and there are paved parking at south side of the site.

#### **Definitions for Energy Checklist**

Energy audit report: An ASHRAE Level I energy audit report was completed within the last three years.

Energy efficient boiler: The energy efficient boiler provided is a condensing boiler installed within the last five years or is energy star rated.

Energy efficient domestic hot water heater: The energy efficient domestic hot water heater provided is direct or power vented natural gas fired or has an electric heat coil.

Energy efficient recovery system: The building is provided with a Heat Recovery Unit (HRU).

Energy efficient HVAC pumps and fan motors: The energy efficient HVAC pumps and fan motors are reportedly provided with a variable frequency drive.

Energy efficient interior lighting: The provided interior lighting is controlled by motion sensors or building automation system and/or the interior light fixtures are provided with T8 or T5 fluorescent lamps and electronic ballast.

Building Automation System: The building has a comprehensive Direct Digital Control (DCC) automation system to monitor and control the mechanical system.

Energy efficient faucets: Approximately 50% of the lavatory faucets are provided with aerators and motion sensors.

Energy efficient urinals and toilets: Approximately 50% of the urinals and toilets are provided with a low flow flush valve (less than 1.6 gpf)

#### **Definitions for Accessibility Checklist**

Designated parking space: The provided designated Barrier Free Accessible parking space is a minimum 2,400 mm wide and is clearly marked with an accessibility sign.

Path of travel to the main entrance door: The provided accessible path of travel from the designated Barrier Free Accessible parking space to an accessible building entrance is a minimum 910 mm wide and includes curb cuts and ramps

Designated entrances: The provided designated Barrier Free Accessible entrance is a minimum 850 mm wide to allow a mobility device, clearly marked with an accessibility sign and is provided with an automatic door open device.

Path of travel to all floors/elevations: The Barrier Free Accessible path of travel is provided with either an accessible ramp or a vertical transportation device where a floor or an elevation difference exists.

Elevator: The provided Barrier Free Accessible Elevator has the following: clear audible communication indicating floors and up/down direction; doors, which open long enough and a minimum 900 mm wide; and a control panel, which is provided with Braille and an emergency call system and where the top is at a maximum height of 1,400 mm above floor.

Instructional spaces entrance doors: The instructional spaces are provided with an entrance door which is a minimum of 850 mm wide.

Fire policy and fire safety plan: Fire policy and fire safety plans are reportedly in place for the evacuation of people with disabilities.

Fire alarm system with strobe and audible signals: Fire alarm system is reported to include strobe lights and audible signals

Communal washrooms: There is a Barrier Free Accessible washroom stall, which is a minimum of 1,500 x 1,500 mm, in the each boys and girls washroom on each accessible floor.

Designated washroom: A designated Barrier Free Accessible washroom is provided on each floor, and is equipped with the following: an automatic door open device; grab bars; emergency call button; lever handle or motion sensor faucets; and a lavatory, where an insulated knee space is provided and the height of lavatory top is a maximum of 815 mm above the floor.

## **Limitations**

This report has been prepared to meet the Ministry of Education (EDU) objectives for the Condition Assessment Program for Educational Facilities in Ontario. The purpose of the Condition Assessment Program was to assess the current physical condition of the schools and associated site features, and to validate information currently contained in the online capital renewal database software Total Capital Planning Solution (TCPS).

The validation of data was limited to a five year period, which is defined as the current assessment year plus four years. Information contained in the database beyond this period was not validated or reviewed.

The provided event costs are intended for global budgeting purposes only. The event costs were adjusted to include regional factors and were based on an approved unit cost list. Actual event costs for the work recommended may differ since the event costs can only be determined after preparation of tender documents, which would consider: specific design conditions, site restrictions, effects of ongoing building operations and construction schedule. The approved cost threshold for the Condition Assessment Program is \$ 10,000.

Barrier Free Accessibility and Energy Conservation Measures assessments were limited to a preapproved checklist presented on Page 2. The assessment of portables (classrooms not integrated with the building envelope), solar photovoltaic panels, other solar energy collectors, wind turbines, sheds, less than 45 sq.m., play-equipment/structures, score boards, goal posts and flag poles, fire extinguishers, decommissioned swimming pools, window coverings, black/white boards, benches, gymnastic equipment and the appropriateness of room space were excluded from the scope of work. Information related to these components contained in the database was not updated to reflect condition observed. Information related to events which are either planned or in progress, and currently locked were not updated.

