

**RIVER GROVE COMMUNITY CENTRE
RENOVATIONS**

5800 River Grove Ave,
Mississauga, ON

Architectural
Mechanical | Electrical | Specifications

Issued for Tender
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Project No. 2522

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Structural Consultant
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Mechanical and Electrical Consultant
JDX Advance Services Inc.

- .1 Refer to Project Manual, Section 00 01 10 - Table of Contents, for indication of document responsibility (DR). Abbreviations for entity responsible for document preparation are as follows:
- .1 A - Denotes documents prepared by Architect.
 - .2 S - Denotes documents prepared by Structural Engineer.
 - .3 M - Denotes documents prepared by Mechanical Engineer.
 - .4 E - Denotes documents prepared by Electrical Engineer.
 - .5 O - Denotes documents prepared by Owner.

DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS

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REPORT(S)

- 1.1 A copy of the following report(s) are appended under separate cover:

Gymnasium Flooring Preventative Maintenance and Replacement

Standard # OPS-109

Prepared by City of Mississauga – Community Services Department

November 26, 2024

Gymnasium Sports Line Resource Guide

Standard # OPS-109b

Prepared by City of Mississauga

(Undated – current operational resource)

- 1.2 The report(s), by their nature, cannot reveal all conditions that exist or can occur on the site. Should conditions be found to vary substantially from the report, immediately notify Consultant in writing and await instructions.
- 1.3 Contractor shall not be entitled to extra payment or extension of Contract Time for work which is required and which is reasonably inferable in the report(s) as being necessary.

END OF SECTION

Gymnasium Flooring Preventative Maintenance and Replacement

Purpose of Standard

To outline the coordination of gymnasium floor maintenance, resurfacing and replacement.

Standard

On an annual basis the Facility Manager will review and assess the need for gymnasium floor maintenance and resurfacing following a collaboration with the Supervisor, Facility Operations, the Manager, Community Programs and the Manager, Sports Development & Customer Service Centre. The Manager of Community Programs will also identify other gymnasium or amenity closures to determine the customer service level impact before approving the timelines.

The amount of maintenance required will be determined by a full assessment of the floor and potential scope of work. The various scopes of work that could be undertaken are as follows;

- Gymnasium Floor Screening
- Sand and Refinish
- Gymnasium Floor Replacement

Gymnasiums must be shut down for a minimum one (1) week for maintenance. A gymnasium floor replacement is a much larger capital project that would require a longer shut down period.

Determination of the shut down week must be coordinated between Supervisor, Facility Operations, the Manager of Community Programs, and the Manager, Sports Development & Customer Service Centre, and confirmed several months in advance of the actual work date, to allow enough notification to Customer Service Centre (Facility Rentals), contractors, user groups and programs.

Supervisor of Operations is responsible to request the maintenance hold through the Supervisor-Customer Service, Bookings and Registration at CSC.

CSC Facility Rentals is responsible to notify any user groups if there are exception dates.

Once the maintenance hold has been placed and the project duration has been confirmed, the Supervisor, Facility Operations will procure a reputable Resurfacing contractor to conduct the work. Refer to OPS-109a for a list of current recommended vendors.

For continuity, outside contractors will be used for gym floor maintenance as opposed to conducting jobs in-house. This is due to relying on industry experts, quality workmanship and the fact that companies will warrant their work and product.

For the long-term preservation of floors, a floor covering system is recommended for non-sporting events. For example, Carassauga, specialty bookings, fairs, and expos.

To extend the life of gymnasium floors, activities may be reviewed by the facility manager and the CSC Sports Manager on a case by case basis.

Maintenance Precautions

- Do not wet mop floor.
- Excessive water may cause the wood to expand and/or rot, causing permanent damage to the flooring.
- Finishes may help minimize water penetration but are not waterproofing products.
- Do not use water or Bona Sport & Commercial Cleaner Concentrate until the floor is thoroughly cured, which is 7 days for water base finishes and 14 days for oil base finishes, after the final coat of finish is applied.
- Do not put plastic over newly finished floors as it may interfere with the curing process.
- If it is necessary to cover for protection, use only brown kraft paper, with nothing taped to the floor, removing at night to allow the floor to breathe and cure.
- Do not use any wax or wax based products. Once you wax a floor, it is exceedingly difficult to recoat.
- Do not use commercial dust mop treatments as they may leave a contaminant on the surface and interfere with recoating.
- The best way to get rid of grime is to lightly saturate a microfiber cloth with a pH-neutral cleaner and using it to wipe the floor.
- If a floor machine is used the following precautions must be taken.
 - Wheels and squeegee must be clean and free of debris.
 - Vacuum must be working at optimal levels.
 - Low water setting is to be used.
 - White or a red pad is to be used.
 - Ph neutral floor cleaner only if other then cold water.

Moisture Monitoring

This will be done through the Building Automation System (BAS). Monitoring humidity levels in gymnasiums is crucial for maintaining the quality and safety of the wood sprung floors because:

- Wood Expansion and Contraction
 - Wood sprung floors are sensitive to changes in moisture levels. High humidity can cause wood planks to expand, potentially warping or buckling, while low humidity can cause them to shrink and crack. Maintaining a consistent humidity level helps prevent these issues, preserving the structural integrity and appearance of the floor.
- Preventing Slip Hazards

- o Appropriate humidity levels help reduce the likelihood of condensation or the accumulation of moisture on the surface of the floor, which can create slip hazards. This is particularly important in a high-traffic environment like gymnasiums.
- Longevity of the Floor
 - o Proper humidity control can extend the lifespan of gymnasium flooring by preventing premature deterioration. This is economically beneficial as it reduces the frequency and severity of needed repairs or replacements.
- Compliance with Manufacturer's Specifications
 - o Many flooring manufacturers require certain conditions, including specific humidity levels, to maintain the warranty on their products. Following these guidelines ensures compliance and warranty protection.

Managing humidity is a critical aspect of facility management in gymnasiums, safeguarding the investment in the flooring and ensuring it remains safe, functional, and aesthetically pleasing for all users.

Gymnasium Preventative Maintenance Projects

Proper cleaning and maintenance of gymnasium floors is essential for risk management as it:

- Reduces the chances of slips, trips, and falls due to debris, moisture, or uneven surfaces.
- Preserves the integrity of the flooring, ensuring it remains safe and functional for all users.

Gymnasium floor screening of wood sprung floors is recommended every 1 to 3 years. This will depend on how much traffic the floor gets and how well it has been maintained.

Sand and Refinish of wood sprung floors can be done less frequently than refinishing. Facilities may only have to resurface floors every 10 to 15 years if maintenance is conducted properly.

Full replacement of wood sprung floors, including new underlay and boards, should only happen when facilities experience the following signs of water damage, wear and tear, excessive damage, warping or buckling, deep gauges and thinning of the wood.

Leading causes of damage to wood sprung floors

1. Heavy traffic
2. Improper cleaning
3. Heavy loads
4. Weather and moisture (Water damage)

When a sand and refinish or full replacement is necessary, game lines will be added to the base and will be approved by the Facility Manager.

Gymnasium Flooring Project Options

Options are outlined in the Definitions section of this SOP.

8 to 12 years would be recommended for a complete re-sand, custom logos, and lines depending on usage and dark spotting that may occur from multiple layers.

Modified oil is used for building specific and heavy usage applications like community centre gymnasiums.

As per Contractor recommendation it is imperative to have HVAC systems turned off after sanding and applying the floor coating for several hours afterward. 36 hours is recommended, weather dependant.

Definitions

Gymnasium Floor Sanding - is the removal of the top layer of a wood sprung gymnasium floor using specialized sanding equipment. This is done by flooring companies and removes the finish, paint, and seal.

Gymnasium Floor Screening - is the removal of the finish so that a new finish can be applied. A new coat of finish can refresh the appearance of a wood sprung gymnasium floor. Screening is a less expensive and less invasive process than sanding. However, screening and refinishing the floor may not be enough to fix deep scratches or stains.

Gymnasium Floor Sealing - is the application of a clear, protective sealant to a floor that has been sanded. The porous wood floor absorbs the sealant which helps protect against moisture and other types of damage to the wood.

Oil-based Polyurethane - oil-based poly is a thicker poly, but it is also softer. Oil poly can be more susceptible to dents, while water-based poly can be more susceptible to surface scratching. Oil-based finishes have a warm amber tone and more depth in appearance, yielding a richer color. An oil-based polyurethane will continue to amber and darken over time.

Sand and Refinish - is the process of taking down the floor to the bare wood and repainting sport lines. Double or triple coat of urethane is typically required.

Screening Coat - screening of a gymnasium floor, also referred to as the coating, is the top layer that helps protect the floor from wear and tear and gives it a shiny appearance. Prepare the floor by a deep clean, etch, buff, and apply one (1) or more coats oil modified urethane.

Volatile organic compounds (VOCs) - are organic compounds that have a high vapor pressure at room temperature. High vapor pressure correlates with a low boiling point, which relates to the number of the sample's molecules in the surrounding air, a trait known as volatility.

Water-based Polyurethane - water-based poly, is an acrylic product, which forms a thinner, but harder coating. Water-based finishes dry clear. A water-based poly will remain clear for the lifetime of the hardwood floor.

Legislation or Municipal By-Laws

Not applicable.

Corporate Policies and Procedures

03 – 06 – 09 Sustainable Procurement Policy Number

Related Standards Operating Procedures

OPS-001 Maintenance Notification Protocol

OPS-004 Facility Cleanliness

Procedure - Daily Maintenance Requirements

- Walk the gymnasium floor, looking for anything that would affect the movement of your dry/wet mop.
- Picking up any trash, debris, remove gum and marks from shoes.
- The best way to get rid of grime is to lightly saturate a microfiber cloth with a pH-neutral cleaner and using it to wipe the floor.
- Vacuum or dust mop floor daily to remove dust, grit, or other abrasive particles using a shop-type vacuum and a fourteen” floor brush tool or untreated dust mop.
- Do not use a vacuum with a beater bar on hardwood floors.
- If desired, use Bona Sport & Commercial Cleaner Concentrate (or comparable cleaner) diluted one part cleaner to seven parts water for dampening the dust mop heads. Do not use any dust mop treatments. Rinse or replace soiled mop covers, as necessary. Continued use of soiled covers may cause streaking.
- Spot clean heavy traffic areas, spills, and spots with Bona Sport & Commercial Cleaner Concentrate (or comparable cleaner), diluted 1:7 cleaner/water ratio (or as directed on the label), and a micro-fiber or UNTREATED dust mop.
- Never use a string mop and bucket method for daily maintenance.
- Using a mop and bucket increases the risk of water damage to your floor. If water flows down the floor cracks, the wood can become saturated and malformed.
- A mop can cross-contaminate your floor with chemicals or dirt that it picked up elsewhere.

Procedure – Placing Maintenance Block

The Supervisor, Facility Operations will coordinate the shut down with programming staff.

Place a maintenance hold on the gymnasium with Customer Service Centre, Facility Rentals (CSC).

Facility Rentals will notify any user groups if there are exception dates.

Procedure – Service Disruption Notification

Follow related standard operating procedure – OPS-001 Maintenance Notification Protocol.

Supervisor, Facility Operations is responsible to post Facility Maintenance Notification signage.

Manager is responsible to communicate with Marketing to update facility web page and social media channels regarding facility service disruption.

Procedure – Water-based Polyurethane Resurfacing

Water-based poly is recommended as it is safer and more environmentally friendly than traditional oil-based polyurethanes. It is easier to clean up and dries more quickly so less of a shutdown period.

With water-based floor finishes, a second coat can generally be applied the same day which can reduce the number of days required to complete the project.

To be applied by a third-party contractor following a sequential procedure:

Step 1: Cleaning The Surface

Step 2: Sanding The Surface

Step 3: Mixing The Polyurethane

Step 4: Brushing or Rolling the Sealer Coat (applied uniformly)

Step 5: Drying and Sanding (after dry)

Step 6: Applying additional Coats

Procedure – Oil, lacquer based, Resurfacing

These products contain VOCs.

Using this type of product will mean that the necessary shutdown period will be longer due to venting requirements, is time-consuming and labor-intensive, and not to mention that it has a stronger odor.

Oil-based finishes need to dry overnight, therefore, second and third coats require additional days of application.

Overall, oil based is more expensive.

When using this type of product, it would follow the same sequential procedure as Water-based Polyurethane Resurfacing listed above.

Procedure - Sanding and Re-lining

Sanding involves removing the polyurethane coats of the gymnasium floor, which includes the finish, paint, and seal, with specialized sanding equipment.

Once sanded down to bare wood, a professional sport flooring company can then paint sport lines.

The professional sports flooring company should be provided with resource OPS-109b for an inventory of community gymnasiums, including game line markings, with dimensions and square footage calculations.

Procedure - Post Work inspection

Post Work Inspection Checklist

1. Uneven Finish: Check for areas where the finish may be uneven or inconsistent.
2. Dust and Debris: Look for any dust or debris that may have been left behind on the floor surface.
3. Stains: Inspect for any stains or discolorations that were not addressed during the refinishing process.
4. Bubbles or Blisters: Look for any bubbles or blisters in the finish, which could indicate improper application or drying.
5. Gaps and Cracks: Check for gaps or cracks in the wood that were not properly filled during the refinishing process.
6. Scratches or Scuffs: Inspect for any scratches or scuffs that may have occurred during the refinishing process or afterwards.
7. Edges and Corners: Pay close attention to the edges and corners of the floor, as these areas can be easily missed during refinishing.
8. Smoothness: Run your hand over the surface of the floor to ensure it feels smooth and consistent.
9. Color Uniformity: Check for any areas where the color of the finish may be inconsistent.
10. Final Clean-Up: Ensure that the contractor has thoroughly cleaned up the work area and removed any debris or materials used during the refinishing process.

Be diligent inspecting these aspects, as this can create a comprehensive deficiency review list to discuss with the contractor and ensure that any necessary touch-ups or corrections are made.

Communication

Managers and Supervisor, Facility Operations are responsible to communicate this standard to all applicable staff under their direction.



COMMUNITY SERVICES DEPARTMENT
STANDARD OPERATING PROCEDURE
Recreation & Culture

Standard #: OPS-109
Keeper of the Standard: Facility Operations
Last Reviewed Date: 2024-10-01
Effective Date: 2024-11-26
Supersedes: N/A

Compliance

Not applicable.

Tools and Resources

OPS-109a Gymnasium & Studio Floor Resurfacing Product & Vendor Recommendation List

OPS-109b Gymnasium Sports Line Resource Guide

[OPS-001a Facility Maintenance Notification Sign](#)

Training Requirements

Not applicable.

Central File/Records Management

Invoices of all completed work and projects to be central filed.

Reference

2024-11-26: Approved by RCLT.

SPORTS LINE RESOURCE 109B

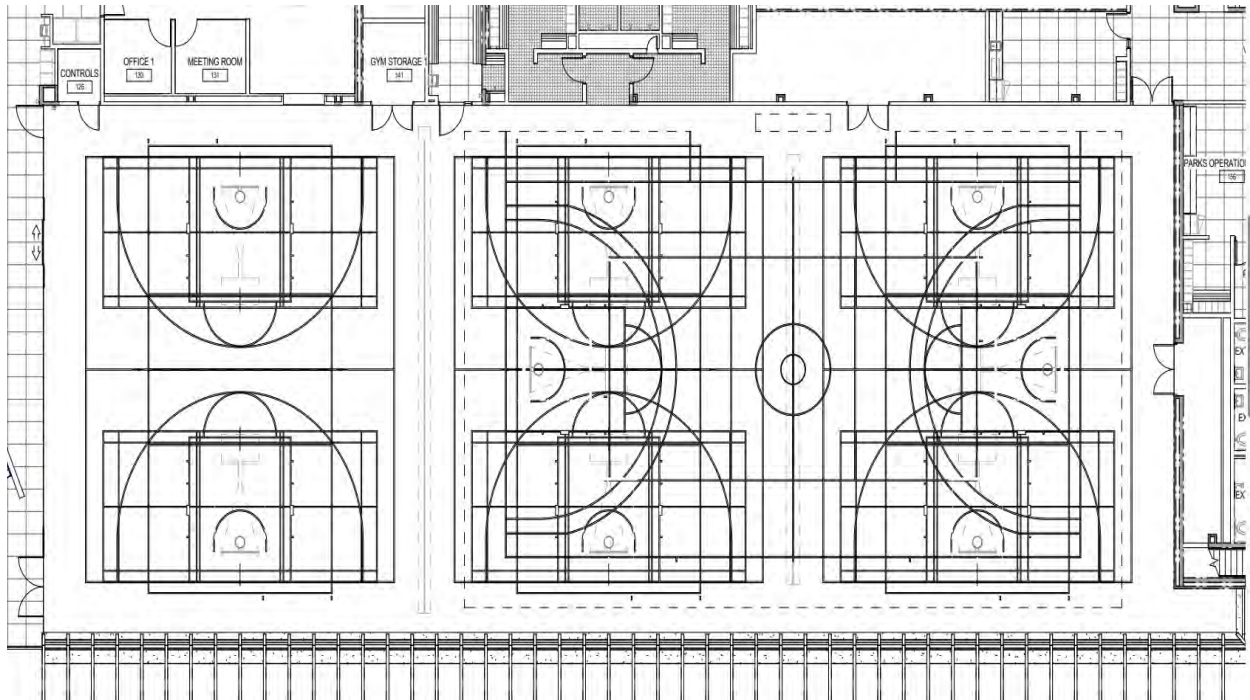
Tracie Stevenson
CITY OF MISSISSAUGA

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Churchill Meadows CC

Diagram of gym

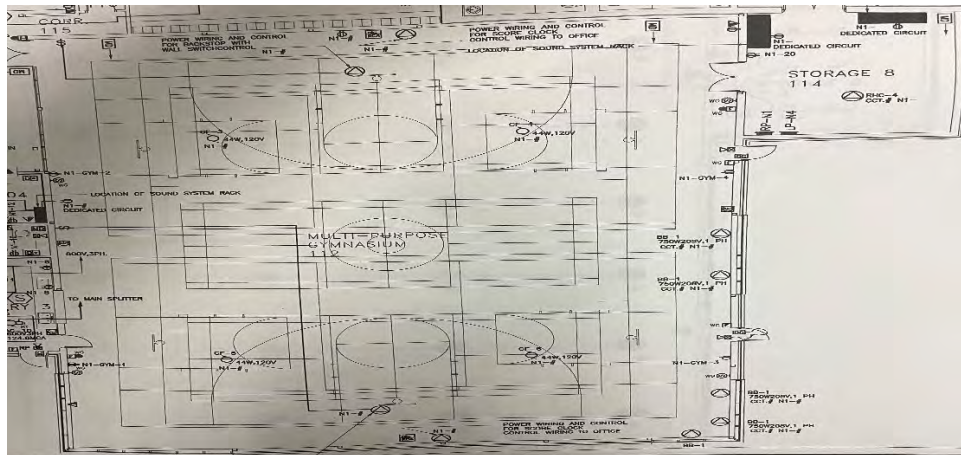


Current gym lines

Sport	Distance to North wall	Distance to East wall	Distance to South wall	Distance to West wall
1 FIBA Basketball	154" to curtain	113"	174"	113"
3 Full court basketball 50'x56'	68"	77"	71"	80"
6 Badminton	106"	77"	109"	80"
6 PickleBall	106"	78"	109"	80"
3 Volleyball	193"	61"	196"	62"

Clarkson CC

Diagram of gym

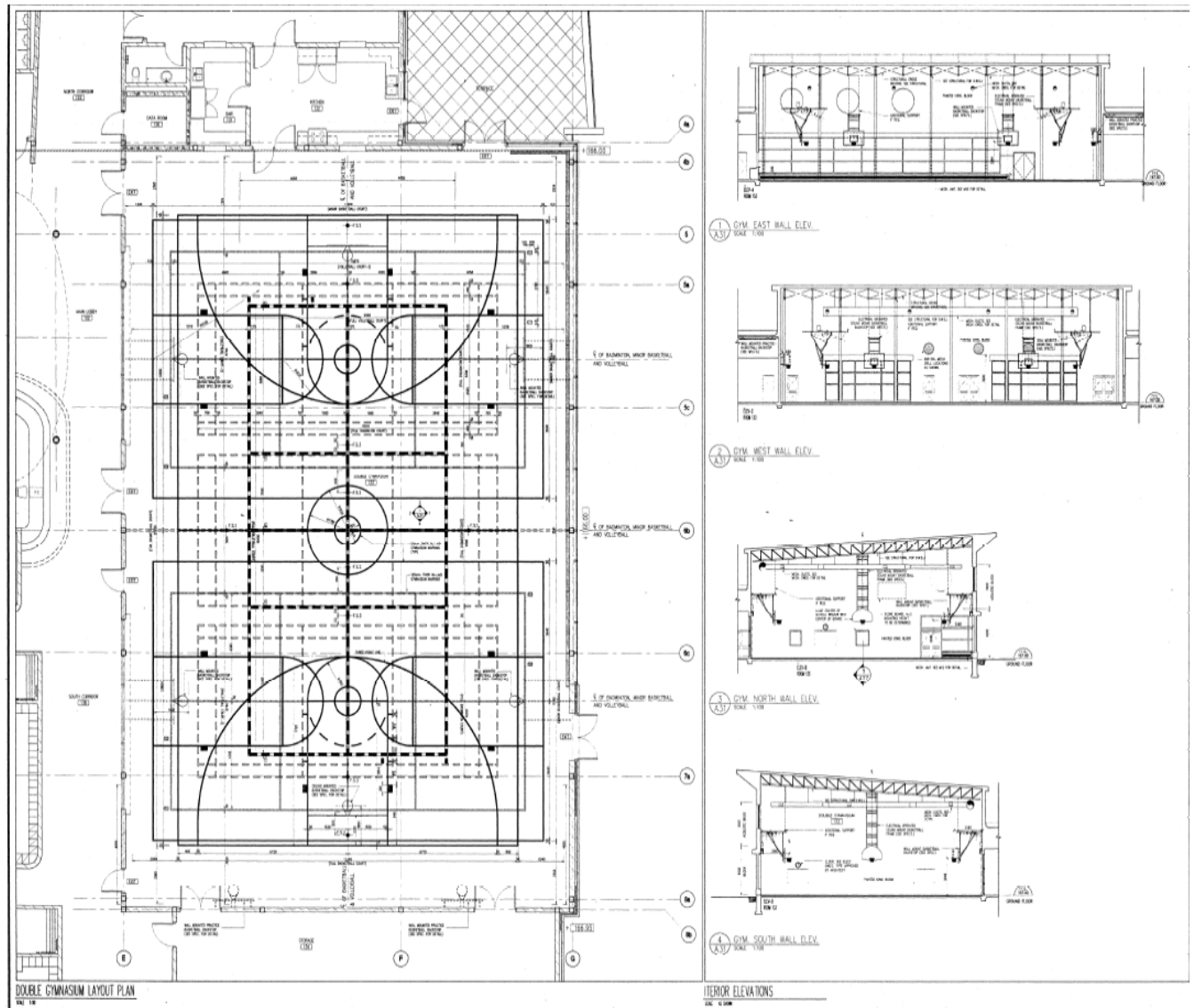


Current gym lines

Sport	Ends	Sides
Full court Basketball	65"	125"
Cross court basketball	57"	67"
Badminton 3 courts	136"	67"
Cross court Volleyball	163"	67"

Frank McKechnie CC

Diagram of gym



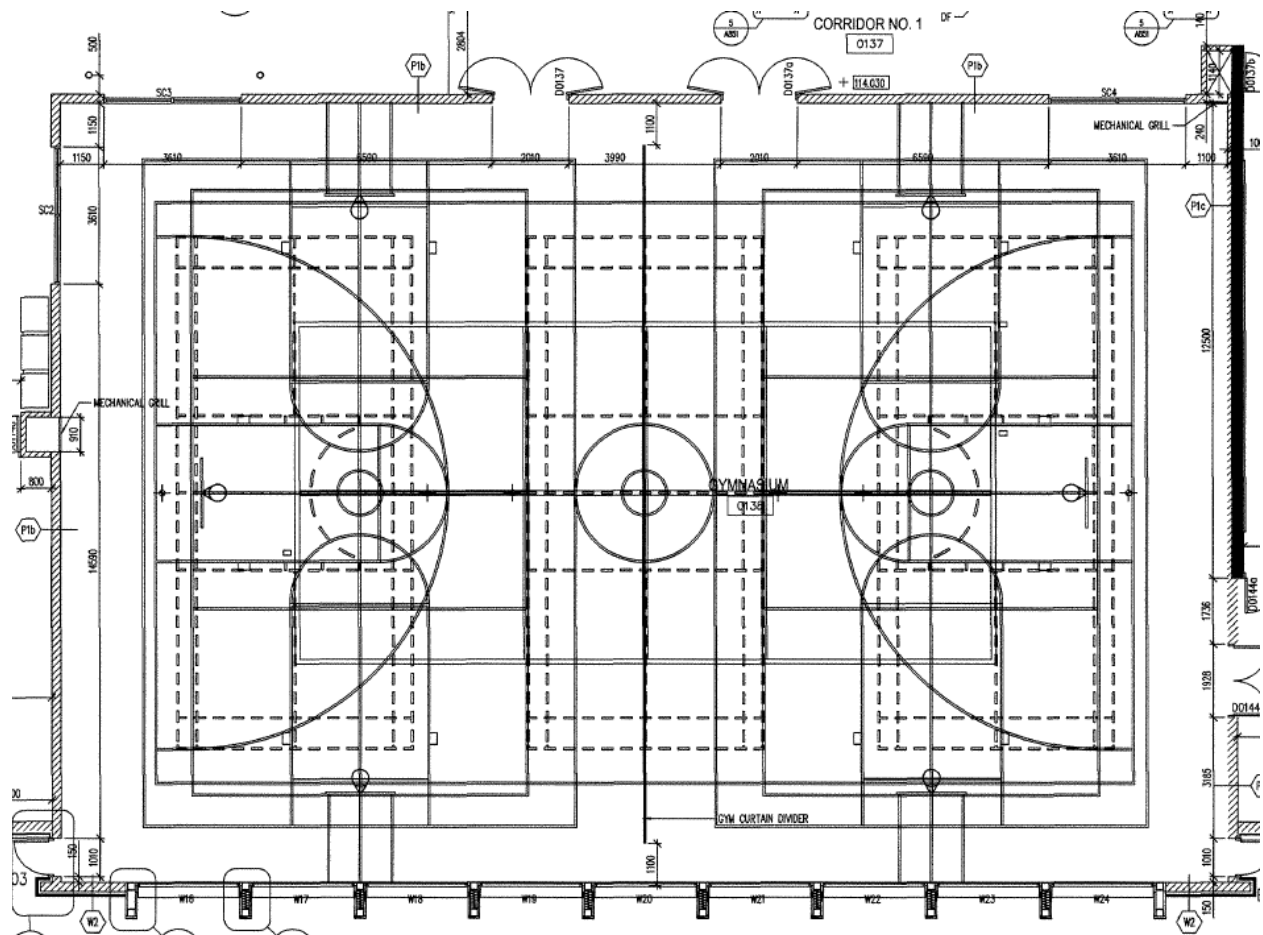
Current gym lines

Sport / Colour	Distance to North wall	Distance to East wall	Distance to South wall	Distance to West wall
White	36"	121"	30.5"	128"
Black	100"	83.5"	94.5"	90"
Green	254"	214"	248.5"	214"
Red	105.5"	45.5"	100.5"	45.5"
Blue	158.5"	31"	153.5"	39.5"

- Radiator runs along N/E wall and sticks out 6.5 inches from the wall

Huron Park CC

Diagram of gym



Current gym lines

Full court basketball- black lines- Out of bounds 7.75 feet back 8.08 feet sides

Cross court basketball – red lines- Out of bounds 3.4 feet back 4.5 feet sides

Cross court volleyball – Blue lines- Out of bounds 4 feet back 10.3 feet sides

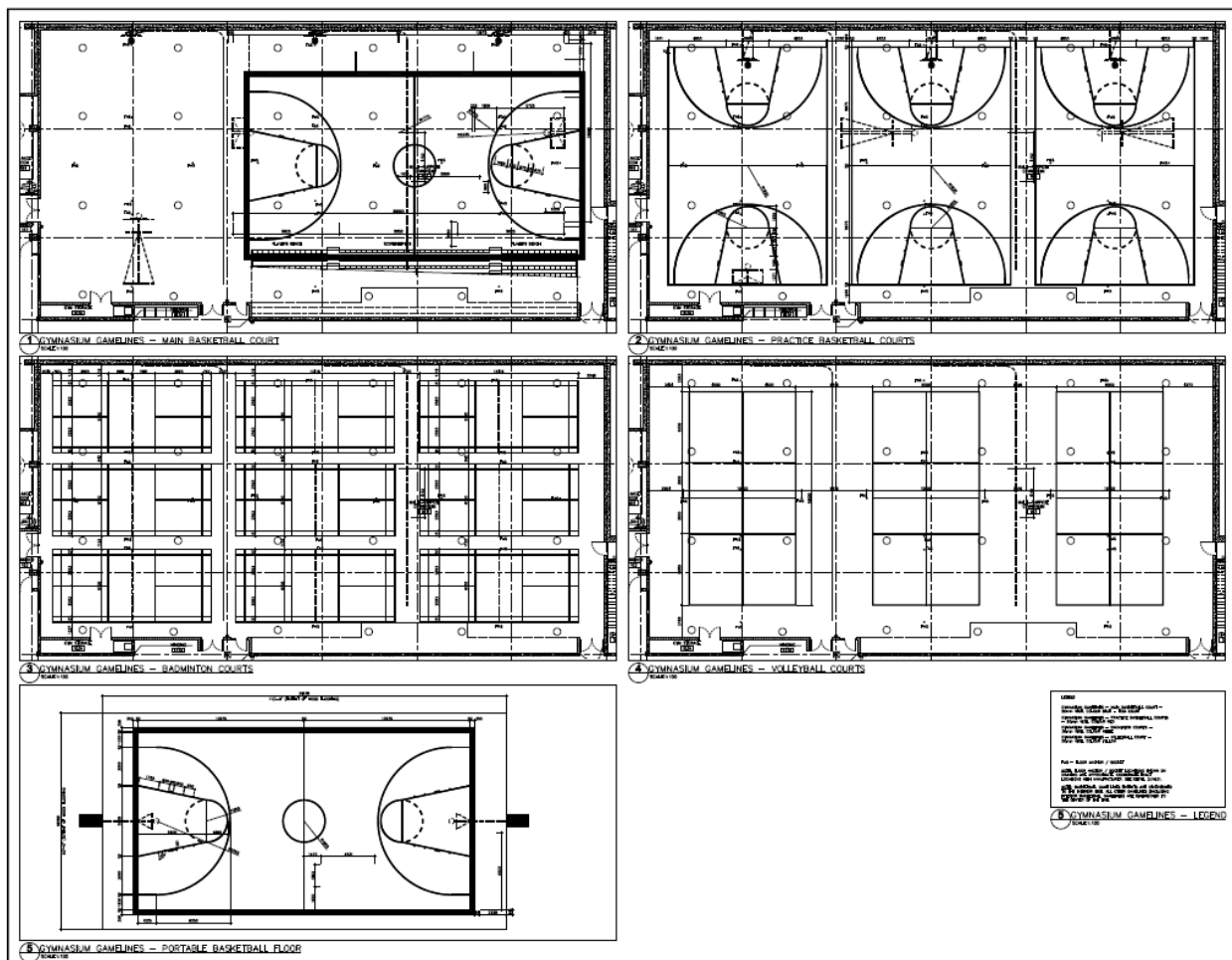
Full court volleyball – green lines- center of gym

Full court tennis – orange lines- centre of gym

Cross court badminton/pickleball- white lines-11.5 feet back 3.3 feet sides

Paramount Sportsplex

Diagram of gym



Current gym lines

Sport	Distance to North wall	Distance to East wall	Distance to South wall	Distance to West wall
1 FIBA Basketball	154" to curtain	113"	174"	113"
3 Full court basketball 50'x56'	68"	77"	71"	80"
6 Badminton	106"	77"	109"	80"
6 PickleBall	106"	78"	109"	80"
3 Volleyball	193"	61"	196"	62"

Last procurement information

1.0 Place of the Work

All work for this project shall be carried out at the Hershey Centre, 5600 Rose Cherry Place, MISSISSAUGA, ON L4Z 4B6.

2.0 Scope of Work

The scope of work involves:

Size of gymnasium: 12,780 square feet.

Sanding to bare wood of the court until the surface is completely smooth followed by screening with 100 grit discs.

After screening, the floor shall be vacuumed and tacked to ensure surface is acceptable for refinishing. Application of 4 coats, using a water-based paint, which has a drying period that, will work within the construction time given (or as per manufacturer's specifications).

Specifications for sealer and floor finish must be provided. Products will be evaluated on the following criteria:

Volatile organic compounds (VOC) count not to exceed 350.

Superior finish hardness.

Single component (no mixing involved).

Ease of application.

High gloss.

Abrasion resistance.

Excellent levelling qualities.

Fast drying time (ready-to-use time).

Particulars of floor product maintenance and recoat program must be provided.

Floor Inspection:

Inspect floor for proper dryness and tolerance and report any discrepancies to the owner in writing. It is the intent of the City to make necessary repairs where deficient materials are discovered.

Any over and above floor repair must be pre-approved by the City prior to performance of the work. Additional costs associated with any floor repair shall be addressed via a Change Order form using unit costs. All floor repairs must be performed and complete prior to the refinishing of the flooring.

Refinishing:

Ensure sure floor is free of moisture.

Sweep floors clean.

Sand with heavy, power driven type sander. Use dust accumulator on machine.

Sand with No. 40 or 36 grit sandpaper if boards are uneven heights. First pass shall be on a diagonal angle to the direction of the floor.

Ensure sure floor is sanded smooth and level before sanding with medium grit (50 or 60 grit) sandpaper. This cut and all subsequent cuts shall be sanded in the direction of the grain of the floor.

Sand edges with No. 60 or 80 grit spinner paper.

Sand entire floor with No. 80 or 100 grit sandpaper.

Screen entire floor with No. 100 disk paper.

Scrape and hand-sand corners and other areas not reached by machine.

Clean floor to remove all dust and debris prior to sealing wood. Floor shall be smooth and free of shiners.

Finishing:

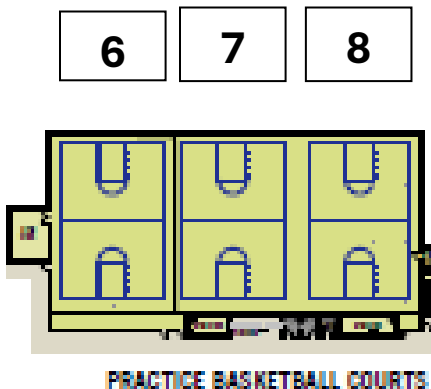
Apply two coats of sealer and two coats of oil modified urethane finish.

Court Markings/Lines:

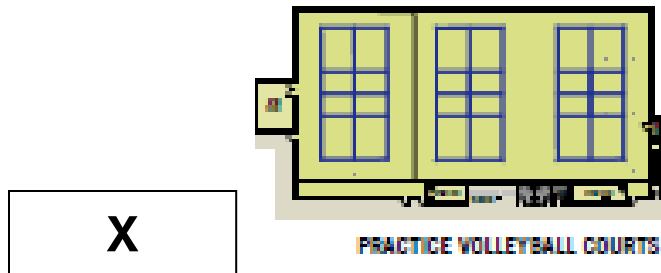
GYM 7 & 8 – Competition Basketball Court will include (on the same competition court) both NBA Court Dimensions and line markings and FIBA 2010 Court Dimensions and line markings.

Updates to Current Design and Line Markings:

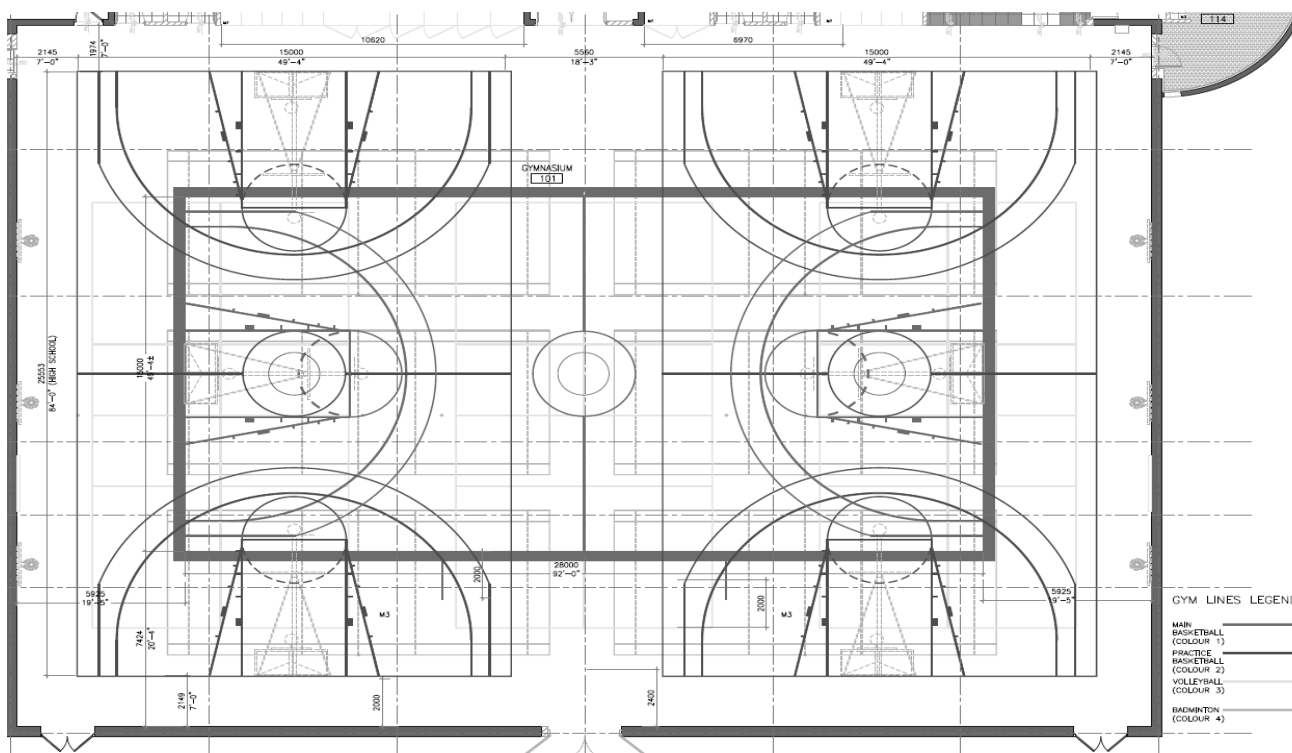
Retain same court dimensions and paint new lines for all three (3) Practice Basketball Courts in Gym 6, 7 and 8.



Retain same court dimension and paint new lines for only one (1) Practice Volleyball Court in Gym 6. Eliminate Volleyball lines in Gym 7 & 8.



Retain same court dimension and paint new lines for only three (3) Practice Badminton Courts in Gym 6. Eliminate Badminton lines in Gym 7 & 8.



Current gym lines

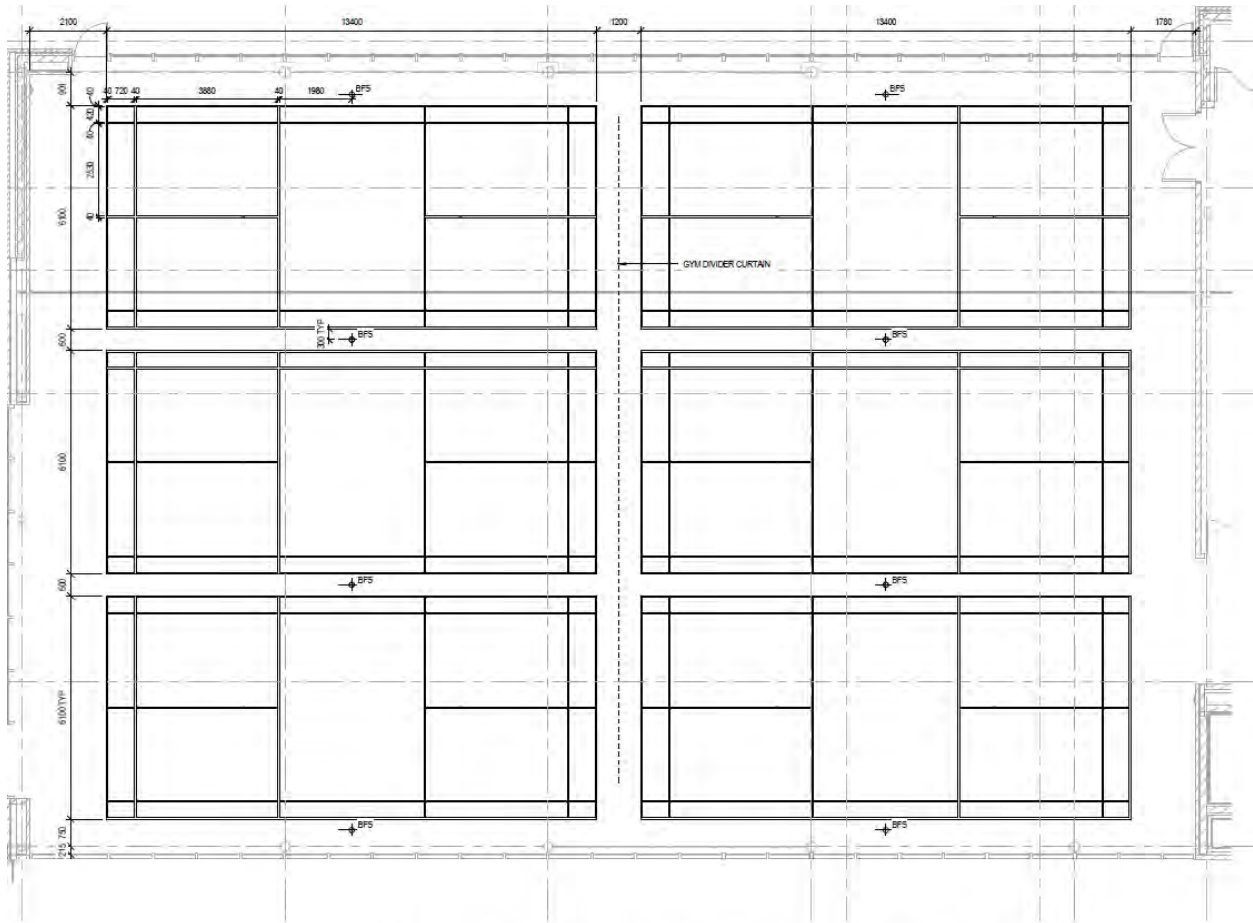
Sport	Distance to North wall	Distance to East wall	Distance to South wall	Distance to West wall
1 FIBA Basketball	282.5"	230"	285.5"	230"
Gym A Basketball (1 Full)	76"	83.5"	79"	97" to Curtain
Gym A Badminton (3 Courts)	209.5"	163"	136.5"	93" to Curtain
Gym B Basketball (1 Full)	76"	99.5" to Curtain	79"	81"
Gym B Badminton (3 Courts)	209.5"	93" to Curtain	136.5"	162.5"
3 Volleyball (148.5" between)	230.5"	105"	233.5"	105.5"

1. FIBA Basketball – White perimeter with blue border, blue markings
2. Gym A & B, 2 Full Basketball Courts – Red markings
3. 6 Badminton (Pickleball) – White markings
4. 3 Volleyball – Yellow markings

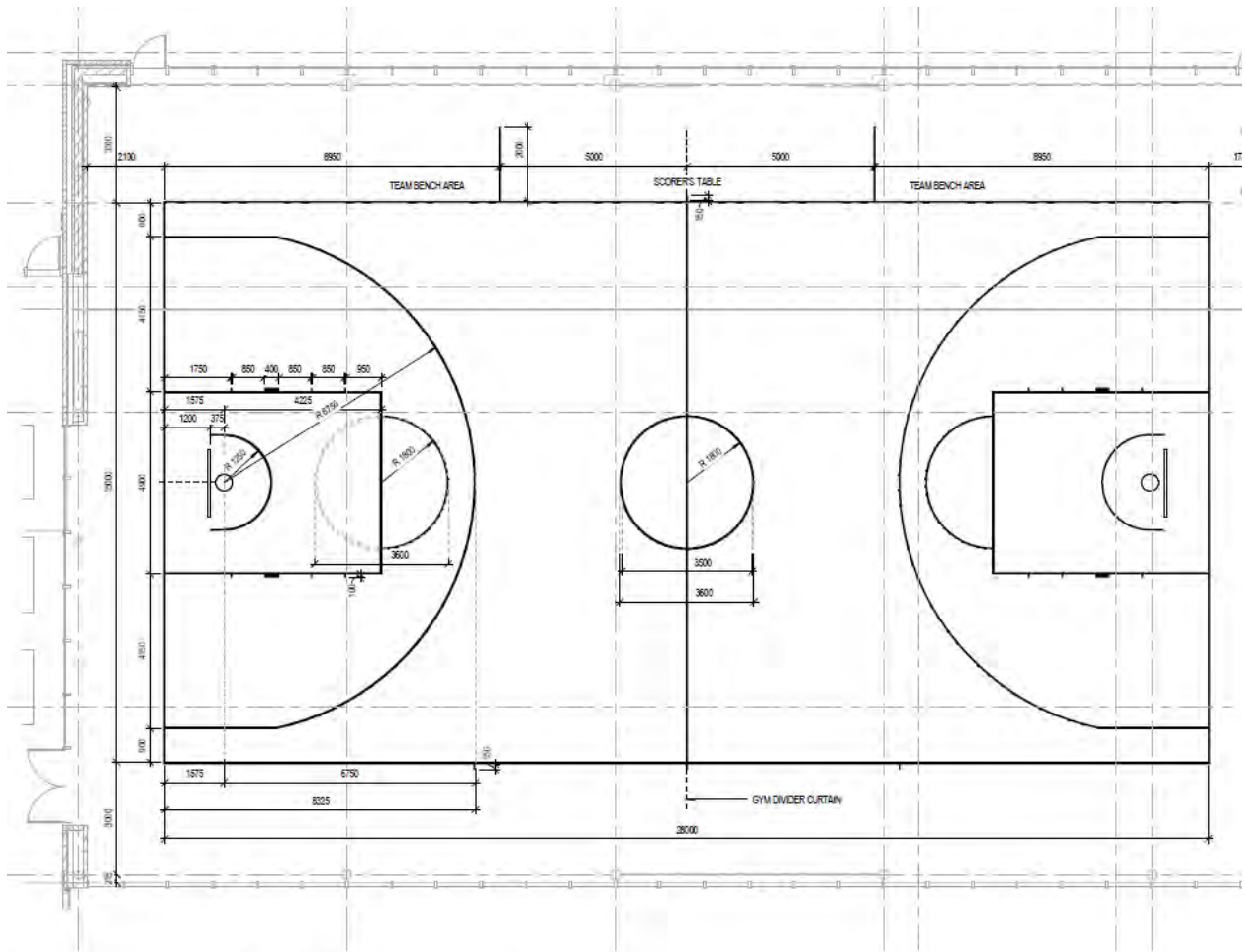


Meadowvale CC

Diagram of gym

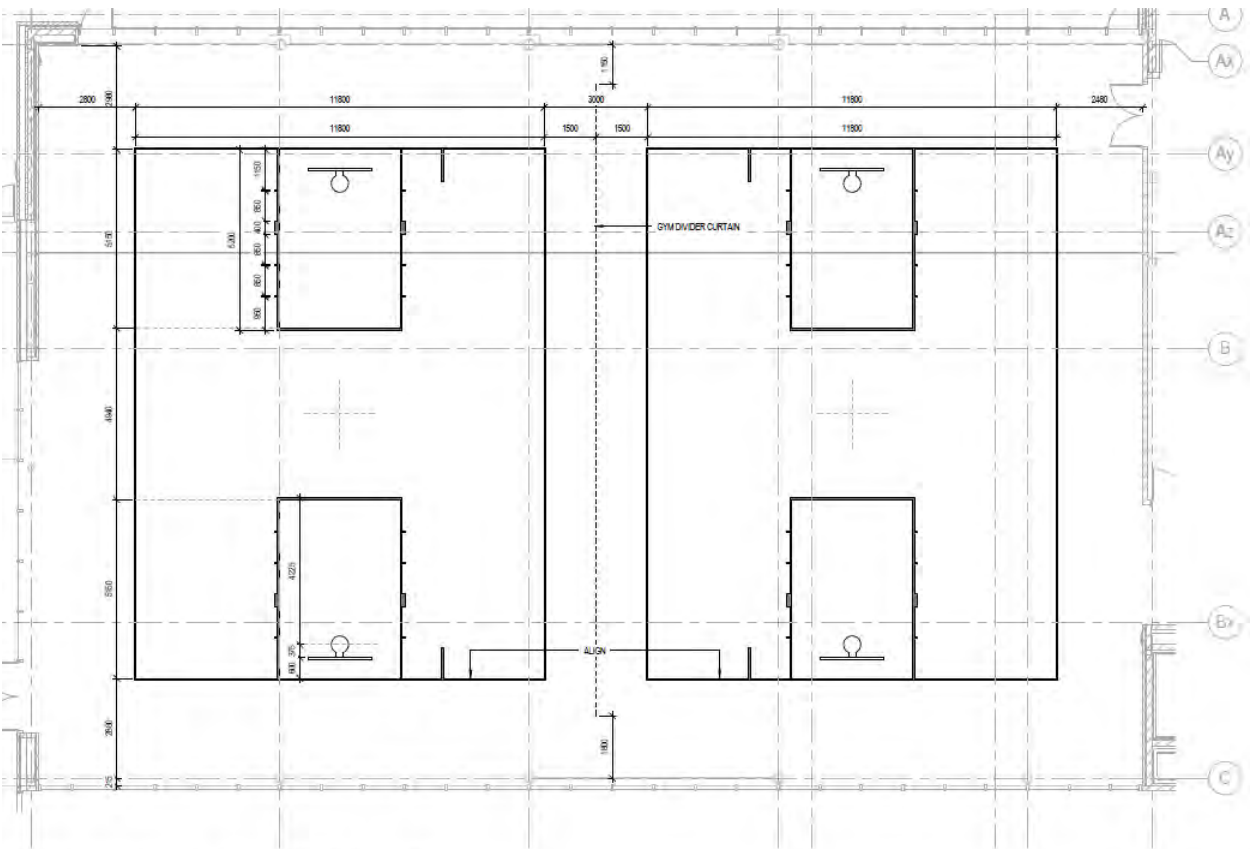


A2 PRACTICE BADMINTON COURT / PICKLEBALL COURT LINES (6 COURTS)
1:75

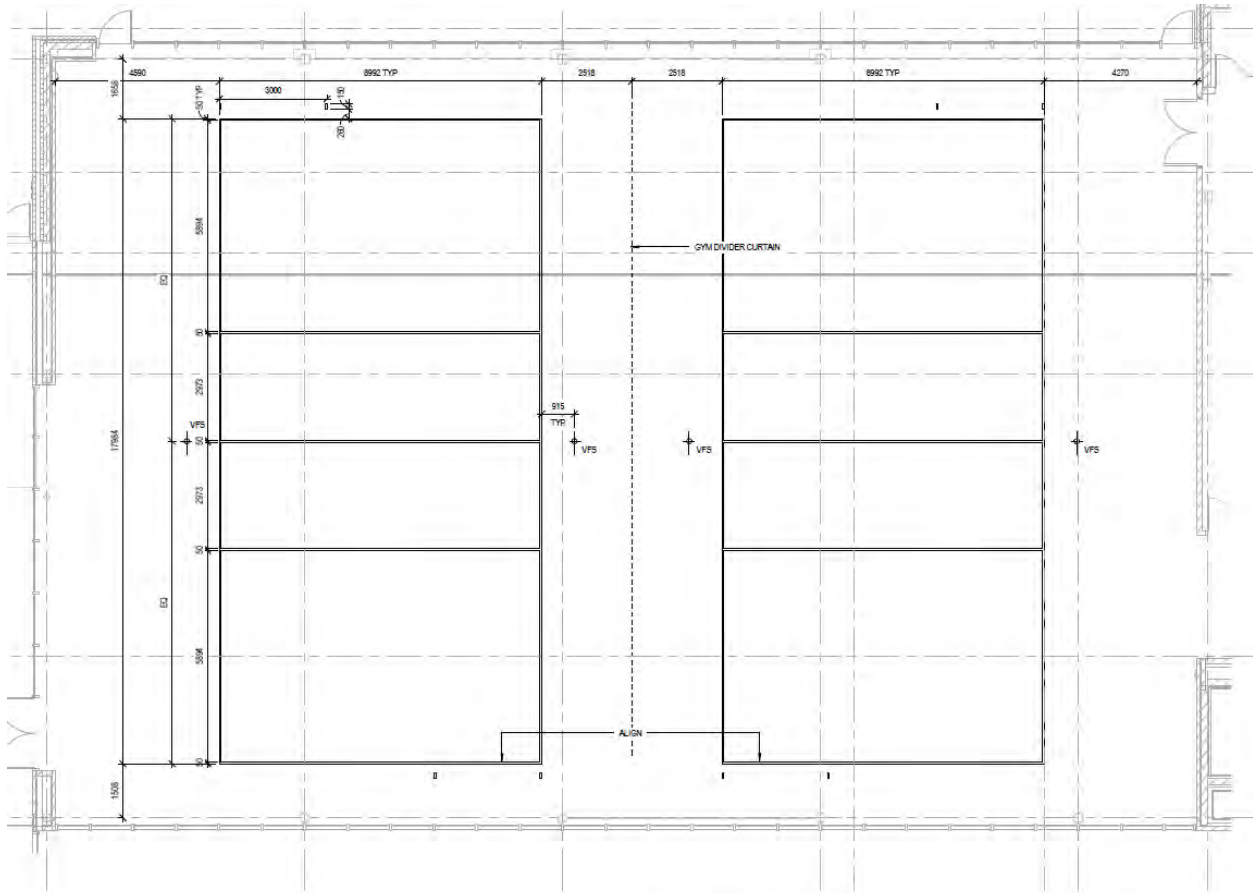


2 COMPETITION BASKETBALL COURT LINES (1 FIBA COURT)

GYM SPORTS LINE RESOURCE 109BPACKAGE



PRACTICE BASKETBALL COURT LINES (2 COURTS)



△1 PRACTICE VOLLEYBALL COURT LINES (2 COURTS)

Current gym lines

Malton CC

Diagram of gym

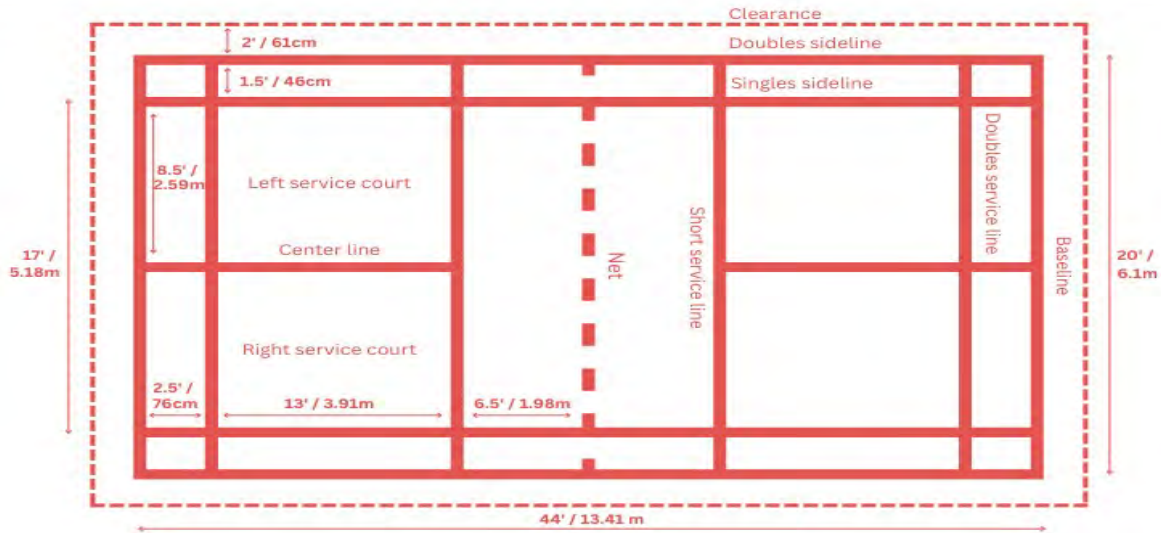


Current gym lines

Sport	Distance to North wall	Distance to East wall	Distance to South wall	Distance to West wall
1 Full Court Basketball	55"	97"	52"	107"
2 Full court basketball 50'x56'	38"	37"	38"	139"
3 Badminton	153"	139"	153"	139"
6 PickleBall	N/A	N/A	N/A	N/A
2 Volleyball	49"	101"	101"	49"

Official Sport lines

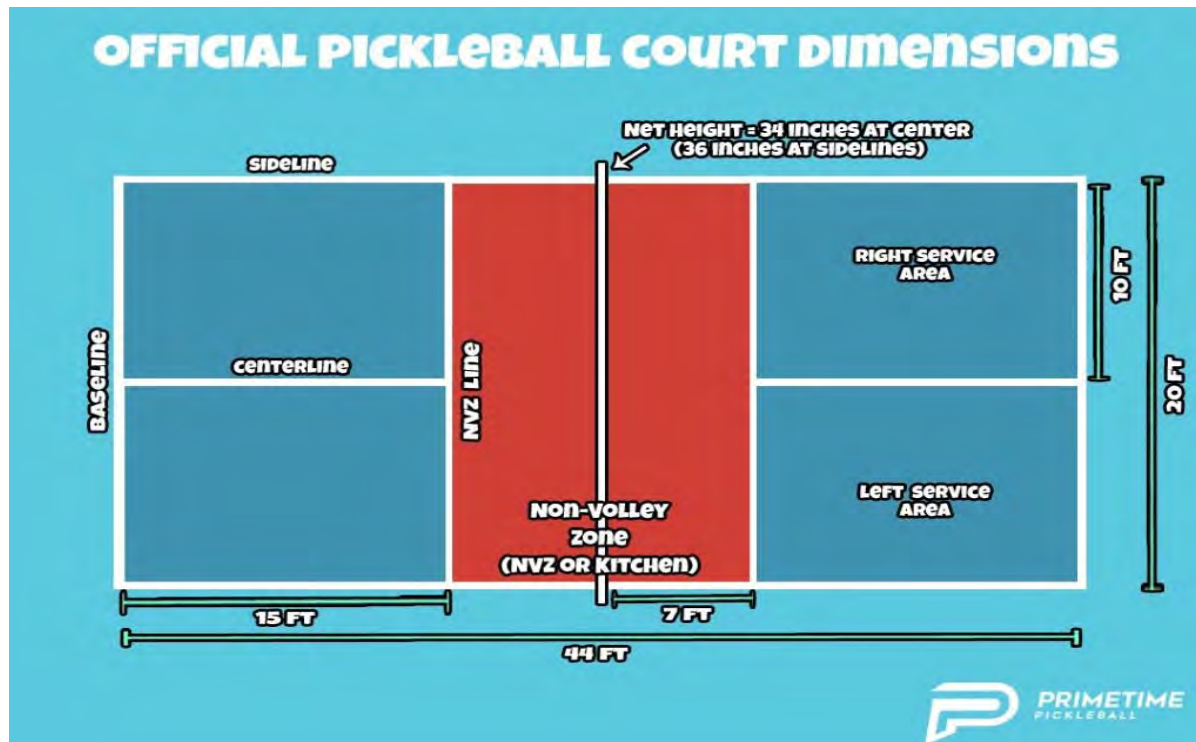
Badminton



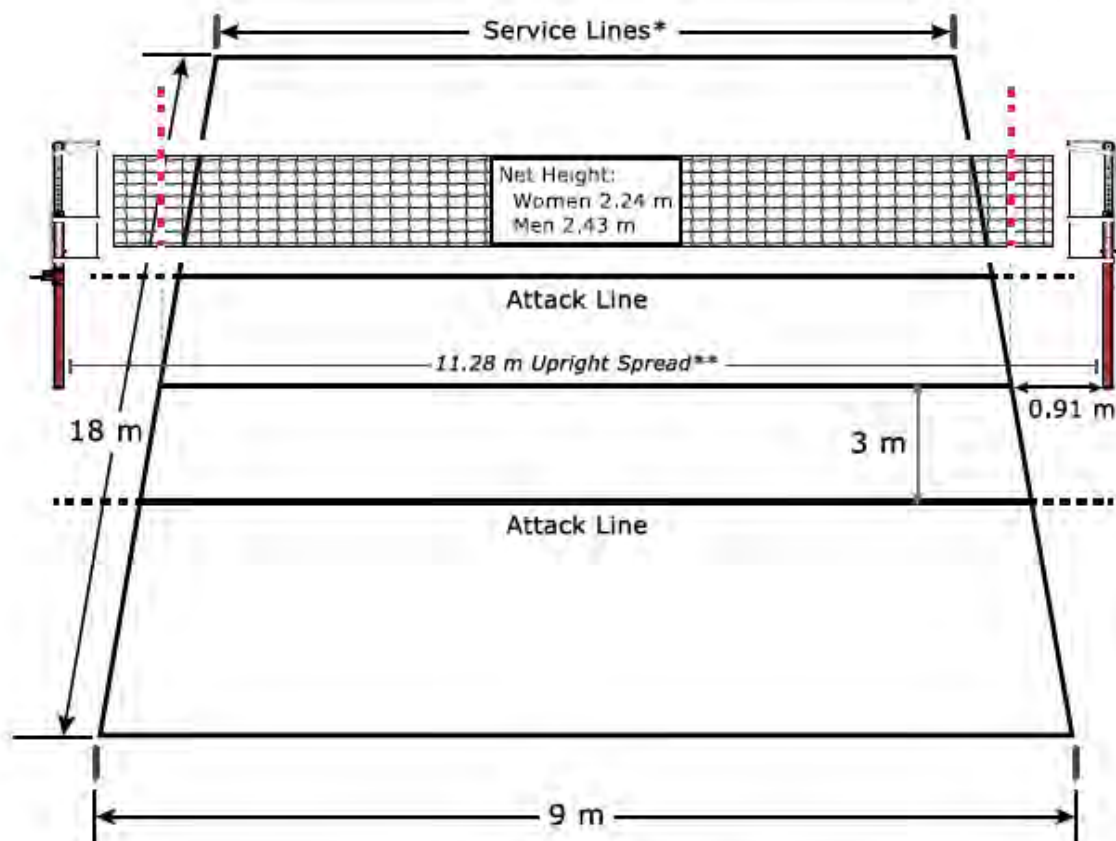
Pickleball

[USA Pickleball - The Official Site of USA Pickleball](https://www.usapickleball.org/) (Canada follows same rules)

Lines: Customarily white. The lines should be 2 inches wide and the Non Volley Zone line is 7 feet from the net. For greater clarity, the distance of 7 feet from the net means the closest edge of the line should be 7 feet away. The non volley zone line is to be made orange.



National Collegiate Athletic Association (NCAA),
USA Volleyball (USAV), International Volleyball Federation (FIVB)



	NCAA	USAV	FIVB
Court Dimensions	18 m x 9 m	18 m x 9 m	18 m x 9 m
Free Zone Minimums	3.05 m outside the sidelines 4.58 m beyond the end lines	3 m on all sides	5 m outside the sidelines 6.5 m beyond the end lines
Ceiling Clearance Minimums	12.4 m facilities built before 2006 7.62 m facilities built after 2006	7 m minimum	12.5 m minimum

* Court measurements are to the outside of the lines

** All court lines are 5 cm wide

*** Sports Imports recommends that all floorplates and uprights be on a min. spread of 11,28 m

NO SCALE

FIBA Basketball

FIBA Court Dimensions:

The playing court shall have dimensions of twenty-eight (28) m in length by fifteen (15) m in width measured from the inner edge of the boundary line.

The playing court shall be limited by the boundary line, consisting of the endlines and the sidelines. These lines are not part of the playing court.

The centre line shall be marked parallel to the endlines from the mid-points of the sidelines. It shall extend 0.15 m beyond each sideline. The centre line is part of the backcourt.

The centre circle shall be marked in the centre of the playing court and have a radius of 1.80 m measured to the outer edge of the circumference.

If the inside of the centre circle is painted, it must be the same colour as the restricted areas.

The free-throw semi-circles shall be marked on the playing court with a radius of 1.80 m measured to the outer edge of the circumference and with their centres at the mid-points of the free-throw lines.

The free-throw line shall be drawn parallel to each endline. It shall have its furthest edge 5.80 m from the inner edge of the endline and shall be 3.60 m long. Its mid-point shall lie on the imaginary line joining the mid-points of the two (2) endlines.

The restricted areas shall be the rectangular areas marked on the playing court

limited by the endlines, the extended free-throw lines and the lines which originate at the endlines, their outer edges being 2.45 m from the mid-points of the endlines and terminating at the outer edge of the extended free-throw lines.

These lines, excluding the endlines, are part of the restricted area. The inside of the restricted areas must be painted.

Free-throw rebound places along the restricted areas, reserved for players during free throws, shall be marked as in Diagram.

The team's three-point field goal area (Diagram) shall be the entire floor area of the playing court, except for the area near the opponents' basket, limited by and including:

Two (2) parallel lines extending from and perpendicular to the endline, with the outer edge 0.90 m from the inner edge of the sidelines.

An arc of radius 6.75 m measured from the point on the floor beneath the exact centre of the opponents' basket to the outer edge of the arc.

The distance of the point on the floor from the inner edge of the mid-point of the endline is 1.575 m. The arc is joined to the parallel lines.

The three-point line is not part of the three-point field goal area.

Throw-in lines, the two (2) lines of 0.15 m in length shall be marked outside the playing court at the sideline opposite the scorer's table, with the outer edge of the lines 8.325 m from the inner edge of the nearest endline.

The no-charge semi-circle lines shall be marked on the playing court, limited by:

A semi-circle with the radius of 1.25 m measured from the point on the floor beneath the exact centre of the basket to the inner edge of the semi-circle.

The semi-circle is joined to:

Two (2) parallel lines perpendicular to the endline, the inner edge 1.25 m from the point on the floor beneath the exact centre of the basket, 0.375 m in length and ending 1.20 m from the inner edge of the endline.

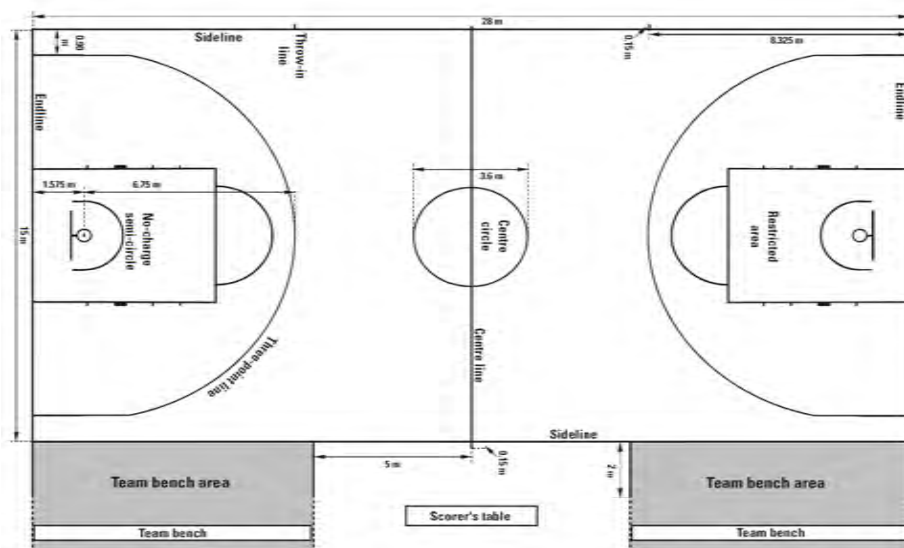
The no-charge semi-circle areas are completed by imaginary lines joining the ends of the parallel lines directly below the front edges of the backboards.

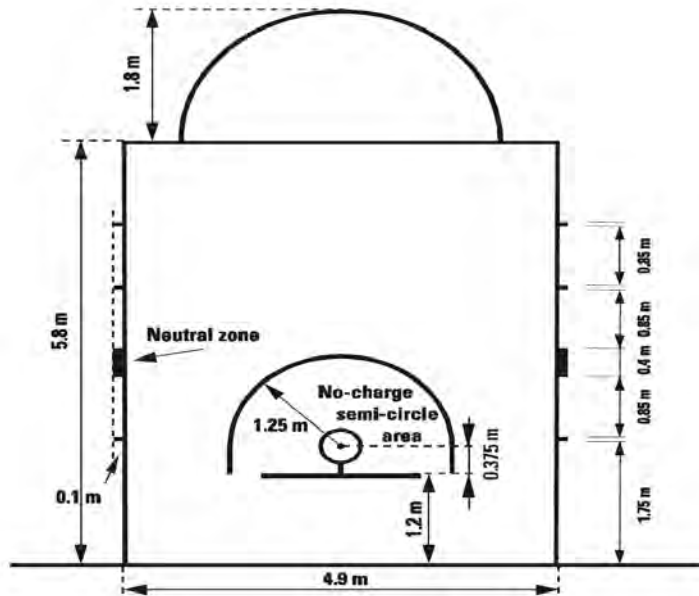
The no-charge semi-circle lines are not part of the no-charge semi-circle areas.

FIBA Court Line Colours:

All lines shall be drawn in white colour, five (5) cm in width and clearly visible.

FIBA Court Schematics





NBA Basketball (Raptors 905 Practice court)

NBA Court Dimensions:

The playing court shall be measured and marked as shown in the court diagram below.

Court needs to be moved westward, from the east wall of the Gymnasium to provide sufficient out-of-bounds area adhering to NBA and FIBA standards. The sideline should be 6.56168 feet or 2 metres away from the east wall.

A free throw lane shall be marked at each end of the court with dimensions and markings as shown on the court diagram. All boundary lines are part of the lane; lane space marks and neutral zone marks are not. The color of the lane space marks and neutral zones shall contrast with the color of the boundary lines. The areas identified by the lane space markings are 2" by 8" inches and the neutral zone marks are 12" by 8".

A free throw line shall be drawn (2" wide) across each of the circles indicated in the court diagram. It shall be parallel to the end line and shall be 15' from the plane of the face of the backboard.

The three-point field goal area has parallel lines 3' from the sidelines, extending from the baseline and an arc of 23'9" from the middle of the basket which inter-sects the parallel lines.

Four hash marks shall be drawn (2" wide) perpendicular to the sideline on each side of the court and 28' from the baseline. These hash marks shall extend 3' onto the court.

Four hash marks shall be drawn (2" wide) perpendicular to the baseline on each side of the free throw lane line. These hash marks shall be 3' from the free throw lane line and extend 6" onto the court.

OPTIMUM LENGTH 94 FT. (INSIDE)

50 FT. (INSIDE)

16 FT. (OUTSIDE)

28 FT. (INSIDE)

2 IN. WIDE BY 3 FT. DEEP

18 FT. 10 IN.

19 FT. TO CENTER OF CURVE

4 FT.

3 FT.

1 FT.

15 IN.

18 IN.

4 FT.

72 IN.

13 FT.

6 IN. LONG LINE, 13 FT. FROM BASELINE (INSIDE) AND 3 FT. FROM FREE THROW LANE LINES (INSIDE)

6 FT. RADIUS (OUTSIDE)

23 FT. 9 IN. (OUTSIDE)

2 IN. LINE

ALL LINES SHALL BE 2 IN. WIDE (NEUTRAL ZONES EXCLUDED)

DIVISION LINE

6 FT. RADIUS (OUTSIDE)

3 FT. RADIUS (INSIDE)

2 IN. LINE

14 FT.

22 FT. (OUTSIDE)

23 FT. 9 IN. (OUTSIDE)

3 FT.

1 FT.

2 IN. WIDE BY 6 IN. DEEP

3 FT.

16 FT. (OUTSIDE)

72 IN.

14 IN.

6 IN.

4 FT.

15 FT.

3 FT.

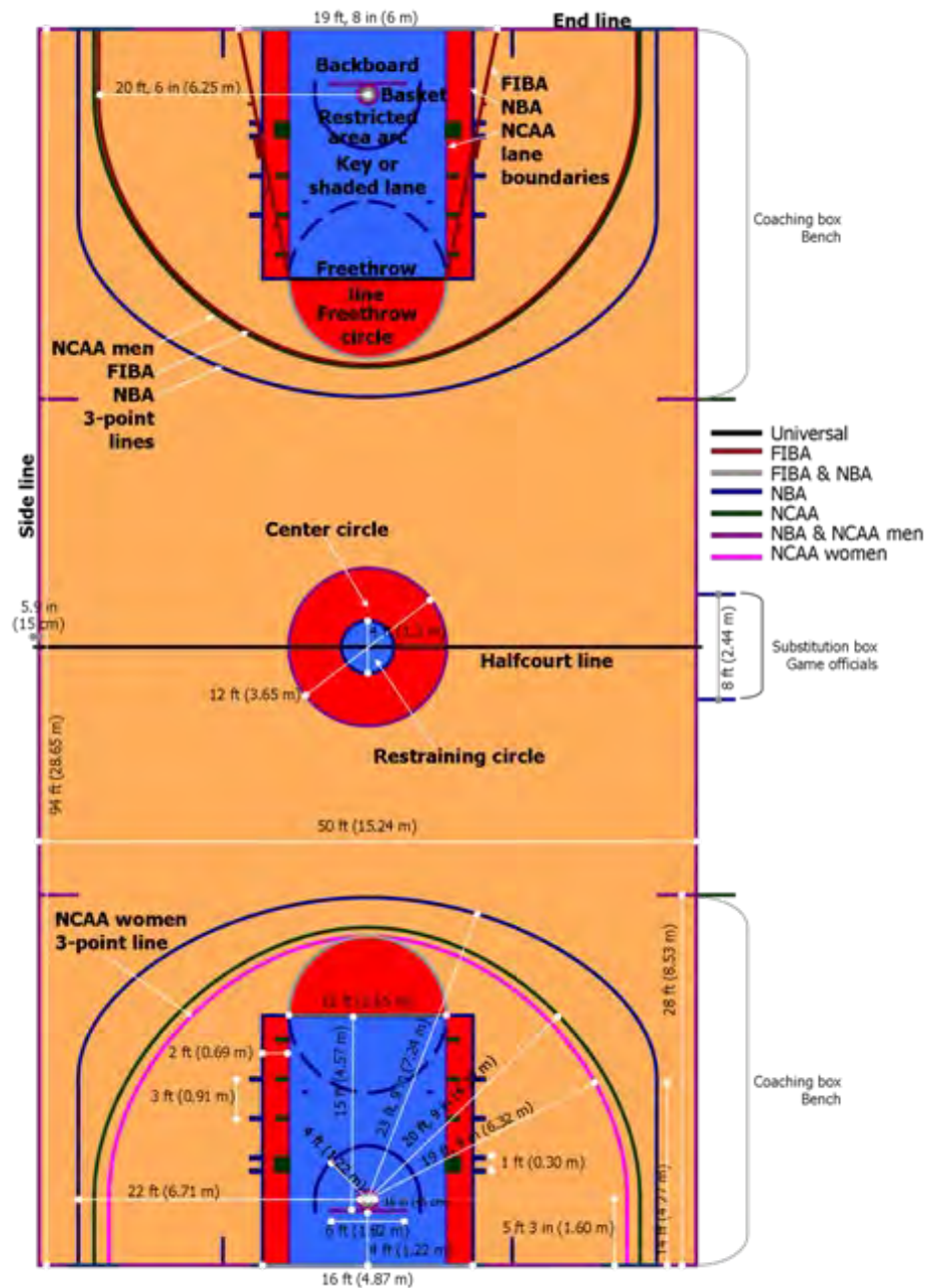
THE COLOR OF THE LANE SPACE MARKS AND NEUTRAL ZONES SHALL CONTRAST WITH THE COLOR OF THE BOUNDING LINES

4 FT.

4 FT.

2 IN. WIDE

Basketball Court Comparisons – NBA to FIBA:





Hazardous Building Materials Assessment (Pre-construction)

River Grove Community Centre
5800 River Grove Avenue,
Mississauga, Ontario

Prepared for:

City of Mississauga

300 City Centre Drive
Mississauga, Ontario, L5B 3C9

February 27, 2026

Pinchin File: 369272.000



Issued to: City of Mississauga
Issued on: February 27, 2026
Pinchin File: 369272.000
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EXECUTIVE SUMMARY

City of Mississauga (Client) retained Pinchin Ltd. (Pinchin) to conduct a hazardous building materials assessment at River Grove Community Centre located at 5800 River Grove Avenue, Mississauga, Ontario. Pinchin performed the assessment on February 5, 2026.

The objective of the assessment was to identify specified hazardous building materials in preparation for building renovation. The proposed work as identified by the Client includes retiling of the pool deck/pool tanks, refinishing the Gym floor and various architectural, mechanical and electrical renovations throughout the facility as indicated on construction drawings provided by the Client via email January 8, 2026.

The results of this assessment are intended for use with a properly developed scope of work or performance specifications and safe work procedures.

SUMMARY OF FINDINGS

The following is a summary of significant findings; refer to the body of the report for detailed findings:

Asbestos: No asbestos-containing materials were identified.

Lead: Lead-containing paints and coatings were identified.

Silica: Crystalline silica is present in concrete, masonry and mortar, and ceramics.

Mercury: Mercury vapour is present in lamp tubes.

Polychlorinated Biphenyls (PCBs): PCBs are not present.

Mould and Water Damage: Visible mould and water damage was not observed during the assessment.

SUMMARY OF RECOMMENDATIONS

The following is a summary of significant recommendations; refer to the body of the report for detailed recommendations.

1. Remedial work is recommended regardless of the planned construction work due to the condition of the material. Refer to Section 5.2 for details.
2. Do not disturb suspected hazardous building materials discovered during the planned work, which have not been identified in this report and arrange for further evaluation and testing.
3. Recycle mercury-containing lamp tubes when removed from service.



Hazardous Building Materials Assessment (Pre-construction)

River Grove Community Centre, 5800 River Grove Avenue, Mississauga, Ontario
City of Mississauga

February 27, 2026
Pinchin File: 369272.000

4. Follow appropriate safe work procedures when handling or disturbing lead and silica.

This Executive Summary is subject to the same standard limitations as contained in the report and must be read in conjunction with the entire report.



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APPENDICES

APPENDIX I	Drawings
APPENDIX II-A	Asbestos Analytical Certificates
APPENDIX II-B	Lead Analytical Certificates
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APPENDIX IV	Location Summary Report
APPENDIX V	Hazardous Materials Summary Report / Sample Log
APPENDIX VI	HMIS All Data Report



1.0 INTRODUCTION AND SCOPE

City of Mississauga (Client) retained Pinchin Ltd. (Pinchin) to conduct a hazardous building materials assessment at River Grove Community Centre located at 5800 River Grove Avenue, Mississauga, Ontario.

Pinchin performed the assessment on February 5, 2026. The assessor was unaccompanied during the assessment. The assessed area was occupied at the time of the assessment.

The objective of the assessment was to identify specified hazardous building materials in preparation for building renovation. The proposed work as identified by the Client includes retiling of the pool deck/pool tanks, refinishing the Gym floor and various architectural, mechanical and electrical renovations throughout the facility as indicated on construction drawings provided by the Client via email January 8, 2026.

The results of this assessment are intended for use with a properly developed scope of work or performance specification.

1.1 Scope of Assessment

The **assessed area** is limited to the portion(s) of the building to be renovated, as described by the Client, and identified in the drawings in Appendix I.

The assessment was performed to establish the type of specified hazardous building materials, locations and approximate quantities incorporated in the structure and its finishes.

For the purpose of the assessment and this report, hazardous building materials are defined as follows:

- Asbestos
- Lead
- Silica
- Mercury
- Polychlorinated Biphenyls (PCBs)
- Mould



The following Designated Substances are not typically found in building materials in a composition/state that is hazardous and were not included in this assessment:

- Arsenic
- Acrylonitrile
- Benzene
- Coke oven emissions
- Ethylene oxide
- Isocyanates
- Vinyl chloride monomer

2.0 METHODOLOGY

Pinchin conducted a room-by-room assessment to identify the hazardous building materials as defined in the scope.

The assessment included limited destructive testing of wall and ceiling finishes (drywall or plaster) to view concealed conditions at representative areas as permitted by the current building use. Limited destructive testing of flooring was conducted where possible (under ceramic tiles, carpets, or multiple layers of flooring). Destructive testing of exterior building finishes, masonry walls (chases, shafts etc.), and structural surrounds was not conducted.

For further details on the methodology including test methods, refer to Appendix III.

3.0 BACKGROUND INFORMATION

3.1 Assessed Area Description

Assessed Area Description Item	Details
Use	Community Centre
Number of Floors	The building is 2 storeys plus 1 level(s) below grade.
Total Area	The assessed area is approximately 30,000 square feet.
Year of Construction	The building was constructed in 1996.
Structure	Concrete, structural steel
Exterior Cladding	Brick
HVAC	Forced Air, boiler to hot water heating
Roof	Built- up roofing
Flooring	Ceramic tiles, wood

Assessed Area Description Item	Details
Interior Walls	Drywall, concrete block
Ceilings	Acoustic ceiling tiles, drywall

3.2 Existing Reports

Pinchin previously prepared the following reports, which have been reviewed as part of this assessment:

- “Hazardous Building Materials Assessment (Management), River Grove Community Centre, 5800 River Grove Avenue, Mississauga, Ontario” dated July 4, 2023, Pinchin File Number 325772.
- “Hazardous Building Materials Assessment (Pre-construction), Roof Replacement Project, River Grove Community Centre, 5800 River Grove Avenue, Mississauga, Ontario” dated May 30, 2024, Pinchin File Number 341897.

4.0 FINDINGS

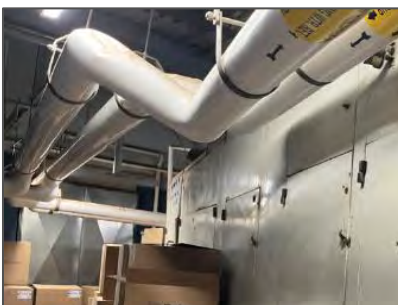
The following section summarizes the findings of the assessment and provides a general description of the hazardous building materials identified. For details on approximate quantities, condition, friability, accessibility, and locations of hazardous building materials; refer to the Hazardous Material Summary / Sample Log and All Data Report in Appendices V and VI.

Any quantities listed in this report or data tables are estimated based on visual approximations only and are subject to variation.

4.1 Asbestos

4.1.1 Pipe Insulation

Pipes in the assessed area are either uninsulated or insulated with non-asbestos fibreglass or other non-asbestos insulation such as mineral fibre or elastomeric foam insulation.



Fibreglass insulation on pipe, Mechanical Room 1 (Loc.57).

4.1.2 Duct Insulation and Mastic

Ducts are either uninsulated or insulated with non-asbestos fibreglass (foil-faced).

The following is a summary of duct mastics sampled.

Colour	Sample Location	Sample Number	Asbestos	Photo
Grey mastic on ducts	Refer to HMIS for location and quality	Previously sampled V0009	No	N/A
Red mastic on ducts	Refer to HMIS for location and quality	Previously sampled V0010	No	
Grey mastic on louvers	Mechanical Room 1 (Loc.57)	S0021A-C	No	
Red mastic on louvers	Mechanical Room 1 (Loc.57)	S0022A-C	No	

4.1.3 Mechanical Equipment Insulation

Mechanical equipment (furnace, hot water tanks, boilers) is either uninsulated or insulated with non-asbestos fibreglass.



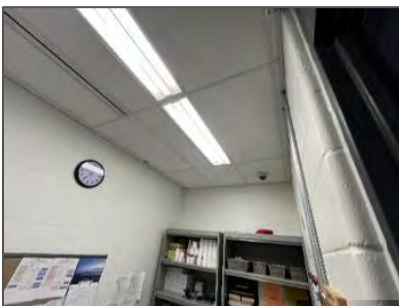
Fibreglass insulation on hot water tank, Mechanical Room 2 (Loc.55).



Uninsulated Boiler, Mechanical Room 2 (Loc.55).

4.1.4 Acoustic Ceiling Tiles

Ceiling tiles are presumed to be non-asbestos based on the age of the materials determined from the age of the building construction. The tiles were manufactured after asbestos stopped being used in acoustic ceiling tiles.



24"x48" textured, Renovated back of house Facilities (Loc.67).

4.1.5 Drywall Joint Compound

Asbestos in drywall joint compound was banned in Canada in 1980. Drywall joint compound in the assessed area was installed on or after 1996 and is presumed to contain no asbestos.

4.1.6 Sealants, Caulking, and Putty

The following is a summary of sealants, caulking, and putties sampled.

Material, Description and Application	Sample Location (Location #)	Sample Number	Asbestos	Photo
Grey window caulking	Refer to HMIS for location	V0001 (Previously Sampled Pinchin File 325772)	No	N/A
Black door caulking	Refer to HMIS for location	V0002 (Previously Sampled Pinchin File 325772)	No	N/A
Light beige expansion joint caulking	Refer to HMIS for location	V0003(Previously Sampled Pinchin File 325772)	No	N/A
Black window caulking	Refer to HMIS for location	V0004(Previously Sampled Pinchin File 325772)	No	N/A
Light grey window caulking	Refer to HMIS for location	V0005(Previously Sampled Pinchin File 325772)	No	N/A

Material, Description and Application	Sample Location (Location #)	Sample Number	Asbestos	Photo
Light red door caulking	Refer to HMIS for location	V0006(Previously Sampled Pinchin File 325772)	No	N/A
Off-white expansion joint caulking	Refer to HMIS for location	V0008(Previously Sampled Pinchin File 325772)	No	N/A
Beige expansion joint caulking	Refer to HMIS for location	V0013(Previously Sampled Pinchin File 341867)	No	N/A
Base of wall caulking	Refer to HMIS for location	V0016(Previously Sampled Pinchin File 341867)	No	N/A
Black butyl sealant on windows	Exterior (Loc.68)	S0025A-C	No	

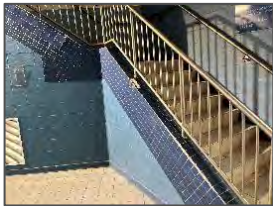
4.1.7 Roofing Products

The materials associated with the built-up roofing do not contain asbestos (Pinchin File 341897 samples S0014A-C and S0015A-C).

4.1.8 Other Building Materials

The following is a summary of other materials sampled.

Description	Sample Location (Location #)	Sample Number	Asbestos	Photo
Yellow baseboard mastic	Refer to HMIS for location	S0007A&B (Previously Sampled Pinchin File 325772)	No	N/A
Dark Red firestopping	Refer to HMIS for location	S0012A-(Previously Sampled Pinchin File 325772) C	No	N/A

Description	Sample Location (Location #)	Sample Number	Asbestos	Photo
Thin set under ceramic floor tiles	Pool (Loc.62)	S0017A-G	No	
Thin set under ceramic wall tiles	Pool (Loc.62)	S0018A-C	No	
Mortar between concrete block	Various, Refer to HMIS data for Locations	S0019A-G	No	
Mastic behind rubber baseboard	Kaneff Auditorium (Loc.6)	S0020A-C	No	
Mortar between concrete block of Awning	Exterior (Loc.68)	S0023A-C	No	
Mortar between concrete upper brick of Awning	Exterior (Loc.68)	S0024A-C	No	

Description	Sample Location (Location #)	Sample Number	Asbestos	Photo
Mortar between base concrete block	Exterior (Loc.68)	S0026A-C	No	

4.1.9 Excluded Materials

The following is a list of materials which may contain asbestos and was excluded from the assessment. These materials are presumed to contain asbestos until otherwise proven by sampling and analysis:

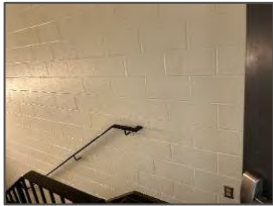
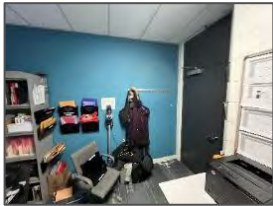
- Vermiculite
- Concealed adhesives
- Caulking and putties not previously sampled
- Mechanical packing, ropes, and gaskets
- Sealants on pipe threads

4.2 Lead

4.2.1 Paints and Surface Coatings

The following table summarizes the analytical results of paints sampled.

Sample Number	Colour, Substrate Description	Sample Location	Lead (%)	Photo
Previously sampled L0001	White on concrete block walls	Various, Refer to HMIS data for Locations	<0.00031	N/A
Previously sampled V0002	White on drywall wall	Various, Refer to HMIS data for Locations	0.00059	N/A
Previously sampled V0004	Sky blue on drywall wall	Various, Refer to HMIS data for Locations	0.00040	N/A
Previously sampled L0006	White on concrete	Various, Refer to HMIS data for Locations	<0.00010	N/A

Sample Number	Colour, Substrate Description	Sample Location	Lead (%)	Photo
Previously sampled L0009	Light grey on concrete floor	Various, Refer to HMIS data for Locations	0.0017	N/A
Previously sampled L0010	Dark blue on concrete	Mechanical Room 1 (Loc.57)	0.00065	N/A
Previously sampled L0011	Blue on concrete block wall	Pool (Loc.62)	<0.0010	N/A
L0012	White paint on concrete block wall	Renovated Back of House (Loc. 67)	0.00037	
L0013	Blue paint on concrete block	Renovated Back of House (Loc. 67)	<0.00010	
L0014	Grey paint on concrete floor	Filtration Room (Loc.44)	0.0012	
L0015	Beige paint on dehumidifier unit	Mechanical Room 1 (Loc.57)	0.0022	
L0016	Blue paint on heat recovery unit	Mechanical Room 2 (Loc.55)	0.20	

Sample Number	Colour, Substrate Description	Sample Location	Lead (%)	Photo
L0017	Dark green paint on domestic hot water boiler	Mechanical Room 2 (Loc.55)	0.11	
L0018	Blue paint on PVC jacketing of hot water tank	Mechanical Room 2 (Loc.55)	0.0061	
L0019	Blue paint on structural steel awning	Exterior (Loc.68)	0.15	
L0020	Grey paint on masonry	Exterior (Loc.68)	0.00073	

Results above 0.1% (1,000 mg/kg) are considered lead-containing, and over 0.5% (5,000 mg/kg) are considered lead-based in accordance with the EACC guideline.

Results greater than 0.009% (90 mg/kg) but less than or equal to 0.1% (1,000 mg/kg) are considered low-level lead paints or surface coatings in accordance with the EACC guideline.

Paints containing lead equal to or less than 0.009% (90 mg/kg) are assumed to be insignificant relating to potential exposure from construction disturbance in accordance with the EACC guideline.

4.2.2 Lead Products and Applications

Lead products were not found during the assessment.



4.2.3 Excluded Lead Materials

Lead is known to be present in several materials which were not assessed or sampled. The following materials, where found, should be presumed to contain lead.

- Electrical components, including wiring connectors, grounding conductors, and solder
- Solder on pipe connections

4.3 Silica

Crystalline silica is assumed to be a component of the following materials where present in the building.

- Concrete
- Masonry and mortar
- Ceramic tiles and grout

4.4 Mercury

4.4.1 Lamps

Mercury vapour is present in fluorescent lamp tubes.

4.5 Polychlorinated Biphenyls

4.5.1 Lighting Ballasts

Based on information from the Client and confirmed by visual observations (e.g., evidence of T-5 fixtures with electronic ballasts) the fixtures will not contain PCB ballasts.

Based on the presence of Light Emitting Diode (LED) lamps, the fixtures will not contain PCB ballasts.

4.5.2 Transformers

All transformers in the building are dry type transformers and do not contain PCB-containing dielectric fluids; however, may contain capacitors, which could not be assessed for PCBs as the equipment was in service.

4.6 Mould and Water Damage

Visible mould growth and water damage was not observed during the assessment.

4.7 Remedial Work

The following remedial work is recommended regardless of the planned construction work due to the condition and location of the material.

Material, Quantity & Condition	Location	Recommended Procedure	Photo
Blue paint on structural steel of Awning, 2000 SF in POOR condition	Exterior (Loc.68)	Remove following Class 2A lead procedures as per EACC Lead Guidelines	

4.8 Construction Work

The following recommendations are made regarding the construction work involving the hazardous materials identified.

4.8.1 Lead

For lead-containing or lead-based paints (i.e., greater than the EACC guideline of 0.1% (1,000 mg/kg) for lead-containing paints, and 0.5% (5,000 mg/kg) for lead-based), construction disturbance may result in over-exposure to lead dust or fumes. The need for work procedures, engineering controls and personal protective equipment should be assessed on a site-specific basis to comply with applicable regulations, and/or guidelines.

For paints identified as having low levels of lead (i.e., greater than 0.009% (90 mg/kg) but less than or equal to the EACC guideline of 0.1% (1,000 mg/kg) for lead-containing paints) special precautions are not recommended unless aggressive disturbance (grinding, blasting, torching) is planned.

Exposure from construction disturbance of paints containing lead equal to or less than 0.009% (90 mg/kg) is assumed to be insignificant in accordance with the EACC guideline.

Items painted with paints containing elevated levels of lead may be a hazardous waste. Test lead-painted materials for leachable lead and other metals prior to disposal. Metallic components coated with lead paint do not require leachate testing and can be disposed of as non-hazardous construction and demolition (C&D) waste.

4.8.2 Silica

Construction disturbance of silica-containing products may result in excessive exposures to airborne silica, especially if performed indoors and dry. Cutting, grinding, drilling or demolition of materials containing silica should be completed only with proper respiratory protection and other worker safety precautions that comply with applicable regulations and guidelines.



4.8.3 *Mercury*

Do not break lamps. Recycle and reclaim mercury from fluorescent lamps when taken out of service. Mercury is classified as a hazardous waste and must be disposed of in accordance with applicable regulations.

5.0 **TERMS AND LIMITATIONS**

This work was performed subject to the Terms and Limitations presented or referenced in the proposal for this project.

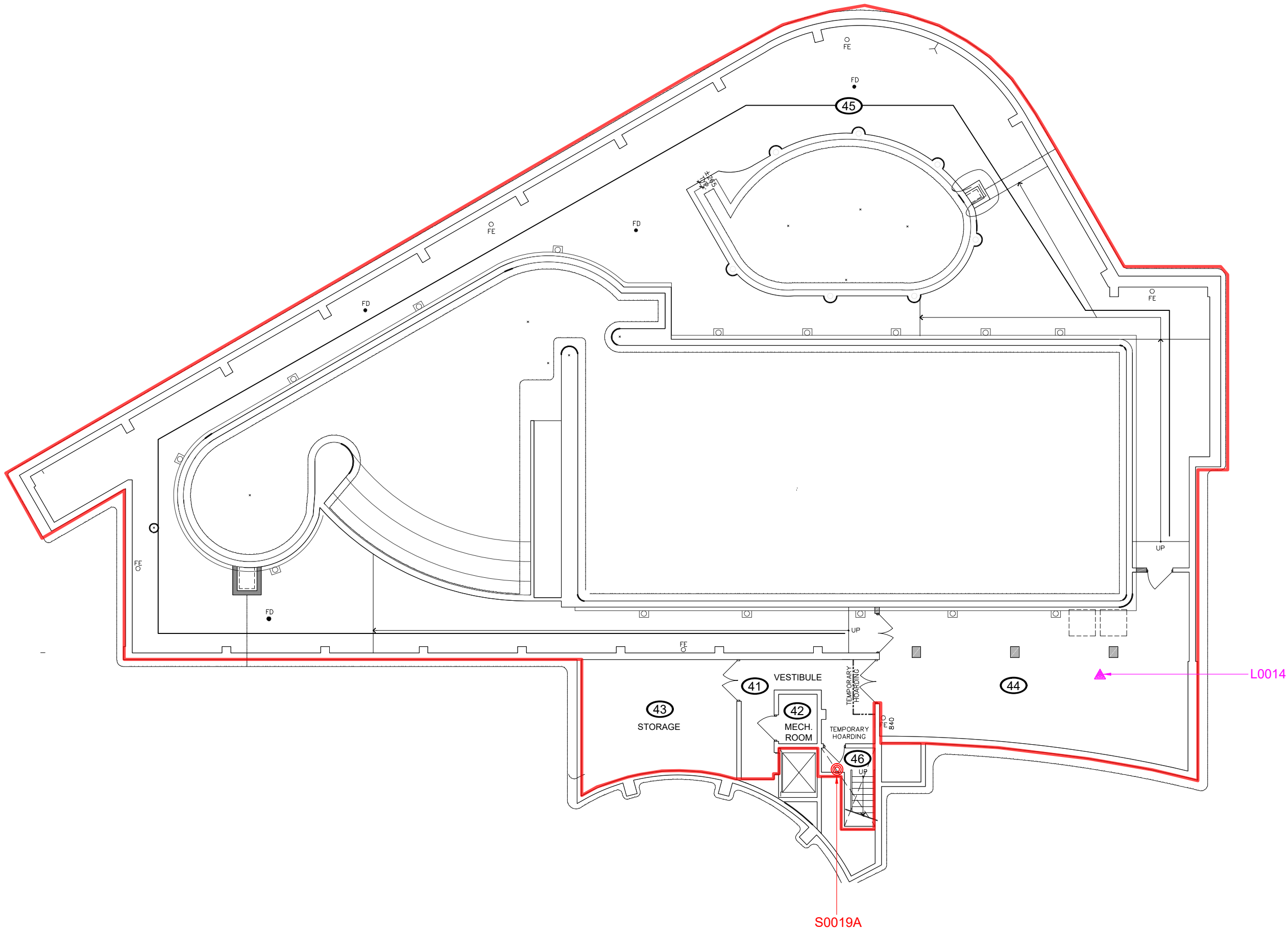
Information provided by Pinchin is intended for Client use only. Pinchin will not provide results or information to any party unless disclosure by Pinchin is required by law. Any use by a third party of reports or documents authored by Pinchin or any reliance by a third party on or decisions made by a third party based on the findings described in said documents, is the sole responsibility of such third parties. Pinchin accepts no responsibility for damages suffered by any third party as a result of decisions made or actions conducted. No other warranties are implied or expressed.

6.0 **REFERENCES**

The following legislation and documents were referenced in completing the assessment and this report:

1. Asbestos on Construction Projects and in Buildings and Repair Operations, Ontario Regulation 278/05.
2. Designated Substances, Ontario Regulation 490/09.
3. Lead on Construction Projects, Ministry of Labour Guidance Document.
4. The Environmental Abatement Council of Canada (EACC) Lead Guideline for Construction, Renovation, Maintenance or Repair.
5. Ministry of the Environment Regulation, R.R.O. 1990 Reg. 347 as amended.
6. Ministry of the Environment Regulation, R.R.O. 1990 Reg. 362 as amended.
7. Silica on Construction Projects, Ministry of Labour Guidance Document.
8. Alert – Mould in Workplace Buildings, Ontario Ministry of Labour.
9. PCB Regulations, SOR/2008-273, Canadian Environmental Protection Act.
10. Surface Coating Materials Regulations, SOR/2016-193, Canada Consumer Product Safety Act.
11. Consolidated Transportation of Dangerous Goods Regulations, including Amendment SOR/2019-101, Transportation of Dangerous Goods Act.
12. Mould Guidelines for the Canadian Construction Industry, Standard Construction Document CCA 82 – 2004 (Revised 2018), Canadian Construction Association.

APPENDIX I
Drawings



- LEGEND**
- PINCHIN LOCATION NUMBER
 - SURVEY BOUNDARY/ASSESSED AREA
 - OUTSIDE ASSESSMENT SCOPE
 - ASBESTOS BULK SAMPLE
 - LEAD BULK SAMPLE
 - VERMICULITE DRILLHOLE

NOT ALL KNOWN OR SUSPECTED HAZARDOUS BUILDING MATERIALS MAY BE DEPICTED ON THE DRAWING. REFER TO THE HAZARDOUS BUILDING MATERIALS ASSESSMENT REPORT FOR A COMPLETE LIST OF KNOWN AND SUSPECTED HAZARDOUS BUILDING MATERIALS.

LEGEND IS COLOUR DEPENDENT. NON-COLOUR COPIES MAY ALTER INTERPRETATION.

BASE PLAN PROVIDED BY CLIENT.



PROJECT NAME:
HAZARDOUS BUILDING MATERIALS ASSESSMENT (PRE-CONSTRUCTION)

CLIENT NAME:
CITY OF MISSISSAUGA

PROJECT LOCATION:
**RIVER GROVE COMMUNITY CENTRE
5800 RIVER GROVE AVENUE
MISSISSAUGA, ONTARIO**

FIGURE NAME:
BASEMENT POOL

PROJECT NUMBER: 369272.000	SCALE: NOT TO SCALE
DRAWN BY: DP	REVIEWED BY: TN
DATE: FEBRUARY 2026	FIGURE NUMBER: 1 OF 6



- NOT ALL KNOWN OR SUSPECTED
HAZARDOUS BUILDING MATERIALS MAY BE
DEPICTED ON THE DRAWING. REFER TO THE
HAZARDOUS BUILDING MATERIALS
ASSESSMENT REPORT FOR A COMPLETE
LIST OF KNOWN AND SUSPECTED
HAZARDOUS BUILDING MATERIALS.

BASE PLAN PROVIDED BY CLIENT.



CLIENT NAME:

PROJECT LOCATION:

FIGURE NAME:

PROJECT NUMBER:

SCALE:

DRAWN BY:

REVIEWED BY:

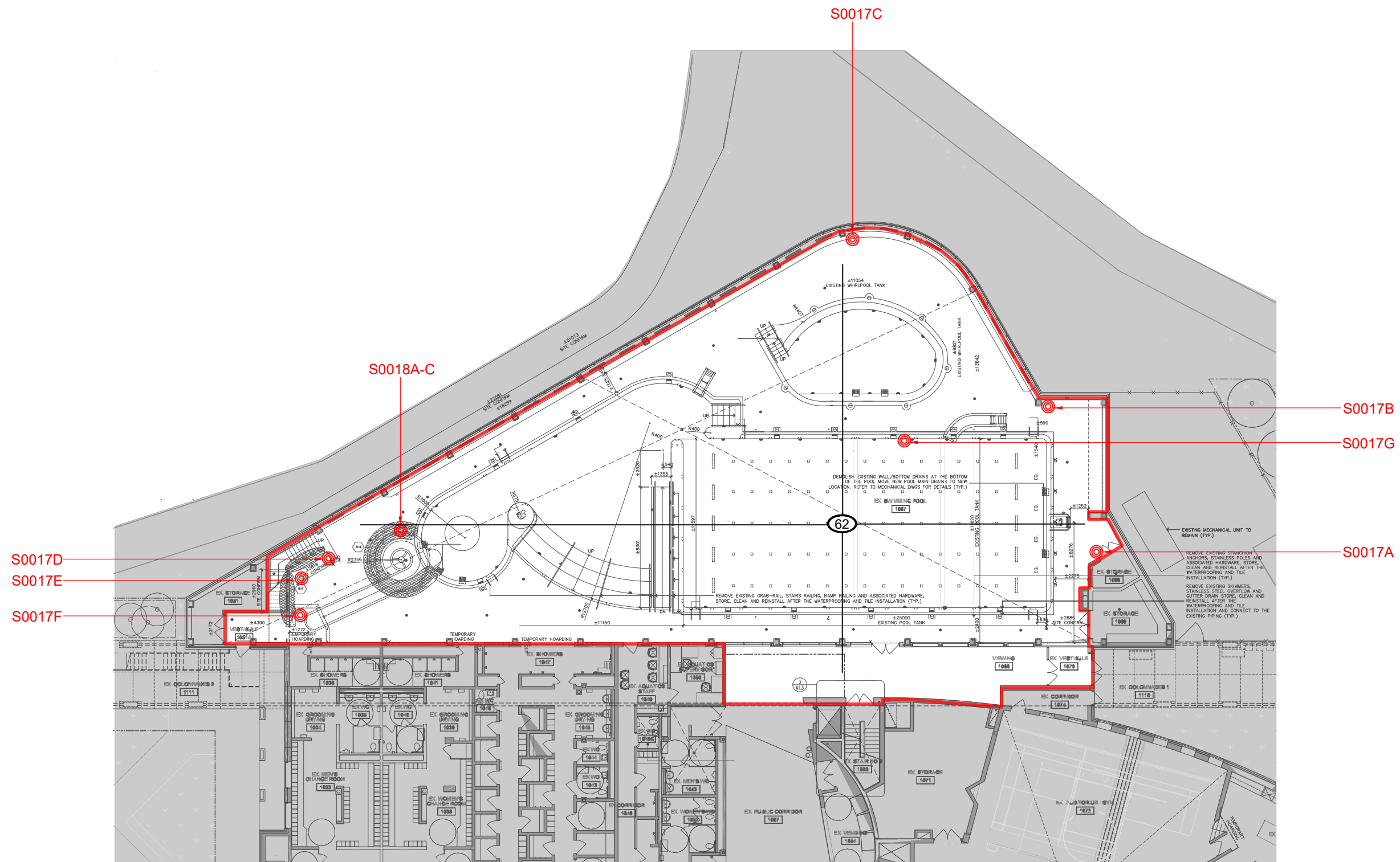
DATE: _____

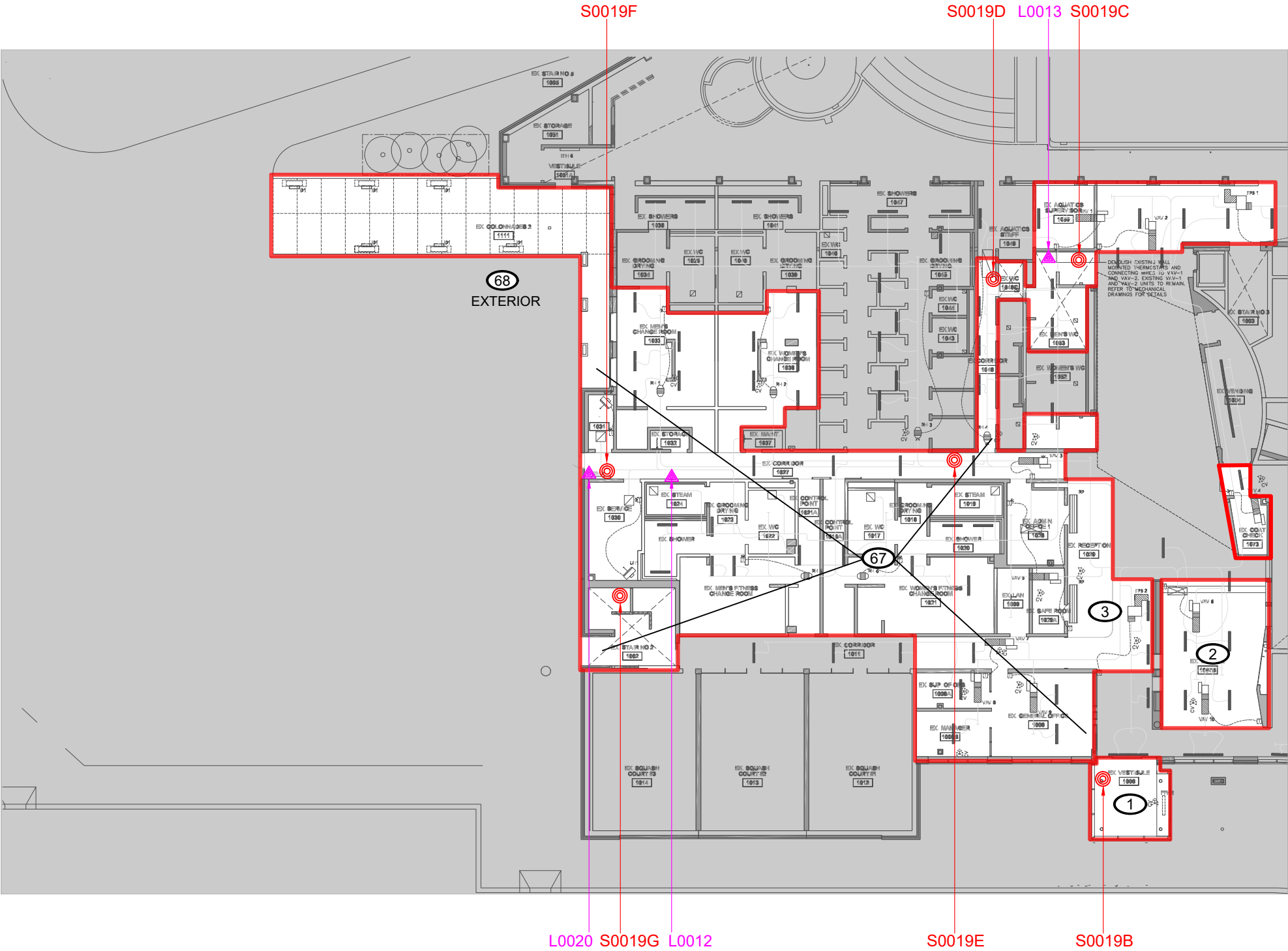
FEBR

FIGURE NUMBER:

FEBRUARY 2020

2010





- LEGEND**
- PINCHIN LOCATION NUMBER
 - SURVEY BOUNDARY/ASSESSED AREA
 - OUTSIDE ASSESSMENT SCOPE
 - ASBESTOS BULK SAMPLE
 - LEAD BULK SAMPLE
 - VERMICULITE DRILLHOLE

NOT ALL KNOWN OR SUSPECTED HAZARDOUS BUILDING MATERIALS MAY BE DEPICTED ON THE DRAWING. REFER TO THE HAZARDOUS BUILDING MATERIALS ASSESSMENT REPORT FOR A COMPLETE LIST OF KNOWN AND SUSPECTED HAZARDOUS BUILDING MATERIALS.

LEGEND IS COLOUR DEPENDENT. NON-COLOUR COPIES MAY ALTER INTERPRETATION.

BASE PLAN PROVIDED BY CLIENT.



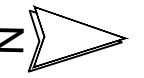
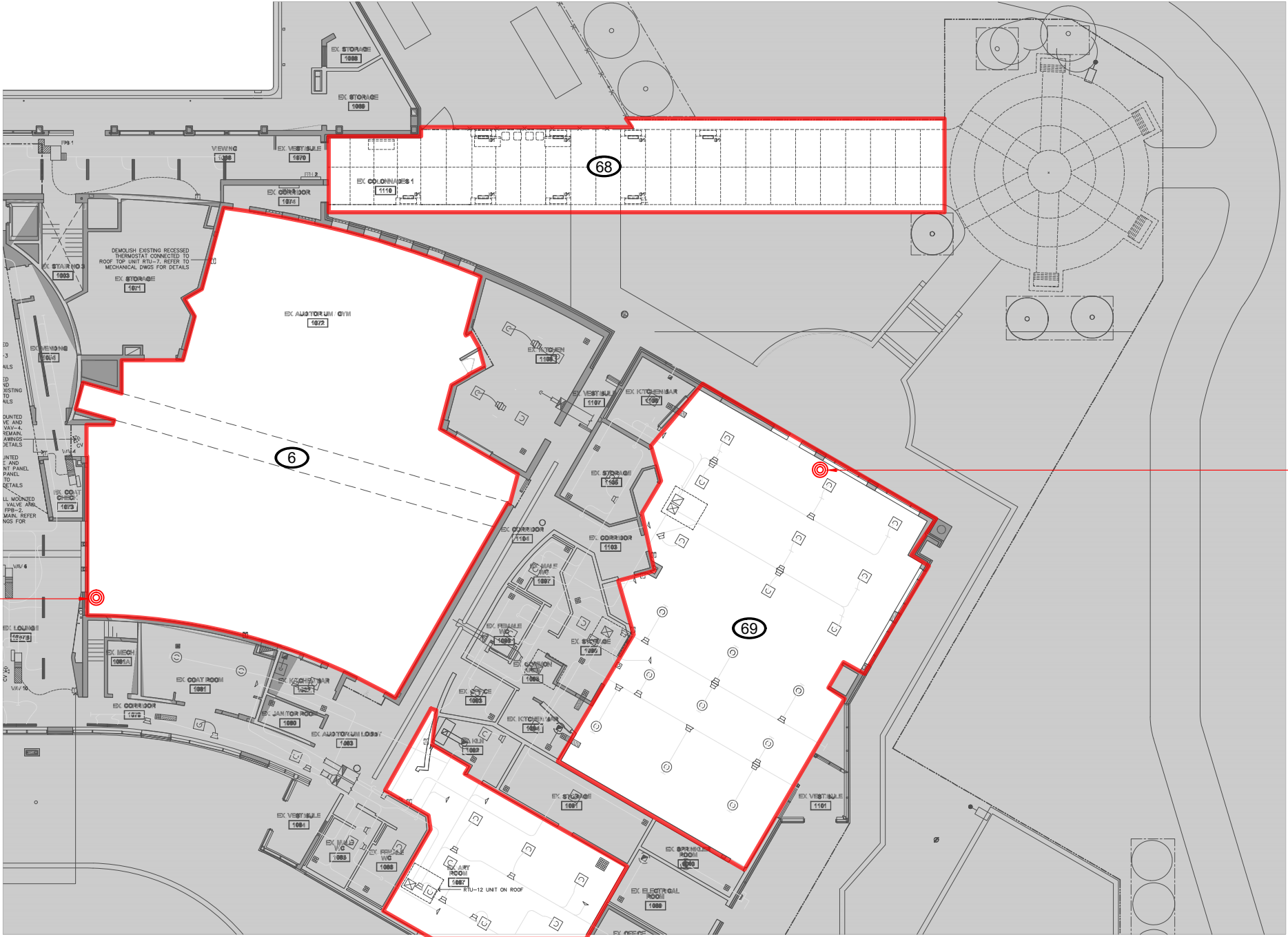
PROJECT NAME:
HAZARDOUS BUILDING MATERIALS ASSESSMENT (PRE-CONSTRUCTION)

CLIENT NAME:
CITY OF MISSISSAUGA

PROJECT LOCATION:
**RIVER GROVE COMMUNITY CENTRE
5800 RIVER GROVE AVENUE
MISSISSAUGA, ONTARIO**

FIGURE NAME:
GROUND FLOOR - FACILITY

PROJECT NUMBER: 369272.000	SCALE: NOT TO SCALE
DRAWN BY: DP	REVIEWED BY: TN
DATE: FEBRUARY 2026	FIGURE NUMBER: 3 OF 6



- LEGEND**
- PINCHIN LOCATION NUMBER
 - SURVEY BOUNDARY/ASSESSED AREA
 - OUTSIDE ASSESSMENT SCOPE
 - ASBESTOS BULK SAMPLE
 - LEAD BULK SAMPLE
 - VERMICULITE DRILLHOLE

NOT ALL KNOWN OR SUSPECTED HAZARDOUS BUILDING MATERIALS MAY BE DEPICTED ON THE DRAWING. REFER TO THE HAZARDOUS BUILDING MATERIALS ASSESSMENT REPORT FOR A COMPLETE LIST OF KNOWN AND SUSPECTED HAZARDOUS BUILDING MATERIALS.

LEGEND IS COLOUR DEPENDENT. NON-COLOUR COPIES MAY ALTER INTERPRETATION.

BASE PLAN PROVIDED BY CLIENT.



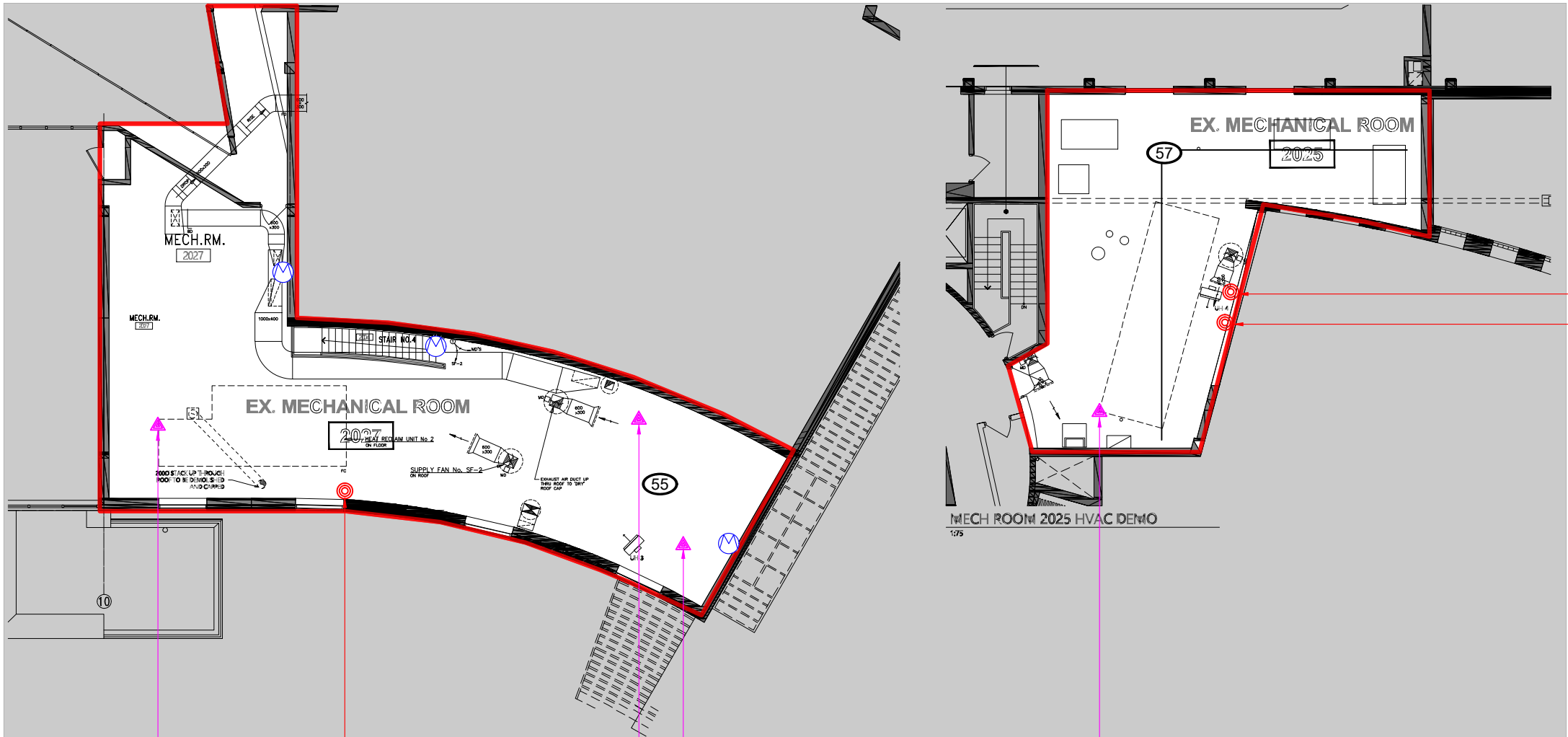
PROJECT NAME:
HAZARDOUS BUILDING MATERIALS ASSESSMENT (PRE-CONSTRUCTION)

CLIENT NAME:
CITY OF MISSISSAUGA

PROJECT LOCATION:
**RIVER GROVE COMMUNITY CENTRE
5800 RIVER GROVE AVENUE
MISSISSAUGA, ONTARIO**

FIGURE NAME:
GROUND FLOOR - GYM/COURT

PROJECT NUMBER: 369272.000	SCALE: NOT TO SCALE
DRAWN BY: DP	REVIEWED BY: TN
DATE: FEBRUARY 2026	FIGURE NUMBER: 4 OF 6



- LEGEND**
- PINCHIN LOCATION NUMBER
 - SURVEY BOUNDARY/ASSESSED AREA
 - OUTSIDE ASSESSMENT SCOPE
 - ASBESTOS BULK SAMPLE
 - LEAD BULK SAMPLE
 - VERMICULITE DRILLHOLE

NOT ALL KNOWN OR SUSPECTED HAZARDOUS BUILDING MATERIALS MAY BE DEPICTED ON THE DRAWING. REFER TO THE HAZARDOUS BUILDING MATERIALS ASSESSMENT REPORT FOR A COMPLETE LIST OF KNOWN AND SUSPECTED HAZARDOUS BUILDING MATERIALS.

LEGEND IS COLOUR DEPENDENT. NON-COLOUR COPIES MAY ALTER INTERPRETATION.

BASE PLAN PROVIDED BY CLIENT.



PROJECT NAME:
HAZARDOUS BUILDING MATERIALS ASSESSMENT (PRE-CONSTRUCTION)

CLIENT NAME:
CITY OF MISSISSAUGA

PROJECT LOCATION:
RIVER GROVE COMMUNITY CENTRE
5800 RIVER GROVE AVENUE
MISSISSAUGA, ONTARIO

FIGURE NAME:
SECOND FLOOR - MECHANICAL

PROJECT NUMBER: 369272.000	SCALE: NOT TO SCALE
DRAWN BY: DP	REVIEWED BY: TN
DATE: FEBRUARY 2026	FIGURE NUMBER: 5 OF 6

 SURVEY BOUNDARY/ASSESSED AREA

 ASBESTOS BULK SAMPLE

 VERMICULITE DRILLHOLE

LEGEND IS COLOUR DEPENDENT.
NON-COLOUR COPIES MAY ALTER
INTERPRETATION.

PROJECT NAME:

CLIENT NAME:

PROJECT LOCATION:

FIGURE NAME:

PROJECT NUMBER:

SCALE:

DRAWN BY:

REVIEWED BY:

DATE: _____

FIGURE NUMBER:

6 OF 6

APPENDIX II-A
Asbestos Analytical Certificates



Your Project #: 369272
Your C.O.C. #: NA

Attention: Anthony Rakic

Pinchin Ltd
2360 Meadowpine Blvd
Unit # 2
Mississauga, ON
CANADA L5N 6S2

Report Date: 2026/02/18
Report #: R8696861
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C614056

Received: 2026/02/11, 14:20

Sample Matrix: Solid
Samples Received: 38

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Asbestos by PLM - 0.5 RDL (1)	38	N/A	2026/02/18	COR3SOP-00002	EPA 600R-93/116

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Bureau Veritas' Asbestos Laboratory is accredited by NVLAP for bulk asbestos analysis by polarized light microscopy, NVLAP Code 600136-0.

This report may not be reproduced, except in full, without the written approval of Bureau Veritas. This report may not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any other agency of the U.S. Government.

Bureau Veritas' scope of accreditation includes EPA -- 40 CFR Appendix E to Subpart E of Part 763, "Interim Method for the Determination of Asbestos in Bulk Insulation Samples" and EPA-600/R-93/116: "Method for the Determination of Asbestos in Bulk Building Materials".

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) P.O.B. - Percent of Bulk

When Asbestos data is reported with other data, this report contains data that are not covered by the NVLAP accreditation.



Your Project #: 369272
Your C.O.C. #: NA

Attention: Anthony Rakic

Pinchin Ltd
2360 Meadowpine Blvd
Unit # 2
Mississauga, ON
CANADA L5N 6S2

Report Date: 2026/02/18
Report #: R8696861
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C614056

Received: 2026/02/11, 14:20

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:

Elora Di Bratto, Project Manager
Email: Elora.Di-Bratto@bureauveritas.com
Phone# (905) 817-5700

=====

This report has been generated and distributed using a secure automated process.

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.



Bureau Veritas Job #: C614056
Report Date: 2026/02/18

Pinchin Ltd
Client Project #: 369272
Sampler Initials: TN

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0017A FLOOR, THIN-SET, CERAMICS ON POOL DECK, LOC:62, POOL					
Bureau Veritas ID: AZVV75		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	70	Homogeneous grey thinset	Not Detected		Non-Fibrous
Layer 2	30	Homogeneous black tar	Not Detected		Non-Fibrous

S0017B FLOOR THIN-SET CERAMICS ON POOL DECK, LOC602 POOL					
Bureau Veritas ID: AZVV76		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	70	Homogeneous grey thinset	Not Detected		Non-Fibrous
Layer 2	30	Homogeneous black tar	Not Detected		Non-Fibrous

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



Bureau Veritas Job #: C614056
Report Date: 2026/02/18

Pinchin Ltd
Client Project #: 369272
Sampler Initials: TN

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0017C FLOOR, THIN-SET, CERAMICS ON POOL DECK, LOC:62, POOL					
Bureau Veritas ID: AZVV77		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	70	Homogeneous grey thinset	Not Detected		Non-Fibrous
Layer 2	30	Homogeneous black tar	Not Detected		Non-Fibrous

S0017D WALL, THIN-SET, CERAMICS ON STAIRCASE, LOC:62, POOL					
Bureau Veritas ID: AZVV78		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous grey thinset	Not Detected		Non-Fibrous

S0017E FLOOR, THIN-SET, CERAMICS ON STAIRCASE, LOC:62, POOL					
Bureau Veritas ID: AZVV79		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous grey thinset	Not Detected		Non-Fibrous

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



Bureau Veritas Job #: C614056
Report Date: 2026/02/18

Pinchin Ltd
Client Project #: 369272
Sampler Initials: TN

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0017F FLOOR, THIN-SET, CERAMICS ON STAIRCASE, LOC:62, POOL					
Bureau Veritas ID: AZVV80		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous grey thinset	Not Detected		Non-Fibrous

S0017G FLOOR, THIN-SET, CERAMICS IN POOL, LOC:62, POOL					
Bureau Veritas ID: AZVV81		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous white thinset	Not Detected		Non-Fibrous

S0018A WALL, THIN-SET, TILES ON WALLS / SLIDES, LOC: 62, POOL					
Bureau Veritas ID: AZVV82		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous white thinset	Not Detected		Non-Fibrous

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



Bureau Veritas Job #: C614056
Report Date: 2026/02/18

Pinchin Ltd
Client Project #: 369272
Sampler Initials: TN

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0018B WALL, THIN-SET, TILES ON WALLS / SLIDES, LOC: 62, POOL					
Bureau Veritas ID: AZVV83		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous white thinset	Not Detected		Non-Fibrous

S0018C WALL, THIN-SET, TILES ON WALLS / SLIDES, LOC:62, POOL					
Bureau Veritas ID: AZVV84		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous white thinset	Not Detected		Non-Fibrous

S0019A WALL, MORTAR, BETWEEN CONCRETE BLOCK, LOC: 46, STAIRCASE NO. 3					
Bureau Veritas ID: AZVV85		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous grey mortar	Not Detected		Non-Fibrous

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



Bureau Veritas Job #: C614056
Report Date: 2026/02/18

Pinchin Ltd
Client Project #: 369272
Sampler Initials: TN

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0019B WALL, MORTAR, BETWEEN CONCRETE BLOCK, LOC: 1, ENTRANCE VESTIBULE					
Bureau Veritas ID: AZVV86		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous grey mortar	Not Detected		Non-Fibrous

S0019C WALL, MORTAR, BETWEEN CONCRETE BLOCK, LOC:67, RENOVATED BACK OF HOUSE FACILITIES					
Bureau Veritas ID: AZVV87		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous grey mortar	Not Detected		Non-Fibrous

S0019D WALL, MORTAR, BETWEEN CONCRETE BLOCK, LOC:67, RENOVATED BACK OF HOUSE FACILITIES					
Bureau Veritas ID: AZVV88		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous grey mortar	Not Detected		Non-Fibrous

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



Bureau Veritas Job #: C614056
Report Date: 2026/02/18

Pinchin Ltd
Client Project #: 369272
Sampler Initials: TN

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0019E WALL, MORTAR, BETWEEN CONCRETE BLOCK, LOC: 67, RENOVATED BACK OF HOUSE FACILITIES					
Bureau Veritas ID: AZVV89		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous grey mortar	Not Detected		Non-Fibrous

S0019F WALL, MORTAR, BETWEEN CONCRETE BLOCK, LOC: 67, RENOVATED BACK OF HOUSE FACILITIES					
Bureau Veritas ID: AZVV90		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous grey mortar	Not Detected		Non-Fibrous

S0019G WALL, MORTAR, BETWEEN CONCRETE BLOCK, LOC:67, RENOVATED BACK OF HOUSE FACILITIES					
Bureau Veritas ID: AZVV91		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous grey mortar	Not Detected		Non-Fibrous

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



Bureau Veritas Job #: C614056
Report Date: 2026/02/18

Pinchin Ltd
Client Project #: 369272
Sampler Initials: TN

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0020A WALL, MASTIC, YELLOW, BASEBOARD, LOC: 6, KANEFF AUDITORIUM					
Bureau Veritas ID: AZVV92		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Non-homogeneous white/beige mastic	Not Detected		Non-Fibrous

S0020B WALL, MASTIC, YELLOW, BASEBOARD, LOC: 6, KANEFF AUDITORIUM					
Bureau Veritas ID: AZVV93		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Non-homogeneous white/beige mastic	Not Detected		Non-Fibrous

S0020C WALL, MASTIC, YELLOW, BASEBOARD, LOC: 69, RENOVATED YOUTH ROOM					
Bureau Veritas ID: AZVV94		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Non-homogeneous white/beige mastic	Not Detected		Non-Fibrous

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



Bureau Veritas Job #: C614056
Report Date: 2026/02/18

Pinchin Ltd
Client Project #: 369272
Sampler Initials: TN

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0021A DUCT, MASTIC, GREY, ON LOUVERS, LOC: 55, MECHANICAL ROOM 2					
Bureau Veritas ID: AZVV95		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous grey mastic	Not Detected		Non-Fibrous

S0021B DUCT, MASTIC, GREY, ON LOUVERS, LOC: 55 MECHANICAL ROOM 2					
Bureau Veritas ID: AZVV96		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous grey mastic	Not Detected		Non-Fibrous

S0021C DUCT, MASTIC, GREY, ON LOUVERS, LOC: 57 MECHANICAL ROOM 1					
Bureau Veritas ID: AZVV97		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous grey mastic	Not Detected		Non-Fibrous

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



Bureau Veritas Job #: C614056
Report Date: 2026/02/18

Pinchin Ltd
Client Project #: 369272
Sampler Initials: TN

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0022A DUCT, MASTIC, RED, ON LOUVERS, LOC: 55, MECHANICAL ROOM 2					
Bureau Veritas ID: AZVV98		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous red mastic	Not Detected		Non-Fibrous

S0022B DUCT, MASTIC, RED, ON LOUVERS, LOC: 55, MECHANICAL ROOM 2					
Bureau Veritas ID: AZVV99		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous red mastic	Not Detected		Non-Fibrous

S0022C DUCT, MASTIC, RED, ON LOUVERS, LOC: 57, MECHANICAL ROOM 1					
Bureau Veritas ID: AZVW00		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous red mastic	Not Detected		Non-Fibrous

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



Bureau Veritas Job #: C614056
Report Date: 2026/02/18

Pinchin Ltd
Client Project #: 369272
Sampler Initials: TN

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0023A WALL, MORTAR, BASE CONCRETE BLOCK OF AWNING, LOC:68, EXTERIOR					
Bureau Veritas ID: AZVW01		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous grey mortar	Not Detected		Non-Fibrous

S0023B WALL, MORTAR, BASE CONCRETE BLOCK OF AWNING, LOC:68, EXTERIOR					
Bureau Veritas ID: AZVW02		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous grey mortar	Not Detected		Non-Fibrous

S0023C WALL, MORTAR, BASE CONCRETE BLOCK OF AWNING, LOC:68, EXTERIO					
Bureau Veritas ID: AZVW03		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous grey mortar	Not Detected		Non-Fibrous

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



Bureau Veritas Job #: C614056
Report Date: 2026/02/18

Pinchin Ltd
Client Project #: 369272
Sampler Initials: TN

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0024A WALL, MORTAR, UPPER BRICK OF AWNING, LOC: 68, EXTERIOR					
Bureau Veritas ID: AZVW04		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous red mortar	Not Detected		Non-Fibrous

S0024B WALL, MORTAR, UPPER BRICK OF AWNING, LOC: 68, EXTERIOR					
Bureau Veritas ID: AZVW05		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous red mortar	Not Detected		Non-Fibrous

S0024C WALL, MORTAR, UPPER BRICK OF AWNING, LOC:68,EXTERIOR					
Bureau Veritas ID: AZVW06		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous red mortar	Not Detected		Non-Fibrous

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



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Pinchin Ltd
Client Project #: 369272
Sampler Initials: TN

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0025A WINDOW LINER, SEALANT, BLACK BUTYL SEALANT, LOC:68, EXTERIOR					
Bureau Veritas ID: AZVW07		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous black caulking	Not Detected		Non-Fibrous

S0025B WINDOW LINER, SEALANT, BLACK BUTYL SEALANT, LOC:68, EXTERIOR					
Bureau Veritas ID: AZVW08		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous black caulking	Not Detected		Non-Fibrous

S0025C WINDOW LINER, SEALANT, BLACK BUTYL SEALANT, LOC:68, EXTERIOR					
Bureau Veritas ID: AZVW09		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous black caulking	Not Detected		Non-Fibrous

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



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Pinchin Ltd
Client Project #: 369272
Sampler Initials: TN

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0026A WALL, MORTAR, BASE CONCRETE BLOCK, LOC:68, EXTERIOR					
Bureau Veritas ID: AZVW10		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous white mortar	Not Detected		Non-Fibrous

S0026B WALL, MORTAR, BASE CONCRETE BLOCK, LOC: 68, EXTERIOR					
Bureau Veritas ID: AZVW11		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous white mortar	Not Detected		Non-Fibrous

S0026C WALL, MORTAR, BASE CONCRETE BLOCK, LOC:68,EXTERIOR					
Bureau Veritas ID: AZVW12		Date Analyzed: 2026/02/18			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous white mortar	Not Detected		Non-Fibrous

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



Bureau Veritas Job #: C614056
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Pinchin Ltd
Client Project #: 369272
Sampler Initials: TN

TEST SUMMARY

Bureau Veritas ID: AZVV75
Sample ID: S0017A FLOOR, THIN-SET, CERAMICS ON POOL DECK, LOC:62, POOL
Matrix: Solid

Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVV76
Sample ID: S0017B FLOOR THIN-SET CERAMICS ON POOL DECK, LOC602 POOL
Matrix: Solid

Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVV77
Sample ID: S0017C FLOOR, THIN-SET, CERAMICS ON POOL DECK, LOC:62, POOL
Matrix: Solid

Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVV78
Sample ID: S0017D WALL, THIN-SET, CERAMICS ON STAIRCASE, LOC:62, POOL
Matrix: Solid

Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVV79
Sample ID: S0017E FLOOR, THIN-SET, CERAMICS ON STAIRCASE, LOC:62, POOL
Matrix: Solid

Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVV80
Sample ID: S0017F FLOOR, THIN-SET, CERAMICS ON STAIRCASE, LOC:62, POOL
Matrix: Solid

Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVV81
Sample ID: S0017G FLOOR, THIN-SET, CERAMICS IN POOL, LOC:62, POOL
Matrix: Solid

Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad



Bureau Veritas Job #: C614056
Report Date: 2026/02/18

Pinchin Ltd
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Sampler Initials: TN

TEST SUMMARY

Bureau Veritas ID: AZVV82
Sample ID: S0018A WALL, THIN-SET, TILES ON WALLS / SLIDES, LOC: 62, POOL
Matrix: Solid

Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVV82 Dup
Sample ID: S0018A WALL, THIN-SET, TILES ON WALLS / SLIDES, LOC: 62, POOL
Matrix: Solid

Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVV83
Sample ID: S0018B WALL, THIN-SET, TILES ON WALLS / SLIDES, LOC: 62, POOL
Matrix: Solid

Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVV84
Sample ID: S0018C WALL, THIN-SET, TILES ON WALLS / SLIDES, LOC:62, POOL
Matrix: Solid

Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVV85
Sample ID: S0019A WALL, MORTAR, BETWEEN CONCRETE BLOCK, LOC: 46, STAIRCASE NO. 3
Matrix: Solid

Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVV86
Sample ID: S0019B WALL, MORTAR, BETWEEN CONCRETE BLOCK, LOC: 1, ENTRANCE VESTIBULE
Matrix: Solid

Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVV87
Sample ID: S0019C WALL, MORTAR, BETWEEN CONCRETE BLOCK, LOC:67, RENOVATED BACK OF HOUSE
Matrix: Solid

Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad



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Sampler Initials: TN

TEST SUMMARY

Bureau Veritas ID: AZVV88
Sample ID: S0019D WALL, MORTAR, BETWEEN CONCRETE BLOCK, LOC:67, RENOVATED BACK OF HOUSEHOLD TIES
Matrix: Solid
Collected: 2026/02/07
Shipped: 2026/02/11
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVV89
Sample ID: S0019E WALL, MORTAR, BETWEEN CONCRETE BLOCK, LOC: 67, RENOVATED BACK OF HOUSEHOLD TIES
Matrix: Solid
Collected: 2026/02/07
Shipped: 2026/02/11
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVV90
Sample ID: S0019F WALL, MORTAR, BETWEEN CONCRETE BLOCK, LOC: 67, RENOVATED BACK OF HOUSEHOLD TIES
Matrix: Solid
Collected: 2026/02/07
Shipped: 2026/02/11
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVV91
Sample ID: S0019G WALL, MORTAR, BETWEEN CONCRETE BLOCK, LOC:67, RENOVATED BACK OF HOUSEHOLD TIES
Matrix: Solid
Collected: 2026/02/07
Shipped: 2026/02/11
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVV92
Sample ID: S0020A WALL, MASTIC, YELLOW, BASEBOARD, LOC: 6, KANEFF AUDITORIUM
Matrix: Solid
Collected: 2026/02/07
Shipped: 2026/02/11
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVV92 Dup
Sample ID: S0020A WALL, MASTIC, YELLOW, BASEBOARD, LOC: 6, KANEFF AUDITORIUM
Matrix: Solid
Collected: 2026/02/07
Shipped: 2026/02/11
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVV93
Sample ID: S0020B WALL, MASTIC, YELLOW, BASEBOARD, LOC: 6, KANEFF AUDITORIUM
Matrix: Solid
Collected: 2026/02/07
Shipped: 2026/02/11
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad



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TEST SUMMARY

Bureau Veritas ID: AZVV94
Sample ID: S0020C WALL, MASTIC, YELLOW, BASEBOARD, LOC: 69, RENOVATED YOUTH ROOM
Matrix: Solid
Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVV95
Sample ID: S0021A DUCT, MASTIC, GREY, ON LOUVERS, LOC: 55, MECHANICAL ROOM 2
Matrix: Solid
Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVV96
Sample ID: S0021B DUCT, MASTIC, GREY, ON LOUVERS, LOC: 55, MECHANICAL ROOM 2
Matrix: Solid
Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVV97
Sample ID: S0021C DUCT, MASTIC, GREY, ON LOUVERS, LOC: 57, MECHANICAL ROOM 1
Matrix: Solid
Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVV98
Sample ID: S0022A DUCT, MASTIC, RED, ON LOUVERS, LOC: 55, MECHANICAL ROOM 2
Matrix: Solid
Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVV99
Sample ID: S0022B DUCT, MASTIC, RED, ON LOUVERS, LOC: 55, MECHANICAL ROOM 2
Matrix: Solid
Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVW00
Sample ID: S0022C DUCT.MASTIC, RED. ON LOUVERS, LOC:57. MECHANICAL ROOM 1
Matrix: Solid
Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad



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TEST SUMMARY

Bureau Veritas ID: AZVW01
Sample ID: S0023A WALL, MORTAR, BASE CONCRETE BLOCK OF AWNING, LOC:68, EXTERIOR
Matrix: Solid
Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVW02
Sample ID: S0023B WALL, MORTAR, BASE CONCRETE BLOCK OF AWNING, LOC:68, EXTERIOR
Matrix: Solid
Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVW02 Dup
Sample ID: S0023B WALL, MORTAR, BASE CONCRETE BLOCK OF AWNING, LOC:68, EXTERIOR
Matrix: Solid
Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVW03
Sample ID: S0023C WALL, MORTAR, BASE CONCRETE BLOCK OF AWNING, LOC:68, EXTERIO
Matrix: Solid
Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVW04
Sample ID: S0024A WALL, MORTAR, UPPER BRICK OF AWNING, LOC: 68, EXTERIOR
Matrix: Solid
Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVW05
Sample ID: S0024B WALL, MORTAR, UPPER BRICK OF AWNING, LOC: 68, EXTERIOR
Matrix: Solid
Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVW06
Sample ID: S0024C WALL, MORTAR, UPPER BRICK OF AWNING, LOC:68, EXTERIOR
Matrix: Solid
Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad



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Pinchin Ltd
Client Project #: 369272
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TEST SUMMARY

Bureau Veritas ID: AZVW07
Sample ID: S0025A WINDOW LINER, SEALANT, BLACK BUTYL SEALANT, LOC:68, EXTERIOR
Matrix: Solid

Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVW08
Sample ID: S0025B WINDOW LINER, SEALANT, BLACK BUTYL SEALANT, LOC:68, EXTERIOR
Matrix: Solid

Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVW09
Sample ID: S0025C WINDOW LINER, SEALANT, BLACK BUTYL SEALANT, LOC:68, EXTERIOR
Matrix: Solid

Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVW10
Sample ID: S0026A WALL, MORTAR, BASE CONCRETE BLOCK, LOC:68, EXTERIOR
Matrix: Solid

Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVW11
Sample ID: S0026B WALL, MORTAR, BASE CONCRETE BLOCK, LOC: 68, EXTERIOR
Matrix: Solid

Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVW12
Sample ID: S0026C WALL, MORTAR, BASE CONCRETE BLOCK, LOC:68,EXTERIOR
Matrix: Solid

Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad

Bureau Veritas ID: AZVW12 Dup
Sample ID: S0026C WALL, MORTAR, BASE CONCRETE BLOCK, LOC:68,EXTERIOR
Matrix: Solid

Collected: 2026/02/07
Shipped:
Received: 2026/02/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A102766	N/A	2026/02/18	Haseeb Ahmad



Bureau Veritas Job #: C614056
Report Date: 2026/02/18

Pinchin Ltd
Client Project #: 369272
Sampler Initials: TN

GENERAL COMMENTS

Results relate only to the items tested.



Bureau Veritas Job #: C614056
Report Date: 2026/02/18

Pinchin Ltd
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Sampler Initials: TN

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

A handwritten signature in black ink, appearing to read "JDSantos", written over a horizontal line.

Jon Delos Santos, Laboratory Supervisor

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NONT-2026-02-1739

Analysed by: _____

Reviewed by: _____

Report Sent by: _____

Pinchin Ltd. - Asbestos Laboratory
Internal Asbestos Bulk Sample Chain of Custody

Special Instructions:

Client Name:		Project Address:	ON
Portfolio/Building No:		Pinchin File:	369272
Submitted by:	Tom Nguyen	Email:	tnguyen@pinchin.com
CC Email:	Anthony Rakic	CC Email:	arakic@pinchin.com
Date Submitted:	February 07 2026	Required by:	February 16 2026
# of Samples:	38	Priority:	5 Day Turnaround
Year of Building Construction (Mandatory, Years ONLY):	1996		
Do NOT Stop on Positive (Sample Numbers):			
Pinchin Group Company (Mandatory Field):	Pinchin		
HMIS2 Building Reference #:	160300/2026151553550		

To be Completed by Lab Personnel Only:

Lab Reference #:		Time:	24 hour clock		
Received by:		Date:	Month	Day	Year
Name(s) of Analyst(s):	FEB 10 2026 <i>AS</i>				

Sample Prefix	Sample No.	Sample Suffix	Sample Description/Location (Mandatory)
S	0017	A	Floor, Thin-set, Ceramics On Pool Deck, Loc:62, Pool
S	0017	B	Floor, Thin-set, Ceramics On Pool Deck, Loc:62, Pool
S	0017	C	Floor, Thin-set, Ceramics On Pool Deck, Loc:62, Pool
S	0017	D	Wall, Thin-set, Ceramics On Staircase, Loc:62, Pool
S	0017	E	Floor, Thin-set, Ceramics On Staircase, Loc:62, Pool
S	0017	F	Floor, Thin-set, Ceramics On Staircase, Loc:62, Pool

AS ANMOLPREET SINGH
2026/02/11 14:20

Sample Prefix	Sample No.	Sample Suffix	Sample Description/Location (Mandatory)
S	0017	G	Floor, Thin-set, Ceramics In Pool, Loc:62, Pool
S	0018	A	Wall, Thin-set, Tiles On Walls / Slides, Loc:62, Pool
S	0018	B	Wall, Thin-set, Tiles On Walls / Slides, Loc:62, Pool
S	0018	C	Wall, Thin-set, Tiles On Walls / Slides, Loc:62, Pool
S	0019	A	Wall, Mortar, Between Concrete Block, Loc:46, Staircase No. 3
S	0019	B	Wall, Mortar, Between Concrete Block, Loc:1, Entrance Vestibule
S	0019	C	Wall, Mortar, Between Concrete Block, Loc:67, Renovated Back Of House Facilities
S	0019	D	Wall, Mortar, Between Concrete Block, Loc:67, Renovated Back Of House Facilities
S	0019	E	Wall, Mortar, Between Concrete Block, Loc:67, Renovated Back Of House Facilities
S	0019	F	Wall, Mortar, Between Concrete Block, Loc:67, Renovated Back Of House Facilities
S	0019	G	Wall, Mortar, Between Concrete Block, Loc:67, Renovated Back Of House Facilities
S	0020	A	Wall, Mastic, Yellow, Baseboard, Loc:6, Kaneff Auditorium
S	0020	B	Wall, Mastic, Yellow, Baseboard, Loc:6, Kaneff Auditorium
S	0020	C	Wall, Mastic, Yellow, Baseboard, Loc:69, Renovated Youth Room
S	0021	A	Duct, Mastic, Grey, On Louvers, Loc:55, Mechanical Room 2

Sample Prefix	Sample No.	Sample Suffix	Sample Description/Location (Mandatory)
S	0021	B	Duct,Mastic, Grey,On Louvers,Loc:55,Mechanical Room 2
S	0021	C	Duct,Mastic, Grey,On Louvers,Loc:57,Mechanical Room 1
S	0022	A	Duct,Mastic, Red,On Louvers,Loc:55,Mechanical Room 2
S	0022	B	Duct,Mastic, Red,On Louvers,Loc:55,Mechanical Room 2
S	0022	C	Duct,Mastic, Red,On Louvers,Loc:57,Mechanical Room 1
S	0023	A	Wall,Mortar,Base Concrete Block Of Awning,Loc:68,Exterior
S	0023	B	Wall,Mortar,Base Concrete Block Of Awning,Loc:68,Exterior
S	0023	C	Wall,Mortar,Base Concrete Block Of Awning,Loc:68,Exterior
S	0024	A	Wall,Mortar,Upper Brick Of Awning,Loc:68,Exterior
S	0024	B	Wall,Mortar,Upper Brick Of Awning,Loc:68,Exterior
S	0024	C	Wall,Mortar,Upper Brick Of Awning,Loc:68,Exterior
S	0025	A	Window Liner,Sealant,Black Butyl Sealant,Loc:68,Exterior
S	0025	B	Window Liner,Sealant,Black Butyl Sealant,Loc:68,Exterior
S	0025	C	Window Liner,Sealant,Black Butyl Sealant,Loc:68,Exterior
S	0026	A	Wall,Mortar,Base Concrete Block,Loc:68,Exterior

Sample Prefix	Sample No.	Sample Suffix	Sample Description/Location (Mandatory)
S	0026	B	Wall,Mortar,Base Concrete Block,Loc:68,Exterior
S	0026	C	Wall,Mortar,Base Concrete Block,Loc:68,Exterior

APPENDIX II-B
Lead Analytical Certificates



Your Project #: 369272
Your C.O.C. #: N/A

Attention: Anthony Rakic

Pinchin Ltd
2360 Meadowpine Blvd
Unit # 2
Mississauga, ON
CANADA L5N 6S2

Report Date: 2026/02/17
Report #: R8696276
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C613680

Received: 2026/02/10, 14:36

Sample Matrix: Bulk
Samples Received: 9

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Metals in Paint	2	2026/02/13	2026/02/13	CAM SOP-00408	EPA 6010D m
Metals in Paint	7	2026/02/13	2026/02/17	CAM SOP-00408	EPA 6010D m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.



Your Project #: 369272
Your C.O.C. #: N/A

Attention: Anthony Rakic

Pinchin Ltd
2360 Meadowpine Blvd
Unit # 2
Mississauga, ON
CANADA L5N 6S2

Report Date: 2026/02/17
Report #: R8696276
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C613680

Received: 2026/02/10, 14:36

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:

Elora Di Bratto, Project Manager
Email: Elora.Di-Bratto@bureauveritas.com
Phone# (905) 817-5700

=====

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ELEMENTS BY ATOMIC SPECTROSCOPY (BULK)

Bureau Veritas ID		AZVF92		AZVF93	AZVF94			
Sampling Date								
COC Number		N/A		N/A	N/A			
	UNITS	L0012, WALL, MASONRY, WHITE ON CONCRETE BLOCK, LOC:67, RENOVATED BACK OF HOUSE FACILITIES	QC Batch	L0013, WALL, MASONRY, BLUE ON CONCRETE BLOCK, LOC:67, RENOVATED BACK OF HOUSE FACILITIES	L0014, FLOOR, CONCRETE (POURED), GREY, LOC: 44, FILTRATION ROOM	RDL	MDL	QC Batch

Metals								
Lead (Pb)	%	0.00037	A100952	<0.00010	0.0012	0.00010	0.000030	A101235
RDL = Reportable Detection Limit QC Batch = Quality Control Batch								

Bureau Veritas ID		AZVF95			AZVF96			
Sampling Date								
COC Number		N/A			N/A			
	UNITS	L0015, MECHANICAL EQUIPMENT, METAL, BEIGE ON DEHUMIDIFIER, LOC:57, MECHANICAL ROOM 1	RDL	MDL	L0016, MECHANICAL EQUIPMENT, METAL, BLUE ON HEAT RECOVERY UNIT, LOC:55, MECHANICAL ROOM 2	RDL	MDL	QC Batch

Metals								
Lead (Pb)	%	0.0022	0.0020	0.00060	0.20	0.00026	0.000078	A101235
RDL = Reportable Detection Limit QC Batch = Quality Control Batch								



ELEMENTS BY ATOMIC SPECTROSCOPY (BULK)

Bureau Veritas ID		AZVF97				AZVF98			
Sampling Date									
COC Number		N/A				N/A			
	UNITS	L0017, MECHANICAL EQUIPMENT, METAL, GREEN ON DOMESTIC HOT WATER BOILER, LOC:55, MECHANICAL ROOM 2	RDL	MDL		L0018 LIGHT BLUE ON PVC JACKING OF HOT WATER TANK, LOC:55, MECHANICAL ROOM 2	RDL	MDL	QC Batch

Metals									
Lead (Pb)	%	0.11	0.00044	0.00013	0.0061	0.00027	0.000081	A101235	
RDL = Reportable Detection Limit QC Batch = Quality Control Batch									

Bureau Veritas ID		AZVF99				AZVG00			
Sampling Date									
COC Number		N/A				N/A			
	UNITS	L0019, STRUCTURE, STEEL, BLUE ON STEEL AWNING, LOC:68, EXTERIOR	RDL	MDL	QC Batch	L0020, WALL, MASONRY, GREY PAINT ON MASONRY WALL, LOC:68, EXTERIOR	RDL	MDL	QC Batch

Metals									
Lead (Pb)	%	0.15	0.00020	0.000060	A100952	0.00073	0.00018	0.000054	A101235
RDL = Reportable Detection Limit QC Batch = Quality Control Batch									



Bureau Veritas Job #: C613680
Report Date: 2026/02/17

Pinchin Ltd
Client Project #: 369272
Sampler Initials: TN

TEST SUMMARY

Bureau Veritas ID: AZVF92
Sample ID: L0012, WALL, MASONRY, WHITE ON CONCRETE BLOCK, LOC:67, RENOVATED BACK OF HOUSEHOLD UTILITIES
Matrix: Bulk
Collected: 2026/02/10
Shipped: 2026/02/10
Received: 2026/02/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Paint	ICP	A100952	2026/02/13	2026/02/13	Indira HarryPaul

Bureau Veritas ID: AZVF93
Sample ID: L0013, WALL, MASONRY, BLUE ON CONCRETE BLOCK, LOC:67, RENOVATED BACK OF HOUSEHOLD UTILITIES
Matrix: Bulk
Collected: 2026/02/10
Shipped: 2026/02/10
Received: 2026/02/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Paint	ICP	A101235	2026/02/13	2026/02/17	Medhat Nasr

Bureau Veritas ID: AZVF94
Sample ID: L0014, FLOOR, CONCRETE (POURED), GREY, LOC: 44, FILTRATION ROOM
Matrix: Bulk
Collected: 2026/02/10
Shipped: 2026/02/10
Received: 2026/02/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Paint	ICP	A101235	2026/02/13	2026/02/17	Medhat Nasr

Bureau Veritas ID: AZVF95
Sample ID: L0015, MECHANICAL EQUIPMENT, METAL, BEIGE ON DEHUMIDIFIER, LOC:57, MECHANICAL ROOM 1
Matrix: Bulk
Collected: 2026/02/10
Shipped: 2026/02/10
Received: 2026/02/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Paint	ICP	A101235	2026/02/13	2026/02/17	Medhat Nasr

Bureau Veritas ID: AZVF96
Sample ID: L0016, MECHANICAL EQUIPMENT, METAL, BLUE ON HEAT RECOVERY UNIT, LOC:55, MECHANICAL ROOM 2
Matrix: Bulk
Collected: 2026/02/10
Shipped: 2026/02/10
Received: 2026/02/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Paint	ICP	A101235	2026/02/13	2026/02/17	Medhat Nasr

Bureau Veritas ID: AZVF97
Sample ID: L0017, MECHANICAL EQUIPMENT, METAL, GREEN ON DOMESTIC HOT WATER BOILER, LOC:55, MECHANICAL ROOM 2
Matrix: Bulk
Collected: 2026/02/10
Shipped: 2026/02/10
Received: 2026/02/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Paint	ICP	A101235	2026/02/13	2026/02/17	Medhat Nasr

Bureau Veritas ID: AZVF98
Sample ID: L0018 LIGHT BLUE ON PVC JACKING OF HOT WATER TANK, LOC:55, MECHANICAL ROOM 2
Matrix: Bulk
Collected: 2026/02/10
Shipped: 2026/02/10
Received: 2026/02/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Paint	ICP	A101235	2026/02/13	2026/02/17	Medhat Nasr



Bureau Veritas Job #: C613680
Report Date: 2026/02/17

Pinchin Ltd
Client Project #: 369272
Sampler Initials: TN

TEST SUMMARY

Bureau Veritas ID: AZVF99
Sample ID: L0019, STRUCTURE, STEEL, BLUE ON STEEL AWNING, LOC:68, EXTERIOR
Matrix: Bulk

Collected:
Shipped:
Received: 2026/02/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Paint	ICP	A100952	2026/02/13	2026/02/13	Indira HarryPaul

Bureau Veritas ID: AZVG00
Sample ID: L0020, WALL, MASONRY, GREY PAINT ON MASONRY WALL, LOC:68, EXTERIOR
Matrix: Bulk

Collected:
Shipped:
Received: 2026/02/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Paint	ICP	A101235	2026/02/13	2026/02/17	Medhat Nasr



GENERAL COMMENTS

Sample AZVF95 [L0015, MECHANICAL EQUIPMENT, METAL, BEIGE ON DEHUMIDIFIER, LOC:57, MECHANICAL ROOM 1] : Metals Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Sample AZVF96 [L0016, MECHANICAL EQUIPMENT, METAL, BLUE ON HEAT RECOVERY UNIT, LOC:55, MECHANICAL ROOM 2] : Metals Analysis: Due to limited amount of sample available for analysis, a smaller than usual portion of the sample was used. Detection limits were adjusted accordingly.

Sample AZVF97 [L0017, MECHANICAL EQUIPMENT, METAL, GREEN ON DOMESTIC HOT WATER BOILER, LOC:55, MECHANICAL ROOM 2] : Metals Analysis: Due to limited amount of sample available for analysis, a smaller than usual portion of the sample was used. Detection limits were adjusted accordingly.

Sample AZVF98 [L0018 LIGHT BLUE ON PVC JACKING OF HOT WATER TANK, LOC:55, MECHANICAL ROOM 2] : Metals Analysis: Due to limited amount of sample available for analysis, a smaller than usual portion of the sample was used. Detection limits were adjusted accordingly.

Sample AZVF99 [L0019, STRUCTURE, STEEL, BLUE ON STEEL AWNING, LOC:68, EXTERIOR] : Metals Analysis: Due to limited amount of sample available for analysis, a smaller than usual portion of the sample was used. Detection limits were adjusted accordingly.

Sample AZVG00 [L0020, WALL, MASONRY, GREY PAINT ON MASONRY WALL, LOC:68, EXTERIOR] : Metals Analysis: Due to limited amount of sample available for analysis, a smaller than usual portion of the sample was used. Detection limits were adjusted accordingly.

Results relate only to the items tested.



Bureau Veritas Job #: C613680
Report Date: 2026/02/17

QUALITY ASSURANCE REPORT

Pinchin Ltd
Client Project #: 369272
Sampler Initials: TN

QC Batch	Parameter	Date	Method Blank		QC Standard	
			Value	UNITS	% Recovery	QC Limits
A100952	Lead (Pb)	2026/02/13	<0.00010	%	96	75 - 125
A101235	Lead (Pb)	2026/02/17	<0.00010	%	95	75 - 125

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.



Bureau Veritas Job #: C613680
Report Date: 2026/02/17

Pinchin Ltd
Client Project #: 369272
Sampler Initials: TN

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

A handwritten signature in cursive script that reads "Louise A. Harding".

