Addendum No. 1

BARRY BRYAN ASSOCIATES

Project No: 25252

Date: May 22, 2026

Tender No: TDSB TR-25-0957

Project: **ACCESSIBILITY UPGRADES – KEELE STREET PUBLIC SCHOOL**
Toronto District School Board

The following information supplements and/or supersedes the bid documents issued on Toronto District School Board.

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.

SPECIFICATIONS

1.1 DIVISION 01 21 00 ‘Allowances’

.1 Add section 01 21 00. Refer to attached.

1.2 DIVISION 08 71 10 Door Hardware

.1 Replace Part 2 Products, 2.1 Materials, Sentence 5 with the following

” Provide interchangeable construction core. Keying for TDSB Medeco cylinders shall be installed separately by Others.”

DRAWINGS

1.3 ARCHITECTURAL DRAWINGS

.1 Delete the following drawings entirely and replace with new drawings issued as part of this addendum. Changes are bubbled on the drawings:

a. BBA Drawing A203 ‘PART FLOOR PLANS & SHCEDULES’ revisions 1, dated May 22, 2026.

GENERAL

1.4 Regarding new Doors, GC to provide interchangeable construction core. Keying for TDSB Medeco cylinders shall be installed separately by Others.

1.5 Refer to the Attached MCW Consultants Ltd. Addendum #001 dated May 22, 2026.

250 Water St. Suite 201
Whitby, ON, L1N 0G5
(905) 666 – 5252
www.bba-archeng.com

1.6 The General Contractor shall coordinate with the local fire department to revise, submit, and obtain approval for the temporary fire safety and exit layout plan associated with the required closure of any means of egress during construction. The Contractor shall implement all required temporary life safety measures, maintain compliance with applicable fire and building codes at all times, and ensure that all occupants are notified of the revised exit arrangements prior to commencement of the work.

1.7 Contractor is to be aware of on-site daycare and pool permits during specified times. Scheduling and coordination of construction activities shall be carried out in a manner as to not impede, disrupt or in any way negatively impact the daily activities or safety of the users. Work can be performed during regular hours. Where the work will impact the users, it shall be carried out outside of regular hours to maintain the schedule. Refer to attached plans identifying areas of work and permit occupancy.

QUESTIONS AND ANSWERS

1.8 Question: Specification does not indicate the gauge of doors, please advise.

Answer: Doors shall be 16 gauge.

End of Addendum No. 1

Yours very truly,

Barry Bryan Associates
Architects, Engineers, Project Managers

Crystal Gardner, M.Arch., OAA

CG/gs

Attachments:
- 01 21 00 Allowances (2 pages)
- BBA Drawing A203 (1 pages)
- Door Hardware Specifications (2 pages)
- MCW Consultants Ltd.'s Addendum #001
- Keele Tenant Floor Plan (1 pages)

I/We hereby acknowledge receipt of this Addendum.

Signature (signing officer of firm)

BARRY BRYAN ASSOCIATES

Position

_____

Name of Firm

One copy of the addendum must be signed and returned with the completed tender, or the tender submitted shall be rejected.

PART 1 GENERAL

1.1 Section Includes

.1 Cash Allowances

1.2 References

.1 Canadian Construction Documents Committee CCDC2-2020 Stipulated Price Contract including the Supplementary Conditions.

1.3 Cash Allowances

.1 Refer to General Conditions, GC4.1.

.2 Unless otherwise specified, Cash Allowances shall cover the cost of the materials and equipment delivered F.O.B. job site, and all applicable taxes, except Harmonized Sales Tax. The Contractor's handling costs on the site, labour, installation costs, overhead and profit and other expenses shall be included separately in the Stipulated Price and not in the Cash Allowance.

.3 Where it is specified that a Cash Allowances is to include both supply and installation costs, such allowances shall cover the cost of the materials and equipment delivered and unloaded at the site, all applicable taxes and the contractor’s handling costs on the site, labour and installation costs and other expenses, except overhead and profit which shall be included separately in the Stipulated Price.

.4 If the cost of the Work covered by Cash Allowances, when determined, is more or less than the allowance, the Contract Sum shall be adjusted accordingly.

.5 In the event that the cost of the work covered by Cash Allowances should exceed the cash allowance, while the Contract Sum will be adjusted in conformity therewith, there shall be no adjustment to the Contractor's fee or other expenses such as overhead or profit, it being understood and agreed that the contract sum includes the Contractor's expenses and profit for all Cash Allowances whether or not they are exceeded.

.6 Progress payments on accounts of work authorized under Cash Allowances shall be included in monthly certificate for payment.

.7 Expenditures from Cash Allowances shall be authorized by Site Instruction, Change Directive or Change Order.

.8 Cash Allowance for independent inspection and testing shall cover the cost of such services as provided by independent testing agency only. The Contractor's cost for labour, overhead and other expenses related to independent inspection and testing shall be included separately in the Stipulated Price and not in the Cash Allowance.

.9 Cause the work covered by Cash Allowances to be performed for such amounts and by such persons as the Consultant may select and direct or as required by the project drawings and specifications.

.10 Cash Allowance to include the following refer to the TPS for amounts to be carried.

.1 Independent Inspection and Testing:

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

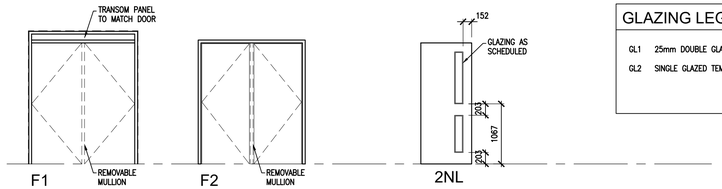
.1 Not used

End of Section

DOOR AND FRAME SCHEDULE

DOOR NO.	SIZE AND THICKNESS	TYPE	MATERIAL	FINISH	GLASS	FRAME TYPE	FRAME DETAIL HEAD	FRAME DETAIL JAMB	FRAME MATERIAL	FRAME FINISH	FIRE RATING	DOOR HARDWARE	REMARKS
209A	915x2150x45 900x2150x45	2NL	HM	PAINT	GL1	F1	–	–	PS	PAINT	–	NOTE: REFER TO DOOR HARDWARE SCHEDULE FOR SPECIFICATIONS	MATCH EXISTING DOOR OPENING USE EXISTING BUZZERS AND CARD READER
209B	915x2150x45 900x2150x45	2NL	HM	PAINT	GL2	F2	–	–	PS	PAINT			

DOOR HARDWARE: 1 — HINGE; DOOR STOP; DOOR STOP; MOP PLATE; THRESHOLD; WEATHER STRIPPING; DOOR CLOSER; PANIC HARDWARE; LOCKSET; ELECTRIC STRIKE; DOOR & FRAME MARKER



FRAME TYPES

DOOR TYPES

GLAZING LEGEND

GL1 25mm DOUBLE GLAZED UNITS

GL2 SINGLE GLAZED TEMPERED GLASS

ROOM SCHEDULE

ROOM NO.	ROOM NAME		FLOOR	BASE	WALLS NORTH	WALLS EAST	WALLS SOUTH	WALLS WEST	CEILING	CEILING HEIGHT	REV.	REMARKS
B07	EXISTING CORRIDOR	MAT.	EX	EX	–	EX CB	EX CB	EX CB	EX	EX		PROTECT EXISTING FINISHES ALLOW NEW PAINT AND BASE AT WALL AFFECTED BY NEW INFILL.
		FIN.	EX	EX	–	P	EX	EX	–	–		
B08	EXISTING GENERAL PURPOSE ROOM	MAT.	EX	EX	EX CB	EX CB	EX CB	EX CB	EX	EX		PROTECT EXISTING FINISHES ALLOW NEW PAINT AND BASE AT WALL AFFECTED BY NEW INFILL.
		FIN.	EX	EX	EX	EX	P	EX	–	–		
B08A	EXISTING P.A.	MAT.	EX	EX	EX CB	EX CB	EX CB	EX CB	EX	EX		
		FIN.	EX	EX	EX	EX	EX	EX	–	–		
B10	VESTIBULE	MAT.	WD	EX	EX CB	EX CB	EX CB/CB	EX CB/CB	GB	2400		MATCH STAGE FLOOR FINISH & BASE.
		FIN.	VT	R	P	P	P	P	P			
B11	EXISTING STAGE	MAT.	EX	EX	EX CB	EX CB	EX CB	EX CB	EX	EX		MAKE GOOD EXISTING FINISHES AT SURFACES AFFECTED BY NEW WORK.
		FIN.	EX	EX	EX	EX	EX	EX	–	–		
B15	EXISTING CORRIDOR	MAT.	EX	EX	EX CB	–	EX CB	EX CB	EX	EX		PROTECT EXISTING FINISHES ALLOW NEW PAINT AND BASE AT WALL AFFECTED BY NEW INFILL.
		FIN.	EX	EX	EX	–	EX	EX	–	–		
209	EXISTING VESTIBULE	MAT.	EX	EX	EX CB	EX CB	EX CB	EX CB	ACP	2400		NEW FINISHES TO MATCH EXISTING.
		FIN.	VT	R	P	P	P	P	–	–		
210	EXISTING LOBBY	MAT.	EX	EX	EX CB	EX CB	EX CB	EX CB	EX	EX		PROTECT EXISTING FINISHES ALLOW FOR PAINTING AT NEW BULKHEAD.
		FIN.	EX	EX	EX	EX	EX	EX	–	–		

GENERAL NOTES

A. GLASS PANELS IN DOORS TO COMPLY WITH BARRIER FREE VISIBILITY REQUIREMENTS.

B. PREPARE DOORS AND FRAMES FOR ELECTRONIC HARDWARE WHERE INDICATED. CONDUITS SHALL BE CONCEALED IN FRAMES.

C. REMOVE AND REINSTALL (MISC. ELECTRONIC ATTACHMENTS) AS PER EXISTING DOOR LOCATIONS. PATCH, REPAIR AND MAKE GOOD ALL AFFECTED SURFACES.

D. PATCH, REPAIR AND MAKE GOOD ALL AFFECTED SURFACES AS REQUIRED FOR NEW WORK.

E. ALL DOORS IN FIRE SEPARATION LOCATIONS SHALL HAVE LATCHING DEVICE.

F. PRESSED STEEL FRAME DEPTHS SHALL BE 146MM UNLESS OTHERWISE NOTED.

FINISH ABBREVIATION LEGEND

ACP	ACOUSTIC CEILING PANEL
CB	CONCRETE BLOCK
CONC	CONCRETE
CT	CERAMIC TILE
EX	EXISTING
EXIST	EXISTING
EXP	EXPOSED
FRG	FIRE RESISTANT GLAZING
G	GLASS
GL	GLASS
GB	GYPSUM BOARD
HM	HOLLOW METAL
NTS	NOT TO SCALE
P	PAINT
PCT	PORCELAIN CERAMIC TILE
PREFIN	PREFINISHED
PS	PRESSED STEEL
R	RUBBER
R.O.	ROUGH OPENING
TG	TEMPERED GLASS
URETH	URETHANE
VCT	VINYL COMPOSITION TILE
VT	VINYL TILE
WD	WOOD

CEILING TYPES

C1 — 13mm GYPSUM BOARD (PAINTED) ON METAL STUD FRAMING ALLOW FOR 1 300mmx300mm ACCESS PANEL IF REQUIRED

C2 — 1220mmx610mm ACOUSTIC CEILING PANELS IN SUSPENDED T-BAR GRID

EX — EXISTING CEILING PATCH/ PAINT SURFACES AFFECTED BY NEW WORK

CEILING NOTATION LEGEND

C# — CEILING TYPE (REFER TO CEILING TYPE SCHEDULE AND ROOM FINISH SCHEDULE)

2400 — CEILING LEVEL ABOVE FINISHED FLOOR (SEE ALSO ROOM FINISH SCHEDULE)

EXP — EXPOSED STRUCTURE WITH PAINT FINISH

EXISTING AIR DIFFUSER (REFER TO MECHANICAL DRAWINGS)

RETURN AIR GRILLE. SIZES VARY (REFER TO MECHANICAL DRAWINGS)

LIGHT FIXTURES (REFER TO ELECTRICAL DRAWINGS)

CEILING OR WALL MOUNTED EXIT LIGHT (REFER TO ELECTRICAL DRAWINGS)

CONSTRUCTION LEGEND

1 — ALLOW FOR NEW WALL BASE AND PAINT ALONG FULL SURFACE OF EXISTING ROOMS WITH NEW WORK/ INFILL SCOPE.

FLOOR PLAN NOTATION LEGEND

CORRIDOR / CA — ROOM NAME & NUMBER

XX — INTERIOR PARTITION OR FURRING TYPE

101 — DOOR NUMBER

1 / A200 — WALL SECTION REFERENCE

D / C / 1 / A901 / B / A — INTERIOR ELEVATION REFERENCE NUMBER

NEW DOOR

EXISTING DOOR

DOOR WITH DOOR OPERATOR

PB — BARRIER FREE DOOR OPERATOR PUSH BUTTON

PL — PUSH TO LOCK PUSH BUTTON

EM — EMERGENCY ASSISTANCE CALL BUTTON

PARTITION TYPES SCHEDULE

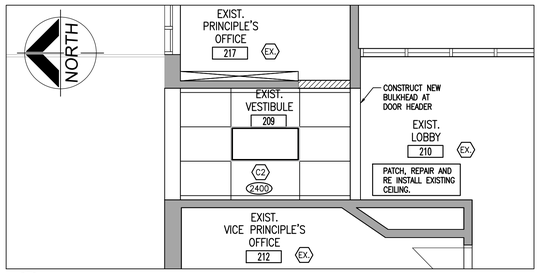
P1 — 190mm CONCRETE BLOCK TO U/S OF STRUCTURE

P2 — 90mm CONCRETE BLOCK TO U/S OF STRUCTURE

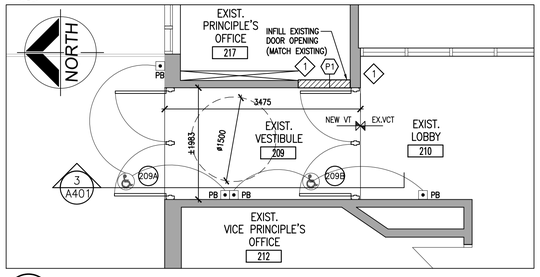
P3 — 13mm GYPSUM BOARD 152mm STEEL STUDS @ 400mm O.C. 13mm GYPSUM BOARD

PARTITION & FURRING NOTES

1. UNLESS OTHERWISE NOTED, ALL PARTITIONS TERMINATE AT UNDERSIDE OF FLOOR OR ROOF STRUCTURE, U.N.O.
2. ALL GYPSUM BOARD BULKHEADS AND PARTITIONS ABOVE MASONRY WALLS OR GLAZING TO BE BRACED AS REQUIRED (TYP.).
3. ALL OUTSIDE CORNERS OF EXPOSED INTERIOR BLOCK WALLS TO BE BULLNOSED BLOCKS. GROUNDING CORNERS ON A JIG WILL BE REJECTED.
4. ALL FULL HEIGHT MASONRY PARTITIONS SHALL BE CONNECTED TO THE U/S OF ROOF DECK U.N.O.
5. ALL ENDS OF TERMINATED EXPOSED MASONRY BLOCK WALLS MUST BE GROUTED SOLID INCLUDING DOORS/ OPENINGS.
6. PROVIDE FIRE STOPPING/ SMOKE SEAL AT TOPS OF ALL RATED PARTITIONS/ FURRING TYPES AT UNDERSIDE OF ROOF DECK C/W INFILL OF FLUTES.
7. ALL PENETRATIONS THROUGH RATED PARTITIONS/ FIREWALL ARE TO BE FIRESTOPPED WITH LISTED FIRESTOPPING SYSTEM.



4 / A203 PART SECOND FLOOR REFLECTED CEILING PLAN
1:50



3 / A203 PART SECOND FLOOR PLAN
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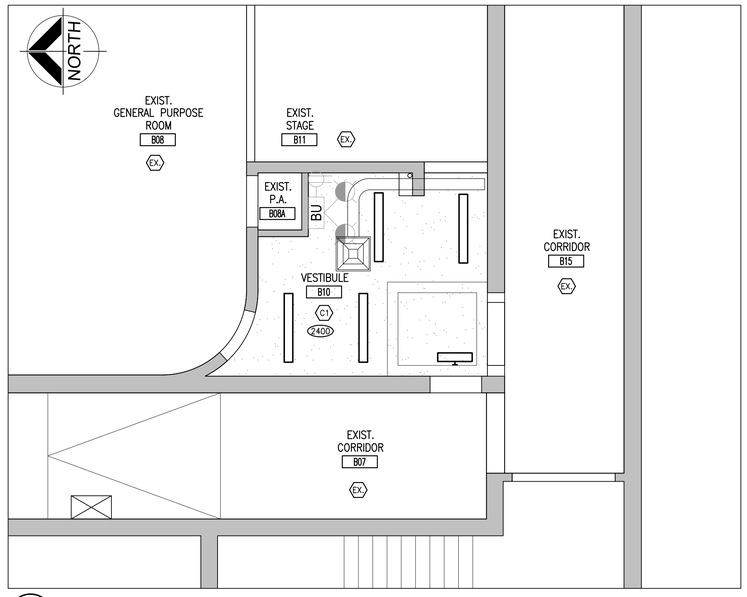
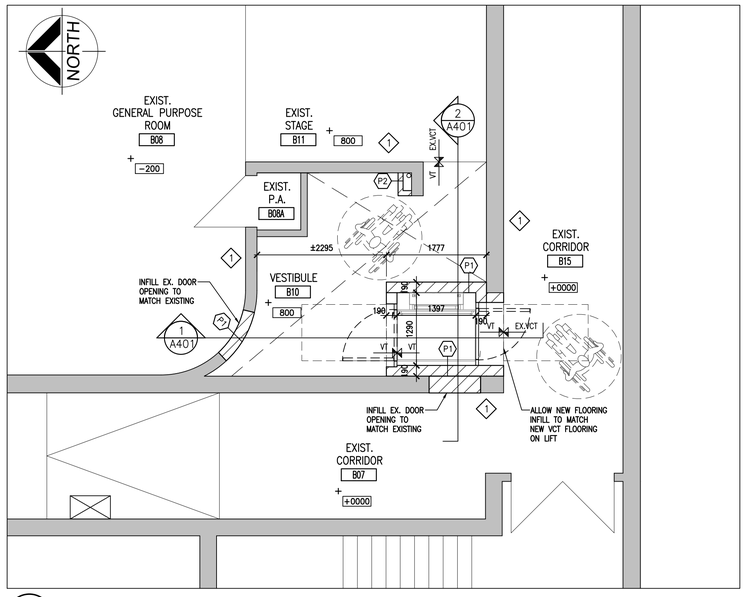


2 / A203 PART BASEMENT REFLECTED CEILING PLAN
1:50



1 / A203 PART BASEMENT FLOOR PLAN
1:50

DO NOT SCALE THE DRAWINGS.
CHECK AND VERIFY ALL DIMENSIONS AT THE SITE.

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DRAWINGS ARE NOT TO BE USED FOR CONSTRUCTION UNTIL SIGNED AND SEALED BY THE CONSULTANT.

tdsb Toronto District School Board

NO.	ISSUES/ REVISIONS	DATE	BY
1	ISSUED FOR REVIEW	FEB. 26, 2026	BBA
2	ISSUED FOR PERMIT & TENDER	APRIL 1, 2026	BBA
3	ISSUED FOR TENDER	APRIL 29, 2026	BBA
4	ISSUED FOR ADDENDUM #1	MAY 22, 2026	BBA

BARRY BRYAN ASSOCIATES

PROJECT:
ACCESSIBILITY UPGRADES AT KEELE ST JR PS & COMMUNITY CENTRE
TDSB# TR-25-0957
99 MOUNTVIEW AVENUE
TORONTO, ON
TORONTO DISTRICT SCHOOL BOARD

DRAWING:
PART FLOOR PLANS & SCHEDULES

DESIGN BY:	BBA
DRAWN BY:	LQ
CHECKED BY:	CM
DATE:	26-02-02
SCALE:	1:50
SEAL:	
PROJECT NO:	25252
DRAWING NO:	A203

Section 08 71 01 Door Hardware Schedule

Heading #1

1 Pair of doors 209A, Exterior From Ex. Vestibule 209 LHR/RHRA

915, 900 x 2150 x 45 - HM DR x HM FR

6	Standard Hinge	NRP-CB199 (4 1/2" x 4)	US32D
1	Exit Device	16-8804 US32D C/W Cylinders - LHR	US15/US32D
1	Exit Device	16-8804 US32D C/W Cylinders - RHR	US15/US32D
2	Door Pull	GSH 1181-2 C32D CONC. TB	US32D
1	Removable Mullion	12-980 USP	USP
1	Electric Strike	F9600-630	630
1	Auto. Door Operator	HA8 Series	
2	36" Long Push Plate	CM-7536/4	
1	Surface Closer	4040XP EDA 689	689
2	Overhead Door Stop Concealed	1020 SL to Suit Opening Size	US32D
2	Kick Plate	K10A x 200 x 2" LDW	US32D
2	Weatherstripping	W-50S-CA x Opening Height (2 x H,1xW)	CA
1	Threshold	CT-45 x Opening Width	
2	Door Sweep	W-13S x Opening Width	CA

NOTE: 120VDC is required at the head of the door for all handicap door operators, 15A dedicated circuit. Wall/Frame must
be reinforced for automatic operator mounting, all conduit and back boxes with pull cords are to be provided by the electrical contractor.

