BARRY BRYAN
ASSOCIATES

Architects
Engineers
Project Managers

Transmittal

To:	Conseil scolaire Viamonde	**Project No.:**	24195
Address:	116 Cornelius Parkway	**Date:**	March 21, 2025
	Toronto, ON M6L 2K5		
Attention:	Majid Bouattane		
Project Name:	Rénovations in École élémentaire Jeanne-Lajoie, Toronto		

For your:	❑	Approval	**Via:**	❑	Mail
	❑	Distribution		❑	Courier
	■	Information and use		❑	By hand
	❑	Review and comment		❑	To be picked up
Action taken:	❑	Reviewed		❑	Fax
	❑	Reviewed as noted		■	E-mail
	❑	Revise and resubmit			
	❑	Not reviewed			

Qty.:	Drawing No.:	Issue No.:	Revision No.:	Description:
1	Copy	-	-	Addendum No. 1 dated March 21, 2025

cc: William Weima, Barry Bryan Associates
Chris Maves, Barry Bryan Associates

Shivanie Motielal

250 Water Street,
Suite 201
Whitby, Ontario
Canada
L1N 0G5

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BARRY BRYAN
ASSOCIATES

Architects
Engineers
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Addendum No. 1

Project No.: 24195

Date: March 21, 2025

Project: **Rénovations in École élémentaire Jeanne-Lajoie, Toronto**
Conseil scolaire Viamonde

The following information supplements and/or supersedes the bid documents issued on March 20, 2025.

This Addendum forms part of the contract documents and is to be read, interpreted, and coordinated with all other parts. The cost of all contained herein is to be included in the contract sum. The following revisions supersede the information contained in the original drawings and specifications issued for the above-named project to the extent referenced and shall become part thereof. Acknowledge receipt of this Addendum by inserting its number and date on the Tender Form. Failure to do so may subject bidder to disqualification.

GENERAL

1.1 Refer to HCC Engineering Addendum E-1 dated March 20, 2025 for all electrical drawings and specifications.

1.2 Refer to Designated Substance Survey - Pre-Renovation dated March 19, 2025, Arcadis Project # 3024616.

SPECIFICATION

1.3 DIVISION 00 Section 00 01 11 Table of Contents

.1 Replace section 00 01 11, Table of Contents, with attached, revised section 00 01

1.4 DIVISION 01 Section 01 00 60 List of Drawings

.1 Replace section 01 00 60, List of Drawings, with attached, revised section 01 00 60.

End of Addendum No. 1

Barry Bryan Associates
Architects, Engineers, Project Managers

Chris Maves, A. Sc. T., Licensed Technologist OAA

CM/sm

Attachments:
HCC Engineering Tender Addendum #E-01 (68 Pages)
Designated Substance Survey– Pre-Renovation (51 Pages)

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Canada
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End of Section

LIST OF DRAWINGS

Dwg. No.	Title	Issue No.	Rev. No.	Issue Date
ARCHITECTURAL				
A000	OBC Matrix, Drawing List and Location Plan	2	-	Mar. 20, 2025
A201	First Floor Demolition and Key Plan	2	-	Mar. 20, 2025
A202	2nd Floor Demolition and Key Plan	2	-	Mar. 20, 2025
A203	Part 1st Floor Demolition Plans	2	-	Mar. 20, 2025
A204	Part Demolition Plans	2	-	Mar. 20, 2025
A205	Part Floor Plans	2	-	Mar. 20, 2025
A206	Part Floor Plans	2	-	Mar. 20, 2025
A207	Part Reflected Ceiling Plans	2	-	Mar. 20, 2025
A208	Part Reflected Ceiling Plans	2	-	Mar. 20, 2025
A301	Part East Elevations	2	-	Mar. 20, 2025
A302	Part West Elevations & Details	2	-	Mar. 20, 2025
A301	Part North and South Elevations	2	-	Mar. 20, 2025
A401	Stage Section and Elevation	2	-	Mar. 20, 2025
A701	Interior Elevations	2	-	Mar. 20, 2025
A702	Interior Elevations	2	-	Mar. 20, 2025
A801	Millwork Sections	2	-	Mar. 20, 2025
A901	Schedules	2	-	Mar. 20, 2025
A905	Elevation Photos	2	-	Mar. 20, 2025
A906	Elevation Photos	2	-	Mar. 20, 2025
A907	Elevation Photos	2	-	Mar. 20, 2025
A908	Elevation Photos	2	-	Mar. 20, 2025
A909	Elevation Photos	2	-	Mar. 20, 2025
A910	Elevation Photos	2	-	Mar. 20, 2025
A911	Elevation Photos	2	-	Mar. 20, 2025
A912	Elevation Photos	2	-	Mar. 20, 2025
A913	Elevation Photos	2	-	Mar. 20, 2025
MECHANICAL				
M-0	Title Sheet	2	-	Mar. 19, 2025
M-1.1	Mechanical Specifications I	2	-	Mar. 19, 2025
M-1.2	Mechanical Specifications II and Legend	2	-	Mar. 19, 2025

Dwg. No.	Title	Issue No.	Rev. No.	Issue Date
M-1.3	Mechanical Schedules and Details	2	-	Mar. 19, 2025
M-2.1	Part 1st & 2nd Floor Demolition Plan - HVAC	2	-	Mar. 19, 2025
M-2.2	Part 1st Floor Demolition Plan - HVAC	2	-	Mar. 19, 2025
M-2.3	Part 1st & 2nd Floor New Plan - HVAC	2	-	Mar. 19, 2025
M-2.4	Part 1st Floor New Plan - HVAC	2	-	Mar. 19, 2025
M-3.1	Part 1st Floor Demolition Plan – Plumbing & Drainage	2	-	Mar. 19, 2025
M-3.2	Part 1st Floor Demolition Plan – Plumbing & Drainage	2	-	Mar. 19, 2025
M-3.3	Part 1st Floor New Plan – Plumbing & Drainage	2	-	Mar. 19, 2025
M-3.4	Part 1st Floor New Plan – Plumbing & Drainage	2	-	Mar. 19, 2025
ELECTRICAL				
E-1.0	Electrical Legend & Details	2	-	Mar. 20, 2025
E-1.1	Electrical Details	2	-	Mar. 20, 2025
E-1.2	Electrical Details	2	-	Mar. 20, 2025
E-1.3	Electrical Details	2	-	Mar. 20, 2025
E-2.1	Electrical Facility Plan – First Floor	2	-	Mar. 20, 2025
E-2.2	Electrical Facility Plan – Second Floor	2	-	Mar. 20, 2025
E-5.1	Electrical Demolition Plan – First Floor	2	-	Mar. 20, 2025
E-5.2	Electrical Demolition Plan – Second Floor	2	-	Mar. 20, 2025
E-6.1	Reflected Ceiling Demolition Plan – First Floor	2	-	Mar. 20, 2025
E-6.2	Reflected Ceiling Demolition Plan – Second Floor	2	-	Mar. 20, 2025
E-9.1	Electrical and Reflected Ceiling Plans – First Floor	2	-	Mar. 20, 2025
E-9.2	Electrical and Reflected Ceiling Plan -Second Floor	2	-	Mar. 20, 2025

End of Section

HCC ENGINEERING LIMITED

Design and Technology Services Group
40 Eglinton Avenue East
Suite 600
Toronto, Ontario
M4P 3A2
Tel: (416) 932-2423

Tender Addendum #E-01

Project:	**Renovations at** **École élémentaire Jeanne-Lajoie** **150 Carnforth Road** **Toronto, Ontario**
HCC Engineering Project No.:	**25001** **BCIN# 28954**
Date:	**March 20, 2025**

1. General
    1. This tender addendum is an integral part of the Specifications and Drawings and shall form an integral part of the Contract Documents.

2. Drawings

    1. Drawing No. E-1.0 (Issued with Addendum)
    2. Drawing No. E-1.1 (Issued with Addendum)
    3. Drawing No. E-1.2 (Issued with Addendum)
    4. Drawing No. E-1.3 (Issued with Addendum)
    5. Drawing No. E-2.1 (Issued with Addendum)
    6. Drawing No. E-2.2 (Issued with Addendum)
    7. Drawing No. E-5.1 (Issued with Addendum)
    8. Drawing No. E-5.2 (Issued with Addendum)
    9. Drawing No. E-6.1 (Issued with Addendum)
    10. Drawing No. E-6.2 (Issued with Addendum)
    11. Drawing No. E-9.1 (Issued with Addendum)
    12. Drawing No. E-9.2 (Issued with Addendum)

3. Specifications

    1. Electrical Specifications (Issued with Addendum)

End of Tender Addendum #E-01

LEGEND

	EXISTING CEILING MOUNTED/SUSPENDED FIXTURE CONNECTED TO BASE BUILDING UTILITY LIGHTING CIRCUIT.
	EXISTING CEILING MOUNTED/SUSPENDED FIXTURE CONNECTED TO NON SWITCHED 24–HOUR NIGHT LIGHTING CIRCUIT.
	CEILING MOUNTED/SUSPENDED FIXTURE. CONNECT TO BASE BUILDING UTILITY LIGHTING CIRCUIT.
	CEILING MOUNTED/SUSPENDED FIXTURE. CONNECT TO NON SWITCHED 24–HOUR NIGHT LIGHTING CIRCUIT.
	RECESSED DOWNLIGHT/PENDANT FIXTURE. CONNECT TO SWITCHED BASE BUILDING UTILITY LIGHTING CIRCUIT.
	RECESSED DOWNLIGHT/PENDANT FIXTURE. CONNECT TO NON SWITCHED 24–HOUR NIGHT LIGHTING CIRCUIT.
	CEILING OR WALL MOUNTED "EXIT" LIGHT.
D1 M1	EMERGENCY BATTERY UNIT, TYPE 'D1', SOURCE 'M1'. BATTERY SHALL BE MOUNTED AT HIGH LEVEL.
D2 M1	REMOTE EMERGENCY LIGHTING FIXTURE, TYPE 'D2' FED FROM SOURCE 'M1'.
$	WHITE DECORA STYLE LIGHT SWITCH, VOLTAGE AND CURRENT RATINGS AS REQUIRED.
$OVX	WALL MOUNTED ROOM LIGHT SWITCH WATT STOPPER LMSW–2XX. 'OV1' DENOTES ONE (1) DIGITAL PUSH BUTTON. 'OV2' DENOTES TWO (2) DIGITAL PUSH BUTTONS. 'OV3' DENOTES THREE (3) DIGITAL PUSH BUTTONS. 'OV4' DENOTES FOUR (4) DIGITAL PUSH BUTTONS.
$TS	'TS' DENOTES WALL MOUNTED LOW VOLTAGE DIGITAL TIME SWITCH C/W POWER PACK (VOLTAGE RATINGS TO SUIT LIGHTING LOADS) AND BOTH VISUAL AND AUDIBLE WARNING (TIMER PRESET AT 20 MINUTE TIME OUT SETTING). BASIS OF DESIGN: WATT STOPPER TS–400–24.
GFI	15AMP/120VOLT, U–GROUND DUPLEX RECEPTACLE. GFI DENOTES OUTLET C/W GROUND FAULT INTERRUPT PROTECTION.
	RECEPTACLE, REQUIREMENT AS NOTED
20/120	20A/120V DUPLEX RECEPTACLE, TAMPER RESISTANT, CSA 5–20R (T–SLOT).
PL 20/120	20A/120V PLUG LOAD CONTROLLED DUPLEX RECEPTACLE, TAMPER RESISTANT, CSA 5–20R (T–SLOT). HUBBELL DR20C2WHITR SERIES.
	DIRECT CONNECTION
	STARTER.
	NON–FUSED HORSEPOWER RATED VISIBLE BLADE HEAVY DUTY DISCONNECT SWITCH C/W PADLOCK PROVISION IN OFF POSITION
30A/15A/3P	VISIBLE BLADE HEAVY DUTY DISCONNECT SWITCH C/W PADLOCK PROVISION IN OFF POSITION FUSED AT '15A'
30A/15A/3P	COMBINATION STARTER C/W PADLOCK PROVISION IN OFF POSITION FUSED AT '15A', FUSES, OVERLOAD PROTECTION, CONTROL TRANSFORMER, 2 NO AND 2 NC CONTACTS, PILOT LIGHT AND HOA. FUSED AT '15A'.
RP–A–X(D)	CIRCUIT 'X' FED FROM RECEPTACLE PANEL 'A'. '(D)' DENOTES DESIGNATED CIRCUIT FOR ISOLATED GROUND DUPLEX RECEPTACLE.
RP–A–X(D)	EXISTING CIRCUIT 'X' FED FROM RECEPTACLE PANEL 'A'. '(D)' DENOTES DESIGNATED CIRCUIT FOR ISOLATED GROUND DUPLEX RECEPTACLE.
	4" SQUARE BACKBOX C/W SINGLE DEVICE COVER (PLASTER RING) AND 3/4" EMPTY ZONE CONDUIT ASSEMBLY FOR COMMUNICATIONS CONTRACTOR'S USE. PROVIDE A PULL STRING IN CONDUIT.
IN	3 GANG BACKBOX C/W 3/4" EMPTY ZONE CONDUIT ASSEMBLY FOR A/V CONTRACTOR'S USE. PROVIDE A PULL STRING IN CONDUIT.
E	DENOTES EXISTING DEVICE TO REMAIN.
ER	DENOTES EXISTING DEVICE TO BE REMOVED. REMOVE CONDUIT AND WIRE BACK TO SOURCE.
R	DENOTES EXISTING DEVICE IN RELOCATED POSITION. PROVIDE CONDUIT AND WIRE.
RE	DENOTES EXISTING DEVICE TO REMAIN. RECIRCUIT AS SHOWN. REMOVE EXISTING CONDUIT AND WIRE BACK TO EXISTING SOURCE. PROVIDE CONDUIT AND WIRE BACK TO NEW SOURCE.
WG	DENOTES DEVICE COMPLETE WITH PROTECTIVE WIRE GUARD
CL	DENOTES CEILING MOUNTED.
CP	DENOTES DEVICE MOUNTED IN CLOCK PANEL.
RM	DENOTES ROOF MOUNTED.
S	DENOTES SURFACE MOUNTED.
WP	DENOTES NEMA TYPE 4X ENCLOSURE SUITABLE FOR HOSE DIRECTED WATER.

	FIRE ALARM SYSTEM HORN. CONNECT TO BASE BUILDING FIRE ALARM SYSTEM. RED IN COLOUR.
B	FIRE ALARM SYSTEM COMBINATION STROBE LIGHT/HORN. CONNECT TO BASE BUILDING FIRE ALARM SYSTEM. RED IN COLOUR.
H	FIRE ALARM SYSTEM STROBE LIGHT. CONNECT TO BASE BUILDING FIRE ALARM SYSTEM. RED IN COLOUR.
	MANUAL PULL STATION. CONNECT TO BASE BUILDING FIRE ALARM SYSTEM.
	SMOKE DETECTOR. CONNECT TO BASE BUILDING FIRE ALARM SYSTEM.
	HEAT DETECTOR. CONNECT TO BASE BUILDING FIRE ALARM SYSTEM.
T	WALL/MODULAR CONTROL PANEL MOUNTED PUBLIC ADDRESS SYSTEM PAGING SPEAKER ROUGH–IN
T CS	WALL MOUNTED PUBLIC ADDRESS SYSTEM PAGING SPEAKER. CONNECT TO PUBLIC ADDRESS SYSTEM. "CS" DENOTES DEVICE C/W CALL SWITCH.
T	WALL MOUNTED PUBLIC ADDRESS SYSTEM PAGING SPEAKER C/W DIGITAL CLOCK. CONNECT SPEAKER TO PUBLIC ADDRESS SYSTEM. CONNECT DIGITAL CLOCK TO MASTER CLOCK SYSTEM.
V CS	WALL/CEILING MOUNTED PUBLIC ADDRESS SYSTEM PAGING SPEAKER CONNECTED TO EXISTING PUBLIC ADDRESS SYSTEM. "CS" DENOTES DEVICE C/W CALL SWITCH. "CL" DENOTES CEILING MOUNTED. "FL" DENOTES RECESSED MOUNTED.
CS	CALL SWITCH CONNECTED TO EXISTING PUBLIC ADDRESS SYSTEM.
HS	INTERCOM HANDSET. CONNECT TO PUBLIC ADDRESS SYSTEM.
CLOCK	DIGITAL CLOCK. CONNECT TO MASTER CLOCK SYSTEM.
CL	WALL MOUNTED CLOCK CONNECTED TO EXISTING MASTER CLOCK SYSTEM.
	PUBLIC ADDRESS SYSTEM HORN SPEAKER. CONNECT TO PUBLIC ADDRESS SYSTEM.
	EXISTING PUBLIC ADDRESS SYSTEM HORN SPEAKER CONNECTED TO EXISTING PUBLIC ADDRESS SYSTEM.
DC	WIRED INTRUSION SYSTEM DOOR CONTACT. CONNECT TO INTRUSION SYSTEM.
H	AUDIBLE ALARM. CONNECT TO ACCESS CONTROL SYSTEM.
CR	CARD READER. CONNECT TO ACCESS CONTROL SYSTEM.
ES	DOOR OPERATOR WAVE SENSOR C/W CONDUIT AND WIRES
EP	ELECTRIC STRIKE. CONNECT TO ACCESS CONTROL SYSTEM.
KP	KEYPAD. CONNECT TO INTRUSION SYSTEM.
MD	MOTION DETECTOR REQUEST TO EXIT. CONNECT TO ACCESS CONTROL SYSTEM.
MS	WIRED INTRUSION SYSTEM MOTION SENSOR. CONNECT TO INTRUSION SYSTEM.
TH	THERMOSTAT SUPPLIED BY MECHANICAL CONTRACTOR AND INSTALLED BY ELECTRICAL CONTRACTOR. PROVIDE CONDUIT AND WIRE.
WAP	WIRELESS ACCESS POINT C/W CONDUIT SYSTEM
MS A	ROOM CEILING MOUNTED OCCUPANCY SENSOR WATT STOPPER LMDC–100. SENSOR PRESET AT 20 MINUTE TIME OUT SETTING C/W MANUAL ON AND AUTO OFF AND DEFAULT DETECTION TECHNOLOGY SETTING.
MS C	NON–SWITCHED CORRIDOR CEILING MOUNTED OCCUPANCY SENSOR WATT STOPPER LMDC–100. SENSOR PRESET AT 20 MINUTE TIME OUT SETTING C/W AUTO ON AND AUTO OFF WALK THROUGH MODE ON AND DEFAULT SETTING.
RA	DIGITAL ON/OFF/DIMMING ROOM CONTROLLER WATT STOPPER LMRC–212/LMRC–212–347 (VOLTAGE RATING AS REQUIRED TO SUIT LIGHTING LOAD).
RA L	DIGITAL DIMMING ROOM CONTROLLER WATT STOPPER 120V LINE VOLTAGE LMRC–222.
PL	DIGITAL PLUG LOAD CONTROLLER WATT STOPPER LMPL–101
SP	WALL MOUNTED GYM SOUND SYSTEM SPEAKER. CONNECT TO GYM SOUND SYSTEM.
GYM	4" SQUARE BACKBOX AND 1 1/2" ZONE CONDUIT SYSTEM C/W LOW VOLTAGE CABLES. CONNECT TO GYMNASIUM SOUND SYSTEM.

1. SUBSTITUTES ARE NOT PERMITTED FOR ALL SPECIFIED PRODUCTS.
2. SHOP DRAWINGS ARE REQUIRED FOR ALL PRODUCTS SPECIFIED FOR THIS PROJECT INCLUDING BUT NOT LIMITED TO LIGHTING CONTROL, LIGHTING FIXTURES, EXIT SIGNS, EMERGENCY LIGHTING SYSTEMS, FIRE ALARM SYSTEM DEVICES, PUBLIC ADDRESS SYSTEM, ACCESS CONTROL SYSTEM, INTRUSION SYSTEM, VIDEO INTERCOM SYSTEM, RECEPTACLES AND COVER PLATES.
3. ELECTRICAL CONTRACTOR AND ALL SUBCONTRACTORS MUST READ AND COMPLY WITH ELECTRICAL SPECIFICATIONS (ISSUED AS A SEPARATE DOCUMENT).
4. CIRCUITING MUST BE COMPLETED AS SHOWN ON DRAWINGS. DO NOT CHANGE CIRCUIT NUMBERS.
5. INSTALLATION OF ALL DEVICES AND SERVICES INCLUDING DISTRIBUTION, LIGHT FIXTURES, FEEDERS, BRANCH CIRCUITS, VARIOUS SYSTEMS, ETC. MUST COMPLY WITH ALL LOCAL SEISMIC RESTRAINT REQUIREMENTS.
6. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE ARCHITECTURAL DRAWINGS FOR DIMENSIONS, MOUNTING HEIGHTS, CONSTRUCTION DETAILS, LOCATION OF LIGHT FIXTURES, FINISHES AND COLOURS.
7. AS PART OF THIS SCOPE OF WORK AND PRIOR TO CONSTRUCTION, ELECTRICAL CONTRACTOR SHALL COORDINATE AND PAY FOR THE SERVICES OF THE FIRE ALARM MANUFACTURER, FIRE INSPECTOR AND BUILDING INSPECTOR TO THOROUGHLY REVIEW THE PROPOSED INSTALLATION LOCATIONS FOR EACH AND EVERY CONTROL PANEL, REMOTE ANNUNCIATOR PANEL, ANCILLARY DEVICE, FIELD DEVICE, ETC TO ENSURE THAT THE PROPOSED INSTALLATION IS FULLY COMPLIANT WITH CAN/ULC S524-2019 AND ONTARIO BUILDING CODE. COMPLIANCE SHALL INCLUDE INTERFERENCE AND PROXIMITY TO EXISTING DEVICES AND OBSTRUCTIONS (INCLUDING BUT NOT LIMITED TO LIGHT FIXTURES, SUPPLY AIR DUCTS, EXPOSED DUCT WORK, BEAMS, RACEWAYS, ETC.), SPACING BETWEEN FIELD DEVICES PROVIDED AS PART OF THIS SCOPE OF WORK IN PROPOSED INSTALLATION LOCATIONS, ETC..
8. AS PART OF THIS SCOPE OF WORK AND PRIOR TO CONSTRUCTION, ELECTRICAL CONTRACTOR SHALL COORDINATE AND PAY FOR THE SERVICES OF THE BUILDING INSPECTOR TO REVIEW THE PROPOSED EXIT SIGN ORIENTATION, LOCATIONS, FACES AND CHEVRONS.
9. AS BUILT DRAWING REQUIREMENTS:
   AS BUILT DRAWINGS TO BE PREPARED AND SUBMITTED IN AUTOCAD FORMAT BY THE ELECTRICAL CONTRACTOR.
   - ALL DEMOLITION SCOPES OF WORK ARE TO BE ERASED FROM AS BUILT DRAWINGS.
   - ROUTING OF ALL FEEDERS, BRANCH WIRING (LIGHTING, EMERGENCY LIGHTING, POWER, ETC.), LOW VOLTAGE WIRING, MISCELLANEOUS SYSTEMS WIRING, MISCELLANEOUS CONDUIT SYSTEMS, ETC., TO BE SHOWN ON AS BUILT DRAWINGS.

   REFER TO DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS AND FOR COSTS TO OBTAIN CAD FILES.
10. AS PART OF THE BASE BID PRICE ELECTRICAL CONTRACTOR SHALL PROVIDE A FIRE WATCH AS REQUIRED THROUGHOUT THE DURATION OF THE PROJECT.
11. INFECTIOUS CONTROL
    1. DUST CONTROL IS REQUIRED ON ALL FLOORS IN THE FACILITY.
    2. THE FOLLOWING REQUIREMENTS MUST BE STRICTLY ADHERED TO:
       1. LIMIT THE NUMBER OF CEILING TILES REMOVED ON A FLOOR AT ANY GIVEN TIME.
       2. VACUUM PERIMETER OF T–BAR PRIOR TO REMOVAL OF A CEILING TILE.
       3. ATTACH VACUUMS TO ALL DRILLS.
12. ALL SCOPES OF WORK REQUIRED TO BE COMPLETED IN OCCUPIED AREAS OF THE FACILITY INCLUDING WORK RELATED TO DEFICIENCIES MUST BE COMPLETED BETWEEN 11PM AND 5AM DURING THE WEEK. REMOVAL AND REINSTALLATION OF CEILING TILES TO ACCOMMODATE ALL SCOPES OF WORK SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR.
13. THE BASE BID PRICE SHALL INCLUDE FOR ALL REQUIRED CUTTING, PATCHING, PAINTING, ETC. OF ALL WALLS REQUIRED TO COMPLETE ALL SCOPES OF WORK. ENSURE CONTINUOUS AND UNIFORM LEVEL 5 FINISH THROUGHOUT. PAINT TO MATCH EXISTING. PROVIDE PAINT CHIPS TO PROJECT MANAGER FOR APPROVAL PRIOR TO CONSTRUCTION.
14. THE CONTRACTOR MUST ENSURE THAT FIRESTOPPING AND SEALANTS ARE INSTALLED AT NEW FLOOR OPENINGS IN ACCORDANCE WITH THE CURRENT FIRE CODE REQUIREMENTS AND TO PREVENT WATER LEAKAGE TO THE FLOORS BELOW. AREAS PRONE TO WATER LEAKAGE ARE TO BE WATERPROOFED PRIOR TO INSTALLATION OF THE TENANT FLOOR COVERINGS. THE LANDLORD WILL APPROVE THE PROPOSED WATERPROOFING METHOD PRIOR TO THE TENANT PROCEEDING WITH CONSTRUCTION. REFER TO SPECIFICATIONS FOR ADDITIONAL FIRESTOPPING REQUIREMENTS.
15. ALL PANEL SCHEDULE DIRECTORIES MUST BE UPDATED AND TYPEWRITTEN PANEL SCHEDULE DIRECTORIES MUST BE PROVIDED. SELF–ADHESIVE LABELING TAPE MUST BE USED FOR ALL LABELING AT ALL OUTLETS. LAMACOIDS MUST BE USED FOR LABELING OF ALL ELECTRICAL ENCLOSURES.
16. PROVIDE A REPORT FROM THE MANUFACTURER FOR ALL FIRESTOP ASSEMBLIES PROVIDED AS PART OF THIS SCOPE OF WORK. REPORT MUST DETAIL COMPLIANCE WITH ONTARIO BUILDING BY–LAW AND ONTARIO BUILDING CODE.

DRAWING LIST

DIGITAL PHOTOS
AS PART OF THIS SCOPE OF WORK ELECTRICAL CONTRACTOR MUST PROVIDE DIGITAL PHOTOS OF WORK IN PROGRESS ON A WEEKLY BASIS.

Conseil scolaire Viamonde

NO.	ISSUES	DATE	BY
1	ISSUED FOR REVIEW	MAR 12, 2025	HCC
2	ISSUED FOR PERMIT & TENDER	MAR 20, 2025	HCC

LICENSED PROFESSIONAL ENGINEER
H.D. COHEN
90414335
20–MAR–25
PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER
X.P. CHEN
100219955
20–MAR–25
PROVINCE OF ONTARIO

NO.	REVISIONS	DATE	BY

HCC ENGINEERING
DESIGN AND TECHNOLOGY SERVICES GROUP
HCC ENGINEERING LIMITED
40 EGLINTON AVENUE EAST, SUITE 600
TORONTO, ONTARIO, M4P 3A2
Tel: (416) 932–2423

HCC PROJECT NO: 25001

PROJECT:

RENOVATIONS AT ECOLE ELEMENTAIRE JEANNE-LAJOIE

150 CARNFORTH ROAD
NORTH YORK, ONTARIO

Conseil scolaire Viamond

DRAWING:
ELECTRICAL LEGEND AND DETAILS

BBA
BARRY BRYAN ASSOCIATES
Architects
Engineers
Project Managers
250 Water Street
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L1N 0G5
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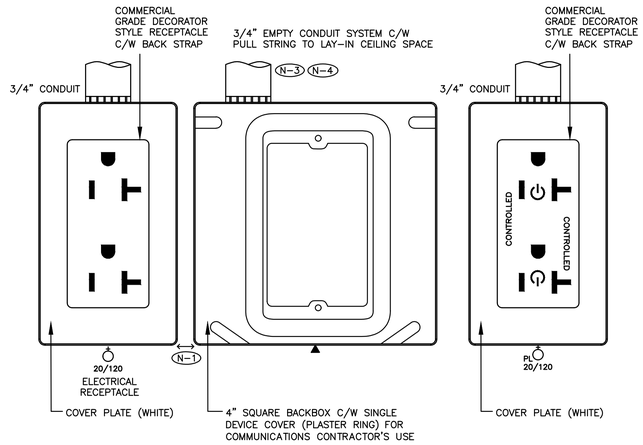
DESIGN BY: PC	DOC CONTROL DATE:
DRAWN BY: TGR	% COMPLETE:
CHECKED BY: PC	INITIAL:
DATE: 12/19/2024	
SCALE: AS SHOWN	
FILE:	

PROJECT NO: **24195**

DRAWING NO: **E-1.0**



N-1 MINIMUM CLEARANCE.

N-2 NEATLY LABEL ALL FLOOR MOUNTED AND WALL DEVICE BOX COVERS WITH CORRESPONDING PANEL NAMES AND CIRCUIT NUMBERS, UTILIZE SELF ADHESIVE MECHANICALLY PRINTED LABELS.

N-3 PROVIDE PUNCH OUTS IN BACKBOX TO ACCOMMODATE CONDUITS INDICATED.

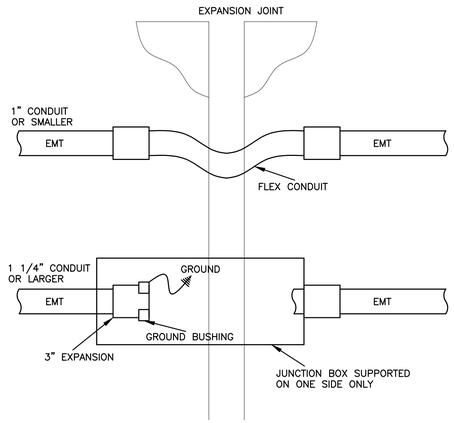
N-4 TERMINATE CONDUIT WITH A 90 DEGREE BEND AND PLASTIC BUSHING IN THE ACCESSIBLE CEILING SPACE.

N-5 ALL RECEPTACLES PROVIDED AS PART OF THIS SCOPE OF WORK TO BE TAMPER RESISTANT TYPE UNLESS INDICATED OTHERWISE.

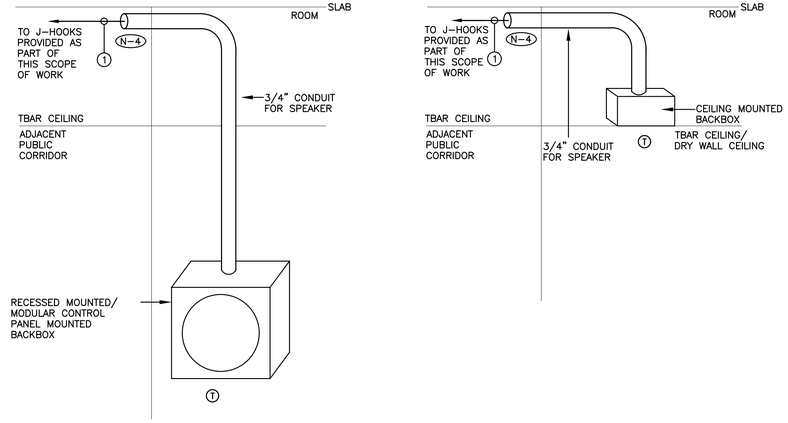
MOUNT RECEPTACLES GROUND PIN UP

UTILITY CCT – WHITE RECEPTACLE

1 E-1.1 TYPICAL WALL MOUNTED DEVICE DETAIL
SCALE: NTS



2 E-1.1 EXPANSION JOINT CROSSING DETAIL
SCALE: NTS



N-1 DETAIL IS DIAGRAMMATIC ONLY. REFER TO FLOOR PLANS FOR QUANTITY AND LOCATIONS OF DEVICES AND FOR ADDITIONAL ACCESSORIES AND REQUIREMENTS.

N-2 PROVIDE DEDICATED FLOOR AND WALL PENETRATIONS. EXACT LOCATION OF ALL CORE DRILLS TO BE DETERMINED BY X-RAY RESULTS. X-RAYS MUST BE REVIEWED AND APPROVED BY LANDLORD AND STRUCTURAL ENGINEER PRIOR TO CORE DRILLING.

N-3 CONDUITS ARE TO BE SUPPORTED BY THE CEILING STRUCTURE ABOVE.

N-4 EXTEND ALL PUBLIC ADDRESS ZONE CONDUITS PROVIDED AS PART OF THIS SCOPE OF WORK TO ABOVE T-BAR CEILING OUTSIDE OF RESPECTIVE ROOMS.

N-5 ALL CONDUITS PROVIDED BY ELECTRICAL CONTRACTOR SHALL BE C/W BUSHINGS AND RUBBERIZED GROMMETS. ALL CONDUITS TO BE EMT. EMT COUPLING AND CONNECTORS SHALL BE T&B STEEL, SET SCREW TYPE.

1 SPEAKER CABLE PROVIDED AS PART OF THIS SCOPE OF WORK

3 E-1.1 TYPICAL PAGING SPEAKER CONDUIT INSTALLATION DETAIL
SCALE: NTS

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NO.	ISSUES	DATE	BY
1	ISSUED FOR REVIEW	MAR 12, 2025	HCC
2	ISSUED FOR PERMIT & TENDER	MAR 20, 2025	HCC

LICENSED PROFESSIONAL ENGINEER
H.D. COHEN
90414335
20-MAR-25
PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER
X.P. CHEN
100219955
20-MAR-25
PROVINCE OF ONTARIO

NO.	REVISIONS	DATE	BY

HCC ENGINEERING
DESIGN AND TECHNOLOGY SERVICES GROUP
HCC ENGINEERING LIMITED
40 EGLINTON AVENUE EAST, SUITE 600
TORONTO, ONTARIO, M4P 3A2
Tel: (416) 932-2423

HCC PROJECT NO: 25001

PROJECT:

RENOVATIONS AT ECOLE ELEMENTAIRE JEANNE-LAJOIE

150 CARNFORTH ROAD
NORTH YORK, ONTARIO

Conseil scolaire Viamond

DRAWING:
ELECTRICAL DETAILS

BARRY BRYAN ASSOCIATES
Architects
Engineers
Project Managers

250 Water Street
Suite 201
Whitby, Ontario
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Tel: (905) 666-5252
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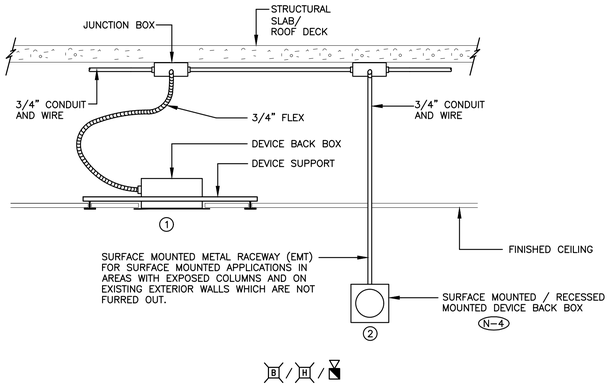
DESIGN BY: PC	DOC. CONTROL: DATE:
DRAWN BY: TGR	% COMPLETE:
CHECKED BY: PC	INITIAL:
DATE: 12/19/2024	
SCALE: AS SHOWN	
FILE:	

PROJECT NO: **24195**

DRAWING NO: **E-1.1**



N-1 DETAIL IS DIAGRAMMATIC ONLY.

N-2 REFER TO FLOOR PLANS FOR EXACT QUANTITY AND LOCATION OF DEVICES.

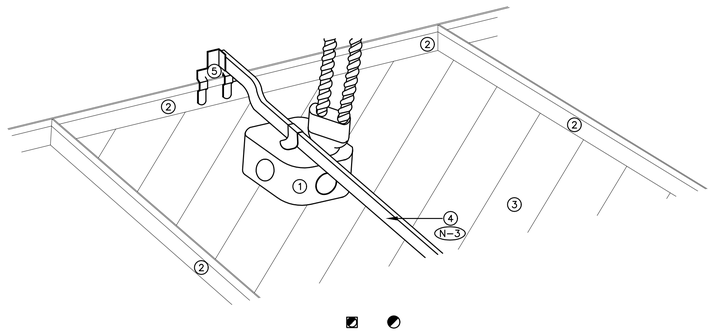
N-3 CONDUIT/TIE WIRE AND OTHER ASSEMBLY MEANS TO SUPPORT DEVICE BACKBOX IS NOT ACCEPTABLE.

N-4 ALL SURFACE / RECESSED MOUNTED DEVICES TO BE RECESSED MOUNTED FOR ALL INTERIOR PARTITIONS.

1 CEILING MOUNTED FIRE ALARM SYSTEM SIGNALLING DEVICE.

2 SURFACE / RECESSED MOUNTED FIRE ALARM SYSTEM SIGNALLING DEVICE.

1 / E-1.2 WALL/CEILING MOUNTED FIRE ALARM SYSTEM SIGNALLING DEVICE DETAIL
SCALE: NTS



N-1 DETAIL IS DIAGRAMMATIC ONLY.

N-2 REFER TO FLOOR PLANS FOR EXACT QUANTITY AND LOCATION OF DEVICES.

N-3 CONDUIT, TIE WIRE AND OTHER ASSEMBLY MEANS TO SUPPORT DEVICE BACKBOX IS NOT ACCEPTABLE.