**All Elements****B SHELL****B10 Superstructure****B1010 Floor Construction****B101001 Structural Frame**

Element Instance : B101001 Structural Frame - Original Building

**Description** 2013-Structural frame assemblies, concrete and Steel structure.

**Condition Assessment** 2013 - The structure frame assembly is showing signs of settlement and cracks on the exterior wall and floors from inside of the building.

Last Replacement Year 1969

Theoretical Life 200

**Technical Condition** Fair

Study[B1010 Structural Frame- Original Building]

Event Type: Study Priority: High

Brief Description Study[B1010 Structural Frame- Original Building]

Estimated Cost \$9,690

Fiscal Event Year 2015

2011-2015 Cost \$9,690

2011-2015 Priority High

2011-2015 Year 2015

**Recommendation** 2013 - Evidence of settlement and cracks on the walls floor. Conduct a study/review to determine the cause, course of corrective action and, cost.

Apr 2013- Evidence of recent floor cracking in the Classroom 308 on the thrid floor east side of the building.



Apr 2013-Crack in the exercis room.



Apr 2013- Evidence of structural Pressure in the GYM storage.





Apr 2013- Crack in the GYM on stage wall.

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## **B20 Exterior Enclosure**

### **B2020 Exterior Windows**

Element Instance : B2020 Exterior Windows - Original Building

**Description** 2013 - Exterior windows are fixed or operable windows located in exterior walls or exterior skin; this includes frames, glazing, caulking, finishes, and other associated work.

**Condition Assessment** 2013 - At the time of the assessment the exterior windows were in poor condition, single pane units with hardware missing or not functioning

Last Replacement Year 1969

Theoretical Life 32

**Technical Condition** Poor

Replacement [B2020 Exterior Windows - Original Building]

Event Type: Replacement Priority: High

Brief Description Replacement [B2020 Exterior Windows - Original Building]

Estimated Cost \$802,934

Fiscal Event Year 2015

2011-2015 Cost \$802,934

2011-2015 Priority High

2011-2015 Year 2015

**Recommendation** 2013 - Due the condition of the exterior windows it is recommended that they be replaced.



Element Instance : B2030 Exterior Doors - Original Building

<b>Description</b>	2013 - Exterior painted hollow metal doors and frames with single glazed non tempered vision lite.
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**Condition Assessment**

2013 - The majority of the exterior door assemblies are original, with worn finish, corroded frames, deteriorated door seals, single glazed vision lites and have exceeded their effective design rated life.

Last Replacement Year 1969

Theoretical Life 27

**Technical Condition**

Poor

**Replacement[B2030 Exterior Door- Original Building]**

Event Type: Replacement Priority: High

Brief Description Replacement[B2030 Exterior Door- Original Building]

Estimated Cost \$45,900

Fiscal Event Year 2015

2011-2015 Cost \$45,900

2011-2015 Priority High

2011-2015 Year 2015

**Recommendation**

2013 - The majority of the exterior door assemblies are original and have exceeded their effective design rated life. Replacement of the door assemblies is recommended.

Apr 2013- Typical exterior doors.



Apr 2013- Deteriorated exterior door.



Apr 2013-Rusted Exterior door frame.



Element Instance : B2030 Exterior Doors - Original Building

**Description** 2013 - Exterior door hardware consists of panic bars, push bars, butt hinges and door pulls

**Condition Assessment** 2013 - At the time of the assessment the exterior door was in poor condition, showing signs of wear and tear due to use.

Last Replacement Year 1969

Theoretical Life 15

**Technical Condition** Poor

Replacement [B2030 Exterior Doors - Original Building]

Event Type: Replacement Priority: High

Brief Description Replacement [B2030 Exterior Doors - Original Building]

Estimated Cost \$20,438

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Fiscal Event Year	2015
2011-2015 Cost	\$20,438
2011-2015 Priority	High
2011-2015 Year	2015

**Recommendation**

2013 - It recommended that the exterior door hardware should be replaced at the time the exterior doors are replaced.

Apr 2013- Typical exterior door hardware.



