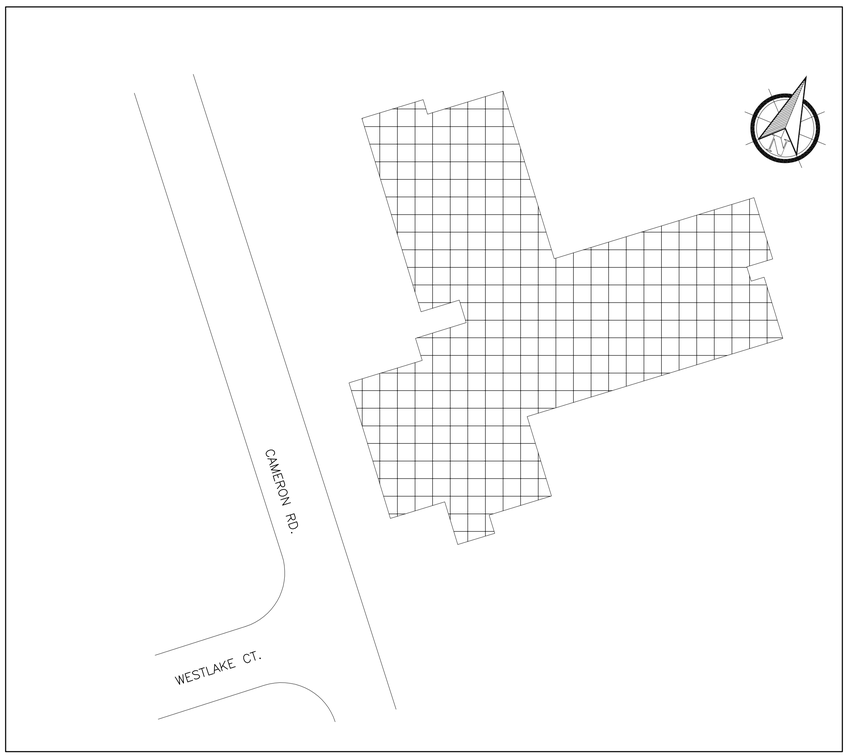
DDSB
FENELON TOWNSHIP PUBLIC SCHOOL

50 CAMERON RD. R.R.#1
CAMERON, ON. K0M 1G0

ISSUED FOR TENDER
MAY 2021





DRAWING LIST

NO.	DRAWING TITLE
	MECHANICAL
M-1	SYMBOL LIST, EQUIPMENT SCHEDULES, DETAILS – MECHANICAL
M-2	GROUND FLOOR – EXISTING & DEMOLITION WORK – MECHANICAL
M-3	GROUND FLOOR – NEW WORK – MECHANICAL
M-4	ROOF – EXISTING, DEMOLITION & NEW WORK – MECHANICAL
M-5	CONTROL DIAGRAMS
	ELECTRICAL
E-1	EQUIPMENT WIRING SCHEDULE, LEGEND & NOTES – ELECTRICAL
E-2	GROUND FLOOR MECH. ROOM & ROOF – EXISTING, DEMOLITION & NEW WORK – ELECTRICAL

SAB ENGINEERING Inc.

SCHEDULE OF SUPPLY AIR HANDLING UNITS

TAG	SERVING	SUPPLY FAN PERFORMANCE				EXHAUST FAN PERFORMANCE				HEATING PERFORMANCE		HEAT RECOVERY WHEEL			DX COOLING PERFORMANCE				WEIGHT KG [LBS]	POWER SUPPLY (V/PH/Hz)	MCA (AMPS)	MOCP (AMPS)	REMARKS
		AIR FLOW (CFM)	E.S.P. Pa [IN]	SPEED RPM	HP	AIR FLOW (CFM)	E.S.P. Pa [IN]	SPEED RPM	HP	INPUT kW [MBH]	OUTPUT kW [MBH]	MIN. OUT. AIR (CFM)	EDBT/EWBT °C(°F)		TOTAL CAP. kW [MBH]	SENS. CAP. kW [MBH]	TEMP °C (°F) EDBT/EWBT	TEMP °C (°F) LDBT/LWBT					
AHU-1	GYM	3,000	373 [1.75]	1760	3.0	3,000	186.7 [0.75]	1265	2.0	57.1 [195]	45.7 [156]	1500	−25/25.2[−13/−13.3]	74.4	35.5 [121]	24.7 [84.48]	24.7/17.6 [76.5/63.7]	10.0/9.6 [50.08/49.3]	1065 [2349]	208/1/60	96	110	HORIZONTAL DISCHARGE, C/W VFD
AHU-2	LIBRARY	3,000	249 [1.0]	1760	3.0	3,000	186.7 [0.75]	1760	3.0	57.1 [195]	45.7 [156]	360	N/A		28.13 [96]	21.22 [72.42]	24.8/17.5 [76.6/63.5]	12.6/11.6 [53.9/52.9]	853 [1881]	208/1/60	91	110	BOTTOM DISCHARGE, C/W VFD

SCHEDULE OF MAKE-UP AIR UNITS

TAG	SERVING	MANUFACTURER	SUPPLY FAN PERFORMANCE				EXHAUST FAN PERFORMANCE				HEATING PERFORMANCE		HEAT RECOVERY				POWER SUPPLY (V/PH/Hz)	MCA (AMPS)	MOCP (AMPS)	WEIGHT KG [LBS]	REMARKS
			AIRFLOW (CFM)	E.S.P. Pa [IN]	SPEED RPM	HP	AIRFLOW (CFM)	E.S.P. Pa [IN]	SPEED RPM	HP	INPUT kW [MBH]	OUTPUT kW [MBH]	AIRFLOW (CFM)	EDBT/EWBT °C [°F]	LDBT/LWBT °C [°F]	TOTAL EFF. %					
MUA-1	CLASSROOMS – WEST	AAON	3,100	249 [1.0]	1760	3.0	3,100	249 [1.0]	1760	3.0	85.7 [292]	68.6 [234]	3,000	−25/25.2[−13/−13.3]	3.2/−0.1[37.8/31.8]	61.5	208/1/60	43	60	796 [1755]	BOTTOM DISCHARGE, C/W VFD
MUA-2	CLASSROOMS – NORTH	AAON	3,540	249 [1.0]	1760	3.0	3,540	249 [1.0]	1760	3.0	46.9 [390]	37.5 [316]	3,500	−10/−11	3.2/−2[37.8/28.3]	58.6	208/1/60	43	60	841 [1795]	BOTTOM DISCHARGE, C/W VFD

SCHEDULE OF EXHAUST FANS

TAG	MANUFACTURER	TYPE	AIR FLOW (CFM)	SP (PA)	WATTS	RPM	POWER (V/PH/HZ)	Amps	REMARKS
EF-2	GREENHECK/REVERSOMATIC/BROAN	CEILING EXHAUST FAN	150	100	129	1050	120/1ø/60	1.7	NOTE 1, 2

NOTES:

1. FAN TO BE ON TIMER.
2. FANS SHALL BE C/W BACKDRAFT DAMPER, UNLESS OTHERWISE NOTED.

SCHEDULE OF GRILLES & DIFFUSERS

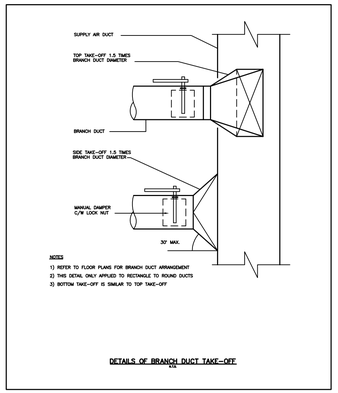
TYPE	SERVICE	MANUFACTURER	MODEL	VOLUME CONTROL	FINISH	REMARKS
A	SUPPLY	E.H. PRICE	SCD	YES	B12	SQUARE CONE DIFFUSER 600X600
B	SUPPLY	E.H. PRICE	RCD	YES	B12	ROUND CONE DIFFUSER
C	RETURN	E.H. PRICE	80	NO	B12	EGG CRATE RETURN GRILLE
D	RETURN	E.H. PRICE	95	NO	B12	LOUVERED RETURN GRILLE