1 BACKBOX SUPPORTING SMOKE DETECTOR/HEAT DETECTOR

2 CEILING TILE FRAME

3 CEILING TILE

4 BOX HANGER C/W BOX MOUNTING CLIP

5 T-BAR CLIP

2 / E-1.2 TYPICAL SMOKE DETECTOR AND HEAT DETECTOR T-BAR CEILING SUPPORT DETAIL
SCALE: NTS

FIXTURE SCHEDULE

TYPE A1 – 1' X 4' SURFACE MOUNTED FLUORESCENT FIXTURE C/W BALLAST, ACRYLIC LENS AND 2 X T8 LAMPS

TYPE A2 – 4' SURFACE MOUNTED FLUORESCENT FIXTURE C/W BALLAST, WRAP-AROUND ACRYLIC LENS AND 1 X T8 LAMP

TYPE A – 3400 LUMEN 29W 2' X 4' RECESSED MOUNTED LED FIXTURE C/W IN LINE POWER DISCONNECT, POWER SUPPLY, 120V 0 TO 10VDC DIMMING DRIVER, OPAQUE ACRYLIC LENS AND LED LAMPS (4000K/80%CRI). METALUX 24EN-LD2-34-UNV-L840-CD1-U

TYPE B – 4000 LUMEN 28W 4' SURFACE MOUNTED LED FIXTURE C/W IN LINE POWER DISCONNECT, POWER SUPPLY, 120V 0 TO 10VDC DIMMING DRIVER, OPAQUE ACRYLIC LENS AND LED LAMPS (4000K/80%CRI). METALUX NWS3C3-UNV-L0W-4000K

TYPE C – 3000 LUMEN 25W 2' X 4' RECESSED MOUNTED LED FIXTURE C/W IN LINE POWER DISCONNECT, POWER SUPPLY, 120V 0 TO 10VDC DIMMING DRIVER, OPAQUE ACRYLIC LENS AND LED LAMPS (4000K/80%CRI). METALUX 24EN-LD2-30-UNV-L840-CD1-U

TYPE D – 4000 LUMEN 34W 2' X 4' RECESSED MOUNTED LED FIXTURE C/W IN LINE POWER DISCONNECT, POWER SUPPLY, 120V 0 TO 10VDC DIMMING DRIVER, OPAQUE ACRYLIC LENS AND LED LAMPS (4000K/80%CRI). METALUX 24EN-LD2-40-UNV-L840-CD1-U

TYPE T1 – THEATER LIGHTING ASSEMBLY C/W 60 INCANDESCENT COLOURED LAMPS

TYPE D1 – EMERGENCY LIGHTING SYSTEM C/W 10 YEAR 24VOLT/720W/0.5 HOUR/BATTERY UNIT/ 120/347 VOLT INPUT ONTO TERMINAL BLOCK/LUMACELL RGS24S720-TMBK OR STANPRO SLD SERIES SLD-24-720-00-X-WH-ACTB/WHITE IN COLOUR.

TYPE D2 – 2 X 4W MR16 LED 24V LUMACELL SIGNATURE COLLECTION OR STANPRO M SERIES REMOTE HEADS, WHITE IN COLOUR.

TYPE D3 – 1 X 4W MR16 LED 24V LUMACELL SIGNATURE COLLECTION OR STANPRO M SERIES REMOTE HEAD, WHITE IN COLOUR.

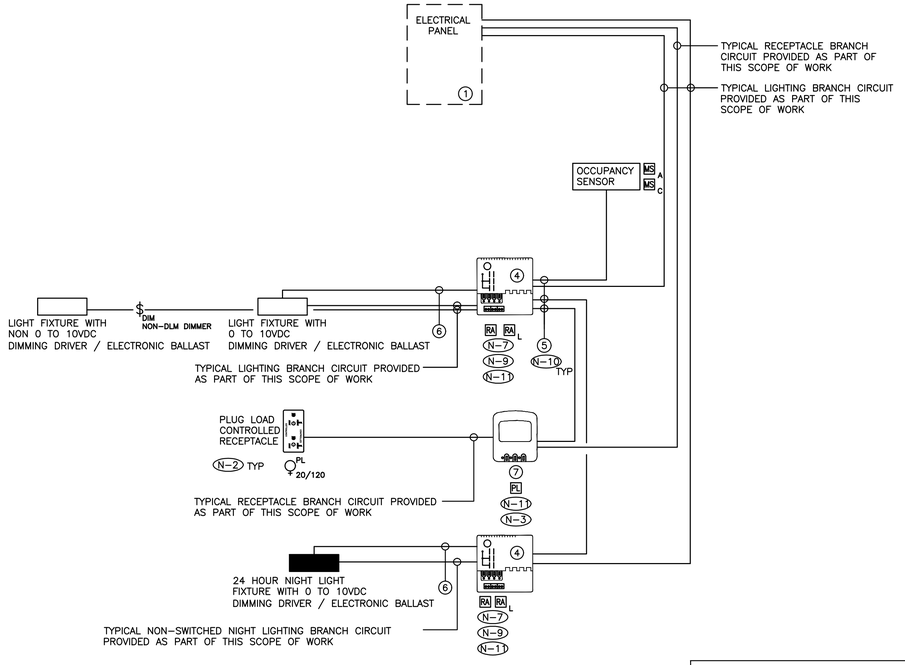
TYPE D4 – 2 X 6W MR16 LED 24V LUMACELL SIGNATURE COLLECTION OR STANPRO M SERIES REMOTE HEADS, WHITE IN COLOUR.

TYPE D7 – 2 X DC EMERGENCY LIGHTING REMOTE HEADS

TYPE E1 – PICTOGRAM WHITE LED EXIT SIGN C/W LUMACELL EZ2 CANOPY. LUMACELL LA-3 SERIES OR STANPRO RMXL PICTOGRAM EXTRUDED ALUMINUM EXIT SIGN C/W 120/347VAC/24VDC LED.

TYPE E2 – PICTOGRAM EXIT SIGN C/W BATTERY UNIT AND 2 X REMOTE HEADS, VANDAL RESISTANT

3 / E-1.2 FIXTURE SCHEDULE
SCALE: NTS



DAYLIGHT HARVESTING SENSORS ARE NOT SPECIFIED FOR CLASSROOMS TO ENSURE UNINTERRUPTED OPERATIONS.

4 / E-1.2 LOW VOLTAGE LIGHTING CONTROL SYSTEM WIRING SCHEMATIC
SCALE: NTS

N-1 SCHEMATIC IS DIAGRAMMATIC ONLY. REFER TO FLOOR PLANS AND REFLECTED CEILING PLANS FOR DEVICE QUANTITY AND LOCATIONS. PROVIDE QUANTITY OF HARDWARE, ROOM CONTROLLERS, PLUG LOAD CONTROLLERS, SENSORS, DEVICES, CONDUIT, WIRE, CONFIGURATION TOOLS, ETC. TO ENSURE A FULLY OPERATIONAL LOW VOLTAGE LIGHTING CONTROL SYSTEM.

N-2 ALL CONTROLLED RECEPTACLES SHALL BE PERMANENTLY MARKED TO VISUALLY DIFFERENTIATE THEM FROM UNCONTROLLED RECEPTACLES.

N-3 PLUG LOAD CONTROLLERS TO BE INSTALLED IN CEILING MOUNTED JUNCTION BOXES.

N-4 ALL LOW VOLTAGE WIRING TO BE INSTALLED IN AN ENCLOSED CONDUIT SYSTEM.

N-5 PROVIDE POWER, CONDUIT, BACKBOX AND WIRING IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS. MINIMUM CONDUIT SIZE 3/4".

N-6 PROVIDE DEDICATED CORE DRILLED WALL AND FLOOR PENETRATIONS ON EVERY FLOOR. EXACT LOCATION OF ALL CORE DRILLS TO BE DETERMINED BY X-RAY RESULTS. ALL X-RAYS MUST BE REVIEWED AND APPROVED BY LANDLORD PRIOR TO CORE DRILLING.

N-7 PROVIDE ROOM CONTROLLERS TO ACCOMMODATE ALL LIGHTING ZONES IN CLOSED ROOMS (IE. OFFICES, MEETING ROOMS, ETC.) PROVIDED AS PART OF THIS SCOPE OF WORK. MAXIMUM OF TWO (2) SWITCH LEGS PER ROOM CONTROLLER.

N-8 NOT USED.

N-9 ROOM CONTROLLERS TO BE INSTALLED IN CEILING MOUNTED JUNCTION BOXES.

N-10 TERMINATE AND TEST ALL LOW VOLTAGE CONTROL CABLES PROVIDED AS PART OF THIS SCOPE OF WORK. PROVIDE TEST RESULTS FOR ALL LOW VOLTAGE CONTROL CABLES PROVIDED AS PART OF THIS SCOPE OF WORK AT THE END OF CONSTRUCTION. TEST RESULTS SHALL BE INCLUDED AS PART OF THE CLOSE OUT DOCUMENTS. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

N-11 REFER TO MANUFACTURER'S INSTALLATION GUIDELINES FOR ADDITIONAL INSTALLATION REQUIREMENTS OVER AND ABOVE THOSE DETAILS ON THIS SCHEMATIC.

N-12 NOT USED.

N-13 NOT USED.

N-14 PROVIDE POWER PACKS, AS REQUIRED FOR A FULLY OPERATIONAL SYSTEM. POWER PACKS NOT SHOWN ON REFLECTED CEILING PLANS.

N-15 ELECTRICAL CONTRACTOR'S BASE BID PRICE SHALL INCLUDE FOUR (4) HOURS OF ON SITE COORDINATION TIME WITH LIGHTING CONTROL SYSTEM MANUFACTURER PRIOR TO ORDERING LIGHTING SYSTEM COMPONENTS TO CONFIRM DEVICES AND WIRING REQUIREMENTS. ALL CHANGES TO BE REVIEWED AND APPROVED BY CONSULTANT ON SITE PRIOR TO EXECUTION.

N-16 LIGHT LEVEL OUTPUT (IE. DIMMING LEVEL) FOR EACH AND EVERY FIXTURE PROVIDED AS PART OF THIS SCOPE OF WORK IN ROOMS/AREAS/CORRIDORS/ETC., WITH DLM CONTROL TO BE FIELD ADJUSTED ON SITE WITH CLIENT POST OCCUPANCY. TARGET LIGHT LEVELS FOR EACH LOW VOLTAGE LIGHTING ZONE TO BE PROVIDED BY THE CLIENT POST OCCUPANCY. PROCURE (COORDINATE AND PAY FOR) THE SERVICES OF WATTSTOPPER TO ADJUST, PROGRAM AND COMMISSION THE LIGHTING CONTROL SYSTEM.

AS PART OF THIS SCOPE OF WORK PROCURE THE SERVICES OF A THIRD PARTY PROFESSIONAL ENGINEER TO MEASURE AND RECORD LIGHTING LEVELS IN FOOT CANDLES THROUGHOUT THE ENTIRE SCOPES OF WORK AREAS WITH A CALIBRATED LIGHT METER, AFTER ALL FIELD ADJUSTMENTS HAVE BEEN COMPLETED. READINGS SHALL BE TAKEN BASED ON A MINIMUM OF ONE READING FOR EVERY 20' CENTER IN OPEN OFFICE AREAS AND CORRIDORS / HALLWAYS AND ONE READING IN EACH CLOSED OFFICE, MEETING ROOM, BOARDROOM, ETC. ALL LIGHT LEVEL READINGS ARE TO BE TAKEN DURING NON-DAYLIGHT HOURS. PROVIDE A SEALED REPORT IDENTIFYING LIGHT LEVEL READINGS.

INSTALL LOW VOLTAGE CONTROL SYSTEM IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS, ASHRAE 90.1 2013, ONTARIO BUILDING CODE, ELECTRICAL SAFETY CODE AND THESE DOCUMENTS.

1 TYPICAL RECEPTACLE / LIGHTING PANEL. REFER TO DRAWING NO. E-7.1 FOR ADDITIONAL REQUIREMENTS

2 NOT USED

3 NOT USED

4 ON / OFF / DIMMING ROOM CONTROLLER

5 PLENUM RATED 4 PAIR CAT6 UTP CABLE AS MANUFACTURED BY LIGHTING CONTROL SYSTEM MANUFACTURER

6 0 TO 10VDC CONTROL WIRING PER MANUFACTURER'S RECOMMENDATIONS

7 PLUG LOAD CONTROLLER

——— DENOTES NEW PROVIDED BY ELECTRICAL CONTRACTOR

— — — — DENOTES EXISTING TO REMAIN

-x-x-x-x- DENOTES EXISTING TO BE REMOVED BY ELECTRICAL CONTRACTOR

Conseil scolaire Viamonde

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PROVINCE OF ONTARIO

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HCC ENGINEERING LIMITED
40 EGLINTON AVENUE EAST, SUITE 600
TORONTO, ONTARIO, M4P 3A2
Tel: (416) 932-2423

HCC PROJECT NO: 25001

PROJECT:

RENOVATIONS AT ECOLE ELEMENTAIRE JEANNE-LAJOIE

150 CARNFORTH ROAD
NORTH YORK, ONTARIO

Conseil scolaire Viamond

DRAWING:
ELECTRICAL DETAILS

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Project Managers
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Tel: (905) 666-5252
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DESIGN BY: PC	DOC. CONTROL DATE:
DRAWN BY: TGR	% COMPLETE:
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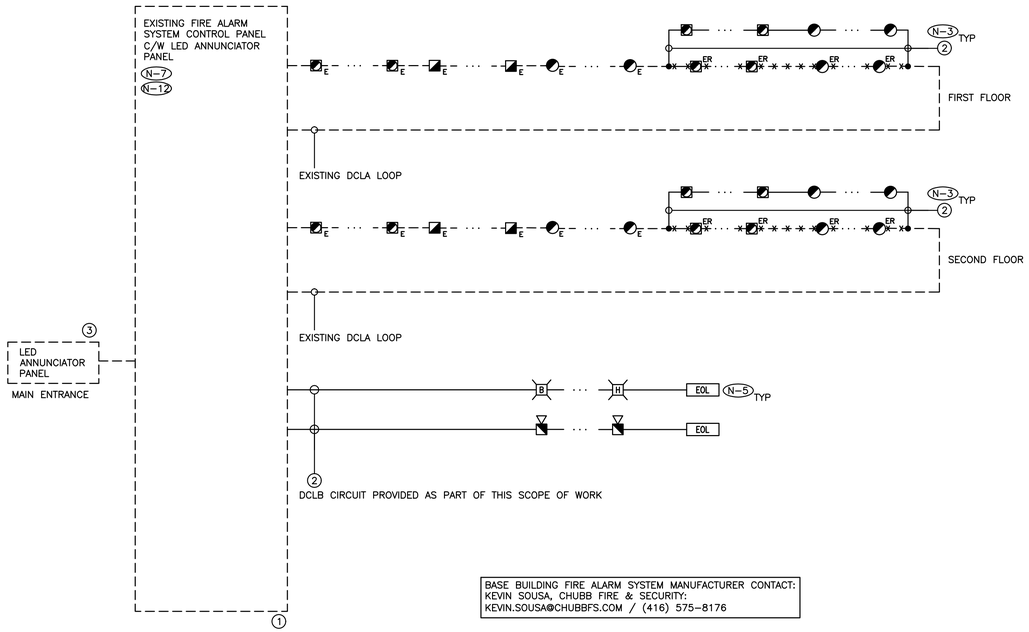
DATE: 12/19/2024	
SCALE: AS SHOWN	
FILE:	

PROJECT NO: **24195**

DRAWING NO: **E-1.2**



BASE BUILDING FIRE ALARM SYSTEM MANUFACTURER CONTACT:
KEVIN SOUSA, CHUBB FIRE & SECURITY:
KEVIN.SOUSA@CHUBBFS.COM / (416) 575-8176

N-1 RISER IS DIAGRAMMATIC ONLY. PROVIDE QUANTITY OF HARDWARE, MODULES, ACCESSORIES, DEVICES, CONDUIT, WIRE, ETC. TO ENSURE A FULLY OPERATIONAL FIRE ALARM SYSTEM.

N-2 REFER TO FLOOR PLANS AND REFLECTED CEILING PLANS FOR EXACT QUANTITY AND LOCATION OF DEVICES, DEVICE PERIPHERALS AND ACCESSORIES (IE. WIRE GUARD, EXPLOSION PROOF DEVICES, WEATHER PROOF DEVICES, ETC)

N-3 PROVIDE POWER, CONDUIT, BACKBOX AND WIRING IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. MINIMUM CONDUIT SIZE 3/4".

N-4 NOT USED.

N-5 PROVIDE STROBE CIRCUIT SYNCHRONIZATION MODULES.

N-6 PROVIDE 24VDC CIRCUITS FOR STROBES AND OTHER 24VDC DEVICES. MAXIMUM LOAD ON EACH CIRCUIT SHALL NOT EXCEED 70%. CIRCUIT REQUIREMENTS NOT SHOWN ON RISER DIAGRAM.

N-7 MODIFY, REWORK AND PROVIDE ALL COMPONENTS AND ACCESSORIES FOR CONTROL PANEL AS REQUIRED TO ACCOMMODATE ALL SCOPES OF WORK AS NOTED ON DRAWINGS AND IN SPECIFICATION.

N-8 PROVIDE DEDICATED CORE DRILLED WALL AND FLOOR PENETRATIONS ON EVERY FLOOR FOR FIRE ALARM SYSTEM CONDUITS/CABLES. EXACT LOCATION OF ALL CORE DRILLS TO BE DETERMINED BY X-RAY RESULTS. ALL X-RAYS MUST BE REVIEWED AND APPROVED BY LANDLORD PRIOR TO CORE DRILLING.

N-9 ALL NEW FIRE ALARM SYSTEM DEVICES PROVIDED AS PART OF THIS SCOPE OF WORK MUST BE CONNECTED TO CIRCUITS PROVIDED AS PART OF THIS SCOPE OF WORK. DO NOT REUTILIZE EXISTING CIRCUITS OR WIRING.

N-10 NOT USED.

N-11 NOT USED.

N-12 PROVIDE ADDITIONAL BATTERIES IN EXISTING CONTROL PANEL AS REQUIRED TO SUPPORT THE TOTAL LOAD REQUIREMENTS AT THE COMPLETION OF THIS PROJECT.

N-13 PROVIDE ULC APPROVED DAMPENING MATERIALS AS REQUIRED DURING VERIFICATION FOR ALL FIRE ALARM HORNS PROVIDED AS PART OF THIS SCOPE OF WORK TO DECREASE AUDIBILITY LEVELS TO BELOW 100 DBA.

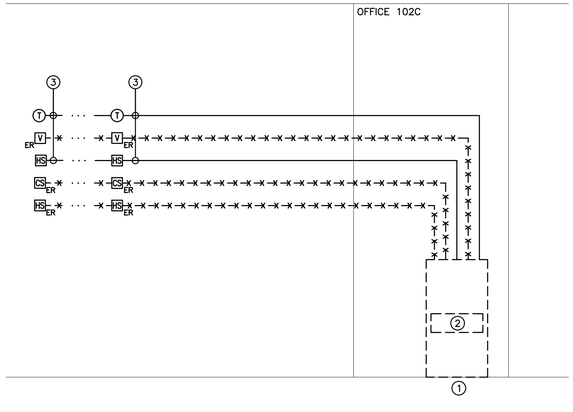
1. EXISTING FIRE ALARM SYSTEM CONTROL PANEL – EDWARDS EST-3
2. CONDUIT AND WIRE PER MANUFACTURER'S REQUIREMENTS
3. EXISTING FIRE ALARM SYSTEM REMOTE LED ANNUNCIATOR PANEL.

——— DENOTES NEW PROVIDED BY ELECTRICAL CONTRACTOR

– – – – – – DENOTES EXISTING TO REMAIN

* * * * * * DENOTES EXISTING TO BE REMOVED BY ELECTRICAL CONTRACTOR

1 / E-1.3 PARTIAL FIRE ALARM SYSTEM RISER DIAGRAM
SCALE: NTS



SPEAKER WIRE SIZE SCHEDULE

SPEAKER CABLE DISTANCES								
AWG Wire Size	Resistance (Ω/feet)	Maximum Distance for a 0.5 dB Cable Loss (feet)						
26	0.0408	1815	908	454	227	---	---	---
24	0.0257	2882	1441	721	360	180	---	---
22	0.0161	4600	2300	1150	575	287	115	---
20	0.0102	7621	3630	1815	908	453	181	90
18	0.00639	11591	5796	2898	1449	724	289	144
16	0.00402	18425	9212	4606	2303	1151	460	230
14	0.00253	29278	14637	7318	3659	1829	732	366
12	0.00159	46583	23291	11645	5822	2911	1164	582
10	0.000999	74141	37070	18535	9267	4633	1853	923
8	0.000628	117941	58970	29485	14742	7371	2948	1474
6	0.000395	187512	93755	46877	23438	11719	4687	2343
Speaker Transformer Tap		0.25 W	0.5 W	1 W	2 W	4 W	10 W	20 W

N-1 RISER IS DIAGRAMMATIC ONLY.

N-2 REFER TO FLOOR PLANS FOR EXACT QUANTITY AND LOCATION OF DEVICES, DEVICE PERIPHERALS AND ACCESSORIES, INCLUDING WIREGUARDS.

N-3 A SINGLE SPEAKER CIRCUIT (I.E. RUN OF WIRING) SHALL NOT EXCEED FIVE (5) SPEAKERS OR A TOTAL POWER/LOAD OF 30W.

N-4 SUPPLY CADDY HANGERS, THREADED ROD EXTENSIONS, CABLE SUPPORTS, TIE-WRAPS AND ANY OTHER MISCELLANEOUS HARDWARE REQUIRED TO SUPPORT LOW VOLTAGE CABLING WHERE CONDUIT HAS NOT BEEN PROVIDED. ANCHORS FOR CADDY HANGERS MUST NOT BE DRILLED INTO POST TENSIONED BEAMS UNDER ANY CIRCUMSTANCES. BRIDAL RING CADDY FASTENERS AND OTHER ALTERNATES TO 'J-HOOKS' OR THEIR EQUIVALENT MAY NOT BE USED TO SUPPORT THE HORIZONTAL CABLING. DO NOT SUPPORT CABLES TO T-BAR CEILING HANGERS OR HAVE ANY CABLES LAYING OR CEILING TILES.

1. EXISTING FREE STANDING PUBLIC ADDRESS SYSTEM – TELECOR XL
2. EXISTING AMPLIFIER AND CONTROL UNIT
3. HANDSET /SPEAKER WIRE
   4 PAIR PLENUM RATED CAT5E UTP CABLE – BELDEN #1213 (COLOUR TO BE DETERMINED DURING SHOP DRAWING PROCESS)

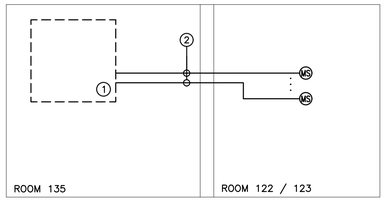
BASE BUILDING PA SYSTEM CONTRACTOR
BARRIE COMMUNICATIONS EQUIPMENT LIMITED
ALFRED SPEDALE
905-564-7026 EX 503
ALFRED@BARRIECOM.CA

——— DENOTES NEW PROVIDED BY ELECTRICAL CONTRACTOR

– – – – – – DENOTES EXISTING TO REMAIN

-X-X-X-X-X- DENOTES EXISTING TO BE REMOVED BY ELECTRICAL CONTRACTOR

2 / E-1.3 PARTIAL PUBLIC ADDRESS SYSTEM RISER DIAGRAM
SCALE: NTS



1. EXISTING SECURITY SYSTEM INTRUSION CONTROL PANEL – CHUBB GUARDALL
2. 2 PAIR #22AWG, PLENUM RATED, -3/4"C

——— DENOTES NEW PROVIDED BY ELECTRICAL CONTRACTOR

– – – – – – DENOTES EXISTING TO REMAIN

-X-X-X-X- DENOTES EXISTING TO BE REMOVED BY ELECTRICAL CONTRACTOR

N-1 RISER IS DIAGRAMMATIC ONLY. PROVIDE QUANTITY OF CONTROL PANELS, ZONE EXPANDERS, HARDWARE, DEVICES, POWER CIRCUITS, CONDUIT, WIRE, SECURITY CABLES, ETC, TO ENSURE A FULLY OPERATIONAL SECURITY INTRUSION AND ACCESS CONTROL SYSTEM. MINIMUM REQUIREMENTS DETAILED ON DRAWING.

N-2 REFER TO FLOOR PLAN DRAWINGS FOR DEVICE QUANTITY AND LOCATIONS.

N-3 PROVIDE CONDUITS AND WIRES IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. MINIMUM CONDUIT SIZE AND WIRING REQUIREMENTS AS DETAILED ON RISER DIAGRAM.

N-4 NOT USED.

N-5 ALL CONDUITS TO BE EMT. EMT COUPLING AND CONNECTORS SHALL BE T&B STEEL, SET SCREW TYPE. PROVIDE SPARE PULLSTRING IN ALL CONDUITS FOR FUTURE USE.

N-6 ELECTRICAL CONTRACTOR SHALL NOT USE PULLBOXES AS SUBSTITUTES FOR 90° BENDS. 12" X 12" X 6" PULLBOXES C/W TYPE SNAKE EYE SECURITY SCREWS SHALL BE PROVIDED ON THE BASIS OF NOT MORE THAN TWO (2) RIGHT ANGLE BENDS OR NOT MORE THAN 100' IN STRAIGHT RUNS BETWEEN BOXES.

N-7 CONTACT SECURITY MANUFACTURER FOR ADDITIONAL WIRE, CONDUIT, PULLBOX AND POWER REQUIREMENTS.

N-8 NOT USED.

N-9 EACH FIELD DEVICE SHALL BE PROGRAMMED AS AN INDIVIDUAL HARDWIRED ZONE. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

N-10 NOT USED.

N-11 PROVIDE DEDICATED FLOOR AND WALL PENETRATIONS. EXACT LOCATION OF ALL CORE DRILLS TO BE DETERMINED BY X-RAY RESULTS. X-RAYS MUST BE REVIEWED AND APPROVED BY TCDSB AND STRUCTURAL ENGINEER PRIOR TO CORE DRILLING.

N-12 REFER TO DRAWING NO. E-2.1 FOR ADDITIONAL SECURITY INTRUSION

ELECTRICAL CONTRACTOR MUST PROCURE THE SERVICES OF CHUBB TO COMPLETE THE SECURITY, INTRUSION AND ACCESS CONTROL SCOPES OF WORK

REFER TO DRAWING NO. E-2.1 FOR ADDITIONAL SECURITY, INTRUSION AND ACCESS CONTROL SCOPES OF WORK.

3 / E-1.3 PARTIAL SECURITY INTRUSION SYSTEM RISER DIAGRAM
SCALE: NTS

Conseil scolaire Viamonde

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TORONTO, ONTARIO, M4P 3A2
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HCC PROJECT NO: 25001

PROJECT:

RENOVATIONS AT ECOLE ELEMENTAIRE JEANNE-LAJOIE

150 CARNFORTH ROAD
NORTH YORK, ONTARIO

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DRAWING:
ELECTRICAL DETAILS

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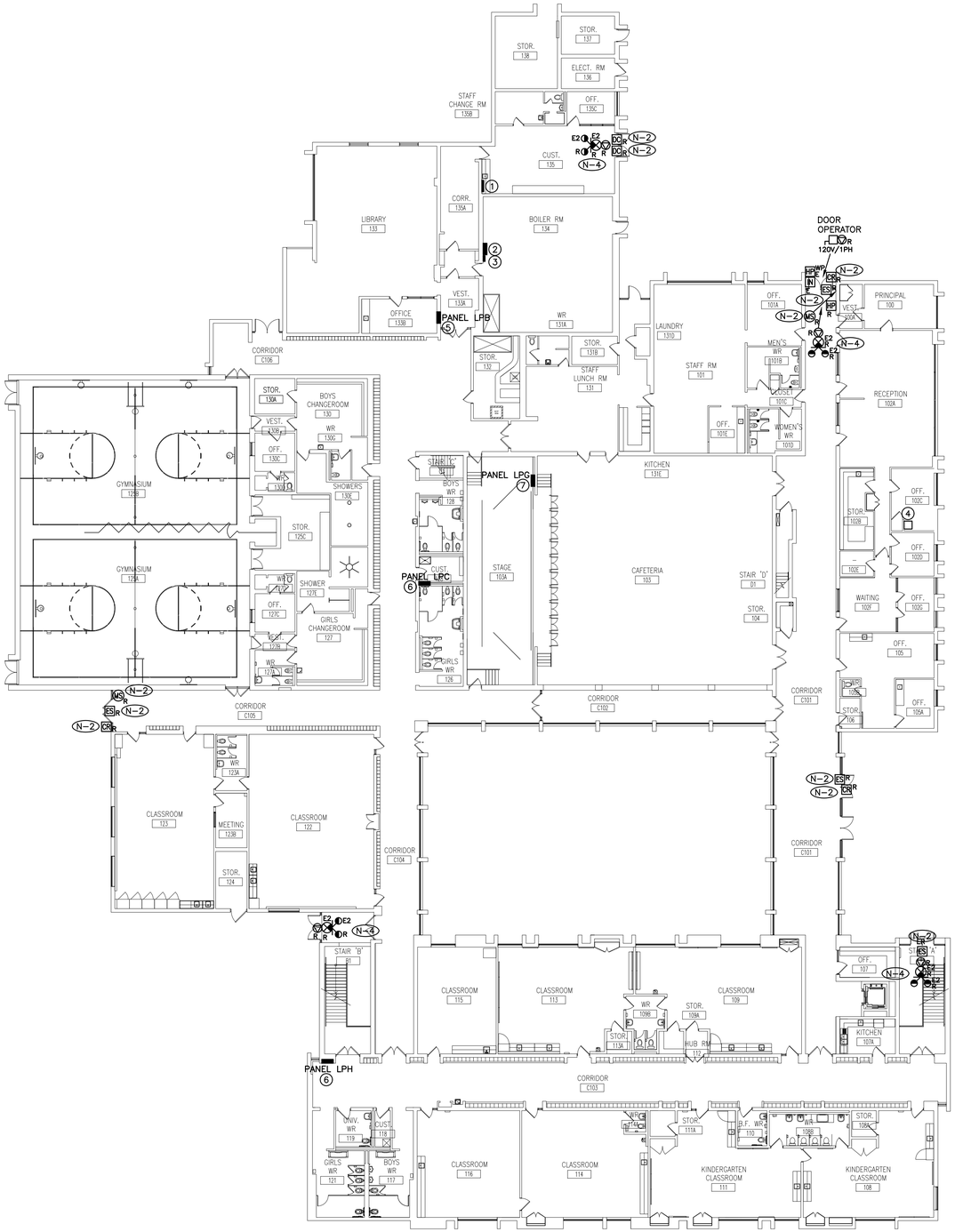
PROJECT NO: **24195**

DRAWING NO: **E-1.3**



N-1 ROUTE ALL CONDUIT SYSTEMS AROUND BEAMS, NEW DUCT WORK AND PIPING AS REQUIRED TO ACCOMMODATE INSTALLATION. REFER TO MECHANICAL DRAWINGS AND ARCHITECTURAL DRAWINGS FOR ADDITIONAL DETAILS.

N-2 AS PART OF THIS SCOPE OF WORK PROCURE THE SERVICES OF CHUBB FIRE & SECURITY TO REMOVE, DISCONNECT, PULL BACK, REWORK, REPULL, RETERMINATE, REINSTALL, TEST, CERTIFY, ETC., EXISTING INTRUSION SYSTEM AND ACCESS CONTROL SYSTEM WIRING AND FIELD DEVICES TO ACCOMMODATE THE REPLACEMENT OF EXTERIOR DOORS BY GENERAL CONTRACTOR.

N-3 REMOVE, DISCONNECT, PULL BACK, REWORK, REPULL, RETERMINATE, REINSTALL, TEST, CERTIFY TWO (2) ADDITIONAL ELECTRIC STRIKES, TWO (2) ADDITIONAL MOTION SENSORS AND FOUR (4) ADDITIONAL DOOR CONTACTS OVER AND ABOVE THE DEVICES SHOWN ON THIS DRAWINGS AND NOTE N-2 ABOVE.

N-4 REMOVE, DISCONNECT, PULL BACK, REWORK, REPULL, RETERMINATE, REINSTALL, TEST, ETC., EXISTING SELF CONTAINED EXIT SIGN, REMOTE HEAD AND EMERGENCY BATTERY UNIT TO ACCOMMODATE THE REPLACEMENT OF EXTERIOR DOORS BY GENERAL CONTRACTOR.

1. EXISTING SECURITY SYSTEM BACKBOARD C/W CONTROL PANELS TO REMAIN
2. EXISTING FIRE ALARM SYSTEM CONTROL PANEL TO REMAIN
3. EXISTING FIRE ALARM SYSTEM MONITORING PANEL TO REMAIN
4. EXISTING PUBLIC ADDRESS SYSTEM HEAD END UNIT TO REMAIN
5. EXISTING RECEPTACLE PANEL – 120/208V/3PH/4W/225A MAINS/ 42 CCT/EATON POW-R-LINE 1A
6. EXISTING RECEPTACLE PANEL – 120/208V/3PH/4W/225A MAINS/ 60 CCT/EATON POW-R-LINE 1A
7. EXISTING RECEPTACLE PANEL – 120/208V/3PH/4W/100A MAINS/ 42 CCT/EATON POW-R-LINE 1A

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2	ISSUED FOR PERMIT & TENDER	MAR 20, 2025	HCC

LICENSED PROFESSIONAL ENGINEER
H.D. COHEN
90414335
20-MAR-25
PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER
X.P. CHEN
100219955
20-MAR-25
PROVINCE OF ONTARIO

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HCC ENGINEERING LIMITED
40 EGLINTON AVENUE EAST, SUITE 600
TORONTO, ONTARIO, M4P 3A2
Tel: (416) 932-2423

HCC PROJECT NO: 25001

PROJECT:

RENOVATIONS AT ECOLE ELEMENTAIRE JEANNE-LAJOIE

150 CARNFORTH ROAD
NORTH YORK, ONTARIO
Conseil scolaire Viamond

DRAWING:

ELECTRICAL FACILITY PLAN - FIRST FLOOR

BBA
BARRY BRYAN ASSOCIATES
Architects
Engineers
Project Managers
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PROJECT NO: 24195

DRAWING NO: E-2.1

N-1 EXACT LOCATION OF ALL DEVICES AND RESPECTIVE HEIGHTS TO BE COORDINATED ON SITE WITH ARCHITECT.

N-2 NEATLY LABEL ALL FLOOR MOUNTED AND WALL DEVICE BOX COVERS WITH CORRESPONDING PANEL NAMES AND CIRCUIT NUMBERS. UTILIZE SELF ADHESIVE MECHANICALLY PRINTED LABELS.

N-3 CIRCUIT NUMBERS MAY NOT BE CHANGED WITHOUT PRIOR APPROVAL FROM THE ELECTRICAL ENGINEER.

N-4 CONFIRM BREAKER/FUSE AND RECEPTACLE/DISCONNECT REQUIREMENTS PRIOR TO INSTALLATION.

N-5 CONFIRM BREAKER AND RECEPTACLE REQUIREMENTS PRIOR TO ORDERING DISTRIBUTION.

N-6 COORDINATE WIRING REQUIREMENTS FOR MECHANICAL EQUIPMENT ON SITE WITH MECHANICAL CONTRACTOR.

N-7 CONFIRM ELECTRICAL REQUIREMENTS AND EXACT LOCATION OF ALL MECHANICAL EQUIPMENT WITH MECHANICAL CONTRACTOR PRIOR TO INSTALLATION OF ELECTRICAL SERVICES.

N-8 ALL FINAL CONNECTIONS TO MECHANICAL EQUIPMENT ARE TO BE IN LIQUID TIGHT FLEXIBLE CONDUIT.

N-9 ROUTE ALL CONDUIT SYSTEMS AROUND BEAMS, NEW DUCT WORK AND PIPING AS REQUIRED TO ACCOMMODATE INSTALLATION. REFER TO MECHANICAL DRAWINGS AND ARCHITECTURAL DRAWINGS FOR ADDITIONAL DETAILS.