Apr 2013- Worn exterior door push bar.



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**C INTERIORS****C10 Interior Construction****C1010 Partitions**

Element Instance : C1010 Partitions - Original Building

**Description**

2013 - A vertical curtain partition is located in the cafeteria.

**Condition Assessment**

2013 - The moveable partition located in the double cafeteria are in fair condition.

Last Replacement Year 1969

Theoretical Life 20

**Technical Condition**

Fair

**Replacement [C1010 Partitions - Original Building]**

Event Type: Replacement Priority: Medium

Brief Description Replacement [C1010 Partitions - Original Building]

Estimated Cost \$109,491

Fiscal Event Year 2016

2011-2015 Cost \$109,491

2011-2015 Priority Medium

2011-2015 Year 2016

**Recommendation**

2013 - The moveable partition has surpassed its EUL Planning for renewal is recommended for the latter portion of 5 year planning window.



Apr 2013- Movable partition in the cafeteria.

Apr 2013- Movable partition in the cafeteria.



### ***C1020 Interior Doors***

Element Instance : C1020 Interior Doors - Original Building

#### ***Description***

2013 - These include all doors within the building except for those through the perimeter walls are Interior Doors. They are constructed of hollow metal with a paint finish, wood with a natural, or paint finish. They often provided with glazed vision or half panels.

#### ***Condition Assessment***

2013 - At the time of the assessment the interior doors were in fair condition, they were showing signs of age and they had past expected useful life.

Last Replacement Year 1969

Theoretical Life 25

#### ***Technical Condition***

Fair

#### **Replacement [C1020 Interior Doors - Original Building]**

Event Type: Replacement Priority: Medium

Brief Description Replacement [C1020 Interior Doors - Original Building]

Estimated Cost \$347,451

Fiscal Event Year 2015

2011-2015 Cost \$347,451

2011-2015 Priority Medium

2011-2015 Year 2015

#### ***Recommendation***

2013 - The interior doors have exceeded their effective design rated life with the majority of the doors exhibiting damage. Replacement of the interior doors is recommended.





Apr 2013- Typical wood veneer interior door.

Apr 2013- Damage interior door.



Element Instance : C1020 Interior Doors - Original Building

**Description** 2013 - Interior door hardware featuring classroom knob locksets, door pulls, hinges, door closer and floor stops.

**Condition Assessment** 2013 - The interior door hardware are in fair. The components are appearing worn.

Last Replacement Year 2008

Theoretical Life 15

**Technical Condition** Fair

Replacement [C1020 Interior Doors - Original Building]

Event Type: Replacement Priority: Medium

Brief Description Replacement [C1020 Interior Doors - Original Building]

Estimated Cost \$116,791

Fiscal Event Year	2015
2011-2015 Cost	\$116,791
2011-2015 Priority	Medium
2011-2015 Year	2015

**Recommendation**

2013 - The interior door hardware has worn out. Replacement is recommended.

Apr 2013- Worn interior hardware.

**C1030 Fittings**

Element Instance : C1030 Fittings - Original Building

**Description**

2013 - Classroom fittings include cabinetry, millwork items, counters and countertops with associated accessories and anchoring devices.

**Condition Assessment**

2013 - At the time of the assessment all cabinetry, millwork items, counters and countertops were in a poor condition

Last Replacement Year	1969
Theoretical Life	20
Fittings Type	Unspecified

**Technical Condition**

Poor

Replacement [C1030 Fittings - Original Building]

Event Type: Replacement Priority: High

Brief Description	Replacement [C1030 Fittings - Original Building]
Estimated Cost	\$583,952
Fiscal Event Year	2015

2011-2015 Cost	\$583,952
2011-2015 Priority	High
2011-2015 Year	2015

**Recommendation**

2013 - As all the cabinetry, millwork items, counters and countertops have exceeded their expected useful life and are in fair condition the recommendation is to replace them

Apr 2013- Typical millworks in the Sience classrooms.



Apr 2013- Damaged Millwork in the home maker classroom.



Apr 2013- Damaged Millwork in the art shop classroom..



Element Instance : C1030 Fittings - Original Building

**Description** 2013 - Painted metal floor mounted toilet partitions situated in all the washrooms of the original building.