SYMBOLS LIST – HVAC

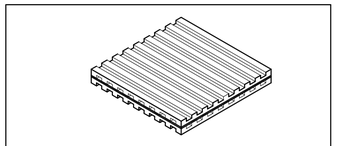
SYMBOL	DESCRIPTION
300x150	SHEET METAL DUCT – FIRST FIGURE INDICATES DIMENSION SHOWN
	SHEET METAL RISER UP – SUPPLY
	SHEET METAL RISER UP – RETURN AND EXHAUST
	SHEET METAL RISER DOWN – SUPPLY
	SHEET METAL RISER DOWN – RETURN AND EXHAUST
F/D	FUSIBLE LINK FIRE DAMPER WITH ACCESS DOOR IN DUCT
VD	VOLUME DAMPER
	FLEXIBLE DUCT CONNECTION. PROVIDE BALANCING DAMPER ON BRANCH TAKE-OFF
	SUPPLY AIR GRILLE
	EXHAUST OR RECIRC. GRILLE
	SUPPLY AIR CEILING DIFFUSER
	FLEXIBLE CONNECTION
O.E.D.	OPEN ENDED DUCT WITH BALANCING DAMPER AND BELLMOUTH INLET
UH	UNIT HEATER
T	ROOM THERMOSTAT

SYMBOLS LIST – ABBREVIATION

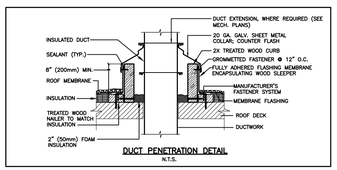
SYMBOL	DESCRIPTION
AV	AIR VENT
CTE	CONNECT TO EXISTING
CUT	CUT POINT OF EXISTING SERVICE
C/W	COMPLETE WITH
EF	EXHAUST FAN
EX	EXISTING TO REMAIN
N	NEW EQUIPMENT
PRV	PRESSURE REDUCING VALVE
RL	RELOCATED
VFD	VARIABLE FREQUENCY DRIVE



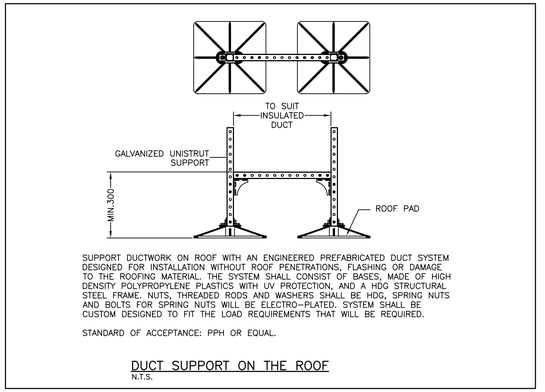
DETAILS OF BRANCH DUCT TAKE-OFF
N.T.S.



NEOPRENE PAD SUPPORT
N.T.S.



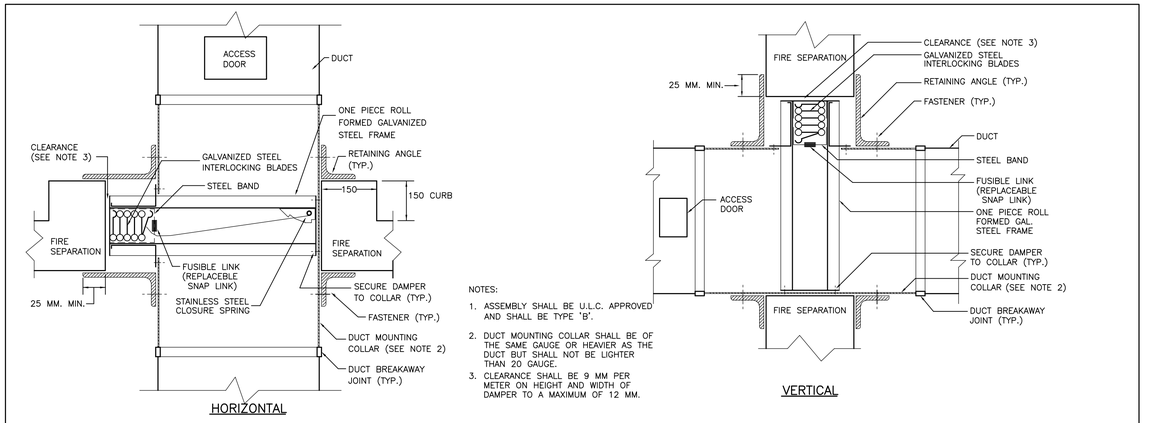
DUCT PENETRATION DETAIL
N.T.S.



SUPPORT DUCTWORK ON ROOF WITH AN ENGINEERED PREFABRICATED DUCT SYSTEM DESIGNED FOR INSTALLATION WITHOUT ROOF PENETRATIONS, FLASHING OR DAMAGE TO THE ROOFING MATERIAL. THE SYSTEM SHALL CONSIST OF BASES, MADE OF HIGH DENSITY POLYPROPYLENE PLASTICS WITH UV PROTECTION, AND A HDG STRUCTURAL STEEL FRAME, NUTS, THREADED RODS AND WASHERS SHALL BE HDG, SPRING NUTS AND BOLTS FOR SPRING NUTS WILL BE ELECTRO-PLATED. SYSTEM SHALL BE CUSTOM DESIGNED TO FIT THE LOAD REQUIREMENTS THAT WILL BE REQUIRED.

STANDARD OF ACCEPTANCE: PPH OR EQUAL.

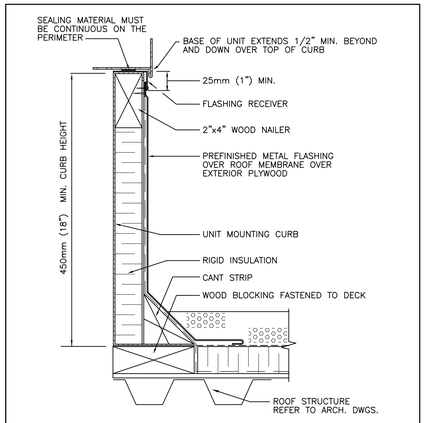
DUCT SUPPORT ON THE ROOF
N.T.S.



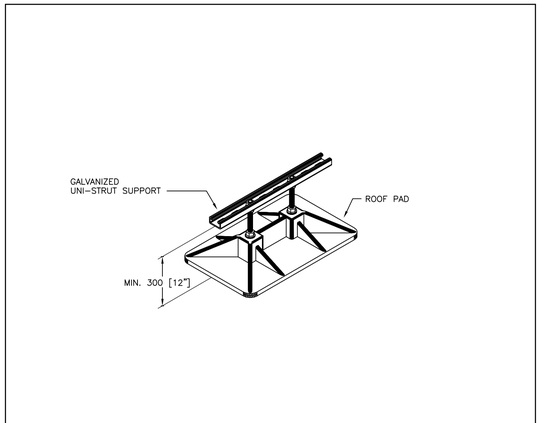
NOTES:

1. ASSEMBLY SHALL BE U.L.C. APPROVED AND SHALL BE TYPE 'B'.
2. DUCT MOUNTING COLLAR SHALL BE OF THE SAME GAUGE OR HEAVIER AS THE DUCT BUT SHALL NOT BE LIGHTER THAN 20 GAUGE.
3. CLEARANCE SHALL BE 9 MM PER METER ON HEIGHT AND WIDTH OF DAMPER TO A MAXIMUM OF 12 MM.