Heading #2

1 Pair of doors 209B, Ex. Vestibule 209 From Ex. Lobby 210 LHR/RHRA

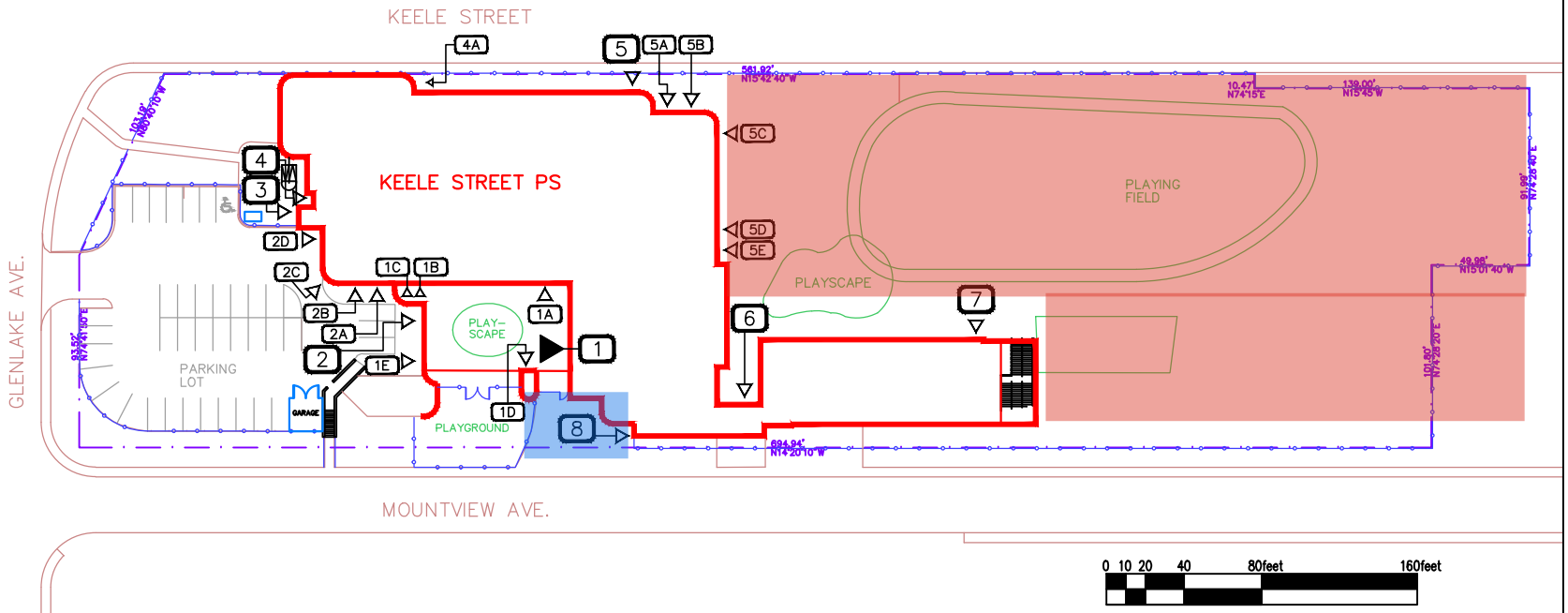
915, 900 x 2150 x 45 - HM DR x HM FR

6	Standard Hinge	NRP-CB168 (4 1/2" x 4)	US26D
1	Exit Device	8815 ETL US26D/US32D - LHR	US26D/US32D
1	Exit Device	8815 ETL US26D/US32D - RHR	US26D/US32D
2	Door Pull	GSH 1181-2 C32D CONC. TB	US32D
1	Removable Mullion	12-980 USP	USP
1	Electric Strike	F9600-630	630
1	Auto. Door Operator	HA8 Series	
2	36" Long Push Plate	CM-7536/4	
1	Surface Closer	4040XP EDA 689	689
2	Overhead Door Stop Concealed	1020 SL to Suit Opening Size	US32D
2	Kick Plate	K10A x 200 x 2" LDW	US32D
2	Weatherstripping	W-50S-CA x Opening Height (2 x H,1xW)	CA
1	Threshold	CT-45 x Opening Width	
2	Door Sweep	W-13S x Opening Width	CA

NOTE: 120VDC is required at the head of the door for all handicap door operators, 15A dedicated circuit. Wall/Frame must
be reinforced for automatic operator mounting, all conduit and back boxes with pull cords are to be provided by the electrical contractor.

- Public Permits - June 29 to September 3, 2026, 10am to 8 pm

- General area of work. Contractor shall refer to contract documents for exact extent



0 10 20 40 80feet 160feet

LEGEND:

EX. DOOR LABEL XXXX

MAIN ENTRANCE

EXTERIOR DOOR

North Arrow

Facility Services

Toronto District School Board

Technical Services Division
Design & Construction Unit
15 Oakburn Cres. Toronto, Ontario M2N 2T5
t. 416-395-4588 / f. 416-395-9734

Facility

Keele Street Public School

Address

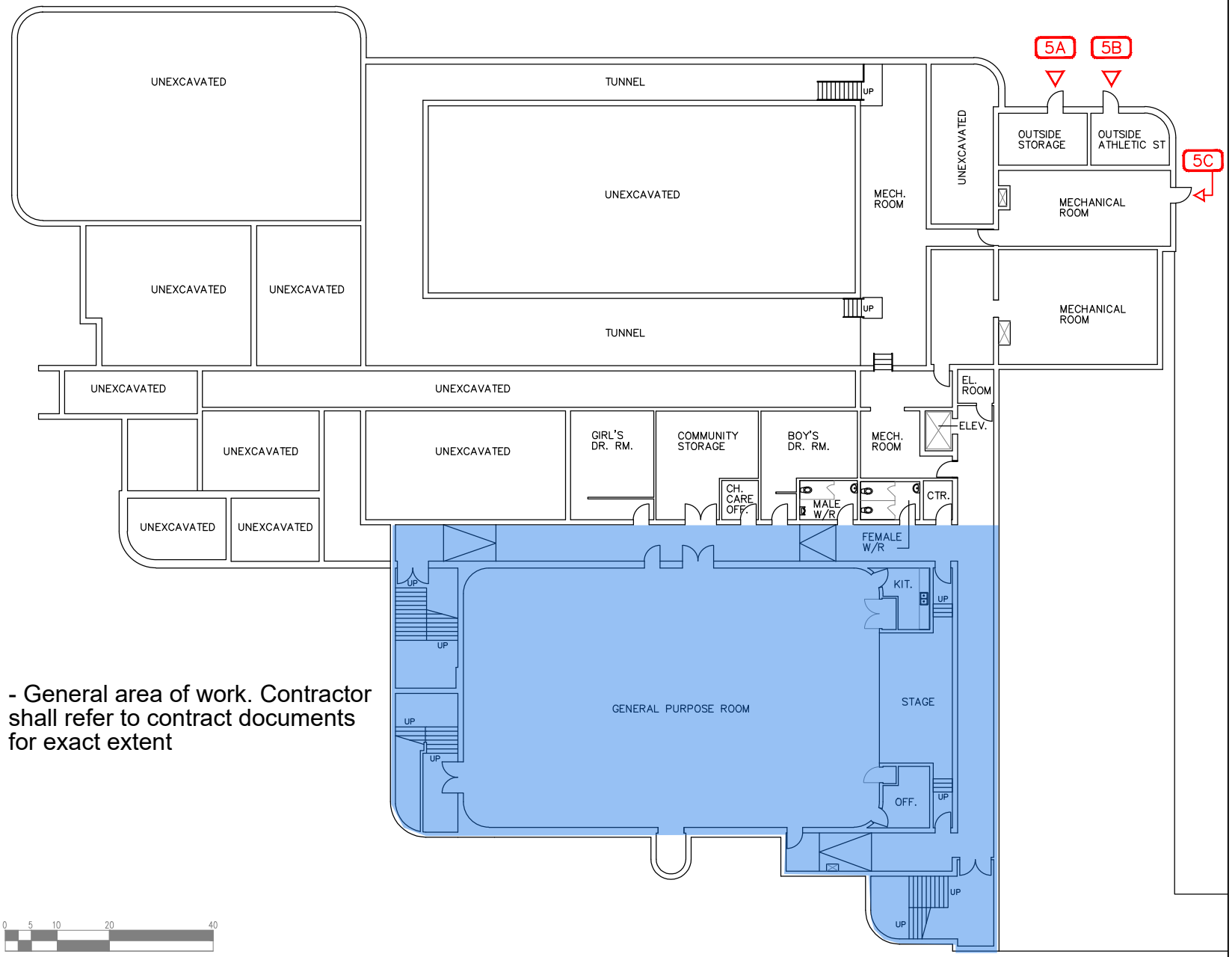
99 Mountview Avenue
M6P 2L5
TORONTO

Sheet Title

Site Plan

Facility # 0605

Last Update 2019Nov19



LEGEND:

EX. DOOR LABEL XXXX

MAIN ENTRANCE

EXTERIOR DOOR

North Arrow

Facility Services

Toronto District School Board

Technical Services Division
Design & Construction Unit
15 Oakburn Cres. Toronto, Ontario M2N 2T5
t. 416-395-4588 / f. 416-395-9734

Facility

Keele Street Public School

Address

99 Mountview Avenue
M6P 2L5
TORONTO

Sheet Title

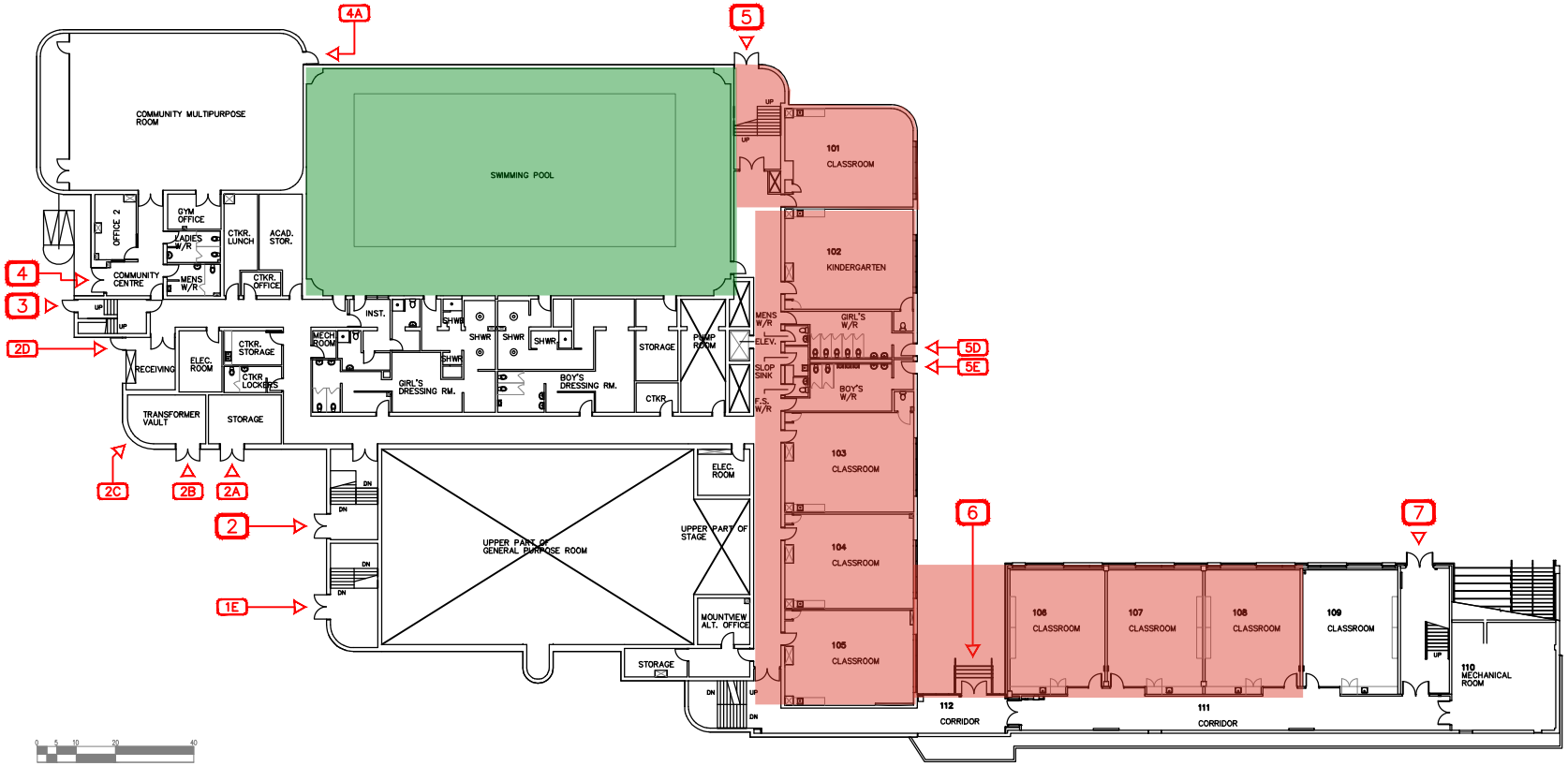
Basement

Facility #

0605

Last Update

2019Nov19



- Public Permits - Childcare - 7am to 6pm

- Swimming Pool Permit - June 29 to August 14, 2026, 8:30am to 8 pm

LEGEND:

EX. DOOR LABEL XXXX

MAIN ENTRANCE

EXTERIOR DOOR

North Arrow

Facility Services

Toronto District School Board

Technical Services Division
Design & Construction Unit
15 Oakburn Cres. Toronto, Ontario M2N 2T5
t. 416-395-4588 / f. 416-395-9734

Facility

Keele Street Public School

Address

99 Mountview Avenue
M6P 2L5
TORONTO

Sheet Title

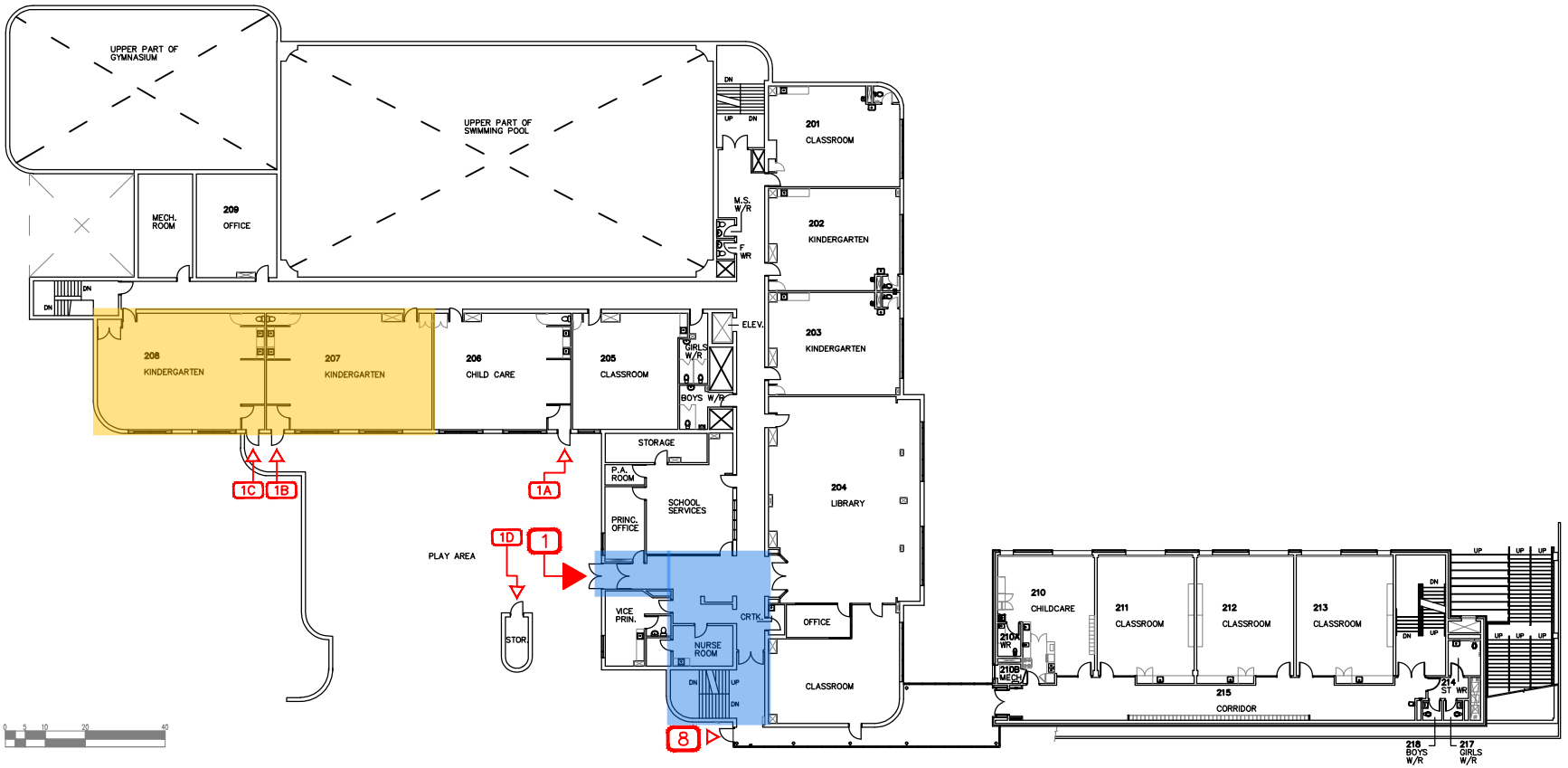
1st Floor

Facility #

0605

Last Update

2019Nov19



- General area of work. Contractor shall refer to contract documents for exact extent

- Childcare - 7am to 6pm

LEGEND:

EX. DOOR LABEL XXXX

MAIN ENTRANCE

EXTERIOR DOOR

North Arrow

Facility Services

Toronto District School Board

Technical Services Division
Design & Construction Unit
15 Oakburn Cres. Toronto, Ontario M2N 2T5
t. 416-395-4588 / f. 416-395-9734

Facility

Keele Street Public School

Address

99 Mountview Avenue
M6P 2L5
TORONTO

Sheet Title

2nd Floor

Facility #	Last Update
0605	2019Nov19

- Childcare - 7am to 6pm

North Arrow

Facility Services

Toronto District School Board

Technical Services Division
Design & Construction Unit
15 Oakburn Cres. Toronto, Ontario M2N 2T5
t. 416-395-4588 / f. 416-395-9734

Facility

Keele Street Public School

Address

99 Mountview Avenue
M6P 2L5
TORONTO

Sheet Title

3rd Floor

Facility #

0605

Last Update

2019Nov19

Addendum

MCW Consultants Ltd.

Queen's Quay Terminal
207 Queen's Quay West, Suite 615
Toronto, Ontario M5J 1A7
Phone 416-598-2920 Fax 416-598-5394
www.mcw.com

Date: May 22, 2026

Project Name: Keele Street Public School

Client: Barry Bryan Associates
To: Barry Bryan Associates
Attention: Crystal Gardner
From: Dung Ta
Paula Terry
Amir Mansour
Distribution:

Project #: 25301-24
ADD #: 001

In accordance with the drawings and specifications, provide in the tender all costs required to complete the work including items as listed below.

Title: Addendum
Reason for Change: Revisions to suit TDSB comments and add seismic restraint to the specifications

Specifications:

Drawing #	Revisions
Mechanical Specifications	• Add Part 8 – Seismic Control and Restraint to the mechanical specifications.
Electrical specification section #5	• Add Seismic Restraints to electrical specification.

Mechanical Drawings:

Drawing #	Revisions
M0-00	• Add general note referencing Seismic Restraints.
M2-00	• In new stage lift Vestibule B10, remove portion of existing supply air ductwork and grille. Provide new ductwork and supply grille as shown. Contractor to pre-balance airflow at existing grille to determine existing airflow and to balance to same airflow after new ductwork and grille is installed. • In new stage lift Vestibule B10, provide new sprinkler head, recessed type to suit new drywall ceiling. Connect sprinkler branch to existing sprinkler line running through this room. Existing sprinkler line serves existing Multi-Purpose Room, Stage and PA Closet. This new vestibule will now be open to the stage and as such requires a sprinkler head as part of this zone.

Electrical Drawings:

Drawing #	Revisions
E0-01	• Add electrical general note #8 for Seismic Restraints. • Add location of the electrical panel, fire alarm control panel and telephone block.

Electrical Drawings:

Drawing #	Revisions
E1-01	• Revise electrical layout on detail 4/E1-01 as indicated. • Revise Keynotes #4 and add keynotes #5, 6, 7, 8, 9 & 10 as indicated. • Add door hardware table. • Add power supply for HC lift as indicated.

End of ADD # 001

MCW Consultants Ltd.

A member of the MCW Group of Companies
www.mcw.com

207 Queen's Quay West, Suite 615
Toronto, Ontario
M5J 1A7

MECHANICAL SPECIFICATIONS

FOR

KEELE ST JRPS & COMMUNITY CENTRE

99 Mountview Avenue

Toronto, ON.

TO

TORONTO DISTRICT SCHOOL BOARD

TDSB# TR-25-0957

DATED

MAY 22, 2026

ISSUED FOR ADDENDUM 001

Contact Person: Can Le
Phone: (416) 598-2920 ext:245
Email: canle@mcw.com

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PART 1 - GENERAL PROVISIONS

1.01 GENERAL REQUIREMENTS

.1 Conform to requirements of the Ontario Building Code, City of Toronto and the Authorities Having Jurisdiction (AHJs); note that there may be more than one AHJ.

.2 Applicable Codes, Standards and Bylaws shall be strictly adhered to. Obtain necessary permits, approvals, and inspections from the Authorities Having Jurisdiction (AHJs).