**Condition Assessment** 2013 - At the time of the assessment the painted metal toilet partitions are original and are showing signs corrosion, damage worn finish and unreliable or missing hardware.

Last Replacement Year	2007
Theoretical Life	15
Fittings Type	Unspecified

**Technical Condition** Fair

Replacement [C1030 Fittings - Original Building]

Event Type:	Replacement	Priority:	Medium
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Brief Description	Replacement [C1030 Fittings - Original Building]
Estimated Cost	\$99,273
Fiscal Event Year	2015
2011-2015 Cost	\$99,273
2011-2015 Priority	Medium
2011-2015 Year	2015

**Recommendation** 2013 - The original floor mounted painted toilet partitions have exceeded their effective rated design life. Replacement is recommended.

Mar 2013- Typical worn floor mounted washroom partitions in the original building.



Element Instance : C1030 Fittings - Original Building

**Description**

2013 - Lockers and chalkboards

**Condition Assessment**

2013 - Lockers are generally in poor condition throughout the school, the chalkboards are from the original build

Last Replacement Year

1969

Theoretical Life

22

Fittings Type

Unspecified

**Technical Condition**

Poor

**Replacement [C1030 Fittings - Original Building]**

Event Type:

Replacement

Priority:

High

Brief Description

Replacement [C1030 Fittings - Original Building]

Estimated Cost

\$328,473

Fiscal Event Year

2015

2011-2015 Cost

\$328,473

2011-2015 Priority

High

2011-2015 Year

2015

**Recommendation**

2013 - Recommend lockers and chalkboards be replaced

Apr 2013- Typical Chalk board in the classrooms.





Apr 2013- Typical worm lockers in the school.

### **C30 Interior Finishes**

#### **C3010 Wall Finishes**

Element Instance : C3010 Wall Finishes - Original Building

**Description** 2013 - The typical painted wall finishes on CMU and GWB

**Condition Assessment** 2013 - At the time of the assessment the typical painted wall finish on CMU and GWB walls was starting to look worn from normal day to day use.

Last Replacement Year	2004
Theoretical Life	10
Wall Finishes Type	Unspecified

**Technical Condition** Poor

#### **Replacement [C3010 Wall Finishes - Original Building]**

Event Type:	Replacement	Priority:	High
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Brief Description	Replacement [C3010 Wall Finishes - Original Building]
Estimated Cost	\$372,269
Fiscal Event Year	2015
2011-2015 Cost	\$372,269
2011-2015 Priority	High
2011-2015 Year	2015

**Recommendation** 2013 - The painted wall finishes throughout the school are starting to look worn from normal day to day use with some faded and peeling areas. Refinishing of the school is recommended.



Apr 2013-Damaged and worn wall covering.



Apr 2013- damaged wall covering.



Apr 2013- Worm wall covering.



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### ***C3020 Floor Finishes***

Element Instance : C3020 Floor Finishes - Original Building

**Description** 2013 - Vinyl composite floor tile and vinyl base.

**Condition Assessment**

2013 - The vinyl composite floor tile is showing signs of wear and discoloration.

Last Replacement Year	1969
Theoretical Life	20
Floor Finishes Type	Unspecified

**Technical Condition**

Poor

**Replacement [C3020 Floor Finishes - Original Building]**

Event Type:	Replacement	Priority:	High
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Brief Description	Replacement [C3020 Floor Finishes - Original Building]
Estimated Cost	\$510,958
Fiscal Event Year	2015
2011-2015 Cost	\$510,958
2011-2015 Priority	High
2011-2015 Year	2015

**Recommendation**

2013 - The vinyl composite floor tile and vinyl base is exhibiting signs of wear and has exceeded its effective rated design life. Replacement planning is recommended.

Apr 2013- Deteriorated VCT.



Apr 2013- Worn VCT and missing base board.