TYPICAL FIRE DAMPER DETAIL
N.T.S.



CURB DETAIL FOR ROOF-TOP UNITS
N.T.S.



TYPICAL PIPE AND CONDUIT SUPPORT ON THE ROOF
N.T.S.

No.	DATE	DESCRIPTION
1	MAY, 2021	ISSUED FOR TENDER

ISSUED

SEAL

LICENSED PROFESSIONAL ENGINEER
APRIL 2021
G. STRASHUN
PROVINCE OF ONTARIO

TRUE NORTH | BLDG. NORTH

Trillium Lakelands DISTRICT SCHOOL BOARD

GENERAL NOTES :

CONTRACTORS SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS AND CONDITIONS ON THE JOB AND THE ENGINEER SHALL BE INFORMED OF ANY VARIATIONS FROM THE DIMENSIONS AND CONDITIONS SHOWN ON THE DRAWINGS. DO NOT SCALE DRAWINGS. SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE PROCEEDING WITH FABRICATION. THIS DRAWING IS THE PROPERTY OF SAB ENGINEERING INC. AND SHALL NOT BE REPRODUCED WITHOUT THEIR PERMISSION AND UNLESS THE REPRODUCTION CARRIES THEIR NAME. ALL INFORMATION SHOWN ON THIS DRAWING IS FOR USE ON THE SPECIFIED PROJECT ONLY AND SHALL NOT BE USED OTHERWISE WITHOUT WRITTEN PERMISSION OF SAB ENGINEERING INC.

ADDRESS

FENELON TOWNSHIP PUBLIC SCHOOL

HVAC SYSTEMS UPGRADE

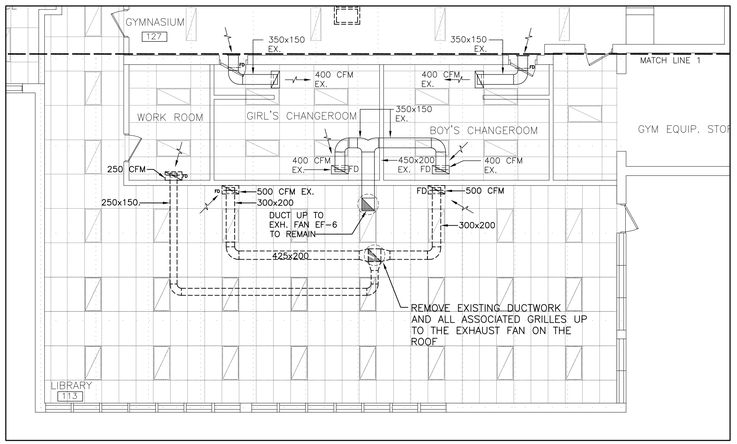
50 Cameron Rd. R.R.#1, Cameron, ON. K0M 1G0

DRAWING TITLE

SYMBOLS, EQUIPMENT SCHEDULES, DETAILS – MECHANICAL

DATE	SCALE
MAY/2021	N.T.S.
DRAWN BY	DWG. No.
P.C.	M-1

JOB No. 2021-48



GROUND FLOOR– LIBRARY – EXISTING & DEMOLITION WORK

SCALE: 1:100

GENERAL NOTES:

REMOVE EXISTING EXHAUST DUCTWORK SERVING THE CLASSROOMS. DISCONNECT FROM THE MAIN EXHAUST FANS LOCATED ON THE ROOF. (REFER TO ROOF PLAN FOR DEMOLITION).

ALL EXHAUST GRILLES SERVING ASSOCIATED WITH THE DUCTWORK TO BE DEMOLISHED ARE TO BE REMOVED.

REMOVE ALL REDUNDANT HANGERS AND SUPPORTS.

COORDINATE REMOVAL OF DUCTWORK WITH EXISTING SERVICES IN THE CEILING SPACE. TEMPORARILY REMOVE AND/OR RELOCATE, AS NECESSARY TO REMOVE THE DUCTWORK.

TEMPORARY REMOVE THE CEILING AND LIGHTS AS REQUIRED TO PERFORM THE WORK.

PATCH AND REPAIR TO MATCH EXISTING ALL THE OPENINGS THROUGH THE EXISTING WALLS AND ROOF THAT ARE REDUNDANT AS A RESULT OF THE WORK.

No.	DATE	DESCRIPTION
1	MAY, 2021	ISSUED FOR TENDER

ISSUED

SEAL

LICENSED PROFESSIONAL ENGINEER
APRIL, 2021
G. STRASHUN
PROVINCE OF ONTARIO

TRUE NORTH

BLDG. NORTH

Trillium Lakelands DISTRICT SCHOOL BOARD

GENERAL NOTES :

CONTRACTORS SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS AND CONDITIONS ON THE JOB AND THE ENGINEER SHALL BE INFORMED OF ANY VARIATIONS FROM THE DIMENSIONS AND CONDITIONS SHOWN ON THE DRAWINGS. DO NOT SCALE DRAWINGS. SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE PROCEEDING WITH FABRICATION. THIS DRAWING IS THE PROPERTY OF SAB ENGINEERING INC. AND SHALL NOT BE REPRODUCED WITHOUT THEIR PERMISSION AND UNLESS THE REPRODUCTION CARRIES THEIR NAME. ALL INFORMATION SHOWN ON THIS DRAWING IS FOR USE ON THE SPECIFIED PROJECT ONLY AND SHALL NOT BE USED OTHERWISE WITHOUT WRITTEN PERMISSION OF SAB ENGINEERING INC.