1 EXISTING RECEPTACLE PANEL TO REMAIN – 120/208V/3PH/4W/225A MAINS/60 CCT/EATON POW-R-LINE 1A

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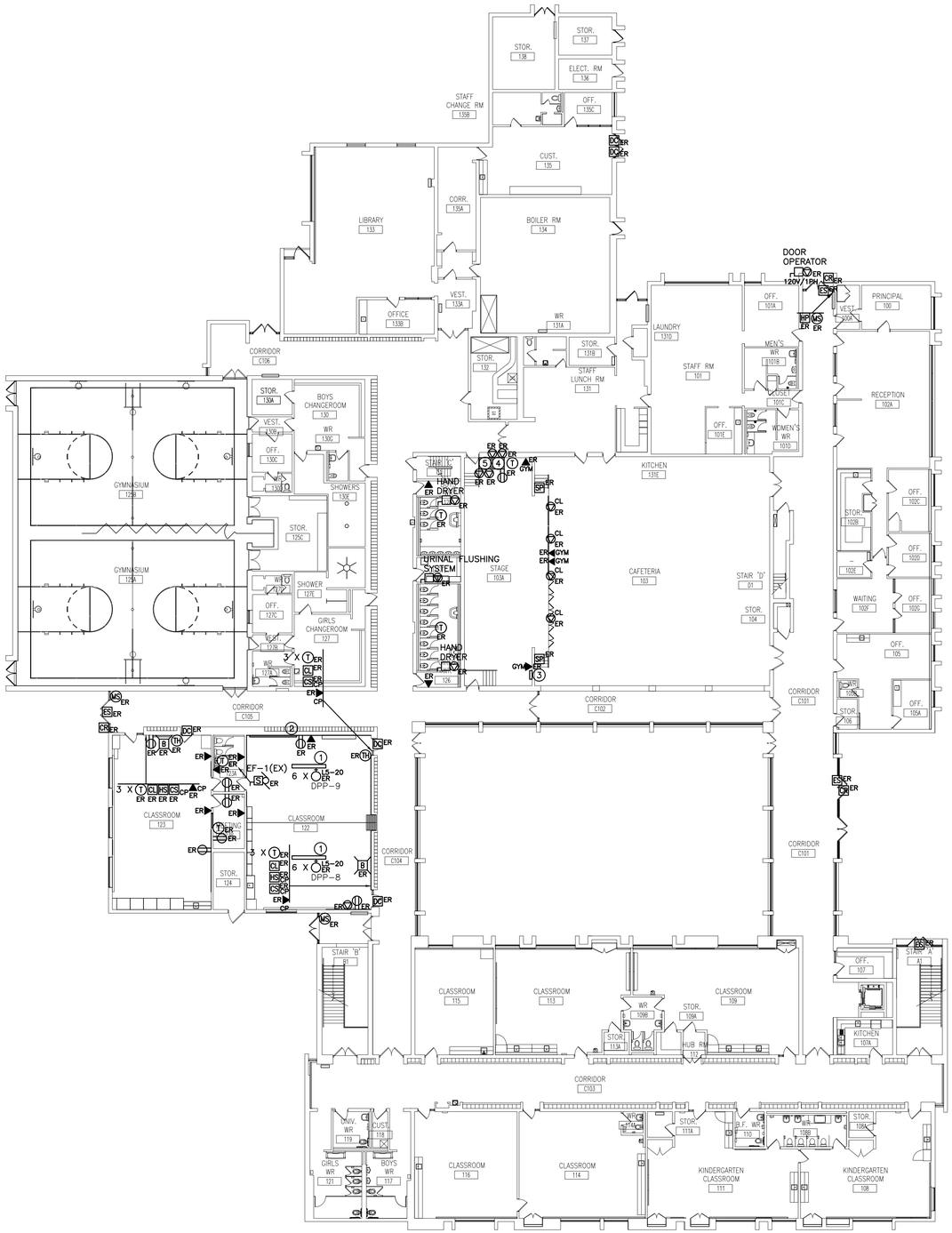
PROJECT NO: **24195**

DRAWING NO: **E-2.2**



N-1 BASE BID PRICE SHALL INCLUDE FOR THE REMOVAL OF 4 ADDITIONAL RECEPTACLES, COMMUNICATIONS ROUGH-INS, ETC. OVER AND ABOVE THOSE SHOWN ON THIS DRAWING. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

N-2 COORDINATE DEMOLITION REQUIREMENTS WITH DIVISION 15 TO ENSURE THAT POWER AND LINE VOLTAGE CONTROL WIRING FOR DIVISION 15 DEVICES TO REMAIN IS NOT DISCONNECTED. EXISTING DIVISION 15 DEVICES NOT SHOWN ON DRAWINGS.

N-3 ALL EXISTING BRANCH WIRING, RACEWAYS AND PACK POLES, INCLUDING THOSE COILED IN CEILING SPACE SHALL BE REMOVED BACK TO SOURCE PANEL. REFER TO SPECIFICATIONS FOR ADDITIONAL DEMOLITION REQUIREMENTS. DO NOT REUSE EXISTING WIRING OR CONDUIT SYSTEM.

N-4 REMOVE ALL EXISTING COMMUNICATIONS ZONE CONDUITS UNLESS NOTED OTHERWISE. EXISTING CONDUIT SYSTEMS NOT SHOWN ON DRAWING.

N-5 REMOVE ALL ABANDONED ZONE CONDUITS INCLUDING THOSE IN CEILING SPACE. EXISTING ZONE CONDUITS NOT SHOWN ON DRAWING.

N-6 CONFIRM DEMOLITION REQUIREMENTS WITH MECHANICAL CONTRACTOR PRIOR TO DISCONNECTING MECHANICAL EQUIPMENT.

N-7 REMOVE CLEAR HINGED SHIELD AND FRAME AND ASSOCIATED LOCAL AUDIBLE ALARM FOR EACH AND EVERY PULLSTATION REMOVED AS PART OF THIS SCOPE OF WORK.

N-8 REWIRE ALL EXISTING TO REMAIN DEVICES AS REQUIRED TO ENSURE CONTINUITY OF SERVICES. EXISTING TO REMAIN DEVICES NOT SHOWN ON DRAWING.

1 CEILING MOUNTED RACEWAY TO BE REMOVED AS PART OF THIS SCOPE OF WORK

2 SURFACE MOUNTED RACEWAY C/W 5 SIMPLEX RECEPTACLES TO BE REMOVED AS PART OF THIS SCOPE OF WORK

3 EXISTING GYM SOUND SYSTEM CONNECTOR BOX TO BE REMOVED AS PART OF THIS SCOPE OF WORK

4 EXISTING GYM SOUND SYSTEM CABINET TO BE REMOVED AS PART OF THIS SCOPE OF WORK

5 EXISTING DIMMING SYSTEM TO BE REMOVED AS PART OF THIS SCOPE OF WORK

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DRAWING:

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PROJECT NO: **24195**

DRAWING NO: **E-5.1**

- (N-1) BASE BID PRICE SHALL INCLUDE FOR THE REMOVAL OF 2 ADDITIONAL RECEPTACLES, COMMUNICATIONS ROUGH-INS, ETC. OVER AND ABOVE THOSE SHOWN ON THIS DRAWING. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- (N-2) COORDINATE DEMOLITION REQUIREMENTS WITH DIVISION 15 TO ENSURE THAT POWER AND LINE VOLTAGE CONTROL WIRING FOR DIVISION 15 DEVICES TO REMAIN IS NOT DISCONNECTED. EXISTING DIVISION 15 DEVICES NOT SHOWN ON DRAWINGS.
- (N-3) ALL EXISTING BRANCH WIRING, RACEWAYS AND PACK POLES, INCLUDING THOSE COILED IN CEILING SPACE SHALL BE REMOVED BACK TO SOURCE PANEL. REFER TO SPECIFICATIONS FOR ADDITIONAL DEMOLITION REQUIREMENTS. DO NOT REUSE EXISTING WIRING OR CONDUIT SYSTEM.
- (N-4) REMOVE ALL EXISTING COMMUNICATIONS ZONE CONDUITS UNLESS NOTED OTHERWISE. EXISTING CONDUIT SYSTEMS NOT SHOWN ON DRAWING.
- (N-5) REMOVE ALL ABANDONED ZONE CONDUITS INCLUDING THOSE IN CEILING SPACE. EXISTING ZONE CONDUITS NOT SHOWN ON DRAWING.
- (N-6) CONFIRM DEMOLITION REQUIREMENTS WITH MECHANICAL CONTRACTOR PRIOR TO DISCONNECTING MECHANICAL EQUIPMENT.
- (N-7) REMOVE CLEAR HINGED SHIELD AND FRAME AND ASSOCIATED LOCAL AUDIBLE ALARM FOR EACH AND EVERY PULLSTATION REMOVED AS PART OF THIS SCOPE OF WORK.
- (N-8) REWIRE ALL EXISTING TO REMAIN DEVICES AS REQUIRED TO ENSURE CONTINUITY OF SERVICES. EXISTING TO REMAIN DEVICES NOT SHOWN ON DRAWING.

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HCC PROJECT NO: 25001

PROJECT:

RENOVATIONS AT ECOLE ELEMENTAIRE JEANNE-LAJOIE

150 CARNFORTH ROAD
NORTH YORK, ONTARIO

Conseil scolaire Viamond

DRAWING:

ELECTRICAL DEMOLITION PLAN - SECOND FLOOR

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PROJECT NO: 24195

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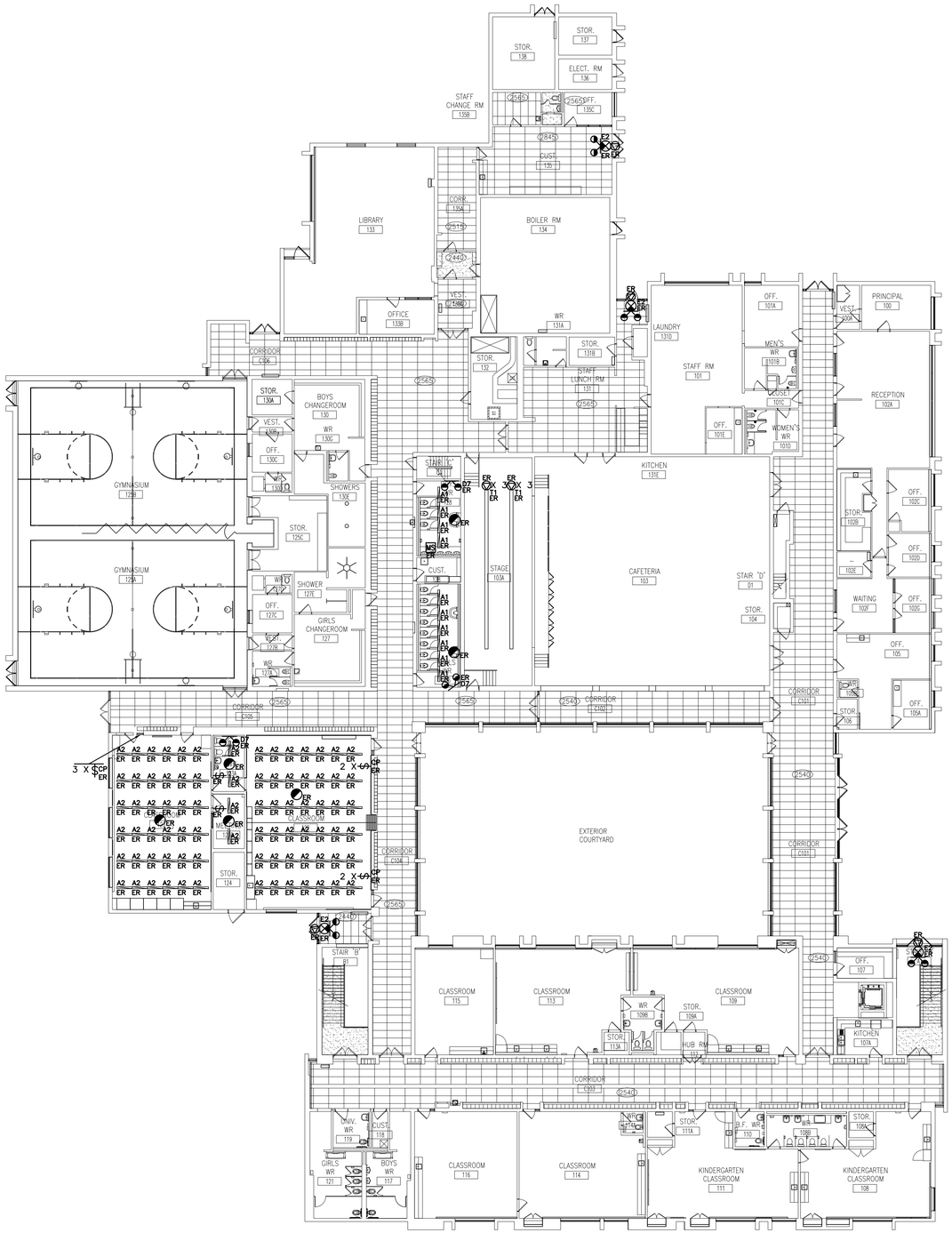

N-1 LIGHTING AND FIRE ALARM LAYOUT SHOWS EXISTING REFLECTED CEILING PLAN ONLY. REFER TO DETAIL NO. 2 ON DRAWING NO. E-9.1 FOR NEW LAYOUT AND FOR ADDITIONAL DEMOLITION REQUIREMENTS.

N-2 NOT USED.

N-3 BASE BID PRICE SHALL INCLUDE FOR THE REMOVAL OF TWO (2) ADDITIONAL FIXTURES AND FIRE ALARM DEVICES OVER AND ABOVE THOSE SHOWN ON DRAWING NO. E-6.1.

N-4 AS PART OF THIS SCOPE OF WORK ELECTRICAL CONTRACTOR TO EXTEND EXISTING DC CIRCUITS TO EMERGENCY LIGHTING BATTERY UNIT M1 PROVIDED AS PART OF THIS SCOPE OF WORK. CONFIRM DC VOLTAGE OF EXISTING BATTERY UNIT ON SITE PRIOR TO SUBMITTING EMERGENCY LIGHTING SHOP DRAWINGS FOR REVIEW. REPORT FINDINGS TO ELECTRICAL ENGINEER.

N-5 NOT USED.

N-6 REWIRE ALL EXISTING TO REMAIN FIXTURES TO ENSURE CONTINUITY OF SERVICES.

N-7 DISPOSE OF ALL FIXTURES REMOVED AS PART OF THIS SCOPE OF WORK. RECYCLE ALL APPLICABLE COMPOUNDS AS DETAILED IN 'GREEN MEASURES' REQUIREMENTS. PROVIDE DOCUMENTATION SUPPORTING RECYCLING MEASURES.

N-8 DO NOT REUSE EXISTING DIMMERS, SWITCHES, LAMPS, ETC DENOTED AS EXISTING TO BE REMOVED AS PART OF THIS SCOPE OF WORK.

N-9 AS PART OF THIS SCOPE OF WORK ELECTRICAL CONTRACTOR MUST PROCURE (ORDER AND PAY FOR) THE SERVICES OF AEVITAS TO DISPOSE OF ALL LAMPS AND BALLASTS REMOVED AS PART OF THIS SCOPE OF WORK IN COMPLIANCE WITH MINISTRY STANDARDS AND ENVIRONMENTALLY SAFE METHODS. ELECTRICAL CONTRACTOR SHALL PROVIDE A SUBMISSION (LETTER) STATING THAT LAMPS AND BALLASTS WERE DISPOSED OF THROUGH ENVIRONMENTALLY SAFE METHODS. THE SUBMISSION BY THE ELECTRICAL CONTRACTOR SHALL INCLUDE THE WAYBILL DETAILING LOCATION OF DISPOSAL AND QUANTITY OF LAMPS AND BALLASTS THAT WERE DISPOSED.

REFER TO DETAIL NO. 3 ON DRAWING NO. E-1.2 FOR FIXTURE SCHEDULE.

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HCC PROJECT NO: 25001

PROJECT:

RENOVATIONS AT ECOLE ELEMENTAIRE JEANNE-LAJOIE

150 CARNFORTH ROAD
NORTH YORK, ONTARIO
Conseil scolaire Viamond

DRAWING:

REFLECTED CEILING DEMOLITION PLAN - FIRST FLOOR

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PROJECT NO: **24195**

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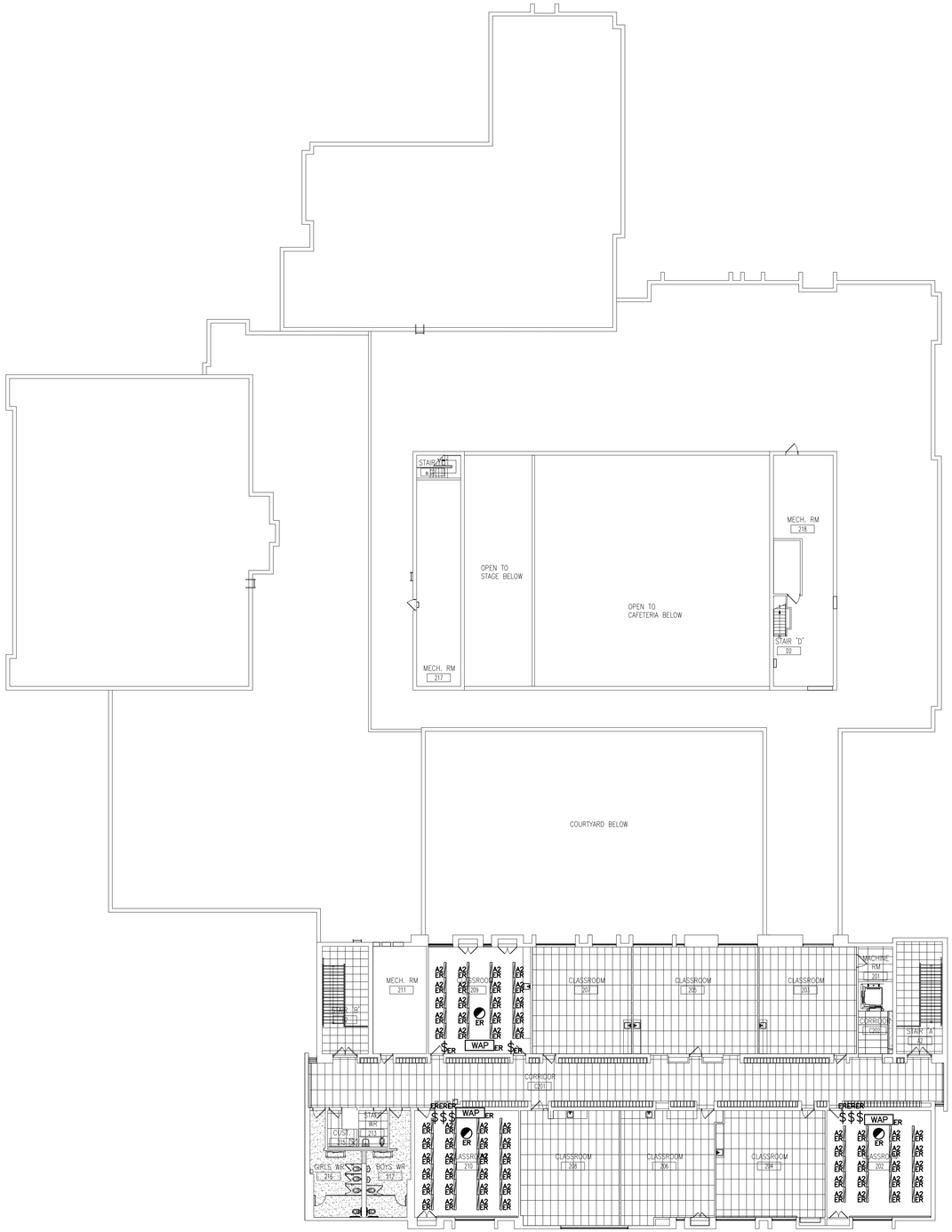

REFER TO DETAIL NO. 3 ON DRAWING NO. E-1.2 FOR FIXTURE SCHEDULE.

(N-1) LIGHTING AND FIRE ALARM LAYOUT SHOWS EXISTING REFLECTED CEILING PLAN ONLY. REFER TO DETAIL NO. 2 ON DRAWING NO. E-9.2 FOR NEW LAYOUT AND FOR ADDITIONAL DEMOLITION REQUIREMENTS.

(N-2) NOT USED.

(N-3) BASE BID PRICE SHALL INCLUDE FOR THE REMOVAL OF TWO (2) ADDITIONAL FIXTURES AND FIRE ALARM DEVICES OVER AND ABOVE THOSE SHOWN ON DRAWING NO. E-6.2.

(N-4) AS PART OF THIS SCOPE OF WORK ELECTRICAL CONTRACTOR TO EXTEND EXISTING DC CIRCUITS TO EMERGENCY LIGHTING BATTERY UNIT M1 PROVIDED AS PART OF THIS SCOPE OF WORK. CONFIRM DC VOLTAGE OF EXISTING BATTERY UNIT ON SITE PRIOR TO SUBMITTING EMERGENCY LIGHTING SHOP DRAWINGS FOR REVIEW. REPORT FINDINGS TO ELECTRICAL ENGINEER.

(N-5) NOT USED.

(N-6) REWIRE ALL EXISTING TO REMAIN FIXTURES TO ENSURE CONTINUITY OF SERVICES.

(N-7) DISPOSE OF ALL FIXTURES REMOVED AS PART OF THIS SCOPE OF WORK. RECYCLE ALL APPLICABLE COMPOUNDS AS DETAILED IN 'GREEN MEASURES' REQUIREMENTS. PROVIDE DOCUMENTATION SUPPORTING RECYCLING MEASURES.

(N-8) DO NOT REUSE EXISTING DIMMERS, SWITCHES, LAMPS, ETC. DENOTED AS EXISTING TO BE REMOVED AS PART OF THIS SCOPE OF WORK.

(N-9) AS PART OF THIS SCOPE OF WORK ELECTRICAL CONTRACTOR MUST PROCURE (ORDER AND PAY FOR) THE SERVICES OF AEVITAS TO DISPOSE OF ALL LAMPS AND BALLASTS REMOVED AS PART OF THIS SCOPE OF WORK IN COMPLIANCE WITH MINISTRY STANDARDS AND ENVIRONMENTALLY SAFE METHODS. ELECTRICAL CONTRACTOR SHALL PROVIDE A SUBMISSION (LETTER) STATING THAT LAMPS AND BALLASTS WERE DISPOSED OF THROUGH ENVIRONMENTALLY SAFE METHODS. THE SUBMISSION BY THE ELECTRICAL CONTRACTOR SHALL INCLUDE THE WAYBILL DETAILING LOCATION OF DISPOSAL AND QUANTITY OF LAMPS AND BALLASTS THAT WERE DISPOSED.

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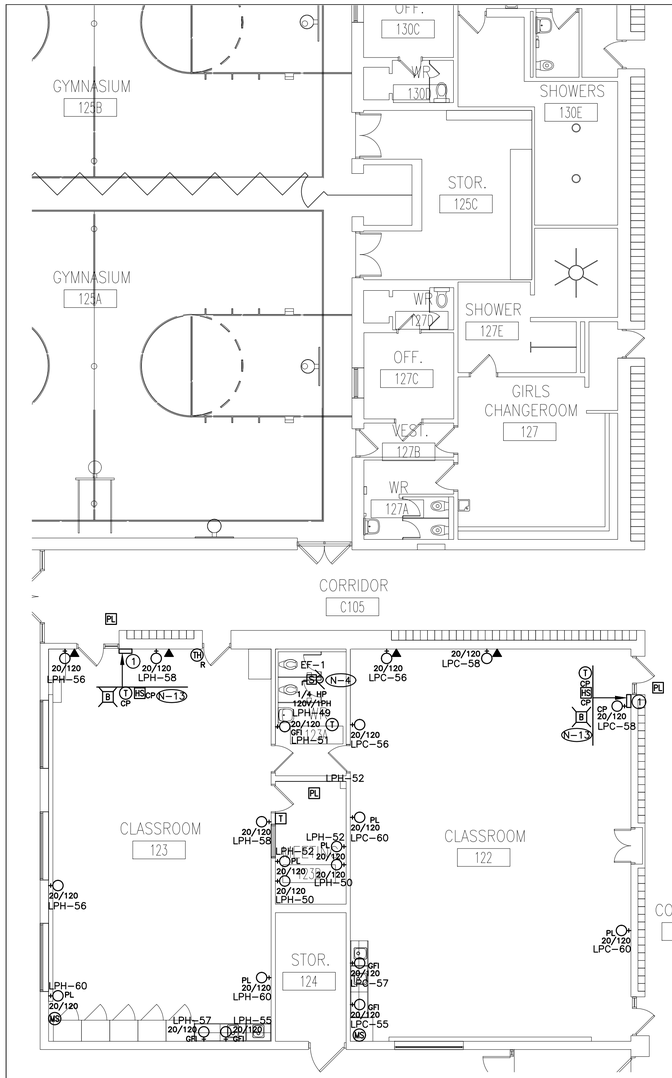
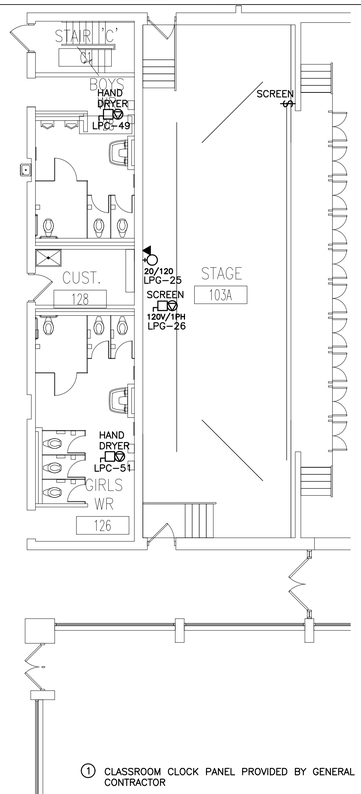
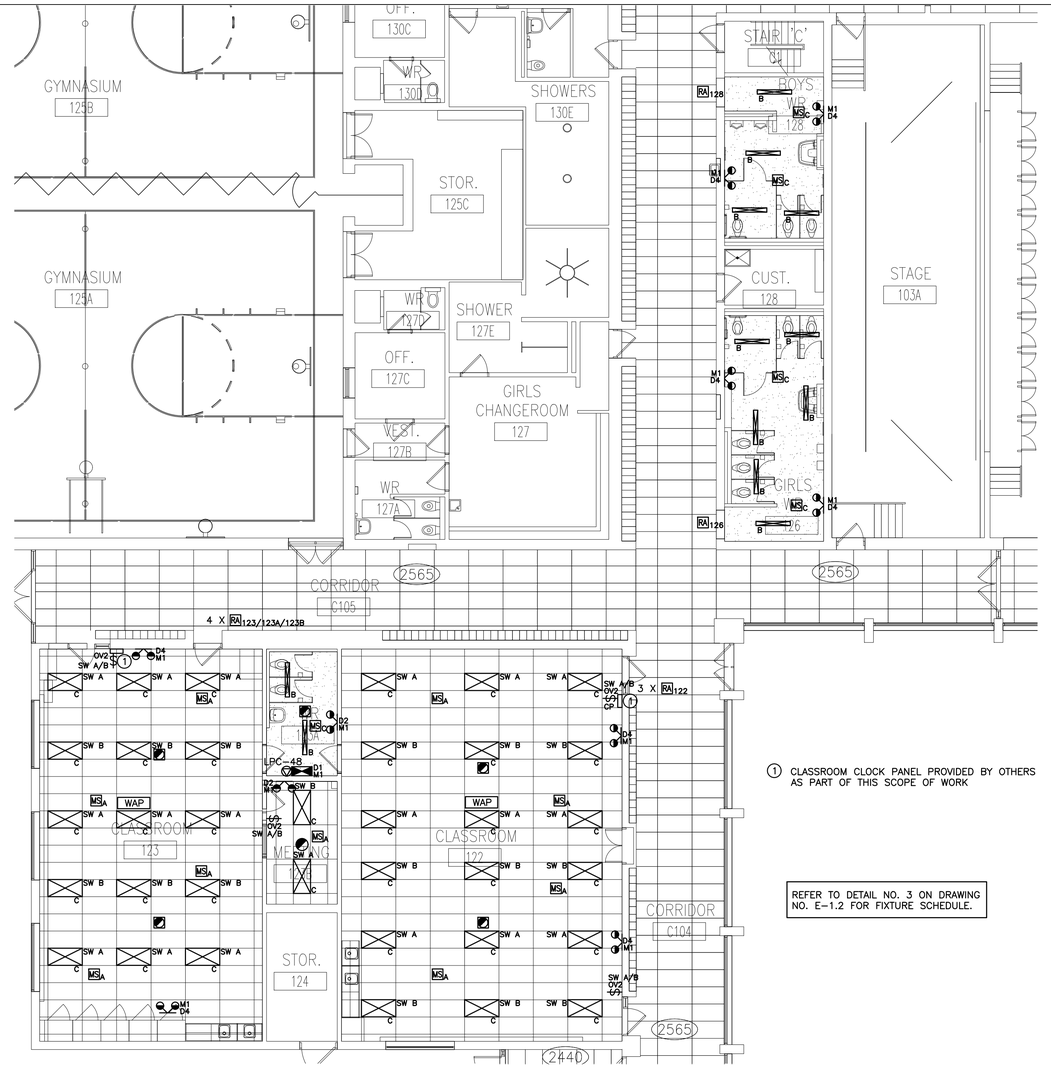




① CLASSROOM CLOCK PANEL PROVIDED BY GENERAL CONTRACTOR



① CLASSROOM CLOCK PANEL PROVIDED BY OTHERS AS PART OF THIS SCOPE OF WORK

REFER TO DETAIL NO. 3 ON DRAWING NO. E-1.2 FOR FIXTURE SCHEDULE.

(N-1) EXACT LOCATION OF ALL DEVICES AND RESPECTIVE HEIGHTS TO BE COORDINATED ON SITE WITH ARCHITECT.

(N-2) NEATLY LABEL ALL FLOOR MOUNTED AND WALL DEVICE BOX COVERS WITH CORRESPONDING PANEL NAMES AND CIRCUIT NUMBERS. UTILIZE SELF ADHESIVE MECHANICALLY PRINTED LABELS.

(N-3) CIRCUIT NUMBERS MAY NOT BE CHANGED WITHOUT PRIOR APPROVAL FROM THE ELECTRICAL ENGINEER.

(N-4) CONFIRM BREAKER/FUSE AND RECEPTACLE/DISCONNECT REQUIREMENTS PRIOR TO INSTALLATION.

(N-5) CONFIRM BREAKER AND RECEPTACLE REQUIREMENTS PRIOR TO ORDERING DISTRIBUTION.

(N-6) COORDINATE WIRING REQUIREMENTS FOR MECHANICAL EQUIPMENT ON SITE WITH MECHANICAL CONTRACTOR.

(N-7) CONFIRM ELECTRICAL REQUIREMENTS AND EXACT LOCATION OF ALL MECHANICAL EQUIPMENT WITH MECHANICAL CONTRACTOR PRIOR TO INSTALLATION OF ELECTRICAL SERVICES.

(N-8) ALL FINAL CONNECTIONS TO MECHANICAL EQUIPMENT ARE TO BE IN LIQUID TIGHT FLEXIBLE CONDUIT.

(N-9) ROUTE ALL CONDUIT SYSTEMS AROUND BEAMS, NEW DUCT WORK AND PIPING AS REQUIRED TO ACCOMMODATE INSTALLATION. REFER TO MECHANICAL DRAWINGS AND ARCHITECTURAL DRAWINGS FOR ADDITIONAL DETAILS.

(N-10) MANUAL STARTER SWITCH/THERMOSTAT SUPPLIED BY MECHANICAL CONTRACTOR AND INSTALLED BY ELECTRICAL CONTRACTOR. PROVIDE CONDUIT AND WIRE.

(N-11) MINIMUM WIRE SIZE #10AWG FOR ALL 120 VOLT CIRCUITS EXCEEDING 90 FEET IN LENGTH.

(N-12) ELECTRICAL CONTRACTOR TO ENSURE THAT DEVICES ARE NOT INSTALLED ON WALLS WITH WHITE BOARDS OR ON FEATURE WALLS. CONFIRM WHITE BOARD AND FEATURE WALL LOCATIONS PRIOR TO INSTALLATION.

(N-13) PROVIDE ONE (1) 14" DIAMETER BATTERY OPERATED CLOCK FOR CLOCK PANEL INDICATED – ITC 90/0014-1 C/W BATTERIES.

(N-14) PROVIDE REQUIRED PENETRATIONS THROUGH BUILDING ENVELOP. COORDINATE WORK AND WEATHERPROOF SEALING REQUIREMENTS WITH LANDLORD.

(N-15) NOT USED.

(N-16) PROVIDE LOCKONS FOR BREAKERS PROTECTING EMERGENCY LIGHTING CIRCUITS AND FIRE ALARM SYSTEM CIRCUITS.

(N-17) AS PART OF THE BASE BID PRICE ELECTRICAL CONTRACTOR SHALL PROVIDE (SUPPLY AND INSTALL) AN ADDITIONAL TWO (2) CSA 5-20R (T-SLOT) TAMPER RESISTANT DUPLEX RECEPTACLES OVER AND ABOVE THOSE SHOWN ON DETAIL NO. 1 ON DRAWING NO. E-9.1 ON AN AD HOC BASIS UP TO SUBSTANTIAL COMPLETION. EACH ADDITIONAL RECEPTACLE SHALL BE ON A DEDICATED CIRCUIT COMPLETE WITH BRANCH WIRING (CONDUIT AND WIRE) AND BREAKER. BREAKER REQUIREMENTS NOT INDICATED ON PANEL SCHEDULES.

PROVIDE RECEPTACLES, CONDUIT, WIRE (100' OF 2#12AWG + G (TOTAL OF 200' WIRE PLUS G) AND 100' 3/4" CONDUIT PER RECEPTACLE), BREAKERS, TERMINATION AT PANEL BREAKER END AND AT DEVICE END, ETC. FOR FULLY FUNCTIONAL LIVE DEVICES. EXACT INSTALLATION LOCATION AND PANEL SOURCE TO BE DETERMINED ON SITE BY CLIENT DURING CONSTRUCTION. PROVIDE UPDATED TYPED PANEL SCHEDULES FOR ALL PANELS AT THE COMPLETION OF THE PROJECT.

(N-18) ALL RECEPTACLES PROVIDED AS PART OF THIS SCOPE OF WORK AND INSTALLED WITHIN KITCHEN EXCEPT THOSE SPECIFICALLY EXCLUDED IN OESC SHALL BE TAMPER RESISTANT RECEPTACLES. ALL RECEPTACLES PROVIDED AS PART OF THIS SCOPE OF WORK FOR ALL OTHER AREAS AND ROOMS SHALL BE TAMPER RESISTANT RECEPTACLES.

1 / E-9.1 ELECTRICAL PLAN – FIRST FLOOR
SCALE: 1:100

(N-1) REFER TO ARCHITECT DRAWINGS FOR EXACT LOCATION AND HEIGHTS FOR MOUNTING OF FIXTURES, OCCUPANCY SENSORS, LIGHT SWITCHES, FIRE ALARM DEVICES, ETC.

(N-2) PROVIDE NEW LIGHTING FIXTURES, EXIT SIGNS, SWITCHES, OCCUPANCY SENSORS, FIRE ALARM DEVICES, ETC. TO SUIT NEW REFLECTED CEILING PLAN.

(N-3) ALL EXIT SIGNS TYPE "E1" UNLESS INDICATED OTHERWISE.

(N-4) COORDINATE INSTALLATION OF FIXTURES WITH MECHANICAL EQUIPMENT, ELECTRICAL EQUIPMENT, SPRINKLERS AND DUCT WORK.

(N-5) CHAIN HANG ALL FIXTURES PROVIDED AS PART OF THIS SCOPE OF WORK IN FINISHED CEILING AREAS ABOVE FROM SLAB (RETROFIT FIXTURES ACCORDINGLY).

(N-6) REUTILIZE EXISTING LIGHTING CIRCUITS UNLESS DENOTED OTHERWISE.

(N-7) UTILIZE CCT #LPC-48 (DC SOURCE M1) TO POWER EXIT SIGN AC BULBS AND 24 HOUR LIGHTING.

(N-8) PROVIDE LOCK ON FOR BREAKERS PROTECTING EMERGENCY LIGHTING SYSTEMS.

(N-9) LOCATE AND POSITION EXIT SIGNS SUCH THAT THEY DO NOT INTERFERE WITH ADJACENT EXIT SIGNS AND EMERGENCY LIGHTING COVERAGE.

(N-10) ALL SWITCHES PROVIDED AS PART OF THIS SCOPE OF WORK TO BE ALIGNED WITH THERMOSTATS.

(N-11) MOUNTING STYLE (CEILING/WALL), HEIGHT AND LOCATION OF EXIT SIGNS TO BE DETERMINED BY DESIGNER ON SITE. COORDINATE AND REVIEW ALL EXIT SIGN LOCATIONS WITH DESIGNER PRIOR TO ORDERING EXIT SIGNS.

(N-12) ELECTRICAL CONTRACTOR TO ENSURE THAT DEVICES ARE NOT INSTALLED ON WALLS WITH WHITE BOARDS OR ON FEATURE WALLS. CONFIRM WHITE BOARD AND FEATURE WALL LOCATIONS PRIOR TO INSTALLATION.

(N-13) ALL DEVICES, FIXTURES, FIRE ALARM DEVICES, SYSTEMS, ETC. MUST BE WIRED SUCH THAT ACCESS PANELS ARE NOT REQUIRED IN DRYWALL CEILING AREAS.

(N-14) DO NOT REUSE EXISTING FIRE ALARM SYSTEM DEVICES, EXIT SIGNS, OCCUPANCY SENSORS, DIMMERS OR SWITCHES REMOVED AS PART OF THIS SCOPE OF WORK.

(N-15) AS PART OF THIS SCOPE OF WORK ELECTRICAL CONTRACTOR TO HAVE WATT STOPPER SERVICE CONSULTANT ONSITE AFTER LIGHTING AND HVAC INSTALLATION IS COMPLETE AND PRIOR TO INSTALLATION OF SENSORS PROVIDED AS PART OF THIS SCOPE OF WORK TO CONFIRM PLACEMENT OF SENSORS.

(N-16) CEILING MOUNTED OCCUPANCY SENSORS PROVIDED AS PART OF THIS SCOPE OF WORK MUST BE INSTALLED AT LEAST 6' AWAY FROM ALL SUPPLY AIR DIFFUSERS AND RETURN AIR GRILLS. COORDINATE EXACT INSTALLATION LOCATION WITH WATT STOPPER LIGHTING CONTROL SERVICE CONSULTANT AND MECHANICAL CONTRACTOR PRIOR TO COMMENCING WORK.

(N-17) CEILING MOUNTED OCCUPANCY SENSORS IN ROOMS WITH DLM CONTROL TO BE PROGRAMMED SUCH THAT THE FUNCTION OF AUTO-ON IS DISABLED. ALL LIGHT FIXTURES WITHIN RESPECTIVE ENCLOSED SPACES SHALL BE TURNED ON MANUALLY THROUGH LOW VOLTAGE OVERRIDE SWITCHES PROVIDED AS PART OF THIS SCOPE OF WORK UNLESS INDICATED OTHERWISE.

(N-18) ALL ROOM CONTROLLERS PROVIDED AS PART OF THIS SCOPE OF WORK MUST BE INSTALLED WITHIN CEILING MOUNTED JUNCTION BOXES PROVIDED AS PART OF THIS SCOPE OF WORK.

(N-19) EACH AND EVERY SPACE ENCLOSED BY CEILING HEIGHT PARTITIONS (IE. OFFICES, MEETING ROOMS, ENCLAVES, ETC.) WITH DLM CONTROL TO BE WIRED WITH TWO CONTROLLABLE SWITCH-LEGS SUCH THAT THERE IS ONE CONTROL STEP OF NOT MORE THAN 50% LIGHTING POWER IN ADDITION TO AN AUTO OFF IN THE RESPECTIVE SPACE. REFER TO ASHRAE 90.1 2013 FOR ADDITIONAL REQUIREMENTS.