### **C3030 Ceiling Finishes**

Element Instance : C3030 Ceiling Finishes - Original Building

**Description** 2013 - Gypsum board ceilings

**Condition Assessment** 2013 - At the time of the assessment the gypsum board ceilings were in fair condition

Last Replacement Year	1969
Theoretical Life	30
Ceiling Finishes Type	Unspecified

**Technical Condition** Poor

Replacement [C3030 Ceiling Finishes - Original Building]

Event Type:	Replacement	Priority:	High
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Brief Description	Replacement [C3030 Ceiling Finishes - Original Building]
Estimated Cost	\$37,230
Fiscal Event Year	2015
2011-2015 Cost	\$37,230
2011-2015 Priority	High
2011-2015 Year	2015

**Recommendation** 2013 - Gypsum board ceilings are un-finished. Paint refinishing recommended.

Apr 2013- repaired but un-finished gypsum board ceiling.



Element Instance : C3030 Ceiling Finishes - Original Building

**Description** 2013 - Acoustical suspended ceiling tile system.

**Condition Assessment** 2013 - The ACT suspended ceiling system is showing signs of wear and damage.

Last Replacement Year	1969
Theoretical Life	25
Ceiling Finishes Type	Unspecified

**Technical Condition** Fair

Replacement [C3030 Ceiling Finishes - Original Building]

Event Type:	Replacement	Priority:	Medium
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Brief Description	Replacement [C3030 Ceiling Finishes - Original Building]
Estimated Cost	\$583,952
Fiscal Event Year	2015
2011-2015 Cost	\$583,952
2011-2015 Priority	Medium
2011-2015 Year	2015

**Recommendation** 2013 - The acoustical suspended ceiling tile system is showing signs of wear. Replacement is recommended.

Apr 2013- Stained ceiling tiles.



Apr 2013- Worn ceiling tile.



Element Instance : C3030 Ceiling Finishes - Original Building

**Description** 2013 - Acoustical suspended ceiling tile system.

**Condition Assessment** 2013 - The ACT suspended ceiling system is showing signs of wear and damage.

Last Replacement Year	2003
Theoretical Life	25
Ceiling Finishes Type	Unspecified

**Technical Condition** Fair

Replacement [C3030 Ceiling Finishes - Original Building]

Event Type:	Replacement	Priority:	Medium
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Brief Description	Replacement [C3030 Ceiling Finishes - Original Building]
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Estimated Cost	\$94,893
Fiscal Event Year	2015
2011-2015 Cost	\$94,893
2011-2015 Priority	Medium
2011-2015 Year	2015

**Recommendation**

2013 - The acoustical suspended ceiling tile system is showing signs of wear. Replacement is recommended.

Apr 2013- Stained acoustic ceiling tiles.

**D SERVICES****D20 Plumbing****D2010 Plumbing Fixtures**

Element Instance : D2010 Plumbing Fixtures - Original Building

**Description**

2013 - The washroom plumbing fixtures include vitreous china water closets, lavatories, urinals, wash basins and showers in the change rooms. Classroom sinks and drinking fountains are also provided in various locations.

**Condition Assessment**

2013 - The majority of the plumbing fixtures appear to be functioning and are in fair to good condition. Some fixtures (40%) have been replaced overtime. The majority of the fixtures have surpassed their normal service life and are inefficient. Planning for renewal is recommended. The Bradley basins and water closets are in fair condition. The science lab sinks are aged stained and in poor to fair condition.

Last Replacement Year 1969

Theoretical Life 25

**Technical Condition** Fair

**Replacement - Science Lab Sinks**

Event Type: Replacement Priority: Medium



Brief Description	Replacement - Science Lab Sinks
Estimated Cost	\$20,400
Fiscal Event Year	2016
2011-2015 Cost	\$20,400
2011-2015 Priority	Medium
2011-2015 Year	2016

**Recommendation**

2013 - Replacement of the aged science lab sinks is recommended based on age and condition.

April 2013 - Aged Science Lab Sinks



April 2013 - Aged Science Lab Sinks



**Replacement [D2010 Plumbing Fixtures - Original Building]**

Event Type: Replacement Priority: Medium

Brief Description	Replacement [D2010 Plumbing Fixtures - Original Building]
Estimated Cost	\$102,000
Fiscal Event Year	2016

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2011-2015 Cost	\$102,000
2011-2015 Priority	Medium
2011-2015 Year	2016

**Recommendation**

2013 - The Bradley basins and water closets in the school are aged and past their rated useful life. Replacement is recommended.