ADDRESS

FENELON TOWNSHIP PUBLIC SCHOOL

HVAC SYSTEMS UPGRADE

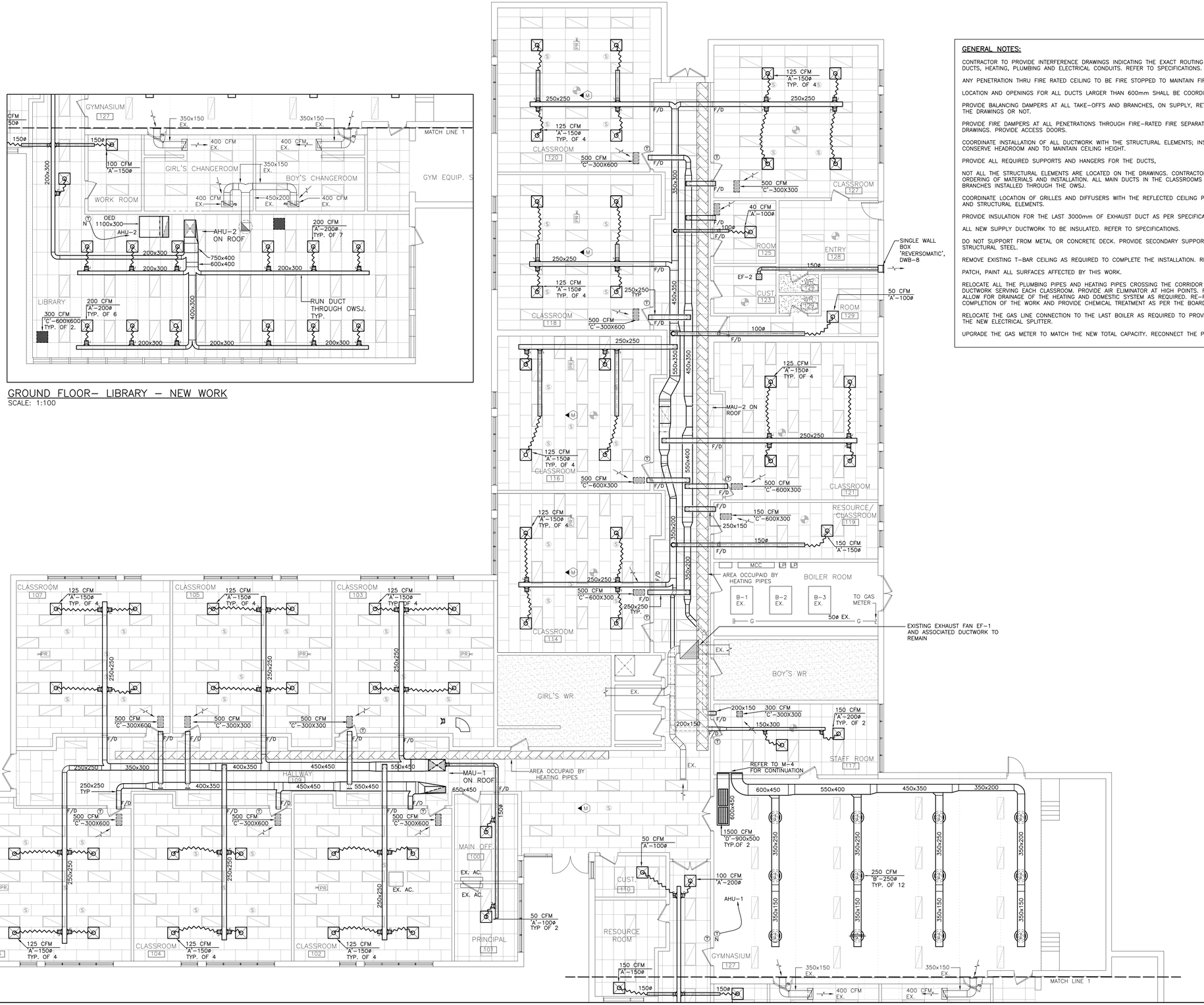
50 Cameron Rd. R.R.#1, Cameron, ON. K0M 1G0

DRAWING TITLE

GROUND FLOOR – EXISTING & DEMOLITION WORK – MECHANICAL

DATE	SCALE
MAY/2021	1:100
DRAWN BY	DWG. No.
P.C.	M-2

JOB No. 2021–48



GROUND FLOOR– LIBRARY – NEW WORK

SCALE: 1:100

GENERAL NOTES:

CONTRACTOR TO PROVIDE INTERFERENCE DRAWINGS INDICATING THE EXACT ROUTING OF ALL MECHANICAL SERVICES INCLUDING DUCTS, HEATING, PLUMBING AND ELECTRICAL CONDUITS. REFER TO SPECIFICATIONS.

ANY PENETRATION THRU FIRE RATED CEILING TO BE FIRE STOPPED TO MAINTAIN FIRE RATED ASSEMBLY.

LOCATION AND OPENINGS FOR ALL DUCTS LARGER THAN 600mm SHALL BE COORDINATED WITH THE STRUCTURAL DIVISION.

PROVIDE BALANCING DAMPERS AT ALL TAKE-OFFS AND BRANCHES, ON SUPPLY, RETURN DUCTWORK, WEATHER SHOWN ON THE DRAWINGS OR NOT.

PROVIDE FIRE DAMPERS AT ALL PENETRATIONS THROUGH FIRE-RATED FIRE SEPARATION, WEATHER SHOWN OR NOT ON THE DRAWINGS. PROVIDE ACCESS DOORS.

COORDINATE INSTALLATION OF ALL DUCTWORK WITH THE STRUCTURAL ELEMENTS; INSTALL DUCTS AS HIGH AS POSSIBLE TO CONSERVE HEADROOM AND TO MAINTAIN CEILING HEIGHT.

PROVIDE ALL REQUIRED SUPPORTS AND HANGERS FOR THE DUCTS,

NOT ALL THE STRUCTURAL ELEMENTS ARE LOCATED ON THE DRAWINGS. CONTRACTOR TO VERIFY THE SITE PRIOR TO ORDERING OF MATERIALS AND INSTALLATION. ALL MAIN DUCTS IN THE CLASSROOMS TO BE INSTALLED BETWEEN OWSJ WITH BRANCHES INSTALLED THROUGH THE OWSJ.

COORDINATE LOCATION OF GRILLES AND DIFFUSERS WITH THE REFLECTED CEILING PLANS, EDUCATIONAL EQUIPMENTS, LIGHTS AND STRUCTURAL ELEMENTS.

PROVIDE INSULATION FOR THE LAST 3000mm OF EXHAUST DUCT AS PER SPECIFICATIONS.

ALL NEW SUPPLY DUCTWORK TO BE INSULATED. REFER TO SPECIFICATIONS.

DO NOT SUPPORT FROM METAL OR CONCRETE DECK. PROVIDE SECONDARY SUPPORT SYSTEM SUPPORTED FROM THE STRUCTURAL STEEL.

REMOVE EXISTING T-BAR CEILING AS REQUIRED TO COMPLETE THE INSTALLATION. REINSTATE AND REPAIR TO MATCH EXISTING.

PATCH, PAINT ALL SURFACES AFFECTED BY THIS WORK.

RELOCATE ALL THE PLUMBING PIPES AND HEATING PIPES CROSSING THE CORRIDOR TO AVOID INTEREFERNCES WITH THE NEW DUCTWORK SERVING EACH CLASSROOM. PROVIDE AIR ELIMINATOR AT HIGH POINTS. RE-INSULATED THE RELOCATED PIPES. ALLOW FOR DRAINAGE OF THE HEATING AND DOMESTIC SYSTEM AS REQUIRED. RE-FILL THE HEATING SYSTEM AT THE COMPLETION OF THE WORK AND PROVIDE CHEMICAL TREATMENT AS PER THE BOARD REQUIREMENTS.

RELOCATE THE GAS LINE CONNECTION TO THE LAST BOILER AS REQUIRED TO PROVIDE CLEARANCE FOR THE INSTALLATION OF THE NEW ELECTRICAL SPLITTER.

UPGRADE THE GAS METER TO MATCH THE NEW TOTAL CAPACITY. RECONNECT THE PIPE SERVING THE BOILER PLANT

No.	DATE	DESCRIPTION
1	MAY, 2021	ISSUED FOR TENDER

ISSUED

SEAL

LICENSED PROFESSIONAL ENGINEER
APRIL, 2021
G. STRASHUN
PROVINCE OF ONTARIO

TRUE NORTH

BLDG. NORTH

Trillium Lakelands DISTRICT SCHOOL BOARD

GENERAL NOTES :

CONTRACTORS SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS AND CONDITIONS ON THE JOB AND THE ENGINEER SHALL BE INFORMED OF ANY VARIATIONS FROM THE DIMENSIONS AND CONDITIONS SHOWN ON THE DRAWINGS. DO NOT SCALE DRAWINGS. SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE PROCEEDING WITH FABRICATION. THIS DRAWING IS THE PROPERTY OF SAB ENGINEERING INC. AND SHALL NOT BE REPRODUCED WITHOUT THEIR PERMISSION AND UNLESS THE REPRODUCTION CARRIES THEIR NAME. ALL INFORMATION SHOWN ON THIS DRAWING IS FOR USE ON THE SPECIFIED PROJECT ONLY AND SHALL NOT BE USED OTHERWISE WITHOUT WRITTEN PERMISSION OF SAB ENGINEERING INC.