Louise Harding, Scientific Specialist

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C613680

2026/02/10 14:36

6740 Campobello Road, Mississauga, Ontario L5N 2L8

Phone: 905-817-5700 Fax: 905-817-5779 Toll Free: 800-563-6266

CAM FCD-01191/6

CHAIN OF CUSTODY RECORD

Page ____ of ____

Invoice Information		Report Information (if differs from invoice)		Project Information (where applicable)		Turnaround Time (TAT) Required	
Company Name: Pinchin Ltd.		Company Name:		Quotation #:		☒ Regular TAT (5-7 days) Most analyses	
Contact Name: Tom Nguyen		Contact Name:		P.O. #/ AFE#:		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS	
Address:		Address:		Project #: 369272		Rush TAT (Surcharges will be applied)	
Phone: Fax:		Phone: Fax:		Site Location:		☐ 1 Day ☐ 2 Days ☐ 3-4 Days	
Email: tnguyen@pinchin.com		Email: araki@pinchin.com		Site #:		Date Required: February 26, 2026	
MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS DRINKING WATER CHAIN OF CUSTODY				Site Location Province: ON		Rush Confirmation #:	
Sampled By: Tom Nguyen							
Regulation 153		Other Regulations		Analysis Requested		LABORATORY USE ONLY	
☐ Table 1 ☐ Res/Park ☐ Med/ Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/ Other ☐ Table ____ FOR RSC (PLEASE CIRCLE) Y / N		☐ CCME ☐ Sanitary Sewer Bylaw ☐ MISA ☐ Storm Sewer Bylaw ☐ PWQO ☐ Region ☐ Other (Specify) ☐ REG 558 (MIN. 3 DAY TAT REQUIRED) ☐ REG 406 Table ____		FIELD FILTERED (CIRCLE) Metals / Hg / CNI BTEX/ PHC F1 PHCS F2 - F4 VOCs REG 153 METALS & INORGANICS REG 153 ICPMS METALS REG 153 METALS (Hg, Cr, V, ICPMS Metals, HWS - B) Lead (Pb) in Paints PCBs HOLD- DO NOT ANALYZE		CUSTODY SEAL Y / N Present Intact COOLING MEDIA PRESENT: Y / N COMMENTS	
SAMPLE IDENTIFICATION		DATE SAMPLED (YYYY/MM/DD)	TIME SAMPLED (HH:MM)	MATRIX	# OF CONTAINERS SUBMITTED		
L0012, Wall, Masonry, White On Concrete Block, Loc:67, Renovated Back Of House Facilities				BULK			
L0013, Wall, Masonry, Blue On Concrete Block, Loc:67, Renovated Back Of House Facilities				BULK			
L0014, Floor, Concrete (poured), Grey, Loc:44, Filtration Room				BULK			
L0015, Mechanical Equipment, Metal, Beige On Dehumidifier, Loc:57, Mechanical Room 1				BULK			
L0016, Mechanical Equipment, Metal, Blue On Heat Recovery Unit, Loc:55, Mechanical Room 2				BULK			
L0017, Mechanical Equipment, Metal, Green On Domestic Hot Water Boiler, Loc:55, Mechanical Room 2				BULK			
Light Blue On Pvc Jacking Of Hot Water Tank, Loc:55, Mechanical Room 2				BULK			
L0019, Structure, Steel, Blue On Steel Awning, Loc:68, Exterior				BULK			
L0020, Wall, Masonry, Grey Paint On Masonry Wall, Loc:68, Exterior				BULK			
RELINQUISHED BY: (Signature/Print)		DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)		DATE: (YYYY/MM/DD)	TIME: (HH:MM)
				<i>Sam Sauer</i>		2026/02/10	14:36



NONT-2026-02-1510

APPENDIX III
Methodology



1.0 GENERAL

An investigation was conducted to identify the type of Hazardous Building Materials incorporated in the structure and its finishes.

Information regarding the location and condition of hazardous building materials encountered and visually estimated quantities were recorded. The locations of any samples collected were recorded on small-scale plans. As-built drawings and previous reports were referenced where provided.

Sample collection was conducted in accordance with our Standard Operating Procedures.

The following methodologies appropriate to each hazardous building material were applied where those materials were included in the scope of work.

1.1 Asbestos

The investigation for asbestos included friable and non-friable asbestos-containing materials (ACM). A friable material is a material that when dry can be crumbled, pulverized, or powdered by hand pressure, or a material that has already become crushed, pulverized, or powdered.

A separate set of samples was collected of each type of homogenous material suspected to contain asbestos. A homogenous material is defined by the US EPA as material that is uniform in texture and appearance, was installed at one time, and is unlikely to consist of more than one type or formulation of material. The homogeneous materials were determined by visual examination and available information on the phases of construction and prior renovations.

Samples were collected at a rate that is in compliance with the requirements of local regulations and guidelines. The sampling strategy was also based on known ban dates and phase out dates of the use of asbestos; sampling of certain building materials is not conducted after specific construction dates. In addition, to be conservative, several years past these dates are added to account for some uncertainty in the exact start / finish date of construction and associated usage of ACM. In some cases, manufactured products such as asbestos cement pipe were visually identified without sample confirmation.

The asbestos analysis of select materials was completed using a stop-positive approach. Only one result meeting the regulated criteria was required to determine that a material is asbestos containing, but all samples must be analyzed to conclusively determine that a material is non-asbestos. The laboratory stopped analyzing samples from a homogeneous material once a result equal to or greater than the regulated criteria is detected in any of the samples of that material. All samples of a homogeneous material were analyzed if no asbestos is detected. In some cases, all samples were analyzed in the sample set regardless of result.

The analysis was performed in accordance with Test Method EPA/600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials, July 1993.

Analytical results were compared to the following criteria:

Jurisdiction*	Friable	Non-Friable
Ontario	0.5%	0.5%

* If there is a conflict between federal and provincial criteria, the more stringent will apply.

Where building materials are described in the report as “non-asbestos” or “does not contain asbestos,” this means that either no asbestos was detected by the analytical method utilized in any of the multiple samples or, if detected, it is below the lower limit of an asbestos-containing material in the applicable regulation. Additionally, these terms are used for materials which historically are known to not include asbestos in their manufacturing.

Asbestos materials were evaluated to determine any remedial work based on the Evaluation Criteria and Basis of Recommendations presented in Annex A.

1.2 Lead

Samples of distinctive paint finishes, and surface coatings present in more than a limited application, where removal of the paint is possible were collected. The samples were collected by scraping the painted finish to include base and covering applications.

Analysis for lead in paints or surface coatings was performed in accordance with regulated or industry accepted methods, including flame atomic absorption or inductively coupled plasma.

Analytical results were compared to the following criteria.

Jurisdiction*	Units (%)	Units (ppm) / (mg/kg)
Ontario	0.009	90

* If there is a conflict between federal and provincial criteria, the more stringent will apply.

Other lead building products (e.g. batteries, lead sheeting, flashing) were identified by visual observation only.

Where included in the scope of work, select paint samples including the substrate (e.g., wood, concrete, plaster) were submitted for waste characterization analysis following CGSB 164-GP-IMP or TCLP Method 1311. Analytical results were compared against local provincial requirements.



1.3 Silica

Building materials known to contain crystalline silica (e.g. concrete, cement, tile, brick, masonry, mortar) were identified by visual inspection only. Pinchin did not perform sampling of these materials for laboratory analysis of crystalline silica content.

1.4 Mercury

Building materials, products, or equipment (e.g. thermostats, barometers, pressure gauges, lamp tubes), suspected to contain mercury were identified by visual inspection only. Dismantling of equipment suspected of containing mercury was not performed. Sampling of these materials for laboratory analysis of mercury content was not performed.

1.5 Polychlorinated Biphenyls

The potential for light ballasts to contain PCBs was based on the age of the building and visual observations of the type of fixture and lamp.

The potential for oil filled transformers to contain PCBs was based on the age of the building, a review of maintenance records, and examination of labels or nameplates on equipment, where present and accessible. The information was compared to known ban dates of PCBs and Environment Canada publications. Fluids (mineral oil, hydraulic, Aroclor or Askarel) in transformers or other equipment were not sampled for PCB content.

Non-liquid forms (caulking, sealants, or paints) were sampled and submitted for PCB analysis. Sampling of certain building materials is not conducted after specific construction dates.

Sample results are compared to the criteria as stated in the PCB Regulation SOR/2008-273.

1.6 Visible Mould

The presence of mould or water damage was determined by visual inspection of exposed building surfaces. If any mould growth or water damage was concealed within building cavities it was not addressed in this assessment.

APPENDIX IV
Location Summary Report

Client:City Of Mississauga

Site: 5800 River Grove Ave, Mississauga, ON

Building Name: River Grove Community Center

Survey Date:

Last Re-Assessment:

Building Phases: A: 1996

Location No.	Name or Description	Area ft ²	Floor No.	Bldg. Phase	Notes
1	Entrance Vestibule, room no. 1006	210	1	A	
2	Entrance Corridor, room no. 1007	2000	1	A	
3	Lobby, room no. 1064	2400	1	A	
6	Kaneff Auditorium, room no. 1072	6000	1	A	Ceiling height 25ft
41	Basement Corridor, room no. B004	200	B	A	
42	Elevator Room, room no. B007	40	B	A	
43	Storage, room no. B001	430	B	A	
44	Filtration Room, room no. B005	1300	B	A	
46	Staircase No. 3, room no. B003	100	B	A	
55	Mechanical Room 2, room no. 2027	2500	2	A	Staircase leading to level 1 present inside
57	Mechanical Room 1, room no. 2025	900	2	A	Access to roof present inside
62	Pool	9500	1	A	Ceiling height 38ft
66	Roof	4162	R	A	Roofing sections B2 and C3 were assessed under 341897
67	Renovated Back Of House Facilities	12000	1	A	
68	Exterior	0		A	
69	Renovated Youth Room	5000	1	A	

APPENDIX V

Hazardous Materials Summary Report / Sample Log

HAZARDOUS MATERIALS SUMMARY / SAMPLE LOG

Client: City Of Mississauga

Site: 5800 River Grove Ave, Mississauga, ON

Building Name: River Grove Community Center

Survey Date:

HAZMAT	Sample No	System/Component/Material/Sample Description	Locations	Bldg. Phase	LF	SF	EA	%	Type	Positive	Friability
Asbestos	S0001 A	Wall Window Caulking Grey	2,3,62	A	260	0	0	0	None Detected	No	
Asbestos	S0002 A	Other Door Caulking Black	2,3,62	A	1330	0	0	0	None Detected	No	
Asbestos	S0003 A	Wall Expansion Joint, Window Caulking Light Beige	2,3,6,62	A	260	0	0	0	None Detected	No	
Asbestos	S0004 A	Other Window Caulking Black	3,62	A	420	0	0	0	None Detected	No	
Asbestos	S0005 ABC	Wall Window Caulking Light Grey	6	A	140	0	0	0	None Detected	No	
Asbestos	S0006 ABC	Wall Door Caulking Light Red	6,69	A	45	0	0	0	None Detected	No	
Asbestos	S0007 AB	Wall Base Mastic Yellow	6,46	A	320	0	0	0	None Detected	No	
Asbestos	V0008	Wall Window, Expansion Joint Caulking Off White	6,62,67,69	A	100	330	0	0	None Detected	No	
Asbestos	V0009	Duct Mastic	55,57,67	A	120	0	0	0	None Detected	No	
Asbestos	S0010 B	Duct Mastic Dark Red	41,42,43,44	A	345	0	0	0	None Detected	No	
Asbestos	S0012 ABC	Piping Fire Stop Caulking Dark Red	57	A	0	0	5	0	None Detected	No	
Asbestos	S0013 ABC	Wall Expansion Joint Caulking Beige	62	A	60	0	0	0	None Detected	No	
Asbestos	S0014 ABC	Other Built Up Roofing Roofing Material Roof Core	66	A	0	4162	0	0	None Detected	No	
Asbestos	S0015 ABC	Other Built Up Roofing Tar Tar Of Soffit	66	A	40	20	0	0	None Detected	No	
Asbestos	S0016 ABC	Other All Caulking Caulking At Base Of Wall	66	A	0	30	0	0	None Detected	No	
Asbestos	S0017 ABCDEFG	Floor, Wall Thin-set	62	A	0	66500	0	0	None Detected	No	
Asbestos	S0018 ABC	Wall Thin-set Tiles On Walls / Slides	62	A	0	2400	0	0	None Detected	No	
Asbestos	S0019 ABCDEFG	Wall Mortar Between Concrete Block	1,2,3,6,46,55,57,62,67,69	A	0	12800	0	0	None Detected	No	
Asbestos	S0020 ABC	Wall Mastic, Yellow Baseboard	6,69	A	0	300	0	0	None Detected	No	
Asbestos	S0021 ABC	Duct Mastic, Grey On Louvers	55,57	A	0	200	0	0	None Detected	No	
Asbestos	S0022 ABC	Duct Mastic, Red On Louvers	55,57	A	0	200	0	0	None Detected	No	
Asbestos	S0023 ABC	Wall Mortar Base Concrete Block Of Awning	68	A	0	800	0	0	None Detected	No	
Asbestos	S0024 ABC	Wall Mortar Upper Brick Of Awning	68	A	0	800	0	0	None Detected	No	
Asbestos	S0025 ABC	Other Window Liner Sealant Black Butyl Sealant	68	A	2000	0	0	0	None Detected	No	
Asbestos	S0026 ABC	Wall Mortar Base Concrete Block	68	A	0	800	0	0	None Detected	No	
Asbestos	V0000	Ceiling Ceiling Tiles (lay-in) 60x24 Grey Textured	2,3,67	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Ceiling Ceramic Tiles 20x8 White	62	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Ceiling Ceramic Tiles Very Small White Squares	67	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Ceiling All Drywall And Joint Compound	1,2,3,6,67,69	A	0	3810	0	0	Non Asbestos	No	
Asbestos	V0000	Duct All Fibreglass	2,3,67	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Duct All Not Insulated	6,41,42,43,44,55,67,69	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Duct Silicone Red On Heat Recovery Unit	55	A	4	0	0	0	Non Asbestos	No	
Asbestos	V0000	Duct Duct Connector Textile	44,55,57	A	0	0	5	0	Non Asbestos	No	

HAZMAT	Sample No	System/Component/Material/Sample Description	Locations	Bldg. Phase	LF	SF	EA	%	Type	Positive	Friability
Asbestos	V0000	Floor All Ceramic Tiles 24x12 Black	1,2,3	A	0	1210	0	0	Non Asbestos	No	
Asbestos	V0000	Floor Ceramic Tiles 24x12 Light Beige	2,3	A	0	3000	0	0	Non Asbestos	No	
Asbestos	V0000	Floor Ceramic Tiles Light Pink Squares With Blue And Grey Mix	62	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Floor Ceramic Tiles Very Small Black Squares	62	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Floor All Ceramic Tiles Very Small Dark Grey Squares	67	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Floor Ceramic Tiles Very Small Light Grey Squares	62	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Floor Ceramic Tiles Very Small White Squares	62	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Floor All Concrete (poured)	41,42,43,44,55,57	A	0	5370	0	0	Non Asbestos	No	
Asbestos	V0000	Floor Non-slip Flooring	46	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Floor All Wood	6,69	A	0	12000	0	0	Non Asbestos	No	
Asbestos	V0000	Mechanical Equipment Tank Fibreglass	55	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Mechanical Equipment Generator Unit, Filters, Pump, Boiler, Air Handling Unit, Fan Unit, Heating Ventilating Air Conditioning Unit Not Insulated	42,44,55,57	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Other Electrical Panel Not Insulated	44,55,57	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Other Window Styrofoam Black	2	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Piping Fibreglass	2,3,44,55,57,67	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Piping Sprinkler, All, Rain Water Leader Not Insulated	2,3,6,41,42,43,44,55,57,62,67,69	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Piping Polyvinyl Chloride (pvc)	44,57	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Structure Stairs Concrete (poured)	55,57	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Structure All Concrete (precast)	2,41,42,43,44	A	0	3970	0	0	Non Asbestos	No	
Asbestos	V0000	Structure All Fireproofing (fibrous)	3,67	A	0	2400	0	0	Non Asbestos	No	
Asbestos	V0000	Structure All, Stairs Metal	6,46,55,57,69	A	0	15400	0	0	Non Asbestos	No	
Asbestos	V0000	Wall Cement Product	2	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Wall Ceramic Tiles 16x4 Yellow	2,3	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Wall Ceramic Tiles 16x8 White	2	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Wall Ceramic Tiles 16x8 White And Mix	3	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Wall All Ceramic Tiles 20x8 White	67	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Wall Ceramic Tiles Light Grey Squares	62	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Wall Ceramic Tiles Very Small White Squares	3	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Wall Ceramic Tiles Black	3	A	0	50	0	0	Non Asbestos	No	
Asbestos	V0000	Wall All Concrete (poured)	41,42,43,44,46,55,57	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Wall All Drywall And Joint Compound	2,3,55,57	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Wall All Masonry	6,46,62,67	A	0	0	0	0	Non Asbestos	No	
Paint	L0001	Wall Masonry White	1,2,3,41,46	A	0	2300	0	0		No	-
Paint	V0002	Ceiling Drywall And Joint Compound White	1,2,3,55	A	0	1810	0	0		No	-

HAZMAT	Sample No	System/Component/Material/Sample Description	Locations	Bldg. Phase	LF	SF	EA	%	Type	Positive	Friability
Paint	L0003	Wall Masonry Off White	6	A	0	5000	0	0		No	-
Paint	V0004	Wall Drywall And Joint Compound Sky Blue	55,57,62	A	0	4600	0	0		No	-
Paint	L0006	Wall Concrete (poured) White	46,55,57	A	0	1900	0	0		No	-
Paint	L0009	Floor Concrete (poured) Light Grey	55,57	A	0	3400	0	0		No	-
Paint	L0010	Duct Concrete (poured) Dark Blue	57	A	0	1500	0	0		No	-
Paint	L0011	Wall Masonry Blue	62	A	0	1200	0	0		No	-
Paint	L0012	Wall Masonry White On Concrete Block	67	A	0	2000	0	0		No	-
Paint	L0013	Wall Masonry Blue On Concrete Block	67	A	0	2000	0	0		No	-
Paint	L0014	Floor Concrete (poured) Grey	44,55,57	A	0	3900	0	0		No	-
Paint	L0015	Mechanical Equipment Metal Beige On Dehumidifier	57	A	0	1000	0	0		No	-
Paint	L0016	Mechanical Equipment Metal Blue On Heat Recovery Unit	55	A	0	500	0	0		Lead (High)	-
Paint	L0017	Mechanical Equipment Metal Green On Domestic Hot Water Boiler	55	A	0	200	0	0		Lead (High)	-
Paint	L0018	Mechanical Equipment Polyvinyl Chloride (pvc) Light Blue On Pvc Jacking Of Hot Water Tank	55	A	0	500	0	0		No	-
Paint	L0019	Structure Steel Blue On Steel Awning	68	A	0	5000	0	0		Lead (High)	-
Paint	L0020	Wall Masonry Grey Paint On Masonry Wall	68	A	0	2000	0	0		No	-
Lead Product	V0000	Batteries In Emer. Lights	1,2,3,6,62	A	0	0	8	0	-	No	-
PCB	V0000	Light Ballasts	1,2,3,41,42,43,44,55,57,62	A	0	0	0	0	-	No	-
PCB	V0000	Transformer	44,55,57	A	0	0	0	0	-	No	-
Hg	V9000	Light Fixture	2,3,41,42,43,44,46,55,57	A	0	0	146	0	Hg	Yes	-
Hg	V0000	Light Fixture	1,6,62	A	0	0	4	0	-	No	-
Hg	V0000	Thermostat	1,55,57	A	0	0	3	0	-	No	-

Legend:

Sample number		Units		
S####	Asbestos sample collected	SF	Square feet	NF Non Friable material.
L####	Paint sample collected	LF	Linear feet	F Friable material
P####	PCB sample collected	EA	Each	PF Potentially Friable material
M####	Mould sample collected	%	Percentage	
V####	Material visually similar to numbered sample collected			
V0000	Known non Hazardous Material			
V9000	Material is visually identified as Hazardous Material			
V9500	Material is presumed to be Hazardous Material			
[Loc. No.]	Abated Material			

APPENDIX VI
HMIS All Data Report

ALL DATA REPORT

Client: City Of Mississauga
Location: #1 : Entrance Vestibule
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1006
Last Re-Assessment: 0000-00-00

Area (sqft): 210

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	Drywall and joint compound			C	Y		210			SF	V0000	Non-Asbestos		None	
Duct	All	None Found														
Floor	All	Ceramic Tiles, 24x12 black			A	Y		210			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Piping	All	None Found														
Structure		None Found									SF					
Wall		Mortar, between concrete block		Paint	A	Y		400			SF	S0019B	None Detected	N.D.	None	
Wall ¹	All	Masonry														

1 - Block wall

Client: City Of Mississauga
Location: #1 : Entrance Vestibule
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1006
Last Re-Assessment: 0000-00-00

Area (sqft): 210

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall ¹	Masonry	50		SF	V0001	White	Pb: <0.00031 %	No	
Ceiling	Drywall and joint compound	210		SF	V0002	white	Pb: 0.00059 %	No	

1 - Block wall

Client: City Of Mississauga
Location: #1 : Entrance Vestibule
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1006
Last Re-Assessment: 0000-00-00

Area (sqft): 210

PB PRODUCTS				
Component	Quantity	Unit	Sample	Hazard
Batteries In Emer. Lights	1	EA	V0000	

Client: City Of Mississauga
Location: #1 : Entrance Vestibule
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1006
Last Re-Assessment: 0000-00-00

Area (sqft): 210

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture ¹			V0000	None
Thermostat ²	1	EA	V0000	None

1 - LED pot lights

2 - Digital

Client: City Of Mississauga

Site: 5800 River Grove Ave, Mississauga, ON

Building Name: River Grove Community Center



ALL DATA REPORT



Location: #1 : Entrance Vestibule
Survey Date: 2026-02-05

Floor: 1

Room #: 1006
Last Re-Assessment: 0000-00-00

Area (sqft): 210

PCB							
Component	Good	Poor	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹				V0000			No

1 - LED

ALL DATA REPORT

Client: City Of Mississauga
Location: #2 : Entrance Corridor
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1007
Last Re-Assessment: 0000-00-00

Area (sqft): 2000

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		Ceiling Tiles (lay-in), 60x24 grey textured			C	Y						V0000	Non-Asbestos		None	
Ceiling	All	Drywall and joint compound			C	Y		800			SF	V0000	Non-Asbestos		None	
Duct	All	Fibreglass		Foil Face	C	N						V0000	Non-Asbestos		None	
Floor		Ceramic Tiles, 24x12 light beige			A	Y		1500			SF	V0000	Non-Asbestos		None	
Floor		Ceramic Tiles, 24x12 black	Edge		A	Y		500			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Other ¹	Door	Caulking, Black			A	Y		70			LF	S0002A	None Detected	N.D.	None	
Other ²	Window	Styrofoam, Black			A	Y						V0000	Non-Asbestos		None	
Piping ³		Fibreglass		Paper	C	N						V0000	Non-Asbestos		None	
Piping	Sprinkler	Not Insulated			C	N						V0000	Non-Asbestos		None	
Structure	All	Concrete (precast)			C	N		2000			SF	V0000	Non-Asbestos		None	
Wall ⁴		Cement Product			C	N					SF	V0000	Non-Asbestos		None	
Wall		Ceramic Tiles, 16x8 White			A	Y						V0000	Non-Asbestos		None	
Wall		Ceramic Tiles, 16x4 yellow			C	Y						V0000	Non-Asbestos		None	
Wall		Mortar, between concrete block		Paint	A	Y		400				V0019	None Detected	N.D.	None	
Wall	All	Drywall and joint compound			A	Y						V0000	Non-Asbestos		None	
Wall	Expansion joint	Caulking, Light beige			A	Y		10			LF	S0003A	None Detected	N.D.	None	
Wall ⁵	Window	Caulking, Grey			A	Y		50			LF	S0001A	None Detected	N.D.	None	

- 1 - Between door frame and glass
2 - Type of foam, between window frame and glass
3 - Heating supply and return
4 - Cement board
5 - Between window frame and wall

Client: City Of Mississauga
Location: #2 : Entrance Corridor
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1007
Last Re-Assessment: 0000-00-00

Area (sqft): 2000

PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Wall	Drywall and joint compound	600		SF	V0002	White	Pb: 0.00059 %	No
Wall ¹	Masonry	500		SF	L0001	White	Pb: <0.00031 %	No

- 1 - Block

Client: City Of Mississauga
Location: #2 : Entrance Corridor
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1007
Last Re-Assessment: 0000-00-00

Area (sqft): 2000

PB PRODUCTS				
Component	Quantity	Unit	Sample	Hazard
Batteries In Emer. Lights	2	EA	V0000	

Client: City Of Mississauga
Location: #2 : Entrance Corridor
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1007
Last Re-Assessment: 0000-00-00
Area (sqft): 2000

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture ¹	20	EA	V9000	Confirmed Mercury

1 - T5

Client: City Of Mississauga
Location: #2 : Entrance Corridor
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1007
Last Re-Assessment: 0000-00-00
Area (sqft): 2000

PCB							
Component	Good	Poor	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹				V0000			No

1 - T5

ALL DATA REPORT

Client: City Of Mississauga
Location: #3 : Lobby
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1064
Last Re-Assessment: 0000-00-00

Area (sqft): 2400

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		Ceiling Tiles (lay-in), 60x24 grey textured			C	Y						V0000	Non-Asbestos		None	
Ceiling	All	Drywall and joint compound			C	Y		800			SF	V0000	Non-Asbestos		None	
Duct	All	Fibreglass		Foil Face	C	N						V0000	Non-Asbestos		None	
Floor		Ceramic Tiles, 24x12 light beige			A	Y		1500			SF	V0000	Non-Asbestos		None	
Floor		Ceramic Tiles, 24x12 black	Edge		A	Y		500			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Other ¹	Door	Caulking, Black			A	Y		60			LF	V0002	None Detected	N.D.	None	
Other ²	Window	Caulking, Black			A	Y		120			LF	S0004A	None Detected	N.D.	None	
Piping ³		Fibreglass		Paper	C	N						V0000	Non-Asbestos		None	
Piping	Sprinkler	Not Insulated			C	N						V0000	Non-Asbestos		None	
Structure	All	Fireproofing (Fibrous)			C	N		2400			SF	V0000	Non-Asbestos		None	
Wall		Ceramic Tiles, 16x8 White and mix			A	Y						V0000	Non-Asbestos		None	
Wall		Ceramic Tiles, 16x4 yellow			C	Y						V0000	Non-Asbestos		None	
Wall		Ceramic Tiles, black	Edge		A	Y		50			SF	V0000	Non-Asbestos		None	
Wall		Ceramic Tiles, Very small white squares			A	Y						V0000	Non-Asbestos		None	
Wall		Mortar, between concrete block		Paint	A	Y		400			SF	V0019	None Detected	N.D.	None	
Wall	All	Drywall and joint compound			A	Y						V0000	Non-Asbestos		None	
Wall	Expansion joint	Caulking, Light beige			A	Y		10			LF	V0003	None Detected	N.D.	None	
Wall ⁴	Window	Caulking, Grey			A	Y		150			LF	V0001	None Detected	N.D.	None	

1 - Between door frame and glass , pool door

2 - between window frame and glass

3 - Heating supply and return

4 - Between window frame and wall

Client: City Of Mississauga
Location: #3 : Lobby
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1064
Last Re-Assessment: 0000-00-00

Area (sqft): 2400

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Drywall and joint compound	600		SF	V0002	White	Pb: 0.00059 %	No	
Wall ¹	Masonry	1000		SF	V0001	White	Pb: <0.00031 %	No	

1 - Block

Client: City Of Mississauga
Location: #3 : Lobby
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1064
Last Re-Assessment: 0000-00-00

Area (sqft): 2400

PB PRODUCTS				
Component	Quantity	Unit	Sample	Hazard
Batteries In Emer. Lights	2	EA	V0000	

Client: City Of Mississauga

Location: #3 : Lobby

Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON

Floor: 1

Building Name: River Grove Community Center

Room #: 1064

Last Re-Assessment: 0000-00-00

Area (sqft): 2400

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture ¹	14	EA	V9000	Confirmed Mercury

1 - T5

Client: City Of Mississauga

Location: #3 : Lobby

Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON

Floor: 1

Building Name: River Grove Community Center

Room #: 1064

Last Re-Assessment: 0000-00-00

Area (sqft): 2400

PCB							
Component	Good	Poor	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹				V0000			No

1 - T5

ALL DATA REPORT

Client: City Of Mississauga
Location: #6 : Kaneff Auditorium
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1072
Last Re-Assessment: 0000-00-00

Area (sqft): 6000

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	Drywall and joint compound			C	Y		1000			SF	V0000	Non-Asbestos		None	
Duct	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Floor	All	Wood			A	Y		6000			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Piping	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Metal			C	Y		6000			SF	V0000	Non-Asbestos		None	
Wall		Mastic, Yellow, baseboard		Rubber	D	N		100			SF	S0020AB	None Detected	N.D.	None	
Wall		Mortar, between concrete block		Paint	A	Y		400			SF	V0019	None Detected	N.D.	None	
Wall ¹	All	Masonry			A	Y						V0000	Non-Asbestos		None	
Wall	Base	Mastic, Yellow		Rubber	A	Y		300			LF	S0007AB	None Detected	N.D.	None	
Wall ²	Door	Caulking, Light red			A	Y		25			LF	S0006ABC	None Detected	N.D.	None	
Wall ³	Window	Caulking, Light grey			A	Y		140			LF	S0005ABC	None Detected	N.D.	None	
Wall ⁴	Window	Caulking, Light beige			A	Y		40			LF	V0003	None Detected	N.D.	None	
Wall ⁵	Window	Caulking, Off white			B	Y		50			SF	V0008	None Detected	N.D.	None	

Ceiling height 25ft

- 1 - Block wall
- 2 - Between wall and door frame, between walls
- 3 - Between wall and window frame
- 4 - Between window frame and wall
- 5 - Between window frame and wall

Client: City Of Mississauga
Location: #6 : Kaneff Auditorium
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1072
Last Re-Assessment: 0000-00-00

Area (sqft): 6000

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall ¹	Masonry	5000		SF	L0003	Off White	Pb: 0.00034 %	No	

Ceiling height 25ft

- 1 - Block wall, green underneath white

Client: City Of Mississauga
Location: #6 : Kaneff Auditorium
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1072
Last Re-Assessment: 0000-00-00

Area (sqft): 6000

PB PRODUCTS				
Component	Quantity	Unit	Sample	Hazard
Batteries In Emer. Lights	3	EA	V0000	

Ceiling height 25ft

ALL DATA REPORT

Client: City Of Mississauga
Location: #6 : Kaneff Auditorium
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1072
Last Re-Assessment: 0000-00-00
Area (sqft): 6000

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture ¹			V0000	None

Ceiling height 25ft
1 - LED

Client: City Of Mississauga
Location: #6 : Kaneff Auditorium
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1072
Last Re-Assessment: 0000-00-00
Area (sqft): 6000

PCB							
Component	Good	Poor	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts							No

Ceiling height 25ft

ALL DATA REPORT

Client: City Of Mississauga
Location: #41 : Basement Corridor
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B004
Last Re-Assessment: 0000-00-00

Area (sqft): 200

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	None Found														
Duct ¹		Mastic, Dark red			C	Y		40			LF	V0010	None Detected	N.D.	None	
Duct	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Floor	All	Concrete (poured)			B	Y		200			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Piping	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Concrete (precast)			C	Y		200			SF	V0000	Non-Asbestos		None	
Wall	All	Concrete (poured)			B	Y						V0000	Non-Asbestos		None	

1 - 8 duct connections

Client: City Of Mississauga
Location: #41 : Basement Corridor
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B004
Last Re-Assessment: 0000-00-00

Area (sqft): 200

PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Wall	Concrete (poured)	500		SF	V0001	White	Pb: <0.00031 %	No

Client: City Of Mississauga
Location: #41 : Basement Corridor
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B004
Last Re-Assessment: 0000-00-00

Area (sqft): 200

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture ¹	10	EA	V9000	Confirmed Mercury

1 - T8

Client: City Of Mississauga
Location: #41 : Basement Corridor
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B004
Last Re-Assessment: 0000-00-00

Area (sqft): 200

PCB							
Component	Good	Poor	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹				V0000			No

1 - T8

ALL DATA REPORT

Client: City Of Mississauga
Location: #42 : Elevator Room
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B007
Last Re-Assessment: 0000-00-00

Area (sqft): 40

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	None Found														
Duct ¹		Mastic, Dark red			C	Y		15			LF	V0010	None Detected	N.D.	None	
Duct	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Floor	All	Concrete (poured)			B	Y		40			SF	V0000	Non-Asbestos		None	
Mechanical Equipment ²	Generator unit	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Piping	Sprinkler	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Concrete (precast)			C	Y		40			SF	V0000	Non-Asbestos		None	
Structure ³	Column				B	Y						V0000	Non-Asbestos		None	
Wall	All	Concrete (poured)			B	Y						V0000	Non-Asbestos		None	

1 - 3 duct connections

2 - Hydraulic Elevator machine

3 - Drywall joint compound

Client: City Of Mississauga
Location: #42 : Elevator Room
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B007
Last Re-Assessment: 0000-00-00

Area (sqft): 40

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture ¹	2	EA	V9000	Confirmed Mercury

1 - T8

Client: City Of Mississauga
Location: #42 : Elevator Room
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B007
Last Re-Assessment: 0000-00-00

Area (sqft): 40

PCB							
Component	Good	Poor	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹				V0000			No

1 - T8

ALL DATA REPORT

Client: City Of Mississauga
Location: #43 : Storage
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B001
Last Re-Assessment: 0000-00-00

Area (sqft): 430

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	None Found														
Duct ¹		Mastic, Dark red			C	Y		10			LF	V0010	None Detected	N.D.	None	
Duct	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Floor	All	Concrete (poured)			B	Y		430			SF	V0000	Non-Asbestos		None	
Mechanical Equipment		None Found														
Piping	Rain water leader	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Piping	Sprinkler	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Concrete (precast)			C	Y		430			SF	V0000	Non-Asbestos		None	
Wall	All	Concrete (poured)			B	Y						V0000	Non-Asbestos		None	

1 - 2 duct connections

Client: City Of Mississauga
Location: #43 : Storage
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B001
Last Re-Assessment: 0000-00-00

Area (sqft): 430

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture ¹	12	EA	V9000	Confirmed Mercury

1 - T8

Client: City Of Mississauga
Location: #43 : Storage
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B001
Last Re-Assessment: 0000-00-00

Area (sqft): 430

PCB							
Component	Good	Poor	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹				V0000			No

1 - T8

ALL DATA REPORT

Client: City Of Mississauga
Location: #44 : Filtration Room
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B005
Last Re-Assessment: 0000-00-00

Area (sqft): 1300

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	None Found														
Duct ¹		Mastic, Dark red			C	Y		180			LF	S0010B	None Detected	N.D.	None	
Duct		Mastic, Dark red			C	Y		100			LF	V0010	None Detected	N.D.	None	
Duct	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Duct	Duct connector	Textile			C	Y		2			EA	V0000	Non-Asbestos		None	
Floor	All	Concrete (poured)			B	Y		1300			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	Filters	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Mechanical Equipment	Pump	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Other	Electrical panel	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Piping		Fibreglass		Paper	B	Y						V0000	Non-Asbestos		None	
Piping		Polyvinyl chloride (PVC)			C	Y						V0000	Non-Asbestos		None	
Piping	Rain water leader	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Piping	Sprinkler	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Concrete (precast)			C	Y		1300			SF	V0000	Non-Asbestos		None	
Wall	All	Concrete (poured)			B	Y						V0000	Non-Asbestos		None	

1 - 40 duct connections

Client: City Of Mississauga
Location: #44 : Filtration Room
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B005
Last Re-Assessment: 0000-00-00

Area (sqft): 1300

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Floor	Concrete (poured)	1300		SF	L0014	Grey	Pb: 0.0012 %	No	

Client: City Of Mississauga
Location: #44 : Filtration Room
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B005
Last Re-Assessment: 0000-00-00

Area (sqft): 1300

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture ¹	24	EA	V9000	Confirmed Mercury

1 - 24T8, LED

Client: City Of Mississauga
Location: #44 : Filtration Room
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B005
Last Re-Assessment: 0000-00-00

Area (sqft): 1300

PCB							
Component	Good	Poor	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹				V0000			No
Transformer				V0000			No

1 - T8

ALL DATA REPORT

Client: City Of Mississauga
Location: #46 : Staircase No. 3
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B003
Last Re-Assessment: 0000-00-00

Area (sqft): 100

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		None Found														
Duct	All	None Found														
Floor		Non-slip Flooring			A	Y						V0000	Non-Asbestos		None	
Floor	All	Ceramic Tiles, 24x12 black														
Mechanical Equipment	All	None Found														
Piping	All	None Found														
Structure ¹	Stairs	Metal			C	Y						V0000	Non-Asbestos		None	
Wall		Concrete (poured)			A	Y						V0000	Non-Asbestos		None	
Wall		Mortar, between concrete block		Paint	A	Y		400			SF	S0019A	None Detected	N.D.	None	
Wall ²	All	Masonry			A	Y						V0000	Non-Asbestos		None	
Wall	Base	Mastic, Yellow			A	Y		20			LF	V0007	None Detected	N.D.	None	

1 - Underneath staircase

2 - Block wall

Client: City Of Mississauga
Location: #46 : Staircase No. 3
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B003
Last Re-Assessment: 0000-00-00

Area (sqft): 100

PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Wall ¹	Masonry	250		SF	V0001	White	Pb: <0.00031 %	No
Wall	Concrete (poured)	500		SF	L0006	White	Pb: <0.00010 %	No

1 - Block wall

Client: City Of Mississauga
Location: #46 : Staircase No. 3
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B003
Last Re-Assessment: 0000-00-00

Area (sqft): 100

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture ¹	6	EA	V9000	Confirmed Mercury

1 - T5

Client: City Of Mississauga
Location: #46 : Staircase No. 3
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B003
Last Re-Assessment: 0000-00-00

Area (sqft): 100

PCB							
Component	Good	Poor	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts							No

ALL DATA REPORT

Client: City Of Mississauga
Location: #55 : Mechanical Room 2
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #: 2027
Last Re-Assessment: 0000-00-00

Area (sqft): 2500

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	None Found														
Duct		Mastic, Red, on Louvers			B	Y		100			SF	S0022AB	None Detected	N.D.	None	
Duct		Not Insulated			C	Y						V0000	Non-Asbestos		None	
Duct ¹		Mastic, Grey			C	Y		50			LF	V0009	None Detected	N.D.	None	
Duct		Mastic, Grey, on Louvers			B	Y		100			SF	S0021AB	None Detected	N.D.	None	
Duct		Silicone, Red on heat recovery unit			B	Y		4			LF	V0000	Non-Asbestos		None	
Duct	Duct connector	Textile			C	Y		2			EA	V0000	Non-Asbestos		None	
Floor	All	Concrete (poured)			B	Y		2500			SF	V0000	Non-Asbestos		None	
Mechanical Equipment		Not Insulated			B	Y						V0000	Non-Asbestos		None	
Mechanical Equipment	Air handling unit	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Mechanical Equipment	Boiler	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Mechanical Equipment	Pump	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Mechanical Equipment ²	Tank	Fibreglass		Plastic	B	Y						V0000	Non-Asbestos		None	
Other	Electrical panel	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Piping		Fibreglass		Polyvinyl chloride (PVC)	C	Y						V0000	Non-Asbestos		None	
Piping	Sprinkler	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Metal			C	Y		2500			SF	V0000	Non-Asbestos		None	
Structure	Stairs	Concrete (poured)			B	Y						V0000	Non-Asbestos		None	
Wall		Concrete (poured)			B	Y						V0000	Non-Asbestos		None	
Wall		Mortar, between concrete block		Paint	A	Y		400			SF	V0019	None Detected	N.D.	None	
Wall	All	Drywall and joint compound			B	Y						V0000	Non-Asbestos		None	

Staircase leading to level 1 present inside

1 - 5 duct connections

2 - Storage tank

Client: City Of Mississauga
Location: #55 : Mechanical Room 2
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #: 2027
Last Re-Assessment: 0000-00-00

Area (sqft): 2500

PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Wall	Drywall and joint compound	400		SF	V0002	White	Pb: 0.00059 %	No
Wall	Concrete (poured)	700		SF	V0006	White	Pb: <0.00010 %	No
Wall	Drywall and joint compound	200		SF	V0004	Sky blue	Pb: 0.00040 %	No
Floor	Concrete (poured)	2500		SF	L0009	Light grey	Pb: 0.0017 %	No
Duct	Metal	500		SF	V0004	Sky blue	Pb: 0.00040 %	No

ALL DATA REPORT

Floor	Concrete (poured)	1300		SF	V0014	Grey	Pb: 0.0012 %	No
Mechanical Equipment	Metal	500		SF	L0016	Blue on heat recovery unit	Pb: 0.20 %	Lead (High)
Mechanical Equipment	Metal	200		SF	L0017	Green on domestic hot water boiler	Pb: 0.11 %	Lead (High)
Mechanical Equipment	Polyvinyl chloride (PVC)	500		SF	L0018	Light blue on pvc jacking of hot water tank	Pb: 0.0061 %	No

Staircase leading to level 1 present inside

Client: City Of Mississauga

Location: #55 : Mechanical Room 2

Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON

Floor: 2

Building Name: River Grove Community Center

Room #: 2027

Last Re-Assessment: 0000-00-00

Area (sqft): 2500

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture ¹	36	EA	V9000	Confirmed Mercury
Thermostat	1	EA	V0000	None

Staircase leading to level 1 present inside

1 - T8

Client: City Of Mississauga

Location: #55 : Mechanical Room 2

Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON

Floor: 2

Building Name: River Grove Community Center

Room #: 2027

Last Re-Assessment: 0000-00-00

Area (sqft): 2500

PCB							
Component	Good	Poor	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹				V0000			No
Transformer				V0000			No

Staircase leading to level 1 present inside

1 - T8

ALL DATA REPORT

Client: City Of Mississauga
Location: #57 : Mechanical Room 1
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #: 2025
Last Re-Assessment: 0000-00-00

Area (sqft): 900

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	None Found														
Duct		Mastic, Red, on Louvers			B	Y		100			SF	S0022C	None Detected	N.D.	None	
Duct		Not Insulated														
Duct ¹		Mastic, Grey			C	Y		20			LF	V0009	None Detected	N.D.	None	
Duct		Mastic, Grey, on Louvers			B	Y		100			SF	S0021C	None Detected	N.D.	None	
Duct	Duct connector	Textile			C	Y		1			EA	V0000	Non-Asbestos		None	
Floor	All	Concrete (poured)			B	Y		900			SF	V0000	Non-Asbestos		None	
Mechanical Equipment		Not Insulated			B	Y						V0000	Non-Asbestos		None	
Mechanical Equipment	Fan unit	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Mechanical Equipment ²	Heating ventilating air conditioning unit	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Mechanical Equipment	Pump	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Other	Electrical panel	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Piping		Fibreglass		Polyvinyl chloride (PVC)	C	Y						V0000	Non-Asbestos		None	
Piping		Polyvinyl chloride (PVC)			B	Y						V0000	Non-Asbestos		None	
Piping	Fire stop	Caulking, Dark red			C	Y		5			EA	S0012ABC	None Detected	N.D.	None	
Piping	Sprinkler	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Metal			C	Y		900			SF	V0000	Non-Asbestos		None	
Structure	Stairs	Concrete (poured)			B	Y						V0000	Non-Asbestos		None	
Wall		Concrete (poured)			B	Y						V0000	Non-Asbestos		None	
Wall		Mortar, between concrete block		Paint	A	Y		400			SF	V0019	None Detected	N.D.	None	
Wall	All	Drywall and joint compound			B	Y						V0000	Non-Asbestos		None	

Access to roof present inside

1 - 4 duct connections

2 - Pool dehumidifier

Client: City Of Mississauga
Location: #57 : Mechanical Room 1
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #: 2025
Last Re-Assessment: 0000-00-00

Area (sqft): 900

PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Wall	Concrete (poured)	700		SF	V0006	White	Pb: <0.00010 %	No
Piping	Metal	500		SF	V0004	Sky blue	Pb: 0.00040 %	No
Floor	Concrete (poured)	900		SF	V0009	Light grey	Pb: 0.0017 %	No
Floor	Concrete (poured)	900		SF	V0004	Sky blue	Pb: 0.00040 %	No
Duct	Metal	500		SF	V0004	Sky blue	Pb: 0.00040 %	No
Duct	Concrete (poured)	1500		SF	L0010	Dark blue	Pb: 0.00065 %	No

ALL DATA REPORT

Floor	Concrete (poured)	1300		SF	V0014	Grey	Pb: 0.0012 %	No
Mechanical Equipment	Metal	1000		SF	L0015	Beige on dehumidifier	Pb: 0.0022 %	No

Access to roof present inside

Client: City Of Mississauga
Location: #57 : Mechanical Room 1
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #: 2025
Last Re-Assessment: 0000-00-00
Area (sqft): 900

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture ¹	22	EA	V9000	Confirmed Mercury
Thermostat	1	EA	V0000	None

Access to roof present inside

1 - T8

Client: City Of Mississauga
Location: #57 : Mechanical Room 1
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #: 2025
Last Re-Assessment: 0000-00-00
Area (sqft): 900

PCB							
Component	Good	Poor	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹				V0000			No
Transformer				V0000			No

Access to roof present inside

1 - T8

ALL DATA REPORT

Client: City Of Mississauga
Location: #62 : Pool
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 9500

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling ¹		Ceramic Tiles, 20x8 white			B	Y						V0000	Non-Asbestos		None	
Ceiling	All	Wood														
Duct	All															
Floor		Ceramic Tiles, Light pink squares with blue and grey mix			B	Y						V0000	Non-Asbestos		None	
Floor		Ceramic Tiles, Very small light grey squares			B	Y						V0000	Non-Asbestos		None	
Floor ²		Ceramic Tiles, Very small white squares			A	Y						V0000	Non-Asbestos		None	
Floor		Ceramic Tiles, Very small black squares			B	Y						V0000	Non-Asbestos		None	
Floor		Thin-set, ceramics on pool deck		Ceramic Tiles	D	N		57000			SF	S0017ABCEFG	None Detected	N.D.	None	
Mechanical Equipment	All	None Found														
Other ³	Door	Caulking, Black			A	Y		1200			LF	V0002	None Detected	N.D.	None	
Other ⁴	Window	Caulking, Black			A	Y		300			LF	V0004	None Detected	N.D.	None	
Piping	Rain water leader	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Wood														
Wall ⁵		Masonry			B	Y						V0000	Non-Asbestos		None	
Wall		Ceramic Tiles, Light grey squares	Edge		B	Y						V0000	Non-Asbestos		None	
Wall		Mortar, between concrete block		Paint	A	Y		2000			SF	V0019	None Detected	N.D.	None	
Wall		Thin-set, Ceramics on staircase		Ceramic Tiles	D	N		9500			SF	S0017D	None Detected	N.D.	None	
Wall		Thin-set, Tiles on walls / slides		Ceramic Tiles	D	N		2400			SF	S0018ABC	None Detected	N.D.	None	
Wall	All	Very small white squares			B	Y						V0000	Non-Asbestos		None	
Wall	Expansion joint	Caulking, Light beige			A	Y		200			LF	V0003	None Detected	N.D.	None	
Wall	Expansion joint	Caulking, Beige			B	Y		60			LF	S0013ABC	None Detected	N.D.	None	
Wall	Expansion joint	Caulking, Off white			B	Y		30			SF	V0008	None Detected	N.D.	None	
Wall ⁶	Window	Caulking, Grey			A	Y		60			LF	V0001	None Detected	N.D.	None	
Wall ⁷	Window	Caulking, Off white			B	Y		200			SF	V0008	None Detected	N.D.	None	

Ceiling height 38ft

- 1 - In vestibule emergency exit
- 2 - Along pool only
- 3 - Between door frame and glass
- 4 - between window frame and glass
- 5 - Block wall
- 6 - Between window frame and wall
- 7 - Between window frame and wall

Client: City Of Mississauga
Location: #62 : Pool
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 9500

2026-02-26

Quantities shown above are based on visual approximations only and may be subject to variation. Copyright Pinchin Ltd. 2026

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PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Wall ¹	Masonry	2000		SF	V0004	Sky blue	Pb: 0.00040 %	No
Wall	Masonry	1200		SF	L0011	Blue	Pb: <0.00010 %	No

Ceiling height 38ft

1 - Block wall

Client: City Of Mississauga

Site: 5800 River Grove Ave, Mississauga, ON

Building Name: River Grove Community Center

Location: #62 : Pool

Floor: 1

Room #:

Area (sqft): 9500

Survey Date: 2026-02-05

Last Re-Assessment: 0000-00-00

PB PRODUCTS				
Component	Quantity	Unit	Sample	Hazard
Batteries In Emer. Lights			V0000	

Ceiling height 38ft

Client: City Of Mississauga

Site: 5800 River Grove Ave, Mississauga, ON

Building Name: River Grove Community Center

Location: #62 : Pool

Floor: 1

Room #:

Area (sqft): 9500

Survey Date: 2026-02-05

Last Re-Assessment: 0000-00-00

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture ¹	4	EA	V0000	None

Ceiling height 38ft

1 - 4T5 in vestibule, LED

Client: City Of Mississauga

Site: 5800 River Grove Ave, Mississauga, ON

Building Name: River Grove Community Center

Location: #62 : Pool

Floor: 1

Room #:

Area (sqft): 9500

Survey Date: 2026-02-05

Last Re-Assessment: 0000-00-00

PCB							
Component	Good	Poor	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹				V0000			No

Ceiling height 38ft

1 - T5, LED

ALL DATA REPORT

Client: City Of Mississauga
Location: #66 : Roof
Survey Date: 2026-02-05

Site: 5800 River Grove Ave, Mississauga, ON
Floor: R

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 4162

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	None Found														
Duct	All	Not Insulated			C	Y										
Floor	All	None Found														
Mechanical Equipment	All	None Found														
Other ¹	All	Caulking, taken at base of wall				Y		30			SF	S0016ABC	None Detected	N.D.	None	
Other ²	Built up roofing	Tar, sampled from soffit			C	Y		60			LF	S0015ABC	None Detected	N.D.	None	
Other	Built up roofing	Roofing material, Roof Core			C	Y		4162			SF	S0014ABC	None Detected	N.D.	None	
Piping	All	Not Insulated			C	Y										
Structure	Not accessible															
Wall	All	None Found														

Roofing sections B2 and C3 were assessed under 341897

1 - Taken from Roof section B2

2 - Taken from roof section C3

ALL DATA REPORT

Client: City Of Mississauga

Site: 5800 River Grove Ave, Mississauga, ON

Building Name: River Grove Community Center

Location: #67 : Renovated Back Of House Facilities **Floor:** 1

Room #:

Area (sqft): 12000

Survey Date: 2026-02-07

Last Re-Assessment: 0000-00-00

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling ¹		Ceiling Tiles (lay-in), 60x24 grey textured			C	Y						V0000	Non-Asbestos		None	
Ceiling		Drywall and joint compound			C	Y						V0000	Non-Asbestos		None	
Ceiling ²		Ceramic Tiles, Very small white squares			A	Y						V0000	Non-Asbestos		None	
Duct		Fibreglass		Foil Face	C	N						V0000	Non-Asbestos		None	
Duct		Not Insulated			C	N						V0000	Non-Asbestos		None	
Duct ³		Mastic, Grey			C	N		50			LF	V0009	None Detected	N.D.	None	
Floor	All	Ceramic Tiles, Very small dark grey squares			B	Y						V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Piping ⁴		Fibreglass		Paper	C	N						V0000	Non-Asbestos		None	
Piping		Not Insulated			C	N						V0000	Non-Asbestos		None	
Structure	All	Fireproofing (Fibrous)			C	N						V0000	Non-Asbestos		None	
Wall ⁵		Masonry			A	Y						V0000	Non-Asbestos		None	
Wall		Mortar, between concrete block		Paint	A	Y		8000			SF	S0019CDEFG	None Detected	N.D.	None	
Wall	All	Ceramic Tiles, 20x8 white			A	Y						V0000	Non-Asbestos		None	
Wall	Expansion joint	Caulking, Off white			A	Y		100			LF	V0008	None Detected	N.D.	None	

1 - Fiberglass

2 - Only steam room

3 - Approx 8 duct connections

4 - D.C.W, D.H.W, heating supply and return, recirc. line

5 - Block wall

Client: City Of Mississauga

Site: 5800 River Grove Ave, Mississauga, ON

Building Name: River Grove Community Center

Location: #67 : Renovated Back Of House Facilities **Floor:** 1

Room #:

Area (sqft): 12000

Survey Date: 2026-02-07

Last Re-Assessment: 0000-00-00

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Masonry	2000		SF	L0012	White on concrete block	Pb: 0.00037 %	No	
Wall	Masonry	2000		SF	L0013	blue on concrete block	Pb: <0.00010 %	No	

ALL DATA REPORT

Client: City Of Mississauga
Location: #68 : Exterior
Survey Date:

Site: 5800 River Grove Ave, Mississauga, ON
Floor:

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 0

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Other	Window	Glass														
Other	Window liner	Sealant, Black butyl sealant			C	Y		2000			LF	S0025ABC	None Detected	N.D.	None	
Structure	Beam deck joist	Steel														
Wall		Masonry														
Wall		Mortar, Base concrete block of awning			A	Y		800			SF	S0023ABC	None Detected	N.D.	None	
Wall		Mortar, Upper brick of awning			C	Y		800			SF	S0024ABC	None Detected	N.D.	None	
Wall ¹		Mortar, base concrete block			A	Y		800			SF	S0026ABC	None Detected	N.D.	None	

1 - under window of the pool

Client: City Of Mississauga
Location: #68 : Exterior
Survey Date:

Site: 5800 River Grove Ave, Mississauga, ON
Floor:

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 0

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Structure	Steel	3000	2000	SF	L0019	Blue on steel awning	Pb: 0.15 %	Lead (High)	
Wall	Masonry	2000		SF	L0020	grey paint on masonry wall	Pb: 0.00073 %	No	

ALL DATA REPORT

Client: City Of Mississauga
Location: #69 : Renovated Youth Room
Survey Date: 2026-02-07

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 5000

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	Drywall and joint compound			C	Y		1000			SF	V0000	Non-Asbestos		None	
Duct	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Floor	All	Wood			A	Y		6000			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Piping	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Metal			C	Y		6000			SF	V0000	Non-Asbestos		None	
Wall		Mastic, Yellow, baseboard		Rubber	D	N		100			SF	S0020C	None Detected	N.D.	None	
Wall		Mastic, Yellow, baseboard		Rubber	D	N		100			SF	V0020	None Detected	N.D.	None	
Wall		Mortar, between concrete block		Paint	A	Y		400			SF	V0019	None Detected	N.D.	None	
Wall ¹	Door	Caulking, Light red			A	Y		20			LF	V0006	None Detected	N.D.	None	
Wall ²	Window	Caulking, Off white			B	Y		50			SF	V0008	None Detected	N.D.	None	

1 - Between wall and door frame, between walls

2 - Between window frame and wall

Legend:

Sample number	Units	Other
S#### Asbestos sample collected	SF Square feet	A Access
L#### Paint sample collected	LF Linear feet	V Visible
P#### PCB sample collected	EA Each	AP Air Plenum
M#### Mould sample collected	% Percentage	F Friable material
V#### Material is visually identified to be identical to S####	LF Linear feet	NF Non Friable material
V0000 Known non hazardous material		PF Potentially Friable material
V9000 Material visually identified as a Hazardous Material		Pb Lead
V9500 Material is presumed to be a hazardous material		Hg Mercury
		As Arsenic
		Cr Chromium

Access
A Accessible to all building occupants
B Accessible to maintenance and operations staff without a ladder
C Accessible to maintenance and operations staff with a ladder. Also rarely entered, locked areas
D Not normally accessible

Condition
Good No visible damage or deterioration
Fair Minor, repairable damage, cracking, delamination or deterioration
Poor Irreparable damage or deterioration with exposed and missing material

Visible
Y The material is visible when standing on the floor of the room, without the removal or opening of other building components (e.g. ceiling tiles or access panels).
N The material is not visible to view when standing on the floor of the room and requires the removal of a building component (e.g. ceilings tiles or access panels) to view and access. Includes rarely entered crawlspaces, attic spaces, etc. Observations will be limited to the extent visible from the access points.
L The material is partially visible to view when standing on the floor of the room and requires the removal of a building component (e.g. ceiling system or access panels) to view completely and access. Includes partially viewed access points to crawlspaces, attic spaces, etc. without entering. Observations are limited to the extent visible from the access points.

Air Plenum
Yes or No The material is in a return air plenum or in a direct airstream or there is evidence of air erosion (e.g. duct for heating or cooling blowing directly on or across an ACM). This field is only completed where Air Plenum consideration is required by regulation.

Colour Coding
The material is a hazardous material, either by analytical results or by visible identification.
The material is presumed to be a hazardous material, based on visual appearance, and was not sampled due to limited access or the non-destructive nature of sampling.

Action					
(1)	Clean up of ACM Debris	(2)	Precautions for Access Which may Disturb ACM Debris	(3)	ACM removal
(4)	Precautions for Work Which may Disturb ACM in Poor Condition	(5)	Proactive ACM removal (Minimum repair required for fair condition)	(6)	ACM repair
(7)	Management program and surveillance				



Hazardous Building Materials Assessment (Management)

River Grove Community Centre
5800 River Grove Avenue,
Mississauga, Ontario

Prepared for:

City of Mississauga

300 City Centre Drive
Mississauga, Ontario, L5B 3C1

July 4, 2023

Pinchin File: 325772.000



Hazardous Building Materials Assessment (Management)

River Grove Community Centre, 5800 River Grove Avenue, Mississauga, Ontario
City of Mississauga

July 4, 2023

Pinchin File: 325772.000

Issued to:	City of Mississauga
Issued on:	July 4, 2023
Pinchin File:	325772.000
Issuing Office:	Mississauga, ON

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EXECUTIVE SUMMARY

City of Mississauga (Client) retained Pinchin Ltd. (Pinchin) to conduct a hazardous building materials assessment at River Grove Community Centre located at 5800 River Grove Avenue, Mississauga, Ontario. Pinchin performed the assessment on May 23, 2023 and May 24, 2023.

The objective of the assessment was to document the locations of specified hazardous building materials, evaluate their condition, and develop corrective action plans as required for the purposes of long-term management and potential future building renovations that are unknown at the time of the assessment. The results of this assessment are not intended for construction, renovation, demolition, or project tendering purposes. Information within this report may be relevant to future renovations and further investigation may be required dependant on the scope of renovations.

SUMMARY OF FINDINGS

Asbestos: No asbestos-containing materials were confirmed to be present during the assessment.

Lead:

- All paints sampled were below the threshold of 0.009% (90 mg/kg) and are assumed to be insignificant.
- Presumed lead containing paint is present in the assessed area, these lead paints are low in total quantity.

Silica: Crystalline silica is present in concrete and other materials such as masonry and drywall.

Mercury: Mercury vapour is present in lamp tubes.

Polychlorinated Biphenyls (PCBs): Based on the date of construction the building will not have PCB-containing materials or equipment.

Mould and Water Damage: Visible mould was not observed. Water staining was observed on drywall ceiling finishes present in the Coat Check (Loc. 4) and in multiple locations on acoustic ceiling tiles.



SUMMARY OF RECOMMENDATIONS

The following is a summary of significant recommendations; refer to the body of the report for detailed recommendations.

1. Perform a pre-construction assessment prior to commencing renovations or demolition.
2. Recycle mercury-containing lamp tubes when removed from service.
3. Follow appropriate safe work procedures when handling or disturbing silica.

This Executive Summary is subject to the same standard limitations as contained in the report and must be read in conjunction with the entire report.



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APPENDICES

APPENDIX I	Drawings
APPENDIX II-A	Asbestos Analytical Certificates
APPENDIX II-B	Lead Analytical Certificates
APPENDIX III	Methodology and Evaluation Criteria
APPENDIX IV	Location Summary Report
APPENDIX V	Hazardous Materials Summary Report / Sample Log
APPENDIX VI	HMIS All Data Report
APPENDIX VII	Additional Photographs



1.0 INTRODUCTION AND SCOPE

City of Mississauga (Client) retained Pinchin Ltd. (Pinchin) to conduct a hazardous building materials assessment at River Grove Community Centre located at 5800 River Grove Avenue, Mississauga, Ontario.

Pinchin performed the assessment on May 23, 2023 and May 24, 2023. The assessor was unaccompanied during the assessment. The assessed area was occupied at the time of the assessment.

The objective of the assessment was to document the locations of specified hazardous building materials, evaluate their condition, and develop corrective action plans as required. This assessment is only to be used for the purposes of long-term management and routine maintenance. The results of this assessment are not to be used for construction, renovation, demolition, or project tendering purposes.

The scope of the assessment is not defined for any specific type of renovation at this time, the assessment was performed as a baseline study for the purpose of future renovations, which are unknown at the time of the assessment.

1.1 Scope of Assessment

The **assessed area** consisted of all interior areas of the building; the exterior of the building was not included.

The assessment was performed to establish the type of specified hazardous building materials, locations and approximate quantities incorporated in the structure and its finishes.

For the purpose of the assessment and this report, hazardous building materials are defined as follows:

- Asbestos
- Lead
- Silica
- Mercury
- Polychlorinated Biphenyls (PCBs)
- Mould

The following Designated Substances are not typically found in building materials in a composition/state that is hazardous and were not included in this assessment:

- Arsenic
- Acrylonitrile
- Benzene



- Coke oven emissions
- Ethylene oxide
- Isocyanates
- Vinyl chloride monomer

2.0 METHODOLOGY

Pinchin conducted a room-by-room assessment (rooms, corridors, service areas, exterior, etc.) to identify the hazardous building materials as defined in the scope.

The assessment was limited to non-intrusive testing. Concealed spaces such as those above solid ceilings and within shafts and pipe chases were accessed via existing access panels only. Destructive testing of flooring was not conducted (under carpets or multiple layers of flooring). Demolition of walls, solid ceilings, structural items, interior finishes, or exterior building finishes, to determine the presence of concealed materials was not conducted. Sampling of roofing materials was not conducted.

For further details on the methodology including test methods and evaluation criteria, refer to Appendix III.

3.0 BACKGROUND INFORMATION

3.1 Building Description

Description Item	Details
Use	Community Centre
Number of Floors	The building is 2 storeys plus 1 level below grade.
Total Area	The total area of the building is 69,190 square feet.
Year of Construction	The building was constructed in 1996.
Structure	Concrete, Metal, Wood
Exterior Cladding	Not assessed
HVAC	Forced air
Roof	Not assessed
Flooring	Carpet, Ceramic tiles, Concrete, Laminate, Non-Slip flooring, Vinyl floor tiles
Interior Walls	Ceramic tiles, Concrete, Drywall, Masonry
Ceilings	Acoustic ceiling tiles, Ceramic tiles, Drywall

4.0 FINDINGS

The following section summarizes the findings of the assessment and provides a general description of the hazardous building materials identified. For details on approximate quantities, condition, friability, accessibility, and locations of hazardous building materials; refer to the Hazardous Material Summary / Sample Log and All Data Report in Appendices V and VI.

Any quantities listed in this report or data tables are estimated based on visual approximations only and are subject to variation.

4.1 Asbestos

4.1.1 Spray-Applied Insulation

Spray-applied fireproofing and overspray present on the structure throughout the assessed area does not contain asbestos based on the date of building construction.



Photo 1: View of non-asbestos sprayed fireproofing present in the Men's Washroom (Loc. 10).



Photo 2: View of non-asbestos sprayed fireproofing present in the Men's Pool Change Room (Loc. 18).

4.1.2 Pipe Insulation

Pipes in the assessed area are either uninsulated or insulated with non-asbestos fibreglass.



Photo 3: View of non-asbestos fibreglass insulated piping present in the Men's Pool Change Room (Loc. 18).



Photo 4: View of uninsulated piping present in the Storage (Loc.43).

4.1.3 Duct Insulation and Mastic

Ducts are either uninsulated or insulated with non-asbestos fibreglass (foil-faced).

Grey duct mastic present at seams / joints on the exterior of ducts throughout the assessed area does not contain asbestos (samples S0009A-C).

Dark Red duct mastic present at seams / joints on the exterior of ducts present in multiple locations of the assessed area does not contain asbestos (samples S0010A-C).



Photo 5: View of non-asbestos grey coloured duct mastic on uninsulated duct present in the Janitor (Loc. 52).



Photo 6: View of non-asbestos dark red coloured duct mastic on uninsulated duct present in the Filtration Room (Loc.44).



Photo 7: View of non-asbestos fibreglass in insulated duct present in the Lobby (Loc. 3).

4.1.4 Mechanical Equipment Insulation

Mechanical equipment (e.g., air handling unit, generator unit, fan unit, unit heater, filters, pumps, boilers, tanks) is either uninsulated or insulated with non-asbestos fibreglass.

Mechanical equipment (fume hood) is insulated with drywall.



Photo 8: View of drywall (no compound) insulated fume hood present in the Kiln and Storage Room (Loc. 32).



Photo 9: View of uninsulated unit heater present in the Youth Storage (Loc. 35).



Photo 10: View of fibreglass insulated tank present in the Mechanical Room 2 (Loc. 55).

4.1.5 Acoustic Ceiling Tiles

Ceiling tiles are presumed to be non-asbestos based on the age of the materials determined from the age of the building construction. The tiles were manufactured after asbestos stopped being used in acoustic ceiling tiles.



Photo 11: View of non-asbestos acoustic ceiling tiles (48"x24" grey textured) present in the Corridor 11 (Loc. 11).



Photo 12: View of non-asbestos acoustic ceiling tiles (48"x24" small fissure and pinholes) present in the Men's Pool Change Room (Loc. 18).

4.1.6 Drywall Joint Compound

Asbestos in drywall joint compound was banned in Canada in 1980. Drywall joint compound in the assessed area was installed on or after 1996 and is presumed to contain no asbestos.



Photo 13: View of non-asbestos drywall joint compound on drywall ceiling finish present in the Men's Washroom (Loc. 10).



Photo 14: View of non-asbestos drywall joint compound on drywall wall finish present in the Coat Check (Loc. 4).

4.1.7 Vinyl Floor Tiles, Baseboard, and Stair Flooring

The following is a summary of baseboard mastics sampled, for a complete list of locations, refer to Appendix V

Description	Sample Location (Location #)	Sample Number	Asbestos (Tile / Adhesive)	Photo
4" black rubber baseboard	Kaneff Auditorium (Loc. 6)	S0007A-C	No / No	
4" white rubber baseboard	Staff Offices	S0011A-C	No/No	

Vinyl floor tiles were presumed to be non-asbestos based on historical knowledge of the date of installation (1996).

4.1.8 Firestopping

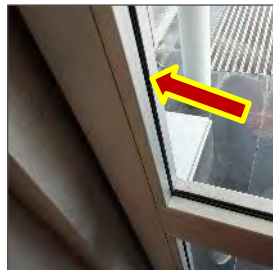
Firestopping (dark red, caulking) present at pipe and conduit penetrations in Mechanical Room 1 does not contain asbestos (samples S0012A-C).



Photo 15: View of non-asbestos firestop (dark red, caulking) present in the Mechanical Room 1 (Loc. 57).

4.1.9 Caulking

The following is a summary of sealants, caulking, and putties sampled, for a complete list of locations, refer to Appendix V.

Material, Description and Application	Sample Location (Location #)	Sample Number	Asbestos	Photo
Caulking, grey on windows frames	Entrance Corridor (Loc. 2)	S0001A-C	No	
Caulking, black on windows and door frames	Entrance Corridor (Loc. 2)	S0002A-C	No	
Caulking, light beige on windows frames and walls	Entrance Corridor (Loc. 2)	S0003A-C	No	

Material, Description and Application	Sample Location (Location #)	Sample Number	Asbestos	Photo
Caulking, black on windows frames	Lobby (Loc. 3)	S0004A-C	No	
Caulking, grey on windows frames	Kaneff Auditorium (Loc. 6)	S0005A-C	No	
Caulking, light red on door frames	Kaneff Auditorium (Loc. 6)	S0006A-C	No	
Expansion joint, caulking, off white on walls	Gym Storage (Loc. 8)	S0008A-C	No	
Expansion joint, caulking, beige on walls	Pool (Loc. 62)	S0013A-C	No	

4.1.10 Excluded Materials

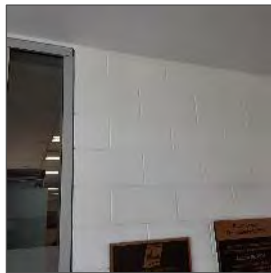
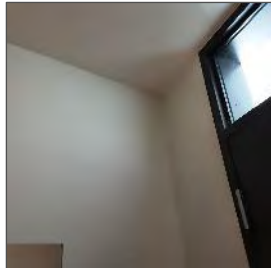
The following is a list of materials which may contain asbestos and was excluded from the assessment. These materials are presumed to contain asbestos until otherwise proven by sampling and analysis :

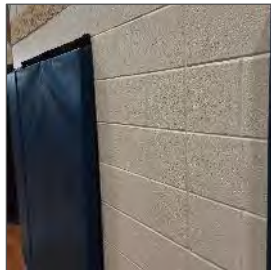
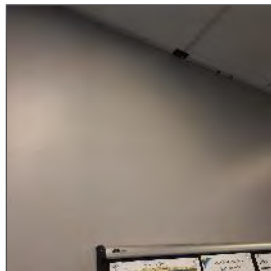
- Roofing felts and tar, mastics
- Floor levelling compound
- Ceramic tile setting compound
- Elevator and lift brakes
- Electrical components
- Mechanical packing, ropes, and gaskets
- Vermiculite
- Adhesives
- Ropes and gaskets in cast-iron bell and spigot joints
- Sealants on pipe threads

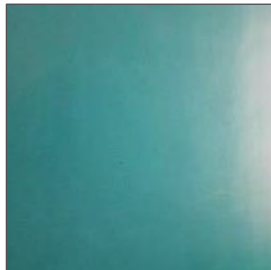
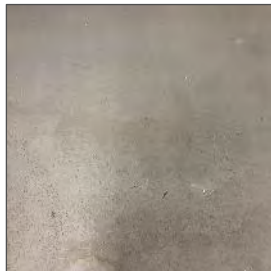
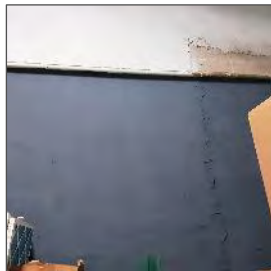
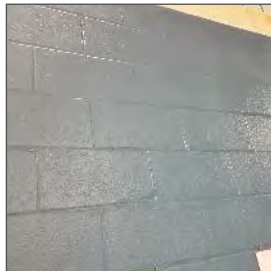
4.2 Lead

4.2.1 Paints and Surface Coatings

The following table summarizes the analytical results of paints sampled.

Sample Number	Colour, Substrate Description	Sample Location	Lead (%)	Photo
L0001	White on masonry walls	Entrance Corridor (Loc. 2)	<0.00031	
L0002	White on drywall	Coat Check (Loc. 4)	0.00059	

Sample Number	Colour, Substrate Description	Sample Location	Lead (%)	Photo
L0003	Off white on masonry walls	Kaneff Auditorium (Loc. 6)	0.00034	
L0004	Sky blue on metal duct	Gym Storage (Loc. 8)	0.00040	
L0005	Grey on drywall	Staff Offices (Loc. 22)	0.00027	
L0006	White on concrete walls	Staircase No. 3 (Loc. 46)	<0.00010	
L0007	Black on drywall	Fitness Studio (Loc. 51)	<0.00019	

Sample Number	Colour, Substrate Description	Sample Location	Lead (%)	Photo
L0008	Teal on drywall	Fitness Centre (Loc. 50)	<0.00024	
L0009	Light grey on concrete floor	Mechanical Room 2 (Loc. 55)	0.0017	
L0010	Dark blue on concrete walls	Mechanical Room 1 (Loc. 57)	0.00065	
L0011	Blue on concrete walls	Pool (Loc. 62)	<0.00010	

All paints sampled were below the threshold of 0.009% (90 mg/kg). Paint containing less than 0.009% (90 mg/kg) lead is assumed to be insignificant.

Other presumed lead containing paint is present in the assessed area but was not sampled as significantly less in quantity.

4.2.2 Lead Products and Applications

Lead products were not found during the assessment.

4.2.3 *Excluded Lead Materials*

Lead is known to be present in several materials which were not assessed or sampled. The following materials, where found, should be presumed to contain lead.

- Electrical components, including wiring connectors, grounding conductors, and solder
- Solder on pipe connections
- Glazing on ceramic tiles

4.3 **Silica**

Crystalline silica is assumed to be a component of the following materials where present in the building.

- Concrete
- Masonry and mortar
- Ceramic tiles and grout
- Drywall
- Ceiling tiles

4.4 **Mercury**

4.4.1 *Lamps*

Mercury vapour is present in fluorescent lamp tubes.

4.4.2 *Mercury-Containing Devices*

Thermostats inspected did not contain liquid mercury ampules.



Photo 16: View of non-mercury containing thermostat present in the Mechanical Room 2 (Loc. 55).

4.5 **Polychlorinated Biphenyls**

Based on the date of construction, PCB-containing materials will not be present.

4.6 Mould and Water Damage

Visible mould growth was not found during the assessment. Water staining was observed on ceiling finishes in multiple locations within the building.

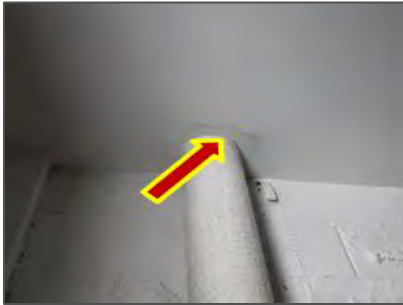


Photo 17: View of water-stained drywall finish on ceiling present in Coat Check (Loc. 4).



Photo 18: View of water-stained acoustic ceiling tiles (48"x24" small fissures and pinholes) present in Men's Pool Change Room (Loc. 17).

5.0 RECOMMENDATIONS

5.1 General

This report does not provide sufficient detail for most renovation or demolition. Perform a detailed intrusive assessment prior to building renovation or demolition operations. The assessment should include; destructive testing (e.g., coring and/or removal of building finishes and components), and sampling of other materials not previously tested (e.g., roofing materials, caulking, mastics).

5.2 On-going Management and Maintenance

The following recommendations are made regarding on-going management and maintenance work involving the hazardous materials identified.

5.2.1 Silica

Disturbance of silica-containing products during maintenance activities may result in excessive exposures to airborne silica, especially if performed indoors and dry. Cutting, grinding, drilling or demolition of materials containing silica should be completed only with proper respiratory protection and other worker safety precautions that comply with applicable regulations and guidelines.

5.2.2 Mercury

Do not break lamps or separate liquid mercury from components. Recycle and reclaim mercury from fluorescent lamps when taken out of service. Mercury is classified as a hazardous waste and must be disposed of in accordance with applicable regulations.



6.0 TERMS AND LIMITATIONS

This work was performed subject to the Terms and Limitations presented or referenced in the proposal for this project.

Information provided by Pinchin is intended for Client use only. Pinchin will not provide results or information to any party unless disclosure by Pinchin is required by law. Any use by a third party of reports or documents authored by Pinchin or any reliance by a third party on or decisions made by a third party based on the findings described in said documents, is the sole responsibility of such third parties. Pinchin accepts no responsibility for damages suffered by any third party as a result of decisions made or actions conducted. No other warranties are implied or expressed.

7.0 REFERENCES

The following legislation and documents were referenced in completing the assessment and this report:

1. Asbestos on Construction Projects and in Buildings and Repair Operations, Ontario Regulation 278/05.
2. Designated Substances, Ontario Regulation 490/09.
3. Lead on Construction Projects, Ministry of Labour Guidance Document.
4. The Environmental Abatement Council of Canada (EACC) Lead Guideline for Construction, Renovation, Maintenance or Repair.
5. Ministry of the Environment Regulation, R.R.O. 1990 Reg. 347 as amended.
6. Ministry of the Environment Regulation, R.R.O. 1990 Reg. 362 as amended.
7. Silica on Construction Projects, Ministry of Labour Guidance Document.
8. Alert – Mould in Workplace Buildings, Ontario Ministry of Labour.
9. Canada Occupational Health and Safety Regulation, SOR/86-304.

\\pinchin.com\Miss\Job\325000s\0325772.000 - CoffMiss,VariousMississaugaSites,DSS,HAZ\Deliverables\RiverGroveComm_May 23,24\325772 HBMA Report, River Grove Mississauga ON, City of Mississauga, July 4 2023.docx

Template: Master Report for Hazardous Materials Assessment Report (Management), HAZ, October 31, 2022

APPENDIX I
Drawings



- NOT ALL KNOWN OR SUSPECTED
HAZARDOUS BUILDING MATERIALS MAY BE
DEPICTED ON THE DRAWING. REFER TO THE
HAZARDOUS BUILDING MATERIALS
ASSESSMENT REPORT FOR A COMPLETE
LIST OF KNOWN AND SUSPECTED
HAZARDOUS BUILDING MATERIALS.

LEGEND IS COLOUR DEPENDENT.
NON-COLOUR COPIES MAY ALTER
INTERPRETATION.

BASE PLAN PROVIDED BY CLIENT.



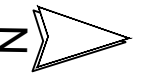
PROJECT NAME:
HAZARDOUS BUILDING
MATERIALS ASSESSMENT

CITY OF MISSISSAUGA

PROJECT LOCATION:
RIVER GROVE COMMUNITY CENTRE
5800 RIVER GROVE AVENUE
MISSISSAUGA, ONTARIO

FIGURE NAME: BASEMENT

PROJECT NUMBER: 325772.000	SCALE: NOT TO SCALE
DRAWN BY: DP	REVIEWED BY: AS
DATE: MAY 2023	FIGURE NUMBER: 1 OF 4



LEGEND

- (X) PINCHIN LOCATION NUMBER
● ASBESTOS BULK SAMPLE
▲ LEAD BULK SAMPLE

NOT ALL KNOWN OR SUSPECTED HAZARDOUS BUILDING MATERIALS MAY BE DEPICTED ON THE DRAWING. REFER TO THE HAZARDOUS BUILDING MATERIALS ASSESSMENT REPORT FOR A COMPLETE LIST OF KNOWN AND SUSPECTED HAZARDOUS BUILDING MATERIALS.

LEGEND IS COLOUR DEPENDENT. NON-COLOUR COPIES MAY ALTER INTERPRETATION.

BASE PLAN PROVIDED BY CLIENT.



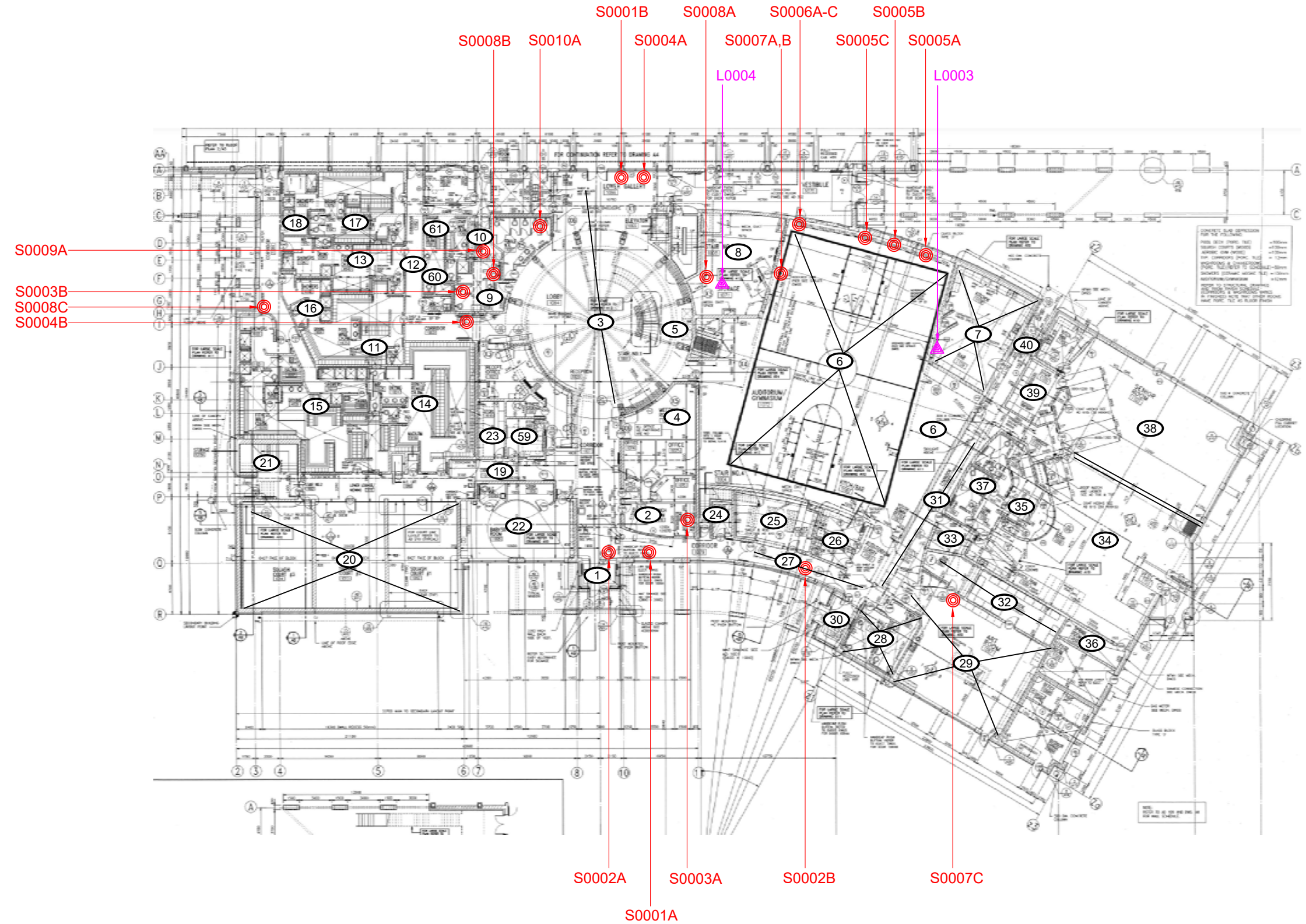
PROJECT NAME:
HAZARDOUS BUILDING MATERIALS ASSESSMENT

CLIENT NAME:
CITY OF MISSISSAUGA

PROJECT LOCATION:
RIVER GROVE COMMUNITY CENTRE
5800 RIVER GROVE AVENUE
MISSISSAUGA, ONTARIO

FIGURE NAME:
GROUND FLOOR

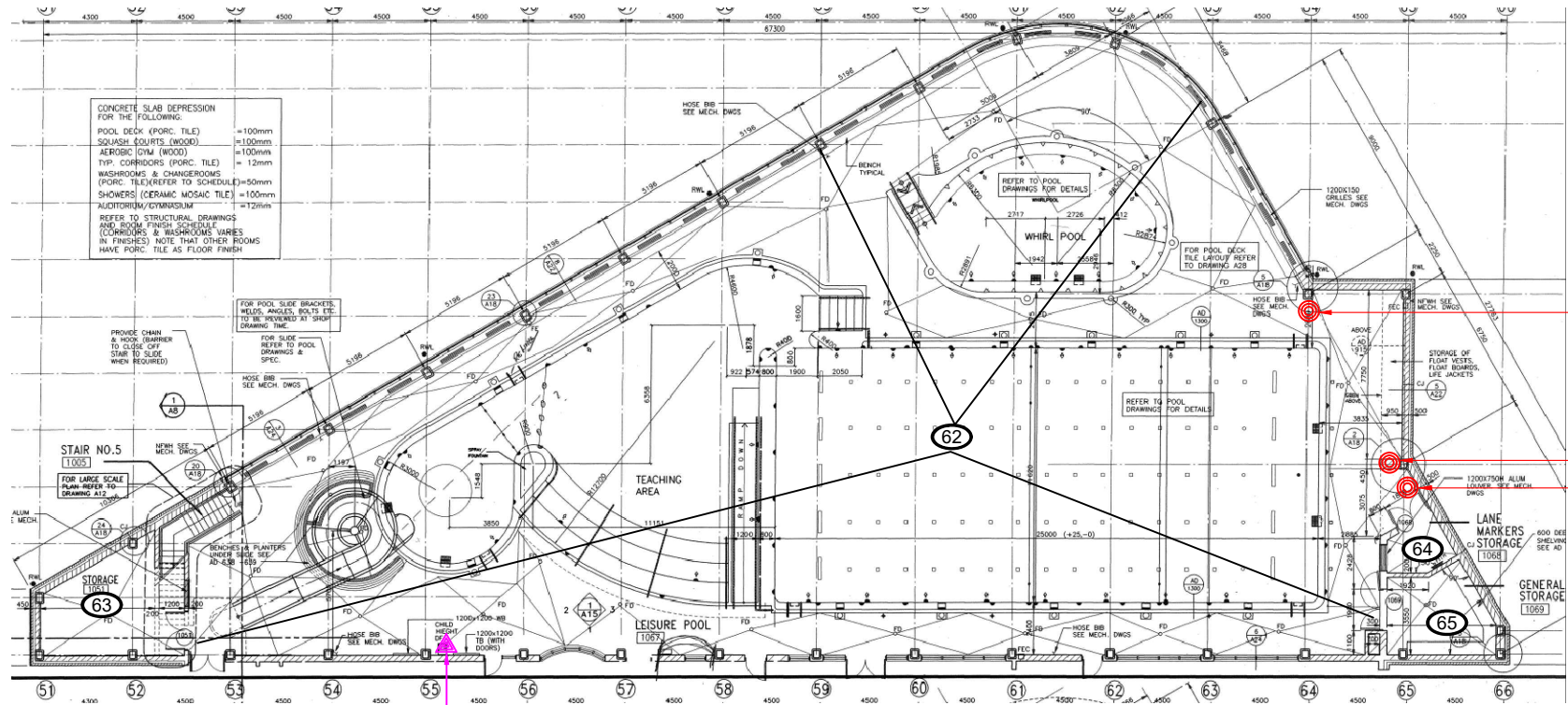
PROJECT NUMBER: 325772.000	SCALE: NOT TO SCALE
DRAWN BY: DP	REVIEWED BY: AS
DATE: MAY 2023	FIGURE NUMBER: 2 OF 4





LEGEND

- (X) PINCHIN LOCATION NUMBER
- ASBESTOS BULK SAMPLE
- LEAD BULK SAMPLE



S0013A

S0013B

S0013C

L0011

NOT ALL KNOWN OR SUSPECTED HAZARDOUS BUILDING MATERIALS MAY BE DEPICTED ON THE DRAWING. REFER TO THE HAZARDOUS BUILDING MATERIALS ASSESSMENT REPORT FOR A COMPLETE LIST OF KNOWN AND SUSPECTED HAZARDOUS BUILDING MATERIALS.

LEGEND IS COLOUR DEPENDENT. NON-COLOUR COPIES MAY ALTER INTERPRETATION.

BASE PLAN PROVIDED BY CLIENT.



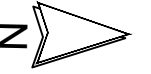
PROJECT NAME:
HAZARDOUS BUILDING MATERIALS ASSESSMENT

CLIENT NAME:
CITY OF MISSISSAUGA

PROJECT LOCATION:
RIVER GROVE COMMUNITY CENTRE
5800 RIVER GROVE AVENUE
MISSISSAUGA, ONTARIO

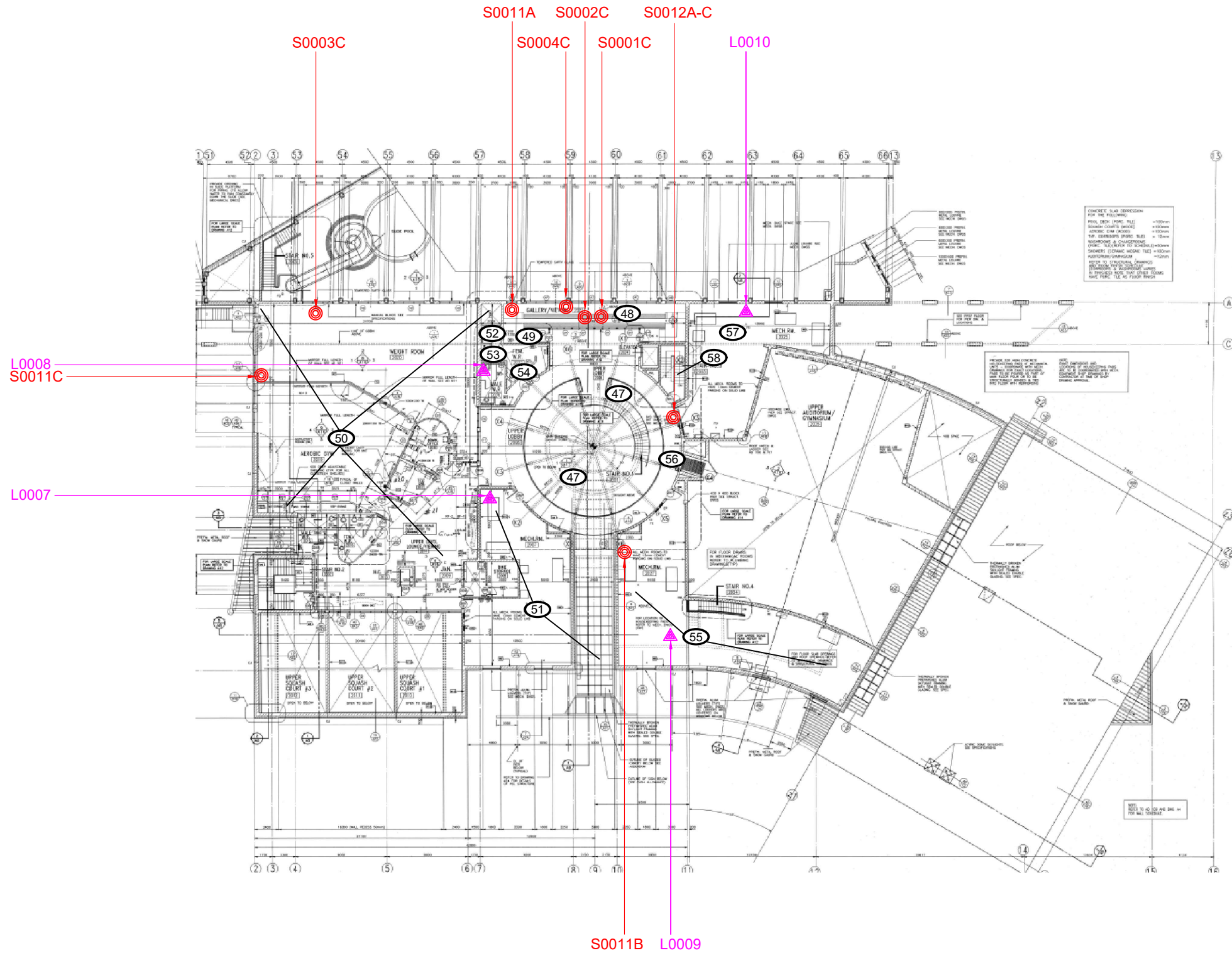
FIGURE NAME:
POOL
GROUND FLOOR

PROJECT NUMBER: 325772.000	SCALE: NOT TO SCALE
DRAWN BY: DP	REVIEWED BY: AS
DATE: MAY 2023	FIGURE NUMBER: 3 OF 4



LEGEND

- (X) PINCHIN LOCATION NUMBER
- ASBESTOS BULK SAMPLE
- LEAD BULK SAMPLE



NOT ALL KNOWN OR SUSPECTED HAZARDOUS BUILDING MATERIALS MAY BE DEPICTED ON THE DRAWING. REFER TO THE HAZARDOUS BUILDING MATERIALS ASSESSMENT REPORT FOR A COMPLETE LIST OF KNOWN AND SUSPECTED HAZARDOUS BUILDING MATERIALS.

LEGEND IS COLOUR DEPENDENT. NON-COLOUR COPIES MAY ALTER INTERPRETATION.

BASE PLAN PROVIDED BY CLIENT.



PROJECT NAME:
HAZARDOUS BUILDING MATERIALS ASSESSMENT

CLIENT NAME:
CITY OF MISSISSAUGA

PROJECT LOCATION:
RIVER GROVE COMMUNITY CENTRE
5800 RIVER GROVE AVENUE
MISSISSAUGA, ONTARIO

FIGURE NAME:
SECOND FLOOR

PROJECT NUMBER: 325772.000	SCALE: NOT TO SCALE
DRAWN BY: DP	REVIEWED BY: AS
DATE: MAY 2023	FIGURE NUMBER: 4 OF 4

APPENDIX II-A
Asbestos Analytical Certificates



Pinchin Ltd. Asbestos Laboratory *Certificate of Analysis*

Project Name: City of Mississauga, 5800 River Grove
Project No.: 0325772.000
Prepared For: A. Sharma / A. Rakic

Lab Reference No.: b292409
Analyst(s): Y. Yan

Date Received:	May 29, 2023	Samples Submitted:	39
Date Analyzed:	June 2, 2023	Phases Analyzed:	41

The Pinchin Ltd. Dartmouth asbestos laboratory is accredited by the National Institute of Standards and Technology, National Voluntary Laboratory Accreditation Program (NVLAP Lab Code 201032-0) for the 'EPA – 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples, ' and the 'EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials'; and meets all requirements of ISO/IEC 17025:2017. The Pinchin asbestos laboratory uses the aforementioned methods of analysis.

Bulk samples are checked visually and scanned under a stereomicroscope. Slides are prepared and observed under a Polarized Light Microscope (PLM) at magnifications of 40X, 100X or 400X as appropriate. Asbestos fibres are identified by a combination of morphology, colour, refractive index, extinction, sign of elongation, birefringence and dispersion staining colours. A visual estimate is made of the percentage of asbestos present. A reported concentration of less than (<) the regulatory threshold indicates the presence of confirmed asbestos in trace quantities, limited to only a few fibres or fibre bundles in an entire sample. This method complies with provincial regulatory requirements where applicable. Multiple phases within a sample are analyzed and reported separately.

All bulk samples submitted to this laboratory for asbestos analysis are retained for a minimum of three months. Samples may be retrieved, upon request, for re-examination at any time during that period.

This report relates only to the items tested.

This report relates only to the items tested and is valid only when signed with a protected, authorized, electronic signature. This report may not be reproduced, except in full, without the written approval of Pinchin Ltd. The client may not use this report to claim product endorsement by NVLAP or any agency of the U.S. Government. Internal verification studies, quality assurance / control data and laboratory documentation on measurement uncertainty are available upon request.



Pinchin Ltd. Asbestos Laboratory Certificate of Analysis

Project Name: City of Mississauga, 5800 River Grove
Project No.: 0325772.000
Prepared For: A. Sharma / A. Rakic

Lab Reference No.: b292409
Date Analyzed: June 2, 2023

BULK SAMPLE ANALYSIS

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)	
		ASBESTOS	OTHER
S0001A Wall, Window, Caulking, Grey, Loc:2, Entrance Corridor	Homogeneous, light grey, caulking material.	None Detected	Non-Fibrous Material > 75%
S0001B Wall, Window, Caulking, Grey, Loc:27, Corridor 3	Homogeneous, light grey, caulking material.	None Detected	Non-Fibrous Material > 75%
Comments:	Foam material is present on the surface of this sample.		
S0001C Wall, Window, Caulking, Grey, Loc:48, Program Room	Homogeneous, light grey, caulking material.	None Detected	Non-Fibrous Material > 75%
S0002A Door, Caulking, Black, Loc:2, Entrance Corridor	Homogeneous, black, caulking material.	None Detected	Non-Fibrous Material > 75%
Comments:	Foam material is present on the surface of this sample.		
S0002B Window, Caulking, Black, Loc:27, Corridor 3	Homogeneous, black, caulking material.	None Detected	Non-Fibrous Material > 75%
S0002C Door, Caulking, Black, Loc:48, Program Room	Homogeneous, black, caulking material.	None Detected	Non-Fibrous Material > 75%
S0003A Wall, Expansion Joint, Caulking, Light Beige, Loc:2, Entrance Corridor	Homogeneous, taupe, caulking material.	None Detected	Non-Fibrous Material > 75%
S0003B Wall, Expansion Joint, Caulking, Light Beige, Loc:13, Family Change Room	Homogeneous, beige, caulking material.	None Detected	Non-Fibrous Material > 75%



Pinchin Ltd. Asbestos Laboratory Certificate of Analysis

Project Name: City of Mississauga, 5800 River Grove
Project No.: 0325772.000
Prepared For: A. Sharma / A. Rakic

Lab Reference No.: b292409
Date Analyzed: June 2, 2023

BULK SAMPLE ANALYSIS

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)	
		ASBESTOS	OTHER
S0003C Wall, Window, Caulking, Loc:50, Fitness Center	2 Phases:		
	a) Homogeneous, taupe, caulking material.	None Detected	Non-Fibrous Material > 75%
	b) Homogeneous, white, caulking material.	None Detected	Non-Fibrous Material > 75%
S0004A Window, Caulking, Black, Loc:3, Lobby	Homogeneous, black, soft, sticky, caulking material.	None Detected	Non-Fibrous Material > 75%
S0004B Window, Caulking, Black, Loc:13, Family Change Room	Homogeneous, black, soft, sticky, caulking material.	None Detected	Non-Fibrous Material > 75%
S0004C Window, Caulking, Black, Loc:48, Program Room	Homogeneous, black, soft, sticky, caulking material.	None Detected	Non-Fibrous Material > 75%
S0005A Wall, Window, Caulking, Light Grey, Loc:6, Kaneff Auditorium	Homogeneous, light grey, caulking material.	None Detected	Non-Fibrous Material > 75%
S0005B Wall, Window, Caulking, Light Grey, Loc:6, Kaneff Auditorium	Homogeneous, light grey, caulking material.	None Detected	Non-Fibrous Material > 75%
S0005C Wall, Window, Caulking, Light Grey, Loc:6, Kaneff Auditorium	Homogeneous, light grey, caulking material.	None Detected	Non-Fibrous Material > 75%
S0006A Wall, Door, Caulking, Light Red, Loc:6, Kaneff Auditorium	Homogeneous, peach, caulking material.	None Detected	Non-Fibrous Material > 75%



Pinchin Ltd. Asbestos Laboratory Certificate of Analysis

Project Name: City of Mississauga, 5800 River Grove
Project No.: 0325772.000
Prepared For: A. Sharma / A. Rakic

Lab Reference No.: b292409
Date Analyzed: June 2, 2023

BULK SAMPLE ANALYSIS

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)	
		ASBESTOS	OTHER
S0006B Wall, Door, Caulking, Light Red, Loc:6, Kaneff Auditorium	Homogeneous, peach, caulking material.	None Detected	Non-Fibrous Material > 75%
S0006C Wall, Door, Caulking, Light Red, Loc:6, Kaneff Auditorium	Homogeneous, peach, caulking material.	None Detected	Non-Fibrous Material > 75%
S0007A Wall, Base, Mastic, Yellow, Loc:6, Kaneff Auditorium	Homogeneous, yellow, hard, adhesive material.	None Detected	Non-Fibrous Material > 75%
S0007B Wall, Base, Mastic, Yellow, Loc:6, Kaneff Auditorium	Homogeneous, yellow, hard, adhesive material.	None Detected	Non-Fibrous Material > 75%
S0007C Wall, Base, Mastic, Yellow, Loc:29, Burt Arts Studio	Homogeneous, yellow, adhesive material.	None Detected	Non-Fibrous Material > 75%
S0008A Wall, Expansion Joint, Caulking, Off White, Loc:8, Gym Storage	Homogeneous, off-white, caulking material.	None Detected	Non-Fibrous Material > 75%
S0008B Wall, Expansion Joint, Caulking, Off White, Loc:13, Family Change Room	Homogeneous, off-white, caulking material.	None Detected	Non-Fibrous Material > 75%
S0008C Wall, Expansion Joint, Caulking, Off White, Loc:18, Men's Pool Change Room	Homogeneous, off-white, caulking material.	None Detected	Non-Fibrous Material > 75%



Pinchin Ltd. Asbestos Laboratory Certificate of Analysis

Project Name: City of Mississauga, 5800 River Grove
Project No.: 0325772.000
Prepared For: A. Sharma / A. Rakic

Lab Reference No.: b292409
Date Analyzed: June 2, 2023

BULK SAMPLE ANALYSIS

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)	
		ASBESTOS	OTHER
S0009A Duct, Mastic, Grey, Loc:10, Men's Washroom	Homogeneous, dark grey, mastic material.	None Detected	Non-Fibrous Material > 75%
S0009B Duct, Mastic, Grey, Loc:27, Corridor 3	Homogeneous, dark grey, mastic material.	None Detected	Non-Fibrous Material > 75%
S0009C Duct, Mastic, Grey, Loc:52, Janitor	Homogeneous, dark grey, mastic material.	None Detected	Non-Fibrous Material > 75%
S0010A Duct, Mastic, Dark Red, Loc:38, Seniors Room	Homogeneous, dark red, mastic material.	None Detected	Wollastonite 5-10% Non-Fibrous Material > 75%
S0010B Duct, Mastic, Dark Red, Loc:44, Filtration Room	Homogeneous, dark red, mastic material.	None Detected	Wollastonite 5-10% Non-Fibrous Material > 75%
S0010C Duct, Mastic, Dark Red, Loc:45, Tunnel	Homogeneous, red, mastic material.	None Detected	Wollastonite 5-10% Non-Fibrous Material > 75%
S0011A Wall, Base, Mastic, Light Yellow, Loc:48, Program Room	Homogeneous, pale yellow, adhesive material.	None Detected	Non-Fibrous Material > 75%
Comments:	Another phase is present but there was insufficient material submitted to analyze.		
S0011B Wall, Base, Mastic, Light Yellow, Loc:51, Fitness Studio	Homogeneous, pale yellow, mastic material.	None Detected	Non-Fibrous Material > 75%
Comments:	Another phase is present but there was insufficient material submitted to analyze.		



Pinchin Ltd. Asbestos Laboratory Certificate of Analysis

Project Name: City of Mississauga, 5800 River Grove
Project No.: 0325772.000
Prepared For: A. Sharma / A. Rakic

Lab Reference No.: b292409
Date Analyzed: June 2, 2023

BULK SAMPLE ANALYSIS

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)	
		ASBESTOS	OTHER
S0011C Wall, Base, Mastic, Light Yellow, Loc:50, Fitness Center	2 Phases: a) Homogeneous, white, soft, cementitious material. b) Homogeneous, pale yellow, adhesive material.	None Detected	Non-Fibrous Material > 75%
S0012A Piping, Fire Stop, Caulking, Dark Red, Loc:57, Mechanical Room 1	Homogeneous, dark red, caulking material.	None Detected	Non-Fibrous Material > 75%
Comments:	Man-made vitreous fibres are present on the surface of this sample.		
S0012B Piping, Fire Stop, Caulking, Dark Red, Loc:57, Mechanical Room 1	Homogeneous, dark red, caulking material.	None Detected	Non-Fibrous Material > 75%
Comments:	Man-made vitreous fibres are present on the surface of this sample.		
S0012C Piping, Fire Stop, Caulking, Dark Red, Loc:57, Mechanical Room 1	Homogeneous, dark red, caulking material.	None Detected	Non-Fibrous Material > 75%
Comments:	Man-made vitreous fibres are present on the surface of this sample.		
S0013A Wall, Expansion Joint, Caulking, Beige, Loc:62, Pool	Homogeneous, yellow, caulking material.	None Detected	Non-Fibrous Material > 75%
S0013B Wall, Expansion Joint, Caulking, Beige, Loc:62, Pool	Homogeneous, yellow, caulking material.	None Detected	Non-Fibrous Material > 75%



Pinchin Ltd. Asbestos Laboratory
Certificate of Analysis

Project Name: City of Mississauga, 5800 River Grove
Project No.: 0325772.000
Prepared For: A. Sharma / A. Rakic

Lab Reference No.: b292409
Date Analyzed: June 2, 2023

BULK SAMPLE ANALYSIS

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)	
		ASBESTOS	OTHER
S0013C Wall, Expansion Joint, Caulking, Beige, Loc:62, Pool	Homogeneous, yellow, caulking material.	None Detected	Non-Fibrous Material > 75%

Reviewed by:

Jason Stapleton
2023.06.02 15:52:10-03'00'

Reporting Analyst:

Yewen Yan
2023.06.02 15:21:37-03'00'

Pinchin Ltd. - Asbestos Laboratory
Internal Asbestos Bulk Sample Chain of Custody

Client Name:	City of Mississauga	Project Address:	5800 River Grove	
Portfolio/Building No:		Pinchin File:	325772	
Submitted by:	Aman Sharma	Email:	asharma@pinchin.com	
CC Results to:	Anthony Rakic	CC Email:	arakic@Pinchin.com	
Date Submitted:	May 26 2023	Required by:	Month	Day
# of Samples:	39	Priority:	5 Day Turnaround	
Year of Building Construction (Mandatory, Years ONLY):		1996		
Do NOT Stop on Positive (Sample Numbers):				
Pinchin Group Company (Mandatory Field):		Pinchin		
HMIS2 Building Reference #:		120490/202342355400346		
To be Completed by Lab Personnel Only:				
Lab Reference #:	MAY 29 2023 DST 14:00 V. 1.0	Time:	24 hour clock	
Received by:		Date:	Month	Day
Name(s) of Analyst(s):				
Sample Prefix	Sample No.	Sample Suffix	Sample Description/Location (Mandatory)	
S	0001	A	Wall, Window, Caulking, Grey, Loc: 2, Entrance Corridor ND	
S	0001	B	Wall, Window, Caulking, Grey, Loc: 27, Corridor 3 ND	
S	0001	C	Wall, Window, Caulking, Grey, Loc: 48, Program Room ND	
S	0002	A	Door, Caulking, Black, Loc: 2, Entrance Corridor ND	
S	0002	B	Window, Caulking, Black, Loc: 27, Corridor 3 ND	
S	0002	C	Door, Caulking, Black, Loc: 48, Program Room ND	
S	0003	A	Wall, Expansion Joint, Caulking, Light Beige, Loc: 2, Entrance Corridor ND	

Sample Prefix	Sample No.	Sample Suffix	Sample Description/Location (Mandatory)
S	0003	B	Wall, Expansion Joint, Caulking, Light Beige, Loc:13, Family Change Room ND
S	0003	C	Wall, Window, Caulking, Loc:50, Fitness Center a) ND b) ND
S	0004	A	Window, Caulking, Black, Loc:3, Lobby ND
S	0004	B	Window, Caulking, Black, Loc:13, Family Change Room ND
S	0004	C	Window, Caulking, Black, Loc:48, Program Room ND
S	0005	A	Wall, Window, Caulking, Light Grey, Loc:6, Kaneff Auditorium ND
S	0005	B	Wall, Window, Caulking, Light Grey, Loc:6, Kaneff Auditorium ND
S	0005	C	Wall, Window, Caulking, Light Grey, Loc:6, Kaneff Auditorium ND
S	0006	A	Wall, Door, Caulking, Light Red, Loc:6, Kaneff Auditorium ND
S	0006	B	Wall, Door, Caulking, Light Red, Loc:6, Kaneff Auditorium ND
S	0006	C	Wall, Door, Caulking, Light Red, Loc:6, Kaneff Auditorium ND
S	0007	A	Wall, Base, Mastic, Yellow, Loc:6, Kaneff Auditorium ND
S	0007	B	Wall, Base, Mastic, Yellow, Loc:6, Kaneff Auditorium ND
S	0007	C	Wall, Base, Mastic, Yellow, Loc:29, Burt Arts Studio ND
S	0008	A	Wall, Expansion Joint, Caulking, Off White, Loc:8, Gym Storage ND

Sample Prefix	Sample No.	Sample Suffix	Sample Description/Location (Mandatory)
S	0008	B	Wall, Expansion Joint, Caulking, Off White, Loc:13, Family Change Room ND
S	0008	C	Wall, Expansion Joint, Caulking, Off White, Loc:18, Men's Pool Change Room ND
S	0009	A	Duct, Mastic, Grey, Loc:10, Men's Washroom ND
S	0009	B	Duct, Mastic, Grey, Loc:27, Corridor 3 ND
S	0009	C	Duct, Mastic, Grey, Loc:52, Janitor ND
S	0010	A	Duct, Mastic, Dark Red, Loc:38, Seniors Room ND
S	0010	B	Duct, Mastic, Dark Red, Loc:44, Filtration Room ND
S	0010	C	Duct, Mastic, Dark Red, Loc:45, Tunnel ND
S	0011	A	Wall, Base, Mastic, Light Yellow, Loc:48, Program Room ND
S	0011	B	Wall, Base, Mastic, Light Yellow, Loc:51, Fitness Studio ND
S	0011	C	Wall, Base, Mastic, Light Yellow, Loc:50, Fitness Center a) ND b) ND
S	0012	A	Piping, Fire Stop, Caulking, Dark Red, Loc:57, Mechanical Room 1 ND
S	0012	B	Piping, Fire Stop, Caulking, Dark Red, Loc:57, Mechanical Room 1 ND
S	0012	C	Piping, Fire Stop, Caulking, Dark Red, Loc:57, Mechanical Room 1 ND
S	0013	A	Wall, Expansion Joint, Caulking, Beige, Loc:62, Pool ND

Sample Prefix	Sample No.	Sample Suffix	Sample Description/Location (Mandatory)
S	0013	B	Wall, Expansion Joint, Caulking, Beige, Loc:62, Pool ND
S	0013	C	Wall, Expansion Joint, Caulking, Beige, Loc:62, Pool ND

2

APPENDIX II-B
Lead Analytical Certificates



Your Project #: 325772
Site Location: RIVER GROVE
Your C.O.C. #: N/A

Attention: Anthony Rakic

Pinchin Ltd
2360 Meadowpine Blvd
Unit # 2
Mississauga, ON
CANADA L5N 6S2

Report Date: 2023/06/06

Report #: R7658960

Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C3F3822

Received: 2023/05/30, 09:24

Sample Matrix: Solid
Samples Received: 11

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Metals in Paint	1	2023/06/01	2023/06/01	CAM SOP-00408	EPA 6010D m
Metals in Paint	9	2023/06/02	2023/06/02	CAM SOP-00408	EPA 6010D m
Metals in Paint	1	2023/06/02	2023/06/05	CAM SOP-00408	EPA 6010D m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCCFP, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.



Your Project #: 325772
Site Location: RIVER GROVE
Your C.O.C. #: N/A

Attention: Anthony Rakic

Pinchin Ltd
2360 Meadowpine Blvd
Unit # 2
Mississauga, ON
CANADA L5N 6S2

Report Date: 2023/06/06
Report #: R7658960
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB#: C3F3822

Received: 2023/05/30, 09:24

Encryption Key

Nilushi Mahathantila
Project Manager
06 Jun 2023 08:49:12

Please direct all questions regarding this Certificate of Analysis to:

Nilushi Mahathantila, Project Manager

Email: Nilushi.Mahathantila@bureauveritas.com

Phone# (905) 817-5700

=====

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Bureau Veritas Job #: C3F3822
Report Date: 2023/06/06

Pinchin Ltd
Client Project #: 325772
Site Location: RIVER GROVE
Sampler Initials: AS

ELEMENTS BY ATOMIC SPECTROSCOPY (SOLID)

Bureau Veritas ID		VYH405			VYH406			
Sampling Date								
COC Number		N/A			N/A			
	UNITS	L0001, WHITE, LOC:2, ENTRANCE CORRIDOR	RDL	MDL	L0002, WHITE, LOC:4, COAT CHECK	RDL	MDL	QC Batch

Metals								
Lead (Pb)	%	<0.00031	0.00031	0.000093	0.00059	0.00013	0.000039	8699747
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								

Bureau Veritas ID		VYH407				VYH408			
Sampling Date									
COC Number		N/A				N/A			
	UNITS	L0003, OFF WHITE, LOC:6, KANEFF AUDITORIUM	RDL	MDL	QC Batch	L0004, SKY BLUE, LOC:8, GYM STORAGE	RDL	MDL	QC Batch

Metals									
Lead (Pb)	%	0.00034	0.00015	0.000045	8699747	0.00040	0.00010	0.000030	8696744
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									

Bureau Veritas ID		VYH409			VYH410			
Sampling Date								
COC Number		N/A			N/A			
	UNITS	L0005, GREY, LOC:22, STAFF OFFICES	RDL	MDL	L0006, WHITE, LOC:46, STAIRCASE NO.3	RDL	MDL	QC Batch

Metals								
Lead (Pb)	%	0.00027	0.00022	0.000066	<0.00010	0.00010	0.000030	8699747
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								



Bureau Veritas Job #: C3F3822
Report Date: 2023/06/06

Pinchin Ltd
Client Project #: 325772
Site Location: RIVER GROVE
Sampler Initials: AS

ELEMENTS BY ATOMIC SPECTROSCOPY (SOLID)

Bureau Veritas ID		VYH411			VYH412			
Sampling Date								
COC Number		N/A			N/A			
	UNITS	L0007, BLACK, LOC:51, FITNESS STUDIO	RDL	MDL	L0008, TEAL,LOC:50,FITNESS CENTER	RDL	MDL	QC Batch

Metals								
Lead (Pb)	%	<0.00019	0.00019	0.000057	<0.00024	0.00024	0.000072	8699747
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								

Bureau Veritas ID		VYH413			VYH414			
Sampling Date								
COC Number		N/A			N/A			
	UNITS	L0009, LIGHT GREY,LOC:55,MECHANICAL ROOM 2	RDL	MDL	L0010, DARK BLUE,LOC:57, MECHANICAL ROOM 1	RDL	MDL	QC Batch

Metals								
Lead (Pb)	%	0.0017	0.00031	0.000093	0.00065	0.00010	0.000030	8699747
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								

Bureau Veritas ID		VYH415			
Sampling Date					
COC Number		N/A			
	UNITS	L0011, BLUE,LOC:62, POOL	RDL	MDL	QC Batch

Metals					
Lead (Pb)	%	<0.00010	0.00010	0.000030	8699747
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					



Bureau Veritas Job #: C3F3822
Report Date: 2023/06/06

Pinchin Ltd
Client Project #: 325772
Site Location: RIVER GROVE
Sampler Initials: AS

TEST SUMMARY

Bureau Veritas ID: VYH405
Sample ID: L0001, WHITE, LOC:2, ENTRANCE CORRIDOR
Matrix: Solid

Collected:
Shipped:
Received: 2023/05/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Paint	ICP	8699747	2023/06/02	2023/06/05	Japneet Gill

Bureau Veritas ID: VYH406
Sample ID: L0002, WHITE, LOC:4, COAT CHECK
Matrix: Solid

Collected:
Shipped:
Received: 2023/05/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Paint	ICP	8699747	2023/06/02	2023/06/02	Japneet Gill

Bureau Veritas ID: VYH407
Sample ID: L0003, OFF WHITE, LOC:6, KANE FF AUDITORIUM
Matrix: Solid

Collected:
Shipped:
Received: 2023/05/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Paint	ICP	8699747	2023/06/02	2023/06/02	Japneet Gill

Bureau Veritas ID: VYH408
Sample ID: L0004, SKY BLUE, LOC:8, GYM STORAGE
Matrix: Solid

Collected:
Shipped:
Received: 2023/05/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Paint	ICP	8696744	2023/06/01	2023/06/01	Japneet Gill

Bureau Veritas ID: VYH409
Sample ID: L0005, GREY, LOC:22, STAFF OFFICES
Matrix: Solid

Collected:
Shipped:
Received: 2023/05/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Paint	ICP	8699747	2023/06/02	2023/06/02	Japneet Gill

Bureau Veritas ID: VYH410
Sample ID: L0006, WHITE, LOC:46, STAIRCASE NO.3
Matrix: Solid

Collected:
Shipped:
Received: 2023/05/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Paint	ICP	8699747	2023/06/02	2023/06/02	Japneet Gill

Bureau Veritas ID: VYH411
Sample ID: L0007, BLACK, LOC:51, FITNESS STUDIO
Matrix: Solid

Collected:
Shipped:
Received: 2023/05/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Paint	ICP	8699747	2023/06/02	2023/06/02	Japneet Gill



Bureau Veritas Job #: C3F3822
Report Date: 2023/06/06

Pinchin Ltd
Client Project #: 325772
Site Location: RIVER GROVE
Sampler Initials: AS

TEST SUMMARY

Bureau Veritas ID: VYH412
Sample ID: L0008, TEAL, LOC:50, FITNESS CENTER
Matrix: Solid

Collected:
Shipped:
Received: 2023/05/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Paint	ICP	8699747	2023/06/02	2023/06/02	Japneet Gill

Bureau Veritas ID: VYH413
Sample ID: L0009, LIGHT GREY, LOC:55, MECHANICAL ROOM 2
Matrix: Solid

Collected:
Shipped:
Received: 2023/05/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Paint	ICP	8699747	2023/06/02	2023/06/02	Japneet Gill

Bureau Veritas ID: VYH414
Sample ID: L0010, DARK BLUE, LOC:57, MECHANICAL ROOM 1
Matrix: Solid

Collected:
Shipped:
Received: 2023/05/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Paint	ICP	8699747	2023/06/02	2023/06/02	Japneet Gill

Bureau Veritas ID: VYH415
Sample ID: L0011, BLUE, LOC:62, POOL
Matrix: Solid

Collected:
Shipped:
Received: 2023/05/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Paint	ICP	8699747	2023/06/02	2023/06/02	Japneet Gill



Bureau Veritas Job #: C3F3822
Report Date: 2023/06/06

Pinchin Ltd
Client Project #: 325772
Site Location: RIVER GROVE
Sampler Initials: AS

GENERAL COMMENTS

Metals Analysis: Due to limited amount of sample available for analysis, a smaller than usual portion of the sample was used. Detection limits were adjusted accordingly.

Results relate only to the items tested.



Bureau Veritas Job #: C3F3822
Report Date: 2023/06/06

QUALITY ASSURANCE REPORT

Pinchin Ltd
Client Project #: 325772
Site Location: RIVER GROVE
Sampler Initials: AS

QC Batch	Parameter	Date	Matrix Spike		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
8696744	Lead (Pb)	2023/06/01	NC	75 - 125	<0.00010	%	6.4	35	98	75 - 125
8699747	Lead (Pb)	2023/06/02			<0.00010	%			100	75 - 125

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)



Bureau Veritas Job #: C3F3822
Report Date: 2023/06/06

Pinchin Ltd
Client Project #: 325772
Site Location: RIVER GROVE
Sampler Initials: AS

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Cristina Carriere, Senior Scientific Specialist

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CHAIN OF CUSTODY RECORD

Page 1 of 1

[illegible]

Unless otherwise agreed to in writing, work submitted on this Chain of Custody is subject to Bureau Veritas' standard Terms and Conditions. Signing of this Chain of Custody document is acknowledgment and acceptance of our terms available at <https://www.bvna.com/bac-terms-and-conditions>

30-May-23 09:24

Antonella Brasil



C3F3822

IDE ENV 1618

APPENDIX III
Methodology and Evaluation Criteria



1.0 GENERAL

An inspection was conducted to identify the type of Hazardous Building Materials incorporated in the structure and its finishes.

Information regarding the location and condition of hazardous building materials encountered and visually estimated quantities were recorded. The locations of any samples collected were recorded on small-scale plans. As-built drawings and previous reports were referenced where provided.

Sample collection was conducted in accordance with our Standard Operating Procedures.

1.1 Asbestos

The inspection for asbestos included friable and non-friable asbestos-containing materials (ACM). A friable material is a material that when dry can be crumbled, pulverized, or powdered by hand pressure.

A separate set of samples was collected of each type of homogenous material suspected to contain asbestos. A homogenous material is defined by the US EPA as material that is uniform in texture and appearance, was installed at one time, and is unlikely to consist of more than one type or formulation of material. The homogeneous materials were determined by visual examination and available information on the phases of construction and prior renovations.

Samples were collected at a rate that is in compliance with the requirements of local regulations and guidelines. The sampling strategy was also based on known ban dates and phase out dates of the use of asbestos; sampling of certain building materials is not conducted after specific construction dates. In addition, to be conservative, several years past these dates are added to account for some uncertainty in the exact start / finish date of construction and associated usage of ACM. In some cases, manufactured products such as asbestos cement pipe were visually identified without sample confirmation.

The asbestos analysis was completed using a stop-positive approach. Only one result meeting the regulated criteria was required to determine that a material is asbestos-containing, but all samples must be analyzed to conclusively determine that a material is non-asbestos. The laboratory stopped analyzing samples from a homogeneous material once a result equal to or greater than the regulated criteria is detected in any of the samples of that material. All samples of a homogeneous material were analyzed if no asbestos is detected. In some cases, all samples were analyzed in the sample set regardless of result.

The analysis was performed in accordance with Test Method EPA/600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials, July 1993.

Analytical results were compared to the following criteria.

Jurisdiction*	Friable	Non-Friable
Ontario	0.5%	0.5%

* If there is a conflict between federal and provincial criteria, the more stringent will apply.

Where building materials are described in the report as “non-asbestos” or “does not contain asbestos,” this means that either no asbestos was detected by the analytical method utilized in any of the multiple samples or, if detected, it is below the lower limit of an asbestos-containing material in the applicable regulation. Additionally, these terms are used for materials which historically are known to not include asbestos in their manufacturing.

Asbestos materials were evaluated in order to make recommendations regarding any remedial work. The priority for remedial action was based on several factors:

- Friability (friable or non-friable);
- Condition (good, fair, poor, debris);
- Accessibility (ranking from accessible to all building users to inaccessible);
- Visibility (whether the material is obscured by other building components).
- Efficiency of the work (for example, if damaged ACM is being removed in an area, it may be most practical to remove all ACM in the area even if it is in good condition).

For a complete description of the Evaluation Criteria and Basis of Recommendations, refer to Annex A.

1.2 Lead

Samples of distinctive paint finishes, and surface coatings present in more than a limited application, where removal of the paint is possible was collected. The samples were collected by scraping the painted finish to include base and covering applications.

Analysis for lead in paints or surface coatings was performed in accordance with EPA Method No. 3050B/Method No. 7420; flame atomic absorption.

Analytical results were compared to the following criteria.

Jurisdiction*	Units (%)	Units (ppm) / (mg/kg)
Ontario	0.1	1000

* If there is a conflict between federal and provincial criteria, the more stringent will apply.

Other lead building products (e.g. batteries, lead sheeting, flashing) were identified by visual observation only.

1.3 Silica

Building materials known to contain crystalline silica (e.g. concrete, cement, tile, brick, masonry, mortar) were identified by visual inspection only. Pinchin did not perform sampling of these materials for laboratory analysis of crystalline silica content.

1.4 Mercury

Building materials, products, or equipment (e.g. thermostats, barometers, pressure gauges, lamp tubes), suspected to contain mercury was identified by visually inspection only. Dismantling of equipment suspected of containing mercury was not performed. Sampling of these materials for laboratory analysis of mercury content was not performed.

1.5 Polychlorinated Biphenyls

The potential for light ballast and oil filled transformers to contain PCBs was based on the age of the building, a review of maintenance records and examination of labels or nameplates on equipment, where present and accessible. The information was compared to known ban dates of PCBs and Environment Canada publications.

Dry type transformers were presumed to be free of dielectric fluids and hence non-PCB.

Fluids (mineral oil, hydraulic, Aroclor or Askarel) in transformers or other equipment were not sampled for PCB content.

Sample results are compared to the criteria of 50 mg/kg for solids as stated in the PCB Regulation, SOR/2008-273.

1.6 Visible Mould

The presence of mould or water damage was determined by visual inspection of exposed building surfaces. If any mould growth or water damage was concealed within building cavities it was not addressed in this assessment.

Template: Methodology for Hazardous Building Materials Assessment, HAZ, January 26, 2023

METHODOLOGY ANNEX A EVALUATION CRITERIA

1.0 EVALUATION CRITERIA AND BASIS OF RECOMMENDATIONS

The detailed asbestos assessment provides information regarding the location, condition, accessibility, and friability of the asbestos-containing materials (ACM). In order to make recommendations for compliance with current regulations, Pinchin developed the following criteria.

2.0 EVALUATION OF CONDITION

2.1 Friable Sprayed or Trowelled Fireproofing, Thermal Insulation and Texture Finishes (Surfacing Materials)

To evaluate the condition of ACM sprayed or trowelled on fireproofing, sprayed, or trowelled thermal insulation (non-mechanical), or texture, decorative or acoustic finishes, the following criteria are applied:

Good	Surface of material shows no significant signs of damage, deterioration, or delamination. Good condition includes unencapsulated or unpainted fireproofing or texture finishes, where no or limited delamination or damage is observed, or encapsulated fireproofing or texture finishes where the encapsulant or paint has been applied after the damage or fallout occurred.
Poor	A sprayed material that shows signs of significant damage or is significantly delaminating or deteriorating. This may be limited to surface delamination, or some portion of the substrate may be exposed.

In Locations where damage exists in isolated areas, both good and poor condition may be applicable.

The extent of each condition will be recorded. Fair condition is not utilized in the evaluation of ACM sprayed or trowelled fireproofing, sprayed or trowelled thermal insulation (non-mechanical), or texture, decorative or acoustic finishes.

The evaluation of the above products above ceilings may be limited by the number of observations and by building components such as ducts or full height walls that obstruct the above ceiling observations.

2.2 Friable Mechanical or Thermal System Insulation (TSI)

To evaluate the condition of mechanical insulation on vessels, boilers, breeching, ducts, pipes, fan units, equipment etc. the following criteria are applied:

Good	Insulation is completely covered in jacketing and exhibits no evidence of damage or deterioration. No insulation is exposed. Includes conditions where the jacketing has minor damage (i.e. scuffs or stains), but the jacketing is not penetrated.
Fair	Minor penetrating damage to jacketed insulation (cuts, tears, nicks, deterioration, or delamination) or undamaged insulation that has never been jacketed. Insulation is exposed but not showing surface disintegration. The extent of missing insulation ranges from minor to none. Damage can be repaired.

Poor	Original insulation jacket is missing, damaged, deteriorated, or delaminated. Insulation is exposed and significant areas have been dislodged. Damage cannot be readily repaired. Includes components where insulation may have been removed incompletely.

The evaluation of mechanical insulation may be limited by the number of observations made and building components such as ducts or full height walls that obstruct observations. It is often not possible to observe each foot of mechanical insulation from all angles.

2.3 Potentially Friable Materials and Miscellaneous Friable Materials

Potentially friable ACM are products that are basically non-friable while in place but have the potential to generate friable dust upon removal or if significantly disturbed without appropriate procedures. These products may become friable if damaged. Potentially friable materials include materials such as acoustic ceiling tiles and plaster. To evaluate the condition of potentially friable materials, the following criteria are applied:

Good	No significant damage or deterioration. Still serving its intended use as a building material or finish.
Fair	Showing signs of some cracking or breakage, but is not deteriorating (e.g. cracked plaster, broken but in place ceiling tile, missing tile, or section of plaster etc.). The condition is such that it is still serving its intended use as a building material or finish but may require repair for mainly cosmetic purposes.
Poor	Significant deterioration or breaking apart of the material. Material has deteriorated to the point it is not serving its intended use as building material or finish. Material has deteriorated to a point it has become friable. Normally potentially friable ACM in Poor condition is not repairable and requires at least localized removal and replacement.

2.4 Non-Friable Materials

Non-friable ACM cover a wide range of products with a wide variation in their tendency to release dust or asbestos fibres to the air. Many of these materials, (particularly where the matrix is an unweathered bitumen, asphalt, or tar material) do not release fibres except in very unusual circumstances or during significant disturbance (e.g. use of abrasive power tools). Others with a cementitious matrix (asbestos-cement products) can more readily release dust due to abrasion, demolition, weathering, etc. The potential for asbestos release from non-friable ACM is always lower than from friable ACM. To evaluate the condition of non-friable Materials, the following criteria are applied:

Good	No significant damage or deterioration. Still serving its intended use as a building material or finish.
Fair	Showing signs of some cracking or breakage but is not deteriorating (e.g. cracked vinyl floor tile, missing piece of tile or transite, etc.). The condition is such that it is still serving its intended use as a building material or finish but may require repair for mainly cosmetic purposes.
Poor	Significant deterioration or breaking apart of the material to the point at which it cannot be repaired, and it will require at least local removal. Material has deteriorated to the point it is not serving its intended use as building material or finish. Material may have deteriorated to a point where traffic or disturbance may cause it to become friable.

2.5 Evaluation of ACM Debris

The identification of the exact location or presence of debris on the top of ceiling tiles is limited by the number of observations made and the presence of building components such as ducts or full height walls that obstruct observations.

The presence of fallen or dislodged ACM is noted separately from the ACM source and is referred to as Debris. Debris may be friable if from a friable ACM source or a badly deteriorated non-friable ACM source. Debris may also be non-friable (such as fallen pieces of transite sheet or mastic fittings, or broken, dislodged floor tiles).

Debris	Debris may be friable or non-friable but is always identified as debris.

2.6 Evaluation of Presumed Asbestos-Containing Material (PACM)

Presumed asbestos-containing materials (PACM), are building materials that may contain asbestos but were not sampled or analyzed due to inaccessibility or the need to perform destructive testing to obtain a reasonable sample set. Evaluation of these materials is based on the assumption that these PACM are asbestos-containing.

A list of PACM is provided in the report and they are generally not included in the detailed room by room reports. Typically, they are excluded because they are inaccessible or present in very small quantities. If PACM are evaluated, Pinchin uses the criteria that correspond with the type (and friability) of the material listed above.

3.0 EVALUATION OF ACCESSIBILITY

The accessibility of building materials known or suspected of being ACM is rated according to the following criteria:

Access (A)	Common areas of the building within reach of all building users (approximately 8' - 9' from floor or standard ceiling height). Includes other areas where occupant activities may result in disturbance of material that is not normally within reach from floor level, but may be disturbed by common activities (e.g. gymnasiums, workshops, warehouses)
Access (B)	Areas of the building accessed primarily by Maintenance/Caretaking/Janitorial Staff and within reach without use of a ladder. Includes areas within reach in Boiler Rooms, Electrical Rooms, Janitors Closets, Elevator Rooms, Mechanical Rooms, etc. Includes materials within reach from fixed ladders or catwalks, mezzanines, and accessible pipe chases.
Access (C) and Visible	Areas of the building above 8' - 9' where use of a ladder or scaffold is required to reach the ACM. Only includes ACM that are visible to view without the removal or opening of other building components such as ceiling tiles or service access panels. Visible column on HMIS sheets will say YES.
Access (C) and not Visible	Areas of the building above 8' - 9' where use of a ladder or scaffold is required to reach the ACM. Includes ACM that are not visible to view and require the removal of a building component to see, such as ceilings tiles or access panels to view and access. Includes rarely entered crawl spaces, attic spaces, etc. Observations will be limited to the extent visible from the access points. Visible column on HMIS sheets will say NO.
Access (D)	Areas of the building behind inaccessible solid ceiling systems, walls, or equipment etc. where demolition of the ceiling, wall or equipment etc. is required to reach the ACM. Material inaccessible due to height or location or is only accessed under unusual situations. Evaluation of condition and extent of ACM is limited or impossible, depending on the surveyor's ability to visually examine materials in Access D.

4.0 ACTION MATRIX AND DEFINITIONS

Pinchin's evaluation of the viability of a specific asbestos control option is based on the consideration of the friability, condition, accessibility, and visibility of a material. The logic used is that damaged ACM located in an area frequently accessed by all building occupants is of a higher priority than damaged ACM located in an infrequently accessed service area. The action matrix considers the potential for fibre release (primarily from friable ACM) and the possible concerns from regulatory bodies and many building occupants to all damaged ACM (including non-friable).

In any building with asbestos, many current regulations require an Asbestos Management Program be implemented. Depending on the condition and the accessibility, more active measures such as repair or removal may be recommended. The following matrix provides guidance for recommended Actions in the absence of renovation or demolition. In the event of construction or maintenance activity which will disturb ACM more aggressive control or removal will be required.

4.1 Action Matrix

The following tables outline the action decisions based on the relationship of assessed factors. Table I applies to friable ACM. Table II applies to non-friable ACM.

Table I Decision Matrix for Friable ACM

Access	Condition			Debris
	Good	Fair	Poor	
(A)	Action 5 ¹	Action 5 ²	Action 3	Action 1
(B)	Action 7	Action 6 ³	Action 3	Action 1
(C) Visible	Action 7	Action 6	Action 3	Action 2
(C) Not Visible	Action 7	Action 7	Action 4	Action 2
(D)	Action 7	Action 7	Action 7	Action 7

Table II Decision Matrix for Potentially Friable and Non-Friable ACM

Access	Condition			Debris
	Good	Fair	Poor	
(A)	Action 7	Action 7 ⁴	Action 3	Action 1
(B)	Action 7	Action 7	Action 3	Action 1
(C) Visible	Action 7	Action 7	Action 4	Action 2
(C) Not Visible	Action 7	Action 7	Action 4	Action 2
(D)	Action 7	Action 7	Action 7	Action 7

4.2 Action Definitions

The following are the definitions in the Action Matrix Table presented above:

¹ If friable ACM in access (A)/Good condition is not proactively removed Action 7 (Manage) is recommended.

² If friable ACM in access (A)/Fair condition is not proactively removed repair is recommended.

³ If friable ACM in access (B)/Fair condition is likely to be disturbed after repair proactive removal is recommended.

⁴ Action 7 is recommended for all non-friable ACM in Fair condition however some clients may wish to repair or take some action primarily for cosmetic reasons

Action Definitions

Action 1	Clean-Up of ACM Debris Restrict access that is likely to cause a disturbance of the ACM Debris and clean up ACM Debris. Utilize appropriate asbestos precautions.
Action 2	Precautions for Access Which may Disturb ACM Debris Use appropriate means to isolate the debris or to limit entry to the area which may disturb the material. At locations where ACM Debris can remain in place in lieu of removal or clean-up (e.g. Debris on top of ceiling tiles or behind lockable door), Utilize appropriate asbestos precautions to enter the area if this will disturb debris. The precautions will be required until the ACM Debris has been cleaned up.
Action 3	ACM Removal Remove ACM. Utilize asbestos procedures appropriate to the scope of the removal work. Until it is removed, restrict access to the material so it is not disturbed.
Action 4	Precautions for Work Which may Disturb ACM in Poor Condition. Utilize appropriate asbestos precautions if ACM may be disturbed by work on or near ACM. This does not require restricting access to the area, only control of work which may contact or disturb the ACM. Removal is the only viable option if work will disturb ACM.
Action 5	Proactive ACM Removal Remove friable ACM where the presence of friable asbestos in Good condition is not desirable. If friable ACM in Fair condition is not removed, then Repair friable ACM.
Action 6	ACM Repair Repair friable ACM in Fair condition which is not likely to be damaged again or disturbed by normal use of the area or room. Pinchin recommends proactive removal if friable ACM is likely to be damaged or disturbed during normal use of the area or room
Action 7	Asbestos Management Program with Routine Surveillance Implement an Asbestos Management Program, including routine surveillance of ACM. Reassess materials regularly (typically once per year).

Master Template: Methodology Annex A to Appendix I Evaluation Criteria, HAZ, January 10, 2020

APPENDIX IV
Location Summary Report

Client:City Of Mississauga

Site: 5800 River Grove Ave, Mississauga, ON

Building Name: River Grove Community Center

Survey Date:

Last Re-Assessment:

Building Phases: A: 1996

Location No.	Name or Description	Area ft ²	Floor No.	Bldg. Phase	Notes
1	Entrance Vestibule, room no. 1006	210	1	A	
2	Entrance Corridor, room no. 1007	2000	1	A	
3	Lobby, room no. 1064	2400	1	A	
4	Coat Check, room no. 1073	90	1	A	
5	Staff Room, room no. 1054	300	1	A	
6	Kaneff Auditorium, room no. 1072	6000	1	A	Ceiling height 25ft
7	Kitchen, room no. 1108	750	1	A	Ceiling height 11ft
8	Gym Storage, room no. 1071	750	1	A	
9	Women's Washroom, room no. 1052	160	1	A	
10	Men's Washroom, room no. 1053	160	1	A	
11	Corridor 1, room no. 1027	700	1	A	
12	Pool Staff Office, room no. 1048,1049	250	1	A	
13	Family Change Room, room no. 1042	1900	1	A	
14	Women's Fitness Change Room, room no. 1018	1100	1	A	
15	Men's Fitness Change Room, room no. 1021	1100	1	A	
16	Maintenance, room no. 1037	40	1	A	
17	Women's Pool Change Room, room no. 1038	1200	1	A	
18	Men's Pool Change Room, room no. 1033	1200	1	A	
19	Corridor 2, room no. 1011	475	1	A	
20	Squash Courts	2100	1	A	Ceiling height 26ft
21	Staircase	200	1	A	Stair A
22	Staff Offices	660	1	A	
23	LAN Room, room no. 1009	80	1	A	
24	Supply Room	60	1	A	
25	Staff Storage	385	1	A	
26	Maintenance	50	1	A	
27	Corridor 3	400	1	A	
28	Washrooms	150	1	A	
29	Burt Arts Studio, room no. 1087	1500	1	A	
30	Vestibule, room no. 1084	100	1	A	
31	Corridor 4, room no. 1104	670	1	A	
32	Kiln And Storage Room, room no. 1092,1091	500	1	A	In arts studio
33	Operations Office	130	1	A	
34	Youth Room, room no. 1100	2200	1	A	
35	Youth Storage	300	1	A	In youth room, access to roof
36	Sprinkler Room, room no. 1090	130	1	A	In youth room
37	Washrooms, room no. 1096, 1097	150	1	A	In youth room
38	Seniors Room, room no. 1102	2100	1	A	Ceiling height 11ft
39	Senior Storage	200	1	A	In senior room
40	Rear Vestibule, room no. 1107	70	1	A	
41	Basement Corridor, room no. B004	200	B	A	
42	Elevator Room, room no. B007	40	B	A	
43	Storage, room no. B001	430	B	A	
44	Filtration Room, room no. B005	1300	B	A	
45	Tunnel, room no. B006	2200	B	A	Partly accessible due to has low height
46	Staircase No. 3, room no. B003	100	B	A	
47	Upper Lobby, room no. 2006	700	2	A	
48	Program Room, room no. 2023	700	2	A	
49	Universal Washrooms	170	2	A	

Location No.	Name or Description	Area ft ²	Floor No.	Bldg. Phase	Notes
50	Fitness Center, room no. 2017	5500	2	A	
51	Fitness Studio, room no. 2008	2100	2	A	
52	Janitor	130	2	A	
53	Electrical Room	140	2	A	
54	Fitness Washrooms	400	2	A	
55	Mechanical Room 2, room no. 2027	2500	2	A	Staircase leading to level 1 present inside
56	Staff Storage	100	2	A	
57	Mechanical Room 1, room no. 2025	900	2	A	Access to roof present inside
58	Staircase B	100	2	A	
59	Information Desk And Office	410	1	A	
60	Pool Staff Change Rooms	200	1	A	
61	Pool Supervisor Office	130	1	A	
62	Pool	9500	1	A	Ceiling height 38ft
63	Pool Storage 1	210	1	A	
64	Pool Storage 2	80	1	A	
65	Pool Storage 3	170	1	A	

APPENDIX V

Hazardous Materials Summary Report / Sample Log

HAZARDOUS MATERIALS SUMMARY / SAMPLE LOG

Client:City Of Mississauga

Site: 5800 River Grove Ave, Mississauga, ON

Building Name: River Grove Community Center

Survey Date:

HAZMAT	Sample No	System/Component/Material/Sample Description	Locations	Bldg. Phase	LF	SF	EA	%	Type	Positive	Friability
Asbestos	S0001 ABC	Wall Window Caulking Grey	2,3,27,47,48,50,51,62	A	670	0	0	0	None Detected	No	
Asbestos	S0002 ABC	Other Door, Window Caulking Black	2,3,27,29,34,38,48,50,51,62	A	2220	0	0	0	None Detected	No	
Asbestos	S0003 ABC	Wall, Other, Wall Window, Expansion Joint Caulking Light Beige	2,3,6,13,27,29,34,38,48,50,62	A	1010	120	0	0	None Detected	No	
Asbestos	S0004 ABC	Other Window Caulking Black	3,13,40,48,62	A	760	0	0	0	None Detected	No	
Asbestos	S0005 ABC	Wall Window Caulking Light Grey	6	A	140	0	0	0	None Detected	No	
Asbestos	S0006 ABC	Wall Door Caulking Light Red	6	A	25	0	0	0	None Detected	No	
Asbestos	S0007 ABC	Wall Base Mastic Yellow	6,29,33,34,39,46	A	705	0	0	0	None Detected	No	
Asbestos	S0008 ABC	Wall Expansion Joint, Window, Door Caulking Off White	6,8,13,14,15,17,18,21,24,25,26,29,32,34,35 38,39,40,50,62	A	990	1210	0	0	None Detected	No	
Asbestos	S0009 ABC	Duct Mastic, Grey	7,9,10,13,14,15,17,18,27,29,33,38,52,55,57 64	A	640	0	0	0	None Detected	No	
Asbestos	S0010 ABC	Duct, Wall Mastic Dark Red	38,41,42,43,44,45,47	A	435	300	0	0	None Detected	No	
Asbestos	S0011 ABC	Wall, Floor Base Mastic Light Yellow	22,23,48,50,51,59	A	450	0	0	0	None Detected	No	
Asbestos	S0012 ABC	Piping Fire Stop Caulking Dark Red	57	A	0	0	5	0	None Detected	No	
Asbestos	S0013 ABC	Wall Expansion Joint Caulking Beige	62	A	60	0	0	0	None Detected	No	
Asbestos	V9500	Duct Mastic Dark Red	29	A	60	0	0	0	Presumed Asbestos	Yes	NF
Asbestos	V0000	Ceiling All Ceiling Tiles (lay-in) 48x24 Grey Textured	7,12,16,22,23,27,28,29,33,34,37,49,50,54,59 60,61	A	0	990	0	0	Non Asbestos	No	
Asbestos	V0000	Ceiling Ceiling Tiles (lay-in) 48x24 Small Fissures And Pinholes	17,18	A	0	30	0	0	Non Asbestos	No	
Asbestos	V0000	Ceiling Ceiling Tiles (lay-in) 60x24 Grey Textured	2,3,13,14,15,17,18,47,48	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Ceiling Ceramic Tiles 20x8 White	13,14,15,17,18,62	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Ceiling Ceramic Tiles Very Small White Squares	14,15,60	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Ceiling All, Bulkhead Drywall And Joint Compound	1,2,3,4,5,6,9,10,11,12,13,14,15,19,21,29,30 47,50,52,53,58,59	A	0	5325	0	0	Non Asbestos	No	
Asbestos	V0000	Duct All Fibreglass	2,3,12,13,14,15,17,18,22,23,28,29,33,37,45 47,48,49,53,54,59,60,61	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Duct All Not Insulated	6,7,8,9,10,12,13,14,15,16,17,18,22,25,27,28	A	0	0	0	0	Non	No	

HAZARDOUS MATERIALS SUMMARY / SAMPLE LOG

HAZMAT	Sample No	System/Component/Material/Sample Description	Locations	Bldg. Phase	LF	SF	EA	%	Type	Positive	Friability
			29,31,32,33,34,35,36,37,38,39,40,41,42,43,44 45,49,50,51,52,53,54,55,57,59,60,61,63,64,65						Asbestos		
Asbestos	V0000	Duct Duct Connector Textile	44,45,55,57,63,64	A	0	0	13	0	Non Asbestos	No	
Asbestos	V0000	Floor All Carpet	22,33,50,59	A	0	120	0	0	Non Asbestos	No	
Asbestos	V0000	Floor All Ceramic Tiles 24x12 Black	1,2,3,4,5,9,10,11,19,21,27,28,31,37,40,46,49 54,58	A	0	6435	0	0	Non Asbestos	No	
Asbestos	V0000	Floor Ceramic Tiles 24x12 Light Beige	2,3	A	0	3000	0	0	Non Asbestos	No	
Asbestos	V0000	Floor All Ceramic Tiles 24x12 White	47	A	0	700	0	0	Non Asbestos	No	
Asbestos	V0000	Floor Ceramic Tiles Light Pink Squares With Blue And Grey Mix	62	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Floor Ceramic Tiles Very Small Black Squares	12,60,62	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Floor All Ceramic Tiles Very Small Dark Grey Squares	13,14,15,17,18	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Floor Ceramic Tiles Very Small Light Grey Squares	62	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Floor Ceramic Tiles Very Small White Squares	62	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Floor All Concrete (poured)	8,16,24,26,32,35,36,38,39,41,42,43,44,45,52 53,55,56,57,63,64,65	A	0	11130	0	0	Non Asbestos	No	
Asbestos	V0000	Floor All Laminate	6,20,51	A	0	8100	0	0	Non Asbestos	No	
Asbestos	V0000	Floor Stairs Non-slip Flooring	7,21,46,48,50,59,61	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Floor Vinyl Floor Tile 12x12 Light Beige With Grey And Light Grey Specks	23	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Floor All Vinyl Floor Tile 24x12 Light Grey With Grey Specks	7,25,29,34	A	0	3335	0	0	Non Asbestos	No	
Asbestos	V0000	Mechanical Equipment Fumehood Drywall (no Compound)	32	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Mechanical Equipment Tank Fibreglass	55	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Mechanical Equipment Unit Heater, Generator Unit, Filters, Pump, Boiler, Air Handling Unit, Fan Unit, Heating Ventilating Air Conditioning Unit Not Insulated	28,35,36,38,39,40,42,44,45,50,51,55,57,65	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Other Electrical Panel, Skylight Not Insulated	35,38,39,44,47,53,55,57	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Other Window Styrofoam Black	2,27,50,51	A	0	0	0	0	Non	No	

HAZMAT	Sample No	System/Component/Material/Sample Description	Locations	Bldg. Phase	LF	SF	EA	%	Type	Positive	Friability
Asbestos	V0000	Piping All Fibreglass	2,3,9,10,12,13,14,15,16,17,18,22,23,24,26,28 29,32,33,36,37,38,39,40,44,45,47,48,49,50,51 52,53,54,55,57,59,60,61	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Piping Sprinkler, Rain Water Leader, All Not Insulated	2,3,4,6,7,8,9,10,12,13,14,15,16,17,18,20,22 23,24,25,26,27,28,29,31,32,33,34,35,36,37,38 39,40,41,42,43,44,45,47,48,49,50,51,52,53,54 55,56,57,59,60,61,62,63,64,65	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Piping Polyvinyl Chloride (pvc)	44,45,57	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Structure Stairs Concrete (poured)	55,57	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Structure All Concrete (precast)	2,8,24,25,26,27,28,29,33,37,41,42,43,44,45	A	0	8845	0	0	Non Asbestos	No	
Asbestos	V0000	Structure All Fireproofing (fibrous)	3,9,10,12,13,14,15,16,17,18,22,23,59,60,61	A	0	2760	0	0	Non Asbestos	No	
Asbestos	V0000	Structure All, Stairs Metal	6,7,20,31,32,34,35,36,38,39,40,46,47,48,49 50,51,52,53,54,55,56,57	A	0	27860	0	0	Non Asbestos	No	
Asbestos	V0000	Structure All Wood	63,64,65	A	0	460	0	0	Non Asbestos	No	
Asbestos	V0000	Wall Cement Product	2,47,49,54	A	0	600	0	0	Non Asbestos	No	
Asbestos	V0000	Wall Ceramic Tiles	16,26	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Wall Ceramic Tiles 16x4 Yellow	2,3	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Wall Ceramic Tiles 16x8 White	2	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Wall Ceramic Tiles 16x8 White And Mix	3	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Wall All Ceramic Tiles 20x8 White	13,14,15,47,49,50,60	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Wall All Ceramic Tiles 20x8 White And 20x8 Teal	9,10,17,18,54	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Wall Ceramic Tiles 20x8 Yellow	52	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Wall Ceramic Tiles Light Grey Squares	62	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Wall Ceramic Tiles Very Small White Squares	3,13,14,15,61	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Wall Ceramic Tiles Black	3	A	0	50	0	0	Non Asbestos	No	
Asbestos	V0000	Wall All Concrete (poured)	41,42,43,44,45,46,55,57	A	0	0	0	0	Non Asbestos	No	

HAZARDOUS MATERIALS SUMMARY / SAMPLE LOG

HAZMAT	Sample No	System/Component/Material/Sample Description	Locations	Bldg. Phase	LF	SF	EA	%	Type	Positive	Friability
Asbestos	V0000	Wall All Drywall And Joint Compound	2,3,4,5,11,19,27,28,29,33,37,48,50,51,52,53 55,56,57	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Wall All Masonry	1,4,5,6,7,8,11,13,14,15,16,17,18,19,20,21,24 25,26,30,31,32,34,35,36,38,39,40,46,47,48,56 58,62,63,64,65	A	0	0	0	0	Non Asbestos	No	
Paint	L0001	Wall Masonry White	1,2,3,4,5,8,11,12,13,14,15,16,17 18,19,20,21,23,25,26,27,28,29,30,31,32 33,34,35,37,38,39,40,41,46,47,48,56,58 59,61,63,64,65	A	0	30920	0	0		No	-
Paint	L0002	Wall Drywall And Joint Compound White	2,3,4,5,19,47,48,50,51,52,53,55,56	A	550	6900	0	0		No	-
Paint	L0003	Wall Masonry Off White	6,7	A	0	6100	0	0		No	-
Paint	L0004	Duct Metal Sky Blue	8,24,55,57,62,63,64,65	A	0	9500	0	0		No	-
Paint	L0005	Wall Drywall And Joint Compound Grey	22	A	0	1500	0	0		No	-
Paint	L0006	Wall Concrete (poured) White	46,55,57	A	0	1900	0	0		No	-
Paint	L0007	Wall Drywall And Joint Compound Black	50,51	A	0	750	0	0		No	-
Paint	L0008	Wall Drywall And Joint Compound Teal	50,59	A	0	710	0	0		No	-
Paint	L0009	Floor Concrete (poured) Light Grey	55,57	A	0	3400	0	0		No	-
Paint	L0010	Wall Concrete (poured) Dark Blue	57	A	0	1500	0	0		No	-
Paint	L0011	Wall Masonry Blue	62	A	0	1200	0	0		No	-
Paint	V9500	Wall Masonry Teal	21	A	0	100	0	0	Presumed Lead	Yes	-
Lead Product	V0000	Batteries In Emer. Lights	1,2,3,6,13,14,15,27,29,31,34,47,53 62	A	0	0	25	0	-	No	-
PCB	V0000	Light Ballasts	1,2,3,4,5,7,8,9,10,11,12,13,14 15,16,17,18,19,20,22,23,24,25,26,27,28 29,30,31,32,33,34,35,36,37,38,39,40,41 42,43,44,45,47,48,49,50,51,52,53,54,55 56,57,58,59,60,61,62,63,64,65	A	0	0	0	0	-	No	-
PCB	V0000	Transformer	44,53,55,57	A	0	0	0	0	-	No	-
Hg	V9000	Fluorescent Light Tube	2,3,7,8,11,12,13,14,15,16,17,18,19 20,21,22,23,24,25,26,29,32,33,35,36,38 39,41,42,43,44,45,46,47,48,50,51,52,53 55,56,57,58,59,60,61,63,64,65	A	0	0	844	0	Hg	Yes	-
Hg	V9500	Fluorescent Light Tube	30,37,49,54	A	0	0	32	0	Presumed Hg	Yes	-
Hg	V0000	Fluorescent Light Tube	1,4,5,6,9,10,27,28,31,34,40,62	A	0	0	4	0	-	No	-
Hg	V0000	Thermostat	1,47,54,55,57	A	0	0	7	0	-	No	-

Legend:

Sample number		Units			
S####	Asbestos sample collected	SF	Square feet	NF	Non Friable material.
L####	Paint sample collected	LF	Linear feet	F	Friable material
P####	PCB sample collected	EA	Each	PF	Potentially Friable material
M####	Mould sample collected	%	Percentage		
V####	Material visually similar to numbered sample collected				
V0000	Known non Hazardous Material				
V9000	Material is visually identified as Hazardous Material				
V9500	Material is presumed to be Hazardous Material				
[Loc. No.]	Abated Material				

APPENDIX VI
HMIS All Data Report

ALL DATA REPORT

Client: City Of Mississauga
Location: #1 : Entrance Vestibule
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1006
Last Re-Assessment: 0000-00-00

Area (sqft): 210

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	Drywall and joint compound			C	Y		210			SF	V0000	Non-Asbestos		None	
Duct	All	None Found														
Floor	All	Ceramic Tiles, 24x12 black			A	Y		210			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Piping	All	None Found														
Structure		None Found									SF					
Wall ¹	All	Masonry			A	Y						V0000	Non-Asbestos		None	

1 - Block wall

Client: City Of Mississauga
Location: #1 : Entrance Vestibule
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1006
Last Re-Assessment: 0000-00-00

Area (sqft): 210

PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Wall ¹	Masonry	50		SF	V0001	White	Pb: <0.00031 %	No

1 - Block wall

Client: City Of Mississauga
Location: #1 : Entrance Vestibule
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1006
Last Re-Assessment: 0000-00-00

Area (sqft): 210

PB PRODUCTS				
Component	Quantity	Unit	Sample	Hazard
Batteries In Emer. Lights	1	EA	V0000	

Client: City Of Mississauga
Location: #1 : Entrance Vestibule
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1006
Last Re-Assessment: 0000-00-00

Area (sqft): 210

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹			V0000	
Thermostat ²	1	EA	V0000	

1 - LED pot lights

2 - Digital

Client: City Of Mississauga
Location: #1 : Entrance Vestibule
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1006
Last Re-Assessment: 0000-00-00

Area (sqft): 210

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - LED

ALL DATA REPORT

Client: City Of Mississauga
Location: #2 : Entrance Corridor
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1007
Last Re-Assessment: 0000-00-00

Area (sqft): 2000

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		Ceiling Tiles (lay-in), 60x24 grey textured			C	Y						V0000	Non-Asbestos		None	
Ceiling	All	Drywall and joint compound			C	Y		800			SF	V0000	Non-Asbestos		None	
Duct	All	Fibreglass		Foil Face	C	N						V0000	Non-Asbestos		None	
Floor		Ceramic Tiles, 24x12 light beige			A	Y		1500			SF	V0000	Non-Asbestos		None	
Floor		Ceramic Tiles, 24x12 black	Edge		A	Y		500			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Other ¹	Door	Caulking, Black			A	Y		70			LF	S0002A	None Detected	N.D.	None	
Other ²	Window	Styrofoam, Black			A	Y						V0000	Non-Asbestos		None	
Piping ³		Fibreglass		Paper	C	N						V0000	Non-Asbestos		None	
Piping	Sprinkler	Not Insulated			C	N						V0000	Non-Asbestos		None	
Structure	All	Concrete (precast)			C	N		2000			SF	V0000	Non-Asbestos		None	
Wall ⁴		Cement Product			C	N					SF	V0000	Non-Asbestos		None	
Wall		Ceramic Tiles, 16x8 White			A	Y						V0000	Non-Asbestos		None	
Wall		Ceramic Tiles, 16x4 yellow			C	Y						V0000	Non-Asbestos		None	
Wall	All	Drywall and joint compound			A	Y						V0000	Non-Asbestos		None	
Wall	Expansion Joint	Caulking, Light beige			A	Y		10			LF	S0003A	None Detected	N.D.	None	
Wall ⁵	Window	Caulking, Grey			A	Y		50			LF	S0001A	None Detected	N.D.	None	

- 1 - Between door frame and glass
- 2 - Type of foam, between window frame and glass
- 3 - Heating supply and return
- 4 - Cement board
- 5 - Between window frame and wall

Client: City Of Mississauga
Location: #2 : Entrance Corridor
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1007
Last Re-Assessment: 0000-00-00

Area (sqft): 2000

PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Wall	Drywall and joint compound	600		SF	V0002	White	Pb: 0.00059 %	No
Wall ¹	Masonry	500		SF	L0001	White	Pb: <0.00031 %	No

- 1 - Block

Client: City Of Mississauga
Location: #2 : Entrance Corridor
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1007
Last Re-Assessment: 0000-00-00

Area (sqft): 2000

PB PRODUCTS				
Component	Quantity	Unit	Sample	Hazard
Batteries In Emer. Lights	2	EA	V0000	

Client: City Of Mississauga
Location: #2 : Entrance Corridor
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1007
Last Re-Assessment: 0000-00-00
Area (sqft): 2000

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹			V9000	Yes

1 - T5

Client: City Of Mississauga
Location: #2 : Entrance Corridor
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1007
Last Re-Assessment: 0000-00-00
Area (sqft): 2000

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - T5

ALL DATA REPORT

Client: City Of Mississauga
Location: #3 : Lobby
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1064
Last Re-Assessment: 0000-00-00

Area (sqft): 2400

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		Ceiling Tiles (lay-in), 60x24 grey textured			C	Y						V0000	Non-Asbestos		None	
Ceiling	All	Drywall and joint compound			C	Y		800			SF	V0000	Non-Asbestos		None	
Duct	All	Fibreglass		Foil Face	C	N						V0000	Non-Asbestos		None	
Floor		Ceramic Tiles, 24x12 light beige			A	Y		1500			SF	V0000	Non-Asbestos		None	
Floor		Ceramic Tiles, 24x12 black	Edge		A	Y		500			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Other ¹	Door	Caulking, Black			A	Y		60			LF	V0002	None Detected	N.D.	None	
Other ²	Window	Caulking, Black			A	Y		120			LF	S0004A	None Detected	N.D.	None	
Piping ³		Fibreglass		Paper	C	N						V0000	Non-Asbestos		None	
Piping	Sprinkler	Not Insulated			C	N						V0000	Non-Asbestos		None	
Structure	All	Fireproofing (Fibrous)			C	N		2400			SF	V0000	Non-Asbestos		None	
Wall		Ceramic Tiles, 16x8 White and mix			A	Y						V0000	Non-Asbestos		None	
Wall		Ceramic Tiles, 16x4 yellow			C	Y						V0000	Non-Asbestos		None	
Wall		Ceramic Tiles, black	Edge		A	Y		50			SF	V0000	Non-Asbestos		None	
Wall		Ceramic Tiles, Very small white squares			A	Y						V0000	Non-Asbestos		None	
Wall	All	Drywall and joint compound			A	Y						V0000	Non-Asbestos		None	
Wall	Expansion Joint	Caulking, Light beige			A	Y		10			LF	V0003	None Detected	N.D.	None	
Wall ⁴	Window	Caulking, Grey			A	Y		150			LF	V0001	None Detected	N.D.	None	

- 1 - Between door frame and glass , pool door
2 - between window frame and glass
3 - Heating supply and return
4 - Between window frame and wall

Client: City Of Mississauga
Location: #3 : Lobby
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1064
Last Re-Assessment: 0000-00-00

Area (sqft): 2400

PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Wall	Drywall and joint compound	600		SF	V0002	White	Pb: 0.00059 %	No
Wall ¹	Masonry	1000		SF	V0001	White	Pb: <0.00031 %	No