April 2013 - Typical Aged Water Closets



April 2013 - Typical Aged Bradley Basin




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**D2020 Domestic Water Distribution**

Element Instance : D2020 Domestic Water Distribution - Original Building

**Description**

2013 - The building domestic water system includes a main line, water meter, pressure reducer and associated piping and insulation. At the time of assessment the domestic water distribution system was estimated to be original to the dates of construction the school.

**Condition Assessment**

2013 - The domestic piping system is mostly concealed and therefore the current condition is not fully known. However due to the age, the expected wear and the theoretical useful life, the system is assessed as being in fair condition.

Last Replacement Year	1969
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Theoretical Life	37
Domestic Water Distribution Type	Unspecified

<b>Technical Condition</b>	Fair
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### Replacement [D2020 Domestic Water Distribution - Original Building]

Event Type:	Replacement	Priority:	Medium
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Brief Description	Replacement [D2020 Domestic Water Distribution - Original Building]
Estimated Cost	\$510,000
Fiscal Event Year	2016
2011-2015 Cost	\$510,000
2011-2015 Priority	Medium
2011-2015 Year	2016

### Recommendation

2013 - Based on the age and theoretical useful life of the domestic water piping system replacement is recommended. A study is recommended to determine the current condition, remaining service life, current service requirements and the cost of replacement.

April 2013 - Domestic Water Distribution Piping



### Study [D2020 Domestic Water Distribution - Original Building]

Event Type:	Study	Priority:	Medium
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Brief Description	Study [D2020 Domestic Water Distribution - Original Building]
Estimated Cost	\$10,200
Fiscal Event Year	2014
2011-2015 Cost	\$10,200
2011-2015 Priority	Medium
2011-2015 Year	2014

**Recommendation**

2013 - An in depth study is recommended to determine the condition of the domestic water piping system, the required recommended scope of work and the cost for system renewal.

**D30 HVAC****D3040 Distribution Systems****D304008 Air Handling Units**

Element Instance : D304008 Air Handling Units - Original Building

**Description**

2013 - HVAC in the school is provided by 11 central air handling units. 9 of the central air handlers are original to 1969, while 2 air handler in the main mechanical room was installed in 2012.

**Condition Assessment**

2013 - The 9 original central air handlers are original and have well exceeded the end of their predictable service life of 35 years.

Last Replacement Year 1969

Theoretical Life 16

**Technical Condition**

Fair

**Replacement [D304008 Air Handling Units - Original Building]**

Event Type: Replacement Priority: High

Brief Description Replacement [D304008 Air Handling Units - Original Building]

Estimated Cost \$600,000

Fiscal Event Year 2017

2011-2015 Cost \$600,000

2011-2015 Priority High

2011-2015 Year 2017

**Recommendation**

2013 - Due to age and mechanical wear, the central air handlers should be replaced within the next 5 years for reliability.

April 2013 - Original Air Handling Unit



April 2013 - Original Air Handling Units



## **D40 Fire Protection**

### **D4030 Fire Protection Specialties**

Element Instance : D4030 Fire Protection Specialties - Original Building

#### **Description**

2013 - The fire protection system in the school includes a variety of fire extinguishers located throughout the school. The last replacement of the fire extinguishers is reported to have been in 2003, but the majority of the fire extinguishers are much older.

#### **Condition Assessment**

2013 - The fire extinguishers are reportedly inspected regularly and are functional. Fire extinguishers have a rated useful life of 10 years.

Last Replacement Year	2003
Theoretical Life	10
Fire Protection Specialties Type	Unspecified

**Technical Condition** Poor

Replacement [D4030 Fire Protection Specialties - Original Building]

Event Type: Replacement Priority: Urgent

Brief Description	Replacement [D4030 Fire Protection Specialties - Original Building]
Estimated Cost	\$15,300
Fiscal Event Year	2015
2011-2015 Cost	\$15,300
2011-2015 Priority	Urgent
2011-2015 Year	2015

### **Recommendation**

2013 - Based on the age and theoretical useful life of the fire extinguishers replacement of the outdated and aged fire extinguishers is recommended within the next three years.