(N-20) SWITCH/DIMMING LEGS SHALL BE WIRED SUCH THAT LEG IS CONTROLLED BY OCCUPANCY SENSORS IN RESPECTIVE SPACE ENCLOSED BY CEILING HEIGHT PARTITIONS. OPERATION OF SAME LIGHT BRANCH CIRCUIT IN ADJACENT AREAS/ROOMS SHALL NOT AFFECT OPERATION OF LIGHTING IN RESPECTIVE AREA. REWIRE EXISTING FIXTURES AS REQUIRED.

(N-21) AS PART OF THIS SCOPE OF WORK EMPLOY AND PAY FOR THE SERVICES OF A CERTIFIED WATT STOPPER SERVICE CONSULTANT TO COMMISSION ALL CEILING MOUNTED OCCUPANCY SENSORS PROVIDED AS PART OF THIS SCOPE OF WORK. COMMISSIONING AND DOCUMENTATION SHALL BE COMPLETED; DETAILED AS REQUIRED TO DEMONSTRATE LEED COMPLIANCE.

(N-22) AS PART OF THE BASE BID PRICE ELECTRICAL CONTRACTOR SHALL PROVIDE (SUPPLY AND INSTALL) AN ADDITIONAL TWO (2) TYPE 'A' CEILING MOUNTED OCCUPANCY SENSORS, 100'-0" OF CONDUIT AND WIRING OVER AND ABOVE THOSE SHOWN ON DETAIL NO. 2 ON DRAWING NO. E-9.1 POST SUBSTANTIAL COMPLETION.

(N-23) AS PART OF THE BASE BID PRICE ELECTRICAL CONTRACTOR SHALL PROVIDE (SUPPLY AND INSTALL) AN ADDITIONAL TWO (2) DIGITAL DIMMING ROOM CONTROLLERS OVER AND ABOVE THOSE SHOWN ON DETAIL NO. 2 ON DRAWING NO. E-9.1 ON AN AD HOC BASIS UP TO SUBSTANTIAL COMPLETION.

PROVIDE WATT STOPPER LMRC-212 C/W CONDUIT, WIRE (75' OF 2#12AWG + G (TOTAL OF 150' WIRE PLUS G, 75' CONDUIT) PER ROOM CONTROLLER), TERMINATIONS, ETC. FOR FULLY FUNCTIONAL LIVE DEVICES. EXACT INSTALLATION LOCATION AND SWITCH LEGS TO BE DETERMINED ON SITE DURING CONSTRUCTION.

2 / E-9.1 REFLECTED CEILING PLAN – FIRST FLOOR
SCALE: 1:100

Conseil scolaire Viamonde

NO.	ISSUES	DATE	BY
1	ISSUED FOR REVIEW	MAR 12, 2025	HCC
2	ISSUED FOR PERMIT & TENDER	MAR 20, 2025	HCC

LICENSED PROFESSIONAL ENGINEER
H.D. COHEN
90414335
20-MAR-25
PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER
X.P. CHEN
100219955
20-MAR-25
PROVINCE OF ONTARIO

NO.	REVISIONS	DATE	BY

HCC ENGINEERING
DESIGN AND TECHNOLOGY SERVICES GROUP
HCC ENGINEERING LIMITED
40 EGLINTON AVENUE EAST, SUITE 600
TORONTO, ONTARIO, M4P 3A2
Tel: (416) 932-2423

HCC PROJECT NO: 25001

PROJECT:

RENOVATIONS AT ECOLE ELEMENTAIRE JEANNE-LAJOIE

150 CARNFORTH ROAD
NORTH YORK, ONTARIO
Conseil scolaire Viamond

DRAWING:

ELECTRICAL AND REFLECTED CEILING PLANS - FIRST FLOOR

BBA
BARRY BRYAN ASSOCIATES
Architects
Engineers
Project Managers
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DESIGN BY: PC	DOC CONTROL DATE:
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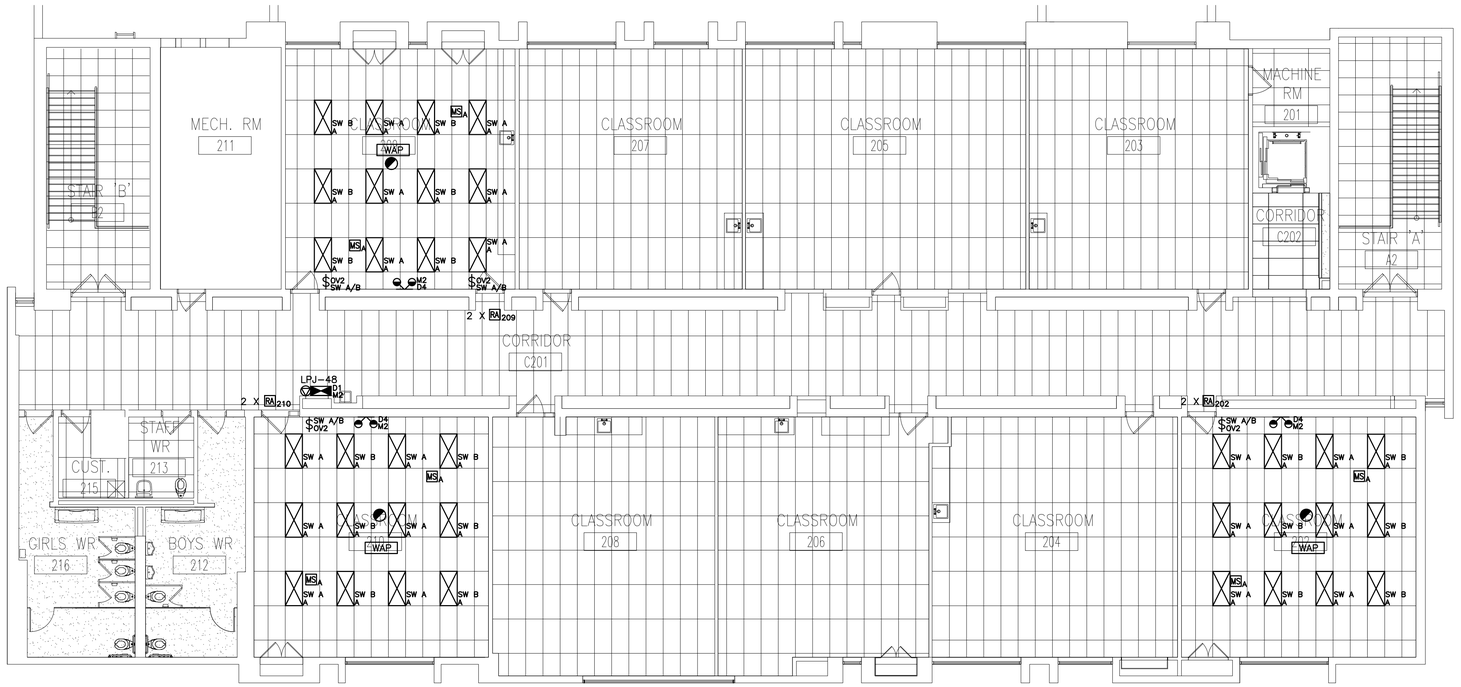
CHECKED BY: PC	INITIAL:
DATE: 12/19/2024	
SCALE: AS SHOWN	
FILE:	

PROJECT NO: 24195

DRAWING NO: E-9.1



REFER TO DETAIL NO. 3 ON DRAWING NO. E-1.2 FOR FIXTURE SCHEDULE.

1 / E-9.2 REFLECTED CEILING PLAN – SECOND FLOOR

SCALE: 1:100

N-1 REFER TO ARCHITECT DRAWINGS FOR EXACT LOCATION AND HEIGHTS FOR MOUNTING OF FIXTURES, OCCUPANCY SENSORS, LIGHT SWITCHES, FIRE ALARM DEVICES, ETC.

N-2 PROVIDE NEW LIGHTING FIXTURES, EXIT SIGNS, SWITCHES, OCCUPANCY SENSORS, FIRE ALARM DEVICES, ETC. TO SUIT NEW REFLECTED CEILING PLAN.

N-3 NOT USED.

N-4 COORDINATE INSTALLATION OF FIXTURES WITH MECHANICAL EQUIPMENT, ELECTRICAL EQUIPMENT, SPRINKLERS AND DUCT WORK.

N-5 CHAIN HANG ALL FIXTURES PROVIDED AS PART OF THIS SCOPE OF WORK IN FINISHED CEILING AREAS ABOVE FROM SLAB (RETROFIT FIXTURES ACCORDINGLY).

N-6 REUTILIZE EXISTING LIGHTING CIRCUITS UNLESS DENOTED OTHERWISE.

N-7 UTILIZE CCT #LPJ-48 (DC SOURCE M2) TO POWER EXIT SIGN AC BULBS AND 24 HOUR LIGHTING.

N-8 PROVIDE LOCK ON FOR BREAKERS PROTECTING EMERGENCY LIGHTING SYSTEMS.

N-9 LOCATE AND POSITION EXIT SIGNS SUCH THAT THEY DO NOT INTERFERE WITH ADJACENT EXIT SIGNS AND EMERGENCY LIGHTING COVERAGE.

N-10 ALL SWITCHES PROVIDED AS PART OF THIS SCOPE OF WORK TO BE ALIGNED WITH THERMOSTATS.

N-11 NOT USED.

N-12 ELECTRICAL CONTRACTOR TO ENSURE THAT DEVICES ARE NOT INSTALLED ON WALLS WITH WHITE BOARDS OR ON FEATURE WALLS. CONFIRM WHITE BOARD AND FEATURE WALL LOCATIONS PRIOR TO INSTALLATION.

N-13 ALL DEVICES, FIXTURES, FIRE ALARM DEVICES, SYSTEMS, ETC. MUST BE WIRED SUCH THAT ACCESS PANELS ARE NOT REQUIRED IN DRYWALL CEILING AREAS.

N-14 DO NOT REUSE EXISTING FIRE ALARM SYSTEM DEVICES, EXIT SIGNS, OCCUPANCY SENSORS, DIMMERS OR SWITCHES REMOVED AS PART OF THIS SCOPE OF WORK.

N-15 AS PART OF THIS SCOPE OF WORK ELECTRICAL CONTRACTOR TO HAVE WATT STOPPER SERVICE CONSULTANT ONSITE AFTER LIGHTING AND HVAC INSTALLATION IS COMPLETE AND PRIOR TO INSTALLATION OF SENSORS PROVIDED AS PART OF THIS SCOPE OF WORK TO CONFIRM PLACEMENT OF SENSORS.

N-16 CEILING MOUNTED OCCUPANCY SENSORS PROVIDED AS PART OF THIS SCOPE OF WORK MUST BE INSTALLED AT LEAST 6' AWAY FROM ALL SUPPLY AIR DIFFUSERS AND RETURN AIR GRILLS. COORDINATE EXACT INSTALLATION LOCATION WITH WATT STOPPER LIGHTING CONTROL SERVICE CONSULTANT AND MECHANICAL CONTRACTOR PRIOR TO COMMENCING WORK.

N-17 CEILING MOUNTED OCCUPANCY SENSORS IN ROOMS WITH DLM CONTROL TO BE PROGRAMMED SUCH THAT THE FUNCTION OF AUTO-ON IS DISABLED. ALL LIGHT FIXTURES WITHIN RESPECTIVE ENCLOSED SPACES SHALL BE TURNED ON MANUALLY THROUGH LOW VOLTAGE OVERRIDE SWITCHES PROVIDED AS PART OF THIS SCOPE OF WORK UNLESS INDICATED OTHERWISE.

N-18 ALL ROOM CONTROLLERS PROVIDED AS PART OF THIS SCOPE OF WORK MUST BE INSTALLED WITHIN CEILING MOUNTED JUNCTION BOXES PROVIDED AS PART OF THIS SCOPE OF WORK.

N-19 EACH AND EVERY SPACE ENCLOSED BY CEILING HEIGHT PARTITIONS (IE. OFFICES, MEETING ROOMS, ENCLAVES, ETC.) WITH DLM CONTROL TO BE WIRED WITH TWO CONTROLLABLE SWITCH-LEGS SUCH THAT THERE IS ONE CONTROL STEP OF NOT MORE THAN 50% LIGHTING POWER IN ADDITION TO AN AUTO OFF IN THE RESPECTIVE SPACE. REFER TO ASHRAE 90.1 2013 FOR ADDITIONAL REQUIREMENTS.

N-20 SWITCH/DIMMING LEGS SHALL BE WIRED SUCH THAT LEG IS CONTROLLED BY OCCUPANCY SENSORS IN RESPECTIVE SPACE ENCLOSED BY CEILING HEIGHT PARTITIONS. OPERATION OF SAME LIGHT BRANCH CIRCUIT IN ADJACENT AREAS/ROOMS SHALL NOT AFFECT OPERATION OF LIGHTING IN RESPECTIVE AREA. REWIRE EXISTING FIXTURES AS REQUIRED.

N-21 AS PART OF THIS SCOPE OF WORK EMPLOY AND PAY FOR THE SERVICES OF A CERTIFIED WATT STOPPER SERVICE CONSULTANT TO COMMISSION ALL CEILING MOUNTED OCCUPANCY SENSORS PROVIDED AS PART OF THIS SCOPE OF WORK. COMMISSIONING AND DOCUMENTATION SHALL BE COMPLETED; DETAILED AS REQUIRED TO DEMONSTRATE LEED COMPLIANCE.

N-22 AS PART OF THE BASE BID PRICE ELECTRICAL CONTRACTOR SHALL PROVIDE (SUPPLY AND INSTALL) AN ADDITIONAL TWO (2) TYPE 'A' CEILING MOUNTED OCCUPANCY SENSORS, 100'-0" OF CONDUIT AND WIRING OVER AND ABOVE THOSE SHOWN ON DETAIL NO. 1 ON DRAWING NO. E-9.2 POST SUBSTANTIAL COMPLETION.

N-23 AS PART OF THE BASE BID PRICE ELECTRICAL CONTRACTOR SHALL PROVIDE (SUPPLY AND INSTALL) AN ADDITIONAL TWO (2) DIGITAL DIMMING ROOM CONTROLLERS OVER AND ABOVE THOSE SHOWN ON DETAIL NO. 1 ON DRAWING NO. E-9.2 ON AN AD HOC BASIS UP TO SUBSTANTIAL COMPLETION.

PROVIDE WATT STOPPER LMRC-212 C/W CONDUIT, WIRE (75' OF 2#12AWG + G (TOTAL OF 150' WIRE PLUS G, 75' CONDUIT) PER ROOM CONTROLLER), TERMINATIONS, ETC. FOR FULLY FUNCTIONAL LIVE DEVICES. EXACT INSTALLATION LOCATION AND SWITCH LEGS TO BE DETERMINED ON SITE DURING CONSTRUCTION.

Conseil scolaire Viamonde

NO.	ISSUES	DATE	BY
1	ISSUED FOR REVIEW	MAR 12, 2025	HCC
2	ISSUED FOR PERMIT & TENDER	MAR 20, 2025	HCC

LICENSED PROFESSIONAL ENGINEER
H.D. COHEN
90414335
20-MAR-25
PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER
X.P. CHEN
100219955
20-MAR-25
PROVINCE OF ONTARIO

NO.	REVISIONS	DATE	BY

HCC ENGINEERING
DESIGN AND TECHNOLOGY SERVICES GROUP
HCC ENGINEERING LIMITED
40 EGLINTON AVENUE EAST, SUITE 600
TORONTO, ONTARIO, M4P 3A2
Tel: (416) 932-2423

HCC PROJECT NO: 25001

PROJECT:

RENOVATIONS AT ECOLE ELEMENTAIRE JEANNE-LAJOIE

150 CARNFORTH ROAD
NORTH YORK, ONTARIO

Conseil scolaire Viamond

DRAWING:

ELECTRICAL AND REFLECTED CEILING PLANS - SECOND FLOOR

BARRY BRYAN ASSOCIATES
Architects
Engineers
Project Managers

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L1N 0G5

Tel: (905) 666-5252
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e-mail bba@bba-archeng.com

DESIGN BY: PC	DOC CONTROL DATE:
DRAWN BY: TGR	% COMPLETE:
CHECKED BY: PC	INITIAL:
DATE: 12/19/2024	
SCALE: AS SHOWN	
FILE:	

PROJECT NO: **24195**

DRAWING NO: **E-9.2**

Electrical Specifications

for

Renovations at
École élémentaire Jeanne-Lajoie
150 Carnforth Road
Toronto, Ontario

HCC PROJECT #25001

The undersigned has reviewed and takes responsibility for this design and has the qualifications and meets the requirements set out in the Ontario Building Code to be a designer.

*QUALIFICATION INFORMATION

Required unless design is exempt under DIV C 3.2.5.1 of the building code

HOWARD COHEN		24553
NAME	SIGNATURE	BCIN

*REGISTRATION INFORMATION

Required unless design is exempt under DIV C 3.2.4.1 of the building code

HCC ENGINEERING LIMITED	28954
FIRM NAME	BCIN

HCC ENGINEERING LIMITED
40 Eglinton Avenue East
Suite 600
Toronto, Ontario
M4P 3A2
Tel: (416) 932-2423

Issued for Tender
March 19, 2025

SECTION 26 05 00: GENERAL CONDITIONS.

1.1 Project Description:

1. The project encompasses the 150 Carnforth Road, Toronto facility. In general, the work shall include, without being limited to the following:

    1. Provide new 120/208 Volt utility power service.
    2. Provide communications conduit systems, grounding systems, lighting, lighting control, fire alarm system, paging system and security and CCTV conduit requirements, etc., as shown on the drawings.

2. The electrical contractor shall provide a comprehensive Methods of Procedures (MOP's) two weeks prior to each and every power shutdown. MOP's must include a detailed sequence of operations to be completed during the respective shutdown as well as a back out plan. MOP's must be approved by the client, landlord and the electrical engineer prior to any work taking place.

1.2 Sub-Contractors:

1. The Contractor may not assign or sub-contract any work without the prior written consent of the Construction Manager or his designated representative. A list of sub-contractors must be submitted with the tender response.

1.3 Substantial Completion Of Contract

1. All the equipment and wire must be cleaned and tested, before acceptance by the consultant.
2. This Contractor shall guarantee all equipment and work furnished under this Division for a period of **two (2) years** or such longer periods as may be provided in the warranty of the manufacturer of individual components, whichever is longer from the date of final acceptance by the Engineer. This contractor shall correct all defects developing as a whole or in part, due to defective workmanship, materials or defective arrangement of the various parts or materials damaged as a result of these defects or repairs. All defects shall be made good to the satisfaction of the Engineer at this Contractor's expense.
3. Replace, at no cost, all incandescent lamps burned out during a thirty (30) day period, all burned-out fluorescent and HID lamps for a period of ninety (90) days and all burned out LEDs based on a 70% lumen maintenance within a 5 year warranty period after date of issuance of certificate of Substantial Performance for the contract of this building.
4. Additional requirements as detailed in Section 26 05 00, paragraph 1.7, sentence 9.

1.4 Inquiries

1. All inquiries will be responded to in writing and will be distributed to all bidders. No questions or inquiries will be answered within 48hrs of the closing period of a bid.

1.5 Site Meeting

1. The site meeting will be scheduled during the tender period by the project manager.

1.6 Examination of Premises And Work

1. Visit and examine the site where the work is to be done. Become familiar with all features and characteristics of the site and/or any existing structure before submitting a bid. No allowances will be made by the Owner for any difficulties encountered by this Contractor due to any peculiarities of the site, surrounding public or private property that existed when the Tender was submitted.
2. This Contractor shall examine the structural, mechanical, architectural and electrical and any other drawings issued to satisfy himself that the work can be satisfactorily carried out. Before commencing work or prefabrication, examine the work of other trades and report at once any defect or interference affecting the work of the electrical trade.
3. Where variances occur between the drawings and the specifications, or within either document itself, the item or arrangement of better quality, greater quantity or higher cost shall be included in the contract sum. The Engineer will decide on the item and manner in which the work shall be installed.
4. All bidders shall familiarize themselves with and adhere to the owner's building standards and guidelines.

1.7 Terms And Conditions

1. DEFINITIONS

    1. The term Owner shall be understood to refer to Conseil Scolaire Viamonde.
    2. The term consultant shall be understood to refer to Howard Cohen, P. Eng., RCDD/LAN, MBA.
    3. Not used.
    4. The term electrical contractor shall be understood to refer to the successful bidder to this specifications package.
    5. The term Contract shall be understood to refer to all items and conditions of this specification, Drawings, the complete tender package, the Contractor's tender submission and any other future contractual arrangements. All such items and conditions shall be binding unless agreed otherwise by the Contractor, Consultant and Owner.
    6. The term Project shall be understood to refer to the complete supply and installation of the Electrical System and components, as defined in this specification and Drawings.
    7. Wherever the words "equal", "equivalent", "approved", or "approved equal" are used, it shall be understood to mean, "equal", "equivalent", "approved", or "approved equal" in the opinion of the Consultant only.
    8. Wherever the words "install", "provide", or "supply and install", are used it shall be understood to mean "provide and install, inclusive of all labour, materials, installation, testing, and connections" for the item to which referred.
    9. "Concealed" is defined as "out of sight" in "normal" viewing conditions, and includes buried in concrete, above acoustic tile or gypsum board ceilings, within masonry or gypsum board constructed walls, within cable trays of below raised access floors.

2. These specifications or the drawings shall not be used alone. Any item or subject omitted from one, but mentioned or reasonably implied in the other, shall be provided. Misinterpretation of any requirements of either the specification or drawings shall not result in any additional charge after submission of Tender. This Contractor shall, by careful study of the total requirements, include all necessary components to make each system workable. The consultant shall be contacted for written clarification on any point before the submission of Tenders.

3. All terms and conditions of the specifications, tender documents and accompanying Drawings shall be strictly adhered to by the Contractor, unless otherwise noted. Any inability to comply with these requirements must be stated in writing, in detail, with the response submission. Otherwise, it shall be understood that the Contractor is bound to compliance with the stated terms and conditions.
4. The Contractor shall co-operate fully with the Owner, Consultant, landlord and landlord's agent and all contractors, sub-contractors and other persons working on the site.
5. The Contractor shall do the complete installation in accordance with the latest editions of the National Building Code, Ontario Building Code, Canadian Electrical Safety Code, C.S.A., or other Codes or governing authorities of competent jurisdiction. In case of discrepancies with this or the manufacturer's specifications, the Contractor shall notify the Consultant immediately.
6. Obtain and pay for permits and ESA plans approvals (note: Building Permit obtained by owner) and inspections required for work performed. Provide Certificate (s) of Acceptance from the Authorities Inspection Department, upon completion of work.
7. Submit required Documents and shop drawings to authorities having jurisdiction in order to obtain approval for the Work. Copies of Contract Drawings and Specifications may be used for this purpose. Prepare any additional information, details and drawings which these authorities may require.
8. The Contractor must comply with all requirements of the Occupational Health & Safety Act.
9. In order to meet the requirements of substantial completion the electrical contractor must complete the following:
    1. Installation and successful testing of all electrical system devices as per mutually agreed to tests and commissioning plan.
    2. Overall system test demonstrating system operation and coordination of the utility systems.
    3. Commissioning of all systems including access control systems, intrusion systems, CCTV systems and duress systems
    4. Client training for all systems including access control systems, intrusion systems, CCTV systems and duress systems.
    5. Submission of all coordination and permit documentation for the Consultant's review.
    6. Submission of all record and As-built documentation.
    7. Correction of any deficiencies in the electrical system.

1.8 Schedule

1. Include for all necessary overtime required to carry out the project. The successful contractor will not be permitted claims as a consequence of this requirement. Successful Contractor to submit a full construction schedule before starting any work.
2. Sufficient manpower, materials, equipment, appliances and services are to be kept on site at all times to maintain the scheduled completion of work.
3. All work required to be done after office hours and weekends (including x-raying, core drilling and power shutdowns), shall be included in the tender price. Note: All x-raying and core drilling shall be provided by the electrical contractor.
4. Work associated with power shutdowns and with testing and commissioning of electrical systems must be carried out on Sunday mornings from 1am to 4 am. All shutdowns must be approved by Owner and by Landlord.
5. **Contractor must provide a dedicated onsite electrician for 8 hours on the Monday following each cutover.**

1.9 Contract Drawings

1. The Drawings for the electrical system work are diagrammatic performance Drawings, intended to convey the scope of work and indicate the approximate sizes and locations of equipment and outlets. The Drawings do not intend to show Designer's Architectural, Mechanical or Structural details.
2. Do not scale or measure Drawings, but obtain information regarding accurate dimensions, from the dimensions shown or by site measurements. Follow the Drawings to lay out the work.
3. Make, at no additional cost, any changes or additions to materials and equipment necessary to accommodate Structural conditions (offsets around beams, columns, etc.).
4. Alter at no additional cost, the location of materials and/or equipment as directed, provided that the changes are made before installation, and do not necessitate additional materials.
5. Change location of termination panels and devices at no extra cost providing cable length increase resulting from relocation does not exceed 3m (10') and information is given before installation.
6. Confirm at the site, the exact location of equipment.
7. Any miscellaneous materials, hardware, devices, wiring, etc., not specifically described, but required for the installation and operation of the electrical system, shall be provided and included as part of the Bid.

1.10 Materials And Equipment

1. All materials and equipment shall be completely new and unused products of only the most recent manufacturer model or version number, CSA certified, and manufactured to the Standards specified.
2. Where there is no alternative to supplying equipment which is not CSA certified, obtain special approval from the local Inspection Department.
3. No damaged, chipped or marked equipment or materials will be accepted and must not be installed.

1.11 Substitutes

1. All tenders must be based on specified items. Tenders shall show one price for the base bid and an itemized breakdown of all of substitutes showing "credit or cost" for each substitute.
2. Manufacturer's Basis of Design product part numbers and / or product photos have been included as part of this specifications package as the basis for the specification and tenders. and to clearly describe the quality of the product that is required for the work. A specific Manufacturer's name and model number also represents specific physical dimensions and operational requirements required on this project.
3. Substitutes will only be considered when submitted in sufficient time to review the proposal before tender closing. Proposals must be submitted at least two weeks prior to the deadline for Addenda Issues and for light fixtures must include detailed photometric plots for proposed light fixture substitutions. The photometric plots must be of the entire floor plan and must include all partitions and workstations (based on 5' high furniture panels). After reviewing the proposals, the Engineer will preliminarily accept or reject the proposed substitute(s). Addenda will be issued to confirm the preliminary acceptance of proposed substitutions. Preliminary acceptance of substitutes does not constitute approval for the use of those substitutes in the work.

4. It is the Contractor's responsibility to demonstrate in his proposal that the proposed substitutions are compatible with all related work and that the characteristics are equal to, or superior to the original specified items, including, but not limited to:
    - performance;
    - physical characteristics (i.e. dimensions, weights);
    - electrical characteristics (i.e. voltage, number of phases, rated load amperage);
    - availability;
    - noise characteristic (i.e. generated sound power, attenuation).
    - average max to min and average light levels (light fixtures).
    - lighting power density.
    - illuminated surface area.
    - lumen maintenance.

5. This Contractor shall be responsible for any additional costs necessary to accommodate substitutes.

6. All shop drawings submitted for approved substituted equipment shall be marked as such by the Contractor.

1.12 Operation And Maintenance Manuals

1. Provide five (5) hard copy sets of operation and maintenance manuals for equipment and products supplied.
2. Provide three (3) soft copy scanned sets of operation and maintenance manuals for equipment and products supplied. Media shall be USB drive.
3. Include the following information in the Operation and Maintenance manuals:
    - Names and address of local suppliers for the items included.
    - Technical data, product data, supplemented by bulletins, component illustrations, exploded views, technical descriptions of items and parts lists. Advertising or sales literature is not acceptable.
    - Details of design elements, construction 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.

4. Review information provided in the maintenance instructions and manuals with the Owners' operating personnel to ensure a complete understanding of the electrical equipment and systems and their operation.

1.13 Progress Payments

1. Submit a complete breakdown of the Contract with each progress billing, indicating percentage of work complete, in a form acceptable to the Owner/Consultant.
2. The amount of monies to be allocated for close out documents must be 3% of contract value. This does not include monies allocated for testing, measurement and verification, commissioning, training, etc.

1.14 Shop Drawings

1. Submitted Shop Drawings must indicate details of construction, dimensions, capacities, weights and electrical performance and flame spread characteristics of equipment or materials, as well as specification reference Section number and project name.
2. Shop Drawings shall be provided with sufficient space on the front for all Consultant's and Contractor's "review" stamps.
3 Work affected by submittal shall not proceed until review is complete.
4. Review submittal prior to submission to Consultant. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of the work and Contract Documents and bears the Stamp of Communications Contractor.
5. Changes made to the Shop Drawings by the Consultant will not affect the Contract Price.
6. Submit Shop Drawings for all material and equipment referred to in contract document.

1.15 Field Supervision

1. Throughout the duration of the Project, a properly qualified Electrical Field Supervisor must be available at all times. The Supervisor who starts the work must not be changed unless requested by the project manager, or written permission from the project manager is obtained.
2. In addition, provide proper office supervision of the work. The person responsible for office supervision must visit the site as often as necessary, to ensure work is properly performed, and attend weekly site meetings when so requested.

1.16 Site Responsibilities

1. Maintain work areas to be free of construction debris and waste. The disposal of all materials shall be the responsibility of the Contractor.
2. Make all necessary arrangements to transport materials and equipment to and within the site. The Contractor shall be responsible for arranging for the use of any hoists, lifts, pulleys, winches, cranes or service elevators.
3. The Contractor is responsible for complete storage, handling, delivery, and installation of all materials used in the performance of the work.
4. Obtain a copy of the Landlord's leasehold design manual and ensure that all requirements are complied with.

1.17 Deliveries / Access

1. Coordinate all deliveries to site with the Building Manager. Book loading dock and service elevators 72 hours in advance. Contractor must pre-arrange all site access and authorization for all site personnel and subcontractor personnel with the Building Project Manager or his representative

1.18 Testing And Commissioning

1. Provide testing and commissioning as per Testing and Commissioning Plan to be reviewed and approved by the Consultant and Project Manager for all items and their related components.
2. Supply all required equipment maintenance and operations manuals, for owner's staff use.
3. Provide all required software for monitoring, annunciation and control/dispatch applications

1.19 Other

1. The tender documents shall remain the property of the Project Manager. Bidders are required to return the tender documents to the Project Manager with their bids.
2. It is the responsibility of the Contractor to perform all cutting, patching and repair related to the electrical system work.
3. Work by the electrical contractor shall be protected during erection against disfigurement, contamination or damage by mechanical abuse or harmful materials. Protective covers shall be installed where exposure to potential damage is likely. The contractor shall ensure that no eating, drinking or smoking is carried out in the finished areas. Damages resulting from a breach of these requirements shall be repaired at the cost of the electrical contractor.
4. Existing and adjacent finishes, work and structures shall be protected from damage resulting from work of this project.

1.20 Record and As-Built Drawings

1. The Contractor shall maintain two sets of drawings on site. Clearly mark on these drawings all changes and deviations from the contract drawings and in particular mark the actual location of all feeder conduit locations.
2. All deviations from the contract drawings shall be recorded on the "as-built" drawings, including those changes due to Addenda, Site Instructions or Change Orders.
3. After the date of Substantial Performance, obtain from the Consultant, a set of AutoCAD Version 2021 files of the most recent Electrical System Drawings. These Drawings shall be marked up to record clearly, neatly, accurately and promptly all locations of Electrical System deviations as a result of Change Orders, Consultant's or Owner's Instruction, site conditions, etc. Utilize normal recognized CAD procedures that match the original drafting methodology. Submit the revised As-Built AutoCAD CD and Drawings (three sets) with changes clearly indicated to the Consultant for review and final presentation to the Owner.

1.21 Drawings

1. For exact details and quantities, refer to the later sections of this document and to drawing E-1.0 through E-1.3 inclusive, E-2.1, E-2.2, E-5.1, E-5.2, E-6.1, E-6.2, E-9.1 and E-9.2 denoted as 'Issued for Tender March 19, 2025.'

1.22 Contract

1. Conform to the conditions stated in the Contract Form, Document CCDC-2.
2. A confidentiality agreement will form an integral part of the contract and will be provided to the successful contractor.

1.23 Cleaning

1. It is the responsibility of the Contractor to dispose of all waste related to this project.
2. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
3. On a daily basis, remove waste materials, rubbish, tools, equipment, machinery, surplus materials and clean all sight exposed surfaces.
4. All materials must be stacked neatly and safely.
5. Handle materials in a controlled manner with as few handlings as possible. Do not drop or throw materials from heights.
6. Cleaning operations shall include those areas used for temporary site access or used on a temporary basis to facilitate work.
7. The contractor will remove all garbage from site on a daily basis at his own expense.

8. Failure to provide housekeeping and/or maintain a clean work area to the satisfaction of the project manager will result in the project manager providing the necessary housekeeping and/or maintenance service with all related costs, including mark-ups, being charged to the electrical contractor.

1.24 Demolition

1. Disconnect and remove existing conduit and wiring in partitions to be demolished and existing 'BX' cables, conduit and wire in ceiling where existing outlets, lighting fixtures, devices and mechanical equipment are to be removed.
2. Remove all branch circuit wiring and raceways originating from the existing receptacle panels. Wiring and raceways shall be removed back to the source panel. Circuits utilized to feed existing to remain mechanical equipment and other 120/208 volt sources to remain must be maintained.
3. Remove all existing electrical outlets and light switches as well as the associated wiring and raceways not being reused and/or not required for new layout (note: existing outlets and switches to be removed are not shown on the drawings). Provide blank coverplates at all locations where electrical and/or communications devices were removed in which partitions are not being demolished.

1.25 Digital Photos

1. Provide digital photos of all progress to date on a weekly basis. Each photo submission must be reviewed and approved by the consultant prior to continuing with the installation.

End of Section

SECTION 26 05 01: COMMON WORK RESULTS - ELECTRICAL.

PART I: GENERAL

1.1 Reference:

1. This section forms part of every section of Division 26.

1.2 Access Doors:

1. Not Required.

1.3 Cleaning:

1. Clean devices and other surfaces that have been exposed to construction dust and dirt. Clean the insides and outsides of panels and other electrical equipment and completely remove all debris and tools from the project.

1.4 Codes and Standards:

1. Complete the installation of the work in accordance with latest editions of the Building Code, Canadian Electrical Safety Code, CSA, ULC, NFPA, OSHA or other codes, as required.
2. Comply with CEC Electrical Bulletins in force at time of Bid submission. While not identified and specified by number in this Division, they are to be considered as forming part of related Standards.
3. Abbreviations for electrical terms are as per CSA Z85.

1.5 Finishes:

1. All shop finished metal equipment and enclosure surfaces, must be prepared by removal of rust and scale from the raw metal, degreasing, cleaning, application of rust resistance primer inside and outside, and at least two coats of finish enamel paint. Use factory standard colours unless otherwise specified. Colour reference numbers are Sico.
2. Paint exterior surfaces of indoor electrical equipment to manufacturer's standard.
3. Clean and touch-up (to Consultant's acceptance) surfaces of shop-finished equipment that is scratched or marred during shipment or installation, so as to match original paint.
4. Leave with the Owner, 0.22 gal. of paint of each colour used, in the form of liquid or spray, to allow for future touch-up of damaged areas.

1.6 Inserts, Hangers and Sleeves:

1. Provide hangers, inserts, sleeves and supports as required.
2. Inserts are to be of lead shield type.
3. Hangers must not be welded to structural steel members and burning of holes in structural steel is prohibited.

4. Sleeves are to be of a type suitable for the application and be sealed and made watertight. Sleeves through concrete shall be sized for free passage of conduit, and installed flush with underside of concrete slab and extend 100mm (4") above finished floor unless otherwise shown.

1.7 Intent:

1. It is the intent of these drawings and specifications that the Contractor provide complete and operational systems as required.
2. Where differences occur, the maximum condition shall govern.
3. Any miscellaneous items, hardware, devices, wiring, etc., not specifically described, but required for the operation of the system, must be provided and included as part of the Bid.

1.8 Mounting Heights:

1. Mounting height of equipment is from finished floor to center line of equipment unless specified or indicated otherwise.
2. If mounting height of equipment is not indicated, verify with Consultant before proceeding with installation.

1.9 Owners Instruction and Trial Usage:

1. Instruct the Owner's operating personnel in the startup, operation, care and maintenance of all the equipment. All equipment to be tested, operational and commissioned before instruction. Provide sheets for signatures of Owner's representative and operating personnel present at each instruction period.
2. Arrange and pay for the service of the manufacturer's factory service Engineer/Technician to supervise the start-up of his equipment installation, and to check, adjust, balance and calibrate components.
3. Provide these services for such period and for as many visits as necessary to ensure that the Owner's operating personnel are conversant with all aspects of its care and operation.

    1. Prior to any instruction sessions, commissioning coordinator shall submit check lists of each system or equipment indicating their operation status for acceptance by the Owner.
    2. Coordinate all instruction sessions to suit Owner's operation personnel schedule. Submit proposed instruction session schedule c/w training agenda three weeks prior to session start date to Owner for review.

5. The Owner's operating personnel must be permitted to operate the systems under the contractor's supervision for a reasonable period of time prior to Substantial Completion of Contract. This use shall not be misconstrued as acceptance of the equipment.

1.10 Plywood Backboard:

1. Supply and install all plywood backboards required for the work of this Division. Plywood to be highest quality fire retardant fir. 1200 mm wide x 2400 mm high (4'-0" wide x 8'-0" high), 19mm (3/4") thick unless otherwise specified. Prime and paint backboards on both sides with fire retardant paint, equal to CGSB spec. #1-GP-151M, of a colour to match the equipment and services mounted thereon as defined in "Finishes" above. Do not paint over fire rated stamps.