- 1 - Block

Client: City Of Mississauga
Location: #3 : Lobby
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1064
Last Re-Assessment: 0000-00-00

Area (sqft): 2400

PB PRODUCTS				
Component	Quantity	Unit	Sample	Hazard
Batteries In Emer. Lights	2	EA	V0000	

Client: City Of Mississauga
Location: #3 : Lobby
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1064
Last Re-Assessment: 0000-00-00

Area (sqft): 2400

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	14	EA	V9000	Yes

1 - T5

Client: City Of Mississauga
Location: #3 : Lobby
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1064
Last Re-Assessment: 0000-00-00

Area (sqft): 2400

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - T5

ALL DATA REPORT

Client: City Of Mississauga
 Location: #4 : Coat Check
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #: 1073
 Last Re-Assessment: 0000-00-00

Area (sqft): 90

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling ¹	All	Drywall and joint compound			C	Y		90			SF	V0000	Non-Asbestos		None	
Duct	All	None Found														
Floor	All	Ceramic Tiles, 24x12 black			B	Y		90			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Piping	Rain Water Leader	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Structure	All	None Found														
Wall		Drywall and joint compound			B	Y						V0000	Non-Asbestos		None	
Wall ²	All	Masonry			B	Y						V0000	Non-Asbestos		None	

1 - Water staining observed
 2 - Block wall

Client: City Of Mississauga
 Location: #4 : Coat Check
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #: 1073
 Last Re-Assessment: 0000-00-00

Area (sqft): 90

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall ¹	Masonry	120		SF	V0001	White	Pb: <0.00031 %	No	
Wall	Drywall and joint compound	250		LF	L0002	White	Pb: 0.00059 %	No	

1 - Block wall

Client: City Of Mississauga
 Location: #4 : Coat Check
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #: 1073
 Last Re-Assessment: 0000-00-00

Area (sqft): 90

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹		EA	V0000	

1 - LED pot lights

Client: City Of Mississauga
 Location: #4 : Coat Check
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #: 1073
 Last Re-Assessment: 0000-00-00

Area (sqft): 90

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - LED

ALL DATA REPORT

Client: City Of Mississauga
 Location: #5 : Staff Room
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #: 1054
 Last Re-Assessment: 0000-00-00

Area (sqft): 300

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	Drywall and joint compound			C	Y		300			SF	V0000	Non-Asbestos		None	
Duct	All	None Found														
Floor	All	Ceramic Tiles, 24x12 black			A	Y		300			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Piping		None Found														
Structure	All	None Found														
Wall		Drywall and joint compound			A	Y						V0000	Non-Asbestos		None	
Wall ¹	All	Masonry			A	Y						V0000	Non-Asbestos		None	

1 - Block wall

Client: City Of Mississauga
 Location: #5 : Staff Room
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #: 1054
 Last Re-Assessment: 0000-00-00

Area (sqft): 300

PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Wall ¹	Masonry	350		SF	V0001	White	Pb: <0.00031 %	No
Wall	Drywall and joint compound	150		LF	V0002	White	Pb: 0.00059 %	No

1 - Block wall

Client: City Of Mississauga
 Location: #5 : Staff Room
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #: 1054
 Last Re-Assessment: 0000-00-00

Area (sqft): 300

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹		EA	V0000	

1 - LED pot lights

Client: City Of Mississauga
 Location: #5 : Staff Room
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #: 1054
 Last Re-Assessment: 0000-00-00

Area (sqft): 300

PCB					
Component	Quantity	Unit	Sample	Sample Description	Amount
Light Ballasts ¹			V0000		No

1 - LED

ALL DATA REPORT

Client: City Of Mississauga
Location: #6 : Kaneff Auditorium
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1072
Last Re-Assessment: 0000-00-00

Area (sqft): 6000

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	Drywall and joint compound			C	Y		1000			SF	V0000	Non-Asbestos		None	
Duct	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Floor	All	Laminate			A	Y		6000			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Piping	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Metal			C	Y		6000			SF	V0000	Non-Asbestos		None	
Wall ¹	All	Masonry			A	Y						V0000	Non-Asbestos		None	
Wall	Base	Mastic, Yellow		Rubber	A	Y		300			LF	S0007AB	None Detected	N.D.	None	
Wall ²	Door	Caulking, Light red			A	Y		25			LF	S0006ABC	None Detected	N.D.	None	
Wall ³	Window	Caulking, Light grey			A	Y		140			LF	S0005ABC	None Detected	N.D.	None	
Wall ⁴	Window	Caulking, Light beige			A	Y		40			LF	V0003	None Detected	N.D.	None	
Wall ⁵	Window	Caulking, Off white			B	Y		50			SF	V0008	None Detected	N.D.	None	

Ceiling height 25ft

- 1 - Block wall
- 2 - Between wall and door frame, between walls
- 3 - Between wall and window frame
- 4 - Between window frame and wall
- 5 - Between window frame and wall

Client: City Of Mississauga
Location: #6 : Kaneff Auditorium
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1072
Last Re-Assessment: 0000-00-00

Area (sqft): 6000

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall ¹	Masonry	5000		SF	L0003	Off White	Pb: 0.00034 %	No	

Ceiling height 25ft

- 1 - Block wall, green underneath white

Client: City Of Mississauga
Location: #6 : Kaneff Auditorium
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1072
Last Re-Assessment: 0000-00-00

Area (sqft): 6000

PB PRODUCTS				
Component	Quantity	Unit	Sample	Hazard
Batteries In Emer. Lights	3	EA	V0000	

Ceiling height 25ft

Client: City Of Mississauga
Location: #6 : Kaneff Auditorium

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1072

Area (sqft): 6000

Survey Date: 2023-05-23

Last Re-Assessment: 0000-00-00

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹			V0000	

Ceiling height 25ft
1 - LED

Client: City Of Mississauga
Location: #6 : Kaneff Auditorium
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1072
Last Re-Assessment: 0000-00-00
Area (sqft): 6000

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts						No

Ceiling height 25ft

ALL DATA REPORT

Client: City Of Mississauga
Location: #7 : Kitchen
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1108
Last Re-Assessment: 0000-00-00

Area (sqft): 750

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	Ceiling Tiles (lay-in), 48x24 grey textured			C	Y		750			SF	V0000	Non-Asbestos		None	
Duct ¹		Mastic, Grey			C	N		50			LF	V0009	None Detected	N.D.	None	
Duct	All	Not Insulated			C	N						V0000	Non-Asbestos		None	
Floor		Non-slip Flooring			A	Y						V0000	Non-Asbestos		None	
Floor	All	Vinyl Floor Tile, 24x12 light grey with grey specks			A	Y		750			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Piping	All	Not Insulated			C	N						V0000	Non-Asbestos		None	
Structure	All	Metal			C	N		750			SF	V0000	Non-Asbestos		None	
Wall ²	All	Masonry			A	Y						V0000	Non-Asbestos		None	

Ceiling height 11ft

1 - Approx 8 duct connections

2 - Block wall

Client: City Of Mississauga
Location: #7 : Kitchen
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1108
Last Re-Assessment: 0000-00-00

Area (sqft): 750

PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Wall ¹	Masonry	1100		SF	V0003	Off White	Pb: 0.00034 %	No

Ceiling height 11ft

1 - Block wall

Client: City Of Mississauga
Location: #7 : Kitchen
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1108
Last Re-Assessment: 0000-00-00

Area (sqft): 750

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	30	EA	V9000	Yes

Ceiling height 11ft

1 - T8

Client: City Of Mississauga
Location: #7 : Kitchen
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1108
Last Re-Assessment: 0000-00-00

Area (sqft): 750

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

Ceiling height 11ft

1 - T8

ALL DATA REPORT

Client: City Of Mississauga
Location: #8 : Gym Storage
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1071
Last Re-Assessment: 0000-00-00

Area (sqft): 750

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	None Found									SF					
Duct	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Floor	All	Concrete (poured)			A	Y		750			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Piping	Rain Water Leader	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Piping	Sprinkler	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Concrete (precast)			C	Y		750			SF	V0000	Non-Asbestos		None	
Wall ¹	All	Masonry			A	Y						V0000	Non-Asbestos		None	
Wall	Expansion Joint	Caulking, Off white			A	Y		80			LF	S0008A	None Detected	N.D.	None	

1 - Block wall

Client: City Of Mississauga
Location: #8 : Gym Storage
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1071
Last Re-Assessment: 0000-00-00

Area (sqft): 750

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall ¹	Masonry	1000		SF	V0001	White	Pb: <0.00031 %	No	
Duct	Metal	100		SF	L0004	Sky blue	Pb: 0.00040 %	No	
Wall ²	Masonry	800		SF	V0004	Sky blue	Pb: 0.00040 %	No	

1 - Block wall

2 - Block wall

Client: City Of Mississauga
Location: #8 : Gym Storage
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1071
Last Re-Assessment: 0000-00-00

Area (sqft): 750

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	24	EA	V9000	Yes

1 - T8

Client: City Of Mississauga
Location: #8 : Gym Storage
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1071
Last Re-Assessment: 0000-00-00

Area (sqft): 750

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No



ALL DATA REPORT



1 - T8

ALL DATA REPORT

Client: City Of Mississauga
Location: #9 : Women's Washroom
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1052
Last Re-Assessment: 0000-00-00

Area (sqft): 160

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		Drywall and joint compound			C	Y		20			SF	V0000	Non-Asbestos		None	
Ceiling ¹	All	Ceiling Tiles (lay-in), 48x24 grey textured			C	Y		140			SF					
Duct ²		Mastic, Grey			C	N		40			LF	V0009	None Detected	N.D.	None	
Duct	All	Not Insulated			C	N						V0000	Non-Asbestos		None	
Floor	All	Ceramic Tiles, 24x12 black			A	Y		160			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Piping ³		Fibreglass		Paper	C	N						V0000	Non-Asbestos		None	
Piping		Not Insulated			C	N						V0000	Non-Asbestos		None	
Structure	All	Fireproofing (Fibrous)			C	N		160			SF	V0000	Non-Asbestos		None	
Wall	All	Ceramic Tiles, 20x8 white and 20x8 teal			A	Y						V0000	Non-Asbestos		None	

- 1 - Fiberglass
2 - Approx 7 duct connections
3 - D.C.W

Client: City Of Mississauga
Location: #9 : Women's Washroom
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1052
Last Re-Assessment: 0000-00-00

Area (sqft): 160

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹			V0000	

- 1 - LED pot lights

Client: City Of Mississauga
Location: #9 : Women's Washroom
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1052
Last Re-Assessment: 0000-00-00

Area (sqft): 160

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts			V0000			No

ALL DATA REPORT

Client: City Of Mississauga
Location: #10 : Men's Washroom
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1053
Last Re-Assessment: 0000-00-00

Area (sqft): 160

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		Drywall and joint compound			C	Y		20			SF	V0000	Non-Asbestos		None	
Ceiling ¹	All	Ceiling Tiles (lay-in), 48x24 grey textured			C	Y		140			SF					
Duct ²		Mastic, Grey			C	N		40			LF	S0009A	None Detected	N.D.	None	
Duct	All	Not Insulated			C	N						V0000	Non-Asbestos		None	
Floor	All	Ceramic Tiles, 24x12 black			A	Y		160			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Piping ³		Fibreglass		Paper	C	N						V0000	Non-Asbestos		None	
Piping		Not Insulated			C	N						V0000	Non-Asbestos		None	
Structure	All	Fireproofing (Fibrous)			C	N		160			SF	V0000	Non-Asbestos		None	
Wall	All	Ceramic Tiles, 20x8 white and 20x8 teal			A	Y						V0000	Non-Asbestos		None	

- 1 - Fiberglass
2 - Approx 7 duct connections
3 - D.C.W

Client: City Of Mississauga
Location: #10 : Men's Washroom
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1053
Last Re-Assessment: 0000-00-00

Area (sqft): 160

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹			V0000	

- 1 - LED pot lights

Client: City Of Mississauga
Location: #10 : Men's Washroom
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1053
Last Re-Assessment: 0000-00-00

Area (sqft): 160

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts			V0000			No

ALL DATA REPORT

Client: City Of Mississauga
Location: #11 : Corridor 1
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1027
Last Re-Assessment: 0000-00-00

Area (sqft): 700

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	Drywall and joint compound			C	Y		700			SF	V0000	Non-Asbestos		None	
Duct	All	None Found														
Floor	All	Ceramic Tiles, 24x12 black			A	Y		700			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Piping		None Found														
Structure	All	None Found														
Wall		Drywall and joint compound			A	Y						V0000	Non-Asbestos		None	
Wall ¹	All	Masonry			A	Y						V0000	Non-Asbestos		None	

1 - Block wall

Client: City Of Mississauga
Location: #11 : Corridor 1
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1027
Last Re-Assessment: 0000-00-00

Area (sqft): 700

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description		Amount	Hazard
Wall ¹	Masonry	1700		SF	V0001	White		Pb: <0.00031 %	No

1 - Block wall

Client: City Of Mississauga
Location: #11 : Corridor 1
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1027
Last Re-Assessment: 0000-00-00

Area (sqft): 700

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	12	EA	V9000	Yes

1 - T5

Client: City Of Mississauga
Location: #11 : Corridor 1
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1027
Last Re-Assessment: 0000-00-00

Area (sqft): 700

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - T5

ALL DATA REPORT

Client: City Of Mississauga
Location: #12 : Pool Staff Office
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1048,1049
Last Re-Assessment: 0000-00-00

Area (sqft): 250

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling ¹		Ceiling Tiles (lay-in), 48x24 grey textured			C	Y						V0000	Non-Asbestos		None	
Ceiling		Drywall and joint compound			C	Y						V0000	Non-Asbestos		None	
Duct		Not Insulated			C	Y						V0000	Non-Asbestos		None	
Duct	All	Fibreglass		Foil Face	C	N						V0000	Non-Asbestos		None	
Floor		Ceramic Tiles, Very small black squares			B	Y						V0000	Non-Asbestos		None	
Piping		Fibreglass		Paper	C	N						V0000	Non-Asbestos		None	
Piping		Not Insulated			C	N						V0000	Non-Asbestos		None	
Structure	All	Fireproofing (Fibrous)			C	N						V0000	Non-Asbestos		None	

1 - Fiberglass

Client: City Of Mississauga
Location: #12 : Pool Staff Office
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1048,1049
Last Re-Assessment: 0000-00-00

Area (sqft): 250

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description		Amount	Hazard
Wall ¹	Masonry	800		SF	V0001	White		Pb: <0.00031 %	No

1 - Block wall

Client: City Of Mississauga
Location: #12 : Pool Staff Office
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1048,1049
Last Re-Assessment: 0000-00-00

Area (sqft): 250

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	7	EA	V9000	Yes

1 - 7T5, LED

Client: City Of Mississauga
Location: #12 : Pool Staff Office
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1048,1049
Last Re-Assessment: 0000-00-00

Area (sqft): 250

PCB					
Component	Quantity	Unit	Sample	Sample Description	Amount
Light Ballasts ¹			V0000		No

1 - T5, LED

ALL DATA REPORT

Client: City Of Mississauga
Location: #13 : Family Change Room
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1042
Last Re-Assessment: 0000-00-00

Area (sqft): 1900

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling ¹		Ceiling Tiles (lay-in), 60x24 grey textured			C	Y						V0000	Non-Asbestos		None	
Ceiling		Ceramic Tiles, 20x8 white			A	Y						V0000	Non-Asbestos		None	
Ceiling	All	Drywall and joint compound			C	Y		410			SF	V0000	Non-Asbestos		None	
Duct		Not Insulated			C	N						V0000	Non-Asbestos		None	
Duct ²		Mastic, Grey			C	N		40			LF	V0009	None Detected	N.D.	None	
Duct	All	Fibreglass		Foil Face	C	N						V0000	Non-Asbestos		None	
Floor	All	Ceramic Tiles, Very small dark grey squares			A	Y						V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Other ³	Window	Caulking, Black			A	Y		60			LF	S0004B	None Detected	N.D.	None	
Piping ⁴		Fibreglass		Paper	C	N						V0000	Non-Asbestos		None	
Piping		Not Insulated			C	N						V0000	Non-Asbestos		None	
Structure	All	Fireproofing (Fibrous)			C	N						V0000	Non-Asbestos		None	
Wall ⁵		Masonry			A	Y						V0000	Non-Asbestos		None	
Wall ⁶		Masonry			A	Y						V0000	Non-Asbestos		None	
Wall		Ceramic Tiles, 20x8 white			A	Y						V0000	Non-Asbestos		None	
Wall		Ceramic Tiles, Very small white squares			A	Y						V0000	Non-Asbestos		None	
Wall	Expansion Joint	Caulking, Light beige			A	Y		330			LF	S0003B	None Detected	N.D.	None	
Wall	Expansion Joint	Caulking, Off white			A	Y		170			LF	S0008B	None Detected	N.D.	None	

- 1 - Fiberglass
- 2 - Approx 7 duct connections
- 3 - between window frame and glass
- 4 - D.C.W, D.H.W, heating supply and return, recirc. line
- 5 - Block wall
- 6 - Brick wall

Client: City Of Mississauga
Location: #13 : Family Change Room
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1042
Last Re-Assessment: 0000-00-00

Area (sqft): 1900

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Masonry	1000		SF	V0001	White	Pb: <0.00031 %	No	

Client: City Of Mississauga
Location: #13 : Family Change Room
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1042
Last Re-Assessment: 0000-00-00

Area (sqft): 1900

PB PRODUCTS				
Component	Quantity	Unit	Sample	Hazard
Batteries In Emer. Lights	2	EA	V0000	

Client: City Of Mississauga
Location: #13 : Family Change Room
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1042
Last Re-Assessment: 0000-00-00
Area (sqft): 1900

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	40	EA	V9000	Yes

1 - T5

Client: City Of Mississauga
Location: #13 : Family Change Room
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1042
Last Re-Assessment: 0000-00-00
Area (sqft): 1900

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - T5

ALL DATA REPORT

Client: City Of Mississauga

Location: #14 : Women's Fitness Change Room

Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON

Floor: 1

Building Name: River Grove Community Center

Room #: 1018

Last Re-Assessment: 0000-00-00

Area (sqft): 1100

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling ¹		Ceiling Tiles (lay-in), 60x24 grey textured			C	Y						V0000	Non-Asbestos		None	
Ceiling		Drywall and joint compound			C	Y						V0000	Non-Asbestos		None	
Ceiling		Ceramic Tiles, 20x8 white			A	Y						V0000	Non-Asbestos		None	
Ceiling ²		Ceramic Tiles, Very small white squares			A	Y						V0000	Non-Asbestos		None	
Duct		Fibreglass		Foil Face	C	N						V0000	Non-Asbestos		None	
Duct		Not Insulated			C	N						V0000	Non-Asbestos		None	
Duct ³		Mastic, Grey			C	N		50			LF	V0009	None Detected	N.D.	None	
Floor	All	Ceramic Tiles, Very small dark grey squares			B	Y						V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Piping ⁴		Fibreglass		Paper	C	N						V0000	Non-Asbestos		None	
Piping		Not Insulated			C	N						V0000	Non-Asbestos		None	
Structure	All	Fireproofing (Fibrous)			C	N						V0000	Non-Asbestos		None	
Wall ⁵		Masonry			B	Y						V0000	Non-Asbestos		None	
Wall ⁶		Masonry			B	Y						V0000	Non-Asbestos		None	
Wall		Ceramic Tiles, Very small white squares			A	Y						V0000	Non-Asbestos		None	
Wall	All	Ceramic Tiles, 20x8 white			A	Y						V0000	Non-Asbestos		None	
Wall	Expansion Joint	Caulking, Off white			B	Y		100			LF	V0008	None Detected	N.D.	None	

1 - Fiberglass

2 - Only steam room

3 - Approx 8 duct connections

4 - D.C.W, D.H.W, heating supply and return, recirc. line

5 - Block wall

6 - Brick wall

Client: City Of Mississauga

Location: #14 : Women's Fitness Change Room

Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON

Floor: 1

Building Name: River Grove Community Center

Room #: 1018

Last Re-Assessment: 0000-00-00

Area (sqft): 1100

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description		Amount	Hazard
Wall ¹	Masonry	2000		SF	V0001	White		Pb: <0.00031 %	No

1 - Block wall

Client: City Of Mississauga

Location: #14 : Women's Fitness Change Room

Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON

Floor: 1

Building Name: River Grove Community Center

Room #: 1018

Last Re-Assessment: 0000-00-00

Area (sqft): 1100

PB PRODUCTS				
Component	Quantity	Unit	Sample	Hazard
Batteries In Emer. Lights	2	EA	V0000	

Client: City Of Mississauga

Location: #14 : Women's Fitness Change Room

Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON

Floor: 1

Building Name: River Grove Community Center

Room #: 1018

Last Re-Assessment: 0000-00-00

Area (sqft): 1100

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	30	EA	V9000	Yes

1 - T5, LED

Client: City Of Mississauga

Location: #14 : Women's Fitness Change Room

Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON

Floor: 1

Building Name: River Grove Community Center

Room #: 1018

Last Re-Assessment: 0000-00-00

Area (sqft): 1100

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - T5

ALL DATA REPORT

Client: City Of Mississauga
Location: #15 : Men's Fitness Change Room
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1021
Last Re-Assessment: 0000-00-00

Area (sqft): 1100

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling ¹		Ceiling Tiles (lay-in), 60x24 grey textured			C	Y						V0000	Non-Asbestos		None	
Ceiling		Drywall and joint compound			C	Y						V0000	Non-Asbestos		None	
Ceiling		Ceramic Tiles, 20x8 white			A	Y						V0000	Non-Asbestos		None	
Ceiling ²		Ceramic Tiles, Very small white squares			A	Y						V0000	Non-Asbestos		None	
Duct		Fibreglass		Foil Face	C	N						V0000	Non-Asbestos		None	
Duct		Not Insulated			C	N						V0000	Non-Asbestos		None	
Duct ³		Mastic, Grey			C	N		50			LF	V0009	None Detected	N.D.	None	
Floor	All	Ceramic Tiles, Very small dark grey squares			B	Y						V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Piping ⁴		Fibreglass		Paper	C	N						V0000	Non-Asbestos		None	
Piping		Not Insulated			C	N						V0000	Non-Asbestos		None	
Structure	All	Fireproofing (Fibrous)			C	N						V0000	Non-Asbestos		None	
Wall ⁵		Masonry			B	Y						V0000	Non-Asbestos		None	
Wall ⁶		Masonry			B	Y						V0000	Non-Asbestos		None	
Wall		Ceramic Tiles, Very small white squares			A	Y						V0000	Non-Asbestos		None	
Wall	All	Ceramic Tiles, 20x8 white			A	Y						V0000	Non-Asbestos		None	
Wall	Expansion Joint	Caulking, Off white			B	Y		100			LF	V0008	None Detected	N.D.	None	

- 1 - Fiberglass
- 2 - Only steam room
- 3 - Approx 8 duct connections
- 4 - D.C.W, D.H.W, heating supply and return, recirc. line
- 5 - Block wall
- 6 - Brick wall

Client: City Of Mississauga
Location: #15 : Men's Fitness Change Room
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1021
Last Re-Assessment: 0000-00-00

Area (sqft): 1100

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description		Amount	Hazard
Wall ¹	Masonry	2000		SF	V0001	White		Pb: <0.00031 %	No

- 1 - Block wall

Client: City Of Mississauga
Location: #15 : Men's Fitness Change Room
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1021
Last Re-Assessment: 0000-00-00

Area (sqft): 1100

PB PRODUCTS				
Component	Quantity	Unit	Sample	Hazard
Batteries In Emer. Lights	2	EA	V0000	

Client: City Of Mississauga

Location: #15 : Men's Fitness Change Room

Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON

Floor: 1

Building Name: River Grove Community Center

Room #: 1021

Last Re-Assessment: 0000-00-00

Area (sqft): 1100

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	30	EA	V9000	Yes

1 - T5, LED

Client: City Of Mississauga

Location: #15 : Men's Fitness Change Room

Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON

Floor: 1

Building Name: River Grove Community Center

Room #: 1021

Last Re-Assessment: 0000-00-00

Area (sqft): 1100

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - T5

ALL DATA REPORT

Client: City Of Mississauga
 Location: #16 : Maintenance
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #: 1037
 Last Re-Assessment: 0000-00-00

Area (sqft): 40

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling ¹	All	Ceiling Tiles (lay-in), 48x24 grey textured			C	Y		40			SF	V0000	Non-Asbestos		None	
Duct	All	Not Insulated			C	N						V0000	Non-Asbestos		None	
Floor	All	Concrete (poured)			B	Y		40			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Piping		Fibreglass		Paper	C	N						V0000	Non-Asbestos		None	
Piping		Not Insulated			C	N						V0000	Non-Asbestos		None	
Structure	All	Fireproofing (Fibrous)			C	N		40			SF	V0000	Non-Asbestos		None	
Wall		Ceramic Tiles			B	Y						V0000	Non-Asbestos		None	
Wall ²	All	Masonry			B	Y						V0000	Non-Asbestos		None	

1 - Fiberglass
 2 - Block wall

Client: City Of Mississauga
 Location: #16 : Maintenance
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #: 1037
 Last Re-Assessment: 0000-00-00

Area (sqft): 40

PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Wall ¹	Masonry	250		SF	V0001	White	Pb: <0.00031 %	No

1 - Block wall

Client: City Of Mississauga
 Location: #16 : Maintenance
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #: 1037
 Last Re-Assessment: 0000-00-00

Area (sqft): 40

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	2	EA	V9000	Yes

1 - T5

Client: City Of Mississauga
 Location: #16 : Maintenance
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #: 1037
 Last Re-Assessment: 0000-00-00

Area (sqft): 40

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - T5

ALL DATA REPORT

Client: City Of Mississauga
Location: #17 : Women's Pool Change Room
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1038
Last Re-Assessment: 0000-00-00

Area (sqft): 1200

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling ¹		Ceiling Tiles (lay-in), 60x24 grey textured			C	Y						V0000	Non-Asbestos		None	
Ceiling ²		Ceiling Tiles (lay-in), 48x24 small fissures and pinholes			C	Y		15			SF	V0000	Non-Asbestos		None	
Ceiling		Ceramic Tiles, 20x8 white			A	Y						V0000	Non-Asbestos		None	
Duct		Not Insulated			C	N						V0000	Non-Asbestos		None	
Duct ³		Mastic, Grey			C	N		50			LF	V0009	None Detected	N.D.	None	
Duct	All	Fibreglass		Foil Face	C	N						V0000	Non-Asbestos		None	
Floor	All	Ceramic Tiles, Very small dark grey squares			A	Y						V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Piping ⁴		Fibreglass		Paper	C	N						V0000	Non-Asbestos		None	
Piping		Not Insulated			C	N						V0000	Non-Asbestos		None	
Structure	All	Fireproofing (Fibrous)			C	N						V0000	Non-Asbestos		None	
Wall ⁵		Masonry			A	Y						V0000	Non-Asbestos		None	
Wall ⁶		Masonry			A	Y						V0000	Non-Asbestos		None	
Wall	All	Ceramic Tiles, 20x8 white and 20x8 teal			A	Y						V0000	Non-Asbestos		None	
Wall	Expansion Joint	Caulking, Off white			A	Y		100			LF	V0008	None Detected	N.D.	None	

1 - Fiberglass, water staining observed

2 - water staining observed

3 - Approx 8 duct connections

4 - D.C.W, D.H.W, heating supply and return, recirc. line

5 - Block wall

6 - Brick wall

Client: City Of Mississauga
Location: #17 : Women's Pool Change Room
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1038
Last Re-Assessment: 0000-00-00

Area (sqft): 1200

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description		Amount	Hazard
Wall ¹	Masonry	800		SF	V0001	White		Pb: <0.00031 %	No

1 - Block wall

Client: City Of Mississauga
Location: #17 : Women's Pool Change Room
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1038
Last Re-Assessment: 0000-00-00

Area (sqft): 1200

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	35	EA	V9000	Yes

1 - T5

Client: City Of Mississauga

Location: #17 : Women's Pool Change Room

Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON

Floor: 1

Building Name: River Grove Community Center

Room #: 1038

Last Re-Assessment: 0000-00-00

Area (sqft): 1200

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - T5

ALL DATA REPORT

Client: City Of Mississauga
Location: #18 : Men's Pool Change Room
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1033
Last Re-Assessment: 0000-00-00

Area (sqft): 1200

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling ¹		Ceiling Tiles (lay-in), 60x24 grey textured			C	Y						V0000	Non-Asbestos		None	
Ceiling ²		Ceiling Tiles (lay-in), 48x24 small fissures and pinholes			C	Y		15			SF	V0000	Non-Asbestos		None	
Ceiling		Ceramic Tiles, 20x8 white			A	Y						V0000	Non-Asbestos		None	
Duct		Not Insulated			C	N						V0000	Non-Asbestos		None	
Duct ³		Mastic, Grey			C	N		50			LF	V0009	None Detected	N.D.	None	
Duct	All	Fibreglass		Foil Face	C	N						V0000	Non-Asbestos		None	
Floor	All	Ceramic Tiles, Very small dark grey squares			A	Y						V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Piping ⁴		Fibreglass		Paper	C	N						V0000	Non-Asbestos		None	
Piping		Not Insulated			C	N						V0000	Non-Asbestos		None	
Structure	All	Fireproofing (Fibrous)			C	N						V0000	Non-Asbestos		None	
Wall ⁵		Masonry			A	Y						V0000	Non-Asbestos		None	
Wall ⁶		Masonry			A	Y						V0000	Non-Asbestos		None	
Wall	All	Ceramic Tiles, 20x8 white and 20x8 teal			A	Y						V0000	Non-Asbestos		None	
Wall	Expansion Joint	Caulking, Off white			A	Y		100			LF	S0008C	None Detected	N.D.	None	

- 1 - Fiberglass, water staining observed
- 2 - water staining observed
- 3 - Approx 8 duct connections
- 4 - D.C.W, D.H.W, heating supply and return, recirc. line
- 5 - Block wall
- 6 - Brick wall

Client: City Of Mississauga
Location: #18 : Men's Pool Change Room
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1033
Last Re-Assessment: 0000-00-00

Area (sqft): 1200

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description		Amount	Hazard
Wall ¹	Masonry	800		SF	V0001	White		Pb: <0.00031 %	No

- 1 - Block wall

Client: City Of Mississauga
Location: #18 : Men's Pool Change Room
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1033
Last Re-Assessment: 0000-00-00

Area (sqft): 1200

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	35	EA	V9000	Yes

1 - T5

Client: City Of Mississauga

Location: #18 : Men's Pool Change Room

Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON

Floor: 1

Building Name: River Grove Community Center

Room #: 1033

Last Re-Assessment: 0000-00-00

Area (sqft): 1200

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - T5

ALL DATA REPORT

Client: City Of Mississauga
Location: #19 : Corridor 2
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1011
Last Re-Assessment: 0000-00-00

Area (sqft): 475

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	Drywall and joint compound			C	Y		475			SF	V0000	Non-Asbestos		None	
Duct	All	None Found														
Floor	All	Ceramic Tiles, 24x12 black			A	Y		475			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Piping		None Found														
Structure	All	None Found														
Wall		Drywall and joint compound			A	Y						V0000	Non-Asbestos		None	
Wall ¹	All	Masonry			A	Y						V0000	Non-Asbestos		None	

1 - Block wall

Client: City Of Mississauga
Location: #19 : Corridor 2
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1011
Last Re-Assessment: 0000-00-00

Area (sqft): 475

PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Wall ¹	Masonry	1000		SF	V0001	White	Pb: <0.00031 %	No
Wall	Drywall and joint compound	150		LF	V0002	White	Pb: 0.00059 %	No

1 - Block wall

Client: City Of Mississauga
Location: #19 : Corridor 2
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1011
Last Re-Assessment: 0000-00-00

Area (sqft): 475

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	10	EA	V9000	Yes

1 - T5

Client: City Of Mississauga
Location: #19 : Corridor 2
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1011
Last Re-Assessment: 0000-00-00

Area (sqft): 475

PCB					
Component	Quantity	Unit	Sample	Sample Description	Amount
Light Ballasts ¹			V0000		No

1 - T5

ALL DATA REPORT

Client: City Of Mississauga
Location: #20 : Squash Courts
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 2100

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	None Found														
Duct	All	None Found														
Floor	All	Laminate			A	Y		2100			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Piping	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Metal			C	N		2100			SF	V0000	Non-Asbestos		None	
Wall ¹	All	Masonry			A	Y						V0000	Non-Asbestos		None	

Ceiling height 26ft
1 - Block wall

Client: City Of Mississauga
Location: #20 : Squash Courts
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 2100

PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Wall ¹	Masonry	2500		SF	V0001	White	Pb: <0.00031 %	No

Ceiling height 26ft
1 - Block wall

Client: City Of Mississauga
Location: #20 : Squash Courts
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 2100

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	120	EA	V9000	Yes

Ceiling height 26ft
1 - T8orT5

Client: City Of Mississauga
Location: #20 : Squash Courts
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 2100

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

Ceiling height 26ft
1 - T8

ALL DATA REPORT

Client: City Of Mississauga
 Location: #21 : Staircase
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 200

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	Drywall and joint compound			C	Y		200			SF	V0000	Non-Asbestos		None	
Duct	All	None Found														
Floor	All	Ceramic Tiles, 24x12 black			A	Y					SF	V0000	Non-Asbestos		None	
Floor	Stairs	Non-slip Flooring			A	Y						V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Piping	All	None Found														
Wall ¹	All	Masonry			A	Y						V0000	Non-Asbestos		None	
Wall	Expansion Joint	Caulking, Off white			B	Y		100			LF	V0008	None Detected	N.D.	None	
Wall ²	Window	Caulking, Off white			A	Y		40			LF	V0008	None Detected	N.D.	None	

Stair A
 1 - Block wall
 2 - Between wall and window frame

Client: City Of Mississauga
 Location: #21 : Staircase
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 200

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall ¹	Masonry	500		SF	V0001	White	Pb: <0.00031 %	No	
Wall ²	Masonry	100		SF	V9500	Teal		Presumed Lead	

Stair A
 1 - Block wall
 2 - Block wall

Client: City Of Mississauga
 Location: #21 : Staircase
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 200

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	6	EA	V9000	Yes

Stair A
 1 - T5

Client: City Of Mississauga
 Location: #21 : Staircase
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 200

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts						No

Stair A

ALL DATA REPORT

Client: City Of Mississauga
 Location: #22 : Staff Offices
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 660

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling ¹		Ceiling Tiles (lay-in), 48x24 grey textured			C	Y						V0000	Non-Asbestos		None	
Duct		Not Insulated			C	N						V0000	Non-Asbestos		None	
Duct	All	Fibreglass		Foil Face	C	N						V0000	Non-Asbestos		None	
Floor	All	Carpet			B	Y						V0000	Non-Asbestos		None	
Floor	Base	Mastic, Yellow		Rubber	B	Y		60			LF	V0011	None Detected	N.D.	None	
Piping		Fibreglass		Paper	C	N						V0000	Non-Asbestos		None	
Piping		Not Insulated			C	N						V0000	Non-Asbestos		None	
Structure	All	Fireproofing (Fibrous)			C	N						V0000	Non-Asbestos		None	

1 - Fiberglass

Client: City Of Mississauga
 Location: #22 : Staff Offices
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 660

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall ¹	Masonry	1000		SF	V0005	Grey	Pb: 0.00027 %	No	
Wall	Drywall and joint compound	500		SF	L0005	Grey	Pb: 0.00027 %	No	

1 - Block wall

Client: City Of Mississauga
 Location: #22 : Staff Offices
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 660

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	20	EA	V9000	Yes

1 - T5

Client: City Of Mississauga
 Location: #22 : Staff Offices
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 660

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - T5

ALL DATA REPORT

Client: City Of Mississauga
 Location: #23 : LAN Room
 Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #: 1009
 Last Re-Assessment: 0000-00-00

Area (sqft): 80

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling ¹		Ceiling Tiles (lay-in), 48x24 grey textured			C	Y						V0000	Non-Asbestos		None	
Duct	All	Fibreglass		Foil Face	C	N						V0000	Non-Asbestos		None	
Floor		Vinyl Floor Tile, 12x12 light beige with grey and light grey specks			B	Y						V0000	Non-Asbestos		None	
Floor	Base	Mastic, Yellow		Rubber	B	Y		30			LF	V0011	None Detected	N.D.	None	
Piping		Fibreglass		Paper	C	N						V0000	Non-Asbestos		None	
Piping		Not Insulated			C	N						V0000	Non-Asbestos		None	
Structure	All	Fireproofing (Fibrous)			C	N						V0000	Non-Asbestos		None	

1 - Fiberglass

Client: City Of Mississauga
 Location: #23 : LAN Room
 Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #: 1009
 Last Re-Assessment: 0000-00-00

Area (sqft): 80

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description		Amount	Hazard
Wall ¹	Masonry	400		SF	V0001	White		Pb: <0.00031 %	No

1 - Block wall

Client: City Of Mississauga
 Location: #23 : LAN Room
 Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #: 1009
 Last Re-Assessment: 0000-00-00

Area (sqft): 80

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	2	EA	V9000	Yes

1 - T5

Client: City Of Mississauga
 Location: #23 : LAN Room
 Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #: 1009
 Last Re-Assessment: 0000-00-00

Area (sqft): 80

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - T5

ALL DATA REPORT

Client: City Of Mississauga
Location: #24 : Supply Room
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 60

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	None Found														
Duct	All	None Found														
Floor	All	Concrete (poured)			B	Y		60			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Piping ¹	All	Fibreglass		Polyvinyl chloride (PVC)	B	Y						V0000	Non-Asbestos		None	
Piping	Rain Water Leader	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Structure	All	Concrete (precast)			C	Y		60			SF	V0000	Non-Asbestos		None	
Wall ²	All	Masonry			B	Y						V0000	Non-Asbestos		None	
Wall ³	Door	Caulking, Off white			B	Y		20			SF	V0008	None Detected	N.D.	None	
Wall	Expansion Joint	Caulking, Off white			B	Y		80			SF	V0008	None Detected	N.D.	None	

- 1 - Heat pump supply and return
2 - Block wall
3 - Between door frame and wall

Client: City Of Mississauga
Location: #24 : Supply Room
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 60

PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Wall ¹	Masonry	300		SF	V0004	Sky blue	Pb: 0.00040 %	No

- 1 - Block wall

Client: City Of Mississauga
Location: #24 : Supply Room
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 60

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	2	EA	V9000	Yes

- 1 - T8

Client: City Of Mississauga
Location: #24 : Supply Room
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 60

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - T8

ALL DATA REPORT

Client: City Of Mississauga
Location: #25 : Staff Storage
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 385

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	None Found														
Duct	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Floor	All	Vinyl Floor Tile, 24x12 light grey with grey specks			A	Y		385			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Piping	Sprinkler	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Concrete (precast)			C	Y		385			SF	V0000	Non-Asbestos		None	
Wall ¹	All	Masonry			A	Y						V0000	Non-Asbestos		None	
Wall ²	Door	Caulking, Off white			B	Y		30			SF	V0008	None Detected	N.D.	None	
Wall	Expansion Joint	Caulking, Off white			B	Y		100			SF	V0008	None Detected	N.D.	None	

- 1 - Block wall
2 - Between door frame and wall

Client: City Of Mississauga
Location: #25 : Staff Storage
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 385

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall ¹	Masonry	800		SF	V0001	White	Pb: <0.00031 %	No	

- 1 - Block wall

Client: City Of Mississauga
Location: #25 : Staff Storage
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 385

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	12	EA	V9000	Yes

- 1 - T8

Client: City Of Mississauga
Location: #25 : Staff Storage
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 385

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

- 1 - T8



ALL DATA REPORT



ALL DATA REPORT

Client: City Of Mississauga
Location: #26 : Maintenance
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 50

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	None Found														
Duct	All	None Found														
Floor	All	Concrete (poured)			B	Y		50			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Piping		Fibreglass		Polyvinyl chloride (PVC)	C	Y						V0000	Non-Asbestos		None	
Piping		Not Insulated			C	N						V0000	Non-Asbestos		None	
Structure	All	Concrete (precast)			C	Y		50			SF	V0000	Non-Asbestos		None	
Wall		Ceramic Tiles			B	Y						V0000	Non-Asbestos		None	
Wall ¹	All	Masonry			B	Y						V0000	Non-Asbestos		None	
Wall ²	Door	Caulking, Off white			B	Y		20			SF	V0008	None Detected	N.D.	None	
Wall	Expansion Joint	Caulking, Off white			B	Y		80			SF	V0008	None Detected	N.D.	None	

- 1 - Block wall
2 - Between door frame and wall

Client: City Of Mississauga
Location: #26 : Maintenance
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 50

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall ¹	Masonry	300		SF	V0001	White	Pb: <0.00031 %	No	

- 1 - Block wall

Client: City Of Mississauga
Location: #26 : Maintenance
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 50

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	2	EA	V9000	Yes

- 1 - T8

Client: City Of Mississauga
Location: #26 : Maintenance
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 50

PCB					
Component	Quantity	Unit	Sample	Sample Description	Amount
Light Ballasts ¹			V0000		No



ALL DATA REPORT



1 - T5

ALL DATA REPORT

Client: City Of Mississauga
Location: #27 : Corridor 3
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 400

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	Ceiling Tiles (lay-in), 48x24 grey textured			C	Y					SF	V0000	Non-Asbestos		None	
Duct ¹		Mastic, Grey			C	N		30			LF	S0009B	None Detected	N.D.	None	
Duct	All	Not Insulated			C	N						V0000	Non-Asbestos		None	
Floor		Ceramic Tiles, 24x12 black	Edge		A	Y		500			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Other ²	Window	Styrofoam, Black			A	Y						V0000	Non-Asbestos		None	
Other ³	Window	Caulking, Black			A	Y		120			LF	S0002B	None Detected	N.D.	None	
Other ⁴	Window	Caulking, Light beige			A	Y		40			LF	V0003	None Detected	N.D.	None	
Piping	Sprinkler	Not Insulated			C	N						V0000	Non-Asbestos		None	
Structure	All	Concrete (precast)			C	N		400			SF	V0000	Non-Asbestos		None	
Wall	All	Drywall and joint compound			A	Y						V0000	Non-Asbestos		None	
Wall ⁵	Window	Caulking, Grey			A	Y		50			LF	S0001B	None Detected	N.D.	None	

- 1 - Approx 5 duct connections
- 2 - Type of foam, between window frame and glass
- 3 - Between door frame and glass
- 4 - Between window frame
- 5 - Between window frame and wall

Client: City Of Mississauga
Location: #27 : Corridor 3
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 400

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall ¹	Masonry	500		SF	V0001	White	Pb: <0.00031 %	No	

- 1 - Block

Client: City Of Mississauga
Location: #27 : Corridor 3
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 400

PB PRODUCTS				
Component	Quantity	Unit	Sample	Hazard
Batteries In Emer. Lights	2	EA	V0000	

Client: City Of Mississauga
Location: #27 : Corridor 3
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 400

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹			V0000	

1 - LED pot lights

Client: City Of Mississauga
Location: #27 : Corridor 3
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00
Area (sqft): 400

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - LED

ALL DATA REPORT

Client: City Of Mississauga
 Location: #28 : Washrooms
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 150

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	Ceiling Tiles (lay-in), 48x24 grey textured			C	Y					SF	V0000	Non-Asbestos		None	
Duct		Fibreglass		Plastic	C	N						V0000	Non-Asbestos		None	
Duct	All	Not Insulated			C	N						V0000	Non-Asbestos		None	
Floor		Ceramic Tiles, 24x12 black	Edge		A	Y		500			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	Unit Heater	Not Insulated			A	Y						V0000	Non-Asbestos		None	
Piping		Fibreglass		Paper	C	N						V0000	Non-Asbestos		None	
Piping	Sprinkler	Not Insulated			C	N						V0000	Non-Asbestos		None	
Structure	All	Concrete (precast)			C	N		150			SF	V0000	Non-Asbestos		None	
Wall	All	Drywall and joint compound			A	Y						V0000	Non-Asbestos		None	

Client: City Of Mississauga
 Location: #28 : Washrooms
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 150

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description		Amount	Hazard
Wall ¹	Masonry	800		SF	V0001	White		Pb: <0.00031 %	No

1 - Block

Client: City Of Mississauga
 Location: #28 : Washrooms
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 150

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹			V0000	

1 - LED pot lights

Client: City Of Mississauga
 Location: #28 : Washrooms
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 150

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - LED

ALL DATA REPORT

Client: City Of Mississauga
Location: #29 : Burt Arts Studio
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1087
Last Re-Assessment: 0000-00-00

Area (sqft): 1500

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling ¹	All	Ceiling Tiles (lay-in), 48x24 grey textured			C	Y					SF	V0000	Non-Asbestos		None	
Ceiling	Bulkhead	Drywall and joint compound			C	Y						V0000	Non-Asbestos		None	
Duct		Fibreglass		Foil Face	C	N						V0000	Non-Asbestos		None	
Duct ²		Mastic, Dark red			C	N		60			LF	V9500	Presumed Asbestos		Presumed Asbestos	NF
Duct ³		Mastic, Grey			C	N		50			LF	V0009	None Detected	N.D.	None	
Duct	All	Not Insulated			C	N						V0000	Non-Asbestos		None	
Floor		Vinyl Floor Tile, 24x12 light grey with grey specks			A	Y						V0000	Non-Asbestos		None	
Mechanical Equipment		None Found														
Other	Skylight				C	Y						V0000	Non-Asbestos		None	
Other ⁴	Window	Caulking, Black			A	Y		100			LF	V0002	None Detected	N.D.	None	
Piping		Fibreglass		Paper	C	N						V0000	Non-Asbestos		None	
Piping	Sprinkler	Not Insulated			C	N						V0000	Non-Asbestos		None	
Structure	All	Concrete (precast)			C	N		1500			SF	V0000	Non-Asbestos		None	
Wall		Drywall and joint compound			C	Y						V0000	Non-Asbestos		None	
Wall	All	Drywall and joint compound			A	Y						V0000	Non-Asbestos		None	
Wall	Base	Mastic, Yellow		Rubber	A	Y		150			LF	S0007C	None Detected	N.D.	None	
Wall ⁵	Door	Caulking, Off white			B	Y		30			SF	V0008	None Detected	N.D.	None	
Wall	Expansion Joint	Caulking, Off white			B	Y		80			SF	V0008	None Detected	N.D.	None	
Wall ⁶	Window	Caulking, Light beige			A	Y		80			LF	V0003	None Detected	N.D.	None	

- 1 - Water staining observed
- 2 - Not accessible with 6ft ladder
- 3 - Approx 8 duct connections
- 4 - Between door frame and glass
- 5 - Between door frame and wall
- 6 - Between window frame and wall

Client: City Of Mississauga
Location: #29 : Burt Arts Studio
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1087
Last Re-Assessment: 0000-00-00

Area (sqft): 1500

PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Wall ¹	Masonry	1200		SF	V0001	White	Pb: <0.00031 %	No

- 1 - Block

Client: City Of Mississauga

Site: 5800 River Grove Ave, Mississauga, ON

Building Name: River Grove Community Center

ALL DATA REPORT

Location: #29 : Burt Arts Studio
Survey Date: 2023-05-23

Floor: 1

Room #: 1087
Last Re-Assessment: 0000-00-00

Area (sqft): 1500

PB PRODUCTS				
Component	Quantity	Unit	Sample	Hazard
Batteries In Emer. Lights			V0000	

Client: City Of Mississauga
Location: #29 : Burt Arts Studio
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1087
Last Re-Assessment: 0000-00-00

Area (sqft): 1500

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	54	EA	V9000	Yes

1 - T5, LED

Client: City Of Mississauga
Location: #29 : Burt Arts Studio
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1087
Last Re-Assessment: 0000-00-00

Area (sqft): 1500

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - T5, LED

ALL DATA REPORT

Client: City Of Mississauga
 Location: #30 : Vestibule
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #: 1084
 Last Re-Assessment: 0000-00-00

Area (sqft): 100

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	Drywall and joint compound			C	Y		100			SF	V0000	Non-Asbestos		None	
Duct	All	None Found														
Floor	All	Ceramic Tiles, 24x12 black			A	Y		100			SF					
Mechanical Equipment	All	None Found														
Piping	All	None Found														
Structure	All	None Found														
Wall ¹	All	Masonry			A	Y						V0000	Non-Asbestos		None	
Wall ²	All	Masonry			A	Y						V0000	Non-Asbestos		None	

- 1 - Brick wall
 2 - Block wall

Client: City Of Mississauga
 Location: #30 : Vestibule
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #: 1084
 Last Re-Assessment: 0000-00-00

Area (sqft): 100

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description		Amount	Hazard
Wall	Masonry				V0001	White		Pb: <0.00031 %	No

Client: City Of Mississauga
 Location: #30 : Vestibule
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #: 1084
 Last Re-Assessment: 0000-00-00

Area (sqft): 100

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	6	EA	V9500	Presumed

- 1 - CFL

Client: City Of Mississauga
 Location: #30 : Vestibule
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #: 1084
 Last Re-Assessment: 0000-00-00

Area (sqft): 100

PCB					
Component	Quantity	Unit	Sample	Sample Description	Amount
Light Ballasts ¹			V0000		No

- 1 - CFL

ALL DATA REPORT

Client: City Of Mississauga
 Location: #31 : Corridor 4
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #: 1104
 Last Re-Assessment: 0000-00-00

Area (sqft): 670

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	None Found						6								
Duct	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Floor	All	Ceramic Tiles, 24x12 black			A	Y		670			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Piping	Sprinkler	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Metal			C	Y		670			SF	V0000	Non-Asbestos		None	
Wall ¹	All	Masonry			A	Y						V0000	Non-Asbestos		None	

1 - Block wall

Client: City Of Mississauga
 Location: #31 : Corridor 4
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #: 1104
 Last Re-Assessment: 0000-00-00

Area (sqft): 670

PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Wall	Masonry	1500		SF	V0001	White	Pb: <0.00031 %	No

Client: City Of Mississauga
 Location: #31 : Corridor 4
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #: 1104
 Last Re-Assessment: 0000-00-00

Area (sqft): 670

PB PRODUCTS				
Component	Quantity	Unit	Sample	Hazard
Batteries In Emer. Lights	2	EA	V0000	

Client: City Of Mississauga
 Location: #31 : Corridor 4
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #: 1104
 Last Re-Assessment: 0000-00-00

Area (sqft): 670

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹			V0000	

1 - LED

Client: City Of Mississauga
 Location: #31 : Corridor 4
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #: 1104
 Last Re-Assessment: 0000-00-00

Area (sqft): 670

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - LED



ALL DATA REPORT



ALL DATA REPORT

Client: City Of Mississauga
 Location: #32 : Kiln And Storage Room
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #: 1092,1091
 Last Re-Assessment: 0000-00-00

Area (sqft): 500

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	None Found														
Duct	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Floor	All	Concrete (poured)			B	Y						V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Mechanical Equipment ¹	Fumehood	Drywall (no compound)			A	Y						V0000	Non-Asbestos		None	
Piping		Fibreglass		Canvas	C	Y						V0000	Non-Asbestos		None	
Piping	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Metal			C	Y						V0000	Non-Asbestos		None	
Wall ²	All	Masonry			B	Y						V0000	Non-Asbestos		None	
Wall ³	Door	Caulking, Off white			B	Y		40			SF	V0008	None Detected	N.D.	None	
Wall	Expansion Joint	Caulking, Off white			B	Y		160			SF	V0008	None Detected	N.D.	None	

In arts studio
 1 - In kiln room
 2 - Block wall
 3 - Between door frame and wall

Client: City Of Mississauga
 Location: #32 : Kiln And Storage Room
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #: 1092,1091
 Last Re-Assessment: 0000-00-00

Area (sqft): 500

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description		Amount	Hazard
Wall ¹	Masonry				V0001	White		Pb: <0.00031 %	No

In arts studio
 1 - Block wall

Client: City Of Mississauga
 Location: #32 : Kiln And Storage Room
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #: 1092,1091
 Last Re-Assessment: 0000-00-00

Area (sqft): 500

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	16	EA	V9000	Yes

In arts studio
 1 - T8

Client: City Of Mississauga
 Location: #32 : Kiln And Storage Room

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #: 1092,1091

Area (sqft): 500

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Quantities shown above are based on visual approximations only and may be subject to variation. Copyright Pinchin Ltd. 2023

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Survey Date: 2023-05-23

Last Re-Assessment: 0000-00-00

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

In arts studio
1 - T8

ALL DATA REPORT

Client: City Of Mississauga
Location: #33 : Operations Office
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 130

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	Ceiling Tiles (lay-in), 48x24 grey textured			C	Y					SF	V0000	Non-Asbestos		None	
Duct		Fibreglass		Plastic	C	N						V0000	Non-Asbestos		None	
Duct		Not Insulated			C	N						V0000	Non-Asbestos		None	
Duct ¹		Mastic, Grey			C	N		30			LF	V0009	None Detected	N.D.	None	
Floor		Carpet			B	Y						V0000	Non-Asbestos		None	
Mechanical Equipment		None Found														
Piping		Fibreglass		Paper	C	N						V0000	Non-Asbestos		None	
Piping	Sprinkler	Not Insulated			C	N						V0000	Non-Asbestos		None	
Structure	All	Concrete (precast)			C	N		130			SF	V0000	Non-Asbestos		None	
Wall	All	Drywall and joint compound			A	Y						V0000	Non-Asbestos		None	
Wall	Base	Mastic, Yellow		Rubber	A	Y		35			LF	V0007	None Detected	N.D.	None	

1 - Approx 5 duct connections

Client: City Of Mississauga
Location: #33 : Operations Office
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 130

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall ¹	Masonry	400		SF	V0001	White	Pb: <0.00031 %	No	

1 - Block

Client: City Of Mississauga
Location: #33 : Operations Office
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 130

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	4	EA	V9000	Yes

1 - T5

Client: City Of Mississauga
Location: #33 : Operations Office
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 130

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - T5

ALL DATA REPORT

Client: City Of Mississauga
Location: #34 : Youth Room
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1100
Last Re-Assessment: 0000-00-00

Area (sqft): 2200

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	Ceiling Tiles (lay-in), 48x24 grey textured			C	Y		200			SF	V0000	Non-Asbestos		None	
Duct	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Floor	All	Vinyl Floor Tile, 24x12 light grey with grey specks			A	Y		2200			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Other ¹	Door	Caulking, Black			A	Y		50			LF	V0002	None Detected	N.D.	None	
Other ²	Window	Caulking, Black			A	Y		130			LF	V0002	None Detected	N.D.	None	
Piping	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Metal			C	Y		2200			SF	V0000	Non-Asbestos		None	
Wall ³	All	Masonry			A	Y						V0000	Non-Asbestos		None	
Wall	Base	Mastic, Yellow		Rubber	A	Y		150			LF	V0007	None Detected	N.D.	None	
Wall	Expansion Joint	Caulking, Off white			A	Y		50			SF	V0008	None Detected	N.D.	None	
Wall ⁴	Window	Caulking, Light beige			A	Y		80			LF	V0003	None Detected	N.D.	None	

- 1 - Between door frame and glass
- 2 - Between door frame and glass
- 3 - Block wall
- 4 - Between window frame and wall

Client: City Of Mississauga
Location: #34 : Youth Room
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1100
Last Re-Assessment: 0000-00-00

Area (sqft): 2200

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description		Amount	Hazard
Wall ¹	Masonry	1200		SF	V0001	White		Pb: <0.00031 %	No

- 1 - Block wall

Client: City Of Mississauga
Location: #34 : Youth Room
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1100
Last Re-Assessment: 0000-00-00

Area (sqft): 2200

PB PRODUCTS				
Component	Quantity	Unit	Sample	Hazard
Batteries In Emer. Lights	2	EA	V0000	

Client: City Of Mississauga
Location: #34 : Youth Room
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1100
Last Re-Assessment: 0000-00-00

Area (sqft): 2200

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹			V0000	

1 - LED

Client: City Of Mississauga
Location: #34 : Youth Room
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1100
Last Re-Assessment: 0000-00-00
Area (sqft): 2200

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - LED

ALL DATA REPORT

Client: City Of Mississauga
Location: #35 : Youth Storage
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 300

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		None Found														
Duct	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Floor	All	Concrete (poured)			B	Y		300			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	Unit Heater	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Other	Electrical Panel	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Piping	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Metal			C	Y		300			SF	V0000	Non-Asbestos		None	
Wall ¹	All	Masonry			B	Y						V0000	Non-Asbestos		None	
Wall ²	Door	Caulking, Off white			B	Y		30			SF	V0008	None Detected	N.D.	None	
Wall	Expansion Joint	Caulking, Off white			B	Y		20			SF	V0008	None Detected	N.D.	None	

In youth room, access to roof
1 - Block wall
2 - Between door frame and wall

Client: City Of Mississauga
Location: #35 : Youth Storage
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 300

PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Wall	Masonry	700		SF	V0001	White	Pb: <0.00031 %	No

In youth room, access to roof

Client: City Of Mississauga
Location: #35 : Youth Storage
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 300

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	10	EA	V9000	Yes

In youth room, access to roof
1 - 4T5, 6T8

Client: City Of Mississauga
Location: #35 : Youth Storage
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 300

PCB					
Component	Quantity	Unit	Sample	Sample Description	Amount
Light Ballasts ¹			V0000		No



ALL DATA REPORT



In youth room, access to roof
1 - T5

ALL DATA REPORT

Client: City Of Mississauga
 Location: #36 : Sprinkler Room
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #: 1090
 Last Re-Assessment: 0000-00-00

Area (sqft): 130

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	None Found														
Duct	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Floor	All	Concrete (poured)			B	Y		130			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	Unit Heater	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Piping		Not Insulated			C	Y						V0000	Non-Asbestos		None	
Piping ¹	All	Fibreglass		Polyvinyl chloride (PVC)	C	Y						V0000	Non-Asbestos		None	
Piping	Rain Water Leader	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Structure	All	Metal			C	Y		130			SF	V0000	Non-Asbestos		None	
Wall ²	All	Masonry			B	Y						V0000	Non-Asbestos		None	

In youth room
 1 - D.C.W
 2 - Block wall

Client: City Of Mississauga
 Location: #36 : Sprinkler Room
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #: 1090
 Last Re-Assessment: 0000-00-00

Area (sqft): 130

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	6	EA	V9000	Yes

In youth room
 1 - T8

Client: City Of Mississauga
 Location: #36 : Sprinkler Room
 Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #: 1090
 Last Re-Assessment: 0000-00-00

Area (sqft): 130

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

In youth room
 1 - T8

ALL DATA REPORT

Client: City Of Mississauga
Location: #37 : Washrooms
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1096, 1097
Last Re-Assessment: 0000-00-00

Area (sqft): 150

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	Ceiling Tiles (lay-in), 48x24 grey textured			C	Y					SF	V0000	Non-Asbestos		None	
Duct		Fibreglass		Foil Face	C	N						V0000	Non-Asbestos		None	
Duct	All	Not Insulated			C	N						V0000	Non-Asbestos		None	
Floor		Ceramic Tiles, 24x12 black	Edge		A	Y		500			SF	V0000	Non-Asbestos		None	
Mechanical Equipment		None Found														
Piping		Fibreglass		Paper	C	N						V0000	Non-Asbestos		None	
Piping	Sprinkler	Not Insulated			C	N						V0000	Non-Asbestos		None	
Structure	All	Concrete (precast)			C	N		150			SF	V0000	Non-Asbestos		None	
Wall	All	Drywall and joint compound			A	Y						V0000	Non-Asbestos		None	

In youth room

Client: City Of Mississauga
Location: #37 : Washrooms
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1096, 1097
Last Re-Assessment: 0000-00-00

Area (sqft): 150

PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Wall ¹	Masonry	800		SF	V0001	White	Pb: <0.00031 %	No

In youth room

1 - Block

Client: City Of Mississauga
Location: #37 : Washrooms
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1096, 1097
Last Re-Assessment: 0000-00-00

Area (sqft): 150

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	8	EA	V9500	Presumed

In youth room

1 - T8

Client: City Of Mississauga
Location: #37 : Washrooms
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1096, 1097
Last Re-Assessment: 0000-00-00

Area (sqft): 150

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

In youth room

1 - T8



ALL DATA REPORT



ALL DATA REPORT

Client: City Of Mississauga
Location: #38 : Seniors Room
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1102
Last Re-Assessment: 0000-00-00

Area (sqft): 2100

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		None Found														
Duct ¹		Mastic, Dark red			C	N		40			LF	S0010A	None Detected	N.D.	None	
Duct ²		Mastic, Grey			C	N		50			LF	V0009	None Detected	N.D.	None	
Duct	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Floor	All	Concrete (poured)			B	Y		2100			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	Unit Heater	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Other	Electrical Panel	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Other ³	Window	Caulking, Black			A	Y		250			LF	V0002	None Detected	N.D.	None	
Piping		Fibreglass		Paper	C	N						V0000	Non-Asbestos		None	
Piping	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Metal			C	Y		2100			SF	V0000	Non-Asbestos		None	
Wall ⁴	All	Masonry			B	Y						V0000	Non-Asbestos		None	
Wall ⁵	Door	Caulking, Off white			B	Y		30			SF	V0008	None Detected	N.D.	None	
Wall	Expansion Joint	Caulking, Off white			B	Y		20			SF	V0008	None Detected	N.D.	None	
Wall	Expansion Joint	Caulking, Off white			B	Y		50			SF	V0008	None Detected	N.D.	None	
Wall ⁶	Window	Caulking, Light beige			A	Y		120			LF	V0003	None Detected	N.D.	None	

Ceiling height 11ft

- 1 - Accessible in kitchen area, 8 duct connections
- 2 - Approx 8 duct connections
- 3 - Between door frame and glass
- 4 - Block wall
- 5 - Between door frame and wall
- 6 - Between window frame and wall

Client: City Of Mississauga
Location: #38 : Seniors Room
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1102
Last Re-Assessment: 0000-00-00

Area (sqft): 2100

PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Wall	Masonry	700		SF	V0001	White	Pb: <0.00031 %	No

Ceiling height 11ft

Client: City Of Mississauga
Location: #38 : Seniors Room
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1102
Last Re-Assessment: 0000-00-00

Area (sqft): 2100

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	10	EA	V9000	Yes

Ceiling height 11ft
1 - 4T5, 6T8

Client: City Of Mississauga
Location: #38 : Seniors Room
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1102
Last Re-Assessment: 0000-00-00

Area (sqft): 2100

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

Ceiling height 11ft
1 - T5

ALL DATA REPORT

Client: City Of Mississauga
Location: #39 : Senior Storage
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 200

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		None Found														
Duct	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Floor	All	Concrete (poured)			B	Y		200			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	Unit Heater	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Other	Electrical Panel	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Piping	All	Fibreglass		Polyvinyl chloride (PVC)	C	Y						V0000	Non-Asbestos		None	
Piping	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Metal			C	Y		200			SF	V0000	Non-Asbestos		None	
Wall ¹	All	Masonry			B	Y						V0000	Non-Asbestos		None	
Wall	Base	Mastic, Yellow		Rubber	A	Y		50			LF	V0007	None Detected	N.D.	None	
Wall ²	Door	Caulking, Off white			B	Y		20			SF	V0008	None Detected	N.D.	None	

In senior room
1 - Block wall
2 - Between door frame and wall

Client: City Of Mississauga
Location: #39 : Senior Storage
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 200

PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Wall	Masonry	700		SF	V0001	White	Pb: <0.00031 %	No

In senior room

Client: City Of Mississauga
Location: #39 : Senior Storage
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 200

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	10	EA	V9000	Yes

In senior room
1 - 4T5, 6T8

Client: City Of Mississauga
Location: #39 : Senior Storage
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 200

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

In senior room

1 - T5

ALL DATA REPORT

Client: City Of Mississauga
Location: #40 : Rear Vestibule
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1107
Last Re-Assessment: 0000-00-00

Area (sqft): 70

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	None Found									SF					
Duct	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Floor	All	Ceramic Tiles, 24x12 black			A	Y		70			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	Unit Heater	Not Insulated			A	Y						V0000	Non-Asbestos		None	
Other ¹	Window	Caulking, Black			A	Y		80			LF	V0004	None Detected	N.D.	None	
Piping	All	Fibreglass		Paper	C	Y						V0000	Non-Asbestos		None	
Piping	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Metal			C	Y		70			SF	V0000	Non-Asbestos		None	
Wall ²	All	Masonry			A	Y						V0000	Non-Asbestos		None	
Wall ³	Window	Caulking, Off white			A	Y		70			SF	V0008	None Detected	N.D.	None	

- 1 - between window frame and glass
2 - Block wall
3 - Between wall and window frame

Client: City Of Mississauga
Location: #40 : Rear Vestibule
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1107
Last Re-Assessment: 0000-00-00

Area (sqft): 70

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description		Amount	Hazard
Wall	Masonry	350		SF	V0001	White		Pb: <0.00031 %	No

Client: City Of Mississauga
Location: #40 : Rear Vestibule
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1107
Last Re-Assessment: 0000-00-00

Area (sqft): 70

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹			V0000	

- 1 - LED

Client: City Of Mississauga
Location: #40 : Rear Vestibule
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #: 1107
Last Re-Assessment: 0000-00-00

Area (sqft): 70

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

- 1 - LED

ALL DATA REPORT

Client: City Of Mississauga
Location: #41 : Basement Corridor
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B004
Last Re-Assessment: 0000-00-00

Area (sqft): 200

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	None Found														
Duct ¹		Mastic, Dark red			C	Y		40			LF	V0010	None Detected	N.D.	None	
Duct	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Floor	All	Concrete (poured)			B	Y		200			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Piping	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Concrete (precast)			C	Y		200			SF	V0000	Non-Asbestos		None	
Wall	All	Concrete (poured)			B	Y						V0000	Non-Asbestos		None	

1 - 8 duct connections

Client: City Of Mississauga
Location: #41 : Basement Corridor
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B004
Last Re-Assessment: 0000-00-00

Area (sqft): 200

PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Wall	Concrete (poured)	500		SF	V0001	White	Pb: <0.00031 %	No

Client: City Of Mississauga
Location: #41 : Basement Corridor
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B004
Last Re-Assessment: 0000-00-00

Area (sqft): 200

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	10	EA	V9000	Yes

1 - T8

Client: City Of Mississauga
Location: #41 : Basement Corridor
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B004
Last Re-Assessment: 0000-00-00

Area (sqft): 200

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - T8

ALL DATA REPORT

Client: City Of Mississauga
Location: #42 : Elevator Room
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B007
Last Re-Assessment: 0000-00-00

Area (sqft): 40

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	None Found														
Duct ¹		Mastic, Dark red			C	Y		15			LF	V0010	None Detected	N.D.	None	
Duct	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Floor	All	Concrete (poured)			B	Y		40			SF	V0000	Non-Asbestos		None	
Mechanical Equipment ₂	Generator Unit	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Piping	Sprinkler	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Concrete (precast)			C	Y		40			SF	V0000	Non-Asbestos		None	
Structure ³	Column				B	Y						V0000	Non-Asbestos		None	
Wall	All	Concrete (poured)			B	Y						V0000	Non-Asbestos		None	

- 1 - 3 duct connections
2 - Hydraulic Elevator machine
3 - Drywall joint compound

Client: City Of Mississauga
Location: #42 : Elevator Room
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B007
Last Re-Assessment: 0000-00-00

Area (sqft): 40

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	2	EA	V9000	Yes

- 1 - T8

Client: City Of Mississauga
Location: #42 : Elevator Room
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B007
Last Re-Assessment: 0000-00-00

Area (sqft): 40

PCB					
Component	Quantity	Unit	Sample	Sample Description	Amount
Light Ballasts ¹			V0000		No

- 1 - T8

ALL DATA REPORT

Client: City Of Mississauga
Location: #43 : Storage
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B001
Last Re-Assessment: 0000-00-00

Area (sqft): 430

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	None Found														
Duct ¹		Mastic, Dark red			C	Y		10			LF	V0010	None Detected	N.D.	None	
Duct	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Floor	All	Concrete (poured)			B	Y		430			SF	V0000	Non-Asbestos		None	
Mechanical Equipment		None Found														
Piping	Rain Water Leader	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Piping	Sprinkler	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Concrete (precast)			C	Y		430			SF	V0000	Non-Asbestos		None	
Wall	All	Concrete (poured)			B	Y						V0000	Non-Asbestos		None	

1 - 2 duct connections

Client: City Of Mississauga
Location: #43 : Storage
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B001
Last Re-Assessment: 0000-00-00

Area (sqft): 430

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	12	EA	V9000	Yes

1 - T8

Client: City Of Mississauga
Location: #43 : Storage
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B001
Last Re-Assessment: 0000-00-00

Area (sqft): 430

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - T8

ALL DATA REPORT

Client: City Of Mississauga
Location: #44 : Filtration Room
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B005
Last Re-Assessment: 0000-00-00

Area (sqft): 1300

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	None Found														
Duct ¹		Mastic, Dark red			C	Y		180			LF	S0010B	None Detected	N.D.	None	
Duct		Mastic, Dark red			C	Y					LF	V0010	None Detected	N.D.	None	
Duct	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Duct	Duct Connector	Textile			C	Y		2			EA	V0000	Non-Asbestos		None	
Floor	All	Concrete (poured)			B	Y		1300			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	Filters	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Mechanical Equipment	Pump	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Other	Electrical Panel	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Piping		Fibreglass		Paper	B	Y						V0000	Non-Asbestos		None	
Piping		Polyvinyl chloride (PVC)			C	Y						V0000	Non-Asbestos		None	
Piping	Rain Water Leader	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Piping	Sprinkler	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Concrete (precast)			C	Y		1300			SF	V0000	Non-Asbestos		None	
Wall	All	Concrete (poured)			B	Y						V0000	Non-Asbestos		None	

1 - 40 duct connections

Client: City Of Mississauga
Location: #44 : Filtration Room
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B005
Last Re-Assessment: 0000-00-00

Area (sqft): 1300

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	24	EA	V9000	Yes

1 - 24T8, LED

Client: City Of Mississauga
Location: #44 : Filtration Room
Survey Date: 2023-05-23

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B005
Last Re-Assessment: 0000-00-00

Area (sqft): 1300

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No
Transformer			V0000			No

1 - T8

ALL DATA REPORT

Client: City Of Mississauga
Location: #45 : Tunnel
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B006
Last Re-Assessment: 0000-00-00

Area (sqft): 2200

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	None Found														
Duct		Fibreglass		Foil Face	B	Y						V0000	Non-Asbestos		None	
Duct ¹		Mastic, Dark red			B	Y		150			LF	S0010C	None Detected	N.D.	None	
Duct	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Duct	Duct Connector	Textile			B	Y		2			EA	V0000	Non-Asbestos		None	
Floor	All	Concrete (poured)			B	Y		1300			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	Filters	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Mechanical Equipment	Pump	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Piping		Fibreglass		Paper	B	Y						V0000	Non-Asbestos		None	
Piping		Polyvinyl chloride (PVC)			C	Y						V0000	Non-Asbestos		None	
Piping	Sprinkler	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Concrete (precast)			C	Y		1300			SF	V0000	Non-Asbestos		None	
Wall	All	Concrete (poured)			B	Y						V0000	Non-Asbestos		None	

Partly accessible due to has low height
1 - 30 duct connections

Client: City Of Mississauga
Location: #45 : Tunnel
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B006
Last Re-Assessment: 0000-00-00

Area (sqft): 2200

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	2	EA	V9000	Yes

Partly accessible due to has low height
1 - 2T8, LED

Client: City Of Mississauga
Location: #45 : Tunnel
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B006
Last Re-Assessment: 0000-00-00

Area (sqft): 2200

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

Partly accessible due to has low height
1 - T8,LED

ALL DATA REPORT

Client: City Of Mississauga
Location: #46 : Staircase No. 3
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B003
Last Re-Assessment: 0000-00-00

Area (sqft): 100

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		None Found														
Duct	All	None Found														
Floor		Non-slip Flooring			A	Y						V0000	Non-Asbestos		None	
Floor	All	Ceramic Tiles, 24x12 black			A	Y					SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Piping	All	None Found														
Structure ¹	Stairs	Metal			C	Y						V0000	Non-Asbestos		None	
Wall		Concrete (poured)			A	Y						V0000	Non-Asbestos		None	
Wall ²	All	Masonry			A	Y						V0000	Non-Asbestos		None	
Wall	Base	Mastic, Yellow			A	Y		20			LF	V0007	None Detected	N.D.	None	

- 1 - Underneath staircase
2 - Block wall

Client: City Of Mississauga
Location: #46 : Staircase No. 3
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B003
Last Re-Assessment: 0000-00-00

Area (sqft): 100

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall ¹	Masonry	250		SF	V0001	White	Pb: <0.00031 %	No	
Wall	Concrete (poured)	500		SF	L0006	White	Pb: <0.00010 %	No	

- 1 - Block wall

Client: City Of Mississauga
Location: #46 : Staircase No. 3
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B003
Last Re-Assessment: 0000-00-00

Area (sqft): 100

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	6	EA	V9000	Yes

- 1 - T5

Client: City Of Mississauga
Location: #46 : Staircase No. 3
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: B

Building Name: River Grove Community Center
Room #: B003
Last Re-Assessment: 0000-00-00

Area (sqft): 100

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts						No

ALL DATA REPORT

Client: City Of Mississauga
Location: #47 : Upper Lobby
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #: 2006
Last Re-Assessment: 0000-00-00

Area (sqft): 700

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		Ceiling Tiles (lay-in), 60x24 grey textured			C	Y						V0000	Non-Asbestos		None	
Ceiling		Drywall and joint compound			C	Y					SF	V0000	Non-Asbestos		None	
Duct		Fibreglass		Foil Face	C	N						V0000	Non-Asbestos		None	
Floor	All	Ceramic Tiles, 24x12 white			A	Y		700			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Other ¹	Skylight	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Piping		Fibreglass		Paper	C	N						V0000	Non-Asbestos		None	
Piping		Not Insulated			C	N						V0000	Non-Asbestos		None	
Structure	All	Metal			C	N		700			SF	V0000	Non-Asbestos		None	
Wall ²		Cement Product			C	N		300			SF	V0010	None Detected	N.D.	None	
Wall ³		Cement Product			C	N					SF	V0000	Non-Asbestos		None	
Wall		Ceramic Tiles, 20x8 white			A	Y						V0000	Non-Asbestos		None	
Wall ⁴	All	Masonry			A	Y						V0000	Non-Asbestos		None	
Wall ⁵	Window	Caulking, Grey			A	Y		80			LF	V0001	None Detected	N.D.	None	

- 1 - Glass
- 2 - Cement board, dated 01/10/14, contains silica
- 3 - Cement board
- 4 - Block wall
- 5 - Between window frame and wall

Client: City Of Mississauga
Location: #47 : Upper Lobby
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #: 2006
Last Re-Assessment: 0000-00-00

Area (sqft): 700

PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Wall	Masonry				V0001	White	Pb: <0.00031 %	No
Wall	Drywall and joint compound				V0002	White	Pb: 0.00059 %	No

Client: City Of Mississauga
Location: #47 : Upper Lobby
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #: 2006
Last Re-Assessment: 0000-00-00

Area (sqft): 700

PB PRODUCTS				
Component	Quantity	Unit	Sample	Hazard
Batteries In Emer. Lights	4	EA	V0000	

Client: City Of Mississauga
Location: #47 : Upper Lobby
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #: 2006
Last Re-Assessment: 0000-00-00

Area (sqft): 700

ALL DATA REPORT

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	8	EA	V9000	Yes
Thermostat	2	EA	V0000	

1 - 8T5, LED

Client: City Of Mississauga
Location: #47 : Upper Lobby
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #: 2006
Last Re-Assessment: 0000-00-00

Area (sqft): 700

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - T5, LED

ALL DATA REPORT

Client: City Of Mississauga
Location: #48 : Program Room
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #: 2023
Last Re-Assessment: 0000-00-00

Area (sqft): 700

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling ¹		Ceiling Tiles (lay-in), 60x24 grey textured			C	Y						V0000	Non-Asbestos		None	
Duct		Fibreglass		Foil Face	C	N						V0000	Non-Asbestos		None	
Floor		Non-slip Flooring			A	Y						V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Other ²	Door	Caulking, Black			A	Y		40			LF	S0002C	None Detected	N.D.	None	
Other ³	Window	Caulking, Black			A	Y		200			LF	S0004C	None Detected	N.D.	None	
Piping		Fibreglass		Paper	C	N						V0000	Non-Asbestos		None	
Piping		Not Insulated			C	N						V0000	Non-Asbestos		None	
Structure	All	Metal			C	N		700			SF	V0000	Non-Asbestos		None	
Wall		Drywall and joint compound			A	Y						V0000	Non-Asbestos		None	
Wall ⁴	All	Masonry			A	Y						V0000	Non-Asbestos		None	
Wall	Base	Mastic, Light yellow		Rubber	A	Y		30			LF	S0011A	None Detected	N.D.	None	
Wall ⁵	Window	Caulking, Grey			A	Y		120			LF	S0001C	None Detected	N.D.	None	
Wall ⁶	Window	Caulking, Light beige	Base		A	Y		70			LF	V0003	None Detected	N.D.	None	

- 1 - Fiberglass
- 2 - Between door frame and glass
- 3 - between window frame and glass
- 4 - Block wall
- 5 - Between window frame and wall
- 6 - Between window frame and floor

Client: City Of Mississauga
Location: #48 : Program Room
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #: 2023
Last Re-Assessment: 0000-00-00

Area (sqft): 700

PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Wall	Masonry				V0001	White	Pb: <0.00031 %	No
Wall	Drywall and joint compound				V0002	White	Pb: 0.00059 %	No

Client: City Of Mississauga
Location: #48 : Program Room
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #: 2023
Last Re-Assessment: 0000-00-00

Area (sqft): 700

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	14	EA	V9000	Yes

1 - T5

ALL DATA REPORT

Client: City Of Mississauga
Location: #48 : Program Room
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #: 2023
Last Re-Assessment: 0000-00-00

Area (sqft): 700

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - T5

ALL DATA REPORT

Client: City Of Mississauga
Location: #49 : Universal Washrooms
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 170

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling ¹	All	Ceiling Tiles (lay-in), 48x24 grey textured			C	Y					SF	V0000	Non-Asbestos		None	
Duct		Fibreglass		Foil Face	C	N						V0000	Non-Asbestos		None	
Duct	All	Not Insulated			C	N						V0000	Non-Asbestos		None	
Floor		Ceramic Tiles, 24x12 black	Edge		A	Y		500			SF	V0000	Non-Asbestos		None	
Mechanical Equipment		None Found														
Piping		Fibreglass		Paper	C	N						V0000	Non-Asbestos		None	
Piping	Sprinkler	Not Insulated			C	N						V0000	Non-Asbestos		None	
Structure	All	Metal			C	N		170			SF	V0000	Non-Asbestos		None	
Wall ²		Cement Product			C	N		300			SF	V0000	Non-Asbestos		None	
Wall		Ceramic Tiles, 20x8 white			A	Y						V0000	Non-Asbestos		None	

1 - Fiberglass

2 - Cement board, dated 01/10/14, contains silica

Client: City Of Mississauga
Location: #49 : Universal Washrooms
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 170

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	6	EA	V9500	Presumed

1 - 6T5, LED

Client: City Of Mississauga
Location: #49 : Universal Washrooms
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 170

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - T5, LED

ALL DATA REPORT

Client: City Of Mississauga
Location: #50 : Fitness Center
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #: 2017
Last Re-Assessment: 0000-00-00

Area (sqft): 5500

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling ¹		Ceiling Tiles (lay-in), 48x24 grey textured			C	Y						V0000	Non-Asbestos		None	
Ceiling ²		Drywall and joint compound			C	Y		100			SF	V0000	Non-Asbestos		None	
Duct	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Floor ³		Carpet			B	Y		120			SF	V0000	Non-Asbestos		None	
Floor		Non-slip Flooring			B	Y						V0000	Non-Asbestos		None	
Mechanical Equipment	Unit Heater	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Other ⁴	Door	Caulking, Black			A	Y		40			LF	V0002	None Detected	N.D.	None	
Other ⁵	Window	Styrofoam, Black			A	Y						V0000	Non-Asbestos		None	
Other ⁶	Window	Caulking, Black			A	Y		120			LF	V0002	None Detected	N.D.	None	
Piping	All	Fibreglass		Polyvinyl chloride (PVC)	C	Y						V0000	Non-Asbestos		None	
Piping	Sprinkler	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Metal			C	Y		5500			SF	V0000	Non-Asbestos		None	
Wall		Ceramic Tiles, 20x8 white			A	Y						V0000	Non-Asbestos		None	
Wall	All	Drywall and joint compound			B	Y						V0000	Non-Asbestos		None	
Wall	Base	Mastic, Light yellow		Rubber	A	Y		150			LF	S0011C	None Detected	N.D.	None	
Wall	Expansion Joint	Caulking, Light beige			A	Y		30			LF	V0003	None Detected	N.D.	None	
Wall ⁷	Window	Caulking, Grey			A	Y		80			LF	V0001	None Detected	N.D.	None	
Wall ⁸	Window	Caulking, Off white			A	Y		200			LF	V0008	None Detected	N.D.	None	
Wall ⁹	Window	Caulking			A	Y		120			SF	S0003C	None Detected	N.D.	None	

- 1 - Fiberglass
- 2 - Washrooms Corridor
- 3 - In supervisor and fitness trainer office only
- 4 - Between door frame and glass
- 5 - Type of foam, between window frame and glass
- 6 - Between window frame and glass
- 7 - Between window frame and floor
- 8 - Between window frame and wall
- 9 - Between wall and window frame

Client: City Of Mississauga
Location: #50 : Fitness Center
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #: 2017
Last Re-Assessment: 0000-00-00

Area (sqft): 5500

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Drywall and joint compound	150		SF	V0007	Black	Pb: <0.00019 %	No	

ALL DATA REPORT

PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Wall	Drywall and joint compound	2500		SF	V0002	White	Pb: 0.00059 %	No
Wall	Drywall and joint compound	200		SF	L0008	Teal	Pb: <0.00024 %	No
Wall ¹	Masonry	350		SF	V0008	Teal	Pb: <0.00024 %	No

1 - Block wall

Client: City Of Mississauga
Location: #50 : Fitness Center
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #: 2017
Last Re-Assessment: 0000-00-00
Area (sqft): 5500

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	90	EA	V9000	Yes

1 - T5

Client: City Of Mississauga
Location: #50 : Fitness Center
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #: 2017
Last Re-Assessment: 0000-00-00
Area (sqft): 5500

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - T5

ALL DATA REPORT

Client: City Of Mississauga
Location: #51 : Fitness Studio
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #: 2008
Last Re-Assessment: 0000-00-00

Area (sqft): 2100

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	Drywall and joint compound			C	Y		150			SF					
Duct	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Floor	All	Laminate			B	Y					SF	V0000	Non-Asbestos		None	
Mechanical Equipment	Unit Heater	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Other ¹	Door	Caulking, Black			A	Y		40			LF	V0002	None Detected	N.D.	None	
Other ²	Window	Styrofoam, Black			A	Y						V0000	Non-Asbestos		None	
Piping	All	Fibreglass		Polyvinyl chloride (PVC)	C	Y						V0000	Non-Asbestos		None	
Piping	Sprinkler	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Metal			C	Y		2100			SF	V0000	Non-Asbestos		None	
Wall	All	Drywall and joint compound			B	Y						V0000	Non-Asbestos		None	
Wall	Base	Mastic, Light yellow		Rubber	A	Y		110			LF	S0011B	None Detected	N.D.	None	
Wall ³	Window	Caulking, Grey			A	Y		80			LF	V0001	None Detected	N.D.	None	

- 1 - Between door frame and glass
2 - Type of foam, between window frame and glass
3 - Between window frame and floor

Client: City Of Mississauga
Location: #51 : Fitness Studio
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #: 2008
Last Re-Assessment: 0000-00-00

Area (sqft): 2100

PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Wall	Drywall and joint compound	600		SF	L0007	Black	Pb: <0.00019 %	No
Wall	Drywall and joint compound	1500		SF	V0002	White	Pb: 0.00059 %	No

Client: City Of Mississauga
Location: #51 : Fitness Studio
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #: 2008
Last Re-Assessment: 0000-00-00

Area (sqft): 2100

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	35	EA	V9000	Yes

- 1 - T5

Client: City Of Mississauga
Location: #51 : Fitness Studio
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #: 2008
Last Re-Assessment: 0000-00-00

Area (sqft): 2100

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - T5

ALL DATA REPORT

Client: City Of Mississauga
Location: #52 : Janitor
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 130

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	Bulkhead	Drywall and joint compound			C	Y						V0000	Non-Asbestos		None	
Duct ¹		Mastic, Grey			C	Y		30			LF	S0009C	None Detected	N.D.	None	
Duct	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Floor	All	Concrete (poured)			B	Y		130			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Piping		Fibreglass		Polyvinyl chloride (PVC)	C	Y						V0000	Non-Asbestos		None	
Piping		Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Metal			C	Y		130			SF	V0000	Non-Asbestos		None	
Wall		Ceramic Tiles, 20x8 yellow			B	Y						V0000	Non-Asbestos		None	
Wall	All	Drywall and joint compound			B	Y						V0000	Non-Asbestos		None	

1 - 6 duct connections

Client: City Of Mississauga
Location: #52 : Janitor
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 130

PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Wall	Drywall and joint compound	500		SF	V0002	White	Pb: 0.00059 %	No

Client: City Of Mississauga
Location: #52 : Janitor
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 130

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	4	EA	V9000	Yes

1 - T5

Client: City Of Mississauga
Location: #52 : Janitor
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 130

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - T5

ALL DATA REPORT

Client: City Of Mississauga
 Location: #53 : Electrical Room
 Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 2

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 140

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	Bulkhead	Drywall and joint compound			C	Y						V0000	Non-Asbestos		None	
Duct		Fibreglass		Canvas	C	Y						V0000	Non-Asbestos		None	
Duct	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Floor	All	Concrete (poured)			B	Y		140			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Other	Electrical Panel	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Piping		Fibreglass		Polyvinyl chloride (PVC)	C	Y						V0000	Non-Asbestos		None	
Piping		Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Metal			C	Y		140			SF	V0000	Non-Asbestos		None	
Wall	All	Drywall and joint compound			B	Y						V0000	Non-Asbestos		None	

Client: City Of Mississauga
 Location: #53 : Electrical Room
 Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 2

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 140

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description		Amount	Hazard
Wall	Drywall and joint compound	650		SF	V0002	White		Pb: 0.00059 %	No

Client: City Of Mississauga
 Location: #53 : Electrical Room
 Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 2

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 140

PB PRODUCTS				
Component	Quantity	Unit	Sample	Hazard
Batteries In Emer. Lights	1	EA	V0000	

Client: City Of Mississauga
 Location: #53 : Electrical Room
 Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 2

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 140

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	4	EA	V9000	Yes

1 - T5

Client: City Of Mississauga
 Location: #53 : Electrical Room
 Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 2

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 140

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No
Transformer			V0000			No

1 - T5

ALL DATA REPORT

Client: City Of Mississauga
 Location: #54 : Fitness Washrooms
 Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 2

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 400

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling ¹	All	Ceiling Tiles (lay-in), 48x24 grey textured			C	Y					SF	V0000	Non-Asbestos		None	
Duct		Fibreglass		Foil Face	C	N						V0000	Non-Asbestos		None	
Duct	All	Not Insulated			C	N						V0000	Non-Asbestos		None	
Floor		Ceramic Tiles, 24x12 black	Edge		A	Y		500			SF	V0000	Non-Asbestos		None	
Mechanical Equipment		None Found														
Piping		Fibreglass		Paper	C	N						V0000	Non-Asbestos		None	
Piping	Sprinkler	Not Insulated			C	N						V0000	Non-Asbestos		None	
Structure	All	Metal			C	N		400			SF	V0000	Non-Asbestos		None	
Wall ²		Cement Product			C	N		300			SF	V0000	Non-Asbestos		None	
Wall		Ceramic Tiles, 20x8 white and 20x8 teal			A	Y						V0000	Non-Asbestos		None	

1 - Fiberglass

2 - Cement board, dated 01/10/14, contains silica

Client: City Of Mississauga
 Location: #54 : Fitness Washrooms
 Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 2

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 400

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	12	EA	V9500	Presumed
Thermostat	2	EA	V0000	

1 - 12T5, LED

Client: City Of Mississauga
 Location: #54 : Fitness Washrooms
 Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 2

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 400

PCB					
Component	Quantity	Unit	Sample	Sample Description	Amount
Light Ballasts ¹			V0000		No

1 - T5, LED

ALL DATA REPORT

Client: City Of Mississauga
Location: #55 : Mechanical Room 2
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #: 2027
Last Re-Assessment: 0000-00-00

Area (sqft): 2500

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	None Found														
Duct		Not Insulated			C	Y						V0000	Non-Asbestos		None	
Duct ¹		Mastic, Grey			C	Y		50			LF	V0009	None Detected	N.D.	None	
Duct	Duct Connector	Textile			C	Y		2			EA	V0000	Non-Asbestos		None	
Floor	All	Concrete (poured)			B	Y		2500			SF	V0000	Non-Asbestos		None	
Mechanical Equipment		Not Insulated			B	Y						V0000	Non-Asbestos		None	
Mechanical Equipment	Air Handling Unit	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Mechanical Equipment	Boiler	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Mechanical Equipment	Pump	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Mechanical Equipment ₂	Tank	Fibreglass		Plastic	B	Y						V0000	Non-Asbestos		None	
Other	Electrical Panel	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Piping		Fibreglass		Polyvinyl chloride (PVC)	C	Y						V0000	Non-Asbestos		None	
Piping	Sprinkler	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Metal			C	Y		2500			SF	V0000	Non-Asbestos		None	
Structure	Stairs	Concrete (poured)			B	Y						V0000	Non-Asbestos		None	
Wall		Concrete (poured)			B	Y						V0000	Non-Asbestos		None	
Wall	All	Drywall and joint compound			B	Y						V0000	Non-Asbestos		None	

Staircase leading to level 1 present inside

1 - 5 duct connections

2 - Storage tank

Client: City Of Mississauga
Location: #55 : Mechanical Room 2
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #: 2027
Last Re-Assessment: 0000-00-00

Area (sqft): 2500

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Drywall and joint compound	400		SF	V0002	White	Pb: 0.00059 %	No	
Wall	Concrete (poured)	700		SF	V0006	White	Pb: <0.00010 %	No	
Wall	Drywall and joint compound	200		SF	V0004	Sky blue	Pb: 0.00040 %	No	
Duct	Metal	500		SF	V0004	Sky blue	Pb: 0.00040 %	No	
Floor	Concrete (poured)	2500		SF	L0009	Light grey	Pb: 0.0017 %	No	

ALL DATA REPORT

Staircase leading to level 1 present inside

Client: City Of Mississauga
Location: #55 : Mechanical Room 2
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #: 2027
Last Re-Assessment: 0000-00-00

Area (sqft): 2500

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	36	EA	V9000	Yes
Thermostat	1	EA	V0000	

Staircase leading to level 1 present inside
1 - T8

Client: City Of Mississauga
Location: #55 : Mechanical Room 2
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #: 2027
Last Re-Assessment: 0000-00-00

Area (sqft): 2500

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No
Transformer			V0000			No

Staircase leading to level 1 present inside
1 - T8

ALL DATA REPORT

Client: City Of Mississauga
Location: #56 : Staff Storage
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 100

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Duct		None Found														
Floor	All	Concrete (poured)			B	Y		100			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Piping	Sprinkler	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Metal			C	Y		100			SF	V0000	Non-Asbestos		None	
Wall ¹		Masonry			B	Y						V0000	Non-Asbestos		None	
Wall	All	Drywall and joint compound			B	Y						V0000	Non-Asbestos		None	

1 - Block wall

Client: City Of Mississauga
Location: #56 : Staff Storage
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 100

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description		Amount	Hazard
Wall	Drywall and joint compound	150		SF	V0002	White		Pb: 0.00059 %	No
Wall	Masonry	200		SF	V0001	White		Pb: <0.00031 %	No

Client: City Of Mississauga
Location: #56 : Staff Storage
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 100

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	2	EA	V9000	Yes

1 - T5

Client: City Of Mississauga
Location: #56 : Staff Storage
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 100

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - T5

ALL DATA REPORT

Client: City Of Mississauga
Location: #57 : Mechanical Room 1
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #: 2025
Last Re-Assessment: 0000-00-00

Area (sqft): 900

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	None Found														
Duct		Not Insulated			C	Y						V0000	Non-Asbestos		None	
Duct ¹		Mastic, Grey			C	Y		20			LF	V0009	None Detected	N.D.	None	
Duct	Duct Connector	Textile			C	Y		1			EA	V0000	Non-Asbestos		None	
Floor	All	Concrete (poured)			B	Y		900			SF	V0000	Non-Asbestos		None	
Mechanical Equipment		Not Insulated			B	Y						V0000	Non-Asbestos		None	
Mechanical Equipment	Fan Unit	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Mechanical Equipment ²	Heating Ventilating Air Conditioning Unit	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Mechanical Equipment	Pump	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Other	Electrical Panel	Not Insulated			B	Y						V0000	Non-Asbestos		None	
Piping		Fibreglass		Polyvinyl chloride (PVC)	C	Y						V0000	Non-Asbestos		None	
Piping		Polyvinyl chloride (PVC)			B	Y						V0000	Non-Asbestos		None	
Piping	Fire Stop	Caulking, Dark red			C	Y		5			EA	S0012ABC	None Detected	N.D.	None	
Piping	Sprinkler	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Metal			C	Y		900			SF	V0000	Non-Asbestos		None	
Structure	Stairs	Concrete (poured)			B	Y						V0000	Non-Asbestos		None	
Wall		Concrete (poured)			B	Y						V0000	Non-Asbestos		None	
Wall	All	Drywall and joint compound			B	Y						V0000	Non-Asbestos		None	

Access to roof present inside
1 - 4 duct connections
2 - Pool dehumidifier

Client: City Of Mississauga
Location: #57 : Mechanical Room 1
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #: 2025
Last Re-Assessment: 0000-00-00

Area (sqft): 900

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Concrete (poured)	700		SF	V0006	White	Pb: <0.00010 %	No	
Piping	Metal	500		SF	V0004	Sky blue	Pb: 0.00040 %	No	
Floor	Concrete (poured)	900		SF	V0009	Light grey	Pb: 0.0017 %	No	
Wall	Concrete (poured)	900		SF	V0004	Sky blue	Pb: 0.00040 %	No	

PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Duct	Metal	500		SF	V0004	Sky blue	Pb: 0.00040 %	No
Wall	Concrete (poured)	1500		SF	L0010	Dark blue	Pb: 0.00065 %	No

Access to roof present inside

Client: City Of Mississauga
Location: #57 : Mechanical Room 1
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #: 2025
Last Re-Assessment: 0000-00-00
Area (sqft): 900

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	22	EA	V9000	Yes
Thermostat	1	EA	V0000	

Access to roof present inside

1 - T8

Client: City Of Mississauga
Location: #57 : Mechanical Room 1
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #: 2025
Last Re-Assessment: 0000-00-00
Area (sqft): 900

PCB					
Component	Quantity	Unit	Sample	Sample Description	Amount
Light Ballasts ¹			V0000		No
Transformer			V0000		No

Access to roof present inside

1 - T8

ALL DATA REPORT

Client: City Of Mississauga
Location: #58 : Staircase B
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 100

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	Drywall and joint compound			C	Y		100			SF	V0000	Non-Asbestos		None	
Duct	All	None Found														
Floor	All	Ceramic Tiles, 24x12 black			A	Y		100			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Piping	All	None Found														
Structure	All				C	N		100			SF					
Wall ¹	All	Masonry			A	Y						V0000	Non-Asbestos		None	

1 - Block wall

Client: City Of Mississauga
Location: #58 : Staircase B
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 100

PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Wall	Masonry	500		SF	V0001	White	Pb: <0.00031 %	No

Client: City Of Mississauga
Location: #58 : Staircase B
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 100

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	5	EA	V9000	Yes

1 - T5

Client: City Of Mississauga
Location: #58 : Staircase B
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 2

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 100

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - T5

ALL DATA REPORT

Client: City Of Mississauga
 Location: #59 : Information Desk And Office
 Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 410

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling ¹		Ceiling Tiles (lay-in), 48x24 grey textured			C	Y						V0000	Non-Asbestos		None	
Ceiling		Drywall and joint compound			C	Y						V0000	Non-Asbestos		None	
Duct		Not Insulated			C	Y						V0000	Non-Asbestos		None	
Duct	All	Fibreglass		Foil Face	C	N						V0000	Non-Asbestos		None	
Floor		Carpet			B	Y						V0000	Non-Asbestos		None	
Floor		Non-slip Flooring			B	Y						V0000	Non-Asbestos		None	
Floor	Base	Mastic, Yellow		Rubber	B	Y		70			LF	V0011	None Detected	N.D.	None	
Piping		Fibreglass		Paper	C	N						V0000	Non-Asbestos		None	
Piping		Not Insulated			C	N						V0000	Non-Asbestos		None	
Structure	All	Fireproofing (Fibrous)			C	N						V0000	Non-Asbestos		None	

1 - Fiberglass

Client: City Of Mississauga
 Location: #59 : Information Desk And Office
 Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 410

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description		Amount	Hazard
Wall ¹	Masonry	550		SF	V0001	White		Pb: <0.00031 %	No
Wall ²	Masonry	160		SF	V0008	Teal		Pb: <0.00024 %	No

1 - Block wall

2 - Block wall

Client: City Of Mississauga
 Location: #59 : Information Desk And Office
 Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 410

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	5	EA	V9000	Yes

1 - 5T5, LED

Client: City Of Mississauga
 Location: #59 : Information Desk And Office
 Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 410

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - T5, LED

ALL DATA REPORT

Client: City Of Mississauga
Location: #60 : Pool Staff Change Rooms
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 200

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling ¹		Ceiling Tiles (lay-in), 48x24 grey textured			C	Y						V0000	Non-Asbestos		None	
Ceiling ²		Ceramic Tiles, Very small white squares			B	Y						V0000	Non-Asbestos		None	
Duct		Not Insulated			C	Y						V0000	Non-Asbestos		None	
Duct	All	Fibreglass		Foil Face	C	N						V0000	Non-Asbestos		None	
Floor		Ceramic Tiles, Very small black squares			B	Y						V0000	Non-Asbestos		None	
Piping		Fibreglass		Paper	C	N						V0000	Non-Asbestos		None	
Piping		Not Insulated			C	N						V0000	Non-Asbestos		None	
Structure	All	Fireproofing (Fibrous)			C	N						V0000	Non-Asbestos		None	
Wall		Ceramic Tiles, 20x8 white			B	Y						V0000	Non-Asbestos		None	

- 1 - Fiberglass
2 - In shower only

Client: City Of Mississauga
Location: #60 : Pool Staff Change Rooms
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 200

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	4	EA	V9000	Yes

- 1 - 4T5, LED

Client: City Of Mississauga
Location: #60 : Pool Staff Change Rooms
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 200

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

- 1 - T5, LED

ALL DATA REPORT

Client: City Of Mississauga
Location: #61 : Pool Supervisor Office
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 130

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling ¹		Ceiling Tiles (lay-in), 48x24 grey textured			C	Y						V0000	Non-Asbestos		None	
Duct		Fibreglass		Foil Face	C	N						V0000	Non-Asbestos		None	
Duct		Not Insulated			C	Y						V0000	Non-Asbestos		None	
Floor		Non-slip Flooring			B	Y						V0000	Non-Asbestos		None	
Piping		Fibreglass		Paper	C	N						V0000	Non-Asbestos		None	
Piping		Not Insulated			C	N						V0000	Non-Asbestos		None	
Structure	All	Fireproofing (Fibrous)			C	N						V0000	Non-Asbestos		None	
Wall		Ceramic Tiles, Very small white squares			B	Y						V0000	Non-Asbestos		None	

1 - Fiberglass

Client: City Of Mississauga
Location: #61 : Pool Supervisor Office
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 130

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description		Amount	Hazard
Wall ¹	Masonry	400		SF	V0001	White		Pb: <0.00031 %	No

1 - Block wall

Client: City Of Mississauga
Location: #61 : Pool Supervisor Office
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 130

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	2	EA	V9000	Yes

1 - 2T5, LED

Client: City Of Mississauga
Location: #61 : Pool Supervisor Office
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 130

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - T5, LED

ALL DATA REPORT

Client: City Of Mississauga
Location: #62 : Pool
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 9500

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling ¹		Ceramic Tiles, 20x8 white			B	Y						V0000	Non-Asbestos		None	
Ceiling	All				C	Y		9500			SF					
Duct	All															
Floor		Ceramic Tiles, Light pink squares with blue and grey mix			B	Y					SF	V0000	Non-Asbestos		None	
Floor		Ceramic Tiles, Very small light grey squares			B	Y						V0000	Non-Asbestos		None	
Floor ²		Ceramic Tiles, Very small white squares			A	Y						V0000	Non-Asbestos		None	
Floor		Ceramic Tiles, Very small black squares			B	Y						V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Other ³	Door	Caulking, Black			A	Y		1200			LF	V0002	None Detected	N.D.	None	
Other ⁴	Window	Caulking, Black			A	Y		300			LF	V0004	None Detected	N.D.	None	
Piping	Rain Water Leader	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All				C	N		9500			SF					
Wall ⁵		Masonry			B	Y						V0000	Non-Asbestos		None	
Wall		Ceramic Tiles, Light grey squares	Edge		B	Y						V0000	Non-Asbestos		None	
Wall	All	Very small white squares			B	Y						V0000	Non-Asbestos		None	
Wall	Expansion Joint	Caulking, Light beige			A	Y		200			LF	V0003	None Detected	N.D.	None	
Wall	Expansion Joint	Caulking, Beige			B	Y		60			LF	S0013ABC	None Detected	N.D.	None	
Wall	Expansion Joint	Caulking, Off white			B	Y		30			SF	V0008	None Detected	N.D.	None	
Wall ⁶	Window	Caulking, Grey			A	Y		60			LF	V0001	None Detected	N.D.	None	
Wall ⁷	Window	Caulking, Off white			B	Y		200			SF	V0008	None Detected	N.D.	None	

Ceiling height 38ft

- 1 - In vestibule emergency exit
- 2 - Along pool only
- 3 - Between door frame and glass
- 4 - between window frame and glass
- 5 - Block wall
- 6 - Between window frame and wall
- 7 - Between window frame and wall

Client: City Of Mississauga
Location: #62 : Pool
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 9500

PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Wall ¹	Masonry	2000		SF	V0004	Sky blue	Pb: 0.00040 %	No
Wall	Masonry	1200		SF	L0011	Blue	Pb: <0.00010 %	No

Ceiling height 38ft
1 - Block wall

Client: City Of Mississauga
Location: #62 : Pool
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00
Area (sqft): 9500

PB PRODUCTS				
Component	Quantity	Unit	Sample	Hazard
Batteries In Emer. Lights			V0000	

Ceiling height 38ft

Client: City Of Mississauga
Location: #62 : Pool
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00
Area (sqft): 9500

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	4	EA	V0000	

Ceiling height 38ft
1 - 4T5 in vestibule, LED

Client: City Of Mississauga
Location: #62 : Pool
Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
Floor: 1

Building Name: River Grove Community Center
Room #:
Last Re-Assessment: 0000-00-00
Area (sqft): 9500

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

Ceiling height 38ft
1 - T5, LED

ALL DATA REPORT

Client: City Of Mississauga
 Location: #63 : Pool Storage 1
 Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 210

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Duct	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Duct	Duct Connector	Textile			C	Y		4			EA	V0000	Non-Asbestos		None	
Floor	All	Concrete (poured)			B	Y		210			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Piping		Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Wood			C	Y		210			SF	V0000	Non-Asbestos		None	
Wall ¹		Masonry			B	Y						V0000	Non-Asbestos		None	

1 - Block wall

Client: City Of Mississauga
 Location: #63 : Pool Storage 1
 Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 210

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description		Amount	Hazard
Wall	Masonry	800		SF	V0001	White		Pb: <0.00031 %	No
Wall	Masonry	1200		SF	V0004	Sky blue		Pb: 0.00040 %	No
Duct	Metal	250		SF	V0004	Sky blue		Pb: 0.00040 %	No

Client: City Of Mississauga
 Location: #63 : Pool Storage 1
 Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 210

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	6	EA	V9000	Yes

1 - T8

Client: City Of Mississauga
 Location: #63 : Pool Storage 1
 Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 210

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - T8

ALL DATA REPORT

Client: City Of Mississauga
 Location: #64 : Pool Storage 2
 Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 80

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Duct ¹		Mastic, Grey			C	Y		10			LF	V0009	None Detected	N.D.	None	
Duct	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Duct	Duct Connector	Textile			C	Y		2			EA	V0000	Non-Asbestos		None	
Floor	All	Concrete (poured)			B	Y		80			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	All	None Found														
Piping		Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Wood			C	Y		80			SF	V0000	Non-Asbestos		None	
Wall ²		Masonry			B	Y						V0000	Non-Asbestos		None	

1 - 2 duct connections
 2 - Block wall

Client: City Of Mississauga
 Location: #64 : Pool Storage 2
 Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 80

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Masonry	400		SF	V0001	White	Pb: <0.00031 %	No	
Wall	Masonry	800		SF	V0004	Sky blue	Pb: 0.00040 %	No	
Duct	Metal	200		SF	V0004	Sky blue	Pb: 0.00040 %	No	

Client: City Of Mississauga
 Location: #64 : Pool Storage 2
 Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 80

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	2	EA	V9000	Yes

1 - T8

Client: City Of Mississauga
 Location: #64 : Pool Storage 2
 Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 80

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts ¹			V0000			No

1 - T8

ALL DATA REPORT

Client: City Of Mississauga
 Location: #65 : Pool Storage 3
 Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 170

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Duct	All	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Floor	All	Concrete (poured)			B	Y		170			SF	V0000	Non-Asbestos		None	
Mechanical Equipment	Fan Unit	Not Insulated			C	Y						V0000	Non-Asbestos		None	
Piping		Not Insulated			C	Y						V0000	Non-Asbestos		None	
Structure	All	Wood			C	Y		170			SF	V0000	Non-Asbestos		None	
Wall ¹		Masonry			B	Y						V0000	Non-Asbestos		None	

1 - Block wall

Client: City Of Mississauga
 Location: #65 : Pool Storage 3
 Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 170

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Masonry	600		SF	V0001	White	Pb: <0.00031 %	No	
Wall	Masonry	1000		SF	V0004	Sky blue	Pb: 0.00040 %	No	
Duct	Metal	250		SF	V0004	Sky blue	Pb: 0.00040 %	No	

Client: City Of Mississauga
 Location: #65 : Pool Storage 3
 Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 170

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Fluorescent Light Tube ¹	6	EA	V9000	Yes

1 - T8

Client: City Of Mississauga
 Location: #65 : Pool Storage 3
 Survey Date: 2023-05-24

Site: 5800 River Grove Ave, Mississauga, ON
 Floor: 1

Building Name: River Grove Community Center
 Room #:
 Last Re-Assessment: 0000-00-00

Area (sqft): 170

PCB					
Component	Quantity	Unit	Sample	Sample Description	Amount
Light Ballasts ¹			V0000		No

1 - T8

Legend:

Sample number		Units		Other	
S####	Asbestos sample collected	SF	Square feet	A	Access
L####	Paint sample collected	LF	Linear feet	V	Visible
P####	PCB sample collected	EA	Each	AP	Air Plenum
M####	Mould sample collected	%	Percentage	F	Friable material
V####	Material is visually identified to be identical to S####	LF	Linear feet	NF	Non Friable material
V0000	Known non hazardous material			PF	Potentially Friable material
V9000	Material visually identified as a Hazardous Material			Pb	Lead
V9500	Material is presumed to be a hazardous material			Hg	Mercury
				As	Arsenic
				Cr	Chromium

Access	
A	Accessible to all building occupants
B	Accessible to maintenance and operations staff without a ladder
C	Accessible to maintenance and operations staff with a ladder. Also rarely entered, locked areas
D	Not normally accessible

Condition	
Good	No visible damage or deterioration
Fair	Minor, repairable damage, cracking, delamination or deterioration
Poor	Irreparable damage or deterioration with exposed and missing material

Visible	
Y	The material is visible when standing on the floor of the room, without the removal or opening of other building components (e.g. ceiling tiles or access panels).
N	The material is not visible to view when standing on the floor of the room and requires the removal of a building component (e.g. ceilings tiles or access panels) to view and access. Includes rarely entered crawlspaces, attic spaces, etc. Observations will be limited to the extent visible from the access points.

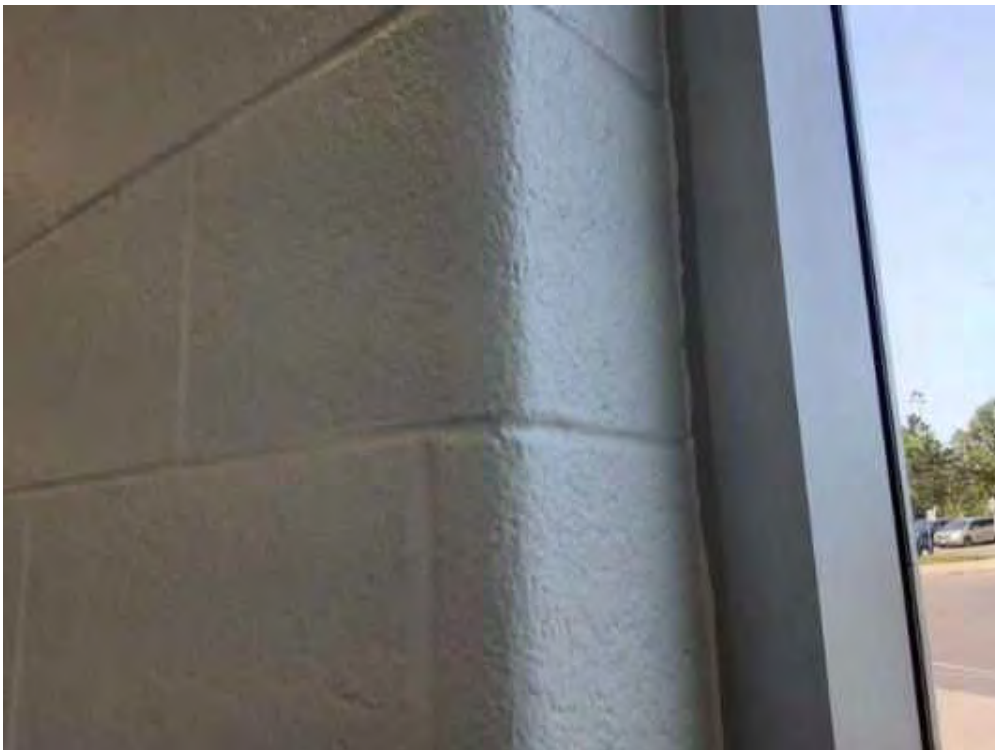
Air Plenum	
Yes or No	The material is in a return air plenum or in a direct airstream or there is evidence of air erosion (e.g. duct for heating or cooling blowing directly on or across an ACM). This field is only completed where Air Plenum consideration is required by regulation.

Colour Coding	
	The material is known to contain regulated concentrations of asbestos; either by analytical results or visible identification (use of the V9000 code).
	The material is presumed to contain asbestos; based on visual appearances; typically a material known to historically contain asbestos; however, not sampled due to limited access or the destructive nature of the sampling.

APPENDIX VII
Additional Photographs



S0001A (None), Wall, Window, Caulking, Entrance Corridor (Location #: 2)
Between window frame and wall



S0001B (None), Wall, Window, Caulking, Corridor3 (Location #: 27)
Between window frame and wall



V0001 (None), Wall, Window, Caulking, Lobby (Location #: 3)
Between window frame and wall



V0001 (None), Wall, Window, Caulking, Lobby (Location #: 3)
Between window frame and wall



S0001C (None), Wall, Window, Caulking, Program Room (Location #: 48)
Between window frame and wall



V0001 (None), Wall, Window, Caulking, Fitness Studio (Location #: 51)
Between window frame and floor



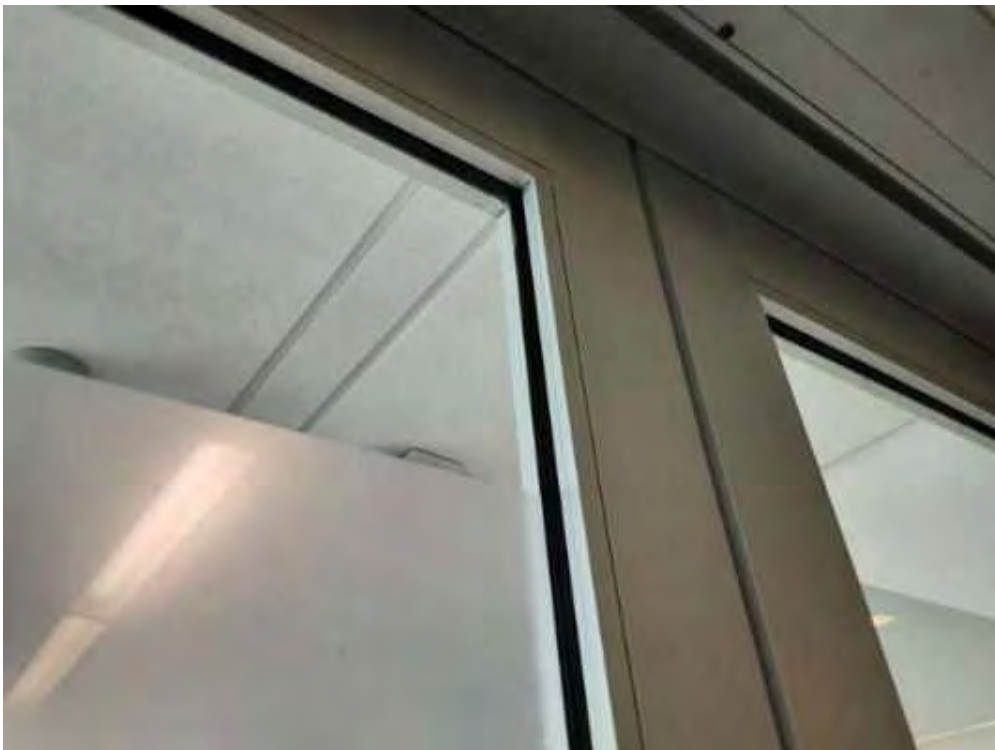
V0001 (None), Wall, Window, Caulking, Pool (Location #: 62)
Between window frame and wall



S0002A (None), Other, Door, Caulking, Entrance Corridor (Location #: 2)
Between door frame and glass



V0002 (None), Other, Door, Caulking, Lobby (Location #: 3)
Between door frame and glass , pool door



S0002C (None), Other, Door, Caulking, Program Room (Location#: 48)
Between door frame and glass



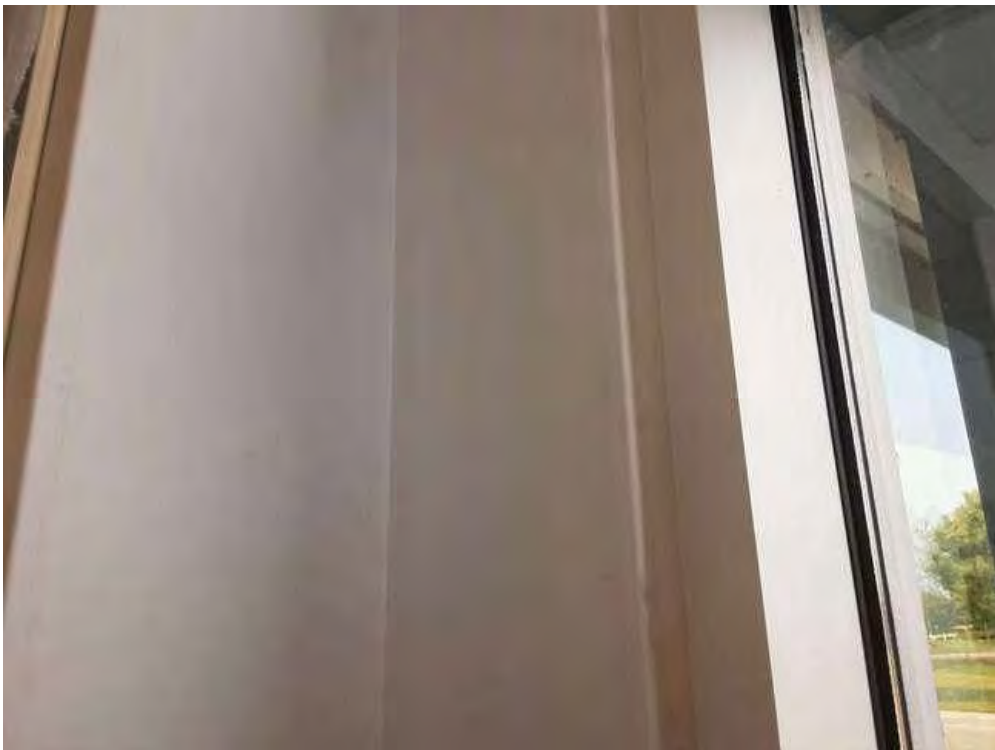
V0002 (None), Other, Window, Caulking, Fitness Center (Location #: 50)
Between window frame and glass



S0003B (None), Wall, Expansion Joint, Caulking, Family Change Room (Location #: 13)



S0003A (None), Wall, Expansion Joint, Caulking, Entrance Corridor (Location #: 2)



V0003 (None), Other, Window, Caulking, Corridor 3 (Location #: 27)
Between window frame



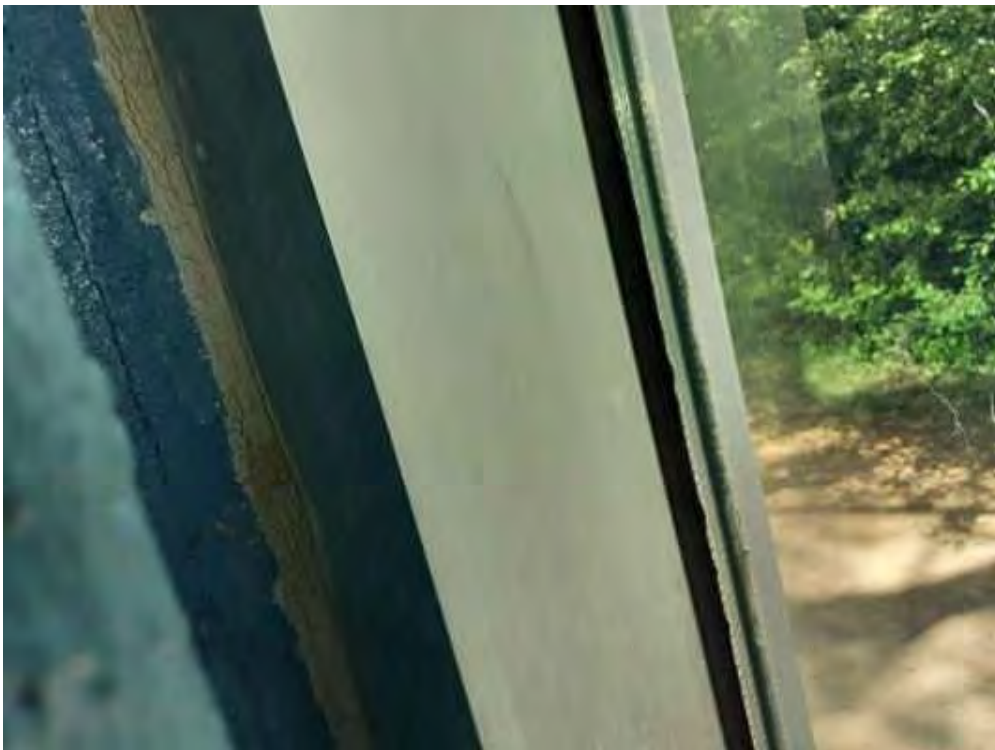
V0003 (None), Wall, Window, Caulking Program Room (Location #: 48)
Between window frame and floor



V0003 (None), Wall, Expansion Joint, Caulking, Fitness Center (Location #: 50)



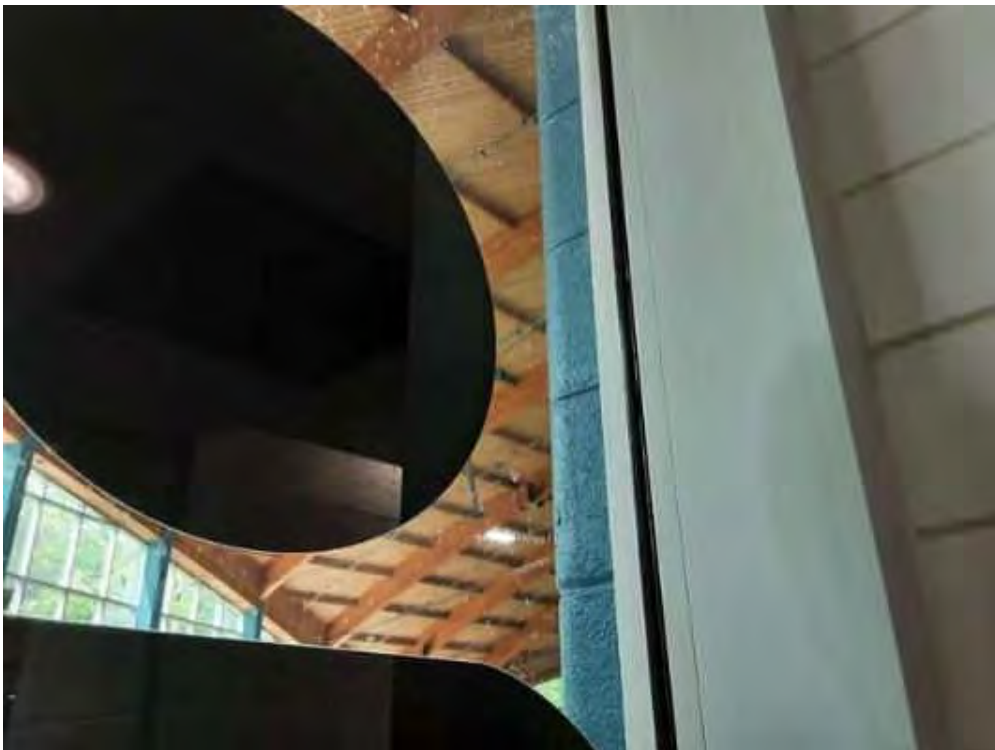
S0003C (None), Wall, Window, Caulking, Fitness Center (Location #: 50)
Between wall and windowframe



V0003 (None), Wall, Expansion Joint, Caulking, Pool (Location #: 62)



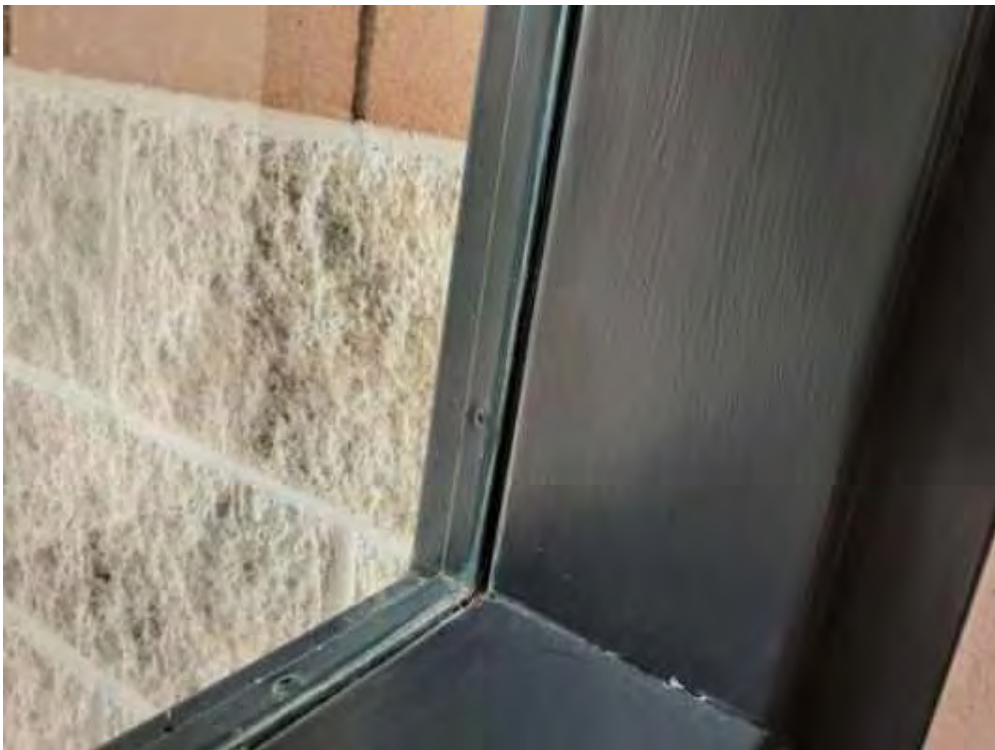
V0003 (None), Wall, Expansion Joint, Caulking, Pool (Location #. 62)



S0004B (None), Other, Window, Caulking, Family Change Room (Location #. 13)
between window frame and glass



S0004A (None), Other, Window, Caulking, Lobby (Location #: 3)
between window frame and glass



V0004 (None), Other, Window, Caulking, Rear Vestibule (Location #: 40)
between window frame and glass



S0004C (None), Other, Window, Caulking, Program Room (Location #: 48)
between window frame and glass



V0004 (None), Other, Window, Caulking, Pool (Location #: 62)
between window frame and glass



S0005A (None), Wall, Window, Caulking, Kan eff Auditorium (Location #: 6)
Between wall and windowframe



S0005B (None), Wall, Window, Caulking, Kan eff Auditorium (Location #: 6)
Between wall and windowframe



S0006A (None), Wall, Door, Caulking, Kan eff Auditorium (Location #: 6)
Between wall and door frame, between walls



S0006A (None), Wall, Door, Caulking, Kan eff Auditorium (Location #: 6)
Between wall and door frame, between walls



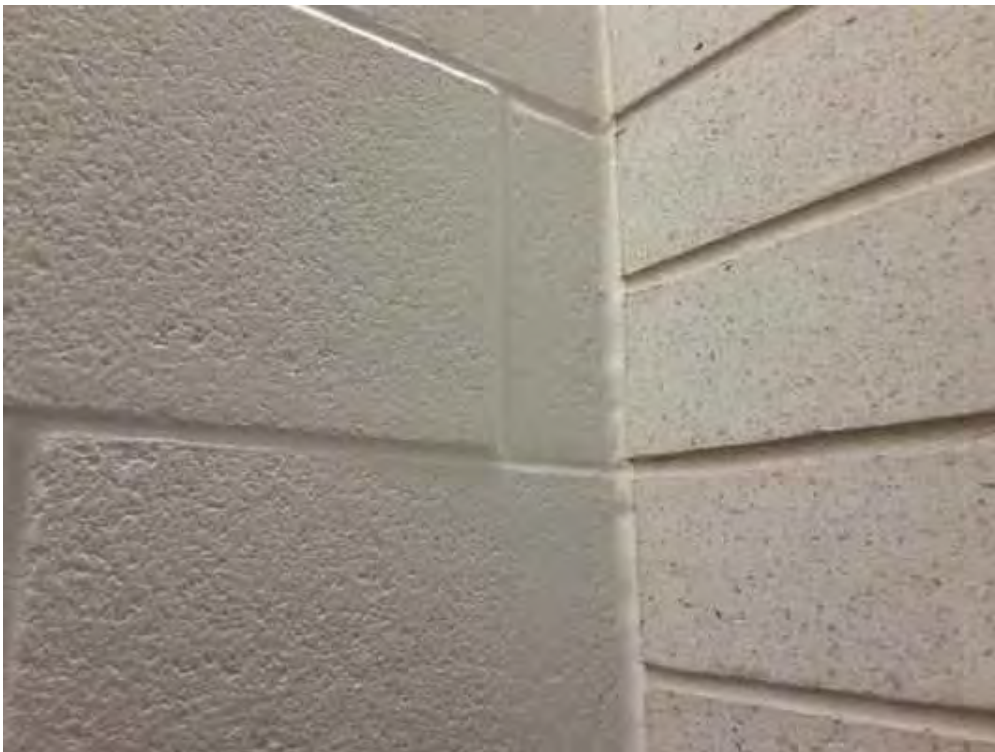
S0007C (None), Wall, Base, Mastic, Burt Arts Studio (Location #: 29)



S0007A (None), Wall, Base, Mastic, Kaneff Auditorium (Location #: 6)



S0007B (None), Wall, Base, Mastic, Kaneff Auditorium (Location #: 6)



S0008B (None), Wall, Expansion Joint, Caulking, Family Change Room (Location #: 13)



V0008 (None), Wall, Expansion Joint, Caulking, Staircase (Location #: 21)



V0008 (None), Wall, Window, Caulking, Staircase (Location #: 21)
Between wall and windowframe



V0008 (None), Wall, Expansion Joint, Caulking, Supply Room (Location #: 24)



V0008 (None), Wall, Door, Caulking, Supply Room (Location #: 24)
Between door frame and wall



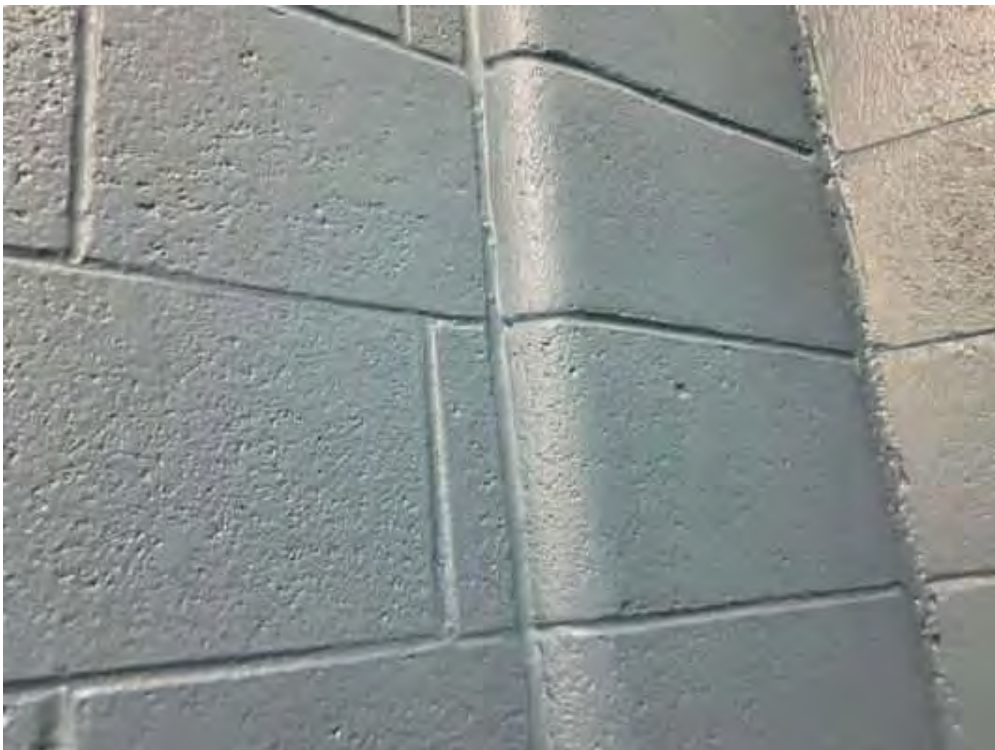
V0008 (None), Wall, Window, Caulking, Rear Vestibule (Location #: 40)
Between wall and windowframe



V0008 (None), Wall, Window, Caulking, Fitness Center (Location #: 50)
Between window frame and wall



V0008 (None), Wall, Window, Caulking, Fitness Center (Location #: 50)
Between window frame and wall



V0008 (None), Wall, Expansion Joint, Caulking, Pool (Location #: 62)



V0008 (None), Wall, Window, Caulking, Pool (Location #: 62)
Between window frame and wall



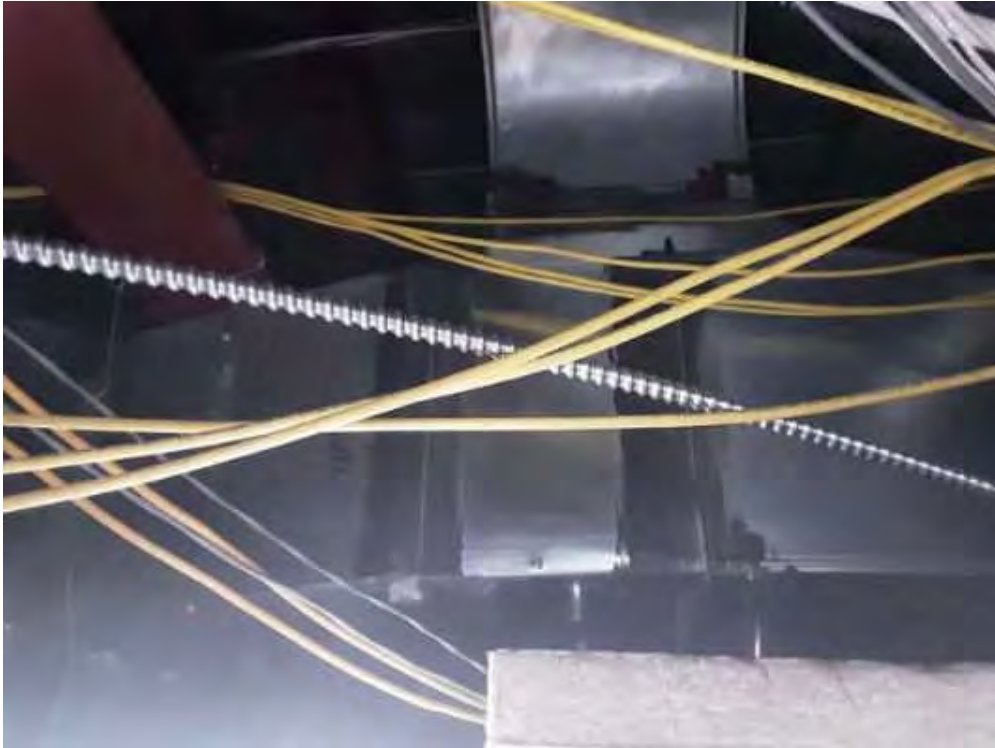
S0008A (None), Wall, Expansion Joint, Caulking, GymStorage (Location #: 8)



S0009A (None), Duct, Mastic, Grey, Men's Washroom (Location #: 10)
Approx 7 duct connections



S0009B (None), Duct, Mastic, Grey, Corridor 3 (Location #: 27)
Approx 5 duct connections



V0009 (None), Duct, Mastic, Grey, BurtArts Studio (Location #: 29)
Approx 8 duct connections



V0009 (None), Duct, Mastic, Grey, Seniors Room (Location #: 38)
Approx 8 duct connections



S0009C (None), Duct, Mastic, Grey, Janitor (Location #: 52)
6 duct connections



V0009 (None), Duct, Mastic, Mechanical Room 2 (Location #: 55)
5 duct connections



S0010A (None), Duct, Mastic, Seniors Room (Location #: 38)
Accessible in kitchen area, 8 duct connections



S0010A (None), Duct, Mastic, Seniors Room (Location #: 38)
Accessible in kitchen area, 8 duct connections



V0010 (None), Duct, Mastic, Basement Corridor (Location#: 41)
8 duct connections



V0010 (None), Duct, Mastic, Elevator Room (Location#: 42)
3 duct connections



V0010 (None), Duct, Mastic, Storage (Location #: 43)
2 duct connections



S0010B (None), Duct, Mastic, Filtration Room (Location #: 44)
40 duct connections



V0010 (None), Duct, Mastic, Filtration Room (Location #: 44)



S0010C (None), Duct, Mastic, Tunnel (Location #: 45)
30 duct connections



V0010 (None), Wall, Cement Product, Upper Lobby (Location #: 47)
Cement board, dated 01/10/14, contains silica



V0011 (None), Floor, Base, Mastic, Staff Offices (Location #: 22)



S0011A (None), Wall, Base, Mastic, Program Room (Location #: 48)



S0011B (None), Wall, Base, Mastic, Fitness Studio (Location #: 51)



S0012A (None), Piping, Fire Stop, Caulking, Mechanical Room 1 (Location # 57)



S0012B (None), Piping, Fire Stop, Caulking, Mechanical Room 1 (Location # 57)



S0013A (None), Wall, Expansion Joint, Caulking, Pool (Location #: 62)



S0013B (None), Wall, Expansion Joint, Caulking, Pool (Location #: 62)



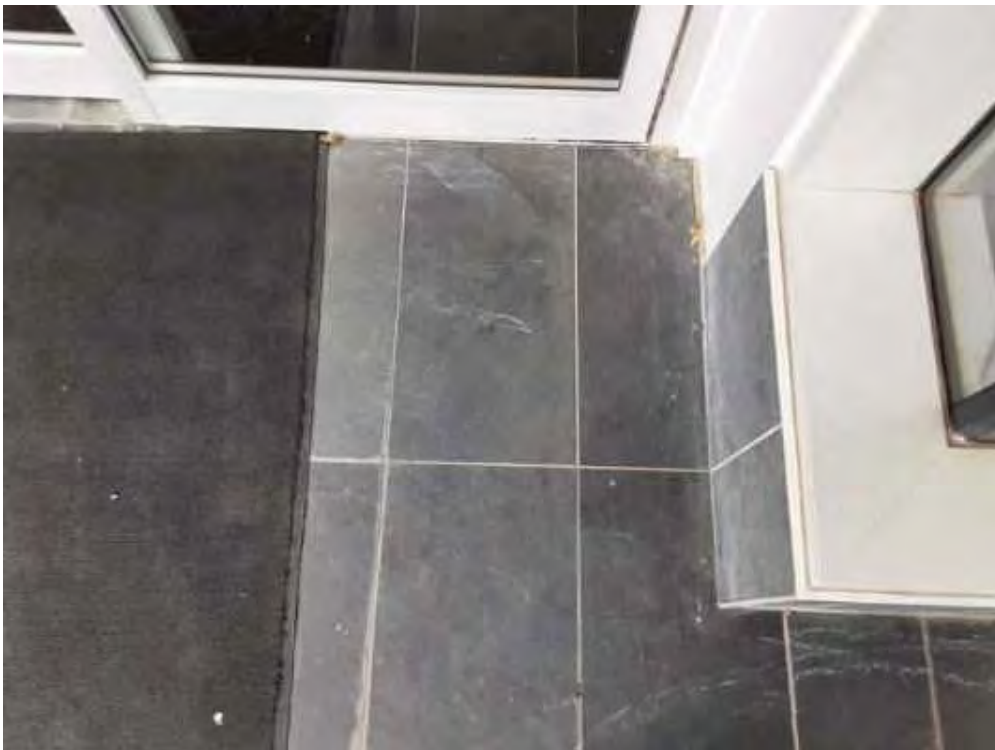
V9500 (Presumed Asbestos), Duct, Mastic, Burt Arts Studio (Location #. 29)
Not accessible with 6ft ladder



V0000 (None), Wall, All, Masonry, Entrance Vestibule (Location #: 1)
Block wall



V0000 (None), Ceiling, All, Drywall and joint compound, Entrance Vestibule (Location #: 1)



V0000 (None), Floor, All, Ceramic Tiles, Entrance Vestibule (Location #: 1)



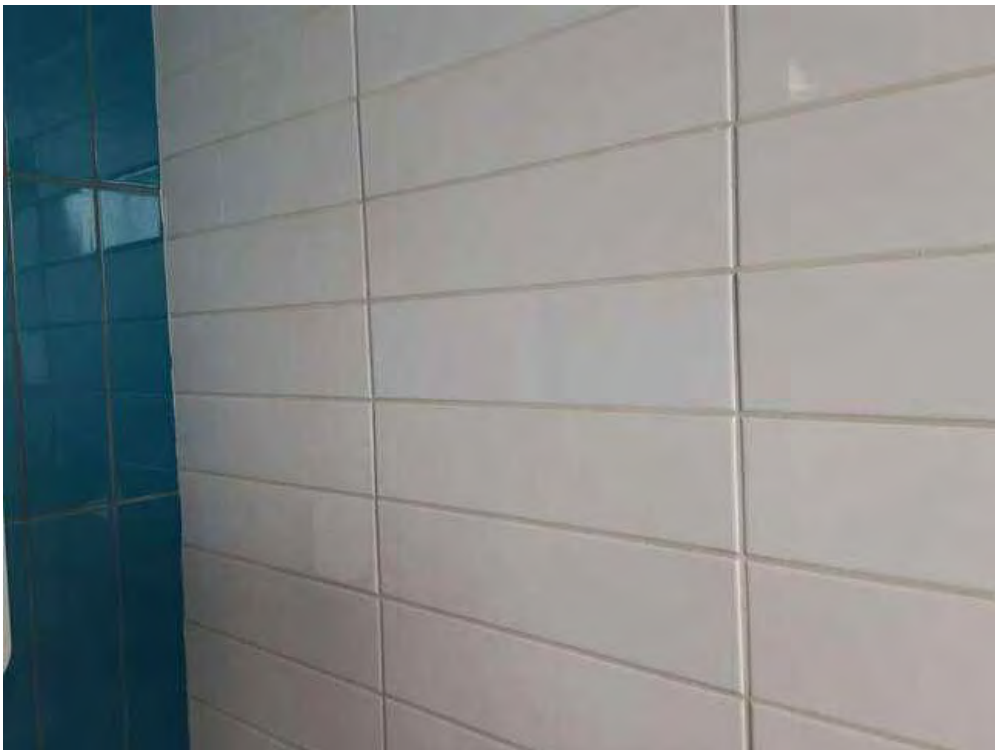
V0000 (None), Duct, All, Not Insulated, Men's Washroom (Location #: 10)



V0000 (None), Piping, Not Insulated, Men's Washroom (Location #: 10)



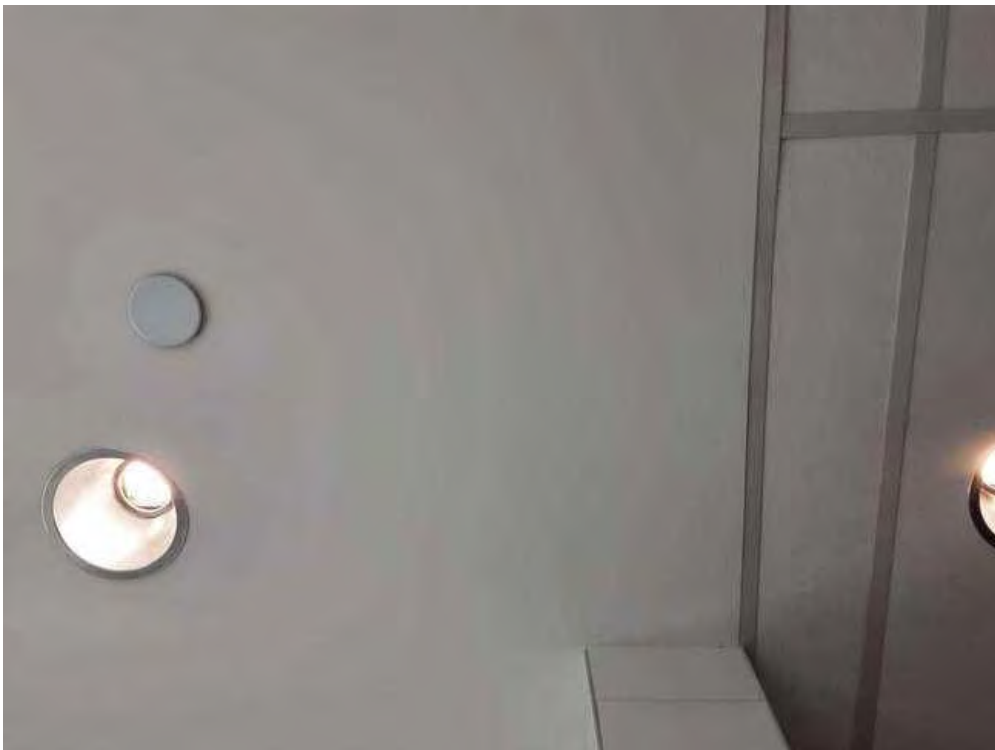
V0000 (None), Structure, All, Fireproofing (Fibrous), Men's Washroom (Location #: 10)



V0000 (None), Wall, All, Ceramic Tiles, Men's Washroom (Location #: 10)



V0000 (None), Wall, All, Ceramic Tiles, Men's Washroom (Location #: 10)



V0000 (None), Ceiling, Dry wall and joint compound, Men's Washroom (Location #: 10)



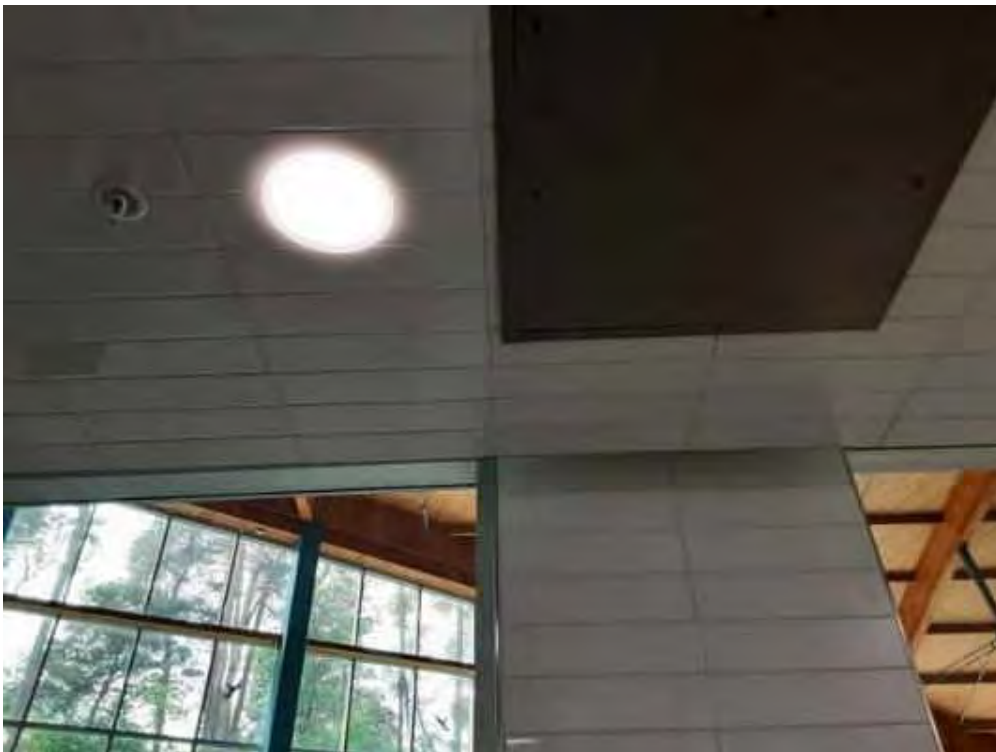
V0000 (None), Piping, Fibreglass, Men's Washroom (Location #: 10)
D.C.W



V0000 (None), Floor, Ceramic Tiles, Pool Staff Office (Location #: 12)



V0000 (None), Wall, Ceramic Tiles, Family Change Room (Location #: 13)



V0000 (None), Ceiling, Ceramic Tiles, Family Change Room (Location #: 13)



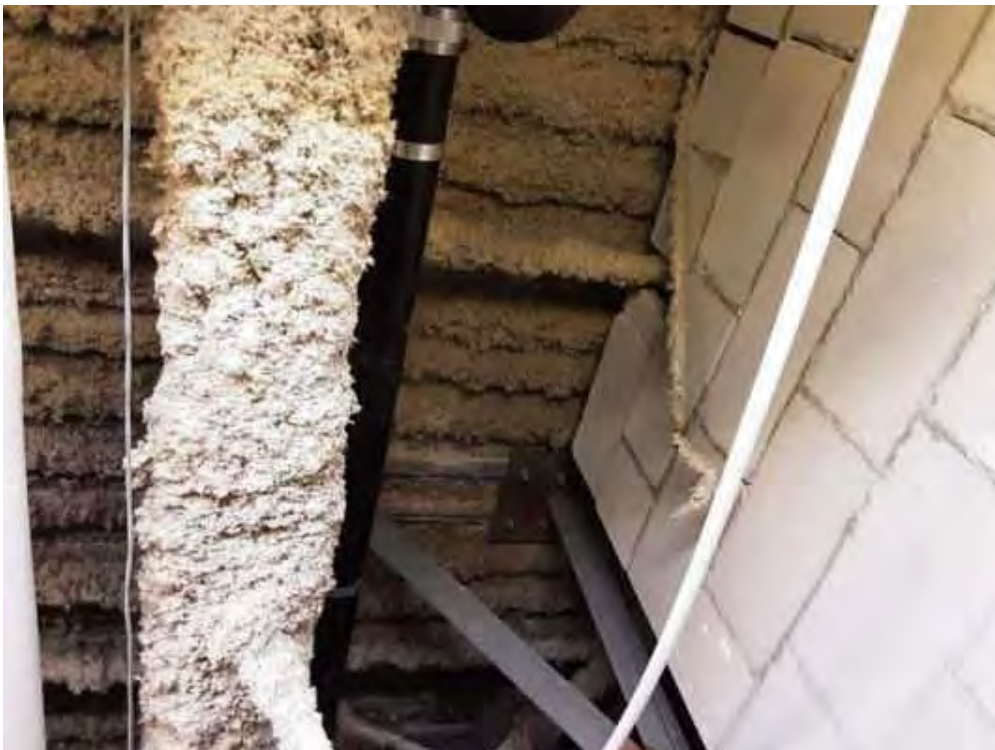
V0000 (None), Duct, Fibreglass, Men's Fitness Change Room (Location#: 15)



V0000 (None), Structure, All, Fireproofing (Fibrous), Men's Fitness Change Room (Location#: 15)



V0000 (None), Piping, Fibreglass, Men's Fitness Change Room (Location #: 15)
D.C.W, D.H.W, heating supply and return, recirc. line



V0000 (None), Structure, AI, Fireproofing (Fibrous), Men's Pool Change Room (Location #: 18)



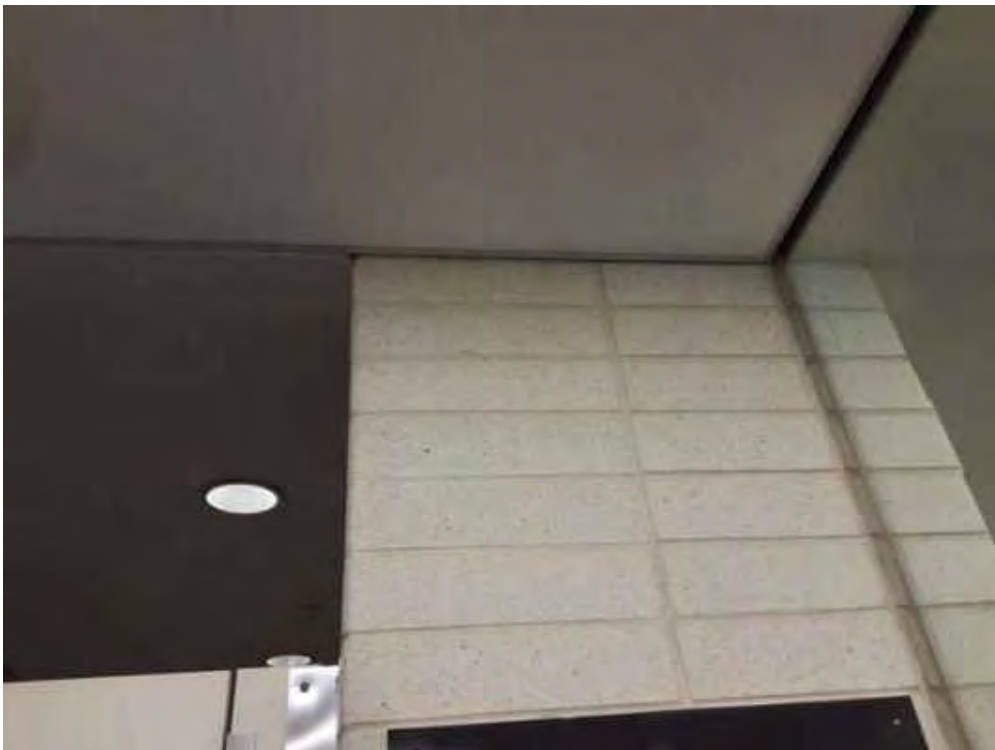
V0000 (None), Floor, All, Ceramic Tiles, Men's Pool Change Room (Location #: 18)



V0000 (None), Ceiling, Ceiling Tiles (lay-in), Men's Pool Change Room (Location #: 18)
Fiberglass, water staining observed



V0000 (None), Ceiling, Ceiling Tiles (lay-in), Men's Pool Change Room (Location #: 18)
Fiberglass, water staining observed



V0000 (None), Wall, Masonry, Men's Pool Change Room (Location #: 18)
Brick wall



V0000 (None), Piping, Fibreglass, Men's Pool Change Room (Location#: 18)
D.C.W, D.H.W, heating supply and return, recirc. line



V0000 (None), Piping, Fibreglass, Men's Pool Change Room (Location#: 18)
D.C.W, D.H.W, heating supply and return, recirc. line



V0000 (None), Wall, All, Ceramic Tiles, Men's Pool Change Room (Location #: 18)



V0000 (None), Wall, All, Ceramic Tiles, Men's Pool Change Room (Location #: 18)



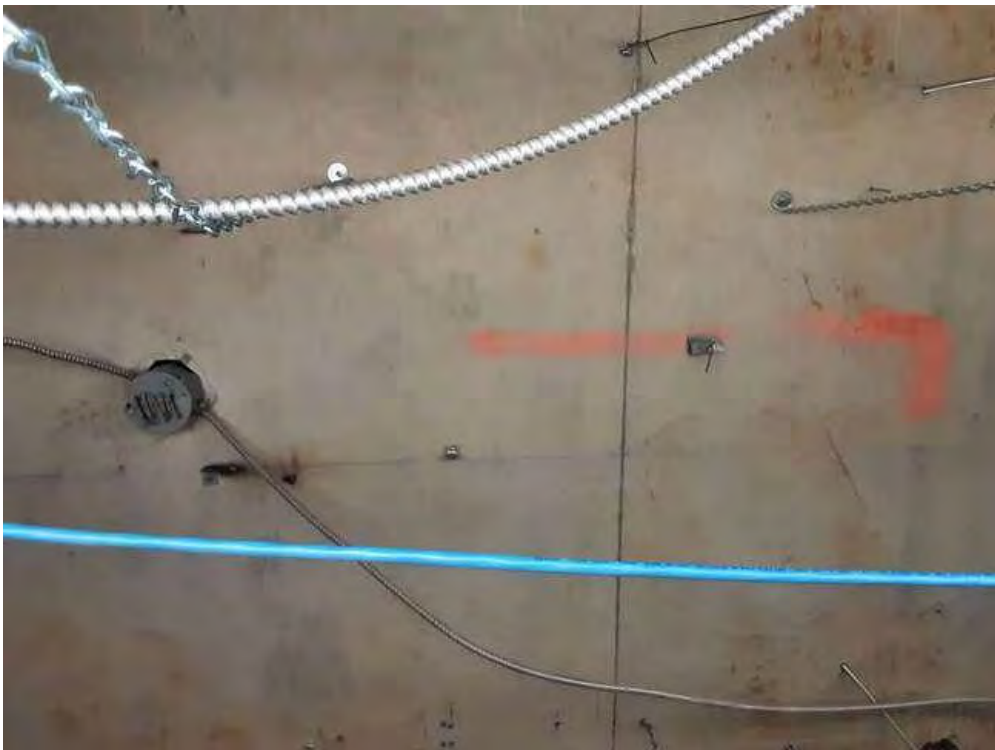
V0000 (None), Ceiling, Ceiling Tiles (lay-in), Men's Pool Change Room (Location #: 18)
water staining observed



V0000 (None), Duct, All, Fibreglass, Entrance Corridor (Location #: 2)



V0000 (None), Piping, Sprinkler, Not Insulated, Entrance Corridor (Location #: 2)



V0000 (None), Structure, All, Concrete (precast), Entrance Corridor (Location #: 2)



V0000 (None), Ceiling, All, Drywall and joint compound, Entrance Corridor (Location #: 2)



V0000 (None), Floor, Ceramic Tiles, Entrance Corridor (Location #: 2)



V0000 (None), Floor, Ceramic Tiles, Entrance Corridor (Location #: 2)



V0000 (None), Ceiling, Ceiling Tiles (lay-in), Entrance Corridor (Location #: 2)



V0000 (None), Wall, Ceramic Tiles, Entrance Corridor(Location#: 2)



V0000 (None), Wall, Ceramic Tiles, Entrance Corridor(Location#: 2)



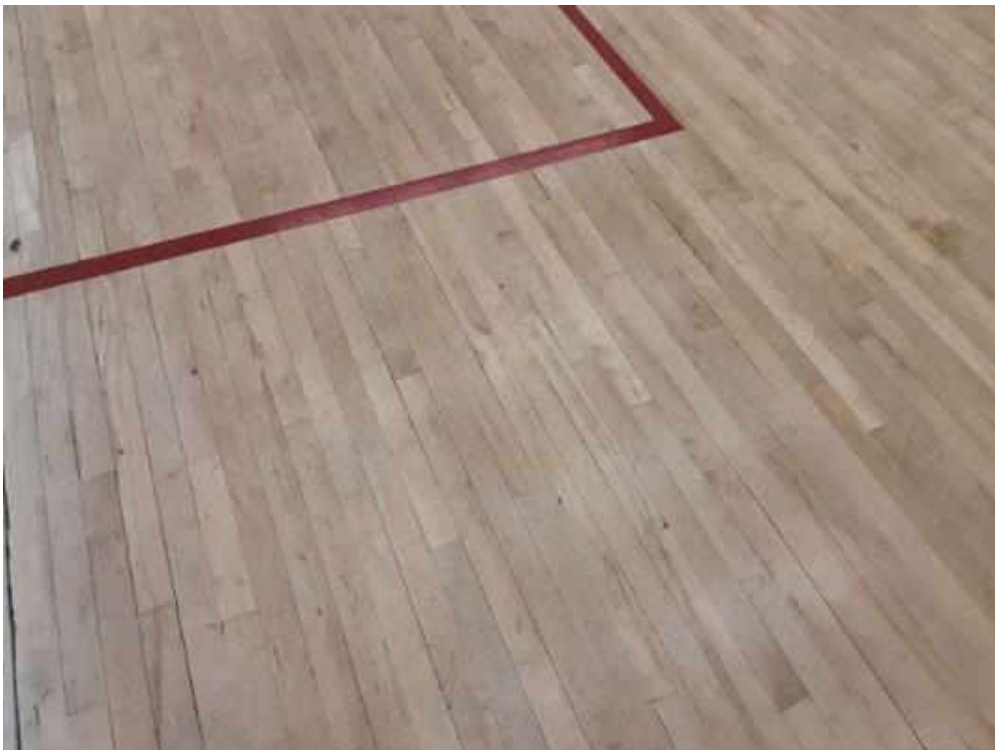
V0000 (None), Piping, Fibreglass, Entrance Corridor (Location #: 2)
Heating supply and return