ADDRESS

FENELON TOWNSHIP PUBLIC SCHOOL

HVAC SYSTEMS UPGRADE

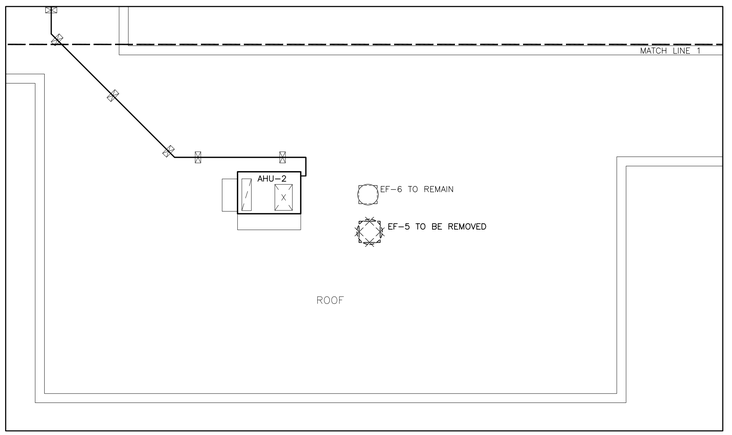
50 Cameron Rd. R.R.#1, Cameron, ON. K0M 1G0

DRAWING TITLE

GROUND FLOOR – NEW WORK – MECHANICAL

DATE	SCALE
MAY/2021	1:100
DRAWN BY	DWG. No.
P.C.	M-3

JOB No. 2021-48



ROOF– LIBRARY – NEW WORK
SCALE: 1:100

GENERAL NOTES:

PROVIDE INSULATED ROOF CURBS FOR ALL ROOFTOP UNITS INSTALLED ON ROOF AS NOTED. THE ROOF CURB TO BE SUPPLIED BY UNIT MANUFACTURE AND BE A MINIMUM OF 400 (16") HIGH.

PROVIDE CURB ADAPTER FOR HORIZONTAL DISCHARGE FOR THE AHU–2 SERVING THE GYM. PROVIDE SUPPORT FOR ALL DUCTWORK INSTALLED ON THE ROOF. PROVIDE SUPPORT FOR THE DUCTS INSTALLED ON THE GYM WALL. SEAL WALL PENETRATION. PROVIDE SHEET METAL ENCLOSURE FOR THE VERTICAL PORTION OF THE DUCTS ON THE FACE OF THE GYM WALL.

COORDINATE INSTALLATION OF EQUIPMENT ON THE ROOF TO MAINTAIN REQUIRED CLEARANCES FOR MAINTENANCE AND MIN 3m (10 FT) BETWEEN INTAKE AND EXHAUST OUTLETS.

LOCATION AND OPENINGS FOR ALL DUCTS LARGER THAN 600mm SHALL BE COORDINATED WITH THE STRUCTURAL DIVISION.

PROVIDE PIPE SUPPORTS FOR THE GAS PIPING. REFER TO DETAIL AND SPECIFICATIONS.

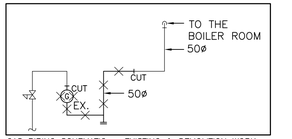
ALL SUPPORTS AND EXPANSION LOOPS TO BE IN ACCORDANCE WITH THE CODE REQUIREMENTS. CONTRACTOR TO ALLOW FOR ADDITIONAL ROOF SUPPORTS AS REQUIRED.

REMOVE THE EXISTING FIVE EXHAUST FANS SERVING THE CLASSROOMS, STAFF ROOM, GYM AND LIBRARY. PROVIDE WEATHER SEAL CAP TO SEAL THE OPENING.

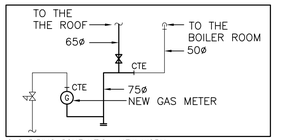
ROOFING NOTES:

1. PROVIDE PROTECTION BOARDS TO EXISTING ROOF AREAS WHEREVER CONSTRUCTION ACTIVITIES OCCUR.
2. CONTRACTOR RESPONSIBLE FOR ALL TEMPORARY SUPPORTS, BRACING AND SHORING REQUIRED AND DESIGN OF SAME.
3. KEEP EXISTING BUILDING WATERTIGHT DURING ALL WORK ON EXISTING ROOF. REPLACE ALL DAMAGED ROOFING INCLUDING SATURATED INSULATION, CAUSED BY CONSTRUCTION ACTIVITIES.
4. MAINTAIN EXISTING BUILDING SECURE FROM UNAUTHORIZED ENTRY DURING DEMOLITION PROCEDURES AND CONSTRUCTION ACTIVITIES.
5. PROVIDE ALL OPENINGS IN EXISTING ROOF TO SUIT NEW MECHANICAL AND ELECTRICAL SERVICES. MAKE GOOD TO SUIT EXISTING ROOFING. REFER TO MECHANICAL AND ELECTRICAL WORK FOR LOCATIONS WHERE OPENINGS ARE REQUIRED IN EXISTING ROOF.
6. SIZE AND LOCATION OF ROOF OPENINGS AND WEIGHTS OF EQUIPMENT SHALL BE COORDINATED WITH THE MECHANICAL CONTRACTOR.





GAS PIPING SCHEMATIC – EXISTING & DEMOLITION WORK
N.T.S.



GAS PIPING SCHEMATIC –NEW WORK
N.T.S.

No.	DATE	DESCRIPTION
1	MAY, 2021	ISSUED FOR TENDER

ISSUED

SEAL

LICENSED PROFESSIONAL ENGINEER
APRIL, 2021
G. STRASHUN
PROVINCE OF ONTARIO

TRUE NORTH | BLDG. NORTH

Trillium Lakelands DISTRICT SCHOOL BOARD

GENERAL NOTES :

CONTRACTORS SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS AND CONDITIONS ON THE JOB AND THE ENGINEER SHALL BE INFORMED OF ANY VARIATIONS FROM THE DIMENSIONS AND CONDITIONS SHOWN ON THE DRAWINGS. DO NOT SCALE DRAWINGS. SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE PROCEEDING WITH FABRICATION. THIS DRAWING IS THE PROPERTY OF SAB ENGINEERING INC. AND SHALL NOT BE REPRODUCED WITHOUT THEIR PERMISSION AND UNLESS THE REPRODUCTION CARRIES THEIR NAME. ALL INFORMATION SHOWN ON THIS DRAWING IS FOR USE ON THE SPECIFIED PROJECT ONLY AND SHALL NOT BE USED OTHERWISE WITHOUT WRITTEN PERMISSION OF SAB ENGINEERING INC.

ADDRESS

FENELON TOWNSHIP PUBLIC SCHOOL

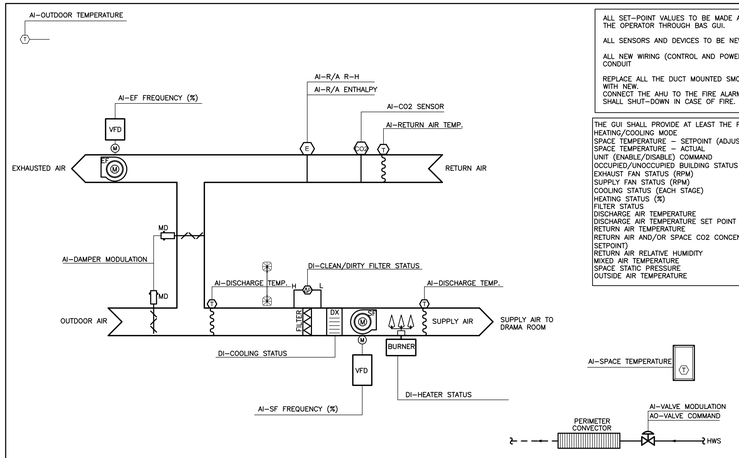
HVAC SYSTEMS UPGRADE

50 Cameron Rd. R.R.#1, Cameron, ON. K0M 1G0

DRAWING TITLE

ROOF – EXISTING & NEW WORK – MECHANICAL

DATE	SCALE
MAY/2021	1:100
DRAWN BY	DWG. No.
P.C.	M-4
JOB No.	2021–48



ALL SET–POINT VALUES TO BE MADE ADJUSTABLE BY THE OPERATOR THROUGH BAS GUI.