.3 Perform all mechanical work detailed in the Documents to provide a complete and fully functional operating system to the satisfaction of the Consultant.

.4 The most rigorous of these Specifications and the Base Building Standards shall form the basis for acceptance of the Work.

1.02 DEFINITIONS

.1 The word "provide" shall mean "supply, install, connect, test and commission".

.2 The term "work" means all equipment, permits, materials and labor to provide a complete mechanical installation as required and detailed in the drawings and specifications.

1.03 SUBMITTALS

.1 Submit shop drawings, unless otherwise specified, for each major item of equipment such as plumbing fixtures, pumps, air handling units, radiation, coils, and special systems.

.2 Shop drawings shall be complete with contractors reviewed stamp. Allow five (5) days for Mechanical Sub-consultant review.

.3 Resubmit shop drawings returned for correction until ‘reviewed’ or ‘reviewed as noted’ status has been achieved.

.4 Documentation and systems acceptance: Provide the following on substantial performance of the work:

.1 As-built drawings: Record accurately installed (as-built) Mechanical Work as “red-line” mark-ups on white prints. Mechanical Trade’s “red-line” as-built drawings shall be transferred to an editable AutoCAD format “as-built drawing” by the Mechanical Trade Contractor. Submit both copies for review. Keep one up-to-date set on site.

.2 Operating and Maintenance (O&M) Manuals

.1 O&M Manuals shall be submitted to the Consultant for review.

.2 O&M Manuals shall include Reviewed shop drawings, Testing, Adjusting and Balancing (TAB) Reports, equipment data sheets, written warranty, operating instructions, and maintenance procedures.

.3 Provide piping pressure tests (fire protection, domestic water, HVAC piping) indicating system tested, pressure held, time of test and date, and certified by the Consultant.

.4 O&M Manuals shall be separated with dividers in appropriate sections.

.3 Make all corrections requested by the Consultant and resubmit for review.

.4 Air balancing report: the Work of Division 23 will not be considered totally performed until completion of air balancing even if undertaken by separate contract from the Work of Division 23.

1.04 Permits, Fees, and Inspections

.1 Apply for, obtain, and pay for all permits, licenses, inspections, examinations, and fees required for the work prior to commencement of construction. Include all sales taxes and the GST.

.2 Arrange for inspection of all work by the authorities having jurisdiction over the work.

.3 In case of conflict, the codes take precedence over the contract documents. In no instance reduce the standard or scope of work or intent established by the drawings and specifications by applying any of the codes referred to herein.

.4 Request in writing for a completed rough-in and final inspection of the mechanical systems. When the final inspection request is made all deficiencies must be complete, balancing reports submitted, systems ready for operation, equipment has been commissioned, operating and maintenance manuals submitted, all tags, charts and nameplates completed, all fixtures and equipment cleaned, spare parts provided, record drawings complete, control systems operational and the Owner's staff instructed in all phases of the system operation.

1.05 CONTRACT DRAWINGS

.1 The drawings for mechanical work are performance drawings, diagrammatic, intended to convey the scope of work and indicate general arrangement and approximate location of equipment, fixtures and systems runs. The drawings do not intend to show architectural, interior design and structural details.

.2 Do not scale drawings. Obtain information involving accurate dimensions from dimensions shown on architectural and structural drawings, and by site measurement.

.3 Make, at no additional cost, any changes, or additions to materials, and/or equipment necessary to accommodate structural conditions (ducts around beams, columns, etc.)

.4 Alter, at no additional cost, the locations of materials and/or equipment as directed that do not necessitate additional material.

.5 Confirm on the site the exact location and mounting elevation of fixtures as related to architectural and structural details.

.6 Record set of drawings to be always kept on site and changes to piping, ductwork and equipment shall be recorded on same.

1.06 EXAMINATION OF SITE AND DOCUMENTATION

.1 Existing site conditions affecting the work of this trade shall be reviewed prior to Bid submission. Failure to do so shall not relieve Mechanical Trades of full contract responsibility. Include for any alternate routing of new or rerouting of existing services to accommodate all site conditions in the Bid Price. Determine exact dimensions and other restrictive conditions on site, not from drawings.

.2 Prior to submitting Bid, the Mechanical Trades shall report all discrepancies to the Consultant and verify the locations of all existing services that are being extended and the routing of new services. Report any ambiguities, discrepancies, departures from building by-laws and/or from good practice. Additional payments will not be made for extra labour or material necessary due to location or nature of beams, joists, walls, furred ceilings, or finishes with which Contractor should be familiar.

.3 Reuse existing materials and equipment wherever possible. Provide new materials and equipment as required to ensure a complete installation.

1.07 PHASING AND SCHEDULING OF WORK

.1 Comply with the General Contractor's construction schedule. Include the cost of premium time in the Bid Price for work provided during nights, weekends, or other times outside normal working hours, necessary to maintain all mechanical services in operation and to meet the project schedule.

.2 Where project phasing is required, refer to the phasing plan(s) included with the Documents. Include all costs associated with completing the Work in sequential phases as outlined in the phasing plan(s).

1.08 COORDINATION DRAWINGS

.1 Prepare drawings in conjunction with all trades concerned, showing sleeves and openings for passage through structure, and all inserts, equipment bases, and supports, and relate these to suitable grid lines and elevation datum.

.2 When requested, provide weights of major items of equipment.

.3 Prepare interference and co-ordination drawings for all areas where the work of this division could conflict with and/or obstruct the work of other trades and/or other sections of this division. Submit drawings for review by the Consultant.

1.09 COORDINATION

.1 Co-ordinate installation of new ductwork, sprinkler, and plumbing lines to suit installation of all other components being installed in ceiling space or extending into ceiling space. Review mechanical, electrical, and architectural drawings to become familiar with installation requirements of these components. Problems with installation of these components due to installation of new ductwork, sprinkler and plumbing lines will result in the Contractor having to relocate new ductwork, sprinkler, and plumbing lines at their own cost.

.2 Co-ordinate arrangement, mounting, and support of mechanical equipment to allow right of way for piping and conduit installed at required slope.

.3 Co-ordinate location of access panels and doors for mechanical items that are behind finished surfaces or otherwise concealed. Provide access doors and panels to suit the finish that it will be installed onto.

.4 Co-ordinate sleeve selection and application with selection and application of firestopping.

.5 Co-ordinate sizes and locations of required concrete pads and bases to support mechanical equipment.

1.10 PRODUCT STANDARDS AND ALTERNATIVES

.1 Use only new materials, capitals and code approved in accordance with all laws, regulations, and Authorities Having Jurisdiction (AHJs).

.2 All material and equipment shall meet or exceed base building standards and have Landlord/Owner's approval before ordering.

.3 Base Bid Price on equipment specified. Show alternative equipment and itemized cost savings with Bid submission.

.4 Equipment substitutions proposed following award of contract will not be considered without written explanation.

.5 The quality and performance characteristics of substituted product shall be equivalent in all respects to the specified product. Substitution of any product other than specified must assure no deviation below the stated capacities, air flow rate, heat transfer rate, filtration efficiency and air mixing quality. Power requirements must not be exceeded and, where specifically defined, sound power levels must not be exceeded. Equipment weight and space requirements shall not be in excess of those allowed in the design. Applications for "equal" or "alternate" must address these factors.

.6 Where no other acceptable manufacturers are indicated, provide the exact make specified. Requests for acceptance of manufacturers not listed must be submitted not less than seven working days prior to closing date of the tender and submissions must bear proof of acceptance by the Consultant if used in the tender.

.7 All substitute products shall be reviewed by the Consultants; do not proceed with substituted equipment without Consultant's written authorization. Revise Record Drawings, incorporating alternates and/or substitutes and all related changes.

.8 Any additional costs incurred by affected Trades for substituted equipment shall be borne by the Mechanical Trades without additional compensation.

1.11 RIGHTS RESERVED

.1 Rights are reserved to furnish any additional detail drawings, which in the judgement of the Consultant may be necessary to clarify the work, and such drawings shall form a part of this contract.

1.12 EXPEDITING AND DELIVERY

.1 Provide new material and equipment as specified and to the acceptance of the Consultant. Manufacturer’s names are listed to set a standard of quality, performance, capacity, appearance, and serviceability.

.2 Where no other acceptable manufacturers are indicated, provide the exact make specified. Requests for acceptance of manufacturers not listed must be submitted not less than seven working days prior to closing date of the tender and submissions must bear proof of acceptance by the Consultant if used in the tender.

1.13 SUPERINTENDENCE

.1 Maintain at the job site, at all times, qualified personnel and supporting staff, with proven experience in erecting, supervising, testing and adjusting projects of comparable nature and complexity.

1.14 SKILLFULNESS

.1 Install equipment, piping, ductwork, and cables in a skillful manner to present a neat appearance to function properly to the satisfaction of the Consultant. Install runs parallel and perpendicular to building lines, in chases, behind furring or above ceilings, where such concealment is possible. In areas where systems are to be exposed install neatly and group to present a tidy appearance.

.2 Install equipment and apparatus requiring maintenance, adjustment or eventual replacement with due allowance therefore.

.3 Include in the work all requirements of manufacturers shown on the shop drawings or manufacturers installation instructions.

.4 Replace work unsatisfactory to the Consultant without extra cost.

.5 Make provision to accommodate future plant and equipment indicated on drawings.

.6 Protect from damage all equipment delivered to the site and during installation. Any damage or marking of finished surfaces shall be made good to the satisfaction of the Consultant.

.7 The Contractor and all sub-trades are responsible to repair or replace any item damaged while performing work outlined in this contract.

1.15 NOISE AND VIBRATION

.1 Mechanical equipment is to operate without objectionable noise or vibration. If, in the opinion of the Consultant, the equipment operates with excessive noise or vibration, then the equipment must be replaced, or noise or vibration eliminated.

.2 Connections to noise-producing and vibrating equipment must be made with flexible connection. Refer to details for more information.

.3 Vibration isolators are to be provided where indicated or required.

1.16 INTERRUPTION OF SERVICES

.1 Comply with Landlord/Owner's requirements for system planned interruption to existing services. Interruption of service must occur at the times and for the duration stipulated by the Landlord/Owner. Carry out all preparatory work, measurements, and similar, without interruptions of existing services.

.2 Arrange with Landlord/Owner for necessary shutdowns of all systems and include all overtime costs in the Bid Price for tie-ins and work within other tenant spaces to be completed on weekends and at other times suitable to Landlord/Owner and other occupants.

1.17 CLEANING

.1 During construction, keep site reasonably clear of rubbish and waste material resulting from work. Clean the Work area on a daily basis.

.2 After completion of the Work, remove rubbish and debris from the site, arrange and pay for disposal of all waste materials. Repair any damage caused. Clean all polished, painted and make plated work bright.

.3 Leave systems operating and premises in good order working. Clean areas to acceptance of the Landlord/Owner.

.4 Carry out additional cleaning operating of systems as specified in other sections of the specification.

1.18 COMPLETION

.1 Consultant's Final Inspection is imperative. Contractor shall contact the Consultant and the Landlord/Owner's Representative to arrange for a final inspection at substantial completion of mechanical work.

.2 Should mechanical work be covered up at the time of the Final Inspection, including services enclosed behind finished drywall, above finished ceilings, or concealed by finished millwork, the Mechanical Trades shall arrange for the Work to be exposed to complete the inspection.

.3 When the final inspection request is made all deficiencies must be complete, balancing reports submitted, systems ready for operation, equipment has been commissioned, operating and maintenance manuals submitted, all tags, charts and nameplates completed, all fixtures and equipment cleaned, spare parts provided, record drawings complete, control systems operational and the Landlord/Owner's staff instructed in all phases of the system operation.

.4 The Mechanical Work will not be considered Substantially Performed until completion of air and water balancing, even if undertaken by separate contract from the Mechanical Trades.

.5 On completion of work, present to the Landlord/Owner a final unconditional certificate of approval from the Authorities Having Jurisdiction (AHJs).

1.19 INSTRUCTION TO OWNER

.1 Instruct the owner's representatives in all aspects of the operation of systems and equipment.

.2 Arrange for and pay for services of service engineers and other manufacturers' representatives required for instruction on specialized portions of the installation.

.3 Submit to the Consultant at the time of final inspection a complete list of systems stating for each system:

.1 Date instructions were given to the owner's staff.
.2 Duration of instruction.
.3 Name of persons instructed.
.4 Other parties present (manufacturer's representative, Consultants, etc.).

.4 Signatures of the owner's staff stating that they properly understood the system installation, operation, and maintenance requirements.

1.20 ADDITIONAL WORK

.1 Before proceeding with any changes, submit for review and approval by the Consultant; approval shall come in the form of a Change Order signed by the Landlord/Owner.

.2 Change quotations shall be submitted complete with an itemized cost breakdown of all materials, equipment and labour costs associated with each submission for additional or deleted work. Failure to provide will result in rejection.

.3 All Mechanical Change Notices shall be priced using mechanical labour unit costs in accordance with Mechanical Contractors Association of America (MCAA) Labor Estimating Manual.

.4 It is understood that each change may have a variety of non-typical or abnormal factors that will require adjustments. Under no circumstances shall the cumulative total of additional factors exceed 20% of the hours established using Base Labour units.

.5 Provide copies of the Allpricer published list prices used to estimate material and equipment costs, less discount of 20%.

.6 The mark-up for overhead and profit shall be limited to and be calculated per Division 1 specifications

1.21 COMMISSIONING

.1 Contractor shall provide commissioning for all the new and modified equipment as part of the Work.

.2 Test and demonstrate all automatic equipment is operating as per sequence of operation (example: test boiler controls package and associated circulating pump interface as an integrated system).

.3 Provide on-site training instruction to the Owner of the proper operation and maintenance of all Mechanical Equipment installed for a minimum of two 4-hour sessions (total 8 hours).

.4 Pressure Testing:

.1 Do not insulate piping systems until pressure testing has been completed, and proven tight. Should leaks develop in any part of the piping system, remove, and replace defective sections, fittings, and other piping system ancillaries.
.2 Flushing and testing shall be completed prior to connection into building system.
.3 Hydrostatically test piping at not less than 1.5 times working pressure of final system, but not less than 75 psi (520 kPa), for a period of not less than 12 hours without pumping.
.4 Test piping system in sections as required by the progress of work.
.5 Test gas piping in accordance with CGA standard and Authorities Having Jurisdiction (AHJs).

.5 Existing Equipment:

.1 Verify with building property manager that existing equipment and controls are maintained and operating as originally designed.

.6 Terminal Units:

.1 Verify that filters, coils, and nozzles are clean, air is balanced,
.2 Calibrate and check all Terminal Unit controls and ensure they are operating as intended.
.3 Repair and clean all Terminal Units.

.7 VAV Boxes:

.1 Verify that dampers, actuators, and thermostats are operating as intended.

.8 Life Safety Integrated Systems Testing (IST):

.1 Integrated Systems Testing (IST) is required by the Ontario Building Code (OBC) test verify the functionality of all life safety systems provided by multiple design consultant and construction trade disciplines; successful completion of IST is required prior to certification for building occupancy.
.2 IST shall include confirmation of integrated systems operation proving fire alarm signaling, fire suppression, smoke control (pressurization), smoke exhaust, or other life safety measures as may be required by the design in response to a fire condition.
.3 IST must be conducted in accordance with the requirements of ULC-S1001 “Integrated Systems Testing of Fire Protection and Life Safety Systems.”

.9 Commissioning Report:

.1 Provide a Commissioning Report that includes a description of all Commissioning Activities undertaken and the results thereof. Commissioning Report shall be in a format acceptable to the Consultant.

.10 Provide record data of test results to the Consultant for review. Include a copy of all the test results in the Commissioning Report.

1.22 WARRANTY

.1 Submit written warranty to Landlord/Owner covering remedy of defects in work at completion of work. Submit similar written warranty for one (1) year from date of Substantial Performance for any part of work accepted by Landlord/Owner.

.2 Repair and/or replace any such defects which appear in work within warranty period without additional expense to owner; ordinary wear and tear and wilful damage by, or carelessness of owner's staff or agents excepted. Where such defects occur, be responsible for costs incurred in making defective work good, includes repair or replacement of building finishes, other materials, or damage to other equipment caused by such defects, or by subsequent replacement or repairs.

.3 During the one-year warranty period, the Mechanical Trades shall respond to the site on a 24 hour "call out" period whereby at any time of day or night appropriate Trades shall attend to all faults and complaints, remedy all defects, replace all malfunctioning items, and maintain the complete installation in a clean and tidy condition to the satisfaction of the Consultant.

PART 2 - DEMOLITION

.1 Demolition work will be executed in accordance with the latest edition of:

.1 CAN/CSA-S350-M1980 Code of Practice for Safety in Demolition of Structures;
.2 Occupational Health & Safety Act;
.3 Ontario Building Code;
.4 Ontario Fire Code.

.2 Visit the site, examine the existing conditions, and become familiar with the extent of the necessary removal, relocation, reconnecting, and rerouting of mechanical equipment and services as necessary for the completion of the project. The drawings indicate the approximate locations of services as far as these are known. Immediately advise Consultant in writing when unknown services are encountered.

.3 Review and confirm with the architect/designer's drawings for the complete extent of demolition and alteration.

.4 Ensure that all mechanical, life safety services, and services for existing equipment in areas outside the areas of this work are required to remain in service, unless otherwise approved by the Owner.

.5 Use only those existing entrances and stairs designated by the Owner for access to the egress from the existing buildings and various floors when work of this contract is to be carried out. No traffic through other areas of the building will be permitted without the prior consent of the Owner. Protect walls of passenger elevators to approval of Owner prior to use. Accept liability for damage, safety of equipment and overloading of existing equipment.

.6 Remove and replace any mechanical equipment on walls or ceilings that will be demolished and rebuilt.

.7 Disconnect, capping and make-safe all gas, water, sewer, storm and other services affected by the Work being demolished.

.8 Package and turn-over any Owner supplied existing equipment, materials and associated controls that is removed or unused under this contract.

.9 Be responsible and pay for any damage to the Base Building incurred by work of this division, or repair to the satisfaction of the Consultant.

.10 Carry out the work with minimum of noise, dust, and disturbance.

.11 Ensure that all existing equipment which are to be reused and/or relocated is thoroughly inspected and refurbished to ensure correct operation when put back into service.

.12 Include in the Bid Price for all shipping and placement in a designated on-site storage location.

PART 3 - BASIC MATERIALS AND METHODS

3.01 EXISTING AND NEW EQUIPMENT

.1 Reuse existing materials and equipment wherever possible. Provide new materials and equipment as required to ensure a complete installation. All existing equipment, materials and associated controls not used in this contract shall be packaged and turned over to the Owner. Include in the tender for all shipping and placement in a designated on-site storage location. Remove any equipment or material not wanted by the Owner from the site.

.1 Do not reuse flexible ductwork.

.2 All existing mechanical equipment (VAV boxes, dampers, heat pumps, valves, etc.) to be relocated out of new drywall ceiling areas.

.3 Existing Equipment: Verify with building property manager that existing equipment and controls are maintained and operating as originally designed.

.1 Induction Units: Verify that filters, nozzles, and coils are clean, air is balanced, control valves and thermostats are operating, etc.
.2 VAV Boxes: Verify that dampers, actuators, and thermostats are operating, etc.

.4 All existing external duct insulation to be inspected and repaired as required.

.5 Repair and clean all induction units. Calibrate and check all induction unit controls.

.6 Where specified, install all equipment provided by the Tenant. Receive, store, install equipment, and accept full responsibility for its correct operation.

.7 Prior to operating any existing or new equipment during any stage of construction, approval from the Owner and Consultant must be received in writing.

.8 All power wiring and equipment starters for mechanical equipment and associated devices including connections shall be provided under the Electrical Contract, Division 26, unless noted otherwise in the specification. Confirm the power characteristics on site prior to processing shop drawings and ordering equipment. All control wiring, line, or low voltage shall be by this Contractor.

.9 Where the drawings indicated equipment to be furnished by the Owner, or by Trades outside of this Contract, provide mechanical rough-in for each unit pursuant to its shop drawings, and make final connections and other mechanical facilities for a complete installation.

.10 Provide all rigging as may be required for all system materials and equipment. Provide all required supplementary steel supports necessary for mounting or hanging equipment. Equipment being suspended from the floor structure, or supported from or on the roof, with a weight greater than 500 pounds, shall have supports reviewed by a structural Consultant. All required structure as recommended by the Consultant, shall be included in the tender.

3.02 MATERIALS AND CONNECTIONS TO EQUIPMENT FURNISHED BY OTHERS

.1 Where materials are furnished by others for installation under this division, the sub-Contractor shall notify the supplier of dates they will be ready for delivery as specified in the general conditions. The sub-Contractor shall receive, unload, handle, store, protect and insure the material until ready for actual installation. Upon receipt of material furnished by others, the sub-Contractor shall spot-check or check the entire shipment and promptly advise the Consultant in writing of any damage and/or missing components. Any material which is subsequently lost or damaged due to negligence on the part of the sub-Contractor shall be promptly replaced (or repaired to the satisfaction of the owner) at the sub-Contractor's expense.

.2 Where the drawings indicated equipment to be furnished by others, provide mechanical rough-in for each unit pursuant to its shop drawings, and make final connections and other mechanical facilities for a complete installation.

3.03 TEMPORARY FILTERS

.1 Cover open end of all base building return air openings including registers, return or exhaust air ducts which are to remain operational during construction with 1" (25mm) thick filter media secured by metal band pulled tight around duct.

.2 Filters shall be replaced weekly.

.3 Remove filters upon construction completion.

.4 Maintain this condition until plastering, drywall and other finishing operations are complete.