V0000 (None), Other, Window, Styrofoam, Entrance Corridor (Location #: 2)
Type of foam, between window frame and glass



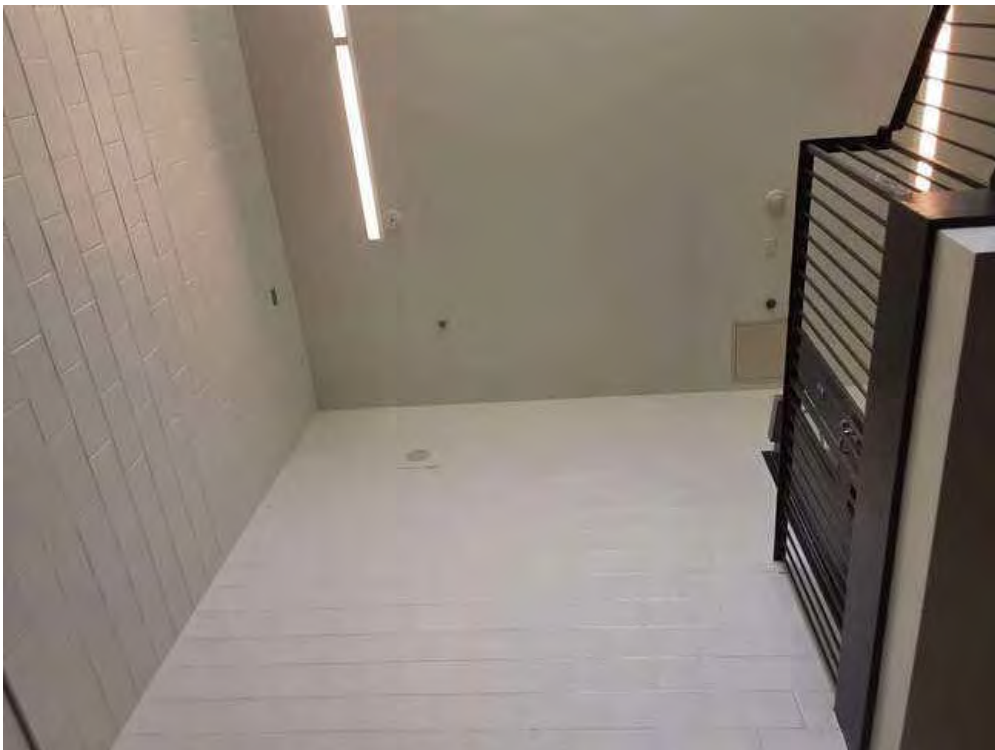
V0000 (None), Wall, All, Masonry, Squash Courts (Location #: 20)
Block wall



V0000 (None), Floor, All, Laminate, Squash Courts (Location #: 20)



V0000 (None), Floor, Stairs, Non-slip Flooring Staircase (Location #: 21)



V0000 (None), Ceiling, All, Drywall and joint compound, Staircase (Location #: 21)



V0000 (None), Floor, All, Carpet, Staff Offices (Location #. 22)



V0000 (None), Structure, All, Fireproofing (Fibrous), Staff Offices (Location #. 22)



V0000 (None), Piping, Fibreglass, Staff Offices (Location #: 22)



V0000 (None), Structure, All, Fireproofing (Fibrous), LAN Room (Location #: 23)



V0000 (None), Floor, Vinyl Floor Tile, LAN Room (Location #: 23)



V0000 (None), Piping, All, Fibreglass, Supply Room (Location #: 24)
Heat pump supply and return



V0000 (None), Piping, All, Fibreglass, Supply Room (Location #: 24)
Heat pump supply and return



V0000 (None), Duct, All, Not Insulated, Staff Storage (Location #: 25)



V0000 (None), Floor, All, Vinyl Floor Tile, Staff Storage (Location #: 25)



V0000 (None), Mechanical Equipment, Unit Heater, Not Insulated, Washrooms (Location #: 28)



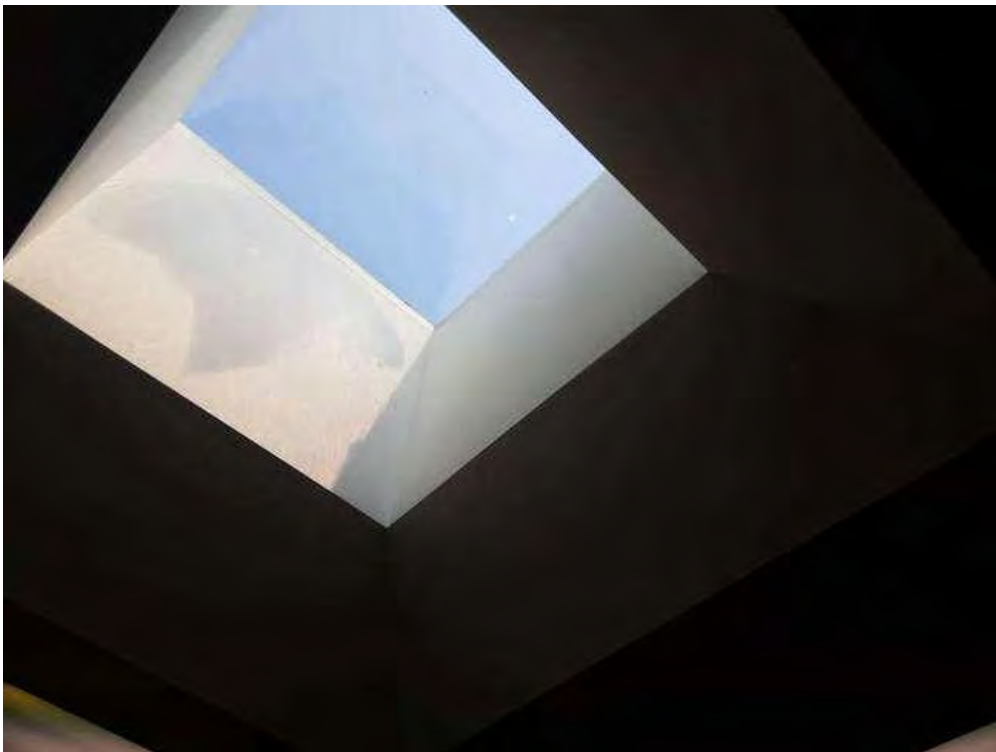
V0000 (None), Duct, Fibreglass, Washrooms (Location #: 28)



V0000 (None), Ceiling, All, Ceiling Tiles (lay-in), Burt Arts Studio (Location #: 29)
Water staining observed



V0000 (None), Floor, Vinyl Floor Tile, Burt Arts Studio (Location #: 29)



V0000 (None), Other, Skylight, Burt Arts Studio (Location #: 29)



V0000 (None), Duct, All, Fibreglass, Lobby (Location #: 3)



V0000 (None), Structure, All, Fireproofing (Fibrous), Lobby (Location #: 3)



V0000 (None), Wall, All, Drywall and joint compound, Lobby (Location #: 3)



V0000 (None), Ceiling, All, Drywall and joint compound, Lobby (Location #: 3)



V0000 (None), Ceiling, Ceiling Tiles (lay-in), Lobby (Location #: 3)



V0000 (None), Wall, Ceramic Tiles, Lobby (Location #: 3)



V0000 (None), Piping, Fibreglass, Lobby (Location #: 3)
Heating supply and return



V0000 (None), Wall, Ceramic Tiles, Lobby (Location #: 3)



V0000 (None), Wall, Ceramic Tiles, Lobby (Location #: 3)



V0000 (None), Wall, All, Masonry, Vestibule (Location #: 30)
Brick wall



V0000 (None), Structure, All, Metal, Kiln And Storage Room (Location #. 32)



V0000 (None), Mechanical Equipment, Fume hood, Drywall (no compound), Kiln And Storage Room (Location #. 32)
In kiln room



V0000 (None), Mechanical Equipment, Fume hood, Drywall (no compound), Kiln And Storage Room (Location #: 32)
In kiln room



V0000 (None), Floor, All, Vinyl Floor Tile, Youth Room (Location #: 34)



V0000 (None), Mechanical Equipment, Unit Heater, Not Insulated, Youth Storage (Location #: 35)



V0000 (None), Duct, All, Not Insulated, Youth Storage (Location #: 35)



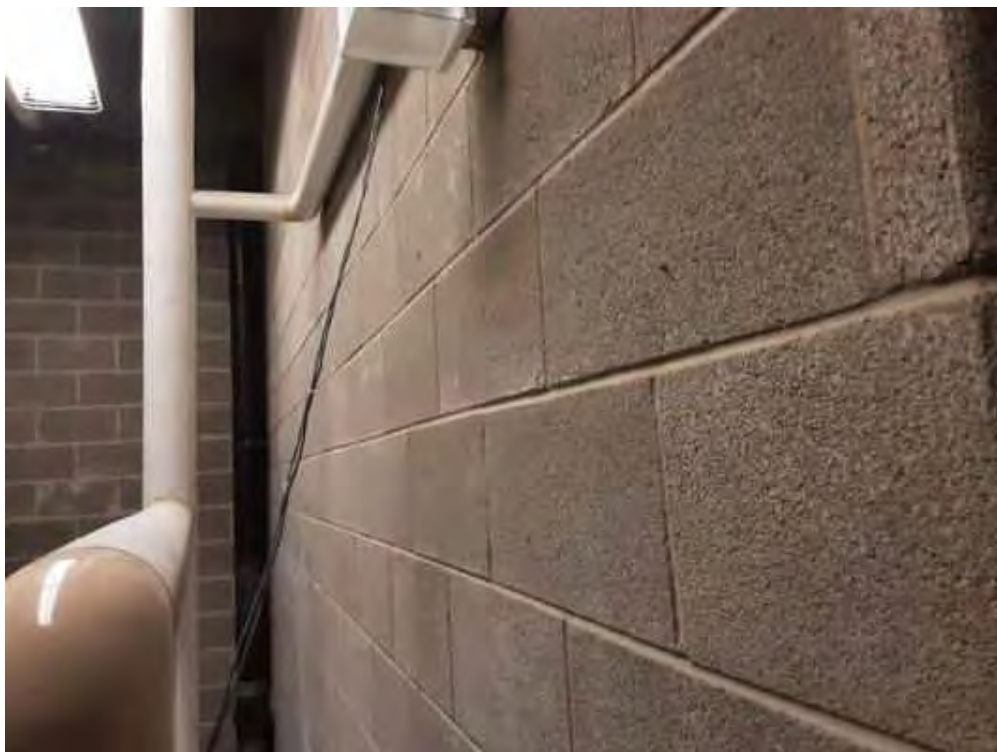
V0000 (None), Other, Electrical Panel, Not Insulated, Youth Storage (Location #: 35)



V0000 (None), Mechanical Equipment, Unit Heater, Not Insulated, Sprinkler Room (Location #: 36)



V0000 (None), Piping, All, Fibreglass, Sprinkler Room (Location #: 36)
D.C.W



V0000 (None), Wall, All, Masonry, Sprinkler Room (Location #: 36)
Block wall



V0000 (None), Piping, Rainwater Leader, Not Insulated, Sprinkler Room (Location # 36)



V0000 (None), Duct, Fibreglass, Washrooms (Location # 37)



V0000 (None), Piping, Fibreglass, Washrooms (Location #: 37)



V0000 (None), Piping, Fibreglass, SeniorsRoom (Location #: 38)



V0000 (None), Piping, Rainwater Leader, Not Insulated, Coat Check (Location #: 4)



V0000 (None), Ceiling, All, Drywall and joint compound, Coat Check (Location #: 4)
Water staining observed



V0000 (None), Ceiling, All, Drywall and joint compound, Coat Check (Location #: 4)
Water staining observed



V0000 (None), Floor, All, Ceramic Tiles, Coat Check (Location #: 4)



V0000 (None), Mechanical Equipment, Unit Heater, Not Insulated, Rear Vestibule (Location #: 40)



V0000 (None), Structure, All, Concrete (precast), Basement Corridor (Location #: 41)



V0000 (None), Mechanical Equipment, Generator Unit, Not Insulated, Elevator Room (Location #: 42)
Hydraulic Elevator machine



V0000 (None), Structure, Column, Elevator Room (Location #: 42)
Drywall joint compound



V0000 (None), Piping, Rainwater Leader, Not Insulated, Storage (Location #: 43)



V0000 (None), Mechanical Equipment, Filters, Not Insulated, Filtration Room (Location #: 44)



V0000 (None), Duct, All, Not Insulated, Filtration Room (Location #: 44)



V0000 (No ne), Other, Electrical Panel, Not Insulated, Filtration Room (Location #: 44)



V0000 (None), Mechanical Equipment, Pump, Not Insulated, Filtration Room (Location #: 44)



V0000 (None), Piping, Polyvinylchloride (PVC), Filtration Room (Location #: 44)



V0000 (None), Piping, Fibreglass, Filtration Room (Location #: 44)



V0000 (None), Piping, Rainwater Leader, Not Insulated, Filtration Room (Location #: 44)



V0000 (None), Duct, Duct Connector, Textile, Filtration Room (Location #: 44)



V0000 (None), Duct, All, Not Insulated, Tunnel (Location #: 45)



V0000 (None), Piping, Polyvinyl chloride (PVC), Tunnel (Location #: 45)



V0000 (None), Piping, Fibreglass, Tunnel (Location #: 45)



V0000 (None), Piping, Fibreglass, Tunnel (Location #: 45)



V0000 (None), Mechanical Equipment, Pump, Not Insulated, Tunnel (Location #: 45)



V0000 (None), Duct, Duct Connector, Textile, Tunnel (Location #: 45)



V0000 (None), Duct, Fibreglass, Tunnel (Location #: 45)



V0000 (None),Floor, Non-slip Flooring, Staircase No. 3 (Location#: 46)



V0000 (None),Floor, Non-slip Flooring, Staircase No. 3 (Location#: 46)



V0000 (None), Structure, Stairs, Metal, Staircase No. 3(Location #: 46)
Undemeath staircase



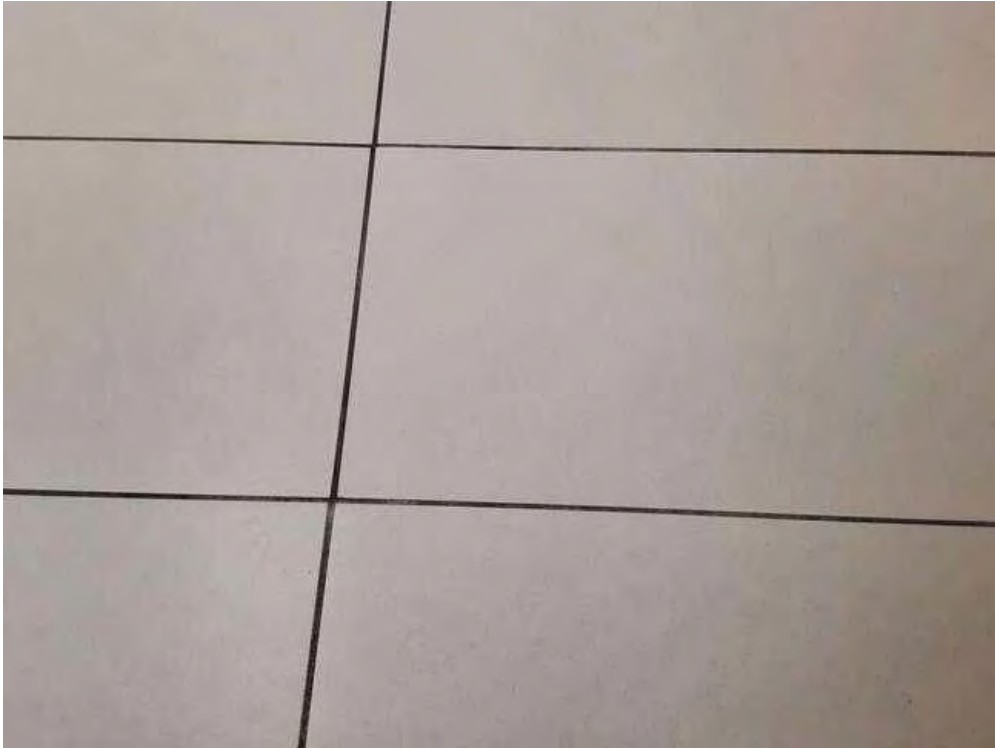
V0000 (None), Structure, All, Metal, Upper Lobby (Location #: 47)



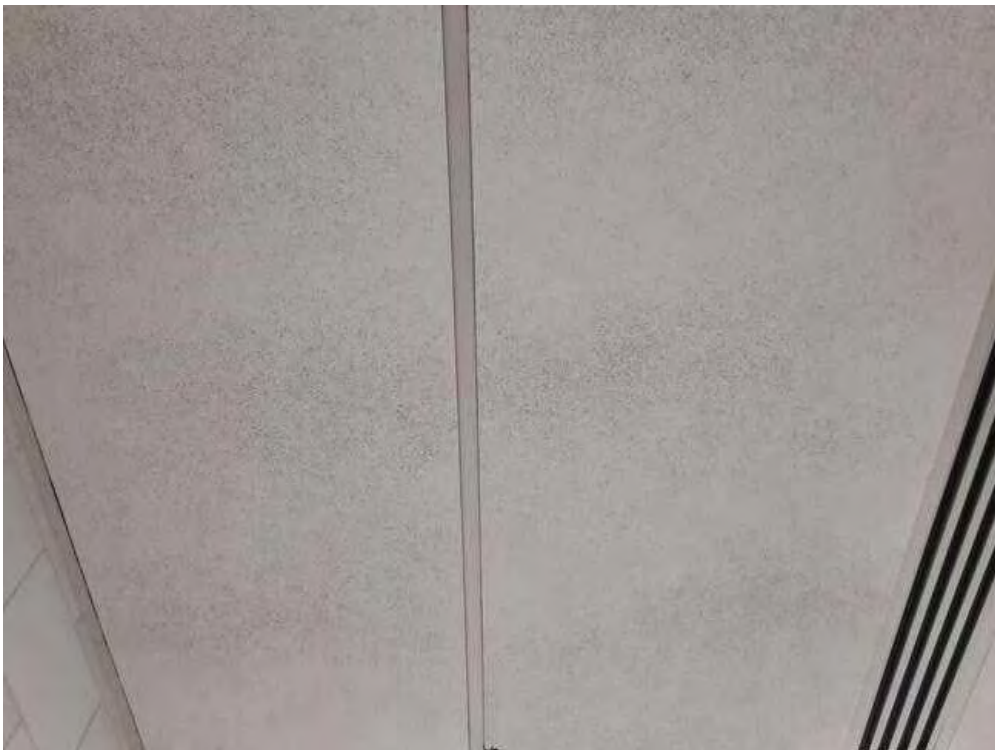
V0000 (None), Wall, All, Masonry, Upper Lobby (Location #: 47)
Block wall



V0000 (None), Ceiling, Drywall and joint compound, Upper Lobby (Location #: 47)



V0000 (None), Floor, All, Ceramic Tiles, Upper Lobby (Location #: 47)



V0000 (None), Ceiling, Ceiling Tiles (lay-in), Upper Lobby (Location #: 47)



V0000 (None), Piping, Fibreglass, Upper Lobby (Location #: 47)



V0000 (None), Wall, Cement Product, Upper Lobby (Location #: 47)
Cement board



V0000 (None), Wall, Ceramic Tiles, Upper Lobby (Location #: 47)



V0000 (None), Other, Skylight, Not Insulated, Upper Lobby (Location #: 47)
Glass



V0000 (None), Duct, Fibreglass, Program Room (Location #: 48)



V0000 (None), Piping, Fibreglass, Program Room (Location #: 48)



V0000 (None), Floor, Non-slip Flooring, Program Room (Location #: 48)



V0000 (None), Piping, Fibreglass, Universal Washrooms (Location #: 49)



V0000 (None), Wall, Cement Product, Universal Washrooms (Location #: 49)
Cement board, dated 01/10/14, contains silica



V0000 (None), Wall, Cement Product, Universal Washrooms (Location #: 49)
Cement board, dated 01/10/14, contains silica



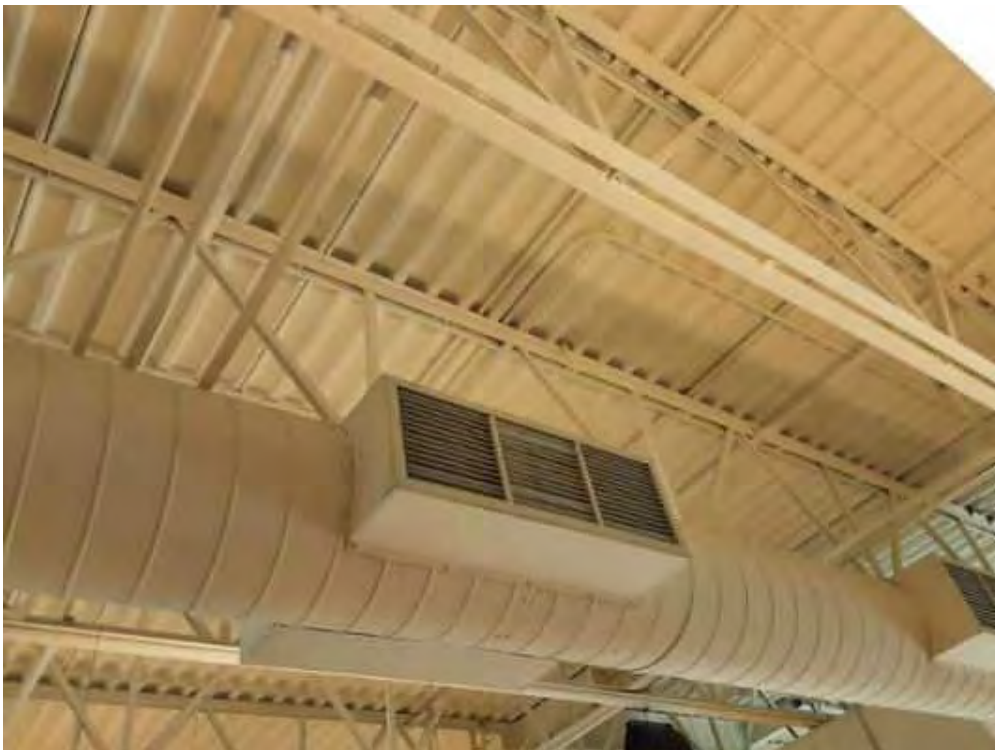
V0000 (None), Floor, Carpet, Fitness Center (Location #: 50)
In supervisor and fitness trainer office only



V0000 (None), Floor, Non-slip Flooring, Fitness Center (Location#: 50)



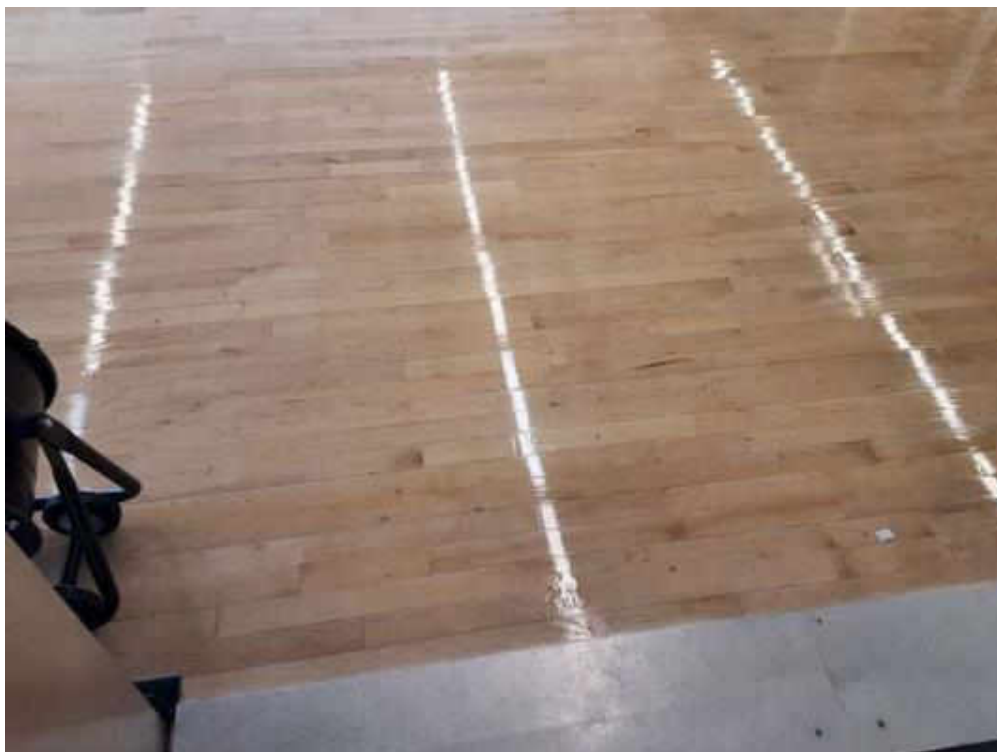
V0000 (None), Mechanical Equipment, Unit Heater, Not Insulated, Fitness Studio (Location #: 51)



V0000 (None), Duct, All, Not Insulated, Fitness Studio (Location #: 51)



V0000 (None), Piping, All, Fibreglass, Fitness Studio (Location #: 51)



V0000 (None), Floor, All, Laminate, Fitness Studio (Location #: 51)



V0000 (None), Other, Window, Styrofoam, Fitness Studio (Location #: 51)
Type of foam, between window frame and glass



V0000 (None), Ceiling, Bulkhead, Drywall and joint compound, Janitor (Location #: 52)



V0000 (None),Other,Electrical Panel,Not Insulated,Electrical Room (Location#: 53)



V0000 (None),Duct,Fibreglass,Electrical Room (Location#: 53)



V0000 (None), Wall, Ceramic Tiles, Fitness Washrooms (Location #: 54)



V0000 (None), Mechanical Equipment, Boiler, Not Insulated, Mechanical Room 2 (Location #: 55)



V0000 (None), Floor, All, Concrete (poured), Mechanical Room 2 (Location #: 55)



V0000 (None), Other, Electrical Panel, Not Insulated, Mechanical Room 2 (Location #: 55)



V0000 (None), Mechanical Equipment, Pump, Not Insulated, Mechanical Room 2 (Location #: 55)



V0000 (None), Piping, Fibreglass, Mechanical Room 2 (Location #: 55)



V0000 (None), Mechanical Equipment, Air Handling Unit, Not Insulated, MechanicalRoom2 (Location #: 55)



V0000 (None), Mechanical Equipment, Air Handling Unit, Not Insulated, MechanicalRoom2 (Location #: 55)



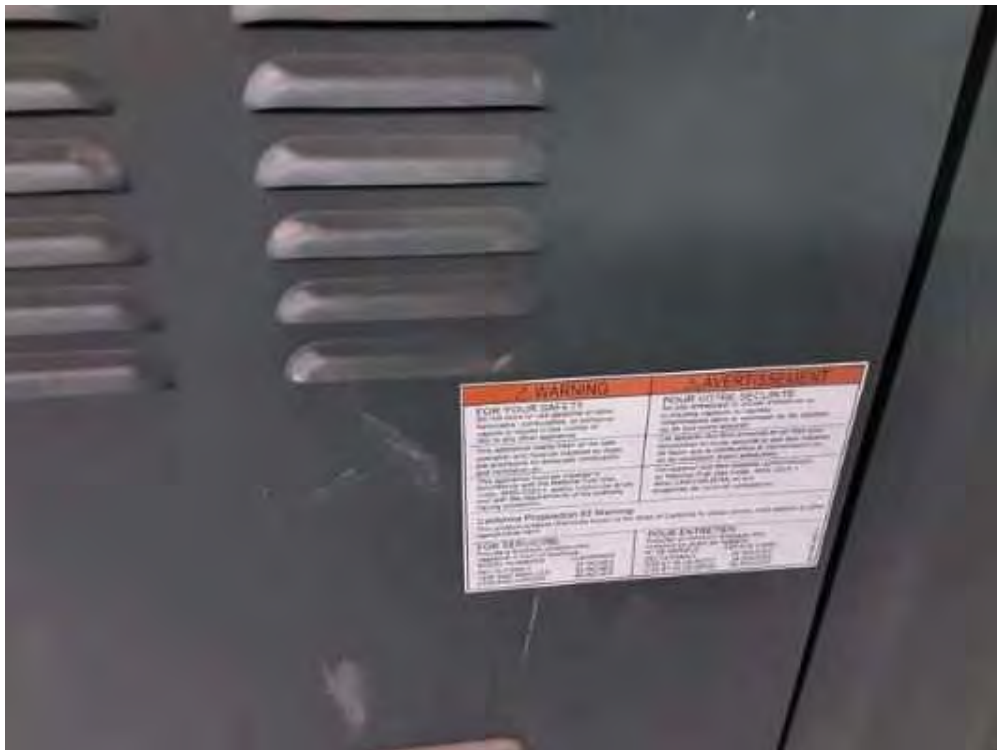
V0000 (None), Mechanical Equipment, Air Handling Unit, Not Insulated, MechanicalRoom2 (Location #: 55)



V0000 (None), Mechanical Equipment, Tank, Fibreglass, MechanicalRoom2 (Location #: 55)
Storage tank



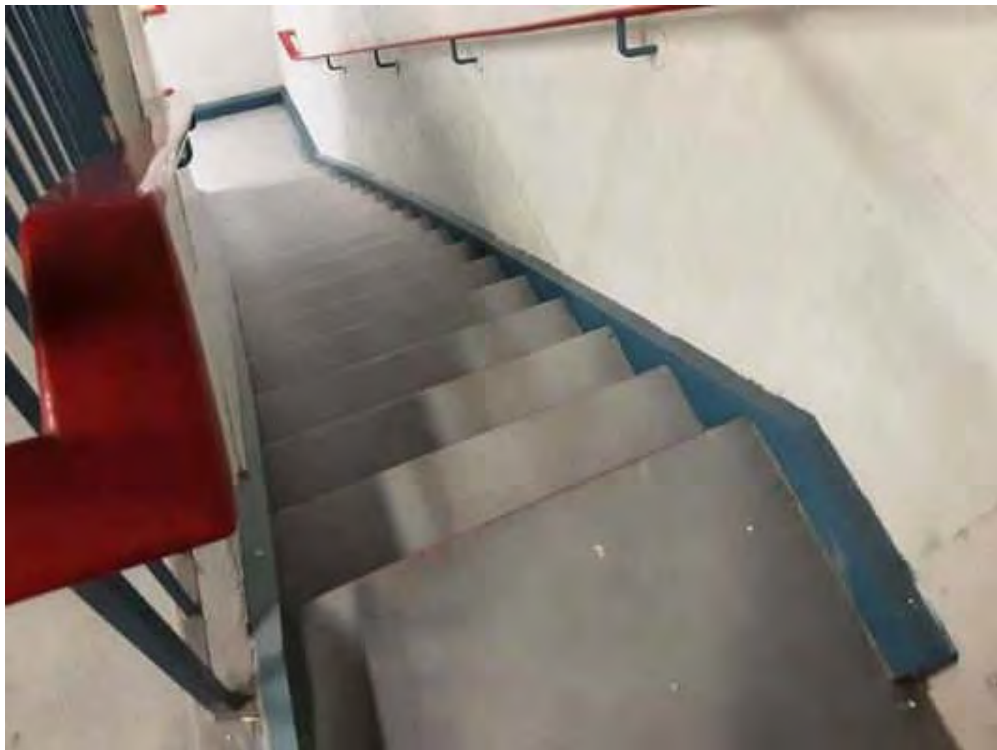
V0000 (None), Mechanical Equipment, Tank, Fibreglass, Mechanical Room 2 (Location #: 55)
Storage tank



V0000 (None), Mechanical Equipment, Not Insulated, Mechanical Room 2 (Location #: 55)



V0000 (None), Mechanical Equipment, Not Insulated, Mechanical Room 2 (Location #: 55)



V0000 (None), Structure, Stairs, Concrete (poured), Mechanical Room 2 (Location #: 55)



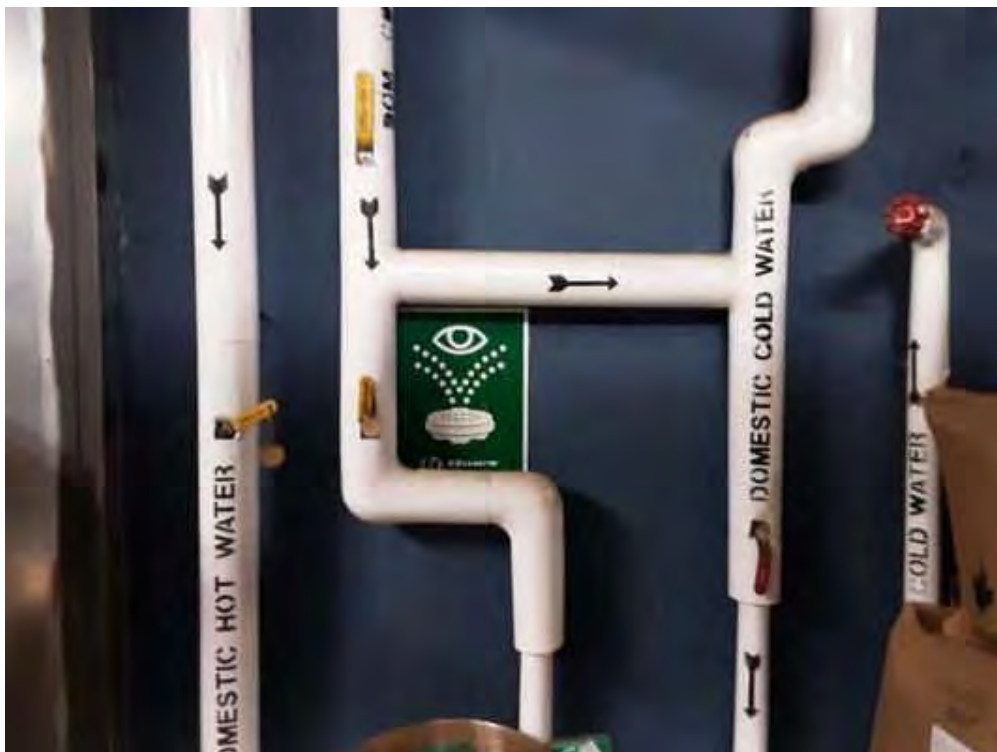
V0000 (None), Floor, All, Concrete (poured), Staff Storage (Location #: 56)



V0000 (None), Mechanical Equipment, Fan Unit, Not Insulated, Mechanical Room 1 (Location #: 57)



V0000 (None), Other, Electrical Panel, Not Insulated, Mechanical Room 1 (Location #: 57)



V0000 (None), Piping, Fibreglass, Mechanical Room 1 (Location #: 57)



V0000 (None), Mechanical Equipment, Heating Ventilating Air Conditioning Unit, Not Insulated, Mechanical Room 1 (Location #: 57)
Pool dehumidifier



V0000 (None), Mechanical Equipment, Heating Ventilating Air Conditioning Unit, Not Insulated, Mechanical Room 1 (Location #: 57)
Pool dehumidifier



V0000 (None), Mechanical Equipment, Heating Ventilating Air Conditioning Unit, Not Insulated, Mechanical Room 1 (Location #: 57)
Pool dehumidifier





V0000 (None), Piping, Polyvinyl chloride (PVC), Mechanical Room 1 (Location #: 57)



V0000 (None), Ceiling, All, Drywall and joint compound, Staircase B (Location #: 58)



V0000 (None), Floor, All, Ceramic Tiles, Staircase B (Location #: 58)



V0000 (None), Floor, Non-slip Flooring, Information Desk And Office (Location #: 59)



V0000 (None), Duct, All, Not Insulated, Kaneff Auditorium (Location #: 6)



V0000 (None), Structure, All, Metal, Kaneff Auditorium (Location #: 6)

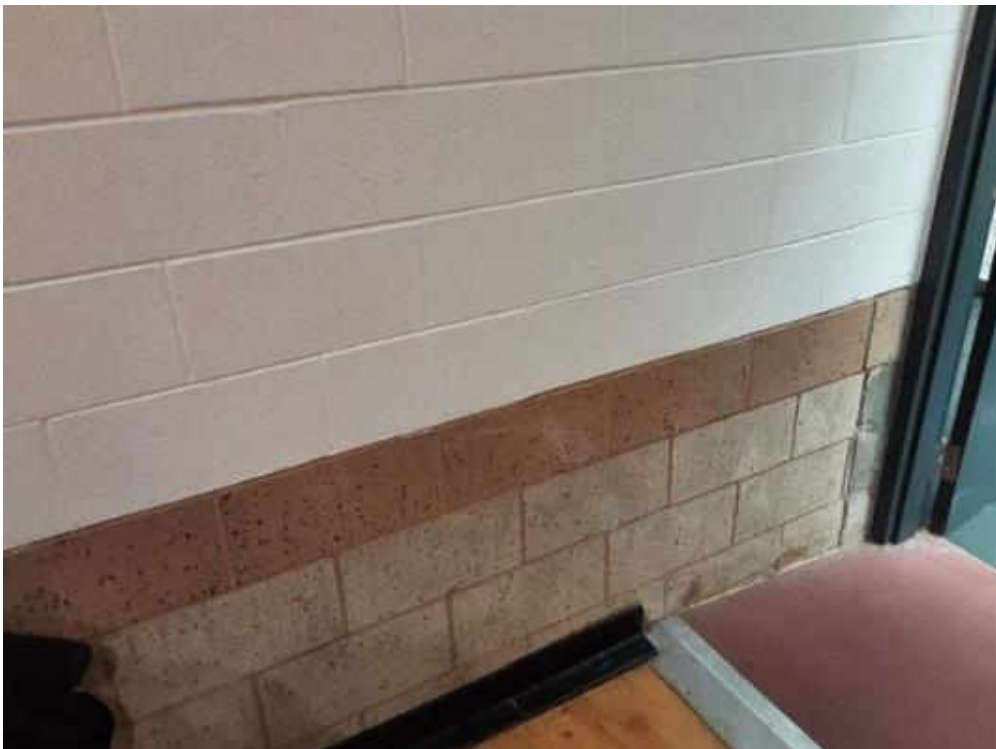




V0000 (None), Wall, All, Masonry, Kan eff Auditorium (Location #: 6)
Block wall



V0000 (None), Wall, All, Masonry, Kan eff Auditorium (Location #: 6)
Block wall

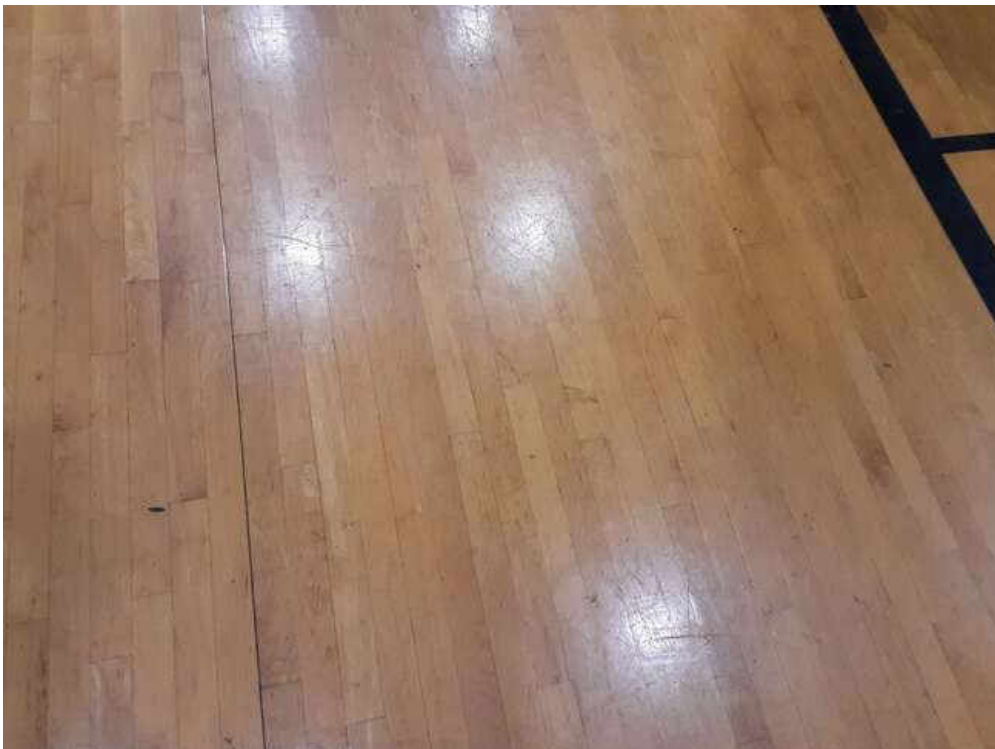




V0000 (None), Wall, All, Masonry, Kaneff Auditorium (Location#: 6)
Block wall



V0000 (None), Ceiling, All, Drywall and joint compound, Kaneff Auditorium (Location#: 6)



V0000 (None), Floor, All, Laminate, Kaneff Auditorium (Location #: 6)



V0000 (None), Duct, All, Fibreglass, Pool Staff Change Rooms (Location#: 60)





V0000 (None), Ceiling, Ceramic Tiles, Pool Staff Change Rooms (Location #: 60)
In shower only



V0000 (None), Floor, Non-slip Flooring, Pool Supervisor Office (Location #: 61)





V0000 (Non e), Piping, Rainwater Leader, Not Insulated, Pool (Location #: 62)



V0000 (None), Wall, All, Pool (Location #: 62)





V0000 (None), Floor, Ceramic Tiles, Pool (Location#: 62)



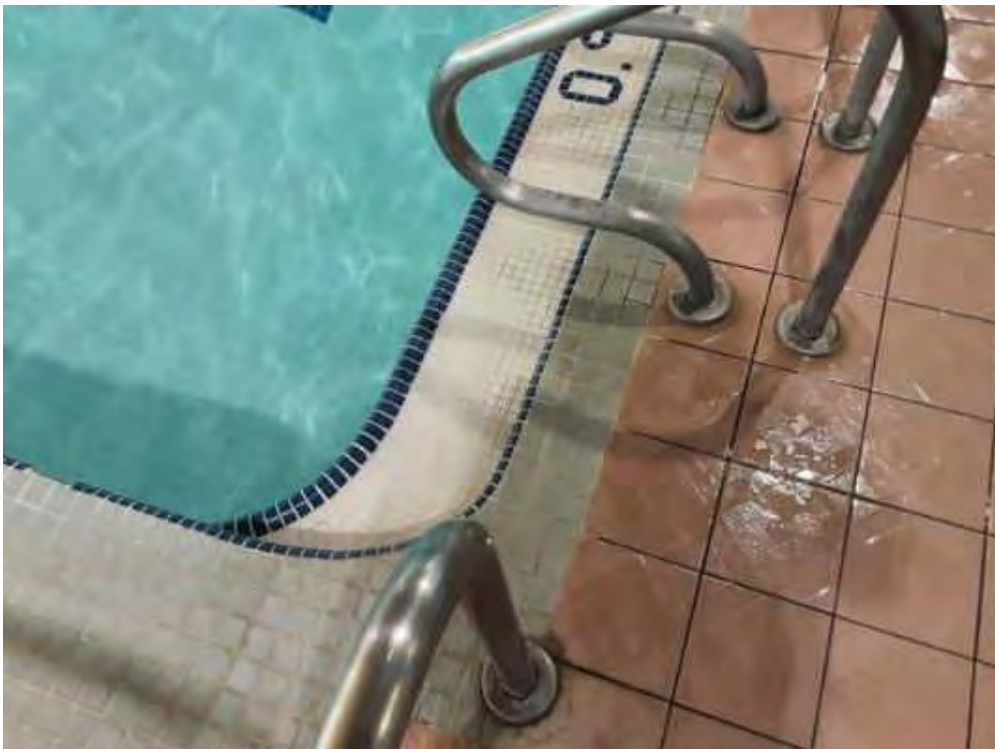
V0000 (None), Floor, Ceramic Tiles, Pool (Location#: 62)



V0000 (None), Floor, Ceramic Tiles, Pool (Location#: 62)



V0000 (None), Floor, Ceramic Tiles, Pool (Location#: 62)



V0000 (None), Floor, Ceramic Tiles, Pool (Location #: 62)
Along pool only



V0000 (None), Wall, Masonry, Pool (Location #: 62)
Block wall



V0000 (None), Ceiling, Ceramic Tiles, Pool (Location #: 62)
In vestibule emergency exit



V0000 (None), Wall, Ceramic Tiles, Pool (Location #: 62)





V0000 (None), Duct, All, Not Insulated, Pool Storage 1 (Location #: 63)



V0000 (None), Structure, All, Wood, Pool Storage 1 (Location #: 63)



V0000 (None), Duct, Duct Connector, Textile, Pool Storage 1 (Location #: 63)



V0000 (None), Mechanical Equipment, Fan Unit, Not Insulated, Pool Storage 3 (Location #: 65)





V0000 (None), Duct, All, Not Insulated, Pool Storage 3 (Location #: 65)



V0000 (None), Ceiling, All, Ceiling Tiles (lay-in), Kitchen (Location #: 7)

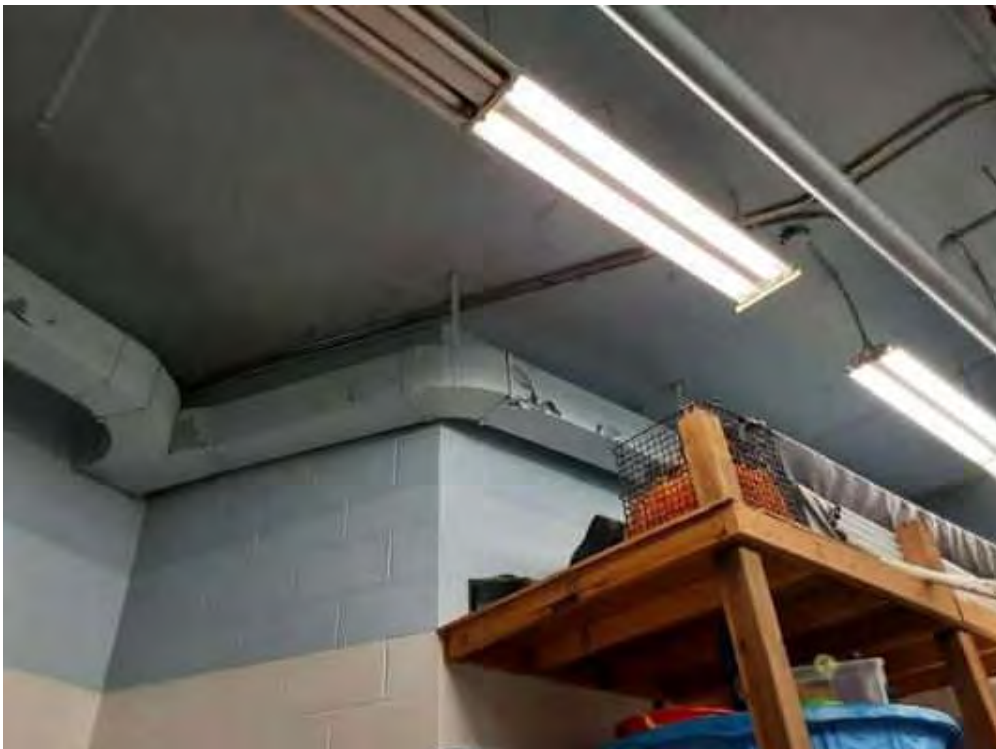




V0000 (None), Floor, All, Vinyl Floor Tile, Kitchen (Location #: 7)



V0000 (None), Floor, Non-slip Flooring, Kitchen (Location #: 7)



V0000 (None), Duct, All, Not Insulated, Gym Storage (Location #: 8)



V0000 (None), Piping, Rainwater Leader, Not Insulated, GymStorage (Location #: 8)





V0000 (None), Structure, All, Concrete (precast), Gym Storage (Location #: 8)



V0000 (None), Floor, All, Concrete (poured), GymStorage (Location #: 8)



V0000 (None), Piping, Sprinkler, Not Insulated, Gym Storage (Location #: 8)



Ceiling, All, Ceiling Tiles (lay-in), Men's Washroom (Location #: 10)
Fiberglass



Ceiling, All, Ceiling Tiles (lay-in), Men's Washroom (Location #: 10)
Fiberglass



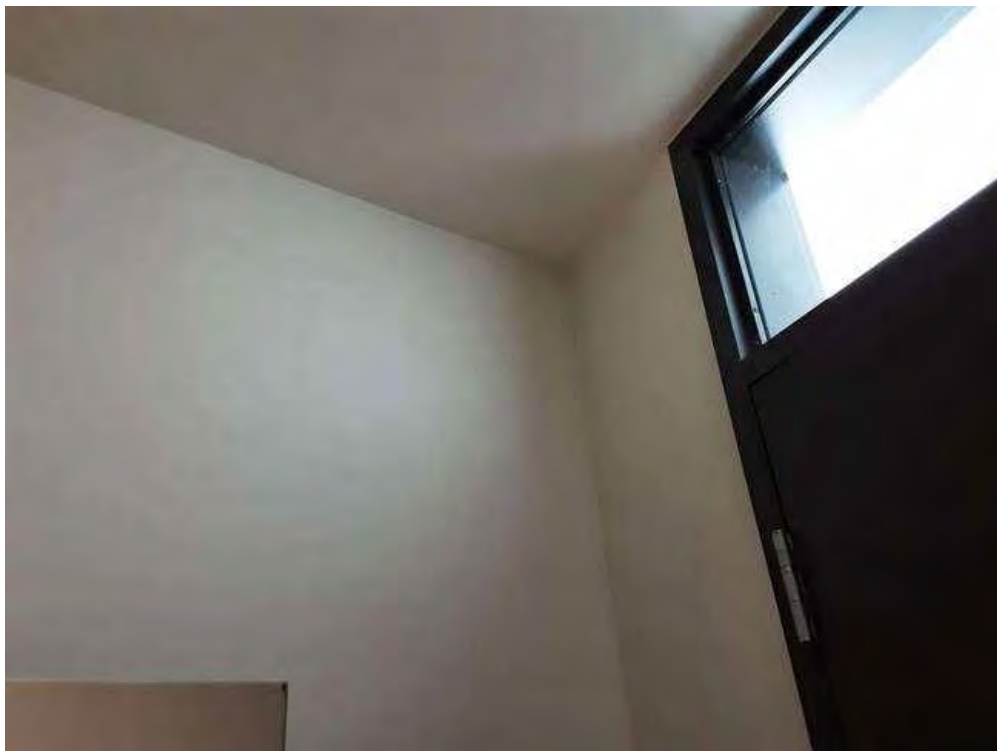
Masonry, White, V0001, Entrance Vestibule (Location #: 1)



Drywall and joint compound, White, V0002, Entrance Corridor (Location #: 2)



Masonry, White, L0001, Entrance Corridor (Location #: 2)



Drywall and joint compound, White, L0002, Coat Check (Location #: 4)



Masonry, Off White, L0003, Kan eff Auditorium (Location #: 6)



Masonry, Off White, L0003, Kan eff Auditorium (Location #: 6)



Masonry,, V0003, Kitchen (Location #: 7)



Masonry, White, V0001, Gym Storage (Location #: 8)



Masonry, White, V0001, Staircase (Location #: 21)



Masonry, Teal, V9500(Presumed Lead), Staircase (Location #: 21)



Drywall and joint compound, Grey, L0005, Staff Offices (Location #: 22)



Concrete (poured), White, L0006, Staircase No. 3 (Location #: 46)



Drywall and joint compound, Teal, L0008, Fitness Center (Location #: 50)



Drywall and joint compound, Black, L0007, Fitness Studio (Location #: 51)



Drywall and joint compound, White, V0002, Fitness Studio (Location #: 51)



Metal, Sky blue, V0004, Mechanical Room 2 (Location #: 55)



Concrete (poured), Light grey, L0009, Mechanical Room 2 (Location #: 55)



Concrete (poured), Dark blue, L0010, Mechanical Room 1 (Location #: 57)



Concrete (poured), Dark blue, L0010, Mechanical Room 1 (Location #: 57)



Masonry, Teal, V0008, Information Desk And Office (Location #: 59)



Masonry, Sky blue, V0004, Pool (Location #: 62)



Masonry, Blue, L0011, Pool (Location #: 62)



Metal,, V0004, Pool Storage1 (Location #: 63)



Pb Products, Entrance Vestibule (Location #: 1)



Pb Products, Lobby (Location #: 3)



Pb Products, Kan eff Auditorium (Location #: 6)



Pb Products, Men's Fitness ChangeRoom (Location #: 15)



Pb Products, Corridor 4 (Location #: 31)



Pb Products, Upper Lobby (Location #: 47)



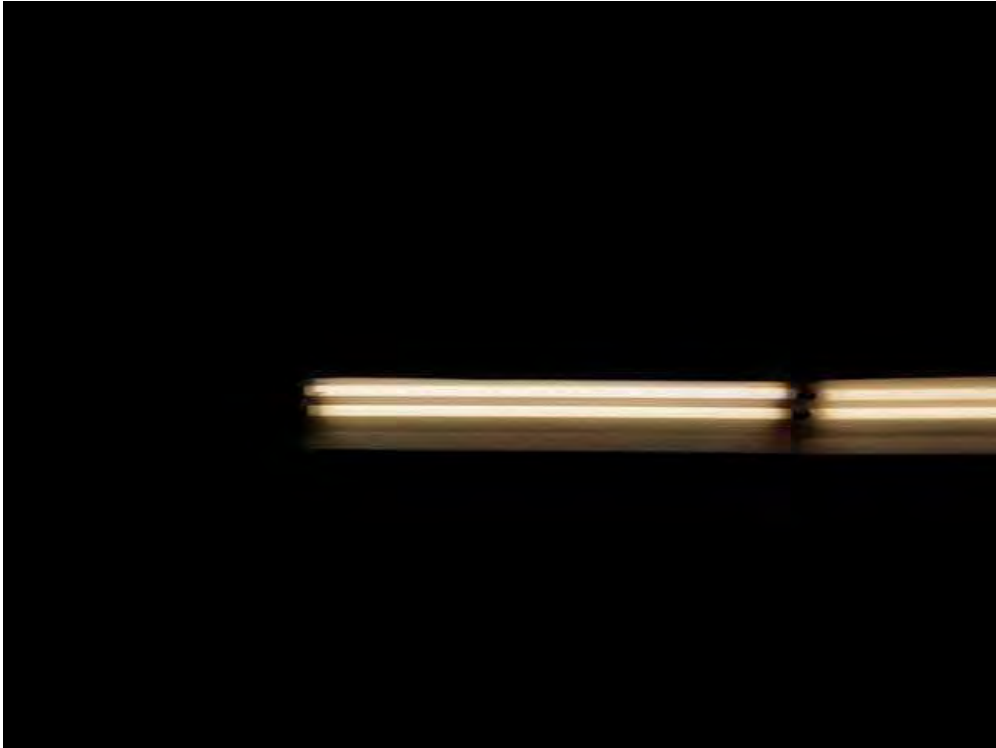
Pb Products, Electrical Room (Location #: 53)



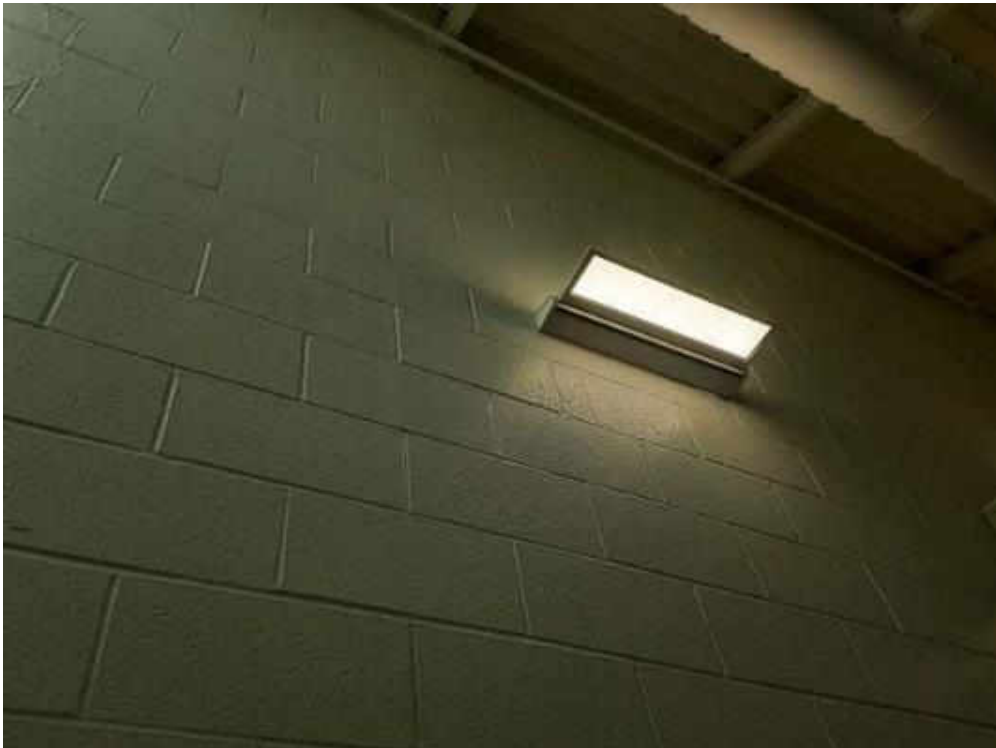
Mercury, Entrance Corridor (Location #: 2)



Mercury, Men's Washroom (Location #: 10)



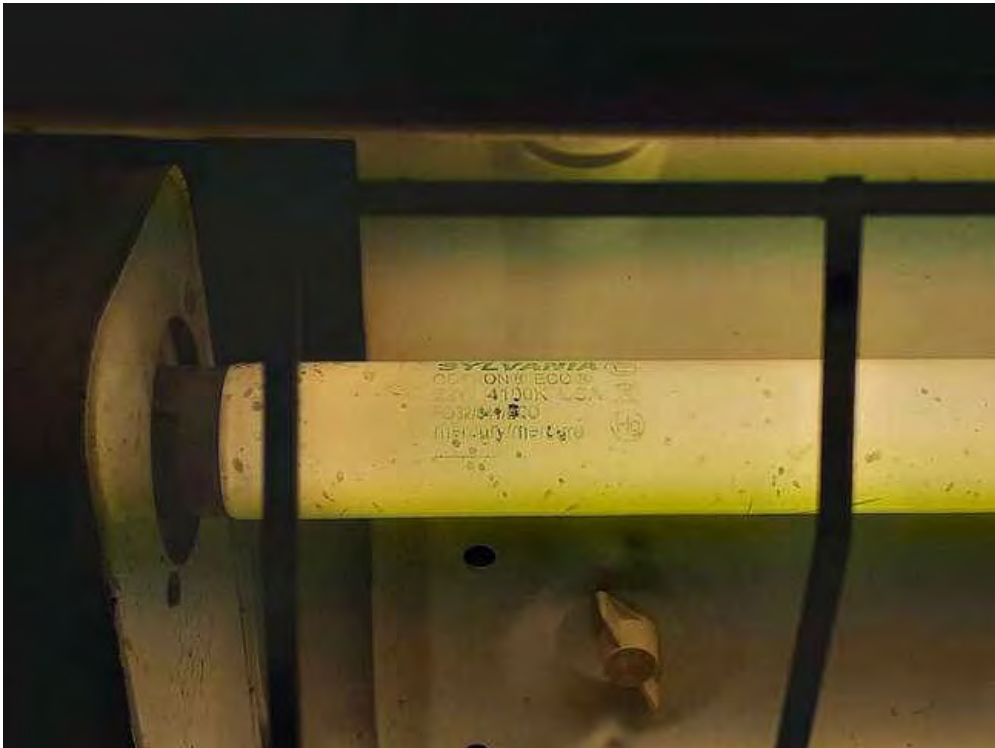
Mercury, Staff Storage (Location #: 25)



Mercury, Corridor 4 (Location #: 31)



Mercury, Youth Storage (Location #: 35)



Mercury, Filtration Room (Location #: 44)



Mercury, Tunnel (Location #: 45)



Mercury, Upper Lobby (Location #: 47)



Mercury, Program Room (Location #: 48)



Mercury, Fitness Studio (Location #: 51)



Mercury, Mechanical Room 2(Location #: 55)



Mercury, Mechanical Room 2(Location #: 55)



Mercury, Pool (Location #: 62)



PCB, Filtration Room (Location #: 44)



PCB, Filtration Room (Location #: 44)



PCB, Electrical Room (Location #: 53)



Burt Arts Studio (Location #: 29)



Operations Office (Location #: 33)



Youth Storage (Location #: 35)



Building Photo



Building Photo

1 GENERAL

- 1.1 The requirements of the Articles of Agreement, Conditions of the Contract, Division 1 apply to and form all Sections of the Contract Documents and the Work.
- 1.2 Work in this Specification is divided into descriptive sections which are not intended to identify absolute contractual limits between Subcontractors, nor between the Contractor and their Subcontractors. The Contractor is responsible for organizing division of labour and supply of materials essential to complete the Contract. The Consultant assumes no liability to act as an arbiter to establish subcontract limits between Sections or Divisions of Work.
- 1.3 It is intended that Work supplied under these Contract Documents shall be complete and fully operational in every detail for the purpose required. Provide all items, articles, materials, services and incidentals, whether or not expressly specified or shown on Drawings, to make finished Work complete and fully operational, consistent with the intent of the Contract Documents.
- 1.4 Work designated as "N.I.C." is not included in this Contract.
- 1.5 Specifications, Schedules and Drawings are complementary and items mentioned or indicated on one may not be mentioned or indicated on the others.
- 1.6 Contractors finding discrepancies or ambiguities in, or omissions from the Drawings, Specifications or other Contract Documents, or having doubt as to the meaning and intent of any part thereof shall contact the Consultant for clarification. If the Consultant is not contacted for clarification, execute the Work in accordance with the most stringent requirements.
- 1.7 Mention in the specifications or indication on the drawings of materials, products, operations, or methods, requires that the Contractor provide each item mentioned or indicated of the quality or subject to the qualifications noted; perform according to the conditions stated in each operation prescribed; and provide labour, materials, Products, equipment and services to complete the Work.
- 1.8 Where the singular or masculine is used in the Contract Documents, it shall be read and construed as if the plural, feminine or neuter had been used when the context or the statement so requires and as required to complete the Work, and the rest of the sentence, clause, paragraph, or Article shall be construed as if all changes in grammar, gender or terminology thereby rendered necessary had been made.
- 1.9 The terms "approved", "review", "reviewed", "accepted", "acceptance", "acceptable", "satisfactory", "selected", "directed", "instructed", "required", "submit", "permitted" or similar words or phases are used in standards or elsewhere in Contract Documents, it shall be understood, that words "by (to) the Consultant" follow, unless context provides otherwise.
- 1.10 Where the words 'submit', 'acceptable' and 'satisfactory' are used in the Contract Documents, they shall be considered to be followed by the words 'to the Consultant' unless the context provides otherwise.
- 1.11 The terms "exposed" or "exposed to view" refers to surfaces that are within the line of vision of persons from any accessible viewpoint, both within and without the building. Where any part of a surface is exposed to view, all other portions of that surface shall also be considered as exposed to view.

- 1.12 Contractor to add The City of Mississauga and Cherie Ng Architect Inc. as Additional Insured Names in the Contractor's Commercial General Liability insurance policy.
- 1.13 Contractor to forward a copy of their Commercial General Liability Insurance Certificate of Insurance with the Additional Insured Names to the architect at the Pre-Construction Meeting.

2 EXISTING SITE CONDITIONS

- 2.1 Make a careful examination of the site, and investigate and be satisfied as to all matters relating to the nature of the Work to be undertaken, as to the means of access and egress thereto and therefrom, as to the obstacles to be met with, as to the extent of the Work to be performed, any limitations under which the work has to be executed, and any and all matters which are referred to in the Contract Documents.
- 2.2 Report any inconsistencies, ambiguities, discrepancies, omissions, and errors between Site conditions and Contract Documents to the Consultant prior to the commencement of Work. If inconsistencies, ambiguities, discrepancies, omissions, and errors are not reported and clarified, the most stringent requirement shall govern, as determined by the Consultant. Ensure that each Subcontractor performing work related to the site conditions has examined it so that all are fully informed on all particulars which affect the Work thereon in order that construction proceeds competently and expeditiously.
- 2.3 Before commencing the Work of any Section or trade, carefully examine the Work of other Sections and trades upon which it may depend, examine substrate surfaces, and report in writing to the Consultant, defects which might affect new Work. Commencement of Work shall constitute acceptance of conditions and Work of other sections, trades, and Other Contractors upon which the new Work depends. If repair of surfaces is required after commencement of specific work it shall be included in the work of the trade providing the specific system or finish.

3 CONTINUITY OF EXISTING SERVICES

- 3.1 Shutdowns and planning of operations that may affect Owner's use of services shall be coordinated with and in accordance with the Owner's written directions. Provide notice for all required interruptions to utility, heating, cooling, mechanical, electrical, and life safety systems.
- 3.2 Make written requests for shutdown at least 5 working days in advance, unless specifically stated herein or as otherwise instructed by the Owner.
- 3.3 Shutdowns shall be scheduled in advance with Owner and shutdown period shall be minimized to Owner's convenience. Facilities in existing adjacent areas will be occupied during the Work.
- 3.4 Major shutdowns shall take place on weekends or at night by prior arrangement with and at no additional cost to the Owner.
- 3.5 Minimize disruption, vibration, noise and dust to the function of existing building.
- 3.6 These requirements are for security reasons and for the consideration of the Owner. Requirements shall not be construed as cause for elimination or restriction of Contractor's working schedule, claims for delay or work, nor additional cost.

4 ACCESS / PROPERTY CONSTRAINTS

- 4.1 Provide and maintain access facilities as may be required for access to the Work.
- 4.2 Minimize disruption, noise and dust to the functions of existing operational areas of existing buildings. Times of entry, routes of access and time required to complete the Work shall be arranged and scheduled in cooperation with the Owner.
- 4.3 Confine Work and operations of employees to limits indicated by the Contract Documents. Do not unreasonably encumber the premises with products.
- 4.4 Organize delivery of materials/equipment to and removal of debris and equipment from place of Work to permit continual progress of work and suitable for restricted site conditions.
- 4.5 Determine and make arrangement as required for loading and unloading of equipment and Products at times that will not affect public traffic flow and that will be permitted by the City of Mississauga. Conform to City by-laws with regard to parking restrictions and other conditions.
- 4.6 Make provisions and arrangements and provide allowances if times for loading and unloading allowed by the City of Mississauga are other than regular working hours.
- 4.7 All Products, materials and equipment required on Site shall be portable and/or size suitable for access and movement on Site and without causing damage to buildings.
- 4.8 Workers shall not enter existing building beyond construction areas except where required for connection or modification to existing services or other such work. Arrange such requirements with Owner prior to entering existing occupied areas.
- 4.9 Provide locked doors in barriers, permit access by Owner and Consultant to Work areas and to areas Contractor is responsible for.

5 SETTING OUT

- 5.1 Before commencing work, verify lines, levels and dimensions shown on the drawing and report discrepancies in levels or dimensions to the Consultant. Be responsible for work done prior to the receipt of the Consultant's decision regarding reported discrepancies

6 PARKING

- 6.1 Parking may be permitted on Site provided it does not disrupt the performance of Work, Site safety or the movement of vehicular or pedestrian traffic and is acceptable to the Consultant and permitted by the City of Mississauga.

7 COORDINATION

- 7.1 Coordination of the Work of all Sections of the specifications as required to complete the Project is the responsibility of the Contractor.
- 7.2 Coordinate with removals/installations specified in other Divisions and Other Contracts.

- 7.3 Ensure that Subcontractors and trades cooperate with other subcontractors and trades whose work attaches to or is affected by their own work. Ensure that minor adjustments are made to make adjustable work fit fixed work.
- 7.4 Allow access of Owner's Other Contractors on site and to areas of Work. Cooperate and coordinate with such Other Contractors. Schedule work to complement work of such Other Contractors.
- 7.5 Entry by the Owner's own forces and by Other Contractors shall not mean acceptance of the Work and shall not relieve the Contractor of their responsibility to complete the Contract.
- 7.6 Existing equipment shall remain in present locations unless designated otherwise. Protect from damage. Remove, store and reinstall existing fixed equipment, fixtures and components which interfere with construction and which are scheduled for relocation.
- 7.7 Placing, installation, application and connection of work by the Owner's own forces or by Other Contractors on and to the Contractor's Work shall not relieve the Contractor of his responsibility to provide and maintain the specified warranties.
- 7.8 Pay particular attention to types of ceiling construction and clearances throughout, especially where recessed fixtures are required. Coordinate work with Other Contractors and Subcontractors wherever ventilation ducts or piping installations occur to ensure that conflicts are avoided.
- 7.9 Install ceiling mounted components in accordance with final ceiling plans. Inform Consultant of conflicting installations. Install as directed.
- 7.10 Install and arrange ducts, piping, tubing, conduit, equipment, fixtures, materials and products to conserve headroom and space with minimum interference and in neat, orderly and tidy arrangement. Run pipes, ducts, tubing and conduit, vertical, horizontal and square with building grid unless otherwise indicated. Install piping, ducts, and conduit as close to underside of structure as possible unless shown otherwise.
- 7.11 Make provision for unrestricted relocation of light fixtures to replace ceiling panels at grid spaces of the same size, without interference or restriction by items located within the ceiling space.
- 7.12 Where supports or openings are to be left for the installation of various parts of the Work furnish the necessary information to those concerned in ample time so that proper provision can be made for such items. Cutting, drilling and the subsequent patching required for failing to comply with this requirement shall be performed at a later date at no additional Cost to Owner.
- 7.13 Ensure that setting drawings, templates, and all other information necessary for the location and installation of materials, fixtures, equipment, holes, sleeves, inserts, anchors, accessories, fastenings, connections, and access panels are provided by each Section whose work requires cooperative location and installation by other Sections, and that such information is communicated to the applicable installer. Cutting, fixing and 'making good' of the work of other Contractors, Subcontractors and trades and making up of lost time involved in failing to comply with this requirement shall be performed at no additional Cost to Owner.
- 7.14 Be responsible for coordinating products supplied in metric (SI) and imperial units into the overall layout.

- 7.15 Properly coordinate the work of the various Sections and trades, taking into account the existing installations to assure the best arrangement of pipes, conduits, ducts and refrigeration, mechanical, electrical and other equipment, in the available space. Under no circumstances will any extra payment be allowed due to the failure by the Contractor to coordinate the Work. If required, in critical locations, prepare interference and/or installation drawings showing the work of the various Sections as well as the existing installation, and submit these drawings to the Consultant for review before the commencement of Work.
- 7.16 Protect from damage. Remove, store and reinstall existing fixed equipment, fixtures and components which interfere with construction and which are scheduled for relocation.
- 7.17 Coordinate with structural, refrigeration, mechanical and electrical trades to ensure protecting, supporting, disconnecting, cutting off, capping, diverting, relocating or removing of existing services in areas of Work before commencement of alteration work.
- 7.18 In case of damage to active services or utilities, notify Consultant and respective authorities immediately and make all required repairs under direction of Consultant and respective authorities. Carry out repairs to such damaged services and utilities continuously to completion, including working beyond regular working hours.

8 METRIC DIMENSIONS

- 8.1 Measurements in this specification are expressed in metric (SI) units and depending on the progress made in the various sectors of the industry are either hard or soft converted units.
- 8.2 All metric units specified shall be taken to be the minimum acceptable unless otherwise noted.
- 8.3 It is the Contractor's responsibility to check and verify with manufacturers and suppliers on the availability of materials and products in either metric or imperial sizes. Be responsible for coordinating products supplied in metric (SI) and imperial units into the overall layout.
- 8.4 Where both metric and imperial sizes or dimensions are shown, the metric size or dimension shall govern.

9 BUILDING DIMENSIONS

- 9.1 Take necessary job dimensions for the proper execution of the work. Assume complete responsibility for the accuracy and completeness of such dimensions, and for coordination.
- 9.2 Verify that work, as it proceeds, is executed in accordance with dimensions and positions indicated which maintain levels and clearances to adjacent work, as set out by requirements of the Drawings, and ensure that work installed in error is rectified before construction resumes.
- 9.3 Check and verify dimensions referring to the work and the interfacing of services.

- 9.4 Do not scale directly from the Drawings. If there is ambiguity or lack of information, immediately inform the Consultant. Changes required through the disregarding of this clause shall be the responsibility of the Contractor.
- 9.5 All details and measurements of any work which is to fit or to conform with work installed shall be taken at the building.
- 9.6 Advise Consultant of discrepancies and if there are omissions on Drawings, particularly reflected ceiling plans and jointing patterns for surfaces finishes, which affect aesthetics, or which interfere with services, equipment or surfaces. Do not proceed with work affected by such items without direction from the Consultant.
- 9.7 Provide written requirements for site conditions and surfaces necessary for the execution of respective work, and provide setting drawings, templates and all other information necessary for the location and installation of material, holes, sleeves, inserts, anchors, accessories, fastenings, connections and access panels. Inform respective contractors whose work is affected by these requirements and preparatory work.

10 INTERFERENCE AND COORDINATION DRAWINGS

- 10.1 Coordinate placement of equipment to ensure that components will be properly accommodated within the spaces provided prior to commencement of work.
- 10.2 Prepare interference and equipment placing drawings to ensure that all components will be properly accommodated within the spaces provided.
- 10.3 Prepare drawings to indicate coordination and methods of installation of a system with other systems where their relationship is critical. Ensure that all details of equipment apparatus, and connections are coordinated.
- 10.4 Take complete responsibility for any remedial work that results from failure to coordinate any aspect of the Work prior to its fabrication/installation.
- 10.5 Ensure that accesses and clearance required by jurisdictional authorities and/or for easy maintenance of equipment are provided in the layout of equipment and services.

11 CUTTING AND PATCHING

- 11.1 Execute Work to avoid damage to other Work.
- 11.2 Execute cutting, fitting and patching including excavation and fill to complete the Work.
- 11.3 Employ appropriate trades with skilled labour to perform cutting Work.
- 11.4 Fit Work segments together, to integrate with penetrations through surfaces and with other Work.
- 11.5 Remove and replace defective and non-conforming Work.
- 11.6 Do any drilling, cutting, fitting, patching and finishing that may be required to make the various classes and kinds of other Work fit together in a professional and finished manner. Make watertight connections with adjoining structures

- 11.7 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.
- 11.8 Execute Work by methods to avoid damage to other Work and which will provide proper surfaces to receive patching and finishing.
- 11.9 Cut Products using proper equipment and methods. On rigid materials, use a masonry saw or core drill. Pneumatic or impact tools are not allowed on masonry work without prior approval.
- 11.10 Where new Work connects with existing structures, cut, patch and make good existing work to match original condition.
- 11.11 Be responsible for correct formation and bridging of openings in masonry and structural walls as required.
- 11.12 Ensure compatibility between installed Products and ensure security of installation.
- 11.13 Restore Work with new Products in accordance with requirements of the Contract Documents.
- 11.14 Fit Work airtight to pipes, sleeves, ducts, conduits and other penetrations through surfaces.
- 11.15 Properly prepare surfaces to receive patching and finishing.
- 11.16 Refinish surfaces to match adjacent finishes; for continuous surfaces refinish to nearest intersection; for an assembly, refinish entire unit.

12 FIRE RATINGS

- 12.1 Where a material, component or assembly is required to be fire rated, the fire rating shall be as determined or listed by one of the following testing authorities acceptable to the authorities having jurisdiction:
- 12.2 Underwriters' Laboratories of Canada.
 - .1 Underwriters' Laboratories Inc.
 - .2 Factory Mutual Laboratories.
 - .3 The National Research Council of Canada.
 - .4 The National Board of Fire Underwriters.
 - .5 Intertek Testing Services.
- 12.3 Where reference is made to only one testing authority an equivalent fire rating as determined or listed by another of the aforementioned testing authorities is acceptable if approved by authorities having jurisdiction. Obtain and submit such approval of authorities, in writing when requesting acceptance of a proposed equivalent rating or test design.

13 FIRE SEPARATIONS

- 13.1 Conform to following requirements to maintain continuity of fire separations whether or not shown on the Contract Drawings.

- 13.2 Fire separations may be pierced by openings for electrical and similar service outlets provided such boxes are non-combustible and are tightly fitted and sealed with a ULC approved sealant for the assembly being sealed.
- 13.3 Construction that abuts on or is supported by a non-combustible fire separation shall be constructed so that its collapse under fire conditions will not cause the collapse of the fire separation.
- 13.4 At penetration through fire rated walls, ceilings or floors, completely seal voids with ULC approved firestopping material; full thickness of the construction element. In locations that require a smoke seal, provide appropriate ULC approved system installed in accordance with the manufacturer's recommendations.

14 CODES

- 14.1 Reference is made to standards in the specifications to establish minimum acceptable standards of materials, products and workmanship. Ensure that materials, products and workmanship meet or exceed requirements of the reference standards specified.
- 14.2 In the event of conflict between documents specified herein, execute the Work in accordance with the most stringent requirements.

15 STANDARDS

- 15.1 Where a material or product is specified in conjunction with a referenced standard, do not supply the material or product if it does not meet the requirements of the standard. Supply another specified material or product, or an acceptable material or product of other approved manufacture which does meet the requirements of the standard, at no additional cost to the Owner.
- 15.2 Where no standard is referred to, provide materials, products and workmanship which meet requirements of the applicable standards of the Canadian Standards Association, and Canadian General Standards Board.
- 15.3 If there is question as to whether a material, product or system is in conformance with applicable standards, the Consultant reserves the right to have such materials, products or systems tested to prove or disprove conformance. The cost for such testing will be paid by the Owner in the event of conformance with contract Documents or by the Contractor in the event of non-conformance.
- 15.4 Where application, installation and workmanship standards are cited, it is intended that referenced standards form the basis for minimum requirements of the specified item and specifications supplement the standards unless specified otherwise.
- 15.5 Matters may be dealt with in part by these specifications which are also dealt with, under the same or similar headings in cited standard. It is not intended that these specifications take the place of the standards but supplement them, unless specified otherwise.
- 15.6 Where reference is made to manufacturer's directions, instructions or specifications they shall include full information on storing, handling, preparing, mixing, installing, erecting, applying, or other matters concerning the materials pertinent to their use and their relationship to materials with which they are incorporated.

16 PRE-CONSTRUCTION MEETING

- 16.1 Attend a pre-construction meeting, arranged and conducted by the Consultant.
- 16.2 Co-ordinate and organize attendance by representatives of major Subcontractors and parties in contract with the Contractor.
- 16.3 Consultant will arrange attendance of other interested parties not responsible to the Contractor.
- 16.4 Consultant will distribute copies of Agenda prior to meeting.
- 16.5 Be prepared to provide specific information relative to agenda items as they are pertinent to the Contract.
- 16.6 Record minutes of meeting and distribute type written copies to all participants and other interested parties, within one week of meeting date.
- 16.7 Refer SECTION 13 11 13 for **PRE-INSTALLATION MEETING**.

17 PROGRESS MEETINGS

- 17.1 Attend regularly scheduled progress meetings to be held on Site at times and dates that are mutually agreed to by the Owner, Consultant, and Contractor.
- 17.2 Co-ordinate and organize attendance of individual Subcontractors and material suppliers when requested. Relationships and discussions between Subcontractor participants are not the responsibility of the Consultant and do not form part of the meetings content.
- 17.3 Ensure that Contractor representatives in attendance at meetings have required authority to commit Contractor to actions agreed upon. Assign same persons to attend such meetings throughout the contract period.\
- 17.4 Inform the Consultant in advance of meetings regarding all items to be added to the agenda.
- 17.5 Consultant will distribute copies of Agenda prior to meeting.
- 17.6 Be prepared to provide specific information relative to agenda items at each meeting as they are pertinent to the Contract.
- 17.7 Agenda will include but not be limited to the following topics as are pertinent to the Contract.
 - .1 Review and agreement of previous minutes.
 - .2 Construction safety.
 - .3 Status of submittals.
 - .4 Quality control.
 - .5 Co-ordination.
 - .6 Contract Schedule.
 - .7 Work plan up to next scheduled meetings.
 - .8 Requests for information/clarification.
 - .9 Contemplated changes.
- 17.8 Record minutes of meeting and distribute type written copies to all participants and other interested parties, within one week of meeting date.

18 PRODUCT DATA

- 18.1 Before delivery of Products to the Site, submit Product data as specified in each section or as requested by the Consultant.
- 18.2 Submit manufacturer's Product data for systems, materials, and methods of installation proposed for use. Such literature shall identify systems, each component, and shall certify compliance of each component with applicable standards

19 SAMPLES

- 19.1 Before delivery of Products to the Site, submit samples of Products as specified or as requested by the Consultant. Label samples as to origin and intended use in the Work and in accordance with the requirements of the Specification Sections. Samples must represent physical examples to illustrate materials, equipment or work quality and to establish standards by which completed Work is judged.
- 19.2 Ensure samples are of sufficient size and quantity, if not already specified, to illustrate:
- .1 The quality and functional characteristics of Products, with integrally related parts and attachment devices.
 - .2 Full range of colours available.
- 19.3 Notify the Consultant in writing, at time of submission, of any deviations in samples from requirements of the Contract Documents, and state the reasons for such deviations.
- 19.4 Identify samples with Project name, Contract number, date, Contractor's name, number and description.
- 19.5 If samples are not acceptable, both samples will be returned. If samples are acceptable, one sample will be so indicated and returned. Be responsible for the cost of samples that are not accepted and for resubmission of samples.
- 19.6 Acceptable samples shall serve as a model against which the products incorporated in the work shall be judged.
- 19.7 Each Product incorporated in the Work shall be precisely the same in all details as the acceptable sample.
- 19.8 Should there be any change from the accepted sample, submit in writing for approval of the revised characteristics and resubmit samples of the Product for approval if requested.
- 19.9 When samples are very large, require assembly, or require evaluation at the Site, they may be delivered to the Site, but only with approval and as directed.

20 SHOP DRAWINGS

- 20.1 Arrange for the preparation of shop drawings as called for in the Contract Documents or as may be reasonably requested by the Consultant. The Contractor and each Subcontractor shall operate as experts in their respective fields and all shop drawings and samples shall conform to the requirements of the Contract Documents.

- 20.2 The term "shop drawings" means drawings, diagrams, schematics, illustrations, schedules, performance charts, brochures and other data which are required to illustrate details of the Work.
- 20.3 In addition to shop drawings specified in the specification sections, submit shop drawings required by jurisdictional authorities in accordance with their requirements.
- 20.4 Shop drawings shall indicate the following minimum criteria and any additional criteria indicated in the individual specification sections requiring shop drawings:
- .1 Clear and obvious notes of any proposed changes from the Contract Documents.
 - .2 Fabrication and erection dimension.
 - .3 Provisions for allowable construction tolerances and deflections provided for live loading.
 - .4 Details to indicate construction arrangements of the parts and their connections, and interconnections with other work.
 - .5 Location and type of anchors and exposed fastenings.
 - .6 Materials, physical dimensions including thicknesses, and finishes.
 - .7 Descriptive names of equipment.
 - .8 Information to verify that superimposed loads will not affect function, appearance, and safety of the work detailed as well as of interconnection work.
 - .9 Assumed design loadings, and dimensions and material specifications for loadbearing members.
- 20.5 Include in shop drawing submissions detailed information, templates, and installation instructions required for incorporation and connection of the Work.
- 20.6 Before submitting to the Consultant, review all shop drawings to verify that the Products illustrated therein conform to the Contract Documents. By this review, the Contractor agrees that it has determined and verified all field dimensions, field construction criteria, materials, catalogue numbers and similar data and that it has checked and coordinated each shop drawing with the requirements of the Work and of the Contract Documents. The Contractor's review of each shop drawing shall be indicated by stamp, date and signature of a qualified and responsible person possessing the appropriate authorization.
- 20.7 Be responsible for dimensions to be confirmed and correlated at the Site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for coordination of the Work of all subtrades.
- 20.8 Submit shop drawings for the Consultant's review with reasonable promptness and in orderly sequence so as to cause no delay in the Work nor in the work of Other Contractors. At the time of submission, notify the Consultant in writing of any deviations in the shop drawings from the requirements of the Contract Documents. The Contractor will be held responsible for changes made from the Contract Documents which are not indicated or otherwise communicated in writing with the submission.
- 20.9 Drawings submitted by the Contractor as required herein are the property of the Owner who may use and duplicate such drawings where required in association with the Work.
- 20.10 Submit shop drawings, as indicated in each section of the Work, signed and sealed by a licensed Professional Engineer registered in the place of the Work.

- 20.11 Shop drawings shall have distinct, uniform letters, numerals and line thicknesses that will ensure the production of clear legible prints and also facilitate reduced reproduction.
- 20.12 Shop drawings shall contain the following identification:
- .1 Project name and Contract number.
 - .2 Applicable 6-digit Contract Specification number describing the item.
 - .3 Location (unit, level, room number, etc.).
 - .4 Name of equipment or Product.
 - .5 Name of Subcontractor or supplier.
 - .6 Signature of Contractor certifying that Shop drawing is in conformance with Contract Documents.
 - .7 On submissions subsequent to the first, the following additional identification:
 - .1 The revision number.
 - .2 Identification of the item(s) revised.
- 20.13 Dimensions and designations of elements shall be shown in the same system of measurement used on the applicable Contract Drawings.
- 20.14 Consultant reserves the right to refuse acceptance of drawing submissions not meeting the above requirements.
- 20.15 Consultant's review will be for conformity to the design concept and for general arrangement only and such review shall not relieve the Contractor of responsibility for errors or omissions in the shop drawings or of responsibility for meeting all requirements of the Contract Documents unless a deviation on the shop drawings has been approved in writing by the Consultant. Review does not mean that Consultant approves detail inherent in shop drawings, responsibility which shall remain with Contractor submitting same.
- 20.16 Contractor shall make any changes in shop drawings which the Consultant may require consistent with the Contract Documents and re-submit unless otherwise directed by the Consultant. When re-submitting the shop drawings, the Contractor shall notify the Consultant in writing of any revisions other than those requested by the Consultant.
- 20.17 Only drawings noted for revision and resubmission need be resubmitted.
- 20.18 File one copy of each submitted shop drawing at the Site.
- 20.19 Allow two weeks for the Consultant's review of each submission.

21 CERTIFICATES

- 21.1 Submit certificates that are required by authorities having jurisdiction or that are requested in the specification sections.
- 21.2 Clearly show on each certification the name and location of the Work, name and address of Contractor, quantity and date of shipment and delivery and name of certifying company.
- 21.3 Certificates shall verify that Products and/or methods meet the specified requirements and shall include test reports of acceptable testing laboratories to validate certificates.
- 21.4 Submit certificates in duplicate and signed by an authorized representative of the certifying company

22 CERTIFICATION OF TRADESPERSON

- 23** Provide certificates, at the request of the Consultant, to establish qualifications of personnel employed on the Work where such certification is required by authorities having jurisdiction, by the Consultant or by the Contract Documents.

24 EXTENDED WARRANTIES

- 24.1** Submit extended warranties as requested in sections of the Specifications showing title and address of Contract, warranty commencement date and duration of warranty.
- 24.2** Extended warranties shall commence on termination of the standard warranty specified in the conditions of the contract and shall be an extension of these provisions. Clearly indicate what is being warranted and what remedial action is to be taken under the warranty. Ensure warranty bears the signature and seal of the Contractor.
- 24.3** Submit each extended warranty on a form that is acceptable to the Owner and Consultant.

25 SAFETY

- 25.1** For the purposes of the Contract, the term "Constructor", as defined in the Occupational Health and Safety Act, shall mean the Contractor who shall be responsible for ensuring that the provisions of the statutes, regulations and by-laws pertaining to the safe performance of the Work are to be observed. The "Constructor" shall submit the Notice of Project.
- 25.2** In the event of conflict between any of the provisions of Statutes, Regulations and Bylaws, and other requirements of authorities, the most stringent provision applies.
- 25.3** The Contractor's representative shall be responsible for ensuring that the provisions of statutes, regulations and by-laws pertaining to safe performance of the Work and the work of Other Contractors and Owner's own forces working on the Site are observed and that the methods of performing the Work do not endanger the personnel employed thereon nor the general public, and are in accordance with the latest edition of the Occupational Health and Safety Act. Include on the Joint Health and Safety Committee representatives of Other Contractors working on Site.
- 25.4** Prior to the Contractor's representative being absent from the Site for an extended period during execution of the Work, the Contractor's representative will name, in writing to the Consultant, another person who is competent to assume these responsibilities. The Contractor shall advise the Consultant of change of the individual identified as the Contractor's representative.
- 25.5** At the discretion of the Consultant, the "Constructor" designation may be transferred to/from a Contractor at any time at no additional cost to the Owner.
- 25.6** Project is located within a public park, occupied community centre and residential properties. Develop a Construction Safety Protocol prior to start of any construction activity in collaboration with the Owner to include all procedural requirements to maintain public safety. Construction Safety Protocol is to include, but not limited to the following items:

- 25.7 Construction safety protocol is to include safety measures related to school/community centre, student/ public access to school, school/community centre operation, public presence in park, entire construction zone and surrounding neighbouring areas, and adjacent residential properties that may be affected by construction.
- 25.8 Employ a designated Safety personnel for entire construction period.
- 25.9 Provide a designated flagperson at any entry to construction site to ensure safety of students and public is maintained when trucks and construction machinery enter or exit the Site.
- 25.10 Allow for any precautionary measures and means and methods required to avoid any impact to school/community centre operation at no extra cost to the Owner.

26 PROJECT RESPONSIBILITIES

- 26.1 The Contractor's representative shall ensure that:
- 26.2 All measures and procedures prescribed by the following Acts and Regulations are carried out on Site:
- .1 The Occupational Health and Safety Act;
 - .2 The Regulations for Construction Projects;
 - .3 WHMIS Regulations;
 - .4 The Environmental Protection Act and regulations,
 - .5 COVID-19 Construction Practice
 - .6 All other legislation, regulations and standards as applicable.
- 26.3 Every employer and every worker performing Work on the Site must comply with the requirements referred to above.
- 26.4 Ensure that the health and safety of workers, employees of the Owner and the general public are protected in relation to the Work performed on the Site.

27 WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)

- 27.1 Be familiar with and comply with WHMIS regulations.
- 27.2 Properly label controlled products. Provide proper warning labels and training at the Site.
- 27.3 Maintain on site for duration of Contract a hazardous materials log containing all required MSDS. Log shall be open for inspection by Owner, Consultant and all personnel on Site.
- 27.4 Provide copies of material safety data sheets (MSDS) for any controlled products prior to delivery to the Site.
- 27.5 Be responsible for all applicable requirements of the regulations.
- 27.6 Before commencing any Work on Site, attend the pre-construction meeting and provide the Consultant with a proposal as to how hazardous materials will be stored and dispensed on Site. In addition, specifically outline the measures which will be undertaken to prevent damage or injury in the event of an accidental spill.
- 27.7 Provide "Handling Procedure for Hazardous Materials".

28 JOINT HEALTH AND SAFETY COMMITTEE

- 28.1 The Contractor shall be responsible for the establishment and operation of the Joint Health and Safety Committee as required by the Occupational Health and Safety Act.

29 SAFETY DELIVERABLES

- 29.1 The Contractor shall deliver to the Consultant:
- .1 The Contractor's Occupational Health and Safety Policy.
 - .2 The Contractor's safety program to implement the Occupational Health and Safety Policy for the Contract, which will effectively prevent and control accidents for the Contract.
 - .3 A copy of all communications with, and including all orders by, the Ministry of Labour or other occupational health and safety enforcement authority.
 - .4 A copy of all accident/injury investigation reports, not just the WSIB Form 7 Employer's Report of Injury Disease. Each report must contain a statement of actions that will be taken to prevent a recurrence.
 - .5 A copy of all inspection reports made by the Contractor in compliance with the employer's responsibility under the Occupational Health and Safety Act.
 - .6 A copy of all safety information pertaining to the Contract made and furnished by the Contractor's own "Safety Personnel" or outside consultants/advisers engaged for the purpose of inspecting the workplace for occupational health and safety.
 - .7 A verification that all workers in the employ of the Contractor on Site, have had a WHMIS training or refresher course within the last twelve months.
 - .8 A verification that all workers in the employ of the Contractor have had "Explosive Activated Tool Training" on the type of tools being used.
 - .9 A verification that the instruction manuals are on Site for all tools and equipment being used.
 - .10 A copy of the most recent workers compensation experience rating account, i.e. CAD-7, NEER, and/or an insurance carrier's experience rating account.
 - .11 Statistical information for the purpose of determining injury frequency and severity rates (hours worked, first-aid injuries, medical aid injuries, lost time injuries, restricted workday injuries, near-miss accident/incident and significant occurrence data), in a timely manner as required by the Consultant.
 - .12 The immediate reporting to the Consultant of all instances that are defined in the Occupational Health and Safety Act as "Notices of Injuries" and "Occurrences" and any occasion that a worker exercises their "Right to Refuse Unsafe Work".
 - .13 The Consultant reserves the right to require additional or amended deliverables pertaining to safety during the duration of the Work at no additional cost to the Owner.
 - .14 Items specified above shall be delivered to the Consultant prior to the Contractor commencing Work on the Site.

30 DUE DILIGENCE

- 30.1 The Contractor acknowledges that it has read and understands the measures and procedures relating to occupational health and safety as prescribed above. The

Contractor acknowledges and understands its duties as therein set out and hereby expressly undertakes and agrees to comply with all such requirements and standards in their entirety and at the Contractor's expense.

- 30.2 The Contractor further agrees to fully cooperate with all health and safety requirements, rules, regulations, standards and criteria set out in the Contract Documents, which agreement is in furtherance of the Contractor's duties and responsibilities under occupational health and safety legislation.
- 30.3 The Contractor agrees that if, in the opinion of the Consultant or Owner, the health and safety of a person or persons is endangered or the effective operation of the system put in place to ensure the health and safety of workers on the Site is not being implemented, the Consultant or Owner may take such action as it deems necessary and appropriate in the circumstances, including, without limitation, the following:
- 30.4 Require the Contractor to remedy the condition forthwith at its own expense;
- 30.5 Require that the Site be shut down in whole or in part until such time as the condition has been remedied;
- 30.6 Remedy the problem and the Owner shall back-charge the Contractor for the cost of such remedial work, together with an appropriate overhead factor as determined by the Owner in its sole discretion; and
- 30.7 Terminate the Contract without further liability in the event the Contractor fails to comply with these provisions.
- 30.8 If a lien is registered, in respect to any monies held back, back-charged or assessed in accordance with these paragraphs, the Contractor shall consent to an order vacating such registration and shall indemnify the Owner for any and all loss, whereby direct or consequential which the Owner may sustain as a consequence of such registration.

31 SITE SAFETY PERSONNEL

- 31.1 In the event the Consultant deems it necessary, because of the Work, the Contractor shall assign a "Competent Safety Person" to assist the Contractor's representative in the discharging of safety responsibility, at no additional cost to the Owner.

32 PROGRESS PHOTOGRAPHS

- 32.1 Concurrently with monthly application for payment submit digital pictures by online cloud storage illustrating the progress of the Work as follows:
- .1 A minimum of 20 pictures that best illustrate the progress on the site.
 - .2 Pictures shall be in focus and properly illuminated; view shall be unobstructed.
 - .3 Pictures shall be taken with a minimum 5 megapixel camera or better such that quality and details can be discerned from photo.
 - .4 The Pictures shall either have an accurate date-stamp present in the photo, or be numbered and dated in the digital filename.
 - .5 The photo's shall be labeled with the following information: The project name, the period the pictures are taken in, the monthly application number which the pictures are associated with.

33 SCHEDULES

33.1 Be responsible for planning and scheduling of the Work. As a minimum, prepare and update the following schedules:

- .1 Contract Schedule.
- .2 Detailed Construction Schedule.

33.2 Be responsible for ensuring that Subcontractors plan and schedule their respective portions of the Work. Subcontractor's schedules shall form part of the above mentioned schedules.

33.3 Contract Schedule:

- .1 Prepare and submit the Contract Schedule within two weeks following award of Contract. This schedule, once it is reviewed by the Consultant and if it meets the Consultant's project requirements, will become contractual.
- .2 The Contract Schedule shall be developed using a logic network technique for planning and scheduling.
- .3 The Contract Schedule shall be submitted for approval in its optimum levelled form. This presentation may be in either a time scaled network or a bar chart form. It shall be subdivided into either work areas or systems as applicable.
- .4 The Contract Schedule shall include the following information:
 - .1 Starting and ending dates of each activity including the float periods;
 - .2 Manpower requirements for each activity;
 - .3 Interdependency with activities of other Contractors;
 - .4 Dates specified in the Contract Documents;
 - .5 Dates on which specific data will be required for submittal, i.e., Vendor data, drawings for review, etc.
- .5 This schedule shall be reviewed and updated monthly by the Contractor so as to reflect any Contract changes as well as major changes to the schedule

33.4 Detailed Construction Schedule:

- .1 Prepare and submit a detailed construction schedule within two weeks of final review and acceptance of the Contract Schedule. This schedule, once it is reviewed and accepted by the Consultant, will be updated and submitted monthly with the Contract Schedule and weekly once the Contractor starts on Site.
- .2 This schedule shall cover the construction period. It will show, in detail, activities on a daily basis indicating durations, manpower and constraints. The activities shown on this schedule shall further clarify or detail the activities shown on the Contract Schedule.
- .3 The detailed construction schedule shall be presented in a bar chart form.

34 INSPECTION AND TESTING BY THE OWNER

34.1 The Consultant, on behalf of the Owner may appoint an independent inspection and testing company to carry out inspection and testing of the Work for conformance to the Contract Documents. Such costs for inspection and testing will be paid by the Owner.

However, any additional inspection and testing due to non-conformance to the Contract Documents shall be at the Contractor's expense.

34.2 Inspections and testing by the independent inspection and testing company will be promptly made. Uncover for examination any Work covered up prior to inspection or without approval of the Consultant. Make good such Work at no cost to the Owner.

34.3 The Owner may inspect and test Products during manufacture, fabrication, shop testing, installation, construction and testing phases of the Contract. The Consultant will ascertain the quantity and quality of testing to be performed. Inspection and testing may be performed at the place of manufacture/fabrication, storage, or at the Site as designated by the Consultant. Where inspection and testing is done either during manufacture, fabrication, or at Site, ensure that proper facilities and assistance are provided.

35 INSPECTION AND TESTING

35.1 Source and Field Quality Control specified in Other Sections:

- .1 This Section includes requirements for performance of inspection and testing specified under Source Quality Control and Field Quality Control in other Sections of the specifications.
- .2 Do not include in work of this Section responsibilities and procedures that relate solely to an inspection and testing company's functions that are specified in another Section which is paid for directly by the Owner. Such information is included in this Section for Contractor's information only.

36 QUALIFICATIONS OF INSPECTION AND TESTING COMPANIES

36.1 Inspection and testing companies to be certified by the Standards Council of Canada (SCC) or Canadian Council of Independent Laboratories (CCIL).

36.2 Companies engaged for inspection and testing shall provide equipment, methods of recording and evaluation, and knowledgeable personnel to conduct tests precisely as specified in reference standards.

36.3 If requested, submit affidavits and copies of certificates of calibration made by an accredited calibrator to verify that testing equipment was calibrated and its accuracy ensured within the previous twelve months.

37 RESPONSIBILITIES OF THE CONTRACTOR DURING INSPECTION AND TESTING PROCEDURES

37.1 Be responsible for quality control methods and procedures to ensure performance of the work in accordance with the Contract Documents.

38 RESPONSIBILITIES OF INSPECTION AND TESTING COMPANIES

38.1 Determine from specifications and Drawings the extent of inspection and testing required for Work of the Contract. Subcontractors shall notify Consultant of any omissions or discrepancies in the work inspected and/or tested.

- 38.2 Perform applicable inspection and testing described in the Specifications and as may be additionally directed.
- 38.3 Provide competent inspection and testing personnel when notified by the Contractor that applicable work is proceeding. Inspection personnel shall cooperate with the Consultant and Contractor to expedite the Work.
- 38.4 Subcontractors shall notify the Consultant and Contractor of deficiencies and irregularities in the Work immediately when they are observed in the course of inspection and testing.
- 38.5 Inspection and testing companies shall not perform or supervise any of the Contractor's work, and shall not authorize:
- 38.6 Performance of work that is not in strict accordance with the Contract Documents.
- 38.7 Approval or acceptance of any part of the Work.

39 INSPECTION AND TESTING PROCEDURES

- 39.1 Perform specified inspection and testing only in accordance with specified reference standards, or as otherwise approved.
- 39.2 Observe and report on compliance of the Work to requirements of Contract Documents.
- 39.3 Ensure that inspectors are on site or at fabricator's operations for full duration of critical operations, and as otherwise required to determine that the Work is being performed in accordance with the contract Documents.
- 39.4 Identify samples and sources of materials.
- 39.5 Review and report on progress of the work. Report on count of units fabricated and inspected at fabricator's operations.
- 39.6 Observe and report on conditions of significance to work in progress at time of inspection or at fabricator's operations. Include where applicable and if critical to the work in progress:
 - .1 Time and date of inspection.
 - .2 Temperature of air, materials, and adjacent surfaces.
 - .3 Humidity of air, and moisture content of materials and adjacent materials.
 - .4 Presence of sunlight, wind, rain, snow and other weather conditions.
 - .5 Include in reports all information critical to inspection and testing.
 - .6 Ensure that only materials from the work and intended for use therein are tested.
 - .7 Determine locations for work to be tested.

40 CASH ALLOWANCE

- 40.1 Allowances included herein are for items of Work which could not be fully quantified prior to Bidding.
- 40.2 Expend each allowance as directed by the Consultant in writing. Work covered by allowances shall be performed for such amounts and by such persons as directed by Consultant.

- 40.3 Each allowance will be adjusted to actual cost as defined hereunder and the Contract Price will be amended accordingly by Contract Change Order.
- 40.4 Progress payments for Work and Products authorized under allowances will be made in accordance with the payment terms set out in Conditions of the Contract.
- 40.5 A schedule shall be prepared jointly by the Consultant and Contractor to show when items called for under allowances must be authorized by the Consultant for ordering purposes so that the progress of the Work will not be delayed.
- 40.6 Where a Cash Allowance is for work performed under a Subcontract, the Contractor shall Bid the work involved and submit the Bids received, with the Contractor's recommendations, for approval.
- 40.7 Cash allowances, unless otherwise specified, cover the net cost to the Contractor of services, Products, construction machinery and equipment, freight, handling, unloading, storage, installation where indicated, and other authorized expenses incurred in performing the Work. Cash allowances shall not be included by a Subcontractor in the amount for their Subcontract work.
- 40.8 Supply only allowances shall include:
- .1 Net cost of Products.
 - .2 Delivery to Site.
 - .3 Applicable taxes and duties, excluding HST.
- 40.9 Supply and install allowances shall include:
- .1 Net cost of Products.
 - .2 Delivery to Site.
 - .3 Unloading, storing, handling or Products on Site.
 - .4 Installation, finishing and commissioning of Products.
 - .5 Applicable taxes and duties, excluding HST.
- 40.10 Inspection and testing allowances shall include:
- .1 Net cost of inspection and testing services.
 - .2 Applicable taxes and duties, excluding HST.
- 40.11 Other costs related to work covered by cash allowances are not covered by the allowance but shall be included in the Contract Price.
- 40.12 Where costs under a cash allowance exceed the amount of the allowance, the Contractor will be compensated for any excess incurred and substantiated plus an allowance for overhead and profit as set out in the Contract Documents.
- 40.13 Progress payments on accounts of work authorized under cash allowances shall be included in the monthly certificate for payment.
- 40.14 Submit, before application for final payment, copies of all invoices and statements from suppliers and Subcontractors for work which has been paid from cash allowances.
- 40.15 The Cash Allowance shall cover the following (in general):

- .1 Inspection and testing
 - .1 Tiling (by TTMAC, Terrazzo Tile & Marble Association of Canada)
 - .2 Concrete Restoration
 - .3 Pool Consultant – Refer to SECTION 13 08 11
- .2 Signage
- .3 Allowance for unseen site conditions relating to existing pool equipment and fixtures.

41 TOLERANCES FOR INSTALLATION OF WORK

- 41.1 Unless specifically indicated otherwise, Work shall be installed plumb, level, square and straight.
- 41.2 Unless acceptable tolerances are otherwise specified in specification sections or are otherwise required for proper functioning of equipment, site services, and mechanical and electrical systems:
 - .1 "Plumb and level" shall mean plumb or level within 1 mm in 1 m.
 - .2 "Square" shall mean not in excess of 10 seconds lesser or greater than 90 degrees.
 - .3 "Straight" shall mean within 1 mm under a 1 m long straightedge.
 - .4 "Flush" shall mean within:
 - .1 6 mm for exterior concrete, masonry, and paving materials.
 - .2 1 mm for interior concrete, masonry, tile and similar surfaces.
 - .3 0.05 mm for other interior surfaces.
- 41.3 Allowable tolerances shall not be cumulative.

42 DEFECTS

- 42.1 Defective products, materials and workmanship found at any time prior to Contract Completion will be rejected regardless of previous inspections, testing, and reviews of the Work. Inspections, testing, and reviews shall not relieve the Contractor from their responsibility, but are a precaution against oversight or error. Remove and replace defective and rejected products, materials, systems, and workmanship. Be responsible for delays and expenses caused by rejection.

43 DOCUMENTS ON SITE

- 43.1 Maintain at job site, one copy of each of the following:
 - .1 Contract Documents including Drawings, Specifications, Addenda, and other modifications to the Contract.
 - .2 'Reviewed' or 'Reviewed as Modified' Shop Drawing
 - .3 Project Construction and Shop Drawing Schedules. Site Instructions and Change Orders.
 - .4 Field Test Reports.
 - .5 Reports by Authorities having Jurisdiction. Building and other applicable permits.

- .6 Daily log including:
 - .1 Weather conditions.
 - .2 Excavation conditions
 - .3 Start and finish date of each Trade Contractor.
 - .4 Erection and removal dates of formwork.
 - .5 Date, quantities and particulars of each concrete pour.
 - .6 Dates and quantities and particulars of roofing and waterproofing work. Visits to the Site by Owner, Consultants, Jurisdictional Authorities, Testing and Inspection companies, and material and equipment supplier representatives.
- .7 Material Safety Data Sheet pursuant to WHMIS (Occupational Health & Safety Act).
- .8 As-built drawings recording as-built conditions, instructions, changes for structure, equipment, wiring, plumbing, etc., prior to being concealed.
- .9 Copies of applicable codes.
- .10 The above material shall be made available to the Consultant at their request.

44 DRAINAGE

- 44.1 Layout and construct work to ensure that positive drainage is provided to floor drains, ditches, site drains and catch basins, as set in their final position, preventing undrained areas and ponding.
- 44.2 Ensure that allowable construction tolerances and structural deflection do not cause ponding of water.
- 44.3 Report to Consultant in writing prior to executing work affected, in case adequate drainage cannot be provided.

45 REGULATORY REQUIREMENTS

- 45.1 The Building Code - Ontario Regulation 332/12, including all amendments, shall govern the construction of the Work.
- 45.2 The CSA B52 Standard – Mechanical Refrigeration Code
- 45.3 Comply with all By-Laws and regulations of authorities having jurisdiction. These codes and regulations constitute an integral part of the Contract Documents.
- 45.4 Owner shall apply and pay for Municipal Building Permit, and Contractor shall obtain and pay for all other permits, licenses, deposits, and certificates of inspection as part of the Contract Price as per Conditions of the Contract. Ensure that permits, licenses, deposits, and certificates included under specific Sections are provided as specified.
- 45.5 If required, pay for construction damage deposit required by authorities having jurisdiction.
- 45.6 Where permits, licences, and inspection fees are required by authorities having jurisdiction for specific trade functions, they shall be obtained by particular subtrade responsible for that work.

- 45.7 Arrange for inspection, testing of Work and acceptance required by the authorities having jurisdiction. Be responsible for necessary preparations, provisions and pay all associated costs.
- 45.8 Be responsible for ensuring that no work is undertaken which is conditional on permits, approvals, reviews, licences, fees, until all applicable conditions are met. No time extension will be allowed for delay in obtaining necessary permits.
- 45.9 Any additional work or changes to the materials due to Work not complying with the Ontario Building Code and Regulations as indicated by the Building Inspector shall be changed. All costs involved shall be borne by Contractor.
- 45.10 Obtain permit required to work on Municipal rights of way. Provide damage deposits for sidewalks, roads and services work, as applicable.
- 45.11 Give notice of completion of project prior to occupancy, as required by applicable legislation.

46 EXISTING PUBLIC SERVICE LINES

- 46.1 Where existing public services are indicated to be removed and/or relocated, perform Work in compliance with authorities having jurisdiction.
- 46.2 Make good public roads, walkways and curbs soiled or damaged due to construction to the requirements of local authorities.

47 CODES

- 47.1 Reference is made to standards in the specifications to establish minimum acceptable standards of materials, products and workmanship. Ensure that materials, products and workmanship meet or exceed requirements of the reference standards specified.
- 47.2 In the event of conflict between documents specified herein, execute the Work in accordance with the most stringent requirements.

48 STANDARDS

- 48.1 Where a material or product is specified in conjunction with a referenced standard, do not supply the material or product if it does not meet the requirements of the standard. Supply another specified material or product, or an acceptable material or product of other approved manufacture which does meet the requirements of the standard, at no additional cost to the Owner.
- 48.2 Where no standard is referred to, provide materials, products and workmanship which meet requirements of the applicable standards of the Canadian Standards Association, Canadian General Standards Board, Ontario Provincial standard specifications (OPSS), Ontario Provincial Standard Drawings (OPSD) and the applicable building code. References to "Measurement for Payment" and "Basis of Payment" in OPSS standard documents are not applicable to this Contract.
- 48.3 If there is question as to whether a material, product or system is in conformance with applicable standards, the Consultant reserves the right to have such materials, products or systems tested to prove or disprove conformance. The cost for such

testing will be paid by the Owner in the event of conformance with contract Documents or by the Contractor in the event of non-conformance.

48.4 Where application, installation and workmanship standards are cited, it is intended that referenced standards form the basis for minimum requirements of the specified item and specifications supplement the standards unless specified otherwise.

48.5 Matters may be dealt with in part by these specifications which are also dealt with, under the same or similar headings in cited standard. It is not intended that these specifications take the place of the standards but supplement them, unless specified otherwise.

48.6 Where reference is made to manufacturer's directions, instructions or specifications they shall include full information on storing, handling, preparing, mixing, installing, erecting, applying, or other matters concerning the materials pertinent to their use and their relationship to materials with which they are incorporated.

48.7 Where standards, specifications, associations, and regulatory bodies are listed in the Specifications by their abbreviated designations. These are but not limited to the following:

- .1 The Aluminium Association
- .2 Architectural Aluminium Manufacturers Association
- .3 American Association of State Highway and Transportation Officials
- .4 American Concrete Institute
- .5 Anti-Friction Bearing Manufacturer's Association
- .6 American Institute of Electrical Engineers
- .7 American Iron and Steel Institute
- .8 Air Movement and Control Association
- .9 Association of Municipal Electric Utilities
- .10 American National Standards Institute
- .11 Air-Conditioning and Refrigeration Institute
- .12 American Standards Association
- .13 American Society of Heating, Refrigeration and Air Conditioning Engineers
- .14 American Society of Mechanical Engineers
- .15 American Society of Testing and Materials
- .16 Architectural Woodwork Manufacturers Association of Canada American Water Works Association
- .17 Canadian Electrical Manufacturer's Association
- .18 Canadian Gas Association
- .19 Canadian General Standards Board
- .20 Canadian Institute of Steel Construction
- .21 Canadian Mortgage and Housing Corporation
- .22 Canadian Paint Manufacturers Association
- .23 Council of Forest Industries of British Columbia
- .24 Canadian Roofing Contractors Association
- .25 Canadian Standards Association
- .26 Canadian Sheet Steel Building Institute
- .27 Canadian Welding Bureau
- .28 Canadian Wood Council
- .29 Electrical and Electronic Manufacturers Association Canada Factory Mutual
- .30 Institute of Electrical and Electronic Engineers
- .31 Maple Flooring Manufacturers Association
- .32 Military Standards

- .33 Manufacturer's Standardization Society
- .34 Ministry of Transportation Ontario
- .35 National Association of Architectural Metal Manufacturers National Fire Protection Association
- .36 National Electrical Manufacturer's Association (U.S.A.) National Lumber Grades Authority
- .37 National Research Council of Canada
- .38 Ontario Concrete Block Association
- .39 Ontario Hydro Electrical Safety Code
- .40 Ontario Provincial Standard Specification
- .41 Porcelain Enamel Institute
- .42 Plumbing Drainage Institute
- .43 Public Health Act
- .44 Sheet Metal and Air Conditioning Contractors National Association
- .45 Steel Structures Painting Council
- .46 Tubular Exchange Manufacturer's Association
- .47 Terrazzo, Tile and Marble Association of Canada Underwriters Laboratories Inc. (U.S.)
- .48 Underwriters Laboratories of Canada

49 FIRE RATINGS, ASSEMBLIES AND SEPARATIONS

- 49.1 Where a material, component, assembly, or separation is required to be fire rated, the fire rating shall be as determined or listed by one of the following testing authorities acceptable to the authorities having jurisdiction:
- .1 Underwriters' Laboratories of Canada.
 - .2 Underwriters' Laboratories Inc.
 - .3 Factory Mutual Laboratories.
 - .4 The National Research Council of Canada.
 - .5 The National Board of Fire Underwriters.
 - .6 Intertek Testing Services.
- 49.2 Where reference is made to only one testing authority an equivalent fire rating as determined or listed by another of the aforementioned testing authorities is acceptable if approved by authorities having jurisdiction. Obtain and submit such approval of authorities, in writing when requesting acceptance of a proposed equivalent rating or test design.
- 49.3 Fire rated door assemblies shall include doors, frame, anchors, and hardware and shall bear label of fire rating authority showing opening classification and rating.
- 49.4 Material having a fire hazard classification shall be applied or installed in accordance with fire rating authorities printed instructions.
- 49.5 Fire rated assemblies shall be constructed in accordance with applicable fire test report information issued by fire rating authority. Deviation from fire test report will not be allowed.
- 49.6 Construct fire separations as continuous, uninterrupted elements except for permitted openings. Extend fire rated walls and partitions from floor to underside of structural deck above.

- 49.7 Fire separations may be pierced by openings for electrical and similar service outlets provided such boxes are non-combustible and are tightly fitted and sealed with a ULC approved sealant for the assembly being sealed.
- 49.8 Construction that abuts on or is supported by a non-combustible fire separation shall be constructed so that its collapse under fire conditions will not cause the collapse of the fire separation.
- 49.9 Do not use combustible members, fastenings, attachments and similar items to anchor electrical, mechanical or other fixtures to fire separations.
- 49.10 At penetration through fire rated walls, ceilings or floors, completely seal voids with ULC approved firestopping material; full thickness of the construction element. In locations that require a smoke seal, provide appropriate ULC approved system installed in accordance with the manufacturer's recommendations.

50 TEMPORARY CONTROLS

- 50.1 Hoarding, fencing and barriers:
 - .1 Before commencing operations, supply, erect and maintain hoarding, fencing, and barriers around work area. Paint outside of hoarding in a colour selected by the Consultant and mark with "POST NO BILLS" signs.
 - .2 Provide temporary enclosures as required to protect the building in its entirety or in its parts, against the elements, to maintain environmental conditions required for work within the enclosure, and to prevent damage to materials stored within.
 - .3 Provide lockable gates through hoarding, fencing, and barriers for access to Site by workers and vehicles.
- 50.2 Prevent unauthorized entry to the Site. Barricade, guard or lock access points to the satisfaction of the Consultant and post "NO TRESPASSING" signs.
- 50.3 Install signs for movement of people around Work Site as required and directed by the Consultant.
- 50.4 Provide secure, rigid guide rails and barricades around open shafts, open edges of floors and roofs as required for protection of Work, workers, and the public.
- 50.5 Remove hoarding, fencing, barriers, building enclosures, guide rails and barricades upon Contract Completion unless otherwise noted on the Contract Drawings or as directed by the Consultant.

51 SERVICE AND UTILITY SYSTEMS

- 51.1 Consult with utility companies and other authorities having jurisdiction to ascertain the locations of existing services on or adjacent to site.
- 51.2 Information as to the location of existing services, if shown on the Drawings, does not relieve the Contractor of his responsibility to determine the exact number and location of existing services.
- 51.3 Give proper notices for new services as may be required. Make arrangements with authorities and utilities for service connections required.

- 51.4 Pay any charges levied by utilities or authorities for work carried out by them in connection with this Contract, unless specified otherwise.
- 51.5 Operate and maintain all utility systems affected by work of this Contract, until the building or specific portions thereof have been accepted by the Owner.
- 51.6 Report existing unknown services encountered during excavation to Consultant for instructions; cut back and cap or plug unused services. Be responsible for the protection of all active services encountered and for repair of such services if damaged.
- 51.7 **SCAFFOLDING, HOISTS AND CRANES**
Select, operate, and maintain scaffolding, hoisting equipment and cranes as may be required.
- .1 Do not erect or operate equipment that will endanger existing structures, local municipalities hydro installations, or traffic signals.
- .2 Design and construct scaffolding in accordance with CAN/CSA S269.2-M.
- 51.8 **TEMPORARY WORKS**
- .1 Installation and Removal: Provide temporary utilities, facilities and controls in order to execute the Work expeditiously. Remove from Site all such Work after use.
- .2 Arrange for connections with Owner and pay all costs for installation, maintenance and removal.
- .3 Be responsible for the careful and reasonable use of Owner supplied water and power.
- .4 Temporary power and lighting systems:
- .5 Supply, install and maintain electrical power and necessary electrical equipment including overhead and underground feeders, transformers, motors, starters, panels, protective devices and equipment. Connections will be made available to any part of the Work within distance of a 30 m extension.
- .6 Provide temporary lighting inside and outside structure of adequate intensity to illuminate construction activities. Provide temporary pedestrian lighting for sidewalk areas affected by the Work.
- .7 Supply and install the type and quantity of minimum lighting equipment in each location to ensure adequate, continual illumination 24 hours per day, 7 days per week for the following:
- .1 Emergency evacuation, safety and security throughout the Project at intensity levels required by jurisdictional authorities.
- .2 General lighting for performance of the Work throughout the Project, evenly distributed, and at intensities to ensure that proper installations and applications are achieved.
- .3 Performance of finishing trades in area as required evenly distributed, and of an intensity of at least 50 Lux.
- .8 In locations approved by the Consultant. install and support the electrical plant, distribution and temporary lighting systems including service equipment and local hydro authority meter energized by the local hydro circuits. Installations shall be

approved by the Consultant and shall be carried out in a neat manner to avoid interference with the application of finish material and to facilitate removal when the installed permanent lighting system is in operation.

- .9 Make all necessary arrangements for and pay all costs for a temporary electrical service of sufficient capacity to supply temporary lighting, operation of power tools, cranes and equipment for all construction, implementation, and inspection and testing purposes. Supply and install necessary temporary cables and other electrical equipment and make all temporary connections as required.
- .10 Temporary power distribution wiring shall comply with Ontario Hydro Electrical Safety Code. Obtain inspection certificates for temporary electrical work.
- .11 Maintain the lighting systems in operation during the life of the Contract. Replace burned or missing lamps immediately.
- .12 Upon Contract Completion, remove electrical plant and temporary lighting from the Site.
- .13 Water Supply:
 - .1 Provide and pay for a continuous supply of potable water for construction use. Provide as a minimum one water connection on each floor level.
 - .2 Provide and maintain all temporary lines, extensions and hoses as required. Remove all temporary connections and lines on completion of the Work and make good any damage.
- .14 Temporary Heating:
 - .1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.
 - .2 Construction heaters used inside buildings must be vented to the outside or be flame less type. Solid fuel salamanders are not permitted.
 - .3 Maintain temperatures of minimum 10oC in areas where construction is in progress unless otherwise indicated in the Contract Documents. Protect exposed and adjacent services from freezing. Repair at no cost to the Owner any such services, buildings or other utilities disrupted by freezing.
 - .4 Ventilate heated areas and keep structures free from exhaust combustion gases.
 - .5 The permanent heating system of the building or portions thereof may be used when available only upon written permission by Consultant. If permission to use heating system is obtained:
 - .1 Before using air handling systems, ensure that dust/debris is removed from the premises and install temporary filters to prevent construction dust/debris from entering via return air or intake openings. Keep unused ducts sealed to prevent entry of dust/debris. Replace filters frequently during construction.
 - .2 On completion of work remove temporary filters and install new filters in accordance with Division 23. After temporary use of air handling system is complete and before turning over system to Owner, vacuum internally to ensure all dust/debris is removed.

- .6 Elevators: Elevators may be used by construction personnel as permitted by the Owner.
- .7 Temporary Telephone and Data: Provide and pay for separate telephones and Data services, for local call only, as required for own use and use of the Consultant and Owner. Long distance call shall be paid by party making call.
- .8 Sanitary Facilities: Provide sanitary facilities in accordance with occupational health and safety requirements in the place of the Work. Use of Owner's existing sanitary facilities or new sanitary facilities is not allowed.

52 SITE SECURITY

- 52.1 Provide and pay for security personnel to guard the Site and contents of the Site after working hours and during holidays as established by the Owner. Control of access shall be through hoarding and barricades during times work is in progress, and by locking hardware otherwise.
- 52.2 Any security service provided by the Owner is for the protection of the Owner's interest in the Work on the Site and shall not relieve the Contractor of the responsibility to protect the Site and the Work of the Contract.

53 PROTECTION

- 53.1 Protection of Public Area: Protect surrounding private and public property from damage during performance of the Work.
- 53.2 Take all necessary precautions to prevent damage to work affected by temperature, water, weather and other environmental conditions.
- 53.3 Protection of Building Finishes and Equipment:
 - .1 Provide protection for existing structure, finished and partially finished building finishes, waterproofing systems, and equipment during performance of the Work.
 - .2 Cover Owner's equipment and plant within the Site with 6 mil PVC sheet, or equal, taped to make it dust-tight. Equipment and existing work moved or altered to facilitate construction, movement of Products or equipment shall be stored, protected with dust-tight covers and subsequently returned to its original location.
 - .3 Obtain approval from the Consultant prior to the installation of temporary supporting devices into existing roof, ceiling, or wall members for the erecting of equipment or machinery. Repair roof, ceiling, and wall members used for this purpose to the satisfaction of the Consultant.
 - .4 Provide necessary screens, covers and hoarding as required.
 - .5 Any Products or equipment damaged while carrying out the Work shall be restored with new Products or equipment matching the original equipment. Damage shall include harm resulting from all construction work, such as falling objects, wheel and foot traffic, failure to remove debris, operation of machinery and equipment, and scaffolding and hoisting operations.
- 53.4 Fire Protection:

- .1 Take precautions to prevent fires. Provide and maintain temporary fire protection equipment of a type appropriate to the hazard anticipated in accordance with authorities having jurisdiction, governing codes, regulations, by-laws and to the satisfaction of the Consultant and insurance authorities.
 - .2 Excessive storage of flammable liquids and other hazardous materials is not allowed on Site. Flammable liquids must be handled in approved containers. Remove combustible wastes frequently.
 - .3 Inspect temporary wiring, drop cords, extension cables for defective insulation or connections frequently.
 - .4 Open burning of rubbish is not permitted on the Site.
 - .5 Handle, transport, store, use and dispose of gasoline, benzine or other flammable materials with good and safe practice as required by authorities having jurisdiction.
 - .6 Provide fire extinguishers of the non-freezing chemical type in each temporary building, enclosure and trailer. Use only fire-proofed tarpaulins.
 - .7 A fire watch shall be required for each of the following activities regardless of the number, duration or size of the activity in operation:
 - .1 any open flame activities (e.g., soldering and welding);
 - .2 shutdown of fire detection system;
 - .3 shutdown of sprinkler system.
- 53.5 Maintain adequate cover over services as required by Utility Authorities.
- 53.6 Report any discharge of a contaminant to the Authorities having jurisdiction.
- 54 PEST CONTROL**
- 54.1 Be responsible to provide control measures, restraining procedures, and treatments to prevent infestation and spread of insects, rodents and other pests deemed to be present at Site and/or noticed during course of the Work. Carry out fumigation, pest control procedure, and posting of warning signs, notices including contents of such notices in accordance with requirements of Pesticides Act and any other authorities having jurisdictions. Pesticides used shall be in accordance with Canada Pest Control Products Act, and provincial and municipal regulations.
- 55 FIRST-AID FACILITIES**
- 55.1 Provide site equipment and medical facilities necessary to supply first-aid service to injured personnel in accordance with regulations of the Workmen's Compensation Act. Maintain facilities for duration of Contract.
- 56 USE OF NEW PERMANENT SERVICE & EQUIPMENT**
- 56.1 Do not use any new permanent service or equipment without Owner's written approval.

- 56.2 Where permission is granted to use permanent services and equipment provide competent persons to operate services and equipment; inspect frequently and maintain facilities in proper operating condition at all times.
- 56.3 Permanent services and equipment shall be turned over to Owner in "as new" and perfect operating condition.
- 56.4 Use of permanent systems and equipment as temporary facilities shall not affect the warranty conditions and warranty period for such systems and equipment. Make due allowance to ensure that Owner will receive full benefits of equipment manufacturers warranty after project takeover.

57 PROJECT IDENTIFICATION

- 57.1 If required, obtain approvals from jurisdictional authorities for temporary signs.
- 57.2 Do not display signs without the Consultant's and Owners written consent.
- 57.3 Maintain signs in good condition for the duration of Contract.

58 SITE MAINTENANCE

- 58.1 Maintain the Site and adjacent premises in a clean and orderly condition, free from debris and other objectionable matter. Immediately remove rubbish and surplus Products, equipment and structures from the Site. If the Site is not cleaned (within 48 hours after the Contractor has been instructed to do so), the Consultant may clean the Site and retain the cost from monies due, or to become due, to the Contractor.
- 58.2 When the Work is substantially performed, remove surplus Products, tools, construction machinery and equipment not required for the performance of the remaining Work

59 SITE STORAGE AND OVER LOADING

- 59.1 Confine the Work and operations of employees to limits indicated by the Contract Documents. Do not unreasonably encumber the Site with Products.
- 59.2 Products shall be stored only in areas designated or approved by the Consultant, and shall not be left lying on streets, sidewalks, boulevards or elsewhere within public view. Products which the Consultant may permit to be stored elsewhere than in the Contractor's storage areas shall be neatly stacked or otherwise disposed and shall be so maintained.
- 59.3 Fabrication shops shall not be set up within the structure except as directed by or with the permission of the Consultant.
- 59.4 Do not load or permit to be loaded any part of the Work with a weight or force that it is calculated to bear safely. Be solely responsible and liable for damages resulting from violation of this requirement. Provide temporary supports as strong as permanent support.
- 59.5 Do not cut, drill or sleeve load bearing members unless shown on drawings or otherwise approved by the Consultant in writing for each location.

- 59.6 Site storage and loading requirements to be in accordance with the Ontario Occupational Health and Safety Act and Regulations for Construction Projects.

60 PUBLIC CONVENIENCE AND SAFETY

- 60.1 Maintain sidewalks at and adjacent to the Site in a safe condition throughout the Contract. Promptly remove ice and snow.
- 60.2 Keep haul routes free at all times from Products spilled on highway or street surfaces and clean highways and streets of deposits due to performance of the Work to the satisfaction of the Consultant and the highway and street authorities. Clean highways and streets within 24 hours of Consultant's instruction.
- 60.3 The Consultant may inspect haul routes, the Site and adjacent premises daily and may halt operations, withhold payment or carry out such additional operations as necessary, deducting the cost from monies due, or to become due, to the Contractor.

61 ACCESS AND EGRESS TO SITE

- 61.1 Where construction requirements demand, construct access roads capable of withstanding construction equipment and haul traffic. Maintain access roads in good condition at all times. Remove access roads prior to completion of the Work unless otherwise noted and restore area as shown on the Contract Drawings.

62 PUBLIC TRAFFIC FLOW

- 62.1 Provide and maintain flag persons, Police Officers, traffic signals, barricades and illumination as required by Authorities having jurisdiction and/or as necessary to perform the Work and protect the public.

62.2 PUBLIC UTILITIES AND SERVICES

- 62.3 Verify limitations imposed on project work by presence of utilities and services, and ensure no damage occurs to them.
- 62.4 Notify service authorities concerned so that they protect, remove, relocate, or discontinue them, as they may require.
- 62.5 Make arrangements and pay for connection charges for services required for project work.
- 62.6 Locate poles, pipes, conduit, wires, fill pipes, vents, regulators, meters, and sanitary services work in inconspicuous locations. If not shown on Drawings, verify location of service work with Consultant before commencing installation.

63 ROADS, CURBS, GUTTERS, AND WALKS

- 63.1 Include all curb cuts and making good of existing curbs, walks and paving on Municipal property to provide fully paved and finished approaches to requirements of authorities having jurisdiction.

64 CONSTRUCTION PARKING

- 64.1 Parking will be permitted on Site provided it does not disrupt the performance of Work, Site safety or the movement of vehicular or pedestrian traffic and is acceptable to the Consultant.

65 SITE VISITORS

- 65.1 During the progress of the Work, afford access to visitors duly authorized by the Consultant and facilitate inspections or tests they may desire to make. Record site visitors in log book maintained on site.
- 65.2 Ensure Site visitors wear appropriate safety apparel.

66 EROSION AND SEDIMENTATION CONTROL

- 66.1 Control drainage on site to prevent flooding, erosion and run-off onto adjacent properties as a result of construction operations.
- 66.2 Dispose of water containing silt in suspension in accordance with requirements of jurisdictional authorities.
- 66.3 Conform to sedimentation and erosion control requirements of the conservation and/or municipal authority having jurisdiction. Provide and maintain until completion of work or until directed by Consultant to be removed, sediment control devices at catch basins, drainage courses and at other locations on site as directed. Comply with requirements of the local Conservation Authority.
- 66.4 Provide storm drain inlet protection consisting of a sediment control barrier or an excavated ponding area around storm drain inlet or curb inlet; add bracing where necessary to withstand high flow volumes and depth. Inspect inlet protection after each rainfall and repair damage. Sweep up accumulated sediment and dispose of in a controlled area. Remove inlet protection after area has been stabilized with permanent vegetation.
- 66.5 Prevent tracking of mud and dirt from site onto paved roads. Provide stabilized vehicle access/egress points, constructed of coarse granular material. Place additional granular material as required to maintain access/egress points in proper working order. Clean mud and dirt from paved roads at end of each day by shovelling or sweeping and subsequent washing. Dispose of mud dirt in a controlled disposal area.

67 TEMPORARY DRAINAGE AND DEWATERING

- 67.1 Drainage lines and gutters shall be kept open at all times. No flow of water shall be directed across or over pavements except through pipes or properly constructed troughs. Keep all portions of Work properly and efficiently drained during construction and until completion. Be responsible for all disturbances, dirt and damage which may be caused by or result from water backing up or flowing over, through, from or along any part of Work, or due to operations which may cause water to flow elsewhere.

- 67.2 Keep trenches and other excavations free of water at all times. Employ adequate means to remove water in a manner that will prevent loss of soil, and maintain the stability of excavation.
- 67.3 Dispose of such water in a manner that will not be dangerous to public health, private property or to any portion of Work completed or under construction, nor which causes an impediment to the use of streets by the public.
- 67.4 Drainage of trenches or other excavation through newly laid storm drainage pipe will be allowed only with the express permission of the authority having jurisdiction.
- 67.5 When drainage is directed to existing catch basins, regularly inspect and clean such catch basins of debris and sediment.

68 SNOW REMOVAL

- 68.1 Allow no accumulation of ice and snow on Site, and on roof deck when roofing operations are scheduled to take place.
- 68.2 Remove snow from road, Site circulation paths and elsewhere as required to permit access to Work, parking and uninterrupted construction progress.

69 POLLUTION (DUST, DEBRIS, AND NOISE) CONTROL

- 69.1 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.
- 69.2 Keep premises free of waste material.
- 69.3 Arrange and pay for removal of all waste generated by the work in manner acceptable to authorities having jurisdiction.
- 69.4 Limit noise levels in accordance with requirements of authorities having jurisdiction.
- 69.5 Maintain temporary erosion and pollution control features installed under this contract.
- 69.6 Control emissions from equipment and plant to local authorities emission requirements.
- 69.7 Prevent abrasive-blasting and other extraneous materials from contaminating air beyond application area, by providing temporary enclosures.

70 TREE PROTECTIONS

- 70.1 All trees are to be protected in accordance with the City of Mississauga, Urban Forestry, Tree Protection Policy.
- 70.2 Within Contractor's assigned work and storage areas and adjacent to designated access routes, protect existing trees and other plants scheduled to remain. Provide approved barrier consisting of snow fencing or plywood around Tree Protection Zone (TPZ).
- 70.3 Leave protection areas undisturbed; do not use areas for storage, stockpiling or any other purpose. Do not dump or flush any contaminants in areas of tree feeder roots.

- 70.4 Where limbs, roots or portions of plants are required to be removed to accommodate new work, they shall be removed with the approval of Urban Forestry and under the supervision of an experienced arborist.
- 70.5 Where root systems of protected trees adjacent to construction are exposed or damaged, they shall be neatly trimmed and the area backfilled with suitable material to prevent desiccation.
- 70.6 Where necessary give plants an overall pruning to restore the balance between roots and top growth and/or to restore appearance.
- 70.7 Except at locations where specific procedures are included in Contract Documents do not alter grades around existing trees/plants without first obtaining Consultant's consent and directions.

71 SUBSTITUTIONS

- 71.1 Requests for substitutions will not be accepted prior to the Notification of Award. Substitutions will be considered by the Consultant provided that:
- .1 The proposed substitutions have been investigated and complete data are submitted in accordance with the Specifications.
 - .2 Data relating to changes in the Contract Schedule, if any, and relation to other Work have been submitted.
 - .3 Same warranty is given for the substitution as for the original Product specified.
 - .4 All claims are waived for additional costs related to the substitution which may subsequently arise.
 - .5 Installation of the accepted substitution is co-ordinated into the Work and that full responsibility is assumed when substitutions affect other work. Make any necessary changes required to complete the Work. Revisions to the drawings for incorporation of the substitutions shall be made by the Consultant and all costs associated with the revisions shall be borne by the Contractor.
- 71.2 Substitutions to methods or process described in the Specifications or drawings, may be proposed for the consideration of the Consultant. Ensure that such substitutions are in accordance with the following requirements:
- .1 Time spent by the Consultant in evaluating the substitution shall not be the basis for a claim by the Contractor for extensions to the Contract Time.
 - .2 Clearly indicate how the proposed substitutions would be advantageous to the Owner or in the opinion of the Contractor would improve the operation of the installation.
 - .3 Be responsible for substitutions to methods or processes concerning such Work and ensure that the warranty covering all parts of the Work will not be affected.
 - .4 The cost of all changes in the work of Other Contractors, necessitated by the substituted methods or processes, if accepted, is borne by the Contractor.
 - .5 The substituted methods or processes fit into space allotted for the specified methods or processes. Revisions to the drawings for incorporation of the substitutions shall be made by the Consultant and all costs associated with the revisions shall be borne by the Contractor.

- 71.3 Substitutions will not be considered if:
- .1 They are indicated or implied on shop drawings or Product data without formal request.
 - .2 Acceptance will require substantial revision of the Specifications and Drawings.
- 71.4 Do not substitute Products or methods or processes into the Work unless such substitutions have been specifically approved for the Work by the Consultant.
- 71.5 Approved substituted Products shall be subject to the Consultant's inspection and testing procedures. Approved substituted Products shall only be installed after receipt of the Consultant's written approval.
- 71.6 The Contract Price will be adjusted accordingly to any and all credits arising from the substitutions mentioned above.

72 APPROVAL OF PRODUCTS AND INSTALLATION METHODS

- 72.1 Wherever in the Specifications it is specified that Products and installation methods shall meet approval of Authorities having Jurisdiction, underwriters, the Consultant, or others, such approval shall be in writing.

73 PRODUCT DELIVERY CONTROL

- 73.1 It is the responsibility of the Contractor to ensure that the supplier or distributor of materials specified or alternatives accepted, which he intends to use, has materials on the site when required. The Contractor shall obtain confirmed delivery dates from the supplier.
- 73.2 The Contractor shall contact the Consultant immediately upon receipt of information indicating that any material or item, will not be available on time, in accordance with the original schedule, and similarly it shall be the responsibility of all subcontractors and suppliers to so inform the Contractor.
- 73.3 The Consultant reserves the right to receive from the Contractor at any time, upon request, copies of actual purchase or work orders of any material or products to be supplied for the work.
- 73.4 If materials and products have not been placed on order, the Consultant may instruct such items to be placed on order, if direct communication in writing from the manufacturer or prime suppliers is not available indicating that delivery of said material will be made in sufficient time for the orderly completion of the Work.
- 73.5 The Consultant's review of purchase orders or other related documentation shall in no way release the Contractor, or his subcontractors and suppliers from their responsibility for ensuring the timely ordering of all materials and items required, including the necessary expediting, to complete the work as scheduled in accordance with the Contract Documents.
- 73.6 In the event of failure to notify the Consultant at commencement of Work and should it subsequently appear that Work may be delayed for such reason, the Consultant reserves the right to direct the Contractor to take the following measures at no increase in Contract Price:

- .1 Substitute more readily available Products of similar or better quality and character, or
- .2 Temporarily install another Product until such time as the specified Product becomes available, at which time the temporarily installed product shall be removed and the specified Product installed.

74 TRADEMARKS AND LABELS

- 74.1 Permanent labels, trademarks and nameplates on Products are not acceptable in the finished Work, except where required by authorities having jurisdiction, for operating instructions, or when located in service rooms.
- 74.2 Remove trademarks and labels by grinding, if necessary, painting out where the particular surface is being painted, or if on plated parts, replace with new plain plated or non-ferrous metal parts.

75 DELIVERY, STORAGE, HANDLING AND PROTECTION

- 75.1 Be responsible for handling and delivery of Products. Protect Products from damage during handling, storage and installation. Deliver store and handle items in accordance with manufacturer's instructions and as specified. Be responsible for all costs of delivery, loading and off-loading, and for transportation back to its origin for correction, if required, due to damage or defect. Reject materials and Products delivered to the Site which are damaged.
- 75.2 Manufacture, pack, ship, deliver, and handle Products so that no damage occurs to structural qualities and finish appearance, nor in any other way which is detrimental to their function and appearance.
- 75.3 Ensure that Products, while transported, are not exposed to an environment which would increase their moisture content beyond the maximum specified.
- 75.4 Organize delivery of materials, Products and equipment to, and removal of debris and equipment from, the site and surrounding property.
- 75.5 Schedule early delivery of Products to enable Work to be executed without delay. Before delivery, arrange for receiving at the Place of the Work.
- 75.6 Coordinate mechanical and electrical equipment and apparatus deliveries with the manufacturer's and suppliers such that equipment and apparatus is delivered to the site when it is required, or so that it can be stored within the building and protected from the elements.
- 75.7 Shop assemble work for delivery to site in size easily handled and to ensure passage through building openings.
- 75.8 Deliver packaged Products, in original unopened wrapping or containers, with manufacturer's seals and labels intact.
- 75.9 Label packaged products to describe contents, quantity, and other information as specified.
- 75.10 Labels attesting that materials conform to specified reference standards will be acceptable as verification that contents meet specified requirements. In the absence

of labels, submit affidavits to validate conformance of Product to reference standards, as requested by the Consultant.

- 75.11 Label fire-rated Products to indicate Underwriters' Laboratories approval.
- 75.12 Handle and store materials and products in such a manner that no damage is caused to the materials and products, the Work, the site and surrounding property.
- 75.13 Do not obstruct or disrupt local traffic flow during construction period.
- 75.14 Allocate an area within the limits of the Work acceptable to the Owner for storage of Products brought to the site by all trades. Keep storage area tidy at all times and do not use other parts of the property for storage. Arrange and pay for off-site storage when required.
- 75.15 Locate products on site in a manner to cause minimal interference with the Work and building activities.
- 75.16 Store Products off the ground, in a manner to prevent damage, adulteration, deterioration and soiling to the Products, other building components, assemblies, other products, the structure, the site and surrounding property, and in accordance with manufacturer's instructions when applicable.
- 75.17 Store packaged or bundled Products in original and undamaged condition complete with written application instructions. Keep manufacturer's seals and labels intact. Do not remove from packaging or bundling until required in the Work.
- 75.18 Do not place or store materials and Products in corridors, public areas, streets, lanes, passageways or similar locations.
- 75.19 Store Products so as not to create any overloading conditions to any part of the building, structure, falsework, form work and scaffolding.
- 75.20 Store Products subject to damage from weather in weatherproof enclosures.
- 75.21 Store cementitious Products clear of earth or concrete floors, and away from walls.
- 75.22 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
- 75.23 Store sheet materials and lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.
- 75.24 Store and handle flammable liquids and other hazardous materials in approved safety containers and as otherwise prescribed by safety authorities. Store no flammable liquids or other hazardous material in bulk within the Work.
- 75.25 Store and mix paints in a heated and ventilated room or area assigned for this purpose. Keep this room or area locked when unattended. Remove oily rags and other combustible debris from the Place of the Work daily. Take every precaution necessary to prevent spontaneous combustion.
- 75.26 Protect prefinished metal surfaces by protective coatings or wrappings until time of final cleanup. Protection shall be easily removable under work of without damage to finishes. Do not permit strippable tape or coatings to become baked on surfaces which they protect.
- 75.27 Touch-up damaged factory finished surfaces to Consultant's satisfaction. Use primer and paint to match original.

- 75.28 Protect glass and other finishes against heat, slag and weld splatter by provision of adequate shielding. Do not apply Visible markings to surfaces exposed to view in finished state or that receive transparent finishes.
- 75.29 Protect surfaces of completed work exposed to view from staining, disfigurement and all other damage by restriction of access or by use of physical means suitable of the material and surface location.
- 75.30 Adequately protect trowelled concrete floors from damage. Take special measure when moving heavy loads or equipment on them.
- 75.31 Keep finished concrete floors free from oils, grease or other material likely to damage or discolour them or affect bond of applied finishes. Once building is enclosed, keep floors as dry as possible after curing.
- 75.32 Protect finished flooring from pedestrian traffic with reinforced kraft paper as a minimum, secured in place and with joints sealed by reinforced pressure sensitive tape. Maintain protection in place until contract completion.
- 75.33 Protect finished flooring from continuing construction work and delivery of products with plywood panels of minimum 6 mm thickness with joints between panels sealed with reinforced pressure sensitive tape. Maintain protection in place until work and deliveries are complete.
- 75.34 Make good or replace damaged materials to the satisfaction of the Consultant.
- 75.35 Hazardous Materials Information:
- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of material safety data sheets (MSDS) in accordance with jurisdictional authorities.
 - .2 Deliver copies of Material Safety Data Sheets (MSDS) to the Consultant on all Products intended for use in the Work and designated as a "controlled product."
- 76 AVAILABILITY**
- 76.1 If delays in supply of Products are foreseeable, notify the Consultant of such, in order that remedial action may be authorized in ample time to prevent delay in performance of Work.
- 76.2 In the event of failure to notify the Consultant at commencement of Work and should it subsequently appear that Work may be delayed for such reason, the Consultant reserves the right to direct the Contractor to take the following measures at no increase in Contract Price:
- .1 Substitute more readily available Products of similar or better quality and character, or
 - .2 Temporarily install another Product until such time as the specified Product becomes available, at which time the temporarily installed product shall be removed and the specified Product installed.

77 MANUFACTURER'S INSTRUCTIONS

- 77.1 Unless otherwise indicated in the Specifications, fabricate, install, apply, connect, install, erect, use, clean, and condition Products in accordance with manufacturer's instructions except where more stringent requirements are specified. Do not rely on labels or enclosures provided with Products. Obtain written instructions directly from manufacturers.
- 77.2 Notify the Consultant in writing, of conflicts between the Specifications and manufacturer's instructions, so that the Consultant may establish the course of action. If requested, make a copy of those instructions available at the Site.
- 77.3 In cases of improper installation or erection of Products, due to failure in complying with these requirements, the Consultant may direct removal and re-installation at no increase in Contract Price.

78 WORKMANSHIP

- 78.1 Workmanship shall be the best quality, executed by workers experienced and skilled in the respective duties for which they are employed. Immediately notify the Consultant if required Work is such as to make it impractical to produce required results.
- 78.2 Do not employ any unfit person or anyone unskilled in their required duties. The Consultant reserves the right to require the dismissal from the Place of the Work, workers deemed incompetent, careless, insubordinate or otherwise objectionable.
- 78.3 Decisions as to the quality or fitness of workmanship in cases of dispute rest solely with the Consultant, whose decision is final.
- 78.4 Give particular attention to finished dimensions and elevations of the Work. Make finished Work fit indicated spaces accurately. Make finished Work flush, plumb, true to lines and levels and accurate in all respects.
- 78.5 In finished areas, conceal pipes, ducts, conduit and wiring in floors, walls, ceilings, chases, or behind furring except where indicated otherwise.
- 78.6 Ensure that service poles, fill-pipes, vents, regulators, metres and similar service installations are located in inconspicuous locations. If not indicated on drawings, verify location of service installations with Consultant prior to commencing installation.
- 78.7 Ensure that integrity of fire separations is maintained where they are penetrated.
- 78.8 Finish access panels and doors to match adjacent wall and/or ceiling finish unless otherwise specified or indicated.
- 78.9 Keep surfaces, on which finished materials will be applied, free from grease, oil, and other contamination which would be detrimental in any way to the application of finish materials.
- 78.10 Enforce fire prevention methods at site. Do not permit fires, open flame heating devices or accumulation of debris. Use flammable materials only if all safety precautions are taken. Provide and maintain in working order ULC labelled fire extinguishers of types suitable for fire hazard in each case, and locate them in prominent location and to approval of jurisdictional authorities.
- 78.11 Where flammable materials are being applied, ensure that adequate ventilation is provided, spark-proof equipment is used, and smoking and open flames are prohibited.

79 DIMENSIONS

- 79.1 Check all dimensions at the Site before fabrication and installation commences and report discrepancies to the Consultant.
- 79.2 Where dimensions are not available before fabrication commences, ensure that dimensions required are agreed upon between the parties concerned.
- 79.3 Prior to commencing work, ensure that clearances required by jurisdictional authorities can be maintained
- 79.4 Wall thicknesses and openings shown on the drawings may be nominal only; ascertain actual sizes at the Site.
- 79.5 Verify dimensions of shop fabricated portions of the Work at the Site before shop drawings and fabrications are commenced. The Owner will not accept claims for extra expense by reason of non-compliance with this requirement.
- 79.6 Fabricate and erect manufactured items, shop fabricated items, and items fabricated on or off site, to suit site dimensions and site conditions.
- 79.7 In areas where equipment is to be installed, check dimensional data on equipment to ensure that area and equipment dimensions are compatible with necessary access and clearance provided. Ensure that equipment supplied is dimensionally suitable for space provided.
- 79.8 Leave areas clear where space is indicated to be reserved for future equipment, including access to such future equipment.
- 79.9 Whether shown on the Drawings or not, leave adequate space and provision for servicing of equipment and removal and reinstallation of replaceable items such as motors, coils and tubes.

80 RELOCATION OF MECHANICAL AND ELECTRICAL ITEMS

- 80.1 The Owner and the Consultant reserve the right to relocate outlets at a later date, but prior to installation, without additional cost to Owner, assuming that the relocation per outlet does not exceed 3000 mm from the original location. No credits will be anticipated where relocation per outlet of up to and including 3000 mm reduces materials, products and labour.
- 80.2 Should relocations per outlet exceed 3000 mm from the original location the Contract Price will be adjusted in accordance with the provisions for changes in the Contract Documents.
- 80.3 Alter the location of pipes and other equipment, without additional cost to the Owner, if approved, provided the change is made before installation.
- 80.4 Make necessary changes, due to lack of coordination, as required and when approved, at no additional cost, to accommodate structural and building conditions.

81 EXPANSION, CONTRACTION, AND DEFLECTION

- 81.1 Conform to manufacturer's recommended installation temperatures. If items, components, assemblies, systems, and finishes are installed at temperatures different from operation or service temperatures, make provisions for expansion and contraction in service as acceptable to manufacturer and consultant. Repair all resulting damage should expansion provisions provide inadequate.
- 81.2 Make provisions for expansion and contraction due to temperature changes within components, Products and assemblies, and between adjacent components, Products and assemblies, and due to building movements including but not limited to creep, column shortening, deflection, sway and twist. Ensure provisions for expansion, contraction and building movements prevent damages from occurring to and within components, Products and assemblies.
- 81.3 Make adequate allowance at wall and partition heads for deflection of the structure above. Determine requirements from Consultant where additional information is required. Where partitions butt to underside of floor assembly, or structural framing, the clearance shall be based on the span of the members supporting the floor or structural framing. In making such allowance use methods which maintain the integrity of the wall or partition as a sound, and/or fire barrier.
- 81.4 Make provisions in pipes, plenums, ducts and vessels containing air and fluids as is necessary to prevent damage due to fluid and air induced pressure, surges and vibrations, to pipes, plenums, ducts and vessels and to adjacent components, assemblies and construction to which pipes, ducts, plenums and vessels are attached or pass through.

82 DIELECTRIC SEPARATION

- 82.1 Ensure that a dielectric separator is provided in a permanent manner over entire contact surfaces to prevent electrolytic action (galvanic corrosion) between dissimilar materials. Similarly, prevent corrosion to aluminum in contact with alkaline materials such as contained in cementitious materials.

83 FASTENINGS

- 83.1 Include in the work of each section necessary fastenings, anchors, inserts, attachment accessories, and adhesives. Where installation of devices is in work or other sections, deliver and locate devices in ample time for installation.
- 83.2 Do not install fibre, plastic or wood plugs or blocking for fastenings in masonry, concrete, or metal construction, unless specified or indicated on drawings.
- 83.3 Install work with fastenings or adhesives in sufficient quantity to ensure permanent secure anchorage of materials, construction, components and equipment under static conditions, and to resist building thermal movement, creep and vibration.
- 83.4 Provide metal fastenings and accessories in same material, texture, colour, sheen and finish as metal on which they occur, unless indicated otherwise.
- 83.5 Prevent electrolytic action between dissimilar metals and materials.
- 83.6 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior Work, and where attached to, or contained within, exterior walls and slabs,

unless stainless steel or other material is specified. Leave steel anchors bare where cast in concrete.

- 83.7 Space anchors within their load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.
- 83.8 Conceal fasteners where indicated. Keep exposed fastenings to a minimum, space evenly and in an organized symmetrical pattern.
- 83.9 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

84 ADJUSTING

- 84.1 Ensure that all components of assemblies fit snugly, accurately and in true planes, and that moving parts operate positively and freely, without binding and scraping.
- 84.2 Verify that work functions properly and adjust it accordingly to ensure satisfactory operation. Lubricate Products as recommended by manufacturer.

85 DEMONSTRATION AND INSPECTION OF PRODUCTS AND SYSTEMS

- 85.1 Arrange for a demonstration of systems and operating Products upon the 100% completion of their installation and prior to certification for Substantial Performance.
- 85.2 Include in the arrangements for the attendance of the Consultant, Owner, jurisdictional authorities, and personnel assigned by the Owner for the operation of the systems and/or Products.
- 85.3 Demonstrations shall be conducted by the Subcontractor responsible for the installation of the systems and/or Product, assisted by representatives of the manufacturer or supplier. All personnel conducting the demonstration shall be completely knowledgeable of all conditions of the operating, functioning and maintenance of the systems and/or Products.
- 85.4 Owner's representative will acknowledge the successful completion of each demonstration on a form provided by the Contractor. The form shall be agreed to by the Owner, Consultant and Contractor prior to demonstration and testing.
- 85.5 Submit copies of letters from manufacturers of Systems and/or Products before making application for certificate of Substantial Performance to verify that the Products has been installed and connected correctly, and that it is operating in a satisfactory manner. The certification shall be based upon inspection and testing of the Products by competent technical personnel. Include in letter of certification the names of personnel conducting the testing and inspection, the methods of inspection utilized, and the location in the building of the Products certified.
- 85.6 Following submission of letters of certification and their acceptance by the Owner, the owner shall have the right to use the Products on a trial basis and for instructing their personnel in its use.

86 FINAL INSPECTIONS AND CLOSE OUT

- 86.1 Submit proposed closeout procedures and schedule of inspection to Consultant for approval before final demonstrations and inspections commence.
- 86.2 Arrange for, conduct and document final demonstrations, inspections, close-out and take-over at completion of the Work in accordance with procedures described in OAA/OGCA TAKE-OVER PROCEDURES, OAA/OGCA Document No. 100. Where "Architect" is referred to in Document No. 100 it shall mean Consultant.

87 CERTIFICATE OF COMPLIANCE

- 87.1 Submit Certificate of Compliance, prior to the application for Substantial Performance, for each of the following items.
 - .1 An affidavit relative to the use of lead-free solder for all domestic water lines, regardless of location.
 - .2 Products for which Material Safety Data Sheets have been submitted and accepted.
 - .3 Other Work/Products identified in the Contract Documents as requiring a Certificate of Compliance.
- 87.2 Each Certificate of Compliance shall indicated names and addresses of the project, the Owner, the date of issue, product description including name, number, manufacturer, with a statement verifying that the Work/Product installed meets specified requirements and, if applicable, complies with the submitted and accepted Material Safety Data Sheets.
- 87.3 Each Certificate of compliance shall be issued on the subcontractor's letterhead, properly executed, under whose work the prospective Work/Product has been provided.
- 87.4 Each Certificate of Compliance shall be endorsed by the Contractor with his authorized stamp/signature. Ensure that submissions are made to allow sufficient time for review without delaying progress of scheduled completion.

88 GARBAGE DISPOSAL AND CLEANUP

- 88.1 Provide waste containers for the disposal of all waste materials resulting from performance of their work.
- 88.2 No hazardous or contaminated waste material shall be placed in Owner's waste containers and Subtrades shall make their own arrangements for the disposal off site of any such material resulting from performance of their work.
- 88.3 Remove all regular waste material and debris from their work areas and deposit in the waste containers at the end of each working day. Any clean up work not performed as requested will be carried out by the Owner with all resultant costs being charged to the Subtrade.

89 CLEANING

- 89.1 Progress cleaning:
 - .1 Remove from finish work, spatters, droppings, labels, and debris, before they set up.

- .2 Ensure that only cleaning materials are used which are recommended for the purpose by both the manufacturer of the surface to be cleaned and of the cleaning material.
 - .3 Maintain building work areas "broom clean" at least on a daily basis, but cleaning shall also be done immediately before finishing work.
 - .4 No waste material may be burned or buried at site. Remove waste as often as required to avoid accumulation, no less than, at the end of each working day.
 - .5 Remove packaging materials and debris from the site immediately after product and equipment is unwrapped or uncrated.
 - .6 Ensure that volatile fluid wastes are not disposed of in storm or sanitary sewers, in open drain courses, or anywhere on site.
 - .7 Do not allow waste material and debris to accumulate in an unsightly or hazardous manner. Sprinkle dusty accumulations with water. Provide containers in which to collect waste material and debris. Dispose of hazardous products in accordance with requirements of jurisdictional authorities.
 - .8 Ensure that cleaning operations are scheduled to avoid deposits of dust or other foreign matter on surfaces during finishing work and until wet or tacky surfaces are cured.
 - .9 Provide instructions for final cleaning of finishing work, and for inclusion in Maintenance and Operating Manuals.
- 89.2 Final cleaning:
- .1 Before final inspection, replace glass and mirrors broken, damaged, and etched during construction, or which are otherwise defective.
 - .2 In addition to requirements for progress cleaning, Work shall include final cleaning by skilled cleaning specialists on completion of construction.
 - .3 Remove temporary protections and make good defects before commencement of final cleaning.
 - .4 Final cleaning shall remove dust, stains, paint spots, soil, grease, fingerprints, and accumulations of construction materials, interior and exterior to the building for all new work throughout new and existing Building. Work shall be done in accordance with manufacturer's instructions for each material.
 - .5 Maintain cleaning until Owner has taken possession of building or portions thereof.
- 90 PROGRESS RECORDS**
- 90.1 Maintain on site, permanent written records of daily progress of the Work. Records shall be open to review by Consultant and Owner at all times and a copy shall be furnished to Consultant on a weekly basis.
- 90.2 Records shall show dates of commencement, progress and completion of various trades and items of work. Particulars pertaining to number of employees of various trades and type and quantity of equipment employed daily, temperature, protection methods and other such data shall be noted.

91 RECORD DRAWINGS

- 91.1 Complete appended Electronic File Release Agreement and submit complete with required fee. Final record drawings to be submitted in both CAD and PDF format.
- 91.2 Authorized deviations from drawings shall be marked in red accurately on one set of drawing prints in a neat, legibly printed manner and shall be dated. Prior to final inspection, neatly transfer the recorded information to a second set of drawing prints of the most recent revision to the drawings and submit both sets to the Consultant.
- 91.3 Maintain record drawings up to date as Work progresses. Status of maintained record drawings may be considered as a condition for validation of applications for payment.
- 91.4 Identify each record drawing as "Contract Record Copy" and maintain the record drawings in good condition. Make record drawings available to the Consultant at all times.
- 91.5 Record drawings shall include accurate dimensioned record of deviations and changes in Work from drawings.
- 91.6 Record drawings shall be signed and dated by Contractor.
- 91.7 Submit record drawing to Consultant for review and make corrections as directed by Consultant.
- 91.8 Record accurately all deviations in the Work.
- 91.9 Accurately record locations of concealed structure, mechanical and electrical services and similar Work not clearly in view, the location of which is required for maintenance, alteration Work and future additions. Do not conceal such Work until the location has been recorded.
- 91.10 Accurately record locations of equipment bases, anchors, concrete pads and roof curbs, sleeves, piping, conduits, ducts, maintenance holes and valves, etc. located either below, outside or within structure.
- 91.11 Where piping, conduits and ducts are underground, underfloor, embedded in concrete or otherwise in unaccessible locations, accurately record with respect to structure column lines or walls and elevations with respect to finished floor levels or grades referenced to the centre line of components.
- 91.12 Accurately record any components which will be in inaccessible locations for Consultant's review before the component is covered, or buried, or made inaccessible.