ALL SENSORS AND DEVICES TO BE NEW.

ALL NEW WIRING (CONTROL AND POWER) TO BE IN CONDUIT

REPLACE ALL THE DUCT MOUNTED SMOKE DETECTORS WITH NEW.
CONNECT THE AHU TO THE FIRE ALARM SYSTEM. UNIT SHALL SHUT–DOWN IN CASE OF FIRE.

THE GUI SHALL PROVIDE AT LEAST THE FOLLOWING POINTS:
HEATING/COOLING MODE
SPACE TEMPERATURE – SETPOINT (ADJUSTABLE)
SPACE TEMPERATURE – ACTUAL
UNIT (ENABLE/DISABLE) COMMAND
OCCUPIED/UNOCCUPIED BUILDING STATUS (ADJUSTABLE)
EXHAUST FAN STATUS (RPM)
SUPPLY FAN STATUS (RPM)
COOLING STATUS (EACH STAGE)
HEATING STATUS (%)
FILTER STATUS
DISCHARGE AIR TEMPERATURE
DISCHARGE AIR TEMPERATURE SET POINT
RETURN AIR TEMPERATURE
RETURN AIR AND/OR SPACE CO2 CONCENTRATION (ACTUAL AND SETPOINT)
RETURN AIR RELATIVE HUMIDITY
MIXED AIR TEMPERATURE
SPACE STATIC PRESSURE
OUTSIDE AIR TEMPERATURE

SEQUENCE OF OPERATION

THE ROOFTOP UNIT SHALL BE EQUIPPED WITH A CONTROLLER CAPABLE OF INTERFACING WITH THE SCHOOL BAS. UNIT CONTROLLER SHALL OPERATE THE EQUIPMENT IN ACCORDANCE WITH THE SEQUENCE DESCRIBED HEREIN, THE BAS SHALL ENABLE/ DISABLE THE UNIT AND MONITOR AS NOTED. UNIT CONTROLLER TO BE BACNET TESTING LAB (BTL) CERTIFIED.

HEATING AND COOLING MODES
THE ROOFTOP UNIT SHALL BE ENABLED/ DISABLED BY THE BAS IN ACCORDANCE WITH THE BOARD STRATEGY.

HEATING/COOLING MODES: THE ROOFTOP UNIT SHALL BE IN HEATING MODE WHEN OUTDOOR TEMPERATURE DROPS BELOW 12°C FOR MORE THAN 30 MIN. THE ROOFTOP UNIT SHALL BE IN COOLING MODE WHEN OUTDOOR TEMPERATURE RISES ABOVE 16°C FOR MORE THAN 30 MINUTES. HEATING/COOLING MODE TO BE DICTATED BY BAS.

EQUIPMENT ON, HEATING MODE, OCCUPIED HOURS

COOLING SECTION IS DISABLED. HEATING SECTION IS ENABLED.

THE SUPPLY AND EXHAUST FANS SHALL RUN CONTINUOUSLY. THE SUPPLY FAN VFD SHALL KEEP THE FAN MOTOR AT A CONSTANT RPM (REQUIRED RPM SHALL BE DETERMINED DURING THE AIR BALANCING). THE EXHAUST FAN VFD SHALL MODULATE AS REQUIRED TO MAINTAIN SPACE PRESSURE SETPOINT (SEE ROOF–TOP UNIT SPECIFICATIONS). SUPPLY AND EXHAUST FAN MODULATION AND FAN START–UP SEQUENCE SHALL BE BY UNIT CONTROLLER.

THE FRESH AIR DAMPER SHALL OPEN TO THE MINIMUM POSITION (MINIMUM POSITION SHALL BE SET DURING AIR BALANCING IN ORDER TO ACHIEVE MINIMUM OUTSIDE AIR FLOW AS SHOWN ON ROOF–TOP UNIT SCHEDULE ON M–1). DAMPERS SHALL BE MODULATED BY THE UNIT CONTROLLER IN ORDER TO MAINTAIN CO2 CONCENTRATION SETPOINT IN RETURN AIR STREAM.

THE GAS FIRED HEAT EXCHANGER SHALL BE MODULATED BY UNIT CONTROLLER AS REQUIRED TO MAINTAIN THE DISCHARGED AIR TEMPERATURE AT A VARIABLE SETPOINT DETERMINED BY THE BAS.

DISCHARGE AIR TEMPERATURE SHALL BE RE–SET BY THE BAS IN ORDER TO MAINTAIN SPACE TEMPERATURE SETPOINT AT 22°C (ADJUSTABLE).

THE BAS SHALL MODULATE THE PERIMETER RADIATION CONTROL VALVE TO MAINTAIN THE SPACE TEMPERATURE AT SET POINT (22°C, ADJUSTABLE) AS FIRST STAGE OF HEATING.

EQUIPMENT ON, HEATING MODE, UNOCCUPIED HOURS

AT THE BEGINNING OF THE UNOCCUPIED PERIOD, THE AIR HANDLER SHALL BE DISABLED

ROOF–TOP UNIT SHALL BE DISABLED. THE HOT WATER RADIATOR SHALL BE ACTIVATED AND RADIATOR CONTROL VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN THE UNOCCUPIED ROOM TEMPERATURE SETPOINT.

EQUIPMENT ON, COOLING MODE, OCCUPIED HOURS,

HEATING SECTION IS DISABLED. COOLING SECTION IS ENABLED.

THE SUPPLY AND EXHAUST FANS SHALL RUN CONTINUOUSLY, THE SUPPLY FAN VFD SHALL KEEP THE FAN MOTOR AT A CONSTANT RPM (REQUIRED RPM SHALL BE DETERMINED DURING THE AIR BALANCING). THE EXHAUST FAN VFD SHALL MODULATE AS REQUIRED TO MAINTAIN SPACE PRESSURE SETPOINT. SUPPLY AND EXHAUST FAN MODULATION AND FAN START–UP SEQUENCE SHALL BE BY UNIT CONTROLLER.

THE FRESH AIR DAMPER SHALL OPEN TO THE MINIMUM POSITION (MINIMUM POSITION SHALL BE SET DURING AIR BALANCING IN ORDER TO ACHIEVE MINIMUM OUTSIDE AIR FLOW AS SHOWN ON ROOF–TOP UNIT SCHEDULE ON M–1). DAMPERS SHALL BE MODULATED BY THE UNIT CONTROLLER IN ORDER TO MAINTAIN CO2 CONCENTRATION SETPOINT IN RETURN AIR STREAM.

THE DX COOLING SECTION SHALL BE MODULATED BY UNIT CONTROLLER AS REQUIRED TO MAINTAIN THE DISCHARGED AIR TEMPERATURE AT A VARIABLE SETPOINT DETERMINED BY THE BAS.

DISCHARGE AIR TEMPERATURE SHALL BE RE–SET BY THE BAS IN ORDER TO MAINTAIN SPACE TEMPERATURE SETPOINT AT 22°C (ADJUSTABLE)

FREE COOLING SHALL BE PROVIDED BY THE UNIT CONTROLLER BASED ON COMPARATIVE ENTHALPY CONTROL.

EQUIPMENT ON, COOLING MODE, UNOCCUPIED HOURS

DURING THE COOLING MODE UNOCCUPIED PERIODS, THE AIR HANDLER SHALL BE DISABLED (FANS OFF, DAMPERS CLOSED).