April 2013 - Aged Fire Extinguishers



April 2013 - Fire Extinguishers Manufacture Date 1984



## **D50 Electrical**

### **D5010 Electrical Service & Distribution**

#### **D501003 Main Switchboards**

Element Instance : D501003 Main Switchboards - Original Building



<b>Description</b>	2013 - The main switchboard has a 1000 kVA capacity and is original in the building construction date .
<b>Condition Assessment</b>	2013 - Although maintained properly, the main switchboard has exceeded the rated useful life and should be replaced due to age and reliability.

Last Replacement Year	1969
Theoretical Life	42

<b>Technical Condition</b>	Fair
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#### Replacement [D501003 Main Switchboards - Original Building]

Event Type:	Replacement	Priority:	High
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Brief Description	Replacement [D501003 Main Switchboards - Original Building]
Estimated Cost	\$350,000
Fiscal Event Year	2017
2011-2015 Cost	\$350,000
2011-2015 Priority	High
2011-2015 Year	2017

<b>Recommendation</b>	2013 - Replacement of the aged main switchboard is recommended based on age.
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April 2013 - Original Main Switchboard



Element Instance : D501003 Main Switchboards - Original Building

<b>Description</b>	2013 - There are 3 motor control centers which are reported to be original to the building construction date.
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<b>Condition Assessment</b>	2013 - The MCCs are aged and reaching the end of their useful lives.
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Last Replacement Year 1969

Theoretical Life 40

**Technical Condition** Fair

### Replacement [D501003 Main Switchboards - Original Building]

Event Type: Replacement Priority: High

Brief Description Replacement [D501003 Main Switchboards - Original Building]

Estimated Cost \$90,000

Fiscal Event Year 2017

2011-2015 Cost \$90,000

2011-2015 Priority High

2011-2015 Year 2017

**Recommendation** 2013 - Planned replacement of the motor control centers is recommended within the next 5 years.

April 2013 - Aged Motor Control Centre



## D5020 Lighting & Branch Wiring

### D502001 Branch Wiring

Element Instance : D502001 Branch Wiring - Original Building

**Description** 2013 - The branch wiring system consists of cabling, raceways, conduit, wiring, bus ducts and wiring terminal devices. Flexible conduit and cabling is provided to motors and other mechanical equipment.

**Condition Assessment** 2013 - Apart from minor renovations the majority of the branch wiring system in the school is original. The branch wiring is in fair condition and is past its theoretical useful life.

Last Replacement Year 1969

Theoretical Life 40

**Technical Condition** Fair

### Replacement [D502001 Branch Wiring - Original Building]

Event Type: Replacement Priority: Medium

Brief Description Replacement [D502001 Branch Wiring - Original Building]

Estimated Cost \$2,450,000

Fiscal Event Year 2017

2011-2015 Cost \$2,450,000

2011-2015 Priority Medium

2011-2015 Year 2017

### Recommendation

2013 - Based on the age of the branch wiring, replacement is recommended. An in depth study should be conducted to determine the current condition, remaining useful life cost of replacement.

April 2013 - Original Branch Wiring Conduit



### Study

Event Type: Study Priority: Medium

Brief Description Study

Estimated Cost \$10,200

Fiscal Event Year 2014

2011-2015 Cost \$10,200

2011-2015 Priority Medium

2011-2015 Year 2014

### **D502002 Lighting Equipment**

Element Instance : D502002 Lighting Equipment - Original Building

**Description**

2013 - Exterior lighting includes HID and incandescent wall, ceiling and soffit lighting fixtures.

**Condition Assessment**

2013 - The exterior lamps and fixtures have exceeded their rated useful life and the lamps are not energy efficient and should be replaced with high efficient lamps. Original incandescent fixtures were observed at entrance soffits, while wall-mounted fixtures were observed to be damaged or discoloured in some locations.

Last Replacement Year	2008
Theoretical Life	15
Lighting Equipment Type	Exterior Lighting

**Technical Condition**

Fair

**Replacement [D502002 Lighting Equipment - Original Building]**

Event Type:	Replacement	Priority:	High
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Brief Description	Replacement [D502002 Lighting Equipment - Original Building]
Estimated Cost	\$35,700
Fiscal Event Year	2016
2011-2015 Cost	\$35,700
2011-2015 Priority	High
2011-2015 Year	2016

**Recommendation**

2013 - The exterior lighting fixtures are original and appear to be functional at this time, but have surpassed their anticipated service life. Replacement of existing aged lamps and fixtures with higher efficiency lamps and fixtures is recommended.