3.04 EQUIPMENT HANGERS AND SUPPORTS

.1 Provide any additional structural steel channels, angles, inserts, beam champs and similar accessories required for hanging or supporting equipment. All new and relocated existing services and equipment must be supported from the building structure. Design steel to support and distribute operating and static loads. All drilling, approved type inserts and hangers shall be included.

.2 Support suspended equipment from the bottom or from manufacturer's designated suspension points. Support tanks and similar equipment with adequate beam strength by saddles with curvature to match the equipment. Continuously support all other equipment.

.3 Auxiliary structural members shall be included and installed where required to accommodate hangers.

.4 Provide base supports for all pipe risers.

.5 Fabricate steel supports in contact with water or humidity conditions from materials having approved corrosion resistance or galvanize after fabrication or brush welds clean and apply a prime coat of rust inhibiting paint.

.6 All supports shall be connected to the top of joists and beams where applicable.

.7 Suspension from metal deck is not allowed.

.8 Suspending one hanger from another is not permitted.

3.05 PIPE HANGERS AND SUPPORTS

.1 All new and relocated existing services must be supported from the building structure. All drilling, approved type inserts and hangers shall be included.

3.06 SEALANT, INSERTS, AND SLEEVES

.1 All new penetrations through floors to be sealed with approved non-shrink, waterproof, and fireproof sealant.

.2 Mechanical service penetrations of required fire separations shall be fire stopped using a ULC listed fire stopping assembly. Repair and/or provide all spay fire-proofing affected by the Mechanical Work to maintain required ratings.

.3 Seal to be airtight around all ductwork and piping penetrations through partitions, baffles above ceilings, and through floors that are not fire rated.

.4 Provide sleeves for all new piping passing through floor and roof slabs, beams, concrete walls, and slab-to-slab partitions, etc.

3.07 CUTTING, PATCHING, AND CORE DRILLING

.1 Any required cutting, patching and core drilling required to perform the Mechanical Work shall be included by the Mechanical Trades. Perform cutting in neat and true fashion, with proper tools and equipment to owner's approval. Patch surfaces to exactly match existing finishes. Utilize tradespeople skilled in particular trade or application worked on to Landlord/Owner's approval.

.2 X-Ray concrete structure in accordance with Landlord/Owner structural engineer's requirements. Verify exact location of core drilling to check for existence of any services (example: electrical conduit, structural re-bar) with Landlord/Owner and Landlord/Owner's structural engineer.

.3 Provide details of new openings through structural components for engineer's approval. Incur all related costs to obtain structural engineer’s approval.

.4 For exterior and/or underground penetrations, provide waterproof, weather-tight, fire rated materials in compliance with local governing authority and code requirements to seal openings.

.5 Patch fire rated partitions and floor to maintain ULC listing for rating upon removal of mechanical services originally spanning fire rated assembly.

.6 Ensure areas of both sides of surface being cut are protected from debris. Be responsible for damage done to existing building and services caused by cutting or drilling.

3.08 GENERAL REQUIREMENTS FOR ALL VALVES

.1 Generally, valve locations are indicated or specified on drawings or specified in Sections of the Specification, however, regardless of locations shown or specified, following requirements shall apply:

.1 Provide shut-off valves to isolate systems, at base of vertical risers, in branch take-offs at mains and risers on floors, to isolate equipment, to permit work phasing as required, and wherever else required for proper system operation and maintenance;
.2 Install shut-off valves with handles upright or horizontal, not inverted, and located for easy access;
.3 Unless otherwise specified, provide a check valve in discharge piping of each pump;
.4 Valve sizes are to be same as connecting pipe size;
.5 Valves are to be permanently identified with size, manufacturer's name, valve model or figure number and pressure rating, and wherever possible, valves are to be a product of the same manufacturer;

.2 For valves in insulated piping, design of valve stem, handle and operating mechanism is to be such that insulation does not have to be cut or altered in any manner to permit valve operation.

3.09 FLASHING AND COUNTER FLASHING

.1 Flashing and counter flashing for exterior mechanical service penetrations or penetrations of water-proofed floors shall be provided by Mechanical Trades.

.2 Flash all mechanical parts passing through, or built into a roof, outside wall or waterproof floor.

.3 Use prefabricated aluminum or PVC flashings for roof, and membrane or copper for walls and floors.

.4 Ensure all openings are weather, water and fireproof, using an approved flexible sealant.

3.10 ACCESS DOORS

.1 Access doors shall be provided for all inaccessible mechanical equipment and services requiring inspection or service. Finish shall suit architect/designer's requirements.

.2 All access doors shall be 12"x12" (300mm x 300mm), except provide 24"x24" (600mm x 600mm) where personnel entry is required.

.3 Provide to the appropriate trade for installation co-ordinate exact location with other trades and architect. Provide for plaster surfaces, recessed 16-gauge prime painted steel door and welded metal lath, ready to take plaster. Provide with concealed hinge and stainless-steel studs with brass sleeves.

.4 Provide to suit wall surface or type of construction, other factory prime coated access doors of welded 12-gauge steel, flush type with concealed hinges, lock, and anchor straps.

.5 Provide fire rated access doors in fire rated partitions. Provide hinged access doors equal to fire rating of wall or ceiling in which installed.

.6 Lay-in type ceiling tiles, properly marked, may serve as access panels. Provide stick-on circular tab (approximately ¼" diameter), located on a tee supporting ceiling tile used as access panel, for all new equipment located in ceiling space. (example: VAV terminals)

3.11 RIGGING AND HOISTING

.1 Mechanical Trades shall be responsible for all lifting, hoisting and transportation of all equipment on site from the point of delivery to the point of installation.

.2 Provide all rigging and hoisting as may be required for all system materials and equipment.

.3 Provide all required supplementary steel supports necessary for mounting or hanging equipment. Equipment being suspended from the floor structure, or supported from or on the roof, with a weight greater than 500 lb. (227 kg), shall have supports reviewed by a Structural Engineer.

.4 All required supplementary structure as recommended by the Consultant, shall be included in the Bid Price.

3.12 CONCRETE WORK

.1 Provide minimum 4" (100 mm) concrete housekeeping pads, unless noted otherwise, complete with reinforcing steel under all floor mounted mechanical equipment and supports. Extend pads over the full equipment base and isolator area.

3.13 MECHANICAL WIRING

.1 All power wiring for mechanical equipment shall be provided by Electrical Trades unless noted otherwise. Confirm the voltage and phase characteristics on site with the Electrical Trades prior to producing shop drawings and ordering equipment.

.2 All control wiring, line or low voltage, shall be by Mechanical Trades; follow Electrical Trades wiring specifications.

3.14 CHEMICAL TREATMENT

.1 Perform piping system cleaning and water treatment services under the supervision of the Base Building Water Treatment Specialist.

.2 Clean and degrease the piping systems prior to connection to the base building system. Clean strainer baskets as often as necessary during cleaning and degreasing. Verify chemical treatment and antifreeze concentrations with the Base Building Water Treatment Specialist.

.3 Add chemical solution to system, circulate for periods required, drain and refill. Repeat chemical treatment rinse. Refill the system, and connect to base building condenser water system.

.4 Maintain chemical levels from the time the system is filled after cleaning, up to Substantial Performance of the Contract.

.5 Provide service visits during Warranty period as required to stabilize and commission the systems. Perform corrosion tests to verify performance requirements are being achieved. Document recommendations and submit a written report to the Owner's representative after each visit.

.6 Pipes intended to carry potable water shall be flushed and disinfected before being placed in service.

.1 Disinfection procedures shall conform to AWWA C601 and AWWA C651, and the requirements of the Authorities Having Jurisdiction (AHJs).

.7 Where stainless steel piping is used for domestic water applications, piping systems shall be annealed, de-greased and pickled and will be subject to formal cleaning and disinfecting along with all other parts and components of the domestic water system as per ASTM A-380.

3.15 METERING

.1 Provide digital meters to match the Base Building standard except as noted otherwise.

PART 4 - AIR DISTRIBUTION

4.01 GENERAL REQUIREMENTS

.1 Provide ductwork and hangers in accordance with SMACNA and ASHRAE standards.

.2 Fabricate ductwork from galvanized sheet metal with a minimum coating of 0.60 oz/sq. ft. (1.83 grams/sq. m) (G60 coating) unless other materials are specifically named.

.3 Seal all transverse joints in supply, return and exhaust ductwork with high velocity duct sealer (Bakelite 530-09 or equivalent). Duct tape not acceptable.

4.02 FLEXIBLE DUCTWORK

.1 At the inlet of each VAV terminal control unit, provide a minimum of three (3) diameters of straight flex duct. Maximum length 4’-0” (1200mm).

.2 Flexible ducts serving diffusers shall be installed as one continuous piece and shall not exceed 10'-0" (3m) lengths.

.3 Connect flexible ductwork to with a minimum of three (3) self-tapping screws, seal with duct sealer and wrap with glass fab tape.

.4 Flexible ductwork to be supported from building structure where it is not self-supporting and must not be allowed to lie on ceiling or other equipment.

.5 Externally insulated flex duct to be Thermaflex type M-KE, Flexmaster Low Pressure Acoustic or approved equal.

.6 Uninsulated flex duct to be Flexmaster T/L spun aluminum or approved equal. Ducting such as aluminum foil, PVC, Mylar, fibreglass mesh and other fibre type will not be accepted.

4.03 BALANCING DAMPERS:

.1 Provide air balancing damper for each branch duct tee-off.

.2 Provide splitter dampers as shown on drawings. Construct of not less than 22-gauge material. Where installed in ducts up to 12” (300mm) deep, provide single blade, and in ducts greater than 12” (300mm) provide multi-blade with linkages, each blade being not wider than 9” (228mm).

.3 Provide spin-on connectors complete with balancing damper at take-off for grilles and diffusers from main duct.

4.04 GRILLES, DIFFUSERS AND REGISTERS

.1 As manufactured by Nailor, E.H. Price or equal as accepted by the Consultant. Refer to Equipment Schedules.

4.05 LINED DUCTWORK

.1 Provide internally lined ductwork as indicated on the drawings. Lining to be 1” (25mm) thick, 1.5 lb/cu. ft (25 kg/cu.m) density fibreglass with neoprene coating. Seal all cut edges of insulation with Bakelite 200-32 or equivalent to ensure fibreglass does not come into contact with air stream.

.2 Duct sizes to increase accordingly to maintain equivalent free area.

.3 All transfer air ductwork to be internally lined.

4.06 FIRE DAMPERS

.1 Provide fire dampers as per wall type layout requirements. ULC listed and labelled type B or C, non-asbestos. Provide latched access doors in ductwork for access to all fire dampers. Minimum 12"x12" (300mm x 300mm) access required.

4.07 SMOKE DAMPERS

.1 To be installed at locations shown on drawing ULC listed and labeled. All smoke damper units to be equipped with linkages for mounting of actuators for smoke control operation. Unit to be positive seal and able to maintain smoke barrier in lobby and corridor. Provide all electric actuators. Actuators to be mounted outside duct. Supply voltage of actuators shall be 120V, 1 phase. Control voltage of actuators shall be 24 Vdc; to facilitate actuator upon fire alarm. Contractor to provide all necessary hardware to achieve this operation.

4.08 CEILING DAMPERS

.1 ULC listed and labeled. For diffusers, damper to be complete with thermal blanket.

4.09 VARIABLE AIR VOLUME (VAV) / CONSTANT AIR VOLUME (CAV) TERMINALS

.1 Install new VAV/CAV terminals with a minimum of four duct diameters of straight ductwork upstream of terminal.

4.10 EXPOSED RETURN AIR OPENINGS

.1 All services above return air grilles to be painted flat black.

4.11 TRANSFER AIR OPENINGS

.1 Provide transfer air openings as indicated without ductwork extension shall be the responsibility of the Mechanical Trades to advise size and location required to General Trades.

4.12 FLEXIBLE CONNECTIONS

.1 ULC listed and labelled, neoprene coated, glass fabric, factory fabricated as approved by local authorities. Connection must not be under tension.

PART 5 - IDENTIFICATION OF EQUIPMENT AND PIPING

5.01 EQUIPMENT

.1 Identify all automatic control devices and motor driven equipment with 3 mm (1/8") lamacoid plastic plates with bevelled edges having engraved white letter on black background giving the nature of equipment service and its number, i.e. "Washroom Exhaust E1", and similar. Provide plates with 6 mm (1/4") lettering for motor starters and 12 mm (1/2") lettering for equipment.

.2 Fix to equipment using sheet metal screws or brass chain.

.3 Where equipment is locally switched, (e.g. Room exhaust fans) provide suitable label at switch. Co-ordinate with architect on site for labelling the switches in an aesthetically pleasing manner.

.4 Coordinate with controls Sub-Contractor and obtain list of automatically operated equipment and provide warning identification on lamacoid plate for each item as follows:

"Warning: This equipment may start at any time. Do not service without disconnecting power."

5.02 PIPING

.1 Provide all major valves with brass or plated plastic numbered tags, 16 mm (5/8") diameter with stamped numbers. Secure by brass chains to the valve. Valves adjacent to plumbing fixtures, convectors, unit heaters and entrance heaters need not be tagged. Prepare an approved list detailing the valve location, tag numbers and purpose it serves. Mount one (1) copy of this list in a glazed frame where advised by the Owner and provide additional copies for the manuals.

.2 Identify the following piping as to service and direction of flow using stencils and black lettering behind each access door, in each room, and/or every 12 m (40 ft.)

.1 Domestic hot, cold, recirculation
.2 Heating system supply and return
.3 Condenser water
.4 Gas (identify to code requirements).
.5 Sprinkler system.
.6 Standpipe system
.7 Supply air and fan system identification
.8 Return air and fan system identification.

PART 6 - TRIAL USAGE AND TESTS

6.01 AIR BALANCING

.1 The mechanical Contractor shall carry the cost of the Air and Water Balancing Company in their tender submission.

.2 Prior to operating any existing or new equipment during any stage of construction, approval from the Landlord and Consultant must be received in writing. Provide assistance to the Consultant for on-site spot verifications of air and water balance report.

.3 Air Balance Report: Air balancing shall be performed by an independent company normally employed in this field. All air quantities to be balanced with a tolerance of +/-5%. Issue a report and certificate covering the following:

.1 Nameplate and actual motor loading in amperes at actual voltage and installed overload heater size and manufacturer.
.2 Specified and achieved air quantities per outlet complete with supporting schematic diagram.
.3 Specified and actual fan total static pressures with breakdown showing inlet and discharge pressures.
.4 Temperature at diffuser farthest from source of air supply.
.5 Supply air quantity and temperature where main duct enters space.
.6 Return air quantity and temperature where air leaves space.

.4 Fan sheaves, belts and pulleys shall be adjusted or replaced as required to obtain design air quantities. Coordinate this Work with Owner/Landlord.

.5 Balance all supply, exhaust and fresh air quantities noted on drawing or in specification.

.6 Provide assistance to the Consultant for on site spot verifications of air balance report.

.7 Submit one copy of report to each: Owner, Tenant, and Consultants.

6.02 TRIAL USAGE

.1 The Landlord/Owner has the privilege of trial usage of Mechanical Systems, or parts thereof, for the purpose of testing.

.2 Assist in trial usage over a length of time as deemed reasonable by the Consultant at no extra cost, and do not waive any responsibility because of trial usage.

.3 Temporary trial usage and testing shall not be construed as “beneficial use” when making an application for Substantial Completion of the Work.

6.03 TESTS

.1 Provide and pay for all testing required on the system components where, in the opinion of the Consultant the manufacturer's ratings or specified performance is not being achieved.

.2 Test and demonstrate all automatic equipment is operating as per sequence of operation. (I.e., Test boiler controls package and circ pump interface, etc.)

.3 Piping system tests: Do not insulate piping systems until completed, perfected, and proven tight. Should leaks develop in any part of the piping system, remove, and replace defective sections, fittings, etc.

.1 Test piping system in sections as required by the progress of work.
.2 Test all hot and chilled water, condenser water and domestic water piping hydraulically to a pressure of 1100 kPa (150 psi) and prove tight for a period of 8 hours with nitrogen is also acceptable provided a pressure of 1380 kPa (200 psi) is used. Test natural gas piping as required by codes and authorities.

.4 All tests must be recorded. Submit recorded data to the Consultant.

.5 Test gas piping in accordance with CGA standard and authorities having jurisdiction. Provide record data of test results to the Consultant for review.

.6 Include a copy of all the test results in the maintenance manuals.

PART 7 - BUILDING AUTOMATION AND CONTROLS

7.01 GENERAL REQUIREMENTS

.1 Control Work shall be completed by Owner's approved contractor. The Mechanical Trades shall carry the cost of the Control Work in their Bid Price.

.2 Provide a complete and fully functioning system operating in accordance with the sequence of operations.

.3 Align all access doors, unit access locations and piping/duct connections to ensure future serviceability of all system.

7.02 CONTROL WIRING AND DEVICES

.1 All control wiring and devices shall be provided by the Controls contractors.

7.03 THERMOSTATS

.1 Thermostats to be located at same mounting height as light switches. Final mounting height and location of the thermostat to be coordinated on site with Interior Designer.

.2 Add and relocate thermostats and revise control wiring as indicated on drawing.

.3 Thermostats to be located a minimum 300 mm (12") away from, but never above, dimmer switches.

.4 New thermostats must be submitted for approval to the consultant.

7.04 ACTUATORS

.1 Electric/Electronic sized to provide adequate power for opening, closing and modulating dampers or valves in specified time.

.2 Provide each actuator with a bracket or attaching to ductwork, building structure, or equipment. Do not install actuators in ducts or fresh air intakes.

.3 Provide electric low temperature protected actuators in unheated areas such as parking garages, ventilation shafts and transformer rooms and on any equipment located outdoors.

.4 All damper and valve actuators to be provided with spring return to normal position.

.5 Unless noted otherwise on drawing Sequence of Operations, actuators are to be provided and set up such that all heating valves and return air dampers are normally open and cooling valves, exhaust and outdoor air dampers are normally closed.

.6 Provide all interlocks, safeties, sensors, and all materials required to achieve the sequence of operation described below.

.7 Program existing automation system to accommodate new VAV terminals, and any other changes, in a manner similar to existing. BAS to sense and control supply air temperature, space temperature, valve position and damper position for all VAV terminals.

7.05 SEQUENCE OF OPERATION

.1 Control dampers modulate to suit thermostat set point.

PART 8 - SEISMIC CONTROL AND RESTRAINT

8.01 WORK PERFORMED BY THIS SECTION

Provide approved seismic restraints for all new equipment, ductwork, and piping covered by divisions 20, 21, 22, 23 and 25. provide positive seismic and wind restraints on systems and components required by the applicable building code and by the local authority having jurisdiction

8.02 REFERENCE STANDARDS

.1 Ontario Building Code

.2 NFPA 13, Standard for the Installation of Sprinkler Systems.

.3 SMACNA "Guidelines for Seismic Restraints of Mechanical Systems and Plumbing Pipe Systems". Each trade shall maintain a copy of this manual on site, for regular reference during construction.

.4 Federal Emergency Management Agency (FEMA) manuals 412, Installing Seismic Restraints for Mechanical Equipment and 414, Installing Seismic Restraints for Ductwork and Pipe.

.5 American Society for Heating, Refrigerating and Air-conditioning Engineers' (ASHRAE) A Practical Guide to Seismic Restraint.

.6 Manufacturers Standardization Society of the Valve and Fittings Industry MSS SP-127-2001, Bracing for Piping Systems, Seismic – Wind – Dynamic, Design, Selection, Application.

8.03 QUALITY ASSURANCE

.1 Seismic Consultant

.1 Provide services of an experienced Seismic Consultant who is a registered Professional Engineer licensed in the jurisdiction of the work and a member in good standing of a Professional Engineers Association in the jurisdiction of the work.

.2 Seismic Consultant is to:

.1 determine proper seismic hazard level, design, recommend, and review proposed mechanical work seismic restraint shop, placement and securing drawings, and sign and stamp drawings prior to submittal for review.

.2 Periodically visit the site to supervise the installation of mechanical work seismic restraint and, when work is complete, certify in writing that seismic restraint work has been installed in accordance with signed, stamped and reviewed drawings.

.2 Installer Qualifications:

.1 A firm experienced in installing seismic/wind, noise and vibration isolation equipment similar to materials, design, and extent to that specified for this project, whose work has a record of successful in-service performance.

.2 Installer is to have a minimum ten (10) years continuous experience in successful installation of seismic/wind, noise and vibration isolation equipment of type and quality specified herein. Installer is to be trained and certified to do this type of work. Submit proof of experience and certification.

.3 A senior, qualified representative is to be at the project site to direct the various stages of operation at all times. Installer's representative is to have a minimum five (5) years' experience.

.3 Seismic and wind control/restraint systems are to be fully integrated into and compatible with noise and vibration controls in accordance with Section 20 05 20 Mechanical Vibration Control.

.4 Acceptable seismic / wind restraint manufacturers are: Kinetics Noise Control, Vibro-Acoustics, Isotech Industries.

.5 Use a single manufacturer to provide and certify seismically rated isolators and restraints.

8.04 SUBMITTALS

.1 Obtain required equipment information and submit manufacturer's shop drawings/product data sheets for restraining devices and steel bases. Include placement data, calculations, and details of attachment to both equipment and structure meeting requirements of forces involved. Product data sheets and drawings are to be signed and stamped by Seismic Consultant referred to above.

.2 Stamped submittal drawings are to be project and product specific. Generic stamped calculations are not acceptable.

.3 Submittal drawings shall be stamped and signed by the Seismic Consultant as defined in section 1.04.1.