2. Plywood backboards are to be provided for mounting the following surface wall mounted equipment:
   - Cabinets.
   - Contactors.
   - Control Panels
   - Disconnect Switches.
   - Junction Boxes 600mm (2') square and larger.
   - Pull Boxes.
   - Panel Boards.
   - Splitters
   - Transient Voltage Surge Suppression Units.
   - External Breakers

3. Where practical, group devices on a common backboard.

1.11 Protection:

1. Protect exposed live equipment during construction for personnel safety.
2. Shield and mark live parts "LIVE 600 VOLTS", or with appropriate voltage in English.

1.12 Sealing:

1. Where cables or conduits pass through non fire-rated floors, walls or roof, provide internal and external sealing thereto.
2. Retain the service of a specialty sealant contractor for the work required.
3. Comply with manufacturer's installation instructions for all sealant applications.
4. For non-fire rated locations, Sealant shall be silicone, that meets requirements of CGSB 19-GP-23, for the size of the joint required, and the types of materials being bonded.
5. For fire rated locations, the fire stop shall meet the requirements of ULC with regards to the type of assembly and the fire separation.
6. Provide architecturally approved air barrier seals and vapor barrier seals to electrical items passing through or terminating within walls, roofs and decks, humidity controlled areas and pressurized areas.
7. Engage the services of a third party architect to provide a sealed report for all fire stopping assemblies provided as part of this scope of work. Sealed report must detail compliance with the Ontario Building Code.

1.13 Sprinkler Proofing:

1. All areas of this building are protected by a wet sprinkler system. All electrical equipment to be configured for installation in such an environment.

1.14 Warning Signs:

1. Provide warning signs, as specified to meet requirements of Ministry of Labour Safety Inspection, Inspection Department, Authorities having jurisdiction and Consultant.
2. Use decal signs, in English minimum as required by Authorities.

1.15 Wire Pulling Lubricant:

1. Lubricant to be non-corrosive and CSA approved for the type of cable used.
2. Lubricants to be soap or wax based, depending upon application. Use soap based for short runs and for semi-conducting insulated wires, and wax based for long runs.

End of Section

SECTION 26 05 20: WIRE AND BOX CONNECTORS.

PART I - GENERAL

1.1 Work Included:

1. Provide all wire and box connectors required for a complete electrical system installation.

PART II - PRODUCTS

2.1 Materials:

1. Pressure type wire connectors are to be manufactured to CSA C22.2 No.65. Clamps and connectors are to be manufactured to CSA C22.2 No. 18.
2. Building Wire Connectors shall be:
    1. For wire sizes up to #6 AWG - Ideal “Wing Nut” or Gardner - Bender “Wing Gard”.
    2. For Wire Sizes #4 AWG and larger:
        - End to end splices - Burndy YS.
        - Parallel splices - Burndy YC & YH (CU) or YHO & YHD (CU / AL).
        - At studs and bus bars - Burndy YA (CU) or YA-A (CU / AL).
        - Two or three conductors in parallel - Burndy KA-U type (CU / AL).
3. Cable connectors shall be:
    1. For armored TECK cables, watertight type, with open compounded head - T&B series “Spin-on 2” with corrosion resistant boot.
    2. For armored cables steel type with nylon insulated throat - T&B “TITE-Bite”.
    3. Clamps or connectors for armored cable, flexible conduit, non-metallic sheathed cable shall be as required.

PART III - EXECUTION

3.1 Installation:

1. Remove insulation carefully from ends of conductors and:
    1. Install connectors and tighten as recommended by manufacturer.
       Installation shall meet secureness tests in accordance with CSA C22.2 No.65.
    2. Install bushing stud connectors in accordance with EEMAC 1Y-2.

End of Section

SECTION 26 05 21: WIRES AND CABLES.

PART I - GENERAL

1.1 Work Included:

1. Provide building wire as detailed below and as required for a complete electrical installation.

PART II - PRODUCTS

2.1 Materials

1. Wire in Conduit:

    1. Conductor material to be annealed commercial grade, copper, 98 percent conductivity, up to #10 AWG solid, with RW90 insulation, #8 and larger, stranded, with RW90 insulation, unless noted otherwise, 300V rating for fire alarm, security and other low voltage circuits, 600V rating for 120 / 208V circuits, 1000V rating for 240 / 416V circuits, 1000V rating for 277 / 480V circuits, 1000V rating for 347 / 600V circuits.

    2. Colour Coding:

        1. 120 / 208V, circuits:
        Two conductor, 1 phase: 1 black, 1 white
        Three conductor, 1 phase: 1 red, 1 black, 1 white
        Three conductor, 3 phase: 1 red, 1 black, 1 blue
        Four conductor, 3 phase: 1 red, 1 black, 1 blue, 1 white

        2. 347 / 600V, circuits:
        Two conductor, 1 phase: 1 orange, 1 white
        Three conductor, 1 phase: 1 orange, 1 brown, 1 white
        Three conductor, 3 phase: 1 orange, 1 brown, 1 yellow
        Four conductor, 3 phase: 1 orange, 1 brown, 1 yellow, 1 white

        3. Ground wires: green.

    3. Low voltage Armored Cables Type AC-90:

        1. Type to be AC-90, Multi-conductor, with solid, annealed commercial grade 98 percent conductivity tinned copper conductors and cross-linked polyethylene with R90 insulation, 600 volt rating, on #10 and #12 size only.

        2. Colour Coding:
        Two conductor, 1 phase: 1 black, 1 white
        Three conductor, 1 phase: 1 black, 1 red, 1 white

        3. Grounding to be uninsulated, solid copper, with impregnated paper separator.

4. Low voltage Armored Cables - TECK:

    1. Type to be TECK, single conductor with annealed. Class B, stranded copper conductors and cross linked polyethylene, RW90 insulation, 1000 volt rating for #8 AWG and larger.

    2. Grounding to be uninsulated tinned stranded copper, with non-hygroscopic filter material to maintain circular cross-section.

    3. The inner and outer jackets to be PVC “Flamenol” suitable for –40˚C, with mylar tape separator and aluminum strip, armour helically wound and interlocked.

PART III - EXECUTION

3.1 Installation:

1. General:

    1. Wire shall be installed in conduit and sized for the connected load (s) and protection as required, unless otherwise specified.
    2. All single neutrals ran with Phase ‘A’,’ B’,’ C’ conductors to be minimum #10 AWG. #12 AWG neutrals may be used when run from final junction box to wiring devices.
    3. Minimum power conductor wire size shall be #12 AWG. Use solid conductors for #10 and smaller and stranded conductors for #8 and larger. All wiring shall be copper conductors, RW90 (90°C ampacity).
    4. Home runs in excess of 25 m (75’) for circuits protected by a 15A over current device, shall be #10 AWG. Refer to drawings for additional requirements.
    5. The current carrying capacity of the feeders, subfeeders and branch circuit conductors shall be sized to equal or better than shown on the drawings. If wire or cable sizes with equivalent current carrying capacity other than that specified is used, ensure that the voltage drop shall not be more than 2%.
    6. The number of wires indicated for various systems is intended to show the general scheme only. The required number and type of wires shall be installed in accordance with the manufacturer’s diagrams and with the requirements of the installation.

2. Wire in Conduit:

    1. Provide pigtails at all outlets for wiring devices. All neutrals and branch circuits shall be connected in each outlet box to avoid a break in the neutral or the circuit wire when fixture or wiring device is disconnected.
    2. At each junction, pull and outlet box make a 360 degree loop of the stripped uncut ground conductor under the ground screws.

3. Low Voltage Armored Cables - (Feeders):

    1. Do not directly bury in or below concrete slabs or walls.
    2. Do not encircle single conductor cable with ferrous metal.
    3. No splices will be permitted.
    4. Single conductors of the three or four wire circuit shall be run with uniform spacing of not less than one cable diameter throughout the feeder length.
    5. Use wood throated cable clamps to ensure proper and uniform cable spacing.
    6. Where cables are installed on walls, provide mechanical protection over them up to 2.4m (8’) above finished floor, using a 12 gauge U section aluminum cover.
    7. Cable connections to all enclosures, boxes and panels shall be by means of a watertight malleable aluminum connector.

End of Section

SECTION 26 05 27: GROUNDING.

PART I - GENERAL

1.1 Work Included:

1. Provide all grounding to conform with the Canadian Electrical Code and the latest instructions of the Inspection Authority, with any further requirements as noted herein.

PART II - PRODUCTS

2.1 Materials:

1. All grounding conductors stranded copper, bare or insulated as indicated on Drawings or in Specifications.
2. All ground wires are to be FT-4 rated factory green. Green tape, spray paint or any other means to alter the colour of the conductor is not permitted.
3. Use Cadweld or Burndy Thermoweld process for all weld connections. AMP of Canada Ltd. Wrench-Lok grounding connectors are an acceptable equivalent to welded connections.
4. All ground connectors to be designed and approved for grounding purposes.

PART III - EXECUTION

3.1 Installation:

1. Ground all conduit, and all non-current carrying metal parts, equipment cases, frames, bases, brackets, etc.
2. Grounding of all trays, AFCRs, racks, cabinets, etc. provided by the electrical contractor.
3. Ground each piece of fixed equipment back to the panel feeding that equipment, by one of the following methods:

    1. Conduit shall **not** be utilized for the ground return conductor.
    2. Where the conduit is flexible, install a separate bare soft drawn copper ground inside the conduit. At the switchboard or distribution panel, provide a grounding bushing, loop the ground conductor through the bushing, and connect to the switchboard ground bus. At the fixed equipment, connect to an internal ground bus, or connect to the inside of the metal enclosure utilizing approved screws and connectors (remove all paint). Run a separate (dedicated) insulated ground wire in all conduits to all devices and fixtures.
    4. Where equipment is fed by a multi-conductor power cable, provide a ground conductor in the cable. At the switchboard or panel, connect to the ground bus. Use a grounding connector on the cable for positive grounding of the metallic sheath. Loop the ground wire to the grounding connector.
    5. Run a separate ground wire in all flexible conduits. Connect each end to ground bus or lug or connector.
    6. Where mechanical protection is required for insulated grounding conductors install in rigid conduit.
    7. Provide weld connection or wrench type grounding connectors for:
    All connections between grounding conductors.

All connections to building steel.
All connections between grounding conductors and cable lugs.

8. Arrange grounding to provide the minimum impedance paths for ground fault currents. Provide any additional grounding required for approval by the inspecting authorities.

3.2 Equipment Grounding

1. Install grounding connections to typical equipment including non-current carrying metal parts of transformers, generators, motors, circuit breakers, cable sheaths, raceways, pipe work, screen guards, switchboards, meter and relay cases, any exposed building metal and building structural steel.

End of Section

SECTION 26 05 29: HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS.

PART I - GENERAL

1.1 Work Included:

1. Provide fastenings and supports as required for a complete electrical system installation.

PART II - PRODUCTS

2.1 Support Channels:

1. U shape pre-galvanized steel, size 41 mm x 41 mm x 22 mm (1-5/8” x 1-5/8” x 7/8”), for surface mounting, suspending, or inserting into poured concrete walls and ceilings as required.
2. All channel fittings to suit channel type.
3. All other fittings to suit equipment weight, location and surface as required.

PART III - EXECUTION

3.1 Installation:

1. Secure plywood backboards, channels, luminaires, equipment and fittings to wood with wood screws, to solid masonry, tile and plaster surfaces with lead anchors, to poured concrete with self-drilling expandable inserts, and to hollow masonry walls with toggle bolts.
2. All ceiling mounted equipment shall be independently supported from the structure. Do not support equipment from ceiling support system.
3. Support equipment, conduit or cable using clips, spring loaded bolts, or cable clamps designed as accessories to basic channel members.
4. Fasten exposed conduit or cables to building using:
    1. Two-hole steel straps to secure surface conduits and cables 50 mm (2”) and smaller.
    2. Two-hole steel straps for conduits and cables larger than 50 mm (2”).
    3. Beam clamps to secure conduit to exposed steel work.
5. For suspended support system:
    1. Support individual cable or conduit runs with 6 mm (1/4”) diameter threaded rods and spring clips.
    2. Support two or more cables or conduits on channels support by 6 mm (1/4”) diameter threaded rod hangers where direct fastening to building construction is impractical.
    3. Support suspended luminaire using two or more lengths of Weldless “Single Jack”, bright zinc plated steel chain, Canadian Standard #10 gauge, 13 links per foot.
6. Provide metal brackets, frames, hangers, clamps and related type of support structure where indicated or as required to support conduit and cable runs.
7. Ensure adequate support for raceways and cables dropped vertically to equipment where there is no wall support.

8. Do not use wire lashing or perforated strap to support or secure raceways or cables.
9. Do not use supports or equipment installed for other trades for conduit or cable support.
10. Install fastenings and supports as required for each type of equipment, cable and conduits, and in accordance with manufacturer's installation recommendations.
11. Hangers shall be spaced such that there is a hanger within 610mm (24") of every bend and that the maximum spacing does not exceed the limits indicated in OESC code.
12. All conduit or cable shall be supported at equipment mounted on spring isolators, with spring hangers for at least 4572mm (15').

End of Section

SECTION 26 05 31: SPLITTERS, JUNCTION, PULL BOXES AND CABINETS.

PART I - GENERAL

1.1 Work Included:

1. Provide splitters, junction boxes, pull boxes and cabinets as shown on the drawings and as required for a complete electrical installation.

PART II - PRODUCTS

2.1 Splitter Troughs:

1. Splitter trough construction is to be based on CSA C22.2 No. 76.
2. They shall have sheet steel enclosure, with welded corners and formed hinged cover suitable for locking in closed position.
3. Connection bars are to match required size and number of incoming and outgoing conductors as indicated.
4. Provide at least three spare terminals on each set of lugs in splitter troughs less than 400A and feed through lugs where required.
5. Provide double lugs for neutrals where required.
6. Enclosures shall be CSA/EEMAC Type 1 modified to sprinkler proof enclosure.

2.2 Junction and Pull boxes.

1. Junction and pull boxes construction is to be based on CSA C22.2 No. 40.
2. They shall be suitable for surface mounting and be of welded steel construction with screw-on flat covers.
3. For flush-mounted pull and junction boxes, provide covers with 25 mm (1”) minimum extension all around.

2.3 General Cabinets:

1. Type D or E to be sheet steel, for surface mounting, complete with screw on cover (D) or hinged door (E), and return flange overlapping sides, handle and catch.

PART III - EXECUTION

3.1 Splitter Installation:

1. Install splitter troughs where required. Mount plumb, true and square to the building lines.
2. Extend splitters for full length of equipment arrangement except where indicated otherwise.
3. Provide watertight connections for all services entering the top of the splitter trough.

3.2 Junction, Pull Boxes and Cabinet installation:

1. Install junction, pull boxes and cabinets in inconspicuous but accessible locations.
2. Only certain junction and pull boxes are indicated. Provide pull boxes so as not to exceed 30 m (100') of conduit run between boxes, and after every two (2) 90 degree bends.

3.3 Identification:

1. Install nameplates.

End of Section

SECTION 26 05 32: OUTLET BOXES, CONDUIT BOXES AND FITTINGS.

PART I - GENERAL

1.1 Work Included:

1. Provide outlet and conduit boxes and fittings as required for a complete electrical system installation.

PART II - PRODUCTS

2.1 Outlet and Conduit boxes - General

1. The construction of outlet boxes, conduit boxes and fittings is to be based on CSA C22.2 No.18.
2. Boxes shall be suitable for the utilization voltage.
3. Combination boxes shall have barriers where outlets for more than one system are grouped.
4. Recessed 100 mm (4”) square or larger outlet boxes shall be complete with single or ganged plaster rings to suit application.

2.2 Sheet Steel Outlet boxes:

1. Electro-galvanized steel single and multi-gang device boxes for flush installation, shall be minimum size 75 mm x 50 mm x 37 mm (3” x 2” x 1-1/2”) unless otherwise specified or required. 100 mm (4”) square outlet boxes shall be used when more than one conduit enters one side, with extension and plaster rings as required.
2. Boxes for door switches and push buttons shall be sized as required.
3. Utility boxes for connection to surface mounted EMT conduit, shall be minimum 100 x 54 x 48 mm (4" x 2-1/8” x 1-7/8”) size.
4. Square or octagonal outlet boxes for lighting fixture outlets, shall be minimum 100 mm (4”) size.
5. Square outlet boxes with extension and plaster rings for flush mounting devices in finished plaster or tile walls, shall be minimum 100 mm (4”) size.

2.3 Masonry Boxes:

1. Electro-galvanized steel masonry single and multi-gang MBD boxes shall be used for flush mounted devices in exposed block walls.

2.4 Concrete boxes:

1. Electro-galvanized sheet steel concrete boxes shall be used for flush mounting in concrete, with matching extension and plaster rings as required.

2.5 Conduit Boxes:

1. Cast FS or FD feraloy boxes with factory-threaded hubs and mounting feet shall be used for outlets connected to surface mounted rigid conduit.

2.6 PVC Boxes:

1. F series and octagon boxes shall be moulded type, with fastening ears and screwed secured covers as required.

2.7 Fittings - General:

1. Bushing and connectors shall be with nylon insulated throats.
2. Provide knock-out fillers to prevent entry of foreign materials.
3. Use conduit outlet bodies for conduit up to and including 32 mm (1-1/4”) and pull boxes for larger conduits.
4. Provide double locknuts and insulated bushings on sheet metal boxes.

PART III - EXECUTION

3.1 Installation:

1. Support boxes independently of connecting conduits.
2. Fill boxes with paper, foam sponges or similar approved material to prevent entry of construction material.
3. Size box wiring chambers in accordance with Canadian Electrical Safety Code.
4. Gang boxes together where wiring devices are grouped.
5. Provide matching blank cover plates for boxes without wiring devices.
6. Use combination boxes where outlets for more than one system or voltage are grouped.
7. For flush installations, mount outlets flush with finished wall using plaster rings to permit wall finish to come within 5mm (1/4”) of opening.
8. Provide correct size of openings in boxes for conduit and armored cable connections. Reducing washers are not allowed.

End of Section

SECTION 26 05 34: CONDUITS, CONDUIT FASTENINGS AND CONDUIT FITTINGS.

PART I - GENERAL

1.1 Work Included:

1. Provide conduits, conduit fastenings and conduit fittings as detailed below and as required for a complete electrical installation.

PART II - PRODUCTS

2.1 Conduits:

1. Rigid and epoxy coated conduit shall be threaded, galvanized steel and shall be manufactured to CSA C22.2 No. 45.
2. Electrical metallic tube (EMT) conduit and couplings shall be manufactured to CSA C22.2 No. 83.
3. Flexible metal conduit and liquid tight - flexible metal conduit shall be manufactured to CSA C22.2 No. 56.

2.2 Conduit Fastenings:

1. Conduit straps shall be steel, double hole for rigid or EMT conduit. Single hole straps are not acceptable.

2.3 Conduit Fittings:

1. Fittings for conduits shall be manufactured to CSA C22.2 No.18. Provide coatings as per conduit.
2. Fittings for rigid conduit shall be steel threaded type, and for EMT conduit, to be steel set screw type.
3. Fittings for EMT conduit in wash bays to be steel compression fitting type.
4. Fittings for flexible conduit and exposed conduit outdoors to be liquid-tight type, straight or angled threaded for rigid and compression for EMT conduit.
5. Expansion fittings for rigid or EMT conduits shall be of the watertight type, with an integral bonding assembly, suitable for deflection in all directions.

2.4 Pulling Cables:

1. Pulling cables shall be polypropylene and of a strength suitable for tension to be pulled.

2.5 Waterproof Membrane:

1. Conduits penetrating waterproof membranes shall be PEM #6372.

PART III - EXECUTION

3.1 Installation (General):

1. The conduits for the following circuits and systems shall be run separately:

   - 120/208 volt utility power distribution.
   - 347/600 volt utility power distribution.
   - Normal power to luminaries.
   - Emergency power to luminaries and exit signs.
   - Fire alarm system multiplex loop devices.
   - Fire alarm system signalling devices.
   - Security, Duress, Intrusion and CCTV system devices.
   - Telephone and data systems.
   - Control wiring.
   - Paging System

2. All conduits to be surface mounted (exposed, EMT) in mechanical and electrical service spaces and rooms and concealed elsewhere unless otherwise shown.
3. Wiring in ceiling spaces and in all partitions shall be EMT.
4. Exposed conduits shall be installed to conserve headroom and cause minimum interference in spaces through which they pass.
5. Use rigid conduit up to 2.4 m (8’-0”) above finished floor where exposed indoors
6. Use RGS conduit PVC coated galvanized rigid steel Robroy Permacote in all outdoor locations and in areas that are not environmentally controlled.
7. Use electrical metallic tubing (EMT) above grade, and above 2.4 m (8’-0”) above finished floor where exposed indoors.
8. Use flexible liquid tight metal conduit for connection to motors, and transformers.
9. Bend conduit without heating. Replace conduit if kinked or flattened more than $1/10^{th}$ of its original diameter.
10. Mechanically bend conduit over 20mm (3/4”) diameter.
11. Field threads on rigid conduit must be of sufficient length to draw conduits tight.
12. Install pulling cables in all conduits that are to remain “empty”.
13. A maximum of two (2) 90 degree bends, or equivalent up to 180 degrees, will be permitted without installation of a pull box. Radius of bends must be no less than ten (10) times the conduit diameter.
14. Conduits must be dry, before installing wires.
15. Support all branch conduits from building structure. Do not clip conduits to ceiling hangers, sprinkler pipes, plumbing or BAS wiring hangers.

3.2 Surface Conduits:

1. Surface conduits shall be run parallel or perpendicular to building lines.
2. Conduits located near any heat producing equipment shall have 1500 mm (5 ‘) clearance.
3. Conduits adjacent to structural steel, beams or columns shall be run within the flanged portion, unless otherwise shown.
4. Group exposed conduits on surface or suspended channels.
5. Do not pass conduits through structural members except where indicated and approved by Landlord.
6. Do not locate conduits less than 75 mm (3”) parallel to steam or hot water lines. Provide a minimum clearance of 25 mm (1”) at crossovers.

3.3 Conduit Size:

1. The minimum conduit size shall be 19 mm (3/4”).
2. All undimensioned conduits in the drawings are 19 mm (3/4”).

3.4 Expansion Fittings:

1. Conduit expansion fittings shall be provided on all conduits crossing expansion joints, and at maximum of 60 m (200’) spacing.
2. Install expansion fittings perpendicular to expansion joint.
3. Refer to structural drawings for location of expansion joints.

End of Section

SECTION 26 05 44: INSTALLATION OF CABLES IN TRENCHES AND IN DUCTS.

PART 1: GENERAL

1.1 Work Included:

1. Provide duct sealing compounds and install cables as detailed below and as required for a complete electrical installation.

PART II - PRODUCTS

2.1 Materials

1. Sand for cable shall be as defined in Division 2.

2.2 Duct Sealing Compound

1. Duct sealing compound shall be a non-thermoplastic compound and shall allow for expansion and contraction of ducts and cables without loss of sealing properties.

PART III - EXECUTION

3.1 Cable Installation in Trenches

1. Provide a minimum of 150 mm (6”) sand bed under cables.

2. Lay cables maintaining a minimum 75 mm (3”) clearance from trench sides.

3. Provide offsets for thermal action and minor earth movements. Offset cables 150 mm (6”) for each 60m (250’) runs, maintaining minimum cable separation and bending radius requirements.

4. Make splices and terminations in accordance with manufacturer’s instructions using approved splicing kits.

5. Minimum permitted radius at cable bends for rubber, plastic or lead covered cables, eight (8) times diameter of cable: for metallic armoured cables, twelve (12) times diameter of cables, or in accordance with manufacturer’s instructions, whichever is the least.

6. Maintain 75 mm (3”) minimum separation between cables of different circuits. Maintain 300 mm (12”) horizontal separation between low and high voltage cables. When low voltage cables cross high voltage cables maintain 300 mm (12”) vertical separation with low voltage cables in upper position. At crossover maintain 75 mm (3”) minimum vertical separation between low voltage cables and 150 mm (6”) between high voltage cables. Maintain 300mm (12”) minimum lateral and vertical separation for fire alarm and control cables when crossing other cables, with fire alarm and control cables in upper position.

7. Install treated planks on lower cables 600 mm (2’) in each direction at crossings.

8. Before backfilling, obtain approval from Consultant and local Hydro Inspection.

9. After cables installation cover cables with minimum 150 mm (6”) sand.

10. Install continuous cable protection on top of sand cover. Ensure protection extends a minimum of 50 mm (2”) beyond cables.

3.2 Cable Installation in Ducts

1. Before installation of cables, pull stiff bristle brush through each duct.
2. Install cables as indicated. Do not pull spliced cables inside ducts.
3. Install multiple cables in ducts simultaneously.
4. Use lubricant to reduce pulling tension.
5. To facilitate matching of colour coded multiconductor control cables, reel off in same direction during installation.
6. After installation of cables, seal duct ends with duct sealing compound.

End of Section

SECTION 26 27 26: WIRING DEVICES.

PART I - GENERAL

1.1 Work Included:

1. Provide all wiring devices indicated on drawings and described below.

PART II - PRODUCTS

2.1 Standards:

1. Construction of manually operated general purpose AC switches is to be based on CSA C22.2 No. 111, snap switches on CSA C22.2 No. 55, and receptacles, plugs and similar wiring devices on CSA C22.2 No. 42.
2. Devices shall be Specification Grade and of one manufacturer throughout

2.2 Switches:

1. Switches shall be suitable for the voltage and load controlled and shall be single pole or three way as indicated.
2. They shall have terminal holes approved for No. 10 AWG wire, silver alloy contacts, and urea or melamine moldings for parts subject to carbon tracking.
3. They shall be suitable for back and side wiring, and rated for tungsten filament and fluorescent lamps, and up to 80% of rated capacity of motor loads.
4. White decorator style switches shall be used for 120V circuits, in all finished areas.
5. White decorator style switches shall be used for 347V circuits in all areas.

2.3 Receptacles:

1. Duplex receptacles shall be CSA Type 5-15R, 125 volt, 15 Amp, U ground and CSA Type 5-20RA, 125 volt, 15/20 Amp, U Ground.
2. They shall be colour, as specified on site by interior designer, decorator style.
3. They shall be suitable for No. 10 AWG, back and side wiring, have break-off links for use as split receptacles and shall have eight (8) back wired entrances, four (4) side wiring screws and double wipe contacts with riveted grounding contacts.

2.4 Coverplates:

1. Coverplates shall be colour, as specified on site by interior designer in finished areas and stainless steel in unfinished areas.
2. Use die cast aluminum coverplates for wiring devices mounted for surface mounted FS or FD boxes, and pressed steel coverplates for utility surface boxes.
3. Use weatherproof spring-loaded, cast aluminum coverplates complete with gaskets for exterior mounted single receptacles and switches, or where indicated.

PART III - EXECUTION

3.1 Installation:

1. Switches:

    1. Install single throw switches with lever in “UP” position when switch closed.
    2. Install switches in gang type outlet box when more than one switch is required in one location.

2. Receptacles:

    1. Install receptacles in gang type outlet box when more than one device is required in one location.

3. Coverplates:

    1. Protect coverplate finish until painting and other work is finished or install after painting is complete.
    2. Do not use flush type coverplates on surface mounted boxes.

End of Section

SECTION 26 28 13.01: FUSES – LOW VOLTAGE.

PART I - GENERAL

1.2 Work Included:

1. Supply and install fuses in disconnect switches, etc. as required to complete this contract.

PART II - PRODUCTS

2.1 Fuses - General:

1. Plug and cartridge fuses shall be manufactured to CSA C22.2 No. 59.
2. HRC fuses shall be manufactured to CSA C22.2 No. 106 and to have interrupting capability of 200,000A symmetrical.
3. Fuses shall be the product of one manufacturer.
4. Fuse type reference L1, L2, J1, R1, etc. have been adopted for use in this specification.

2.2 Fuse Types:

1. HRCI - J fuses.
    1. Type J1, time delay, capable of carrying 500% of its rated current for 10 seconds minimum.
    2. Type J2, fast acting.
2. HRC - L.
    1. Type L1, time delay, capable of carrying 500% of its rated current for 10 seconds minimum.
    2. Type L2, fast acting.
3. HRC - R fuses (For UL Class RK1 fuses, peak let-through current and I^2t values not to exceed limits of UL 198E table 10.2.)
    1. Type R1, (UL Class RK1), time delay capable of carrying 500% of its rate current for 10 seconds 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 seconds minimum.
    3. Type R3, (UL Class RK1), fast acting Class R, to meet UL Class RK1 maximum let-through limits.
    4. HRCII - C fuses.

PART III - EXECUTION

3.1 Installation:

1. Install fuses in mounting devices immediately before energizing circuit.
2. Ensure circuit fuses fitted to physically matched mounting devices. Install Class R rejection clips for HRCI-R fuses.
3. Ensure correct fuses fitted to assigned electrical circuit.
4. Fuses protecting motor loads and transformers to be type J1 for up to and including 600A and L1 for ratings above 600A.
5. Fuses protecting feeder circuits to be type J2 for up to and including 600A and type L2 ratings above 600A.
6. Fuses protecting other services or equipment shall be of the type required for that purpose.

End of Section

SECTION 26 28 23: DISCONNECT SWITCHES - FUSED AND NON-FUSED.

PART I - GENERAL

1.1 Work Included:

1. Provide all disconnect switches shown on the drawings and as required for motors.

PART II - PRODUCTS

2.1 Equipment

1. Fuseholder assemblies to CSA C22.2 No. 39
2. Fusible and non-fusible disconnect switches shall be installed in CSA enclosures.
3. Provide for padlocking in “OFF” switch position by one lock.
4. Provide a mechanically interlocked door to prevent opening when handle in “ON” position.
5. Provide fuses sized as required.
6. Fuseholders in each switch shall be suitable without adapters, for type of fuse as specified.
7. Provide quick make, quick break action.
8. Provide ON-OFF switch position indication on switch enclosure cover.
9. Enclosures shall be CSA/EEMAC Type 1 modified to sprinkler proof enclosure.

PART III - EXECUTION

3.1 Installation:

1. Install disconnect switches with or without fuses as required.
2. Provide watertight connections for all services entering the top of the disconnect switches.

End of Section

SECTION 26 50 00: LIGHTING EQUIPMENT.

PART I - GENERAL

1.1 Work Included:

1. Provide Lighting fixtures as shown on the drawings and described below.

PART II - PRODUCTS

2.1 Lamp Standards:

1. Incandescent lamps shall be manufactured to CSA C22.2 No. 84.
2. Fluorescent lamps shall be manufactured to ANSI C78.
3. Incandescent, fluorescent and HID lamps shall be of 1 (one) manufacturer, either in total, or in groups defined by lamp type.
4. Ballast and lamps provided under this contract must be an approved combination by both respective manufacturers.

PART III - EXECUTION

3.1 Lamp and Ballast Installation:

1. Refer to luminaire schedule and drawings, for lamp and ballast requirements.
2. Install lamps only when the luminaires are clean.
3. Ensure that lamps are suitable for luminaires before energization and lamp length and colours are that as specified. Report any discrepancies to the consultant.

3.2 Luminaire Installation:

1. Install luminaires accurately and carefully aligned complete with all mounting hardware. Ensure any suspension rods are vertical.
2. All luminaires shall be supplied with accessory items such as yokes, plaster rings, frame adjusters, etc., where required for proper installation.
3. At the time of date of “Substantial Completion” all luminaires, lenses, louvers and lamps must be clean, and the lamps illuminated.

3.3 Luminaire Support:

1. All fixtures must be chained by 2 points directly to main structure such that they are supported independently of the lay-in ceiling system.
2. All fixtures in exposed ceiling areas (no T-bar or Drywall) shall be mounted on 1-5/8” unistrut, running the full length of the run of fixtures. The unistrut is to be suspended from the ceiling deck by 3/8” threaded rod from unistrut between the joists. Do not puncture ceiling deck.
3. All lighting feeds for suspended fixtures shall be dropped from the deck or slab straight down into the fixture or raceway. Fixture to fixture conduits will not be permitted. Conduit must go to the deck then to the next fixture.

3.4 Cleaning:

1. All luminaires must be cleaned before lamping and installing lenses or louvres.
2. Use dry, clean, soft cloths if luminaires are dusty. Use mild solvents to clean soiled luminaires.

End of Section

SECTION 26 60 01: ELECTRICAL IDENTIFICATION.

PART I - GENERAL

1.1 Work Included:

1. Identify electrical equipment as specified herein.

1.2 Manufacturer's Nameplates:

1. Have the manufacturer's nameplates affixed to each item of all equipment showing the size, name of equipment, serial number and all information usually provided, including voltage, cycle, phase, horsepower, etc., and the name of the manufacturer and his address. Ensure that all stamped, etched or engraved lettering on plates is perfectly legible. Ensure that nameplates are not painted over. Where apparatus is to be concealed, attach the nameplate in an approved location on the equipment support or frame.
2. Ensure that panels and other apparatus which have exposed faces in finished areas do not have any visible trademarks or other identifying symbols. Mount nameplates behind doors.

PART II - PRODUCTS

2.1 Lamacoid Plates:

1. Refer to drawings for lamacoid background and text colour. Minimum size 75mm x 25mm (3" x 1") and 3.2mm (1/8") thick laminated plastic and 6.4mm (1/4") deep engraved lettering.

2.2 Conductor Markers:

1. Cable diameter less than 13 mm (1/2") - Electrovert type Z.
2. Cable diameter 13 mm (1/2") and larger - Electrovert #510 strap-on.
3. Colour - white with black markings except fire alarm and life safety system which shall be white with red markings.

PART III - EXECUTION

3.1 Conduit Services - Power:

1. Locate identification:

   - Behind each access door.
   - At each change of direction and at junction boxes.
   - At not more than 10 m (40') apart in straight runs of conduit behind removable enclosures such as lay-in type ceiling, but on both sides of sleeves through walls or floors.
   - Above each floor or platform for vertical exposed conduits, preferably 1500 m (60") above floor or platform.

- Use stencils and stencil paint or lamacoid plates on all conduits.
- Use minimum 25 mm (1") high letters.
- The identification shall describe system voltage and service, i.e., "120 / 208V lighting to panel AA".

3.2 Conduits and outlet boxes:

1. Identify conduits and outlet boxes for the various systems by the use of the following distinctive colour paints. Apply a small area of paint to the inside of each outlet box, pull box and panel as it is being installed. Identify junction boxes in suspended ceiling areas with colour on both inside and outside.

    1. 120 / 208 volt system. - Black
    2. Fire Alarm systems. - Red
    3. 347/600 volt system. - Blue
    4. Security Alarm system - Orange

2. Use the colour coding as defined in CGSB Code 24-GP-3A and CSA Standard B53.
3. Where the existing colour coding differs from these Specifications, notify the Consultant of colours used and maintain existing colour coding.

3.3 Equipment Nameplates:

1. Identify all equipment listed below with lamacoid plates, letters 10 mm (0.4") high, unless otherwise noted.
    1. Lighting and Power Panels - Plates to be on outsides of door. Typical identification: "Lighting Panel C 120/208V, 3PH, 4W MAINS 225A 18KA RMS. Supplied from Panel BB".
    2. Disconnect switches and starters - Plates to be mounted externally on switch cover. Typical identification: "Fan S4, 208V, 3PH".
    3. Transformers - Plates to be mounted externally on case. Typical identification: "Transformer TR-UPSA 225 KVA/416/120/208V, 3PH / 4W fed from Panel UPS A".

2. Secure with mechanical fastening devices except on the inside of panel doors where gluing will be acceptable.

3.7 Wiring Colour Code:

1. <u>Power and Lighting Conductors:</u>

    1. Phase A - Red
    2. Phase B - Black
    3. Phase C - Blue
    4. Neutral - White
    5. Ground - Green

2. For sizes available in black only, use coloured tape markers at junction boxes and terminal points to match phase coding described above.
3. Band green isolated ground conductors with yellow tape.

4. Control conductors - Orange
5. Fire Alarm System Conductors.

    1. Alarm initiating devices and manual pull stations - red and blue.
    2. Alarm signaling devices - black and white.

3.8 Conductor Markers:

1. For power feeders, install markers at either end of the conductors where terminated inside of equipment to match wiring diagram conductor identification or panelboard circuit numbers. Typical identification Panel AA circuits - 21; use “AA-21”. For a three phase circuit provide identification on phase A conductor only. For a single phase circuit provide identification on the phase conductor.
2. For Branch circuits supplying single phase and three phase devices such as receptacles and connections to equipment identify conductors at panel and in device outlet box. Install marker on phase conductor inside outlet box. Typical identification if device is connected to Panel B - circuit 14, marker identification “B-14”.

End of Section

SECTION 26 60 02: TESTING AND COMMISSIONING OF ELECTRICAL SYSTEMS.

PART I - GENERAL

1.1 Description:

1. Include in work of this section, the testing and commissioning of all new electrical and component systems.
2. Include any specific testing of equipment required by the Hydro Inspection or Supply Authorities.
3. The complete costs of the site, load bank and factory testing and commissioning witnessing of Electrical Equipment is to be included in the Bid price.
4. Inform manufacturers of all factory and site testing requirements and include all their costs in the Bid price.
5. At their own discretion, testing is to be witnessed by the Owner and the Electrical Consultant.

1.2 Scope:

1. Include factory testing and approved certification, where required.
2. Coordinate with the equipment manufacturer, notify the Electrical Consultant in writing, 10 (ten) days before any factory testing to confirm Consultant's desired presence, and be present for all site testing.

1.3 Completion of Work:

1. All electrical systems and equipment shall be totally commissioned and operating before date of "Substantial Completion".
2. Coordinate with other trades and the building operations staff for work which affects the operation of the electrical systems, before submitting request for testing and commissioning. Failing to comply, bear all costs including Consultant's time cost, incurred for re-testing and re-commissioning.

PART II - PRODUCTS

2.1 Materials:

1. Provide all tools, equipment, labour and materials required to perform electrical testing and commissioning as specified. Provide the test results report (s).

2.2 Temporary Load Bank:

1. For testing of the UPS systems, provide resistive variable load banks.
2. Load banks must be complete with breakers to protect generators and UPS systems from cable faults.