92 OPERATION AND MAINTENANCE MANUALS

- 92.1 Hand over to the Consultant two (2) copies of a comprehensive operations and maintenance manual and material suitable for the Owner's maintenance employees. Manuals shall cover all Products supplied and installed under the Contract.
- 92.2 Submit draft of the operation and maintenance manuals for the Consultant's review at least 15 days before testing systems and equipment. Incorporate alterations and additions, as found to be necessary during testing, and prepare the final version of the manual from the corrected draft.

- 92.3 Submit final version of operation and maintenance manuals prior to Contract Completion.
- 92.4 Testing of systems and equipment will not be deemed to be complete until the requisite number of copies of the final version of the manuals has been handed over to the Consultant.
- 92.5 If standard literature is incorporated into the operations and maintenance manual, any irrelevant information shall be deleted, or suitably noted.
- 92.6 The manuals shall have sufficient detail in order that the Owner can totally maintain the equipment without outside help.
- 92.7 Submit all material in English.
- 92.8 Operation and maintenance manuals shall contain the following minimum information and data:
- 92.9 Table of contents: Provide title of Contract; names, addresses, and telephone numbers of Consultants and Contractor with name of responsible parties; schedule of Products and systems, indexed to content of the volume.
- 92.10 For each Product or system: List names, addresses and telephone numbers of Subcontractors, suppliers and service representatives, including local source of replacement supplies and parts including telephone numbers.
- 92.11 Warranties: Warranties are between the Contractor and Owner. Warranties shall include, as a minimum:
- .1 Description of warranty coverage.
 - .2 Date warranty starts (being date of Contract Completion).
 - .3 Date warranty expires.
 - .4 Contact name, address and phone number (the Contractor shall also be responsible for advising the Owner of changes in contact information during the warranty period).
 - .5 Equipment and components performance curves.
 - .6 Hydro certificates.
- 92.12 Reports: For each Product or system provide the following:
- .1 Manufacturer's certified reports
 - .2 Factory test reports.
 - .3 Field testing reports.
- 92.13 Details of design, construction and/or fabrication features, component function and maintenance requirements, to permit effective start-up, operation, maintenance, repair, modification, extension and expansion of any portion or feature of the installation.
- 92.14 Technical data, Product data, supplemented by bulletins, component illustrations, detailed views, technical descriptions of items and parts lists.
- 92.15 Schematics, interconnection lists: Manuals shall be complete with schematic and wiring diagrams, wiring interconnection lists and diagrams fully cross referenced and coordinated, printed circuit board layouts including the component identification, component parts list with electronic substitution equivalent. Provide cross referenced components lists and sequence of operations.
- 92.16 Trouble shooting and fault location guide: Instructions to facilitate quick return of malfunctioning equipment to operation.

- 92.17 Routine servicing and preventative maintenance schedule for Products and/or estimated hours required for routine servicing and preventative maintenance tasks.
 - 92.18 List of recommended spare parts and recommended quantity of each item to be stocked based on spare part availability and re-order time.
 - 92.19 Complete set of reviewed shop drawings.
 - 92.20 Product data: Mark each sheet to clearly identify specific Products and component parts, and data applicable to installation; delete inapplicable information.
 - 92.21 Drawings: Supplement Product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams and as required in the Specifications.
 - 92.22 Typed text: As required to supplement Product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions and as required in the Specification.
- 93 AS-BUILT DRAWINGS**
- 93.1 Prepare all required drawings on CAD (.dwg), using CAD Version 2010 or higher.
 - 93.2 Prepare CAD drawings to meet the requirements of the Owners or Consultant's CAD Standards and Procedures.
 - 93.3 Supply and hand over to the Consultant one CD of drawings for each final drawing prepared under this Contract, including but not limited to circuit drawings, equipment layout drawings, and shop drawings.
 - 93.4 The final size of drawings shall be 560 mm x 860 mm. Half size reproductions (280 mm x 430 mm) shall also be provided.
 - 93.5 Prior to Contract Completion, supply and hand over to the Consultant, one complete set of .dwg Drawing Files in CAD format on storage media acceptable to Consultant for each final drawing prepared under this Contract, including but not limited to circuit drawings, equipment layout drawings, and shop drawings.
 - 93.6 Text files shall be written in word processing program acceptable to Owner.
 - 93.7 Authorized deviations from drawings shall be marked in red accurately on one set of drawing prints in a neat, legibly printed manner and shall be dated. Prior to final inspection, neatly transfer the recorded information to a second set of drawing prints of the most recent revision to the drawings and submit both sets to the Consultant.
 - 93.8 Maintain as-built drawings up to date as Work progresses. Status of maintained as-built drawings may be considered as a condition for validation of applications for payment.
 - 93.9 Identify each as-built drawing as "As-Built Copy" and maintain the as-built drawings in good condition. Make as-built drawings available to the Consultant at all times.

- 93.10 As-built drawings shall include accurate dimensioned record of deviations and changes in Work from drawings.
- 93.11 As-built drawings shall be signed and dated by Contractor.
- 93.12 Submit as-built drawing to Consultant for review and make corrections as directed by Consultant.
- 93.13 Record accurately all deviations in the Work.
- 93.14 Accurately record locations of concealed structure, mechanical and electrical services and similar Work not clearly in view, the location of which is required for maintenance, alteration Work and future additions. Do not conceal such Work until the location has been recorded.
- 93.15 Accurately record locations of equipment bases, anchors, concrete pads and roof curbs, sleeves, piping, conduits, ducts, maintenance holes and valves, etc. located either below, outside or within structure.
- 93.16 Where piping, conduits and ducts are underground, underfloor, embedded in concrete or otherwise in inaccessible locations, accurately record with respect to structure column lines or walls and elevations with respect to finished floor levels or grades referenced to the centre line of components.
- 93.17 Accurately record any components which will be in inaccessible locations for Consultant's review before the component is covered, or buried, or made inaccessible.
- 93.18 CAD drawings of Contract Drawings can be obtained from Consultant at a cost of \$750.00 plus HST per sheet drawing and with a signed CAD Wavier.
- 93.19 Clearly and prominently mark each drawing "AS-BUILT DRAWING prepared by _____ (name of Contractor)"

94 TRANSMITTAL

- 94.1 Transmittal shall contain the list of file names contained on the storage media.
- 94.2 Data forwarded to the Owner shall contain the following files in addition to the design information:
- .1 Library parts/cells used in the design
 - .2 Level convention used for each design file.
 - .3 Plotting instructions used to prepare hard copies including colour tables, pen tables and plot scale.
 - .4 Working units of the design files.
 - .5 Font library, if the standard is not used.

95 PHASED CONSTRUCTION

- 95.1 The Work shall be conducted in multiple phases, with each phase focusing on a single room.
- 95.2 Construction activities shall be planned and executed in phases, with each phase focusing on a single room.
- 95.3 No subsequent phase shall commence until the current room is fully completed and returned to service.
- 95.4 The Contractor shall submit a detailed construction schedule indicating the start and completion dates for each room.
- 95.5 The schedule must be approved by the Consultant and the Owner before any work commences.
- 95.6 The Contractor shall coordinate with the facility management to ensure that only one room is out of commission at any given time.
- 95.7 The Contractor shall ensure that access to and from rooms not under construction remains unobstructed.
- 95.8 Construction materials and debris must be confined to the room under construction and shall not impede the operation of adjacent areas.
- 95.9 The room will be considered complete when all punch list items are resolved and the room is fully operational.
- 95.10 Once a room is approved and back in commission, the contractor may commence work on the next room as per the approved schedule.

96 MOVING, STORING, AND REINSTALLING EXISTING FURNITURE AND FITNESS / GYM EQUIPMENT

- 96.1 **Furniture:** Includes all movable articles within the room such as desks, chairs, tables, cabinets, etc.
- 96.2 **Fitness or Gym Equipment:** Includes all exercise machines, weights, mats, and other related apparatus.
- 96.3 Contractor shall coordinate with the Owner to schedule the moving and reinstallation activities to minimize disruption.
- 96.4 Work shall be conducted in phases, ensuring that each room's furniture and equipment are handled separately.
- 96.5 No room shall have furniture or fitness equipment moved, stored, or reinstalled without prior approval from the Owner.

- 96.6 Prior to moving, all furniture and equipment shall be inventoried and documented, including photographs and descriptions.
- 96.7 Contractor shall be responsible for the unloading of all furniture and equipment supplied to the work site. The Contractor shall be responsible for any damage occurring during these operations.
- 96.8 Any existing damage shall be noted, documented by photographs and communicated to the Consultant and Owner.
- 96.9 Furniture and equipment shall be carefully disassembled, if necessary, and moved using appropriate equipment to prevent damage.
- 96.10 Items shall be labeled clearly to ensure correct reinstallation.
- 96.11 Contractor is responsible for providing all secured storage containers required for the furniture and equipment.
- 96.12 A secure, dry, clean and secure storage area shall be designated for the temporary storage of furniture, equipment and stored on the site of the work in a manner satisfactory to the Owner.
- 96.13 Items shall be stored in an organized manner, with protective coverings to prevent dust and damage.
- 96.14 Stored items shall be protected from environmental conditions and potential impacts.
- 96.15 Regular inspections shall be conducted to ensure the integrity of stored items.
- 96.16 After painting is completed and fully cured, the room shall be prepared for reinstallation.
- 96.17 Contractor shall verify that the room is clean and free of any debris or dust.
- 96.18 Furniture and equipment shall be carefully moved back into the room and reassembled as necessary.
- 96.19 Items shall be positioned according to the original layout unless otherwise directed by the Owner.
- 96.20 Once reinstallation is complete, the contractor shall conduct a final inspection with the Owner.
- 96.21 Any issues or discrepancies shall be addressed promptly.
- 96.22 Upon completion of each phase, a final inspection shall be conducted to ensure all furniture and equipment are properly reinstalled and the room is ready for use.
- 96.23 Contractor shall provide a final inventory and condition report of all moved items.

- 96.24 Any damage or issues noted during the process shall be documented and remedied at the Contractor's expense.
- 96.25 Store all materials and equipment in a secure and protected manner, which will not overload the structure and shall prevent vandalism or unauthorized use.
- 96.26 Be responsible for the security of all materials and equipment. Make no claims for theft or damage to the Owner.

97 OCCUPIED BUILDING

- 97.1 This is an occupied building and normal building routine will have to carry on while this work is being done. There may be instances where the Contractor will be asked to complete certain types of work after hours or on weekends. This will not constitute an extra fee.
- 97.2 Take proper care to avoid unnecessary noise, clutter or obstruction in pedestrian areas, and arrange for storage of materials and tools where they will cause minimum inconvenience.
- 97.3 Where excessive noise or obstruction is in certain cases unavoidable, advise the Owner ahead of time and make suitable arrangements.
- 97.4 The Owner will allow access to the building and to the work site at times designated by the Owner.
- 97.5 The Owner will not assign storage space, for materials and tools. Contactor shall provide secure storage containers on site on designated parking lot space or stored in a location acceptable to the building Owner.
- 97.6 Perform work which interferes with the public comfort at the times specified by the Owner.
- 97.7 The Owner to be notified up to 2 weeks in advance of deliveries of any major equipment and materials arriving on site during normal working hours. Otherwise, all deliveries are to be made prior to 8:00 a.m. and after 7:00 p.m.

98 TEMPORARY ENCLOSURE AND PROTECTION

- 98.1 Provide and maintain, signs, guardrails, barrier, warning lights and other protection as required by authorises having jurisdiction for safety of the Place of the Work. Be responsible for adequacy of protection.
- 98.2 Plant, Machinery and Scaffolding:
 - .1 Provide formwork, scaffolding, equipment, tools, machinery and incidental appurtenances necessary for the proper execution of the Work.

- .2 Erect plant machinery and scaffolding to permit access to building and the Work.
 - .3 Use scaffolds in such manner as to interfere as little as possible with other trades' operations
 - .4 Support scaffolds from finished surfaces only after taking precautions to prevent damage. No supports, clips, brackets, or similar devices shall be welded, bolted, or otherwise affixed to any finished member or surface without prior permission.
- 98.3 Maintain temporary barriers and enclosures in good condition for the duration of the Work.
- 98.4 Remove temporary barriers and enclosures from Place of the Work when no longer required.
- 98.5 **PROTECTION OF THE PUBLIC**
- .1 Provide fencing, barricades, hoarding, notices and warning boards and maintain lights and signals for protection of workers engaged on the Work, for protection of adjoining property and for protection of the public.
 - .2 Where any special hazard exists from which it is not possible to protect the public safety by other means, watchpersons shall be employed to preserve public safety until the area of special hazard no longer poses a risk to public safety.
- 98.6 Fire Routes
- .1 Maintain fire access routes, including overhead clearances, for use by emergency response vehicles.
- 99 COVID-19 SITE PROTOCOL**
- 99.1 the Owner and Authorities having jurisdiction over the project site. Including but not limited to screening and PPE requirements.
- 99.2 The Owner and Consultant reserves the right to request disclosure from the General Contractor regarding the wellness of all site personnel with respect to the COVID-19 novel coronavirus. The General Contractor should make it known to the Owner and Consultant if any worker or visitor to the site has been placed in self-isolation and/or is in a medical or travel-imposed quarantine.

END OF SECTION

- 1 General
- 1.1 **GENERAL**
 - 1.1.1 Provide labour, Products, equipment, services, tools, and supervision necessary for cutting and patching work in accordance with the Contract Documents.
 - 1.1.2 Obtain Consultant's approval prior to cutting, boring or sleeving load-bearing members.
- 1.2 **DEFINITION(S)**
 - 1.2.1 The terms "make good", "making good", "made good", "restore to existing", "patch", "repair", or similar words or phases are used in standards and these Contract Documents to mean the following, unless context provides otherwise:
 - 1.2.1.1 Make good materials and finishes which are damaged or disturbed during the process of additions and reconstruction under the Contract.
 - 1.2.1.2 Where existing work is to be made good, match new work exactly with the existing work in material, form, construction and finish unless otherwise noted or specified.
 - 1.2.1.3 Where existing work is to be made good, there shall be no visible difference in appearance, performance, or aesthetics between the existing work and the new work by the naked eye at a distance of 3 metres from the surface being made good.
- 1.3 **SUBMITTALS**
 - 1.3.1 Submit written request in advance of cutting or alteration which affects:
 - 1.3.1.1 Structural integrity of any element of the Structure or Contract.
 - 1.3.1.2 Integrity of weather-exposed or moisture-resistant elements.
 - 1.3.1.3 Efficiency, maintenance, or safety of any operational element.
 - 1.3.1.4 Visual qualities of sight-exposed elements.
 - 1.3.1.5 Work of Owner's or Other Contractors.
 - 1.3.2 Include in request:
 - 1.3.2.1 Identification of Contract.
 - 1.3.2.2 Location and description of affected Work.
 - 1.3.2.3 Statement of necessity for cutting or alteration.
 - 1.3.2.4 Description of proposed Work and products to be used.
 - 1.3.2.5 Alternatives to cutting and patching.
 - 1.3.2.6 Effect on work of Owner's or Other Contractors.
 - 1.3.2.7 Date and time Work will be executed.
 - 1.3.3 Obtain Consultant's approval of proposed method of cutting prior to proceeding with the Work.

- 2 Products
- 2.1 Same quality or better than Products incorporated in original installation.
- 2.2 **PREPARATION**
 - 2.2.1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
 - 2.2.2 After uncovering, inspect conditions affecting performance of the Work.
 - 2.2.3 Beginning of cutting or patching means acceptance of existing conditions.
 - 2.2.4 Provide supports to assure structural integrity of surroundings; devices and methods to protect other portions of the project from damage.
 - 2.2.5 Provide protection from elements for areas which may be exposed by uncovering Work; maintain excavations free of water.
 - 2.2.6 Protect work such as floors, finishes, trim, etc., as completely as possible to hold the replacing of damaged work to a minimum.
 - 2.2.7 Preparation for new finishes:
 - 2.2.7.1 Remove existing finishes, including painting.
 - 2.2.7.2 Fill cracks and depressions with suitable filler and finish smooth, as recommended by the manufacturer of the new finishes.
 - 2.2.7.3 Grind protrusions level with substrates and finish smooth.
 - 2.2.7.4 Remove all evidences of existing adhesive, grease, oil, soil and other encrustations of foreign material by washing, scraping and grinding if necessary.
 - 2.2.7.5 Clean and prepare substrates to receive new work.
- 2.3 **SPECIAL PROCEDURES: CONCRETE CUTTING AND CORING**
 - 2.3.1 Prior to cutting or coring any concrete slab, suspended or on grade, or any concrete beam, investigate by x-ray or radar scanning only the element for presence of embedded services (piping, cabling, conduit, etc.), and for locations of reinforcing steel in suspended concrete slabs and beams. Hand held magnetic radio scanners are not permitted.
 - 2.3.2 Provide Owner and Consultant with inspection agency's written report, summarizing investigations and conclusions.
 - 2.3.3 Obtain Consultant's direction where investigations reveal that cutting or coring required in Contract would cut or damage embedded services, or cut or damage reinforcing steel in suspended concrete slabs or beams.
 - 2.3.4 Execute cutting and coring to prevent damage to all embedded services. Make good all damage arising from cutting embedded services.
 - 2.3.5 Execute cutting and coring to prevent damage (cutting in whole or in part) reinforcing steel in suspended concrete slabs without Consultant's prior authorization.
 - 2.3.6 Make good all damage arising from cutting reinforcing steel in suspended concrete slabs and beams.

3 EXECUTION

- 3.1 Execute Work to avoid damage to other Work.
- 3.2 Execute cutting, fitting and patching including excavation and fill to complete the Work.
- 3.3 Employ appropriate trades with skilled labour to perform cutting Work.
- 3.4 Fit Work segments together, to integrate with penetrations through surfaces and with other Work.
- 3.5 Remove and replace defective and non-conforming Work.
- 3.6 Do any drilling, cutting, fitting, patching and finishing that may be required to make the various classes and kinds of other Work fit together in a professional and finished manner. Make watertight connections with adjoining structures.
- 3.7 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.
- 3.8 Execute Work by methods to avoid damage to other Work and which will provide proper surfaces to receive patching and finishing.
- 3.9 Cut Products using proper equipment and methods. On rigid materials, use a masonry saw or core drill. Pneumatic or impact tools are not allowed on masonry work without prior approval.
- 3.10 Where new Work connects with existing structures, cut, patch and make good existing work to match original condition.
- 3.11 Be responsible for correct formation and bridging of openings in masonry and structural walls as required.
- 3.12 Ensure compatibility between installed Products and security of installation.
- 3.13 Restore Work with new Products in accordance with requirements of the Contract Documents.
- 3.14 Fit Work airtight to pipes, sleeves, ducts, conduits and other penetrations through surfaces.
- 3.15 Properly prepare surfaces to receive patching and finishing.
- 3.16 Refinish surfaces to match adjacent finishes; for continuous surfaces refinish to nearest intersection; for an assembly, refinish entire unit.
- 3.17 At penetration of fire rated wall, ceiling, or floor construction, completely fire stop, seal voids and penetrations as specified elsewhere, full thickness of the construction element.

END OF SECTION

1 General

1.1 SECTION INCLUDES

- .1 Labour, Products, equipment and services necessary for demolition and removals Work in accordance with the Contract Documents.
- .2 Work included: Requirements for demolishing, salvaging and removing wholly or in part the various items designated on the drawings or required to be removed or partially removed for the receipt of the Work of this Contract, including not necessarily limited to:
 - .1 Alteration and renovations to existing building.
 - .2 Cutting and removing of walls, floors, ceilings, doors and frames, in the existing buildings as indicated on Drawings.
 - .3 Patching, making good openings and chases in walls, floors, ceilings, including the supply and installation of lintels, channels and finishes.
 - .4 Removal of rubbish, debris, demolished fixtures, fittings and items not scheduled to remain the Owner's property, resulting from the demolition and preparatory work.
 - .5 Remove abandoned services such as conduits, pipes, wiring, ducts, fixtures, equipment, etc. where required for the work or indicated on the drawings.
 - .6 Removal of all mechanical items including plumbing fixtures, services etc. where required for the work or indicated on drawings and or where not required to be relocated.
 - .7 Removal of existing electrical items including fixtures, etc. where required for the work or indicated on the drawings and not required to be relocated.
 - .8 Dust control during the operations of the work of this Section.
 - .9 Removal shall mean removal from site and safe disposal in a legal manner.
 - .10 Protect existing pool equipment in the basement pool mechanical room.

1.2 REFERENCES

- .1 CSA S350-M, Code of Practice for Safety in Demolition of Structures.
- .2 OPSS, Ontario Provincial Standard Specification.

1.3 SUBMITTALS

- .1 Where required by Authorities having jurisdiction, submit a Fire Plan to local fire department for review and approval.
- .2 Submit shop drawings, diagrams and details in accordance with Section 01 10 10.
- .3 30 calendar days prior to start of demolition and removals work, submit for review, drawings, diagrams or details showing sequence of disassembly work and shoring of supporting structures in accordance with authorities having jurisdiction.
- .4 Submit for approval, a plan showing impacts, interruptions and delays to Owners operations
- .5 Submit Dust Control Plan conforming to requirements of the City of Mississauga's Public Health Services.

- .6 Have submissions signed and sealed by Professional Engineer licensed in Province of Ontario.
- .7 Submit to Consultant, details of where rubble, debris and other materials are to be disposed or reused. Include each disposal/reuse site location, operator's name and business address, type of license under which site operates, and criteria used by site to assess suitability of rubble, debris and other materials for disposal.
- .8 Give notice to Utility Authorities controlling services and appurtenances which will be affected by demolition work.

1.4 **QUALITY ASSURANCE**

- .1 Prepare waste audits, waste reduction workplans, source separation programs and recycling programs as required by jurisdictional authorities and update programs and implement such programs as required.
- .2 Perform the work of this section in accordance with the 'Environmental Protection Act' including Ontario Regulation 102 and the 'Environmental Assessment Act' including Ontario Regulation 103.
- .3 Conform to Fire Code, Regulation under the Fire Marshals Act.
- .4 The demolition contractor must engage a registered professional engineer who holds a certificate of authorization and an appropriate level of liability insurance to prepare demolition procedures.
- .5 As part of the contract requirements, the engineer for the demolition contractor should be required to sign the general review commitment required by city building departments.

1.5 **SITE CONDITIONS**

- .1 Interruptions to Owners operations will not be permitted.
- .2 Perform operations, machine and equipment movements, deliveries and removals at time or times that will permit uninterrupted operations in and around structures, including parking, deliveries, and Site access and egress.
- .3 Take over structures to be demolished based on condition on date that Tenders close.
- .4 Contractor shall photo document all existing conditions prior to demolition and make such material available to Cons

2 Products

2.1 **MATERIALS**

- .1 All materials requiring removal shall become the Contractor's property and shall be removed and disposed of from the site, as the work progresses, unless indicated otherwise.
- .2 Salvaged material:
 - .1 Salvage and stockpile Products, materials, and equipment as specified herein, indicated on Site or indicated on drawings.
 - .2 Coordinate items to be salvaged with Owner. Dispose of items Owner deems to be of no further use.
 - .3 Salvaged materials shall not be chipped, cracked, split, stained or damaged.

- .4 Store items off of moist surfaces.

3 Execution

3.1 GENERAL

- .1 Schedule skylight removal work to coincide with commencement of new roofing system installation.
- .2 Clean up rubble and debris, resulting from work promptly and dispose at end of day or place in waste disposal bins. Empty bins on regular basis.
- .3 Stockpiling of rubble, debris, and surplus Products on Site will not be permitted.
- .4 Remove, handle and transport Products indicated to be salvaged and stored for future use. Transport Products to storage area(s) designated by Consultant. Perform work to prevent any damage to Products during removal and in storage. Products damaged during removal, will be inspected by Consultant. Consultant will determine extent of damage and accept or refuse Products.
- .5 List and description of items to be removed and stored or reused:
 - .1 Items as indicated on the drawings or by the Consultant.
- .6 Tag and log all items to be salvaged to the satisfaction of the Consultant. Ensure identification tags do not damage items to be salvaged and are non-permanent, removable and durable.
- .7 Communicate Dust Control Plan procedures to all appropriate personnel on site and their head offices and due diligence measures to be maintained to control all fugitive emissions.
- .8 Take precautions to guard against movement, settlement or collapse of adjacent services, sidewalks, driveways, or trees. Be liable for such movement, settlement or collapse caused by failure to take necessary precautions. Repair promptly such damage when ordered.

3.2 EXAMINATION

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.
- .2 Examine adjacent structures and other installations prior to commencement of demolition and removals work.

3.3 PRESERVATION OF REFERENCES

- .1 Record location and designation of survey markers and monuments located within demolition area, prior to removal. Store and restore markers and monuments upon completion of Work or relocate as directed by Consultant.

3.4 PROTECTION

- .1 Prevent movement or damage of adjacent structures, services, walks, paving, trees, landscaping, adjacent grades, and parts of existing structure to remain. Supply and install bracing and shoring as required. Make good damage caused by demolition to acceptance of Consultant.

- .2 Protect adjacent structures and property against damage which might occur from falling debris or other causes. Repair or replace damage caused from work of this Section to acceptance of Consultant.
- .3 Do not interfere with use of adjacent structures and Work areas. Maintain free, safe passage to and from adjacent structures and Work areas.
- .4 Take precautions to support affected structures. If safety of structure being demolished, adjacent structures or services are endangered, cease demolition operations and take necessary action to support endangered item. Immediately inform Consultant. Do not resume demolition until reasons for endangering have been determined and corrected and action taken to prevent further endangering.
- .5 If movement or settlement occurs, install additional bracing and shoring as necessary and make good damage to acceptance of Consultant.
- .6 Hang tarpaulins where debris and other materials are lowered. Build in around openings with wood and plywood at locations used for removal of debris and materials.
- .7 Prevent debris from blocking surface drainage system, elevators, mechanical, and electrical systems which are required to remain in operation.
- .8 Pay particular attention to prevention of fire and elimination of fire hazards which would endanger Work or adjacent structures and premises.
- .9 Supply and install adequate protection for materials to be re-used, set on ground and prevent moisture pick-up. Cover stockpiles of materials with tarpaulins.
- .10 Close off access to areas where demolition is proceeding by barricades and post warning signs.
- .11 Supply, install and maintain legal and necessary barricades, guards, railings, lights, warning signs, security personnel and other safety measures, and fully protect persons and property.
- .12 Dust/weather partitions:
 - .1 Prior to demolition work proceeding in existing structures, temporarily enclose Work areas, access and supply and install dustproof and weatherproof partitions. Design partitions to prevent dust and dirt infiltration into adjoining areas, prevent ingress of water, and to resist loads due to wind.
 - .2 Prevent dust, dirt and water from demolition operations entering operational areas.
 - .3 Adjust and relocate partitions as required for various operations of work.
 - .4 Upon completion of work, remove and dispose of partitions from Site.
- .13 Dust protection:
 - .1 Perform dust control procedures in accordance with approved Dust Control Plan and work of this Section.
 - .2 Clean water to be applied to hard and soft surfaces and on open excavation faces on Site daily to eliminate dust.
 - .3 Roadways and sidewalks to be cleaned daily or as required.

- .4 A designated truck loading area on granular material or existing asphalt to be used to mitigate tracking of potentially contaminated soil and demolition debris off Site. Contaminated loading points to be cleaned or re-established.
 - .14 Removed skylights:
 - .1 Provide temporary protective sheeting over removed skylights.
 - .2 Turn sheeting up and over parapets and curbing. Retain sheeting in position with weights or temporary fasteners.
 - .3 Provide for surface drainage from sheeting to roof drains.
 - .4 Do not permit traffic over unprotected or repaired deck surface.
 - .15 Blasting is not permitted
- 3.5 **PREPARATION**
- .1 Disconnect and/or re-route electrical data, communication and telephone service lines entering structures to be demolished. Remove abandoned lines as indicated on Contract Drawings. Post warning signs on electrical lines and equipment which is required to remain energized.
 - .2 Disconnect and cap designated mechanical services:
 - .1 Natural gas supply lines: As indicated on drawings, to be removed by qualified workers in accordance with gas company instructions.
 - .2 Sewer and water lines: Remove and dispose of as indicated on Contract Drawings.
 - .3 Other underground services: Remove and dispose of as indicated on Contract Drawings.
 - .3 Disassemble and remove mechanical equipment, ductwork and piping complete with supports and associated components.
 - .4 Do not disrupt active or energized utilities designated to remain undisturbed
 - .5 Perform rodent and vermin control to comply with health regulations
- 3.6 **DEMOLITION**
- .1 Perform demolition with extreme care. Confine effects of demolition to those parts which are to be demolished.
 - .2 Perform work and prevent inconvenience to persons outside those parts which are to be demolished.
 - .3 Carry out demolition in accordance with the requirements of CSA S350-M.
 - .4 Demolish parts of structure to permit remedial work as indicated
 - .5 Demolition shall proceed safely in systematic manner from roof to grade and as necessary to accommodate remedial work indicated. Work on each floor level shall be complete before commencing work on supporting structure and safety of its supports are impaired. Parts of building which would otherwise collapse prematurely shall be securely shored. Walls and piers shall not be undermined.
 - .6 Do not overload floor or wall with accumulations of material or debris or by other loads.

- .7 Perform work to minimize dusting. Keep work area wetted down with fog sprays to prevent dust and dirt rising. Supply and install temporary water lines and connections that may be required. Upon completion, remove installed temporary water lines. Use covered chutes, water down.
- .8 Do not sell or burn materials on Site.
- .9 Remove existing equipment, services, and obstacles where required for refinishing or making good of existing surfaces, and replace as Work progresses.
- .10 At end of day's work, leave Work in safe condition with no part in danger of toppling or falling. Protect interiors of parts not to be demolished from exterior elements.
- .11 Drainage and sewer system protection:
 - .1 Ensure that no dust, debris or slurry enters drainage and sewer system on Site.
 - .2 Remove and dispose of debris and slurry promptly from Site.
 - .3 Comply with City of Mississauga Sewer Use By-Law.
- .12 Concrete:
 - .1 Demolish concrete by methods which avoid impact loads on items which are not to be demolished.
 - .2 Where only part or parts of a concrete floor, wall, or other items are to be demolished, use saw cuts to isolate areas which are to be demolished except where existing reinforcing steel is to be left in place. Prior to such isolating, install suitable support to prevent premature movement of area(s) being isolated and undesirable transfer of loads as cutting progresses. If necessary, remove area(s) to be demolished by successively isolating small sections.
 - .3 Where reinforcing steel is to be left in place, use saw cuts from surface of concrete around perimeter(s) of area(s) to be demolished, chip concrete without damaging reinforcing steel. Retouch damaged epoxy coating of existing reinforcing steel.
- .13 Steel: Where only part or parts of structure is to be demolished, dismantle and maintain structure stable. Do not place excessive loads on components. Install adequate temporary guys and supports to ensure stability and to prevent excessive loading. Support each component being disconnected from structure, and lower, do not drop, component after it is disconnected.
- .14 Cut openings through existing walls, partitions and floors. Establish exact location of steel reinforcing in existing concrete slabs or walls before cutting. Be responsible for damage to existing steel reinforcing and be liable for structural failure. Make good surfaces disturbed with materials to match existing.
- .15 Cladding:
 - .1 Remove cladding, girts, channels, and additional components as indicated or necessary for new cladding work, unless otherwise indicated.
 - .2 Form openings in cladding such that edges are left straight, clean and not ragged. Where openings abut flashings, ducts or similar items projecting through, or forming integral part of cladding system, preserve and support as required unless otherwise shown.

- .3 Take care to not damage existing cladding material that is to remain.
- .4 Where doors are scheduled to be removed, include removal of door frames and door hardware.
- .5 Remove interior partitions, fittings, fixtures and accessories as indicated on drawings. Partitions and walls shall be removed full height to structure above.
- .6 Remove interior finishes, such as ceiling and floor finishes, where new finishes are indicated on Contract Drawings.
- .7 Removal of existing ceilings shall include complete removal including bulkheads and suspension system.
- .8 Removal of adhesive applied finishes shall include complete removal to substrate including adhesive. Take adequate care to prevent damage to substrate.
- .9 Remove existing floor finishes, include mortar bed, underlayment or other cleavage membranes, underpad, base, floor moulding and transition strips.
- .16 Demolish all other items indicated or required.
- .17 Cut openings through existing walls, partitions, roofs and floors. Establish exact location of steel reinforcing in existing concrete slabs or walls before cutting. Be responsible for damage to existing steel reinforcing and be liable for structural failure. Make good surfaces disturbed with materials to match existing.
- .18 Where doors are scheduled to be removed, include:
 - .1 Removal in re-usable condition of door hardware.
 - .2 Removal of doors and door frames.
- .19 Remove interior partitions, fittings, fixtures and accessories as indicated on drawings. Partitions and walls shall be removed full height to structure above.
- .20 Remove interior finishes, such as ceiling and floor finishes, where new finishes are indicated on Room Finish Schedule.
 - .1 Removal of existing ceilings shall include complete removal including bulkheads and suspension system.
 - .2 Removal of adhesive applied finishes shall include complete removal to substrate including adhesive. Take adequate care to prevent damage to substrate.
- .21 Remove existing floor finishes, include mortar bed, underlayment or other cleavage membranes, base, floor moulding and transition strips.
- .22 Demolish all other items indicated or required.

3.7 **PROTECTION AND SHORING**

- .1 General Contractor is responsible to plan and take any precautionary measures to protect existing pool tank and pool deck during construction.
- .2 Review of the shoring as required by the City of Mississauga Building Departments, and oversee the implementation and the removal of the shoring after completion of work.

- .3 It is the responsibility of the General Contractor to determine which of these proposed protective measures is efficient and applicable at any given time based on the status of the construction.
 - .4 Shoring for Existing Pool Structure and Shoring for Demolition Scope where required for structural restoration work.
 - .5 The General Contractor is responsible to provide and implement any shoring required to protect and support the existing pool structure during demolition and construction.
- 3.8 **DISPOSAL OF MATERIALS**
- .1 Remove from Site, rubble, debris, and other materials resulting from demolition and removals work in accordance with Authorities having Jurisdiction, except where specified or indicated on Contract Drawings to be reused.
 - .2 Conform to requirements of municipality's Works Department regarding disposal of waste materials.
 - .3 Materials prohibited from municipality waste management facilities shall be removed from Site and dispose of at recycling companies specializing in recyclable materials.
- 3.9 **RESTORATION**
- .1 Where demolition removed a structure or installation, rough grade and restore area in accordance with Authorities having Jurisdiction.

END OF SECTION

1 General

1.1 SECTION INCLUDES

- .1 Labour, Products equipment and services necessary for the management of designated substances work in accordance with the Contract Documents.

1.2 DEFINITIONS

- .1 Hazardous Materials: Designated Substances as covered by the Ontario Occupational Health and Safety Act as well PCBs, CFCs, HCFCs, and Fuel Oil.
- .2 PCBs: Polychlorinated Biphenyls.
- .3 PCB equipment: Equipment designed or manufactured to operate with PCB liquid or to which PCB liquid was added or drums or other containers used for the storage of PCB liquid.
- .4 PCB liquid: Material containing PCBs at a concentration of more than 50 mg/kg
- .5 PCB material: Material containing PCBs at a concentration of more than 50 mg/kg whether the material is liquid or not
- .6 PCB waste: PCB equipment, PCB liquid, or PCB material, but does not include:
 - .1 PCB material or PCB equipment after it has been decontaminated pursuant to guidelines issued by the Ministry of Environment or instructions issued by the director.
 - .2 PCB equipment that is:
 - .1 An electrical capacitor that has never contained over one kilogram of PCBs.
 - .2 Electrical, heat transfer or hydraulic equipment or a vapour diffuser pump that is being put to the use for which it was originally designed or is being stored for such use by a person who uses such equipment for the purpose for which was originally designed.
 - .3 Machinery or equipment referred to in Clause 1.2.6.3.1.
 - .3 PCB liquid that:
 - .1 Is at the site of fixed machinery or equipment, the operation of which is intended to destroy the chemical structure of PCB's by using the PCB's as a source of fuel or chlorine for purposes other than the destruction of PCB's or other wastes and with respect to which a certificate of approval has been issued under Section 9 of the Act after the 1st day of January 1981 specifying the manner in which PCB liquid be processed in the machinery or equipment.
 - .2 Is in PCB equipment referred to in subclause (b) (2) Ontario Regulation 11/82.
 - .3 HCFC: Hydrochlorofluorocarbons.
 - .4 CFC: Chlorofluorocarbons.

1.3 REGULATORY AGENCIES

- .1 Comply with Federal, Provincial, and local requirements pertaining to the handling, management, haulage, and/or disposal of Hazardous Materials including but not limited to the following:
 - .1 Ontario Regulation 356, Highway Traffic Act.
 - .2 R. R. O. 1990, Regulation 347, General - Waste Management.

1.4 SUBMITTALS

- .1 Submit proof satisfactory to the Consultant that suitable arrangements have been made to dispose of Hazardous Materials in accordance with requirements of authorities having jurisdiction.
- .2 Submit notifications to applicable authorities having jurisdiction regarding the handling, storage, haulage, and/or disposal of Hazardous Materials as required by Regulations.
- .3 Submit proof satisfactory to the Consultant that the Hazardous Waste materials were appropriately disposed of.

1.5 EXISTING CONDITIONS

- .1 Information pertaining to the presence of Hazardous Materials to be handled; removed, or otherwise disturbed during this project is identified in the report: SECTION 00 31 00.
- .2 Assessment:
 - .1 Employ an Asbestos Abatement Consultant to confirm the presence of asbestos in the materials being demolished and to remove hazardous materials in accordance with authorities having jurisdiction.
 - .2 Submit Asbestos Abatement Consultant's certificate that hazardous materials have been removed in accordance with Authorities having Jurisdiction

1.6 INSTRUCTION AND TRAINING

- .1 Before commencing work, provide to the Consultant satisfactory proof that every worker has had instruction and training in the hazards of handling and storage of Hazardous Materials, in personal hygiene and work practices, and in the use, cleaning, and disposal, of respirators and protective clothing as required.
- .2 Instruction and training related to respirators shall include instruction and training related to:
 - .1 The limitations of the equipment.
 - .2 The inspection and maintenance of the equipment.
 - .3 The fitting of the equipment.
 - .4 The disinfecting of the equipment.

1.7 WORKER PROTECTION

- .1 Respirators: Provide workers with personally issued and marked as to efficiency and purpose non-powered reusable or replaceable filter type air purifying respirators suitable for the materials being handled and acceptable to the Provincial Authority having jurisdiction (as required).
 - .2 Protective Clothing: Provide workers with full body disposable type coveralls (as required).
 - .3 Eating, drinking, chewing, and smoking are not permitted in the work area.
 - .4 Store protective clothing in clean plastic bag for reuse or if protective clothing is not to be reused, dispose of as contaminated waste.
 - .5 Workers shall wash hands and face when leaving the work area and before eating or drinking.
- 2** Products
- 2.1 **MATERIALS**
- NOT USED
- 3** Execution
- 3.1 **EXAMINATION**
- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.
- 3.2 **ASBESTOS CONTAINING MATERIALS**
- .1 Conform to and Manage and dispose of asbestos containing materials in accordance with Regulation Designated Substance - Asbestos on Construction Projects And In Buildings And Repair Operations R.R.O. 1990, Reg. 838, made under Occupational Health and Safety Act as amended by O.Reg. 278/05 and O.Reg 837 as amended by O.Reg. 279/05.

END OF SECTION

- 1** General
- 1.1** **SECTION INCLUDES**
 - .1 Design, labour, Products, equipment and services necessary for the miscellaneous and metal fabrication Work in accordance with the Contract Documents.
- 1.2** **REFERENCES**
 - .1 ANSI/BHMA A156.21, American National Standard for Thresholds.
 - .2 ASTM A108, Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished
 - .3 ASTM A123, Specification for Zinc (Hot Dip Galvanized) Coatings on Iron & Steel Products.
 - .4 ASTM A153, Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - .5 ASTM A269, Specification for Seamless and Welded Austenitic Stainless Steel Sanitary Tubing for General Service.
 - .6 ASTM A307, Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
 - .7 ASTM A653/A653M, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process.
 - .8 CAN/CSA-G40.20/G40.21-M, General Requirements for Rolled or Welded Structural Quality Steel/ Structural Quality Steels.
 - .9 CAN/CSA S16.1-M, Limit States Design of Steel Structures.
 - .10 CSA S136.1-M, Commentary on CAN/CSA S136-M, Cold Formed Steel Structural Members.
 - .11 CSA W47.1, Certification of Companies for Fusion Welding of Steel Structures.
 - .12 CSA W48, Filler Metal and Allied Materials for Metal Arc Welding.
 - .13 CSA W59-M, Welded Steel Construction (Metal Arc Welding).
 - .14 CAN/CSA W117.2-M, Safety in Welding, Cutting and Allied Processes.
 - .15 CGSB 1-GP-181, Organic Zinc Rich Primer.
 - .16 NAAMM, The National Association of Architectural Metal Manufacturers.
 - .17 Steel Structures Painting Council (SSPC), Steel Structures Painting Manual, Vol. 2.
- 1.3** **DESIGN REQUIREMENTS**
 - .1 Design details and connections, where not shown on Drawings, in accordance with CAN/CSA-S16.1 and CSA S136.1.
 - .2 All exposed metal, including both steel and aluminum to have eased edges and corners. No sharp edges are permitted.
- 1.4** **SUBMITTALS**
 - .1 Shop drawings:

- .1 Submit shop drawings for fabrication and erection of miscellaneous and metal items in accordance with Section 01 10 10 indicating:
 - .1 Materials, core thicknesses, class of finish (AMP 555), connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.
 - .2 Ensure shop drawings are of one uniform size and based on field measurements.
- .2 Samples:
 - .1 Submit samples of the following:
 - .1 Two 300 x 300 samples of metal demonstrating finish and colour of galvanized steel with clear finish for the Consultant's approval.

1.5 QUALITY ASSURANCE

- .1 Retain a Professional Engineer, licensed in the Province of Ontario, with experience in Work of comparable complexity and scope, to perform the following services as part of the Work of this Section:
 - .1 Design oversized hollow metal frames, hollow metal doors, hollow metal glazing transom, hollow metal sidelite, and metal fabrication items that are required to resist live, dead, lateral, wind, or seismic loads.
 - .2 Design millwork, bench, sliding grills supports
 - .3 Review, stamp, date and sign shop drawings.
- .2 Workmanship: Fabricate Work of this Section to meet the required class of workmanship indicated below in accordance with AMP 555, Section 8.
 - .1 Class 1: for use on direct exposed to view fabricated items:
 - .1 Exposed surfaces are finished smooth with pits, mill marks, nicks, burrs, sharp edges, and scratches filled or ground off. Defects should not show when painted, polished, or finished. .
 - .2 Welds should be concealed where possible. Exposed welds are ground to small radius with uniform sized cove unless otherwise noted.
 - .3 Distortions should not be visible to the eye.
 - .4 Exposed joints are fitted to a hairline finish.
- .3 Execute welding by firms certified in accordance with CSA W47.1 Division 1 or 2.1. Ensure welding operators are licensed per CSA W47.1 for types of welding required by Work.

2.1 MATERIALS

- .1 General:
 - .1 All materials under Work of this Section, including but not limited to, primers and paints are to have low VOC content limits.
 - .2 Unless detailed or specified herein, standard products will be acceptable if construction details and installation meet intent of Drawings and Specifications.
 - .3 Include all materials, products, accessories, and supplementary parts necessary to complete assembly and installation of Work of this Section.
 - .4 Incorporate only metals that are free from defects which impair strength or durability, or which are visible. Install only new metals of best quality, and free from rust or waves and buckles, and that are clean, straight, and with sharp defined profiles.
- .2 Structural shapes, plates, and similar items:
 - .1 Conforming to CAN/CSA-G40.20/G40.21-M, Grade 350W.
 - .2 Hollow structural sections: CAN/CSA-G40.20/G40.21-M, Grade 350W, Class H.
 - .3 Provide cold rolled steel for exposed metal items.
 - .4 Standard field painted finish: In accordance with Section 09 91 00.
 - .5 High performance steel coatings on steel material (PT-10 and STL-2): In accordance with Section 09 97 13 for finish PT-10, for use on STL-2 changeroom steel supports and additional areas as indicated.
- .3 Galvanized sheet steel: ASTM A653/A653M Grade A, Z275 Commercial Quality zinc coating, size and shape as shown.
 - .1 G90 galvanized steel (STL-1).
- .2 Welding materials: CSA W48 and CSA W59-M.
- .3 Fasteners: Conforming to ASTM A307, Grade A, in areas not exposed to view, use unfinished bolts with hexagon heads and nuts. In areas exposed to view, use bolts, nuts, washers, rivets, lock washers, anchor bolts, machine screws and machine bolts Z275 zinc coated in accordance with ASTM A653/A653M. Supply bolts of lengths required to suit thickness of material being joined, but not projecting more than 6 mm beyond nut, without the use of washers.
- .4 Galvanized primer paint: Inorganic zinc rich primer. For use on galvanized fabrications where touch up is to remain unpainted in finished work; Carbozinc 11WB by Carboline Company, Catha-Coat 305 by Devoe Coatings or Zinc Clad XI by Sherwin Williams.
- .5 Drilled inserts: Mega by ITW Construction Products or HSL by Hilti Inc. heavy-duty anchors, sizes as shown.

- .6 Sleeve anchors: Sleeve anchors, 'HLC Sleeve Anchors, Flat Phillips Head - HLC-FPH 3.8 x 4' by Hilti or approved alternative with countersink flush. Provide sleeve anchors for bolting of steel posts to floor where bolts indicated to be exposed.

2.2 **FABRICATION**

- .1 Verify dimensions of existing Work before commencing fabrications and report any discrepancies to the Consultant.
- .2 Fit and assemble Work in shop where possible. Execute Work in accordance with details and reviewed shop drawings.
- .3 Use self-tapping shake-proof screws on items requiring assembly by screws or as indicated. Use screws for interior metal work. Use welded connections for exterior metal Work unless otherwise found acceptable by the Consultant.
- .4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush. Seal exterior steel fabrications against corrosion in accordance with CAN/CSA S16.1-M.
- .5 Execute shop welding to requirements specified.
- .6 Carefully make and fit details. Take special care with exposed finished Work to produce a neat and correct appearance to the Consultant's acceptance.
- .7 Assemble members without twists or open joints.
- .8 Correctly size holes for connecting Work of other trades where such can be determined prior to fabrication. Where possible, show holes on shop drawings. Place holes not to cause appreciable reduction in strength of member.
- .9 Draw mechanical joints to hairline tightness and seal countersunk screw and access holes for locking screws with metal filler where these occur on exposed surfaces.
- .10 Exposed metal edges shall be eased to prevent sharp edges and corner conditions.

2.3 **FABRICATED ITEMS**

- .1 Refer to Drawings for details of metal fabrication work and related items not specifically listed in this Section.
- .2 Where work is required to be built into work of other Sections supply such members to respective Sections.
- .3 Provide metal fabrication items indicated below and items not indicated to be supplied under other Sections. The following items includes miscellaneous and metal fabrication including but not limited to the items listed below.
- .4 Shelf Angles: Of size indicated on Drawings and as specified in structural steel specifications, with adjustable inserts for vertical adjustment and slotted holes for horizontal; galvanized.
- .5 Metal support framing for general millwork, concealed items
- .6 Metals requested to support glazed screens, partitions and doors.

- .7 Miscellaneous steel brackets, supports and angles for Gymnasium Dividers (STL-3).
- .8 Miscellaneous steel brackets, supports and angles:
 - .1 Supply and install or supply for installation by trades responsible, all loose steel brackets, supports and angles where indicated, except where such brackets, supports and angles are specified under work of other Sections. Drill for countersunk screws, expansion anchors and anchor bolts.
 - .2 Unless otherwise specified, prime paint for interior installation; hot dipped galvanized steel galvanized finish for exterior installation.
- .9 Lintels:
 - .1 Fabricated from CAN/CSA-G40.20/G40.21-M, Grade 350W, size and location as shown, width to be not less than 25 mm less than width of wall and extend 200 mm beyond opening at each end. Unless otherwise shown, fabricate lintels in block walls of steel sections.

2.4 **ANCHORS AND FASTENING**

- .1 Use weld studs of size not larger than 10 mm for attaching miscellaneous materials and equipment to building steel. If weight of item requires larger fasteners use clips or brackets and secure by welding or through bolting.
- .2 Use self drilling expansion type concrete anchors for attaching to masonry and concrete
- .3 Do not secure items to steel deck.

2.5 **WELDING**

- .1 Perform welding by electric arc process.
- .2 Execute welding to avoid damage or distortion to Work. Execute welding in accordance with following standards:
 - .1 CSA W48 - for Electrodes. If rods are used, only coated rods are allowed.
 - .2 CSA W59-M and CSA W59S1-M for design of connections and workmanship.
 - .3 CAN/CSA W117.2-M - for safety.
- .3 Thoroughly clean welded joints and expose steel for a sufficient distance to perform welding operations. Finish welds smooth. Supply continuous and ground welds which will be exposed to view and finish paint.
- .4 Test welds for conformance and remove Work not meeting specified standards and replace to Consultant's acceptance.

2.6 **HOT DIP GALVANIZING**

- .1 After fabrication, hot dip galvanize specific miscellaneous steel items as indicated. After galvanizing, plug relief vents air tight with appropriate aluminum plugs as suitable and required for intended metal fabricated item. Straighten shapes and

assemblies true to line and plane after galvanizing. Repair damaged galvanized surfaces with zinc rich primer in accordance with manufacturer's printed directions.

- .2 Hot-dip galvanize members in accordance with requirements of the following ASTM, with minimum coating weights or thicknesses as follows:
 - .1 Rolled, pressed and forged steel shapes, plates, bars and strips: ASTM A123; average weight of zinc coating per square/metre of actual surface, for 4.8 mm and less thickness members 600 g/m2 for 6 mm and heavier members 640 g/m2.
 - .2 Iron and steel hardware: ASTM A153; minimum weight of zinc coating, in ounces per square foot of surface, in accordance with ASTM A153, Table 1 for the various classes of materials used in the Work.

2.7 SHOP PAINTING

- .1 Clean steel to SSPC SP6 and remove loose mill scale, weld flux and splatter.
- .2 Shop prime steel with one coat of primer paint to dry film thickness of 0.07 mm. Paint on dry surfaces, free from rust, scale, grease. Do not paint when temperature is lower than 7 deg C. Paint items under cover and leave under cover until primer is dry. Follow paint manufacturer's recommendations regarding application methods, equipment, temperature, and humidity conditions.
- .3 Shop prime galvanized steel in accordance with CGSB 85-GP-16M.
- .4 Clean but do not paint surfaces being welded in field.
- .5 Do not paint surfaces embedded in concrete, but clean as if they were to be primed.
- .6 Do not prime steel to be fireproofed or to receive intumescent paint coating.
- .7 Do not prime machine finished surfaces, but apply an effective anti-rust compound.
- .8 Take precautions to avoid damage to adjacent surfaces.

3 Execution

3.1 EXAMINATION

- .1 Examine previously installed Work, upon which this Section depends, verify dimensions and condition of existing Work, and coordinate repairs, alterations, and rectification if necessary. Commencement of Work of this Section is deemed to signify acceptance of existing, prior conditions.
- .2 Obtain Consultant's written approval prior to field cutting or altering of structural members.

3.2 ERECTION

- .1 Install metal fabrications in accordance with reviewed shop drawings and manufacturer's written instructions.
- .2 Fit joints and intersecting members accurately. Make Work in true planes with adequate fastenings. Build and erect Work plumb, true, square, straight, level and

accurate to sizes detailed, free from distortion or defects detrimental to appearance or performance.

3.3 TOUCH UPS

- .1 Paint bolt heads, washers, nuts, field welds and previously unpainted items. Touch up is to remain unpainted in finished work; Carbozinc 11WB by Carboline Company, Catha-Coat 305 by Devoe Coatings or Zinc Clad XI by Sherwin Williams.

END OF SECTION

1 General

1.1 SECTION INCLUDES

- .1 Labour, Products, equipment and services necessary for rough carpentry Work in accordance with the Contract Documents.

1.2 REFERENCES

- .1 ASTM A153, Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- .2 ASTM A325, Specification for Bolts Quenched/Tempered Steel Nominal Thread Diameter M16 - M36 For Structural Steel Joints.
- .3 ASTM A653, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .4 ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials.
- .5 ASTM F1667, Driven Fasteners: Nails, Spikes and Staples.
- .6 CAN/CSA O80 Series M, Wood Preservation.
- .7 CSA O121-M, Douglas Fir Plywood.
- .8 CAN/CSA O141, Softwood Lumber.
- .9 CAN/ULC-S102, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
- .10 NLGA, Standard Grading Rules for Canadian Lumber, National Lumber Grades Authority.

1.3 QUALITY ASSURANCE

- .1 Lumber identification: Grade stamp of an agency certified by the Canadian Lumber Standards Accreditation Board.
- .2 Plywood identification: Grade mark in accordance with applicable CSA standards.
- .3 Lumber quality: Carefully select individual pieces so that knots and obvious defects will not interfere with placing bolts, proper nailing or making proper connections.
- .4 Moisture Content of wood at time of construction shall be 19% maximum.
- .5 Each piece of pressure treated lumber and fire retardant treated lumber shall be shop marked with the pressure treatment brand and ULC monogram respectively, in accordance with CAN/CSA O80-M.
- .6 Dimensions of lumber shall conform to dressed sizes specified in CAN/CSA-0141 unless actual dimensions are otherwise indicated or specified.
- .7 Dimensional references to lumber on Drawings and in Specifications are to nominal sizes unless actual dimensions are indicated. Such actual dimensions shall be dry size.
- .8 Lumber defects: Discard wood with defects which will render a piece unable to serve

its intended function. Lumber will be rejected by Consultant for excessive warp, twist, bow, crook, mildew, fungus, or mould, as well as for improper cutting and fitting, whether or not it has been installed.

1.4 ENVIRONMENTAL REQUIREMENTS

- .1 When it is required that wood maintain dimensional stability and tolerances to ensure accurate installation of later work, store and install it only in dry areas, and where no further installation of moist materials is contemplated.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- .1 Store materials in a dry area. Cover materials with tarpaulins or polyethylene sheets to prevent moisture absorption and impairment of structural and aesthetic properties. Vent to allow air movement. Tie covering to keep in place.

2 Products

2.1 MATERIALS

- .1 General: All materials under Work of this Section, including but not limited to, adhesives are to have low VOC content limits.
- .2 Lumber: Softwood, G4S, moisture content 19% or less at time of installation, in accordance with the following:
 - .1 Lumber shall be of same species and grade, equally seasoned and shall be processed and stamped at same mill. .
 - .2 CSA O141 and NLGA Standard Grading Rules for Canadian Lumber.
 - .3 Board quality: Construction or better.
 - .4 Dimension quality:
 - .1 Structural joists, planks, and framing: No. 1 Select Structural.
 - .2 Light framing: Construction
- .3 Plywood:
 - .1 Plywood (WD-3): Pressure treated plywood, thickness as indicated on drawings, with pressure treatment as specified in this Section.
- .4 Surface applied wood preservative: Green coloured copper naphthenate or 5% pentachlorophenol solution, water repellent preservative or same copper based preservative as used for shop impregnation, in accordance with CAN/CSA O80.
- .5 Fire retardant treatment of lumber and plywood (interior and protected locations): 'Dricon FRT' fire retardant treatment by Biewer Lumber or approved alternative, conforming to ASTM E84, to provide a flame spread rating of 25 or less.
- .6 Rough hardware: Conforming to ASTM F1667; Nails, bolts, screws, anchors, expansion shields, and other fastenings required to frame and fix rough carpentry as

follows: .

- .1 Nails, spikes and staples: Spiral type.
- .2 Bolts: ASTM A325; 12.7 mm diameter minimum with nuts and washers unless noted otherwise.
- .3 Screws: Countersunk head, full thread type.
- .4 Proprietary fasteners: Toggle bolts, expansion shields, lag bolts, screws, inorganic fibre plugs, recommended for purpose by manufacturer.
- .5 Galvanize rough hardware used in fire treated wood and hardware exposed to the atmosphere.
- .7 Fasteners for use in pressure treated wood: Provide hot dipped galvanized fasteners complying to ASTM A153 and connectors in accordance with ASTM A653, Class G185 for non-structural members. Provide type 304 or 316 stainless steel fasteners and connectors for use in Structural, pressure treated wood.

3 Execution

3.1 EXAMINATION

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.

3.2 GENERAL

- .1 Lay out work carefully and to accommodate work of others. Cut and fit accurately: erect in position indicated by Drawings.
- .2 Install rough carpentry to allow for expansion and contraction of the materials.
- .3 Cut work into lengths as long as practicable and with square ends. Align, level, square, plumb, and secure work permanently in place. Brace work temporarily as required. Join work only over solid backing.
- .4 Bore holes true to line and to same size as bolts. Drive bolts into place for snug fit, and use plates or washers for bolthead and nut bearings. Turn up bolts and lag screws tightly when installed, and again just before concealed by other work or at completion of Work.
- .5 Provide anchors, bolts, and inserts required for attachment of the work of this Section, to those performing the work of other Sections and who are responsible for their installation.
- .6 Do not attach work by wood plugs or blocking in concrete or masonry. Use lead shields, expansion shields, or similar methods only as approved by Consultant.

3.3 MISCELLANEOUS WOODWORK

- .1 Fit and install wood furring, strapping, grounds and blocking. Adequately size,

correctly place and conceal members for finishes, fitments and for Work under other Sections. Do not assume that Drawings show required work exactly or completely. Anchor wood members securely in place.

- .2 Install rough bucks, nailing strips and linings to rough openings as required for backing for frames and other Work.
- .3 Except where steel supports are specifically shown, provide wood blocking and supports in metal stud partitions for fastening of item such as casework and other wall mounted accessories. Have respective trades approve the location of such wood blocking.
- .4 Bolt wood blocking or nailing strips to steel framing.
- .5 Align and plumb faces of furring and blocking to tolerance of 1:600.
- .6 Use fire retardant lumber for blocking/framing in ceiling\spaces, partitions and bulkheads.
- .7 Miscellaneous blocking: Provide miscellaneous wood blocking in wall cavities for securing millwork and Smart Boards, Washroom accessories, partitions, baby and adult change tables, drinking fountains, basketball hoop framing, washroom partitions and screens, flat screen televisions, wall hung sinks and toilets and any additional areas as indicated and required.
- .8 At all hollow metal frames, install wood blocking at header and jambs to ensure rigid installation and to prevent doors and frames from rattling.

3.4 WALL SHEATHING

- .1 Provide plywood wall sheathing for interior wall assemblies as required and indicated on Contract Drawings.
- .2 Apply lumber wall sheathing so that all ends are supported with end joints staggered.
- .3 Apply panel-type sheathing board so that vertical joints are staggered if the sheathing is applied horizontally and a gap of not less than 1.5 mm left between sheets of plywood.

3.5 BACKBOARDS

- .1 Install plywood backboards, primed and painted white on both sides, with fire retardant paint.
- .2 Use minimum 19 mm thick plywood on 19 x 38 mm furring around perimeter and at maximum 300 mm intermediate spacing.

3.6 FASTENERS

- .1 Frame, anchor, fasten, tie and brace members for required strength and rigidity.
- .2 Use hot dipped galvanized fasteners for exterior Work and Work below grade.
- .3 Countersink bolts and bolt heads as required for clearance of other Work.

- .4 Size fasteners to penetrate base member by half of fastener length minimum.
Minimize splitting of wood members by staggering nails in direction of grain.
 - .5 For plywood use spiral, annular or resin coated nails and staples.
- 3.7 **SURFACE-APPLIED WOOD PRESERVATIVE**
- .1 Treat raw surfaces, drilled holes and cut ends of pressure treated wood with 2 coats of wood preservative immediately after cutting.
 - .2 Apply preservative by dipping, by brush or by pouring into plugged holes to completely saturate surface.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

- .1 Labour, Products equipment and services necessary for the finish carpentry Work in accordance with the Contract Documents.

1.2 **REFERENCES**

- .1 ANSI A208.1, Particleboard.
- .2 ANSI/HPVA HP-1, Hardwood and Decorative Plywood.
- .3 ANSI A208.2, Medium Density Fibreboard for Interior Use.
- .4 ANSI/NEMA LD 3, High-Pressure Decorative Laminates.
- .5 APA - The Engineered Wood Association.
- .6 ASTM F1667, Driven Fasteners: Nails, Spikes and Staples.
- .7 Architectural Woodwork Manufacturers Association of Canada (AWMAC).
- .8 Architectural Woodwork Standards (AWS) - Quality Standards for Architectural Woodwork.
- .9 CAN/CSA O141, Softwood Lumber.
- .10 CSA O151-M, Canadian Softwood Plywood.
- .11 National Hardwood Lumber Association (NHLA) Rules for the Measurement and Inspection of Hardwood and Cypress.
- .12 National Lumber Grades Authority (NLGA) Standard Grading Rules for Canadian Lumber.
- .13 AAMA 611, Voluntary Standards for Anodized Architectural Aluminum.
- .14 ASTM B211, Specification for Aluminum and Aluminum-Alloy Bar, Rod, and Wire

1.3 **SUBMITTALS**

- .1 Shop drawings: Submit shop drawings of finish carpentry Work in accordance with Section 01 10 10 indicating materials, thicknesses, sizes, finishes, wood species, grades, profiles, connection attachments, shop jointing, field jointing, reinforcing, anchorage, fastener types and sizes, location of exposed fastenings, mechanical

and electrical service routes, service outlets, cutout locations, and sizes. Include erection drawings, plans, elevations, sections, and details as applicable.

- .2 Samples: Submit samples of the following in accordance with the requirements of Section 01 10 10:

- .1 Two representative pieces of each type of wood to receive a stained or natural finish.
- .2 Two representative pieces of each type of wood finished as specified.
- .3 Two of each colour, pattern, gloss, and texture of plastic laminate, in manufacturer's standard tag size.
- .4 Two samples of laminated plastic joints, edging, cutouts and postformed profiles.
- .5 Two of each solid surface, in 100 x 75 x 12 mm samples.
- .6 Two samples of melamine surfaced board, edging and postformed profiles.
- .7 One of each item of finish carpentry hardware.

1.4 QUALITY ASSURANCE

- .1 Execute Work of this Section by member of AWMAC, with 5 years experience in finish carpentry Work of comparable complexity and scope. Submit proof of experience upon Consultant's request.
- .2 Fabricate finish carpentry Work in accordance with AWS Quality Standards, Premium Quality materials and installation unless otherwise indicated. Perform Work in accordance with the definition of Good Workmanship as defined in the AWS Quality Standards.
- .3 Remove and replace finish carpentry Work which does not conform to the AWS Quality standards or as amended by these Specifications.

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, store, and handle finish carpentry in accordance with the AWS Quality Standards. Control the temperature and humidity in accordance with the AWS recommendations, before, during, and after finish carpentry delivery, and also during storage and installation.

- .2 Cover finished plastic laminated work with heavy kraft paper or put in cartons during shipment. Protect installed surfaces by approved means. Do not remove until immediately before final inspection.

1.6 EXTENDED WARRANTY

- .1 Submit an extended warranty for plastic laminate work of this Section in accordance with General Conditions, except that warranty period is extended to 5 years from date of Substantial Performance of the Work.
 - .1 Warrant against defects in material and workmanship including but not limited to opening of joints, cracking, shrinkage, warpage, and delamination of plastic laminate.
 - .2 Coverage: Complete replacement including affected adjacent Work.

2 Products

2.1 MATERIALS

- .1 General: All materials under Work of this Section, including but not limited to, adhesives and mastics, are to have low VOC content limits.
- .2 Solid Surfacing (SOL):
 - .1 13 mm thick sheet stock, provide with bullnose edge and all cutouts as required. 'Corian' solid surfacing by DuPont or approved alternative. Allow for three colours to be selected by Consultant.
 - .2 Installation and seam adhesives to be as recommended by solid surfacing manufacturer, colour matched to solid surfacing.
 - .3 Colours:
 - .1 SOL-1: 13 mm, Colour to be selected by Consultant from the full range of standard colour by Corian Solid Surfacing
- .3 Nails and staples: Conforming to ASTM F1667; Size and type to suit application, galvanized for exterior work, interior humid areas and for treated lumber; plain finish elsewhere.
- .4 Bolts, nuts, washers, blind fasteners, lags and screws: Size and type to suit application. Stapling is not acceptable.

- .5 Adhesive and bituminous mastic: Selected by the millwork fabricator with low VOC content.
- .6 Miscellaneous metals: In accordance with Section 05 50 00.
- .7 Finishing: In accordance with Section 09 91 00.

2.2 SAUNA SOLID SURFACING BENCH

- .1 Provide all specified benches square, straight, plumb and true, complete as detailed and as per manufacturer's instructions. Safeguard surface of benches from abrasions during installation.
- .2 Determine locations of benches and contact Consultant for verification. Notify any conflicts with other trades or amenity elements.
- .3 Contractor to provide all required stainless-steel anchors required to install all surface mount benches to meet or exceed manufacturers specification.
- .4 Ensure mounting surface is smooth and level. Drill the appropriate size pilot holes into the steel brackets surface with a new, sharp steel drill bit to ensure a clean hole free of steel surface chips. Apply Bakor 7 mil rubber gasket between mounting flange and steel surface. Trim of excess so as not to be visible. Touch-up paint all exposed bolt head to match colour of framework.
- .5 Co-ordinate and execute all work in accordance with other trades and in sequence as required by the construction schedule. Make good any damage to any other Sections caused by this Work of this Section and remove excess materials and other debris from the Site.

2.3 FABRICATION

- .1 Be responsible for methods of construction and for ensuring that materials are rigidly and securely attached and will not be loosened by the work of other sections.
- .2 Coordinate locations of concealed supports and blocking with other parts of Work. Provide cutouts for outlet boxes and other fixtures.
- .3 Fabricate work in a manner which will permit expansion and contraction of the materials without visible open joints. Conceal joints and connections in wherever possible.
- .4 Mitre exposed corners, no end grain shall be visible in completed installation.

- .5 Finish millwork in accordance with Section 09 91 00. Finished millwork shall be free from bruises, blemishes, mineral marks, knots, shakes and other defects and shall be selected for uniformity of colour, grain and texture.
- 3 Execution**
- 3.1 EXAMINATION**
 - .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.
- 3.2 INSTALLATION**
 - .1 Install Work in accordance with AWS Quality Standards and tolerances for Architectural Woodwork. Set and secure finish carpentry in place, rigid, plumb, square, and level.
 - .2 Scribe and cut as required, fit to abutting walls, and surfaces, fit properly into recesses and to accommodate columns, fixtures, outlets, or other projecting, intersecting or penetrating objects leaving a 0.8 mm gap maximum.
 - .3 Coordinate cutouts for plumbing fixtures, inserts, appliances, outlet boxes, and other fixtures, in finish carpentry. Round internal corners of cut-outs and seal exposed cores.
 - .4 Form joints to conceal shrinkage.
 - .5 Install prefinished millwork at locations shown on drawings. Position accurately, level, plumb straight.
 - .6 Solid surfacing:
 - .1 Install solid surfacing in accordance with manufacturer's instructions.
 - .2 Align work plumb and level.
 - .3 Seal perimeter of fabrication to adjacent construction in accordance with Section 07 91 00.
 - .7 Sauna Benches:
 - .1 Construct built-in solid surfacing bench of sizes and details as noted.
 - .2 Bench top to be solid surfacing SOL.

- .3 Bench vertical surfaces to be solid surfacing SOL.
- .4 Anchor to supports in a concealed manner.
- .5 Mitre joints at corners. Keep joints to a minimum.
- .6 Round all corners, edges and ends.
- .7 Install bench brackets and supports supplied
- .8 MW-02A, MW-02B, MW-02C Change Room Upper Storage Millwork
 - .1 Construct upper storage sizes and details as noted.
 - .2 Anchor wood to supports in a concealed manner.
 - .3 Mitre joints at corners. Keep joints to a minimum.
 - .4 Round all corners, edges and ends.
 - .5 Install LED strip lights supplied under work of Electrical Section.
- .9 Fastening:
 - .1 Coordinate wall securement, anchorage, and blocking for finish carpentry items.
 - .2 Position items of finished carpentry work accurately, level, plumb, true and fasten or anchor securely.
 - .3 Design and select fasteners to suit size and nature of components being joined. Use proprietary devices as recommended by manufacturer.
 - .4 Provide heavy duty fixture attachments for wall mounted cabinets.
- .10 Remove and replace damaged, marked, or stained finish carpentry.

END OF SECTION

1 General

1.1 DESCRIPTION

- .1 This section provides the installing 2-ply Modified Bitumen membrane, including but not limited to the following:

.1 Roof Type RF1

- .1 Mechanically fastened gypsum sheathing boards
- .2 Self-adhesive vapour retarder (AVB-3)
- .3 Rigid insulation in adhesive
- .4 Composite panel of asphaltic board and Base Sheet in adhesive
- .5 Self-adhesive Base Sheet Flashing
- .6 Torched Cap and Cap Sheet Flashing

1.2 REFERENCES

- .1 Use most current version of listed standards.
- .2 Perform roofing and sheet metal work in conformance with roofing manufacturer's written recommendations as well as requirements of ULC laboratories Class C, and Canadian Roofing Contractor's Association (CRCA).
- .3 ASTM C1177/C1177M, Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
- .4 ASTM C1289, Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation board.
- .5 ASTM E96, Standard Test Method for Water Vapour Transmission of Materials.
- .6 CGSB 37-GP-9M, Primer, Asphalt Roofing, Dampproofing and Waterproofing.
- .7 CGSB 37-GP-56M, Membrane Modified, Bituminous, Prefabricated, and Reinforced for Roofing.
- .8 CGSB-37.5-M89, Cutback Asphalt Plastic Cement.
- .9 CSA A123.21, Standard Test Method for the Dynamic Wind Uplift Resistance of Membrane-Roofing Systems.
- .10 CSA A123.23, Product Specification for Polymer-modified Bitumen Sheet, Prefabricated and Reinforced.

- .11 CRCA Roofing Manual, Canadian Roofing Contractors Association.
- .12 OIRCA, Ontario Industrial Roofing Contractors Association.

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Roof-Mounted Items: Collaborate with installers of roof-mounted items, equipment, and mechanical and electrical components to ensure their installation does not compromise the integrity of the roofing system.
- .2 Air Barrier Continuity: Coordinate the installation of the air barrier at walls to ensure seamless integration with the roofing system. Overlap the roofing air barrier membrane with the wall system air barrier membrane by a minimum of 75 mm (3") and terminate securely to maintain a continuous air barrier system for the building.

1.4 SUBMITTALS

- .1 Product data: Submit copies of manufacturer's product data in accordance with Section 01 10 10 indicating:
 - .1 Systems, materials, and methods of installation proposed for use.
 - .2 Identify systems and component
 - .3 Certify compliance of each component with applicable standards.
 - .4 Submit cold weather construction procedures and methods of protection which will be initiated, installed and maintained when ambient temperature falls below 0°C.
- .2 Shop drawings; general details:
 - .1 Include plans, elevations, sections, details, and attachments to other work for the following:
 - .1 Base flashings, cants, and membrane terminations.
 - .2 Tapered insulation, including slopes.
 - .3 Crickets, saddles, and tapered edge strips, including slopes.
 - .4 Insulation fastening patterns.
 - .5 Partitioning water cut-offs.
 - .2 Certificates:
 - .1 Installer certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.

- .2 Manufacturer certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
- .3 Submit evidence of compliance with performance requirements.
- .3 Roofing manufacturer's warranty and design criteria:
 - .1 Submit copy of completed roofing manufacturer's pre-installation notification form at least 15 Working Days prior to commencement of roofing installation.
 - .2 Submit copy of roofing manufacturer's warranty specimen and warranty design criteria for roofing system prior to commencement of roofing installation.
- .4 Samples:
 - .1 Submit samples complete with manufacturer's labels intact, of materials to be used for work of this section prior to commencement of work. Allow ample time for review and acceptance by Consultant and roofing inspection company. Do not proceed with work until samples are accepted.

1.5 **QUALITY ASSURANCE**

- .1 Manufacturer's reports:
 - .1 ISO 9001 and ISO 14001 certification.
 - .2 Ensure materials of this section are provided by one single source
 - .3 Perform Work of this Section by a company that is a member in good standing of the Ontario Industrial Roofing Contractors Association (OIRCA) and has a minimum of 10 years proven acceptable roofing experience on installations of similar complexity and scope.
 - .4 Roofing Subcontractor must be approved by the membrane manufacturer for the warranty program specified. Submit the Subcontractor's certification letter prepared by the membrane manufacturer.
 - .5 Execute work of this section only under the full-time supervision of the qualified Subcontractor's site supervisor.
 - .6 Ensure roofing system has been tested and conforms to CAN/CSA A123.21 to ensure wind uplift resistance applicable to the Place of Work.
 - .7 Perform roofing Work in accordance with CRCA Roofing Specifications Manual and applicable CSGB Specifications, except where indicated otherwise.

- .8 Ensure membrane manufacturer's representative has full access to this Work for proper inspection prior to and during membrane installation. Roof inspections shall be conducted at a minimum when the roof is 10%, 25%, 50%, 75% and 100% complete. Membrane manufacturer must certify that roof installation conforms to the manufacturer's written requirements.
- .9 Pre-installation meetings: Arrange a meeting on Site to be attended by the Consultant, Contractor, and roofing manufacturer's representative to inspect substrates and review installation procedures 48 hours prior to installation.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver and store materials in dry location in their original packaging, displaying the manufacturer's name, product name, weight, and reference standards, as well as all other indications or references considered standard.
- .2 Store adhesives and sealants at a minimum +5°C. Store adhesives and solvent-based mastics at sufficiently high temperatures to ensure ease of application.
- .3 Keep membrane materials stored in rolls standing on end, selvage edge up elevated from moisture at temperatures no less than 5°C.
- .4 Deliver roofing materials to the Project site in original containers with seals unbroken and labeled with the manufacturer's name, product brand name and type, date of manufacture, and storage directions.
- .5 Protect roof insulation materials from physical damage and deterioration caused by sunlight, moisture, soiling, and other sources. Store in a dry location and comply with the insulation manufacturer's written instructions for handling, storage, and protection during installation.
- .6 Handle and store roofing materials and place equipment in a manner that avoids permanent deflection of the deck.
- .7 Handle materials carefully to prevent damage, following the manufacturer's written recommendations.
- .8 Label each container of asphalt bitumen or provide a certificate with each load of bulk bitumen to attest to flash point (FP), finished blowing temperature (FBT), softening point (SP), and equiviscous temperature (EVT) of the bitumen supplied for the work.
- .9 Package materials with attached labels identifying the manufacturer, brand, contents, weight (as applicable), and product and specification numbers.
- .10 Protect the edges of roll goods from damage during handling and store rolls upright to prevent flattening.

- .11 Avoid storing roofing materials on the roof. Store materials in a dry area protected from inclement weather when roofing installation is not in progress. Use opaque, breathable, and waterproof tarpaulins or sheds for storage.
- .12 Prevent compression of insulation panels at any point and protect edges and corners from breakage. Discard wet, cupped, bowed, or otherwise damaged insulation from the Place of Work.
- .13 Protect the edges and corners of precast concrete paving slabs to prevent damage.
- .14 Place 19 mm thick plywood runways over Work to enable movement of Product and other traffic.
- .15 Have a minimum 9 kg. dry chemical fire extinguisher fully charged and in operable condition at every location where open flames are used.
- .16 Use warning signs and barriers. Maintain in good order until completion of Work.
- .17 Clean off drips and smears of bituminous immediately.
- .18 Dispose of rain water off roof and away from face of building until roof drains or hoppers are installed and connected.
- .19 At end of each day's Work or when stoppage occurs due to inclement weather, protect completed Work and Products.

1.7 **SITE CONDITIONS**

- .1 Proceed with installation only when current and forecasted weather conditions comply with the roofing system manufacturer's written instructions and warranty requirements.
- .2 Ensure all roofing materials are dry, properly stored, and protected from adverse weather conditions before and during installation.

1.8 **EXTENDED WARRANTIES**

- .1 Provide written document in the owner's name, valid for a twenty (20), year period, stating that manufacturer will repair any leaks in the roofing membrane to restore the roofing system to a dry and watertight condition, to the extent that membrane manufacturing or installation deficiencies caused water infiltration. The warranty must cover for the entire cost of the repair(s) during the entire warranty period. Ensure warranty is transferable, at no extra cost, to subsequent building owners starting from the date of acceptance.
- .2 Provide contractor's workmanship warranty valid for a period of two (2) years.
- .3 Warranty shall include for labour, materials, and workmanship.

2 **Products**

2.1 **FASTENERS**

- .1 Roofing fasteners to steel decking: Use # 12, FM approved, with 3" round metal plates
- .2 Roofing nails: spiral nails with steel round-top cap 25 mm in diameter and 3 mm diameter shank; long enough to penetrate solid wood supports by at least 38 mm and plywood substrates by at least 20 mm.
- .3 **Termination Bars:** Provide pre-punched aluminum termination bars measuring 25 mm (1") wide x 1.5 mm (1/16") thick x 3000 mm (10 ft) long. Bars shall have 6.4 mm (1/4") x 9.5 mm (3/8") slotted holes spaced at 200 mm (8") centers.

2.2 **GYPSUM SHEATHING BOARDS**

- .1 ASTM C1177/C1177M. Minimum 16 mm thick, glass mat faced, exterior grade gypsum board. Primed finish.
- .2 Specified product: 16mm DensDeck Prime by Georgia Pacific or approved equivalent.

2.3 **PRIMER**

- .1 CGSB 37-GP-9M, Stabilised primer used to enhance adhesion of membranes.
- .2 Specified product: ELASTOCOL STICK by SOPREMA (for self adhesive membranes) or approved equivalent.
- .3 Specified product: ELASTOCOL 500 by SOPREMA (for heat welded membranes) or approved equivalent.

2.4 **VAPOUR RETARDER (AVB-3)**

- .1 ASTM E96, Self-adhesive air/vapour barrier membrane composed of tri-laminated woven polyethylene facer and SBS modified bitumen. Water vapour permeability: 2.5 ng/Pa•s•m² (0.04 perm)
- .2 Specified product: SOPRAVAP'R by SOPREMA or approved equivalent.

2.5 **ADHESIVE**

- .1 Low-rise two-part urethane adhesive with no solvent content.
- .2 Specified product: DUOTACK INSULATION ADHESIVE by SOPREMA or approved equivalent

2.6 **INSULATION (INS-4 and INS-5)**

- .1 INS-4 (Bottom Layers) CAN/ULC S704, ASTM C1289. Closed cell, polyisocyanurate foam core between organic facers reinforced with glass fibres.

- .2 INS-5 (Upper Layers) Specified product: SOPRA-ISO and SOPRA-ISO tapered by SOPREMA or approved equivalent.
 - .3 Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where required to ensure proper drainage. Fabricate to the slopes indicated in the Contract Documents, ensuring a minimum slope of 1:48 (1/4 inch per 12 inches) in addition to the slope of the roof structure or the tapered insulation slope, as applicable.
- 2.7 **ASPHALTIC DECK COVER BOARD WITH LAMINATED BASE SHEET MEMBRANE**
- .1 CSA A123.23, SBS modified base sheet membrane and polyester reinforcement, factory-laminated on asphaltic board. Top surface covered with thermofusible poly film. Side laps 60% self-adhesive and 40% thermofusible. 7 mm total thickness.
 - .2 Specified product: 2-1 SOPRASMART BOARD by SOPREMA or approved equivalent.
- 2.8 **COVER STRIP**
- .1 CSA A123.23, Membrane strip of 330 mm (13 in) made of SBS modified bitumen with a composite reinforcement. Top surface covered with thermofusible poly film, underface self-adhesive. The strip ensures watertightness in the end laps.
 - .2 Specified product: SOPRALAP by SOPREMA or approved equivalent.
- 2.9 **MEMBRANES**
- .1 Base Sheet Flashing:
 - .1 CGSB 37-GP-56M, Type 2, Class C, Grade 2 (CSA A123.23, Type C, Grade 3)
 - .2 Roofing membrane with glass and polyester reinforcement and SBS modified bitumen. Top face covered with thermofusible poly film, under side self-adhesive. Top face marked with three (3) distinctive blue chalk lines to ensure proper roll alignment.
 - .3 Specified product: SOPRAPLY FLAM STICK by SOPREMA or approved equivalent.
 - .2 Cap Sheet and Cap Sheet Flashing:
 - .1 CGSB 37-GP-56M, Type 1, Class A, Grade 2 (CSA A123.23, Type C, Grade 1)
 - .2 Roofing membrane with glass and polyester reinforcement and SBS modified bitumen. Top surface covered with ceramic granules, underface with thermofusible poly film.

- .3 Specified products: SOPRAPLY TRAFFIC CAP by SOPREMA or approved equivalent.

.3 WATERPROOFING MASTICS

- .1 CGSB-37.5-M89, Mastic made of synthetic rubbers, plasticized with bitumen and solvents.
 - .1 Specified product: SOPRAMASTIC by SOPREMA or approved equivalent.
 - .2 Specified product: SOPRAMASTIC ALU by SOPREMA. (for exposed areas) or approved equivalent.

.4 WATERPROOFING OF PENETRATIONS

- .1 One component polyurethane /bitumen resin.
- .2 Specified product: Alsan Flashing and Alsan Flashing reinforcement by Soprema or approved equivalent.

.5 EXPANSION JOINTS

- .1 Expansion joint system shall be manufactured from a proprietary copolymer with internal polyester reinforcement and monolithic seam vulcanization.
- .2 Movement and Fabrication: System shall allow tri-directional movement and serve as a waterproofing joint system. Joints shall be factory-fabricated in one piece for the entire contiguous expansion joint. For joints exceeding the manufacturer's shipping and handling guidelines, sections shall be lapped and vulcanized on-site by the manufacturer's authorized personnel. Any damaged materials shall be repaired by the manufacturer's authorized personnel.
- .3 Ensure compatibility with adhesives and membranes used in expansion joint construction, as per the manufacturer's installation instructions.
- .4 Provide a manufacturer's warranty covering the full duration specified in this section.
- .5 Hydrostatic Pressure Limit: The system shall perform under static hydrostatic pressure not exceeding 10 m (33 ft) of water.
- .6 Expansion joint system to meet the roofing assembly type and movement design requirements, by Situra Inc. 'RedLINE' or approved equivalent.

.6 FILTER FABRIC

- .1 Lightweight woven polyethylene fabric

- .2 Specified product: SOPRAFILTRE by Soprema or approved equivalent.

3 Execution

3.1 EXAMINATION

- .1 Conduct an examination of substrates, areas, and conditions with the roofing installer present to confirm compliance with the following requirements and any other conditions affecting the performance of the roofing system:
 - .1 Verify that roof openings and penetrations are properly positioned, and curbs are set, braced, and securely anchored.
 - .2 Ensure roof drain bodies are securely clamped in place.
 - .3 Confirm that blocking, curbs, and nailers are securely fastened to the roof deck at penetrations and terminations.
 - .4 Ensure nailers match the thickness of the insulation.
 - .5 Verify that the surface plane flatness and fastening of the steel roof deck comply with the requirements.
 - .6 Test for moisture by pouring 0.5 L (1 pint) of hot roofing asphalt onto the substrate at the start of each day's work and at the beginning of each roof area or plane.
 - .7 Do not proceed with roofing work if the test sample foams or can be easily.
 - .8 Do not proceed with installation until all unsatisfactory conditions have been identified and corrected to meet the project specifications.

3.2 SURFACE EXAMINATION AND PREPARATION

- .1 Complete surface examination and preparation in conformance with manufacturer's recommendations, particularly for fire safety precautions.
- .2 Do not begin any work before surfaces are smooth, dry, and exempt of ice and debris. Do not use calcium or salt for ice or snow removal.
- .3 Do not install materials during rain or snowfall.
- .4 Prevent materials, debris, and substances from entering and clogging roof drains and conductors. Protect surrounding surfaces from spills or material migration during preparation and installation. Remove roof drain plugs only when no work is taking place or when rain is forecast, to ensure proper drainage.

3.3 METHOD OF INSTALLATION

- .1 Install roofing elements on clean and dry surfaces, in conformance with manufacturer's instructions and recommendations.
- .2 Complete installation in a continuous fashion as surfaces are prepared and weather conditions permit.
- .3 Ensure watertight conditions for roofs at all times, including protection during installation work by other trades and progressive protection as work is completed (e.g. vents, drains, etc.)
- .4 Prepare surfaces and complete waterproofing work in accordance with the roofing manufacturer's printed installation instructions.
- .5 Install roofing elements on clean and dry surfaces, following the manufacturer's instructions and recommendations.
- .6 Complete roofing work in a continuous manner as surfaces are prepared and weather conditions allow.
- .7 Seal seams that are not covered by a cap sheet membrane on the same day of installation. Do not install the cap sheet if moisture is present on or within the base sheet seams.
- .8 Lay roofing membrane free of wrinkles, air pockets, fishmouths, tears, and prominent lap joints. Ensure full bonding of the cap sheet to the base sheet. Overlap seams and bond them fully.
- .9 Before installing the base sheet and cap sheet, unroll and allow the sheet to relax for the duration recommended by the manufacturer, based on the ambient temperature at the time of installation.
- .10 Extend roofing to the outer edges of the roof and up vertical surfaces at least 200 mm (8") above horizontal roofing, and the full height beneath counter flashing and top of curb flashing.
- .11 Complete roofing up to the line of termination for each day's work.
- .12 For roofing systems with adhered field base sheet, insulation, and/or sheathing board using oxidized asphalt:
 - .1 Secure mechanical attachments (screws and plates) at 305 mm (12") centers at the base of the upstand.
- .13 For roofing systems adhered with cold adhesive, bitumen, or asphalt, where insulation at the base of the vertical upstand exceeds 150 mm (6") in thickness:
 - .1 Install a continuous fastening bar and anchors at the base of the vertical upstand.

- .2 Screws and plates longer than 150 mm (6") are not permitted in these applications.

3.4 **CLEANING**

- .1 Immediately before roofing materials are applied, clean decks of roughness, rubbish, dust, dirt, oil, grease, snow, and ice.
- .2 Clean the substrate thoroughly, removing dust, debris, moisture, and other substances detrimental to the roofing installation, in accordance with the roofing manufacturer's written instructions. Remove all sharp projections to ensure a smooth and safe surface for roofing application.

3.5 **EQUIPMENT FOR WORK EXECUTION**

- .1 Maintain all roofing equipment and tools in good working order.
- .2 Use tools recommended by membrane's manufacturer.

3.6 **APPLICATION OF GYPSUM SHEATHING BOARDS**

- .1 Lay sheathing board with tightly butted joints. Ensure longitudinal joints are at right angles to flute direction. Joints occurring along widths of board to be continuously supported on top flute of metal deck.
- .2 Ensure the substrate board is promptly protected with a membrane immediately after installation.
- .3 Mechanically fasten sheathing to deck with self-tapping, non-corroding screws, spaced evenly to each board and to only top flutes. Use 8 fasteners per 4' x 8' panels and 12 fasteners per corner panels
- .4 Ensure sheathing is immediately protected with membrane.
- .5 Tape all seams in the substrate board before installing the air/vapour barrier. Apply 150 mm (6") wide strips of self-adhering base sheet to prevent leakage into the building.

3.7 **APPLICATION OF PRIMER**

- .1 Roofing substrate surfaces shall be primed with a coat applied at the rate specified in the roofing manufacturer's printed installation instructions.
- .2 Ensure all surfaces to be primed are free of rust, dust, or any residue that may hinder adhesion.
- .3 Cover primed surfaces with the roofing membrane as soon as possible, ensuring same-day coverage for self-adhesive membranes.

3.8 **APPLICATION OF VAPOUR RETARDER (AVB-3)**

- .1 Beginning at the bottom of the slope, without adhering the membrane, unroll onto the substrate for alignment. Do not immediately remove the silicone release sheet.
- .2 Align the roll parallel to the corrugations of the steel deck. Make sure the membrane overlaps are supported along their entire length.
- .3 Peel back one end of the silicone release sheet and adhere this part of the membrane to the substrate. Peel back the remaining release sheet at a 45° angle to avoid wrinkles in the membrane.
- .4 If the membrane is not properly aligned, do not try to adjust it. Instead, cut the roll and start again, making sure that it is properly aligned and that it overlaps the end of the misaligned piece by 150 mm.
- .5 Overlap adjacent membranes by 75 mm. Overlap end laps by 150 mm. Stagger end laps by at least 300 mm.
- .6 Completely seal the air and vapour barrier at all terminations, obstructions, and penetrations to prevent air infiltration into the roofing system.

3.9 INSULATION INSTALLATION

- .1 Install insulation with adhesive in conformance with manufacturer's written recommendations.
- .2 Install only as much insulation as can be covered in the same day.
- .3 Install insulation in two layers and stagger seams between layers.
- .4 Around the drains lower insulation by 1" to create a sump 4' X 4' in area. Bevel the edge of the 3" insulation on a 45° angle.
- .5 Stagger and offset vertical joints of insulation boards by 305 mm (12") from those in the preceding layer.
- .6 Trim the surface of insulation as needed around roof drains to ensure the completed surface is flush and does not impede water flow.
- .7 Place insulation boards with edges in moderate contact without forcing. Fill any gaps greater than 6 mm (1/4") with insulation material.
- .8 Cut insulation to fit tightly around blocking, upstands, and penetrations. Fill gaps greater than 6 mm (1/4") with insulation material.
- .9 Install tapered insulation in roofing areas as required to achieve the slopes indicated in the design documents:
 - .1 Provide tapered insulation in adhesive throughout.

- .2 Apply insulation adhesive to the underside of tapered insulation and immediately bond it to the substrate.

- .10 Protect insulation from moisture and maintain it in a dry, new condition. Do not install insulation that is wet or damaged.

3.10 ROOFING DETAILS

- .1 Install as indicated in the drawings and in accordance with the various roofing details specified in the roofing manufacturer's printed installation instructions.

3.11 APPLICATION OF ASPHALTIC OVERLAY BOARD WITH LAMINATED BASE SHEET MEMBRANE

- .1 Install composite board with adhesive in continuous strips spaced 30 cm (12 in) on the field. Decrease the spacing between ribbons to a minimum of 15 cm (6") at the perimeter and 10 cm (4") at the corners.
- .2 Adhere the first 60 mm (2.5 in) of the self-adhesive side and end laps by removing the silicone release paper and using a membrane roller, then heat-weld the last 40 mm (1.5 in) (self-adhesive, heat-welded side laps).
- .3 Seal end laps by installing a 330-mm (13-in) wide protection strip centered on the joint.

- .1 Ensure all boards are evenly and tightly butted together

- .2 Avoid forming wrinkles, swelling or fishmouths

3.12 APPLICATION OF BASE-SHEET FLASHING

- .1 Apply primer to the substrate at a rate of .25 L/m². Allow primer to dry before installation of Base Sheet.
- .2 Install reinforcing gussets at all inside and outside corners.
- .3 Install base sheet flashing in one- (1) metre widths to cover roofing substrate over 100 mm. Overlap side laps by 75 mm. Stagger side laps by at least 100 mm from base sheet overlaps on roof to avoid excessive layering.
- .4 Apply base sheet flashing directly onto substrate by removing siliconed paper cover sheet. Proceed from top to bottom. Once in place, apply pressure manually in a uniform fashion to obtain homogenous adherence over entire surface. Preferably seal seams with rubber roller. Nail outside edge at 300 mm o/c.

- .1 Avoid forming wrinkles, air pockets or fishmouths.

- .2 Always seal overlaps at the end of the workday.

3.13 APPLICATION OF CAP SHEET

- .1 Once base sheet is applied and no defects are apparent, proceed with cap sheet installation, starting at the roof drains.
- .2 Unroll cap sheet at drain. Carefully align first side lap (parallel to roof edge).
- .3 Weld cap sheet onto base sheet with torch recommended by membrane manufacturer. During application, simultaneously melt both designated contact surfaces so a bead of bitumen is apparent as cap sheet unrolls.
- .4 Avoid overheating.
- .5 Unless overlap widths differ between cap and base sheets, make sure joints between the two layers are staggered by at least 300 mm.
- .6 Overlap cap sheet side laps by 75 mm and end laps by 150 mm. Cut off corners at end laps to be covered by next roll. All overlap surfaces must be granule-free or degranulated.
- .7 Complete perfect welds between two membranes. Leave no zone unwelded. In cold weather, adjust welding time to obtain homogenous seam (it may be necessary to slow down.)
- .8 Once cap sheet is installed, carefully check all overlapped joints.
- .9 During installation, care should be taken to avoid excessive bitumen bleed-out at joints.

3.14 APPLICATION OF CAP SHEET FLASHING

- .1 Install cap sheet in one (1) -metre width. Overlap side laps by 75 mm. Stagger base and cap sheet overlaps on roof by at least 100 mm to avoid excessive layering. Roof overlaps will be 200 mm wide.
- .2 Draw parallel chalk line 150 mm from upstand or parapet bases.
- .3 Sink surface granules into bed of hot bitumen with torch and round-nosed trowel [from chalk line on roof to upstand or parapet base as well as] over granulated vertical parts to be overlapped.
- .4 Torch weld cap sheet directly onto base sheet from top to bottom to soften both membranes and obtain homogenous seal.
- .5 During installation, avoid overheating membrane and excessive bitumen bleed-out at joints.

3.15 APPLICATION OF WATERPROOFING OF PENETRATIONS

- .1 Ensure substrate is clear of loose granules and all foreign substances that can impair adhesion.

- .2 Apply a base coat of liquid waterproofing.
- .3 Trim reinforcing material to conform to shape of penetrations and embed in base coat.
- .4 Apply a second coat fully saturating the reinforcement.
- .5 To add colour or match existing granules, apply a thin coat of liquid waterproofing and embed granules before it dries.

3.16 ROOF PENETRATIONS

- .1 Install curb flashings around ducts, pipes, structural steel, and other projections through membrane systems in accordance with the manufacturer's written instructions and as detailed in the drawings.
- .2 Install penetration flashings supplied under the scope of mechanical work and this section, following the roofing manufacturer's installation instructions.
- .3 Prime metal flanges with the specified primer and allow solvents to flash off completely before installation.
- .4 Remove poly film from areas where metal flashing will be applied. Set the metal flange in a full layer of waterproofing mastic to ensure a positive bond and seal.
- .5 Install the base ply up to the base of the metal flashing, ensuring it does not extend onto the curved metal section.
- .6 Install the cap ply over the base ply flashing, ensuring a full bond to the base ply. Apply a bead of waterproofing sealer at the termination point for a secure and watertight seal.

3.17 FIELD QUALITY CONTROL

- .1 Conduct quality control in accordance with Section 01 45 23 and the following inspection and testing procedures:
 - .1 Cap Sheet Membrane Review:
 - .1 Prior to the installation of the cap sheet membrane, the base sheet membrane installation shall be reviewed by the manufacturer and an independent inspection and testing company.
 - .2 Both the manufacturer and the inspection company shall submit field review reports to the Consultant.
 - .2 Independent Inspection and Testing:
 - .1 The independent inspection and testing company shall perform the following:

- .2 Inspections: Provide detailed inspection reports.
- .3 Tests: Conduct and document the results of tests, including: Core cuts (if requested) and patching.
- .3 Moisture Survey:
 - .1 Submit results of a non-destructive moisture test of the roof system conducted by an approved third party using one of the following methods: Infrared Thermography and/or Nuclear Backscatter.
 - .4 If the test results or inspections indicate non-compliance, remove and replace or repair the roofing as recommended in writing by the manufacturer. Retest and re-inspect until the roofing installation passes.

3.18 **ADJUSTING AND CLEANING**

- .1 Clean roofing, metal, masonry, and similar surfaces of dirt, debris, stains, and foreign matter upon completion of the Work. Clean bituminous markings from finished surfaces.
- .2 Repair or replace any finishes that are defaced or disfigured as a result of the work performed under this section.

END OF SECTION

- 1. General**
- 1.1 SECTION INCLUDES**
 - .1 Labour, Products, equipment and services necessary for spray applied fireproofing Work in accordance with the Contract Documents.
- 1.2 REFERENCES**
 - .1 CAN/ULC S101, Standard Methods of Fire Endurance Test of Building Construction and Materials.
 - .2 CAN/ULC S102, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
 - .3 Technical Manual 2-A, Standard Practice for the Testing and Inspection of Field Applied Sprayed Fire-Resistive Materials by Association of the Wall and Ceiling Industry (AWCI).
 - .4 UL 1479, Standard Method of Fire Tests of Through-Penetrations.
- 1.3 DESIGN REQUIREMENTS**
 - .1 Design fireproofing for structural members, floor/ceiling assemblies, and floor/roof assemblies as unrestrained unless otherwise specifically noted as restrained on the structural drawings.
- 1.4 SUBMITTALS**
 - .1 Product data:
 - .1 Submit copies of manufacturer's Product data in accordance with Section 01 33 00 indicating:
 - .1 Performance criteria, compliance with appropriate reference standard, characteristics, limitations.
 - .2 Product transportation, storage, handling and installation requirements.
 - .2 Certification:
 - .1 Submit certified documentation for each worker performing Work of this Section, to substantiate 5 years minimum of experience in sprayed fireproofing installation.
 - .2 Submit installer's and Product manufacturer's certification verifying compliance with Contract Documents.
 - .3 For assemblies not tested and rated in accordance with CAN/ULC S101 and CAN/ULC S102, submit proposals based on related designs using accepted fireproofing design criteria.
 - .4 Submit manufacturer's inspection reports and verification/certification that work has been correctly installed.
- 1.5 QUALITY ASSURANCE**
 - .1 Qualifications: Execute work of this Section by manufacturer-approved, skilled, qualified, and experienced workers, trained in installation of Work of this Section.

- .2 Regulatory Requirements: Be responsible for securing approval of materials and installation of work from authority having jurisdiction:
 - .1 Perform work in compliance with ULC or cUL listed designs for the required fire resistance ratings.
 - .2 Submit signed engineering proposals to Authority having Jurisdiction for acceptance if there are no listed designs that match project conditions.
 - .3 Perform tests required by Authorities having Jurisdiction.
 - .3 Manufacturer's Site Inspection: Manufacturer's technical representative shall inspect Work at suitable intervals during application and at conclusion of Work of this Section, to ensure Work is correctly installed.
 - .4 Mock-up:
 - .1 Construct one 1200 mm long mock-up of fireproofing in location acceptable to Consultant.
 - .2 Arrange for Consultant's review and acceptance, allow 48 hours after acceptance before proceeding with Work.
 - .3 Mock-up may remain as part of Work if accepted by Consultant. Remove and dispose of mock-ups which do not form part of Work.
 - .4 Upon acceptance, mock-up shall serve as a minimum standard of quality for the balance of the work of this Section.
- 1.6 **SITE CONDITIONS**
- .1 Maintain a 5°C air and substrate temperature for 24 hours before, during, and 24 hours after application in accordance with manufacturer's instructions.
 - .2 Ventilate to dry fireproofing. In enclosed areas circulate interior air and exhaust to the exterior.
 - .3 Protect adjacent surfaces and equipment around application areas from overspray, marring or damage. Clean, polish or replace materials damaged to acceptance of Consultant.
2. **Products**
- 2.1 **MATERIALS**
- .1 All materials under work of this Section, including but not limited to, primers, adhesives, paints, and sealers are to have low VOC content limits.
 - .2 Primer: As recommended by spray fireproofing manufacturer.
 - .3 Spray fireproofing: CAN/ULC S101, Spray applied, cementitious fireproofing with a minimum density of 240 kg/m³:
 - .1 'Blaze-Shield II' by Cafco Industries Ltd.
 - .2 'Southwest Type 5GP' by A/D Fire Protection Systems Inc.
 - .4 Sealer: Latex based emulsion:

- .1 'Bond-Seal' by Cafco Industries Ltd
 - .2 'A/D Sealer' by A/D Fire Protection Systems Inc
 - .5 Metal Lath: Expanded metal lath fabricated from material of weight, configuration, and finish required to comply with fire resistance designs acceptable to Authority having Jurisdiction and fire resistive material manufacturer's written recommendations. Include clips, lathing accessories, corner beads, and other anchorage devices required to attach lath to substrates and to receive sprayed fire-resistive material.
 - .6 Water: Clean, free from organic and mineral impurities which would be harmful to application.
- 2.2 **MIXING**
- .1 Mix Products in accordance with manufacturer's instructions.
3. Execution
- 3.1 **EXAMINATION**
- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.
 - .2 Verify that substrates are compatible and have suitable bonding characteristics to receive fireproofing.
 - .3 Ensure written confirmation is received from steel fabricators of the specific surface preparation procedures and primers used to ascertain compatibility with work of this Section.
 - .4 Ensure that items required to penetrate fireproofing are placed before installation of fireproofing.
 - .5 Ensure that ducts, piping, equipment, or other items which would interfere with application of fireproofing are not positioned until fireproofing is completed.
- 3.2 **PREPARATION**
- .1 Prime substrates where required by ULC or by sprayed fireproofing material manufacturer, unless compatible shop primer has been applied and is in satisfactory condition to receive work.
 - .2 Clean surfaces of steel members free of dust, dirt, oil, grease, loose paint, mill scale, rust and other foreign matter in accordance with manufacturers written instructions which would interfere with bond of fireproofing. Steel to receive fireproofing should have no primers or coatings applied to the surface prior to application.
 - .3 Install metal lath where required to comply with fire resistance ratings and fireproofing manufacturer's written recommendations for conditions of exposure and intended use. Securely attach lath to substrate in position required for support and reinforcement of fire-resistive material. Use anchorage devices of type recommended in writing by sprayed fire-resistive material manufacturer. Attach lathing accessories where indicated or required for secure attachment to substrate.

- .4 Coat substrates with bonding adhesive where required to achieve fire resistance rating or as recommended in writing by spray fireproofing manufacturer for material and application indicated.
- .5 Use temporary enclosures to prevent spray from contaminating air beyond application area. Protect adjacent surfaces and equipment from damage by overspray, fall-out, and dusting of fireproofing material. Protect walls, windows, floors and other surfaces around areas to be fireproofed, from marring or damage.

3.3 APPLICATION

- .1 Apply fireproofing in separate coats in accordance with the manufacturer's written instructions to total thickness required to achieve fire ratings shown on the Contract Drawings. Comply with accepted ULC or Intertek Testing Services design.
- .2 Apply fireproofing on steel over 2000 mm long as indicated or as required by authorities having jurisdiction.
- .3 Maintain continuity of fireproofing without gaps or voids.
- .4 Water tamping: Provide low pressure spray to finished surface of fireproofing to provide dense, medium smooth surface.
- .5 Apply sealer to surfaces of fireproofing in accordance with the manufacturer's instructions after tamping.
- .6 Repair fireproofing damaged by other trades, to acceptance of Consultant.

3.4 FIELD QUALITY CONTROL

- .1 Perform field tests as required by Authorities having Jurisdiction. Tests to be carried out as outlined in Technical Manual 12-A by AWCI and UL 1479.

3.5 CLEANING UP

- .1 Clean exposed wall, ceiling or other surfaces of fireproofing materials to the acceptance of Consultant.

END OF SECTION

- 1 General
- 1.1 **SECTION INCLUDES**
 - .1 Labour, Products, equipment and services necessary for firestopping and smoke seals work in accordance with the Contract Documents.
- 1.2 **REFERENCES**
 - .1 ASTM C303, Standard Test Method for Dimensions and Density of Preformed Block and Board-Type Thermal Insulation.
 - .2 ASTM C920, Standard Specification for Elastomeric Joint Sealants.
 - .3 ASTM C1104, Standard Test Method for Determining the Water Vapor Sorption of Unfaced Mineral Fiber Insulation.
 - .4 ASTM E814, Test Method for Fire Tests of Through-Penetration Fire Stops.
 - .5 ASTM E2174, Standard Practice for On-Site Inspection of Installed Fire Stops.
 - .6 ASTM G21, Standard Test for Determining Resistance of Synthetic Polymeric Materials to Fungi.
 - .7 CAN/CGSB 19.13, Sealing Compound, One Component, Elastomeric, Chemical Curing.
 - .8 CAN/ULC S102, Surface Burning Characteristics of Building Materials and Assemblies.
 - .9 CAN/ULC S114, Standard Method of Test for Determination of Non-Combustibility in Building Materials.
 - .10 CAN/ULC S115, Standard Method of Fire Tests of Firestop Systems.
 - .11 CAN/ULC S129, Standard Method Of Test For Smoulder Resistance Of Insulation (Basket Method).
 - .12 CAN/ULC S702, Thermal Insulation, Mineral Fibre for Buildings.
- 1.3 **DEFINITIONS**
 - .1 Fire Separation: A construction assembly, plane or device, either vertical or horizontal, which is required to prevent the passage of fire and smoke for a prescribed period of time. Proof of compliance to required time rating shall be by ULC, Warnock Hersey (or similar approved) certification or shall be as listed in the Ontario Building Code Supplementary Standard SB-2.
 - .2 Smoke Separation: A construction assembly, plane or device, either vertical or horizontal, which is not required to prevent the passage of fire for a prescribed period of time but is required to prevent the passage of smoke. A "Smoke Separation" is also known as a "Fire Separation with No Rating" or a "Zero Hour Rated Separation".
 - .3 Non-Rated Separation: A construction assembly, plane or device, either vertical or horizontal, which is not required to prevent the passage of fire for a prescribed period of time and is not required to prevent the passage of smoke.
- 1.4 **SYSTEM DESCRIPTION**

- .1 Firestopping and smoke seals: ULC or Intertek Testing Services listed Products and systems in accordance with CAN/ULC S115 suitable to actual application and installation conditions.
- .2 Firestop applications that exist for which no ULC or cUL tested system is available through a manufacturer, a manufacturer's engineering judgment derived from similar ULC or cUL system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineer judgment drawings must follow requirements set forth by the International Firestop Council.
- .3 Firestop and smoke seal system shall achieve a fire resistance rating and smoke seal rating equal to that of assemblies into which they are installed.
- .4 Provide smoke sealants over firestopping materials or combination smoke seal/firestop seal material to form air tight barriers to retard the passage of gas and smoke.
- .5 Firestopping and smoke seals located at movement joints shall be designed with movement capability.
- .6 Provide penetration firestopping with mould and mildew resistance rating of 0 in accordance with ASTM G21.
- .7 Firestopping and smoke seals within mechanical and electrical assemblies shall be provided as part of the work of Divisions of mechanical, electrical and refrigeration respectively.

1.5 SUBMITTALS

- .1 Product data:
 - .1 Submit copies of manufacturer's Product data in accordance with 01 10 10 indicating:
 - .1 Performance criteria, compliance with appropriate cUL or ULC reference standard, characteristics, limitations.
 - .2 Product transportation, storage, handling and installation requirements.
 - .3 Submit firestop and smoke seal manufacturer's Product data for materials and prefabricated devices, including manufacturer's printed installation instructions.
 - .2 Shop drawings:
 - .1 Submit shop drawings in accordance with Section 01 10 10 indicating:
 - .1 Fire rated and smoke sealed systems for each typical application.
 - .2 Construction details, accurately reflecting actual job conditions.
 - .3 ULC or Intertek Testing assembly listing.
 - .4 Each floor and wall assembly requiring firestop system with each corresponding ULC firestop system.
 - .3 Certification:
 - .1 Submit certified documentation from manufacturer for each worker performing work of this Section.

- .2 Submit installer's and Product manufacturer's certification verifying compliance with the Contract Documents and conformance with ASTM E814 and CAN/ULC S115.

1.6 QUALITY ASSURANCE

- .1 Installers qualifications: Perform work of this Section by a company that has a minimum of five years proven experience in the installation of firestopping and smoke seal work of a similar size and nature and that is approved by manufacturer. Submit to Consultant, applicator's current certificate of approval by the material manufacturer as proof of compliance.
- .2 Manufacturer's direct representative and/or fire protection specialist shall be on-site during initial installation of firestop systems to train appropriate contractor personnel in proper selection and installation procedures conforming to manufacturer's written recommendations published in their literature and drawing details.
- .3 Pre-construction meetings: Arrange with manufacturer's representative, Contractor, Consultant and Field Engineer to determine responsibility for handling such issues as FT rated partitions, firestop custom details, compatibility, mixed penetrations, and to review installation procedures 48 hours in advance of installation.

1.7 DELIVERY STORAGE AND HANDLING

- .1 Deliver materials to Place of Work in manufacturer's unopened containers, containing classification label with labels intact and legible at time of use.
- .2 Do not use damaged or adulterated materials exceeding their expiry date.

1.8 SITE CONDITIONS

- .1 Conform to manufacturer's requirements and maintain a minimum temperature of 5°C for a minimum period of 24 hour before application, during, and until application is fully cured.
- .2 Maintain sealant at a minimum 18°C for best workability.

2 Products

2.1 ACCEPTABLE MANUFACTURERS

- .1 Acceptable manufacturers of rated systems include:
 - .1 AD Fire Protection Systems Inc.
 - .2 Hilti Canada Corporation.
 - .3 3M Canada Inc.
 - .4 Tremco Ltd.

2.2 GENERAL SYSTEM REQUIREMENTS

- .1 All materials under work of this Section, including but not limited to, primers and sealants are to have low VOC content limits.
- .2 Do not use Products containing asbestos.
- .3 Firestopping components shall not contain volatile solvents or require special application to protect plastic pipe from firestopping compound.
- .4 Provide smoke seal sealant in following colours:

- .1 Grey or white in finished areas.
- .2 Red in unfinished areas.
- .5 Smoke sealant for overhead and vertical joints for floor to be self-levelling and non-sagging sealant.
- .6 Smoke sealant at vertical through penetrations in areas with floor drains shall be waterproof type.

2.3 MATERIALS

- .1 Following materials have been provided for convenience. Contractor shall provide complete system with all components and accessories as required for fire resistant and smoke seal installation.
- .2 Firestop sealant: single component, low modulus, silicone rubber, moisture curing sealant to ASTM C920, ULC labelled to CAN/ULC S115.
- .3 Pre-Installed firestop devices for use with non-combustible and combustible pipes, conduit and/or cable bundles penetrating concrete floors and walls.
 - .1 Cast-in place firestop device complete with aerator adaptor when used in conjunction with aerator system. Model CP 680-P by Hilti or approved alternative.
 - .2 Cast-in place firestop device for use with non-combustible penetrants. Model CP 680-M by Hilti or approved alternative.
 - .3 Speed sleeve for use with cable penetrations. Model CP 653 by Hilti or approved alternative.
 - .4 Firestop block. Model CFS-BL by Hilti or approved alternative.
- .4 Re-penetrable, round cable management devices for use with new or existing cable bundles penetrating walls:
 - .1 Speed sleeve with integrated smoke seal fabric membrane. Model CP 653 by Hilti or approved alternative.
 - .2 Firestop Sleeve. Model CFS-SL SK by Hilti or approved alternative.
 - .3 Retrofit sleeve for use with existing cable bundles. Model CFS-SL RK by Hilti or approved alternative.
 - .4 Gangplate for use with multiple cable management devices. Model CFS-SL GP by Hilti or approved alternative.
 - .5 Gangplate Cap for use at blank openings in gangplate for future penetrations. Model CFS-SL GP CAP by Hilti or approved alternative.
- .5 Firestop insulation: to CAN/ULC S702, Type 2; mineral fibre manufactured from rock or slag, suitable for manual application.
 - .1 Density: Minimum 64 kg/m³ when tested to ASTM C303.
 - .2 Combustibility: Noncombustible to CAN/ULC S114.
 - .3 Melt temperature: >1175 degrees C.
 - .4 Surface burning characteristics: to CAN/ULC S102, maximum flame spread of 0, smoke developed of 0.

- .5 Moisture Absorption: 0.04 percent when tested to ASTM C1104.
- .6 Smoulder Resistance: 0.01 percent when tested to CAN/ULC S129.
- .6 Damming, back-up, supports, and anchorage: In accordance with manufacturer's fire rated systems and to acceptance of authorities having jurisdiction.
- .7 Primer: As recommended by firestopping sealant manufacturer.
- 3 Execution
- 3.1 **EXAMINATION**
 - .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.
 - .2 Verify that substrates and surfaces to receive firestopping and smoke seals are clean, dry, and frost free.
- 3.2 **PREPARATION**
 - .1 Prepare, modify, and adjust void sizes, proportions, and conditions to conform to fire rated and smoke sealed assembly requirements such as assembly opening size and dimensional restrictions.
 - .2 Clean surfaces to remove material detrimental to bond including dust, paint, rust, oil, grease, moisture, frost and other foreign matter to manufacturers recommendations.
 - .3 Mask adjacent surfaces to avoid spillage and over-coating of adjacent surfaces. Remove stains from adjacent surfaces.
- 3.3 **INSTALLATION**
 - .1 Install firestopping and smoke seal systems in accordance with reviewed Shop Drawings, manufacturer's instructions and fire rated assembly to establish continuity and integrity of fire separations.
 - .2 Install firestop insulation in compacted thicknesses required by ULC design. Compress insulation approximately 50 percent.
 - .3 Install primers as recommended by firestop and smoke seal Product manufacturers.
 - .4 Install temporary forming, damming, back-up as required, remove after materials have achieved initial cure and will resist displacement.
 - .5 Install firestop and smoke seal filler in horizontal joints providing 25% compression fit.
 - .6 Use resilient, elastomeric firestopping and smoke seal systems in following locations:
 - .1 Openings and sleeves for future use.
 - .2 Penetration systems subject to vibration or thermal movement.
 - .3 Penetration systems in acoustical containment enclosures.
 - .7 Trowel and tool exposed firestop and smoke seal. Product surfaces to uniform, smooth finish.
 - .8 Seal joints to ensure an air and water resistant seal capable of withstanding compressions and extensions due to thermal wind or seismic joint movement.
 - .9 Taped joints will not be acceptable.

- .10 Repair damaged firestopped and smoke sealed surfaces to acceptance of Consultant.
 - .11 Identify each firestop and smoke seal penetration assembly with permanent label listing following:
 - .1 Assembly and rating in hours.
 - .2 Date of installation.
 - .3 Installing company's name and telephone number.
 - .12 Do not cover materials until full cure has taken place.
- 3.4 **INSPECTION AND TESTING**
- .1 Inspection of through-penetration firestopping shall be performed in accordance with ASTM E2174 to ensure that firestopping and smoke seals have been installed in accordance with Contract documents and to tested and listed firestop system.
- 3.5 **CLEAN-UP**
- .1 Clean all surfaces adjacent to sealed holes and joints to be free of excess firestop materials and soiling as work progresses.
 - .2 Remove excess materials and debris immediately after application.
- 3.6 **SCHEDULE OF FIRESTOP AND SMOKE SEAL LOCATIONS**
- .1 Following firestop and smoke seal location schedule is included for convenience and may not be complete. Examine Contract Drawings and other specification sections and determine entire extent of work of this Section. Generally provide systems with required fire and smoke ratings at following locations:
 - .1 Gaps at intersections of fire-resistance rated walls and partitions.
 - .2 Control and sway joints in fire-resistance rated walls and partitions.
 - .3 Gaps at top of fire-resistance rated partitions and walls.
 - .4 Penetrations through fire-resistance rated walls and partitions including mechanical and electrical services and openings and sleeves for future use.
 - .5 Penetrations through fire-resistance rated floor slabs, ceilings, and roofs.
 - .6 Gaps at edge of floor slabs at exterior walls.
 - .7 Perimeter of retaining angles on rigid ducts greater than 0.012 m², firestopping material between retaining angle and fire separation and between retaining angle and duct, on each side of fire separation.
 - .8 Where indicated on drawings.
 - .9 At non-rated assemblies that require a smoke seal.
 - .10 Where required by Ontario Building Code.

END OF SECTION

1 General

1.1 DESCRIPTION

- .1 This section provide the elastomeric sealants and their implementation that are used to seal building joint assemblies.
- .2 Labour, Products, equipment and services necessary for sealant Work in accordance with the Contract Documents.
- .3 Work of this Section does not include sealants in firestopping and smoke sealed assemblies.
- .4 Work of this Section does not include sealant work identified in individual specification sections.

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C 919-[08], Standard Practice for Use of Sealants in Acoustical Applications.
 - .2 ASTM C834, Specification for Latex Sealants.
 - .3 ASTM C920, Specification for Elastomeric Joint Sealants.
 - .4 ASTM C1330, Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.
- .2 Canadian General Standards Board (CGSB)
 - .1 CGSB 19-GP-5M-[1984], Sealing Compound, One Component, Acrylic Base, Solvent Curing (Issue of 1976 reaffirmed, incorporating Amendment No. 1).
 - .2 CAN/CGSB-19.13-[M87], Sealing Compound, One-component, Elastomeric, Chemical Curing.
 - .3 CGSB 19-GP-14M-[1984], Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing (Reaffirmation of April 1976).
 - .4 CAN/CGSB-19.17-[M90], One-Component Acrylic Emulsion Base Sealing Compound.
 - .5 CAN/CGSB-19.24-[M90], Multi-component, Chemical Curing Sealing Compound.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for joint sealants and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Product data: Submit copies of Product data in accordance with Section 01 10 10 describing type, composition and recommendations or directions for surface preparation, material preparation and material installation.
 - .3 Manufacturer's product to describe:

- .1 Caulking compound.
 - .2 Primers.
 - .3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.
 - .2 Samples:
 - .1 Submit samples of each type of material and colour.
 - .2 Cured samples of exposed sealants for each colour where required to match adjacent material.
 - .3 Two samples of sealant/caulking, for colour selection. Two samples of back-up material and primer for physical characteristics.
 - .3 Manufacturers' Instructions
 - .1 Submit instructions to include installation instructions for each product used.
- 1.4 **DELIVERY, STORAGE AND HANDLING**
 - .1 Arrange delivery of materials in original, unopened packages with labels intact, including batch number, and ensure that on-site storage is kept to a minimum. Do not store materials on site where there exists any danger of damage from moisture, direct sunlight, freezing and other contaminants.
 - .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
 - .3 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
 - .4 Storage and Handling Requirements:
 - .1 Store materials indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect joint sealants from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
- 1.5 **QUALITY ASSURANCE**
 - .1 Qualifications: Work of this Section shall be executed by trained applicators approved by sealant manufacturer and having a minimum of 5 years proven experience.
- 1.6 **EXTENDED WARRANTY**
 - .1 Submit an extended warranty for Sealant Work in accordance with General Conditions, except that warranty period is extended to 2 years from date of Substantial Performance of the Work.
 - .1 Warrant against leakage, cracking, crumbling, melting, shrinkage, running, loss of adhesion and staining adjacent surfaces.
 - .2 Coverage: Complete replacement including affected adjacent Work.
- 1.7 **SITE CONDITIONS**

- .1 Do not install materials when ambient air temperature is less than 5 degrees Celsius, when recesses are wet or damp, or to manufacturer's recommendations.
- .2 Ambient Conditions:
 - .1 Proceed with installation of joint sealants only when:
 - .1 Ambient and substrate temperature conditions are within limits permitted by joint sealant manufacturer or are above 4.4 degrees C.
 - .2 Joint substrates are dry.
 - .3 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.
 - .3 Joint-Width Conditions
 - .1 Proceed with installation of joint sealants only where joint widths are as allowed by joint sealant manufacturer for applications indicated.
 - .4 Joint-Substrate Conditions:
 - .1 Proceed with installation of joint sealants only after contaminants capable of interfering with adhesion are removed from joint substrates.
- 2 Products**
- 2.1 SEALANT MATERIALS**
 - .1 All materials under Work of this Section, including but not limited to, primers and sealants are to have low VOC content limits.
 - .2 Use materials as received from manufacturers, without additives or adulterations. Use one manufacturer's Product for each kind of Product specified.
 - .3 Do not use caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant in air handling units.
 - .4 When low toxicity caulks are not possible, confine usage to areas which off gas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off gas time.
 - .5 Where sealants are qualified with primers use only these primers.
 - .6 Where exposed the colours shall match the substrate, as approved by the Owner.
- 2.2 Sealant Type A: ASTM C920, Type S, Grade NS, Class 25; One-part, non-sag type, silicone sealant, in standard colours selected.**
 - .1 'DC CWS' by Dow Corning Inc.
 - .2 'Sikasil 305CN' by Sika.
 - .3 'Tremsil 400' by Tremco.
- 2.3 Sealant Type B: ASTM C920, Type S, Grade NS; One-part mildew-resistant silicone, in standard colours selected.**
 - .1 '786 Mildew Resistant Silicone Sealant' by Dow Corning Inc.
 - .2 'Sikasil GP Mildew Resistant' by Sika.

- .3 'Tremsil 200 Silicone Sealant' by Tremco Ltd.
- 2.4 Sealant Type C: ASTM C834; Pure acrylic siliconized sealant; in standard white colour (paintable).
 - .1 '950A Siliconized Acrylic Latex Caulk' by Sherwin Williams.
 - .2 'Tremflex 834 Siliconized Sealant' by Tremco Ltd.
 - .3 Sealant Type D: Urethanes one part: Non-sag: to CAN/CGSB-19.13, Type 2, approved products include:
 - .1 Dymonic by Tremco;
 - .2 SikaFlex 15LM by Sika;
 - .3 or approved alternate.
 - .4 Preformed compressible and non-compressible back-up materials:
 - .1 Polyethylene, urethane, neoprene or vinyl foam:
 - .1 Extruded closed cell foam backer rod.
 - .2 Size: oversize 30 %.
 - .2 Neoprene or butyl rubber:
 - .1 Round solid rod, Shore A hardness 70.
 - .3 High density foam:
 - .1 Extruded closed cell polyvinyl chloride (PVC), extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/m³ density, or neoprene foam backer, size as recommended by manufacturer.
 - .4 Bond breaker tape:
 - .1 Polyethylene bond breaker tape which will not bond to sealant.
- 2.5 **ACCESSORIES**
 - .1 Primers: Type recommended by material manufacturers for various substrates, primers to prevent staining of adjacent surfaces encountered on project.
 - .2 Joint backing: ASTM C1330; Round, solid section, closed cell, skinned surface, soft polyethylene foam gasket stock, compatible with primer and sealant materials, 30 to 50% oversized, Shore A hardness of 20, tensile strength 140 to 200 kPa. Bond breaker type surface.
 - .3 Bond breaker: Type recommended by material manufacturers.
 - .4 Void filler around the window frames to be one part expanding polyurethane foam.
 - .5 Cleaning agents: As recommended by material manufacturer, non-staining, harmless to substrates and adjacent finished surfaces.
- 2.6 **MIXING**
 - .1 Follow manufacturers instructions on mixing, shelf and pot life.
- 2.7 **JOINT CLEANER**

- .1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant in accordance with sealant manufacturer's written recommendations.
- .2 Primer: in accordance with sealant manufacturer's written recommendations.
- 3 Execution**
- 3.1 EXAMINATION**
 - .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for joint sealants installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence prior to sealant installation.
 - .2 Inform the Consultant of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied. Proceeding with the installation will be the acceptance of the substrate by the Contractor.
- 3.2 SURFACE PREPARATION**
 - .1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.
 - .2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other
 - .3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.
 - .4 Ensure joint surfaces are dry and frost free.
 - .5 Prepare surfaces in accordance with manufacturer's directions.
 - .6 Prepare joints to receive sealants to manufacturer's instructions. Ensure that joints are clean and dry and ferrous surfaces are free from rust and oil.
 - .7 Clean recesses to receive sealant, to be free of dirt, dust, loose material, oil, grease, form release agents and other substances detrimental to sealant's performance.
 - .1 Remove lacquer or other protective coatings from metal surfaces, without damaging metal finish, using oil-free solvents. Remove rust, mill scale and coatings from ferrous metals by wire brush, grinding or sand blasting. Ensure recess is dry.
 - .2 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings. Remove incompatible coatings as required.
 - .8 Ensure that all materials in contact with sealant are compatible. Test substrate for adhesion.
 - .9 Depth of recess: Maintain depth to ½ joint width up to a maximum of 13 mm and not less than 6 mm at centre of joint. For greater depth, use joint backing under. Where recess is less than specified depth, cut back surface of recess to specified recess depth.

- .10 Install polyethylene backing rod in joints 6 mm or more in width. Roll backing rod into joint. Do not stretch or bend backing rod. Install bond breaker to back of recess.
- .11 Prime sides of recess, in accordance with sealant manufacturer's instructions.
- .12 Condition products for use in accordance with manufacturer's recommendations.

3.3 **INSTALLATION**

- .1 Apply sealant immediately after adjoining Work is in condition to receive such Work. Apply sealant in continuous bead using gun with correctly sized nozzle. Use sufficient pressure to evenly fill joint.
- .2 Ensure sealant has full uniform contact with, and adhesion to, side surfaces of recess. Superficial painting with skin bead is not acceptable. Tool sealant to smooth surface, free from ridges, wrinkles, sags, air pockets, embedded impurities, dirt, stains or other defects.
 - .1 At recesses in angular surfaces, finish sealant with flat profile, flush with face of material at each side.
 - .2 At recesses in flush surfaces, finish compound with concave face, flush with face of material at each side.
- .3 Make sealant bead uniform in colour.
- .4 Cure sealants in accordance with sealant manufacturer's instructions. Do not cover up sealants until proper curing has taken place.
- .5 Immediately remove excess compound or droppings which would set up or become difficult to remove from adjacent finished surfaces, using recommended cleaners, as work progresses. Do not use scrapers, chemicals or other tools which could damage finished surfaces. Remove defective sealant.
- .6 Clean recesses and re-apply sealant.
- .7 Remove masking tape immediately after joints have been sealed and tooled.

3.4 **PRIMING**

- .1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.
- .2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

3.5 **BACKUP MATERIALS**

- .1 Apply bond breaker tape where required to manufacturer's instructions.
- .2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

3.6 **APPLICATION**

- .1 Sealant:
 - .1 Apply sealant in accordance with manufacturer's written instructions to achieve the required minimum and maximum sealant depths.

- .2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.
- .3 Apply sealant in continuous beads.
- .4 Apply sealant using gun with proper size nozzle to achieve a minimum 6mm depth over the joint profile and adhesive to substrate a minimum of 9mm, and 10mm minimum joint width, while maintaining a consistent depth-to-width ratio.
- .5 Use sufficient pressure to fill voids and joints solid.
- .6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.
- .7 Tool exposed surfaces before skinning begins to give slightly concave shape.
- .8 Remove excess compound promptly as work progresses and upon completion.
- .9 Apply multiple application of sealant to build up the required joint-to-width ratio for joints in excess of 19mm wide, and within the manufacturer's recommendations.
- .2 Curing:
 - .1 Cure sealants in accordance with sealant manufacturer's instructions.
 - .2 Do not cover up sealants until proper curing has taken place.

3.7 CLEANING

- .1 Clean surfaces adjacent to joints, remove sealant smears or other soiling resulting from application of sealants. At metal surfaces, remove residue. Do not mar or damage finishes on materials adjacent to joints. Repair or replace marred or damaged materials.
- .2 Leave Work area clean at end of each day.
- .3 Clean adjacent surfaces immediately.
- .4 Remove excess and droppings, using recommended cleaners as work progresses.
- .5 Remove masking tape after initial set of sealant.
- .6 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

3.8 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by joint sealants installation.

3.9 SCHEDULE OF LOCATIONS

- .1 Following sealant location schedule is included for convenience and may not be complete. Examine Contract Drawings and other specification sections and determine entire extent of Work of this Section. Generally seal following locations:

- .1 Concrete, masonry, wood and stone to metal. Wood to masonry, concrete and stone.
- .2 Metal to metal.
- .3 All dissimilar materials.
- .4 Where 'sealant' or 'caulking' is indicated on drawings.
- .2 Sealant Type A:
 - .1 Exterior joints between masonry and steel or aluminum.
 - .2 Exterior joints between masonry and shelf angle.
 - .3 Exterior joints between steel or aluminum and concrete or masonry. Interior and exterior control joints, except in floors.
 - .4 Door frames, louvre frames, interior and exterior side.
 - .5 Protrusions through interior and exterior walls and floors, interior and exterior side, except where fire rated seals are required.
 - .6 Seal thresholds.
- .3 Sealant Type B:
 - .1 Between mechanical fixtures/fittings. Between access panels.
- .4 Sealant Type C:
 - .1 Perimeter of interior windows.
 - .2 Junction between drywall and masonry.
- .5 Sealant Type D:
 - .1 Exterior joints between roof and mechanical fixtures/fittings
 - .2 Perimeter of roof.

END OF SECTION

- 1** General
- 1.1** **SECTION INCLUDES**
 - .1 Labour, Products, equipment, tools, and services necessary for the metal doors and frames work in accordance with the Contract Documents.
- 1.2** **REFERENCES**
 - .1 ASTM A653/A653M, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .2 ASTM A568/A568M, Specification for General Requirements for Steel, Carbon and High-Strength Low-Alloy, Hot-Rolled Sheet and Cold-Rolled Sheet.
 - .3 CAN4/ULC-S104M, Standard Method for Fire Test of Door Assemblies.
 - .4 CAN4/ULC-S105M, Standard Specification for Fire Door Frames, Meeting the Performance Required by CAN4/ULC-S104M.
 - .5 CAN/CGSB-1.198, Cementitious Primer, (for Galvanized Surfaces).
 - .6 CSA W47.1, Certification of Companies for Fusion Welding of Steel Structures.
 - .7 CGSB 31-GP-105Ma Zinc Phosphate Conversion Coating for Paint Base
 - .8 CAN/CSA-G40.21-M92 Structural Quality Steels
 - .9 CSA W59-M89 Welded Steel Construction (Metal Arc Welding)
 - .10 NFPA 80 Fire Doors and Windows
 - .11 NFPA 252-95 Standard Methods of Fire Tests of Door Assemblies
- 1.3** **DESIGN REQUIREMENTS**
 - .1 Design exterior frame assemblies to accommodate expansion and contraction when subjected to minimum and maximum surface temperature of -35°C to 35°C.
- 1.4** **SUBMITTALS**
 - .1 Product data: Submit manufacturer's Product data in accordance with Section 01 10 10 indicating door and frame construction.
 - .2 Shop drawings:
 - .1 Submit shop drawings in accordance with Section 01 10 10 for each type of door and frame indicating:
 - .1 Thickness and type of steel.
 - .2 Thickness and type of core.
 - .3 Thickness and type of steel stiffeners and location of them within the door.
 - .4 Thickness and type of metal facing on edges of door and method of fastening.
 - .5 Location of mortises, reinforcement, anchorages, joining, welding, sleeving, exposed fasteners, openings and arrangement for hardware.

- .2 Include schedule identifying each unit with door marks and numbers relating to numbering on Contract Drawings and in door schedule
- .3 Mill Certification: Submit mill certification on all materials used to fabricate items specified.

1.5 QUALITY ASSURANCE

- .1 Perform work in accordance with requirements by a member of the Canadian Steel Door and Frame Manufacturers Association.
- .2 Label and list fire rated doors and frames by an organization acceptable to authorities having jurisdiction and accredited by the Standards Council of Canada in conformance with CAN4/ULC-S104M and CAN4/ULC-S105M for ratings indicated, labelling shall be in accordance with NFPA 80.

2 Products

2.1 ACCEPTABLE MANUFACTURERS

- .1 Apex Industries
- .2 Daybar Industries Limited
- .3 Fleming Doors Products.
- .4 Steel-Craft Door Products Ltd

2.2 MATERIALS

- .1 General:
 - .1 All materials under work of this Section, including but not limited to, primers are to have low VOC content limits.
 - .2 Materials used for the door & frame construction in this section to conform to: CAN/CSA-G40.21, Type 44W coating designation to ASTM A653.
 - .3 Galvanized Steel Sheets: (G90) Mill phosphatize in addition to coating specified at referenced HM standard. Provide at shower, washrooms doors and frames and other doors and frames where indicated as well as at exterior doors and frames.
 - .4 Supports and Anchors: Same material as frame including gage and galvanizing where indicated.
 - .5 Inserts, Bolts, and Fasteners: Manufacturer's standard units. Hot-dip galvanize in compliance with ASTM A 153, Class C or D as applicable at exterior walls and where opening is indicated to be galvanized.
 - .6 Provide shop primers for security hollow metal doors & frames were welded.
- .2 Minimum base steel thickness:
 - .1 Frames 2.7 mm G90 Galvanized steel
 - .2 Typical doors 1.91 mm G90 Galvanized steel faces

.3	Lock/strike reinforcements	1.6 mm
.4	Hinge reinforcements	2.7 mm
.5	All other reinforcement	1.6 mm
.6	Top and bottom channels	1.2 mm
.7	Glazing stops	0.9 mm
.8	Guard boxes	0.9 mm
.9	Jamb spreaders	0.9 mm
- .3 Top caps and thermal breaks: CGSB 41-GP-19Ma; Rigid PVC extrusions.
- .4 Primer: CAN/CGSB 1.198.
- .5 Door material:
- .1 Interior and Exterior Doors: Provide minimum 1.91 mm (14 gauge) sheet G90 galvanized steel faces.
 - .2 Stiffeners: Provide 16ga A40 galvaneal stiffeners to extend full height top to bottom and maximum 75 mm(3") from door sides. Where stiffeners are not continuous between face sheets, weld internal joints 100 mm (4") o.c. max. Cope at hardware preparations only. Provide one of the following stiffener types:
 - .3 Edge Channels: Continuously weld to both face sheets.
 - .4 Flush Closing Channels: Continuously weld to both face sheets.
 - .5 Insulation: Core mineral fiber 48 kg/cubic meters density minimum.
 - .6 Hardware Reinforcements and Preparations: Comply with referenced HM standard and the following:
 - .1 Strike Plate: Do not cut edge channel to receive entire strike or keeper. Provide punched opening to engage bolt in edge channel matching cut-out in strike plate.
 - .2 Drilling and tapping for surface applied hardware may be done at project site.
 - .7 Exterior doors: Rigid poly/isocyanurate, closed cell insulation, 32 kg/m³, thermal value: RSI 1.9.
 - .8 Fire rated doors: Mineral fibre insulation to CAN/ULC S702, Type 1A; 24 kg/m³.
- .6 Screws: Stainless steel screws with countersunk flat head.
- .7 Door silencers: Type 6-180, black neoprene.
- .8 Frame anchors:
- .1 Frames in masonry: 1.2 mm minimum, adjustable T-strap jamb anchors.

- .2 Frames in steel stud partitions: 0.9 mm minimum steel anchors of suitable design securely welded inside each jamb.
- .3 Frames in precast: Countersunk galvanized expansion bolts complete with galvanized anchor, base anchors, and spacers behind hollow metal frame.
- .4 Frames in existing masonry/concrete/precast walls: 0.9 mm minimum frame anchors to suit design.
- .5 Labeled frames: In accordance with ULC requirements.
- .9 Floor anchors: 1.6 mm minimum adjustable floor clip angles with 2 holes for anchorage to floor.
- .10 Labels for fire doors and door frame: Brass plate, riveted to door and door frame.
- .11 Grilles: Corrosion resistant steel with baked enamel finish. Model 61DG Series by Nailor Industries Inc or approved alternative by Hart and Cooley.
- .12 Glass and glazing: In accordance with Section 08 80 00.

2.3 **FABRICATION**

- .1 General
 - .1 Fabricate doors and frames in accordance with reviewed shop drawings.
 - .2 Welding: CSA W59-M to produce a finished unit with no visible seams or joints, square, true and free of distortion.
 - .3 Welding: Continuous unless specified otherwise. Execute welding by a firm fully acceptable to the Canadian Welding Bureau to requirements of CSA W47.1.
 - .4 Form profiles accurately to details shown on Contract Drawings.
 - .5 Ream and remove burrs from drilled and punched holes.
 - .6 Grind welded corners and joints to a flat plane and fill with metallic filler and sand to a uniform smooth finish. Apply one coat of primer.
 - .7 Provide weather strip for exterior doors in accordance with Section 08 70 00 and door manufacturer.
- .2 Frames and screens:
 - .1 Fabricate frames of welded construction. Cut mitres and joints accurately and weld continuously on inside of frame profile. Exterior frames to be thermally broken.
 - .2 Construct large frame sections with provision for on Site assembly to suit Site conditions.
 - .3 Blank, reinforce, drill and tap frames for mortised, templated hardware. Protect mortised cut-outs with guard boxes.
 - .4 Reinforce frames where required for surface mounted hardware.

- .5 Reinforce frames over 1200 mm wide with roll formed steel channels or hollow structural sections specified in Section 05 50 00 and as indicated on drawings.
- .6 Furnish exterior door frames with a continuously welded integral steel weather drip at head of frame.
- .7 Prepare each door opening for single stud rubber door silencers, 3 for single door openings located in strike jamb, and 2 for double door openings located in head.
- .8 Install 2 channel or angle spreaders per frame, to ensure correct frame alignment. Install stiffener plates or spreaders between frame trim where required, to prevent bending of trim and to maintain alignment when setting in place.
- .9 Form channel glazing stops minimum 16 mm height, accurately cut, mitred, fitted and fastened to frame sections with stainless steel counter-sunk, flat head screws spaced at maximum 450 mm throughout and 50 mm from each end.
- .10 Frame Fill: Prepare heads, jambs, and sills abutting structure, walls, or floors for solid anchorage with full grout fill. Exclude grout from mullions except where otherwise indicated.
 - .1 Grout Guards: At frames to be grouted, tightly weld 0.45 mm(0.018") minimum steel grout guards at screw holes, cut outs, and hardware preparations including those for removable glazing stops, locksets, pushbuttons, strike plates, hinges, etc. Additionally at hinge preparations Contractor to provide polyurethane or polystyrene foam fill or otherwise tightly seal grout guards to keep screw holes grout free.
- .3 Anchorage:
 - .1 Anchor units to floor and wall construction. Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb, minimum number of anchors for each jamb:
 - .1 Frames up to 2285 mm 3 anchors.
 - .2 Frames from 2285 mm to 2440 mm 4 anchors.
 - .2 Where frames are to be set in masonry or concrete, supply adjustable anchors to trade installing frame.
 - .3 Fabricate frames for installation in steel stud partitions with steel anchors of suitable design, minimum number of anchors for each jamb:
 - .1 Frames up to 2285 mm height 4 anchors.
 - .2 Frames 2285 mm to 2440 mm 5 anchors.

- .4 Frames in previously placed concrete, masonry, precast or structural steel:
 - .1 Anchors located at 150 mm maximum from top and bottom of each jamb, and intermediate anchors at maximum 660 mm o.c.
- .4 General Door Requirements:
 - .1 Hollow steel construction, flush swing type, of sizes to conform to details, schedules and reviewed shop drawings with provisions for cut-outs for glass and grilles and reinforced to receive hardware fastenings.
 - .2 Blank, reinforce, drill and tap doors for mortised, templated hardware. Where required, reinforce doors for surface mounted hardware and door closers.
 - .3 Reinforce oversized doors with steel channels and plates specified in Section 05 50 00 and as indicated on drawings.
 - .4 Where openings are required, form integral cut-outs with framing, glass stop moldings and division bars.
 - .5 Install grilles to fit tight and secure into openings.
 - .6 Bevel both stiles of single doors 1 in 16.
 - .7 Reinforce doors with galvanized metal stiffeners at 150 mm o.c.
- .5 Interior Doors:
 - .1 Supply and install inverted, recessed, mechanically interlocked with tack welded channels at top and bottom of doors.
 - .2 Fabricate doors with joints between front and back panels meeting on stile edges. Make joints mechanically interlocked and tack welded for entire height of door. After welding has been completed, grind joints smooth to match metal. Ensure that no filler is used in joints.
 - .3 Fill hollow space within door and vertical stiffeners from top to bottom with mineral fibre batt insulation.
- .6 Exterior Doors:
 - .1 Supply and install inverted, recessed, mechanically interlocked with tack welded channels at top and bottom of doors. Supply and install PVC top caps.
 - .2 Fabricate doors with joints between front and back panels meeting on stile edges. Make joints mechanically interlocked and tack welded for entire height of door. After welding has been completed, grind joints smooth to match metal. Ensure that no filler is used in joints.
 - .3 Fill hollow space within door from top to bottom with rigid polyisocyanurate insulation.
- .7 Fire Rated Doors:

- .1 Supply and install inverted, recessed, spot welded channels at top and bottom of doors. Supply and install steel flush top caps on exterior doors.
- .2 Fabricate doors with joints between front and back panels meeting on stile edges. Make joints continuously welded for entire height of door. After welding has been completed, grind joints smooth to match metal. Ensure that no filler is used in joints.
- .3 Fabricate doors to achieve fire rating as indicated on drawings and in accordance with ULC. Provide ULC label plate on door at hinged edge midway between top hinge and head of door.

3 Execution

3.1 EXAMINATION

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.

3.2 HOLLOW METAL DOOR AND FRAME INSTALLATION

- .1 Install hollow metal doors and frames plumb, square, level, secure, and at correct elevation.
- .2 Install doors clear of floor finishes, and with the correct rebate opening for the door installation. Install door silencers.
- .3 Secure anchorages and connections to adjacent construction. Brace frames rigidly in position while building-in. Remove temporary steel shipping jamb spreaders. Install wood spreaders at third points of frame rebate height to maintain frame width. Supply and install vertical supports as indicated on drawings for openings over 1200 mm in width. Remove wood spreaders after frames have been built-in.
- .4 Allow for structural deflection and prevent structural loads from being transmitted to hollow metal frames.
- .5 Touch-up areas where galvanized coating has been removed or damaged with primer.
- .6 Fire rated doors: Install fire rated doors and frames in accordance with requirements of NFPA 80.

3.3 ADJUSTING AND CLEANING

- .1 Adjust doors for smooth and balanced door movement.
- .2 Clean doors and frames.

END OF SECTION

1 General

1.1 SECTION INCLUDES

- .1 Labour, Products, equipment and services necessary for painting work in accordance with the Contract Documents.

1.2 REFERENCES

- .1 AAMA 611, Voluntary Standards for Anodized Architectural Aluminum.
- .2 AAMA CW-10, Care and Handling of Architectural Aluminum from Shop to Site.
- .3 AAMA CW-DG-1, Aluminum Curtain Wall Design Guide Manual.
- .4 AAMA/WDMA/CSA 101/I.S.2/A440, Standard Specification for Windows, Doors, and Unit Skylights.
- .5 ANSI H35.1M, Alloy and Temper Designation Systems for Aluminum (Metric).
- .6 ASTM A167, Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip.
- .7 ASTM B209M, Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- .8 ASTM B221M, Specification for Aluminum-Alloy Extruded Bars, Rods, Wires, Profiles and Tubes.
- .9 ASTM C920, Specification for Elastomeric Joint Sealants.
- .10 ASTM E283, Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
- .11 ASTM E330, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- .12 ASTM E331, Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.
- .13 ASTM F738M, Specification for Stainless Steel Metric Bolts, Screws, and Studs.
- .14 CAN/CGSB 1.108-M, Bituminous Solvent Type Paint.
- .15 CAN/ULC S702, Thermal Insulation, Mineral Fibre, for Buildings.
- .16 NFRC 100, Procedure for Determining Fenestration Product U-factors
- .17 NFRC 200, Procedure for Determining Fenestration Product Solar Heat Gain

1.3 DEFINITION

- .1 Aluminum Work: Shall mean aluminum curtainwall, windows, and framing.

1.4 DESIGN REQUIREMENTS

- .1 Design Aluminum Work to meet requirements of AAMA/WDMA/CSA 101/I.S.2/A440, AAMA CW-DG-1, ASTM E283, ASTM E330, ASTM E331, NFRC 100, NFRC 200 and to meet performance and energy requirements specified herein and as required by authorities having jurisdiction.
- .2 Design Aluminum Work in accordance with following Climatic Design Data for Mississauga contained in the Ontario Building Code:
 - .1 Design temperature: January 1%, July 2 1/2% .
 - .2 Hourly wind pressures: 1 in 50 year occurrence.
- .3 Design Aluminum Work to accommodate following without producing detrimental effect:
 - .1 Cyclic 40°C daily thermal swing of components.
 - .2 Cyclic, dynamic loading and release of loads such as wind loads.
 - .3 13 mm vertical deflection in supporting structure and movement of supporting structure due to live, dead load, and creep or deflections, seismic load, sway displacement and similar items.
- .4 Design to prevent accumulation of condensate on interior side of Aluminum Work framing under the following service conditions:
 - .1 Interior summer temperature: 21°C.
 - .2 Interior winter temperature: 21°C.
 - .3 Exterior temperature: -20°C.
 - .4 Interior RH: 35%.
- .5 Design windows in accordance to AAMA/WDMA/CSA -101/I.S.2/ A440, to the following performance levels:
 - .1 Performance class: CW.
 - .2 Minimum performance grade (PG): 35.
 - .3 Minimum positive design pressure: 1680 Pa.
 - .4 Minimum negative design pressure: - 1680 Pa.
 - .5 Minimum water penetration test pressure: 290 Pa.
 - .6 Minimum air infiltration/exfiltration: A3.
 - .7 Condensation resistance: I57
- .6 Restrict air infiltration/exfiltration, through Aluminum Work in accordance with ASTM E283 at pressure differential as indicated:
 - .1 Curtainwalls assemblies: 0.0003 m³/s m² at differential of 300Pa.
- .7 Design and detail controlled drainage path to actively discharge water, which enters into or forms within Aluminum Work, to exterior; prevent accumulation or storage of water within Aluminum Work. Prevent water from entering interior when tested in accordance with ASTM E331.
- .8 Design and detail air barrier, vapour retarder, and rainscreen products and

assemblies into continuous and integrated Aluminum Work envelope. Optimize Aluminum Work design to align envelope layers and to minimize thermal bridges.

- .9 Prevent deflection and permanent or progressive glazing displacement. Restrict horizontal and vertical mullion deflection to less than $L/175$ and 19 mm maximum for heights under 4115 mm and $L/240$ and 25 mm maximum for heights over 4115 mm.
- .10 When tested at 150 percent of positive and negative wind-load design pressures, systems, including anchorage, do not evidence material failures, structural distress, and permanent deformation of main framing members exceeding 0.2 percent of span in accordance with ASTM E330.
- .11 Design anchorage inserts for installation as part of other Sections of Work. Design anchorage assemblies to accommodate construction and installation tolerances.
- .12 Provide all reinforcing within aluminum members as required by design and OBC to provide structurally sound assembly. In any case, mullion size shall not be increased due to provision of reinforcing.
- .13 Design Aluminum Work and connections to substrate where the bottom of the Aluminum Work extends to a point below 1070 mm above finished floor level and separates a floor level from an adjacent interconnected space to withstand the required guard and handrail loads in accordance with the OBC and applicable local regulations. When requested by Consultant, provide a letter signed and sealed by a Professional Engineer certifying that the Aluminum Work conforms to the OBC requirements.
- .14 Design operable windows within reach of occupants with limiting stops conforming to requirements of OBC.

1.5 SUBMITTALS

- .1 Shop drawings:
 - .1 Submit shop drawings in accordance with Section 01 10 10 indicating:
 - .1 Plans, sections, details, type of extrusions, profiles, finishes, panels, operating components, related flashings, closures, fillers, and end caps, and sealants.
 - .2 Products and glazing types.
 - .3 Calculations or modelling confirming Aluminum Work conforms to specified performance and energy requirements.
 - .4 Structural integrity of Aluminum Work, anchorage inserts, and system installation tolerances.
 - .5 Section and hardware reinforcement, anchorage, assembly fixings.
 - .6 Detailing, locations, and allowances for movement, expansion, contraction
 - .7 Air barrier and vapour retarder continuity and path of cavity drainage and air pressure equalization.
 - .2 Samples:

- .1 Submit two samples of following in accordance with Section 01 10 10.
 - .1 250 mm long samples of each type of extrusion and finish.
 - .2 250 x 200 mm samples of insulating glass unit.
 - .3 250 x 200 mm sample of aluminum panel.
- .3 Reports:
 - .1 Submit substantiating engineering data, and independent test results of pre-tested, Aluminum Work to substantiate compliance with the design criteria including air leakage and water penetration conforming to ASTM E283 and ASTM E331.
 - .2 Submit documentation to substantiate ten years of experience in Aluminum Work manufacture and installation.
- .4 Close-out submittals: Submit Aluminum Work data for incorporation into the Operations and Maintenance Manual as part of Section 01 10 10.

1.6 QUALITY ASSURANCE

- .1 Retain a Professional Engineer, licensed in Province of Ontario, with experience in Aluminum Work of comparable complexity and scope to perform the following services as part of the Work of this Section:
 - .1 Design of Aluminum Work.
 - .2 Review, stamp, and sign shop drawings.
 - .3 Conduct on-Site inspections and prepare and submit inspection reports.
- .2 Shop mock-up:
 - .1 Fabricate and erect one, full scale mock-up in shop of Aluminum Work for shop testing, including air leakage, water penetration, and deflection in accordance with AAMA/WDMA/CSA 101/I.S.2/A440, ASTM E283, ASTM E330, and ASTM E331.
 - .2 Demonstrate conformance to specified design requirements.
 - .3 Mock-up shall show full range of Products, finishes, textures, quality of fabrication, and workmanship including, but not limited to, framing members, glazing units, anchorage, opening units, and transitions to adjoining assemblies and materials.

1.7 DELIVERY, STORAGE, AND HANDLING

- .1 Handle Aluminum Work in accordance with AAMA CW-10.
- .2 Protect aluminum surfaces with strippable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather. Do not remove before final cleaning of building.

1.8 EXTENDED WARRANTY

- .1 Aluminum work: Submit an extended warranty for Aluminum Work in accordance with General Conditions, except that warranty period is extended to 5 years.
 - .1 Warrant against failure to meet the design criteria and requirements such as interior leakage, finish degradation, frame condensation.
 - .2 Coverage: Complete replacement including affected adjacent Work
- .2 Glazing:

- .1 Provide a 10 year warranty, commencing from date of Substantial Performance, against defects in the insulating glass units and warrant them to be free from material obstruction of vision as a result of dust or film formation on the internal glass surfaces by any cause, under normal design conditions. Warrant the following:
 - .1 The insulating glass units shall be free from condensation, fogging material obstruction of vision as a result of dust or film formation on the internal glass surfaces by any cause under design conditions.
 - .2 The insulating glass units shall not change their mechanical design properties and shall not in any way deteriorate, degrade, delaminate or change their visual appearance.
 - .3 The glass units will not break due to thermal shock and temperature differential due to inherent glass faults, other than extrinsic glass breakage.
- .2 Warrant that glazing work is water and weather tight and free from distortion; that glazing materials will not deteriorate from exposure to the atmosphere and weather, will not be displaced, and will be free from permanent deformation under load; and that glass and insulating glass units will not be broken, cracked or scratched by causes resulting from defects in material, workmanship or design of glazing installation.
- .3 Cracked or scratched glass, shrinking, cracking, staining, hardening, sagging of glazing materials; loosening or rattling of glass; and leaking of glazed joints will be considered defective work.
- .4 Warranty shall provide for the removal of defective Products, replacement with new Products conforming to the specifications, and restoration of work damaged by removal and replacement including labour and installation costs.

2 Products

2.1 ACCEPTABLE MANUFACTURER(S) AND SYSTEM(S):

- .1 Curtain Wall (CTW-1): "1600 SS Curtain Wall System" by Kawneer, or approved alternative by Alumicor Limited or CRL or Windspec Inc.. Designed for 133 mm back section and 19 mm deep mullion caps.

2.2 MATERIALS

- .1 All materials under Work of this Section, including but not limited to, sealants are to have low VOC content limits.
- .2 Aluminum extrusions and channels: ASTM B221 and ANSI H35.1 AA6063 alloy, T6 temper.
 - .1 Profile and dimensions: Refer to Contract Drawings.
 - .2 Thermal breaks in frame members: Vertically aligned with glazing.
- .3 Aluminum sheet: ASTM B209 and ANSI H35.1 AA1100 aluminum alloy, H14 temper, minimum 1.29 mm for sheets less than 610 mm wide and minimum 2.05 mm for sheets of a greater dimension.
- .4 Reinforcements and anchors: ASTM A167, Type 304 to AISI No. 2B finish. Size as shown.
- .5 Glass and glazing materials: As specified in Section 08 80 00.
- .6 Air seal and Aluminum Work sealant: ASTM C920, Type S, Grade NS, Class 100/50;

One-part, low-modulus, moisture-curing, silicone. 'Dow Corning 790' by Dow Corning; 'Spectrem 1' by Tremco. Verify compatibility with insulating glass unit manufacturer's secondary sealant. Colour as selected by Consultant. Primer as recommended by manufacturer.

- .7 Frame sealant: Type as recommended by the Aluminum Work manufacturer.
- .8 Joint backing: Closed cell foam polyethylene rod, outsized minimum 30-50% larger than joint width and compatible with joint sealant. Product as recommended by sealant manufacturer.
- .9 Air seal transition membrane: 'Soprseal Stick 1100' by Soprema Inc., 'Exoair 110' by Tremco or 'Air-Shield' by W.R. Meadows. Membrane to come complete with applicable primer.
- .10 Anchors, clips, and angles: Extruded aluminum or stainless steel.
- .11 Shims and blocking for frame: Rigid plastic, wood is not permitted.
- .12 Flashings, closures and trim: 2.0 mm minimum aluminum sheet, finish to match curtain wall extrusion finish.
- .13 Screws, bolts and other fasteners: ASTM F738M; Stainless Steel Type 304.
- .14 Isolation coating: CAN/CGSB-1.108-M; Bitumastic coating, acid and alkali resistant material.
- .15 Pocket filler: PVC pocket filler.
- .16 Window hardware: Manufacturer's standard heavy duty corrosion resistant hardware.
- .17 Weatherstripping: Durable, non-absorbing material resistant to deterioration by aging and weathering.

2.3 FABRICATION

- .1 Fabricate sections true to detail, free from defects impairing appearance, strength and durability. Fabricate extrusions with sharp, well defined corners.
- .2 Fabricate Aluminum Work in accordance with reviewed shop drawings and manufacturer's written instructions.
- .3 Fabricate, fit, and secure framing joints and corners accurately, with flush surfaces, and hairline joints. Apply frame sealant at joints for weatherproof seams.
- .4 Conceal anchors, reinforcement and attachments from view. Fabricate reinforcement in accordance with design requirements.
- .5 Do not expose manufacturer's identification labels on aluminum assemblies.
- .6 Fabricate continuous sill flashings with intermediate anchor clips, and joint reinforcing, form to profile shown. Fabricate filler and closure pieces as necessary for a complete and weather tight installation.
- .7 Certify aluminum windows as complying with the AAMA/WDMA/CSA 101/I.S.2/A440 design criteria and requirements using an easily removable label located on the inside face of glazing.
- .8 Position operable windows on main frame to provide direction of opening specified, free and smooth operation, without binding or sticking against main frame members.
- .9 Fabricate Aluminum Work closures and trim from aluminum sheet. Form to profile shown. Make weathertight.
- .10 Double weatherstrip windows. Install weatherstripping in specially extruded ports and secure to prevent shrinkage or movement.
- .11 Fabricate glazing recess with drainage to exterior.

2.4 FINISH

- .1 Extrusion finish: Colour anodized to AAMA 611 per Aluminum Association Designation System for Aluminum Finishes AA-M12C22A44. Colour: To match existing.
- .2 Panel and sheet finish: As indicated on drawings to match adjacent extrusion finish

3 Execution

3.1 EXAMINATION

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.

3.2 REMOVAL OF EXISTING WINDOWS

- .1 Remove existing glazing, framing, sealant and other components of the existing window system as indicated.
- .2 Remove existing windows where indicated to be replaced only as new windows are ready for installation. Openings shall not be open to weather for more than a few hours from removal of existing windows to installation of new windows.
- .3 Thoroughly clean openings of dust, dirt, mortar and other foreign materials prior to installation of new windows. Ensure openings are dry prior to installation of new windows.
- .4 Dispose of removed material in accordance with Authorities having Jurisdiction.

3.3 INSTALLATION

- .1 Install Aluminum Work in accordance with reviewed shop drawings, manufacturer's instructions, AAMA/WDMA/CSA 101/I.S.2/A440 and to meet requirements of authorities having jurisdiction.
- .2 Install work of this Section securely, in correct location, level, square, plumb, at proper elevations, free of warp or twist.
- .3 Apply isolation coating at 0.8 mm dry film thickness to prevent corrosive or electrolytic action between dissimilar materials such as aluminum to concrete, masonry, galvanized steel and similar conditions.
- .4 Install flashings, closures, and trim pieces.
- .5 Fill voids between aluminum framing and adjacent construction with PVC pocket fillers.
- .6 Install sills in maximum lengths possible. For sills over 1200 mm in length, maintain 3 mm to 6 mm space at each end.
- .7 Refer to Contract Drawings for glazing type locations. Install glazing in accordance with Section 08 80 00.
- .8 Insulated panels:
 - .1 Set back pans to framing, apply sealant to cover screw heads to maintain air tight seal between back pans and framing.
 - .2 Adhere stick clips to metal back pans at 300 mm o.c. both ways. Apply insulation adhesive over entire surface of barrier and around clips held with adhesive.
 - .3 Cut insulation slightly over-size and press insulation boards firmly to barrier impaling them on clips without bending clips. Butt insulation boards tightly. install retainers to clips.
- .9 Remove damaged or unacceptable Products and assemblies from Site and replace

- to Consultant's acceptance.
- .10 Install glass presence markers, in two cross stripes extending from diagonal corners. Maintain markers until final clean-up.

3.4 ERECTION TOLERANCES

- .1 Tolerances: Non-cumulative.
- .1 Maximum variation from plumb: 1.5 mm/3 m non-cumulative or 12 mm/30 m, whichever is less.
- .2 Maximum misalignment of two adjoining members abutting in plane: 0.8 mm.
- .3 Vertical and horizontal positions: +/- 3 mm.
- .4 Racking of face: 6 mm, nil in elevation.
- .5 Operable components: Consistent with smooth operation and weatherproof performance.
- .6 Maximum perimeter sealant joint between Aluminum Work and adjacent construction: 13 mm.