.4 At the completion of the project, provide a sealed written report and completion letter certifying that the installations have been completed in accordance with the specified design(s) and shop drawing(s).

8.05 ENGINEERING PERFORMANCE REQUIREMENTS

.1 Specified design criteria for seismic and vibration for elements and components are to be designed to accommodate these specific calculation components factors as indicated on structural drawings. Refer to structural drawing S101 and coordinate with Structural Engineer.

importance 1.3 uls
seismic data: sa(0.2) = 0.391 / sa(0.5) = 0.328 / sa (1.0) = 0.187 / sa (2.0) = 0.0872
site data; site class d; seismic category sc3; les(0.2)=0.5083

8.06 COORDINATION

.1 Coordinate size, shape, reinforcement and attachment of all housekeeping pads supporting vibration/seismically rated equipment. Concrete is to have a minimum compressive strength as specified by the seismic consultant.

.2 Coordinate with vibration/seismic restraint manufacturer and the structural engineer of record to locate and size structural supports underneath vibration/seismically restrained equipment (e.g. roof curbs, cooling towers and other similar equipment).

8.07 SEISMIC RESTRAINTS APPLICATION

.1 General

.1 All equipment, piping and ductwork shall be restrained to resist seismic forces per the applicable building code. Additional requirements specified herein are included specifically for this project; as needed basis.

.2 Install seismic restraint devices per the manufacturer's submittals. Any deviation from the manufacturer's instructions shall be reviewed and approved by the manufacturer.

.3 Attachment to structure for suspended equipment, pipe and duct: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.

.4 Provide hanger rod stiffeners where indicated or as required to prevent buckling of rods due to seismic forces.

.5 Where rigid restraints are used on equipment, ductwork or piping, the support rods for the equipment, ductwork or piping at restraint locations must be supported by anchors rated for seismic use. Post-installed concrete anchors must be in accordance with ACI 355.2.

.2 Equipment Restraints

.1 Install fasteners, straps and brackets as required to secure the equipment.

.2 Install seismic snubbers on HVAC equipment supported by floor-mounted, non-seismic vibration isolators. Position snubbers as necessary and attach to equipment base and supporting structure as required.

.3 Install neoprene grommet washers or fill the gap with epoxy on equipment anchor bolts where clearance between anchor and equipment support hole exceeds 3 mm (1/8").

.4 Suspended Equipment: All suspended equipment that meets any of the following conditions requires seismic restraints as specified by the supplier:

.1 Rigidly attached to pipe or duct that is 75 lbs. and greater.

.2 Items hung independently or with flexible connections greater than 20 lbs. For importance factors greater than **[1.0]** all suspended equipment requires seismic restraints regardless of the above notes.

.3 Wall mounted equipment weighing more than 20 lbs. with an importance factor of **[1.0]**.

.4 The 300mm (12") rule does not apply to suspended equipment.

.5 Roof Mounted Equipment: Needs to be installed on a structural frame, seismically rated roof curb, or structural curb frame mechanically connected to the structure. Items shall not be mounted onto sleepers or pads that are not mechanically and rigidly attached to the structure. Restraint must be adequate to resist both seismic and wind forces.

.6 Rigid Mounted Equipment:

.1 Anchor floor and wall mounted equipment to the structure as per the stamped seismic certifications / drawings.

.2 Suspended equipment shall be restrained using seismic cable restraints, or struts, and hanger rods as per the stamped seismic certifications / drawings.

.7 Vibration Isolated Equipment:

.1 Seismic control shall not compromise the performance of noise control, vibration isolation or fire stopping systems.

.2 equipment supported by vibration-isolation hangers shall be detailed and installed with approximately a 3mm (1/8") gap between the isolation hangers and the structure. isolators at restraint locations must be fitted with uplift limit stops

.3 Piping and Ductwork Systems

.1 Provide seismic control measures with spacing and anchorage engineered for the specific project.

.2 All piping and duct systems are to be restrained to meet code requirements.

.1 All piping associated with "Life Safety Systems" shall always have an importance factor of **[1.5]**. Seismic restraint requirements / exemptions vary with code and seismic acceleration – see specific code and comply with applicable restraint requirements.

.2 All piping systems (regardless of type of pipe) assigned a component importance factor of **[1.5]** shall require seismic restraints. Seismic restraint requirements / exemptions vary with code and seismic acceleration – see specific code and comply with applicable restraint requirements.

.3 Piping associated with an importance factor of **[1.0]** may not require seismic restraint; see specific code for requirements.

.4 Seismically restrain / brace all pipes 65 mm (2-½") in nominal diameter and larger.

.5 Seismically restrain / brace all piping in boiler rooms, mechanical rooms and refrigeration mechanical rooms 32 mm (1-¼") in nominal diameter and larger.

.6 Seismically restrain / brace all gas (i.e.: natural gas, medical gas, vacuum, petroleum based liquid, compressed air, etc.) piping 25 mm (1") in nominal diameter and larger.

.7 Branch lines may not be used to brace main lines.

.3 Restraint Spacing for Piping:

.1 For ductile piping: Transverse supports a maximum of 12 m (40') o.c.

.2 For ductile piping: Longitudinal supports a maximum of 24 m (80') o.c.

.3 For non-ductile piping (e.g., cast iron, PVC) space transverse supports a maximum of 6 m (20') o.c., and longitudinal supports a maximum of 12 m (40') o.c. Differential spacing can be designed depending upon pipe size and length(s) of run (design will be indicated on drawings of approved method).

.4 For pipe risers, restrain the piping at floor penetrations using the same spacing requirements as above.

.4 Seismically restrain per specific code requirements, all ductwork listed below (unless otherwise indicated on the drawings), using seismic cable restraints (ductwork not meeting listed below criteria is to be "exempt"):

.1 All ducts with cross sectional area equal to or greater than 0.55 m2 (6 ft2).

.2 All round ducts with diameters equal to or greater than 700mm (28").

.3 Any ductwork, pipe or equipment, which if it were to fail would result in damage to a piece of equipment or building function that has a component importance factor of **[1.5]**.

.4 All ductwork weighing more than 25 kg/m (17 lb/ft).

.5 Restraint Spacing For Ductwork:

.1 Transverse supports a maximum of 9 m (30') o.c.

.2 Longitudinal supports a maximum of 18 m (60') o.c.

.6 Brace a change of direction longer than 3.7 m (12').

.7 This specification does not allow the use of the "12-inch rule" where the piping and duct may be exempted from seismic restraint based on the length of the support rods provided that the rods are not subjected to bending moments.

.8 Install restraint cables so they do not bend across edges of adjacent equipment or building structure. Tie back to structure at 45 degrees to the structure.

.9 Longitudinal restraints for single pipe supports shall be attached rigidly to the pipe, not to the pipe hanger.

.10 Adjust restraint cables so that they are not visibly slack. Cable not to support weight during normal operation.

.11 Seismic systems are to be compatible with requirements for anchoring and guiding of systems.

.12 Drilled or power driven anchors or fasteners shall not be permitted for use with seismic control measures.

.13 Friction due to gravity does not constitute a seismic attachment.

.14 Seismic restraint connections are not to be connected to the bottom chord of steel joists or the bottom flange of steel beams.

.15 Standard beam clamps can be used to support restrained components; they cannot be used to connect the seismic restraint to the structure, only for the hanger rods.

.16 Brace remaining piping and ductwork to code requirements or in conformance with SMACNA "seismic restraint manual guidelines for mechanical systems", latest edition.

8.08 INSPECTION AND CERTIFICATION

.1 Notify the local representative of the seismic restraint manufacturer prior to installing any seismic restraint devices. Seek the representative's guidance in any installation procedures

.2 Upon completion of the installation, arrange for the Seismic Consultant to visit the site to verify the proper installation of all seismic restraint devices herein specified. The local representative of the vibration manufacturer shall be present as well to support the Seismic Consultant in the inspection of the completed system. A written report citing any installation errors, improperly selected devices, or other fault in the system which could affect the performance of the system is to be generated by the Seismic Consultant. Also, the local representative shall verify that isolators are adjusted, with spring's perpendicular to bases or housing, adjustment bolts are tightened up on equipment mountings, and hangers are not cocked.

.3 Submit a report including the manufacturer's representative's final report, indicating that all seismic restraint material has been properly installed, or steps that are to be taken by the contractor to properly complete the seismic restraint work as per the specifications and approved shop drawings with which he/she is unfamiliar

MCW Consultants Ltd.

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ELECTRICAL SPECIFICATIONS

FOR

KEELE ST JRPS &

COMMUNITY CENTRE

99 Mountview Avenue

Toronto, ON.

TO

TORONTO DISTRICT SCHOOL BOARD

TR-25-0957

DATED

MAY 22, 2026

ISSUED FOR ADD-001

Contact Person: Ryan Lien
Phone: (416) 598-2920 ext:293
Email: rlien@mcw.com

ELECTRICAL SPECIFICATIONS

1. **General Provisions:**

1.1 Codes, Regulations, Permits

1.1.1 Work shall conform to the latest edition of the Canadian Electrical Safety Code.

1.1.2 All equipment and material shall be CSA and ULC approved and so labelled.

1.1.3 Obtain permit, pay all fees and present final unconditional approval certificate from Hydro Inspection and authority having jurisdiction.

1.1.4 Refer to and comply with the general conditions as indicated in the Architects specification.

1.1.5 Existing and new services penetrating floor slab or fire rated walls to be sealed with ULC listed and labelled 3.0 hr “F” rated fire retardant sealant.

1.2 Examination of Site:

1.2.1 Before tendering, examine site and all applicable drawings so that the tender price includes for everything necessary for completion of work. Failure to visit the site or adequately review all the required interfacing details will not entitle this sub contractor to any additional compensation.

1.3 Work in Existing Building:

1.3.1 Refer to architectural and structural drawings for details of building renovation.

1.3.2 Base building redundant equipment and materials: To be turned over to the Landlord.

1.3.3 Existing base building mullions, ceiling grid and curtain wall: Do not make any penetrations under any conditions.

1.3.4 Execute all work using materials and methods to provide system operation, quality and appearance equal to or better than the existing base building.

1.3.5 X-Ray all locations where openings are required in the floor slab to ensure that post tension cables are not damaged. Coordinate with the project supervisor prior to proceeding.

1.3.6 Co-ordination of the installation, phasing, working conditions, and time schedules is to be carefully co-ordinated to allow the present business to continue during the renovation period.

1.3.7 Where existing services presently mounted on and/or concealed behind existing finishes become exposed during the renovation work, and where these services will not be concealed behind or mounted on new finishes, include for relocating the service so as to be concealed behind new or existing finishes. Co-ordinate new locations with the Architect.

1.3.8 Maintain all parts of the existing building in operation during normal working hours.

1.3.9 Where disruptions of existing services are required co-ordinate the shut-downs with the Owner and carry out the work at a time and in a manner acceptable to them. Carefully schedule all disruptions and/or shut-downs and ensure that the duration of same is kept to the absolute minimum. Submit for approval a written concise schedule of each disruption at least 72 hours in advance of performing work and obtain Owner's written consent prior to implementing.

1.3.10 Where disruptions of life safety systems are required comply with paragraph 1.3.9 above and also provide continuous monitoring during shut-down period and ensure all systems are reactivated prior to leaving the site at the end of each working day.

1.3.11 Assume full responsibility for any disruption or damage to existing services or systems. Should any temporary connections be required to maintain services during work in the existing building, supply and install all necessary material and equipment and provide all labour at no extra cost. Should any existing system or device be damaged in the course of work by this Division, make full repairs without extra cost and to the satisfaction of the Owner.

1.4 Owner's Right to Relocate Electrical Items:

1.4.1 The Owner reserves the right to relocate electrical items at a later date, but prior to installation, without cost, assuming that the relocation of each item does not exceed 10 feet from it's original location.

1.5 Shop Drawings

1.5.1 Provide seven copies of manufacturer's shop drawings for approval. Shop drawings shall include, all distribution equipment, light fixtures, emergency battery units, electrical heating units and other special equipment.

1.6 Cutting and Patching:

1.6.1 Be responsible for all cutting and patching necessary for completion of your work.

1.7 Identification

1.7.1 Identify electrical work as specified herein:

1) For each piece of electrical distribution equipment from the electrical source of supply up to and including panelboards and motor systems, for special control panels and cabinets, and for any other piece of equipment where specified in this Section, provide engraved lamacoid identification nameplates.

2) Nameplates shall generally be black-white-black with bevelled edges, secured to apparatus with stainless steel screws. Generally lettering shall be 6mm high but equipment in the main electrical room shall be provided with lettering 13mm high.

3) Warning signs, if and when required, shall be red with white lettering.

4) Equip large multiple cell or component apparatus such as switchboards and distribution panels with main nameplates identifying the equipment, voltage characteristics and capacity, and with sub-nameplates clearly identifying each cell or component and its service.

5) Panelboard nameplates shall identify the panelboard numbers designated on the drawings, unless otherwise instructed. Nameplates for disconnect switches, control panels and cabinets shall outline their service.
6) Motor starters, magnetic and manual, shall identify the piece of motorized equipment being serviced.

7) Exact nameplate wording and sizes must be approved by and confirmed by the Consultant prior to manufacture.

8) Directories for branch circuit panelboards shall be clearly and neatly typewritten, accurately identifying the type, location and wattage of the connected load for each circuit breaker. Directories shall be secured to the rear of the cabinet door under protective plastic. Incorporate copies of all panel board directories in each copy of operating and instruction manuals.

9) Clearly identify each branch circuit breaker in a permanent manner to correspond with directories. Glued paper identification will not be acceptable.

10) Clearly identify main pull or junction boxes (excluding obvious outlet boxes) by painting the outside of the covers. Paint colours shall be in accordance with the following schedule:

Lighting	-	Yellow
Power	-	Blue
Emergency Power	-	Orange
Fire Alarm	-	Red
Telephone	-	Cream
Miscellaneous Signals	-	Brown

11) In addition to painting miscellaneous signal boxes clearly identify the specific system in which the box is installed.

12) Colour code empty conduit capped and terminated for future use as specified above and clearly identify its intended use by means of securely attached tags.

13) Colour code conductors throughout, to identify phases, neutrals and grounds, by means of coloured conductor insulation. Colours shall be as follows:

Phase A	-	Red
Phase B	-	Black
Phase C	-	Blue
Ground	-	Green
Neutral	-	White

14) Control conductors, in addition, shall be numbered with Brady Ltd., or Electrovert Ltd., Z-type markers. Colour code conductors, for special component per manufacturer's recommendations.

15) Use dymo tape to label each receptacle with its circuit number (e.g., UA-27).

1.8 Documentation and systems acceptance

1.8.1 Provide three (3) CDs of electronic copies and one (1) copy three-ring binder of hard copy of closeout documentation and as-built PDF copy and autocad files.

1.8.2 Each manual shall contain the following data:

- A set of as-built mark-up print for Consultant to prepare autocad as-built files
- Letters of Owner's Instructions
- Final ESA certificate.
- A copy of each "reviewed" shop drawing.
- Complete explanation of operation principles and sequences.
- Complete part lists with numbers.
- Recommended maintenance practices and precautions.
- Complete wiring and connections diagrams.
- Certificate of warranty.
- Emergency Lighting Verification Report.
- Representative certificates for Fire Alarm System verification.

1.8.3 Ensure that operating and maintenance instructions are specific and apply to the models and types of equipment provided.

1.9 Testing and commissioning

1.9.1 Perform, in conjunction with the consultant, testing and verification of all following systems as discussed hereinafter. This testing and verification shall be provided after, and in addition to, the standard manufacturers' testing and verification procedures.

- Major distribution equipment and components;
- Wiring;
- Emergency lighting;
- Fire alarm system;
    - **Ensure door holders are properly integrated with the smoke detectors and fire alarm system**
- Lighting control system.
- Dimming system.

1.9.2 Test and verify that all equipment is installed within and operating within manufactures' guidelines and in accordance with the contract document requirements, to ensure the systems can be safely energized and operated.

1.9.3 Obtain and have available the necessary reference document for review during the testing period.

1.9.4 Execute Work of this section only by personnel that have taken part in the construction program of this project and manufacturer appointed qualified technical staff capable of setting-up, adjusting, balancing and calibrating all equipment, components and systems.

1.10 Instruction to owners

1.10.1 Instruct the Owner's representatives in all aspects of the operation of systems and equipment.

1.10.2 Arrange for and pay for services of service engineers and other manufacturers' representatives required for instruction on specialized portions of the installation.

1.10.3 Submit to the Consultant at the time of final inspection a complete list of systems stating for each system:

A. Date instructions were given to the Owner's staff.
B. Duration of instruction.
C. Name of persons instructed.
D. Other parties present (manufacturer's representative, consultants, etc.).

1.10.4 Signatures of the Owner's staff stating that they properly understood the system installation, operation and maintenance requirements.

1.11 Extra work

1.11.1 In case where extra work of any kind is required, obtain written instruction from the architect / design consultant before proceeding. Payments will be made for authorized changes only.

1.11.2 Quotation with breakdown of material, labour, overhead, profit, etc., shall be submitted for each change. Labour units shall be based on the latest National Electrical Contractors Association (NECA) labour column one for the complete duration of the project. Material prices shall be based on the current National Price System with trade discounts. Hourly labour rate shall include all rated changes for supervision, Hydro inspection, hand tools, parking, clean-up, as-built drawings and additional bonding.

2 Basic Material and Methods:

2.1 Wiring Methods:

2.1.1 All building wires and cables shall be copper thermoplastic type RW90 degrees C rated and installed in conduit. Minimum size shall be #12 AWG. For final connections to lighting fixtures use type GTF wire. For final connections to heating equipment use silicone insulated type wire, suited for this purpose. All conduit shall be EMT type galvanized steel utilizing compression type, factory-installed insulated throats and gland watertight and compression type couplings (cast fittings/ set-screws not acceptable) to be forged steel. All conduit shall be concealed except in unfinished areas. Paint exposed conduit to match existing wall/ ceiling finish.

2.1.2 Branch circuit wiring exceeding 100 feet to the furthest outlet from a panelboard shall be #10 AWG.

2.1.3 Armoured cable (BX) may be used for fixture tails and wall mounted outlets maximum length 5 feet.

2.1.4 Provide VFD rated cabling for all VFD equipment.

2.1.5 All conduit shall be run parallel to walls and ceilings. Provide a nylon fish wire in all empty conduit. All connectors shall be Ideal wing nut type. Refer to clause 2.1.4, Include for 'Where EMT conduit is required, provide compression type EMT couplings (cast fitting and set-screw not acceptable) and glan watertight EMT connector with factory insulated throats and to be forged steel. Paint exposed conduit to match existing finish'

2.1.6 In areas with drywall ceilings, contractor shall locate/relocate all new/existing junction boxes, pull boxes, disconnects, etc. to accessible areas; as required by the Canadian Electrical Code. Where it is no possible to relocate/install existing/new services in accessible areas, Contractor shall provide access panels c/w fire ratings as required. Exact location of access panels shall be co-ordinated with the Architect.

2.1.7 Where conduit penetrate through the fire rated wall, seal up air gap with ULc fire rated material.

2.1.8 Support all conduit independent of ceiling system.

2.2 Outlet Boxes and Junction Boxes:

2.2.1 Provide an outlet box for each lighting fixture, wiring device, data outlet, telephone outlet, etc. Boxes shall be suitable for the application.

2.2.2 Support boxes independent of conduit.

2.2.3 All boxes shall be installed so as to be accessible after work is complete. Provide pull boxes on all conduit runs on the basis of not more than two right angle bends or their equivalent or a distance not to exceed 100 feet between boxes.

2.3. Devices:

2.3.1. Devices shall be stainless steel, unless otherwise specified.

2.3.2. Decorator duplex receptacles (15A, 250V max.) shall be Pass & Seymour Tamper-Resistant Cat. #885TRW, mounted 18" AFF or 8" above counter tops.

2.3.3. Decorator switches (15A, 120/277V max.) shall be Pass & Seymour #2601 (Single Pole), #2603 (Three Way), mounted 4'-0" AFF.

2.3.4. Coverplates shall be Pass & Seymour SS series smooth stainless steel, for flush mounted service boxes.

2.3.5. Receptacles located within 3 metre of washbasins or similar facilities shall be Pass & Seymour #1595. (Receptacles c/w GFI protection.)

2.3.6. Receptacles located in kitchens and installed within 1.5 metre of kitchen sink along the wall behind counter work surfaces shall be protected by ground fault interrupter.

2.3.7. Receptacles located in bathrooms, washrooms or similar location within 3 metres of washbasin, bathtub or shower stalls shall be protected by ground fault interrupter.

2.3.8. Flush mounted floor boxes shall be HUBBELL. Refer electrical legend drawing E-01.

2.3.9. Isolated ground receptacles shall be Pass & Seymour Cat. #IG26262-HG.

2.3.10. Decorator exhaust fan switches (20A max.) shall be Pass & Seymour Cat. #2629, illuminated when on.

2.3.11. Decorator variable speed exhaust fan switches shall be Pass & Seymour Lumaspec non-preset series, wattage as required.

2.3.12. Wall mounted lighting dimmers shall be white, Lutron NT series, wattage as required.

2.3.13. Variable speed exhaust fan switches shall be Lutron NTF Series, wattage as required.

3. **Distribution:**

3.1. Extend and modify the existing base building distribution system as indicated on the drawings.

3.2. Provide new switches and breakers in existing distribution equipment as detailed. New equipment shall, in all respects, be compatible with existing equipment.

3.3. Balance the loading on feeders so that unbalanced load is less than 10%.

3.4. Provide updated all affected panel typewritten directories, hand written are not acceptable.

3.5. New Equipment:

3.5.1. Safety switches shall be Eaton Canada Ltd. HNF series, quick make, quick break type. Where outdoor switches shall be CEMA-3 or equal.