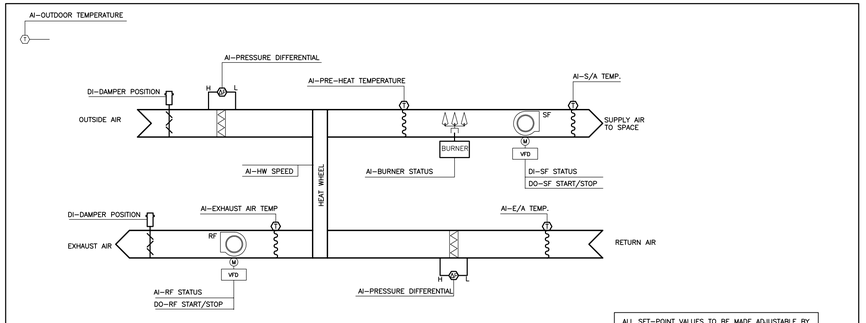
ALARMS

THE BAS SHALL GENERATE ALARMS IN CASE OF:

ANY FAN FAILURE;
ANY VFD FAILURE;
ANY DAMPER FAILURE;
SPACE AIR TEMPERATURE IS MORE THAN ±2°C FROM SETPOINT;
DISCHARGED AIR LOWER THAN 8°C – HEATING MODE ONLY (IN ADDITION TO ALARM, THE UNIT SHALL BE DISABLED);
DIRTY FILTER ALARM.

AHU–2 CONTROL DIAGRAM

N.T.S.



ALL SET–POINT VALUES TO BE MADE ADJUSTABLE BY THE OPERATOR THROUGH BAS GUI.

ALL SENSORS AND DEVICES TO BE NEW.

ALL NEW WIRING (CONTROL AND POWER) TO BE IN CONDUIT

PROVIDE NEW DUCT MOUNTED SMOKE DETECTORS.

CONNECT THE MAU–1 & 2 TO THE FIRE ALARM SYSTEM. UNITs SHALL SHUT–DOWN IN CASE OF FIRE.

SEQUENCE OF OPERATION

THE MAKE–UP AIR UNITS SHALL BE EQUIPPED WITH A CONTROLLER CAPABLE OF INTERFACING WITH THE SCHOOL BAS. UNIT CONTROLLER SHALL OPERATE THE EQUIPMENT IN ACCORDANCE WITH THE SEQUENCE DESCRIBED HEREIN, THE BAS SHALL ENABLE/ DISABLE THE UNIT AND MONITOR AS NOTED. UNIT CONTROLLER TO BE BACNET TESTING LAB (BTL) CERTIFIED.

HEATING/VENTILATION MODES: THE MAU UNIT SHALL BE IN HEATING MODE WHEN OUTDOOR TEMPERATURE DROPS BELOW 16°C FOR MORE THAN 30 MIN. THE ROOFTOP UNIT SHALL BE IN COOLING MODE WHEN OUTDOOR TEMPERATURE RISES ABOVE 16°C FOR MORE THAN 30 MINUTES. HEATING/COOLING MODE TO BE DICTATED BY BAS.

EQUIPMENT ON/OFF:

UNIT SHALL BE ENABLED/DISABLED BY THE BAS BASED ON THE TIME OF DAY SCHEDULE (OCCUPIED/UNOCCUPIED). WHEN DISABLED, THE SUPPLY AND EXHAUST FANS WILL STOP, THE FRESH AIR AND EXHAUST DAMPERS SHALL BE FULLY CLOSED.

THE VFD CONNECTED TO EACH FAN SHALL BE USED FOR BALANCING PURPOSES ONLY. UNIT IS TO BE CONSTANT VOLUME. THE SUPPLY AND EXHAUST FAN VFD SHALL BE SET AT A CERTAIN VALUE DURING BALANCING WHICH WILL BE CONSIDERED THE OPERATION RPM.

EQUIPMENT ON, OCCUPIED PERIODS, HEATING MODE:

AT THE BEGINNING OF THE OCCUPIED PERIOD, BOTH INTAKE AND EXHAUST DAMPERS SHALL OPEN. 15 SECONDS AFTER CONFIRMATION OF DAMPER OPENINGS, THE EXHAUST FAN WILL START. AFTER A 15 SECONDS DELAY, THE SUPPLY FAN WILL START.

THE ENTHALPY WHEEL SPEED WILL MODULATE TO MAINTAIN THE SUPPLY TEMPERATURE AT 22°C (ADJUSTABLE), THE BURNER SHALL REMAIN OFF. IF THE WHEEL SPEED IS AT 100% AND THE SUPPLY TEMPERATURE FALLS BELOW 22°C, THE GAS BURNER SHALL BE ENERGIZED AND SHALL MODULATE AS REQUIRED TO MAINTAIN THE DISCHARGED AIR AT SET POINT (22°C ADJUSTABLE).

EQUIPMENT ON, OCCUPIED PERIODS, VENTILATION MODE:

AT THE BEGINNING OF THE OCCUPIED PERIOD, BOTH INTAKE AND EXHAUST DAMPERS SHALL OPEN. 15 SECONDS AFTER CONFIRMATION OF DAMPER OPENINGS, THE EXHAUST FAN WILL START. AFTER A 15 SECONDS DELAY, THE SUPPLY FAN WILL START.

ONCE CONFIRMATION OF BOTH FANS RUNNING, THE ENTHALPY WHEEL WILL RUN CONTINUOUSLY AT 100% SPEED THROUGHOUT THE OCCUPIED PERIOD.

UNOCCUPIED PERIODS, HEATING OR VENTILATION MODE:

THE UNIT SHALL BE OFF; THE MAIN INTAKE AND EXHAUST DAMPERS SHALL BE CLOSED, THE FANS SHALL BE DE–ENERGIZED, AND THE ENTHALPY WHEEL SHALL STOP.

BAS GUI SHALL DISPLAY AT LEAST THE FOLLOWING POINTS:

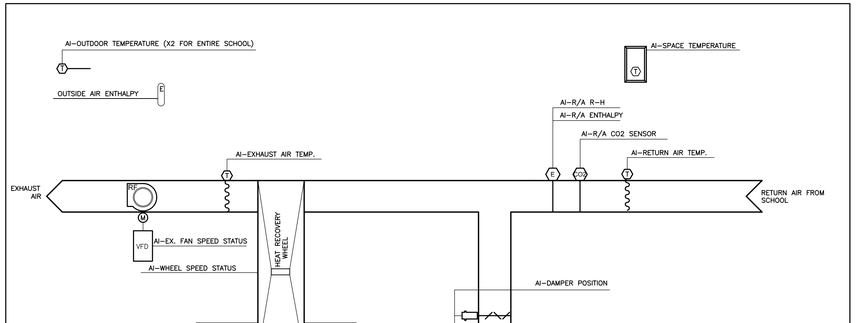
HEATING/VENTILATION MODE
UNIT (ENABLE/DISABLE) COMMAND
OCCUPIED/UNOCCUPIED BUILDING STATUS (ADJUSTABLE)
EXHAUST FAN STATUS (RPM)
SUPPLY FAN STATUS (RPM)
ENERGY RECOVERY WHEEL RPM
VENTILATION STATUS
HEATING STATUS (%)
FILTER STATUS
DISCHARGE AIR TEMPERATURE
DISCHARGE AIR TEMPERATURE SET POINT (ADJUSTABLE)
RETURN AIR TEMPERATURE
ERW LEAVING EXHAUST AIR TEMPERATURE
ERW LEAVING SUPPLY AIR TEMPERATURE
SPACE STATIC PRESSURE
OUTSIDE AIR TEMPERATURE

BAS ALARMS

THE BAS SHALL GENERATE ALARMS IN CASE OF:

ANY FAN FAILURE;
MAIN INTAKE OR EXHAUST DAMPER FAILURE;
SUPPLY TEMPERATURE BELOW 12°C, IN ADDITION TO THE ALARM, THE UNIT WILL SHUT DOWN;
EXHAUST AIR TEMPERATURE DOWNSTREAM OF THE HEAT RECOVERY WHEEL DROPS BELOW –18°C. THE WHEEL SPEED WILL DECREASE.