3.5 GLAZING PERIMETER AIR SEAL

- .1 Install glazing perimeter air seal at entire perimeter of each insulating glass unit to achieve an air seal from insulating glass unit to curtain wall frame. Do not obstruct path of cavity drainage and air pressure equalization.
- .2 Perform sealant work in accordance with manufacturer's written requirements.

3.6 AIR SEAL TRANSITION MEMBRANE

- .1 Install primer and air seal transition membrane in accordance with manufacturer's instructions. Install air seal transition membrane into extrusion reglet as indicated on drawings. If there is no extrusion reglet, mechanically fasten air seal transition membrane to frame with batten bar fastened at 150 mm o.c.
- .2 Overlap air seal transition membrane 75 mm minimum and lap in direction of waterflow.
- .3 Coordinate air seal transition to adjacent parts of Work.
- .4 Provide end-dams and terminations fabricated from same material as air seal transition membrane or material recommended by membrane manufacturer at sills, lintels, openings, and where horizontal surfaces intersect with vertical surfaces to ensure moisture is shed to exterior.

3.7 JOINT BACKING AND ALUMINUM WORK SEALANT

- .1 Prepare substrate surface and mask as recommended by sealant manufacturer.
- .2 Install joint backing and sealant at Aluminum Work and perimeter joints for weather tight installation in accordance with sealant manufacturer's instructions. Tool sealant. Remove excess sealant.

3.8 CLEANING

- .1 Maintain Aluminum Work, inside and outside, in clean condition throughout construction period.
- .2 Remove labels, protective material, and glass presence markers from prefinished surfaces.
- .3 Remove AAMA/WDMA/CSA 101/I.S.2/A440 certification labelling when directed by Consultant, in writing.
- .4 Wash Aluminum Work with solution of mild detergent in warm water, with particular attention to recesses and corners. Wipe surfaces clean and dry.

SECTION 08 44 00
ALUMINUM FRAMED GLAZING SYSTEM
RIVER GROVE COMMUNITY CENTRE RENOVATIONS
CHERIE NG ARCHITECT INC.

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END OF SECTION

- 1 General**
- 1.1 SECTION INCLUDES**
 - .1 Labour, Products, equipment and services necessary for finish hardware work in accordance with the Contract Documents.
- 1.2 REFERENCES**
 - .1 BHMA, Builders Hardware Manufacturing Association.
 - .2 NFPA 80, Standard for Fire Doors and Other Opening Protectives.
- 1.3 SUBMITTALS**
 - .1 Product data: Submit manufacturer's Product data in accordance with Section 01 10 10 indicating compliance with reference standards, transportation, storage, handling and installation requirements.
 - .2 Shop Drawings:
 - .1 Submit Shop Drawings and 3 complete hardware lists in accordance with Section 01 10 10 indicating:
 - .1 Door locations, sizes, hardware manufacturer's catalogue numbers, finish symbols and quantities required.
 - .2 Locations and mounting heights of each type of hardware.
 - .2 Supply templates and required information to door and frame manufacturer to enable accurate sizes, locations of cut-outs and reinforcement for hardware.
 - .3 Submit templates to required trade to arrange for provisions for accurate setting and fitting of hardware.
 - .3 Samples:
 - .1 Submit 2 samples in accordance with Section 01 10 10 of each item that is different from hardware specified and include manufacturer's parts lists and installation instructions.
 - .2 Submit hardware component samples illustrating style, colour and finish. Tag samples identifying applicable Specification article number, brand name and number, finish, building location, date and catalogue number.
 - .3 Do not order hardware until samples have been accepted. Submit new samples to replace rejected samples. Supply hardware and finishes identical to each accepted sample.
 - .4 Closeout submittals:
 - .1 Submit the following in accordance with Section 01 10 10 for each Product for incorporation into Operation and Maintenance Manual:
 - .1 Maintenance data.
 - .2 Operating instructions and safety precautions.
 - .3 Parts list with name and address of supplier.
 - .4 Lubrication schedule and type of lubricant recommended.
 - .5 Keys, tools and special devices.

.6 Inspection procedures related to preventive maintenance

1.4 QUALITY ASSURANCE

.1 General:

- .1 Manufacturers: Companies specializing in manufacturing door hardware.
- .2 Hardware supplier: Company specializing in supplying commercial door hardware and acceptable to manufacturer.

.2 Certifications:

- .1 Employ an Architectural Hardware Consultant to inspect completed installation and certify that hardware has been installed in accordance with manufacturer's printed instructions, Authorities having Jurisdiction and as specified.
- .2 Submit manufacturer's certificate that finish hardware and fire rated hardware meets specified requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Be responsible for packaging of hardware, on a set by set basis. As material is received from various manufacturers identify it to correspond to Hardware List symbols.
- .2 Label packages legibly, indicating manufacturer's number, types, sizes, opening number and Hardware List reference number. Wrap hardware and include in package, screws, bolts and fastening necessary for correct installation. If hardware package is not complete, pay additional charges incurred by installer.
- .3 Deliver hardware to Site packaged, labelled and cross-referenced to hardware list for each item and its scheduled installation location.
- .4 Accept Products of this Section on Site and ensure that each item is undamaged.
- .5 Catalogue and store hardware in secure area.

2 Products

2.1 GENERAL

- .1 Provide hardware schedule to Consultant for approval indicating products, materials and finishes. Do not order products until schedule has been approved by Consultant.
- .2 Carefully check and verify Hardware List against Contract Drawings to ensure that hardware listed can be used as specified. Inform Consultant of concerns regarding quality, quantity, operation or function of hardware selected:
 - .1 Verify hand of doors, examine details on Contract Drawings and at Site to ensure hardware supplied can be correctly installed and is correct for work as constructed.
 - .2 Select hardware in accordance with applicable codes and regulations and to approval of local Fire Marshal.
 - .3 Replace and pay for defective hardware including hardware which was incorrectly selected, and remedial and installation costs.

- .3 Ensure that hardware selected will function correctly, meets Contract requirements and Ontario Building Code and authorities having jurisdiction.
 - .4 Ensure that each hardware item is of same type, design and by same manufacturer.
 - .5 Manufacturer's names or trade marks are not permitted on exposed surfaces of hardware.
 - .6 Include in packing slip a list of parts, name of supplier and door number in which lock is to be installed.
 - .7 Hardware for fire rated and labelled door and frame assemblies: ULC listed or as accepted by authorities having jurisdiction.
 - .8 Fire rated assemblies:
 - .1 Hardware: Selected and installed in accordance with applicable codes and regulations, NFPA-80 and to approval of [Ontario] Fire Marshal.
 - .2 Fire rated doors: ULC labelled hardware. Submit written certification of conformance to ULC requirements for each type of hardware prior to delivery.
 - .3 Locksets and latchsets on fire rated doors: 19 mm throw minimum.
- 2.2 **ACCESSORIES**
- .1 Items to be attached to masonry or concrete with expandable shields, lag screws, bolts or other fastening devices as required. Exposed screws: Stainless steel, Phillips or Robertson heads.
- 2.3 **FINISHES**
- .1 Metal finishes: Free from defects, clean, unstained and of a uniform colour for each type of finish required. Exposed surfaces and anchors: Specified finish symbol of item.
- 3 Execution**
- 3.1 **EXAMINATION**
- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.
- 3.2 **INSTALLATION**
- .1 Install hardware in accordance with reviewed Shop Drawings, manufacturer's installation instructions, and applicable Codes and regulations.
 - .2 Install hardware in accordance with hardware templates.
 - .3 Adjust fixed and operable hardware for correct clearances and function.
 - .4 Mount hardware measured from finished floor to centre of hardware, unless indicated otherwise or required by Code:
 - .1 Top hinge: 250 mm from head of door to top.
 - .2 Bottom hinge: 265 mm from finished floor to bottom of hinge.
 - .3 Intermediate hinge: Equal distance between top and bottom hinge.
 - .4 Locksets, latchsets: 1000 mm.

- .5 Panic device crossbar: 1000 mm.
- .6 Push plates: 1100 mm to bottom of plates.
- .7 Guard bars: 1100 mm.
- .8 Door pulls: 1100 mm to bottom of pulls.
- .9 Blank strike: 1450 mm.
- .10 Blank fronts: 1450 mm.
- .5 Include for supply and installation of wiring for electric strikes from electrical junction box to electric strike hardware.
- .6 Locate door stops to contact doors 75 mm from latch edge.
- .7 Install hardware and trim square and plumb to doors.
- .8 Replace wrappings for hardware provided by manufacturer after installation.
- .9 Safeguard keys to keep them out of unauthorized hands, tag them with door number, and deliver them to person designated by Consultant at building completion.

3.3 FIELD QUALITY CONTROL

- .1 Have hardware inspected after installation by hardware supplier's representative, obtain certification in writing that hardware has been supplied and installed in accordance with Specifications and hardware manufacturer's instructions and is functioning correctly.
- .2 Inspect fire rated openings to ensure they are installed in compliance with NFPA 80 requirements and Authorities having Jurisdiction.
- .3 Test access control system and electrified hardware devices for proper operation. Verify electric door release hardware operates properly upon activation of fire alarm system.

3.4 ADJUSTING

- .1 Verify under work of this Section, that installed hardware functions properly.
- .2 Adjust hardware so that latches and locks operate smoothly and without binding, and closers act positively with the least possible resistance in use. Lubricate hardware if required by manufacturer's instructions.
- .3 Adjust doors with self closing devices or automatic closing devices for proper operation after the HVAC system is balanced and adjusted. Verify spring power of non sized door closers is properly adjusted.

3.5 CLEANING

- .1 Remove wrappings at completion of the Project and clean hardware in accordance with manufacturer's instructions

END OF SECTION

- 1 General
- 1.1 **SECTION INCLUDES**
 - .1 Labour, Products, equipment and services necessary for masonry Work in accordance with the Contract Documents.
- 1.2 **REFERENCES**
 - .1 ASTM D2240, Test Method for Rubber Property - Durometer Hardness.
 - .2 CAN/CGSB-12.1-M, Tempered or Laminated Safety Glass.
 - .3 CAN/CGSB-12.3-M, Flat, Clear Float Glass.
 - .4 CAN/CGSB-12.8, Insulating Glass Units.
 - .5 CAN/CGSB-12.20-M, Structural Design of Glass for Buildings.
 - .6 Glass Association of North America (GANA) Glazing Manual.
- 1.3 **DESIGN REQUIREMENTS**
 - .1 Glass Design:
 - .1 Design glass using a probability of breakage of 8 lites per 1000 at the first application of design load.
 - .2 Design glass to CAN/CGSB-12.20-M. Perform stress analysis. Design units to accommodate live, dead, lateral, wind, seismic, handling, transportation, and erection loads.
 - .3 Perform a thermal stress analysis on each glass unit with Low-E coating and provide heat strengthening and/or tempered units as necessary to prevent thermal breakage.
 - .4 Perform a thermal stress analysis on each insulating thermal unit and provide heat strengthening and/or tempered units as necessary to prevent thermal breakage.
 - .5 Where required, design glazing units so as not to allow thermal stress fracture due to heat build-up behind insulating units.
 - .2 Limit glass deflection to flexural limit of glass with full recovery of glazing materials.
 - .3 Utilize inner light of multiple light sealed units for continuity of air and vapour seal.
- 1.4 **SUBMITTALS**
 - .1 Shop drawings:
 - .1 Shop drawings: Submit shop drawings in accordance with Section 01 10 10 for fabrication and erection of glazing elements indicating materials, thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.
 - .2 Samples:

- .1 Submit following samples in accordance with Section 01 10 10.
- .2 Submit one sample of each type of glass.
 - 1. 300 x 300 mm of each type of insulating glass unit, complete with each different Low-E coating.
- .3 Certificates: Submit manufacturer's certification that glass and glazing materials are compatible Submit following samples in accordance with Section 01 10 10.
- .4 IGMA Compliance Audit: Submit in accordance with Section 01 10 10, a written certification of successful completion of a Compliance Audit within the last six months.

1.5 **QUALITY ASSURANCE**

- .1 Insulating glass unit fabricators shall be a certified member of the Insulating Glass Manufacturer's Alliance (IGMA). IGMA members must participate in the certification program and shall have successfully passed a Compliance Audit within the last six months.
- .2 Installers qualifications: Perform Work of this Section by a company that has a minimum of five years proven experience in the installation of glazing units of a similar size and nature.

1.6 **SITE CONDITIONS**

- .1 Glaze with compounds, sealants, or tapes only when glazing surfaces are at temperatures over 4 degree C, and when positive that no moisture is accumulating on them from rain, mist, or condensation.
- .2 When temperature of glazing surfaces is below 4 degree C, obtain from Consultant approval of glazing methods and protective measures which will be used during glazing operations.

2 **Products**

2.1 **ACCEPTABLE MANUFACTURERS**

- .1 Glass manufacturers:
 - .1 AGC Flat Glass.
 - .2 Cardinal Glass Industries.
 - .3 Guardian Industries.
 - .4 PPG Industries Ltd.
 - .5 Viracon Inc.
 - .6 Oldcastle Building Envelope.
 - .7 Other approved manufacturer.

2.2 **MATERIALS**

- .1 All materials under Work of this Section, including but not limited to, primers, coatings, sealers, sealants, adhesives and cleaners are to have low VOC content limits
- .2 Float glass: CAN/CGSB-12.3-M; clear, glazing quality, minimum 6 mm thick. Clear or tinted as indicated. Heat strengthened as required.
- .3 Tempered glass: CAN/CGSB-12.1-M, Type 2, Class B, Category II, clear, minimum 12.5 mm thick.
- .4 Laminated glass: to CAN/CGSB-12.1, Category II, consisting of top layer of 3 mm thick clear float glass, 0.8 mm thick clear PVB interlayer, and bottom layer of 3 mm thick clear float glass. Heat strengthening and/or tempered laminated glass as necessary to prevent thermal breakage.
- .5 Glass Film (FILM-1): Cityscape – 4"x4" pattern film by Feather Friendly 3M or approved equivalent on all existing windows. Install as per manufacturer specifications.
- .6 Insulating glass units: To CAN/CGSB-12.8-M and IGMA requirements utilizing approved metallic stainless steel edge spacer. Dual seal with a PIB primary seal and silicone secondary seal.
- .7 Low-E coating: High performance sputtered low-E coating. Provide insulating glass units with low-E coating edge deletion and low-E coating. Apply low-E coating to surface as indicated. 'EnergySelect 36' by AGC Flat Glass, 'Cardinal LoE-272' by Cardinal Glass Industries or 'SN 68' by Guardian Industries.
- .8 Argon gas: 100% pure. Argon gas to be used to fill air space at all insulated glass units.
- .9 Glazing types:
 - .1 GL-1:
 - .1 6 mm thickness, as determined by glazing engineer employed by this Section 08 80 00.
 - .2 Tempered safety glass to CAN/CGSB-12.1-M90, Type 2, Class B,
 - .3 Tempering shall be obtained using horizontal, tong-free method.
 - .4 Glazing and rebate primers, sealants, sealers, and cleaners: Compatible with each other.
 - .5 Type as recommended by glass manufacturer.
 - .2 GL-2: 6 MM thickness clear tempered glass
 - .3 SU-1: GL-1 outside, argon filled air space, Low E on surface 3, GL-2 inside. 25 mm overall thickness.
- .10 Glazing sealant: Silicone sealant as recommended by glazing manufacturer. Verify compatibility with insulating glass unit secondary sealant.
- .11 Glazing and rebate primers, sealants, sealers, and cleaners: Compatible with each

other. Type as recommended by glass manufacturer.

- .12 Heel & toe bead: Silicone sealant as recommended by glazing manufacturer.
- .13 Glazing gasket: 'Visionstrip' by Tremco Ltd., extruded composite glazing seal, size as recommended by manufacturer.
- .14 Glazing tape: 'Polyshim II' glazing tape EPDM shim.
- .15 Glazing splines: EPDM or neoprene, extruded shape to suit glazing channel retaining slot, colour as selected.
- .16 Setting blocks (regular): EPDM, 80 - 90 Shore A durometer hardness to ASTM D2240, sized to suit glazing method, glass unit weight and area.
- .17 Edge blocks: EPDM, 60-70 Shore A Durometer hardness, sized with 3 mm clearance from glass edge and spanning glass thickness(es). Capable of withstanding weight of glass unit, self adhesive on face.
- .18 Glass presence markers: Easily removable, non-residue depositing.
- .19 Screws, bolts and fasteners: Type 304 stainless steel.

2.3 FABRICATION

- .1 Verify glazing dimensions on Site.
- .2 Clearly label each glass lite with maker's name and glass type. Ensure labels are easily removable, non-residue depositing type. Do not remove labels until after Work is accepted by Consultant.
- .3 Fabricate glazing not less than 3 mm smaller than rebate size in either dimension; allow for edge spacers, shims, and setting blocks as necessary.
- .4 Work shall have smooth finished surfaces free from distortion and defects detrimental to appearance and performance.
- .5 Carefully make and fit details. Take special care with exposed finished Work to produce a neat and correct appearance to the Consultant's acceptance.
- .6 Grind and polish a 1.5 mm arise to both edges of exposed glazing at locations where glazing is not encapsulated in framing and where edges are exposed to occupants.
- .7 Fabricate argon filled thermal units with air space filled minimum 90% with argon gas.
- .8 Provide bird warning glass in accordance with City of Mississauga Green Development Standards - Bird Friendly Glazing Guidelines. Style as selected by Consultant.

3 Execution

3.1 EXAMINATION

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.
- .2 Verify that openings for glazing are correctly sized and within tolerance.
- .3 Verify that surfaces of glazing channels or recesses are clean, free of obstructions, and ready to receive glazing.
- .4 Laminated glass edges shall be completely covered by tape to protect against sealants and water if required by Manufacturer.

3.2 PREPARATION

- .1 Clean contact surfaces with solvent and wipe dry.
- .2 Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- .3 Prime surfaces scheduled to receive sealant.

3.3 INSTALLATION

- .1 Provide glazing in accordance with IGMA recommendations. Provide continuous contact between glazing tapes and gasket to the glazing.
- .2 Install glazing to the Work of Section 08 44 00 Aluminum Framed Glazing System.
- .3 Provide neat, straight sight lines. Trim excess glazing material flush with top of stops and fixed leg of frames.
- .4 Remove protective coatings, glazing stops, clean rebate and glass contact surfaces with solvent, wipe dry.
- .5 Apply primer/sealer to contact surfaces, prior to glazing
- .6 Apply glazing tape as per manufacturer's instructions including recommended corner sealant.
- .7 Use setting blocks at 1/4 points and spacers to centre glass unit in frame.
- .8 Install glazing in accordance with reviewed shop drawings and manufacturer's written instructions. Install glazing with full contact and adhesion at perimeter. Maintain edge clearance recommended by glass manufacturer.
- .9 Re-install glazing stops ensuring continuous contact and rattle-free installation. Do not distort glass. Trim tape protruding more than 2 mm above stop.
- .10 Install glazing gasket in accordance with manufacturer's recommendations.
- .11 Do not cut or abrade tempered, heat treated, or coated glass.
- .12 Install glass presence markers in two cross stripes extending from diagonal corners. Maintain markers until final clean-up.
- .13 Remove, dispose of, and replace broken, cut, abraded glass, and defective glass including but not limited to production dimples, 'tiger-stripping', chips, cracks, etc.

- .14 Exterior glass: Glaze units with gasket on exterior side and glazing tape on interior side. Seal gap between glazing and stop with sealant to depth equal to bite of frame. Apply cap head of sealant along void between stop and glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.
- .15 Interior glass: Glaze interior glass using glazing gasket glazing tape.
 - .1 Install so that appropriate ULC markings remain permanently visible.
- .16 Glass Film
 - .1 Install glass film with adhesive, applied in accordance with film manufacturer's instructions.
 - .2 Place without air bubbles, creases or visible distortion.
 - .3 Fit tight to glass perimeter with razor cut edge.
- .17 Install bird warning glass in accordance with City of Mississauga Green Development Standard - Bird-Friendly Development Guidelines.
- .18 Apply a continuous heel bead of sealant around perimeter of inboard lite of the sealed unit and the metal framing.

3.4 CLEANING

- .1 Immediately remove sealant and compound droppings from finished surfaces.
- .2 Remove labels, protective material, and glass presence markers from prefinished surfaces.
- .3 Clean glass surfaces with cleaning agents and methods in accordance with Manufacturer's written instructions.
- .4 Do not wash glass film for 30 days after installation.
- .5 Do not use bristle brushes on glass film.

END OF SECTION

- 1** General
- 1.1 SECTION INCLUDES**
 - .1 Design, labour, Products, equipment and services necessary for gypsum board work.
- 1.2 REFERENCES**
 - .1 ASTM A653/A653M, Specification for Steel Sheet, Zinc-coated (Galvanized) or Zincron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .2 ASTM C475, Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
 - .3 ASTM C645, Specification for Nonstructural Steel Framing Members.
 - .4 ASTM C665, Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
 - .5 ASTM C754, Specification for Steel Framing Members to Receive Screw-Attached Gypsum Board.
 - .6 ASTM C834, Standard Specification for Latex Sealants.
 - .7 ASTM C840, Specification for Application and Finishing of Gypsum Board.
 - .8 ASTM C1002, Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
 - .9 ASTM C1178, Specification for Glass Mat Water-Resistant Gypsum Backing Board.
 - .10 ASTM C1278, Specification for Fiber-Reinforced Gypsum Panel.
 - .11 ASTM C1396, Specification for Gypsum Board.
 - .12 ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials.
- 1.3 DESIGN REQUIREMENTS**
 - .1 Design ceiling suspension system in accordance with manufacturer's printed directions and ASTM C754.
 - .2 Design ceiling system for adequate support of electrical fixtures as required by the current bulletin of the Electrical Safety Authority.
 - .3 Design hanger anchor and entire suspension system static loading not to exceed 25% of their ultimate capacity including lighting fixture dead loads.
 - .4 Design suspension system to support weight of mechanical and electrical items such as air handling boots and lighting fixtures, and with adequate support to allow rotation/relocation of light fixtures.
 - .5 Design subframing as necessary to accommodate, and to circumvent, conflicts and interferences where ducts or other equipment prevent the regular spacing of hangers.
 - .6 Design wall framing system and reinforce as necessary to accommodate and support items attached to and supported by wall framing system.
 - .7 Design wall framing system for wall assemblies with a height greater than 3000 mm and those assemblies incorporating non-standard gypsum board assemblies

including, but not limited to, abuse resistant gypsum board, large format tile applications, etc.

1.4 REGULATORY REQUIREMENTS

- .1 Provide fire separations and fire protection exactly as specified in test design specification that validates the specified rating. Verify that work specified in other Sections, as a part of the entire assembly, meets applicable validating test design specification.

1.5 SUBMITTALS

- .1 Product data:
 - .1 Submit copies of manufacturer's Product data in accordance with Section 01 10 10 indicating:
 - .1 Performance criteria, compliance with appropriate reference standard, characteristics, and limitations.
 - .2 Product transportation, storage, handling and installation requirements.
- .2 Shop Drawings:
 - .1 Submit Shop Drawings in accordance with Section 01 10 10 indicating:
 - .1 Wall assemblies, suspension systems, adjacent construction, elevations, sections and details, dimensions, thickness, finishes and relationship to adjacent construction.
 - .2 Framing and blocking for items being supported of wall systems.
- .3 Certifications: Submit written certification stating that suspended ceiling system is designed for adequate support of electrical fixtures as required by the current bulletin of the Electrical Safety Authority.

1.6 QUALITY ASSURANCE

- .1 Qualifications: Execute the work of this Section by skilled, qualified, and experienced workers trained in the installation of the work of this Section.
- .2 Retain a Professional Engineer, licensed in Province of Ontario, with experience in work of comparable complexity and scope, to perform following services as part of work of this Section:
 - .1 Design of wall systems with height greater than 3000 mm and at nonstandard gypsum board assemblies including, but not limited to, assemblies incorporating abuse resistant gypsum board, large format tile applications, etc.
 - .2 Design of suspended gypsum board assemblies.
 - .3 Review, stamp, and sign Shop Drawings and design calculations.
 - .4 Conduct shop and on-site inspections, prepare and submit written inspection reports verifying that this part of Work is in accordance with Contract Documents and reviewed Shop Drawings.

1.7 SITE CONDITIONS

- .1 Do not begin work of this Section until:

- .1 Mechanical and electrical work above the ceiling is complete.
- .2 Substrate and ambient temperature is above 15 degrees Celsius.
- .3 Relative humidity is below 80%.
- .4 Ventilation is adequate to remove excess moisture.
- .2 Install temporary protection and facilities to maintain Product manufacturer's, and above specification, environmental requirements 24 h before, during, and 24 h after installation.

2 Products

2.1 MATERIALS

- .1 General:
 - .1 All materials under work of this Section, including but not limited to, sealants, adhesives, and primers are to have low VOC content limits.
- .2 Steel framing: ASTM C754; ASTM A653/A653-M, Z275; cold rolled, galvanized steel sheet.
 - .1 Bailey Metal Products Limited
 - .2 Corus Metal Profiles
- .3 Steel studs and track runners: ASTM C645; Galvanized steel studs and runners, 32 mm wide x depth as indicated on Contract Drawings. Formed from galvanized steel sheet, thicknesses as follows:
 - .1 Studs less than 3000 mm: Minimum 0.53 mm (25 ga.).
 - .2 Studs greater than 3000 mm and non-standard assemblies: Minimum 0.91 mm (20 ga.), unless stud thickness of greater thickness is required to accommodate intended loading, spans, or conditions.
 - .3 Track runners and ancillary components to match stud thickness.
- .4 Main carrying channels: ASTM C645; Formed from galvanized steel sheet, 38 x 19 mm cold rolled, channels.
- .5 Resilient channel: ASTM C645; 0.5 mm thick galvanized metal, 57 mm wide x 12 mm deep for walls and ceiling to reduce sound transmission.
- .6 Furring channels: ASTM C645; Formed from galvanized steel sheet, 22 mm winged flange type, cold rolled.
- .7 Furring channels (hat type): ASTM C645; 0.5 mm base steel thickness, galvanized. 70 mm wide x 22 mm deep hat shaped channel.
- .8 Heavy duty furring channels: ASTM C645; 0.9 mm steel thickness, galvanized hat shaped channel with a wider and deeper size as required by manufacturers.
- .9 Hanger wires: 4.1 mm minimum diameter galvanized pencil rod.
- .10 Tie wire: 1.6 mm thick minimum diameter, soft annealed, galvanized steel wire.

- .11 Corner bead, casing bead, and special shapes: Formed from 0.6 mm thick minimum, galvanized steel sheet, designed to be concealed by joint compound.
- .12 Deflection track: ASTM C 645 top runner with 50.8-mm- deep flanges, in thickness indicated for studs and in width to accommodate depth of studs.
- .13 Deflection track (fire rated): Provide 25 mm deep leg deflection track where indicated on rated walls. 'Fire Trak Shadowline' by Fire Trak Corporation or approved alternative.
- .14 Ceiling clips: Hot dip galvanized partition attachment clips, in square and reveal edge; 'PAC 15 Series' to match grid system by CGC Inc. or approved alternative.
- .15 Gaskets (acoustic partitions): Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 3.2 mm thick, in width to suit steel stud size.
- .16 Control joint strip: Roll formed from galvanized steel sheet, with a tape protected recess, 6 mm wide x 11 mm deep.
- .17 Screw fasteners: ASTM C1002 Type S; Corrosion resistant.
- .18 Concrete anchors: tie wire sleeve anchors, 'Redi-Drive Anchors' by ITW Red Head or approved alternative.
- .19 Acoustic/Fire insulation: ASTM C665, Paperless, semi-rigid, spun mineral fibre mats, of thickness as indicated on Contract Drawings, 'Sustainable Insulation, NoiseReducer' by CertainTeed, 'EcoTouch Quiet Zone Pink Fiberglas Acoustic Insulation' by Owens Corning Inc. or 'Roxul AFB' by Roxul Inc.
- .20 Sealants:
 - .1 Acoustic sealant (non-rated): Non-hardening acoustic sealant for use at nonrated assemblies, ASTM C834; Acrylic, mould resistant sealant, paintable. 'Smoke and Acoustic Sealant CP506' by Hilti or approved alternative.
 - .2 Sealant (fire-rated): Non-hardening sealant for use at fire-rated assemblies: ASTM E84; Acrylic based firestop sealant, colour: red or white as selected by Consultant. 'Flexible Firestop Sealant CP606' by Hilti or approved alternative.
 - .3 Standard sealants: In accordance with Section 07 91 00.
- .21 Moisture / Abuse resistant board (GB-1): 15.9MM thick of maximum practical lengths to minimize end joists, unless indicated otherwise; moisture and abuse resistant board "Fiberock Aquatough Interior Panel" by CGC Inc. or 'DensArmor Plus' by Georgia-Pacific Canada LP.
- .22 Tile Backer (GB-2): Water resistant tile backer board meeting ASTM C1178 or ASTM C1278, 15.9MM thick. "Diamondback Tile Backer" by CertainTeed Gypsum Canada, Fiberock Aqua-Tough Underlayment' by CGC Inc. or "Dens Shield" By Georgia-Pacific Canada LP.
- .23 Primer: Where indicated by board manufacturer, provide primer as required to achieve finishes as defined in ASTM C840.
- .24 Joint reinforcing tape:
 - .1 Standard gypsum board: ASTM C475; 50 mm wide x 0.25 mm thick, perforated paper, with chamfered edges.

- .2 Moisture resistant and tile backer boards: ASTM C475; fibreglass mat joint tape as recommended by board manufacturer to suit location.
 - .25 Bonding adhesive: Type for purpose intended and as recommended and approved by manufacturer.
 - .26 Joint and patching compound: ASTM C475; Asbestos-free, supplied by manufacturer of gypsum board used.
 - .27 Fast setting patching compound: ASTM C475; Asbestos-free, Sheetrock or Durabond by CGC Inc., 'Moisture and Mold Resistant Setting Compound with M2Tech' by Certaineed Gypsum Canada or approved alternative.
 - .28 Access doors: Supplied by other Sections for installation as part of the work of this Section
- 3 Execution**
- 3.1 EXAMINATION**
 - .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.
- 3.2 SUSPENSION FRAMING**
 - .1 Install ceiling systems in accordance with reviewed Shop Drawings and manufacturer's written instructions.
 - .2 Install hanger wires plumb and securely anchored to the building structural framing, independent of walls, pipes, ducts, and metal deck; install additional framing and hangers to bridge interference items.
 - .3 Install hanger wires at 1200 mm maximum centres along carrying channels, not less than 25 mm, and not more than 150 mm from channel ends.
 - .4 Install additional hangers at lighting fixture and ductwork locations. Do not attach hanger wires to mechanical or electrical equipment. Do not support mechanical and electrical fixtures and fitting on ceiling without the ceiling manufacturer's written acceptance.
 - .5 Install main carrying channels transverse to structural framing members. Lap main carrying channels 200 mm minimum at splices and wire each end with two loops and prevent clustering or lining-up of splices.
 - .6 Install furring channels at 400 mm o.c., not less than 25 mm, and not more than 150 mm from perimeter walls, at openings, at interruptions in ceiling continuity, and at change in plane. Install furring channels to a tolerance of 3 mm maximum in 3600 mm.
 - .7 Install additional main carrying and furring channels to frame and to reinforce openings such as recessed lighting fixtures, access hatches, ceiling grilles, outlet boxes, ventilating outlets and similar items.
- 3.3 STEEL STUDS AND FURRING**

- .1 Install steel studs and furring in accordance with reviewed Shop Drawings and manufacturer's written instructions.
- .2 Install steel stud partitions to underside of structure unless indicated otherwise.
- .3 Install track runners at floors, ceilings, and underside of structure; align track runners accurately and secure to structure at 600 mm centres maximum.
- .4 Install double top track runner assembly to prevent the transmission of structural loads to steel studs.
- .5 Install steel studs vertically at 400 mm o.c., unless otherwise indicated, and not more than 50 mm from abutting walls, at openings, and at each side of corners. Install studs securely to track runners.
- .6 Schedule and coordinate steel framing installation with mechanical and electrical services installation.
- .7 Install full height, double studs at door and service openings, fastened together and stiffened back to the structure to prevent vibration when doors close.
- .8 Provide double studs boxed together at all openings, sill, head and jambs and at door jambs, fastened together and stiffened back to the structure to prevent vibration. At each opening exceeding 900 mm in width, double studs shall be 20 ga. extending to structure above, and adequately anchored at each end. Provide steel studs above and below openings spaced at 400 mm oc maximum. All metal stud partitions above doors and screens over 1220 mm wide shall be secured to structure over and reinforced with sway bracing to stabilize walls to prevent lateral movement.
- .9 Erect three studs at corner and intermediate intersections of partitions. Space 50 mm apart and brace together with wired 19 mm channels.
- .10 Stiffen partitions over 2440 mm high or 3000 mm long, or both, with horizontal bracing extended for full length of partitions. Provide one line of bracing in partitions. Space lines to provide equal unbraced panels. Provide bracing for portions of partitions over door openings in partitions over 3000 mm high, and bracing both above and below openings in partitions located no greater than 150 mm from top and bottom of opening, and extending two stud spaces beyond each edge of opening for both doors and windows. Wire tie or weld bracing to studs.
- .11 Frame control joints using back to back double studs at abutting structural elements, at dissimilar backup interface, at dissimilar walls and ceilings, at structural expansion and control joints, at door and other openings, and at 9000 mm maximum spacing in continuous runs. Install control joint strips and secure in place.
- .12 Install additional support framing at openings and cutouts for built-in equipment, upper cabinet support, access panels and similar items.
- .13 Attach to framing adequate steel reinforcing members or a 1.2 mm (18 ga.) steel stud mounted horizontally and notched around furring members to support the load of, and to withstand the withdrawal and shear forces imposed by, items installed upon the work of this Section. Such items include, but are not restricted to, miscellaneous metals, coat hooks, washroom accessories, handrail anchors, rub rails, grab bars, guards, wall-hung cabinets and fittings, shelving, curtain and drape tracks, miscellaneous specialties; Owner supplied equipment; and minor mechanical and

electrical work. Heavy mechanical and electrical equipment shall be selfsupporting in Divisions 21, 22, 23 and 26.

- .14 Provide for support and incorporation of flush-mounted and recessed mechanical and electrical equipment and fixtures only after consultation and verification of methods with those performing the work of Divisions 21, 22, 23 and 26.
- .15 Install cross bracing in accordance with the steel stud manufacturer's recommendations.

3.4 FIRE RATED ASSEMBLIES

- .1 Install Products in fire rated assemblies in strict accordance with applicable ULC tested and approved designs.
- .2 Stiffen fire rated walls over 3.66 m high, where linear length of wall is greater than 2.44 m between perpendicular wall supports, with diagonal bracing above the ceiling extending perpendicular to wall at a 45E angle to structure above. Locate diagonal bracing at maximum 2.44 m o.c.
- .3 Where double layers of gypsum board are shown, and required for fire rating, screw first layer to studs and furring and laminate the second layer to the first using joint filler as an adhesive. Stagger joints between first and second layers.

3.5 ACOUSTICAL INSULATION

- .1 Install acoustic insulation in partitions, between steel studs, and as indicated on Contract Drawings and in accordance with the manufacturer's instructions. Fill stud cavities to full height of partitions and carefully cut and fit acoustic insulation around services and protrusions.

3.6 ACOUSTICAL SEALANT

- .1 Install acoustical sealant to acoustically insulated partitions in accordance with the manufacturer's instructions and Contract Drawings.
- .2 Install acoustical sealant under floor runner track, at partition perimeter both sides and at openings, cut-outs, and penetrations, concealed from view in the final installation.
- .3 Install firestop fill material behind fire rated acoustical sealant and provide firestop identification tag.
- .4 Smooth acoustical sealant with trowel prior to skin forming.

3.7 BUILT-IN CORNER GUARDS

- .1 Install built-in corner guards in accordance with manufacturer's written instructions level, secure and rigid.

3.8 GYPSUM BOARD

- .1 Comply with ASTM C840. Install gypsum board in accordance with reviewed Shop Drawings and manufacturer's written instructions.
- .2 Install gypsum board vertically or horizontally, whichever results in fewer end joints. Locate end joints over supporting members.

- .3 Install gypsum board in lightly butted contact at edges and ends and with 1.6 mm maximum open space between boards; do not force gypsum board into place. Do not install imperfect, damaged or damp boards.
- .4 Install gypsum board butting paired tapered edge joints, and mill-cut or field-cut end joints; do not place tapered edges against cut edges or ends.
- .5 Install vertical joints minimum 300 mm from the jamb lines of openings and stagger vertical joints over different studs on opposite sides of partitions.
- .6 Do not locate joints within 200 mm of corners or openings, except where control joints occur at jamb lines or where openings occur adjacent to corners. Where necessary, place a single vertical joint over the centre of wide openings.
- .7 Cut, drill and patch gypsum board as may be necessary to accommodate the work of other trades.
- .8 Fire Separations:
 - .1 Construct gypsum board assemblies, where located, in accordance with tested assemblies to obtain required or indicated fire rated assemblies. As a minimum fire separations shall consist of metal framing covered on both sides by fire-rated gypsum board.
 - .2 Install assemblies tightly to enclosing constructions to maintain integrity of the separations. Install casing beads at all perimeter edges.

3.9 CORNER, CASING BEADS AND TRIM

- .1 Corner reinforcing bead: Install along all external angles, erect plumb, level and with a minimum of joints. Secure with screws at 225 mm o.c. apply filler over flanges flush with nose of the bead and extending at least 75 mm onto surface of board each side of corner. When filler dries, apply a thin coat of topping cement and blend onto adjoining surfaces.
- .2 Casing bead: Install where wallboard butts against a surface having no trim concealing the juncture and where shown on drawings. Erect casing beads plumb or level, with minimum joints, and secure with screws at 300 mm o.c. apply filler over flange flush with bead and extending at least 75 mm onto surface of board. When dry, apply a thin coat of topping cement and blend onto adjoining surfaces.
- .3 Recess channels and trim: Install recess channels and special metal trim where shown. Secure to substrate. Provide casing beads full height on wallboard edges at recess channels and metal trim.

3.10 JOINT TAPING AND FINISHING

- .1 Install reinforcing tape and a minimum of 3 coats of joint compound over gypsum board joints, metal trim and accessories, and screw fasteners in accordance with the gypsum board manufacturer's instructions.
- .2 Fill gaps between, and any imperfections in, gypsum boards with joint compound, allow to dry, and sand smooth ready for painting.
- .3 Install finished gypsum board work smooth, seamless, plumb, true, flush, and with square, plumb, and neat corners.
- .4 Finish gypsum board in accordance with ASTM C840 to the following grades:

- .1 Level 0: No taping, finishing, or accessories required. Use above suspended ceilings and within other concealed spaces, unless the assembly is fire rated, sound rated, sound or smoke controlled, or unless the space serves as an air plenum.
- .2 Level 1: At joints and interior angles embed tape in joint compound. Leave surface free of excess joint compound. Tool marks and ridges are acceptable. Use above suspended ceilings and within other concealed spaces if the gypsum board assembly is fire rated, sound rated, sound or smoke controlled, or the space serves as an air plenum.
- .3 Level 2: At joints and interior angles embed tape in joint compound with one separate coat of joint compound applied over joints, angles, fastener heads, and accessories. Use for water resistant gypsum board indicated for use as a substrate for ceramic tile.
- .4 Level 3: At joints and interior angles embed tape in joint compound with two separate coats of joint compound applied over all joints, angles, fastener heads, and accessories. Apply joint compound smooth and free of tool marks and ridges. Use where heavy grade wall coverings are the final decoration.
- .5 Level 4: At joints and interior angles embed tape in joint compound with three separate coats of joint compound applied over all joints, angles, fastener heads, and accessories. Apply joint compound smooth and free of tool marks and ridges. Use for all locations except those indicated for other finish levels.
- .6 Level 5: At joints and interior angles embed tape in joint compound with three separate coats of joint compound applied over all joints, angles, fastener heads, and accessories. Apply a thin skim coat of joint compound, or a material manufactured especially for this purpose, to the entire surface. Leave surface smooth and free of tool marks and ridges. Use where semi-gloss or gloss finish coatings are the final decoration.

3.11 ACCESS DOORS

- .1 Install access doors, supplied as part of other parts of the work, in accordance with manufacturer's written instructions. Access Doors by SECTION 10 95 00.

3.12 SITE TOLERANCES

- .1 Install metal support systems to ensure that, within a tolerance of +3 mm and -1.5 mm for plaster thickness, finish surfaces will be flat within 3 mm under a 3 m straightedge, and with no variation greater than 1.5 mm in any running 300 mm, and that surface planes shall be within 3 mm of dimensioned location.

3.13 WORK IN EXISTING AREAS

- .1 In existing areas, where existing gypsum board work has been demolished and/or damaged and repair work is required, provide new gypsum board finish.
- .2 Thoroughly prepare areas to be repaired. Provide neat, clean and straight cuts.
- .3 Finish all repair work as specified for new work.
- .4 In existing areas where existing openings are to be filled in with gypsum board, provide new gypsum board wall and ceiling construction. Ensure new board faces are flush with faces of abutting existing walls and ceilings.

3.14 **REPAIR**

- .1 Make good cut-outs for services and other work, fill in defective joints, holes and other depressions with joint compound.
- .2 Make good defective work, and ensure that surfaces are smooth, evenly textured and within specified tolerances to receive finish treatments.

END OF SECTION

- 1 General**
- 1.1 SECTION INCLUDES**
 - .1 Labour, Products, equipment and services necessary for tile work in accordance with the Contract Documents.
- 1.2 REFERENCES**
 - .1 ANSI A108/A118/A136.1, Installation of Ceramic Tile.
 - .2 ANSI A137.1, Specifications for Ceramic Tile.
 - .3 ASTM C144, Specification for Aggregate for Masonry Mortar.
 - .4 ASTM C920, Specification for Elastomeric Joint Sealants.
 - .5 CAN/CSA A3000, Cementitious Materials Compendium.
 - .6 CGSB 71-GP-22M, Organic Adhesive for Installation of Ceramic Wall Tile.
 - .7 ISO 23599, Assistive Products for Blind and Vision-Impaired Persons - Tactile Walking Surface Indicators.
 - .8 TTMAC Specification Guide 09300 Tile Installation Manual.
 - .9 TTMAC, Maintenance Guide.
- 1.3 SUBMITTALS**
 - .1 Product data:
 - .1 Submit copies of manufacturer's Product data in accordance with Section 01 10 10 indicating:
 - .1 Performance criteria, compliance with appropriate reference standard, characteristics, limitations and warranties.
 - .2 Product transportation, storage, handling and installation requirements.
 - .2 Shop drawings:
 - .1 Submit shop drawings in accordance with Section 01 10 10 indicating:
 - .1 Tile layout, patterns, and colour arrangement.
 - .2 Perimeter conditions, junctions with dissimilar materials.
 - .3 Setting details
 - .3 Samples:
 - .1 Submit following sample panels in accordance with Section 01 10 10.
 - .1 Each colour, texture, size, and pattern of tile.
 - .2 Adhere tile samples to 400 x 400 x 12.5 mm thick cement board complete with selected grout colour in joints.
 - .4 Certificates: Submit manufacturer's certificates stating that materials supplied are in accordance with this specification.

- .5 Closeout submittals: Submit recommended maintenance instructions and listing of recommended maintenance Products for incorporation into Operations and Maintenance Manuals in accordance with Section 01 10 10.
- 1.4 **QUALITY ASSURANCE**
 - .1 Perform work of this Section by a company with proven, acceptable experience on installations of similar complexity and scope.
- 1.5 **DELIVERY, STORAGE AND HANDLING**
 - .1 Deliver materials in adequate crates or containers with manufacturer's name and product description clearly marked.
 - .2 Handle and store tiles in a manner to avoid chipping, breakage or the instruction of foreign matter. Take precautions to protect the mortar and grout admixtures from freezing or from excessive heat.
- 1.6 **SITE CONDITIONS**
 - .1 Do not install work of this Section outside of the following environmental ranges without the Consultant's and Product manufacturer's written acceptance:
 - .1 Ambient air and surface temperature: 15 degree Celsius to 45 degree Celsius.
 - .2 Precipitation: None.
 - .2 Install temporary protection and facilities to maintain the Product manufacturer's, and specified, environmental requirements for 7 Days before, during, and 7 Days after installation.
- 1.7 **MAINTENANCE**
 - .1 Submit extra tile amounting to 3% of gross area covered, allowing proportionately for each pattern and type specified and which are part of the same Production run as installed Products. Store maintenance Products as directed by the Consultant.
- 2 Products
- 2.1 **MATERIALS**
 - .1 General: All materials under work of this Section, including but not limited to, sealants, adhesives, and sealers are to have low VOC content limits.
 - .2 Tile:
 - .1 To ANSI A137.1.
 - .2 Supply coves, caps, inside and outside corners and bullnose tile as required.
 - .3 Where unfinished tile edge is exposed, supply cap to Consultant's selection.
 - .4 Tile Types:
 - .1 Porcelain tile (POR-7): Porcelain wall tile, sized at 2" x 2" mosaic tile. 'Keystones' by Daltile or approved alternative. To be selected by the Consultant from the manufacturer's full colour range in Price Groups 1, 2, 3 and 4.

- .2 Porcelain tile (POR-8): Porcelain wall tile, sized at 2" x 2" mosaic tile. 'Keystones' by Daltile or approved alternative. To be selected by the Consultant from the manufacturer's full colour range in Price Groups 1, 2, 3 and 4.
- .3 Porcelain tile (POR-10): Porcelain floor tile, sized at 2" x 2" mosaic tile. 'Keystones' by Daltile or approved alternative. To be selected by the Consultant from the manufacturer's full colour range in Price Groups 1, 2, 3 and 4.
- .4 Porcelain tile (POR-11): Porcelain wall tile, sized at 2" x 2" mosaic tile. 'Keystones' by Daltile or approved alternative. To be selected by the Consultant from the manufacturer's full colour range in Price Groups 1, 2, 3 and 4.
- .5 Porcelain tile (POR-12): Porcelain ceiling tile, sized at 2" x 2" mosaic tile. 'Keystones' by Daltile or approved alternative. To be selected by the Consultant from the manufacturer's full colour range in Price Groups 1, 2, 3 and 4.
- .6 Porcelain Tile Base: Cove porcelain base tile to match floor porcelain tile.
- .5 Floor transitions:
 - .1 Tile to adjacent floor finish with flush condition: Schluter 'SCHIENE', anodized aluminium finish.
 - .2 Tile to adjacent floor finish at lower elevation not exceeding 13 mm (1/2"): Schluter 'RENO-U', anodized aluminium finish.
 - .3 Tile to adjacent floor finish at lower elevation exceeding 13 mm (1/2") or to finished concrete: Schluter 'RENO-RAMP/-K', anodized aluminium finish. Wall edge protection: Aluminium edge protection with trapezoid-perforated anchoring leg and an anodized finish, continuous at all exposed tile edges, depth as required to suit tile thickness. 'Jolly' by Schluter Systems or approved alternative.
- .6 POR-1 Baseboard edge protection: Aluminium edge protection with trapezoid-perforated anchoring leg and an anodized finish, continuous at all exposed tile edges, depth as required to suit tile thickness. 'Jolly' by Schluter Systems or approved alternative.

2.2 ACCESSORIES

- .1 Cement: CAN/CSA A3000, Type GU.
- .2 Sand: ASTM C144.
- .3 Water: Potable and free of minerals and other contaminants which are detrimental to mortar and grout mixes.
- .4 Polymer additive: Keralastic by Mapei Inc or approved alternative by Ardex, Flextile Ltd. or Laticrete International.
- .5 Thin-set mortar: 2 component to ANSI A108/A118/A136.1:

- .1 'Kerabond with Keralastic Latex Additive' by Mapei Inc., 'Ardex X77 Microtec' by Ardex, '56SR/51 w/44' by Flextile Ltd., or '254/255' by Laticrete International.
- .2 White coloured mortar shall be provided at appropriate tile types including, but not limited to; glass tile, light coloured marble, green marble and light coloured granite.
- .6 Medium bed mortar: to ANSI A118.4:
 - .1 'Ultraflex LFT' by Mapei Inc., or approved alternative by Ardex, Flextile Ltd., or Laticrete International.
 - .2 White coloured mortar shall be provided at appropriate tile types including, but not limited to; glass tile, light coloured marble, green marble and light coloured granite
- .7 Thick bed sloped topping: Factory mixed blend of portland cement and aggregates with latex admix. 'Ardex X32 Microtec' by Ardex, '226 thick bed mortar with 3701 admix' by Laticrete, or 'Topcem with Planicrete AC Admixture' by Mapei Inc.
- .8 Saura area system: Provide the following system for use at Saura surfaces (floor, wall and ceiling) as manufactured by Laticrete or Mapei Inc.:
 - .1 Adhesive: Polymer fortified, thin-set mortar complete with antimicrobials. '254' by Laticrete or 'Ultraflex LFT' by Mapei.
 - .2 Mortar bed: Factory mixed blend of portland cement and aggregates with latex admixture '226 thick bed mortar with 3701 admixture' by Laticrete or approved alternative by Mapei.
 - .3 Waterproofing: Single component, rubber polymer membrane. 'Hydro Ban Sheet Membrane' by Laticrete or 'Mapeguard WP 200 System' by Mapei.
 - .4 Finish: As indicated on Interior Design Schedule.
 - .5 Epoxy grout: High performance sanded epoxy grout 'SpectraLOCK Pro Grout' by Laticrete or 'Kerapoxy CQ' by Mapei in colour as selected by Consultant.
- .9 Primer: To meet specified requirements of adhesive manufacturer.
- .10 Cleaner: In accordance with TTMAC's requirements and as recommended by tile manufacturer.
- .11 Organic adhesive (walls): CGSB 71-GP-22M, Type 1.
- .12 Grout:
 - .1 Floors and bases (below 3 mm joint width): 'Keracolor U' by Mapei Inc. or approved alternative by Ardex, Flextile Ltd. or Laticrete International.
 - .2 Floors and bases (3 mm to 10 mm joint width): 'UltraColor Plus' by Mapei Inc. or approved alternative by Ardex, Flextile Ltd. or Laticrete International.
 - .3 Walls and Ceiling (1.5 mm to 3 mm joint width): 'Keracolor U' by Mapei Inc. or approved alternative by Ardex, Flextile Ltd. or Laticrete International.
 - .4 Walls and Ceiling (over 3 mm joint width): 'Ultracolor Plus' by Mapei Inc. or approved alternative by Ardex, Flextile Ltd. or Laticrete International.

- .5 Grout colour: To be selected by the Consultant from the manufacturer's full colour range.
 - .13 Tile sealant: In accordance with Section 07 91 00.
 - 2.3 **MIXES**
 - .1 Levelling bed mix:
 - .1 1 part Portland cement.
 - .2 4 parts sand.
 - .3 1 part water (including polymer additive), adjusted for water content of sand
 - .4 1/10 part polymer additive.
- 3 Execution
 - 3.1 **EXAMINATION**
 - .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.
 - 3.2 **SURFACE PREPARATION**
 - .1 Clean and dry surfaces thoroughly. Remove oil, wax, grease, dust, dirt, paint, tar, primers, form release agents, curing compound, and other foreign material from substrate surfaces which may prevent or reduce adhesion.
 - .2 Neutralize any trace of strong acids or alkali from the substrate.
 - 3.3 **CONTROL JOINTS**
 - .1 Provide control, expansion and isolation joints in accordance with TTMAC specification 301MJ and as indicated on drawings. Install in locations indicated on drawings and specified herein.
 - .2 Continue control, construction, and cold joints in the structural substrate up through the tile finish, and align with mortar joints where possible. Review joint locations on Site with the Consultant.
 - .3 Install joint widths to match grout joint widths, except where a minimum width is indicated.
 - .4 Install control joints in the following typical locations:
 - .1 Aligned over changes in type of substrate.
 - .2 At the restraining perimeters such as walls and columns.
 - .3 Interior areas (not subject to sunlight): 6 mm minimum width, at 7320 mm o.c. maximum.
 - .4 Interior areas (subject to sunlight): 6 mm minimum width, at 3660 mm o.c. maximum.
 - .5 As indicated on the Contract Drawings.

- .5 Seal control joints in accordance with Section 07 91 00.

3.4 **LEVELLING BED**

- .1 Install a levelling bed on uneven substrate surfaces, level and plumb substrates in accordance with the following tolerances:
 - .1 Vertical surfaces: 3 mm in 2.4 m maximum.
 - .2 Horizontal surfaces: 6 mm in 3 m from finished levels of the surface, or better.
- .2 Clean structural substrate control joints and blow-clean with compressed air. Grout fill control joints flush to slab with levelling bed.

3.5 **SAUNA AREA SYSTEM**

- .1 Install mortar bed over thin set adhesive on uneven substrate surfaces, level and plumb substrates in accordance with manufacturer's written instructions and having the following tolerances:
 - .1 Vertical surfaces: 3 mm in 2.4 m maximum.
 - .2 Horizontal surfaces: 6 mm in 3 m from finished levels of the surface, or better.
- .2 Provide slopes to drains as indicated on drawings.
- .3 Apply waterproofing with applicator on prepared substrate in accordance with manufacturer's printed directions. Carry up entire walls and ceiling.
- .4 Install finish materials after site inspection by manufacturer, ensuring that materials have been installed correctly and in accordance with manufacturers written instructions. Provide written inspection report verifying manufacturers warranty of system.
- .5 Apply grout for sauna area system in accordance with epoxy grout manufacturer's directions to produce watertight, filled joints without voids, cracks and excess grout. Thoroughly compact and tool grout. Finish grout flush to edge thickness of tile and remove excess grout with soft burlap or sponge moistened with clean water.

3.6 **GENERAL INSTALLATION REQUIREMENTS**

- .1 Install tiles in accordance with manufacturer's instructions and TTMAC Specification Guide 09300 Tile Installation Manual. Manufacturer's installation instructions govern over TTMAC Installation Manual.
- .2 Lay out work to produce a symmetrical pattern with minimum amount of cutting. Ensure cut tile at room perimeter and at joints is not less than ½ full size.
- .3 Install trim to be placed under tile in locations indicated on Drawings.
- .4 Set tiles in place and rap or beat with a beating block as necessary to ensure a proper bond and to level surface. Align tile for uniform joints and allow to set until firm. Clean excess mortar from surface of tile with a wet cloth or sponge while mortar is fresh.
- .5 Ensure following minimum mortar contact coverage to back of tiles. Contact must be evenly distributed to give full support of the tile.
 - .1 98% for large format (305 mm x 305 mm or greater) interior applications.
 - .2 90% for non-large format interior applications.

- .3 100% for shower applications.
 - .4 100% for exterior applications.
 - .6 Adjust joints between units uniform, plumb, straight, even, and true, with adjacent tile flush. Align grout joints in both directions unless indicated otherwise.
 - .7 Align floor, base and wall grout joints.
 - .8 Install tile accessory fittings for a complete and fully coordinated tile assembly.
 - .9 Install wall tile full height unless indicated otherwise.
 - .10 Do not place tile, trim, and accessories over control, expansion, or isolation joints. Stop materials in either side on joints and provide control, expansion and isolation joints as specified.
 - .11 Cut and fit tile neatly around piping, fittings, joints, projections and around recesses items e.g. washroom accessories. Where surface mounted equipment and accessories are installed on tile surfaces, extend tile over surfaces. Cut edges smooth, even, and free from chipping; chipped and broken edges are not acceptable.
 - .12 Do not proceed with grouting until minimum 48 hours after tile has set, to prevent displacement of tiles.
 - .13 Apply grout in accordance with grout manufacturer's directions to produce watertight, filled joints without voids, cracks and excess grout. Thoroughly compact and tool floor grout. Finish grout flush to edge thickness of tile and remove excess grout with soft burlap or sponge moistened with clean water.
- 3.7 **CLEANING**
- .1 Clean off excess grout with soft burlap or sponge moistened with clean water.
 - .2 Polish floor and wall tile after grout has cured in accordance with TTMAC recommendations in the Maintenance Guide; do not use acid for cleaning.
 - .3 Re-point joints after cleaning as required to eliminate imperfections, then re-clean as necessary. Avoid scratching tile surfaces.
- 3.8 **JOINT BACKING AND TILE SEALANT**
- .1 Install joint backing under sealant as necessary.
 - .2 Install tile sealant around piping and fittings extending through tiled surfaces.
 - .3 Seal tile control joints.
 - .4 Seal internal tile to tile junctions. Tool to a smooth, flush surface, free from air bubbles and contamination.
- 3.9 **PROTECTION**
- .1 Prevent traffic over tiled areas, and protect tiled assemblies from weather, freezing, and water immersion, for 72 hours minimum, after final installation.
 - .2 Prevent direct impact, vibration and heavy hammering on adjacent and opposite walls for 24 hours minimum, after final installation.
 - .3 Cover work temporarily with building paper properly lapped and taped at joints until work has been approved by Consultant.

SECTION 09 30 00

TILE

RIVER GROVE COMMUNITY CENTRE RENOVATIONS

CHERIE NG ARCHITECT INC.

PAGE 09 30 00.8

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Project 2522

END OF SECTION

1 General

1.1 SECTION INCLUDES

- .1 Labour, Products, equipment and services necessary for tactile warning surfacing Work in accordance with the Contract Documents.

1.2 REFERENCES

- .1 ASTM E2180 Standard Test Method for Determining the Activity of Incorporated Antimicrobial Agent(s) In Polymeric or Hydrophobic Materials
- .2 ASTM G21 Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi
- .3 ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension
- .4 ASTM D2240 Standard Test Method for Rubber Property—Durometer Hardness
- .5 ASTM D955 Standard Test Method of Measuring Shrinkage from Mold Dimensions of Thermoplastics
- .6 ISO 23599 Assistive Products for Blind and Vision-Impaired Persons – Tactile Walking Surface Indicators

1.3 SUBMITTALS

- .1 Product data: Submit copies of manufacturer's Product data in accordance with Section 01 10 10 indicating:
 - .1 Submit manufacturer's Product data sheets for Products proposed for use in the work of this section.
 - .2 Product data sheets shall include material test reports from qualified independent testing laboratories, current within a 24 month period preceding date of installation, indicating that materials proposed for use in the Work are in compliance with the requirements of the Contract Documents, and meet the properties specified or indicated.
- .2 Shop drawings: Submit shop drawings indicating seam layout and welding procedures in accordance with Section 01 10 10.
- .3 Samples:
 - .1 Submit full size sample of each type and colour of tactile warning surfacing specified or required for the Work.
- .4 Closeout submittals: Submit maintenance and cleaning data for incorporating into Operations and Maintenance Manuals in accordance with Section 01 10 10.

1.4 QUALITY ASSURANCE

- .1 Installers / applicators / erectors: Provide work of this section, executed by competent installers with minimum 3 years experience in application of Products,

systems and assemblies specified, and with approval and training of Product manufacturers.

- .2 Provide Stainless Steel Detectable Warning Surface Domes and accessories as produced by a single manufacturer with a minimum of three (3) years' experience.
- .3 Installer's Qualifications: Engage an experienced installer who has successfully completed installations similar in material, design, and extent to that indicated for project.
- .4 Provide Stainless Steel Detectable Warning Surface Domes which are in compliance with:
 - .1 Americans with Disabilities Act (Title III Regulations, 28 CFR Part 36 ADA STANDARDS FOR ACCESSIBLE DESIGN, Appendix A, Section 4.29.2 DETECTABLE WARNINGS ON WALKING SURFACES).
 - .2 California Code of Regulations (CCR): Provide only approved DSAAC detectable warning products as provided in the California Code of Regulations (CCR) Title 24, Part 2, Section 205 definition of "Detectable Warning". Section 1117A.4 and 1127B.5 for "Curb Ramps" and Section 1133B.8.5 for "Detectable Warnings at Hazardous Vehicular Areas".
- .5 Stainless Steel Detectable Warning Surface Domes material shall meet the following ASTM specifications: A182, A193, A276, A313, A314, A320, A479, A493 and A580.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Stainless Steel Detectable Warning Surface Domes shall be suitably packaged to prevent damage in shipment or handling.

1.6 SITE CONDITIONS

- .1 Ambient conditions: Maintain minimum temperature of 5°C in spaces to receive tactile warning surfaces for at least 24 hours prior to installation, during installation, and for not less than 24 hours after installation.
- .2 Environmental Conditions: Maintain a suitable temperature as per manufacturer's requirements.

2 Products

2.1 MATERIALS

- .1 Acceptable Interior Product: 316 Stainless Steel Domes/Bars TWSI by ADA Solutions, LLC.
 - .1 Existing engineered and field-tested products, which have been in successful service for five (5) years are subject to compliance with requirements, may be incorporated in the work and shall meet or exceed the specified test criteria and characteristics. Requests for Approved Equal Status must be

submitted and approved by the Owner before the Tender Phase of the Project.

- .2 Colour: Colour shall be matte stainless steel throughout the domes/bars.
- .3 Stainless Steel Detectable Warning Surface Domes shall be manufactured from grade 316L, marine grade stainless steel and have an integral non-slip surface on the top of the Domes. The Domes shall have measurements of nominal 0.2 inch in height, 0.9 inch base diameter and 0.45 inch top diameter. "Advantage One Tactile Walking Surface Indicators (TWSI)" as manufactured by Advantage Tactile Systems Inc by Kinesilk or approved equivalent.
- .4 Stainless Steel Detectable Warning Surface Domes material shall meet the following ASTM specifications: A182, A193, A276, A313, A314, A320, A479, A493 and A580.
- .5 Chemical properties shall be: C 0.08%, Cr 17%, Fe 65%, Mn 2%, Mo 2.5%, Ni 12%, P 0.045%, S 0.03%, Si 1%.
- .6 Mechanical properties shall be:
 - .1 Tensile Strength > 79,800 psi,
 - .2 Yield Strength >34,800 psi,
 - .3 Elongation at Break (in 50 mm) > 60%,
 - .4 Rockwell B Hardness < 80,
 - .5 Brinell Hardness < 149,
 - .6 Izod Impact > 95.1 ft-lb.
- .7 Slip Resistance when tested by ASTM C 1028-96 the combined Wet and Dry Static CoEfficients of Friction not to be less than 0.80 on top of domes.
- .8 Chemical Stain Resistance when tested by ASTM D 543-95 (re approved 2001) to withstand without discoloration or staining - saturated calcium chloride, red enamel spray paint, red lipstick, red wax crayon, black liquid ink, chewing gum, mustard, ketchup, urine, coffee, asphalt, tobacco juice, hydraulic oil and used motor oil.
- .9 Abrasive Wear when tested by BYK – Gardener Tester ASTM D 2486-00 with reciprocating linear motion of 37± cycles per minute over a 10" travel. The abrasive medium, a 40 grit Norton Metallite sand paper, to be fixed and leveled to a holder. The combined mass of sled, weight and wood block is to be 3.2 lb. Average wear depth shall not exceed 0.04" after 1,000 abrasion cycles when measured on the top surface of the dome representing the average of three measurement locations per sample.
- .10 Abrasive Wear when tested by Taber Tester ASTM C 501-84 and US Specifications SS-T308b with H22 coarse Calibrate Wheels with each

- testing coupon weighed to the nearest 0.01 gram. Average wear index shall be a minimum of 480 after 1,000 abrasion cycles with ASTM C 501-84 parameters and 210 with SS-T-308b parameters when measured on the top surface of the dome representing the average of four sample measurements.
- .11 Salt and Spray Performance when tested to ASTM B 117-03 not to show any deterioration or other defects after 100 hours of exposure.
 - .12 AASHTO HB-17 single wheel HS20-44 loading "Standard Specifications for Highways and Bridges". The Directional Tactile Detectable Warning Tactile Domes and Bars shall be mounted on a platform then subjected to the specified maximum load of 10,400 lbs., corresponding to an 8,000 lb individual wheel load and a 30% impact factor. The Domes shall exhibit no visible damage at the maximum load of 10,400 lbs. Tactile warning surfacing plates, interior:
 - .13 Fabricated from cast iron to ASTM A48 Class 35B.
 - .14 Truncated domes shall have a base diameter of 23 mm (0.9") minimum and 36 mm (1.4") maximum, a top diameter of 50% of the base diameter minimum, to 65% of the base diameter maximum, and a height of 5.0 mm (0.2").
 - .15 Truncated domes shall have a centre-to-centre spacing of 41 mm (1.6") minimum and 61 mm (2.4") maximum, and a base-to-base spacing of 17 mm (0.65") minimum, measured between the most adjacent domes on a square grid.
 - .16 Coefficient of friction: 0.9.
 - .2 Acceptable Pool Deck/Stairs Product: Ecoglo anti-slip "Eon Tile – modified for barefoot and wet use or approved alternative.
 - .3 Tactile warning surfacing plates, pool:
 - .1 Material: Factory-manufactured Eon Tile tactile indicators by Ecoglo, comprising photoluminescent, slip-resistant composite material, integrally formed for interior wet-area applications.
 - .2 Dome Geometry: Truncated domes shall have a base diameter between 23 mm minimum and 36 mm maximum, a top diameter between 50% and 65% of the base diameter, and a uniform height of 5.0 mm.
 - .3 Dome Spacing: Domes shall be arranged on a square grid with centre-to-centre spacing between 41 mm and 61 mm, and a minimum base-to-base spacing of 17 mm between adjacent domes.
 - .4 Slip Resistance: Minimum coefficient of friction of 0.9 when tested in wet conditions.

- .5 Photoluminescence: Provide integral photoluminescent properties complying with applicable egress marking standards, with luminance performance suitable for low-light and emergency conditions.
- .6 Colour: Selected by Consultant from manufacturer's full range of standard colours.
- .4 Acceptable interior stair nosing photoluminescent contrast strip
 - .1 Material: Factory-manufactured Step Edge E40 Series – E40 Contrast Strip by Ecoglo, comprising durable, slip-resistant, photoluminescent composite material suitable for interior and exterior stair applications.
 - .2 Profile Geometry: Strip shall be rectangular in section with uniform thickness and consistent visible leading-edge width, designed to provide clear visual demarcation at stair edges without creating a trip hazard.
 - .3 Installation: Provide continuous strips at the leading edge of each tread, mechanically fixed or adhesively bonded in accordance with manufacturer's written instructions to ensure permanent adhesion, durability, and alignment.
 - .4 Visibility and Photoluminescence: Provide high visibility in both light and dark conditions with integral photoluminescent properties complying with ASTM E2073, DIN 67510, and ISO 17398 for luminance performance suitable for low-light and emergency egress conditions.
 - .5 Slip Resistance: Provide slip-resistant surface complying with UL 410 and AS/NZS 4586 for pedestrian surface materials.
 - .6 Durability: Material shall demonstrate resistance to environmental exposure including UV stability (ASTM G155), salt spray (ASTM B117), and freeze-thaw cycling (ASTM C1026), suitable for long-term interior and exterior use.
 - .7 Abrasion Resistance: Provide hard-wearing surface tested in accordance with ASTM D1242, ASTM F510, and JIS H8682-1 for resistance to wear.
 - .8 Washability: Surface shall be easily cleanable and tested in accordance with ASTM D4828.
 - .9 Fire Performance: Material shall be self-extinguishing or non-burning, complying with ASTM E162, ASTM D635, and FAA AC 23.2 horizontal burn test.
 - .10 Health and Safety: Material shall be non-radioactive and non-toxic, tested in accordance with ASTM D3648 and Bombardier SMP 800-C.
 - .11 Colour: Selected by Consultant from manufacturer's full range of standard colours to provide high visual contrast with adjacent stair finishes.

3 Execution

3.1 EXAMINATION

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.

3.2 INTERIOR INSTALLATION

- .1 Select correct drill bit size for peg diameter of dome. Ensure you use correct drill bit for corresponding surface/substrate. Mark drill bit to gauge depth or add a depth limiter which corresponds to overall peg length. DO NOT MEASURE FROM TIP OF DRILL BIT. This will allow dome hole to be slightly deeper than the length of the peg. B.
- .2 Lay the template down (purchased from manufacture) on working surface. Check alignment of holes, holes/domes placement look best when holes are centered in field of work. Use weights/pressure to help secure template on surface while drilling first hole. Use a dowel and insert in newly drilled hole to secure the template. Repeat same procedure to opposite corner.
- .3 Drill out remaining holes in template as needed. Move template through field of work using pegs (more may be needed) to align template with previous drilled holes. (There will be 25 holes per square foot.)
- .4 Clean loose debris from holes, using shop vac or similar means that suits your surface/substrate.
- .5 Inject adhesive into drilled holes. (Quarter filled should be sufficient.) DO NOT OVER FILL HOLES. Once Stainless Steel Detectable Warning Surface Domes are inserted and if adhesive spills out, clean immediately with appropriate manufactures recommended cleaning agent.
- .6 Refer to the adhesive manufactures installation instructions for correct guidelines for that adhesive.

3.3 ADJUSTING AND CLEANING

- .1 Clean tiles by method recommended by tile manufacturer not less than 4 days prior to inspection for Substantial Performance of the Work.
- .2 Protect Stainless Steel Domes/Bars against damage during the construction period to comply with TaWSI domes/bars manufacturer's specifications.
- .3 Protect Stainless Steel Domes/Bars against damage from rolling loads following installation by covering with plywood or hardwood.
- .4 Clean Stainless Steel Domes/Bars TWSI not more than four (4) days before the date scheduled for inspection intended to establish the date of substantial completion in each area of the project. Clean Stainless Steel Domes/Bars TWSI by manufacturer instructions.
- .5 Comply with manufacturer maintenance manual for cleaning and maintaining Stainless Steel Domes/Bars. It is recommended to perform annual inspections for safety and TWSI integrity.

3.4 PROTECTION

- .1 Protect tiles and installation against damage during construction period in accordance with the tile manufacturer's instructions and recommendations.
- .2 Protect tiles against damage from rolling loads following installation by covering with plywood or hardwood in accordance with tile manufacturer's instructions and recommendations.

END OF SECTION

- 1 General**
- 1.1 SECTION INCLUDES**
 - .1 Labour, Products, equipment and services necessary for sanding, sealing and finishing wood athletic flooring Work in accordance with the Contract Documents.
- 1.2 REFERENCES**
 - .1 CAN/CGSB-51.34, Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
 - .2 CAN/CSA-O80 Series, Wood Preservation.
 - .3 CSA O151-M, Canadian Softwood Plywood.
 - .4 Master Painters' Institute (MPI), Painting Specification Manual.
 - .5 MFMA, Maple Flooring Manufacturers Association.
 - .6 FIBA: Federation of International Basketball Association.
 - .7 FIVA: Federation of International Volleyball Association.
 - .8 City of Mississauga: Gymnasium Floor Preventative Maintenance and Replacement OPS-109
 - .9 City of Mississauga: Sports Line Resource 109B
- 1.3 DESIGN REQUIREMENTS**
 - .1 Gymnasium floor markings shall be in accordance with each applicable sport's associations regulations. Where line colour is not outlined by association provide the following line colours:
 - .1 Basketball court lines: Green
 - .2 Volleyball court lines: Blue
 - .3 Badminton court lines: Red
 - .4 Pickleball court lines: Yellow
- 1.4 SUBMITTALS**
 - .1 Product data:
 - .1 Submit copies of manufacturer's Product data in accordance with Section 01 10 10 indicating:
 - .1 Performance criteria, compliance with appropriate reference standard, characteristics, and limitations.
 - .2 Product transportation, storage, handling and installation requirements.
 - .2 Shop drawings: Submit shop drawings indicating seam layout and welding procedures in accordance with Section 01 10 10.
 - .3 Submit shop drawings for Consultant review prior to fabrication and installation. Shop drawings shall include:

- .1 Complete court line layouts for all sports indicated with site dimensions.
- .2 Court dimensions and offsets.
- .3 Line widths and colours.
- .4 Coordination with floor joints, game equipment, and architectural features.
- .5 Identification of each sport and corresponding line markings.
- .6 Overlay of all court lines demonstrating compliance with referenced standards and Contract Documents.
- .7 Do not proceed with court line installation until reviewed shop drawings have been returned.
- .4 Samples:
 - .1 Submit samples in accordance with Section 01 10 10:
 - .1 Submit two 250 x 200 mm samples of each type of sheet material and colour.
 - .5 Closeout submittals: Submit maintenance and cleaning data for incorporating into Operations and Maintenance Manuals in accordance with Section 01 10 10.

1.5 **QUALITY ASSURANCE**

- .1 Installers qualifications: Perform Work of this Section by a company that has a minimum of five years proven acceptable experience on installations of similar complexity, size, and nature.
- .2 Submit with Tender: Flooring Contractor Experience: list a minimum of five (5) University, College or Secondary School level Wood Athletic Gymnasium Floor Sand & Refinish projects completed in the last 3 years. List the following for all five:
 - .1 Project Name
 - .2 Date Completed
 - .3 Project Contact (Name, Telephone Number & Email address.)
- .3 Submit with Tender: Letter from the MFMA confirming Flooring Contractor is a current Member in good standing and; has been a Member in good standing for a minimum of (5) years.
- .4 Submit with Tender: MFMA Approved Sealer, Finish & Gameline Paint Technical Data Sheets.
 - .1 Sealer and Finish must be manufactured for use on Wood Athletic.
 - .2 Gameline Paint must be compatible with sealer & finish.
- .5 Submit with Tender: MSDS (Material Data Safety Sheets): Sealer, Finish & Gameline Paint.
- .6 Upon completion submit three (3) copies of Floor Care / Maintenance instructions.

1.6 **DELIVERY, STORAGE, HANDLING AND DISPOSAL**

- .1 Store materials in fully enclosed ventilated, clean and dry storage space in areas of installation for minimum of 72 hours prior to commencing of work.

- .2 The Flooring Contractor is responsible for disposal.
 - .3 Sanding sawdust is to be removed from the site daily and disposed of accordingly.
 - .4 All rags/towels are to be removed from site daily and disposed of accordingly.
 - .5 Upon completion remove all debris and excess material resulting from the work of this Section
- 2 Products**
- 2.1 FLOOR SEALER, FINISH & GAMELINE PAINT:**
- .1 Sealer: Waterborne Bona Sport® SuperSport™ DTS Sanding Sealer or approved equivalent
 - .2 Finish: Waterborne Bona Sport® SuperSport™ HD or approved equivalent
 - .3 Gameline Paint: Bona Sport® Supersport® Floor Paint. or approved equivalent
 - .1 Basketball court lines: Green
 - .2 Volleyball court lines: Blue
 - .3 Badminton court lines: Red
 - .4 Pickleball court lines: Yellow
- 2.2 VENTED COVE BASE (B-4) – Bio-Channel Star by Robbins or approved equivalent.**
- 2.3 THRESHOLDS/EXPANSION COVER:** Clear anodized, extruded aluminum cover designed for anchorage to slab side in sufficient dimension to cover expansion space. 'Model GYMF' by C/S Group or approved alternative.
- 2.4 REFERENCED MUNICIPAL STANDARDS**
- .1 Comply with the latest applicable requirements of the following City of Mississauga standards:
 - .1 City of Mississauga OPS-109 – Gymnasium Floor Preventative Maintenance and Replacement
 - .2 City of Mississauga Sports Line Resource 109B.2
 - .2 Where requirements of referenced standards conflict with this specification, the more stringent requirement shall govern.
- 2.5 COURT LINE REQUIREMENTS**
- .1 Court line layout, dimensions, colours, and line widths shall conform to the latest editions of the following standards and reference documents:
 - .1 City of Mississauga OPS-109 – Gymnasium Floor Preventative Maintenance and Replacement
 - .2 City of Mississauga Sports Line Resource 109B

- .3 Architectural drawings and approved court layout drawings.
 - .2 Where discrepancies occur between referenced standards and Contract Documents, notify Consultant prior to installation. Do not proceed until direction is provided.
 - .3 Line layout shall be coordinated with all court markings indicated on the drawings to avoid conflicts, overlaps, or non-compliant clearances.
- 3 Execution**
- 3.1 EXAMINATION**
- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.
 - .2 Examine the existing conditions and ensure surface variations do not exceed 3 mm in 3000 mm (1/8" in 9.84').
 - .3 Acclimatize materials on site to manufacturer's written instructions.
 - .4 Examine substrate surfaces to receive the work of this section and ensure that work done as part of the work of other sections is complete and that there are no conditions which will adversely affect the performance of this work. Notify the Contractor of any unsatisfactory conditions. Do not proceed with this work until unsatisfactory conditions have been corrected. Commencement of work of this section implies acceptance of surfaces and conditions.
 - .5 Verify that temperature and environmental conditions required by the flooring manufacturer are suitable for installation of materials. Examine substrate for proper dryness in accordance with manufacturer's requirements.
 - .6 Do not commence installation until work of other sections that may damage the flooring is complete.
- 3.2 FLOOR SANDING**
- .1 Reference to the follow standards for additional requirements:
 - .1 City of Mississauga: Gymnasium Floor Preventative Maintenance and Replacement OPS-109
 - .2 City of Mississauga: Sports Line Resource 109B
 - .2 Coordinate with facility staff to have authorized electrician provide hook-up to electrical panel for floor sanding equipment.
 - .3 Replace and repair damaged flooring where required. Areas are to be established and marked on floor by Board Staff.
 - .4 Drum sand flooring with coarse, medium and fine papers to remove all layers of finish and gamelines down to raw wood. Floor to be a smooth, even and uniform surface.

- .5 Inspect entire area of floor to ensure floor surface is acceptable for finishing, completely free from sanding dust and perfectly clean.

3.3 **FINISHING / WALL BASE / THRESHOLDS / FLANGE & LIDS**

- .1 Screen hardwood as required throughout finishing and as per finish Manufacturers specification.
- .2 Apply a combined (5) coat sealer and finish system.
- .3 Gameline layout and quantity shall be as per existing if drawing not provided. Lines shall be straight with sharp edges.
- .4 Install gym cove base, mitering inside and outside corners and anchoring to walls with adhesive and tapcons. (heads to be painted black to match base.) NOTE: TAPCONS ARE MANDATORY.
- .5 Install threshold at all connections with other floor finishes and or doorways, anchoring firmly in concrete floor beyond limits of wood flooring.
- .6 Polish brass flange & lids.

3.4 **INSTALLATION**

- .1 Install court lines in accordance with the latest applicable requirements of the following reference standards:
 - .1 City of Mississauga OPS-109 – Gymnasium Floor Preventative Maintenance and Replacement
 - .2 City of Mississauga Sports Line Resource 109B
- .2 Installation methods, materials, preparation, curing times, and application procedures shall comply with the referenced standards and manufacturer's written instructions.
- .3 Provide new Vent Cove Base for installation
 - .1 Install base to substrate as scheduled and/or detailed and in accordance with manufacturer's recommendations.
 - .2 Ensure that substrate is solid and free of voids, gaps, or other defects which will preclude adequate adhesion, or will ghost or telegraph through finished base installation.
 - .3 Cope mitre corners. Fasten with manufacturer's recommended adhesive at corners.
 - .4 Install base in longest lengths possible.
 - .5 Install straight and level to variation of 1:1000 and free of buckles.
 - .6 Scribe and fit to door frames and other obstructions.
 - .7 Joints shall be not less than 610 mm (24") from corners.
 - .8 Provide joints in base over substrate control joints.

- .9 Joints shall be tightly fitted, straight and vertical.
- .10 Set base to ensure installation over finished flooring material is free of gaps.
- .4 Install threshold/expansion covers at openings and where indicated. Attach cover to adjacent rigid floor surface. Threshold to act as ramp between floor surfaces over expansion space.
- .5 After floor finishing, Install floor sockets at locations indicated. Secure socket housing in concrete sub-floor by grouting, ensuring socket vertical. Secure lid and frame flush in floating wood floor surface.
- .6 Install vent cove base anchored to walls with base cement or screws. Use pre-molded outside corners and neatly mitered inside corner.

3.5 FINISHING

- .1 Power sand floor surface smooth and true. Vacuum clean and remove dust.
- .2 Apply sealer coat immediately after sanding.
- .3 Permit to dry thoroughly prior to permitting any foot traffic.
- .4 Clean flooring in accordance with manufacturer's instructions.
- .5 Apply game lines to floor surface to layout indicated. Follow colour schedule of court layouts.
- .6 Install floor sockets at locations indicated. Secure socket housing in concrete sub-floor by grouting, ensuring vertical and plumb. Secure lid and frame in floating wood floor surface flush and square.

3.6 PROTECTION

- .1 Protect new floors from after completion of floor finishing until final inspection.
- .2 Traffic is prohibited on floor finish coats for a period of 48 hours minimum, with only light traffic permitted up to 7 days. Until floor is fully cured (7 days minimum), traffic over floor finish is discouraged, including the application of protection sheets.
- .3 Do not use protection materials which will damage floor finish, such as plastic film, rosin paper, non-breathable membranes, and the like, to recommendations of manufacturer.
- .4 Do not use cleaning compounds until floor finish is fully cured.
- .5 Protect Work of this Section from damage and debris until final inspection.

END OF SECTION

- 1 General**
- 1.1 SECTION INCLUDES**
 - .1 Labour, Products, equipment and services necessary for painting work in accordance with the Contract Documents.
- 1.2 REFERENCES**
 - .1 CAN/CGSB 85.10, Protective Coatings for Metals.
 - .2 CAN/CGSB-85.100, Painting.
 - .3 Master Painters Institute (MPI), Painting Specification Manual.
 - .4 SSPC Steel Structures Painting Council, Standards.
 - .5 AMPP Association for Materials Protection & Performance, Standards.
- 1.3 SUBMITTALS**
 - .1 Product data:
 - .1 Submit copies of manufacturer's Product data in accordance with Section 01 10 10 indicating:
 - .1 Performance criteria, compliance with appropriate reference standard, characteristics, limitations.
 - .2 Product transportation, storage, handling and installation requirements.
 - .3 Product name, type and use.
 - .4 Manufacturer's product number.
 - .5 Colour numbers.
 - .6 MPI Environmentally Friendly classification system rating.
Manufacturer's WHMIS Safety Data Sheets (SDS).
 - .2 Submit listing of manufacturer's Product types, Product codes, and Product names, number of coats, and dry film thicknesses, corresponding to each Painting Schedule code; submit listing minimum of 8 weeks before materials are required.
 - .2 Samples:
 - .1 Submit following samples in accordance with Section 01 10 10.
 - .1 Four 300 x 150 mm draw downs of each colour minimum 4 weeks before paints are required.
 - .2 Identify each sample with Contract number and title, colour reference, sheen, date, and name of applicator.
 - .3 Certificates:
 - .1 Submit certification from paint manufacturer, on company letterhead, indicating each product proposed for use is Manufacturer's premium grade, first line Product.

- .2 Submit certified documentation to confirm each airless spray painter has minimum of 5 years experience on applications of similar complexity and scope.
- .3 Submit certified documentation to confirm each worker has Provincial Tradesman Qualification certificate of proficiency.
- .4 Reports:
 - .1 Submit written field inspection and test report results after each inspection.
 - .2 Submit Field Quality Control test result reports for alkali content, substrate moisture, and dry film thickness.
 - .3 Submit electronic moisture meter manufacturer's specifications including tolerances. Submit record of latest meter calibration to meet manufacturer's recommendations.

1.4 **QUALITY ASSURANCE**

- .1 Finishing work: Perform work to MPI requirements for premium grade.
- .2 Supervision: Have work supervised by a full-time qualified foreperson who has 10 years minimum experience on Contracts of similar complexity and scope
- .3 Mock-up:
 - .1 Construct three 2 square metre mock-ups of different Paint Schedule code systems, selected by Consultant, in locations acceptable to Consultant to demonstrate installation workmanship, colour, and hiding power of Products.
 - .2 Obtain Consultant's acceptance in writing before proceeding with the work of this Section.
 - .3 Mock-ups may remain as part of the Work if acceptable to Consultant and will serve as a standard for similar code systems.
 - .4 Repaint over mock-ups which do not form part of the Work.

1.5 **EXTRA MATERIALS**

- .1 Submit one - four litre can of each type and colour of primer and finish coating. Identify colour and paint type in relation to established colour schedule and finish system.

1.6 **DELIVERY, STORAGE, AND HANDLING**

- .1 Install correct, safe temporary storage for paint, thinner, solvents, and other volatile, corrosive, hazardous, and explosive materials in accordance with requirements of authorities having jurisdiction.
- .2 Post hazard warning signage in areas of storage and mixing. Install and maintain sufficient CO2 fire extinguishers of minimum 9 kg capacity, accessible in each storage mixing and storage areas.
- .3 Maintain storage enclosures at minimum 10 degrees Celsius ambient temperature and to manufacturer's instructions.

- .1 Labels shall clearly indicate:
 - .1 Manufacturer's name and address.
 - .2 Type of paint or coating.
 - .3 Compliance with applicable standard.
 - .4 Colour number in accordance with established colour schedule.

1.7 **SITE CONDITIONS**

- .1 Heating, Ventilation and Lighting:
 - .1 Ventilate enclosed spaces.
 - .2 Perform no painting work unless adequate and continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate temperatures above 10°C for 24 hours before, during and after paint application until paint has cured sufficiently.
 - .3 Where required, provide continuous ventilation for seven days after completion of application of paint.
 - .4 Perform no painting work unless a minimum lighting level of 323 Lux is provided on surfaces to be painted. Adequate lighting facilities shall be provided by General Contractor.
- .2 Apply coatings under the following conditions:
 - .1 Exterior coatings (except Latex): 5 degrees Celsius minimum.
 - .2 Exterior latex coatings: 10 degrees Celsius minimum.
 - .3 24 hours minimum after rain, frost, condensation, or dew.
 - .4 When no condensation is possible (unless specifically formulated against condensation).
 - .5 Interior coatings: 7 degrees Celsius minimum.
 - .6 Relative humidity: 85% maximum.
 - .7 Not in direct exposure to sun light.
- .3 Maintain temperature conditions indicated above for 24 hours before, during and 24 hours after painting.
- .4 Install clean plywood sheets to protect floors and walls in storage and mixing areas, from paint drips, spatters, and spills.
- .5 Surface and Environmental Conditions:
 - .1 Apply paint finish only in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.
 - .2 Apply paint only to adequately prepared surfaces and to surfaces within moisture limits noted herein.
 - .3 Apply paint only when previous coat of paint is dry or adequately cured.

- .4 Apply paint finishes only when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.
 - .5 Apply paint in occupied facilities during silent hours only. Schedule operations to approval of Owner such that painted surfaces will have dried and cured sufficiently before occupants are affected.
 - .6 Apply sufficient masking, clean drop cloths, and protective coverings for full protection of work not being painted including, but not limited to, the following:
 - .1 Light fixtures, fire and smoke detectors.
 - .2 Sprinkler heads.
 - .3 Non-Prepainted diffusers and registers.
 - .4 Non-Prepainted equipment.
 - .5 Fire rating labels and equipment specification plates.
 - .6 Finished surfaces.
 - .7 Nameplates.
- 1.8 **ENVIRONMENTAL PERFORMANCE REQUIREMENTS**
- .1 Provide paint products meeting MPI "Green Performance Standard GPS-1-05".
- 1.9 **WASTE MANAGEMENT AND DISPOSAL**
- .1 Remove from site and dispose of packaging materials at appropriate recycling facilities.
 - .2 Place materials defined as hazardous or toxic in designated containers.
 - .3 Ensure emptied containers are sealed and stored safely.
 - .4 Unused paint, coating materials must be disposed of at official hazardous material collections site as approved by Owner.
 - .5 Paint, stain and wood preservative finishes and related materials (thinners, and solvents) are regarded as hazardous products and are subject to regulations for disposal.
 - .6 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.
 - .7 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.
 - .8 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into ground follow these procedures:
 - .1 Retain cleaning water for water-based materials to allow sediments to be filtered out.
 - .2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.

- .3 Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.
- .4 Dispose of contaminants in approved legal manner in accordance with hazardous waste regulations.
- .5 Empty paint cans are to be dry prior to disposal or recycling (where available).

1.10 **MAINTENANCE**

- .1 Deliver to Owner's place of storage on completion of work, sealed containers of each finish painting material applied, and in each colour. Label each container as for original, including mixing formula. Provide the following:
 - .1 1 L of extra materials when less than 50 L are used for Project;
 - .2 3.78 L of extra stock when 50 to 200 L are used;
 - .3 7.57 L of extra stock when over 200 L are used.

1.11 **SCHEDULE OF WORK**

- .1 Submit work schedule for various phases of painting to Consultant for approval. Submit schedule minimum of 1 week in advance of proposed operations.
- .2 Obtain written authorization from Consultant for any changes in work schedule.
- .3 Schedule painting operations to prevent disruption of occupants in and about the building.

2 **Products**

2.1 **MATERIALS**

- .1 Paint:
 - .1 All materials under work of this Section, including but not limited to, primers, stains, and paints are to have low VOC content limits.
 - .2 Products in accordance with the MPI Painting Specification Manual, and MPI Maintenance Repainting Manual, Exterior and Interior Systems;
 - .1 For each MPI paint code, manufacture's premium grade, first line Products is to be use.
 - .2 Uniform dispersion of pigment in a homogeneous mixture.
 - .3 Ready-mixed and tinted whenever possible.
- .2 Products within each MPI paint system code: From single manufacturer.
- .3 Acceptable manufacturers:
 - .1 Benjamin Moore.
 - .2 Dulux Paints/PPG.
 - .3 Sherwin Williams.

2.2 COLOUR SCHEDULE

- .1 Consultant will select choice of colours and gloss when compiling a Colour Schedule after award of Contract; allow for colour selection beyond paint manufacturer's standard colour range.
- .2 Second coat in a three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.
- .3 Refer to Colour Schedule for selected colour references. Allow for 12 different colours, an additional deep and ultra-deep colours; 4 coats may be required.
- .4 Conform to gloss reflectance definitions listed in MPI Specification Manual.

2.3 PAINTING AND FINISHING SCHEDULE

- .1 Refer to Table 1, MPI Painting and Finishing Schedule coded systems, comply with MPI Painting Specification Manual.

Table 1: Interior Painting and Finish Schedule				
TYPICAL INTERIOR SUBSTRATES (unless otherwise noted in Table 3 and Table 4 below)	Typical substrates (Including but not limited to)	MPI Manual Ref.	MPI Finish System Code	Primer/Topcoat (PPG)
Concrete Masonry Units	Concrete walls	RIN 4.2	RIN 4.2F	Prime – Dulux Gripper Universal Acrylic Primer/ Sealer 60000A Topcoat – PPG Pitt-Glaze WB1 Precatalyzed Acrylic Epoxy Eggshell
Gypsum Board	Walls & ceilings	RIN 9.2	RIN 9.2F	Prime – Dulux Gripper Universal Acrylic Primer/ Sealer 60000A Topcoat – PPG Pitt-Glaze WB1 Precatalyzed Acrylic Epoxy Eggshell
Galvanized Metal/ Structural Steel and Deck	HM Doors & Frames, Columns, beams, joists, deck	RIN 5.3 RIN 5.1	RIN 5.3J RIN 5.3RR	Prime – Dulux Gripper Universal Acrylic Primer/ Sealer 60000A Topcoat – PPG Pitt-Glaze WB1 Precatalyzed Acrylic Epoxy Semi-Gloss 16-1510

3 Execution

3.1 EXAMINATION

- .1 Verify condition of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.

3.2 CONDITION OF SURFACES:

- .1 Prior to commencement of repainting work, thoroughly examine (and test as required) all interior conditions and surfaces scheduled to be repainted and report in writing to the Consultant any conditions or surfaces that will adversely affect work of this section.
- .2 The degree of surface deterioration (DSD) shall be assessed using the assessment criteria indicated in the MPI Maintenance Repainting Manual. In general, the MPI DSD ratings and descriptions are as follows:

CONDITION	DESCRIPTION
DSD-0	Sound Surface (may include visual (aesthetic) defects that do not affect film's protective properties).
DSD-1	Slightly Deteriorated Surface (may show fading; gloss reduction, slight surface contamination, minor pin holes scratches, etc.) / Minor cosmetic defects (runs, sags, etc.).
DSD-2	Moderately Deteriorated Surface (small areas of peeling, flaking, slight cracking, staining, etc.).
DSD-3	Severely Deteriorated Surface (heavy peeling, flaking, cracking, checking, scratches, scuffs, abrasion, small holes and gouges).
DSD-4	Substrate Damage (repair or replacement of surface required by Contractor).

- .3 Other than the repair of DSD-1 to DSD-3 defects included under this scope of work, structural and DSD-4 substrate defects discovered prior to and after surface preparation or after first coat of paint shall be made good and sanded by others ready for painting, unless otherwise agreed to by the Consultant and painter to be included in this Work.
- .4 No repainting work shall commence until all such DSD-4 adverse conditions and defects have been corrected and surfaces and conditions are acceptable to the Painting Subcontractor. The Painting Subcontractor shall not be responsible for the condition of the substrate or for correcting defects and deficiencies in the substrate, which may adversely affect the painting work except for minimal work normally performed by the Painting Subcontractor and as, indicated herein. It shall always, however, be the responsibility of the Painting Subcontractor to see that surfaces are properly prepared before any paint or coating is applied. It shall also be the Painting Subcontractor's responsibility to paint the surface as specified providing that the Wwner accepts responsibility for uncorrected DSD-4 substrate conditions.

3.3 PREPARATION

- .1 General:
 - .1 Clean substrate surfaces free from, dust, grease, soiling, or extraneous matter, which are detrimental to finish.

- .2 Patch, repair, and smoothen minor substrate defects and deficiencies e.g. machine, tool and sand paper marks, shallow gouges, marks, and nibs.
- .3 Clean, sweep, and vacuum floors and surfaces to be painted, debris and dustfree prior to painting.
- .4 Refer to MPI Painting Specification Manual for surface preparation requirements of substrates not listed here.
- .2 Where finish hardware has been installed remove, store, re-install finish hardware, to accommodate painting. Do not clean hardware with solvent that will remove permanent lacquer finishes.
- .3 Alkali Content tests and neutralization:
 - .1 Test for ph level using litmus paper on dampened substrate.
 - .2 Neutralize surfaces over 8.5 ph with 4% solution of Zinc Sulphate for solvent based systems and tetrapotassium pyrophosphate for latex based systems, to below 8.0 ph, and allow to dry.
 - .3 Brush-off any residual Zinc Sulphate crystals.
 - .4 Coordinate paint system primer / sealer to be alkali-resistant.
- .4 Substrate moisture tests:
 - .1 Test for moisture content over entire surface to be painted, minimum one test/2 m2 in field areas and one test/600 mm along inside corners including at ceiling to wall juncture.
 - .2 If any test registers above 10% allow entire substrate surfaces, within the plane, to dry further before paint system application. Install temporary drying fans if necessary.
 - .3 Re-test employing same criteria.
- .5 Mildew removal: Scrub with solution of trisodium phosphate and sodium hypochlorite (Javex) bleach, rinse with water, and allow to dry completely.
- .6 Cementitious and masonry (existing): Clean existing surfaces by pressure washing where indicated on drawings with a TSP solution and pressure range of 1500 - 4000 PSI at 150 mm - 300 mm. Rinse areas with clean water and allow to thoroughly dry. Provide for collection and disposal of water.
- .7 Cementitious and masonry (Concrete, block):
 - .1 Allow 28 days cure before painting.
 - .2 Coordinate repair of protrusion-chipping and grinding, and honeycomb filling with responsible trades.
 - .3 Remove dirt, loose mortar, scale, powder, efflorescence, and other foreign matter.
 - .4 Remove form oil and grease with trisodium phosphate, rinse, and allow to dry thoroughly.
 - .5 Prepare surfaces in accordance with CAN/CGSB-85.100.

- .6 Remove rust stains with solution of sodium metasilicate after thorough wetting;
 - .1 allow to dry thoroughly.
- .8 Metal Fabrications (existing): Scrape and either hand or power wire brush surfaces to remove mill and scale.
- .9 Galvanized steel sheet:
 - .1 Z275 (Satin & Spangled Sheet): SSPC SP7 brush blast.
 - .2 ZF075 (Wiped Coat): Remove contamination, wash with Xylene solvent.
 - .3 Touch-up damaged galvanized areas with organic zinc rich primer.
- .10 Galvanized iron and steel: Prepare galvanized and ungalvanized metal surfaces as
 - .1 Z275 (Satin & Spangled Sheet): SSPC SP7 brush blast.
 - .2 ZF075 (Wiped Coat): Remove contamination, wash with Xylene solvent.
 - .3 Touch-up damaged galvanized areas with organic zinc rich primer.
- .11 Galvanized iron and steel: Prepare galvanized and ungalvanized metal surfaces as follows:
 - .1 Unpassivated, unweathered and weathered: Remove contamination, wash with Xylene or Toluol solvent, allow to dry thoroughly. Make paint system primer/sealer an etching type primer.
 - .2 Manufacturer pre-treated (including passivated): SSPC SP7.
 - .3 Touch-up damaged galvanized areas with organic zinc rich primer.
- .12 Structural steel and miscellaneous metal fabrications:
 - .1 Coordinate the following with the responsible trades:
 - .1 Rust, mars, mill scale, and weld-burn touch-ups.
 - .2 Oil, grease, weld flux and other residue removal.
 - .2 Prime paint items, not otherwise indicated to be primed as part of another Section.
 - .3 Touch-up damaged galvanized areas with organic zinc rich primer
- .13 Factory primed surfaces:
 - .1 Touch up damaged areas.
 - .2 Clean as required for top coat.
- .14 Gypsum board (existing):
 - .1 Remove dust, dirt, oil, grease, glue and all foreign material. Clean with stiff fibre brush prior to applying primer coat.
 - .2 Coordinate repairs and touch-ups with the responsible trade.
 - .3 Lightly sand surface to smooth out ridges and provide neat smooth surface.
- .15 Gypsum board:

- .1 Apply primer/sealer paint to reveal defects and deficiencies and to equalize absorption areas.
 - .2 Coordinate repairs and touch-ups with the responsible trade.
 - .3 Re-prime repairs.
 - .16 Coordinate with other trades to prevent:
 - .1 Damage, and inadvertent activation of fire and smoke detectors.
 - .2 Odour and dust distribution by permanent HVAC systems including fouling of ducts and filters.
 - .17 Field-mix Products in accordance with manufacturer's written instructions.
- 3.4 **APPLICATION**
- .1 Apply painting systems in accordance with the MPI Painting Specification Manual. Apply each Product to manufacturer's recommended dry film thickness.
 - .2 Method of application to be as approved by Consultant. Apply paint by brush, roller, air sprayer, airless sprayer. Conform to manufacturer's application instructions unless specified otherwise.
 - .3 Brush and Roller Application:
 - .1 Apply paint in a uniform layer using brush and/or roller of types suitable for application.
 - .2 Work paint into cracks, crevices and corners.
 - .3 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces shall be free of roller tracking and heavy stipple.
 - .4 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
 - .5 Remove runs, sags and brush marks from finished work and repaint.
 - .4 Spray application:
 - .1 Provide and maintain equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
 - .2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
 - .3 Apply paint in a uniform layer, with overlapping at edges of spray pattern.
 - .4 Brush out immediately all runs and sags.
 - .5 Use brushes to work paint into cracks, crevices and places which are not adequately painted by spray.
 - .5 Painting systems listed are required minima, apply additional coats if necessary to obtain substrate hiding acceptable to the Consultant.

- .6 Tint intermediate coats lighter than final top coats for identification of each succeeding coat and to facilitate inspections. Include only manufacturer's recommended reducing and tinting accessories. Do not add adulterants.
- .7 Primer to be specialized primer coating system as required by manufacturer for selected colour. Standard primer being tinted shall be tinted to a maximum of 1.5% by volume.
- .8 Sand lightly between coats to achieve a tooth or anchor for subsequent coats.
- .9 Apply paint uniformly in thickness, colour, texture, and gloss, as determined by the Consultant under adequate illumination and viewed at a distance of 1500 mm. Apply finishes free of defects in materials and application which, in the opinion of the Consultant, affect appearance and performance. Defects include, but are not limited to:
 - .1 Improper cleaning and preparation of surfaces.
 - .2 Entrapped dust, dirt, rust.
 - .3 Alligatoring, blisters, peeling.
 - .4 Scratches, blemishes.
 - .5 Uneven coverage, misses, drips, runs, and poor cutting in.
- .10 Do not apply coatings on substrates which are not sufficiently dry. Unless indicated otherwise, allow each painting system coat to cure dry and hard before following coats are applied.
- .11 Repaint entire areas of damaged or incompletely covered surfaces, to the nearest inside or outside corner; patching will not be permitted.
- .12 Miscellaneous painting requirements:
 - .1 Paint projecting ledges, and tops, bottoms and sides of doors both above and below sight lines to match adjacent surfaces.
 - .2 Paint door frames, access doors and frames, door grilles, prime coated butts, and prime coated door closers to match surface in which they occur.
 - .3 Finish closets and alcoves as specified for adjoining rooms.
 - .4 Paint light coves white whether a light lense is installed or not, unless otherwise indicated.
 - .5 Paint interior columns to match walls of room.
 - .6 Allow for:
 - .1 2 wall colours per room, one ceiling colour per room.
 - .2 Different door colours in each functionally different area.
 - .3 Different colours on both sides of same door.
- .13 Mechanical, electrical, refrigeration and other painting coordination:
 - .1 Coordinate painting of pipes, ducts, and coverings with the work to precede pipe colour banding, flow arrows, and other pipe identification labeling installation.

- .2 Paint exposed conduit, pipes, hangers, ductwork, grilles, gratings, louvres, access panels, fire hose cabinets, registers, convactor and radiator covers, enclosures, and other mechanical and electrical equipment including services concealed inside cupboard and cabinet work; apply colour and sheen to match adjacent surfaces, except as noted otherwise.
- .3 Paint portions of surfaces such as duct interiors, piping, ductwork, hangers, insulation, walls, and similar items, visible through grilles, louvres, convactor covers etc., colour as noted on drawings.
- .4 Paint inside of ductwork where visible behind grilles, registers and diffusers with primer and one coat of matt black paint.
- .5 Remove the following to accommodate painting, carefully store, clean, then reinstall on completion of each area and when dry:
 - .1 Switch and receptacle plates, fittings and fastenings, grilles, gratings, louvres, access panels, convactor covers, and enclosures.
- .6 Unless otherwise specified, paint finished area exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as noted otherwise.
- .7 Boiler room, mechanical and electrical rooms: paint exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment.
- .8 Paint fire protection piping red.
- .9 Paint disconnect switches for fire alarm system and exit light systems in red enamel.
- .10 Paint natural gas piping yellow.
- .11 Paint both sides and edges of backboards for telephone and electrical equipment before installation. Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.

3.5 **FIELD QUALITY CONTROL**

- .1 Dry film thickness tests:
 - .1 Test for film thickness over entire surface to be painted, minimum one test 2m2 in field areas and one test/600 mm along inside corners including at ceiling to wall juncture.
 - .2 If any test registers below specified thickness, re-apply paint to entire surface to nearest inside and outside corners.
 - .3 If test registers more than 50% above specified thickness, consult with paint manufacturer, determine if problem exists, offer solutions to Consultant, and repair as directed.
 - .4 Re-test employing same criteria after repair.

3.6 **RESTORATION**

- .1 Clean and re-install all door hardware items removed before undertaken painting operations.
- .2 Remove protective coverings and warning signs as soon as practical after operations cease.
- .3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.
- .4 Protect freshly completed surfaces from paint droppings and dust to approval of Consultant. Avoid scuffing newly applied paint.
- .5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Departmental Representative.

3.7 **CLEANING**

- .1 Remove spilled, splashed, and spattered paint promptly as work proceeds and on completion of work. Clean surfaces soiled by paint spillage and paint spatters. Repair or replace damaged work, as directed by Consultant.

3.8 **PROTECTION**

- .1 Post Wet Paint signs during drying and restrict or prevent traffic where necessary.
- .2 Post sign, after Consultant's inspection and acceptance of each room, reading: PAINTING COMPLETE - NO ADMITTANCE WITHOUT CONTRACTOR'S PERMISSION.

END OF SECTION

- 1** General
- 1.1 SECTION INCLUDES**
 - .1 Labour, Products, equipment and services for washroom accessories work in accordance with the Contract Documents.
- 1.2 REFERENCES**
 - .1 ASTM A167, Specification for Stainless Steel and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 - .2 ASTM A312, Specification for Seamless and Welded Austenitic Stainless Steel Pipes.
 - .3 ASTM A653/A653M, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process.
 - .4 CAN/CSA B651-M, Barrier Free Design.
- 1.3 SUBMITTALS**
 - .1 Product data: Submit Product data to requirements of Section 01 10 10 indicating each washroom accessory describing size, finish, details of function, attachment methods, hardware and locks, description of rough-in frame, and building-in details of anchors for grab bars.
 - .2 Closeout submittals:
 - .1 Submit for each Product operation and maintenance instructions for incorporating into the Operations and Maintenance Manuals in accordance with Section 01 10 10.
 - .1 Supply 2 keys for each lockable washroom accessory to Consultant.
 - .2 Master key washroom accessories which are keyed.
- 1.4 DELIVERY, STORAGE AND HANDLING**
 - .1 Deliver materials in sealed cartons and containers with manufacturer's name and product description clearly marked.
- 1.5 EXTENDED WARRANTY**
 - .1 Submit an extended warranty for washroom accessories work in accordance with the General Conditions, except that the warranty period is extended to 10 years.
 - .1 Against cracked or scratched mirrors, spoiling or deterioration of silvering or backing, loosening of fastenings or adhesive
 - .2 Coverage: complete replacement including effected adjacent work.
- 1.6 MAINTENANCE**
 - .1 Maintenance Tools: Provide special tools necessary for accessing, assembly/disassembly or removal of toilet, bath and cleaning accessories in accordance with Section 01 10 10.
- 2** Products

2.1 MATERIALS

- .1 Stainless steel:
 - .1 Sheet metal: ASTM A167, Type 304.
 - .2 Tubing: ASTM A312, Type 304.
- .2 Sheet steel: ASTM A653M, Z275; Cold rolled, commercial quality, surface preparation and pre-treatment as required for applied finish.
- .3 Fasteners, screws and bolts: ASTM A167, Type 304 stainless steel, tamper-proof.

2.2 ACCESSORIES

- .1 Refer to drawings for quantity and location of washroom accessories.
- .2 Toilet tissue dispenser (TTD):
 - .1 #B-2892 by Bobrick or #0040 by ASI Group Canada; Surface mounted, multi roll dispenser, with second roll enclosed in cabinet above.
 - .2 Finish: Type 304 stainless steel with satin finish.
- .3 Sanitary napkin disposal (ND):
 - .1 #B-270; surface mounted stainless steel waste receptacle, drawn cover, one-piece construction, secured to cabinet with full length stainless steel piano hinge. Receptacle capacity:
 - .2 Finish: Type 304 stainless steel with satin finish.
- .4 L-Shaped Grab bar (GBR-1):
 - .1 '3200 Series' by ASI/Watrous or approved alternative; 38 mm diameter, 1.2 mm thick, concealed mounting with flange, L-shape as indicated on drawings.
 - .2 Finish: Type 304 stainless steel with a satin finish and peened grip.
- .5 Grab bar (GBR-2):
 - .1 '3200 Series' by ASI/Watrous or approved alternative; 600 mm length, 38 mm diameter, 1.2 mm thick, concealed mounting, complete with escutcheons as indicated on drawings.
 - .2 Finish: Type 304 stainless steel with a satin finish and peened grip.
- .6 Barrier-free mirror with shelf (BFM):
 - .1 #B-166 1830; 6 mm thick, mirror quality float glass complete with stainless steel channel frame with galvanized steel back having integral horizontal hanging brackets, integral stainless steel shelf with return edge and galvanized steel concealed wall hanger.
 - .2 Frame finish: Type 304 stainless steel satin finish.
 - .3 Locations as indicated on the Contract Drawings.
- .7 Soap dispenser (SD):

- .1 B-2111 by Bobrick or #0347 by ASI Group Canada; Vertical surface wall mounted dispenser, 100 mm from wall to push button, 1.18 -litre capacity stainless steel container with tamper resistant sight gauge.
 - .2 Finish: Type 304 stainless steel with satin finish.
- .8 Coat hook (CH) :
 - .1 1150-CLRS – Colored Safety Coat Hook approved alternative by Bobrick, Gamco; single break away hook, vandal-resistant.
 - .2 Finish: Type 304 stainless steel, bright polished finish. Consultant to select from full arrange of standard colours, minimum 4 difference colours.
- .9 Backrest:
 - .1 Provide barrier-free backrests in washrooms where shown on Contract Drawings.
 - .2 Backrest to be fabricated from 32 mm o.d. stainless steel tubing having a satin finish, complete with concealed mounting and a 16 mm thick solid panel finished with white plastic laminate.
 - .3 Backrest, 'Model 1028' by Frost Products Ltd. or approved alternative.
- .10 Stainless Steel Shelf:
 - .1 #B-298 x 24 by Bobrick or approved alternative by ASI/Watrous or Bradley Corporation;; shelf fabricated from 1.2 mm thick stainless steel with 19 mm return edge and front edge hemmed for safety.
 - .2 Shelf complete with brackets fabricated from 1.6 mm thick stainless steel.
 - .3 Size: 200 mm wide x 600 mm length.
 - .4 Finish: Type 304 stainless steel, satin finish.
 - .5 Locations in Room 102 and 106. Total 2 units.
- 3 Execution**
- 3.1 EXAMINATION**
 - .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.
- 3.2 INSTALLATION**
 - .1 Verify and coordinate templates, inserts, and rough-in frames and verify exact location of washroom accessories for installation.
 - .2 Verify there is adequate supports and/or blocking in gypsum wall assemblies prior to installation of washroom accessories.
 - .3 Provide fastening and mounting kits for washroom accessories.
 - .4 Locate washroom accessories where indicated on Drawings and where directed by Consultant.

- .5 Install washroom accessory fixtures, accessories, and items in accordance with manufacturer's instructions and CAN/CSA B651-M. Provide exposed tamper-proof screws of stainless steel to match units.
- .6 Install washroom accessories plumb, level, and securely and rigidly anchored to substrate surfaces and framing. Adjust accessories for proper operation and verify mechanisms function smoothly.
- .7 Install grab bars to withstand minimum 408 kg downward pull. Provide necessary reinforcements as required.
- .8 Clean and polish exposed surfaces

END OF SECTION

- 1** General
- 1.1** **SECTION INCLUDES**
 - .1 Labour, Products equipment and services necessary for the miscellaneous specialties Work in accordance with the Contract Documents.
- 1.2** **SUBMITTALS**
 - .1 Product data:
 - .1 Submit manufacturer's Product data for each Product specified in accordance with Section 01 10 10 indicating:
 - .1 Performance criteria, compliance with appropriate reference standard(s),
 - .2 Product transportation, storage, handling and installation requirements.
 - .2 Shop drawings:
 - .1 Submit shop drawings in accordance with Section 01 10 10 indicating elevations, sections, details, dimensions, materials, gauges, and finishes.
 - .3 Closeout submittals: Submit cleaning and maintenance instructions for miscellaneous specialties for incorporation into Operations and Maintenance Manuals in accordance with Section 01 10 10.
- 1.3** **DELIVERY, STORAGE, AND HANDLING**
 - .1 Package or crate, and brace products to prevent distortion in shipment and handling. Label packages and crates, and protect finish surfaces by sturdy wrappings.
- 2** Products
- 2.1** **MATERIALS**
 - .1 Access doors (non-fire rated walls and ceilings):
 - .1 Access door, "Bauco Plus II TX" by Access Panel Solutions or approved alternative.
 - .2 Seamless access panel for gypsum board with concealed aluminum frame with continuous factory installed perimeter EPDM gasket, galvanized steel hardware, pivoting hinge and steel safety cable with clip for ceiling operation.
 - .3 Provide concealed mechanical touch-latch for ceiling access doors and tamper-resistant torx head can latch lock for wall and ceiling applications.
 - .4 Door size as approved by the Consultant for intended applications.
 - .5 Finishing: In accordance with Section 09 91 00.
 - .2 Access doors (tiled insert – walls):

- .1 Access door, "Bauco Plus II TX" by Access Panel Solutions or approved alternative.
- .2 Seamless access panel for gypsum board with concealed aluminum frame with continuous factory installed perimeter EPDM gasket, galvanized steel hardware, pivoting hinge and steel safety cable with clip for ceiling operation.
- .3 Provide concealed mechanical touch-latch for ceiling access doors and tamper-resistant torx head cam latch lock for wall and ceiling applications.
- .4 Door size as approved by the Consultant for intended applications.
- .5 Finishing: In accordance with Section 09 30 00 and 09 91 00.
- .6 Install bench brackets and supports supplied under work of Section 05 50 00.

3 Execution

3.1 EXAMINATION

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.

3.2 PREPARATION

- .1 Verify substrate surfaces are solid, free from surface water, dust, oil, grease, projections and other foreign matter detrimental to performance.
- .2 Items to be built-in: Provide information and templates required for installation of work of this Section, and assist or supervise, or both, the setting of anchorage devices, and construction of other work incorporated with products specified in this Section in order that they function as intended.
- .3 Verify there is adequate supports and / or blocking in gypsum wall assemblies prior to installation of miscellaneous speciality items as required.

3.3 INSTALLATION

- .1 Install miscellaneous specialties level and securely and rigidly anchored to substrate in accordance with authorities having jurisdiction, reviewed shop drawings, and manufacturer's written instructions.
- .2 After installation, adjust miscellaneous specialties in accordance with manufacturer's written instructions.

3.4 CLEANING

- .1 Clean and polish exposed surfaces prior to acceptance by Consultant.

END OF SECTION

- 1** General
 - 1.1 SECTION INCLUDES**
 - .1 Labour, Products equipment and services necessary for the gymnasium dividers and netting Work in accordance with the Contract Documents.
 - 1.2 SUBMITTALS**
 - .1 Submit duplicate copies of manufacturer's Product data for each Product specified in accordance with Section 01 10 10 indicating:
 - .1 Performance criteria, compliance with appropriate reference standards characteristic, and limitations:
 - .2 Shop drawings: Submit engineered shop drawings in accordance with Section 01 10 10 indicating elevations, sections, details, dimensions, materials, gauges, and finishes.
 - .3 Samples: Submit 3 samples of each finish
 - .4 Closeout submittals: Submit cleaning and maintenance instructions for gymnasium equipment for incorporation into Operations and Maintenance Manuals in accordance with Section 01 10 10.
 - 1.3 QUALITY ASSURANCE**
 - .1 Qualifications
 - .1 Installers / applicators / erectors: Provide work of this section, executed by competent installers with minimum 5 years experience in application of Products, specified.
- 2** Products
 - 2.1 MANUFACTURED UNITS**
 - .1 BASE: Douglas #420 Knotless High Tenacity Polypropylene (HTPP) Pylon Netting as manufactured by: Douglas Industries, Inc. or Sports Systems Canada approved equivalent.
 - .2 COMPONENTS:
 - .1 Material: #420 Knotless High Tenacity Polypropylene (HTPP) Pylon
 - .2 Fire retardant, urethane-coated knotted netting
 - .3 Break Strength: 125 lbs.
 - .4 UV & Weather Resistant
 - .5 Available 1-1/2" Square Mesh & 7/8" SQ Mesh
 - .6 Colors: Black or White
 - .7 Reinforced Vinyl Edging Double Sewn Perimeter with Brass Grommets or Sewn Rope Border Execution
 - .3 Aluminum uprights with hoist system for easy net handling.

- .4 Aluminum ground sleeves with caps.

2.2 EXAMINATION

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.

2.3 PREPARATION

- .1 Verify substrate surfaces are solid, free from surface water, dust, oil, grease, projections and other foreign matter detrimental to performance.
- .2 Items to be built-in: Provide information and templates required for installation of work of this Section, and assist or supervise, or both, the setting of anchorage devices, and construction of other work incorporated with products specified in this Section in order that they function as intended.
- .3 Verify there is adequate supports prior to installation of gymnasium equipment.

2.4 INSTALLATION

- .1 Install gymnasium equipment level and securely and rigidly anchored to substrate in accordance with authorities having jurisdiction, reviewed shop drawings, and manufacturer's written instructions.
- .2 Submit manufacturer's information and templates required for installation of work of this section, and assist or supervise, or both, the setting of anchorage devices, and construction of other Work incorporated with Products specified in the work of this section in order that they function as intended.
- .3 Include reinforcing, anchorage and mounting devices required for the installation of each Product.
- .4 Install work to meet manufacturers' specifications and installation instructions true, tightly fitted, and level or flush to adjacent surfaces, as suitable for installation.
- .5 Fit joints and junction between components tightly and in true planes, conceal and weld joints where possible.
- .6 After installation, adjust gymnasium equipment in accordance with manufacturer's written instructions.

2.5 ADJUSTMENT AND CLEANING

- .1 Verify that installed Products function properly, and adjust them accordingly to ensure satisfactory operation.
- .2 Clean and polish exposed surfaces prior to acceptance by Consultant.
- .3 Refinish damaged or defective work so that no variation in surface appearance.

END OF SECTION

1 General

- .1 Labour, Products, equipment and services necessary for swimming pool general condition and drain & refill Work in accordance with the Contract Documents.
- .2 Perform work in accordance with applicable provisions of local Health Code, Building Code. Provide materials and labor necessary to comply with rules, regulations, and ordinances.
- .3 The most stringent shall govern between building codes, provincial laws, local ordinances, utility company regulations, and Contract Documents.

2 POOL SUB-CONTRACTOR QUALIFICATIONS

- 2.1 Execute work of this Section using a company who has experience in application of Products, systems and assemblies specified, and illustrated. Perform Work using skilled tradesman and experienced in Work of this complexity.
- 2.2 The Pool Sub-Contractor must prove their capacity and resources to compete all work in the Contract Document.
- 2.3 The Pool Sub-Contractor to have completed a minimum of three 25-meter lap pools with similar scope of work within the past five years for municipalities.
- 2.4 The Pool Sub-Contractor to provide a list of referrals for similar projects, minimum three (3) projects.

3 POOL CONSULTANT

- 3.1 Pool Sub-Contractor shall retain an experienced swimming Pool Consultant for the duration of this project with experience in Work of comparable complexity and scope, to perform the following services as part of the Work of Division 13.
- 3.2 The Pool Consultant who is a specialist and can provide the necessary technical assistance during the renovation of this swimming pool. There is a technical element to the renovation of public swimming pools that requires a specialist input.
- 3.3 The Pool Consultant shall minimum have the following qualifications:
 - .1 Minimum 15 years of professional experience in commercial aquatic consulting field.
 - .2 C.P.O. (Certified Pool Operator),
 - .3 C.P.I (Certified Pool Inspector), and
 - .4 AFO (Aquatic Facility Operator).
 - .5 They shall be active members in good standing of a Professional Associations such as Pool & Hot Tub Council of Canada, National Recreation Parks Association, Ontario Recreational Facilities Association or approved equivalent.

- 3.4 The Pool Consultant shall be available on an as needed basis by the Pool Sub-Contractor to assist in the shop drawing review stage, provide the information for ordering equipment.
- 3.5 The Pool Consultant shall be available for the initial site meeting/kick-off meeting to review the project requirements, scheduling and outstanding issues. Include five site meetings at four hours each.
- 3.6 The Pool Consultant shall attend the Pre-Installation Meeting as per SECTION 13 11 13.
- 3.7 The Pool Consultant shall review the site, prior to concrete restoration, verify placement of individual items and provide a completed report of their findings. No concrete work shall be completed until the report has been received by the prime Consultant and approved.
- 3.8 The Pool Consultant shall supervise the procedures to be followed for testing, refilling and balancing the pool water.
- 3.9 The Pool Consultant shall include the cost of two (2) additional days (total 16 hours) of instruction and operational checks during the first season of operation.
- 3.10 The Pool Consultant services to be pay out of CASH ALLOWANCE as per SECTION 01 10 10 with the approval of the prime Consultant.

4 PERMITS, REGULATIONS AND FEES

- 4.1 All materials and quality of work shall meet all current and latest Provincial, Municipal and local requirements, regulations, codes and by-laws in force having jurisdiction in the area of the project.
- 4.2 The Contractor shall give all necessary notices, obtain all necessary permits, and pay all fees in order that the work shown or specified may be carried out. The Contractor shall furnish any certificates necessary as evidence that the work installed conforms to the laws and regulations of all authorities having jurisdiction in the area of the project.
- 4.3 In the event that changes, or alterations are required on completed work by authorized inspectors, these changes shall be made at the contractor's expense, with no impact to project schedule.
- 4.4 All costs and fees for inspections shall be borne by the Contractor.
- 4.5 Submit a copy of all final certificates in the maintenance manuals to Consultant during the Closeout Procedure.

- 4.6 The Contractor shall be responsible for contacting and arranging all required inspections and pay all inspection fees associated with final inspection and approval for this project.

5 INDEPENDENT TEST AND INSPECTION BY THE OWNER

- 5.1 Owner may arrange and pay for pool inspection by independent inspection agency out of the CASH ALLOWANCE as per SECTION 01 10 10.
- 5.2 Independent inspection agency may conduct periodic inspections during the installation of the pool, pool waterproofing components and tiling/finishing of the pool to ensure strict compliance with contract documents, including but not limited to:
- .1 Pool reinforced steel.
 - .2 Surface preparation of concrete restoration.
 - .3 Investigation of cementitious surface prior to installing of waterproofing finishes.
 - .4 Waterproofing inspection
 - .5 Porcelain tile installation and bonding tests.
 - .6 Pool equipment and fixture inspection.

6 FALL PROTECTION MEASURES AROUND THE EXISTING POOL TANK

- .1 Provide and maintain fall protection around existing pool tank to mitigate any fall hazard. Fall protection measures may include and not limited to; temporary guards around pool tank perimeter, and implementation of necessary modification or adjustment to temporary guard to accommodate construction activities.

7 PREPARATION FOR POOLING DRAINING

- .1 Turn off/isolate heating/dehumidification systems to the pool mechanical system.
- .2 Turn off all pool pumps, circulations pumps and chemical feed pumps.
- .3 Isolate the chemical pool controller and remove the probes.
- .4 Clean the probes as per manufacturers' instructions.
- .5 Place the cleaned probes in distilled water for storage, until time to re-install.
- .6 Remove all handrails, escutcheon plates, wedge anchors, roll out skimmer grilles and inserts. Stainless steel products may show signs of discolouration or rust, this is typically only a surface rust mark and a *mild non-abrasive* stainless steel or brass cleaner and a damp cloth can be used to remove surface build-up and restore shine.
- .7 All stainless steel components shall be professionally cleaned and apply a chemical passivation treatment, NS-NOX 21 (Northern Stainless & Rail Products) or equal.

- .8 This will remove impurities and promotes the formation of a thin transparent oxide film on decontaminated stainless steel surfaces. Chemical passivation ensures the formation of an even protective skin compared to simple exposure to oxygen in the atmosphere, thus providing a better safeguard against corrosion.
- .9 Visual inspection of the rear diving board anchors and bolts as well as the track guide.
- .10 Order replacement parts if required for a 1 meter Duraflex model 70-231-400.
- .11 Place the required barricades surrounding the pool tank and place the appropriate signage as required.
- .12 Please note that City of Mississauga Bylaw 219-85, as amended, prohibits the discharge of swimming pool water onto private property without the property owner's consent. The By-law also prohibits the discharge of swimming pool water onto public property unless it is directly discharged onto the street and into the storm sewer, or otherwise as authorized by the City. Contact the City's Environmental Services at 905-615-3200 ext. 5170, for further directions.

8 DRAINING OF POOL

- .1 Isolate all skimmer and return inlet piping in the pool mechanical room.
- .2 Separate the filter system from the pool mechanical system. If directed by the owner/architect, add filter cleaner (supplied by the owner) to the filter tanks for the prescribed period of time and then allow to drain completely to sanitary drain.
- .3 Open the drain valve connected to the sanitary connection.
- .4 The sanitary system is protected from the swimming pool by a backflow preventer or an air gap above the drain connection.
- .5 Open the valve connecting the bottom main drain(s). Open the valve directing water to the sanitary system. Allow the water to flow at a rate to the sanitary system that does not exceed the capacity of the drain. Do NOT overflow or cause the water to backflow into the mechanical room. This will require adjustment to the drain valve to the required flow rate.
- .6 Obtain permission of Architect to use recirculation system to drain the pool utilizing the circulation pump. It will require throttling of the pump to equal to the flow rate of the sanitary system. Allow the water to drain completely. When complete isolate the circulation system and add distilled water to the pump hair & lint strainer to completely cover the impellor and seal.

9 POOL DRAINED

- .1 Carefully remove all the in-wall return inlet cover plates. Order replacement cover plates. Return inlets replacements Pac Fab model 08428 and screws 37077-0582. Provide one complete inlet at the south wall pool tank at structural concrete restoration.
- .2 Remove the pool main drain covers located at the deepest part of the pool. Order new replacement grates if the drain covers are old or past their expiry date.
- .3 Remove deck skimmer cover and stainless-steel overflow and order new Pac Fab Model U3 or approved equivalent with custom make stainless less roll our skimmer grille.
- .4 Carefully remove the hydrostatic relief valve(s) and order new ones for replacement.
- .5 Leave the pipe stub open to allow water into the pool if hydrostatic pressure of water below the pool increases. Do NOT place a plug in the pipe stub. It may require a submersible pump in the main drain sump to remove standing water.
- .6 Do NOT use the drained pool for staging/work except for the removal of tile and waterproofing. Do NOT let oil/grease or other contaminates permeate into the pool shell.

10 INITIAL FILL

- .1 Install new hydrostatic relief valve(s).
- .2 Install new drain covers and provide a copy of the drain cover model as well as the expiry date to the owner/architect.
- .3 Install all new return inlet fitting cover plates.
- .4 Install all deck anchors, handrail(s) and ladder(s) with new bumpers, to prevent damage to the wall.
- .5 The fill water must be tempered to match the temperature of the pool shell to avoid thermal shock to the pool tank and finishes.
- .6 When there is sufficient water in the pool to permit the filter system to operate, the filter system may be activated while continuing to fill, provided that the temperature of the water entering the pool is regulated to match the pool shell temperature.
- .7 If the filter system is operational continuously monitor during the filling process and carry out back-washing as required.
- .8 Add chemicals during the filling process to achieve the chemical levels described in Section 2.5. After the pool has been filled with water matching the shell

temperature, raise the temperature of water at a maximum rate of 0.3°C per hour.

11 CHEMICAL TREATMENT OF POOL WATER

- .1 Prior to the initial filling of the swimming pools, the Pool Sub-Contractor shall conduct the following tests on the source of water and advise the owner/architect the correct types and amounts of chemicals to be added during the filling process:
 - .1 Chlorine - Free and combined (ppm)
 - .2 Total alkalinity (ppm)
 - .3 Iron (ppm)
 - .4 Copper (ppm)
 - .5 Calcium hardness (ppm)
 - .6 Total dissolved solids
- .2 While the pools are being filled, the water shall be treated to bring the following parameters to the recommended levels:
 - .1 Free available chlorine: 0.5 to 1.5 ppm
 - .2 Combined chlorine: > 0.2ppm maximum
 - .3 pH: 7.4 to 7.8
 - .4 Total alkalinity: 100ppm
 - .5 Calcium hardness: 250ppm
- .3 Regularly monitor the above levels during the filling process and add chemicals as required throughout the filling process to maintain these values.
- .4 Ensure that the water is properly treated during filling of the pool to prevent any damage to the finishes.

12 START UP AND COMMISSIONING

- .1 The Pool Sub-Contractor shall attend the filling of the pool and start-up of the pool systems and chemical controller.
- .2 The Pool Sub-Contractor shall be responsible for the initial filling of the pools and heating of the water. Providing all chemicals required for the initial and subsequent

treatment of the water until takeover by the Owner at the date of Substantial Performance.

- .3 After the start -up, adjust and balance the systems to achieve the specified flows.

END OF SECTION

- 1** General
- 1.1** **SECTION INCLUDES**
 - .1 Labour, Products, equipment and services necessary for swimming pool tanks and decks Work in accordance with the Contract Documents.
- 1.2** **PRE-INSTALLATION MEETING:**
 - .1 The Contractor shall schedule and conduct pre-installation meetings for swimming pool tanks as specified herein and in accordance with Section 01 10 10.
 - .2 Pre-installation meeting for swimming pool tank work shall occur at least 2 months prior to commencement of swimming pool tank work at the Place of the Work.
 - .3 Attendees at swimming pool tank pre-installation meeting shall include Subcontractors responsible for or affected by the work of the following sections:
 - .1 03 03 30 Concrete Restoration
 - .2 13 11 13 Swimming Pool Tanks and Decks.
 - .3 13 11 15 Swimming Pool Waterproofing and Tiling.
 - .4 13 11 18 Swimming Pool Accessories.
 - .5 Divisions 22, 23, 26, 28.
 - .4 Independent inspection and testing company shall attend pre-installation meeting.
 - .5 Agenda including and not limited to the following:
 - .1 Role of Pool Subcontractor
 - .2 Schedule of Shop Drawings and Samples Submissions
 - .3 Construction Schedule
 - .4 Testing and Inspections
 - .5 Pool Equipment, Accessories uninstall and reinstall
 - .6 Pool Tank Concrete Restoration Procedures
 - .7 Water Testing Procedures
 - .8 Safety Barricades
 - .9 Coordination with Divisions 22, 23, 26, 28.
- 1.3** **SUBMITTALS**
 - .1 Shop drawings:
 - .1 Submit shop drawings in accordance with Section 01 10 10 indicating.
 - .2 Shop drawings will include pool layout and configuration, pool tank cross sections, materials and finishes, gutters, equipment locations, dimensions, details of assembly, reinforcing, anchors, water stops, pipe penetrations, joints, and utility rough-in locations.
 - .2 Samples:

- .1 Submit samples in accordance with Section 01 10 10.
- .2 Submit manufacturer's detailed technical Product data and installation instructions for each principal component or Product, and include certified test reports of required testing. List and describe features of control system, performances, and operating characteristics. Quality control submittals: Submit manufacturer's certificates stating that materials supplied are in accordance with this Specification.

1.4 QUALITY ASSURANCE

- .1 Certificates:
 - .1 Submit to the Owner copies of inspection/acceptance certificates and operating permits as required by governing authorities to allow normal, unrestricted use of swimming pools.
- .2 Qualifications:
 - .1 Installers / applicators / erectors: Provide the work of this section by a Subcontractor who has adequate pool tanks, decks, equipment, and skilled workers to perform the work expeditiously, and is known to have been responsible for satisfactory installations similar to that specified during a period of at least the immediate past 5 years, who is completely familiar with referenced standards and requirements of the work of this section, and with approval of Product manufacturers.

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, store and handle Products in accordance with the Conditions of the Contract and as specified herein.
- .2 Remove unacceptable materials from Site and replace to acceptance of Consultant.

1.6 FIELD CONDITIONS

- .1 Before commencement of the work of this section, examine the Place of the Work and report unsatisfactory conditions in writing to the Consultant.

1.7 EXTENDED WARRANTY

- .1 Warrant work of this section for a period of 5 years in accordance with Section 01 10 10 and as follows:
 - .1 Warranty includes no leakage in concrete pool tanks and buried piping.
 - .2 Warranty period for defects in materials or workmanship of the pool structure causing a loss of water: 10 years.
 - .3 Warranty period for defects in material or workmanship of the pool underground piping systems: 5 years.
 - .4 Warranty requirements and duration for pool secondary waterproofing and tiling systems: in accordance with Section 13 11 15.
 - .5 Pool accessories and pool gutter grates specified under Section 13 11 18.

1.8 CLOSET SUBMITTALS

- .1 Deliver, store and handle Products in accordance with the Conditions of the Contract and as specified herein.
- .2 Remove unacceptable materials from Site and replace to acceptance of Consultant.
- .3 Submit closeout submittals, as-built documents, record drawings, and operation and maintenance manuals and service data in accordance with Section 01 10 10.

2 Products

2.1 PERFORMANCE AND DESIGN REQUIREMENTS

- .1 Provide design and layout information as required.
- .2 Concrete pool tanks are designed to be waterproof prior to the application of additional waterproofing membranes. Follow American Concrete Institute 350 Committee recommendations for watertight structures.
- .3 Work of this section includes restoration of existing pool tank, together with complete finishes, and installation/reinstallation of equipment and fixtures indicated or required for a complete installation under the responsibility on a single Subcontractor. Work includes, but is not limited to the following:
 - .1 Pool deck drains: provide deck drains, including setting beds required to achieve deck slopes indicated. Coordinate penetrations through the deck slab. Plumbing below the deck slab shall be provided by Division 22.
 - .2 Pool tank and foundations:
 - .1 Restoration of concrete tank, including formwork, reinforcing, accessories, poured concrete, waterproofing admixture, waterstops, inserts, control joints.
 - .2 Pool decks (in areas indicated), setting beds.
 - .3 Pool deck drains and associated plumbing.
 - .4 Tank and deck finishes, to extents indicated or scheduled; ceramic tile finish, secondary waterproofing, joint sealants, tank markings as indicated and as required by the building code and coordinated with authorities having jurisdiction, and in accordance with Section 13 11 15.
 - .5 Pool Filtration System, including skimmers, overflows, outlets, and jets.
 - .6 Supply and installation of electrical grounding and bonding of metal in pool tanks, and within 3 metres of pool tanks, in accordance with Section 68 of the Ontario Electrical Safety Code (latest edition).
 - .7 Coordination with Owner and suppliers for other equipment.
 - .8 Supply and installation of pool accessories in accordance with Section 13 11 18.
 - .9 Supply and installation of housekeeping pads, hangers, fire stops, pipe seals through sleeves, thrust blocks, anchorage and supports for pool piping,

sprinkler lines and equipment. Furnish pipe sleeves for installation by other contractors at the proper locations.

.10 Supply and installation of pool and safety signage as required by the building code, Federal, Provincial, and local municipal regulations, and authorities having jurisdiction. Provide customized signage that is integrated with the Owner's wayfinding and signage standards. As part of the shop drawing process, provide a location plan and sign inventory with text, font sizes and proofs for review. Final installation will be by the Owner in coordination with the Contractor.

.11 Supply and installation of floor access hatches.

.4 Regulatory Requirements

.1 Design, fabricate and install work of this section to requirements of the building code and other authorities having jurisdiction.

.2 In addition to the building code, pool and associated systems shall meet requirements of the Ontario Ministry of Health regulations.

.3 Obtain all required inspections and permits, as applicable.

2.2 **MATERIALS**

.1 Ferrous metals: only stainless steel 316L to be used in the pool deck and pool tank, unless specifically indicated otherwise.

.2 Concrete: in accordance with Section 03 03 30.

.3 Concrete reinforcement: in accordance with Section 03 20 00.

.4 Waterstops:

.1 Ribbed PVC waterstops:

.1 Wall to floor joints (vertical installations): Type 3, 100 mm (4") length, 4.7 mm (3/16") thickness.

.2 Floor to wall joints (horizontal installations): Type 500 Split ribbed type, 150 mm (6") length, 9.5 mm (3/8") thickness.

.3 Wall to wall movement joints: Type 5, 150 mm (6") length, 9.5 mm thickness.

.4 Acceptable Products:

.1 'PVC Waterstops' by Durajoint.

.2 'PVC Waterstop' Sika.

.3 Or approved equivalent.

.2 Adhesive waterstops:

.1 Floor to wall joints (horizontal installations), at curving walls where indicated.

- .2 Acceptable Products:
- .3 Synko-Flex Preformed Adhesive Waterstop or approved equivalent
- .3 External type joint seals:
 - .1 Acceptable Products: Baseal PVC Joint Seal by Durajoint or approved equivalent.
 - .2 Floor to floor expansion control joints: Baseal type 62, 225 mm length, 4.7 mm
- .4 Hydrophilic (swell-seal) waterstop:
 - .1 Overflow perimeter at wall movement joints.
 - .2 Acceptable Products: 'Adeka P-201' by OCM or approved equivalent.
- .5 Pipe penetrations: seal around pipe penetrations in method suitable to installation conditions.
- .6 Sealant:
 - .1 For joints in ceramic tile: in accordance with Section 13 11 15.
 - .2 For joints other than in ceramic tile: two component polysulphide to CAN/CGSB 19.24-M90 Type 2 Class A, white colour when adjacent white grout, light grey in other areas of pool tanks.
 - .1 Acceptable Product: Duoflex by Sika Canada Inc.
- .7 Joint filler: at expansion joints where indicated, 12 mm rigid extruded Styrofoam insulation, Styrofoam SM by Dow Chemical; seal as above.
- .8 Applied flexible waterproofing membrane, at pool gutters: in accordance with Section 13 11 15.
- .9 Pool tiling system, including secondary waterproofing: in accordance with Section 13 11 15.
- .10 Swimming pool accessories, deck drains, and pool gutter grates: in accordance with Section 13 11 18.

2.3 FABRICATION TOLERANCES

- .1 Tank Markings: ± 5 mm.
- .2 Location of Inserts: ± 5 mm.

3 Execution

3.1 EXAMINATION

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.

3.2 INSTALLATION

- .1 Comply with manufacturer's instructions and shop drawings for assembly of

swimming pool and pad, and for installation of required equipment and accessories.

- .2 Before commencing concrete restoration, verify electrical bonding of swimming pool embedded items and reinforcing steel and verify that any required electrical, plumbing or building inspections have been performed.

3.3 POOL TANK RESTORATION

- .1 Set and cast equipment into concrete as required. Refer to Division 03 for materials and methods for concrete construction and remedial work.
- .2 Waterstops:
 - .1 Install continuous waterstops where indicated or required to prevent leakage, and to manufacturer's instructions. Build waterstops into forms and support against displacement during pouring of concrete. Do not displace concrete reinforcing when installing waterstops.
 - .2 Use butted, welded connections in accordance with manufacturer's recommendation. Only straight heat sealed welds shall be performed in the field. Use preformed or shop welded corners and intersections.

- 3.4 Align joints with tile grout lines to avoid cutting finish tile. Seal joints with approved sealants.

3.5 SURVEYING

- .1 Perform measurements prior to installation of waterproofing and tile work.

3.6 POOL DECK RESTORATION

- .1 Install pool deck drains to achieve code compliance for drainage.
- .2 Seal expansion and control joints in pool tanks and decks with sealant as specified.

3.7 POOL TILE AND WATERPROOFING INSTALLATION

- .1 Provide secondary waterproofing where indicated and in accordance with Section 13 11 15.
- .2 Provide pool tile in tanks and on surrounding pool decks complete including base in accordance with Section 13 11 15.
- .3 Expansion and construction joints in concrete tanks and slabs must align with tile joints.

3.8 EQUIPMENT REINSTALLATION

- .1 Install or reinstall equipment and fixtures in accordance with manufacturer's recommended instructions.

3.9 PROTECTION

- .1 Supply and install temporary waterproof, non-staining coverings, secured against displacement, to extend over walls and down sides to protect masonry Work from snow and wind driven rain, and from drying too quickly, until masonry Work is completed and protected by flashings or other permanent construction.

- .2 Items to be cast-in or incorporated in work of other sections and supervise installation of same sections.
 - .3 Coordinate with Owner's representative and other contractors as they install equipment not included in the work of this section.
- 3.10 **SWIMMING POOL ACCESSORIES INSTALLATION**
- .1 Install swimming pool accessories in accordance with Section 13 11 18.
 - .2 Supply and install non-staining, protective coverings on horizontal and vertical surfaces to protect Work of this Section from damage, staining, marking, and mortar droppings.
- 3.11 **FIELD QUALITY CONTROL**
- .1 Conduct quality control in accordance with Section 01 10 10.
 - .2 Conduct pressure tests of all buried or encased piping with water at 170 kPa (24.7 psi) for 12 hours minimum.
 - .3 Restore concrete or backfill only around piping under 170 kPa (24.7 PSI) pressure. Monitor pressure during concreting and backfilling.
 - .4 Testing for watertightness: Provide 3 waterproofing tests of the pool tanks at the following milestones:
 - .1 Test 1: Minimum 28 days after concrete placement and when the concrete has developed sufficient strength as determined by the Consultant, and after high-pressure water blast specified under Section 13 11 15.
 - .2 Test 2: After the pool area has been closed in and protected from the exterior environmental conditions and after placement of waterproofing membrane.
 - .3 Test 3: After thin-set waterproofing and porcelain tile work is complete, with setting bed and grout materials properly cured and after start-up procedures are complete.
 - .5 Testing procedures: Test 1
 - .1 Clean out pool tank structures, remove foreign matter that inhibits the performance of the materials being used. Plug drains, outlets and shut valves. Test hydrostatic pressure relief valves.
 - .2 Fill pool tank at a rate of 25 mm (1") per hour to a depth of 100 mm (4") below the overflow channel (gutter). Allow water to remain at this depth for 24 hours to ensure that drains, returns and other penetrations are not leaking.
 - .3 After 24 hours fill to the lip and flood the overflow channel.
 - .4 Let water stand in pool for 48 hours to allow for absorption by concrete. Top up the pool water level.
 - .5 Fill a control bucket with water. Mark pool and bucket. Let water stand in pool tank, gutter and bucket for 72 hours.

- .6 Record water and air temperature and relative humidity of the pool area every hours.
- .7 Every 12 hours, check the water level in the pool tank and gutter, and compare it with the water level in the pail. Document test every 12 hours.
- .8 Test for 72 hours. Any loss more than 10 mm in a 24 hour period will require repairs.
- .9 Drain pool, locate and repair leakage, if any, working from the interior, undercutting and patching using the same concrete mixture as pool, mixed with bonding agent, except coarse aggregate shall be left out. Retest until pools are watertight. Do not apply waterproofing membrane and tile work until pools are watertight. Do not rely on tile and setting bed for water proof qualities.
- .10 Moisture and alkalinity:
 - .1 Prior to performing Test 2, test for moisture vapour transmission in accordance with ASTM F710-11 and ASTM F1869-16 or ASTM F2170-16a in accordance with manufacturer's written flooring installation instructions. Results must not exceed 170 $\mu\text{g}/\text{m}^2$ (3 lb per 1,000 ft^2) in 24 hours when tested to ASTM F1869-16, or exceed 75% when tested to ASTM F2170-16a.
 - .2 Test for surface pH. Levels shall not exceed 9 pH. Test in accordance with ASTM F710-11.
 - .3 For each test type: Conduct 3 tests for areas up to 100 m^2 (1000 ft^2), and conduct 1 additional test for each additional 100 m^2 (1000 ft^2) of flooring area.
- .6 Testing procedures: Test 2
 - .1 Follow fill and pool water level monitoring procedures of Test 1 as outlined above.
 - .2 Drain pool, inspect membrane for damage, adhesion and continuity. Inspect membrane installation at junctures of vertical and horizontal surfaces, drains, penetrations, as well as the membrane termination and overlap at the overflow channel. Make repairs to the membrane as required and as directed by the manufacturer's field representative. Locate and repair leakage, if any, as required and directed by the Consultant. Retest until pools are watertight.
- .7 Testing procedures: Test 3
 - .1 Fill pool as per Initial Start-up instructions.
 - .2 Follow pool water level monitoring procedures of Test 1 as outlined above.
 - .3 Drain pool if there is evidence of leakage.
 - .4 Locate and repair leakage, if any, as required and directed by the Consultant. Retest until pools are watertight.

- .8 A calibrated Water Loss Sensor, such as the Leakalyzer by Anderson Manufacturing, may be used in lieu of a control bucket. Submit proposed testing procedures to the Consultant for review.
- 3.12 Water costs:
 - .1 The cost of water required for the initial leak tests and final fill will be paid by the Owner.
 - .2 Any subsequent fillings or partial fillings resulting from required repair work or failed leak tests are included in the Contract Price.
- 3.13 **START-UP**
 - .1 Start-up equipment, balance equipment, and furnish necessary starting chemicals, in consultation with Owner, as required to bring water's chemical characteristics into proper balance.
 - .2 Maintain the chemical balance of the pool water (including the cost of all chemicals required) until the pool and mechanical system is fully operational and accepted by the Consultant and the Owner.
 - .3 Provide to the Owner sufficient quantities of the necessary chemicals to maintain the pools operation for a minimum of 30 days from the date of Substantial Performance of the Work.
 - .4 Provide the Owner with a list of necessary chemicals 90 days prior to filling of the pool complete with estimated monthly quantities.
 - .5 Provide chemicals required for subsequent treatment of water to achieve chemical treatment standards outlined below, until take-over by Owner at date of Substantial Performance of the Work.
 - .6 Initial fill:
 - .1 Commence filling of the pool when the last piece of thin-set mortar installed by Section 13 11 15 has cured for a minimum of 14 days.
 - .2 Fill pool tank at rate of 25 mm (1") per hour.
 - .3 Water temperature shall match the temperature of the pool tanks to prevent thermal shock to the concrete and finishes.
 - .7 Water costs:
 - .1 The cost of water, supplied at the required temperature, is paid by the Owner.
- 3.14 **CHEMICAL TREATMENT OF WATER**
 - .1 .1 While the pools are being filled, water shall be treated during complete filling process to bring water to the following recommended levels, including supply and installation of necessary chemicals to adjust and balance water chemistry in the pools to these levels:
 - .1 Free available chlorine: 1.5.

- .2 Combined chlorine: ≤ 0.2 .
- .3 pH: 7.5.
- .4 Calcium hardness: 250 – 350 ppm.
- .5 Total alkalinity: 90 – 110 ppm.
- .6 Saturation index between -0.3 and +0.3.
- .2 Regularly monitor above levels during filling process and add chemicals as required throughout filling process to maintain these values. Ensure that water is properly treated during filling of pool to prevent damage to pool finish.
- .3 Monitor and verify fill water is balanced with a saturation index between -0.3 and +0.3.
- .4 Prior to initial filling of swimming pools, swimming pool subcontractor shall conduct the following water tests on the source of water, and correct the amount of chemicals to be added during the filling process:
 - .1 Chlorine - Free and combined (ppm). Total Alkalinity (ppm).
 - .2 pH.
 - .3 Iron (ppm).
 - .4 Copper (ppm).
 - .5 Calcium hardness.
 - .6 Total dissolved solids.
- 3.15 **TRAINING**
 - .1 At a time to be identified by Consultant, during the initial fill and start-up of the system, provide instruction in maintenance and operations of pool systems.
 - .2 Verify sequence of operation for each operational mode with the Owner's representatives.
 - .3 Training period shall be a minimum of 24 hours (total) conducted at the Place of the Work and as follows:
 - .1 Initial training: 8 hours minimum.
 - .2 Follow-up training: 8 hours, minimum, after Owner's staff has had 2 weeks experience operating the systems. 8 hours, minimum, 4 weeks after 2nd training session.
- 3.16 **CLEANING**
 - .1 Clean exposed and semi-exposed surface. Touch-up finishes to restore damaged and soiled areas.
 - .2 Refer also to cleaning requirements specified under Section 13 11 15.
- 3.17 **PROTECTION**
 - .1 Protect and maintain conditions necessary to ensure that pools, decks, equipment

and fixtures will be without damage or deterioration at date of Substantial
Performance of the Work.

- .2 Refer also to protection requirements specified under Section 13 11 15.

END OF SECTION

- 1 General
- 1.1 **SECTION INCLUDES**
 - .1 Labour, Products, equipment and services necessary for hard surface tiling for pool tank and deck including waterproofing, tile trim accessories work in accordance with the Contract Documents.
- 1.2 **REFERENCES**
 - .1 ANSI A108/A118/A136.1.1:2020, Installation of Ceramic Tile.
 - .2 ANSI A108.5 – Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex Portland Cement Mortar.
 - .3 ANSI A118.7 – Polymer Modified Cement Grout
 - .4 ANSI A108.10 – Installation of Grout in Tile Work.
 - .5 ANSI A108.13 – Installation of Waterproof Membranes for Thin-Set Tile and Stone.
 - .6 ANSI A118.3 – Chemical Resistant, Water-Cleanable Tile Setting and Grouting Epoxy and Water-Cleanable Tile Setting Epoxy Adhesive.
 - .7 ANSI A118.4 – Latex Portland Cement Mortar.
 - .8 ANSI A118.7 – Polymer Modified Cement Grout.
 - .9 ANSI A136.1 – Organic Adhesives, Type I Adhesive and Type II Adhesive. W. TCA – Handbook for Ceramic Tile Installation.
 - .10 ANSI A137.1, Specifications for Ceramic Tile.
 - .11 ASTM C144, Specification for Aggregate for Masonry Mortar.
 - .12 ASTM C920, Specification for Elastomeric Joint Sealants.
 - .13 CAN/CSA A3000, Cementitious Materials Compendium.
 - .14 ISO 23599, Assistive Products for Blind and Vision-Impaired Persons - Tactile Walking Surface Indicators.
 - .15 International Association of Plumbing & Mechanical Officials certificate
 - .16 TTMAC Specification Guide 09 30 00 Tile Installation Manual 2019-2021.
 - .17 TTMAC, Maintenance Guide.
- 1.3 **SUBMITTALS**
 - .1 Product data:
 - .1 Submit copies of manufacturer's Product data in accordance with Section 01 10 10 indicating:
 - .1 Performance criteria, compliance with appropriate reference standard, characteristics, limitations and warranties.
 - .2 Product transportation, storage, handling and installation requirements.
 - .2 Shop drawings:

- .1 Submit shop drawings in accordance with Section 01 10 10 indicating:
 - .1 Tile layout, patterns, and colour arrangement.
 - .2 Perimeter conditions, junctions with dissimilar materials.
 - .3 Setting details
- .3 Samples:
 - .1 Submit following sample panels in accordance with Section 01 10 10.
 - .1 Each colour, texture, size, and pattern of tile.
 - .2 Adhere tile samples to 400 x 400 x 12.5 mm thick cement board complete with selected grout colour in joints.
- .4 Certificates: Submit manufacturer's certificates stating that materials supplied are in accordance with this specification.
- .5 Closeout submittals: Submit recommended maintenance instructions and listing of recommended maintenance Products for incorporation into Operations and Maintenance Manuals in accordance with Section 01 10 10.

1.4 **QUALITY ASSURANCE**

- .1 Perform work of this Section by a company with proven, acceptable experience on installations of similar complexity and scope.
- .2 Mock-ups:
 - .1 Grouted mock-up: 1500mm x 1500mm sample panels of each tile type and colour, texture, size, and pattern of tile and grout.
 - .2 Non-grouted mock-up: 1500mm x 1500mm area for each type and colour, texture, size, and pattern of tile.
 - .3 Install each product and colour mock-up for acceptance by Consultant. Accepted mock-up shall form basis of standard of workmanship for remainder of work. Mock-up shall consist of floor/wall/base corner intersection, with 600mm of finish product on each face.
 - .4 All work related to the pool environment is to be carried out by a single Contractor who is to be responsible for the complete installation of the system from the concrete surface to the completed finished installation.

1.5 **DELIVERY, STORAGE AND HANDLING**

- .1 Deliver materials in adequate crates or containers with manufacturer's name and product description clearly marked.
- .2 Handle and store tiles in a manner to avoid chipping, breakage or the instruction of foreign matter. Take precautions to protect the mortar and grout admixtures from freezing or from excessive heat.

1.6 **SITE CONDITIONS**

- .1 Before commencement of the work of this section, examine the Place of the Work and report unsatisfactory conditions in writing to the Consultant.

- .2 Do not install work of this Section outside of the following environmental ranges without the Consultant's and Product manufacturer's written acceptance:
 - .1 Ambient air and surface temperature: 15 degree Celsius to 45 degree Celsius.
 - .2 Precipitation: None.
- .3 Install temporary protection and facilities to maintain the Product manufacturer's, and specified, environmental requirements for 7 Days before, during, and 7 Days after installation.
- .4 Execute work of this section while temperature is maintained within safe working temperatures in accordance with manufacturer's installation instructions for a period of 3 Days before, during and following installation. Avoid concentrated or irregular heating during curing period.
- .5 Test for Relative Humidity (ASTM F2170 – Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using In-situ Probes) The Relative Humidity (RH) test involves placing probes in the concrete and taking readings with a hygrometer. A relative humidity reading of 75% or below is acceptable for most tile and resinous flooring applications. Please note that the ASTM F2170 test should only be conducted in interior conditions when the building is completely enclosed and air conditioning or heating system is turned on, unless otherwise instructed by the probe manufacturer.
- .6 Protect work of this section against damage by work of other sections for a minimum of 3 Days after application of grouting by prohibiting passage of traffic over tile. Do not immerse in water and protect tilework from freezing for at least 28 Days after installation.

1.7 **WARRANTY**

- .1 Tiling system (waterproofing, mortar, setting materials, grout, and tile) manufacturer's system warranty including the following: labour, materials, and workmanship 25 years system warranty.

1.8 **MAINTENANCE**

- .1 Submit extra tile amounting to 3% of gross area covered, allowing proportionately for each pattern and type specified and which are part of the same Production run as installed Products. Store maintenance Products as directed by the Consultant.

2 **Products**

2.1 **MATERIALS**

- .1 General: All materials under work of this Section, including but not limited to, sealants, adhesives, and sealers are to have low VOC content limits.
- .2 Tile:
 - .1 To ANSI A137.1 Specifications for Ceramic Tile.
 - .2 Supply coves, caps, inside and outside corners and bullnose tile as required.

- .3 Where unfinished tile edge is exposed, supply cap to Consultant's selection.
- .4 Tile Types:
 - .1 Porcelain tile (POR-1): Porcelain floor tile, sized at 2" x 2" mosaic tile. 'Keystones' by Daltile or approved alternative by American Olean 'Unglazed Colorbody Porcelain Mosaics'.. To be selected by the Consultant from the manufacturer's full colour range in Price Groups 1, 2, 3 and 4.
 - .2 Porcelain tile (POR-2): Porcelain floor tile, sized at 2" x 2" mosaic tile. 'Keystones' by Daltile or approved alternative by American Olean 'Unglazed Colorbody Porcelain Mosaics'.. To be selected by the Consultant from the manufacturer's full colour range in Price Groups 1, 2, 3 and 4.
 - .3 Porcelain tile (POR-3): Porcelain floor tile, sized at 2" x 2" mosaic tile. 'Keystones' by Daltile or approved alternative by American Olean 'Unglazed Colorbody Porcelain Mosaics'.. To be selected by the Consultant from the manufacturer's full colour range in Price Groups 1, 2, 3 and 4.
 - .4 Porcelain tile (POR-4): Porcelain floor tile, sized at 1" x 1" mosaic tile. 'Keystones' by Daltile or approved alternative by American Olean 'Unglazed Colorbody Porcelain Mosaics'.. To be selected by the Consultant from the manufacturer's full colour range in Price Groups 1, 2, 3 and 4.
 - .5 Porcelain tile (POR-5): Porcelain floor tile, sized at 1" x 1" mosaic tile. 'Keystones' by Daltile or approved alternative by American Olean 'Unglazed Colorbody Porcelain Mosaics'.. To be selected by the Consultant from the manufacturer's full colour range in Price Groups 1, 2, 3 and 4.
 - .6 Porcelain tile (POR-6): Porcelain floor tile, sized at 2" x 2" mosaic tile. 'Keystones' by Daltile or approved alternative by American Olean 'Unglazed Colorbody Porcelain Mosaics'.. To be selected by the Consultant from the manufacturer's full colour range in Price Groups 1, 2, 3 and 4.
 - .7 Porcelain Tile Base: Cove porcelain base tile with Cove Base Corners to match floor porcelain tile.

	Location	Size	Product	Finish	Colour
POR-1	Pool Tank Floors Interior	50mm x 50mm	2" x 2" mosaic tile. 'Keystones'	Standard	Price Groups 1, 2, 3 and 4.
POR-1D	Deck Tile	50mm x 50mm	2" x 2" mosaic tile. 'Keystones'	Standard	Price Groups 1, 2, 3 and 4.

POR-2	Pool Deck and Tank Walls and Floor (Accent Band)	50mm x 50mm	2" x 2" mosaic tile. 'Keystones'	Standard	Price Groups 1, 2, 3 and 4.
POR-3	Pool Lane Markers & End Wall Targets	50mm x 50mm	2" x 2" mosaic tile. 'Keystones'	Standard	Price Groups 1, 2, 3 and 4.
POR-4	Deck Markers	25mm x 25mm	1" x 1" mosaic tile. 'Keystones'	Abrasive	Nautical Blue D621
POR-5	Deck Marker Field	25mm x 25mm	1" x 1" mosaic tile. 'Keystones'	Abrasive	Biscuit D317
POR-6	Pool Deck Strip	50mm x 50mm	2"x 2" mosaic tile. 'Keystones'	Abrasive	Red D017
POR-N	Bullnose Edges of Seats /Stairs / Steps / Ramp/ Ledges / Whirlpool in Pools at all Nosing	50mm x 50mm	2" x 2" S832 mosaic tile. 'Keystones'	Abrasive	Price Groups 1, 2, 3 and 4. (Custom)
POR-F	Pool Edge Finger Grip / Overflow Drop	50mm x 25mm	2" x 1" C701 mosaic tile. 'Keystones'	Abrasive	Price Groups 1, 2, 3 and 4. (Custom)
POR-C	Pool Edge Cove Base at Stairs / Steps / Seatings / Ramps / Whirlpool	50mm x 50mm	2" x 2" C833 mosaic tile. 'Keystones'	Abrasive	Price Groups 1, 2, 3 and 4. (Custom)

Commented [NM1]: As per Client selection

- .5 Specialty Tiles:
- .1 Provide specialty tiles for external and internal corners, angles and coved bases.
 - .2 Provide nosing, stretcher and cove tiles to match size, colour and finish of adjacent tiles, unless otherwise indicated.

- .3 Universal Trim C701 pool finger grip 'Keystones' by Daltile
- .4 Universal Trim S832 pool overflow 'Keystones' by Daltile
- .5 Universal Trim S833 pool overflow 'Keystones' by Daltile
- .6 Specialty Ideogram Tile: custom size 152.4mm x152.4mm
 - .1 Ceramic tile, beveled edge, with custom ceramic graphic safety markers. INLAYS Inc.
 - .1 C621500 No Diving w/ Int'l Symbol (Red)
 - .2 Custom Deep Water
 - .3 Clarity Dots

PICT-1	"NO DIVING" inset ideogram tile	152mm x 152mm	www.inlaysinc.com	Abrasive	Background: Ice White A25 Print Colour: Red Circle and Diagonal line, Black for person and water lines
PICT-2	"DEEP WATER" inset ideogram tile (CUSTOM)	152mm x 152mm	www.inlaysinc.com	Abrasive	Background: Ice WhiteA25 Print Colour: Black
Black Disc	Clarity Dots at the bottom of the pool (deepest) 150mm diameter	150mm (6") diameter	www.inlaysinc.com WJ00010		Black

- .7 Floor transitions:
 - .1 Tile to adjacent floor finish with flush condition: Schluter 'SCHIENE', anodized aluminium finish.
 - .2 Tile to adjacent floor finish at lower elevation not exceeding 13 mm (1/2"): Schluter 'RENO-U', anodized aluminium finish.
 - .3 Tile to adjacent floor finish at lower elevation exceeding 13 mm (1/2") or to finished concrete: Schluter 'RENO-RAMP/-K', anodized

aluminium finish. Wall edge protection: Aluminium edge protection with trapezoid-perforated anchoring leg and an anodized finish, continuous at all exposed tile edges, depth as required to suit tile thickness. 'Jolly' by Schluter Systems or approved alternative.