April 2013 - Original Soffit Lighting Fixture



April 2013 - Original Wall Mounted Lighting Fixture



April 2013 - Aged Lighting Fixture Main Entrance Overhang



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**D5090 Other Electrical Services****D509002 Emergency Lighting & Power**

Element Instance : D509002 Emergency Lighting & Power

**Description**

2013 - The emergency lighting and power equipment include a small generator, automatic transfer switch, emergency lighting battery bank and associated equipment.

**Condition Assessment**

2013 - The emergency lighting and power equipment is original to the date of construction of the school.

Last Replacement Year 1969

Theoretical Life 30

**Technical Condition** Fair

**Replacement**

Event Type: Replacement Priority: High

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Brief Description	Replacement
Estimated Cost	\$102,000
Fiscal Event Year	2016
2011-2015 Cost	\$102,000
2011-2015 Priority	High
2011-2015 Year	2016

April 2013 - Aged Generator



April 2013 - Original ATS





## April 2013 - Aged Emergency Lighting Battery Bank

**D509099 Other Special Systems and Devices**

Element Instance : D509099 Other Special Systems and Devices - Dust Collector

**Description**

2013 - The woodshop machinery is serviced by a dust collector which is located at the exterior of the woodshop class.

**Condition Assessment**

2013 - The dust collector was reported to be to be working fairly well with minor issues reported. The dust collector is located outside and being exposed to the elements, excessive rusting was visible during the time of assessment.

Last Replacement Year 1980

Theoretical Life 35

**Technical Condition** Poor

**Replacement**

Event Type: Replacement Priority: Urgent

Brief Description Replacement

Estimated Cost \$81,600

Fiscal Event Year 2015

2011-2015 Cost \$81,600

2011-2015 Priority Urgent

2011-2015 Year 2015

**Recommendation**

2013 - Replacement of the aged and corroding dust collector is recommended.

April 2013 - Aged and Corroding Dust Collector



## **G BUILDING SITEWORK**

### **G20 Site Improvement**

#### **G2010 Roadways**

Element Instance : G2010 Roadways - Site

**Description** 2013 - Asphalt paved roadway circling the school.

**Condition Assessment** 2013 - The asphalt paved roadway is exhibiting alligator cracking and some depressed areas.

Last Replacement Year 1969

Theoretical Life 20

**Technical Condition** Fair

Replacement [G2010 Roadways - Site]

Event Type: Replacement Priority: Medium

Brief Description Replacement [G2010 Roadways - Site]

Estimated Cost \$31,209

Fiscal Event Year 2016

2011-2015 Cost \$31,209

2011-2015 Priority Medium

2011-2015 Year 2016

**Recommendation** 2013 - The asphalt paved roadway is showing signs of alligator cracking. Replacement planning is warranted.



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Estimated Cost	\$44,370
Fiscal Event Year	2015
2011-2015 Cost	\$44,370
2011-2015 Priority	Medium
2011-2015 Year	2015

**Recommendation**

2013 - The concrete sidewalks are showing signs of uneven and cracked surfaces with signs of vegetation growth and spalling sections of concrete. Replacement is recommended.

Apr 2013- Cracked concrete pedestrian.



Apr 2013- Cracked concrete pedestrian.



# Hamilton-Wentworth District School Board

## Report Summary

Saved Report Name	Final Report Template mod1
User Name	william lo
Report Type	Text With Pictures
Report Name	Condition Assessment
Start Year	2013
Number of Years	5
Priority	Default
Structure / Instance	Sir Allan MacNab SS, Building ID 9145-1
Filter	Parent Criteria Summary: Structure parent - A SUBSTRUCTURE OR Structure parent - B SHELL OR Structure parent - C INTERIORS OR Structure parent - D SERVICES OR Structure parent - G BUILDING SITEWORK - where the detail criteria for the parent node is - Technical Condition <> Not Assessed ;
Asset Photos	Default Photos Only
Current Backlog FCI	No
Element Photos	No Photos
Include Element ACL Criteria	No
Exclude Elements Without Events	Yes
Include Event level details	Yes
Event Photos	All Photos
Include Costlines	No
Printed Date	10/30/2013