PART III - EXECUTION

3.1 Installation:

1. Perform site testing and commissioning only after all equipment is installed and operational.
2. Furnish manufacturer's certificate or letter confirming that entire installation as it pertains to each system has been installed to manufacturer's instructions.
3. Provide 4 (four) copies of certificates of all factory and site testing in complete detail bearing in each case, the seal of the engineer responsible for the tests.
4. Submit all test results for Consultant's review.
5. All equipment or system deficiencies identified by factory or site testing procedures, to be corrected by the Contractor prior to obtaining a "Certificate of Substantial Completion".
6. Submit report, at completion of measurements, listing phase and neutral currents on panelboards, dry-type transformers and motor control centres, operating under normal load. Include hour and date on which load was measured, and voltage at time of test.
7. General operations: energize and operate electrical circuit and item. Repair, alter, replace, test and adjust as necessary for a complete and operating electrical system.
8. Test systems and obtain written confirmation from manufacturers that components have been installed correctly and system functioning as intended. Submit certification for power distribution, communications systems and emergency power to Owner's Consultant.
9. Provide labour, instruments, apparatus and pay expenses required for testing. Owner's Consultant reserves right to demand proof of accuracy of instruments used.
10. Perform the following tests on completed power systems:
    1. Supply voltage: measure line voltage of each phase at load terminals of main breakers and report results in writing to Owner's Consultant. Perform test with majority of electrical equipment in use.
    2. Motor loading: measure line current of each phase of motors with motor operating under load, and report results in writing to Owner's Consultants.
        1. Upon indications of imbalances or overloads, thoroughly examine electrical connections and rectify defective parts or wiring.
        2. If electrical connections are correct, report overloads due to defects in driven machines in writing to Owner's Consultant.
    3. Insulation resistance tests:
        1. Megger circuits, feeders and equipment up to 350V with a 500V instrument for at least one (1) minute.
        2. Megger 350-600V circuits, feeders and equipment with a 1000V instrument for at least one (1) minute.
        3. Check resistance to ground before energizing.
        4. Coordinate and carry out motor testing at same time as driven equipment is being tested. In addition to motor loading tests, provide labour and instruments to read and record motor load readings required to supplement tests on driven equipment through various load sequences, as required by driven equipment tests.
11. Immediately prior to occupancy, test entire electrical system by performing loss and return of utility power test. Demonstrate operation of:
    1. Low voltage service equipment and metering
    2. Exit and emergency lighting
    3. restabilization of systems after power return. Attach report printouts as evidence of expected operation on systems.
    4. User equipment shut-down and auto-restart.

3.2 Field Tests

1. Provide advance notice to Owner's Consultant of proposed testing schedule.
2. Perform tests at time of acceptance of work.
3. Conduct and pay for field tests:
    1. Power distribution, including phase voltage, grounding and load balancing.
    2. Circuits originating from branch distribution panels.
    3. Lighting and lighting control. Motors, heaters and associated control equipment, including sequenced operation.
    4. Emergency Power Systems
4. Perform tests in presence of Owner's Representative.
    1. Provide instruments, meters, equipment and personnel required to conduct required tests.
    2. Test systems to verify operation as specified.
5. Conduct di-electric tests, hi-pot tests, insulation resistance tests and ground continuity tests as required by nature of various systems and equipment

3.3 General Testing:

1. With the system completely connected, perform the following tests:

    1. Control and Switching - all circuits shall be tested for the correct operation of devices, switches and controls.
    2. Polarity Tests - all sockets shall be tested for correct polarity.
    3. Voltage Test - a voltage test shall be made at the last outlet of each circuit. The maximum drop in potential permitted will be 2% on 120 and 208 volt branch circuits and on 208 volt feeder circuits. Any deficiency in this respect shall be corrected.
    4. Phase Balance - measure the load on each phase at each splitter, and lighting and power panelboard and report the results in writing to the Consultant. Rearrange phase connections as necessary to balance the load on each phase as instructed by the Consultant, with the re-arrangement being restricted to the exchanging of connections at the distribution points mentioned in this paragraph. After making any such changes, make available to the Consultant drawings or marked prints showing the modified connections.
    5. General Operations - energize and put into operation each and every electrical circuit and item. Necessary repairs, alterations, replacements, tests and adjustments required shall be made for complete and satisfactory operating systems.

3.4 Sealing:

1. Ensure and verify that all penetrations of electrical equipment have been properly sealed with appropriate material and to the manufacturers' requirements.

3.5 Noise and vibration:

1. Ensure and verify that all isolation equipment has been installed where required and to the manufacturers' recommendations. Include the locations of and measurements of static deflection of spring isolators.

3.6 Coordination Study

1. For the entire electrical distribution system provided as part of this contract and for the existing high voltage base building switchgear and low voltage base building switchgear, supply a report from an independent test agency of the short circuit, protection, co-ordination study of the electrical distribution system. **An existing coordination study is not available for contractor's use.**

2. Procure (coordinate and pay for) the services of Krka Power Inc. David Bibic david@krka.ca, or Brosz Technical Services Kyle Bunte kbunte@brosz.net to prepare the coordination study and arc flash analysis.

3. Co-ordination of Protective Devices:
   .1 Ensure circuit protective devices such as overcurrent trips, relays, circuit breakers and fuses are installed to values and settings so as to provide protection by means of opening the closest device to the fault.
   .2 Submit a short circuit protection and co-ordination study as follows:
      1. Obtain and organize all electrical protection data for all the equipment. This will consist of obtaining the relay types and settings, transformer impedances, cable sizes, fuse sizes and types, motor data, etc.., required to carry out the short circuit.
      2. Perform a short circuit analysis to determine short circuit current levels at all critical points in the distribution system, having obtained the available short circuit current available from the Hydro Supply Authority.
      3. Generate appropriate settings for all relays and protective devices from the level of the Hydro Supply Authority feeder protective devices to the largest downstream device on all the feeder secondary distribution levels.
   .3 Provide a complete, comprehensive report at the conclusion of the short circuit, protection and co-ordination study consisting of the following:
      1. A set of time current curve characteristics of all protective devices in the system plotted on log/log graph paper with corresponding short circuit current levels.
      2. Time current damage curves for all transformers, large motors and cables are also to be plotted.
      3. Provide a complete schedule of all main protective relays, fuses and other protective device listing device locations, function number, manufacturer, model number, size, range, setting, etc.
      4. The complete study will illustrate and ensure that the settings and sizes of all protective devices for each voltage level have been chosen to ensure maximum or optional protection and co-ordination during electrical fault or overload conditions.
      5. These generated settings will then be applied by "in-field" testing methods to the respective devices.

3.7 Ground Fault Protection System

1. Inspect relays visually for condition and clean where necessary.
2. Check all connections for tightness.
3. Apply settings to each relay as specified in the short circuit, protection and co-ordination study and test operation by means of a relay test set.
4. Verify each protective system by means of a primary current injection through the zero phase sequence transformer. This will provide correct operation of both the transformer and relay as well as proper functioning of the circuitry through to the breaker tripping elements.

3.8 Arc Flash Analyses

1. For the entire electrical distribution system provided as part of this contract and the existing electrical distribution system shown on the drawings, conduct an electrical arc flash hazard analysis as prescribed under NFPA 70E (CSA Z462-18) and provide a written report summarizing the findings and recommended control measures to be taken. The arc flashing analysis results must be deemed acceptable prior to the equipment purchase.
2. The power systems software utilized to perform the study must be SKM Powertools
3. Provide appropriate labels for all equipment (including all prepurchased equipment and equipment supplied by owner). The labels shall warn a qualified worker who intends to open the equipment for analysis or work that a serious hazard exists and that the workers should follow appropriate work practices and wear appropriate personal protection equipment (PPE) for the specific hazard.
4. An existing coordination study is not available for the electrical contractor's use.
5. Procure (coordinate and pay for) the services of Krka Power Inc. David Bibic david@krka.ca, or Brosz Technical Services Kyle Bunte kbunte@brosz.net to prepare the coordination study and arc flash analysis.

3.9 Emergency Light Level Measurements

1. As part of this scope of work procure the services of a professional engineer to measure and record emergency lighting levels in foot candles throughout all scope of work areas with a calibrated light meter. Readings shall be taken based on a minimum of one reading for every 20' center in open office areas and corridors / hallways and one reading in each closed office, meeting room, boardroom and stairwell.
2. All light level readings are to be taken during non-daylight hours.
3. Provide a sealed letter identifying light level readings and stating that the emergency lighting levels meet the requirements of the National Building Code. Notify Owner and Consultant at least ten (10) days prior to proposed testing date and schedule testing at time and date acceptable to Owner and Consultant.

3.10 Test Results

1. Submit test results to Owner's Consultant for review.
2. Testing methods and test results: to CSA, CEC and authorities having jurisdiction.
3. Remove and replace conductors found damaged with new materials.
4. Provide required labour and tools, if during testing Owner's Representative requests equipment be opened and removed from their housings to examine equipment, terminations and connections.

End of Section

SECTION 28 13 00: ACCESS CONTROL.

PART I – GENERAL

1.1 Work Included:

1. All power and conduit work required and /or shown on drawings related to security system (ie: for electric strike hardware, maglocks, door release button, glass break detectors, etc) shall be included in the electrical contractor's tender price. Provide all conduit and junction boxes and all necessary accessories and devices to facilitate the complete installation of the security system. Obtain exact requirements (including power requirements) from the security contractor. Installation shall be under the direct guidance of, and to the manufacturer's recommendations.

PART II - PRODUCTS

2.1 Refer to drawings for product details.

2.2 Material Standards:

1. All equipment will be manufactured in accordance with applicable CEMA and NEMA specifications, and CSA/ULC standards.

End of Section

SECTION 28 13 00.02: FIRE ALARM SYSTEM.

PART I – GENERAL

1.1 Work Included:

1. All work required and /or shown on drawings related to life safety systems (ie: fire alarm, EVAC speakers, etc.) shall be included in the tenant electrical contractor's tender price. Employ and pay for the services of the landlord's contractor to provide all conduit, wiring, devices, final connections, modifications and provision of new interfacing devices in existing system control panels (ie: modules, relays, sub-panel, etc.). Ensure new devices to be used are compatible with the existing system. Maintain the integrity of the existing supervised circuits when new devices are to be connected. The system shall be tested and certified for proper operation upon completion of the work. Employ and pay for the services of the landlord's verification contractor.

2. Employ and pay for the services of the landlord's contractor to update the base building active graphic software system with all devices provided, deleted and relocated as part of this scope of work and with fire alarm system zone changes as part of this scope of work.

3. Employ and pay for the services of the landlord's contractor to update the base building passive graphics with all devices provided, deleted and relocated as part of this scope of work and with fire alarm system zone changes as part of this scope of work.

4. Employ and pay for the services of the landlord's contractor to provide additional power boosters, amplifiers and all other controls and accessories as required to ensure that the existing fire alarm system can accommodate all signaling devices shown on the drawings.

5. In **addition** to the field devices indicated on the drawings to be provided under this contract, include in the tender price to supply and install the following quantities of additional devices throughout the scope of contract floors, complete with 75'-0" of conduit and wiring, programming, testing and certification, labeling, verification and 100% repeat verification for each device post City Fire Department inspection. Reverify all existing fire alarm devices.

Quantity of Devices	Device Type
2	Fire Alarm System Horn
2	Strobe Light
1	Fire Alarm System Smoke Detector

6. Test and verification in conformance with CAN/ULC S1001, Integrated Systems Testing Of Fire Protection And Life Safety Systems. Provide a satisfactory Integrated Testing Report. As part of the base bid price, electrical contractor must procure (engage, coordinate and pay for) an Integrated Testing Coordinator, responsible to develop and implement the Integrated Testing Plan. The systems which must be included as part of the integrated systems testing to be determined by the Integrated Testing Coordinator hired by the electrical contractor. All costs related to the integrated systems testing must be included as part of the base bid price. Electrical contractor is responsible to provide all requirements to all required trades through the construction manager / general contractor during the bid period. The integrated systems testing must be completed after hours.

7. Electrical contractor must include the following scopes of work as part of the base bid price specific to the CAN/ULC S1001, Integrated Systems Testing Of Fire Protection And Life Safety Systems:

    - Fire Alarm Technician required for operations and resetting of the fire alarm control panel for the duration.
    - Electrician required for operations and initiating alarms, demonstrating wiring, etc., for the duration.

End of Section

SECTION 33 65 73: CONCRETE ENCASED DUCT BANKS AND MANHOLES.

PART I - GENERAL

1.1 Work Included:

1. The correct routing, slopes, size, location and construction of all manholes, ductbanks, drainage pits and markers area within the scope of this Section.

PART II - PRODUCTS

2.1 Pulling Cable:

1. Pulling cable shall be 6mm (1/4”) stranded nylon or polypropylene rope.

2.2 Cable Racks:

1. Cable racks shall be manufactured from hot dipped galvanized steel and mounted on 12 x 100mm (1/2” x 4”) preset inserts.

2.3 Ductwork:

1. Rigid plastic power cable ducts shall be manufactured to CSA C22.2 No. 211.1.
2. PVC telecommunication and data cable ducts shall be manufactured to CSA B196.3.
3. Duct couplings, straight and angle fittings, expansion joints, plugs, caps, adaptors and solvent shall be as required to make a complete installation.

2.4 Formwork and Shoring:

1. Provide all required framework and shoring.

2.5 Markers:

1. Markers shall be pre-cast concrete type, with direction arrows.

PART III - EXECUTION

3.1 General:

1. Prior to any concrete pouring, obtain approval from both Consultant and local Utilities Inspectors.
2. Slope ductbank away from manhole and building towards property line. Provide drainage pit between manhole and building and between manhole and property line if above slope is not possible and at all low points in the system.
3. After completion of ductbank/manhole system, install pulling cables in each duct.

3.2 Drainage Pit:

1. Provide drainage pit at low points of ductbank where required. At pit, use perforated duct with openings on the underside and compacted Granular 'A' gravel drainage material. 1m (3ft.) dia. pre-cast concrete pipe sections shall form the exterior of the pit. Depth of pit shall be such that base is down to permeable material.

3.3 Ductbank:

1. Build the ductbank on undisturbed soil, or on well compacted granular fill, no less than 150mm (6") thick, compacted to 95% of maximum Proctor dry density and at the elevations as required and with a minimum slope of 0.3%, towards the property line unless otherwise shown.
2. Provide formwork and shoring as required when sides of excavation are not suitable for ductbank encasement.
3. Install base spacers at maximum intervals of 1.5m (5'-0").
4. Make transpositions, offsets and changes in direction using 5° bend sections, do not exceed a total of 20° with duct offset. Use Bell ends, at duct entry to building or manholes. At the end of a ductbank run, terminate duct with a duct coupling, set flush with the concrete envelope.
5. Lay ducts with configuration as indicated with preformed interlocking, rigid plastic, intermediate spacers to maintain spacing between ducts at not less than 75mm (3") horizontally and vertically unless otherwise shown. Stagger joints in adjacent duct layers at least 150mm (6") and make joints watertight. Clean and cap ducts before allowing any reinforcing or concrete work.
6. Use15M reinforcing rods that conform to CSA G30.12, grade 400, unless otherwise noted and form ductbank as required.
7. Ensure ductwork is encased with 75mm (3") thick 20MPA (3000 psi) concrete envelope unless otherwise shown. Ensure ducts do not move during reinforcing work or concrete pouring operation.
8. Immediately after placing of concrete, pull through each duct a (steel) mandrel not less than 300mm (12") long and of a diameter 6mm (1/4") less than internal diameter of duct, followed by stiff bristle brush to remove sand, earth and other foreign matter. Avoid disturbing or damaging ducts where concrete has not set completely.
9. Ensure concrete has attained 50% of its specified strength before any backfilling.
10. Install four (4) 3m (10') lengths of 15M reinforcing rods, one at each corner of ductbank, when connecting ductbank to manholes or buildings.

End of Section

Project: École élémentaire Jeanne-Lajoie #25001

Panelboard: LPC
Voltage (V):
Phase/Wire:
Bus and Lugs Rating (A):

CCT NO	Load	Breaker Amp	Breaker Pole		CCT NO	Load	Breaker Amp	Breaker Pole
1	EX. CCT TO REMAIN	20	1		2	EX. CCT TO REMAIN	15	1
3	EX. CCT TO REMAIN	20	1		4	EX. CCT TO REMAIN	15	1
5	EX. CCT TO REMAIN	20	1		6	EX. CCT TO REMAIN	15	1
7	EX. CCT TO REMAIN	15	1		8	EX. CCT TO REMAIN	15	1
9	EX. CCT TO REMAIN	15	1		10	EX. CCT TO REMAIN	15	1
11	EX. CCT TO REMAIN	15	1		12	EX. CCT TO REMAIN	15	1
13	EX. CCT TO REMAIN	15	1		14	EX. CCT TO REMAIN	20	1
15	EX. CCT TO REMAIN	15	1		16	EX. CCT TO REMAIN	15	1
17	EX. CCT TO REMAIN	15	1		18	EX. CCT TO REMAIN	15	1
19	EX. CCT TO REMAIN	15	1		20	EX. CCT TO REMAIN	20	1
21	EX. CCT TO REMAIN	20	1		22	EX. CCT TO REMAIN	20	1
23	EX. CCT TO REMAIN	15	1		24	EX. CCT TO REMAIN	15	1
25	EX. CCT TO REMAIN	15	1		26	EX. CCT TO REMAIN	15	1
27	EX. CCT TO REMAIN	15	1		28	EX. CCT TO REMAIN	20	1
29	EX. CCT TO REMAIN	15	1		30	EX. CCT TO REMAIN	15	1
31	EX. CCT TO REMAIN	15	1		32	EX. CCT TO REMAIN	15	1
33	EX. CCT TO REMAIN	15	1		34	EX. CCT TO REMAIN	15	1
35	EX. CCT TO REMAIN	15	1		36	EX. CCT TO REMAIN	20	1
37	EX. CCT TO REMAIN	15	1		38	EX. CCT TO REMAIN	15	1
39	EX. CCT TO REMAIN	15	1		40	EX. CCT TO REMAIN	20	1
41	EX. CCT TO REMAIN	20	1		42	EX. CCT TO REMAIN	20	1
43	EX. CCT TO REMAIN	20	1		44	EX. CCT TO REMAIN	20	1
45	EX. CCT TO REMAIN	20	1		46	EX. CCT TO REMAIN	20	1
47					48	EMERGENCY LIGHTING SYSTEM BATTERY UNIT	15	1
49	BOYS WR HAND DRYER	20	1		50			
51	GIRLS WR HAND DRYER	20	1		52			
53					54			
55	CLASSROOM 122 GFI	20	1		56	CLASSROOM 122 RECEPTACLE	20	1
57	CLASSROOM 122 GFI	20	1		58	CLASSROOM 122 RECEPTACLE	20	1
59					60	CLASSROOM 122 PLUG-LOAD CONTROLLED	20	1

Project: École élémentaire Jeanne-Lajoie #25001

Panelboard: LPG
Voltage (V):
Phase/Wire:
Bus and Lugs Rating (A):

CCT NO	Load	Breaker Amp	Breaker Pole		CCT NO	Load	Breaker Amp	Breaker Pole
1	EX. CCT TO REMAIN	20	1		2	EX. CCT TO REMAIN	20	1
3	EX. CCT TO REMAIN	20	1		4	EX. CCT TO REMAIN	20	1
5	EX. CCT TO REMAIN	20	1		6	EX. CCT TO REMAIN	20	1
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15	EX. CCT TO REMAIN	20	1		16	EX. CCT TO REMAIN	20	1
17	EX. CCT TO REMAIN	15	1		18	EX. CCT TO REMAIN	15	1
19	EX. CCT TO REMAIN	15	1		20	EX. CCT TO REMAIN	15	1
21					22			
23					24			
25	STAGE RECEPTACLE	20	1		26	SCREEN	15	1
27					28	EF-SAN	25	1
29					30			
31					32			
33					34			
35					36			
37					38			
39					40			
41					42			

Project: École élémentaire Jeanne-Lajoie #25001

Panelboard: LPH
Voltage (V):
Phase/Wire:
Bus and Lugs Rating (A):

CCT NO	Load	Breaker Amp	Breaker Pole		CCT NO	Load	Breaker Amp	Breaker Pole
1	EX. CCT TO REMAIN	20	1		2	EX. CCT TO REMAIN	20	1
3	EX. CCT TO REMAIN	15	1		4	EX. CCT TO REMAIN	15	1
5	EX. CCT TO REMAIN	15	1		6	EX. CCT TO REMAIN	15	1
7	EX. CCT TO REMAIN	15	1		8	EX. CCT TO REMAIN	15	1
9	EX. CCT TO REMAIN	15	1		10	EX. CCT TO REMAIN	15	1
11	EX. CCT TO REMAIN	15	1		12	EX. CCT TO REMAIN	15	1
13	EX. CCT TO REMAIN	15	1		14	EX. CCT TO REMAIN	15	1
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17	EX. CCT TO REMAIN	15	1		18	EX. CCT TO REMAIN	15	1
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39	EX. CCT TO REMAIN	15	1		40	EX. CCT TO REMAIN	15	1
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43	EX. CCT TO REMAIN	15	1		44	EX. CCT TO REMAIN	15	1
45	EX. CCT TO REMAIN	15	1		46	EX. CCT TO REMAIN	15	1
47	EX. CCT TO REMAIN	15	1		48			
49	WR 123A EF-1	15	1		50	MEETING 123B RECEPTACLE	20	1
51	WR 123A GFI	20	1		52	MEETING 123B PLUG-LOAD CONTROLLED	20	1
53					54			
55	CLASSROOM 123 GFI	20	1		56	CLASSROOM 123 RECEPTACLE	20	1
57	CLASSROOM 123 GFI	20	1		58	CLASSROOM 123 RECEPTACLE	20	1
59					60	CLASSROOM 123 PLUG-LOAD CONTROLLED	20	1

Project: École élémentaire Jeanne-Lajoie #25001

Panelboard: LPJ
Voltage (V):
Phase/Wire:
Bus and Lugs Rating (A):

CCT NO	Load	Breaker Amp	Breaker Pole		CCT NO	Load	Breaker Amp	Breaker Pole
1	EX. CCT TO REMAIN	20	1		2	EX. CCT TO REMAIN	15	1
3	EX. CCT TO REMAIN	20	1		4	EX. CCT TO REMAIN	15	1
5	EX. CCT TO REMAIN	15	1		6	EX. CCT TO REMAIN	15	1
7	EX. CCT TO REMAIN	15	1		8	EX. CCT TO REMAIN	15	1
9	EX. CCT TO REMAIN	15	1		10	EX. CCT TO REMAIN	15	1
11	EX. CCT TO REMAIN	15	1		12	EX. CCT TO REMAIN	15	1
13	EX. CCT TO REMAIN	15	1		14	EX. CCT TO REMAIN	15	1
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17	EX. CCT TO REMAIN	15	1		18	EX. CCT TO REMAIN	15	1
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25	EX. CCT TO REMAIN	15	1		26	EX. CCT TO REMAIN	15	1
27	EX. CCT TO REMAIN	15	1		28	EX. CCT TO REMAIN	15	1
29	EX. CCT TO REMAIN	15	1		30	EX. CCT TO REMAIN	15	1
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35	EX. CCT TO REMAIN	15	1		36	EX. CCT TO REMAIN	15	1
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41	EX. CCT TO REMAIN	15	1		42	EX. CCT TO REMAIN	20	1
43	EX. CCT TO REMAIN	15	1		44	EX. CCT TO REMAIN	15	1
45	EX. CCT TO REMAIN	15	1		46	EX. CCT TO REMAIN	15	1
47					48	EMERGENCY LIGHTING SYSTEM BATTERY UNIT	15	1
49					50			
51					52			
53					54			
55					56			
57					58			
59					60			

Designated Substance Survey– Pre-Renovation

École élémentaire Jeanne-Lajoie, 150 Carnforth Road, Toronto, Ontario

March 19, 2025
Arcadis Project No. 30248616

Designated Substance Survey -Pre-Renovation

École élémentaire Louise-Charron, 2520 Cabana Road West, Windsor, Ontario

March 19, 2025

Arcadis Project No. 30248616

Prepared By:
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Our Ref: 30248616

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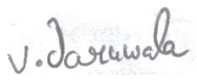

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Reviewed by: Jean Daigle

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Version Control

Issue	Revision No.	Date Issued	Page No.	Description	Reviewed By
01	00	March 20, 2025	All	Final Report	Jean Daigle

Contents

Tables

Appendices

Acronyms and Abbreviations

ACM	Asbestos-Containing Materials
Arcadis	Arcadis Professional Services (Canada) Inc.
CLC	Canada Labour Code
COHSR	Canada Occupational Health and Safety Regulations
DSS	Designated Substance Survey
EACC	Environmental Abatement Council of Canada
HBMA	Hazardous Building Materials Assessment
HCE	Halocarbon-Containing Equipment
LPB	Lead Based Paints
NIOSH	National Institute for Occupational Safety and Health
NJC	National Joint Council
OHS	Occupational Health and Safety
AACM	Assumed Asbestos-Containing Materials
PCBs	Polychlorinated Biphenyls
PLM	Polarized Light Microscopy
TEM	Transmission Electron Microscopy
USEPA	United States Environmental Protection Agency

1 Introduction

1.1 Purpose

Arcadis Professional Services (Canada) Inc. (Arcadis) was retained by Conseil scolaire Viamonde (CSV) (Client) to conduct a project-specific pre-renovation designated substance survey (DSS) of in designated areas of École élémentaire Jeanne-Lajoie, 150 Carnforth Road, Toronto, Ontario.

The objective of the assessment was to identify specified designated substances (DS) in preparation for building renovation. This assessment is intended to be used for renovation purposes only and may not provide sufficient detail for long term management of hazardous materials as required by Health and Safety regulations. The results of this assessment are intended for use with a properly developed scope of work and performance specification.

The project consisted of a limited intrusive assessment in designated areas in the building referred to as the "assessed area" as shown on the floor plan included in Appendix D.

Arcadis performed the assessment on February 10, 2025. The assessment was conducted by Mr. Viraj Daruwala, M. Eng. P. Eng. of Arcadis.

1.2 Scope of Work

The scope of work for the project included:

- Review of previous documents related to the work, including floor plans and previous reports.
- Development of sampling strategy to address any identified gaps.
- Conduct a comprehensive, limited intrusive DSS on interior and exterior finishes of the site.
- Submit representative samples of suspect materials identified to accredited laboratories for analysis.
- Evaluation and interpretation of field findings and sample analytical results to develop conclusions and recommendations pertaining to hazardous building materials identified and to provide a summary of the locations of HBMs.

For the purpose of this assessment, designated substances (DS) are defined as follows:

- Asbestos-containing materials (ACM)
- Paint (lead)
- Lead Products
- Silica
- Mercury
- Polychlorinated Biphenyls (PCBs)
- Halocarbon-Containing Equipment (HCE)
- Suspect visible mould

- Other Biological Hazards (Rodent/Bird Droppings)

The assessment was restricted to accessible locations of the buildings. Limited finishes, if present, such as carpeting were lifted, to assess area and materials beneath it. Solid ceiling and walls were investigated where access hatches were present. Roof access and assessment was not included as part of the DSS. Drawings showing assessment areas in the building is provided in Appendix D.

A general description of the building included in this DSS is provided in Table 1 below:

Table 1: Building Description

Building Name	Address	Year Constructed Additions	Building Description
École Élémentaire Jeanne-Lajoie	150 Carnforth Road, Toronto, Ontario	1967 No Additions	Two story structure with mezzanine mechanical rooms. Typical construction includes slab on grade foundation, concrete block walls with exterior brick finishes. Interior finishes include concrete block walls, drywall, acoustic ceiling tiles, cement panels, vinyl floor tiles, vinyl sheet flooring, vinyl baseboard, and fireproofing on some structural elements

2 Background Information

Background information for the Site includes the following:

Arcadis reviewed the following reports prepared by Arcadis for the CSV:

- *"Updated Survey of Asbestos Containing Materials, École élémentaire Jeanne-Lajoie, 150 Carnforth Road, Toronto Ontario"* dated September 30, 2022.
- *"Revised Pre-Renovation Designated Substances and Hazardous Materials Survey, École élémentaire Jeanne-Lajoie, 150 Carnforth Road, Toronto Ontario"* dated February 2, 2021.

2.1 Exclusions

Exclusions that apply for this assessment are included in the table below:

Table 2: Exclusions

Item	Reason
24" x 24" vinyl floor tiles in Corridors C102, C104, C105 and C201	Vinyl floor tiles are of a newer vintage and were not tested to limit damage to flooring applications. This vintage of flooring should not contain asbestos. These floor finishes should not be affected by the proposed renovation scope.

3 Results

The following section summarizes the findings of the assessment and provides a general description of the designated substances (DS) identified and their locations. A summary of asbestos-containing building materials found to be present in areas assessed is included in Appendix A. Laboratory certificates of analysis of samples collected as part of this assessment work are provided in Appendix B. A list of building materials sampled for asbestos content as part of this assessment and previous assessments and laboratory analyses results are included in Appendix C. Floor plans showing locations of asbestos-containing building materials and assessment areas are provided in Appendix D. Appendix E provides information on applicable regulation and guidelines. Refer to Appendix F for the survey methodology.

3.1 Asbestos

Arcadis reviewed a report prepared by Arcadis for the CSV titled "*Updated Survey of Asbestos Containing Materials, École élémentaire Jeanne-Lajoie, 150 Carnforth Road, Toronto Ontario"* dated September 30, 2022. Information taken from this previous report was used by Arcadis during the course of our assessment and in the preparation of this report.

During previous assessments conducted by Arcadis, cavities in concrete block walls were accessed in various locations throughout the facility to check for potential asbestos-containing materials such as vermiculite block fill insulation. Vermiculite was not observed in all concrete block wall cavities accessed.

During the course of our assessment, additional bulk samples of material were collected by Arcadis staff. The samples were forwarded to EMSL in Mississauga, Ontario for asbestos analyses. EMSL holds a current Certificate of Accreditation for Bulk Asbestos Fibre Analysis under the Voluntary Accreditation Program (NVLAP). Bulk sampling was performed in general accordance with the requirements specified in the ASTM E2356 Standard, and O Reg 278/05. Please refer to the Asbestos Summary Table in Appendix A for additional details.

3.1.1 Suspect Building Materials Not Found

The following types of building materials may historically contain asbestos but were not observed in the assessed area and are not discussed in the report findings:

- Texture finishes (acoustic/decorative)
- Roofing Products

3.1.2 Asbestos-Containing Building Materials in Assessed Area

The following accessible asbestos-containing building materials were found to be present in the assessed area:

- Mortar in concrete block walls in all assessed areas and throughout the entire facility.
- Joint compounds on drywall walls in Rooms 103A, 123A, C104, C105, C106, 202, 205, 209, 210 and C201;
- Joint compounds on drywall ceiling in Room 123;
- Thermal insulation on pipe fittings below ceilings in Rooms 124 and 123B;
- Thermal insulation confirmed and/or assumed to be present above ceilings in Rooms 122, 123, 123A, 123B, C104, C105, C106, 202, 205, 209, 210, and C201;
- Cement panels on walls in Rooms 123 and 123B;
- Cement panels on ceilings in Room 123;
- Asbestos paper present between layers of fiberglass in fiberglass batts on the upper side of ceiling assembly in Room 123;
- Vinyl floor tiles in Rooms 103A (lower star landings only), 123, 123B, 202, 209 and 210;
- 12” x 12” acoustic ceiling tiles on suspended metal grid system in Room 122; and
- Caulking in control joints in exterior brick.

3.1.3 Potentially Asbestos-Containing Materials

A number of materials which might contain asbestos were not sampled during the assessment due to limitations in scope and methodology. Where present, these materials are considered to be potentially asbestos-containing materials (PACM) until otherwise proven by sampling and analysis. Materials that potentially contain asbestos include:

- floor levelling compound
- electrical components or wiring within control centers, breakers, motors or lights, insulation on wiring
- fire resistant doors

3.2 Paint

Arcadis reviewed a report prepared by Arcadis for the CSV titled *“Revised Pre-Renovation Designated Substances and Hazardous Materials Survey, École élémentaire Jeanne-Lajoie, 150 Carnforth Road, Toronto, Ontario”* dated February 2, 2021. Results of paint sample analyses for lead taken from this previous report was used by Arcadis during the course of the investigation and in the preparation of this report. Results of bulk sample analysis of paint taken from the previous report is provided in the table below.

Table 3: Results of Analyses of Bulk Samples for Metals in Paint

Sample ID	Sample Location	Sample Description	Lead Content
P-1	Room 04	White-coloured paint on concrete block wall	2,300 mg/kg (2)
P-2	Room 125C	Beige-coloured paint on concrete block wall	1,800 mg/kg (2)

Sample ID	Sample Location	Sample Description	Lead Content
P-3	Room 202	Red-coloured paint on concrete block wall	1,500 mg/kg (2)
P-4	Room 218	Beige-coloured paint on metal duct	1,500 mg/kg (2)
P-5	Room 218	Grey coloured paint on concrete floor	5,600 mg/kg (3)
P-1	Room 107	Paint-multi-layered on metal radiator cover turquoise/cream coloured	1,400 mg/kg (2)
P-2	Room 110	Paint-multi-layered on concrete block wall – cream coloured	2,000 mg/kg (2)
P-3	Room 113	Paint-multi-layered on drywall – cream coloured	1 mg/kg (1)
P-4	Room 129	Paint on concrete roof deck – cream coloured	2,100 mg/kg (2)

FOOT NOTES:

1. Lead concentrations less than or equal to 0.1% lead by weight (1,000 ppm)
2. Lead concentrations greater than 0.1% (1,000 ppm) or equal to 0.5% (5,000 ppm)
3. Lead concentrations greater than 0.5% (5,000 ppm)

1 mg/kg = 1 ppm

The *Environmental Abatement Council of Canada (EACC) Lead Guideline* for Construction, Renovation, Maintenance or Repair, October 2014, states the following:

- Paints or coatings containing less than or equal to 0.1% lead by weight (1,000 ppm) are considered low-level lead paints. If these materials are disturbed in a non-aggressive manner, performed using normal dust control procedures, then worker protection from the inhalation of lead is not required.
- Paints or coatings containing between 0.1% and 0.5% (5,000 ppm) lead by weight are considered lead-containing paints. Tasks performed that disturb these materials must be completed using precautionary measures and procedures specified in the guideline.
- Construction operations involving lead-based paints with concentrations greater than 0.5% lead must always be completed in accordance with precautionary measures and procedures specified in the guideline.

Similarly painted areas throughout the building are presumed to contain lead at the same concentrations as noted above.

3.3 Lead Products

Materials presumed to contain lead were observed in the assessed area including:

- Electrical components including wiring connectors, grounding conductors, and solder.
- Glazing on ceramic tiles, in the solder (in buildings built pre-1986) on the seals of bell joints of any cast iron drainpipe and in the solder on the sweated-on joints between copper pipe and fittings.

3.4 Silica

Crystalline silica is a presumed component of the following materials where present in the assessed area:

- poured or pre-cast concrete
- cement
- masonry and mortar
- ceramic tiles, grout and associated mortar beds
- plaster, gypsum board and taping compound
- Concrete block

3.5 Mercury

Mercury vapor is present in fluorescent lamps which were present in the assessed area.

3.6 Polychlorinated Biphenyls (PCBs)

Based on visual observations (evidence of T-8 Type florescent light fixtures) the building has been comprehensively re-lamped and ballasts associated with T-8 Type florescent light fixtures, should not contain PCBs.

3.7 Halocarbon-Containing Equipment (HCE)

Equipment suspected to be HCE was not observed in the assessed area.

3.8 Suspect Visible Mould

Suspect visible mould and/or water staining was not observed in the assessed area.

3.9 Other Biological Hazards

Rodent/Bird/Bat droppings were not observed in the assessed area.

4 Recommendations

We recommend the following on the basis of the findings of the HBMA outlined in this report

4.1 General

1. Ensure that all asbestos-containing materials identified not impacted by the proposed renovations are managed in place. The Ontario Regulation 278/05 Regulation Respecting Asbestos on Construction Projects and in Buildings and Repair Operations provides guidance in asbestos management programs including risk assessment, development of safe work procedures, worker instructions, development and implementation of Asbestos Management Plans and record keeping.

2. Investigate any items excluded from the scope of work of this report. Ideally this investigation will be performed as part of the development of the specifications, or at a minimum immediately prior to commencing renovations when the areas are no longer occupied.
3. Provide this report and the detailed plans and specifications to the contractor prior to bidding or commencing work.
4. Retain a qualified consultant to specify, inspect and verify the successful removal of hazardous materials.
5. Update the asbestos inventory upon completion of the abatement and removal of asbestos-containing materials.

4.2 Renovation Work Involving Hazardous Materials

1. Prepare plans and performance specifications for hazardous building materials handling and removal required for the planned renovation work. The specifications should include the scope of work, safe work practices, personal protective equipment, respiratory protection, and disposal of waste materials. Provide this report and the detailed plans and specifications to the contractor prior to bidding or commencing work.
2. Remove all asbestos-containing materials (ACM) in the designated work area prior to renovation, alteration, maintenance or demolition work. If the identified ACM will not be removed prior to commencement of the work, disturbance of ACM must follow the appropriate asbestos precautions for the classification of work being performed. Asbestos-containing materials must be disposed of at a landfill approved to accept asbestos waste.
3. Test PACM if impacted by the proposed renovations or demolition. If PACM is not tested, it must be treated as ACM.
4. If work activities may cause exposure to paint containing elevated levels of metal (arsenic, chromium, lead, mercury) conduct a risk assessment for exposure, develop an exposure control plan, write safe work procedures, and implement controls. The Ministry of Labour Guideline, Lead on Construction Projects provides guidance in assessment and control of lead exposure, which can be used as a guide for other metals.
5. 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. Dispose of painted non-metallic materials exceeding the criteria for leachable lead as hazardous waste. Well adhered paints containing elevated levels of lead on metal substrates do not require leachable lead analysis as the materials can be recycled with the paint intact.
6. Lead-containing items [lead-acid batteries, others] should be recycled when taken out of service or prior to building demolition.
7. If silica-containing materials will be affected by sanding, drilling, chipping, grinding, cutting, sawing, sweeping, demolition or blasting, develop a silica exposure control plan to address control methods and personal protective equipment requirements in order to reduce worker exposure to a level as low as reasonably achievable below the occupational exposure limit prescribed in the Choose an item. Guidance is provided in the Ministry of Labour Guideline, Silica on Construction Projects Silica control methods can include construction of barriers or enclosure systems to restrict access to and contain the

work area; the use of wet methods; local exhaust ventilation when practical; and the use of personnel protective equipment.