- .8 POR-1 Baseboard edge protection if cove base not suitable: Aluminium edge protection with trapezoid-perforated anchoring leg and an anodized finish, continuous at all exposed tile edges, depth as required to suit tile thickness. 'Jolly' by Schluter Systems or approved alternative.

2.2 ADHESIVE, MORTAR AND GROUT MATERIALS

.1 Acceptable manufacturers:

- .1 Laticrete International Inc. or approved equivalent
.2 Refer to Adhesive, Mortar, and Grout Materials schedule for specific acceptable Products.

.2 Primer: Low VOC, low viscosity primer as recommended by manufacturer to suit substrate and site conditions.

.3 Fortified Mortar Bed and Levelling Coat:

Latex Portland Cement Mortar for thick beds, screeds, leveling beds and scratch/plaster coats to be weather, frost, shock resistant, UL GREENGUARD Gold certified, and meet the following physical requirements:

1. Compressive Strength (ANSI A118.4 Modified): >4,000 psi (27.6 MPa)
2. Water Absorption (ANSI A118.6): ≤ 5%
3. Flexural Strength (ANSI A118.7 3.5): 1,100 – 1,200 psi (7.5 – 8.3 MPa)
4. Service Rating (TCA/ASTM C627): Extra Heavy
5. Shrinkage (ASTM C157 - 7 Day Cure): 0.05%
6. VOC Content: 0.00 g/L
7. Total VOC Emissions: ≤0.22 mg/m³
8. Before placing mortar bed on horizontal surfaces, apply a slurry bond coat made from 254 Platinum. While the slurry bond coat is wet, spread the mortar and compact well.

(Basis of Design: LATICRETE 3701 Fortified Mortar)**

.4 Floor tile systems

.5 Thin-set mortar

- .1 Modified Dry-Set Cement Thin Bed Mortar for thin set and slurry bond coats to be weather, frost, shock resistant, non-flammable, UL GREENGUARD Gold certified, conform to ISO C2TES1P1, and meet the following physical requirements:

1. Bond strength (ANSI A118.4): >450 psi (3.1 MPa)
2. Smoke & Flame Contribution (ASTM E84 Modified): 0
3. VOC Content: 0.00 g/L
4. Total VOC Emissions: ≤0.22 mg/m³

(Basis of Design: LATICRETE® 254 Platinum)**

- .2 White coloured mortar shall be provided at appropriate tile types including, but not limited to; glass tile, light coloured marble, green marble and light coloured granite.
- .6 Thick bed sloped topping: Factory mixed blend of portland cement and aggregates. 3701 Fortified Mortar Bed by Laticrete.

	Laticrete System
Slurry Bond Coat	Laticrete 254 Platinum
Thick Bed Mortar Leveling Coat (decks): Fortified Portland Cement	Laticrete 3701 Fortified Mortar
Mortar Leveling Coat (pool tanks): Fortified Portland Cement	Laticrete 3701 Fortified Mortar
Thinset Mortar (decks): Modified Portland Cement	Laticrete 254 Platinum
Thinset Mortar (pool tanks): Modified Portland Cement	Laticrete 254 Platinum
Grout: Epoxy	Laticrete SpectraLock PRO Grout

- .7 Epoxy Grout: Epoxy Grout (Commercial/Residential) shall be non-toxic, non-flammable, non-hazardous during storage, mixing, application and when cured, UL GREENGUARD Gold certified, and shall meet the following physical requirements:
1. Compressive Strength (ANSI A118.3): 3,800 psi (26.2 MPa)
 2. Shear Bond Strength (ANSI A118.3): 1,100 psi (7.6 MPa)
 3. Tensile Strength (ANSI A118.3): 1,100 psi (7.6 MPa)
 4. Thermal Shock (ANSI A118.3): >800 psi (5.5 MPa)
 5. Water Absorption (ANSI A118.3): <0.05%
 6. Vertical Joint Sag (ANSI A118.3): Pass
 7. VOC Content: 0.031 g/L
 8. Total VOC Emissions: ≤0.22 mg/m³
 9. Cured Epoxy Grout to be chemically and stain resistant to ketchup, mustard, tea, coffee, milk, soda, beer, wine, bleach (5% solution), ammonia, juices, vegetable oil, brine, sugar, cosmetics, and blood, as well as chemically resistant to dilute acids and dilute alkalis.

(Basis of Design: LATICRETE SPECTRALOCK® PRO Premium Grout)**

1. Grout colour: To be selected by the Consultant from the manufacturer's full colour range.
2. Grout sealer: as recommended by grout manufacturer.
3. Install in accordance with TTMAC Specification Guide 09 30 00 Tile Installation Manual

Location	Waterproofing Membrane	Thick Bed Mortar Leveling Coat (over Slurry Bond Coat)	Thin-Set Mortar (Adhesive)	Grout	TTMAC Details
Pool Tank	Yes	As required for leveling purposes	Modified Portland Cement	Epoxy	317SP
Pool Deck	Yes	Yes	Modified Portland Cement	Epoxy	310F

- .8 Waterproofing Membrane Materials: Waterproofing and Crack Isolation Membrane to be thin, cold applied, single component liquid and load bearing and UL GREENGUARD Gold certified. Reinforcing fabric to be non-woven rot-proof specifically intended for waterproofing membrane. Waterproofing Membrane to be non-toxic, non-flammable, and non-hazardous during storage, mixing, application and when cured. It shall be certified by IAPMO and ICC approved as a shower pan liner and shall also meet the following physical requirements:

.1	Hydrostatic Test (ASTM D4068):	Pass
.2	Elongation @ break (ASTM D751):	20-30%
.3	System Crack Resistance (ANSI A118.12):	Pass (High)
.4	7 day Tensile Strength (ANSI A118.10):	265 psi (1.8 MPa)
.5	7 day Shear Bond Strength (ANSI A118.10)	200 psi (1.4 MPa)
.6	28 Day Shear Bond Strength (ANSI A118.4):	214 psi (1.48 – 2.4 MPa)
.7	Service Rating (TCNA/ASTM C627):	Extra Heavy
.8	VOC Content:	2.39 g/L
.9	Total VOC Emissions:	≤0.22 mg/m ³

(Basis of Design: LATICRETE® HYDRO BAN®)

- .9 Accessories:
- .1 Reinforcing fabric to be non-woven rot-proof specifically intended for waterproofing membrane as recommended by waterproofing manufacturer.
 - .2 Mortar bed: Factory mixed blend of portland cement and aggregates by Laticrete.
- .10 Accessories and Related Materials
- .1 Prefabricated movement and control joints: Schluter 'DILEX-BWS' or approved equivalent.
 - .1 Joint sealants: mildew resistant sealant in accordance with Section 07 92 00 or as recommended by waterproofing membrane and grout manufacturer. 8 ft to 10 ft in each direction and changes in plane.

- .2 Expansion and Control Joint Sealant to be a one component, neutral cure, exterior grade silicone sealant and meet the following requirements:

1. Tensile Strength (ASTM C794):280 psi (1.9 MPa)
2. Hardness (ASTM D751; Shore A):25 (colored sealant) /15 (clear sealant)
3. Weather Resistance (QUV Weather-ometer):10,000 hours (no change)
4. VOC Emissions:≤0.5 mg/m³
5. VOC Content:35 g/L (translucent) and 42 g/L (sanded)

(Basis of Design: LATICRETE LATASIL™ and LATICRETE LATASIL 9118 Primer)

.11 Cementitious Waterproofing Membrane:

- .1 Applied waterproofing membrane, at pool overflow: and then apply a skim coat of Laticrete 254 .
- .2 A one component, polymer fortified, cement based waterproofing that mixes with water that passes ANSI A118.10. Fracture Fabric and can withstand 2 Bars (29 psi) of negative hydrostatic pressure.
 1. 7 Day Hydrostatic Test (ANSI A118.10): Pass
 2. 7 Day Breaking Strength (ANSI A118.10): 450 - 500 psi (3.1 – 3.45 MPa)
 3. 7 Day Water Immersion (ANSI A118.10): 120 - 150 psi (0.83 – 1.03 MPa)
 4. 7 Day Shear Bond Strength (ANSI A118.10):320 – 400 psi (2.21 – 2.76 MPa)
 5. 28 Day Shear Strength (ANSI A118.10): 370 – 450 psi (2.55 – 3.10 MPa)
 6. Water Vapor Transmission (ASTM E96 Procedure B): 1.6 – 1.7 grains/hr·ft (1.1 – 1g/hr·ft)
 7. Water Vapor Permeance (ASTM E96 Procedure B): 3.9 – 4 perms (225 – 235 ng/Pa·s·m²)
 8. System Performance (ASTM C627 – TCNA Rating): Cycles 1 – 14 “Extra Heavy”
 9. Tensile Strength for Elongation: 25%
 10. Installed Thickness (Dried): 40 mil (1.02mm)

(Basis of Design: LATICRETE® HYDRO BAN® Cementitious Waterproofing)

.12 Mixes

- .1 Mix premanufactured mortars and grouts in accordance with referenced standards, and mortar and grout manufacturer's instructions.

3 Execution

3.1 EXAMINATION

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.
- .2 Coordinate examination, preparation, and installation of pool waterproofing and tiling systems specified in this section with work of Section 13 11 13, including inspection and testing sequences and procedures.

- .3 Ensure compatibility of Products supplied under this section, and which bear contact with substrate.
- .4 Before work of this section commences, examine the areas to be covered and report any flaw or adverse conditions in writing to the Contractor and the Consultant. Do not proceed with work until surfaces and conditions comply with the requirements indicated in the manufacturer's instructions and in ANSI A108.5 (ANSI A108/A118/A136.1-2020) specification.
- .5 Non-calibrated tiles, tiles with chipped corners, tiles with holes, will not be accepted for installation.
- .6 Inspect tiles for colour variation. Tiles presenting noticeable variations shall be carefully selected, set aside and used in areas where they fit in the pattern homogeneously. Provide for appropriate lighting equipment in addition to existing lighting in the immediate area where the installation is being performed so that any shade differences which are normally very slight can be identified easily.

3.2 SURFACE PREPARATION

- .1 Clean and dry surfaces thoroughly. Remove oil, wax, grease, dust, dirt, paint, tar, primers, form release agents, curing compound, and other foreign material from substrate surfaces which may prevent or reduce adhesion.
- .2 Neutralize any trace of strong acids or alkali from the substrate.
- .3 General:
 - .1 Ensure surfaces are dimensionally stable, cured free of contaminants such as oil, sealants and cured compound. Ensure concrete cures for a minimum of 90 days with a steel trowel and fine broom finish for thin set applications and a screed finish for mortar bed applications.
 - .2 Prepare substrates in accordance with adhesive / waterproofing system manufacturer's instructions.
 - .3 Prime concrete with primer, brush or roller applied at full strength in accordance with adhesive / waterproofing system manufacturer's instructions
- .4 Floor surfaces (pool tank and deck):
 - .1 Prepare substrate in accordance with adhesive manufacturer's instruction or waterproofing system manufacturer's instructions, as applicable, and prepare concrete with ultra high-pressure water blast (30,000 to 40,000 psi) to International Concrete Repair Institute (ICRI) designation CSP-3.
 - .2 Remove dust, dirt, oil, grease, paint, laitance, efflorescence, curing compounds, sealers, water repellents and other materials that prevent bond. Metal plumbing pipe penetrations and fixtures must be clean of oil, grease, rust and other potential bond breakers.
 - .3 Completely remove contaminants and deleterious substances and debris which may prevent, reduce, and affect adhesion or performance or may act as bond breaker.

- .4 Wire brush steel substrates to remove deleterious substances and rust, to promote full adhesion to steel.
- .5 Concrete shall be cured for 90 days minimum.
- .6 Where substrate varies beyond the limits of the following:
 - .1 Mortar bed application substrate surface variation greater than 6 mm in 3000 mm, apply levelling underlayment.
 - .2 Thin set application substrate surface variation greater than 3 mm in 3000 mm thickness, apply levelling underlayment. Above 8 mm correct irregularity by mortar bed method.
- .5 Levelling Underlayment:
 - .1 Where substrate varies beyond limitations, prime substrate, mix and apply underlayment in accordance with manufacturer's instructions.
- .6 Pool Tank Wall surfaces:
 - .1 Rout out all construction joints and visible cracks exceeding 6.4 mm in size to minimum 19 mm. Remove all cement scum, dirt, dust and thoroughly rinse with water all concrete slab surfaces.
 - .2 Clean out all shrinkage cracks, tie holes, construction joints, and 'bug' holes and fill with an approved bonding compound.
 - .3 Prepare concrete with ultra high-pressure water blast between 30,000 to 40,000 psi to International Concrete Repair Institute (ICRI) designation Concrete Surface Preparation Part 3.
 - .4 Ensure all areas to be tiled and waterproofed have manufacturer's recommended moisture and alkalinity content prior to application. Record and document moisture alkalinity content and forward to Consultant.
 - .5 Ensure that surface areas shall have an open capillary system to assure permanent bonding of the application.
 - .6 Remove all form scale, oil, form release agents and any other foreign materials likely to affect bond, penetration and performance of the adhesive / waterproofing.
 - .7 Use waterproofing mortar mix to create coves where horizontal and vertical surfaces meeting and on inside corners and for grouting in inserts and other protrusions.
- .7 **MIXING**
 - .1 Mix mortars, additives and grouts in accordance with manufacturer's requirements.
 - .2 Rotating blade mechanical mixer: Pour latex additive, start mixer and add sand first, followed by Portland cement. Mix no mortar in same mixer as a dissimilar type of mortar unless the mixer is first thoroughly washed clean.
 - .3 Pail batch mixing with low revolution drill mixers as follows:

- .1 Premix separately prior to adding to the latex additive.
- .2 Pour latex additive into clean mixing vessel and add dry materials slowly while mixing into a homogeneous and smooth consistency.

.8 GENERAL INSTALLATION REQUIREMENTS

- .1 Install tiles in accordance with manufacturer's instructions and TTMAC Specification Guide 093000 Tile Installation Manual. Manufacturer's installation instructions govern over TTMAC Installation Manual.
- .2 Install in accordance with Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex Portland Cement Mortar ANSI A108.5 (ANSI A108/A118/A136.1-2020) and Installation of Grout in Tilework ANSI A108.10 (ANSI A108/A118/A136.1-2020).
- .3 Lay out work to produce a symmetrical pattern with minimum amount of cutting. Ensure cut tile at room perimeter and at joints is not less than ½ full size.
- .4 Install trim to be placed under tile in locations indicated on Drawings.
- .5 Set tiles in place and rap or beat with a beating block as necessary to ensure a proper bond and to level surface. Align tile for uniform joints and allow to set until firm. Clean excess mortar from surface of tile with a wet cloth or sponge while mortar is fresh.
- .6 Ensure following minimum mortar contact coverage to back of tiles. Contact must be evenly distributed to give full support of the tile.
- .7 100% for tack and deck applications.
- .8 Adjust joints between units uniform, plumb, straight, even, and true, with adjacent tile flush. Align grout joints in both directions unless indicated otherwise.
- .9 Align floor, base and wall grout joints.
- .10 Install tile accessory fittings for a complete and fully coordinated tile assembly.
- .11 Install wall tile full height unless indicated otherwise.
- .12 Do not place tile, trim, and accessories over control, expansion, or isolation joints. Stop materials in either side on joints and provide control, expansion and isolation joints as specified.
- .13 Cut and fit tile neatly around piping, fittings, joints, projections and around recesses items e.g. washroom accessories. Where surface mounted equipment and accessories are installed on tile surfaces, extend tile over surfaces. Cut edges smooth, even, and free from chipping; chipped and broken edges are not acceptable.
- .14 Do not proceed with grouting until minimum 48 hours after tile has set, to prevent displacement of tiles.

- .15 Apply grout in accordance with grout manufacturer's directions to produce watertight, filled joints without voids, cracks and excess grout. Thoroughly compact and tool floor grout. Finish grout flush to edge thickness of tile and remove excess grout with soft burlap or sponge moistened with clean water.
- .16 At floor deck drains, install slopes to drains as required by applicable codes and regulations, authorities having jurisdiction, and as indicated and water test before tile installation.
- .17 Ponding of water on pool deck and in emptied pool basin is unacceptable. Areas where ponding occurs shall be removed and reinstalled.
- .18 Provide edge protection at tile edges and corners, unless otherwise indicated, using maximum length pieces.
- .19 Provide edge protection and transition strips at tile transitions, unless otherwise indicated, using maximum length pieces.
- .20 Review locations of tile accessories with Consultant prior to setting tile and comply with directions of Consultant.
- .21 Lap tile and seal with sealant at inside corners. Caulk around pipes and openings made in tile with sealant.

.9 WATERPROOFING MEMBRANE INSTALLATION

- .1 Install waterproof membrane to locations as indicated or scheduled to provide watertight performance.
- .2 Install waterproofing to comply with ANSI A108.13 (ANSI A108/A118/A136.1-2020) and manufacturer's written instructions to produce waterproof membrane of uniform thickness and bonded securely to substrate.
- .3 Work waterproofing membrane into adhesive with a flat trowel to achieve full contact and to remove air pockets.
- .4 Install prefabricated corners at outside and inside corner conditions.
- .5 Install prefabricated pipe collars at penetrations.
- .6 Install waterproofing strips at corner conditions at change in substrate plane conditions and where required by manufacturer's installation instructions.
- .7 Provide strips of waterproofing where required to span expansion joints or terminate waterproofing into movement joint type tile setting accessories, in accordance with manufacturer's instructions.
- .8 Seal waterproofing at penetrations and terminations in accordance with manufacturer's installation instructions.

.10 TILE SETTING

- .1 Lay out tile work as indicated on drawings, and where lay-out is not indicated, lay-out tiles so tiles less than 1/2 the least dimension do not occur and with minimum amount of cutting.
- .2 Using a damp towel, wipe off the back side of tile to remove any dust or other residue that may be left over from the manufacturing process.

- .3 Place as much tile as possible in one operation before setting bed reaches initial set. Clean back and remove bed when it has set before tile is laid.
- .4 Prime materials and by methods specified by manufacturer of bond coat.
- .5 Line up joints between tile installed on stairs from tread to tread.
- .6 Except where tiles have setting tabs, and except for expansion, control and isolation joints, maintain joint widths as selected by Consultant.
- .7 Back up tile coves, curbs and other shaped pieces solid with mortar. Rigidly set, reinforce or otherwise make firm and secure such pieces.
- .8 Beat tiles in thoroughly and sufficiently to cause mortar ribs or notches to come together into a continuous void free bed and allow the mortar to flow up partially into the joint space to maximum of 1/3 the thickness of the tile. Sound floor tiles by tapping and reset all tiles with voids in setting bed.
- .9 Tile shall contact setting materials for minimum of 100% coverage unless otherwise indicated.
- .10 Obtain 100% mortar coverage with applicable requirements for back buttering of tile in referenced TTMAC and ANSI A108/A118/A136.1-2020 series of tile installation standards.
- .11 Remove any excess setting material from the joint area so that 2/3 of the depth of the tile is available for grouting.
- .12 Remove smudges or smears of setting material from the tile surface with a damp sponge or cloth immediately after final adjustment and beat-in while the mortar is fresh.
- .13 Do necessary cutting and drilling of fixtures, fittings, and built-in or penetrating units without marring the tile. Replace all cracked or damaged tile.
- .14 Cut tiles to conform to irregularities in wall lines and vertical planes along outer edges. Smooth cut edges with carborundum block or by other means to provide clean straight edge.
- .15 Install tiles to provide even distribution of shading, colour, and characteristics.
- .11 **MORTAR-BED TILING**
 - .1 Apply latex-Portland cement thin bed mortar with flat trowel as a slurry bond coat approximately 1.5 mm thick over clean concrete slab.
 - .2 Place latex-Portland cement thick bed mortar over slurry bond coat while bond coat is wet and tacky. Omit reinforcing wire fabric and fully compact bed by tamping.
 - .3 Spread latex-Portland cement thin bed mortar with flat trowel over surface of "green"/fresh mortar bed as a slurry bond coat approximately 1.5 mm (1/16") thick.

- .4 Apply latex-Portland cement thin bed mortar slurry bond coat to back of tile or threshold and place each piece/sheet while slurry bond coats are wet and tacky. Beat with a hardwood block or rubber mallet to level/imbed pieces before mortar bed takes initial set.
- .5 Clean excess mortar from finished surfaces.
- .6 For installation of tile over cured (pre-floated) latex-Portland cement thick bed mortar, follow Thin-Set Method.
- .12 **THIN-SET METHOD**
 - .1 Use the appropriate trowel notch size to ensure full bedding of the tile.
 - .2 Work the thin-set mortar into good contact with the substrate and comb with notched side of trowel.
 - .3 Beat each piece/sheet into the thin-set mortar with a beating block or rubber mallet to insure full bedding and flatness.
 - .4 Clean excess thin-set mortar from tile face and joints between pieces. Do not cover, bridge or fill tile joints located over expansion joints with adhesive.
- .13 **CONTROL JOINTS**
 - .1 Carry substrate control and movements joints through to tile work.
 - .2 Install control joints around the perimeter of tiled areas, around columns and where tile abuts other hard materials.
 - .3 Cut tiles on both sides along the edges of control or movement joints.
 - .4 Install control joints in the following typical locations:
 - .1 Aligned over changes in type of substrate.
 - .2 At the restraining perimeters such as walls and columns.
 - .3 Interior areas (not subject to sunlight): 6 mm minimum width, at 6000 mm o.c. maximum.
 - .4 Interior areas (subject to sunlight): 6 mm minimum width, at 3660 mm o.c maximum.
 - .5 Review locations with Consultant prior to setting tile and comply with instruction given by Consultant.
 - .6 Control joint width: 6.4 mm minimum, unless indicated otherwise.
- .14 **TRIM ACCESSORIES INSTALLATION**
 - .1 Coordinate transitions with work of other sections.
 - .2 Install trims in accordance with manufacturer's installation instructions.
 - .3 Install in continuous lengths.
 - .4 Scribe and fit to obstructions.
 - .5 Cope mitre corners.

.15 GROUTING OR POINTING

- .1 Apply grout in accordance with manufacturer's printed instructions.
- .2 The initial curing time for thin-set mortar prior to application of grout shall be 72 hours or more unless advised by manufacturer and approved by Consultant.
- .3 The minimum cure time for epoxy grout and thin-set mortar shall be 21 days before immersion in water.
- .4 ANSI A118.3 2000 Chemical Resistant, Water-Cleanable Tile Setting and Grouting Epoxy and Water-Cleanable Tile Setting Epoxy Adhesive.
- .5 Allow tile installation to cure a minimum of 24 hours at ambient temperature of 21°C prior to grouting.
- .6 Install chemical epoxy resistant grout in compliance with current revisions of Installation of Ceramic Tile Portland. Cement Mortar ANSI A108.1 (ANSI A108/A118/A136.1-2020) and Installation of Grout in Tile Work ANSI A108.10 (ANSI A108/A118/A136.1-2020).
- .7 Verify grout joints are free of dirt, debris, water or tile spacers and face of tiles are clean.
- .8 Apply grout release to face of absorptive, abrasive, non-slip or rough textured tile units that are not hot paraffin coated to facilitate cleaning.
- .9 Spread using a sharp edged, hard rubber float and work grout into joints using diagonal strokes (45° angle).
- .10 Pack joints full and free of voids/pits. Stroke diagonally to remove excess grout and to avoid pulling grout out of filled joints.
- .11 Once excess grout is removed, begin cleaning grout haze approximately 20-30 minutes after grouting depending on temperature. Using a circular motion, lightly scrub grouted surfaces with the damp sponge to dissolve grout film/haze. Then drag sponge diagonally over the scrubbed surfaces to remove froth. Rinse sponge frequently and change cleaning solution at least every 5m2. Discard sponges as they become tacky texture with residue.
- .12 Within 1 hour of finishing first cleaning, clean the same area again following the same procedure but utilizing a clean white scrub pad and fresh cleaning solution. Rinse scrub pad frequently. Drag a clean sponge diagonally over the scrubbed surfaces to remove froth. Use each side of sponge only once before rinsing and change cleaning solution at least every 5m2. Allow cleaned areas to dry and inspect tile surface. Rinse with clean water and allow surface to dry. Inspect grout joint for pinholes/voids and repair them with freshly mixed grout.
- .13 Grout joint width to be 3.2 mm unless otherwise indicated.
- .14 Do not cover, bridge or fill any expansion joints in tile with grout.

.16 TILE INSTALLATION TOLERANCES

- .1 Tile up to 152 mm x 152 mm in size: 1 mm: maximum lippage.

- .2 Tile on pool deck, and pool tank floors with depth later than 1350 mm: no lippage.
- .3 Finish planes shall be straight and plumb to within 6 mm in 3000 mm.
- .17 **CEMENTITIOUS WATERPROOFING MEMBRANE INSTALLATION POOL OVERFLOW**
 - .1 Follow coating manufacturer's written instructions using compatible materials in quantities and techniques so recommended.
 - .2 Examine all construction substrates and conditions under which waterproofing materials are to be installed. Do not proceed with the waterproofing application until unsatisfactory conditions are corrected.
 - .3 Preparation:
 - .1 After acceptance of surfaces, prepare them as required to receive the work of this section. Remove projections and other conditions that may affect the installation of the waterproofing system.
 - .2 Substrate shall be sound, smooth and free from surface irregularities.
 - .3 Remove projections and other conditions which may affect installation of the waterproofing.
 - .4 Completely remove contaminants and deleterious substances and debris which may prevent, reduce, and affect adhesion or performance or may act as bond breaker.
 - .5 Prepare concrete surfaces by mechanical method approved by membrane manufacturer in accordance with International Concrete Repair Institute (ICRI) recommendations to achieve a Concrete Surface Profile classifications 3 light shorblast profile. Thoroughly clean upon completion of operation. Substrate to be approved in writing by manufacturer prior to application of waterproof membrane.
 - .6 Submit written report to Consultant following procedures for manufacturer's field review in accordance with Section 01 10 10.
 - .7 Fill surface irregularities in substrates with appropriate repair materials and with methods as recommended by membrane manufacturer.
 - .8 Rinse surfaces to be waterproofed (excluding drywall or similar) with clean water to saturated surface dry (SSD) condition, with no standing water on horizontal surfaces.
 - .9 Perform adhesion tests for waterproofing to concrete substrate.
 - .4 Installation:
 - .1 Prime concrete substrates as recommended by membrane manufacturer on prepared substrates in accordance with manufacturer's written instructions.
 - .2 Cavity fill, honeycombs & form tie holes: fill in accordance with membrane manufacturer's written instructions and recommendations.

- .3 Tape construction joints and cracks in accordance with membrane manufacturer's written instructions and recommendations.
- .4 Seal around penetrations in accordance with membrane manufacturer's written instructions and recommendations.
- .5 Mix component waterproofing material in proportions recommended by manufacturer.
- .6 Positive side waterproofing:
 - .1 Apply 2 coats of waterproofing material in quantities and number of coats in accordance with membrane manufacturer's instructions and recommendations:
 - .2 Finish 2 coats 40mil (1mm) Thick
- .7 Surface finish: Overflow: Surface finish shall be "smooth" by applying a top coating of 10 mils - 20 mils special smooth powder mix of two-component waterproofing material.

.18 CLEANING AND ADJUSTING

- .1 Clean off excess grout with soft burlap or sponge moistened with clean water.
- .2 Remove grout residue from tile after grouting has cured.
- .3 Unglazed tile may be cleaned with acid solutions only when permitted by tile and grout manufacturer's written instructions, but no sooner than 10 days after installation. Protect metal surfaces, cast iron, and vitreous plumbing fixtures from effects of acid cleaning.
- .4 Polish floor and wall tile after grout has cured in accordance with Tile, Marble, Terrazzo, Stone Specifications & Standards TTMAC recommendations in the Maintenance Guide; do not use acid for cleaning.
 - .1 Re-point joints after cleaning as required to eliminate imperfections, then re-clean as necessary. Avoid scratching tile surfaces.
 - .2 Flush surface with clean water before and after cleaning.

.19 PROTECTION

- .1 Prevent traffic over tiled areas, and protect tiled assemblies from weather, freezing, and water immersion, for 96 hours minimum, after final installation.
- .2 Prevent direct impact, vibration and heavy hammering on adjacent and opposite walls for 96 hours minimum, after final installation.
- .3 Cover work temporarily with building paper properly lapped and taped at joints until work has been approved by Consultant.

END OF SECTION

- 1** General
- 1.1** **SECTION INCLUDES**
 - .1 Labour, Products, equipment and services necessary for swimming pool accessories and custom stainless-steel overflow/skimers. Work in accordance with the Contract Documents.
- 1.2** **SUBMITTALS**
 - .1 Product data sheets:
 - .1 Submit manufacturer's Product data sheets for Products proposed for use in the work of this section.
 - .2 Submit manufacturer's installation instructions.
 - .2 Shop drawings:
 - .1 Submit shop drawings in accordance with Section 01 10 10 indicating.
 - .2 Clearly indicate fabrication details, plans, elevations, hardware, and installation details.
 - .3 Templates:
 - .1 Submit templates to Contractor for use by installers and fabricators as required for proper location and installation of hardware.
- 1.3** **QUALITY ASSURANCE**
 - .1 Qualifications:
 - .1 Installers / applicators / erectors: Provide the work of this section by a Subcontractor who has adequate pool tanks, decks, equipment, and skilled workers to perform the work expeditiously, and is known to have been responsible for satisfactory installations similar to that specified during a period of at least the immediate past 5 years, who is completely familiar with referenced standards and requirements of the work of this section, and with approval of Product manufacturers.
 - .2 Workmanship: Fabricate Work of this Section to meet the required class of workmanship indicated below in accordance with AMP 555, Section 8.
 - .3 Class 1: for use on direct exposed to view fabricated items:
 - .1 Exposed surfaces are finished smooth with pits, mill marks, nicks, burrs, sharp edges, and scratches filled or ground off. Defects should not show when painted, polished, or finished. .
 - .2 Welds should be concealed where possible. Exposed welds are ground to small radius with uniform sized cove unless otherwise noted.
 - .3 Distortions should not be visible to the eye.
 - .4 Exposed joints are fitted to a hairline finish.
 - .2 Execute welding by firms certified in accordance with CSA W47.1 Division 1 or 2.1.

Ensure welding operators are licensed per CSA W47.1 for types of welding required by Work.

1.4 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, store and handle Products in accordance with the Conditions of the Contract and as specified herein.
- .2 Remove unacceptable materials from Site and replace to acceptance of Consultant.

1.5 FIELD CONDITIONS

- .1 Before commencement of the work of this section, examine the Place of the Work and report unsatisfactory conditions in writing to the Consultant.

1.6 CLOSET SUBMITTALS

- .1 Deliver, store and handle Products in accordance with the Conditions of the Contract and as specified herein.
- .2 Remove unacceptable materials from Site and replace to acceptance of Consultant.
- .3 Submit closeout submittals, as-built documents, record drawings, and operation and maintenance manuals and service data in accordance with Section 01 10 10.

2 Products

2.1 PERFORMANCE AND DESIGN REQUIREMENTS

- .1 Regulatory requirements
- .2 Design, fabricate and install work of this section to requirements of the building code and other authorities having jurisdiction.
- .3 Design details and connections, where not shown on Drawings, in accordance with CAN/CSA-S16.1 and CSA S136.1.
- .4 All exposed metal, including both steel to have eased edges and corners. No sharp edges are permitted.

2.2 Acceptable manufactures:

- .1 Spectrum Aquatics
- .2 Aquam Aquatic Specialist
- .3 Paragon Aquatics
- .4 DB Perks & Associates Ltd
- .5 Astral Pool
- .6 S.R. Smith

2.3 MATERIALS AND FINISHES

- .1 Exposed ferrous metals: type 316L Stainless Steel (316L SST).
 - .1 Factory applied anti-corrosion systems:
 - .1 Passivation: in compliance with ASTM A967-99, incorporating organic

passivation techniques for maximum corrosion resistance.

- .2 Protective coating: Spectra-Shield intra-granular protection.

2.4 ANCHORS KITS

- .1 Provide Stainless Steel (316L SST) anchor kits for chairs and platforms.
- .2 Provide 316L SST for elements exposed to view.

2.5 ESCUTCHEON PLATES

- .1 Provide escutcheon plates at anchor locations.
- .2 Match material and finish of the associated rail or post.
- .3 Escutcheons are not required at compressions anchors.

2.6 CUSTOM STAINLESS-STEEL WORK AT SKIMMER/OVERFLOW

- .1 Refer to Drawings for details of metal fabrication work and related items not specifically listed in this Section.
- .2 Take all necessary precautions to safeguard against latent surface discolouration due to disturbance of the natural protective oxide coating of the material or to contamination from other sources. All stainless steel within pool environment to be Type 316.
- .3 Execute stainless steel work in accordance with the applicable instructions in the Atlas Stainless Steels' "Technical Data" handbook on stainless steel.
- .4 Stainless steel fabrication shall be completed in clean shops, located away from areas where carbon steel is burnt, ground, or cut with abrasive wheels. Ensure that carbon steel dust will not be embedded into the stainless steel, and as follows:
 - .1 In fabrication of stainless steel do not use tools and dies which have been used on carbon steels.
 - .2 Ensure tools and dies use for forming and cutting stainless steel are free of nicks and other damage.
 - .3 Do not use carbon grits and grinding wheels which will imbed foreign particles into stainless steel surfaces. Use only stainless steel wool when wool polishing is required.
 - .4 Stainless steel items, on which rust stains appear, shall be replaced with new fabricated material.
- .5 Verify dimensions of existing Work before commencing fabrications and report any discrepancies to the Consultant.
- .6 Fit and assemble Work in shop where possible. Execute Work in accordance with details and reviewed shop drawings.
- .7 Use self-tapping shake-proof screws on items requiring assembly by screws or as indicated. Use screws for interior metal work. Use welded connections for exterior metal Work unless otherwise found acceptable by the Consultant.

- .8 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush. Seal exterior steel fabrications against corrosion in accordance with CAN/CSA S16.1-M.
- .9 Execute shop welding to requirements specified.
- .10 Carefully make and fit details. Take special care with exposed finished Work to produce a neat and correct appearance to the Consultant's acceptance.
- .11 Assemble members without twists or open joints.
- .12 Correctly size holes for connecting Work of other trades where such can be determined prior to fabrication. Where possible, show holes on shop drawings. Place holes not to cause appreciable reduction in strength of member.
- .13 Draw mechanical joints to hairline tightness and seal countersunk screw and access holes for locking screws with metal filler where these occur on exposed surfaces.
- .14 Exposed metal edges shall be eased to prevent sharp edges and corner conditions.
- 2.7 Refer to drawings for additional pool accessories specifications (gutter drains, skimmers, overflows and jets)
- 2.8 Deck drains refer to DIVISION 22 and mechanical drawings.
- 3 Execution**
- 3.1 EXAMINATION**
 - .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.
- 3.2 INSTALLATION**
 - .1 Install pool accessories in accordance with manufacturer's printed instructions.
 - .2 Submit manufacturer's information and templates required for installation of work of this section, and assist or supervise, or both, the setting of anchorage devices, and construction of other work incorporated with Products specified in this section in order that they function as intended.
 - .3 Metal within 3000mm of pool tank to be grounded in accordance with Divisions 26 and 28.
 - .4 Deliver items to be cast-in or incorporated in work of other sections and supervise installation of same.
 - .5 Cooperate with Owner's representative and other contractors as they install equipment not included in the work of this section.
 - .6 Install work to meet manufacturers' recommended specifications, true, tightly fitted, and level or flush to adjacent surfaces, as suitable for installation.
 - .7 Include reinforcing, anchorage and mounting devices required for the installation of each Product.

- .8 Fit joints and junction between components tightly and in true planes, conceal and weld joints where possible.
- .9 Fabricate Products with materials and component sizes, metal gauges, hardware, reinforcing, anchors, and fastenings of adequate strength to ensure that swimming pool accessories will remain free of warping, buckling, opening of joints and seams, and distortion within limits of intended use.
- .10 Supply handling instructions, anchorage information, roughing-in dimensions, templates and service requirements for installation of the work of this section, and assist or supervise, or both, the setting of anchorage devices and construction of other work incorporated with Products specified in this section.

3.3 STAINLESS STEEL ANTICORROSION PROCEDURES

- .1 Field treat stainless steel fittings used in Pool Deck and Pool Tank against corrosion prior to project turnover to the Owner.
 - .1 Exposed ferrous metals: Type 316 stainless steel (316L SST).
- .2 Treat stainless steel with 2-step process as follows:
 - .1 Passivation incorporating organic passivation techniques.
 - .2 Treatment to protect intra-granular structure of steel against corrosion.
- .3 Standard of acceptance:
 - .1 'Spectrum System 1 Field Passivation' and 'Spectra-Shield' treatment by DB Perks & Associates Ltd.
- .4 Provide training to Owner's staff using field application techniques.

3.4 ERECTION

- .1 Install metal fabrications in accordance with reviewed shop drawings and manufacturer's written instructions.
- .2 Fit joints and intersecting members accurately. Make Work in true planes with adequate fastenings. Build and erect Work plumb, true, square, straight, level and accurate to sizes detailed, free from distortion or defects detrimental to appearance or performance.

3.5 CLEANING

- .1 Clean exposed and semi-exposed surface. Touch-up finishes to restore damaged and soiled areas.

3.6 PROTECTION

- .1 Protect and maintain conditions necessary to ensure that pools, decks, equipment and fixtures will be without damage or deterioration at date of Substantial Performance of the Work.

END OF SECTION

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Appendix ME1 City of Mississauga Master Specifications for EMCS

Section 22 05 00

Common Work Results for Plumbing

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 07 62 00 - Sheet Metal Flashing and Trim
- .2 Section 07 84 00 - Firestopping
- .3 Section 09 91 23 - Interior Painting
- .4 Section 22 07 19 - Plumbing Piping Insulation.
- .5 Section 26 05 00 - Common Work Results for Electrical

1.2 DEFINITIONS

- .1 Environmental product declaration: Third-party verified documentation with the supporting product category rule and life cycle assessment information, including at least a cradle-to-gate scope. Prepared in accordance with ISO 14025 , ISO 14040 , ISO 14044 , and EN 15804 or ISO 21930 .
- .2 Industry average environmental product declaration: Developed by an industry association and represents the average product of multiple companies. Products covered by industry average environmental product declarations are required to follow the same product category rule. Industry average environmental product declarations cannot represent a certain manufacturer or its product. Industry average environmental product declarations may be referred to as "industry-wide environmental product declarations" or "generic environmental product declarations."
- .3 Product-specific type III environmental product declaration: Provides data on one product made by one manufacturer, but can involve multiple factories. Product-specific environmental product declarations can cover a product produced by a manufacturer in several plants throughout the world if all plants use the same processes. Product-specific environmental product declarations cannot represent several products and several manufacturers.

1.3 REFERENCE STANDARDS

- .1 International Organization for Standardization (ISO):
 - .1 ISO 14025: 2006 , Environmental labels and declarations — Type III environmental declarations — Principles and procedures
 - .2 ISO 14040: 2006 , Environmental management — Life cycle assessment — Principles and framework
 - .3 ISO 14044: 2006 , Environmental management — Life cycle assessment — Requirements and guidelines

- .4 ISO 14067: 2018 , Greenhouse gases - Carbon footprint of products - Requirements and guidelines for quantification
- .5 ISO 21930: 2017 , Sustainability in buildings and civil engineering works — Core rules for environmental product declarations of construction products and services
- .2 Mechanical Contractors Association of Canada (MCAC):
 - .1 Shop Drawing Submittal Title Sheet
- .3 NSF International (NSF):
 - .1 NSF/ANSI/CAN 61- 2023 , Drinking Water System Components - Health Effects (Includes NSF/ANSI/CAN 600- 2023 , Health Effects Evaluation and Criteria for Chemicals in Drinking Water)

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination:
 - .1 Coordinate with Section 07 62 00 - Sheet Metal Flashing and Trim for installation of flashing at plumbing systems penetrating building envelope.
 - .2 Coordinate with Section 07 84 00 - Firestopping for through penetration firestopping or smoke seal systems.
 - .3 Coordinate with Section 26 05 00 - Common Work Results for Electrical for electrical connections for plumbing equipment.
- .2 Pre-installation meetings: Conduct a site meeting in accordance with Section 01 31 19 - Project Meetings and attended by the Consultant and appropriate Subcontractors to:
 - .1 Verify project requirements.
 - .2 Review delivery, storage, and handling requirements.
 - .3 Review installation and substrate conditions.
 - .4 Coordinate with other Subcontractors.
 - .5 Review manufacturer's instructions and warranty requirements.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures .
 - .1 Submit the following with product data and shop drawings:
 - .1 detailed drawings of bases, supports, and anchor bolts;
 - .2 acoustical sound power data, where applicable;
 - .3 points of operation on performance curves;
 - .4 manufacturer's certification of current model production; and
 - .5 certification of compliance to applicable codes.
- .2 Shop drawings:

- .1 Signed and sealed by a qualified professional in accordance with Section 01 43 00 - Quality Assurance .
- .2 Show location of each component, dimensioned plans and elevations , large scale details, mounting arrangements, operating and maintenance clearances, and attachment details.
- .3 Show locations and sizes of framing, blocking, or backing required for wall mounting, including concealed items specified in other sections.
- .4 In addition to transmittal letter specified in Section 01 33 00 - Submittal Procedures , use the MCAC Shop Drawing Submittal Title Sheet . Identify section and paragraph number.

1.6 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals .
- .2 Operation and maintenance data:
 - .1 Include, in the operation and maintenance manual, manufacturer's operating and maintenance instructions and recommended cleaning materials and methods.
 - .2 Operation data to include:
 - .1 control schematics for systems including environmental controls;
 - .2 descriptions of systems and their controls;
 - .3 descriptions of operation of systems at various loads, together with reset schedules and seasonal variances;
 - .4 Valves Schedule and flow diagram.
 - .3 Maintenance data to include:
 - .1 Data to include schedules of tasks, frequency, tools required, and task time.
 - .4 Performance data to include:
 - .1 Equipment manufacturers' performance datasheets with point of operation as left after commissioning is complete.
 - .2 Equipment performance verification test results.
 - .5 Review:
 - .1 Submit electronic copies of draft operation and maintenance manual for review. Submission of individual data will not be accepted unless directed by the Consultant .
 - .2 Make changes as required and resubmit as directed by the Consultant .
 - .6 Additional data:

- .1 Prepare and insert into operation and maintenance manual additional data as needed during specified demonstrations and instructions.
- .3 Record documentation:
 - .1 Site records:
 - .1 The Consultant will provide one set of Mechanical Drawings . Provide sets of white prints as required for each phase of work.
 - .2 Mark changes as work progresses and as changes occur. Include changes to existing mechanical systems, control systems, and low voltage control wiring .
 - .3 Transfer information weekly to as-built drawings, revising to show work as actually installed.
 - .4 Use different colour waterproof ink for each service.
 - .5 Make available for reference purposes and inspection.
 - .2 As-built drawings:
 - .1 Prior to start of testing, adjusting, and balancing for plumbing, finalize production of as-built drawings.
 - .2 Identify each drawing in lower right-hand corner in letters at least 13 mm high as follows: "AS BUILT DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW MECHANICAL SYSTEMS AS INSTALLED" (Signature of Contractor) (Date).
 - .3 Submit to the Consultant for review and make corrections as directed.
 - .4 Perform testing, adjusting, and balancing for plumbing using as-built drawings.
 - .5 Submit completed reproducible as-built drawings with operating and maintenance manuals.
 - .3 Submit copies of as-built drawings for inclusion in final TAB report.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals .
- .2 Spare parts:
 - .1 One set of packing for each pump.
 - .2 One casing joint gasket for each size pump.
 - .3 One glass for each gauge glass.
- .3 Tools:
 - .1 Supply one set of special tools required to service equipment as recommended by manufacturers.

1.8 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store, and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

Part 2 Products

2.1 PERFORMANCE/DESIGN CRITERIA

- .1 Potable water: Products intended to convey or dispense drinking water to comply with NSF/ANSI/CAN 61 .
- .2 Design and install system with consideration to access to main components for repairs, replacements, and alterations.
- .3 Ensure plumbing penetrations for the purpose of running pipes do not compromise structural integrity.
- .4 Use chemical resilient gaskets and other plumbing products to reduce the potential for deterioration.
- .5 Insulate domestic hot water supply lines to minimum RSI 0.7.

2.2 MATERIALS

- .1 Maintain zero lead content in water distribution lines, including solder material. Remove lead solder and galvanized piping during renovation work.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for mechanical installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Consultant.
 - .2 Inform Consultant of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.

3.2 PENETRATIONS THROUGH EXISTING STRUCTURE

- .1 Cut and core drill, as required for plumbing work, in accordance with Section 01 73 00 - Execution .
- .2 Layout cutting of structural elements, such as floor slabs, walls, columns, and beams and obtain acceptance before starting work.
 - .1 Conduct an electromagnetic scan of reinforcing rods and submit results to the Consultant for review.
 - .2 Based on electromagnetic scan results, arrange and pay for supplemental X-ray examination as required, to locate concrete reinforcement and embeds.

- .1 Employ a qualified technician to perform examination, in a safe manner and in accordance with applicable regulations governing examination activity.
- .2 Submit examination results and obtain acceptance prior to starting any work.
- .3 Make adjustments to location of openings as required to minimize cutting of rebar and completely avoid electrical conduits.
- .3 Neatly cut or drill holes in existing construction to accommodate piping, ductwork, or conduits. Cut holes through slabs only. Do not cut holes through beams. Cut holes to 200 mm diameter or smaller only. Maintain at least 100 mm clearance from beam faces. Space cuts at least three hole diameters apart on-centre. Repair cut and damaged surfaces with materials and finishes to match existing.
- .4 Provide sleeves and follow the Consultant 's instructions where necessary to completely penetrate existing floors, walls, ceilings, roofs, or structural members.
- .5 Repair damage to fireproofing material or insulation on the building structure, where mechanical equipment has been removed or added.
- .6 Provide firestopping as required, and in accordance with Section 07 84 00 - Firestopping , at each location where existing penetrations through fire-resistance rated wall or floor assemblies remain due to removal of existing piping or other mechanical services.

3.3 RESTORATION

- .1 Repainting:
 - .1 Prime and touch-up marred finished paintwork to match original.
 - .2 Perform painting in accordance with Section 09 91 23 - Interior Painting .
 - .3 Restore finishes which have been damaged to as new condition.

3.4 CLEANING

- .1 Clean in accordance with Section 01 74 00 - Cleaning , and:
 - .1 Clean interior and exterior of all systems including strainers.
- .2 Waste management:
 - .1 Manage waste in accordance with Section 01 74 19 - Waste Management and Disposal.

3.5 PROTECTION

- .1 Protect equipment and systems openings from dirt, dust, and other foreign materials with materials appropriate to each system.

END OF SECTION

Section 22 05 15

Plumbing Specialties and Accessories

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 22 11 19 - Domestic Water Piping Specialites.

1.2 REFERENCE STANDARDS

- .1 ASTM International (ASTM)
 - .1 ASTM A126-04(2009), Standard Specification for Gray Iron Castings for Valves, Flanges and Pipe Fittings.
 - .2 ASTM B62-09, Standard Specification for Composition Bronze or Ounce Metal Castings.
- .2 American Water Works Association (AWWA)
 - .1 ANSI/AWWA C700-09, Standard for Cold Water Meters-Displacement Type, Bronze Main Case.
 - .2 ANSI/AWWA C701-12, Standard for Cold Water Meters-Turbine Type for Customer Service.
 - .3 ANSI/AWWA C702-10, Standard for Cold Water Meters-Compound Type.
- .3 Canada Green Building Council (CaGBC)
 - .1 LEED Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environmental Design):Green Building Rating System Reference Package For New Construction and Major Renovations (including Addendum 2007).
 - .2 LEED Canada-CI Version 1.0-2007, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide For Commercial Interiors.
 - .3 LEED Canada 2009 for Design and Construction-2010, LEED Canada 2009 for Design and Construction Leadership in Energy and Environmental Design Green Building Rating System Reference Guide.
 - .4 LEED Canada for Existing Buildings, Operations and Maintenance-2009, LEED Canada 2009 Leadership In Energy and Environmental Design Green Building Rating System Reference Guide.
- .4 CSA Group (CSA)
 - .1 CSA-B64 Series-11, Backflow Preventers and Vacuum Breakers.
 - .2 CSA B79-08, Commercial and Residential Drains and Cleanouts.
 - .3 CAN/CSA-B356-10, Water Pressure Reducing Valves for Domestic Water Supply Systems.

- .5 Efficiency Valuation Organization (EVO)
 - .1 International Performance Measurement and Verification Protocol (IPMVP).
 - .1 IPMVP 2007 Version.
- .6 National Research Council Canada (NRC)
 - .1 National Plumbing Code of Canada 2015 (NPC).
- .7 Plumbing and Drainage Institute (PDI)
 - .1 PDI-G101-R2010, Testing and Rating Procedure for Grease Interceptors with Appendix of Installation and Maintenance.
 - .2 PDI-WH201-R2010, Water Hammer Arresters Standard.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for plumbing products and include product characteristics, performance criteria, physical size, finish and limitations.

1.4 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for plumbing specialties and accessories for incorporation into manual.
 - .1 Description of plumbing specialties and accessories, giving manufacturers name, type, model, year and capacity.
 - .2 Details of operation, servicing and maintenance.
 - .3 Recommended spare parts list.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect plumbing materials from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 FLOOR DRAINS

- .1 As indicated.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for plumbing specialties and accessories installation in accordance with manufacturer's written instructions.
 - .1 Inform Consultant of unacceptable conditions immediately upon discovery.
 - .2 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.

3.2 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and data sheet.

3.3 INSTALLATION

- .1 Install in accordance with National Plumbing Code of Canada (NPC), provincial codes, and local authority having jurisdiction.
- .2 Install in accordance with manufacturer's instructions and as specified.

3.4 START-UP

- .1 General:
 - .1 In accordance with Section 01 91 13 - General Commissioning Requirements: General Requirements, supplemented as specified herein.
- .2 Timing: start-up only after:
 - .1 Pressure tests have been completed.
 - .2 Disinfection procedures have been completed.
 - .3 Certificate of static completion has been issued.
 - .4 Water treatment systems operational.
- .3 Provide continuous supervision during start-up.

3.5 TESTING AND ADJUSTING

- .1 General:
 - .1 Test and adjust plumbing specialties and accessories in accordance with Section 01 91 13 - General Commissioning Requirements: General Requirements, supplemented as specified.

- .2 Timing:
 - .1 After start-up deficiencies rectified.
 - .2 After certificate of completion has been issued by authority having jurisdiction.
- .3 Floor drains:
 - .1 Check security, accessibility, removability of strainer.
 - .2 Clean out baskets.

3.6 CLOSEOUT ACTIVITIES

- .1 Commissioning Reports: in accordance with Section 01 91 13 - General Commissioning Requirements: reports, supplemented as specified.
- .2 Training: provide training in accordance with Section 01 91 13 - General Commissioning Requirements: Training of O&M Personnel, supplemented as specified.

3.7 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.

3.8 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by plumbing specialties and accessories installation.

END OF SECTION

Section 22 07 19 Plumbing Piping Insulation

Part 1 General

1.1 SUMMARY

- .1 Thermal insulation for plumbing piping and piping accessories.

1.2 RELATED REQUIREMENTS

- .1 Section 07 84 00 – Firestopping
- .2 Section 07 92 00 - Joint Sealants
- .3 Section 22 05 00 – Common Work Results for Plumbing

1.3 DEFINITIONS

- .1 For the purposes of this Section:
 - .1 Concealed means insulated mechanical services in suspended ceilings, or in non-accessible chases, or in furred-in spaces.
 - .2 Exposed means not concealed.
 - .3 Jacketing is synonymous with insulation cladding and lagging.
 - .4 Mineral fibre is synonymous with glass fibre, rock wool, or slag wool.

1.4 REFERENCE STANDARDS

- .1 American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE):
 - .1 ANSI/ASHRAE/IES 90.1-2013, Energy Standard for Buildings Except Low-Rise Residential Buildings
- .2 ASTM International (ASTM):
 - .1 ASTM C335/C335M-17, Standard Test Method for Steady-State Heat Transfer Properties of Pipe Insulation
 - .2 ASTM C411-19, Standard Specification for Hot-Surface Performance of High-Temperature Thermal Insulation
 - .3 ASTM C449/C449M-07, Standard Specification for Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement
 - .4 ASTM C533-17, Standard Specification for Calcium Silicate Block and Pipe Thermal Insulation
 - .5 ASTM C547-22a, Standard Specification for Mineral Fiber Pipe Insulation
 - .6 ASTM C921-10, Standard Practice for Determining the Properties of Jacketing Materials for Thermal Insulation

- .7 ASTM C1136-21, Standard Specification for Flexible, Low Permeance Vapor Retarders for Thermal Insulation
- .8 ASTM C1729-21, Standard Specification for Aluminum Jacketing for Insulation
- .9 ASTM C1767M-21, Standard Specification for Stainless Steel Jacketing for Insulation
- .3 Green Seal Environmental Standards (GS):
 - .1 GS-36-13, Adhesives for Commercial Use
- .4 Midwest Insulation Contractors Association (MICA):
 - .1 North American Commercial and Industrial Insulation Standards (NACIIS) Manual, 9th edition
- .5 ULC Standards (ULC):
 - .1 CAN/ULC-S102-10, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies
 - .2 CAN/ULC-S702.1-14, Standard for Mineral Fibre Thermal Insulation for Buildings, Part 1: Material Specification

1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's product literature, specifications, and datasheets. Include product characteristics, performance criteria, and limitations.
 - .2 Submit WHMIS Safety Data Sheet (SDS).
- .3 Certificates: When requested, submit manufacturer's certificates certifying that materials comply with specified performance characteristics and physical properties.

1.6 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Installer: Specialist in performing work of this Section with at least three years successful experience in this type and size of project, member of Thermal Insulation Association of Canada (TIAC).

1.7 DELIVERY, STORAGE, AND HANDLING

- .1 Perform in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Protect insulation, canvas, and other moisture-sensitive materials from moisture.

Part 2 Products

2.1 DESCRIPTION

- .1 Regulatory Requirements:

- .1 Combustible piping materials, including adhesives in accordance with CAN/ULC-S102:

- .1 Flame-spread rating: Maximum 25.
- .2 Smoke developed classification: Maximum 50.

2.2 GLASS FIBRE

- .1 Insulation: ASTM C547, rigid moulded, noncombustible.
 - .1 Thermal Conductivity (K-factor): ASTM C335/C335M, 0.035 W/m.K at 24 degrees C.
 - .2 Minimum Service Temperature: -28.9 degrees C.
 - .3 Maximum Service Temperature: 150 degrees C.
 - .4 Maximum Moisture Absorption: 0.2% by volume.
- .2 Vapour Barrier Jacket:
 - .1 ASTM C921, White kraft paper reinforced with glass fibre yarn and bonded to aluminized film.
 - .2 Moisture Vapour Transmission: ASTM E96/E96M, 0.03 ng/(Pa s sq m).
 - .3 Secure with self sealing longitudinal laps and butt strips.
 - .4 Secure with outward clinch expanding staples and vapour barrier mastic.
- .3 Tie Wire: 1.3 mm stainless steel with twisted ends on maximum 300 mm centres.
- .4 Vapour Barrier Lap Adhesive:
 - .1 Compatible with insulation.
- .5 Insulating Cement/Mastic:
 - .1 ASTM C195, hydraulic setting on mineral wool.
- .6 Fibrous Glass Fabric:
 - .1 Cloth: Untreated; 305 g/sq m weight.
 - .2 Blanket: 16 kg/cu m density.
- .7 Indoor Vapour Barrier Finish:
 - .1 Vinyl emulsion type acrylic, compatible with insulation, white colour.
- .8 Outdoor Vapour Barrier Mastic:
 - .1 Vinyl emulsion type acrylic, compatible with insulation, white colour.
- .9 Insulating Cement: ASTM C449.

2.3 HYDROUS CALCIUM SILICATE

- .1 Insulation: ASTM C533, rigid moulded white; asbestos free.
 - .1 Thermal Conductivity (K-factor): ASTM C177, ASTM C518, 0.060 W/m.K at 147 degrees C.

- .2 Maximum Service Temperature: 815 degrees C.
- .3 Density: 208 kg/cu m.
- .2 Tie Wire: 1.2 mm stainless steel with twisted ends on maximum 300 mm centres.
- .3 Insulating Cement: ASTM C449.

2.4 JACKETS

- .1 PVC Plastic:
 - .1 Jacket: ASTM C921, One-piece moulded type fitting covers and sheet material, off white colour.
 - .1 Minimum Service Temperature: -40 degrees C.
 - .2 Maximum Service Temperature: 66 degrees C.
 - .3 Moisture Vapour Transmission: ASTM E96/E96M; 0.002 perm inches.
 - .4 Maximum Flame Spread: ASTM E84, 25.
 - .5 Maximum Smoke Developed: ASTM E84, 50.
 - .6 Thickness: 0.5 mm.
 - .7 Connections: Pressure sensitive colour matching vinyl tape.
 - .2 Covering Adhesive Mastic: Compatible with insulation.

2.5 ACCESSORIES

- .1 Weatherproof Sealant for Jackets Installed Outdoors: In accordance with Section 07 92 00 - Joint Sealants.
- .2 Tape: Self-adhesive, aluminum, reinforced, minimum 50 mm wide.
- .3 Contact Adhesive: Quick setting type.
- .4 Tie Wire: Stainless steel, minimum 1.5-mm diameter.
- .5 Bands: Stainless steel, 19 mm wide, minimum 0.5 mm thick.
- .6 Vapour Retarder Lap Adhesive: Water-based and fire retardant type, compatible with insulation.
- .7 Indoor Vapour Retarder Finish: Vinyl emulsion type acrylic, compatible with insulation.

Part 3 Execution

3.1 PREPARATION

- .1 Verify that pressure testing of piping systems and adjacent equipment is complete, witnessed, and certified.
- .2 Verify that surfaces are clean, dry, and free from foreign material.

3.2 INSTALLATION

- .1 Install to manufacturer's instructions and in accordance with MICA, NACIIS Manual.
- .2 Provide two layers of insulation with staggered joints when required nominal wall thickness exceeds 75 mm.
- .3 Maintain uninterrupted continuity and integrity of vapour retarder jacket and finishes.
- .4 Install piping insulation continuous through wall and ceiling openings and sleeves, except where firestopping is required. Coordinate with Section 07 84 00 – Firestopping.
- .5 Supports and Hangers:
 - .1 Hangers and supports in accordance with Section 22 05 00 – Common Work Results for Plumbing.
 - .2 Install hangers and supports outside vapour retarder jacket.
 - .3 Apply high compressive strength insulation that is suitable for piping service at oversized saddles and shoes where insulation saddles have not been provided.

3.3 SITE QUALITY CONTROL

- .1 Non-Conforming Work: Replace insulation where there is damage to the vapour barrier and insulation is saturated with moisture.

END OF SECTION

Section 22 10 00 Plumbing Piping

Part 1 General

1.1 SECTION INCLUDES

- .1 Pipe, pipe fittings, valves, and connections for piping systems sanitary sewer, domestic water.

1.2 RELATED REQUIREMENTS

- .1 Section 08 31 13 - Access Doors and Frames.
- .2 Section 09 91 00 - Painting.
- .3 Section 22 10 10 - Plumbing Pumps.
- .4 Section 22 11 19 - Domestic Water Piping Specialties.
- .5 Section 22 47 00 - Plumbing Equipment.
- .6 Section 23 05 16 - Expansion Fittings and Loops for HVAC Piping.
- .7 Section 23 05 29 - Hangers and Supports for HVAC Piping and Equipment.
- .8 Section 23 05 48 - Vibration Isolation.
- .9 Section 23 05 53 - Mechanical Identification.
- .10 Section 23 07 19 - Piping Insulation.

1.3 REFERENCE STANDARDS

- .1 ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.
- .2 ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
- .3 ASME B16.23 - Cast Copper Alloy Solder Joint Drainage Fittings - DWV.
- .4 ASME B16.26 - Cast Copper Alloy Fittings for Flared Copper Tubes.
- .5 ASME B16.29 - Wrought Copper And Wrought Copper Alloy Solder Joint Drainage Fittings - DWV.
- .6 ASME B16.50 - Wrought Copper and Copper Alloy Braze-Joint Pressure Fittings.
- .7 ASME B31.1/B31.3 - Power Piping and Process Piping (Set).
- .8 ASME B31.2 - Fuel Gas Piping.
- .9 ASME B31.9 - Building Services Piping.
- .10 ASME Boiler and Pressure Vessels Code, Section I - Rules for Construction of Power Boilers.
- .11 ASME Boiler and Pressure Vessels Code, Section IV - Rules for Construction of Heating Boilers.

- .12 ASME Boiler and Pressure Vessel Code, Section IX - Welding and Brazing Qualifications.
- .13 ASTM A53/A53M-22 Standard specification for pipe, steel, black and hot-dipped, zinc-coated, welded and seamless
- .14 ASTM A74-21 Standard specification for cast iron soil pipe and fittings
- .15 ASTM A234/A234M-23a Standard specification for piping fittings of wrought carbon steel and alloy steel for moderate and high temperature service
- .16 ASTM A312/A312M-22a Standard specification for seamless, welded, and heavily cold worked austenitic stainless steel pipes
- .17 ASTM A774/A774M-14(2019) Standard specification for as-welded wrought austenitic stainless steel fittings for general corrosive service at low and moderate temperatures
- .18 ASTM B32-20 Standard specification for solder metal
- .19 ASTM B75/B75M-20 Standard specification for seamless copper tube
- .20 ASTM B88M-20 Standard specification for seamless copper water tube (metric)
- .21 ASTM B88-22 Standard specification for seamless copper water tube
- .22 ASTM B280-23 Standard specification for seamless copper tube for air conditioning and refrigeration field service
- .23 ASTM B306-20 Standard specification for copper drainage tube (DWV)
- .24 ASTM B837-19 Standard specification for seamless copper tube for natural gas and liquified petroleum (LP) gas fuel distribution systems
- .25 ASTM C14M-20 Standard specification for nonreinforced concrete sewer, storm drain, and culvert pipe (metric)
- .26 ASTM C14-20 Standard specification for nonreinforced concrete sewer, storm drain, and culvert pipe
- .27 ASTM C443M-21 Standard specification for joints for concrete pipe and manholes, using rubber gaskets (metric)
- .28 ASTM C443-21 Standard specification for joints for concrete pipe and manholes, using rubber gaskets
- .29 ASTM C564-20a Standard specification for rubber gaskets for cast iron soil pipe and fittings
- .30 ASTM C1053-00(2015) Standard specification for borosilicate glass pipe and fittings for drain, waste, and vent (DWV) applications (Withdrawn 2019)
- .31 ASTM D2235-22 Standard specification for solvent cement for acrylonitrile-butadiene-styrene (ABS) plastic pipe and fittings
- .32 ASTM D2241-20 Standard specification for poly(vinyl chloride) (PVC) pressure-rated pipe (SDR series)
- .33 ASTM D2464-23 Standard specification for threaded poly(vinyl chloride) (PVC) plastic pipe fittings, Schedule 80

- .34 ASTM D2513-20 Standard specification for polyethylene (PE) gas pressure pipe, tubing, and fittings
- .35 ASTM D2564-20 Standard specification for solvent cements for poly(vinyl chloride) (PVC) plastic piping systems
- .36 ASTM D2683-20 Standard specification for socket-type polyethylene fittings for outside diameter-controlled polyethylene pipe and tubing
- .37 ASTM D3138-21 Standard specification for solvent cements for transition joints between acrylonitrile-butadiene-styrene (ABS) and poly(vinyl chloride) (PVC) non-pressure piping components
- .38 ASTM E814-23a Standard test method for fire tests of penetration firestop systems
- .39 ASTM F708-92(2018)e1 Standard practice for design and installation of rigid pipe hangers
- .40 ASTM F1281-23a Standard specification for crosslinked polyethylene/aluminum/crosslinked polyethylene (PEX-AL-PEX) pressure pipe
- .41 ASTM G17-07(2020) Standard test method for penetration resistance of pipeline coatings (blunt rod)
- .42 Specification A5.8M/A5.8:2019 Specification for filler metals for brazing and braze welding
- .43 AWWA C105/A21.5-18 Polyethylene encasement for ductile-iron pipe systems
- .44 AWWA C651-14 Disinfecting water mains
- .45 CSA B70:19 Cast iron soil pipe, fittings, and means of joining
- .46 CSA B1800:21 Thermoplastic nonpressure piping compendium
- .47 CAN/ULC-S102.2 - Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings and Miscellaneous Materials and Assemblies.
- .48 ANSI Z21.22-2015/CSA 4.4:R2020 Relief valves for hot water supply systems
- .49 STD SP-110-2010 Ball valves threaded, socket-welding, solder joint, grooved and flared ends
- .50 STD SP-58-2018 Pipe hangers and supports - materials, design, manufacture, selection, application, and installation
- .51 STD SP-67-2022 Butterfly valves
- .52 STD SP-70-2011 Gray iron gate valves, flanged and threaded ends
- .53 STD SP-71-2018 Gray iron swing check valves, flanged and threaded ends
- .54 STD SP-78-2011 Gray iron plug valves, flanged and threaded ends
- .55 STD SP-80-2019 Bronze gate, globe, angle, and check valves
- .56 STD SP-85-2011 Gray iron globe and angle valves, flanged and threaded ends
- .57 NFPA 54/ANSI Z223.1 - National Fuel Gas Code.
- .58 NFPA 58 - Liquefied Petroleum Gas Code.

- .59 UL 1479 - Standard for Fire Tests of Through-Penetration Firestops.

1.4 ACTION SUBMITTALS

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalogue information. Indicate valve data and ratings.

1.5 CLOSEOUT SUBMITTALS

- .1 Section 01 78 00: Submission procedures.
- .2 Record Documentation: Record actual locations of valves.

1.6 QUALITY ASSURANCE

- .1 Products of This Section: Manufactured to ISO 9000 certification requirements.
- .2 Valves: Manufacturer's name and pressure rating marked on valve body.
- .3 Welding Materials and Procedures: Conform to ASME BPVC.IX.
- .4 Welder's Certification: To ASME BPVC.IX. Submit proof upon request.

1.7 DELIVERY, STORAGE, AND HANDLING

- .1 Section 01 61 00: Transport, handle, store, and protect products.
- .2 Accept valves on site in shipping containers with labelling in place. Inspect for damage.
- .3 Provide temporary protective coating on cast iron and steel valves.
- .4 Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- .5 Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

1.8 SITE CONDITIONS

- .1 Ambient Conditions: Do not install underground piping when bedding is wet or frozen.

Part 2 Products

2.1 DESCRIPTION

- .1 Regulatory Requirements:
- .1 Perform Work to applicable plumbing code.
- .2 Conform to applicable code for installation of backflow prevention devices.
- .3 Provide certificate of compliance from authority having jurisdiction indicating approval of installation of backflow prevention devices.

2.2 SANITARY SEWER PIPING, BURIED, INSIDE BUILDING

- .1 Cast Iron Pipe: CAN/CSA-B70.
 - .1 Fittings: Cast iron, FSWW-P-401, hubless cast iron pipe fittings.
 - .2 Joints: ASTM C564, rubber or compression gaskets.
- .2 ABS Pipe: CAN/CSA-B1800, Type DWV.
 - .1 Fittings: ASTM D2468, ABS socket type, Schedule 40.
 - .2 Joints: ASTM D2235, solvent cement and primer for fittings; ASTM D3138, solvent cement and primer for transition joints.
- .3 PVC Pipe: CAN/CSA-B1800, SDR 35 pipe.
 - .1 Fittings: ASTM D2468, ABS socket type, Schedule 40.
 - .2 Joints: ASTM D2564 solvent cement and primer.
- .4 Copper Tube: ASTM B306, DWV.
 - .1 Fittings: ASME B16.23, cast bronze.
 - .2 Joints: ASTM B32, soldered.

2.3 SANITARY SEWER PIPING, ABOVE GROUND

- .1 Cast Iron Pipe: CAN/CSA-B70.
 - .1 Fittings: Hubless Cast Iron Pipe Fittings: FSWW-P-401.
 - .2 Joints: ASTM C564, rubber or compression gaskets.
- .2 Copper Tube: ASTM B306, DWV.
 - .1 Fittings: ASME B16.23 cast bronze.
 - .2 Joints: Joints: ASTM B32, soldered.
- .3 PVC Pipe: CAN/CSA-B1800, and CAN/ULC-S102.2 flame spread rating 15.
 - .1 Fittings: CAN/CSA-B1800, socket type, and CAN/ULC-S102.2 flame spread rating 15.
 - .2 Joints: ASTM D2564 solvent cement and primer.

2.4 DOMESTIC WATER PIPING, ABOVE GROUND

- .1 Copper Tubing: ASTM B88M, Type L, H (drawn) temper.
 - .1 Fittings: ASME B16.18 cast copper alloy.
 - .2 Joints: ASTM B32, soldered.

2.5 FLANGES, UNIONS, AND COUPLINGS

- .1 Ferrous Pipe Size 75 mm and Under: Class 150 malleable iron threaded unions.
- .2 Copper Tube and Pipe Size 75 mm and Under: Class 150 bronze unions with soldered joints.

- .3 Ferrous Pipe Size Over 25 mm: Class 150 malleable iron threaded or forged steel slip-on flanges; preformed neoprene gaskets.
- .4 Copper Tube and Pipe Size Over 25 mm: Class 150 slip-on bronze flanges; preformed neoprene gaskets.
- .5 Grooved and Shouldered Pipe End Couplings:
 - .1 Housing: Malleable iron clamps to engage and lock, designed to permit some angular deflection, contraction, and expansion; steel bolts, nuts, and washers; galvanized for galvanized pipe.
 - .2 Sealing gasket: C-shape composition sealing gasket.
- .6 Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.

2.6 PIPE HANGERS AND SUPPORTS

- .1 Plumbing Piping - Drain, Waste, and Vent:
 - .1 Conform to ASME B31.9.
 - .2 Hangers for Pipe Sizes 13 to 38 mm: Malleable iron, adjustable swivel, split ring.
 - .3 Hangers for Pipe Sizes 50 mm and Over: Carbon steel, adjustable, clevis.
 - .4 Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
 - .5 Wall Support for Pipe Sizes to 75 mm: Cast iron hook.
 - .6 Wall Support for Pipe Sizes 100 mm and Over: Welded steel bracket and wrought steel clamp.
 - .7 Vertical Support: Steel riser clamp.
 - .8 Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
 - .9 Copper Pipe Support: Carbon steel ring, adjustable, copper plated.
- .2 Plumbing Piping - Water:
 - .1 Conform to ASME B31.9.
 - .2 Hangers for Pipe Sizes 13 to 38 mm: Carbon steel, adjustable swivel, split ring.
 - .3 Hangers for Cold Pipe Sizes 50 mm and Over: Carbon steel, adjustable, clevis.
 - .4 Hangers for Hot Pipe Sizes 50 to 100 mm: Carbon steel, adjustable, clevis.
 - .5 Hangers for Hot Pipe Sizes 150 mm and Over: Adjustable steel yoke, cast iron pipe roll, double hanger.
 - .6 Multiple or Trapeze Hangers: Steel channels with welded supports or spacers and hanger rods.

- .7 Multiple or Trapeze Hangers for Hot Pipe Sizes 150 mm and Over: Steel channels with welded supports or spacers and hanger rods, cast iron roll.
- .8 Wall Support for Pipe Sizes to 75 mm: Cast iron hook.
- .9 Wall Support for Pipe Sizes 100 mm and Over: Welded steel bracket and wrought steel clamp.
- .10 Wall Support for Hot Pipe Sizes 150 mm and Over: Welded steel bracket and wrought steel clamp with adjustable steel yoke and cast iron pipe roll.
- .11 Vertical Support: Steel riser clamp.
- .12 Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
- .13 Floor Support for Hot Pipe Sizes to 100 mm: Cast iron adjustable pipe saddle, locknut, nipple, floor flange, and concrete pier or steel support.
- .14 Floor Support for Hot Pipe Sizes 150 mm and Over: Adjustable cast iron pipe roll and stand, steel screws, and concrete pier or steel support.
- .15 Copper Pipe Support: Carbon steel ring, adjustable, copper plated.

2.7 BALL VALVES

- .1 Ball Valves 100 mm and Smaller: MSS SP-110, Class 150, 2760 kPa CWP, bronze, two-piece body, chrome plated brass ball, regular port, teflon seats and stuffing box ring, blow-out proof stem, lever handle with balancing stops, solder ends with union, lead free.
 - .1 Product: 858/859 Series, manufactured by KITZ.

2.8 SWING CHECK VALVES

- .1 Swing Check Valves Up To and Including 50 mm: MSS SP-80, Class 125, bronze body and cap, bronze swing disc with rubber seat, solder ends.
 - .1 Product: LFCV, manufactured by WATTS.
- .2 Swing Check Valves 50 mm and Larger: MSS SP-71, Class 125, iron body, bronze swing disc, renewable disc seal and seat, flanged ends.
 - .1 Product: 411, manufactured by WATTS.

2.9 WATER PRESSURE REDUCING VALVES

- .1 Water Pressure Reducing Valves Up to 50 mm: MSS SP-80, bronze body, stainless steel and thermoplastic internal parts, fabric reinforced diaphragm, strainer, threaded ends.
 - .1 Product: LF123LP, manufactured by WATTS.
- .2 Water Pressure Reducing Valves Over 50 mm: MSS SP-85, cast iron body, bronze fitted, elastomeric diaphragm and seat disc, flanged.
 - .1 Product: LFN223F, manufactured by WATTS.

2.10 RELIEF VALVES

- .1 Pressure Relief Valves: ANSI Z21.22/CSA 4.4, certified, bronze body, teflon seat, steel stem and springs, automatic, direct pressure actuated.
 - .1 Product: LF3L, manufactured by WATTS.
- .2 Temperature and Pressure Relief Valves: ANSI Z21.22/CSA 4.4 certified, bronze body, teflon seat, stainless steel stem and springs, automatic, direct pressure actuated, temperature relief maximum 98.9 degrees C, capacity ASME BPVC.IV certified and labelled.
 - .1 Product: LF100XL, manufactured by WATTS.

2.11 STRAINERS

- .1 Strainers 50 mm and Under: Class 150 threaded brass body for 1200 kPa CWP, Y pattern with 0.8 mm stainless steel perforated screen.
 - .1 Product: LF777, manufactured by WATTS.
- .2 Strainers 38 mm to 100 mm: Class 125, flanged iron body, Y pattern with 1.6 mm stainless steel perforated screen.
 - .1 Product: 77F-DI 125, manufactured by WATTS.
- .3 Strainers 125 mm and Larger: Class 125, flanged iron body, basket pattern with 3.2 mm stainless steel perforated screen.
 - .1 Product: 97FB-CI, manufactured by WATTS.

2.12 FIRE STOP SYSTEMS

- .1 General Purpose Fire Stopping Sealant: Water based, nonslumping, premixed sealant with intumescent properties, rated for 3 hours to ASTM E814.
- .2 General Purpose Vibration Resistant Fire Stopping Sealant: Silicone based, nonslumping, premixed sealant with intumescent properties, vibration and moisture resistant, rated for three (3) hours per ASTM E814.
- .3 DWV Plastic Pipe Systems Fire Stopping Sealant: Silicone based, premixed sealant with intumescent properties, vibration and moisture resistant, rated for three (3) hours per ASTM E814 with metal collars.

Part 3 Execution

3.1 EXAMINATION

- .1 Section : Verify existing conditions before starting work.
- .2 Verify that excavations are to required grade, dry, and not over-excavated.

3.2 PREPARATION

- .1 Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- .2 Remove scale and dirt, on inside and outside, before assembly.
- .3 Prepare piping connections to equipment with flanges or unions.

3.3 INSTALLATION

- .1 Install to manufacturer's written instructions.
- .2 Provide non-conducting dielectric connections wherever jointing dissimilar metals.
- .3 Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
- .4 Install piping to maintain headroom, conserve space, and not interfere with use of space.
- .5 Group piping whenever practical at common elevations.
- .6 Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings. Refer to Section 23 07 19.
- .7 Provide access where valves and fittings are not exposed. Coordinate size and location of access doors with Section 08 31 13.
- .8 Install vent piping penetrating roofed areas to maintain integrity of roof assembly.
- .9 Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.
- .10 Provide support for utility meters to requirements of utility companies.
- .11 Prepare exposed, unfinished pipe, fittings, supports, and accessories ready for finish painting. Refer to Section 09 91 00.
- .12 Install bell and spigot pipe with bell end upstream.
- .13 Install valves with stems upright or horizontal, not inverted.
- .14 Install water piping to ASME B31.9.
- .15 Sleeve pipes passing through partitions, walls and floors.
- .16 Inserts:
 - .1 Provide inserts for placement in concrete formwork.
 - .2 Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
 - .3 Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 100 mm.
 - .4 Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
 - .5 Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut flush with top of slab.
- .17 Pipe Hangers and Supports:
 - .1 Install to ASME B31.9.
 - .2 Support horizontal piping as scheduled.

- .3 Install hangers to provide minimum 15 mm space between finished covering and adjacent work.
- .4 Place hangers within 300 mm of each horizontal elbow.
- .5 Use hangers with 40 mm minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
- .6 Support vertical piping at every other floor. Support riser piping independently of connected horizontal piping.
- .7 Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
- .8 Provide copper plated hangers and supports for copper piping.
- .9 Prime coat exposed steel hangers and supports. Refer to Section 09 91 00. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
- .10 Provide hangers adjacent to motor driven equipment with vibration isolation; refer to Section 23 05 48.
- .11 Support cast iron drainage piping at every joint.

3.4 APPLICATION

- .1 Use grooved mechanical couplings and fasteners only in accessible locations.
- .2 Install unions downstream of valves and at equipment or apparatus connections.
- .3 Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.
- .4 Install ball valves for shut-off and to isolate equipment, part of systems, or vertical risers.
- .5 Install globe valves for throttling, bypass, or manual flow control services.
- .6 Provide flow controls in water recirculating systems where indicated.

3.5 ERECTION TOLERANCES

- .1 Section 01 73 00: Tolerances.
- .2 Establish invert elevations, slopes for drainage to 1% minimum. Maintain gradients.
- .3 Slope water piping minimum 0.25% and arrange to drain at low points.

END OF SECTION

Section 22 10 10 Plumbing Pumps

Part 1 General

1.1 SUMMARY

- .1 Section Includes: Materials and installation for plumbing pumps.

1.2 RELATED REQUIREMENTS

- .1 Section 22 10 00 - Plumbing Piping.

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-Installation Meeting: Convene pre-installation meeting one week prior to beginning work of this Section in accordance with Section 01 31 19 - Project Meetings.
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Coordination with other building subtrades.
 - .4 Review manufacturer's installation instructions and warranty requirements.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's product literature, specifications and data sheet for fixtures and equipment.
- .3 Shop Drawings: Submit shop drawings to indicate:
 - .1 Equipment, including connections, fittings, control assemblies and ancillaries. Identify whether factory or site assembled.
 - .2 Wiring and schematic diagrams.
 - .3 Dimensions and recommended installation.
 - .4 Pump performance and efficiency curves.

1.5 CLOSEOUT SUBMITTALS

- .1 Submit maintenance and engineering data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals, include:
 - .1 Manufacturers name, type, model year, capacity and serial number.
 - .2 Details of operation, servicing and maintenance.
 - .3 Recommended spare parts list with names and addresses.

Part 2 Products

2.1 FLEXIBLE COUPLED IN-LINE CENTRIFUGAL PUMP

- .1 Manufacturers:
 - .1 Xylem/Bell & Gossett; Product: e-60.
 - .2 Substitutions: Refer to Section 01 25 00.
- .2 Construction:
 - .1 Internally self-flushing, unitized mechanical seal.
 - .2 Bolted flange pipe connections.
 - .3 Motor, coupler, seal, and impeller repairable/replaceable without removing pump from piping.
 - .4 Volute: Cast iron ASTM A159.
 - .5 Face Plate: 304 stainless steel.
 - .6 Impeller: ASTM B584.
 - .7 Impeller Key: Carbon steel.
 - .8 Impeller Lock Washer: Stainless steel.
 - .9 Impeller Lock Nut: Stainless steel.
 - .10 Shaft: Steel.
 - .11 Shaft Sleeve: Copper alloy 110
 - .12 Volute Gasket: Cellu-fiber.
 - .13 Cover Plate: Cast iron ASTM A159.
 - .14 Companion Flanges: formed steel up to 1.5-in. pipe connections, cast iron for pipe connections larger than 1.5-in.
 - .15 Seal: EPR/carbon/SiC.
- .3 Motor:
 - .1 Permanently lubricated rotating bearings.
 - .2 ODP enclosure standard.
- .4 Ratings:
 - .1 Suitable for up to 107°C (225°F) operation at 1207-kPa (175-PSIG) working pressure.
- .5 Options:
 - .1 ECM motor. On-board dial for manual speed control. 0-10V DC signal input for automatic control.
 - .2 TEFC motor enclosure.
 - .3 Potable water construction (cast bronze ASTM B584 volute, CF8 stainless ASTM A351 cover plate, brass companion flanges).

.4 FKM/carbon/SiC seal.

.5 EPB/SiC/SiC seal.

2.2 DRY ROTOR CIRCULATOR PUMP

.1 Manufacturers:

.1 Xylem/Bell & Gossett; Product: PL series.

.2 Construction:

.1 Pump Body: Cast iron.

.2 Face Plate: Stainless steel.

.3 Impeller: 30% glass filled Noryl for pumps with 1/6-hp motors and smaller, glass filled PPS for pumps with motors larger than 1/6-hp.

.4 Shaft: Carbon steel with stainless steel sleeve for pumps with 1/6-hp motors and smaller, stainless steel for pumps with motors larger than 1/6-hp.

.5 Mechanical Seal: Carbon or silicon carbide.

.6 Elastomers: EPDM.

.7 Motor Bearings: Sealed precision steel ball bearing.

.3 Motor:

.1 Permanently lubricated rotating bearings.

.2 ODP enclosure.

.4 Ratings:

.1 Maximum Working Pressure: 1034-kPa (150-psig).

.2 Maximum Operating Temperature: 107°C (225°F).

.5 Options:

.1 Potable water construction (lead-free bronze pump body).

2.3 SUBMERSIBLE SUMP PUMP - LOW CAPACITY

.1 Manufacturers:

.1 Liberty Pumps; Product: 237.

.2 Substitutions: Refer to Section 01 25 00.

.2 Features:

.1 9.525-mm (3/8-in.) solids handling.

.3 Construction:

.1 Vortex-style high temperature engineered thermoplastic impeller permitting passage of solids without clogging.

.2 38-mm (1-1/2-in.) discharge.

- .3 Polypropylene and powder coated aluminum construction.
- .4 Stainless steel rotor shaft.
- .5 Non-corrosive stainless steel fasteners.
- .6 Anti-airlock hole allows trapped air to escape and the pump to prime and start pumping.
- .7 Removable base allowing suction down to 3.175-mm (1/8-in.).
- .4 Motor:
 - .1 Oil-filled, hermetically sealed motor with thermal overload protection.
 - .2 Permanently lubricated upper and lower bearings.
- .5 Electrical:
 - .1 3-m (10-ft) power cord length.
 - .2 Power cord replaceable without breaking seals to motor.
 - .3 Automatic vertical magnetic float switch.
- .6 Ratings:
 - .1 Maximum Fluid Temperature: 60°C (140°F) intermittent, 40°C (104°F) continuous.
- .7 Options:
 - .1 7.62-m (25-ft) power cord length.

2.4 SUBMERSIBLE SUMP PUMP - MEDIUM CAPACITY

- .1 Manufacturers:
 - .1 Xylem/Flygt; Product: N 3127.
 - .2 Substitutions: Refer to Section 01 25 00.
- .2 Features:
 - .1 Mechanically self-cleaning.
 - .2 Suitable for submersible and dry installations.
 - .3 Dry solids handling up to 8%.
 - .4 Impeller capable of lifting when large solid objects pass through to avoid clogging.
- .3 Construction:
 - .1 Impeller: Hard iron or stainless steel.
 - .2 Two sets of mechanical shaft seals that operate independently.
 - .3 100-mm (4-in) discharge.
- .4 Motor:
 - .1 Premium efficiency (IE3).

- .2 Stator trickle impregnated in resin (class H insulation) and windings rated at 180°C (355°F).
- .3 Capable of up to 30 starts per hour.
- .4 Thermal sensors embedded in stator windings to prevent overheating.
- .5 Bearings with minimum 50,000-hr service life.
- .5 Electrical:
 - .1 Water-resistant cable entry providing both sealing and strain relief functions.
- .6 Options:
 - .1 Grey cast iron impeller.
 - .2 Hard iron impeller.
 - .3 Chopper impeller ring for cutting long fibers or solids.
 - .4 Leakage sensors in stator and oil housing.
 - .5 Flush valve.
 - .6 Pump monitoring system to monitor pump conditions and operational status with data management capabilities.
 - .7 Variable speed pump controller for up to three alternating pumps. Handles pump cleaning, pipe cleaning, sump cleaning, soft starts and stops.

2.5 SEWAGE AND DEWATERING SUMP PUMP

- .1 Manufacturers:
 - .1 Liberty Pumps; Product: LSV200 Series.
 - .2 Substitutions: Refer to Section 01 25 00.
- .2 Features:
 - .1 75-mm (3-in) solids handling.
- .3 Construction:
 - .1 100-mm (4-in.) discharge.
 - .2 Cast iron construction with epoxy powder coating.
 - .3 Impeller: Class 30 cast iron, vortex-style.
 - .4 Hardware: stainless steel.
 - .5 Mechanical Shaft Seal: Silicon carbide/silicon carbide.
 - .6 O-ring: Buna-N.
 - .7 Motor Housing: Class 25 cast iron.
 - .8 Volute: Class 30 cast iron.
 - .9 Shaft: Stainless steel.

- .10 Horizontal discharge.
- .4 Motor:
 - .1 Thermal protector on 1-phase models.
 - .2 Oil-filled, class F insulation.
 - .3 Upper and lower ball bearings.
- .5 Electrical:
 - .1 10.668-m (35-ft) power cord.
- .6 Ratings:
 - .1 Maximum Fluid Temperature: 40°C (104°F) continuous.
- .7 Options:
 - .1 Vertical discharge.
 - .2 15.24-m (50-ft) power cord length.
 - .3 30.48-m (100-ft) power cord length.
 - .4 100-mm (4-in.) to 75-mm (3-in.) discharge conversion kit.

Part 3 Execution

3.1 INSTALLATION

- .1 Make piping and electrical connections to pump and motor assembly and controls as indicated.
- .2 Ensure pump and motor assembly do not support piping.
- .3 Align vertical pit mounted pump assembly after mounting and securing cover plate.
- .4 Place 150 mm sand under sump pit tank.

3.2 SITE QUALITY CONTROL

- .1 Site Tests/Inspection:
 - .1 Check power supply.
 - .2 Check starter protective devices.
- .2 Start-up, check for proper and safe operation.
- .3 Check settings and operation of hand-off-auto selector switch, operating, safety and limit controls, audible and visual alarms, over-temperature and other protective devices.
- .4 Adjust flow from water-cooled bearings.
- .5 Adjust impeller shaft stuffing boxes, packing glands.

3.3 START-UP

- .1 Refer to Section 01 91 13 - General Commissioning Requirements for commissioning requirements.
- .2 General: In accordance with Section 01 91 13 - General Commissioning Requirements: General Requirements, supplemented as specified herein.
 - .1 Procedures:
 - .1 Check power supply.
 - .2 Check starter O/L heater sizes.
 - .3 Start pumps, check impeller rotation.
 - .4 Check for safe and proper operation.
 - .5 Check settings, operation of operating, limit, safety controls, over-temperature, audible/visual alarms, other protective devices.
 - .6 Test operation of hands-on-auto switch.
 - .7 Test operation of alternator.
 - .8 Adjust leakage through water-cooled bearings.
 - .9 Adjust shaft stuffing boxes.
 - .10 Adjust leakage flow rate from pump shaft stuffing boxes to manufacturer's recommendations.
 - .11 Check base for free-floating, no obstructions under base.
 - .12 Run-in pumps for 12 continuous hours.
 - .13 Check installation, operation of mechanical seals, packing gland type seals. Adjust as necessary.
 - .14 Adjust alignment of piping and conduit to ensure full flexibility.
 - .15 Eliminate causes of cavitation, flashing, air entrainment.
 - .16 Measure pressure drop across strainer when clean and with flow rates as finally set.
 - .17 Replace seals if pump used to degrease system or if pump used for temporary heat.
 - .18 Verify lubricating oil levels.

3.4 PERFORMANCE VERIFICATION (PV) - SANITARY AND STORM WATER PUMPS

- .1 Application tolerances:
 - .1 Flow: plus 10%; minus 0%.
 - .2 Pressure: plus 10%; Minus 5%.
- .2 Timing:
 - .1 After installation.
- .3 PV Procedures:

- .1 Fill sump at rate slower than capacity of pump #1.
- .2 Record levels at which pump #1 starts and stops. Determine flow rate by observing time taken to down water level.
- .3 Fill sump at rate faster than capacity of pump #1 but slower than capacities of pumps #1 and #2 operating in parallel.
- .4 Record levels at which pumps start and stop - water level rising and water level falling.
- .5 Verify operation of alternator.
- .6 Adjust water level controls as necessary.
- .7 Fill sump at rate faster than capacities of pumps #1 and #2 operating in parallel.
- .8 Record levels at pump starts and stops - water level rising and falling.
- .9 Check operation of alternator.
- .10 Adjust level controls as necessary.
- .11 Check level at which high water level alarm starts and stops. Adjust as necessary.
- .4 Check removability of pumps for servicing without interfering with installation or operation of other equipment.
- .5 Verify non-clog capability and maximum size of solids, using procedures recommended by manufacturer.

3.5 REPORTS

- .1 In accordance with Section 01 91 13 - General Commissioning Requirements: reports, supplemented as specified. Include:
 - .1 PV results on approved PV Report Forms.
 - .2 Product Information report forms.
 - .3 Pump performance curves (family of curves) with final point of actual performance.

3.6 TRAINING

- .1 In accordance with Section 01 91 13 - General Commissioning Requirements: Training of O&M personnel, supplemented as specified.

END OF SECTION

Section 22 11 19

Domestic Water Piping Specialties

Part 1 General

1.1 SECTION INCLUDES

- .1 Backflow preventers.

1.2 RELATED REQUIREMENTS

- .1 Section 22 05 15 - Plumbing Specialties and Accessories.
- .2 Section 22 10 00 - Plumbing Piping.
- .3 Section 22 47 00 - Plumbing Equipment.

1.3 REFERENCE STANDARDS

- .1 ASSE 1011 Performance requirements for hose connection vacuum breakers
- .2 ASSE 1012 Backflow preventers with an intermediate atmospheric vent
- .3 ASSE 1013 Performance requirements for backflow preventer with intermediate atmospheric vent
- .4 ASSE 1019 Performance requirements for wall hydrant with backflow protection and freeze resistance
- .5 ASTM C478/C478M Standard specification for circular precast reinforced concrete manhole sections
- .6 AWWA C510 Double check-valve backflow prevention assembly
- .7 AWWA C511 Reduced-pressure principle backflow prevention assembly
- .8 ISO 9000 Quality Management.
- .9 ISO 14000 Environmental Management.
- .10 PDI G101 Testing and rating procedure for hydro mechanical grease interceptors with appendix of installation and maintenance
- .11 PDI WH201 Water hammer arresters

1.4 ACTION SUBMITTALS

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide component sizes, rough-in requirements, service sizes, and finishes.

1.5 INFORMATIONAL SUBMITTALS

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Manufacturer's special installation requirements including assembly and support requirements.

1.6 CLOSEOUT SUBMITTALS

- .1 Section 01 78 00: Submission procedures.
- .2 Maintenance Data: Include installation instructions, spare parts lists, exploded assembly views.
- .3 Record Documentation: Record actual locations of backflow preventers.

1.7 QUALITY ASSURANCE

- .1 Products of This Section: Manufactured to ISO 9000 certification requirements.
- .2 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience.

1.8 DELIVERY, STORAGE, AND HANDLING

- .1 Section 01 61 00: Transport, handle, store, and protect products.
- .2 Accept specialties on site in original factory packaging. Inspect for damage.

Part 2 Products

2.1 BACKFLOW PREVENTERS

- .1 Reduced Pressure Backflow Preventers: ASSE 1013, bronze body with bronze internal parts and stainless steel springs, two (2) independently operating, spring loaded check valves and diaphragm type differential pressure relief valve located between check valves; third check valve that opens under back pressure in case of diaphragm failure.
 - .1 Non-threaded vent outlet.
 - .2 Assembled with two (2) gate valves, strainer, and four test cocks.
 - .3 50mm and smaller: Series 009, manufactured by WATTS.
 - .4 Above 50mm: Series LF909, manufactured by WATTS.
 - .5 Substitutions: Refer to Section 01 25 00.

Part 3 Execution

3.1 INSTALLATION

- .1 Install to manufacturer's written instructions.
- .2 Install approved potable water protection devices on plumbing lines where contamination of domestic water may occur; on boiler feed water lines, janitor rooms, fire sprinkler systems, premise isolation, irrigation systems, flush valves, interior and exterior hose bibs.
- .3 Pipe relief from backflow preventer to nearest drain.

END OF SECTION

Section 22 47 00 Plumbing Equipment

Part 1 General

1.1 SECTION INCLUDES

- .1 Water heaters.
- .2 Expansion tanks.

1.2 RELATED REQUIREMENTS

- .1 Section 22 10 00 - Plumbing Piping.
- .2 Section 22 11 19 - Domestic Water Piping Specialties.
- .3 Section 26 05 83 - Equipment Wiring: Electrical characteristics and wiring connections.

1.3 REFERENCE STANDARDS

- .1 ASHRAE 62.1 Ventilation for acceptable indoor air quality
- .2 ASME Boiler and Pressure Vessels Code, Section VIII, Division 1 - Rules for Construction of Pressure Vessels.
- .3 CGA P-3 Specifications, properties, and recommendations for packaging, transportation, storage and use of ammonium nitrate. (Withdrawn)
- .4 CSA (Canadian Standards Association).
- .5 CSA B51 Boiler, pressure vessel, and pressure piping code
- .6 ISO 9000 Quality Management.
- .7 ISO 14000 Environmental Management.
- .8 NEMA EN 10250 Enclosures for electrical equipment (1000 volts maximum)
- .9 NFPA 30 Flammable and Combustible Liquids Code.
- .10 NFPA 31 Standard for the Installation of Oil-Burning Equipment.
- .11 NFPA 54/ANSI Z223.1 National Fuel Gas Code.
- .12 NFPA 58 Liquefied Petroleum Gas Code.
- .13 UL (Underwriters Laboratories Inc.).
- .14 UL 174 Standard for Household Electric Storage Tank Water Heaters.
- .15 UL 1453 Standard for Electric Booster and Commercial Storage Tank Water Heaters.

1.4 ACTION SUBMITTALS

- .1 Section 01 33 00: Submission procedures.

- .2 Product Data:
 - .1 Provide dimension drawings of equipment indicating components and connections to other equipment and piping.
 - .2 Provide manufacturer literature indicating performance data of equipment.
 - .3 Provide electrical characteristics and connection requirements.

1.5 CLOSEOUT SUBMITTALS

- .1 Section 01 78 00: Submission procedures.
- .2 Record Documentation: Record actual locations of components.
- .3 Operation and Maintenance Data: Include operation, maintenance, and inspection data, replacement part numbers and availability, and service depot location and telephone number.
- .4 Warranty Documentation: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.6 QUALITY ASSURANCE

- .1 Products of This Section: Manufactured to ISO 9000 certification requirements.
- .2 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience.
- .3 Ensure products and installation of specified products are to recommendations and requirements of the following organizations:
 - .1 American Gas Association (AGA).
 - .2 National Sanitation Foundation (NSF).
 - .3 American Society of Mechanical Engineers (ASME).
 - .4 National Board of Boiler and Pressure Vessel Inspectors (NBBPVI).
 - .5 National Electrical Manufacturers' Association (NEMA).
 - .6 Underwriters Laboratories (UL).

1.7 DELIVERY, STORAGE, AND HANDLING

- .1 Section 01 61 00: Transport, handle, store, and protect products.
- .2 Provide temporary inlet and outlet caps. Maintain caps in place until installation.

1.8 WARRANTY

- .1 Section 01 78 00: Warranties.

Part 2 Products

2.1 DESCRIPTION

- .1 Regulatory Requirements:

- .1 Conform to AGA, NSF, NBBPVI, NFPA 54/ANSI Z223.1, UL 1453 requirements for water heaters.
- .2 Conform to ASME BPVC.VIII.1 for manufacture of pressure vessels for heat exchangers.
- .3 Conform to ASME BPVC.VIII.1 for tanks.
- .4 Products Requiring Electrical Connection: Listed and classified by CSA as suitable for the purpose specified and indicated.

2.2 COMMERCIAL GAS FIRED WATER HEATER

- .1 Manufacturers:
 - .1 PVI; Product: Centurion.
 - .2 Substitutions: Refer to Section 01 25 00.
- .2 Features:
 - .1 Condensing.
 - .2 Modulating.
 - .3 Suitable for sidewall, vertical, and ducted combustion.
 - .4 Footprint capable of fitting through standard 914-mm (36-in.) wide single door.
 - .5 Natural gas or propane fueled.
 - .6 Dedicated hot water re-circulation connection.
 - .7 NOx emissions of less than 20-ppm.
 - .8 Power burner.
 - .9 Temperature/pressure relief valve with a setting of 1034-kPa (150-psig) and 99°C (210°F)
- .3 Construction:
 - .1 Heat Exchanger: Stainless steel firetube with corrugated tubes which is thermal shockproof and inherently immune to aqueous corrosion and chloride stress corrosion cracking.
 - .2 Pressure vessel, combustion chamber, and fire tubes constructed from phase-balanced austenitic and ferritic duplex steel containing minimum 21% chromium.
 - .3 Non-ferrous or stainless steel pressure vessel connections.
 - .4 Burner: Stainless steel body covered by metal-fiber mesh with spark ignition and flame rectification.
- .4 Controls:
 - .1 Dynamic feed-forward sensing.
 - .2 Sequencing logic for up to 16 units.

- .3 Hot water set point adjustable from 10°C (50°F) to 88°C (190°F), with control to +/- 2.2°C (4°F).
- .4 O2 trim system that self-adjusts and maintains air/fuel ratios at optimum levels. Oxygen levels can be directly displayed on unit or remotely monitored.
- .5 Integrated BACnet IP, BACnet MS/TP, Modbus IP and Modbus RTU communication.
- .6 4.3-in touchscreen.
- .7 Low-water cutoff.
- .8 Adjustable supply water temperature high limit and low limit.
- .9 Freeze protection.
- .10 Electric, single-seated combination safety shutoff valve/regulator with proof of closure switch in gas train. Dual over-temperature protection with manual reset.
- .5 Electrical:
 - .1 Single-point field power connection with factory-installed and factory-wired switches, motor controllers, transformers and other electrical devices.
- .6 Ratings:
 - .1 Working Pressure: 1103-kPa (160-psig).
 - .2 Ambient Temperature: -18°C (0°F) to 54°C (130°F).
- .7 Certifications:
 - .1 ASME section IV (HLW) stamped.
 - .2 UL/cUL listed.
 - .3 FM compliant.
 - .4 NSF-61.
- .8 Options:
 - .1 Natural gas trim kit.
 - .2 Propane trim kit.
 - .3 Sequencing isolation valve kits.
 - .4 Zero-side clearance installation kit.
 - .5 Condensate neutralizer tank.
 - .6 Johnson N2 communications gateway.
 - .7 LonWorks communications gateway.
 - .8 Gateway 120VAC/24VAC transformer.
 - .9 Exhaust muffler.

2.3 COMMERCIAL HEAT PUMP WATER HEATER

- .1 Manufacturers:
 - .1 A.O. Smith; Product: CAHP-120.
 - .2 Substitutions: Refer to Section 01 25 00.
- .2 Features:
 - .1 Capable of operating in heat pump heating, electric heating, or hybrid heating modes.
 - .2 Pre-charged R-134a refrigeration system including compressor, electronic expansion valve, coil, accumulator, 4-way valve, and charging ports.
 - .3 Temperature and pressure relief valve.
 - .4 Drain valve.
- .3 Construction:
 - .1 Alkaline borosilicate composition glass-coating fused to steel tank.
 - .2 Incoloy sheathing on heating elements.
 - .3 Protective anode in tank.
 - .4 Microchannel heat exchanger.
- .4 Controls:
 - .1 Touch screen LCD display for control of operating mode, setpoints, performance information, alerts, troubleshooting, and detail.
- .5 Electrical:
 - .1 Internal power circuit fusing.
- .6 Ratings:
 - .1 Working Pressure: 1103-kPa (160-psig).
 - .2 Operating Ambient Temperature Range: -7°C (20°F) to 43°C (110°F).
- .7 Certifications:
 - .1 NSF-5.
- .8 Options:
 - .1 Air filter kit.

2.4 EXPANSION TANK, BLADDER TYPE, POTABLE WATER

- .1 Manufacturers:
 - .1 Watts; Product: DETA Series.
 - .2 Substitutions: Refer to Section 01 25 00.
- .2 Features:
 - .1 Bladder type.

- .2 Factory pre-charged to 275.8-kPa (40-psi), field adjustable..
- .3 Bladder integrity monitor.
- .3 Construction:
 - .1 ASME Section VIII construction.
 - .2 Fixed butyl bladder (FDA approved).
 - .3 Shell: Carbon steel.
 - .4 System Connection: Stainless steel.
 - .5 Prime painted exterior.
- .4 Ratings:
 - .1 Maximum Design Pressure: 10-bar (150-psi)
 - .2 Maximum Design Temperature: 115°C (240°F)
- .5 Certifications:
 - .1 NSF-61.

Part 3 Execution

3.1 INSTALLATION

- .1 Install water heaters to manufacturer's instructions and to AGA, NSF, NFPA 54/ANSI Z223.1, ULC requirements.
- .2 Coordinate with plumbing piping and related fuel piping, gas venting, and electrical work to achieve operating system.

END OF SECTION

Section 22 51 00 Swimming Pool Plumbing Systems

Part 1 General

1.1 SECTION INCLUDES

- .1 Pipe and Pipe Fittings, Valves, Strainers.
- .2 Circulators and Pumps.

1.2 RELATED REQUIREMENTS

- .1 Section 26 05 83 - Equipment Wiring: Electrical characteristics and wiring connections.

1.3 REFERENCE STANDARDS

- .1 AGA (American Gas Association).
- .2 ASME Boiler and Pressure Vessels Code, Section VIII, Division 1 Rules for Construction of Pressure Vessels.
- .3 ASME B16.22 Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
- .4 ASTM A36/A36M Standard specification for carbon structural steel
- .5 ASTM B32 Standard specification for solder metal
- .6 ASTM B88 Standard specification for seamless copper water tube
- .7 ASTM B88M Standard specification for seamless copper water tube (metric)
- .8 ASTM D1785 Standard specification for poly(vinyl chloride) (PVC) plastic pipe, Schedules 40, 80, and 120
- .9 ASTM D2467 Standard specification for poly(vinyl chloride) (PVC) plastic pipe fittings, Schedule 80
- .10 ASTM D2855 Standard practice for the two-step (primer and solvent cement) method of joining poly (vinyl chloride) (PVC) or chlorinated poly (vinyl chloride) (CPVC) pipe and piping components with tapered sockets
- .11 AWS A5.8M/A5.8 Specification for filler metals for brazing and braze welding
- .12 CSA (Canadian Standards Association).
- .13 CSA Z21.56/CSA 4.7 Gas-fired pool heaters
- .14 ISO 9000 Quality Management.
- .15 ISO 14000 Environmental Management.
- .16 NFPA 54/ANSI Z223.1 National Fuel Gas Code.
- .17 NFPA 70 National Electrical Code (NEC).

- .18 NPSI (National Pool and Spa Institute) - Minimum Standards for Public Swimming Pools.
- .19 NSF Canadian/international standard 50 Equipment and chemicals for swimming pools, spas, hot tubs, and other recreational water facilities
- .20 UL (Underwriters Laboratories Inc.).
- .21 UL 174 Standard for Household Electric Storage Tank Water Heaters.
- .22 UL 1081 Swimming Pool Pumps, Filters, and Chlorinators.
- .23 UL 1261 Standard for Electric Water Heaters for Pools and Tubs.
- .24 UL 1453 Standard for Electric Booster and Commercial Storage Tank Water Heaters.

1.4 ACTION SUBMITTALS

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data:
 - .1 Include data on pipe materials, pipe fittings, valves and accessories.
 - .2 Include component sizes, rough-in requirements, service sizes, and finishes.
 - .3 Include product description, model, dimensions, component sizes, rough-in requirements, service sizes, and finishes.
 - .4 Indicate pump type, capacity, power requirements, and affected adjacent construction. Submit certified pump curves showing pump performance characteristics with pump and system operating point plotted. Include NPSH curve when applicable.
 - .5 Provide electrical characteristics and connection requirements.
- .3 Shop Drawings: Indicate detailed assembly of components of each system or sub-system.

1.5 CLOSEOUT SUBMITTALS

- .1 Section 01 78 00: Submission procedures.
- .2 Operation and Maintenance Data:
 - .1 Include installation instructions, lubrication instructions, and assembly views.
 - .2 Include maintenance and inspection data, replacement part numbers and availability, and service depot location and telephone number.
- .3 Warranty Documentation: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- .4 Record Documentation: Record actual locations of controlling devices and underfloor piping.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- .1 Section 01 78 23: Maintenance and extra material requirements.

1.7 QUALITY ASSURANCE

- .1 Products of This Section: Manufactured to ISO 9000 certification requirements.
- .2 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience.
- .3 Installer Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience and approved by the manufacturer.

1.8 DELIVERY, STORAGE, AND HANDLING

- .1 Section 01 61 00: Transport, handle, store, and protect products.
- .2 Accept equipment on site in shipping containers with labelling in place. Inspect for damage.
- .3 Protect equipment from damage and elements by maintaining shipping packaging in place until installation. Maintain temporary inlet and outlet caps in place until installation.

1.9 WARRANTY

- .1 Section 01 78 00: Warranties.
- .2 Provide a five (5) year warranty to include coverage for failure to meet specified requirements, for circulating pumps.

Part 2 Products

2.1 DESCRIPTION

- .1 Regulatory Requirements:
 - .1 Conform to applicable code for installation of swimming pool and whirlpool systems.
 - .2 Perform work to local health department regulations.
 - .3 Provide certificate of compliance from authority having jurisdiction indicating approval of installation.
 - .4 Products Requiring Electrical Connection: Listed and classified by CSA as suitable for the purpose specified and indicated.

2.2 WATER PIPING AND PIPE FITTINGS

- .1 PVC Pipe: ASTM D1785, Schedule 80.
 - .1 Fittings: ASTM D2467, PVC.
 - .2 Joints: ASTM D2855, solvent weld.
 - .3 Manufacturers:

- .1 IPEX; Product: Xirtec PVC Schedule 80.
 - .2 Substitutions: Refer to Section 01 25 00.
- .2 Unions for Pipe Sizes 50 mm and Under: PVC for plastic piping; bronze unions for copper pipe, soldered joints.
- .3 Flanges for Pipe Sizes over 50 mm: PVC for plastic piping; bronze for copper piping.
- .4 Ball Valves: PVC plastic body and ball, double lever handle, double union with socket or threaded ends, EPDM seals, teflon seats.
 - .1 Manufacturers:
 - .1 Hayward; Product: TBH Series.
- .5 Butterfly Valves: PVC plastic body and disc, EPDM seals, wafer style, 19 lockable position lever handle.
 - .1 Manufacturers:
 - .1 Hayward; Product: BYCN/BYCS Series.
- .6 Check Valves: Wafer type, PVC plastic body, EPDM seals.
 - .1 Manufacturers:
 - .1 Hayward; Product: WCV Series.

2.3 POOL FILTER PUMPS

- .1 Manufacturers:
 - .1 Bell & Gossett; Product: e-1531 Series.
 - .2 Substitutions: Refer to Section 01 25 00.
- .2 Features:
 - .1 Close coupled, foot mounted, single stage, end suction, vertical split case design.
 - .2 Internally self-flushing mechanical seals.
 - .3 Pump internals capable of being serviced without disconnecting pump pipe connections.
- .3 Construction:
 - .1 Stainless steel fitted.
 - .2 Shaft: Carbon steel.
 - .3 Volute: Cast iron ASTM A48 class 30B. Volute includes gauge ports at nozzles, and vent and drain ports.
 - .4 Impeller: ASTM A743 grade CF8 - 304 stainless steel. Hydraulically and dynamically balanced.
 - .5 Shaft Sleeve: ASTM 312 grade TP304 - 304 stainless steel.
 - .6 Impeller Key: 304 stainless steel.

- .7 Impeller Washer: Steel.
- .8 Impeller Lock Washer: 304 stainless steel.
- .9 Impeller Cap Screw: 304 stainless steel.
- .10 Volute Gasket: Cellulose fiber.
- .11 Mechanical Seal Assembly: Buna elastomer, carbon rotating face, ceramic stationary face, stainless steel/brass hardware.
- .4 Motor:
 - .1 Heavy-duty grease lubricated ball bearings.
- .5 Ratings:
 - .1 Maximum Working Pressure: 12-bar (175-psi).
 - .2 Maximum Operating Temperature: 107°C (225°F).
- .6 Options:
 - .1 Stainless steel volute wear ring.
 - .2 External flush line.
 - .3 Certified performance tests (per HI standard 14.6).
 - .4 Stuffing box configuration.
 - .5 Epoxy coated internal cast iron components.
 - .6 Special impeller balancing (ISO 1940 G2.5 or G1.0).

Part 3 Execution

3.1 INSTALLATION

- .1 Install equipment to manufacturer's written instructions.
- .2 Install Work to City of Mississauga standards.
- .3 Install piping to conserve building space, not interfere with use of space and other work. Route piping in orderly manner, and maintain gradient. Group whenever practical at common elevations.
- .4 Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. Provide access to valves and fittings.
- .5 Pipe relief valve outlet and backwash to nearest floor drain.
- .6 Install unions downstream of valves and at equipment or apparatus connections.
- .7 Pumps:
 - .1 Provide air cock and drain connection on horizontal pump casings.
 - .2 Provide line sized valve and strainer on suction and line sized soft seated check valve and valve on discharge.
 - .3 Decrease from line size, with long radius reducing elbows or reducers.

- .4 Support piping adjacent to pump such that no weight is carried on pump casings.
- .5 Provide supports under elbows on pump suction and discharge line sizes 100 mm and over.

END OF SECTION

Section 23 05 00 Common Work Results for HVAC

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 07 62 00 - Sheet Metal Flashing and Trim
- .2 Section 07 84 00 - Firestopping
- .3 Section 09 01 90.63 - Interior Repainting
- .4 Section 09 91 23 - Interior Painting
- .5 Section 26 05 00 - Common Work Results for Electrical

1.2 REFERENCE STANDARDS

- .1 American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) :
 - .1 ANSI/ASHRAE 62.2-2022, Ventilation and Acceptable Indoor Air Quality in Residential Buildings
- .2 CSA Group (CSA):
 - .1 CSA F280-12, Determining the required capacity of residential space heating and cooling appliances
 - .2 CAN/CSA-F326-M91, Residential Mechanical Ventilation Systems
- .3 Mechanical Contractors Association of Canada (MCAC):
 - .1 Shop Drawing Submittal Title Sheet

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination:
 - .1 Coordinate with Section 07 62 00 - Sheet Metal Flashing and Trim for installation of flashing at HVAC systems penetrating building envelope.
 - .2 Coordinate with Section 07 84 00 - Firestopping for through penetration firestopping or smoke seal systems.
 - .3 Coordinate with Section 26 05 00 - Common Work Results for Electrical for electrical connections for mechanical equipment.
- .2 Pre-installation meetings: Conduct a site meeting in accordance with Section 01 31 19 - Project Meetings and attended by the Consultant and appropriate Subcontractors to:
 - .1 Verify project requirements.
 - .2 Review delivery, storage, and handling requirements.
 - .3 Review installation and substrate conditions.

- .4 Coordinate with other Subcontractors.
- .5 Review manufacturer's instructions and warranty requirements.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Submit the following with product data and shop drawings:
 - .1 detailed drawings of bases, supports, and anchor bolts;
 - .2 acoustical sound power data, where applicable;
 - .3 points of operation on performance curves;
 - .4 manufacturer's certification of current model production; and
 - .5 certification of compliance to applicable codes.

1.5 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and maintenance data:
 - .1 Include, in the operation and maintenance manual, manufacturer's operating and maintenance instructions and recommended cleaning materials and methods.
 - .2 Operation data to include:
 - .1 control schematics for systems including environmental controls;
 - .2 descriptions of systems and their controls;
 - .3 descriptions of operation of systems at various loads, together with reset schedules and seasonal variances;
 - .4 operation instruction for systems and components; and
 - .5 description of actions to be taken in event of equipment failure.
 - .3 Maintenance data to include:
 - .1 Schedules of tasks, frequency, tools required and task time.
 - .4 Performance data to include:
 - .1 Equipment manufacturer's performance datasheets with point of operation as left after commissioning is complete.
 - .2 Equipment performance verification test results.
 - .5 Review:
 - .1 Submit draft operation and maintenance manual for review. Submission of individual data will not be accepted unless directed by the Consultant.
 - .2 Make changes as required and resubmit as directed by the Consultant.

- .6 Additional data:
 - .1 Prepare and insert into operation and maintenance manual additional data when need for it becomes apparent during specified demonstrations and instructions.
- .3 Record documentation:
 - .1 Site records:
 - .1 The Consultant will provide one set of Mechanical Drawings. Provide sets of white prints as required for each phase of work.
 - .2 Transfer information weekly to as-built drawings, revising to show work as actually installed.
 - .2 As-built drawings:
 - .1 Finalize production of as-built drawings before start of testing, adjusting, and balancing for HVAC.
 - .2 Identify each drawing in lower right-hand corner in letters at least 13 mm high as follows: "AS BUILT DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW MECHANICAL SYSTEMS AS INSTALLED" (Signature of Contractor) (Date).
 - .3 Submit to the Consultant for review and make corrections as directed.
 - .4 Perform testing, adjusting, and balancing for HVAC using as-built drawings.
 - .5 Submit copies of as-built drawings for inclusion in final TAB report.

1.6 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Installers and maintenance personnel: Trained and authorized by respective equipment manufacturers.

1.7 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, store, and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

Part 2 Products

2.1 PERFORMANCE/DESIGN CRITERIA

- .1 Ensure all connected HVAC system components, including controls, are fully compatible and integrable.
- .2 Design and install system with consideration to access to main components for repairs, replacements, and alterations throughout the service life of the building.
- .3 Ensure plumbing penetrations for the purpose of running HVAC ductwork and piping do not compromise structural integrity.
- .4 Provide CSA or ULC certified heating and cooling appliances.

Part 3 Execution

3.1 RESTORATION

- .1 Repainting:
 - .1 Prime and touch-up marred finished paintwork to match original.
 - .2 Perform painting in accordance with Section 09 01 90.63 - Interior Repainting.
 - .3 Restore to as-new condition, finishes which have been damaged.

3.2 SYSTEM STARTUP

- .1 Perform in accordance with:
 - .1 Section 01 91 13 - General Commissioning Requirements.

3.3 CLEANING

- .1 Clean in accordance with Section 01 74 00 - Cleaning and:
 - .1 Clean interiors and exteriors of all systems.
- .2 Waste management:
 - .1 Manage waste in accordance with Section 01 74 19 - Waste Management and Disposal.

3.4 CLOSEOUT ACTIVITIES

- .1 Provide demonstration and training, where identified in the technical sections, in accordance with Section 01 79 00 - Demonstration and Testing.

3.5 PROTECTION

- .1 Protect equipment and system openings from dirt, dust, and other foreign materials with materials appropriate to each system.

END OF SECTION

Section 23 05 05

Selective Demolition for Heating, Ventilating, and Air Conditioning (HVAC)

Part 1 General

1.1 SUMMARY

- .1 Section Includes:
 - .1 Selective demolition and removal of:
 - .1 heating, ventilation, and air conditioning systems; and
 - .2 controls and automation components.

1.2 RELATED REQUIREMENTS

- .1 Section 02 41 19 – Selective Demolition
- .2 Section 02 42 00 - Removal and Salvage of Construction Materials
- .3 Section 02 50 00 – Site Remediation
- .4 Section 02 81 00 – Transportation and Disposal of Hazardous Materials
- .5 Section 07 84 00 – Firestopping
- .6 Section 23 11 23 - Facility Natural Gas Piping.

1.3 DEFINITIONS

- .1 Demolish: Detach items from existing construction and dispose of off site.
- .2 Remove: Deconstruct, or disassemble, and detach items from existing construction.
- .3 Hazardous Materials: Products, mixtures, materials, or substances classified as physical hazards or health hazards in accordance with Schedule 2 of the Hazardous Products Act.

1.4 REFERENCE STANDARDS

- .1 CSA Group (CSA):
 - .1 CSA Z783:12, Deconstruction of Buildings and Their Related Parts
- .2 Department of Justice Canada:
 - .1 Hazardous Products Act, 1985
- .3 Environment and Climate Change Canada (ECCC):
 - .1 Environmental Code of Practice for Elimination of Fluorocarbon Emissions from Refrigeration and Air Conditioning Systems 2015

1.5 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination:
 - .1 Coordinate work of this Section with:
 - .1 Section 02 41 19 – Selective Demolition
 - .2 Section 02 42 00 - Removal and Salvage of Construction Materials

1.6 QUALITY ASSURANCE

- .1 Licensed Professional Qualifications: In accordance with Section 01 43 00 – Quality Assurance.

1.7 SITE CONDITIONS

- .1 Existing Conditions: Condition of materials identified as being salvaged or demolished are based on their observed condition.
- .2 Hazardous materials are not expected to be encountered in the Work.
- .3 Review the designated substance report and hazardous materials assessment in accordance with Section 00 31 00 – Available Project Information.
- .4 The Owner will remove Hazardous Materials before the start of the Work.
 - .1 Stop working immediately and take preventative measures if Hazardous Materials are encountered. Notify the Consultant immediately.
 - .2 Proceed with Work after receipt of written instructions from the Consultant.
- .5 Undertake work, protect workers and building occupants, and contain and dispose of hazardous materials in accordance with Section 02 81 00 - Transportation and Disposal of Hazardous Materials.

Part 2 Products

2.1 MATERIAL OWNERSHIP

- .1 Coordinate material ownership with the Owner.
 - .1 The Owner will retain ownership of:
 - .1 items to remain;
 - .2 items to be re-used;
 - .3 items to be re-installed;
 - .4 items to be removed and turned over to the Owner;
 - .5 other items of interest or value to the Owner that may be encountered during demolition.
 - .2 Take possession of demolished materials and remove from site.

2.2 REPAIR MATERIALS

- .1 Use repair materials identical to existing materials.

- .1 If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces as closely as possible.
- .2 Use materials whose installed performance equals or surpasses that of existing materials.
- .2 HVAC Repair Materials: Use new materials required for completion or repair matching materials damaged during performance of work of this Section. New materials are required to meet assembly or system characteristics as existing systems indicated to remain and carry CSA approval labels required by the AHJ.
- .3 Firestopping Repair Materials: Use fire stopping materials compatible with existing firestopping systems in accordance with Section 07 84 00 – Firestopping. Where removal or demolition work affects rated assemblies, restore to match existing fire rated performance.

Part 3 Execution

3.1 EXAMINATION

- .1 Review existing conditions and coordinate with indicated requirements to determine extent of demolition required.
- .2 Review record documents of existing facility available from the Consultant, and Owner.
- .3 The Owner or Consultant does not guarantee record documents are accurate, complete, or appropriate.
- .4 Inventory and record the condition of items being removed and turned over to the Owner. Promptly submit a written report to the Consultant and Owner.
- .5 When unforeseen structural, mechanical, electrical, or other issues are encountered that interfere with demolition or removal, investigate and measure the nature and extent of the interference. Promptly submit a written report to the Consultant.
- .6 Verify Hazardous Materials have been abated or remediated before proceeding with work of this Section.

3.2 PREPARATION

- .1 Protection of In-Place Conditions:
 - .1 Minimize noise, dust, vibration, and inconvenience to occupants in accordance with Section 01 14 00 – Work Restrictions. Provide temporary negative air pressure in demolition areas relative to adjacent occupied areas.
 - .2 Protect building systems, utilities, equipment, landscaping, and other items to remain.
 - .3 Provide temporary dust screens, covers, railings, supports, and other protection in accordance with Section 01 56 00 – Temporary Barriers and Enclosures.

- .4 Protect interior items exposed to the weather in accordance with Section 01 56 00 – Temporary Barriers and Enclosures.
- .5 Maintain access to egress, walkways, corridors, exits, and other adjacent occupied or partially-occupied facilities, unless approved, in writing, by the AHJ.
- .1 Submit copy of written approval from the AHJ.

3.3 DEMOLITION AND REMOVAL REQUIREMENTS

- .1 Demolish or remove select HVAC items in accordance with CSA Z783.
- .2 Disconnect and cap gas supply and electrical services in accordance with requirements of the AHJ.
- .3 Disconnect and remove electrical items from existing construction including removal of conduit, junction boxes, cabling and wiring from electrical component to panel. Do not damage adjacent assemblies designated to remain.
- .4 Do not disrupt active or energized utilities without approval of the Consultant.
- .5 Use methods to minimize dust, such as wetting dust-producing materials.
- .6 Leave Work in safe and stable condition at end of each Working Day.
- .7 Dispose of demolished items off site. Comply with hauling and disposal regulations of AHJ.

3.4 DEMOLITION

- .1 Demolish items as indicated on Drawings and required to facilitate new construction.

3.5 REMOVE AND REINSTALL

- .1 Remove items as indicated on Drawings, in accordance with Section 02 42 00 - Removal and Salvage of Construction Materials.
- .2 Examine removed items. Confirm Consultant 's acceptance for reinstallation if removed items appear in poor condition.
- .3 Temporarily store, protect, and prepare removed items for re-use.
- .4 Reinstall removed items as indicated on the Drawings.

3.6 REMOVE AND SALVAGE

- .1 Remove items as indicated on Drawings in accordance with Section 02 42 00 - Removal and Salvage of Construction Materials.
- .2 Store and protect removed items where acceptable to the Owner, and deliver to Owner.

3.7 REPAIRS AND RESTORATION

- .1 Promptly repair damage to adjacent construction caused by work of this Section. Patch existing surfaces to make suitable for new materials.

- .2 Restore exposed finishes on patched surfaces. Extend restoration to adjoining construction to eliminate evidence of patching and refinishing.

3.8 CLEANING

- .1 Waste Management:
 - .1 Manage waste in accordance with Section 01 74 19 – Waste Management and Disposal and:
 - .1 Hazardous Materials Disposal: In accordance with Section 02 81 00 - Transportation and Disposal of Hazardous Materials.
 - .2 Refrigerant Disposal: Dispose of refrigerants at an approved facility in accordance with the ECCC Environmental Code of Practice for the Elimination of Fluorocarbon Emissions from Refrigeration and Air Conditioning Systems.

END OF SECTION

Section 23 05 16

Expansion Fittings and Loops for Piping

Part 1 General

1.1 SECTION INCLUDES

- .1 Flexible pipe connectors.
- .2 Pipe loops, offsets, and swing joints.

1.2 RELATED REQUIREMENTS

- .1 Section 22 10 00 - Plumbing Piping.
- .2 Section 23 21 00 - Hydronic Piping.

Part 2 Products

2.1 PERFORMANCE / DESIGN CRITERIA

- .1 Provide structural work and equipment required to control expansion and contraction of piping. Verify that anchors, guides, and expansion joints provided, adequately protect system.
- .2 Expansion Calculations:
 - .1 Installation Temperature: 10 degrees C.
 - .2 Hot Water Heating: 99 degrees C.
 - .3 Domestic Hot Water: 60 degrees C.
 - .4 Safety Factor: 30%.

2.2 FLEXIBLE PIPE CONNECTORS

- .1 Steel Piping:
 - .1 Inner Hose: Carbon Steel.
 - .2 Exterior Sleeve: Single braided, stainless steel.
 - .3 Pressure Rating: 862 kPa WSP and 232 degrees C.
 - .4 Pressure Rating: 1380 kPa WOG and 121 degrees C.
 - .5 Joint: As specified for pipe joints.
 - .6 Size: Use pipe sized units.
 - .7 Maximum offset: 20 mm on each side of installed centre line.
- .2 Copper Piping:
 - .1 Inner Hose: Bronze.
 - .2 Exterior Sleeve: Braided bronze.
 - .3 Pressure Rating: 862 kPa WSP and 232 degrees C.

- .4 Pressure Rating: 1380 kPa WOG and 121 degrees C.
- .5 Joint: As specified for pipe joints.
- .6 Size: Use pipe sized units.
- .7 Maximum offset: 20 mm on each side of installed centre line.

2.3 ACCESSORIES

- .1 Pipe Alignment Guides:
 - .1 Two-piece welded steel with enamel paint, bolted, with spider to fit standard pipe, frame with four mounting holes, clearance for minimum 25 mm thick insulation, minimum 75 mm travel.
- .2 Swivel Joints:
 - .1 Fabricated steel body, double ball bearing race, field lubricated, with rubber (Buna-N) o-ring seals.

Part 3 Execution

3.1 INSTALLATION

- .1 Install to manufacturer's written instructions.
- .2 Construct spool pieces to exact size of flexible connection for future insertion.
- .3 Install flexible pipe connectors on pipes connected to equipment supported by vibration isolation. Provide line size flexible connectors.
- .4 Install flexible connectors at right angles to displacement. Install one end immediately adjacent to isolated equipment and anchor other end. Install in horizontal plane unless indicated otherwise.
- .5 Rigidly anchor pipe to building structure where necessary. Provide pipe guides so movement is directed along axis of pipe only. Erect piping such that strain and weight is not on cast connections or apparatus.
- .6 Provide support and equipment required to control expansion and contraction of piping. Provide loops, pipe offsets, and swing joints, or expansion joints where required.
- .7 Provide expansion loops as indicated on drawings.

END OF SECTION

Section 23 05 29

Hangers and Supports for HVAC Piping and Equipment

Part 1 General

1.1 SECTION INCLUDES

- .1 Pipe and equipment hangers and supports.
- .2 Equipment bases and supports.
- .3 Sleeves and seals.
- .4 Flashing and sealing equipment and pipe stacks.

1.2 RELATED REQUIREMENTS

- .1 Section 03 30 00 - Cast-in-place Concrete: Equipment bases.
- .2 Section 07 84 00 - Firestopping: Joint seals for piping and duct penetration of fire rated assemblies.
- .3 Section 09 91 00 - Painting.
- .4 Section 23 07 19 - Piping Insulation.
- .5 Section 23 07 16 - Equipment Insulation.
- .6 Section 22 10 00 - Plumbing Piping.
- .7 Section 23 05 48 - Vibration and Seismic Controls for HVAC.
- .8 Section 23 21 00 - Hydronic Piping.
- .9 Section 25 30 00 - Instrumentation and Terminal Devices.

1.3 REFERENCE STANDARDS

- .1 ASME B31.1/B31.3 Power Piping and Process Piping.
- .2 ASME B31.2 Fuel Gas Piping.
- .3 ASME B31.5 Refrigeration Piping and Heat Transfer Components.
- .4 ASME B31.9 Building Services Piping.
- .5 ASTM F708 Standard practice for design and installation of rigid pipe hangers
- .6 MSS SP-58 Pipe hangers and supports - materials, design, manufacture, selection, application, and installation
- .7 NFPA 13 Standard for the Installation of Sprinkler Systems.
- .8 NFPA 14 Standard for the Installation of Standpipe and Hose Systems.
- .9 UL 203 Standard for Safety Pipe Hanger Equipment for Fire Protection Service.

Part 2 Products

2.1 DESCRIPTION

- .1 Regulatory Requirements:
 - .1 Conform to applicable code for support of plumbing and hydronic piping.
 - .2 Supports for Sprinkler Piping: To NFPA 13.
 - .3 Supports for Standpipes: To NFPA 14.

2.2 PIPE HANGERS AND SUPPORTS

- .1 Plumbing Piping - DWV:
 - .1 Conform to ASME B31.9, ASTM F708, MSS SP-58.
 - .2 Hangers for Pipe Sizes 13 to 38 mm: Carbon steel, adjustable swivel, split ring.
 - .3 Hangers for Pipe Sizes 50 mm and Over: Carbon steel, adjustable, clevis.
 - .4 Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
 - .5 Wall Support for Pipe Sizes to 75 mm: Cast iron hook.
 - .6 Wall Support for Pipe Sizes 100 mm and Over: Welded steel bracket and wrought steel clamp.
 - .7 Vertical Support: Steel riser clamp.
 - .8 Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
 - .9 Copper Pipe Support: Carbon steel ring, adjustable, copper plated.
- .2 Plumbing Piping - Water:
 - .1 Conform to ASME B31.9, ASTM F708, MSS SP-58.
 - .2 Hangers for Pipe Sizes 13 to 38 mm: Carbon steel, adjustable swivel, split ring.
 - .3 Hangers for Cold Pipe Sizes 50 mm and Over: Carbon steel, adjustable, clevis.
 - .4 Hangers for Hot Pipe Sizes 50 to 100 mm: Carbon steel, adjustable, clevis.
 - .5 Hangers for Hot Pipe Sizes 150 mm and Over: Adjustable steel yoke, cast iron roll, double hanger.
 - .6 Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
 - .7 Multiple or Trapeze Hangers for Hot Pipe Sizes 150 mm and Over: Steel channels with welded spacers and hanger rods, cast iron roll.
 - .8 Wall Support for Pipe Sizes to 76 mm: Cast iron hook.

- .9 Wall Support for Pipe Sizes 100 mm and Over: Welded steel bracket and wrought steel clamp.
- .10 Wall Support for Hot Pipe Sizes 150 mm and Over: Welded steel bracket and wrought steel clamp with adjustable steel yoke and cast iron roll.
- .11 Vertical Support: Steel riser clamp.
- .12 Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
- .13 Floor Support for Hot Pipe Sizes to 100 mm: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
- .14 Floor Support for Hot Pipe Sizes 150 mm and Over: Adjustable cast iron roll and stand, steel screws, and concrete pier or steel support.
- .15 Copper Pipe Support: Carbon steel ring, adjustable, copper plated.
- .3 Hydronic Piping:
 - .1 Conform to ASME B31.9, ASTM F708, MSS SP-58.
 - .2 Hangers for Pipe Sizes 13 to 38 mm: Carbon steel, adjustable swivel, split ring.
 - .3 Hangers for Cold Pipe Sizes 50 mm and Over: Carbon steel, adjustable, clevis.
 - .4 Hangers for Hot Pipe Sizes 50 to 100 mm: Carbon steel, adjustable, clevis.
 - .5 Hangers for Hot Pipe Sizes 150 mm and Over: Adjustable steel yoke, cast iron roll, double hanger.
 - .6 Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
 - .7 Multiple or Trapeze Hangers for Hot Pipe Sizes 150 mm and Over: Steel channels with welded spacers and hanger rods, cast iron roll.
 - .8 Wall Support for Pipe Sizes to 76 mm: Cast iron hook.
 - .9 Wall Support for Pipe Sizes 100 mm and Over: Welded steel bracket and wrought steel clamp.
 - .10 Wall Support for Hot Pipe Sizes 150 mm and Over: Welded steel bracket and wrought steel clamp with adjustable steel yoke and cast iron roll.
 - .11 Vertical Support: Steel riser clamp.
 - .12 Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
 - .13 Floor Support for Hot Pipe Sizes to 100 mm: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
 - .14 Floor Support for Hot Pipe Sizes 150 mm and Over: Adjustable cast iron roll and stand, steel screws, and concrete pier or steel support.
 - .15 Copper Pipe Support: Carbon steel ring, adjustable, copper plated.

2.3 ACCESSORIES

- .1 Hanger Rods: Mild steel threaded both ends, threaded one end, or continuous threaded.

2.4 INSERTS

- .1 Inserts: Malleable iron case of galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.

2.5 FLASHING

- .1 Metal Flashing: 0.50 mm galvanized steel.
- .2 Metal Counterflashing: 0.80 mm galvanized steel.
- .3 Lead Flashing:
 - .1 Waterproofing: 24.5 kg/sq m sheet lead.
 - .2 Soundproofing: 5 kg/sq m sheet lead.
- .4 Flexible Flashing: 1.2 mm thick sheet butyl; compatible with roofing.
- .5 Caps: Steel, 0.8 mm minimum; 1.5 mm at fire resistant elements.

2.6 SLEEVES

- .1 Sleeves for Pipes Through Non-fire Rated Floors: 1.2 mm thick galvanized steel.
- .2 Sleeves for Pipes Through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Steel pipe or 1.2 mm thick galvanized steel.
- .3 Sleeves for Pipes Through Fire Rated and Fire Resistive Floors and Walls, and Fire Proofing: Prefabricated fire rated sleeves including seals, UL listed, refer to Section 07 84 00.
- .4 Sleeves for Round Ductwork: Galvanized steel.
- .5 Sleeves for Rectangular Ductwork: Galvanized steel or wood.
- .6 Stuffing Insulation: Glass fibre type, non-combustible; refer to Section 07 84 00.
- .7 Sealant: Acrylic, refer to Section 07 92 00.

Part 3 Execution

3.1 INSTALLATION

- .1 Install components to manufacturer's written instructions.

3.2 INSERTS

- .1 Provide inserts for placement in concrete formwork.
- .2 Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
- .3 Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 100 mm.

- .4 Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
- .5 Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut flush with top of slab.

3.3 PIPE HANGERS AND SUPPORTS

- .1 Install hangers to provide minimum 13 mm space between finished covering and adjacent work.
- .2 Place hangers within 300 mm of each horizontal elbow.
- .3 Use hangers with 38 mm minimum vertical adjustment.
- .4 Support horizontal cast iron pipe adjacent to each hub, with 1.5 m maximum spacing between hangers.
- .5 Support vertical piping at every other floor. Support vertical cast iron pipe at each floor at hub.
- .6 Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
- .7 Support riser piping independently of connected horizontal piping.
- .8 Provide copper plated hangers and supports for copper piping.
- .9 Design hangers for pipe movement without disengagement of supported pipe.
- .10 Prime coat exposed steel hangers and supports as specified in Section 09 91 00. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.

3.4 EQUIPMENT BASES AND SUPPORTS

- .1 Provide housekeeping pads of concrete, minimum 100 mm thick and extending 150 mm beyond supported equipment. Refer to Section 03 30 00.
- .2 Provide templates, anchor bolts, and accessories for mounting and anchoring equipment.
- .3 Construct supports of steel members. Brace and fasten with flanges bolted to structure.
- .4 Provide rigid anchors for pipes after vibration isolation components are installed.

3.5 FLASHING

- .1 Provide flexible flashing and metal counterflashing where piping and ductwork penetrate weather or waterproofed walls, floors, and roofs.
- .2 Flash vent and soil pipes projecting 75 mm minimum above finished roof surface with lead worked 25 mm minimum into hub, 200 mm minimum clear on sides with 600 x 600 mm sheet size. For pipes through outside walls, turn flanges back into wall and caulk, metal counterflash, and seal.
- .3 Flash floor drains in floors with topping over finished areas with lead, 250 mm clear on sides with minimum 910 x 910 mm sheet size. Fasten flashing to drain clamp device.

- .4 Seal floor drains watertight to adjacent materials.
- .5 Provide acoustical lead flashing around ducts and pipes penetrating equipment rooms, installed to manufacturer's written instructions for sound control.
- .6 Provide curbs for mechanical roof installations 350 mm minimum high above roofing surface. Flash and counterflash with sheet metal; seal watertight. Attach counterflashing mechanical equipment and lap base flashing on roof curbs. Flatten and solder joints.
- .7 Adjust storm collars tight to pipe with bolts; caulk around top edge. Use storm collars above roof jacks. Screw vertical flange section to face of curb.

3.6 SLEEVES

- .1 Set sleeves in position in formwork. Provide reinforcing around sleeves.
- .2 Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
- .3 Extend sleeves through floors 25 mm above finished floor level. Caulk sleeves.
- .4 Where piping or ductwork penetrates floor, ceiling, or wall, close off space between pipe or duct and adjacent work with stuffing insulation and caulk. Provide close fitting metal collar or escutcheon covers at both sides of penetration.
- .5 Install stainless steel escutcheons at finished surfaces.

END OF SECTION

Section 23 05 48

Vibration and Seismic Controls for HVAC

Part 1 General

1.1 SECTION INCLUDES

- .1 Inertia bases.
- .2 Vibration isolation.

1.2 RELATED REQUIREMENTS

- .1 Section 03 30 00 - Cast-in-place Concrete: Supply of concrete for placement by this section.
- .2 Section 22 10 00 - Plumbing Piping.
- .3 Section 23 05 29 - Supports And Anchors.
- .4 Section 23 21 00 - Hydronic Piping.
- .5 Section 25 30 00 - Instrumentation and Terminal Devices.

1.3 ACTION SUBMITTALS

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide schedule of vibration isolator type with location and load on each.
- .3 Shop Drawings: Indicate inertia bases and locate vibration isolators, with static and dynamic load on each.

1.4 CLOSEOUT SUBMITTALS

- .1 Section 01 78 00: Submission procedures.
- .2 Record Documentation: Record actual locations of hangers including attachment points.

Part 2 Products

2.1 PERFORMANCE / DESIGN CRITERIA

- .1 Provide vibration isolation on motor driven equipment over 0.35 kW, plus connected piping and ductwork.
- .2 Use concrete inertia bases for fans having static pressure in excess of 0.85 kPa or motors in excess of 30 kW, and on base mounted pumps over 7 kW.

2.2 INERTIA BASES

- .1 Structural Bases:
 - .1 Design: Sufficiently rigid to prevent misalignment or undue stress on machine, and to transmit design loads to isolators and snubbers.

- .2 Construction: Welded structural steel with gusseted brackets, supporting equipment and motor with motor slide rails.
- .2 Concrete Inertia Bases:
 - .1 Mass: Minimum of 1.5 times weight of isolated equipment.
 - .2 Construction: Structured steel channel perimeter frame, with gusseted brackets and anchor bolts, adequately reinforced, concrete filled.
 - .3 Connecting Point: Reinforced to connect isolators and snubbers to base.
 - .4 Concrete: Reinforced 20 MPa concrete.

2.3 VIBRATION ISOLATORS

- .1 Open Spring Isolators:
 - .1 Spring Isolators:
 - .1 For Exterior and Humid Areas: Provide hot dipped galvanized housings and neoprene coated springs.
 - .2 Code: Colour code springs for load carrying capacity.
 - .2 Springs: Minimum horizontal stiffness equal to 75% vertical stiffness, with working deflection between 0.3 and 0.6 of maximum deflection.
 - .3 Spring Mounts: Provide with levelling devices, minimum 6 mm thick neoprene sound pads, and zinc chromate plated hardware.
 - .4 Sound Pads: Size for minimum deflection of 1.2 mm; meet requirements for neoprene pad isolators.
- .2 Restrained Spring Isolators:
 - .1 Spring Isolators:
 - .1 For Exterior and Humid Areas: Provide hot dipped galvanized housings and neoprene coated springs.
 - .2 Code: Colour code springs for load carrying capacity.
 - .2 Springs: Minimum horizontal stiffness equal to 75% vertical stiffness, with working deflection between 0.3 and 0.6 of maximum deflection.
 - .3 Spring Mounts: Provide with levelling devices, minimum 6 mm thick neoprene sound pads, and zinc chromate plated hardware.
 - .4 Sound Pads: Size for minimum deflection of 1.2 mm; meet requirements for neoprene pad isolators.
 - .5 Restraint: Provide heavy mounting frame and limit stops.
- .3 Closed Spring Isolators:
 - .1 Spring Isolators:
 - .1 For Exterior and Humid Areas: Provide hot dipped galvanized housings and neoprene coated springs.
 - .2 Code: Colour code springs for load carrying capacity.

- .2 Type: Closed spring mount with top and bottom housing separated with neoprene rubber stabilizers.
- .3 Springs: Minimum horizontal stiffness equal to 75% vertical stiffness, with working deflection between 0.3 and 0.6 of maximum deflection.
- .4 Housings: Incorporate neoprene isolation pad meeting requirements for neoprene pad isolators, and neoprene side stabilizers with minimum 6 mm clearance.
- .4 Restrained Closed Spring Isolators:
 - .1 Spring Isolators:
 - .1 For Exterior and Humid Areas: Provide hot dipped galvanized housings and neoprene coated springs.
 - .2 Code: Colour code springs for load carrying capacity.
 - .2 Type: Closed spring mount with top and bottom housing separated with neoprene rubber stabilizers.
 - .3 Springs: Minimum horizontal stiffness equal to 75% vertical stiffness, with working deflection between 0.3 and 0.6 of maximum deflection.
 - .4 Housings: Incorporate neoprene isolation pad meeting requirements for neoprene pad isolators, and neoprene side stabilizers with minimum 6 mm clearance and limit stops.
- .5 Spring Hanger:
 - .1 Spring Isolators:
 - .1 For Exterior and Humid Areas: Provide hot dipped galvanized housings and neoprene coated springs.
 - .2 Code: Colour code springs for load carrying capacity.
 - .2 Springs: Minimum horizontal stiffness equal to 75% vertical stiffness, with working deflection between 0.3 and 0.6 of maximum deflection.
 - .3 Housings: Incorporate neoprene isolation pad meeting requirements for neoprene pad isolators.
 - .4 Misalignment: Capable of 20 degree hanger rod misalignment.
- .6 Neoprene Pad Isolators:
 - .1 Rubber or neoprene waffle pads:
 - .1 30 durometer.
 - .2 Minimum 13 mm thick.
 - .3 Maximum loading 275 kPa.
 - .4 Height of ribs: maximum 0.7 times width.
 - .2 Configuration: Single layer.
 - .3 Configuration: 13 mm thick waffle pads bonded each side of 6 mm thick steel plate

- .7 Glass Fibre Pads: Neoprene jacketed pre-compressed moulded glass fibre.
- .8 Rubber Mount or Hanger: Moulded rubber designed for 13 mm deflection with threaded insert.
- .9 Seismic Snubbers:
 - .1 Type: Non-directional and double acting unit consisting of interlocking steel members restrained by neoprene elements.
 - .2 Neoprene Elements: Replaceable, minimum of 18 mm thick.
 - .3 Capacity: 4 times load assigned to mount groupings at 10 mm deflection.
 - .4 Attachment Points and Fasteners: Capable of withstanding 3 times rated load capacity of seismic snubber.

Part 3 Execution

3.1 INSTALLATION

- .1 Install to manufacturer's written instructions.
- .2 Install isolation for motor driven equipment.
- .3 Bases:
 - .1 Set steel bases for 25 mm clearance between housekeeping pad and base.
 - .2 Set concrete inertia bases for 50 mm clearance between housekeeping pad and base.
 - .3 Adjust equipment level.
- .4 Install spring hangers without binding.
- .5 On closed spring isolators, adjust so side stabilizers are clear under normal operating conditions.
- .6 Prior to making piping connections to equipment with operating weights substantially different from installed weights, block up equipment with temporary shims to final height. When full load is applied, adjust isolators to load to allow shim removal.
- .7 Provide pairs of horizontal limit springs on fans with more than 1.5 kPa static pressure, and on hanger supported, horizontally mounted axial fans.
- .8 Provide resiliently mounted equipment, piping, and ductwork with seismic snubbers. Provide each inertia base with minimum of four seismic snubbers located close to isolators. Snub equipment designated for post disaster use to 1.5 mm maximum clearance. Provide other snubbers with clearance between 4 mm and 7 mm.
- .9 Support piping connections to isolated equipment resiliently as follows.
 - .1 Up to 100 mm Diameter: First three points of support.
 - .2 125 to 200 mm Diameter: First four points of support.
 - .3 250 mm Diameter and Over: First six points of support.

- .4 Select three hangers closest to vibration source for minimum 25 mm static deflection or static deflection of isolated equipment. Select remaining isolators for minimum 25 mm static deflection or 1/2 static deflection of isolated equipment.
- .10 Connect wiring to isolated equipment with flexible hanging loop.

3.2 FIELD QUALITY CONTROL

- .1 Inspect isolated equipment after installation and submit report. Include static deflections.

END OF SECTION

Section 23 05 53

Identification for HVAC Piping and Equipment

Part 1 General

1.1 SECTION INCLUDES

- .1 Nameplates.
- .2 Tags.
- .3 Pipe Markers.

1.2 RELATED REQUIREMENTS

- .1 Section 09 91 00 - Painting: Identification painting.
- .2 Section 22 10 00 - Plumbing Piping.
- .3 Section 23 05 19.13 - Thermometers and Pressure Gauges - Piping Systems.
- .4 Section 23 07 19 - HVAC Piping Insulation.
- .5 Section 23 21 00 - Hydronic Piping.

1.3 REFERENCE STANDARDS

- .1 ASME A13.1 Scheme for the Identification of Piping Systems.

1.4 ACTION SUBMITTALS

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide manufacturers catalogue literature for each product required.
- .3 Identification Information:
 - .1 Submit list of wording, symbols, letter size, and colour coding for mechanical identification.
 - .2 Submit valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.

1.5 CLOSEOUT SUBMITTALS

- .1 Section 01 78 00: Submission procedures.
- .2 Record Documentation: Record actual locations of tagged valves.

Part 2 Products

2.1 NAMEPLATES

- .1 Description: Laminated three-layer plastic with engraved black letters on light contrasting background colour.

2.2 TAGS

- .1 Plastic Tags: Laminated three-layer plastic with engraved black letters on light contrasting background colour. Round tags, minimum size 25-mm.
- .2 Metal Tags: Brass with stamped letters; round tags, minimum size 25-mm, with smooth edges.
- .3 Chart: Typewritten letter size list in anodized aluminum frame.

2.3 PIPE MARKERS

- .1 Colour: Conform to ASME A13.1.
- .2 Plastic Pipe Markers: Factory fabricated, flexible, semi- rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid being conveyed.
- .3 Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.

2.4 CEILING TACKS

- .1 Description: Steel with 20 mm diameter colour coded head.
- .2 Colour code as follows:
 - .1 Yellow - HVAC equipment.
 - .2 Red - Fire dampers/smoke dampers.
 - .3 Green - Plumbing valves.
 - .4 Blue - Heating/cooling valves.

Part 3 Execution

3.1 PREPARATION

- .1 Degrease and clean surfaces to receive adhesive for identification materials.

3.2 INSTALLATION

- .1 Install plastic nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.
- .2 Install tags with corrosion resistant chain.
- .3 Install plastic pipe markers to manufacturer's written instructions.
- .4 Install plastic tape pipe markers complete around pipe to manufacturer's written instructions.
- .5 Identify air handling units, pumps, heat transfer equipment, tanks, and water treatment devices with plastic nameplates. Small devices, such as in-line pumps, may be identified with tags.
- .6 Identify control panels and major control components outside panels with plastic nameplates.

- .7 Identify thermostats relating to terminal boxes or valves with nameplates.
- .8 Identify valves in main and branch piping with tags.
- .9 Identify air terminal units and radiator valves with numbered tags.
- .10 Tag automatic controls, instruments, and relays. Key to control schematic.
- .11 Identify piping, concealed or exposed, with plastic tape pipe markers. Identify service, flow direction, and pressure. Install in clear view and align with axis of piping. Locate identification not to exceed 6 m on straight runs including risers and drops, adjacent to each valve and Tee, at each side of penetration of structure or enclosure, and at each obstruction.
 - .1 Use tags on piping 20 mm diameter and smaller.
 - .2 Identify service, flow direction, and pressure. Install in clear view and align with axis of piping.
 - .3 Locate identification not to exceed 6 m on straight runs including risers and drops, adjacent to each valve and Tee, at each side of penetration of structure or enclosure, and at each obstruction.
- .12 Provide ceiling tacks to locate valves or dampers above T-bar type panel ceilings. Locate in corner of panel closest to equipment.

END OF SECTION

Section 23 05 93

Testing, Adjusting, and Balancing for HVAC

Part 1 General

1.1 SECTION INCLUDES

- .1 Testing, adjustment, and balancing of air systems.
- .2 Testing, adjustment, and balancing of hydronic systems.
- .3 Measurement of final operating condition of HVAC systems.
- .4 Sound measurement of equipment operating conditions.
- .5 Vibration measurement of equipment operating conditions.

1.2 RELATED REQUIREMENTS

- .1 Section 01 43 00 - Quality Assurance:
 - .1 Testing laboratory services.
 - .2 Employment of testing agency and payment for services.
 - .3 Inspection and testing allowances.
- .2 Section 01 78 00 - Closeout Submittals:
 - .1 Starting of Systems.
 - .2 Testing, Adjusting, and Balancing of Systems.

1.3 REFERENCE STANDARDS

- .1 AABC National standards for total system balance
- .2 ADC 1062: GRD Test Code for Grilles, Registers and Diffusers.
- .3 ASHRAE 111 Testing, adjusting, and balancing of building HVAC systems
- .4 NEBB Procedural standard for testing adjusting and balancing of environmental systems

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Section 01 31 00: Project management and coordination procedures.
- .2 Pre-installation Meetings: Convene one (1) week before starting work of this section.
- .3 Sequencing: Sequence work to commence after completion of systems and schedule completion of work before Substantial Completion of Project.
- .4 Scheduling: Schedule and provide assistance in final adjustment and test of life safety system with Fire Authority.

1.5 INFORMATIONAL SUBMITTALS

- .1 Section 01 33 00: Submission procedures.
- .2 Submit name of adjusting and balancing agency for approval within thirty (30) days after award of Contract.
- .3 Field Reports: Submit procedures for submitting Field Reports.
 - .1 Indicate deficiencies in systems that would prevent proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.
 - .2 Prior to commencing work, submit report forms or outlines indicating adjusting, balancing, and equipment data required.
 - .3 Submit draft copies of report for review prior to final acceptance of Project. Provide final copies for Consultant and for inclusion in operating and maintenance manuals.
 - .4 Provide reports in soft cover, letter size, 3-ring binder manuals, complete with index page and indexing tabs, with cover identification at front and side. Include set of reduced drawings with air outlets and equipment identified to correspond with data sheets, and indicating thermostat locations.
 - .5 Include detailed procedures, agenda, sample report forms and copy of AABC National Project Performance Guaranty prior to commencing system balance.
- .4 Test Reports: Indicate data on AABC National Standards for Total System Balance forms. Submit data in SI (metric) units.

1.6 CLOSEOUT SUBMITTALS

- .1 Section 01 78 00: Submission procedures.
- .2 Record Documentation: Record actual locations of flow measuring stations, balancing valves and rough setting.

1.7 QUALITY ASSURANCE

- .1 Perform total system balance to AABC National Standards for Field Measurement and Instrumentation, Total System Balance.
- .2 Agency Qualifications: Company specializing in the testing, adjusting, and balancing of systems specified in this Section with minimum three (3) years documented experience certified by AABC.

Part 2 Products - Not Used

Part 3 Execution

3.1 EXAMINATION

- .1 Section 01 71 00: Verify existing conditions before starting work.
- .2 Verify that systems are complete and operable before commencing work. Ensure the following conditions:

- .1 Systems are started and operating in a safe and normal condition.
- .2 Temperature control systems are installed complete and operable.
- .3 Proper thermal overload protection is in place for electrical equipment.
- .4 Final filters are clean and in place. If required, install temporary media in addition to final filters.
- .5 Duct systems are clean of debris.
- .6 Fans are rotating correctly.
- .7 Fire and volume dampers are in place and open.
- .8 Air coil fins are cleaned and combed.
- .9 Access doors are closed and duct end caps are in place.
- .10 Air outlets are installed and connected.
- .11 Duct system leakage is minimized.
- .12 Hydronic systems are flushed, filled, and vented.
- .13 Pumps are rotating correctly.
- .14 Proper strainer baskets are clean and in place.
- .15 Service and balance valves are open.
- .3 Submit field reports. Report defects and deficiencies noted during performance of services which prevent system balance.
- .4 Beginning of work means acceptance of existing conditions.

3.2 PREPARATION

- .1 Provide instruments required for testing, adjusting, and balancing operations. Make instruments available to Consultant to facilitate spot checks during testing.
- .2 Provide additional balancing devices as required.

3.3 INSTALLATION TOLERANCES

- .1 Air Handling Systems: Adjust to within plus or minus 5% of design for supply systems and plus or minus 10% of design for return and exhaust systems.
- .2 Air Outlets and Inlets: Adjust total to within plus 10% and minus 5% of design to space. Adjust outlets and inlets in space to within plus or minus 10% of design.
- .3 Hydronic Systems: Adjust to within plus or minus 10% of design.

3.4 ADJUSTING

- .1 Ensure recorded data represents actual measured or observed conditions.
- .2 Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.
- .3 After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.

- .4 Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.
- .5 At final inspection, recheck random selections of data recorded in report. Recheck points or areas as selected and witnessed by the Owner.
- .6 Check and adjust systems approximately six months after final acceptance and submit report.

3.5 AIR SYSTEM PROCEDURE

- .1 Adjust air handling and distribution systems to provide required or design supply, return, and exhaust air quantities at site altitude.
- .2 Make air quantity measurements in ducts by Pitot tube traverse of entire cross sectional area of duct.
- .3 Measure air quantities at air inlets and outlets.
- .4 Adjust distribution system to obtain uniform space temperatures free from objectionable drafts and noise.
- .5 Use volume control devices to regulate air quantities only to extend that adjustments do not create objectionable air motion or sound levels. Effect volume control by duct internal devices such as dampers and splitters.
- .6 Vary total system air quantities by adjustment of fan speeds. Provide drive changes required. Vary branch air quantities by damper regulation.
- .7 Provide system schematic with required and actual air quantities recorded at each outlet or inlet.
- .8 Measure static air pressure conditions on air supply units, including filter and coil pressure drops, and total pressure across the fan. Make allowances for 50% loading of filters.
- .9 Adjust outside air automatic dampers, outside air, return air, and exhaust dampers for design conditions.
- .10 Measure temperature conditions across outside air, return air, and exhaust dampers to check leakage.
- .11 Where modulating dampers are provided, take measurements and balance at extreme conditions. Balance variable volume systems at maximum air flow rate, full cooling, and at minimum air flow rate, full heating.
- .12 Measure building static pressure and adjust supply, return, and exhaust air systems to provide required relationship between each to maintain approximately 12.5 Pa positive static pressure near the building entries.
- .13 Check multi-zone units for motorized damper leakage. Adjust air quantities with mixing dampers set first for cooling, then heating, then modulating.
- .14 For variable air volume system powered units set volume controller to air flow setting indicated. Confirm connections properly made and confirm proper operation for automatic variable air volume temperature control.

- .15 On fan powered VAV boxes, adjust air flow switches for proper operation.

3.6 WATER SYSTEM PROCEDURE

- .1 Adjust water systems to provide required or design quantities.
- .2 Use calibrated Venturi tubes, orifices, or other metered fittings and pressure gauges to determine flow rates for system balance. Where flow metering devices are not installed, base flow balance on temperature difference across various heat transfer elements in the system.
- .3 Adjust systems to provide specified pressure drops and flows through heat transfer elements prior to thermal testing. Perform balancing by measurement of temperature differential in conjunction with air balancing.
- .4 Effect system balance with automatic control valves fully open to heat transfer elements.
- .5 Effect adjustment of water distribution systems by means of balancing cocks, valves, and fittings. Do not use service or shut-off valves for balancing unless indexed for balance point.
- .6 Where available pump capacity is less than total flow requirements or individual system parts, full flow in one part may be simulated by temporary restriction of flow to other parts.

END OF SECTION

Section 23 05 19.13

Thermometers and Pressure Gauges - Piping Systems

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 23 05 53 - Identification For HVAC Piping and Equipment

1.2 REFERENCE STANDARDS

- .1 American Society of Mechanical Engineers (ASME):
 - .1 ASME B40.100-2013, Pressure Gauges and Gauge Attachments
 - .2 ASME B40.200-2008, Thermometers, Direct Reading and Remote Reading
- .2 Efficiency Valuation Organization (EVO):
 - .1 International Performance Measurement and Verification Protocol (IPMVP) – 2014, Core Concepts

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, product literature and data sheets for thermometers and pressure gauges and include product characteristics, performance criteria, physical size, finishes, and limitations.

1.4 DELIVERY, STORAGE, AND HANDLING

- .1 Perform in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Packaging Waste Management: Perform in accordance with Section 01 74 19 - Waste Management and Disposal.

Part 2 Products

2.1 DIRECT READING THERMOMETERS

- .1 Industrial, variable angle type, mercury-free, liquid filled, 125-mm scale length, in accordance with ASME B40.200.
 - .1 Resistance to shock and vibration.

2.2 REMOTE READING THERMOMETERS

- .1 Dial type: 100-mm diameter, mercury-free activated, in accordance with ASME B40.200. Accuracy within one scale division, brass movement, stainless steel capillary, stainless steel spiral armour, stainless steel bulb, and polished stainless steel case for wall mounting.

2.3 THERMOMETER WELLS

- .1 Copper Pipe: Copper or bronze.
- .2 Steel Pipe: Stainless steel.