3.5.2. Panelboard shall be Eaton Canada type PRL1A, ratings as indicated on the drawings. Provide a clearly typed directory with each panelboard. Breakers shall be thermal magnetic, bolt on type, copper tinted bus, full neutral and 10,000 Amp symmetrical interrupting capacity or equal.

3.5.3. Manual starters shall be Allan Bradley Bulletin 600, with pilot light and on/off toggle switch.

3.5.4. Fuses shall be Gould Shawmut HRC 1, Class J series CJ for constant running equipment and series AJT for equipment that cycles on and off.

3.5.5. The enclosure for all distribution equipment shall be sprinklered proof with an extended top cover located on the front of the unit.

3.5.6. Accept manufacturers: Eaton, Schneider Electric and Siemens Canada.

3.5.7. General purpose transformer – dry type

- Transformer shall be sized as shown on plans, 3 phase, 3 coils with a common core construction, 60 Hz.
- Primary winding shall be 600 volts, 3 phase, delta connected, complete with two full capacity 4.5% adjustment taps, 1 below (FCBN) and 1 above (FCAN) the rated voltage for 10 kVA and less, and four full capacity 2.5% adjustment taps, 2 below (FCBN) and 2 above (FCAN) the rated voltage for more than 10 kVA.
- Secondary winding shall be 208Y/120 volts, 3 phase, wye connected, with a 30° angular displacement (lagging) with respect to the primary winding.
- All winding conductors shall be of copper.
- Temperature rise at full load shall not exceed 80°C with a class 220 insulation system.
- Windings shall be wound with the secondary winding nearest to the core and shall be round coils.
- The core shall be constructed of high grade, grain oriented silicon steel laminations.
- The impregnation process for the core-and-coil assembly shall include a period under vacuum, followed by pressure impregnation using epoxy resin (EVI process).
- The transformer shall be isolated from the enclosure to reduce noise and vibration by means of anti-vibration pads.
- The transformer enclosure shall be fabricated from sheet steel and shall be of Type 4 (totally enclosed), Sprinkler-proof.

- The enclosure coating shall be grey ASA 61, color option available and suitable for indoor/outdoor use.

3.5.8. General purpose Step-Up Transformer – dry type

- Step-up Transformer shall be sized as shown on plans, 3 phase, 3 coils with a common core construction, 60 Hz.
- Step-up transformer should be a purpose built step-up transformer rather than a reverse fed step-down transformer.
- Primary winding shall be 208V volts, 3 phase, DELTA connected, complete with two full capacity 4.5% adjustment taps, 1 below (FCBN) and 1 above (FCAN) the rated voltage for 10 kVA and less, and four full capacity 2.5% adjustment taps, 2 below (FCBN) and 2 above (FCAN) the rated voltage for more than 10 kVA.
- Secondary winding shall be 480/277 volts, 3 phase, wye connected, with a 30° angular displacement (lagging) with respect to the primary winding.
- All winding conductors shall be of copper.
- Temperature rise at full load shall not exceed 80°C with a class 220 insulation system.
- Windings shall be wound with the secondary winding nearest to the core and shall be round coils.
- The core shall be constructed of high grade, grain oriented silicon steel laminations.
- The impregnation process for the core-and-coil assembly shall include a period under vacuum, followed by pressure impregnation using epoxy resin (EVI process).
- The transformer shall be isolated from the enclosure to reduce noise and vibration by means of anti-vibration pads.
- The transformer enclosure shall be fabricated from sheet steel and shall be of Type 4 (totally enclosed), Sprinkler-proof.
- The enclosure coating shall be grey ASA 61, color option available and suitable for indoor/outdoor use.

3.5.9. Provide arc flash study for all new panels. The arc flash study will be performed by an equipment manufacturer or Enkompass Power and Energy Corp.

3.5.10. Grounding and Bonding:

Provide a complete grounding and bonding system throughout the entire electrical system in accordance with the requirements of the O.E.S.C. and to the satisfaction of the local inspector.

4. Fire Alarm System:

4.1. The building presently has an existing Edwards fire alarm system.

4.2. Provide new fire alarm devices as noted. Devices shall match existing system and connect to control and annunciator panels.

4.3. Obtain the services of the system manufacturer to perform any and all modifications required to base building control and annunciator equipment.

4.4. All wiring for the system shall be installed in conduit and shall comply with requirements of the system manufacturer.

4.5. Upon completion of the modifications to the fire alarm system the system manufacturer shall provide and inspection and verification report on all devices and wiring.

4.6. Upon completion of the modifications to the fire alarm system the system manufacturer shall provide an updated fire alarm schedule to reflect the changes made during the course of this project.

5. Seismic Restraints

5.1. GENERAL

5.1.1. SUMMARY

5.1.1.1. Provide approved seismic restraints for all equipment, conduits, panels, cable trays and light fixture covered by Division 26.

5.1.1.2. Design seismic restraint systems to conform to the Ontario Building Code for the project location.

5.1.1.3. Submit test certificates for each seismic restraint device, identifying maximum tested load capacities.

5.1.1.4. Submit calculations for each piece of restrained equipment, and conduit, including seismic forces, restraint selection, and selection data.

5.1.1.5. Provide adequate attachment to structure in accordance with drawings and specifications.

5.1.1.6. Ensure housekeeping pads for all electrical equipment are reinforced to withstand seismic loading and that housekeeping pad is rigidly fastened to support structure.

5.1.2. REFERENCES

5.1.2.1. Ontario Building Code

5.1.3. SUBMITTALS

5.1.3.1. Submit manufacturer's instructions, printed product literature and data sheets and include product characteristics, performance criteria, physical size, finish and limitations.

5.1.3.2. Submit operation and maintenance data for incorporation into manual.

5.2. PRODUCTS

5.2.1. MANUFACTURERS

5.2.1.1. Acceptable Products: Product shall be provided by a single manufacturer. Products and manufacturers specified are to establish a standard of quality for design, function, materials, and appearance. Products shall be modified as necessary by the manufacturer for compliance with requirements. Provide the following specified product and manufacturer without exception, unless approved as a substitute by addendum to the Contract Documents prior to the bid date:

5.2.1.1.1. Kinetics Noise Control Inc.
5.2.1.1.2. BVA
5.2.1.1.3. Vibration Mountings & Controls, Inc.
5.2.1.1.4. Tecoustics
5.2.1.1.5. Hilti

5.3. EXECUTION

5.3.1. INSTALLATION

5.3.1.1. Provide all directional seismic snubber for floor mounted dry type transformers.

5.3.1.2. Provide slack seismic restraint cables for platform mounted assemblies.

5.3.1.3. All equipment shall meet the requirements of the OBC and all equipment shall have seismically acceptable attachment points.

5.3.1.4. Seismic restraints may be omitted from the following installations:

5.3.1.4.1. Conduits in electrical and mechanical rooms less than 1 1/4" (32mm) inside diameter.
5.3.1.4.2. All other conduits less than 2 1/2" (65mm) inside diameter.
5.3.1.4.3. All conduits suspended by individual hangers where top of conduit are suspended 12" (300mm) or less from the supporting structure member.

5.3.1.5. Unless indicated otherwise, seismic restraints shall be capable to withstand a horizontal force equal to 2g in any direction.

5.3.1.6. All conduit supported on either side of a building expansion joint shall have provision for building motion, i.e. flexible conduit.

5.3.1.7. Ensure equipment is sufficiently rigid for seismic restraint point loading.

5.3.1.8. Light fixtures shall not be supported solely by suspended ceilings. Provide independent supporting system to carry weight of fixtures (minimum 2 corners).

5.3.1.9. Provide transverse and longitudinal bracing to conduits as required by this specification.

5.3.1.10. Maximum spacing for transverse bracing shall be 20 ft. (6 m) and longitudinal restraints at 40 ft. (12 m).

5.3.1.11. Vary adjacent spacing of restraints runs by 10% to 30% to avoid coincident resonance.

5.3.1.12. At vertical risers, wherever possible, support the weight of the riser at a point or points above the centre of gravity of the riser. Provide lateral guides at the top and bottom of the riser and at intermediate points not to exceed the transverse spacing discussed on item .7.

5.3.1.13. Restraints shall be installed at least 2" (50mm) clear of all other equipment, services and any other anchors or supports.

5.3.1.14. Provide transverse and axial restraints within 12 ft. (3.6 m) of all vertical bend.

5.3.1.15. At steel trusses, connect to top chords and follow truss manufacturer's instructions.

5.3.1.16. Select the anchors in the concrete slab for a minimum load equal to twice the weight of the equipment.

5.3.1.17. Equipment manufacturer shall be responsible for ensuring that all integral components are capable of withstanding a lateral force of 2g.

5.3.1.18. Restraining devices shall be placed on all sides of equipment with the exception of light fixtures.

5.3.1.19. Provide additional steel brackets, inserts, bolts, cable, etc. to provide seismic restraints.

5.3.1.20. The installation of seismic restraints shall not compromise vibration isolation capabilities.

5.3.1.21. Install seismic snubbers at the corner of the transformer core and coil assembly, to prevent the assembly from sliding on the vibration isolation pads.

5.3.1.22. For non-vibrating equipment, secure the equipment to the structure by:

5.3.1.22.1. Bolting directly to the structure.
5.3.1.22.2. Use rigid seismic restraints.
5.3.1.22.3. Use taught cable restraints - not slack.
5.3.1.22.4. Rigid restraints are preferable to cable restraints as cables have no compression load capabilities.

5.3.1.23. Install bolts and tighten in accordance with manufacturer's torque recommendations.

5.3.1.24. Prior to the installation of any seismic restraints, review with the Structural Consultant the methods of attachment to the building structure and equipment loads.

5.3.2. SLACK CABLE REQUIREMENTS

5.3.2.1. Provide slack cable restraints systems, or other approved systems.

5.3.2.2. Other approved systems are: rigid restraint where the conduits pass through a block or concrete wall, or cable strap and spacer piece attached to the structure, used where the conduit is adjacent to a wall and conventional slack cable restraints cannot be used.

5.3.2.3. Connect slack cable restraints to ceiling hung equipment in such a way that the axial projection of the wires passes through the centre of gravity of the equipment.

5.3.2.4. Orient restraint wires on ceiling hung equipment at approximately 90ø to each other (in plan), and tie back to the ceiling slab at an angle not exceeding 45ø to the slab.

5.3.2.5. Install cables using appropriate grommets, shackles, and other hardware to ensure alignment of the restraints and to avoid bending the cable at connection points.

5.3.2.6. Adjust restraint cables such that they are not visibly slack, or that the flexibility is approximately 1 1/2" (40mm) under thumb pressure for 5 ft. (1.5m) cable length (equivalent ration for other cable lengths). Adjust the clearance at cable strap/spacer piece restraint to not exceed 1/4" (6mm).

LEGEND (NOT ALL SYMBOLS SHOWN ON THIS LEGEND ARE NECSSARILY USED ON THIS PROJECT)

VALVES

NEW

- GATE VALVE
- BALL VALVE
- BUTTERFLY VALVE
- GLOBE VALVE (TOP / SIDE)
- CIRCUIT BALANCING VALVE
- HORIZONTAL VALVE
- ANGLE GLOBE VALVE
- AUTO-FLOW BALANCING VALVE
- TWO-WAY CONTROL VALVE
- TERMINAL CONTROL AND BALANCE VALVE
- PRESSURE INDEPENDENT CONTROL VALVE (PICV)
- THREE-WAY CONTROL VALVE
- SOLENOID OPERATED VALVE
- PLUG VALVE
- SHUTOFF COCK
- MANUAL THREE-WAY VALVE
- HAND WHEEL - RISING STEM (OS&Y)
- HAND WHEEL - NON-RISING STEM
- HAND WHEEL - SUPERVISED (SV)
- GEAR OPERATED MANUAL VALVE
- PINCH VALVE
- NEEDLE VALVE
- QUICK OPEN VALVE
- QUICK CLOSE VALVE
- BACK FLOW PREVENTER
- SWING CHECK VALVE
- SPRING TYPE CHECK VALVE
- INLINE MULTIPURPOSE VALVE
- ANGLE MULTIPURPOSE VALVE
- REDUCED PRESSURE BACKFLOW PREVENTER
- DOUBLE CHECK VALVE ASSEMBLY
- DIFFERENTIAL PRESSURE CONTROL VALVE
- DIFFERENTIAL PRV REGULATOR
- REDUCING REGULATOR
- GAS PRV (PRV)
- SAFETY OR RELIEF VALVE
- HOSE BIBB VALVE

STEAM TRAPS

- INVERTED BUCKET (IB)
- FLOAT AND THERMOSTATIC (F&T)
- THERMOSTATIC (T)
- THERMODYNAMIC (DISK) (TD)
- VARIABLE ORIFICE (PITON)
- FIXED ORIFICE

PIPE FITTINGS

- 90 DEGREE ELBOW
- 45 DEGREE ELBOW
- ELBOW UP
- ELBOW DOWN
- PIPE CAP
- TEE
- TEE UP
- TEE DOWN
- BOTTOM BRANCH
- TOP BRANCH
- FLANGE
- SCREWED UNION
- CONCENTRIC REDUCER
- ECCENTRIC REDUCER (FLAT ON BOTTOM) (FOB)
- ECCENTRIC REDUCER (FLAT ON TOP) (FOT)
- QUICK CONNECT
- SIGHT GLASS

PIPE ACCESSORIES

- SIGHT GLASS
- VACUUM BREAKER
- GAS METER (GM)
- WATER METER (WM)
- MAGNETIC FLOW METER (M)
- FLEXIBLE CONNECTION
- HEAT TRACE (INSULATED) (INS)
- HEAT TRACE (NON-INSULATED)
- THRUST BLOCK
- PIPE ANCHOR
- PIPE GUIDES
- EXPANSION COMPENSATOR
- AUTO VENT (AV)
- MANUAL VENT (MV)
- AIR SEPARATOR
- PIPE SPRING HANGER
- PUMP SUCTION DIFFUSER
- BASKET STRAINER
- PIPE STRAINER
- PIPE STRAINER - WITH BLOWDOWN
- PIPE STRAINER - WITH BALL VALVE BLOWDOWN AND HOSE CONNECTION

MULTI-LINE VALVE SYMBOLS

- PIPE CAP
- REDUCER: CONCENTRIC
- REDUCER: ECCENTRIC
- TEE
- PIPE
- PIPE HANGER
- PIPE SLEEVE
- FLANGES: SLIP ON
- FLANGES: WELD NECK
- FLANGES: BLIND
- ELBOW DOWN (90°)
- ELBOW UP (90°)
- 11.25° ELBOW
- 22.5° ELBOW
- 45° ELBOW
- 90° ELBOW
- BUTTERFLY VALVE (WITH WELDNECK FLANGES)
- BUTTERFLY VALVE (WITH BLIND FLANGES)

PLUMBING & DRAINAGE

- SHOWER HEAD
- SINGLE / DOUBLE GAS SUPPLY VALVE
- FUNNEL FLOOR DRAIN / SQUARE FLOOR DRAIN
- FLOOR DRAIN / FLOOR DRAIN WITH TRAP
- HUB DRAIN / WITH TRAP
- ROOF DRAIN
- CLEAN OUT PLUG / FLOOR
- P-TRAP / P-TRAP BELOW GRADE
- SINK TRAP
- HOT / DRAIN / COLD CONNECTIONS (H / D / C)
- WATER HAMMER ARRESTOR
- PLUMBING EQUIPMENT - INTERCEPTOR
- PLUMBING EQUIPMENT - WATER HEATER

PIPE INSTRUMENTS

- FLOW MEASUREMENT PORT
- INSTRUMENT WELL
- PRESSURE GAUGE
- TEMPERATURE OR PRESSURE TAP
- TEMPERATURE GAUGE

FIRE PROTECTION

NOTE: DEMOLISHED ITEMS WITH "R" DENOTES "SAVE FOR REINSTALLATION IN NEW LOCATION"

- PENDANT
- PENDANT (EXISTING TO REMAIN)
- PENDANT (DEMOLISHED) (D)
- PENDANT (REMOVE AND REINSTALL IN NEW LOCATION) (R)
- RECESSED
- UPRIGHT
- CONCEALED
- DRY PENDANT
- DRY PENDANT (EXISTING)
- PRE-ACTION
- SIDEWALL
- CONCEALED SIDEWALL
- RECESSED SIDEWALL
- FIRE HOSE CABINET (FHC)
- FIRE HOSE CABINET WITH HOSE REEL (FHC)
- FIRE VALVE CABINET (FVC)
- FIRE EXTINGUISHER (FE)
- FIRE EXTINGUISHER (EXISTING) (FE)
- SURFACE MOUNTED F.E. CABINET
- SEMI-RECESSED F.E. CABINET
- FULLY RECESSED F.E. CABINET
- FIRE DEPARTMENT CONNECTION
- FIRE DEPARTMENT TEST CONNECTION
- WET ALARM VALVE
- DRY ALARM VALVE
- PRE-ACTION ALARM VALVE
- FIRE HAZARD LEVEL

SITE ELEMENTS:

- SPLASH PAD
- CATCH BASIN
- CATCH BASIN (HALF)
- MANHOLE
- FIRE HYDRANT (SINGLE OUTLET)
- FIRE HYDRANT (DOUBLE OUTLET)
- FIRE HYDRANT (TRIPLE OUTLET)
- FIRE HYDRANT (QUAD OUTLET)

CONTROLS AND CONTROL POINTS

- CONTROL WIRE
- THERMOSTAT / SPACE TEMPERATURE SENSOR (T)
- THERMOSTAT WITH GUARD (T)
- HUMIDISTAT / HUMIDITY SENSOR (H)
- CO2 SENSOR (CO2)
- SWITCH ($)
- PUSH BUTTON
- FLOW SWITCH (FS)
- PRESSURE SWITCH (PS)
- CONTROL POINT - ANALOG INPUT (AI)
- CONTROL POINT - ANALOG OUTPUT (AO)
- CONTROL POINT - DIGITAL INPUT (DI)
- CONTROL POINT - DIGITAL OUTPUT (DO)
- CONTROL POINT - BACNET COMMUNICATIONS (COM)
- VARIABLE FREQUENCY DRIVE (VFD)
- END SWITCH (ES)
- DAMPER MOTOR (DM)
- TEMPERATURE PROBE (TP)
- FLOW TRANSMITTER (FT)
- HUMIDITY PROBE (HP)
- DIFFERENTIAL PRESSURE (DP)
- FREEZE STAT (FZ)
- OUTSIDE AIR TEMPERATURE SENSOR (OAT)
- VARIABLE FREQUENCY DRIVE (VFD)
- PRESSURE SENSOR (PS)
- BTU METER (BTU)

EXISTING/DEMOLISHED PIPING:

- [TYPE] EXISTING PIPEWORK TO BE DEMOLISHED
- [TYPE] EXISTING PIPEWORK TO REMAIN
- DCW EXISTING DOMESTIC COLD WATER
- DHW EXISTING DOMESTIC HOT WATER
- DHWR EXISTING DOMESTIC HOT WATER RECIRC.