8. Recycle and reclaim mercury from fluorescent lamps and thermostats when taken out of service. Do not break lamps or separate liquid mercury from components. Liquid mercury is classified as a hazardous waste and must be disposed of in accordance with local regulations.
9. When light fixtures are removed from service, ensure a qualified person examines the light ballasts for PCB content. If ballasts are not clearly labelled as “non-PCB” or are suspected to contain PCBs, package, and ship ballasts for destruction at a federally permitted facility. Liquid in oil transformers should be sampled for classification purposes. Capacitors suspected to contain PCBs must be disposed of as hazardous waste when removed from service. Dispose of non-liquid PCB materials as hazardous waste when they are removed from the building.
10. Conduct an intrusive mould investigation to determine the extent of suspect visible mould growth. The investigation should identify the source of the water intrusion that contributed to the suspect visible mould growth and water damage observed during this assessment.
11. Investigate the source of the rodent/bird/bat droppings observed and implement preventative measures such as sealing openings to prevent further rodent intrusion. Mist rodent droppings with amended water and dispose of in sealed containers. Seal all opening and penetrations that may permit rodent intrusion into the building. Monitor for rodent activity and implement mitigation methods as required Follow Environmental Abatement Council of Canada procedures for clean-up of bird or bat droppings.
12. Ensure toxic and flammable chemicals are stored in sealed containers with safety data sheets available. Material is required to be removed and disposed of in accordance with local regulations prior to demolition activities.
13. Remove radioactive smoke detectors when removed from service. Dispose of in accordance with local regulations.
14. Remove and recover refrigerants prior to disposal in compliance with provincial Choose an item. And Federal Halocarbon Regulations, 2022, SOR/2022-110 regulations. Use certified persons to perform this work. Before dismantling, decommissioning or destroying any system, the following will occur:
    i. Recover all halocarbons contained in the system into a container designed and manufactured to be refilled and to contain that specific type of halocarbon.
    ii. Affix a notice to the system before dismantling, decommissioning, or destruction; and
    iii. Keep a record of the information on the notice.

5 References

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

1. Occupational Health and Safety Act, (OSHA).
2. ASTM E2356 Standard Practice for Comprehensive Buildings Asbestos Surveys, 2018 Edition.
3. Technical Guideline to Asbestos Exposure Management Programs, Employment and Social Development Canada, January 16, 2018.

4. Ontario Regulation 278/05 – Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations, O. Reg. 278/05
5. R.R.O. 1990, Reg. 347: General - Waste Management
6. Ozone Depleting Substances and Other Halocarbons, O Reg. 463-10.
7. Ontario Ministry of Labour, Immigration, Training and Skills Development (MLITSD) "*A Guide to the Regulation Respecting Asbestos on Construction Projects and in Buildings and Repair Operations*", November 2007
8. Federal Halocarbon Regulations, 2022, SOR/2022-110, under Canadian Environmental Protection Act, 1999.
9. PCB Regulations, SOR/2008-273, as amended up to October 31, 2021, under Canadian Environmental Protection Act, 1999.
10. Identification of Lamp Ballasts Containing PCBs. Report EPS 2/CC/2 (revised), Environment Canada, August 1991.
11. Surface Coating Materials Regulations, SOR/2016-193, as amended up to December 19, 2022, under Canada Consumer Product Safety Act.
12. Guideline, Lead on Construction Projects, Ministry of Labour, 2011.
13. Environmental Abatement Council of Canada Lead Guidelines for Construction, Renovation, Maintenance or Repair, 2014
14. Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing, United States Housing and Urban Development (HUD), 2012 Edition.
15. Transportation of Dangerous Goods Regulations, SOR/2001-286, as amended up to July 5, 2023, under Transportation of Dangerous Goods Act, 1992.
16. Mould Guidelines for the Canadian Construction Industry, Canadian Construction Association, 2018 Edition.
17. Environmental Abatement Council of Canada Mould Abatement Guidelines, Edition 3 (2015).
18. Guideline, Silica on Construction Projects Ministry of Labour, 2011.
19. Canada Labour Code, R.S.C., 1985, c. L-2, as amended up to July 9, 2023.
20. Canada Occupational Health and Safety Regulations, SOR/86-304, as amended up to April 12, 2023, under Canada Labour Code.

6 Limitations and Service Constraints

The opinions, conclusions and recommendations presented in this report are limited to the information obtained during the performance of the specific scope of service identified in the report. To the extent that Arcadis relied upon any information prepared by other parties not under direct contract to Arcadis, no representation as to the accuracy or completeness of such information is made. This report is an instrument of professional service and the services described in the report were performed in accordance with generally accepted standards and level of skill and care ordinarily exercised by members of the profession working under similar conditions including comparable

budgetary and schedule constraints. No warranty, guarantee or certification express or implied, is intended or given with respect to Arcadis' services, opinions, conclusions or recommendations.

Arcadis' observations, the results of any testing and Arcadis' opinions, conclusions and recommendations apply solely to conditions existing at the specific times when and specific locations where Arcadis' investigative work was performed. Arcadis affirms that data gathered and presented in this report was collected in an appropriate manner in accordance with generally accepted methods and practices. Arcadis cannot be responsible for decisions made by our client solely on the basis of economic factors. Observation and testing activities such as those conducted by Arcadis are inherently limited and do not represent a conclusive or complete characterization. Arcadis analyzed only the substances, conditions and locations described in the report at the time indicated. Conditions in other parts of the project site, building or area may vary from conditions at the specific locations where observations were made and where testing was performed by Arcadis. Additionally, other building material hazards which were not identified by Arcadis, may also be present un-accessed areas and in walls, ceilings, cavities, and floors.

This report is expressly for the sole and exclusive use of the Client for whom this report was originally prepared and for the particular purpose outlined in the report. Reuse of this report or any portion thereof for other than its intended purpose, or if modified, or if used by third parties, shall be at the user's sole risk. This report must be presented in its entirety.

Appendix A

Asbestos Summary Table

APPENDIX A – ASBESTOS SUMMARY TABLE

ASBESTOS-CONTAINING BUILDING MATERIALS IN ASSESSED AREA		
Location	**Description**	**Asbestos Content**
Entire Facility	Asbestos-containing mortar in concrete block walls	2.6% Chrysotile Asbestos
Rooms 103A, 123A, C104, C105, C106, 202, 205, 209, 210 and C201.	Asbestos-containing joint compounds on drywall walls	1% Chrysotile Asbestos
Room 123	Asbestos-containing joint compounds on drywall ceiling	1% Chrysotile Asbestos
Rooms 124 and 123B	Asbestos-containing thermal insulation on pipe fittings below ceilings	40% Chrysotile Asbestos
Rooms 122, 123, 123A, 123B, C104, C105, C106, 202, 205, 209, 210, and C201.	Asbestos-containing thermal insulation confirmed and/or assumed to be present on pipe fittings above ceilings	40% Chrysotile Asbestos
Rooms 123 and 123B.	Asbestos-containing cement panels on walls	1.3% Chrysotile Asbestos
Room 123	Asbestos-containing cement panels on ceiling	1.3% Chrysotile Asbestos
Room 123	Asbestos-containing paper present between layers of fiberglass in fiberglass batts on the upper side of ceiling assembly	57.2% Chrysotile Asbestos
Rooms 103A (lower star landings only), 123, 123B, 202, 209 and 210	Asbestos-containing vinyl floor tiles	30.6% Chrysotile Asbestos
Room 122	Asbestos-containing 12” x 12” acoustic ceiling tiles on suspended metal grid system	1.3% Amosite Asbestos
Exterior Brick	Asbestos-containing caulking in control joints	0.62% Chrysotile Asbestos

Appendix B

Laboratory Certificates of Analysis

EMSL Canada Inc.

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EMSL Canada Order 552502488
Customer ID: 55DCSL97B
Customer PO: 30248616-01
Project ID:

Attn: Viraj Daruwala
Arcadis Canada Inc.
8133 Warden Ave, Unit 300
Markham, ON L6G 1B3

Phone: (905) 940-6161
Fax:
Collected:
Received: 2/10/2025
Analyzed: 2/18/2025

Proj: 30248616-01 Jeanne Lajoie

Summary Test Report for Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05

Client Sample ID: 1-A **Lab Sample ID:** **552502488-0001**
Sample Description: 210/Ceiling tile mastic

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	2/14/2025	Brown	0.0%	100%	None Detected	
TEM Grav. Reduction	2/18/2025	Brown	0.0%	100.0%	None Detected	

Client Sample ID: 1-B **Lab Sample ID:** **552502488-0002**
Sample Description: 123A/Ceiling tile mastic

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	2/13/2025	Brown	0.0%	100.0%	None Detected	

Client Sample ID: 1-C **Lab Sample ID:** **552502488-0003**
Sample Description: 123B/Ceiling tile mastic

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	2/13/2025	Brown	0.0%	100.0%	None Detected	

Client Sample ID: 2-A-Vinyl Sheet Flooring **Lab Sample ID:** **552502488-0004**
Sample Description: 205/Vinyl sheet flooring - beige

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	2/14/2025	Yellow/Beige	0.0%	100%	None Detected	
TEM Grav. Reduction	2/18/2025	Yellow/Beige	0.0%	100.0%	None Detected	

Client Sample ID: 2-A-Mastic **Lab Sample ID:** **552502488-0004A**
Sample Description: 205/Vinyl sheet flooring - beige

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	2/14/2025	Gray/Black/Yellow	0.0%	100%	None Detected	
TEM Grav. Reduction	2/18/2025	Gray/Black/Yellow	0.0%	100.0%	None Detected	

Client Sample ID: 2-B-Sheet Flooring **Lab Sample ID:** **552502488-0005**
Sample Description: 205/Vinyl sheet flooring - beige

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	2/13/2025	Beige	20.0%	80.0%	None Detected	

Client Sample ID: 2-B-Mastic/Leveler **Lab Sample ID:** **552502488-0005A**
Sample Description: 205/Vinyl sheet flooring - beige

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	2/13/2025	Gray/Yellow	0.0%	100.0%	None Detected	

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Summary Test Report for Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05

Client Sample ID: 2-C-Sheet Flooring ***Lab Sample ID:*** **552502488-0006**

Sample Description: 205/Vinyl sheet flooring - beige

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	2/13/2025	Beige	20.0%	80.0%	None Detected	

Client Sample ID: 2-C-Mastic/Leveler ***Lab Sample ID:*** **552502488-0006A**

Sample Description: 205/Vinyl sheet flooring - beige

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	2/13/2025	Gray/Yellow	0.0%	100.0%	None Detected	

Client Sample ID: 3-A ***Lab Sample ID:*** **552502488-0007**

Sample Description: Door S07/Interior door caulking - grey

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	2/14/2025	Gray	0.0%	100%	None Detected	
TEM Grav. Reduction	2/18/2025	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 3-B ***Lab Sample ID:*** **552502488-0008**

Sample Description: Door S07/Interior door caulking - grey

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	2/13/2025	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 3-C ***Lab Sample ID:*** **552502488-0009**

Sample Description: Door S07/Interior door caulking - grey

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	2/13/2025	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 4-A ***Lab Sample ID:*** **552502488-0010**

Sample Description: 123A/Ceramic tile grout - 12" tan

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	2/13/2025	Beige	0.0%	100.0%	None Detected	

Client Sample ID: 4-B ***Lab Sample ID:*** **552502488-0011**

Sample Description: 123A/Ceramic tile grout - 12" tan

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	2/13/2025	Beige	0.0%	100.0%	None Detected	

Client Sample ID: 4-C ***Lab Sample ID:*** **552502488-0012**

Sample Description: 123A/Ceramic tile grout - 12" tan

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	2/14/2025	Beige	0.0%	100.0%	None Detected	

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Project ID:

Summary Test Report for Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05

Client Sample ID: 5-A-Mortar ***Lab Sample ID:*** **552502488-0013**

Sample Description: 123A/Ceramic tile mortar - 12" tan

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	2/13/2025	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 5-A-Joint Compound ***Lab Sample ID:*** **552502488-0013A**

Sample Description: 123A/Ceramic tile mortar - 12" tan

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	2/13/2025	Beige	0.0%	100.0%	None Detected	

Client Sample ID: 5-B ***Lab Sample ID:*** **552502488-0014**

Sample Description: 123A/Ceramic tile mortar - 12" tan

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	2/13/2025	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 5-C-Mortar ***Lab Sample ID:*** **552502488-0015**

Sample Description: 123A/Ceramic tile mortar - 12" tan

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	2/14/2025	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 5-C-Joint Compound ***Lab Sample ID:*** **552502488-0015A**

Sample Description: 123A/Ceramic tile mortar - 12" tan

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	2/14/2025	Beige	0.0%	100.0%	None Detected	

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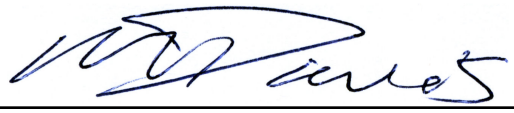
Summary Test Report for Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05

Analyst(s):

Diana Costantino	PLM Grav. Reduction (4)
Nickesh Mistry	PLM (13)
Sarah De Frias	TEM Grav. Reduction (4)
Vanessa Gallego	PLM (3)

Reviewed and approved by:



Matthew Davis or other approved signatory
or Other Approved Signatory

None Detected = <0.1%. EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This is a summary report; official reports are available on LabConnect or upon request and relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 "Interim Method") but augmented with procedures outlined in the 1993 ("final") version of the method. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Estimation of uncertainty is available on request.

Samples analyzed by EMSL Canada Inc. Mississauga, ON NVLAP Lab Code 200877-0

Initial report from: 02/18/202516:41:06

Appendix C

Asbestos Bulk Sample Analyses List

APPENDIX C – ASBESTOS BULK SAMPLE LIST

Samples - This Assessment			
Sample №	**Location**	**Description**	**Asbestos Content**
1-A	Room 210	Ceiling tile mastic	None Detected (PLM)
			None Detected (TEM)
1-B	Room 123A	Ceiling tile mastic	None Detected
1-C	Room 123B	Ceiling tile mastic	None Detected
2-A	Room 205	Vinyl sheet flooring - beige	None Detected (PLM)
			None Detected (TEM)
		Mastic under vinyl sheet flooring	None Detected (TEM)
2-B	Room 205	Vinyl sheet flooring - beige	None Detected
		Mastic/Leveler under vinyl sheet flooring	None Detected
2-C	Room 205	Vinyl sheet flooring - beige	None Detected
		Mastic/Leveler under vinyl sheet flooring	None Detected
3-A	Door S07	Grey caulking on door frame	None Detected (PLM)
			None Detected (TEM)
3-B	Door S07	Grey caulking on door frame	None Detected
3-C	Door S17	Grey caulking on door frame	None Detected
4-A	Room 123A	Grout in 12" tan ceramic floor tile	None Detected
4-B	Room 123A	Grout in 12" tan ceramic floor tile	None Detected
4-C	Room 123A	Grout in 12" tan ceramic floor tile	None Detected
5-A	Room 123A	Mortar bed under 12" ceramic floor tile	None Detected
5-A	Room 123A	Remnant joint compound on mortar sample	None Detected
5-B	Room 123A	Mortar bed under 12" ceramic floor tile	None Detected
5C	Room 123A	Mortar bed under 12" ceramic floor tile	None Detected
5C	Room 123A	Remnant joint compound on mortar sample	None Detected

NOTES:

Bulk samples were analyzed by Polarized Light Microscopy (PLM) analysis, except where "TEM" is noted, in which case Transmission Electron Microscopy analysis was also performed.

APPENDIX C – ASBESTOS BULK SAMPLE LIST

Samples - Previous Assessments			
Sample No.	**Location**	**Description**	**Asbestos Content**
1A	Corridor C103	2' x 4' ceiling tile-pinhole small fissure	None Detected [1]
1B	Corridor C103	2' x 4' ceiling tile-pinhole small fissure	None Detected [1]
1C	Corridor C103	2' x 4' ceiling tile-pinhole small fissure	None Detected [1]
2A	Room 115	2' x 4' ceiling tile-pinhole random fissure	None Detected [1]
2B	Room 135A	2' x 4' ceiling tile-pinhole random fissure	None Detected [1]
2C	Room 135C	2' x 4' ceiling tile-pinhole random fissure	None Detected [1]
3A	Room 101	2' x 4' ceiling tile-textured	None Detected [1]
3B	Room 105	2' x 4' ceiling tile-textured	None Detected [1]
3B	Room 208	2' x 4' ceiling tile-textured	None Detected [1]
4A	Corridor C201	Grout in 2" x 6" ceramic wall tile	None Detected [1]
4B	Corridor C201	Grout in 2" x 6" ceramic wall tile grout	None Detected [1]
4C	Corridor C201	Grout in 2" x 6" ceramic wall tile grout	None Detected [1]
5A	Corridor C201	Mortar bed in 2" x 6" ceramic wall tile	None Detected [1]
5B	Corridor C201	Mortar bed in 2" x 6" ceramic wall tile	None Detected [1]
5C	Corridor C201	Mortar bed in 2" x 6" ceramic wall tile	None Detected [1]
6A	Room A2	Grout in gray with black dot ceramic tile at stair	None Detected [1]
6B	Room B1	Grout in gray with black dot ceramic tile at stair	None Detected [1]
6C	Room B2	Grout in gray with black dot ceramic tile at stair	None Detected [1]
7A	Room A2	Mortar bed in gray with black dot ceramic tile at stair	None Detected [1]
7B	Room B1	Mortar bed in gray with black dot ceramic tile at stair	None Detected [1]
7C	Room B2	Mortar bed in gray with black dot ceramic tile at stair	None Detected [1]
8A	Room 125	Vinyl partition wall cover	None Detected [1]
8B	Room 125	Vinyl partition wall cover	None Detected [1]
8C	Room 125	Vinyl partition wall cover	None Detected [1]
9A	Room 217	Firestop at floor pipe penetration	**4% Amosite** [1]
1A	Room 102C	12"x12" ceiling tile – pinhole and fissure	**10% Amosite** [2,3]
2A	Room 101	12"x12" ceiling tile – deep and light fissure	None Detected [2]
2B	Room 102D	12"x12" ceiling tile – deep and light fissure	None Detected [2]
2C	Room 131	12"x12" ceiling tile – deep and light fissure	None Detected [2]

APPENDIX C – ASBESTOS BULK SAMPLE LIST

Samples - Previous Assessments			
Sample No.	**Location**	**Description**	**Asbestos Content**
3A	Corridor C104	12” vinyl floor tile – off white with maroon fleck	None Detected (PLM) [2] None Detected (TEM) [2]
3B	Corridor C105	12” vinyl floor tile – off white with maroon fleck	None Detected [2]
3C	Corridor C106	12” vinyl floor tile – off white with maroon fleck	None Detected [2]
4A	Corridor C104	Mastic under vinyl floor tile (black)	None Detected [2]
4B	Corridor C105	Mastic under vinyl floor tile (black)	None Detected [2]
4C	Corridor C106	Mastic under vinyl floor tile (black)	None Detected [2]
5A	Room 103	Mastic under 12” vinyl floor tile – beige with green and orange streaks (black)	None Detected [2]
5B	Room 103	Mastic under 12” vinyl floor tile – beige with green and orange streaks (black)	None Detected [2]
5C	Room 103	Mastic under 12” vinyl floor tile – beige with green and orange streaks (black)	None Detected [2]
6A	Room 101B	Mastic under 12” vinyl floor tile – white with black streaks (black)	None Detected [2]
6B	Room 101D	Mastic under 12” vinyl floor tile – white with black streaks (black)	None Detected [2]
6C	Room 101B	Mastic under 12” vinyl floor tile – white with black streaks (black)	None Detected [2]
7A	Room 103	Vinyl baseboard (black)	None Detected (PLM) [2] None Detected (TEM) [2]
7B	Corridor C105	Vinyl baseboard (black)	None Detected [2]
7C	Corridor C106	Vinyl baseboard (black)	None Detected [2]
8A	Room 103	Mastic under vinyl baseboard (yellow)	None Detected [2]
8B	Corridor C105	Mastic under vinyl baseboard (yellow)	None Detected [2]
8C	Corridor C106	Mastic under vinyl baseboard (yellow)	None Detected [2]
9A	Room 101	Vinyl baseboard (grey)	None Detected (PLM) [2] None Detected (TEM) [2]
9B	Room 102B	Vinyl baseboard (grey)	None Detected [2]
9C	Room 102C	Vinyl baseboard (grey)	None Detected [2]
10A	Room 101	Mastic under vinyl baseboard (yellow)	None Detected [2]

APPENDIX C – ASBESTOS BULK SAMPLE LIST

Samples - Previous Assessments			
Sample No.	**Location**	**Description**	**Asbestos Content**
10B	Room 102B	Mastic under vinyl baseboard (yellow)	None Detected [2]
10C	Room 102C	Mastic under vinyl baseboard (yellow)	None Detected [2]
11A	Room 130	6” blue ceramic wall tile – grout	None Detected [2]
11B	Room 130	6” blue ceramic wall tile – grout	None Detected [2]
11C	Room 130	6” blue ceramic wall tile – grout	None Detected [2]
12A	Room 130	6” blue ceramic wall tile – mortar bed	None Detected [2]
12B	Room 130	6” blue ceramic wall tile – mortar bed	None Detected [2]
12C	Room 130	6” blue ceramic wall tile – mortar bed	None Detected [2]
13A	Room 130	1”x2” ceramic floor tile – grout	None Detected [2]
13B	Room 127A	1”x2” ceramic floor tile – grout	None Detected [2]
13C	Room 130	1”x2” ceramic floor tile – grout	None Detected [2]
14A	Room 130	1”x2” ceramic floor tile – mortar bed	None Detected [2]
14B	Room 127A	1”x2” ceramic floor tile – mortar bed	None Detected [2]
14C	Room 130	1”x2” ceramic floor tile – mortar bed	None Detected [2]
15A	Corridor C106	Caulking on door frame (white)	None Detected (PLM) [2] None Detected (TEM) [2]
15B	Room 127	Caulking on door frame (white)	None Detected [2]
15C	Room 130	Caulking on door frame (white)	None Detected [2]
16A	Room 101D	Paint on concrete block	None Detected [2]
16B	Room 105	Paint on concrete block	None Detected [2]
16C	Room 130	Paint on concrete block	None Detected [2]
1A-Mortar	Room 212	Masonry mortar in concrete block	**0.94% chrysotile** [2]
2A-Mortar	Room 117	Masonry mortar in concrete block	**1% chrysotile** [2]
1A	Room 201	Mastic – black in colour under 12” x 12” vinyl floor tile green with white streaks.	None Detected [2]
1B	Room 201	Mastic – black in colour under 12” x 12” vinyl floor tile green with white streaks.	None Detected [2]
1C	Room 201	Mastic – black in colour under 12” x 12” vinyl floor tile green with white streaks	None Detected [2]
S1A-VFT-C101	Corridor C101	12”x12” vinyl floor tiles – beige streaks with cream	None Detected (TEM) [2]
S1B-VFT-102	Room 102	12”x12” vinyl floor tiles – beige streaks with cream	None Detected [2]
S1C-VFT -103A	Room 103A	12”x12” vinyl floor tiles – beige streaks with cream	None Detected [2]
S2A-VFT -106	Room 106	12”x12” vinyl floor tiles – white with green and orange streaks	**30.6% chrysotile (TEM)** [2]
S3A-CT-106	Room 106	12”x12” ceiling tiles – deep fissures	None Detected [2]

APPENDIX C – ASBESTOS BULK SAMPLE LIST

Samples - Previous Assessments			
Sample No.	**Location**	**Description**	**Asbestos Content**
S3B-CT-102B	Room 102B	12”x12” ceiling tiles – deep fissures	None Detected [2]
S3C-CT-127	Room 127	12”x12” ceiling tiles – deep fissures	None Detected [2]
S4A – JC – 15	Room 15	Drywall joint compound	**1% chrysotile** [2]
S5A-VFT-102E	Room 102E	12”x12” vinyl floor tiles – green with white streaks	**30.8% chrysotile (TEM)** [2]
S6A-CT-101A	Room 101A	12”x12” ceiling tiles – wide and thin fissures	**1.3% amosite** [2]
S7A-VFT-101D	Room 101D	12”x12” vinyl floor tiles – white with black streaks	**0.7% chrysotile (TEM)** [2]
S7B-VFT-101B	Room 101B	12”x12” vinyl floor tiles – white with black streaks	None Detected [2]
S7C-VFT-C106	Corridor C106	12”x12” vinyl floor tiles – white with black streaks	None Detected [2]
S8A-PL-130	Room 130	Plaster ceiling	None Detected [2]
S8B-PL-130	Room 130	Plaster ceiling	None Detected [2]
S8C-PL-130	Room 130	Plaster ceiling	None Detected [2]
S9A-CT-135C	Room 135C	2’x4’ suspended ceiling tiles – pinhole (smooth surface), brownish backing	None Detected [2]
S9B-CT-C103	Room C103	2’x4’ suspended ceiling tiles – pinhole (smooth surface), brownish backing	None Detected [2]
S9C-CT-C103	Room C103	2’x4’ suspended ceiling tiles – pinhole (smooth surface), brownish backing	None Detected [2]
S10A–P-STR-INS-217	Room 217	Insulation – Black Tar between canvas and foil	None Detected [2]
S10B–P-STR-INS-217	Room 217	Insulation – Black Tar between canvas and foil	None Detected [2]
S10C–P-STR-INS-217	Room 217	Insulation – Black Tar between canvas and foil	None Detected [2]
S11A-TD-217	Room 217	Tape at the duct – joint tape	None Detected [2]
S12A-VFT-123A	Room 123A	12”x12” vinyl floor tiles - grey with maroon, white and black streaks	None Detected (TEM) [2]
S12B-VFT-123A	Room 123A	12”x12” vinyl floor tiles - grey with maroon, white and black streaks	None Detected [2]
S12C-VFT-122	Room 122	12”x12” vinyl floor tiles - grey with maroon, white and black streaks	None Detected [2]
S13A-UM-B1	Room B1	Black material between concrete wall and metal deck	None Detected [2]
S13B-UM-B1	Room B1	Black material between concrete wall and metal deck	None Detected [2]
S13C-UM-B1	Room B1	Black material between concrete wall and metal deck	None Detected [2]
S15A-FP-C103	Corridor C103	Fireproofing – Fibrous	None Detected [2]

APPENDIX C – ASBESTOS BULK SAMPLE LIST

Samples - Previous Assessments			
Sample No.	**Location**	**Description**	**Asbestos Content**
S15B-FP-C103	Corridor C103	Fireproofing – Fibrous	None Detected [2]
S15C-FP-C103	Corridor C103	Fireproofing – Fibrous	None Detected [2]
S16A-FP-203	Room 203	Fireproofing – Cementitous	None Detected [2]
S16B-FP-204	Room 204	Fireproofing – Cementitous	None Detected [2]
S16C-FP-206	Room 206	Fireproofing – Cementitous	None Detected [2]
2107-03	N/A	Vibration gasket	**35% chrysotile** [2]
2107-08	N/A	MJC	**40% chrysotile** [2]
2107-06	N/A	2' x 2' Transite dot CT	**55% chrysotile** [2]
2107-16	N/A	Fire stop gasket	**65% amosite** [2]
1-A	Room 107	Mastic on asbestos vinyl floor tile – black coloured	None Detected (TEM) [2]
1-B	Room 111A	Mastic on asbestos vinyl floor tile – black coloured	None Detected [2]
1-C	Room 114	Mastic on asbestos vinyl floor tile – black coloured	None Detected [2]
2-A	Room 107	Mastic on vinyl baseboard – brown coloured	None Detected (TEM) [2]
2-B	Room 111A	Mastic on vinyl baseboard – brown coloured	None Detected [2]
2-C	Room C103	Mastic on vinyl baseboard – brown coloured	None Detected [2]
3-A	Room 107	Caulking on door frame – white coloured	<0.25% chrysotile (TEM) [2][4]
3-B	Room 111A	Caulking on door frame – white coloured	None Detected [2]
3-C	Room 114	Caulking on door frame – white coloured	None Detected [2]
4-A	Room 116	Ceiling tile mastic – dark brown coloured	None Detected (TEM) [2]
4-B	Room 123A	Ceiling tile mastic – dark brown coloured	None Detected [2]
4-C	Room 123B	Ceiling tile mastic – dark brown coloured	None Detected [2]
5-A	Room 113	Mastic on sheet flooring – brown coloured and traces of black coloured mastic	None Detected (TEM) [2]
5-B	Room 112	Mastic on sheet flooring – brown coloured and traces of black coloured mastic	None Detected [2]
5-C	Room 112	Mastic on sheet flooring – brown coloured and traces of black coloured mastic	None Detected [2]
6-A	Room 113	Mastic on vinyl baseboard – beige coloured	None Detected (TEM) [2]
6-B	Room 113	Mastic on vinyl baseboard – beige coloured	None Detected [2]
6-C	Room 113	Mastic on vinyl baseboard – beige coloured	None Detected [2]
7-A	Room 119	Mastic on non-asbestos vinyl floor tile – black coloured	None Detected (TEM) [2]
7-B	Room C103	Mastic on non-asbestos vinyl floor tile – black coloured	None Detected [2]

APPENDIX C – ASBESTOS BULK SAMPLE LIST

Samples - Previous Assessments			
Sample No.	**Location**	**Description**	**Asbestos Content**
7-C	Room C103	Mastic on non-asbestos vinyl floor tile – black coloured	None Detected [2]
8-A	Room 108	Mastic on asbestos vinyl floor tile – black coloured	**0.64% chrysotile (TEM)** [1][2]
9-A	Room 109	Mortar in brick	None Detected (TEM) [2]
9-B	Room 112	Mortar in brick	None Detected [2]
9-C	Room 107	Mortar in brick	None Detected [2]
10-A	Room 109	Mortar in concrete block wall	**2.6% chrysotile (TEM)** [2]
11	Room C103	Fireproofing	None Detected [2]
12-A	Room 122	Mastic on non-asbestos vinyl floor tile – black coloured	None Detected (TEM) [2]
12-B	Room 123A	Mastic on non-asbestos vinyl floor tile – black coloured	None Detected [2]
12-C	Room 123A	Mastic on non-asbestos vinyl floor tile – black coloured	None Detected [2]
13-A	Room 122	Mastic on vinyl floor tile – contact cement mixed with black coloured mastic	None Detected (TEM) [2]
13-B	Room 122	Mastic on vinyl floor tile – contact cement mixed with black coloured mastic	None Detected [2]
13-C	Room 122	Mastic on vinyl floor tile – contact cement mixed with black coloured mastic	None Detected [2]
14-A	Room 123	Paper between layers of glass-fibre batt insulation – white coloured	**57.2% chrysotile** [2]
15-A	Room 126	Grout on ceramic wall tile – white coloured	None Detected (TEM) [2]
15-B	Room 129	Grout on ceramic wall tile – white coloured	None Detected [2]
15-C	Room 216	Grout on ceramic wall tile – white coloured	None Detected [2]
16-A	Room 126	Grout on ceramic floor tile – grey coloured	None Detected (TEM) [2]
16-B	Room 129	Grout on ceramic floor tile – grey coloured	None Detected [2]
16-C	Room 216	Grout on ceramic floor tile – grey coloured	None Detected [2]
17-A	Room 107	Caulking in control joint on exterior brick wall – brown coloured	**0.62% chrysotile (TEM)** [2]
18-A	Room 107	Vinyl baseboard – beige coloured	None Detected (TEM) [2]
18-B	Room C103	Vinyl baseboard – black coloured	None Detected [2]
18-C	Room 113	Vinyl baseboard – light brown coloured	None Detected [2]
19-A	Room 113	Vinyl sheet floor – orange/brown coloured	None Detected (TEM) [2]
19-B	Room 113	Vinyl sheet floor – orange/brown coloured	None Detected [2]
19-C	Room 112	Vinyl sheet floor – orange/brown coloured	None Detected [2]
20-A	Room 122	12” x 12” vinyl floor tile – cream coloured with white coloured flecks	None Detected (TEM) [2]

APPENDIX C – ASBESTOS BULK SAMPLE LIST

Samples - Previous Assessments			
Sample No.	**Location**	**Description**	**Asbestos Content**
20-B	Room 122	12" x 12" vinyl floor tile – cream coloured with white coloured flecks	None Detected (2)
20-C	Room 122	12" x 12" vinyl floor tile – cream coloured with white coloured flecks	None Detected (2)
21-A	Room 115	Drywall joint compound on drywall wall	None Detected (2)
21-B	Room 113	Drywall joint compound on drywall wall at door	None Detected (2)
21-C	Room 112	Drywall joint compound on drywall wall south	None Detected (2)
21-D	Room 112	Drywall joint compound on drywall wall at door	None Detected (2)
21-E	Room 109	Drywall joint compound on drywall wall south	None Detected (2)
22-A	Room 116	12" x 12" cellulose ceiling tile – large and small hole style	None Detected (2)
22-B	Room 123A	12" x 12" cellulose ceiling tile – large and small hole style	None Detected (2)
22-C	Room 123B	12" x 12" cellulose ceiling tile – large and small hole style	None Detected (2)

NOTES:

(1) Sample results taken from a report prepared by Arcadis for the Conseil scolaire Viamonde titled *"Designated Substances and Hazardous Material Survey, École élémentaire Jeanne-Lajoie, 150 Carnforth Road, Toronto, Ontario"* dated February 2, 2021

(2) Sample results taken from a report prepared by Arcadis for the Conseil scolaire Viamonde titled *Survey of Asbestos-Containing Materials, École élémentaire Jeanne-Lajoie, 150 Carnforth Road, Toronto, Ontario* dated November 16, 2018.

(3) "Asbestos materials have been removed from areas sampled and are provided for references purposes

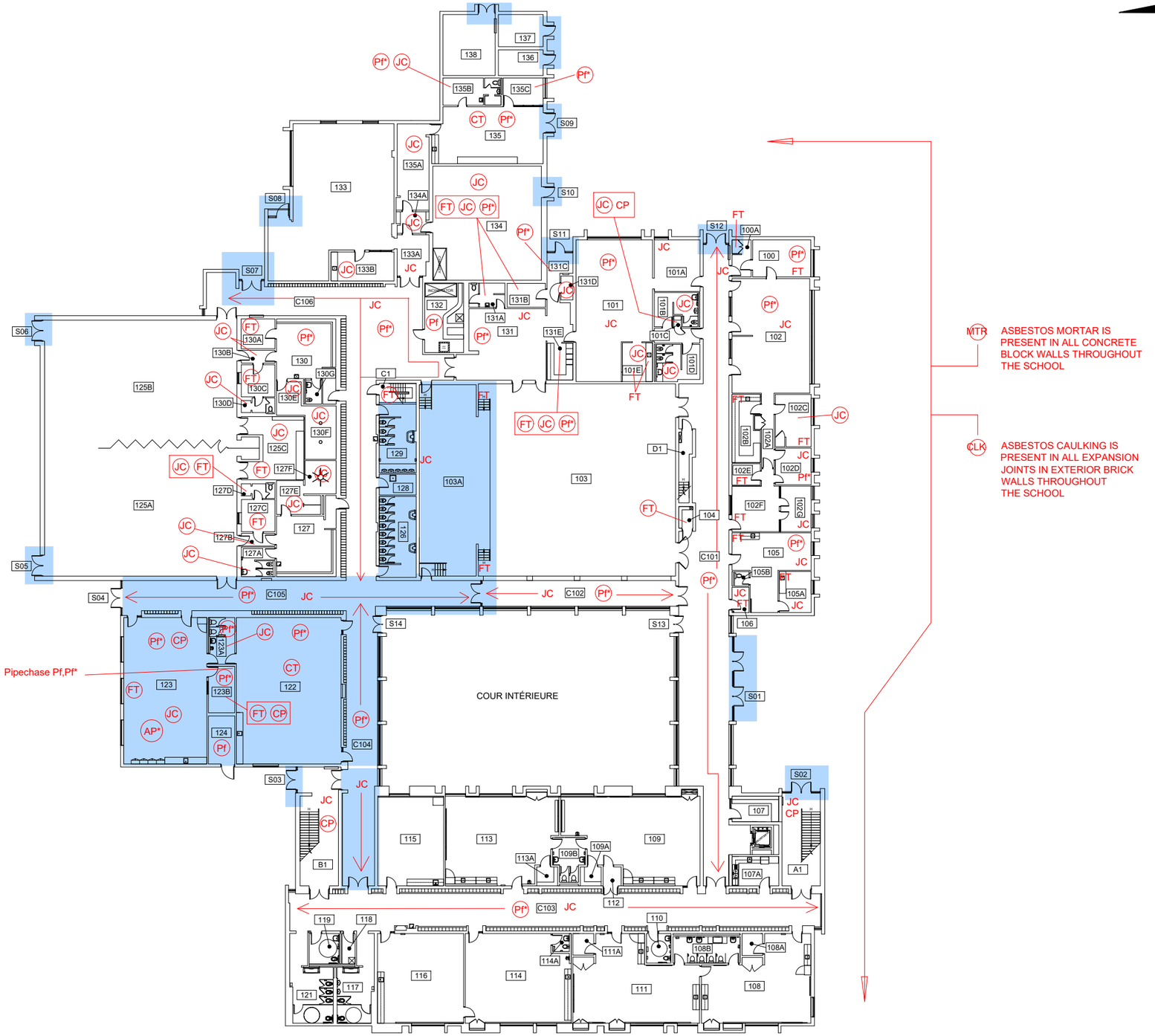
(4) Asbestos-containing material" is defined as material that contains 0.5% or more asbestos by dry weight.