2.4 PRESSURE GAUGES

- .1 Dial type: To ASME B40.100, Grade 2A, 112-mm size, stainless steel bourdon tube having 0.5% accuracy full scale unless otherwise specified.
- .2 Provide:
 - .1 Siphon for steam service.
 - .2 Snubber for pulsating operation.
 - .3 Diaphragm assembly for corrosive service.
 - .4 Gasketed pressure relief back with solid front.
 - .5 Bronze stop cock.
 - .6 Oil filled for high vibration applications.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: Verify that conditions of substrate previously installed are acceptable for installation in accordance with manufacturer's instructions.
 - .1 Inform Consultant of unacceptable conditions immediately upon discovery.
 - .2 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.

3.2 INSTALLATION

- .1 Install thermometers and gauges so they can be easily read from floor or platform. If this cannot be accomplished, install remote reading units.
- .2 Install between equipment and first fitting or valve.

3.3 THERMOMETERS

- .1 Install in wells on piping. Include heat conductive material inside well.
- .2 Install in locations as indicated on drawings and on inlet and outlet of:
 - .1 Heat exchangers.
 - .2 Water heating and cooling coils.
 - .3 Water boilers.
 - .4 DHW tanks.
- .3 Install wells as indicated on drawings only for balancing purposes.
- .4 Use extensions where thermometers are installed through insulation.

3.4 PRESSURE GAUGES

- .1 Install in locations:
 - .1 Suction and discharge of pumps.
 - .2 Upstream and downstream of pressure reducing valves.
 - .3 Upstream and downstream of control valves.
 - .4 Inlet and outlet of coils.
 - .5 Inlet and outlet of liquid side of heat exchangers.
 - .6 Outlet of boilers.
 - .7 In other locations as indicated.
- .2 Install gauge cocks for balancing purposes elsewhere, as indicated on drawings.
- .3 Use extensions through insulation where pressure gauges are installed.

3.5 NAMEPLATES

- .1 Install nameplates in accordance with Section 23 05 53 - Identification For HVAC Piping and Equipment, identifying medium.

3.6 CLEANING

- .1 Clean in accordance with Section 01 74 00 - Cleaning.

3.7 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by installation of work in this Section.

END OF SECTION

Section 23 07 16

HVAC Equipment Insulation

Part 1 General

1.1 SECTION INCLUDES

- .1 Equipment insulation.
- .2 Covering.
- .3 Breeching insulation.

1.2 RELATED REQUIREMENTS

- .1 Section 23 05 29 - Hangers and Supports for HVAC Piping and Equipment.

1.3 REFERENCE STANDARDS

- .1 ASTM A167 Standard specification for stainless and heat-resisting chromium-nickel steel plate, sheet, and strip. (Withdrawn)
- .2 ASTM B209/B209M Standard specification for aluminum and aluminum-alloy sheet and plate
- .3 ASTM C177 Standard test method for steady-state heat flux measurements and thermal transmission properties by means of the guarded-hot-plate apparatus
- .4 ASTM C195 Standard specification for mineral fiber thermal insulating cement
- .5 ASTM C240 Standard test methods for testing cellular glass insulation block
- .6 ASTM C449 Standard specification for mineral fiber hydraulic-setting thermal insulating and finishing cement
- .7 ASTM C518 Standard test method for steady-state thermal transmission properties by means of the heat flow meter apparatus
- .8 ASTM C533 Standard specification for calcium silicate block and pipe thermal insulation
- .9 ASTM C534/C534M Standard specification for preformed flexible elastomeric cellular thermal insulation in sheet and tubular form
- .10 ASTM C547 Standard specification for mineral fiber pipe insulation
- .11 ASTM C552 Standard specification for cellular glass thermal insulation
- .12 ASTM C553 Standard specification for mineral fiber blanket thermal insulation for commercial and industrial applications
- .13 ASTM C592 Standard specification for mineral fiber blanket insulation and blanket-type pipe insulation (metal-mesh covered) (industrial type)
- .14 ASTM C612 Standard specification for mineral fiber block and board thermal insulation

- .15 ASTM C921 Standard practice for determining the properties of jacketing materials for thermal insulation. (Withdrawn)
- .16 ASTM D1056 Standard specification for flexible cellular materials - sponge or expanded rubber
- .17 ASTM E84 Standard test method for surface burning characteristics of building materials
- .18 ASTM E96/E96M Standard test methods for gravimetric determination of water vapor transmission rate of materials
- .19 ISO 9000 Quality Management.
- .20 ISO 14000 Environmental Management.
- .21 NAIMA National Insulation Standards.
- .22 NFPA 255 Standard Method of Test of Surface Burning Characteristics of Building Materials.
- .23 UL 723 Tests for Surface Burning Characteristics of Building Materials.

1.4 ACTION SUBMITTALS

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide product description, thermal characteristics, list of materials and thickness for equipment scheduled.

1.5 INFORMATIONAL SUBMITTALS

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Indicate installation procedures which ensure acceptable workmanship and installation standards will be achieved.

1.6 QUALITY ASSURANCE

- .1 Products of This Section: Manufactured to ISO 9000 certification requirements.
- .2 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience.
- .3 Installer Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience and approved by the manufacturer.

1.7 DELIVERY, STORAGE, AND HANDLING

- .1 Section 01 61 00: Transport, handle, store, and protect products.
- .2 Accept materials on site in original factory packaging, labelled with manufacturer's identification, including product density and thickness.
- .3 Protect insulation from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original wrapping.

1.8 SITE CONDITIONS

- .1 Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics, and insulation cements.
- .2 Maintain temperature during and after installation for minimum period of twenty-four (24) hours.

Part 2 Products

2.1 DESCRIPTION

- .1 Regulatory Requirements:
 - .1 Materials: Flame spread/smoke developed rating of 25/50 to ASTM E84, UL 723.

2.2 GLASS FIBRE

- .1 Insulation: ASTM C547, rigid moulded, noncombustible.
 - .1 Thermal Conductivity (K-factor): ASTM C335/C335M, 0.035 W/m.K at 24 degrees C.
 - .2 Minimum Service Temperature: -28.9 degrees C.
 - .3 Maximum Service Temperature: 150 degrees C.
 - .4 Maximum Moisture Absorption: 0.2% by volume.
- .2 Vapour Barrier Jacket:
 - .1 ASTM C921, White kraft paper reinforced with glass fibre yarn and bonded to aluminized film.
 - .2 Moisture Vapour Transmission: ASTM E96/E96M, 0.03 ng/(Pa s sq m).
 - .3 Secure with self sealing longitudinal laps and butt strips.
 - .4 Secure with outward clinch expanding staples and vapour barrier mastic.
- .3 Tie Wire: 1.3 mm stainless steel with twisted ends on maximum 300 mm centres.
- .4 Vapour Barrier Lap Adhesive:
 - .1 Compatible with insulation.
- .5 Insulating Cement/Mastic:
 - .1 ASTM C195, hydraulic setting on mineral wool.
- .6 Fibrous Glass Fabric:
 - .1 Cloth: Untreated; 305 g/sq m weight.
 - .2 Blanket: 16 kg/cu m density.
- .7 Indoor Vapour Barrier Finish:
 - .1 Vinyl emulsion type acrylic, compatible with insulation, white colour.
- .8 Outdoor Vapour Barrier Mastic:
 - .1 Vinyl emulsion type acrylic, compatible with insulation, white colour.

- .9 Insulating Cement: ASTM C449.

2.3 HYDROUS CALCIUM SILICATE

- .1 Insulation: ASTM C533, rigid moulded white; asbestos free.
 - .1 Thermal Conductivity (K-factor): ASTM C177, ASTM C518, 0.060 W/m.K at 147 degrees C.
 - .2 Maximum Service Temperature: 815 degrees C.
 - .3 Density: 208 kg/cu m.
- .2 Tie Wire: 1.2 mm stainless steel with twisted ends on maximum 300 mm centres.
- .3 Insulating Cement: ASTM C449.

2.4 JACKETS

- .1 PVC Plastic:
 - .1 Jacket: ASTM C921, One-piece moulded type fitting covers and sheet material, off white colour.
 - .1 Minimum Service Temperature: -40 degrees C.
 - .2 Maximum Service Temperature: 66 degrees C.
 - .3 Moisture Vapour Transmission: ASTM E96/E96M; 0.002 perm inches.
 - .4 Maximum Flame Spread: ASTM E84, 25.
 - .5 Maximum Smoke Developed: ASTM E84, 50.
 - .6 Thickness: 0.5 mm.
 - .7 Connections: Pressure sensitive colour matching vinyl tape.
 - .2 Covering Adhesive Mastic: Compatible with insulation.

2.5 ACCESSORIES

- .1 Weatherproof Sealant for Jackets Installed Outdoors: In accordance with Section 07 92 00 - Joint Sealants.
- .2 Tape: Self-adhesive, aluminum, reinforced, minimum 50 mm wide.
- .3 Contact Adhesive: Quick setting type.
- .4 Tie Wire: Stainless steel, minimum 1.5-mm diameter.
- .5 Bands: Stainless steel, 19 mm wide, minimum 0.5 mm thick.
- .6 Vapour Retarder Lap Adhesive: Water-based and fire retardant type, compatible with insulation.
- .7 Indoor Vapour Retarder Finish: Vinyl emulsion type acrylic, compatible with insulation.

Part 3 Execution

3.1 EXAMINATION

- .1 Section 01 71 00: Verify existing conditions before starting work.
- .2 Verify that equipment has been tested before applying insulation materials.
- .3 Verify that surfaces are clean and dry, with foreign material removed.

3.2 INSTALLATION

- .1 Install components to manufacturer's written instructions.
- .2 Factory Insulated Equipment: Do not insulate.
- .3 Exposed Equipment: Locate insulation and cover seams in least visible locations.
- .4 Apply insulation close to equipment by grooving, scoring, and bevelling insulation. Fasten insulation to equipment with studs, pins, clips, adhesive, wires, or bands.
- .5 Fill joints, cracks, seams, and depressions with bedding compound to form smooth surface. On cold equipment, use vapour barrier cement.
- .6 Insulated equipment containing fluids below ambient temperature: Insulate entire system.
- .7 Fibre glass insulated equipment containing fluids below ambient temperature: Provide vapour barrier jackets, factory-applied or field-applied. Finish with glass cloth and vapour barrier adhesive.
- .8 For hot equipment containing fluids 60 degrees C or less, do not insulate flanges and unions, but bevel and seal ends of insulation.
- .9 For hot equipment containing fluids over 60 degrees C, insulate flanges and unions with removable sections and jackets.
- .10 Fibre glass insulated equipment containing fluids above ambient temperature: Provide standard jackets, with or without vapour barrier, factory-applied or field-applied. Finish with glass cloth and adhesive.
- .11 Inserts and Shields:
 - .1 Application: Equipment 40 mm diameter or larger.
 - .2 Shields: Galvanized steel between hangers and inserts.
 - .3 Insert location: Between support shield and equipment and under the finish jacket.
 - .4 Insert configuration: Minimum 150 mm long, of same thickness and contour as adjoining insulation; may be factory fabricated.
 - .5 Insert material: Hydrous calcium silicate insulation or other heavy density insulating material suitable for the planned temperature range.
- .12 Finish insulation at supports, protrusions, and interruptions.
- .13 Equipment in Mechanical Equipment Rooms or Finished Spaces: Finish with PVC jacket and fitting covers.

- .14 Exterior Applications: Provide vapour barrier jacket or finish with glass mesh reinforced vapour barrier cement. Cover with aluminum jacket with seams located on bottom side of horizontal equipment.
- .15 Nameplates and ASME Stamps: Bevel and seal insulation around; do not insulate over.
- .16 Equipment Requiring Access for Maintenance, Repair, or Cleaning: Install insulation so it can be easily removed and replaced without damage.

END OF SECTION

Section 23 07 19 HVAC Piping Insulation

Part 1 General

1.1 SECTION INCLUDES

- .1 Piping insulation.
- .2 Jackets and accessories.

1.2 RELATED REQUIREMENTS

- .1 Section 22 10 00 - Plumbing Piping: Placement of hangers and hanger inserts.
- .2 Section 23 05 29 - Hangers and Supports for HVAC Piping and Equipment.
- .3 Section 23 05 53 - Mechanical Identification.
- .4 Section 23 21 00 - Hydronic Piping: Placement of hangers and hanger inserts.

1.3 REFERENCE STANDARDS

- .1 ASTM B209/B209M Standard specification for aluminum and aluminum-alloy sheet and plate
- .2 ASTM C177 Standard test method for steady-state heat flux measurements and thermal transmission properties by means of the guarded-hot-plate apparatus
- .3 ASTM C195 Standard specification for mineral fiber thermal insulating cement
- .4 ASTM C335/C335M Standard test method for steady-state heat transfer properties of pipe insulation
- .5 ASTM C449 Standard specification for mineral fiber hydraulic-setting thermal insulating and finishing cement
- .6 ASTM C518 Standard test method for steady-state thermal transmission properties by means of the heat flow meter apparatus
- .7 ASTM C533 Standard specification for calcium silicate block and pipe thermal insulation
- .8 ASTM C534/C534M Standard specification for preformed flexible elastomeric cellular thermal insulation in sheet and tubular form
- .9 ASTM C547 Standard specification for mineral fiber pipe insulation
- .10 ASTM C552 Standard specification for cellular glass thermal insulation
- .11 ASTM C578 Standard specification for rigid, cellular polystyrene thermal insulation
- .12 ASTM C585 Standard practice for inner and outer diameters of thermal insulation for nominal sizes of pipe and tubing

- .13 ASTM C591 Standard specification for unfaced preformed rigid cellular polyisocyanurate thermal insulation
- .14 ASTM C610 Standard specification for molded expanded perlite block and pipe thermal insulation
- .15 ASTM C921 Standard practice for determining the properties of jacketing materials for thermal insulation. (Withdrawn)
- .16 ASTM D1056 Standard specification for flexible cellular materials - sponge or expanded rubber
- .17 ASTM D1667 Standard specification for flexible cellular materials - poly (vinyl chloride) foam (closed-cell)
- .18 ASTM D2842 Standard test method for water absorption of rigid cellular plastics
- .19 ASTM E84 Standard test method for surface burning characteristics of building materials
- .20 ASTM E96/E96M Standard test methods for gravimetric determination of water vapor transmission rate of materials
- .21 ISO 9000 Quality Management.
- .22 ISO 14000 Environmental Management.
- .23 NFPA 255 Standard Method of Test of Surface Burning Characteristics of Building Materials.
- .24 UL 723 Tests for Surface Burning Characteristics of Building Materials.

1.4 ACTION SUBMITTALS

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide product description, list of materials and thickness for each service, and locations.

1.5 QUALITY ASSURANCE

- .1 Products of This Section: Manufactured to ISO 9000 certification requirements.
- .2 Materials: Flame spread/smoke developed rating of 25/50 or less to ASTM E84, UL 723.
- .3 Applicator: Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience and approved by the manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

- .1 Section 01 61 00: Transport, handle, store, and protect products.
- .2 Deliver materials to site in original factory packaging, labelled with manufacturer's identification, including product density and thickness.
- .3 Store insulation in original wrapping and protect from weather and construction traffic.

- .4 Protect insulation against dirt, water, chemical, and mechanical damage.

1.7 SITE CONDITIONS

- .1 Ambient Condition:
 - .1 Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics, and insulation cements.
 - .2 Maintain temperature during and after installation for minimum period of twenty-four (24) hours.

Part 2 Products

2.1 GLASS FIBRE

- .1 Insulation: ASTM C547, rigid moulded, noncombustible.
 - .1 Thermal Conductivity (K-factor): ASTM C335/C335M, 0.035 W/m.K at 24 degrees C.
 - .2 Minimum Service Temperature: -28.9 degrees C.
 - .3 Maximum Service Temperature: 150 degrees C.
 - .4 Maximum Moisture Absorption: 0.2% by volume.
- .2 Vapour Barrier Jacket:
 - .1 ASTM C921, White kraft paper reinforced with glass fibre yarn and bonded to aluminized film.
 - .2 Moisture Vapour Transmission: ASTM E96/E96M, 0.03 ng/(Pa s sq m).
 - .3 Secure with self sealing longitudinal laps and butt strips.
 - .4 Secure with outward clinch expanding staples and vapour barrier mastic.
- .3 Tie Wire: 1.3 mm stainless steel with twisted ends on maximum 300 mm centres.
- .4 Vapour Barrier Lap Adhesive:
 - .1 Compatible with insulation.
- .5 Insulating Cement/Mastic:
 - .1 ASTM C195, hydraulic setting on mineral wool.
- .6 Fibrous Glass Fabric:
 - .1 Cloth: Untreated; 305 g/sq m weight.
 - .2 Blanket: 16 kg/cu m density.
- .7 Indoor Vapour Barrier Finish:
 - .1 Vinyl emulsion type acrylic, compatible with insulation, white colour.
- .8 Outdoor Vapour Barrier Mastic:
 - .1 Vinyl emulsion type acrylic, compatible with insulation, white colour.
- .9 Insulating Cement: ASTM C449.

2.2 HYDROUS CALCIUM SILICATE

- .1 Insulation: ASTM C533, rigid moulded white; asbestos free.
 - .1 Thermal Conductivity (K-factor): ASTM C177, ASTM C518, 0.060 W/m.K at 147 degrees C.
 - .2 Maximum Service Temperature: 815 degrees C.
 - .3 Density: 208 kg/cu m.
- .2 Tie Wire: 1.2 mm stainless steel with twisted ends on maximum 300 mm centres.
- .3 Insulating Cement: ASTM C449.

2.3 JACKETS

- .1 PVC Plastic:
 - .1 Jacket: ASTM C921, One-piece moulded type fitting covers and sheet material, off white colour.
 - .1 Minimum Service Temperature: -40 degrees C.
 - .2 Maximum Service Temperature: 66 degrees C.
 - .3 Moisture Vapour Transmission: ASTM E96/E96M; 0.002 perm inches.
 - .4 Maximum Flame Spread: ASTM E84, 25.
 - .5 Maximum Smoke Developed: ASTM E84, 50.
 - .6 Thickness: 0.5 mm.
 - .7 Connections: Pressure sensitive colour matching vinyl tape.
 - .2 Covering Adhesive Mastic: Compatible with insulation.

2.4 ACCESSORIES

- .1 Weatherproof Sealant for Jackets Installed Outdoors: In accordance with Section 07 92 00 - Joint Sealants.
- .2 Tape: Self-adhesive, aluminum, reinforced, minimum 50 mm wide.
- .3 Contact Adhesive: Quick setting type.
- .4 Tie Wire: Stainless steel, minimum 1.5-mm diameter.
- .5 Bands: Stainless steel, 19 mm wide, minimum 0.5 mm thick.
- .6 Vapour Retarder Lap Adhesive: Water-based and fire retardant type, compatible with insulation.
- .7 Indoor Vapour Retarder Finish: Vinyl emulsion type acrylic, compatible with insulation.

Part 3 Execution

3.1 EXAMINATION

- .1 Section 01 71 00: Verify existing conditions before starting work.

- .2 Verify that piping has been tested before applying insulation materials.
- .3 Verify that surfaces are clean, foreign material removed, and dry.

3.2 INSTALLATION

- .1 Install materials to manufacturer's written instructions.
- .2 On exposed piping, locate insulation and cover seams in least visible locations.
- .3 Insulated dual temperature pipes or cold pipes conveying fluids below ambient temperature:
 - .1 Provide vapour barrier jackets, factory applied or field applied.
 - .2 Insulate fittings, joints, and valves with moulded insulation of like material and thickness as adjacent pipe.
 - .3 Finish with glass cloth and vapour barrier adhesive.
 - .4 PVC fitting covers may be used.
 - .5 Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations.
 - .6 Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies and expansion joints.
- .4 For insulated pipes conveying fluids above ambient temperature:
 - .1 Provide standard jackets, with or without vapour barrier, factory applied or field applied.
 - .2 Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe.
 - .3 Finish with glass cloth and adhesive.
 - .4 PVC fitting covers may be used.
 - .5 For hot piping conveying fluids 60 degrees C or less, do not insulate flanges and unions at equipment, but bevel and seal ends of insulation.
 - .6 For hot piping conveying fluids over 60 degrees C, insulate flanges and unions at equipment.
- .5 Inserts and Shields:
 - .1 Application: Piping 40 mm diameter or larger.
 - .2 Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
 - .3 Insert Location: Between support shield and piping and under the finish jacket.
 - .4 Insert Configuration: Minimum 150 mm long, of same thickness and contour as adjoining insulation; may be factory fabricated.
 - .5 Insert Material: Hydrous calcium silicate insulation or other heavy density insulating material suitable for the planned temperature range.

- .6 Finish insulation at supports, protrusions, and interruptions.
- .7 For pipe exposed in mechanical equipment rooms or in finished spaces below 3 m above finished floor, finish with PVC jacket and fitting covers.
- .8 For exterior applications, provide vapour barrier jacket. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe, and finish with glass mesh reinforced vapour barrier cement. Cover with aluminum jacket with seams located on bottom side of horizontal piping.
- .9 For buried piping, provide factory fabricated assembly with inner all-purpose service jacket with self sealing lap, and asphalt impregnated open mesh glass fabric, with 0.025 mm thick aluminum foil sandwiched between three layers of bituminous compound; outer surface faced with a polyester film.
- .10 For heat traced piping, insulate fittings, joints, and valves with insulation of like material, thickness, and finish as adjoining pipe. Size large enough to enclose pipe and heat tracer. Cover with aluminum jacket with seams located on bottom side of horizontal piping.

3.3 TOLERANCE

- .1 Substituted insulation materials: Thermal resistance within 10% at normal conditions, as materials indicated.

END OF SECTION

Section 23 09 23 Programmable Controllers

Part 1 General

1.1 SECTION INCLUDES

- .1 Programmable controllers.
- .2 Remote input/output units.
- .3 Programmer/loader unit.

1.2 REFERENCE STANDARDS

- .1 ISO 9000 Quality Management.
- .2 ISO 14000 Environmental Management.
- .3 NEMA IA 10030 Industrial control and systems - enclosures
- .4 NEMA ICS 1 Industrial control and systems - general requirements
- .5 NEMA ICS 3 Industrial control and systems - medium voltage controllers rated 2001 to 7200 V AC. (Withdrawn)

1.3 ACTION SUBMITTALS

- .1 Section 01 33 00: Submission procedures.
- .2 Shop Drawings: Indicate electrical characteristics and connection requirements, including layout of completed assemblies, interconnecting cabling, dimensions, weights, and external power requirements.
- .3 Product Data: Provide data for each component specified showing electrical characteristics and connection requirements.

1.4 CLOSEOUT SUBMITTALS

- .1 Section 01 78 00: Submission procedures.
- .2 Maintenance Contracts: Provide manufacturer's service and maintenance of programmable controllers for one (1) year from Date of Substantial Completion.
- .3 Operation and Maintenance Data:
 - .1 Include bound copies of operating and programming instructions.
 - .2 Include card replacement, adjustments, and preventative maintenance procedures and materials.
- .4 Record Documentation: Record actual locations of controller cabinets and input and output devices connected to system. Include interconnection wiring and cabling information, and terminal block layouts in controller cabinets.

1.5 QUALITY ASSURANCE

- .1 Products of This Section: Manufactured to ISO 9000 certification requirements.
- .2 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience and with service facilities within 160 km of Project.
- .3 Supplier Qualifications: Authorized distributor of specified manufacturer with minimum three (3) years documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

- .1 Section 01 61 00: Transport, handle, store, and protect products.
- .2 Accept products on site in factory containers. Inspect for damage.
- .3 Store products in clean, dry area; maintain temperature to NEMA ICS 1.

1.7 SITE CONDITIONS

- .1 Maintain area free of dirt and dust during and after installation of products.

Part 2 Products

2.1 DESCRIPTION

- .1 Regulatory Requirements:
 - .1 Provide Products listed and classified by CSA as suitable for purpose specified and indicated.

2.2 PROGRAMMABLE CONTROLLER

- .1 Description: Programmable controller manufactured to NEMA ICS 3.
- .2 Configuration:
 - .1 Processor Unit: Include processor, power supply, erasable-programmable read only memory and input/output modules.
 - .2 Remote Input/Output Unit: Include input/output modules, interface module and power supply for system inputs and outputs.
- .3 Ratings:
 - .1 Input/Output Capacity: 256.
 - .2 Scan Rate: 40 milliseconds per kilobyte.
 - .3 Digital Inputs: As required.
 - .4 Analog Inputs: As required.
 - .5 Digital Outputs: As required.
 - .6 Analog Outputs: As required.
- .4 Programming Instruction Set:
 - .1 Logic Operations: AND, OR, XOR, NOT.
 - .2 Register Operations: Store, recall.

.3 Process Control: Proportional-Integral-Derivative.

2.3 PROCESSOR UNIT

- .1 Memory Size: 512 mbs.
- .2 Storage Registers: 96.
- .3 Internal Relay Equivalents: 256 retentive; 256 non-retentive.

2.4 ENCLOSURE

- .1 Enclosure: NEMA IA 10030; Type 12.

Part 3 Execution

3.1 INSTALLATION

- .1 Install components to manufacturer's written instructions.
- .2 Do not install products until major construction is complete and building interior is enclosed and heated.
- .3 Connect input and output devices as indicated.

3.2 FIELD QUALITY CONTROL

- .1 Inspection and Testing:
 - .1 Perform operational testing on control systems to verify proper operation and field wiring connections.

3.3 CLOSEOUT ACTIVITIES

- .1 Demonstration:
 - .1 Demonstrate operation and programming of controller.
 - .2 Provide 4 hours of instruction each for two (2) persons, to be conducted at project site with manufacturer's representative. Include travel and living expenses for Owner personnel.

END OF SECTION

Section 23 09 33

Electric and Electronic Control System for HVAC

Part 1 General

1.1 SUMMARY

- .1 Section includes:
 - .1 Thermostats:
 - .1 line voltage, hot and cold;
 - .2 line voltage;
 - .3 low voltage;
 - .4 fan coil;
 - .5 thermostat guards.
 - .2 Alarms:
 - .1 low limit temperature;
 - .2 high limit temperature.
 - .3 Switches:
 - .1 flow;
 - .2 pressure.
 - .4 Power operated dampers;
 - .5 Central control cabinets;
 - .6 Motor operators:
 - .1 electric.

1.2 RELATED REQUIREMENTS

- .1 Section 25 05 00 - Common Work Results for Integrated Automation
- .2 Section 26 05 00 - Common Work Results for Electrical

1.3 DEFINITIONS

- .1 Environmental product declaration: Third-party verified documentation with the supporting product category rule and life cycle assessment information, including at least a cradle-to-gate scope. Prepared in accordance with ISO 14025, ISO 14040, ISO 14044, and EN 15804 or ISO 21930.
- .2 Industry average environmental product declaration: Developed by an industry association and represents the average product of multiple companies. Products covered by industry average environmental product declarations are required to follow the same product category rule. Industry average environmental product

declarations cannot represent a certain manufacturer or its product. Industry average environmental product declarations may be referred to as "industry-wide environmental product declarations" or "generic environmental product declarations."

- .3 Product-specific type III environmental product declaration: Provides data on one product made by one manufacturer, but can involve multiple factories. Product-specific environmental product declarations can cover a product produced by a manufacturer in several plants throughout the world if all plants use the same processes. Product-specific environmental product declarations cannot represent several products and several manufacturers.
- .4 Smart thermostat: Wi-Fi enabled thermostat that automatically adjusts heating and cooling temperatures for optimal performance.

1.4 REFERENCE STANDARDS

- .1 American Society of Heating, Refrigeration and Air Conditioning Engineers / Illuminating Engineering Society (ASHRAE/IES):
 - .1 ASHRAE Guideline 13-2024, Specifying Building Automation Systems
 - .2 ANSI/ASHRAE/IES 90.1-2013, Energy Standard for Buildings Except Low-Rise Residential Buildings
 - .3 ANSI/ASHRAE 62.1-2016, Ventilation for Acceptable Indoor Air Quality
- .2 CSA Group (CSA):
 - .1 CSA B651-18, Accessible design for the built environment
 - .2 CSA C22.2 No. 24:15, Temperature-indicating and -regulating equipment
 - .3 CSA C22.2 No. 94.2:15: Enclosures for electrical equipment, environmental considerations
- .3 European Committee for Standardization (CEN):
 - .1 EN 15804:2012+A2:2019, Sustainability of construction works. Environmental product declarations. Core rules for the product category of construction products
- .4 International Organization for Standardization (ISO):
 - .1 ISO 14025:2006, Environmental labels and declarations - Type III environmental declarations - Principles and procedures
 - .2 ISO 14040:2006, Environmental management - Life cycle assessment - Principles and framework
 - .3 ISO 14044:2006, Environmental management - Life cycle assessment - Requirements and guidelines
 - .4 ISO 14067:2018, Greenhouse gases - Carbon footprint of products - Requirements and guidelines for quantification
 - .5 ISO 21930:2017, Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products and services

1.5 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination:
 - .1 Coordinate with Section 25 05 00 - Common Work Results for Integrated Automation for management of building systems.
 - .2 Coordinate with Section 26 05 00 - Common Work Results for Electrical for requirements related to administration and execution of electrical work.

1.6 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data: Product literature and data sheets for HVAC control systems, including product characteristics, performance criteria, physical sizes, finishes, and limitations.
- .3 Shop Drawings:
 - .1 Installation layouts and details of the components and equipment and room layout and the design of the control system.

1.7 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and maintenance data:
 - .1 Include, in the operation and maintenance manual, manufacturer's maintenance and operating instructions and recommended cleaning materials and methods.

1.8 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, store, and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

Part 2 Products

2.1 PERFORMANCE/DESIGN CRITERIA

- .1 Provide electric and electronic control systems that comply with CSA C22.2 No. 24.
- .2 Provide ENERGY STAR certified smart thermostat products.
- .3 Provide controls fully compatible with heating and cooling systems.
- .4 Provide motors and controllers with the required pieces of equipment with electric wiring and connection.
- .5 Provide also variable air volume and mixing boxes with valves, dampers, controllers and required accessories for automatic function of airflow as specified by manufacturer.
- .6 Products requiring electrical connection: Listed and certified by a certification body accredited by the Standards Council of Canada or acceptable to authority having jurisdiction as suitable for purpose specified.

- .7 Controls: Easily programmable, with simple electronic set-up.
- .8 Displays: Digital, backlit.
 - .1 Internally illuminated thermostats:
 - .1 background illumination level of 50 to 100 lx;
 - .2 operating controls that are luminance (colour) contrasted with their background.
- .9 Thermostats:
 - .1 Hard wired to, and powered by, the furnace.
 - .2 Provide battery back-up to maintain programming in event of power outage.
 - .3 Include "Fan On" and "Auto" settings.
 - .4 Temperature display: Celsius.
 - .5 Electric space heaters: Provide individually-dedicated wall-mounted thermostats for each room with an electric space heater.
- .10 Ventilation controls:
 - .1 Include hygrometer and relative humidity display.
 - .2 Include maintenance indicator and mode indicators.
- .11 Setpoints and controls for cooling, heating, and ventilation shall be designed and systems' performance in accordance with the requirement of both ANSI/ASHRAE 62.1 and ANSI/ASHRAE/IES 90.1.
- .12 All controls that are exposed to outside ambient conditions shall be enclosed with the electrical code requirement and be weatherproofed.
- .13 Install controls as specified by electrical requirement in Division 26, design layouts, and with available access for maintenance and replacement in accordance with ASHRAE Guideline 13.

2.2 LINE VOLTAGE HEATING AND COOLING THERMOSTATS

- .1 Line voltage, wall-mounted thermostat, for heating and cooling with:
 - .1 Temperature setting range: 5°C to 30°C.
 - .2 Thermometer range: 5°C to 30°C.
 - .3 Differential temperature fixed at 1.1°C.

2.3 LINE VOLTAGE HEATING THERMOSTATS

- .1 Line voltage wall-mounted or integral electric heating thermostat with:
 - .1 Temperature setting range: 5°C to 30°C.
 - .2 Thermometer range: 5°C to 30°C.

2.4 LOW-VOLTAGE THERMOSTATS

- .1 Low-voltage wall thermostats:

- .1 For use on 24 V circuit at 1.5 A capacity.
- .2 With heat anticipator adjustable 0.1 to 1.2 A.
- .3 Temperature setting range: 10°C to 25°C.

2.5 FAN COIL THERMOSTATS

- .1 Line voltage fan coil heating-cooling thermostat with:
 - .1 Four-position fan switches for "Low-Medium-High-Off" fan switch.
 - .2 "Heat-Cool" switch and fan "Off" switch. Fan "Off" switch to break all circuits except heating.
 - .3 Two rocker switches for "Heat-Off-Cool" and "Low-Medium-High" fan switching. Isolate heating and cooling circuits. "Off" switch to break power to fan and thermostat.

2.6 THERMOSTAT GUARDS

- .1 Thermostat guards: Clear, with slots for air circulation to thermostat , lockable.

2.7 LOW LIMIT TEMPERATURE ALARMS

- .1 Low limit temperature alarm with:
 - .1 Sensing bulb and 6 m long capillary tube.
 - .2 Switching action: Manual.
 - .3 Temperature setting range: 0°C to 15°C.

2.8 HIGH LIMIT TEMPERATURE ALARMS

- .1 High limit temperature alarm with:
 - .1 Positive lock-out.
 - .2 Manual reset after 14°C drop-in temperature.
 - .3 Cutout setting: 50°C.

2.9 FLOW CONTROL VALVES

- .1 Provide flow control valves for modulating the flange as required in alignment with the coil for effective control.
- .2 Provide valve position indicators to show its positions as required for proper function.
- .3 These valves can be used for hydronic or steam with the selection of the material for valves as required by each fluid or operation.

2.10 FLOW SWITCHES

- .1 Flow switch for pipe size as indicated.
 - .1 Maximum liquid temperature: 121°C.
 - .2 Maximum liquid gauge pressure: 1034 kPa.

- .3 Ambient temperature range: 0°C to 82°C.

2.11 PRESSURE SWITCHES

- .1 Pressure switch for air to gauge pressure of 1034 kPa with automatic reset, contacts open on rise.
 - .1 Maximum allowable gauge pressure: 1.2 MPa.

2.12 POSITION SWITCH - SURFACE - OPERABLE OPENING

- .1 Magnetic contact, concealed, vandal resistant.

2.13 POWER OPERATED DAMPERS

- .1 Provide power operated dampers that control air passing through ducts by adjusting its position and regulating air flow. These dampers can be operated by pneumatic or electric switches that are operated by electric motor to adjust damper's blade.

2.14 ELECTRIC MOTOR OPERATORS

- .1 Provide reversible type electric motor operator modulating control of fluids or gas by positioning of valves and dampers. Since these reversible type electric control operators are used in alignment with feedback systems, the operator can monitor the position of the damper or valve and allow for real time adjustment.
- .2 Ensure the reversible type electric motor operator is suitable for modulating control operation and compatible with the control system and equipment in use. Proper installation and calibration are essential to ensure motor operates correctly and as required for the modulating function.
- .3 Electric motor operator with:
 - .1 Maximum safe air gauge pressure: 172 kPa.
 - .2 Maximum safe air temperature: 43°C.
 - .3 With junction box, two-wire control circuit, voltage as indicated.

2.15 CENTRAL CONTROL CABINETS

- .1 Construct cabinets in accordance with manufacturer's standard factory finishing, with certification that it withstands required factory testing.
- .2 Provide graphical display of data and information from a control system such as diagrams or schematics. The central control cabinet provides integrated inputs from different sensors, controllers, and devices into a single output location in order to have unified control location of multiple systems with real time monitoring and operational control.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of conditions:

- .1 Verify substrate and project conditions in accordance with Section 01 71 00 - Examination and Preparation.

3.2 INSTALLATION

- .1 Install work of this section in accordance with manufacturer's instructions and reviewed Shop Drawings.
- .2 Install control devices.
 - .1 On outside walls: Mount thermostats on brackets or insulated pads 25 mm from exterior wall.
- .3 Install thermostats at heights in accordance with CSA B651, with centre of thermostat maximum 1200 mm above finished floor.
- .4 Install thermostats centrally on a main floor interior wall away from supply air registers and ducts, and other heat emitting devices like televisions.
- .5 Heat recovery ventilator (HRV) controls: Locate main HRV control with thermostat. Install auxiliary controls in bathrooms and kitchen.
- .6 Install remote sensing devices and capillary tubes in metallic conduit. Prevent conduit enclosing capillary tubes from touching heaters or heating cables.
- .7 Install thermostat guards where thermostat is accessible by public or at risk of mechanical damage.
- .8 Verify the sequence of operations of mechanical controls is provided and is aligned with the design and integration and commissioning plan in accordance with ASHRAE Guideline 13.
- .9 Execute and optimize HVAC equipment setpoints and control settings in accordance with the designer's approach and ASHRAE Guideline 13.

3.3 CLEANING

- .1 Clean in accordance with Section 01 74 00 - Cleaning.
- .2 Waste management:
 - .1 Manage waste in accordance with Section 01 74 19 - Waste Management and Disposal.

END OF SECTION

Section 23 11 23 Facility Natural Gas Piping

Part 1 General

1.1 SUMMARY

- .1 Section Includes: materials and installation for piping, valves and fittings for gas fired equipment.

1.2 REFERENCE STANDARDS

- .1 American Society of Mechanical Engineers (ASME):
 - .1 ASME B16.5-20, Pipe Flanges and Flanged Fittings: NPS 1/2 through NPS 24, Metric/Inch Standard
 - .2 ASME B16.18-18, Cast Copper Alloy Solder Joint Pressure Fittings
 - .3 ASME B16.22-18, Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings
 - .4 ASME B18.2.1-12, Square and Hex Bolts and Screws Inch Series
- .2 ASTM International (ASTM):
 - .1 ASTM A47/A47M-99(2018)e1, Standard Specification for Ferritic Malleable Iron Castings
 - .2 ASTM A53/A53M-20, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc Coated, Welded and Seamless
 - .3 ASTM B75M-20, Standard Specification for Seamless Copper Tube Metric
 - .4 ASTM B837-19, Standard Specification for Seamless Copper Tube for Natural Gas and Liquefied Petroleum (LP) Gas Fuel Distribution Systems
- .3 CSA Group (CSA):
 - .1 CAN/CSA B149.1HB:20, Natural Gas and Propane Installation Code Handbook
 - .2 CAN/CSA B149.2:20, Propane Storage and Handling Code
 - .3 CSA W47.1:19, Certification of Companies for Fusion Welding of Steel
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS):
 - .1 Safety Data Sheets (SDS)

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:

- .1 Submit manufacturer's product literature, specifications and datasheet for piping, fittings and equipment.
- .2 Indicate on manufacturers catalogue literature following: valves.
- .3 Closeout Submittals: submit maintenance and engineering data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

Part 2 Products

2.1 PIPE

- .1 Steel pipe: to ASTM A53/A53M, Schedule 40, seamless as follows:
 - .1 NPS 1/2 to 2, screwed.
 - .2 NPS 2 1/2 and over, plain end.
- .2 Copper tube: to ASTM B837

2.2 JOINTING MATERIAL

- .1 Screwed fittings: pulverized lead paste.
- .2 Welded fittings: to CSA W47.1
- .3 Flange gaskets: non-metallic flat.
- .4 Brazing: to ASTM B837.

2.3 FITTINGS

- .1 Steel pipe fittings, screwed, flanged or welded:
 - .1 Malleable iron: screwed, banded, Class 150.
 - .2 Steel pipe flanges and flanged fittings: to ASME B16.5
 - .3 Welding: butt-welding fittings.
 - .4 Unions: malleable iron, brass to iron, ground seat, to ASTM A47/A47M
 - .5 Bolts and nuts: to ASME B18.2.1
 - .6 Nipples: schedule 40, to ASTM A53/A53M
- .2 Copper pipe fittings, screwed, flanged or soldered:
 - .1 Cast copper fittings: to ASME B16.18
 - .2 Wrought copper fittings: to ASME B16.22

2.4 VALVES

- .1 Provincial Code approved, lubricated plug type.

Part 3 Execution

3.1 PIPING

- .1 Install in accordance with Section 23 05 05 - Installation of Pipework, applicable Provincial/Territorial Codes, CAN/CSA B149.1, CAN/CSA B149.2, supplemented as specified.

- .2 Install drip points:
 - .1 At low points in piping system.
 - .2 At connections to equipment.

3.2 VALVES

- .1 Install valves with stems upright or horizontal unless otherwise approved by Consultant.
- .2 Install valves at branch take-offs to isolate pieces of equipment, and as indicated.

3.3 SITE QUALITY CONTROL

- .1 Site Tests and Inspections:
 - .1 Test system in accordance with CAN/CSA B149.1 and requirements of authorities having jurisdiction.
- .2 Obtain reports within 3 days of review and submit immediately to Consultant.
- .3 PV procedures:
 - .1 Test performance of components.

3.4 ADJUSTING

- .1 Purging: purge after pressure test in accordance with CAN/CSA B149.1.
- .2 Pre-Start-Up Inspections:
 - .1 Check vents from regulators, control valves, terminate outside building in approved location, protected against blockage, damage.
 - .2 Check gas trains, entire installation is approved by authority having jurisdiction.

3.5 CLEANING

- .1 Perform cleaning operations as specified in Section 01 74 00 - Cleaning and in accordance with manufacturer's recommendations.

END OF SECTION

Section 23 21 00 Hydronic Piping

Part 1 General

1.1 SECTION INCLUDES

- .1 Pipe and pipe fittings for:
 - .1 Heating water (and glycol) piping system.
 - .2 Equipment drains and overflows.
- .2 Valves:
 - .1 Ball valves.

1.2 RELATED REQUIREMENTS

- .1 Section 08 31 13 - Access Doors And Frames.
- .2 Section 09 91 00 - Painting.
- .3 Section 23 05 29 - Hangers and Supports for HVAC Piping and Equipment.
- .4 Section 23 05 53 - Mechanical Identification.
- .5 Section 23 05 48 - Vibration Isolation.
- .6 Section 23 07 19 - Piping Insulation.
- .7 Section 23 25 00 - Chemical Treatment for Piping: for Piping.
- .8 Section 23 82 00 - Convection Heating and Cooling Units.

1.3 REFERENCE STANDARDS

- .1 ASME Boiler and Pressure Vessel Code, Section IX Welding and Brazing Qualifications.
- .2 ASME B16.3 Malleable Iron Threaded Fittings: Classes 150 and 300.
- .3 ASME B16.18 Cast Copper Alloy Solder Joint Pressure Fittings.
- .4 ASME B16.22 Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
- .5 ASME B31.5 Refrigeration Piping and Heat Transfer Components.
- .6 ASME B31.9 Building Services Piping.
- .7 ASTM A53/A53M Standard specification for pipe, steel, black and hot-dipped, zinc-coated, welded and seamless
- .8 ASTM A234/A234M Standard specification for piping fittings of wrought carbon steel and alloy steel for moderate and high temperature service
- .9 ASTM B32 Standard specification for solder metal
- .10 ASTM B88 Standard specification for seamless copper water tube

- .11 ASTM B88M Standard specification for seamless copper water tube (metric)
- .12 ASTM D1785 Standard specification for poly(vinyl chloride) (PVC) plastic pipe, Schedules 40, 80, and 120
- .13 ASTM D2235 Standard specification for solvent cement for acrylonitrile-butadiene-styrene (ABS) plastic pipe and fittings
- .14 ASTM D2241 Standard specification for poly(vinyl chloride) (PVC) pressure-rated pipe (SDR series)
- .15 ASTM D2310 Standard classification for machine-made "fiberglass" (glass-fiber-reinforced thermosetting-resin) pipe. (Withdrawn)
- .16 ASTM D2466 Standard specification for poly(vinyl chloride) (PVC) plastic pipe fittings, Schedule 40
- .17 ASTM D2467 Standard specification for poly(vinyl chloride) (PVC) plastic pipe fittings, Schedule 80
- .18 ASTM D2680 Standard specification for acrylonitrile-butadiene-styrene (ABS) and poly(vinyl chloride) (PVC) composite sewer piping
- .19 ASTM D2683 Standard specification for socket-type polyethylene fittings for outside diameter-controlled polyethylene pipe and tubing
- .20 ASTM D2751 Standard specification for acrylonitrile-butadiene-styrene (abs) sewer pipe and fittings. (Withdrawn)
- .21 ASTM D2855 Standard practice for the two-step (primer and solvent cement) method of joining poly (vinyl chloride) (PVC) or chlorinated poly (vinyl chloride) (CPVC) pipe and piping components with tapered sockets
- .22 ASTM F477 Standard specification for elastomeric seals (gaskets) for joining plastic pipe
- .23 ASTM F708 Standard practice for design and installation of rigid pipe hangers
- .24 ASTM F876 Standard specification for crosslinked polyethylene (PEX) tubing
- .25 ASTM F877 Standard specification for crosslinked polyethylene (PEX) hot- and cold-water distribution systems
- .26 AWS A5.8M/A5.8 Specification for filler metals for brazing and braze welding
- .27 AWS D1.1/D1.1M Structural welding code - steel
- .28 AWWA C105/A21.5 Polyethylene encasement for ductile-iron pipe systems
- .29 AWWA C110/A21.10 Ductile-iron and gray-iron fittings
- .30 AWWA C111/A21.11 Rubber-gasket joints for ductile-iron pressure pipe and fittings
- .31 AWWA C151/A21.51 Ductile-iron pipe, centrifugally cast
- .32 ISO 9000 Quality Management.
- .33 ISO 14000 Environmental Management.

- .34 MSS SP-58 Pipe hangers and supports - materials, design, manufacture, selection, application, and installation

1.4 ACTION SUBMITTALS

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Include data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalogue information. Indicate valve data and ratings.

1.5 CLOSEOUT SUBMITTALS

- .1 Section 01 78 00: Submission procedures.
- .2 Maintenance Data: Include installation instructions, spare parts lists, exploded assembly views.
- .3 Record Documentation: Record actual locations of valves.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- .1 Section 01 78 23: Maintenance and extra material requirements.
- .2 Extra Stock Materials: Provide two (2) repacking kits for each size and valve type.

1.7 QUALITY ASSURANCE

- .1 Products of This Section: Manufactured to ISO 9000 certification requirements.
- .2 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience.
- .3 Installer Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience.
- .4 Welders: Certify to ASME BPVC.IX, AWS D1.1/D1.1M.

1.8 DELIVERY, STORAGE, AND HANDLING

- .1 Section 01 61 00: Transport, handle, store, and protect products.
- .2 Accept valves on site in shipping containers with labeling in place. Inspect for damage.
- .3 Provide temporary protective coating on cast iron and steel valves.
- .4 Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- .5 Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

Part 2 Products

2.1 DESCRIPTION

- .1 System Description:

- .1 Use grooved mechanical couplings and fasteners in accessible locations.
- .2 Use unions, flanges, and couplings downstream of valves and at equipment or apparatus connections. Do not use direct welded or threaded connections to valves, equipment or other apparatus.
- .3 Use non-conducting dielectric connections whenever jointing dissimilar metals in open systems.
- .4 Provide pipe hangers and supports to ASME B31.9, MSS SP-58 unless indicated otherwise.
- .5 Use ball valves for shut-off and to isolate equipment, part of systems, or vertical risers.
- .6 Use ball valves for throttling, bypass, or manual flow control services.
- .7 Use plug cocks for throttling service. Use non-lubricated plug cocks only when shut-off or isolating valves are also provided.
- .8 Use butterfly valves in heating water systems interchangeably with gate and globe valves.
- .9 Use lug end butterfly valves to isolate equipment.
- .10 Use 20 mm, ball valves with cap for drains at main shut-off valves, low points of piping, bases of vertical risers, and at equipment. Pipe to nearest floor drain.
- .2 Regulatory Requirements:
 - .1 Conform to ASME B31.9 code for installation of piping system.
 - .2 Welding Materials and Procedures: Conform to applicable provincial labour regulations.
 - .3 Provide certificate of compliance from authority having jurisdiction indicating approval of welders.

2.2 HEATING WATER [AND GLYCOL] PIPING, ABOVE GROUND

- .1 Steel Pipe: ASTM A53/A53M, Schedule 40, 10 mm wall for sizes 300 mm and over, black.
 - .1 Fittings: ASME B16.3, malleable iron or ASTM A234/A234M, forged steel welding type fittings.
 - .2 Joints: Threaded, or AWS D1.1/D1.1M, welded.

2.3 EQUIPMENT DRAINS AND OVERFLOWS

- .1 Steel Pipe: ASTM A53/A53M, Schedule 40 galvanized.
 - .1 Fittings: Galvanized cast iron, or ASME B16.3, malleable iron.
 - .2 Joints: Threaded, or grooved mechanical couplings.

2.4 UNIONS, FLANGES, AND COUPLINGS

- .1 Unions for Pipe 50 mm and Under:

- .1 Ferrous Piping: 1034 kPa malleable iron, threaded.
- .2 Copper Pipe: Bronze, soldered joints.
- .2 Flanges for Pipe Over 50 mm:
 - .1 Ferrous Piping: 1034 kPa forged steel, slip-on.
 - .2 Copper Piping: Bronze.
 - .3 Gaskets: 1.6 mm thick preformed neoprene.
- .3 Grooved and Shouldered Pipe End Couplings:
 - .1 Housing Clamps: Malleable iron galvanized to engage and lock, designed to permit some angular deflection, contraction, and expansion.
 - .2 Sealing Gasket: C-shape elastomer composition for operating temperature range from -34 degrees C to 110 degrees C.
 - .3 Accessories: Steel bolts, nuts, and washers.
- .4 Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.

2.5 BALL VALVES

- .1 Up To and Including 50 mm:
 - .1 Manufacturers:
 - .1 KITZ; Product: 58/59 Series.
 - .2 Substitutions: Refer to Section 01 25 00.
 - .2 Bronze, one (1) piece body, chrome plated brass ball, teflon seats and stuffing box ring, lever handle with balancing stops, solder ends with union.

Part 3 Execution

3.1 PREPARATION

- .1 Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- .2 Remove scale and dirt on inside and outside before assembly.
- .3 Prepare piping connections to equipment with flanges or unions.
- .4 Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.
- .5 After completion, fill, clean, and treat systems. Refer to Section 23 25 00.

3.2 INSTALLATION

- .1 Install to manufacturer's written instructions.
- .2 Install heating water, glycol, chilled water condenser water, and engine exhaust piping to ASME B31.9. Install chilled water piping to ASME B31.5.

- .3 Route piping in orderly manner, parallel to building structure, and maintain gradient.
- .4 Install piping to conserve building space, and not interfere with use of space.
- .5 Group piping whenever practical at common elevations.
- .6 Sleeve pipe passing through partitions, walls and floors.
- .7 Slope piping and arrange to drain at low points.
- .8 Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. Refer to Section 23 05 16.
- .9 Inserts:
 - .1 Provide inserts for placement in concrete formwork.
 - .2 Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
 - .3 Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 100 mm.
 - .4 Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
 - .5 Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut flush with top of slab.
- .10 Pipe Hangers and Supports:
 - .1 Install to ASTM F708, ASME B31.9.
 - .2 Support horizontal piping as scheduled.
 - .3 Install hangers to provide minimum 13 mm space between finished covering and adjacent work.
 - .4 Place hangers within 300 mm of each horizontal elbow.
 - .5 Use hangers with 38 mm minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
 - .6 Support vertical piping at every other floor. Support riser piping independently of connected horizontal piping.
 - .7 Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
 - .8 Provide copper plated hangers and supports for copper piping.
 - .9 Prime coat exposed steel hangers and supports. Refer to Section 09 91 00. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
- .11 Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings. Refer to Section 23 07 19.

- .12 Provide access where valves and fittings are not exposed. Coordinate size and location of access doors with Section 08 31 13.
- .13 Slope piping and arrange systems to drain at low points. Use eccentric reducers to maintain top of pipe level.
- .14 Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welds.
- .15 Prepare unfinished pipe, fittings, supports, and accessories, ready for finish painting. Refer to Section 09 91 00.
- .16 Install valves with stems upright or horizontal, not inverted.

END OF SECTION

Section 23 25 00 HVAC Water Treatment

Part 1 General

1.1 SECTION INCLUDES

- .1 Chemical feeder equipment.
- .2 Chemical treatment.

1.2 RELATED REQUIREMENTS

- .1 Section 23 21 00 - Hydronic Piping.

1.3 REFERENCE STANDARDS

- .1 CSA (Canadian Standards Association).
- .2 ISO 9000 Quality Management.
- .3 ISO 14000 Environmental Management.
- .4 UL (Underwriters Laboratories Inc.).

1.4 ACTION SUBMITTALS

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide chemical treatment materials, chemicals, and equipment including electrical characteristics and connection requirements.
- .3 Product Data: Provide chemical treatment materials, chemicals, and equipment.

1.5 CLOSEOUT SUBMITTALS

- .1 Section 01 78 00: Submission procedures.
- .2 Record Documentation: Record actual locations of equipment and piping, including sampling points and location of chemical injectors.
- .3 Operation and Maintenance Data: Include data on chemical feed pumps, agitators, and other equipment including spare parts lists, procedures, and treatment programs. Include step by step instructions on test procedures including target concentrations.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- .1 Section 01 78 23: Maintenance and extra material requirements.
- .2 Extra Stock Materials: Provide sufficient chemicals for treatment and testing during warranty period.

1.7 QUALITY ASSURANCE

- .1 Products of This Section: Manufactured to ISO 9000 certification requirements.

- .2 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience. Company to have local representatives with water analysis laboratories and full time service personnel.
- .3 Installer Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience and approved by the manufacturer.

1.8 REGULATORY REQUIREMENTS

- .1 Conform to applicable code for addition of non-potable chemicals to building mechanical systems, and for to public sewage systems.

Part 2 Products

2.1 MATERIALS

- .1 Closed System Treatment (Water):
 - .1 Sequestering agent to reduce deposits and adjust pH; polyphosphate.
 - .2 Corrosion Inhibitors: Liquid boron-nitrite, sodium nitrite and borax, sodium tolyltriazole, low molecular weight polymers, phosphonates, sodium molybdate, or sulphites.
 - .3 Conductivity Enhancers: Phosphates or phosphonates.

2.2 BY-PASS (POT) FEEDER

- .1 Manufacturers:
 - .1 General Filtration; Product: Chemical Bypass Pot Feeder.
 - .2 Substitutions: Refer to Section 01 25 00.
- .2 By-Pass (Pot) Feeder: 7.57-L (2-USgal) quick opening cap for working pressure of 2068-kPa (300-psi).

2.3 CARTRIDGE FILTER HOUSING

- .1 Maximum flow rate through filter up to 0.63-L/s (10-GPM):
 - .1 Construction:
 - .1 Head: Cast iron.
 - .2 Body: 304 stainless steel.
 - .3 Center Post and Nut: Carbon steel.
 - .4 Head Gasket: Buna-N.
 - .5 Cap Nut Gasket: PTFE.
 - .2 Ratings:
 - .1 Maximum Operating Temperature: 93°C (200°F).
 - .2 Maximum Operating Pressure: 1207-kPa (175-psi).
 - .3 Manufacturers:

- .1 General Filtration; Product: GFO Series.
- .2 Maximum flow rate through filter greater than 0.63-L/s (10-GPM) and up to 5.05-L/s (80-GPM):
 - .1 Construction:
 - .1 Head and Body: Carbon steel.
 - .2 Centre Post: Carbon steel.
 - .3 Cover O-Ring: Buna-N.
 - .2 Ratings:
 - .1 Maximum Operating Temperature: 121°C (250°F).
 - .2 Maximum Operating Pressure: 1034-kPa (150-psi) standard, 2068-kPa (300-psi) optional.
 - .3 Manufacturers:
 - .1 General Filtration; Product: GFC Series.
 - .2 Substitutions: Refer to Section 01 25 00.

2.4 CARTRIDGE FILTER

- .1 Manufacturers:
 - .1 General Filtration; Product: Viper Series.
 - .2 Substitutions: Refer to Section 01 25 00.
- .2 Features:
 - .1 String wound.
 - .2 Removal ratings available from 0.5-micron to 150-micron.
 - .3 Cartridge lengths available from 248-mm (9.75-in) to 1016-mm (40-in).
 - .4 Filter media available in polypropylene, premium polypropylene, cotton, premium cotton, rayon, and fibreglass.
 - .5 Core material available in polypropylene, tin, 304 stainless steel, 316 stainless steel.

2.5 TEST EQUIPMENT

- .1 Provide white enamel test cabinet with local and fluorescent light, capable of accommodating 0.135 to 0.338 ml zeroing titrating burettes and associated reagents.
- .2 Provide the following test kits:
 - .1 Alkalinity titration test kit.
 - .2 Chloride titration test kit.
 - .3 Sulphite titration test kit.
 - .4 Total hardness titration test kit.

- .5 Low phosphate test kit.
- .6 Conductivity bridge, range 0 - 10,000 microhms.
- .7 Creosol red pH slide complete with reagent.
- .8 Portable electronic conductivity meter.
- .9 High nitrite test kit.

Part 3 Execution

3.1 PREPARATION

- .1 Systems to be operational, filled, started, and vented prior to cleaning. Use water meter to record capacity in each system.
- .2 Place terminal control valves in open position during cleaning.
- .3 Verify that electric power is available and of the correct characteristics.

3.2 CLEANING SEQUENCE

- .1 Concentration:
 - .1 As recommended by manufacturer.
 - .2 1 kg per 1000 L of water contained in the system.
 - .3 1 kg per 1000 L of water for hot systems and 1 kg per 500 L of water for cold systems.
 - .4 Fill steam boilers only with cleaner and water.
- .2 Hot Water Heating Systems:
 - .1 Apply heat while circulating, slowly raising temperature to 71 degrees C and maintain for twelve (12) hours minimum.
 - .2 Remove heat and circulate to 37.8 degrees C or less; drain systems as quickly as possible and refill with clean water.
 - .3 Circulate for six (6) hours at design temperatures, then drain.
 - .4 Refill with clean water and repeat until system cleaner is removed.
- .3 Use neutralizer agents on recommendation of system cleaner supplier and approval of Consultant.
- .4 Flush open systems and glycol filled closed systems with clean water for one (1) hour minimum. Drain completely and refill.
- .5 Remove, clean, and replace strainer screens.
- .6 Inspect, remove sludge, and flush low points with clean water after cleaning process is completed. Include disassembly of components as required.

3.3 INSTALLATION

- .1 Install to manufacturer's written instructions.

3.4 CLOSED SYSTEM TREATMENT

- .1 Provide one bypass feeder on each system. Install isolating and drain valves and necessary piping. Install around balancing valve downstream of circulating pumps unless indicated otherwise.
- .2 Introduce closed system treatment through bypass feeder when required or indicated by test.
- .3 Provide 19 mm water coupon rack around circulating pumps with space for twelve (12) test specimens.

END OF SECTION

Section 23 82 00

Convection Heating and Cooling Units

Part 1 General

1.1 SECTION INCLUDES

- .1 Air Curtain.

1.2 RELATED REQUIREMENTS

- .1 Section 23 21 00 - Hydronic Piping.
- .2 Section 26 05 83 - Equipment Wiring.

1.3 REFERENCE STANDARDS

- .1 CSA (Canadian Standards Association).
- .2 ISO 9000 Quality Management.
- .3 ISO 14000 Environmental Management.
- .4 UL (Underwriters Laboratories Inc.).

1.4 ACTION SUBMITTALS

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide typical catalogue of information including arrangements.

1.5 CLOSEOUT SUBMITTALS

- .1 Section 01 78 00: Submission procedures.
- .2 Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, installation instructions, maintenance and repair data, and parts listings.
- .3 Warranty Documentation: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- .4 Record Documentation: Record actual locations of components and locations of access doors in radiation cabinets required for access or valving.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- .1 Section 01 78 23: Maintenance and extra material requirements.
- .2 Extra Stock Materials: Provide two (2), sets of filters.

1.7 QUALITY ASSURANCE

- .1 Products of This Section: Manufactured to ISO 9000 certification requirements.
- .2 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience.

1.8 WARRANTY

- .1 Section 01 78 00: Warranties.
- .2 Provide five (5) year manufacturer's warranty for fan-coil unit motor.

Part 2 Products

2.1 DESCRIPTION

- .1 Regulatory Requirements:
 - .1 Products Requiring Electrical Connection: Listed and classified by CSA as suitable for the purpose specified and indicated.

2.2 AIR CURTAIN

- .1 Manufacturers:
 - .1 Berner Air Curtains; Product: Architectural Recessed 12, Hot Water Heated Air Curtain.
 - .2 Substitutions: Refer to Section 01 25 00.
- .2 Features:
 - .1 High efficiency, low noise nozzle.
 - .2 Factory installed coil.
 - .3 Washable filter.
- .3 Construction:
 - .1 Cabinet: Minimum 16-gauge aluminized steel.
 - .2 Coil: Galvanized steel casing, copper tube, aluminum fins, copper headers.
 - .3 Fan Wheels and Housings: Galvanized steel.
- .4 Fans:
 - .1 Balanced forward curved type.
 - .2 Double inlet.
 - .3 Aerodynamically formed air inlet venturis.
- .5 Motor:
 - .1 Ten speed 0.5-hp AC motor.
 - .2 Single-phase.
 - .3 ODP.
 - .4 Direct drive.
 - .5 Internal thermal-overload protection.
 - .6 Permanently lubricated sealed ball bearings.
- .6 Controls:

- .1 Digital controller with touchscreen interface.
- .7 Options:
 - .1 BACnet IP, BACnet MS/TP, Modbus RTU, and Modbus TCP communications.
 - .2 Bottom panel finish: custom color or stainless steel.

Part 3 Execution

3.1 INSTALLATION

- .1 Install to manufacturer's written instructions.
- .2 Install equipment exposed to finished areas after walls and ceiling are finished and painted. Avoid damage.
- .3 Protection: Provide finished cabinet units with protective covers during balance of construction.
- .4 Fan-Coil Units: Install as indicated. Coordinate to assure correct recess size for recessed units.
- .5 Hydronic Units: Provide with shut-off valve on supply and lockshield balancing valve on return piping. If not easily accessible, extend vent to exterior surface of cabinet for easy servicing. For cabinet unit heaters, fan coil units, and unit heaters, provide float operated automatic air vents with stop valve.

3.2 CLEANING

- .1 Section 01 74 10: Cleaning installed work.
- .2 After construction is completed, including painting, clean exposed surfaces of units. Vacuum clean coils and inside of cabinets.
- .3 Touch-up marred or scratched surfaces of factory-finished cabinets, using finish materials provided by manufacturer.
- .4 Install new filters.

END OF SECTION

Section 25 05 00

Common Work Results for Integrated Automation

Part 1 General

1.1 SUMMARY

- .1 Section Includes:
 - .1 Common work results and general provisions to establish a fully operational integrated automation system dedicated for the control, supervision, and management of building systems.
 - .2 Common requirements to Division 25, including:
 - .1 Submittal procedures required to conduct a review of integrated automation as a whole.
 - .2 Coordination activities for systems and equipment that forms the integrated automation system.
 - .3 Common product requirements that apply to the entire integrated automation installation.
 - .4 Quality assurance requirements and procedures.
 - .5 Demonstration and training requirements for the integrated automation system as a whole.
 - .6 Requirements and procedures for closeout documents and operation and maintenance (O&M) manuals, related to integrated automation and other systems interfaced.

1.2 DEFINITIONS

- .1 Master Systems Integrator: Specialist responsible for coordinating and executing the integration work required for the integrated automation system. Responsibilities include coordinating interfaces between equipment, managing network and connection requirements, supervising devices/systems interconnections, and overseeing the overall integration process.
- .2 Point: May be logical or physical.
 - .1 Logical points: Values computed by the system such as setpoints, totals, counts, and derived corrections. Includes results of statements in control descriptive logic.
 - .2 Physical points: Inputs or outputs connected to hardware wired to controllers. These inputs measure physical properties or provide status conditions of contacts or relays, facilitating interaction with related equipment, such as starting or stopping, and valve or damper actuators.

1.3 REFERENCE STANDARDS

- .1 American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE):
 - .1 ANSI/ASHRAE 135-2020, BACnet – A Data Communication Protocol for Building Automation and Control Networks
- .2 Electrical and Electronic Manufacturers Association (EEMAC):
 - .1 EEMAC 2Y-1-1958, Light Grey Colour for Indoor Switch Gear
- .3 ULC Standards (ULC):
 - .1 CAN/ULC-S102.4:2017, Standard Method of Test for Fire and Smoke Characteristics of Electrical Wiring, Cables and Non-Metallic Raceways
- .4 COM EMCS Master Spec: City of Mississauga Master Specifications for Energy Management Control Systems

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Appoint an MSI to be responsible for administrative requirements specified in this section.
- .2 Coordination:
 - .1 Coordinate integration of components, equipment, software, applications, and third-party systems to meet the functionalities of the integrated automation system.
 - .2 Coordinate engagement of Subcontractors, manufacturers, and suppliers in:
 - .1 Verifying work conforms to the established integration standards.
 - .2 Reviewing submittals and installation requirements for system interfaces.
 - .3 Assisting testing and demonstration activities related to their work.
- .3 Integrated Automation Meetings: Arrange meetings to be attended by Consultant, Owner's Representative, and affected Subcontractors to:
 - .1 Coordination of integration:
 - .1 Review and coordinate equipment controls and interface requirements for integration with systems provided under Division 25.
 - .2 Before starting work:
 - .1 Review mock-up requirements.
 - .2 Review manufacturer literature and installation manuals related to systems, components, and equipment provided with built-in controls and interfaces.

- .3 Coordinate and review network requirements, including network performance, data communication protocols used, location of connection points, and network security policies.
- .3 During execution of work but before start of commissioning activities:
 - .1 Debug issues related to systems integration.
 - .2 Review as-built records and final integration configuration/settings.
- .4 Sequencing:
 - .1 Integrated systems: Test integrated systems only after testing for each individual system forming part of the integrated automation system has been completed.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with COM EMCS Master Spec 25 05 02.
- .2 Product Data: Product literature and data sheets, including product characteristics, performance criteria, and limitations for:
 - .1 Submit product data for:
 - .1 Main system architecture components: Servers, workstations, operator interfaces, and related software.
 - .2 Instrumentation: Field instrumentation and control devices, actuators and operators, smart sensors, metering systems, and accessories.
 - .3 Networking equipment.
 - .2 Submit with the related Shop Drawings for verification of compliance with the Specifications.
- .3 Shop Drawings:
 - .1 Preliminary Shop Drawings:
 - .1 Review critical products proposed for integrated automation and establish conformance with overall design philosophy, system performance, and capabilities.
 - .2 Submit preliminary Shop Drawings within 10 Working Days of award of Contract. Include:
 - .1 Product data and certificates of proposed building automation controllers, as specified in COM EMCS Master Spec Section 25 30 01 – Building Automation Controllers.
 - .2 Product data and certificates of proposed software and applications for the centralized BMS, as specified in COM EMCS Master Spec Section 25 30 01 – Building Automation Controllers.
 - .3 Sketch of site-specific system architecture.
 - .4 Description of software programs provided.

- .2 Detailed Shop Drawings:
 - .1 Submit Detailed Shop Drawings within 30 Working Days after award of Contract and before start of installation.
 - .1 Include corrected and updated versions of submissions made during preliminary review.
 - .2 System architecture diagram: Submit detailed network architecture diagram showing all main components, control devices, and communication links of the integrated automation.
 - .1 Include:
 - .1 Components forming the centralized BMS, such as servers, operator workstation (OWS), operator interfaces, and data storage systems.
 - .2 Building automation controllers.
 - .3 Third-party control devices and interfaces.
 - .4 Network equipment.
 - .5 Communication links to show primary Ethernet transmission control protocol/internet protocol (TCP/IP) links and secondary buses. For each link, indicate data communication protocol used and cable type.
 - .3 Floor plans: Indicate locations of controllers, auxiliary control cabinets, components of the centralized BMS, and network equipment.
 - .1 Show cable routings for power supply network and indicate locations of local distribution panels and transformers.
 - .4 Equipment Schedules:
 - .1 Control valves: Schedule listing with designation, service, manufacturer, model, point ID, design flow rate, design pressure drop, valve's flow coefficient (Cv) (required and actual), valve size, spring range, pilot range, torque (required and actual), close-off pressure (required and actual), and actuator details.
 - .2 Damper actuators: Schedule listing with designation, manufacturer, model, point ID, associated system ID, damper assembly dimensions, damper blade type, design airflow rate, normal position, spring requirements, torque (required and actual), power supply, and control signal type.
 - .3 Flow measuring stations: Schedule listing with designation, service, point ID, manufacturer, model, size, velocity at design flow rate, and operational range of transmitters.

- .5 Building Controller Schedules: Points list indicating all points associated with each controller.
 - .1 Include:
 - .1 Point name, point ID, point description, sensor/transmitter type and range, signal type, and wiring termination details.
 - .2 Spare point capacity of each controller by number and type.
- .6 Control schematics: For each building system or equipment under control of the integrated automation system.
 - .1 Include:
 - .1 System schematic (for example, ventilation/hydronic diagram) showing location of instrumentation, control devices, and system interface complete with point name and ID.
 - .2 Wiring diagrams.
 - .3 Interface wiring diagrams showing termination connections and signal levels for equipment supplied by other Divisions.
- .7 Sequences of operation: For each control schematic in narrative format. Include description of automatic control required to achieve proper operation under normal conditions, on alarm detection, during a power failure, a fire alarm condition, and under complete failure of building automation controller.
 - .1 Include software and programming details such as time of day schedules, setpoints, and alarm limits (high and low, critical or non-critical).
 - .2 Cross-reference sequences of operation with control schematics, using the same point IDs and point names.
- .8 Electrical system: Submit conduit layout for system wiring.
- .4 Test and Evaluation Reports:
 - .1 Existing products intended for reuse: Test report within 40 Working Days of award of Contract listing each component to be reused and indicating whether it is in good conditions or requires repair.
- .5 Manufacturer's Instructions:
 - .1 Special delivery, storage, and handling requirements.
 - .2 Installation instructions.
 - .3 Recommended sequencing.

- .6 Material Delivery Schedule: In accordance with [Section 01 32 16.16 - Construction Progress Schedule - Critical Path Method (CPM)][Section 01 32 16.19 - Construction Progress Schedule - Bar (Gantt) Chart].
 - .1 Submit within 2 weeks of award of Contract.
- .7 Training Program:
 - .1 Proposed training program and materials as specified in TRAINING in this section.
 - .2 Training agenda detailing hour-by-hour schedule and including brief content overview of each segment:
 - .1 List name of trainers and participants from project team, including the Consultant.
 - .1 The Owner will provide a list of participants that will attend training.
 - .2 Indicate type of visual and audio aids to be used during training.
 - .3 Indicate coordinated interface with other mechanical and electrical training programs.
 - .4 Submit minimum 30 days before beginning of training.
 - .3 Submit training completion report within [1] week after completion of complete training program stating satisfactorily training completion.

1.6 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with COM EMCS Master Spec Section 01 77 00 – Closeout Procedures.
 - .1 Submit minimum 2 weeks before beginning training.
- .2 Operation and Maintenance Data:
 - .1 Include, in the operation and maintenance manual, manufacturer's maintenance and operating instructions.
 - .2 Use concise language and common terminology of functional and operational requirements of system, for clear understanding by operating personnel. Assume readers to have basic working knowledge of computers, electronics, or in-depth control theory.
 - .3 Include information related to systems forming the integrated automation system and subjects referred to in this section.
 - .1 Indicate name, address, and telephone number of each Subcontractor involved in the equipment installation and local representative for each item of equipment and system.
 - .4 Functional description to include:
 - .1 system operation;
 - .2 design philosophy and specific functions and systems;

- .3 detailed data communication procedures, including data protocols used, data processing and data link components, interfaces, integration equipment, and procedures for checking data link integrity;
- .4 detailed hardware and software functions, interfaces, and requirements for components in functions and operating modes; and
- .5 detailed procedures for human-machine interactions (HMI) required to supplement system description, known or established constraints on system operation, operation sequences, and operating procedures currently implemented or planned for implementation in automatic mode.
- .5 System operation description to include:
 - .1 detailed step-by-step procedures for system operation, including required actions at each interface (servers, OWS, HMI);
 - .2 operation of computer peripherals, input and output formats;
 - .3 emergency, alarm, and failure recovery procedures and actions; and
 - .4 step-by-step instructions for start-up, back-up equipment operation, execution of systems functions, and operating modes. Include keystrokes for each command, allowing to easily reference the required keystrokes to call up display or to input command.
- .6 Software description to include:
 - .1 software requirements and capabilities;
 - .2 data required for modification, relocation, reprogramming, and new and existing software modules to respond to changing system functional requirements without disrupting normal operation;
 - .3 comprehensive program cross-reference, including linking, data exchange, and data file requirements, necessary subroutine lists, and other essential information for loading, integrating, interfacing, and program execution;
 - .4 software for each controller, including a summary for controller common parameters and functions; and
 - .5 requirements for software updates, security patches and recommended update intervals, and software maintenance schedule.
- .7 Maintenance procedures to include:
 - .1 document procedures for inspection, periodic preventive maintenance, fault diagnosis, and repair or replacement of defective components;

- .2 calibration, maintenance, and repair of sensors, transmitters, transducers, controllers, and interface firmware; and
 - .3 diagnostics and repair or replacement of system hardware.
 - .8 System configuration to include:
 - .1 provisions and procedures for planning, implementing, and recording hardware and software modifications required during operating lifetime of system; and
 - .2 information for coordination of hardware and software changes, data link or message format/content changes, and sensor or control changes in event that system modifications are required.
- .3 Record Documentation:
 - .1 Submit updated version of documents generated during the detailed Shop Drawing review. Include:
 - .1 modifications made to installation, system configuration, control devices, and operation sequences through the course of the Project:
 - .1 change orders and other modifications to Contract;
 - .2 modifications to interface wiring;
 - .3 changes to cable routing and equipment location;
 - .4 changes made during commissioning process to meet the required performance;
 - .2 listing of alarm messages;
 - .3 Control Panel Schedule showing power source used. Indicate local distribution panel ID, circuit number, and source type (normal, emergency, or uninterruptible power supply (UPS));
 - .4 complete system control descriptive logics (CDLs) and include English explanations on same sheet, in different font and italics. Indicate specified energy optimization programs.
 - .5 Record important settings and parameters configured during construction progress such as minimum damper positions and supply air static pressure setpoints.
- .4 Certificates and Test Reports:
 - .1 Test procedures and reports: Provide records of start-up procedures, test procedures, checkout tests, and final commissioning reports as specified in COM EMCS Master Spec Section 25 01 11 - Commissioning of Integrated Automation.
 - .2 Calibration certificates for metering systems and equipment.

Part 2 Products

2.1 DESCRIPTION

- .1 Work covered in Division 25 provides a fully operational integrated automation system and a unified automation environment designed to consolidate various automation systems, control devices, software, and applications to promote data exchange, data collection, and optimization of building operations.
- .2 The integrated automation system, as a whole, consists of components that control and manage building systems. This system includes products specified in Division 25, COM EMCS Master Spec and third-party components described in other Divisions, consisting of:
 - .1 Building controllers: Network of building automation controllers as specified in COM EMCS Master Spec Section 25 30 01 00 – Building Automation Controllers.
 - .2 Field instrumentation and control devices as specified in COM EMCS Master Spec Section 25 30 02 – Integrated Automation Instrumentation and Terminal Devices.
 - .3 Centralized BMS: Software-based platform to provide a user interface for integrated automation.
 - .4 Servers, operator workstations, operator interfaces, and database storage to support the centralized BMS.
 - .5 Interface of third-party systems and components.
 - .6 Network infrastructure to support integrated automation.
 - .7 Data analytics software.

2.2 PERFORMANCE/DESIGN CRITERIA

- .1 Design Criteria:
 - .1 Equip each system or component interfaced to the integrated automation system with the necessary hardware and software to operate independently and perform their basic control functions.
 - .1 Building automation controllers perform direct control and supervision of selected systems and equipment.
 - .2 Supply third-party systems and components with built-in controls and interface to allow the integrated automation system to poll data and modify control functions and settings.
 - .3 Use data exchange for data collection, to perform optimization control and display system data at user interfaces.
 - .2 The integrated automation environment prioritizes the use of internet protocol (IP) communications to enable data exchange between system components (communications at system level) and data exchange between systems (cross-system communications).

- .1 Perform communication at other levels (secondary buses) through integration panels, building automation controllers equipped with router or gateway functions.
 - .2 Perform exchange between software through the centralized BMS by using a database interface such as an application programming interface (API).
 - .2 Provide equipment, components, and software specifically developed to operate in accordance with ANSI/ASHRAE 135. Prioritize products that use communication interfaces that conform with the Ethernet standard, the IP protocol suite, and BACnet/IP in accordance with ANSI/ASHRAE 135, Annex J.
 - .3 System Database:
 - .1 Integrated automation relies on the centralized BMS to host the system database. System data (for example, control points, historical data, parameters) must reside in a SQL based database as specified in Section 25 45 00 – Centralized Building Management System.
 - .2 Data exchange with other software applications, at an enterprise-level, is possible through the system database using a connector tool such as the following APIs:
 - .1 Microsoft Open Database Connectivity (ODBC); or
 - .2 Java Database Connectivity (JDBC).
 - .4 Language Operating Requirements: Provide text in English.
 - .1 Graphic terminal displays: Use non-linguistic symbols for displays on graphic terminals whenever possible.
 - .2 Operating system executive: Provide primary hardware-to-software interface as part of hardware purchase, with associated documentation in English.
 - .3 System manager software: Include system definition point database, additions, deletions or modifications, control loop statements, use of high-level programming languages, report generator utility, and other operating system utilities necessary for maintaining optimal operating efficiency.
 - .4 Input and output commands: Input and output commands and messages from operator-initiated functions as defined in CDL's or assigned limits (such as commands relating to day-to-day operating functions and not to system modifications, additions, or logic redefinitions).
 - .5 Graphic "display" functions, point commands to turn systems on/off, and manual overrides of automatic control for specified hardware points to be available in English at specified OWS.
 - .1 System to be able to operate one terminal in English and another in French simultaneously.
 - .2 Provide point name expansions in both languages.

- .6 Reporting function such as trend log, trend graphics, alarm report logs, energy report logs, and maintenance generated logs.
- .5 Electrical:
 - .1 Provide complete conduit system for system wiring.
 - .1 Provide separate conduit systems for line-voltage power wiring and for instrumentation and communication wiring.
 - .2 Conduit sizes to suit wiring requirements and to allow for future expansion capabilities specified for systems.
 - .3 Conduit fill: Maximum of 40%.
 - .2 Provide utility power and emergency power to components of the integrated automation system from dedicated circuits in local distribution panels as indicated on Drawings.
 - .3 Provide power from local UPS distribution panels for selected components as indicated in Division 25.
 - .4 Power supply and conditioning equipment: Provide all transformers, DC power supplies, and low voltage power networks required to power local controllers, field instrumentation, and control devices.
 - .1 Power supplies complete with over-voltage protection module and sized for two times the connected load.

2.3 WIRING

- .1 70 V and Above: Copper conductors in accordance with Division 26.
- .2 Under 70V: Use FT6-rated wiring where wiring is not run in conduit, and FT4-wiring in other cases, in accordance with CAN/ULC-S102.4.
- .3 Sizes:
 - .1 120 V power supply: Match or exceed the current rating of the breaker.
 - .1 Minimum wire size: #12 AWG.
 - .2 Wiring for safeties and interlocks: For starters and motor control centres.
 - .1 Minimum wire size: #12 AWG.
 - .3 Field wiring: Shielded wire.
 - .1 Minimum wire size: #18 AWG solid copper.
 - .4 Power loss through conductor not to exceed 5%.
- .4 Colour coding and cable jacket colours: In accordance with Section 25 05 53 – Identification for Integrated Automation.

2.4 SOURCE QUALITY CONTROL

- .1 Provide equipment and material from manufacturer's regular production, CSA certified, and manufactured to specified standards and requirements.

- .2 Where CSA certified equipment is not available, submit equipment to AHJ for special inspection and approval before delivery to site.
- .3 Submit proof of compliance to specified standards with Shop Drawings and product data. Label or listing of specified organization is acceptable evidence.
- .4 Provide calibration certificates for products that require certificates after production or when installed and started-up at the site.
- .5 If the original documentation cannot be provided, submit certificate from testing organization, acceptable to the Consultant, certifying that item was tested in accordance with their test methods and conforms to their standards and codes.
- .6 For material not regulated by the organization's own listing or labeling, provide a certificate stating that the material complies with the applicable reference standards, specifications, and codes specified in Section 01 41 00 – Regulatory Requirements.

Part 3 Execution

3.1 INSTALLATION

- .1 Install and configure components in accordance with manufacturer's recommendations.
- .2 Install equipment and components so that manufacturers and CSA labels are visible and legible after commissioning is complete.
- .3 Electrical:
 - .1 Install electrical components in accordance with requirements in Division 26.
 - .2 Modify existing starters to provide integrated automation control as indicated on the Drawings. Refer to electrical control schematics included as part of control schematics [on the Drawings].
 - .3 Terminate wires with screw terminal type connectors suitable for wire size and number of terminations.
 - .4 Provide grounding for the integrated automation installation and components in accordance with Division 26 requirements.
 - .5 Wiring in conduits:
 - .1 Install all wiring in electrical metallic tubing (EMT) conduit.
 - .2 To be continuous without joints.
 - .3 Install conduits parallel or perpendicular to building lines to conserve headroom and minimize interference.
 - .4 Avoid running exposed conduits in normally occupied spaces unless impossible to do otherwise.
 - .1 When impossible to do otherwise, obtain written authorization from the Consultant before starting work.

- .2 Enclose wiring in conduit in mechanical and service rooms, as well as any exposed wiring.
- .6 Wiring outside conduits:
 - .1 FT6 plenum-rated wiring may run without conduits in accessible ceiling space to connect building controllers and their components. This includes wiring for:
 - .1 low-voltage power supply and communication links; or
 - .2 field instrumentation, operators, and actuators.
 - .2 Run wiring parallel or perpendicular to building lines. Secure wiring with cable supports every 2 m.
 - .1 Cable supports: Reconfigurable system such as telecommunications hooks. Avoid using tape or tie-wraps.
 - .3 Wiring to be continuous without joints.
 - .4 Fix cable supports to building structure. Avoid attaching wiring to building systems, such as electrical conduits, ductwork, piping, or their associated hangers.
 - .5 For wall-mounted components, run wiring in conduit inside the wall and up to the ceiling space. At the end of the conduit, install a plastic ring to protect wiring against abrasion.
- .7 Identify conduits and wiring in accordance with Section 25 05 53 – Identification for Integrated Automation.

3.2 PROGRAMMING AND CONFIGURATION

- .1 All programming performed in Division 25 to be self-documenting.
- .2 Programs of similar systems to be standardized and follow a common structure.
- .3 The Consultant has the right to revise the sequence or subsequent CDL before software finalization without incurring additional costs.
- .4 Configuration Standards:
 - .1 Configure systems and components forming part of the integrated automation in accordance with Section 25 25 00 – Integrated Automation Interoperability Requirements. Follow requirements for:
 - .1 object naming and tagging;
 - .2 device naming and addressing;
 - .3 Data sharing properties;
 - .4 trending configuration; and
 - .5 alarm/event management.
- .5 Record Documentation: Enter soft copy submission of O&M manuals and record documentation at each server and OWS.

3.3 PAINTING

- .1 Paint in accordance with Section 09 91 23 - Interior Painting, and:
 - .1 Clean and touch up damaged or scratched surfaces of factory-finished equipment to match original finish.
 - .2 Restore extensively damaged finished surfaces to be primed and touched up.
 - .3 Clean and prime exposed hangers, racks, fastenings, and other support components.
 - .4 Paint unfinished equipment installed indoors in accordance with EEMAC 2Y-1.

3.4 ADJUSTING

- .1 Corrections: Provide equipment, materials, and labour as required to correct installation or equipment deficiencies identified through the commissioning process.

END OF SECTION

Section 26 05 00 Common Work Results for Electrical

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 22 05 00 - Common Work Results for Plumbing.
- .2 Section 23 05 00 - Common Work Results for HVAC.
- .3 Section 23 09 33 - Electric and Electronic Control System for HVAC.
- .4 Section 26 28 13.01 - Fuses - Low Voltage.
- .5 Section 26 28 23 - Disconnect Switches - Fused and Non-Fused.
- .6 Section 26 29 10 - Motor Starters to 600 V.

1.2 DEFINITIONS

- .1 Electrical and electronic terms: unless otherwise specified or indicated, terms used in these specifications, and on drawings, are those defined by IEEE SP1122.

1.3 REFERENCE STANDARDS

- .1 Canada Green Building Council (CaGBC)
 - .1 LEED Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations (including Addendum 2007).
 - .2 LEED Canada-CI Version 1.0-2007, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide For Commercial Interiors.
 - .3 LEED Canada 2009 for Design and Construction-2010, LEED Canada 2009 for Design and Construction Leadership in Energy and Environmental Design Green Building Rating System Reference Guide.
 - .4 LEED Canada for Existing Buildings, Operations and Maintenance-2009, LEED Canada 2009 Leadership In Energy and Environmental Design Green Building Rating System Reference Guide.
- .2 CSA Group
 - .1 CSA C22.1-12, Canadian Electrical Code, Part 1 (22nd Edition), Safety Standard for Electrical Installations.
 - .2 CSA C22.2.
 - .3 CAN/CSA-C22.3 No.1-10, Overhead Systems.

- .4 CAN3-C235-83(R2010), Preferred Voltage Levels for AC Systems, 0 to 50,000 V.
- .3 Institute of Electrical and Electronics (IEEE)/National Electrical Safety Code Product Line (NESC)
 - .1 IEEE SP1122-2000, The Authoritative Dictionary of IEEE Standards Terms, 7th Edition.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for equipment and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Submit for review single line electrical diagrams under plexiglass and locate as follows.
 - .1 Electrical distribution system in main electrical room.
- .4 Certificates:
 - .1 Provide CSA certified equipment and material.
 - .2 Where CSA certified equipment and material is not available, submit such equipment and material to authority having jurisdiction for special approval before delivery to site.
 - .3 Submit test results of installed electrical systems and instrumentation.
 - .4 Permits and fees: in accordance with General Conditions of contract.
 - .5 Submit, upon completion of Work, load balance report as described in PART 3 - LOAD BALANCE.
 - .6 Submit certificate of acceptance from authority having jurisdiction upon completion of Work to Consultant.
- .5 Manufacturer's Field Reports: submit to Consultant manufacturer's written report, within 3 days of review, verifying compliance of Work and electrical system and instrumentation testing, as described in PART 3 - FIELD QUALITY CONTROL.

1.5 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for equipment for incorporation into manual.
 - .1 Provide for each system and principal item of equipment as specified in technical sections for use by operation and maintenance personnel.
 - .2 Operating instructions to include following:
 - .1 Wiring diagrams, control diagrams, and control sequence for each principal system and item of equipment.

- .2 Start up, proper adjustment, operating, lubrication, and shutdown procedures.
- .3 Safety precautions.
- .4 Procedures to be followed in event of equipment failure.
- .5 Other items of instruction as recommended by manufacturer of each system or item of equipment.
- .3 Print or engrave operating instructions and frame under glass or in approved laminated plastic.
- .4 Post instructions where directed.
- .5 For operating instructions exposed to weather, provide weather-resistant materials or weatherproof enclosures.
- .6 Ensure operating instructions will not fade when exposed to sunlight and are secured to prevent easy removal or peeling.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect products from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 DESIGN REQUIREMENTS

- .1 Operating voltages: to CAN3-C235
- .2 Motors, electric heating, control and distribution devices and equipment to operate satisfactorily at 60 Hz within normal operating limits established by above standard.
 - .1 Equipment to operate in extreme operating conditions established in above standard without damage to equipment.
- .3 Language operating requirements: provide identification nameplates and labels for control items in English.
- .4 Use one nameplate or label for each language.

2.2 MATERIALS AND EQUIPMENT

- .1 Provide material and equipment in accordance with Section 01 61 00 - Common Product Requirements.

- .2 Material and equipment to be CSA certified. Where CSA certified material and equipment is not available, obtain special approval from authority having jurisdiction before delivery to site and submit such approval as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.
- .3 Factory assemble control panels and component assemblies.

2.3 ELECTRIC MOTORS, EQUIPMENT AND CONTROLS

- .1 Verify installation and co-ordination responsibilities related to motors, equipment and controls, as indicated.
- .2 Control wiring and conduit: in accordance with Section 25 05 00 - Common Work Results for Integrated Automation except for conduit, wiring and connections below 50 V which are related to control systems specified in mechanical sections and as shown on mechanical drawings.

2.4 WARNING SIGNS

- .1 Warning Signs: in accordance with requirements of authority having jurisdiction.
- .2 Porcelain enamel signs, minimum size 175 x 250 mm.

2.5 WIRING TERMINATIONS

- .1 Ensure lugs, terminals, screws used for termination of wiring are suitable for either copper or aluminum conductors.

2.6 EQUIPMENT IDENTIFICATION

- .1 Identify electrical equipment with nameplates and labels as follows:
 - .1 Nameplates: 3 mm thick plastic engraving sheet, black face, white core, lettering accurately aligned and engraved into core.
 - .2 Sizes as follows:
 - .1

NAMEPLATE SIZES			
Size 1	10 x 50 mm	1 line	3 mm high letters
Size 2	12 x 70 mm	1 line	5 mm high letters
Size 3	12 x 70 mm	2 lines	3 mm high letters
Size 4	20 x 90 mm	1 line	8 mm high letters
Size 5	20 x 90 mm	2 lines	5 mm high letters
Size 6	25 x 100 mm	1 line	12 mm high letters
Size 7	25 x 100 mm	2 lines	6 mm high letters

- .2 Labels: embossed plastic labels with 6 mm high letters unless specified otherwise.
- .3 Wording on nameplates and labels to be approved by Consultant prior to manufacture.
- .4 Allow for minimum of twenty-five (25) letters per nameplate and label.
- .5 Nameplates for terminal cabinets and junction boxes to indicate system and/or voltage characteristics.

- .6 Identify equipment with Size 3 labels engraved "ASSET INVENTORY NO. [NUMBER]" as directed by Consultant.
- .7 Disconnects, starters and contactors: indicate equipment being controlled and voltage.
- .8 Terminal cabinets and pull boxes: indicate system and voltage.
- .9 Transformers: indicate capacity, primary and secondary voltages.

2.7 WIRING IDENTIFICATION

- .1 Identify wiring with permanent indelible identifying markings, coloured plastic tapes, on both ends of phase conductors of feeders and branch circuit wiring.
- .2 Maintain phase sequence and colour coding throughout.
- .3 Colour coding: to CSA C22.1
- .4 Use colour coded wires in communication cables, matched throughout system.

2.8 CONDUIT AND CABLE IDENTIFICATION

- .1 Colour code conduits, boxes and metallic sheathed cables.
- .2 Code with plastic tape or paint at points where conduit or cable enters wall, ceiling, or floor, and at 15 m intervals.
- .3 Colours: 25 mm wide prime colour and 20 mm wide auxiliary colour.
- .1

Type	Prime	Auxiliary
up to 250 V	Yellow	
up to 600 V	Yellow	Green
up to 5 kV	Yellow	Blue
up to 15 kV	Yellow	Red
Telephone	Green	
Other Communication Systems	Green	Blue
Fire Alarm	Red	
Emergency Voice	Red	Blue
Other Security Systems	Red	Yellow

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate.
 - .2 Inform Consultant of unacceptable conditions immediately upon discovery.

- .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.

3.2 INSTALLATION

- .1 Do complete installation in accordance with CSA C22.1 except where specified otherwise
- .2 Do overhead and underground systems in accordance with CAN/CSA-C22.3 No.1 except where specified otherwise

3.3 NAMEPLATES AND LABELS

- .1 Ensure manufacturer's nameplates, CSA labels and identification nameplates are visible and legible after equipment is installed

3.4 CONDUIT AND CABLE INSTALLATION

- .1 Install conduit and sleeves prior to pouring of concrete.
 - .1 Sleeves through concrete: schedule 40 steel pipe, sized for free passage of conduit, and protruding 50 mm.
- .2 If plastic sleeves are used in fire rated walls or floors, remove before conduit installation.
- .3 Install cables, conduits and fittings embedded or plastered over, close to building structure so furring can be kept to minimum.

3.5 LOCATION OF OUTLETS

- .1 Locate outlets in accordance with Section 26 05 33.16 - Boxes for Electrical Systems.
- .2 Do not install outlets back-to-back in wall; allow minimum 150 mm horizontal clearance between boxes.
- .3 Change location of outlets at no extra cost or credit, providing distance does not exceed 3000 mm, and information is given before installation.
- .4 Locate light switches on latch side of doors.
 - .1 Locate disconnect devices in mechanical and elevator machine rooms on latch side of floor.

3.6 MOUNTING HEIGHTS

- .1 Mounting height of equipment is from finished floor to centreline of equipment unless specified or indicated otherwise.
- .2 If mounting height of equipment is not specified or indicated, verify before proceeding with installation.
- .3 Install electrical equipment at following heights unless indicated otherwise.
 - .1 Local switches: 1400 mm.
 - .2 Wall receptacles:

- .1 General: 300 mm.
- .2 Above top of continuous baseboard heater: 200 mm.
- .3 Above top of counters or counter splash backs: 175 mm.
- .4 In mechanical rooms: 1400 mm.
- .3 Panelboards: as required by Code or as indicated.
- .4 Telephone and interphone outlets: 300 mm.
- .5 Wall mounted telephone and interphone outlets: 1500 mm.
- .6 Fire alarm stations: 1500 mm.
- .7 Fire alarm bells: 2100 mm.
- .8 Television outlets: 300 mm.
- .9 Wall mounted speakers: 2100 mm.
- .10 Clocks: 2100 mm.
- .11 Door bell pushbuttons: 1500 mm.

3.7 CO-ORDINATION OF PROTECTIVE DEVICES

- .1 Ensure circuit protective devices such as overcurrent trips, relays and fuses are installed to required values and settings.

3.8 FIELD QUALITY CONTROL

- .1 Load Balance:
 - .1 Measure phase current to panelboards with normal loads (lighting) operating at time of acceptance; adjust branch circuit connections as required to obtain best balance of current between phases and record changes.
 - .2 Measure phase voltages at loads and adjust transformer taps to within 2% of rated voltage of equipment.
 - .3 Provide upon completion of work, load balance report as directed in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS, phase and neutral currents on panelboards, dry-core transformers and motor control centres, operating under normal load, as well as hour and date on which each load was measured, and voltage at time of test.
- .2 Conduct following tests in accordance with Section 01 45 00 - Quality Control.
 - .1 Power distribution system including phasing, voltage, grounding and load balancing.
 - .2 Circuits originating from branch distribution panels.
 - .3 Lighting and its control.
 - .4 Motors, heaters and associated control equipment including sequenced operation of systems where applicable.
 - .5 Systems: communications.

- .6 Insulation resistance testing:
 - .1 Megger circuits, feeders and equipment up to 350 V with a 500 V instrument.
 - .2 Megger 350-600 V circuits, feeders and equipment with a 1000 V instrument.
 - .3 Check resistance to ground before energizing.
- .3 Provide instruments, meters, equipment and personnel required to conduct tests during and at conclusion of project.
- .4 Manufacturer's Field Services:
 - .1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.
 - .2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

3.9 SYSTEM STARTUP

- .1 Instruct operating personnel in operation, care and maintenance of systems, system equipment and components.
- .2 Arrange and pay for services of manufacturer's factory service engineer to supervise start-up of installation, check, adjust, balance and calibrate components and instruct operating personnel.
- .3 Provide these services for such period, and for as many visits as necessary to put equipment in operation, and ensure that operating personnel are conversant with aspects of its care and operation.

3.10 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

Section 26 05 19

Low-Voltage Electrical Power Conductors and Cables

Part 1 General

1.1 SECTION INCLUDES

- .1 Building wire and cable.
- .2 Wiring connectors and connections.

1.2 RELATED REQUIREMENTS

- .1 Section 26 05 53 - Electrical Identification.

1.3 REFERENCE STANDARDS

- .1 CSA (Canadian Standards Association).
- .2 CSA C22.1 Canadian electrical code, part I safety standard for electrical installations
- .3 CSA C22.2 NO. 0.3 Test methods for electrical wires and cables
- .4 CSA C22.2 NO. 48 Nonmetallic sheathed cable
- .5 CSA C22.2 NO. 51 Armoured cables
- .6 CSA C22.2 NO. 52 Underground secondary and service-entrance cables
- .7 CSA C22.2 NO. 65 Wire connectors
- .8 CSA C22.2 NO. 75 Thermoplastic insulated wires and cables
- .9 CSA C22.2 NO. 123 Metal sheathed cables
- .10 CSA C22.2 NO. 131 Type TECK 90 cable
- .11 CSA C22.2 NO. 208 Fire alarm and signal cable
- .12 ISO 9000 Quality Management.
- .13 ISO 14000 Environmental Management.
- .14 NETA ATS Standard for acceptance testing specifications for electrical power equipment and systems
- .15 UL (Underwriters Laboratories Inc.).

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Section 01 31 00: Project management and coordination procedures.
- .2 Coordination:
 - .1 Coordinate with other work having a direct bearing on work of this section.

- .2 Where wire and cable destination is indicated and routing is not shown, determine exact routing and lengths required.

1.5 ACTION SUBMITTALS

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide for each cable assembly type.

1.6 INFORMATIONAL SUBMITTALS

- .1 Section 01 33 00: Submission procedures.
- .2 Test Reports: Indicate procedures and values obtained.
- .3 Design Data: Indicate voltage drop and ampacity calculations for aluminum conductors substituted for copper conductors.
- .4 Installation Data: Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements.

1.7 CLOSEOUT SUBMITTALS

- .1 Section 01 78 00: Submission procedures.
- .2 Record Documentation: Record actual locations of components and circuits.

1.8 QUALITY ASSURANCE

- .1 Products of This Section: Manufactured to ISO 9000 certification requirements.
- .2 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience.

1.9 SITE CONDITIONS

- .1 Conductor sizes are based on copper unless indicated as aluminum or "AL".
- .2 Wire and cable routing indicated is approximate unless dimensioned. Include wire and cable lengths within 3 m of length shown.

Part 2 Products

2.1 DESCRIPTION

- .1 Regulatory Requirements:
 - .1 Conform to CSA-C22.1.
 - .2 Most authorities having jurisdiction with respect to electrical code enforcement accept listing and classification as evidence that a product meets adequate safety standards and, in the case of classification, is suitable for the classified environment or application.
 - .3 Provide products listed and classified by CSA as suitable for the purpose specified and indicated.

2.2 CONDUCTORS

- .1 Conductor: Copper.
- .2 Insulation Voltage Rating: 600 volts.
- .3 Insulation: Type RW.
- .4 Insulation: Thermosetting material rated 90 degrees C.

2.3 ARMoured CABLE

- .1 Conductor: Copper.
- .2 Insulation Voltage Rating: 600 volts.
- .3 Insulation Temperature Rating: 90 degrees C.
- .4 Insulation Material: Thermosetting.
- .5 Conductor Assembly Covering: Lead.

Part 3 Execution

3.1 EXAMINATION

- .1 Section 01 71 00: Verify existing conditions before starting work.
- .2 Verify that field measurements are as indicated.
- .3 Verify that interior of building has been protected from weather.
- .4 Verify that mechanical work likely to damage wire and cable has been completed.
- .5 Verify that raceway installation is complete and supported.

3.2 PREPARATION

- .1 Completely and thoroughly swab raceway before installing wire.

3.3 WIRING METHODS

- .1 Concealed Dry Interior Locations: Use only building wire type RW.
- .2 Use Type RW conductors in EMT raceway except where otherwise specifically permitted or required.

3.4 INSTALLATION

- .1 Install wire and cable to manufacturer's written instructions.
- .2 Route wire and cable as required to meet project conditions.
- .3 Install cable to the CSA-C22.1.
- .4 Use solid conductor for feeders and branch circuits 10 AWG and smaller.
- .5 Use stranded conductors for control circuits.
- .6 Use conductor not smaller than 12 AWG for power and lighting circuits.
- .7 Use conductor not smaller than 16 AWG for control circuits.

- .8 Use 10 AWG conductors for 20 ampere, 120 volt branch circuits longer than 25 m.
- .9 Use 10 AWG conductors for 20 ampere, 277 volt branch circuits longer than 160 m.
- .10 Pull all conductors into raceway at same time.
- .11 Use suitable wire pulling lubricant for building wire 4 AWG and larger.
- .12 Protect exposed cable from damage.
- .13 Support cables above accessible ceiling, using spring metal clips or metal cable ties to support cables from structure or ceiling suspension system. Do not rest cable on ceiling panels.
- .14 Use suitable cable fittings and connectors.
- .15 Neatly train and lace wiring inside boxes, equipment, and panelboards.
- .16 Clean conductor surfaces before installing lugs and connectors.
- .17 Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
- .18 Terminate aluminum conductors with tin-plated aluminum- bodied compression connectors only. Fill with anti- oxidant compound before installing conductor.
- .19 Use suitable reducing connectors or mechanical connector adaptors for connecting aluminum conductors to copper conductors.
- .20 Use split bolt connectors for copper conductor splices and taps, 6 AWG and larger. Tape uninsulated conductors and connector with electrical tape to 150 percent of insulation rating of conductor.
- .21 Use solderless pressure connectors with insulating covers for copper conductor splices and taps, 8 AWG and smaller.
- .22 Use insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.
- .23 Trench and backfill for direct burial cable installation as specified in Section 32 23 18 and Section 32 23 23. Install warning tape along entire length of direct burial cable, within 75 mm of grade.
- .24 Identify and colour code wire and cable to Section 26 05 53. Identify each conductor with its circuit number or other designation indicated.

END OF SECTION

Section 26 05 26

Grounding and Bonding for Electrical Systems

Part 1 General

1.1 SECTION INCLUDES

- .1 Grounding electrodes and conductors.
- .2 Equipment grounding conductors.
- .3 Bonding.

1.2 RELATED REQUIREMENTS

- .1 Section 26 05 33.13 - Conduit for Electrical Systems.
- .2 Section 26 12 16 - Dry-Type, Medium-Voltage Transformers.
- .3 Section 26 24 00 - Panelboards.

1.3 REFERENCE STANDARDS

- .1 CSA (Canadian Standards Association).
- .2 CSA C22.1 Canadian electrical code, part I safety standard for electrical installations
- .3 ISO 9000 Quality Management.
- .4 ISO 14000 Environmental Management.
- .5 NETA ATS Standard for acceptance testing specifications for electrical power equipment and systems
- .6 NFPA 70 National Electrical Code (NEC).
- .7 NFPA 99 Health Care Facilities.
- .8 UL (Underwriters Laboratories Inc.).
- .9 Ontario Electrical Safety Code (OESC) 28th Edition, 2021.

Part 2 Products

2.1 DESCRIPTION

- .1 Regulatory Requirements:
 - .1 Products: Listed and classified by CSA as suitable for the purpose specified and indicated.

2.2 PERFORMANCE / DESIGN CRITERIA

- .1 Grounding System Resistance: 5 ohms.

Part 3 Execution

3.1 INSTALLATION

- .1 Install to manufacturer's written instructions.
- .2 Provide bonding to meet Regulatory Requirements.
- .3 Interface with site grounding system.

END OF SECTION

Section 26 05 29

Hangers and Supports for Electrical Systems

Part 1 General

1.1 SECTION INCLUDES

- .1 Conduit and equipment supports.
- .2 Anchors and fasteners.

1.2 RELATED REQUIREMENTS

- .1 Section 26 05 33.13 - Conduit for Electrical Systems.
- .2 Section 26 27 16 - Electrical Cabinets and Enclosures.

1.3 REFERENCE STANDARDS

- .1 CECA (Canadian Electrical Contractors Association).
- .2 CSA (Canadian Standards Association).
- .3 CSA C22.1 Canadian electrical code, part I safety standard for electrical installations
- .4 UL (Underwriters Laboratories Inc.).
- .5 Ontario Electrical Safety Code (OESC) 28th Edition, 2021.

Part 2 Products

2.1 DESCRIPTION

- .1 Regulatory Requirements:
 - .1 Provide products listed and classified by CSA as suitable for purpose specified and shown.

2.2 PRODUCT REQUIREMENTS

- .1 Materials and Finishes: Provide adequate corrosion resistance.
- .2 Provide materials, sizes, and types of anchors, fasteners and supports to carry the loads of equipment and conduit. Consider weight of wire in conduit when selecting products.
- .3 Anchors and Fasteners:
 - .1 Concrete Structural Elements: Use powder actuated anchors.
 - .2 Steel Structural Elements: Use beam clamps.
 - .3 Concrete Surfaces: Use self-drilling anchors.
 - .4 Hollow Masonry, Plaster, and Gypsum Board Partitions: Use toggle bolts.
 - .5 Solid Masonry Walls: Use expansion anchors.

- .6 Sheet Metal: Use sheet metal screws.
- .7 Wood Elements: Use wood screws.

Part 3 Execution

3.1 INSTALLATION

- .1 Install products to manufacturer's written instructions.
- .2 Provide anchors, fasteners, and supports to OESC.
- .3 Do not fasten supports to pipes, ducts, mechanical equipment, and conduit.
- .4 Do not use powder-actuated anchors.
- .5 Obtain permission from Consultant before using powder-actuated anchors.
- .6 Do not drill or cut structural members.
- .7 Obtain permission from Consultant before drilling or cutting structural members.
- .8 Fabricate supports from structural steel or steel channel. Rigidly weld members or use hexagon head bolts to present neat appearance with adequate strength and rigidity. Use spring lock washers under all nuts.
- .9 Install surface-mounted cabinets and panelboards with minimum of four anchors.
- .10 In wet and damp locations use steel channel supports to stand cabinets and panelboards 25 mm off wall.
- .11 Use sheet metal channel to bridge studs above and below cabinets and panelboards recessed in hollow partitions.

END OF SECTION

Section 26 05 53 Identification for Electrical Systems

Part 1 General

1.1 SECTION INCLUDES

- .1 Nameplates and labels.
- .2 Wire markers.

1.2 RELATED REQUIREMENTS

- .1 Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables.
- .2 Section 26 05 33.13 - Conduit for Electrical Systems.
- .3 Section 26 24 00 - Panelboards.
- .4 Section 26 24 19 - Motor-Control Centers.
- .5 Section 26 29 23 - Variable-Frequency Motor Controllers.

1.3 REFERENCE STANDARDS

- .1 CSA (Canadian Standards Association).
- .2 UL (Underwriters Laboratories Inc.).

Part 2 Products

2.1 DESCRIPTION

- .1 Regulatory Requirements:
 - .1 Provide products listed and classified by CSA as suitable for purpose specified and shown.

2.2 NAMEPLATES AND LABELS

- .1 Nameplates: Engraved three-layer laminated plastic, black letters on white background.
- .2 Locations:
 - .1 Each electrical distribution and control equipment enclosure.
- .3 Labels: Embossed adhesive tape, with 5 mm white letters on black background. Use only for identification of individual wall switches and receptacles, control device stations.

2.3 WIRE MARKERS

- .1 Description: Tape type wire markers.
- .2 Locations: Each conductor at panelboard gutters and each load connection.
- .3 Legend:

- .1 Power and Lighting Circuits: Branch circuit or feeder number indicated on drawings.

Part 3 Execution

3.1 PREPARATION

- .1 Degrease and clean surfaces to receive nameplates and labels.

3.2 APPLICATION

- .1 Install nameplate and label parallel to equipment lines.
- .2 Secure nameplate to equipment front using adhesive.

END OF SECTION

Section 26 05 83 Wiring Connections

Part 1 General

1.1 SECTION INCLUDES

- .1 Electrical connections to equipment specified under other sections.

1.2 RELATED REQUIREMENTS

- .1 Section 22 47 00 - Plumbing Equipment.
- .2 Section 22 51 00 - Swimming Pool Plumbing Systems.
- .3 Section 23 82 00 - Convection Heating and Cooling Units.
- .4 Section 25 30 00 - Instrumentation and Terminal Devices.

1.3 REFERENCE STANDARDS

- .1 CSA (Canadian Standards Association).
- .2 CSA C22.1 Canadian electrical code, part I safety standard for electrical installations
- .3 NEMA WD 1 General color requirements for wiring devices
- .4 NEMA WD 6 Wiring devices - dimensional specifications
- .5 NFPA 70 National Electrical Code (NEC).
- .6 UL (Underwriters Laboratories Inc.).
- .7 Ontario Electrical Safety Code (OESC) 28th Edition, 2021.

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination:
 - .1 Coordinate with other work having a direct bearing on work of this section.
 - .2 Obtain and review shop drawings, product data, and manufacturer's instructions for equipment provided under other sections.
 - .3 Determine connection locations and requirements.
- .2 Sequencing:
 - .1 Sequence rough-in of electrical connections to coordinate with installation schedule for equipment.
 - .2 Sequence electrical connections to coordinate with start-up schedule for equipment.

Part 2 Products

2.1 DESCRIPTION

- .1 Regulatory Requirements:
 - .1 Provide products listed and classified by CSA as suitable for purpose specified and shown.

Part 3 Execution

3.1 EXAMINATION

- .1 Section 01 71 00: Verify existing conditions before starting work.
- .2 Verify that equipment is ready for electrical connection, wiring, and energization.

3.2 ELECTRICAL CONNECTIONS

- .1 Make electrical connections to equipment manufacturer's written instructions.
- .2 Make conduit connections to equipment using flexible conduit. Use liquid-tight flexible conduit with watertight connectors in damp or wet locations.
- .3 Make wiring connections using wire and cable with insulation suitable for temperatures encountered in heat producing equipment.
- .4 Provide receptacle outlet where connection with attachment plug is indicated. Provide cord and cap where field-supplied attachment plug is indicated.
- .5 Provide suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.
- .6 Install disconnect switches, controllers, control stations, and control devices as indicated.
- .7 Modify equipment control wiring with terminal block jumpers as indicated.
- .8 Provide interconnecting conduit and wiring between devices and equipment where indicated.

END OF SECTION

Section 26 05 33.13 Conduit for Electrical Systems

Part 1 General

1.1 SECTION INCLUDES

- .1 Liquid tight flexible metal conduit.
- .2 Electrical metallic tubing.

1.2 RELATED REQUIREMENTS

- .1 Section 07 84 00 - Firestopping.
- .2 Section 26 05 33.16 - Boxes.
- .3 Section 26 05 26 - Grounding And Bonding.
- .4 Section 26 05 29 - Electrical Supporting Devices.
- .5 Section 26 05 53 - Electrical Identification.
- .6 Section 26 12 16 - Dry-Type, Medium-Voltage Transformers.

1.3 REFERENCE STANDARDS

- .1 CSA (Canadian Standards Association).
- .2 CSA C22.1 Canadian electrical code, part I safety standard for electrical installations
- .3 CSA C22.2 NO. 45.1 Electrical rigid metal conduit - steel. (Withdrawn)
- .4 CSA C22.2 NO. 45.2 Electrical rigid metal conduit - aluminum, red brass, and stainless steel
- .5 CSA C22.2 NO. 56 Flexible metal conduit and liquid-tight flexible metal conduit
- .6 CSA C22.2 NO. 83.1 Electrical metallic tubing - steel
- .7 CSA C22.2 NO. 211.1 Rigid types EB1 and DB2/ES2 PVC conduit
- .8 CSA C22.2 NO. 211.2 Rigid PVC (unplasticized) conduit
- .9 CSA C22.2 NO. 227.1 Electrical nonmetallic tubing
- .10 ISO 9000 Quality Management.
- .11 ISO 14000 Environmental Management.
- .12 NFPA 70 - National Electrical Code (NEC).
- .13 UL (Underwriters Laboratories Inc.).
- .14 Ontario Electrical Safety Code (OESC) 28th Edition, 2021.

Part 2 Products

2.1 DESCRIPTION

- .1 Regulatory Requirements:
 - .1 Design conduit size to CSA-C22.1.
 - .2 Provide products listed and classified by CSA as suitable for purpose specified and shown.

2.2 CONDUIT REQUIREMENTS

- .1 Minimum Size: 19 mm unless otherwise specified.
- .2 Wet and Damp Locations: Use liquid tight flexible metal conduit.
- .3 Dry Locations:
 - .1 Concealed: Use electrical metallic tubing.
 - .2 Exposed: Use electrical metallic tubing.

2.3 LIQUID TIGHT FLEXIBLE METAL CONDUIT

- .1 Description: Interlocked steel construction with PVC jacket.
- .2 Fittings: CSA-C22.2 No. 56.

2.4 ELECTRICAL METALLIC TUBING (EMT)

- .1 Description: CSA-C22.2 No. 83.1; galvanized tubing.
- .2 Fittings and Conduit Bodies: CSA-C22.2 No. 83.1; steel, compression type.

Part 3 Execution

3.1 EXAMINATION

- .1 Section 01 71 00: Verify existing conditions before starting work.
- .2 Verify that field measurements are as shown on Drawings.
- .3 Verify routing and termination locations of conduit prior to rough-in.
- .4 Conduit routing is shown on Drawings in approximate locations unless dimensioned. Route as required to complete wiring system.

3.2 INSTALLATION

- .1 Install conduit to CSA-C22.1.
- .2 Arrange supports to prevent misalignment during wiring installation.
- .3 Support conduit using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
- .4 Group related conduits; support using conduit rack.
- .5 Construct rack using steel channel provide space on each for 25% additional conduits.
- .6 Fasten conduit supports to building structure and surfaces to Section 26 05 29.

- .7 Do not support conduit with wire or perforated pipe straps. Remove wire used for temporary supports.
- .8 Do not attach conduit to ceiling support wires.
- .9 Arrange conduit to maintain headroom and present neat appearance.
- .10 Route exposed conduit parallel and perpendicular to walls.
- .11 Maintain adequate clearance between conduit and piping.
- .12 Maintain 300 mm clearance between conduit and surfaces with temperatures exceeding 40 degrees C.
- .13 Cut conduit square using saw or pipe cutter; de-burr cut ends.
- .14 Bring conduit to shoulder of fittings; fasten securely.
- .15 Install no more than equivalent of three 90-degree bends between boxes.
 - .1 Use conduit bodies to make sharp changes in direction, as around beams.
- .16 Avoid moisture traps; provide junction box with drain fitting at low points in conduit system.
- .17 Provide suitable fittings to accommodate expansion and deflection where conduit crosses seismic joints.
- .18 Provide suitable pull string in each empty conduit except sleeves and nipples.
- .19 Use suitable caps to protect installed conduit against entrance of dirt and moisture.
- .20 Ground and bond conduit to Section 26 05 26.
- .21 Identify conduit to Section 26 05 53.

END OF SECTION

Section 26 05 33.16 Boxes for Electrical Systems

Part 1 General

1.1 SECTION INCLUDES

- .1 Pull and junction boxes.

1.2 RELATED REQUIREMENTS

- .1 Section 07 84 00 - Firestopping.
- .2 Section 08 31 13 - Access Doors And Frames.
- .3 Section 26 05 00 - Common Work Results for Electrical.
- .4 Section 26 05 33.13 - Conduit for Electrical Systems.

1.3 REFERENCE STANDARDS

- .1 CSA (Canadian Standards Association).
- .2 CSA C22.1 Canadian electrical code, part I safety standard for electrical installations
- .3 CSA C22.2 NO. 18.1 Metallic outlet boxes
- .4 CSA C22.2 NO. 85 Rigid PVC boxes and fittings
- .5 UL (Underwriters Laboratories Inc.).
- .6 Ontario Electrical Safety Code (OESC) 28th Edition, 2021.

Part 2 Products

2.1 DESCRIPTION

- .1 Regulatory Requirements:
 - .1 Provide products listed and classified by CSA as suitable for the purpose specified and indicated.

2.2 PULL AND JUNCTION BOXES

- .1 Sheet Metal Boxes: CSA-C22.2 No. 18.1, galvanized steel.
- .2 Hinged Enclosures.

Part 3 Execution

3.1 EXAMINATION

- .1 Section 01 71 00: Verify existing conditions before starting work.

3.2 INSTALLATION

- .1 Install boxes to CSA-C22.1.

- .2 Install in locations as shown on drawings, and as required for splices, taps, wire pulling, equipment connections and compliance with regulatory requirements.
- .3 Set wall mounted boxes at elevations to accommodate mounting heights indicated.
- .4 Electrical boxes are shown on drawings in approximate locations unless dimensioned. Adjust box location up to 3 m if required to accommodate intended purpose.
- .5 Orient boxes to accommodate wiring devices.
- .6 Maintain headroom and present neat mechanical appearance.
- .7 Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
- .8 Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 150 mm from ceiling access panel or from removable recessed luminaire.
- .9 Coordinate mounting heights and locations of outlets mounted above counters, benches, and backsplashes.
- .10 Locate outlet boxes to allow luminaires positioned as shown on reflected ceiling plan.
- .11 Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.
- .12 Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.
- .13 Use stamped steel bridges to fasten flush mounting outlet box between studs.
- .14 Install flush mounting box without damaging wall insulation or reducing its effectiveness.
- .15 Use adjustable steel channel fasteners for hung ceiling outlet box.
- .16 Do not fasten boxes to ceiling support wires.
- .17 Support boxes independently of conduit.
- .18 Use gang box where more than one device is mounted together. Do not use sectional box.
- .19 Use gang box with plaster ring for single device outlets.
- .20 Use cast outlet box in exterior locations exposed to the weather and wet locations.
- .21 Set floor boxes level.
- .22 Large Pull Boxes: Use hinged enclosure in interior dry locations, surface-mounted cast metal box in other locations.

3.3 ADJUSTING

- .1 Adjust flush-mounting outlets to make front flush with finished wall material.
- .2 Install knockout closures in unused box openings.

3.4 CLEANING

- .1 Section 01 74 10: Cleaning installed work.
- .2 Clean interior of boxes to remove dust, debris, and other material.
- .3 Clean exposed surfaces and restore finish.

END OF SECTION

Section 26 09 16

Electrical Controls and Relays

Part 1 General

1.1 SECTION INCLUDES

- .1 Relays.
- .2 Control power transformers.

1.2 REFERENCE STANDARDS

- .1 CSA (Canadian Standards Association).
- .2 CSA C22.1 Canadian electrical code, part I safety standard for electrical installations
- .3 CSA C22.2 NO. 14 Industrial control equipment
- .4 CSA C22.2 NO. 94 Special purpose enclosures. (Withdrawn)
- .5 CSA C22.2 NO. 178.2 Requirements for manually operated generator transfer panels
- .6 CSA E61558-2-2 Safety of power transformers, power supplies, reactors, and similar products - Particular requirements and tests for control transformers and power supplies incorporating control transformers. (Withdrawn)
- .7 CSA E61558-2-13 Safety of transformers, reactors, power supply units and similar products for supply voltages up to 1 100 V - Particular requirements and tests for auto transformers and power supply units incorporating auto transformers
- .8 ISO 9000 Quality Management.
- .9 ISO 14000 Environmental Management.
- .10 NEMA IA 10030 Industrial control and systems - enclosures
- .11 NEMA ICS 1 Industrial control and systems - general requirements
- .12 UL (Underwriters Laboratories Inc.).

1.3 ACTION SUBMITTALS

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide for each component showing electrical characteristics and connection requirements.
- .3 Shop Drawings: Submit drawings indicating control panel layouts, wiring connections and diagrams, dimensions, support points.

1.4 QUALITY ASSURANCE

- .1 Products of This Section: Manufactured to ISO 9000 certification requirements.

- .2 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience and with service facilities within 160 km of project site.

Part 2 Products

2.1 DESCRIPTION

- .1 Regulatory Requirements:
 - .1 Provide Products listed and classified by CSA as suitable for purpose specified and indicated.

2.2 SOLID STATE CONTROL RELAYS

- .1 Solid State Relays: CSA-C22.2 No. 14.
- .2 Contact Ratings: CSA-C22.2 No. 14, Class A150.

2.3 CONTROL POWER TRANSFORMER

- .1 Description: CSA-E61558-2-2, machine tool transformer with isolated secondary winding.
- .2 Voltage Rating: 120 volts primary; 24 volts secondary.

Part 3 Execution

3.1 INSTALLATION

- .1 Install to manufacturer's instructions.
- .2 Install individual relays and time delay relays in enclosures.
- .3 Install cabinets under the provisions of Section 26 27 16.
- .4 Make electrical wiring interconnections as indicated.

END OF SECTION

Section 26 12 16

Dry-Type, Medium-Voltage Transformers

Part 1 General

1.1 SECTION INCLUDES

- .1 Two-winding transformers.

1.2 RELATED REQUIREMENTS

- .1 Section 26 05 26 - Grounding And Bonding.
- .2 Section 26 05 33.13 - Conduit: Flexible conduit connections.

1.3 REFERENCE STANDARDS

- .1 CSA (Canadian Standards Association).
- .2 CSA C22.1 Canadian electrical code, part I safety standard for electrical installations
- .3 CSA C22.2 NO. 47 Air-cooled transformers (dry type)
- .4 CSA C22.2 NO. 65 Low voltage transformers - general requirements
- .5 CSA C22.2 NO. 66.1 Low voltage transformers - general requirements
- .6 NETA ATS Standard for acceptance testing specifications for electrical power equipment and systems
- .7 ISO 9000 Quality Management.
- .8 ISO 14000 Environmental Management.
- .9 UL (Underwriters Laboratories Inc.).

1.4 ACTION SUBMITTALS

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide outline and support point dimensions of enclosures and accessories, unit weight, voltage, power, and impedance ratings and characteristics, tap configurations, insulation system type, and rated temperature rise.

1.5 INFORMATIONAL SUBMITTALS

- .1 Section 01 33 00: Submission procedures.
- .2 Test Reports: Indicate loss data, efficiency at 25%, 50%, 75% and 100% rated load, and sound level.
- .3 Installation Data: Manufacturer's special installation requirements.
 - .1 Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements.

- .2 Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.6 CLOSEOUT SUBMITTALS

- .1 Section 01 78 00: Submission procedures.
- .2 Record Documentation: Record actual locations of transformers in project record documents.

1.7 QUALITY ASSURANCE

- .1 Products of This Section: Manufactured to ISO 9000 certification requirements.
- .2 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience.

1.8 DELIVERY, STORAGE, AND HANDLING

- .1 Section 01 61 00: Transport, handle, store, and protect products.
- .2 Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
- .3 Handle to manufacturer's written instructions. Lift only with lugs provided for the purpose. Handle carefully to avoid damage to transformer internal components, enclosure, and finish.

Part 2 Products

2.1 DESCRIPTION

- .1 Regulatory Requirements:
 - .1 Products: Listed and classified by CSA as suitable for the purpose specified and indicated.

2.2 TWO-WINDING TRANSFORMERS

- .1 Description: CSA-C22.2 No. 47, factory-assembled, air cooled dry type transformers ratings as indicated.
- .2 Primary Voltage: as indicated.
- .3 Secondary Voltage: as indicated.
- .4 Insulation system and average winding temperature rise for rated kVA as follows:
 - .1 1-15 kVA: Class 185 with 80 Degrees C rise.
 - .2 16-500 kVA: Class 220 with 80 Degrees C rise.
- .5 Case temperature: Do not exceed 35 Degrees C rise above ambient at warmest point at full load.
- .6 Winding Taps:

- .1 Transformers Less than 15 kVA: Two 5% below rated voltage, full capacity taps on primary winding.
- .2 Transformers 15 kVA and Larger: CSA-C22.2 No. 47.
- .7 Basic Impulse Level: 10 kV for transformers less than 300 kVA, 30 kV for transformers 300 kVA and larger.
- .8 Ground core and coil assembly to enclosure by means of a visible flexible copper grounding strap.
- .9 Coil Conductors: Continuous windings with terminations brazed or welded.
- .10 Isolate core and coil from enclosure using vibration-absorbing mounts.
- .11 Nameplate: Include transformer connection data and overload capacity based on rated allowable temperature rise.

Part 3 Execution

3.1 INSTALLATION

- .1 Install transformers to manufacturer's instructions.
- .2 Set transformer plumb and level.
- .3 Use flexible conduit, under the provisions of Section 26 05 33.13, 600 mm minimum length, for connections to transformer case. Make conduit connections to side panel of enclosure.
- .4 Mount wall-mounted transformers using integral flanges or accessory brackets provided by the manufacturer.
- .5 Mount floor-mounted transformers on vibration isolating pads suitable for isolating the transformer noise from the building structure.
- .6 Mount trapeze-mounted transformers as indicated.
- .7 Provide seismic restraints.
- .8 Provide grounding and bonding to Section 26 05 26.

3.2 ADJUSTING

- .1 Measure primary and secondary voltages and make appropriate tap adjustments.

END OF SECTION

Section 26 24 00 Panelboards

Part 1 General

1.1 SECTION INCLUDES

- .1 Manufactured wiring assemblies and accessories.

1.2 RELATED REQUIREMENTS

- .1 Section 26 28 16.02 - Moulded Case Circuit Breakers.

1.3 REFERENCE STANDARDS

- .1 CSA (Canadian Standards Association).
- .2 ISO 9000 Quality Management.
- .3 ISO 14000 Environmental Management.
- .4 UL (Underwriters Laboratories Inc.).
- .5 Ontario Electrical Safety Code (OESC) 28th Edition, 2021.

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Section 01 31 00: Project management and coordination procedures.
- .2 Coordination:
 - .1 Coordinate with other work having a direct bearing on work of this section.
 - .2 Provide luminaire connectors to luminaire manufacturer for factory installation.

1.5 ACTION SUBMITTALS

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide for each cable type and for each fitting and accessory.
- .3 Shop Drawings: Indicate distribution box, switch box, outlet, and cable layout and branch circuit configuration.

1.6 INFORMATIONAL SUBMITTALS

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Indicate application conditions and limitations of use stipulated by Product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

1.7 CLOSEOUT SUBMITTALS

- .1 Section 01 78 00: Submission procedures.

- .2 Record Documentation: Record actual locations of cable assemblies and branch circuits.

1.8 QUALITY ASSURANCE

- .1 Products of This Section: Manufactured to ISO 9000 certification requirements.
- .2 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience.

Part 2 Products

2.1 MANUFACTURERS

- .1 Manufacturers:
 - .1 Siemens.
 - .2 Eaton.
 - .3 Schneider Electric.
 - .4 Substitutions: Refer to Section 01 25 00.

2.2 DESCRIPTION

- .1 Regulatory Requirements:
 - .1 Products: Listed and classified by CSA as suitable for the purpose specified and indicated.

2.3 DISTRIBUTION PANELBOARDS

- .1 Description: CSA-C22.2 No. 29, circuit breaker type.
- .2 Panelboard Bus: Copper ratings as indicated. Provide copper ground bus in each panelboard.
- .3 Minimum integrated short circuit rating: as indicated.
- .4 Fusible Switch Assemblies: NEMA KS 1, quick-make, quick-break, load interrupter enclosed knife switch with externally operable handle. Provide interlock to prevent opening front cover with switch in ON position. Handle lockable in OFF position. Fuse clips: Designed to accommodate Class J fuses.
- .5 Moulded Case Circuit Breakers: CSA-C22.2 No. 5, circuit breakers with integral thermal and instantaneous magnetic trip in each pole. Provide circuit breakers listed as Type HACR for air conditioning equipment branch circuits.
- .6 Moulded Case Circuit Breakers with Current Limiters: CSA-C22.2 No. 5, circuit breakers with replaceable current limiting elements, in addition to integral thermal and instantaneous magnetic trip in each pole.
- .7 Current Limiting Moulded Case Circuit Breakers: CSA-C22.2 No. 5, circuit breakers with integral thermal and instantaneous magnetic trip in each pole, coordinated with automatically resetting current limiting elements in each pole. Interrupting rating 100,000 symmetrical amperes, let-through current and energy level less than permitted for same size Class RK-5 fuse.

- .8 Controllers: NEMA ICS 2, AC general-purpose Class A magnetic controller for induction motors rated in horsepower, with bimetal overload relay. Coil operating voltage: 120 volts, 60 Hz. Size as shown on Drawings. Provide unit mounted control power transformer, HAND-OFF-AUTO selector switch, GREEN indicating light in front cover.
- .9 Circuit Breaker Accessories: Trip units and auxiliary switches as indicated.
- .10 Enclosure: NEMA Type 1 sprinkler proof unless otherwise indicated.
- .11 Cabinet Front: Surface type, fastened with screws, hinged door with flush lock finished in manufacturer's standard gray enamel.

2.4 BRANCH CIRCUIT PANELBOARDS

- .1 Manufacturers:
 - .1 Same as distribution panelboards.
- .2 Description: CSA-C22.2 No. 29, circuit breaker type, lighting and appliance branch circuit panelboard.
- .3 Panelboard Bus: Copper ratings as indicated. Provide copper ground bus in each panelboard; provide insulated ground bus where scheduled.
- .4 Minimum Integrated Short Circuit Rating: as indicated.
- .5 Moulded Case Circuit Breakers: CSA-C22.2 No. 5, plug-on type thermal magnetic trip circuit breakers, with common trip handle for all poles, listed as Type SWD for lighting circuits, Type HACR for air conditioning equipment circuits, Class A ground fault interrupter circuit breakers where scheduled. Do not use tandem circuit breakers.
- .6 Current Limiting Moulded Case Circuit Breakers: CSA-C22.2 No. 5, circuit breakers with integral thermal and instantaneous magnetic trip in each pole, coordinated with automatically resetting current limiting elements in each pole. Interrupting rating 100,000 symmetrical amperes, let-through current and energy level less than permitted for same size Class RK-5 fuse.
- .7 Enclosure: NEMA, Type 1, sprinklerproof.
- .8 Cabinet Front: Flush cabinet front with concealed trim clamps, concealed hinge, metal directory frame, and flush lock all keyed alike. Finish in manufacturer's standard gray enamel.

Part 3 Execution

3.1 EXAMINATION

- .1 Section 01 71 00: Verify existing conditions before starting work.
- .2 Verify that field measurements are as indicated on Shop Drawings.

3.2 INSTALLATION

- .1 Install panelboards as indicated, to manufacturer's instructions, and OESC-21.
- .2 Install panelboards plumb. Install recessed panelboards flush with wall finishes.

- .3 Height: 6 ft to top of panelboard; install panelboards taller than 6 ft with bottom no more than 4 inches above floor.
- .4 Provide filler plates for unused spaces in panelboards.
- .5 Provide typed or neatly handwritten circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes required to balance phase loads.
- .6 Provide engraved plastic nameplates under the provisions of Section 26 05 53.
- .7 Provide spare conduits out of each recessed panelboard to an accessible location above ceiling. Minimum spare conduits: five (5) empty 1 inch. Identify each as SPARE.
- .8 Ground and bond panelboard enclosure according to Section 26 05 26.

3.3 FIELD QUALITY CONTROL

- .1 Inspection and Testing:
 - .1 Perform inspections and tests listed in NETA ATS for switches and circuit breakers.

3.4 ADJUSTING

- .1 Adjust all operating mechanisms for free mechanical movement.
- .2 Tighten bolted bus connections to manufacturer's written instructions.
- .3 Adjust circuit breaker trip and time delay settings to values as required for appropriate selective coordination.
- .4 Measure steady state load currents at each panelboard feeder; rearrange circuits in the panelboard to balance the phase loads to within 20% of each other.
- .5 Maintain proper phasing for multi-wire branch circuits.

3.5 CLEANING

- .1 Section 01 74 10: Cleaning installed work.
- .2 Touch up scratched or marred surfaces to match original finish.

END OF SECTION

Section 26 24 19 Motor-Control Centers

Part 1 General

1.1 SECTION INCLUDES

- .1 Motor control centres.

1.2 RELATED REQUIREMENTS

- .1 Section 03 30 00 - Cast-in-place Concrete: Housekeeping pads.
- .2 Section 26 05 53 - Electrical Identification: Engraved nameplates.

1.3 REFERENCE STANDARDS

- .1 CSA (Canadian Standards Association).
- .2 CSA C22.1 Canadian electrical code, part I safety standard for electrical installations
- .3 CSA C22.2 NO. 4 Enclosed and dead-front switches
- .4 CSA C22.2 NO. 5 Molded-case circuit breakers, molded-case switches and circuit-breaker enclosures
- .5 CSA C22.2 NO. 14 Industrial control equipment
- .6 CSA C22.2 NO. 248.1 Low-voltage fuses - general requirements
- .7 ISO 9000 Quality Management.
- .8 ISO 14000 Environmental Management.
- .9 NEMA ICS 2 Industrial control and systems - controllers, contactors and overload relays rated 600 V
- .10 UL (Underwriters Laboratories Inc.).

1.4 ACTION SUBMITTALS

- .1 Section 01 33 00: Submission procedures.
- .2 Shop Drawings: Include front and side views of enclosures with overall dimensions shown; conduit entrance locations and requirements; nameplate legends; size and number of bus bars per phase; electrical characteristics including voltage, frame size and trip ratings, withstand ratings, and time/current curves of all equipment and components.

1.5 INFORMATIONAL SUBMITTALS

- .1 Section 01 33 00: Submission procedures.
- .2 Test Reports: Indicate field test and inspection procedures and test results.

- .3 Installation Data: Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of product.

1.6 CLOSEOUT SUBMITTALS

- .1 Section 01 78 00: Submission procedures.
- .2 Maintenance Data: Include spare parts data listing; source and current prices of replacement parts and supplies; and recommended maintenance procedures and intervals.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- .1 Section 01 78 23: Maintenance and extra material requirements.
- .2 Extra Stock Materials: Provide two (2) of each size and type fuse installed.

1.8 QUALITY ASSURANCE

- .1 Perform Work to CSA-C22.1.
- .2 Products of This Section: Manufactured to ISO 9000 certification requirements.
- .3 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience.

1.9 DELIVERY, STORAGE, AND HANDLING

- .1 Section 01 61 00: Transport, handle, store, and protect products.
- .2 Deliver in 1.2 m maximum width shipping splits, individually wrapped for protection, and mounted on shipping skids.
- .3 Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
- .4 Handle to CSA-C22.2 No. 14. Lift only with lugs provided for the purpose. Handle carefully to avoid damage to motor control centre components, enclosure, and finish.

1.10 SITE CONDITIONS

- .1 Conform to NEMA ICS 2 service conditions during and after installation of motor control centres.

Part 2 Products

2.1 MANUFACTURERS

- .1 Manufacturers:
 - .1 Schneider Electric; Product: MCC Model 6.
 - .2 Substitutions: Refer to Section 01 25 00.

2.2 DESCRIPTION

- .1 Regulatory Requirements:
 - .1 Provide products listed and classified by CSA as suitable for purpose specified and indicated.

2.3 MOTOR CONTROL CENTRE

- .1 Motor Control Centres: CSA-C22.2 No. 14, Class I, Type B.
- .2 Main Overcurrent Protection: Moulded case circuit breaker.
- .3 Feeder Tap Units: Moulded case thermal-magnetic circuit breakers.
- .4 Voltage Rating: 600 volts, three phase, three-wire, 60 Hertz.
- .5 Horizontal Bus: Copper, with a continuous current rating of 600 amperes. Include copper ground bus entire length of control centre.
- .6 Vertical Bus: Copper.
- .7 Integrated Equipment Short Circuit Rating: 50,000 amperes rms symmetrical at 600 volts.
- .8 Configuration: Units front mounting only, accessible from the front only.
- .9 Enclosure: CSA-C22.2 No. 14, Type 1A.
- .10 Finish: Manufacturer's standard grey enamel.

2.4 DISCONNECTS

- .1 Combination Controllers: Combine motor controllers with thermal magnetic circuit breaker disconnect in common enclosure. Provide means for locking disconnect handle and means for defeating cover interlock.
- .2 Motor Circuit Protector: CSA-C22.2 No. 5, circuit breakers with integral instantaneous magnetic trip in each pole.

Part 3 Execution

3.1 EXAMINATION

- .1 Section 01 71 00: Verify existing conditions before starting work.
- .2 Verify that surface is suitable for motor control centre installation.

3.2 PREPARATION

- .1 Provide housekeeping pads to Section 03 30 00.

3.3 INSTALLATION

- .1 Install motor control centres to manufacturer's written instructions.
- .2 Tighten accessible bus connections and mechanical fasteners after placing motor control centre.
- .3 Install fuses in fusible switches.

- .4 Select and install heater elements in motor starters to match installed motor characteristics.
- .5 Provide engraved plastic nameplates under the provisions of Section 26 05 53.
- .6 Motor Data: Provide neatly typed label inside each motor starter door identifying motor served, nameplate horsepower, full load amperes, code letter, service factor, and voltage/phase rating.

3.4 FIELD QUALITY CONTROL

- .1 Inspection and Testing:
 - .1 Inspect and test motor control centre and each controller to CSA-C22.2 No. 14.

END OF SECTION

Section 26 27 16

Electrical Cabinets and Enclosures

Part 1 General

1.1 SECTION INCLUDES

- .1 Hinged cover enclosures.
- .2 Cabinets.
- .3 Terminal blocks.
- .4 Accessories.

1.2 RELATED REQUIREMENTS

- .1 Section 26 09 16 - Electrical Controls and Relays.

1.3 REFERENCE STANDARDS

- .1 CSA (Canadian Standards Association).
- .2 CSA C22.1 Canadian electrical code, part I safety standard for electrical installations
- .3 CSA C22.2 NO. 94 Special purpose enclosures. (Withdrawn)
- .4 CSA C22.2 NO. 158 Terminal blocks
- .5 UL (Underwriters Laboratories Inc.).
- .6 Ontario Electrical Safety Code (OESC) 28th Edition, 2021.

1.4 ACTION SUBMITTALS

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide manufacturer's standard data for enclosures and cabinets.

1.5 INFORMATIONAL SUBMITTALS

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- .1 Section 01 78 23: Maintenance and extra material requirements.
- .2 Extra Stock Materials: Provide two (2) of each key.

Part 2 Products

2.1 DESCRIPTION

- .1 Regulatory Requirements:
 - .1 Conform to requirements of CSA-C22.1.
 - .2 Products: Listed and classified by CSA as suitable for the purpose specified and indicated.

2.2 HINGED COVER ENCLOSURES

- .1 Construction: CSA-C22.2 No. 94.
 - .1 Indoor: Steel, Type 2 enclosure.
 - .2 Outdoor: Steel, Type 3R enclosure.
- .2 Covers: Continuous hinge, held closed by flush latch operable by key.
- .3 Enclosure Finish: Manufacturer's standard enamel.

2.3 CABINETS

- .1 Boxes: Galvanized steel with removable end walls.
- .2 Backboard: Provide 19 mm thick plywood backboard for mounting terminal blocks. Paint matte white.
- .3 Fronts: Steel, surface type with concealed trim clamps door with concealed hinge, and flush lock keyed to match branch circuit panelboard. Finish with gray baked enamel.
- .4 Provide metal barriers to form separate compartments wiring of different systems and voltages.
- .5 Provide accessory feet for free-standing equipment.

2.4 TERMINAL BLOCKS

- .1 Terminal Blocks: CSA-C22.2 No. 158.
- .2 Power Terminals: Unit construction type with closed back and tubular pressure screw connectors, rated 600 volts.
- .3 Signal and Control Terminals: Modular construction type, suitable for channel mounting, with tubular pressure screw connectors, rated 300 volts.
- .4 Provide ground bus terminal block, with each connector bonded to enclosure.

Part 3 Execution

3.1 INSTALLATION

- .1 Install components to CSA-C22.1 and manufacturer's written instructions.
- .2 Install enclosures and boxes plumb. Anchor securely to wall and structural supports at each corner to Section 26 05 29.
- .3 Install cabinet fronts plumb.

3.2 CLEANING

- .1 Section 01 74 10: Cleaning installed work.
- .2 Clean electrical parts to remove conductive and harmful materials.
- .3 Remove dirt and debris from enclosure.
- .4 Clean finishes and touch up damage.

END OF SECTION

Section 26 28 23

Disconnect Switches - Fused and Non-Fused

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 26 05 00 - Common Work Results for Electrical
- .2 Section 26 28 13.01 - Fuses - Low Voltage

1.2 REFERENCE STANDARDS

- .1 CSA Group
 - .1 CAN/CSA-C22.2 No.4-04(R2009), Enclosed and Dead-Front Switches (Tri-National Standard, with ANCE NMX-J-162-2004 and UL 98).
 - .2 CSA C22.2 No.39-13, Fuseholder Assemblies.
- .2 OESC-2024 Ontario Electrical Safety Code, 29th Edition - 2024

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for disconnect switches - fused and non-fused and include product characteristics, performance criteria, physical size, finish and limitations.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect disconnect switches - fused and non-fused from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 DISCONNECT SWITCHES

- .1 To CAN/CSA-C22.2 No.4 size as indicated.
- .2 Provision for padlocking in on-off switch position by 3 locks.

- .3 Mechanically interlocked door to prevent opening when handle in ON position.
- .4 Fuses: size as indicated, in accordance with Section 26 28 13.01 - Fuses - Low Voltage.
- .5 Fuseholders: to CSA C22.2 No.39 suitable without adaptors, for type and size of fuse indicated.
- .6 Quick-make, quick-break action.
- .7 ON-OFF switch position indication on switch enclosure cover.

2.2 EQUIPMENT IDENTIFICATION

- .1 Indicate name of load controlled on size 4 nameplate.

Part 3 Execution

3.1 INSTALLATION

- .1 Install disconnect switches complete with fuses if applicable.
- .2 Install in accordance with OESC-2024.

3.2 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.

END OF SECTION

Section 26 28 13.01 Fuses - Low Voltage

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 26 28 23 - Disconnect Switches - Fused and Non-Fused.
- .2 Section 26 05 00 - Common Work Results for Electrical

1.2 REFERENCE STANDARDS

- .1 Ontario Electrical Safety Code (OESC) 28th Edition, 2021.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Provide fuse performance data characteristics for each fuse type. Performance data to include: average melting time-current characteristics.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Ship fuses in original containers.
- .2 Do not ship fuses installed in switchboard.
- .3 Store fuses in original containers in moisture free location.

1.5 EXTRA MATERIALS

- .1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Three spare fuses of each type and size installed above 600 A.
- .3 Six spare fuses of each type and size installed up to and including 600 A.

Part 2 Products

2.1 FUSES - GENERAL

- .1 Fuse type references L1, L2, J1, R1, etc. have been adopted for use in this specification.
- .2 Fuses: product of one manufacturer.

2.2 FUSE TYPES

- .1 Class L fuses.
 - .1 Type L1, time delay, capable of carrying 500% of its rated current for 10 s minimum.

- .2 Type L2, fast acting.
- .2 Class J fuses.
 - .1 Type J1, time delay, capable of carrying 500% of its rated current for 10 s minimum.
 - .2 Type J2, fast acting.
- .3 Class R -R fuses.
 - .1 Type R1, (UL Class RK1), time delay, capable of carrying 500% of its rated current for 10 s minimum, to meet UL Class RK1 maximum let-through limits
 - .2 Type R2, time delay, capable of carrying 500% of its rated current for 10 s minimum.
 - .3 Type R3, (UL Class RK1), fast acting Class R, to meet UL Class RK1 maximum let-through limits
- .4 Class C fuses.

Part 3 Execution

3.1 INSTALLATION

- .1 Install fuses in mounting devices immediately before energizing circuit.
- .2 Ensure correct fuses fitted to physically matched mounting devices.
 - .1 Install rejection clips for Class R fuses.
- .3 Ensure correct fuses fitted to assigned electrical circuit.
- .4 Where UL Class RK1 fuses are specified, install warning label "Use only UL Class RK1 fuses for replacement" on equipment
- .5 Install spare fuses in fuse storage cabinet.

END OF SECTION

Section 26 28 16.02

Moulded Case Circuit Breakers

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 26 24 00 - Panelboards.

1.2 REFERENCE STANDARDS

- .1 CSA Group (CSA):
 - .1 CSA C22.2 No. 5-16, Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures (tri-national standard with UL 489 and NMX-J-266-ANCE-2016)
 - .2 CAN/CSA-C22.2 No. 144-M91, Ground Fault Circuit Interrupters
 - .3 CSA C22.2 No.144.1-16, Ground-Fault Circuit-Interrupters (tri-national standard with UL 943 and NMX-J-520-ANCE)
 - .4 Ontario Electrical Safety Code (OESC) 28th Edition, 2021.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, product literature, and data sheets for circuit breakers. Include product characteristics, performance criteria, physical sizes, finishes, and limitations.
 - .2 Include time-current characteristic curves for breakers with interrupting capacity of 22 000 A symmetrical rms and over at system voltage.

1.4 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, store, and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Storage and Handling Requirements:
 - .1 Store circuit breakers off ground indoors in a clean, dry, well-ventilated location, and in accordance with manufacturer's recommendations.
 - .2 Store and protect circuit breakers from damage that impairs function or lifespan.

Part 2 Products

2.1 BREAKERS - GENERAL

- .1 Circuit Breakers, and Ground-Fault Circuit Interrupters: To CSA C22.2 No. 5.

- .2 Bolt-on Moulded Case Circuit Breakers: Over-centre, trip-free toggle-operating mechanism to provide quick-make, quick-break contact action, for manual and automatic operation with temperature compensation for 40°C ambient.
- .3 Common-Trip Breakers: With single handle for multi-pole applications.
- .4 Magnetic instantaneous trip elements in circuit breakers to operate only when value of current reaches setting.
 - .1 Trip settings on breakers with adjustable trips to range from 3 to 8 times current rating.
- .5 Circuit breakers with interchangeable trips as indicated.
- .6 Provide red toggle handles on breakers for fire alarm and exit lighting.

2.2 THERMAL MAGNETIC BREAKERS

- .1 Moulded case circuit breaker to operate automatically by means of thermal and magnetic tripping devices to provide inverse time current tripping and instantaneous tripping for short-circuit protection.

2.3 INSTANTANEOUS-TRIP BREAKERS

- .1 Moulded case circuit breaker to operate automatically by means of magnetic tripping devices to provide instantaneous tripping for short-circuit protection.
- .2 Instantaneous-trip circuit breaker to be used only as part of a combination motor starter or controller that also provides overload protection.

2.4 SERIES-RATED THERMAL MAGNETIC BREAKERS

- .1 Series-rated breakers to be manufacturer tested and listed.
 - .1 Breakers applied following manufacturer's guidelines and accepted best practice.

2.5 SOLID-STATE TRIP BREAKERS

- .1 Moulded case circuit breaker to operate by means of solid-state trip unit with associated current sensors and self-powered shunt trip to provide inverse time current trip under overload conditions, and instantaneous tripping for ground fault short-circuit protection.

2.6 GROUND FAULT CIRCUIT INTERRUPTER BREAKERS

- .1 Ground fault circuit interrupter (GFCI) breakers: To CAN/CSA-C22.2 No. 144 and 144.1, Class A Type, single-pole GFCI breakers, rating as scheduled, complete with test and reset facilities.

2.7 ADDITIONAL FEATURES

- .1 As indicated, or otherwise required, include:
 - .1 Shunt trip.
 - .2 Auxiliary switch.
 - .3 Motor-operated mechanism with time delay unit.

- .4 Under-voltage release.
- .5 On-off locking device.
- .6 Handle mechanism.

2.8 ENCLOSURE

- .1 Provide breakers compatible with existing panelboards.

Part 3 Execution

3.1 INSTALLATION

- .1 Install circuit breakers as indicated.

END OF SECTION

Section 26 29 10 Motor Starters to 600 V

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 26 05 00 - Common Work Results for Electrical

1.2 REFERENCE STANDARDS

- .1 International Electrotechnical Commission (IEC)
 - .1 IEC 947-4-1-2002, Part 4: Electromechanical contactors and motor-starters.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Provide manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

1.4 CLOSEOUT SUBMITTALS

- .1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Submit operation and maintenance data for each type and style of motorstarter for incorporation into maintenance manual.
- .3 Extra Materials:
 - .1 Provide listed spare parts for each different size and type of starter.
 - .1 3 contacts, stationary.
 - .2 3 contacts, movable.
 - .3 1 contacts, auxiliary.
 - .4 1 control transformer s.
 - .5 1 operating coil.
 - .6 2 fuses.
 - .7 10% indicating lamp bulbs used.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle in accordance with Section 01 61 00 - Common Product Requirements.

- .2 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.

Part 2 Products

2.1 MATERIALS

- .1 Starters: to IEC 947-4 with AC4 utilization category

2.2 MANUAL MOTOR STARTERS

- .1 Manual motor starters of size, type, rating, and enclosure type as indicated, with components as follows:
 - .1 Switching mechanism, quick make and break.
 - .2 Overload heater(s), manual reset, trip indicating handle.
- .2 Accessories:
 - .1 Locking tab to permit padlocking in "ON" or "OFF" position.

2.3 FULL VOLTAGE MAGNETIC STARTERS

- .1 Magnetic and combination magnetic starters of size, type, rating and enclosure type as indicated with components as follows:
 - .1 Contactor solenoid operated, rapid action type.
 - .2 Motor overload protective device in each phase, manually reset from outside enclosure.
 - .3 Wiring and schematic diagram inside starter enclosure in visible location.
 - .4 Identify each wire and terminal for external connections, within starter, with permanent number marking identical to diagram.
- .2 Combination type starters to include motor circuit interrupter with operating lever on outside of enclosure to control motor circuit interrupter, and provision for:
 - .1 Locking in "OFF" position with up to 3 padlocks.
 - .2 Independent locking of enclosure door.
 - .3 Provision for preventing switching to "ON" position while enclosure door open.
- .3 Accessories:
 - .1 1-N/O and 1-N/C spare auxiliary contacts unless otherwise indicated.

2.4 FULL VOLTAGE REVERSING MAGNETIC STARTERS

- .1 Full voltage reversing magnetic starters of size, type, rating and enclosure type as indicated with components as follows:
 - .1 Two - 3 pole magnetic contactors mounted on common base.
 - .2 Mechanical and electrical interlocks to prevent both contactors from operating at same time.
 - .3 Three overload relays with heater elements, automatic reset.

- .2 Accessories:
 - .1 Auxiliary control devices as indicated.

2.5 ACCESSORIES

- .1 Pushbutton: heavy duty, oil tight as required.
- .2 Selector switches: heavy duty, oil tight as required.
- .3 Indicating lights: heavy duty, oil tight, type and colour as indicated.

2.6 FINISHES

- .1 Apply finishes to enclosure in accordance with Section 26 05 00 - Common Work Results for Electrical.

2.7 EQUIPMENT IDENTIFICATION

- .1 Provide equipment identification in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Manual starter designation label, white plate, black letters, engraved as indicated.
- .3 Magnetic starter designation label, white plate, black letters, engraved as indicated.

Part 3 Execution

3.1 INSTALLATION

- .1 Install starters and control devices in accordance with manufacturer's instructions.
- .2 Install and wire, starters and controls as indicated.
- .3 Ensure correct fuses installed.
- .4 Confirm motor nameplate and adjust overload device to suit.

3.2 FIELD QUALITY CONTROL

- .1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical and manufacturer's instructions.
- .2 Operate switches and contactors to verify correct functioning.
- .3 Perform starting and stopping sequences of contactors and relays.
- .4 Check that sequence controls, interlocking with other separate related starters, equipment, control devices, operate as indicated.

3.3 CLEANING

- .1 Clean in accordance with Section 01 74 00 - Cleaning.
 - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

Section 26 29 23

Variable-Frequency Motor Controllers

Part 1 General

1.1 SECTION INCLUDES

- .1 Variable frequency controller.

1.2 RELATED REQUIREMENTS

- .1 Section 03 30 00 - Cast-in-place Concrete: Housekeeping pads.
- .2 Section 26 05 53 - Electrical Identification: Engraved nameplates.

1.3 REFERENCE STANDARDS

- .1 CSA (Canadian Standards Association).
- .2 CSA C22.1 Canadian electrical code, part I safety standard for electrical installations
- .3 CSA C22.2 NO. 14 Industrial control equipment
- .4 ISO 9000 Quality Management.
- .5 ISO 14000 Environmental Management.
- .6 NEMA EN 10250 Enclosures for electrical equipment (1000 volts maximum)
- .7 NEMA IA 10029 Industrial control and systems - guide for the application, handling, storage, installation and maintenance of medium voltage ac contactors, controllers and control centers
- .8 UL (Underwriters Laboratories Inc.).

1.4 ACTION SUBMITTALS

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide catalogue sheets showing voltage, controller size, ratings and size of switching and over-current protective devices, short circuit ratings, dimensions, and enclosure details.
- .3 Shop Drawings: Include front and side views of enclosures with overall dimensions and weights shown; conduit entrance locations and requirements; and nameplate legends.

1.5 INFORMATIONAL SUBMITTALS

- .1 Section 01 33 00: Submission procedures.
- .2 Test Reports: Indicate field test and inspection procedures and test results.
- .3 Installation Data: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include

instructions for storage, handling, protection, examination, preparation, installation, and starting of Product.

- .4 Manufacturer's Field Reports: Indicate start-up inspection findings.

1.6 CLOSEOUT SUBMITTALS

- .1 Section 01 78 00: Submission procedures.
- .2 Maintenance Contracts: Provide service and maintenance of controller for one (1) year from Date of Substantial Completion.
- .3 Maintenance Data: Include routine preventive maintenance schedule.
- .4 Operation Data: Include instructions for starting and operating controllers, and describe operating limits that may result in hazardous or unsafe conditions.

1.7 QUALITY ASSURANCE

- .1 Products of This Section: Manufactured to ISO 9000 certification requirements.
- .2 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience and with service facilities within 160 km of Project.

1.8 DELIVERY, STORAGE, AND HANDLING

- .1 Section 01 61 00: Transport, handle, store, and protect products.
- .2 Accept controllers on site in original packing. Inspect for damage.
- .3 Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
- .4 Handle to manufacturer's written instructions. Lift only with lugs provided for the purpose. Handle carefully to avoid damage to components, enclosure, and finish.

Part 2 Products

2.1 DESCRIPTION

- .1 System Description:
 - .1 Provide enclosed variable frequency controllers suitable for operating the indicated loads. Conform to requirements of CSA-C22.2 No. 14, NEMA IA 10029.
- .2 Regulatory Requirements:
 - .1 Provide products listed and classified by CSA as suitable for purpose specified and indicated.

2.2 RATINGS

- .1 Displacement Power Factor: Between 1.0 and 0.95, lagging, over entire range of operating speed and load.
- .2 Operating Ambient: 0 to 40 degrees C.

2.3 DESIGN

- .1 Employ microprocessor-based inverter logic isolated from power circuits.
- .2 Employ pulse width modulated inverter system.
- .3 Employ switching power supply operating off DC link.
- .4 Design for ability to operate controller with motor disconnected from output.
- .5 Design to attempt five automatic restarts following fault condition before locking out and requiring manual restart.

2.4 PRODUCT OPTIONS AND FEATURES

- .1 Display: Provide integral digital display to indicate output voltage, output frequency, and output current.
- .2 Status Indicators: Separate indicators for overcurrent, overvoltage, ground fault, overtemperature, and input power ON.
- .3 Volts Per Hertz Adjustment: Plus or minus 10%.
- .4 Current Limit Adjustment: 60 - 110% of rated.
- .5 Acceleration Rate Adjustment: 0.5 - 30 seconds.
- .6 Deceleration Rate Adjustment: 1 - 30 seconds.
- .7 Provide HAND-OFF-AUTOMATIC selector switch and manual speed control.
- .8 Input Signal:
 - .1 0-10 mV DC.
- .9 Safety Interlocks: Provide terminals for remote contact to inhibit starting under both manual and automatic mode.
- .10 Control Interlocks: Provide terminals for remote contact to allow starting in automatic mode.
- .11 Manual Bypass: Provide contactor, motor running overload protection, and short circuit protection for full voltage, non-reversing operation of the motor. Include isolation switch to allow maintenance of inverter during bypass operation.

2.5 FABRICATION

- .1 Wiring Terminations: Match conductor materials and sizes indicated.
- .2 Enclosure: NEMA EN 10250, Type 1.
- .3 Finish: Manufacturer's standard enamel.

2.6 SOURCE QUALITY CONTROL

- .1 Section 01 43 00: Manufacturer quality control.
- .2 Inspect and production-test each product specified in this section.

Part 3 Execution

3.1 EXAMINATION

- .1 Section 01 71 00: Verify existing conditions before starting work.
- .2 Verify that surface is suitable for controller installation.
- .3 Do not install controller until building environment can be maintained within the service conditions required by the manufacturer.

3.2 PREPARATION

- .1 Provide concrete housekeeping pad under the provisions of Section 03 30 00.

3.3 INSTALLATION

- .1 Install controller where indicated, to CSA-C22.2 No. 14, NEMA IA 10029, manufacturer's written instructions.
- .2 Tighten accessible connections and mechanical fasteners after placing controller.
- .3 Install fuses in fusible switches.
- .4 Select and install overload heater elements in motor controllers to match installed motor characteristics.
- .5 Provide engraved plastic nameplates under the provisions of Section 26 05 53.
- .6 Provide neatly typed label inside each motor controller door identifying motor served, nameplate horsepower, full load amperes, code letter, service factor, and voltage/phase rating.

3.4 ADJUSTING

- .1 Make final adjustments to installed drive to assure proper operation of fan system. Obtain performance requirements from installer of driven loads.

3.5 CLEANING

- .1 Section 01 74 10: Cleaning installed work.
- .2 Touch up scratched or marred surfaces to match original finish.

3.6 CLOSEOUT ACTIVITIES

- .1 Demonstration: Demonstrate operation of controllers in automatic and manual modes.

END OF SECTION

Section 26 33 13 Batteries

Part 1 General

1.1 SECTION INCLUDES

- .1 Batteries.

1.2 REFERENCE STANDARDS

- .1 CSA (Canadian Standards Association).
- .2 CSA C22.1 Canadian electrical code, part I safety standard for electrical installations
- .3 CSA C282 Emergency electrical power supply for buildings
- .4 ISO 9000 Quality Management.
- .5 ISO 14000 Environmental Management.
- .6 UL (Underwriters Laboratories Inc.).

1.3 ACTION SUBMITTALS

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide catalogue and data sheets showing electrical characteristics and connection requirements. Include unit ratings, dimensions, and finishes. Include performance data for batteries.

1.4 CLOSEOUT SUBMITTALS

- .1 Section 01 78 00: Submission procedures.
- .2 Maintenance Data: Include battery maintenance and unit testing procedures.

Part 2 Products

2.1 DESCRIPTION

- .1 Regulatory Requirements:
 - .1 Provide products listed and classified by CSA as suitable for purpose specified and indicated.

2.2 BATTERIES

- .1 As indicated.

Part 3 Execution

3.1 INSTALLATION

- .1 Install to manufacturer's written instructions.

3.2 FIELD QUALITY CONTROL

.1 Inspection and Testing:

.1 Verify operation of each unit by simulating outage.

3.3 CLOSEOUT ACTIVITIES

.1 Demonstration: Demonstrate normal operation of unit.

END OF SECTION