PLUMBING:

- CA COMPRESSED AIR PIPE
- CV CENTRAL VAC - DRY MOP
- CV-W CENTRAL VAC - WET
- DCW DOMESTIC COLD WATER
- DHW DOMESTIC HOT WATER
- DHWR DOMESTIC HOT WATER RECIRC.
- PB DOMESTIC COLD WATER - PRESSURE BOOSTED
- SW SOFTENED DOMESTIC WATER
- TW DOMESTIC TEMPERED WATER
- NPW NON-POTABLE WATER PIPE
- SAN SANITARY DRAINAGE
- SAN↓ SANITARY DRAINAGE (BELOW)
- V SANITARY VENT
- STW STORM WATER DRAINAGE
- STW↓ STORM WATER DRAINAGE (BELOW)
- AW ACID WASTE DRAINAGE PIPE
- AV ACID VENT PIPE
- GW GREY WATER DRAIN
- WT WEEPING TILE

FUEL PIPING:

- G NATURAL GAS - LOW PRESSURE
- MG NATURAL GAS - MEDIUM PRESSURE
- HG NATURAL GAS - HIGH PRESSURE
- P PROPANE
- FOF FUEL OIL SUPPLY
- FOS FUEL OIL SUPPLY
- FOR FUEL OIL RETURN
- FOV FUEL VENT

HEATING/COOLING PIPING:

- HWS HEATING WATER SUPPLY
- HWR HEATING WATER RETURN
- HGS HEATING GLYCOL SUPPLY
- HGR HEATING GLYCOL RETURN
- DTWS DUAL TEMPERATURE WATER SUPPLY
- DTWR DUAL TEMPERATURE WATER RETURN
- CWS CHILLED WATER SUPPLY
- CWR CHILLED WATER RETURN
- CS CONDENSER WATER SUPPLY
- CR CONDENSER WATER RETURN
- GWS GROUND WATER SUPPLY
- GWR GROUND WATER RETURN
- CGS CHILLED GLYCOL SUPPLY
- CGR CHILLED GLYCOL RETURN
- BS BRINE SUPPLY
- BR BRINE RETURN
- BV BRINE VENT
- RL REFRIGERANT LIQUID SUPPLY
- RV REFRIGERANT VAPOUR RETURN
- LPS LOW PRESSURE STEAM
- LPC LOW PRESSURE CONDENSATE
- MV MEDIUM PRESSURE STEAM
- MV MEDIUM PRESSURE CONDENSATE
- HPS HIGH PRESSURE STEAM
- HPC HIGH PRESSURE CONDENSATE

LAB GAS:

- LCA LAB COMPRESSED AIR
- CO2 LAB CARBON DIOXIDE GAS
- H2 LAB HYDROGEN GAS
- LN2 LIQUID NITROGEN
- N2 LAB NITROGEN GAS
- O2 LAB OXYGEN GAS
- VAC LAB VACUUM PIPING

MEDICAL GAS:

- MA MEDICAL AIR
- CO2 MEDICAL CO2
- N2 MEDICAL NITROGEN
- N2O MEDICAL NITROUS OXIDE
- O2 MEDICAL OXYGEN
- MGS MEDICAL GAS SCAVENGING
- MV MEDICAL VACUUM

MEDICAL GAS VALVES

- MEDICAL GAS ZONE VALVE
- MEDICAL GAS OUTLET (TYPE INDICATED) (3x2)
- MEDICAL GAS - NON RETURN VALVE

SPRINKLER AND FIRE PROTECTION

- FIRE PROTECTION ZONE
- FIRE PROTECTION RATING
- F XXXØ FIRE PROTECTION PIPE
- SP XXXØ SPRINKLER MAIN
- XXXØ SPRINKLER BRANCH PIPING
- DSP XXXØ DRY SPRINKLER PIPING
- PA XXXØ PRE-ACTION SPRINKLER PIPING
- IG XXXØ INERT GAS (CLEAN AGENT) PIPE

VENTILATION:

- TERMINAL BOX / WITH ATTENUATOR / AND REHEAT COIL
- DNDP RISE
- [TYPE] EXISTING DUCT TO REMAIN (TYPE INDICATED)
- EXISTING DUCT TO BE DEMOLISHED
- S/A SUPPLY AIR DUCT
- R/A RETURN AIR DUCT
- T/A TRANSFER AIR DUCT
- O/A OUTDOOR AIR DUCT
- G/E GENERAL EXHAUST DUCT
- W/E WASHROOM EXHAUST DUCT
- K/E KITCHEN EXHAUST DUCT
- F/E FUME HOOD EXHAUST DUCT
- RECTANGULAR DUCTS UP: (SUPPLY / RETURN / EXHAUST)
- RECTANGULAR DUCTS DOWN: (SUPPLY / RETURN / EXHAUST)
- MOTORIZED DAMPER / BALANCING DAMPER
- FIRE DAMPER / SMOKE DAMPER / COMBINATION FIRE-SMOKE DAMPER
- ROUND ELBOWS - 45°: R1.0 / R1.5 / R2.0
- ROUND ELBOWS - 90°: R1.0 / R1.5 / R2.0
- RECTANGULAR ELBOWS - 45°: R1.0 / R1.5
- RECTANGULAR ELBOWS - 90°: R1.0 / R1.5
- RECTANGULAR ELBOWS WITH TURNING VANES: (90° R1.0 / 45° R1.0 / 90° SQUARE)
- ACOUSTICALLY LINED DUCT
- GRILLES AND DIFFUSERS: SUPPLY / RETURN / EXHAUST
- SUPPLY DIFFUSERS: SQUARE / ROUND PLAQUE OR CONE
- HORIZONTAL OR WALL GRILLES / DIFFUSER: SUPPLY / RETURN OR EXHAUST.

- PIPEWORK SHORTENED FOR CLARITY
- PIPEWORK CONTINUED ELSEWHERE
- PIPEWORK SHORTENED FOR CLARITY (ALTERNATE SYMBOL)
- PIPE FLOW ARROW (SMALL)
- PIPE FLOW ARROW (LARGE)

EQUIPMENT:

- PUMP
- FIN TUBE RADIATION
- FIN TUBE RADIATION IN CABINET
- RADIANT PANEL
- UNIT HEATER (HORIZONTAL)
- UNIT HEATER (VERTICAL)

MECHANICAL ACRONYMS:

ACD	AUTOMATIC CONTROL DAMPER
AD	ACCESS DOOR
AP	ACCESS PANEL
AS	AIR SEPARATOR
BD	BALANCING DAMPER
BDD	BACKDRAFT DAMPER
FD	FIRE DAMPER
FSD	FIRE/SMOKE DAMPER
FT	FLASH TANK
FTR	FINNED TUBE RADIATOR
H	HUMIDIFIER
MD	MOTORIZED DAMPER
OBD	OPPOSED BLADE DAMPER
PRV	PRESSURE REDUCING VALVE
SA	SOUND ATTENUATOR
SD	SMOKE DAMPER
SRV	SAFETY RELIEF VALVE

EQUIPMENT ACRONYMS:

ACU-	AIR CONDITIONING UNIT
AHU-	AIR HANDLING UNIT
CAV-	CONSTANT AIR VOLUME TERMINAL UNIT
CH-	CHILLER
CP-	CONDENSATE PUMP
CU-	CONDENSING UNIT
CSG-	CLEAN STEAM GENERATOR
CUH-	CABINET UNIT HEATER
EAHU-	EXHAUST AIR HANDLING UNIT
EFC-	EVAPORATIVE FAN COOLER
ERV-	ENERGY RECOVERY VENTILATOR
ET-	EXPANSION TANK
EX-	EXHAUST FAN
FCU-	FAN COIL
HRC-	HEAT RECOVERY COIL
HVU-	HEATING/VENTILATING UNIT
HX-	HEAT EXCHANGER
UH-	UNIT HEATER
VAV-	VARIABLE AIR VOLUME TERMINAL BOX
VFD-	VARIABLE FREQUENCY DRIVE
P-	PUMP
HC-	HEATING COIL
CC-	COOLING COIL
RHC-	REHEAT COIL
SC-	STEAM COIL
PF-	PRE-FILTER
FF-	FINAL FILTER
EF-	EXHAUST FAN
SF-	SUPPLY FAN
RF-	RETURN FAN
SAV-	SUPPLY AIR VALVE
EAV-	RETURN AIR VALVE

PIPE RISE / DROPS

- UP FROM BELOW / UP TO ABOVE
- DOWN TO BELOW / DOWN FROM ABOVE
- VENT UP FROM BELOW / UP TO ABOVE
- VENT UP FROM BELOW / UP TO VENT CAP

TAGS

- SCHEMATIC INLET/OUTLET
- TYPE — PLUMBING FIXTURE TYPE TAG
- TYPE / SIZE / FLOW — GRILLE / DIFFUSER TAG
- TYPE / EN LENGTH / OUTPUT — FIN TUBE RADIATION TAG
- TYPE / OUTPUT — RADIANT PANEL TAG
- XXXX — EQUIPMENT IDENTIFICATION TAG
- TP / # — TIE-IN POINT

DRAWING LIST:

DRAWING:	DESCRIPTION:	SCALE:
M0-00	MECHANICAL DRAWING LIST, LEGEND, & GENERAL NOTES	N.T.S.
M1-00	MECHANICAL KEY PLAN	1 : 50
M2-00	MECHANICAL PLAN	1 : 50

GENERAL NOTES:

NOTE:	DESCRIPTION:
1.	THIS DRAWING SET SHALL BE READ IN CONJUNCTURE WITH ARCHITECTURAL DRAWINGS.
2.	THIS DRAWING SET SHALL BE READ IN CONJUNCTURE WITH THE MECHANICAL SPECIFICATIONS PROVIDED.
3.	THESE DRAWINGS DO NOT REPRESENT A FULLY COORDINATED INFORMATION PACKAGE FOR THE PURPOSES OF CONSTRUCTION, AND DO NOT RELIEVE THE CONTRACTOR OF THE REQUIREMENT TO COORDINATE THE WORK IN ALL RESPECTS.
4.	IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE THE WORK OF ALL TRADES AND SUPPLIERS TO ACHIEVE COMPLETE AND OPERATIONAL BUILDING SYSTEMS.
5.	DO NOT SCALE DRAWINGS. LOCATIONS OF ITEMS ARE APPROXIMATE AND ARE INTENDED TO BE USED FOR COORDINATION. EXACT LOCATIONS ARE DEPENDANT UPON SITE CONDITIONS. REVIEW ANY REVISIONS WITH CONSULTANT.
6.	ALL EXISTING EQUIPMENT TO REMAIN SHALL BE INSPECTED AND TESTED FOR PROPER OPERATIONS. REPORT RESULTS OF INSPECTION AND TESTING TO CONSULTANT.

THIS BUILDING IS RATED AS SEISMIC CATEGORY SC3. AS SUCH SEISMIC RESTRAINT IS REQUIRED FOR MECHANICAL SYSTEMS. REFER TO THE SEISMIC CONTROL AND RESTRAINT SECTION OF THE MECHANICAL SPECIFICATIONS.

DO NOT SCALE THE DRAWINGS.
CHECK AND VERIFY ALL DIMENSIONS AT THE SITE.

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tdsb
Toronto District School Board

NO.	ISSUES/ REVISIONS	DATE	BY
01	ISSUED FOR 60% REVIEW	2026 02 17	DT/AM
02	ISSUED FOR PERMIT & TENDER	2026 04 01	DT/AM
03	ISSUED FOR TENDER	2026 04 29	DT/AM

NO.	REVISIONS	DATE	BY
01	ADDENDUM 001	2026 05 22	AM

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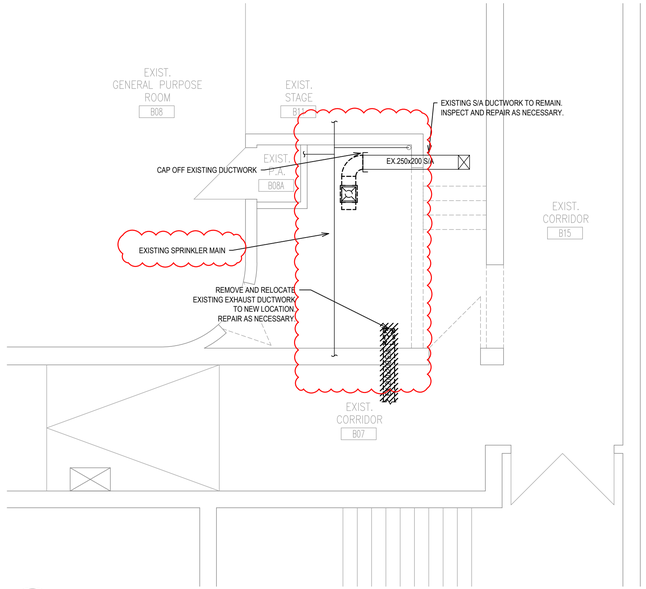
BARRY BRYAN ASSOCIATES

PROJECT:
ACCESSIBILITY UPGRADES AT KEELE ST JR PS & COMMUNITY CENTRE
TDSB# TR-25-0957
99 MOUNTVIEW AVENUE
TORONTO, ON
TORONTO DISTRICT SCHOOL BOARD

DRAWING:
MECHANICAL LEGEND AND GENERAL DRAWING NOTES

DESIGN BY:	AM
DRAWN BY:	AM
CHECKED BY:	PT
DATE:	MAY 2026
SCALE:	N.T.S.
SEAL:	
PROJECT NO:	25301-24
DRAWING NO:	M0-00



1 M2-00 **BASEMENT DEMOLITION PLAN**

Scale: 1:50

REGISTERS, GRILLES AND DIFFUSERS SCHEDULE

TAG	FUNCTION	CONFIGURATION	MODEL NUMBER	MOUNTING TYPE	REMARKS:
A	SUPPLY	STEEL LOUVERED GRILLE	520	DUCT MOUNTED	C/W VOLUME DAMPER. REFER TO PLANS FOR SIZE.

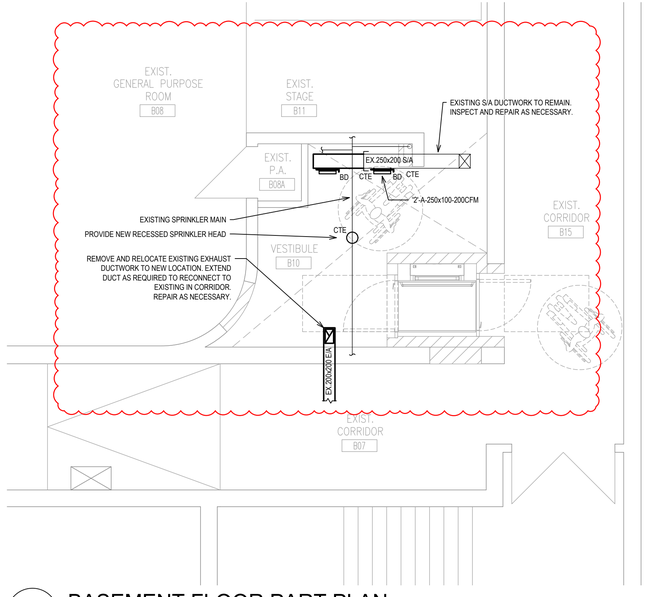
SYMBOL CLARIFICATION

SELECTION BASED ON: EH PRICE

A
8"Ø
200

A - DIFFUSER/GRILLE TYPE
8"Ø - NECK SIZE
200 - AIR QUANTITY CFM

NOTES:
-EQUAL ALTERNATE MANUFACTUERS: TITUS, AIRVECTOR



1 M2-00 **BASEMENT FLOOR PART PLAN**

Scale: 1:50

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NO.	REVISIONS	DATE	BY
01	ADDENDUM 001	2026 05 22	AM

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25301-25

BARRY BRYAN ASSOCIATES

PROJECT:
ACCESSIBILITY UPGRADES AT KEELE ST JR PS & COMMUNITY CENTRE
TDSB# TR-25-0957
99 MOUNTVIEW AVENUE
TORONTO, ON
TORONTO DISTRICT SCHOOL BOARD

DRAWING:
MECHANICAL PLAN

DESIGN BY: AM
DRAWN BY: AM
CHECKED BY: PT
DATE: MAY 2026
SCALE: N.T.S.
SEAL:

PROJECT NO: 25301-24
DRAWING NO: M2-00

ELECTRICAL SYMBOL LEGEND

NOTE:

SYMBOLS SHOWN ON THIS LEGEND ARE NOT NECESSARILY USED ON THIS PROJECT.

LIGHTING

- RECESSED 2'X4'LIGHTING FIXTURES
- DOUBLE SURFACE MOUNTED EMERGENCY LIGHTING - REMOTE HEADS
- CEILING MOUNTED EMERGENCY LIGHTING REMOTE HEAD
- EMERGENCY LIGHTING BATTERY UNIT C/W DUPLEX RECEPTACLE AND DOUBLE REMOTE HEADS. EXIT LIGHTING: SHADED AREAS DENOTE DIRECTION OF FACE OF EXIT SIGN. DIRECTIONAL ARROWS AS INDICATED.
- WALL MOUNTED DOUBLE FACED EXIT LIGHT
- WALL MOUNTED SINGLE FACED EXIT LIGHT
- CEILING MOUNTED DOUBLE FACED EXIT LIGHT
- CEILING MOUNTED SINGLE FACED EXIT LIGHT

COMMUNICATIONS

- TELEVISION OUTLET - WALL MOUNTED
- TELEVISION OUTLET - FLUSH CEILING MOUNTED
- DATA OUTLET - WALL MOUNTED OR MOUNTED ABOVE COUNTER
- DATA OUTLET - FLUSH CEILING MOUNTED
- DATA OUTLET - FLUSH FLOOR MOUNTED
- PUBLIC ADDRESS SPEAKER REFER TO SCHOOLBOARD STANDARD SPECIFICATION
- DOUBLE GANGED AV OUTLET C/W PLASTER RING

FIRE ALARM SYSTEM

- PULL STATION
- FLUSH / SURFACE MOUNTED HORN
- STROBE - CEILING / WALL MOUNTED
- SMOKE DETECTOR - WALL OR CEILING MOUNTED
- AUTOMATIC COMBINATION FIXED TEMPERATURE/RATE OF RISE HEAT DETECTOR - CEILING / WALL MOUNTED

SECURITY SYSTEM

- ACCESS CONTROL CARD READER
- ACCESS CONTROL DOOR CONTACT
- ACCESS CONTROL ELECTRIC STRIKE
- VIDEO SURVEILLANCE CAMERA
- INTERCOM

EQUIPMENT CONNECTIONS & CONTROLS

- DIRECT CONNECTION - 120 OR 208V C/W UNFUSED DISCONNECT SWITCH AS SPECIFIED
- DIRECT CONNECTION - 347 OR 600V C/W UNFUSED DISCONNECT SWITCH AS SPECIFIED
- MOTOR CONNECTION AS SPECIFIED
- MOTOR CONNECTION C/W UNFUSED DISCONNECT SWITCH
- MOTOR CONNECTION C/W FUSED DISCONNECT SWITCH
- MOTOR CONNECTION C/W LOOSE STARTER
- MOTOR STARTER AS SPECIFIED
- UNFUSED DISCONNECT SWITCH
- DIRECT CONNECTION - 120 OR 208V AS SPECIFIED
- DIRECT CONNECTION - 374 OR 600V AS SPECIFIED
- RECESS MOUNTED ELECTRICAL PANEL
- SURFACE MOUNTED ELECTRICAL PANEL

GENERAL POWER

- 15A, U-GROUND DUPLEX RECEPTACLE
- (5-20RA) T-SLOT U-GROUND DUPLEX RECEPTACLE
- 15A, U-GROUND SPLIT WIRED DUPLEX RECEPTACLE - STANDARD MOUNTING HEIGHT OR MOUNTED ABOVE COUNTER
- 15A, U-GROUND DUPLEX RECEPTACLE C/W GROUND FAULT CIRCUIT INTERRUPTER - STANDARD MOUNTING HEIGHT OR MOUNTED ABOVE COUNTER
- (5-20RA) T-SLOT U-GROUND DUPLEX RECEPTACLE C/W GROUND FAULT CIRCUIT INTERRUPTER
- 15A, U-GROUND DUPLEX RECEPTACLE - FLUSH FLOOR MOUNTED UNLESS NOTED OTHERWISE
- (5-20RA) T-SLOT U-GROUND DUPLEX RECEPTACLE - FLUSH FLOOR MOUNTED UNLESS NOTED OTHERWISE

LIGHTING CONTROL

- ONE, TWO, THREE AND FOUR GANG SINGLE POLE TOGGLE SWITCHES
- OCCUPANCY SENSOR SWITCH
- FAN CONTROL SWITCH
- VARIABLE SPEED FAN CONTROL SWITCH
- MANUAL TIMER SWITCH
- DIMMER SWITCH
- PROGRAMMABLE TIME CLOCK
- CEILING MOUNTED OCCUPANCY SENSOR

MISCELLANEOUS

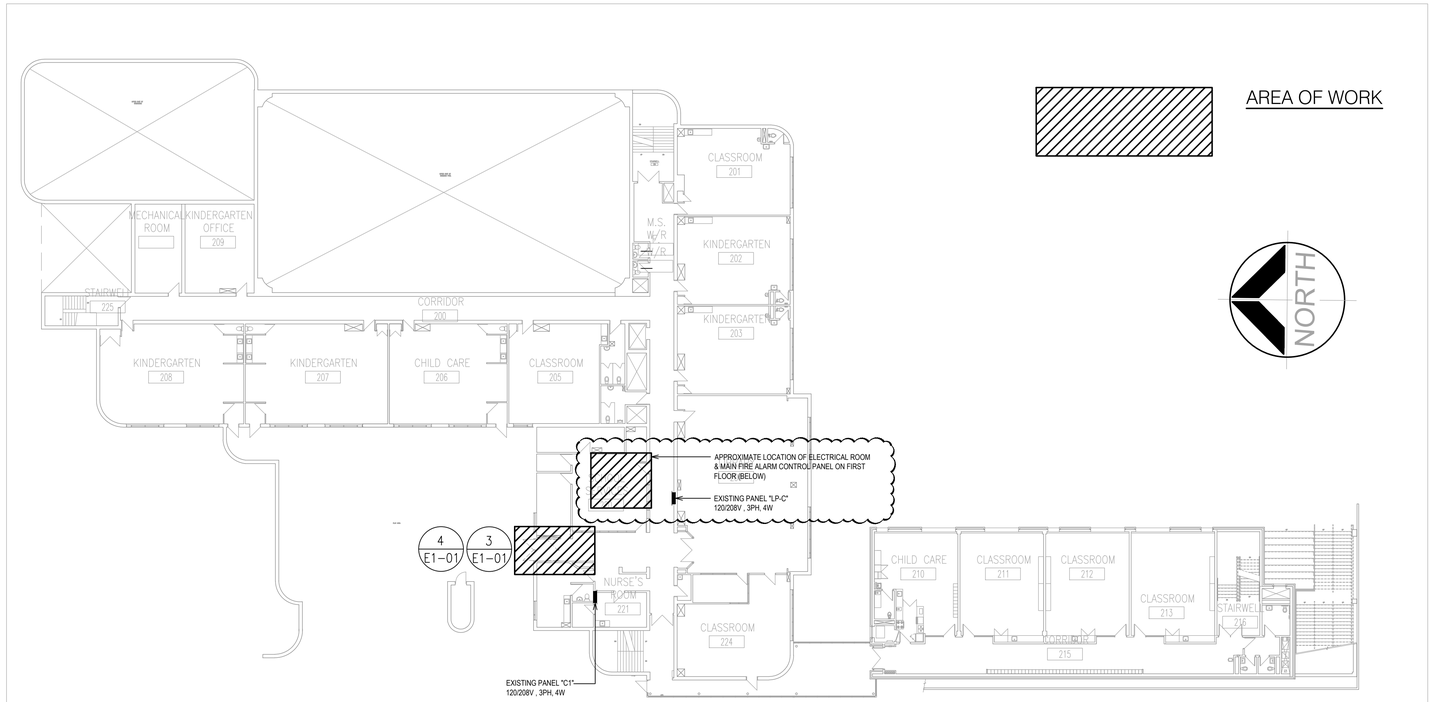
- E — INDICATES EXISTING DEVICE TO REMAIN
- RL — INDICATES EXISTING DEVICE IN RELOCATED POSITION
- BK — INDICATES BLACK COVER PLATE
- (1) — ELECTRICAL DRAWING KEY NOTES
- R/R — REMOVE & RE-INSTALL