Bulk samples were analyzed by Polarized Light Microscopy (PLM) analysis, except where "TEM" is noted, in which case Transmission Electron Microscopy analysis was also performed.

< = Less than.
Chrysotile = Chrysotile asbestos.
Amosite = Amosite asbestos.

Appendix D

Floor Plans



REZ-DE-CHAUSSÉE

LEGEND:

127	FUNCTIONAL SPACE
◯	THROUGHOUT FUNCTIONAL SPACE
*	ABOVE CEILING ASSEMBLY
Pf	ASBESTOS ON PIPE FITTINGS
CT	ASBESTOS CEILING TILE
FT	ASBESTOS VINYL FLOOR TILE
AP	ASBESTOS PAPER
JC	ASBESTOS DRYWALL JOINT COMPOUND
CP	ASBESTOS CEMENT PIPE
CLK	ASBESTOS CAULKING
MTR	ASBESTOS MORTAR
	STUDY AREA

NOTES:

1.

REVISIONS:

No.	Date:	By:	Revisions

REFERENCE:

1.

ARCADIS

Conseil scolaire Viamonde

PRE-RENOVATION DESIGNATED SUBSTANCES AND HAZARDOUS MATERIALS SURVEY

ÉCOLE ÉLÉMENTAIRE JEANNE-LAJOIE
TORONTO, ONTARIO
LOCATIONS OF
ASBESTOS-CONTAINING MATERIALS
AND STUDY AREAS

FIRST FLOOR PLAN

Drawn By: M.K.R	Approved By: V.D	Project No: 30248616
Date: FEB. 2025	Scale: N.T.S	Drawing No: 30248616-1

CITY:(Read) DIV/GROUP:(Read) DB:(Read) LD:(Opt) PIC:(Opt) PM:(Read) TM:(Opt) LYR:(On)ON=*;OFF=*REF*
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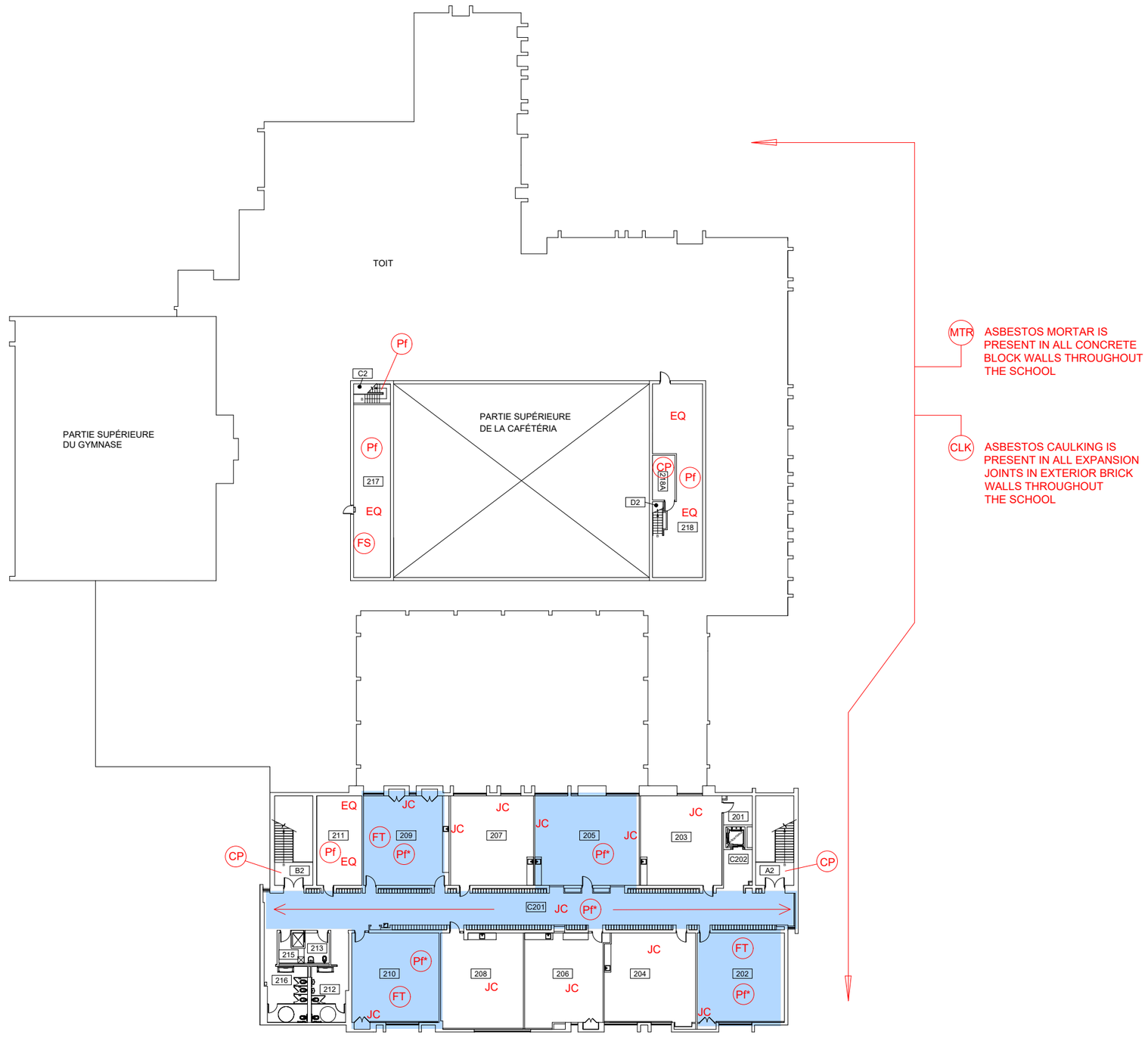

DEUXIÈME ÉTAGE

LEGEND:

127	FUNCTIONAL SPACE
◯	THROUGHOUT FUNCTIONAL SPACE
*	ABOVE CEILING ASSEMBLY
Pf	ASBESTOS ON PIPE FITTINGS
CT	ASBESTOS CEILING TILE
FT	ASBESTOS VINYL FLOOR TILE
AP	ASBESTOS PAPER
JC	ASBESTOS DRYWALL JOINT COMPOUND
CP	ASBESTOS CEMENT PIPE
CLK	ASBESTOS CAULKING
MTR	ASBESTOS MORTAR
FS	ASBESTOS PIPE PENETRATION FIRE STOP
	STUDY AREA

NOTES:

1.

REVISIONS:

No.	Date:	By:	Revisions

REFERENCE:

1.

ARCADIS

Conseil scolaire Viamonde

PRE-RENOVATION DESIGNATED SUBSTANCES AND HAZARDOUS MATERIALS SURVEY

ÉCOLE ÉLÉMENTAIRE JEANNE-LAJOIE
TORONTO, ONTARIO
LOCATIONS OF
ASBESTOS-CONTAINING MATERIALS
AND STUDY AREAS

SECOND FLOOR PLAN

Drawn By: M.K.R	Approved By: V.D	Project No: 30248616
Date: FEB. 2025	Scale: N.T.S	Drawing No: 30248616-2

CITY:(Req'd) DIV/GROUP:(Req'd) DB:(Req'd) LD:(Opt) PIC:(Opt) PM:(Req'd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
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Appendix E

Regulations and Guidelines

Canada Labour Code

Requirements related to disclosing the presence of hazardous substances (including designated substances) in federal government buildings are specified in Part II of the Canada Labour Code, sections 125(1)y and 125(1)(z.14), which state that employers shall:

1.1.1 "*ensure that the activities of every person granted access to the workplace do not endanger the health and safety of employees [Section y]; and*

1.1.2 *take all reasonable care to ensure that all of the persons granted access to the workplace, other than the employer's employees, are informed of every known or foreseeable health or safety hazard to which they are likely to be exposed in the workplace [Section z.14]*".

Canada Occupational Health and Safety Regulations

The requirement for employees to keep and maintain a record of all hazardous substances that are used, produced, handled or stored for use in the work place and the criteria to employ in carrying out an investigation into potential exposure to a hazardous substance are specified in Part X – Hazardous Substances – of the Canada Occupational Health and Safety Regulations.

Asbestos

Occupational Health and Safety (OHS) for federal employees is regulated by the Canada Labour Code (CLC) Part II. The *Canada Occupational Health and Safety Regulations (COHSR), Part X, Hazardous Substances* covers specific requirements related to the management and control of asbestos-containing materials (ACM). The COHSR, Part X, Hazardous Substances, states an employer shall ensure that an employee's exposure to a concentration of airborne asbestos fibres is as close to zero as possible, but in any event the employer shall ensure that the concentration does not exceed the value for airborne asbestos fibres adopted by the American Conference of Governmental Industrial Hygienists in its publication entitled *Threshold Limit Values (TLV) and Biological Exposure Indices (BEI)*, as amended from time to time (currently 0.1 fibre/cm^3 or f/cc). There are also specific requirements for hazard prevention detailed in the Hazard Prevention Program (HPP) in the CLC.

For the purposes of this report, the following federal requirements will be followed, unless provincial requirements are more stringent. Federal legislation and policy referenced in this report includes:

- Canada Labour Code, R.S.C., 1985, c. L-2., as amended up to July 9, 2023
- Canada Occupational Health and Safety Regulations Part X, Hazardous Substances; SOR/86-304, as amended up to April 12, 2023
- Public Services and Procurement Canada Standard on Asbestos Management, 2024
- Public Services and Procurement Canada Directive on Asbestos Management, 2024
- Department of National Defence Canadian Forces Asbestos Management Directive, March 2007
- Government of Canada Technical Guideline to Asbestos Exposure Management Program, January 2018
- Transportation of Dangerous Goods Regulations, SOR/2001-286, as amended up to July 5, 2023

The management and requirements for the potential disturbance of asbestos in buildings is also regulated at the provincial level under the Ontario Occupational Health and Safety Act (OHSA), and Regulation 278/05 – *Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations.*

Disposal of asbestos waste (friable and non-friable materials) is governed by Ontario Regulation 278/05 and by R.R.O. 1990, Reg. 347: General - Waste Management. O.Reg. 278/05 classifies asbestos work operations into three types (Type 1, 2 and 3), and specifies procedures to be followed in conducting asbestos abatement work. The Federal Transportation of Dangerous Goods Regulation set out the requirements for the proper transport of asbestos waste in Ontario.

Paint

In Canada, the Surface Coating Materials Regulations (SOR/2016-193) under the federal Hazardous Products Act provides a concentration of metals that must not be exceeded in surface coatings that are presently sold in this country. Where no criteria is listed, the laboratory detection limit is used.

The *National Plumbing Code* allowed lead as an acceptable material for pipes until 1975 and in solder until 1986.

The Ministry of Labour *Guideline, Lead on Construction Projects*, dated April 2011, provides guidance in the measures and procedures that should be followed when handling lead containing materials during construction projects. In the guideline, lead-containing construction operations are classified into three groups – Type 1 (low risk), Type 2 (medium risk) and Type 3 (high risk) based on presumed airborne concentrations of lead. Any operation that may expose a worker to lead that is not a Type 1, Type 2, or Type 3b operation, is classified as a Type 3a operation.

The *Environmental Abatement Council of Canada (EACC) Lead Guideline* for Construction, Renovation, Maintenance or Repair, October 2014, states the following:

- Paints or coatings containing less than or equal to 0.1% lead by weight (1,000 ppm) are considered low-level lead paints. If these materials are disturbed in a non-aggressive manner, performed using normal dust control procedures, then worker protection from the inhalation of lead is not required.
- Paints or coatings containing between 0.1% and 0.5% (5,000 ppm) lead by weight are considered lead-containing paints. Tasks performed that disturb these materials must be completed using precautionary measures and procedures specified in the guideline.
- Construction operations involving lead-based paints with concentrations greater than 0.5% lead must always be completed in accordance with precautionary measures and procedures specified in the guideline.

For building materials that are to be disposed at a landfill, all lead-based paints and associated substrate (concrete, plaster, wood, etc.) must undergo Toxicity Characteristic Leachate Properties (TCLP) testing to determine disposal procedures. The disposal of lead-containing paint is regulated under the Federal Transportation of Dangerous Goods Regulations and by the Ontario Ministry of Environment, Conservation and Parks.

PCB

The management of equipment classified as waste and containing Polychlorinated Biphenyls (PCBs) at concentrations of 50 parts per million (mg/kg) or greater is regulated by Ontario Regulation 362*, Waste Management – PCBs*. Under this regulation, PCB waste is defined as any waste material containing PCBs in concentrations of 50 mg/kg or greater. Any equipment containing PCBs at or greater than this level, such as transformers, switchgear, light ballasts and capacitors, which is removed from service due to age, failure or as a result of decommissioning, is considered to constitute a PCB waste. Although current federal legislation (effective 1 July 1980) has prohibited the manufacture and sale of new equipment containing PCBs since that time, continued operation of equipment supplied prior to this date and containing PCBs is still permitted. Handling, storage and disposition of such

equipment is, however, tightly regulated and must be managed in accordance with provincial and federal government requirements as soon as it is taken out of service or becomes unserviceable.

Removal of in-service equipment containing PCBs, such as fluorescent light ballasts, capacitors and transformers, is subject to the requirements of the federal *PCB Regulations* (discussed below).

The *PCB Regulations*, which came into force on 5 September 2008, were made under the *Canadian Environmental Protection Act*, 1999 (CEPA 1999) with the objective of addressing the risks posed by the use, storage and release to the environment of PCBs, and to accelerate their destruction. The *PCB Regulations* set different end-of-use deadlines for equipment containing PCBs at various concentration levels.

The Regulations Amending the PCB Regulations and Repealing the Federal Mobile PCB Treatment and Destruction Regulations were published on 23 April 2014, in the Canada Gazette, Part II, and came into force on 1 January 2015. The most notable part of the amendments is the addition of an end-of-use deadline date of 31 December 2025 for specific electrical equipment located at electrical generation, transmission and distribution facilities.

When the PCB materials are classified as waste, jurisdiction falls under the Ontario Ministry of the Environment and Climate Change (MOECC) and O.Reg. 362. All remedial and PCB management work must be carried out under the terms of a Director's Instruction issued by an MOECC District Office (for quantities of PCB fluid greater than 50 litres). The PCB waste stream, regardless of quantity, must be registered with the MOECC, in accordance with O.Reg. 347, *General - Waste Management*. O.Reg. 362 applies to any equipment containing greater than 1 kg of PCBs.

The Federal Transportation of Dangerous Goods Regulation sets out the requirements for the proper transport of PCB waste across provincial boundaries.

Suspect Visible Mould

At present, there are no specific laws or regulations governing acceptable levels of mould in buildings. The lack of specific regulatory standards is due in part to an inability to establish exposure-response relationships. Variation in individual susceptibility, limitations in sampling and analytical techniques, and the vast number of fungal agents and their products make it difficult to establish safe levels of exposure for all individuals. With a lack of defined exposure criteria, current Health Canada and other agency guidelines on the assessment and control of mould contamination in public buildings are largely based on prudent avoidance (i.e., remove any indoor growth or amplification site of mould, regardless of the concentration of moulds or their products in the indoor environment).

Although there are currently no regulations in Canada pertaining specifically to mould in buildings, occupational health and safety regulations typically require employers to take every precaution reasonable in the circumstances for the protection of workers.

Control of exposure to mould is required under Section 25(2)(h) of the Ontario *Occupational Health and Safety Act*, which states that employers shall take every precaution reasonable in the circumstances for the protection of workers. Recommended work practices are outlined in the following documents:

- Canadian Construction Association. Mould Guidelines for the Canadian Construction Industry. Standard Construction Document CCA 82 2004.
- Environmental Abatement Council of Canada (EACC) Mould Abatement Guideline Edition 3, 2015.

Mercury

In Canada, the Surface Coating Materials Regulations (SOR/2005-109) under the federal *Hazardous Products Act* provides a concentration of mercury that must not be exceeded in surface coatings that are presently sold in this country. This value was set at 10 ppm in 2005. However, it is important to note that there is not a direct correlation between the concentration of mercury in a material to the potential occupational exposure if the material is disturbed.

Waste light tubes generated during renovations or building demolition and waste mercury from equipment must either be recycled or disposed of in accordance with the requirements of Ont. Reg. 347 - *Waste Management, General*. Waste mercury in amounts less than 5 kg (per month) are exempt from the generator registration requirements prescribed by O.Reg. 347 – *Waste Management – General*. Waste mercury from mercury switches or gauges should, however, be properly collected and shipped to a recycling facility or disposed of as a hazardous waste. Removal of mercury-containing equipment (e.g., switches, gauges, controls, etc.) should be carried out in a manner which prevents spillage and exposure to workers.

Silica

The Ministry of Labour *Guideline, Silica on Construction Projects*, dated April 2011, provides guidance in controlling exposure to silica dust during construction activities. In the guideline, silica-containing construction operations are classified into three groups - Type 1 (low risk), Type 2 (medium risk) and Type 3 (high risk) based on presumed airborne concentrations of respirable crystalline silica in the form of cristobalite, tridymite, quartz and tripoli.

Additional precautionary measures should also be implemented for certain types of materials (e.g., plaster and texture coat materials, including non-asbestos applications, concrete block, etc.). For minor disturbances such as drilling, a HEPA-filtered attachment should be used. For removal of more than a minor amount of material, enclosures should be constructed for dust control and separation of the work area from adjacent areas.

Halocarbon Containing Equipment (HCE)

Ontario Regulation 463/10 – *Ozone Depleting Substances and Other Halocarbons*, applies to the use, handling and disposal of Class 1 ozone-depleting substances, including various chlorofluorocarbons (CFCs), halons and other halocarbons, Class 2 ozone-depleting substances, including various hydrochlorofluorocarbons (HCFCs) and halocarbons, and other halocarbons, including fluorocarbons (FCs) and hydrofluorocarbons (CFCs). The most significant requirements for handling of ozone-depleting substances (ODS') and other Halocarbons, which include, for example, refrigerants used in refrigeration equipment and chillers, include the following:

- certification is required for all persons testing, repairing, filling or emptying equipment containing ODS' and other halocarbons;
- the discharge of a Class 1 ODS or anything that contains a Class 1 ODS to the natural environment or within a building is prohibited;
- the making, use of, selling of or transferring of a Class 1 ODS is restricted to certain conditions;
- the discharge of a solvent or sterilant that contains a Class 2 ODS is prohibited;
- the making, use of, selling of or transferring of a solvent or sterilant that contains a Class 2 ODS is restricted to certain conditions;
- fire extinguishing equipment that contains a halon may be discharged to fight fires, except fires for firefighting training purposes;

- portable fire extinguishing equipment that contains a halon may be used or stored if the extinguisher was sold for use for the first time before 1 January 1996;
- records of the servicing and repair of equipment containing ODS' and other halocarbons must be prepared and maintained by the owner of the equipment; and
- equipment no longer containing ODS' and other halocarbons must be posted with a notice completed by a certified person.

Ontario Regulation 347, *General – Waste Management*, has also been amended to provide for more strict control of CFCs. The requirements under the amended regulation apply primarily to the keeping of records for the receipt or recycling of CFC waste.

On federal land, aboriginal land and federal works, buildings and undertakings, the Federal Halocarbon Regulations, 2022 (SOR/2022-110) applies. The regulations prohibit the release of halocarbons contained in refrigeration systems, air conditioning systems, fire extinguishers (except to fight a fire that is not a fire caused for training purposes) or containers or equipment used in the re-use, recycling, reclamation or storage of a halocarbon.

The regulations also impose restrictions on the servicing and dismantling, disposing of or decommissioning of any system containing halocarbons and requires the recovery of halocarbons into an appropriate container by a certified person. The regulation also details an owner's record-keeping obligations.

The Federal Transportation of Dangerous Goods Regulation set out the requirements for the proper transport of halocarbon waste in Ontario.

Other Biological Hazards

Hantaviruses are found in the droppings, urine and saliva of infected rodents and humans can contract the virus from breathing in airborne particles or from being bitten. In Canada, a hantavirus capable of causing disease in humans – named Sin Nombre virus – has been identified in deer mice. Although the risk in Canada is low, when it happens, the disease can be very severe.

Exposure to hantaviruses can cause a rare, but often fatal, disease called Hantavirus pulmonary syndrome (HPS). The earliest documented case of HPS in Canada was contracted in Alberta in 1989. Since then, there have been over 70 confirmed cases. Most of the cases occurred in western Canada (Manitoba, Saskatchewan, Alberta and British Columbia), except for one case in Quebec.[1]

Hantavirus is typically transmitted by breathing particles in air from the droppings, urine and saliva of infected rodents. However, there have been a small number of reported cases of HPS believed to have been contracted through rodent bites.

Workers removing accumulations of bird or bat droppings are at risk of exposure to airborne fungal spores (and other microbial hazards) likely to be released when this material is disturbed. Bird and bat droppings should be presumed to be contaminated with the fungi Histoplasma capsulatum, Cryptococcus neoformans, and other infectious hazards. The spores of some of these organisms can remain infectious for decades after their growth in the guano has ceased. Many of these microorganisms are known to cause respiratory infections in workers exposed during construction or maintenance disturbance.

[1] Health Canada – "It's Your Health – Hantaviruses" – August 2009.

Toxic and Flammable Chemical

Toxic and Flammable chemicals are regulated in Ontario under OSHA. If a worker is or may be exposed to a chemical agent, or biological agent designated as a toxic substance, the employer must ensure that the identity of the chemical agent or toxic agent, its possible effects on worker health and safety and any precautions required to protect the health and safety of the worker are clearly indicated by labels, SDSs, or other similar means and the information required is clearly communicated to the worker. Written procedures must be prepared and implemented to eliminate or minimize a risk of exposure to a chemical agent or toxic agent by any route that could cause an adverse health effect, and to address emergency and cleanup procedures in the event of a spill or release of a chemical agent or toxic agent.

Radioactive Materials

Radioactive Materials are regulated in Ontario under Radiation Protection Regulations SOR/2003-203 and Nuclear Substances and Radiation Devices Regulations, SOR/2000-207, s. 6, as amended up to March 13, 2015, under Nuclear Safety and Control Act. An exposure control plan is required if a worker's radiation exposure exceeds or may exceed the applicable action level.

Appendix F

Survey Methodology

Sampling activities were conducted in accordance with Arcadis' Standard Operation Procedures which take into account current federal and provincial regulations pertaining to such work (i.e., sampling procedures, required number of samples and laboratory analytical procedures).

Representative bulk samples were collected of accessible suspect paint, and asbestos-containing materials in sufficient quantities for laboratory analysis. Samples were sealed in polyethylene zip-lock bags labeled with the sample number, suspect material description, and sample location. As part of sampling procedures, sampling tools were cleaned between sample collection events to avoid the potential for cross-contamination of samples.

All sample bags were compiled in order and placed into a single container accompanied with a chain of custody form outlining the project information, date, building location, number of samples, and sample description. Samples were submitted to the analytical laboratory in a sealed container via courier.

Asbestos

Asbestos has been widely used in buildings, both in friable applications (materials which can be crumbled, pulverized or powdered by hand pressure, when dry) such as pipe and tank insulation, sprayed-on fireproofing and acoustic texture material and in non-friable manufactured products such as floor tile, gaskets, cement board and so on. The use of asbestos in friable applications was curtailed around the mid-1970s and, as such, most buildings constructed prior to the mid to-late 1970s contain some form of friable construction material with an asbestos content. Asbestos vermiculite has been reported to be used up until about 1990. The use of asbestos in certain non-friable materials continued beyond the mid-1970s and are commonly found in buildings constructed up to and including the mid-1980s, with some materials still in production through 2018. Manufacturing, importation, and use of asbestos was banned in Canada in 2018.

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 are determined by visual examination, available information on the phases of the construction and prior renovations.

Bulk sampling protocols followed the ASTM E2356 Standard, which indicates requirements for the number of samples to collect for each homogeneous material. The table below provides an outline of the minimum number of samples to be collected from the ASTM E2356 Standard.

Table F-1: Bulk Material Sample Quantities

Type of Material	Size of Area of Homogeneous Material	Minimum Number of Samples Collected
Any homogeneous material, including but not limited to fireproofing, drywall joint compound, ceiling tile stucco, acoustical and stipple finishes, and visually similar floor tiles	Less than 90 m^2 (<1,000 ft^2)	3
	90 m^2 or more, but less than 450 m^2 (1,000-5,000 ft^2)	5
	450 m^2 or more (>5,000 ft^2)	7

In some cases, manufactured products such as asbestos cement pipe were visually identified without sample confirmation.

Flooring mastic/adhesive were only sampled and analyzed if present on the underside of flooring samples (vinyl floor tile and vinyl sheet flooring) in sufficient quantity for laboratory analysis.

Attempts to distinguish and delineate asbestos-containing drywall compound from new non-asbestos drywall compound is often unachievable. Arcadis collected drywall joint compound samples from exterior walls, columns or other locations which are unlikely to have been renovated in an attempt to determine the presence of asbestos in the original drywall compound.

Arcadis samples roofing felts only at the Clients request. A temporary repair will be made with asphalt-based mastic and fibreglass mesh. A more permanent repair is required if the roofing or the building is to remain in use for any extended period of time. Arcadis will not be responsible or liable for leaks or water damage caused by sampling and or repair.

Arcadis conducts limited demolition of masonry block walls (core holes) to investigate for loose fill insulation. The core holes are temporarily patched with expanding foam.

Arcadis will submit the bulk samples to a NVLAP accredited laboratory for analysis. The analysis is performed in accordance with Test Method EPA/600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials, July 1993.

EPA Method 600 states that materials characterized by interfering binder/matrix or low asbestos content may require additional gravimetric reduction sample treatment beyond routine polarized light microscopy (PLM) analysis (e.g., dissolution with hydrochloric acid, treatment with organic solvents or ashing in a muffle furnace or low temperature plasma asher to remove unwanted components). Arcadis will submit one sample of each sample set (3) of vinyl floor tiles to be analyzed by transmission electron microscopy (TEM) if the first two samples are reported negative by PLM.

The asbestos analysis was completed using a stop positive approach. Only one result of greater than the regulated criteria is 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 will stop analyzing samples from a homogeneous material once greater than the criteria was detected in any of the samples of that material. All samples of a homogeneous material will be analyzed if no asbestos is detected.

Bulk samples of materials which could contain asbestos were collected and submitted to EMSL Canada Inc. (EMSL) for analysis of asbestos content. Asbestos-containing materials are defined as 0.5% or greater, or any amount if vermiculite.

Classification, Condition and Accessibility

Spray Applied Fireproofing, Insulation and Texture Finishes

To evaluate the condition of ACM spray applied as fireproofing, thermal insulation, or texture, decorative or acoustic finishes, the following criteria are applied:

GOOD

Surface of material shows no significant signs of damage, deterioration, or delamination. Up to 1 percent visible damage to surface is allowed within range of **GOOD**. Evaluation of sprayed fireproofing requires the surveyor to be familiar with the irregular surface texture typical of sprayed asbestos products. **GOOD** condition includes un-encapsulated or unpainted fireproofing or texture finishes, where no delamination or damage is observed, and encapsulated fireproofing or texture finishes where the encapsulation has been applied after the damage or fallout occurred.

POOR

Sprayed materials show signs of damage, delamination, or deterioration. More than 1 percent damage to surface of ACM spray.

In observation areas where damage exists in isolated locations, both **GOOD** and **POOR** condition may be reported. The extent or percentage of each condition will be recorded on the survey or re-assessment form.

NOTE: **FAIR** condition is not utilized in the evaluation of the sprayed fireproofing, sprayed insulation, or texture coat finishes.

The evaluation of ACM spray applied as fireproofing, non-mechanical thermal insulation, or texture, decorative or acoustic finishes which are present above ceilings, may be limited by the number of observations made, and by building components such as ducts or full height walls that obstruct the above ceiling observations. Persons entering the ceiling are advised to be watchful for ACM **DEBRIS** prior to accessing or working above ceilings in areas of buildings with ACM regardless of the reported condition.

Mechanical Insulation

The evaluation of the condition of mechanical insulation (on boilers, breaching, ductwork, piping, tanks, equipment etc.) utilizes the following criteria:

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 surface 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 should be minor to none.

POOR

Original insulation jacket is missing, damaged, deteriorated, or delaminated. Insulation is exposed and significant areas have been dislodged. Damage cannot be readily repaired.

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 not possible to observe the full length of mechanical insulation from all angles.

Non-friable and Potentially Friable Materials

Non-friable materials generally have little potential to release airborne fibres, even when damaged by mechanical breakage. However, some non-friable materials, i.e., exterior asbestos cement products, may have deteriorated so that the binder no longer effectively contains the asbestos fibres. In such cases of significantly deteriorated non-friable material, the material should be treated as a friable product.

ACM DEBRIS

DEBRIS from Friable ACM

The presence of fallen ACM is noted separately from the presumed friable ACM source (sprayed fireproofing, thermal insulation, texture, decorative or acoustic finishes or mechanical insulation) and is referred to as **DEBRIS**.

DEBRIS from Damaged Non-Friable ACM

The presence of fallen ACM from damaged non-friable ACM is also reported separately from the non-friable ACM source. Only fallen non-friable ACM that has become friable is reported as **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. Workers are advised to be watchful for the presence of **DEBRIS** prior to accessing or working in proximity to mechanical insulation or above ceilings in areas of buildings with ACM regardless of the reported presence or absence of **DEBRIS**.

Paint

Arcadis collects samples of distinctive paint finishes and surface coatings present in more than a limited application, where removal of the paint is possible. Arcadis collects samples by scraping the painted finish to include base and covering applications. Paint and surface coatings are evaluated for condition. All paints will be analyzed for arsenic, lead, and mercury. At least one sample per building will be analyzed for PCBs where the age of construction is pre-1985.

When evaluating the condition of paints, an attempt is made to determine whether the deterioration is due to a moisture problem or some other existing building deficiency. **"Poor"** surfaces are considered to be a hazard and should be corrected. "**Fair"** surfaces should be repaired but are not yet considered to be a hazard; if not repaired, they should be monitored frequently. "**Good/intact"** surfaces should be monitored to ensure that they remain in a nonhazardous condition.

In addition, the presence of paint debris is considered in evaluating conditions. Given the variety of paint uses, there are many applications that can have a tendency for the paint to "wear" from the surface slowly, over an extended period of time. Conditions where paint has worn from a surface are worth noting for maintenance discussions (i.e., related to re-coating the surface should, for example, the coating provide weather protection), however, in the absence of loose paint chip debris/dust, such conditions would not represent a potential exposure situation related to lead.

The condition evaluation criteria for paints is summarized in the table below.

Table F-2: Paint Condition Categories

Type of Building Component[1]	Total Area of Deteriorated Paint on Each Component		
	Good/Intact	Fair[2]	Poor[3]
Exterior components with large surface areas.	Entire surface is intact.	Less than or equal to 10 square feet	More than 10 square feet
Interior components with large surface areas (walls, ceilings, floors, doors.	Entire surface is intact.	Less than or equal to 2 square feet	More than 2 square feet
Interior and exterior components with small surface areas (windowsills,	Entire surface is intact.	Less than or equal to 10% of the total surface area of the	More than 10% of the total surface area of the component

NOTES:

1 Building component in this table refers to each individual component or side of building, not the combined surface area of all similar components in a room (e.g., a wall with 1 square foot of deteriorated paint is in "fair" condition, even if the other three walls in a room are intact).

2 Surfaces in "fair" condition should be repaired and/or monitored but are not considered to be "lead-containing paint hazards".

3 Surfaces in "poor" condition are considered to be "lead-containing paint hazards" and should be addressed through abatement or interim controls.

Analysis for lead in paints or surface coatings is performed in accordance with US EPA SW-846 Method No. 3050B/Method No. 7000B; Flame Atomic Absorption (FAA) at an accredited laboratory by the American Industrial Hygiene Association (AIHA). For the purpose of this report a criteria of Choose an item. will be used to define lead-based paint.

Analysis for mercury in paint is performed in accordance with EPA Cold Vapor Atomic Absorption (CVAA) via 7471B. For the purpose of this project, a criteria of 10 ppm is used as stipulated in the Surface Coating Materials Regs (SOR/2016-93).

Analysis for arsenic in paint is performed in accordance with Individual Elements by EPA Inductively Coupled Plasma (ICP) via 6010D. There is no current regulated criteria; therefore, the laboratory detection limit of 10 ppm is used for this project.

Analysis for PCB is performed via EPA SW 846 3540C/8082A. For the purpose of this project a criteria of 50ppm or greater is used based on the threshold given in Canadian Environmental Protection Act (1999) SOR/2008-273.

Lead Products

Lead is a heavy metal that can be found in construction materials such as paints, coatings, mortar, concrete, pipes, solder, packings, sheet metal, caulking, glazed ceramic products and cable splices. Lead building products were identified by visual observation only.

Leachate Testing

Representative samples are collected of each material (eg. wood, gypsum, concrete) coated with metal-containing paint. Samples are submitted for analysis to EMSL Canada Inc. OR Bureau Veritas labs, Burnaby, BC, NVLAP accredited Laboratory in accordance with the Toxicity Characteristic Leaching Procedure (TCLP) outlined in US EPA SW-846 Method 1311 and Method 6010D.

Results are compared to Ontario Ministry of Environment, Conservation and Parks Leachable toxic waste means waste when subject to the TCLP leaks or spills which may lead to the escape of hazardous waste from the facility or may pose a threat to human health.

Silica

Silica exists in several forms of which crystalline silica is of most concern with respect to potential worker exposures. Quartz is the most abundant type of crystalline silica. Some commonly used construction materials containing silica include brick, refractory brick, concrete, concrete block, cement, mortar, rock and stone, sand, fill dirt, topsoil and asphalt containing rock or stone.

Arcadis identified building materials suspected of containing crystalline silica (e.g., concrete, cement, tile, brick, masonry, mortar) by knowledge of current and historic applications and visual inspection only. Arcadis did not perform sampling of these materials for laboratory analysis of crystalline silica content.

Mercury

Mercury has been used in electrical equipment such as alkaline batteries, fluorescent light bulbs (lamps), high intensity discharge (HID) lights (mercury vapour, high pressure sodium and metal halide), “silent switches” and in instruments such as thermometers, manometers and barometers, pressure gauges, float and level switches and flow meters. Mercury-containing lamps, the bulk of which are 1.22 m (four feet) fluorescent lamps contain between 7 and 40 mg of mercury each. Mercury compounds have also been used historically as additives in latex paint to protect the paint from mildew and bacteria during production and storage.

Building materials/products/equipment suspected to contain mercury were identified by visual inspection only. Dismantling of equipment suspected of containing mercury was not performed. Mercury spills or damaged mercury-containing equipment were recorded where observed.

Polychlorinated Biphenyls (PCBs)

In most institutional, commercial facilities and in smaller industrial facilities, the primary source of equipment potentially containing PCBs is fluorescent and H.I.D. light ballasts. Small transformers may also be present. In larger industrial facilities, larger transformers and switch gear containing, or potentially containing, PCBs may also be present.

PCBs were also commonly added to industrial paints from the 1940s to the late 1970s. PCBs were added directly to the paint mixture to act as a fungicide, to increase durability and flexibility, to improve resistance to fires and to increase moisture resistance. The use of PCBs in new products was banned in Canada in the 1970s. PCB amended paints were used in specialty industrial/institutional applications prior to the 1970s including government buildings and equipment such as industrial plants, radar sites, ships as well as non-government rail cars, ships, grain bins, automobiles and appliances.

Arcadis determined the potential for light ballast and wet transformers to contain PCBs 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. Arcadis recorded spills or leakage of suspect PCB-containing fluids where observed or identified in historical documents. Fluids (mineral oil, hydraulic or Askaral) in transformers, capacitors or other equipment are not sampled for PCB content. Capacitors which were installed in 1980 or earlier are assumed to contain PCBs.

Window, door, penetration, and expansion caulking were sampled for PCB content in buildings older than 1985. The material was considered a PCB solid if PCB content is 50ppm or greater based on the threshold given in PCB Regulations, SOR/2008-273.

Halocarbon-Containing Equipment (HCE)

Arcadis determines the potential presence of halocarbons (chlorofluorocarbons, hydrochlorofluorocarbons, hydrofluorocarbons, halons, etc.) in air conditioning units, chillers, commercial coolers, and fire suppression systems by visual inspection of manufactures' labels or plates, maintenance records, or logbooks, etc.

Suspect Visible Mould

Moulds are forms of fungi that are found everywhere both indoors and outdoors all year round. Outdoors, moulds live in the soil, on plants and on dead and decaying matter. More than 1000 different kinds of indoor moulds have been found in buildings. Moulds spread and reproduce by making spores, which are all small and light-weight, able to travel through air, capable of resisting dry, adverse environmental conditions, and hence capable of surviving a long time. Moulds need moisture and nutrients to grow and their growth is stimulated by warm, damp and humid conditions.

Arcadis identified the presence of any suspect visible mould or water damage observed during the course of our site investigation. Suspect visible mould is typically a coloured, textured substance or discolouration or staining on a building material surface which, based on our experience, may be mould growth. The adjective suspect is used where the presence of mould has not been confirmed by laboratory analysis.

Other Biological Hazards (Rodent Droppings)

Arcadis identifies other biological hazards by visual observation only. Areas where rodent or bird droppings are noticed will be noted and photographed. Arcadis does not perform sampling of these materials for laboratory analysis, unless specifically requested by the Client.

Toxic or Flammable Chemicals

Arcadis identifies toxic or flammable chemical by visual observation only. Areas used to store toxic and flammable chemicals will be noted and photographed.

Radioactive Materials

Arcadis identifies radioactive materials, such as smoke detectors, by visual observation only. Suspect areas where radioactive materials are present will be noted and photographed. Testing for radiation is not conducted.

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