DRAWING LIST:

DRAWING:	DESCRIPTION:	SCALE:
E0-01	ELECTRICAL LEGEND, GENERAL NOTES, KEY PLAN AND DRAWING LIST	N.T.S.
E1-01	ELECTRICAL PLANS	1:50

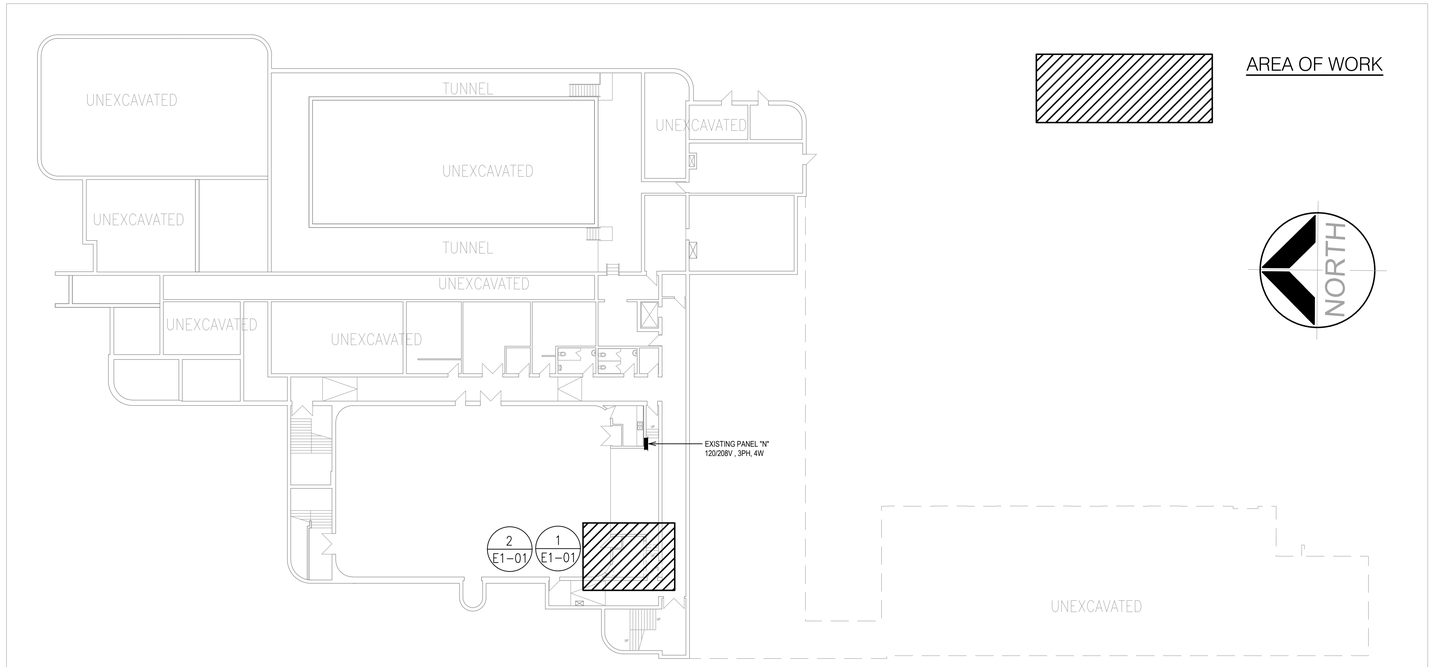
GENERAL NOTES:

NOTE:	DESCRIPTION:
1.	THE ELECTRICAL DRAWINGS ARE GENERALLY DIAGRAMMATIC. THE ELECTRICAL INSTALLATION SHALL BE COORDINATED WITH OTHER TRADES SO THAT INTERFERENCES BETWEEN THE ELECTRICAL INSTALLATION AND ARCHITECTURAL, STRUCTURE, MECHANICAL, PLUMBING, FIRE PROTECTION AND EQUIPMENT INSTALLATION WILL BE AVOIDED.
2.	REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONS, ROOM AND AREA FINISHES, CEILING PLANS, DOOR SWINGS, FIRE RELATED PARTITIONS, CABINET AND CASE WORK AND BUILT-IN DETAILS.
3.	ALL THE FINAL CONNECTIONS SHOWN ON THE DRAWINGS ARE ACTUAL REQUIREMENTS OF THE EQUIPMENT AND ARE SHOWN IN THEIR APPROXIMATE LOCATION. CO-ORDINATE WITH MECHANICAL AND ARCHITECTURAL DRAWINGS FOR EXACT LOCATION.
4.	ELECTRICAL SYSTEM EQUIPMENTS AND COMPONENTS SHALL BE CERTIFIED BY A RECOGNIZED TESTING AGENCY PER THE SCC.
5.	ALL WIRING TO BE SIZE #12 AWG UNLESS NOTED OTHERWISE.
6.	CIRCUIT NUMBERS SHOWN ARE GROUPING ONLY. REFER ON JOB-SITE FOR EXACT CIRCUIT USED.
7.	PROVIDE UPDATED TYPED PANEL DIRECTORY TO REPLACE EXISTING DIRECTORY
8.	THIS BUILDING IS RATED AS SEISMIC CATEGORY SC3. AS SUCH SEISMIC RESTRAINT IS REQUIRED FOR ELECTRICAL SYSTEMS. REFER TO THE SEISMIC RESTRAINTS SECTION OF THE ELECTRICAL SPECIFICATIONS.



2 E0-01 SECOND FLOOR KEY PLAN

Scale: 1:250



1 E0-01 BASEMENT KEY PLAN

Scale: 1:250

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tdsb Toronto District School Board

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01	ADDENDUM 001	2026 05 22	DT

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25301-25

BARRY BRYAN ASSOCIATES

PROJECT:
ACCESSIBILITY UPGRADES AT KEELE ST JR PS & COMMUNITY CENTRE
TDSB# TR-25-0957
99 MOUNTVIEW AVENUE
TORONTO, ON
TORONTO DISTRICT SCHOOL BOARD

DRAWING:
ELECTRICAL LEGEND, GENERAL NOTES, KEY PLAN AND DRAWING LIST

DESIGN BY:	DT
DRAWN BY:	DT
CHECKED BY:	RL
DATE:	FEB. 2026
SCALE:	N.T.S.
SEAL:	
PROJECT NO:	25301-24
DRAWING NO:	E0-01

IMPORTANT NOTE

ALL EXISTING POWER OUTLETS, COMMUNICATION OUTLETS, AND OTHER DEVICES INDICATED FOR DEMOLITION ON BLOCK WALL SHALL BE COMPLETELY REMOVED, INCLUDING DEVICE, COVER PLATE, BACK BOX, AND ASSOCIATED CONDUIT AND WIRING TO THE NEAREST ACTIVE JUNCTION BOX OR SOURCE. COMPLETELY PATCH AND RESTORE WALL SURFACE TO MATCH EXISTING ADJACENT FINISH. INSTALLATION OF BLANK COVER PLATES IS NOT PERMITTED.

LIGHTING FIXTURE SCHEDULE

SYMBOLS	BASE MANUFACTURER (AS SPECIFIED)	MODEL NO.	CEILING TYPE			WALL TYPE					BALLAST VOLTAGE			REMARKS
			SURFACE	RECESSED	SUSPENDED	SURFACE	RECESSED	BRACKET	No. OF LAMPS	WATTAGE	120 V.	347 V.	24 VDC.	
L1	COLUMBIA LIGHTING	MULTIPURPOSE LINEAR LED CAT# MPS4-40MW-CW-ED-U C/W WIRE GUARD	●		●	●				44.7W LED	●			CONTACT: RICK ARDENTE CELL: 905.706.9789 rardente@omnilumen.com
L2	PEERLUX LIGHTING	WET LOCATION LED/LUMINAIRE CAT# AP2W-2-22-40-P3-LA-S-W-MV	●			●				21W LED	●			
EM BU1	EMERGI-LITE	EMERGENCY BATTERY UNIT 24V, 200WATT CAT# 24ESL200 WITH 10MIN TURN OFF DELAY				●					●		●	

ELECTRICAL KEY NOTES

KEYNOTE	DESCRIPTION
1	CONNECT NEW LIGHT FIXTURE TO THE EXISTING LIGHTING CIRCUIT C/W NEW WIRE AND CONDUIT TO THE NEAREST JUNCTION BOX SERVING THE LIGHTING CIRCUIT. PROVIDE SUPPORT INDEPENDENT OF THE CEILING SYSTEM STRUCTURE AS REQUIRED.
2	ELECTRICAL CONTRACTOR TO PROVIDE 3/4" CONDUIT FROM ELEVATOR MACHINE CONTROL BOX TO MAIN TELEPHONE ROOM C/W 1 X CAT6 WITH BLUE JACKET FOR A DEDICATED TELEPHONE LINE TERMINATING AT THE PRIMARY ELEVATOR SIGNAL CONTROL CABINET FOR EMERGENCY CALL SYSTEM.
3	PROVIDE ONE (1) GFCI RECEPTACLE COMPLETE WITH WEATHERPROOF COVER AND LABEL "FOR LIFT USE". EXACT LOCATION TO BE COORDINATED WITH ELEVATOR CONTRACTOR
4	CONTRACTOR TO REPLACE EXISTING WITH NEW SECURITY CARD READER. CONNECT NEW CARD READER TO EXISTING SECURITY CONTROL PANEL. FINAL CABLE TERMINATION, TEST AND COMMISSION BY TDSB IN-HOUSE .
5	CONTRACTOR TO REMOVE AND RE-INSTALL EXISTING INTERCOM STATION. CONNECT RELOCATED INTERCOM STATION TO EXISTING MASTER INTERCOM SYSTEM AND RUN OUTPUT CABLE FROM MASTER INTERCOM TO NEW DOOR ELECTRIC FOR RELEASING DOOR.
6	CONTRACTOR TO REPLACE EXISTING WITH SECURITY ELECTRIC STRIKE. CONNECT NEW SECURITY ELECTRIC STRIKE TO EXISTING SECURITY CONTROL PANEL AND INTERFACE WITH EXISTING INTERCOM SYSTEM FOR RELEASING DOOR AND INTERFACE WITH FIRE ALARM SYSTEM FOR RELEASING DOOR UPON ACTIVATION OF FIRE ALARM SYSTEM. FINAL SECURITY CABLE TERMINATIONS, TEST AND COMMISSION BY TDSB IN-HOUSE
7	NEW DOOR OPERATOR TO BE SUPPLIED BY GC (DOOR HARDWARE CONTRACTOR) AND INSTALLED AND WIRED BY THIS ELECTRICAL CONTRACTOR . REFER TO DOOR HARDWARE NOTE FOR DEVICE PART NUMBERS.
8	NEW PUBLIC ADDRESS SPEAKER, TYPE TO MATCH EXISTING SYSTEM. CONNECT NEW SPEAKER TO EXISTING PA SPEAKER CIRCUIT.
9	NEW FIRE ALARM SMOKE DETECTOR, TYPE TO MATCH EXISTING SYSTEM. CONNECT NEW FIRE ALARM DETECTOR TO EXISTING INITIATING ZONE.
10	PROVIDE #6 INSULATED GREEN WIRE FROM LIFT CONTROL BOX TO EXISTING BUILDING GROUNDING SYSTEM. CONTRACTOR TO ALLOW FOR 150 FEET.

DOOR HARDWARE NOTE

CARD READERS:
BOX MOUNT CARD READER - HID-5395CG100 THINLINE II
MULLION CARD READER - HID-5365EGP00 MINIPROX

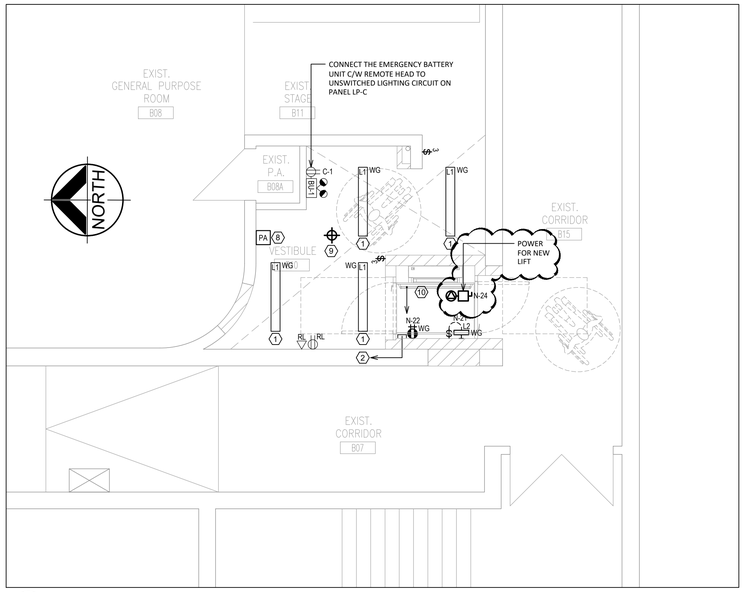
STRIKE POWER SUPPLY:
12/24VDC 2.5A STRIKE - AX-EFL3N

ELECTRIC STRIKES:
1/2 SURFACE STRIKE - HES 9400
3/4 SURFACE STRIKE - HES 9600

DOOR OPERATORS:
SINGLE DOOR - CAMDEN CD-CX-12PLUS
DOUBLE DOOR - CAMDEN CD-CX-33

ELECTRICAL DEMOLITION KEY NOTES:

KEYNOTE:	DESCRIPTION:
1	CONTRACTOR SHALL INVESTIGATE AND VERIFY ALL EXISTING ELECTRICAL CONDUITS, WIRING, AND RELATED SERVICES WITHIN WALLS AND FLOORS AFFECTED BY THE NEW ELEVATOR INSTALLATION. X-RAY AS REQUIRED PRIOR TO SAW-CUTTING OR CORING TO IDENTIFY EMBEDDED ELECTRICAL SERVICES. ANY ELECTRICAL SERVICES THAT CONFLICT WITH THE NEW ELEVATOR SHAFT, PIT, OR STRUCTURAL OPENINGS SHALL BE SAFELY DISCONNECTED, REMOVED, AND/OR RELOCATED AS REQUIRED. ENSURE CONTINUITY OF ALL EXISTING CIRCUITS SERVING AREAS TO REMAIN AND COORDINATE WITH ALL TRADES PRIOR TO CUTTING OR DEMOLITION.
2	EXISTING LIGHTING CONTROL TO BE DISCONNECTED AND REMOVED. PATCH THE BRICK WALL AS REQUIRED.
3	EXISTING LIGHTING FIXTURE TO BE DISCONNECTED, REMOVED AND DISPOSED THE FIXTURE OFF SITE. REMOVE ALL EXISTING FIXTURE SUPPORTS TO THE STRUCTURE AND WIRING TO THE NEAREST JUNCTION BOX SERVING THE LIGHTING CIRCUIT IN THE THIS ROOM.
4	EXISTING SURFACE MOUNTED POWER AND COMMUNICATION OUTLETS TO BE DISCONNECTED AND RELOCATED.



2 E1-01 PART BASEMENT ELECTRICAL PLAN
1:50

EXISTING PANEL 'C1'

■ 225 A, 120/208 V, 3 ϕ, 4 W. MAINS
☐ A, V, ϕ, W. MAINS
■ RECESSED ☐ SURFACE MOUNTED
☐ DOUBLE LUGS

■* VIA TIME SWITCH
■** PROVIDE BREAKER LOCKING DEVICES

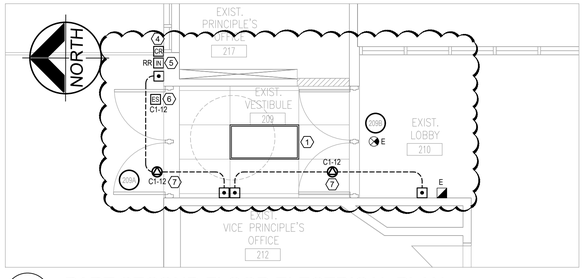
DESCRIPTION	LOAD	BKR	CCT		CCT	BKR	LOAD	DESCRIPTION
EXISTING SERVICES		15A	1		2	15A		EXISTING SERVICES
EXISTING SERVICES		15A	3		4	15A		EXISTING SERVICES
EXISTING SERVICES		15A	5		6	15A		EXISTING SERVICES
EXISTING SERVICES		15A	7		8	15A		EXISTING SERVICES
EXISTING SERVICES		15A	9		10	15A		EXISTING SERVICES
EXISTING SERVICES		15A	11		12	15A	500	DOOR OPERATOR
TOTAL CONNECTED LOAD = 500 WATT + EXISTING SERVICES								

EXISTING PANEL 'N'

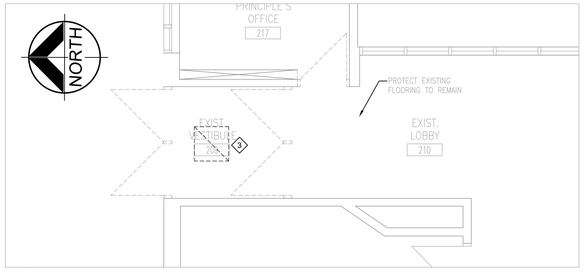
■ 100 A, 120/208 V, 3 ϕ, 4 W. MAINS
☐ A, V, ϕ, W. MAINS
■ RECESSED ☐ SURFACE MOUNTED
☐ DOUBLE LUGS

■* VIA TIME SWITCH
■** PROVIDE BREAKER LOCKING DEVICES

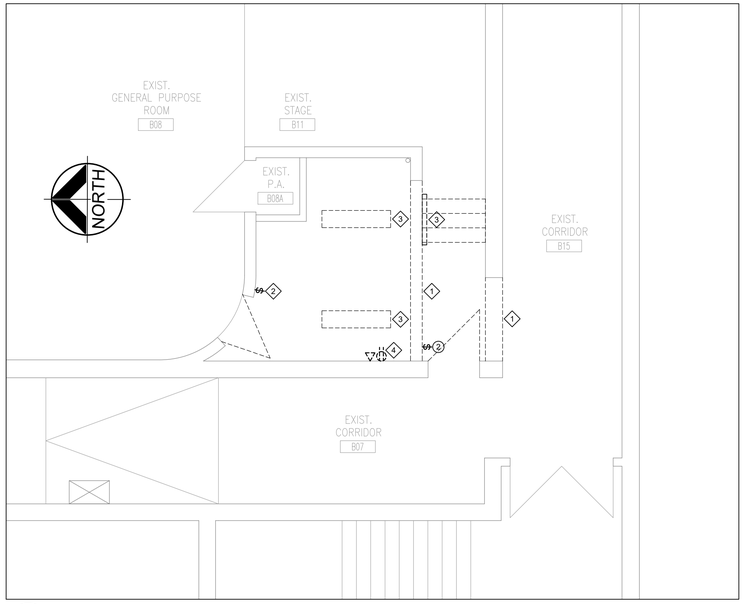
DESCRIPTION	LOAD	BKR	CCT		CCT	BKR	LOAD	DESCRIPTION
EXISTING SERVICES		15A	1		2	15A		EXISTING SERVICES
EXISTING SERVICES		15A	3		4	15A		EXISTING SERVICES
EXISTING SERVICES		15A	5		6	15A		EXISTING SERVICES
EXISTING SERVICES		15A	7		8	15A		EXISTING SERVICES
EXISTING SERVICES		15A	9		10	15A		EXISTING SERVICES
EXISTING SERVICES		15A	11		12	15A		EXISTING SERVICES
EXISTING SERVICES		15A	13		14	15A		EXISTING SERVICES
EXISTING SERVICES		15A	15		16	15A		EXISTING SERVICES
EXISTING SERVICES		15A	17		18	15A		EXISTING SERVICES
ELEVATOR LIGHT	50	15A	21		22	15A	500	GFI RECEPTACLE
BU-1	200	15A	23		24	20A	2000	HC LIFT
TOTAL CONNECTED LOAD = 2,750 WATT + EXISTING SERVICES								



4 E1-01 PART SECOND FLOOR ELECTRICAL PLAN
1:50



3 E1-01 PART SECOND FLOOR ELECTRICAL DEMOLITION PLAN
1:50



1 E1-01 PART BASEMENT ELECTRICAL DEMOLITION PLAN
1:50

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tdsb
Toronto District School Board

NO.	ISSUES/ REVISIONS	DATE	BY
01	ISSUED FOR 60% REVIEW	2026 02 17	DT/AM
02	ISSUED FOR PERMIT & TENDER	2026 04 01	DT/AM
03	ISSUED FOR TENDER	2026 04 29	DT/AM

NO.	REVISIONS	DATE	BY
01	ADDENDUM 001	2026 05 22	DT

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BBA
BARRY BRYAN ASSOCIATES

PROJECT:
ACCESSIBILITY UPGRADES AT KEELE ST JR PS & COMMUNITY CENTRE
TDSB# TR-25-0957
99 MOUNTVIEW AVENUE
TORONTO, ON
TORONTO DISTRICT SCHOOL BOARD

DRAWING:
ELECTRICAL PLANS

DESIGN BY: DT
DRAWN BY: DT
CHECKED BY: RL
DATE: 2026-01-22
SCALE: 1 : 50
SEAL:

PROJECT NO: 25301-24
DRAWING NO: E1-01