MAU–1 & 2 CONTROL SCHEMATIC



SEQUENCE OF OPERATION:

THE ROOFTOP UNIT SHALL BE EQUIPPED WITH A CONTROLLER CAPABLE OF INTERFACING WITH THE SCHOOL BAS. UNIT CONTROLLER SHALL OPERATE THE EQUIPMENT IN ACCORDANCE WITH THE SEQUENCE DESCRIBED HEREIN, THE BAS SHALL ENABLE/ DISABLE THE UNIT AND MONITOR AS NOTED. UNIT CONTROLLER TO BE BACNET TESTING LAB (BTL) CERTIFIED.

HEATING/COOLING MODES: THE ROOFTOP UNIT SHALL BE IN HEATING MODE WHEN OUTDOOR TEMPERATURE DROPS BELOW 16°C FOR MORE THAN 30 MIN. THE ROOFTOP UNIT SHALL BE IN COOLING MODE WHEN OUTDOOR TEMPERATURE RISES ABOVE 16°C FOR MORE THAN 30 MINUTES. HEATING/COOLING MODE TO BE DICTATED BY BAS.

UNIT SHALL BE ENABLED/DISABLED BY THE BAS BASED ON THE TIME OF DAY SCHEDULE (OCCUPIED/UNOCCUPIED). WHEN RTU IS ENABLED DURING THE OCCUPIED MODE, THE SUPPLY FAN SHALL RUN CONTINUOUSLY WITH ALL OTHER PARAMETERS BEING CONTROLLED BY THE INTEGRAL RTU CONTROLLER AS REQUIRED TO PROVIDE CONTINUOUS VENTILATION (BASED ON SPACE CO2 CONCENTRATION) AND TO MAINTAIN THE OCCUPIED SPACE TEMPERATURE SETPOINT (24.5 DEC C – COOLING MODE).

DURING OCCUPIED HEATING MODE OF OPERATION, THE BAS SHALL MODULATE THE PERIMETER RADIATION CONTROL VALVE TO MAINTAIN THE SPACE TEMPERATURE SET POINT (22°C, ADJUSTABLE) AS THE FIRST STAGE OF HEATING. THE RTU CONTROLLER SHALL MODULATE THE GAS FIRED HEATING SECTION AS REQUIRED TO MAINTAIN THE SUPPLY TEMPERATURE AT 20°C (ADJUSTABLE BY BAS).

IN THE UNOCCUPIED MODE – HEATING AND COOLING MODE, THE RTU INCLUDING, SUPPLY FAN, HEAT EXCHANGER AND OTHER PARAMETERS SHALL BE DISABLED.

DURING HEATING UNOCCUPIED MODE OF OPERATION THE PERIMETER RADIATION VALVE SHALL MODULATE AS REQUIRED TO MAINTAIN THE SPACE SETPOINT TEMPERATURE.

HEAT RECOVERY PORTION AND EXHAUST FAN SHALL BE CONTROLLED BY THE INTEGRAL RTU CONTROLLER AS PER THE PRE–PROGRAMMED SEQUENCE BY UNIT MANUFACTURER.

FREE COOLING SHALL BE PROVIDED BY THE UNIT CONTROLLER BASED ON COMPARATIVE ENTHALPY CONTROL.

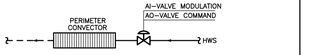
BAS GUI SHALL DISPLAY AT LEAST THE FOLLOWING POINTS:

HEATING/COOLING MODE
SPACE TEMPERATURE – SETPOINT (ADJUSTABLE)
SPACE TEMPERATURE – ACTUAL
UNIT (ENABLE/DISABLE) COMMAND
OCCUPIED/UNOCCUPIED BUILDING STATUS (ADJUSTABLE)
EXHAUST FAN STATUS (RPM)
SUPPLY FAN STATUS (RPM)
ENERGY RECOVERY WHEEL RPM
COOLING STATUS (EACH STAGE)
HEATING STATUS (%)
FILTER STATUS
RHSCHARGE AIR TEMPERATURE
DISCHARGE AIR TEMPERATURE SET POINT
RETURN AIR TEMPERATURE
RETURN AIR AND/OR SPACE CO2 CONCENTRATION (ACTUAL AND SETPOINT)
RETURN AIR RELATIVE HUMIDITY
ERW LEAVING EXHAUST AIR TEMPERATURE
ERW LEAVING SUPPLY AIR TEMPERATURE
MIXED AIR TEMPERATURE
SPACE STATIC PRESSURE
OUTSIDE AIR TEMPERATURE
ERW BYI–PASS DAMPER STATUS

ALARMS

THE BAS SHALL GENERATE ALARMS IN CASE OF:

SUPPLY FAN FAILURE
EXHAUST FAN FAILURE
ERW FAILURE
DISCHARGE AIR BELOW 12°C (HEATING MODE ONLY)
DISCHARGE AIR ABOVE 26°C (COOLING MODE ONLY)
SPACE TEMPERATURE VARIANCE OF +/–3°C FROM SETPOINT
DIRTY FILTER



ALL SET–POINT VALUES TO BE MADE ADJUSTABLE BY THE OPERATOR THROUGH BAS GUI.

ALL SENSORS AND DEVICES TO BE NEW.

ALL NEW WIRING (CONTROL AND POWER) TO BE IN CONDUIT

CONNECT THE RTU TO THE FIRE ALARM SYSTEM. UNIT SHALL SHUT–DOWN IN CASE OF FIRE.

AHU– 2 CONTROL DIAGRAM

No.	DATE	DESCRIPTION
1	MAY, 2021	ISSUED FOR TENDER

ISSUED

SEAL

LICENSED PROFESSIONAL ENGINEER
APRIL, 2021
G. STRASHUN
PROVINCE OF ONTARIO

TRUE NORTH | BLDG. NORTH

Trillium Lakelands DISTRICT SCHOOL BOARD

GENERAL NOTES :

CONTRACTORS SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS AND CONDITIONS ON THE JOB AND THE ENGINEER SHALL BE INFORMED OF ANY VARIATIONS FROM THE DIMENSIONS AND CONDITIONS SHOWN ON THE DRAWINGS. DO NOT SCALE DRAWINGS. SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE PROCEEDING WITH FABRICATION. THIS DRAWING IS THE PROPERTY OF SAB ENGINEERING INC. AND SHALL NOT BE REPRODUCED WITHOUT THEIR PERMISSION AND UNLESS THE REPRODUCTION CARRIES THEIR NAME. ALL INFORMATION SHOWN ON THIS DRAWING IS FOR USE ON THE SPECIFIED PROJECT ONLY AND SHALL NOT BE USED OTHERWISE WITHOUT WRITTEN PERMISSION OF SAB ENGINEERING INC.

ADDRESS

FENELON TOWNSHIP PUBLIC SCHOOL

HVAC SYSTEMS UPGRADE

50 Cameron Rd. R.R.#1, Cameron, ON. K0M 1G0

DRAWING TITLE

CONTROL DIAGRAMS

DATE	SCALE
MAY/2021	N.T.S.
DRAWN BY: P.C.	DWG. No.: M-5
JOB No.: 2021–48	

ELECTRICAL GENERAL NOTES

GENERAL

EXAMINE ARCHITECTURAL, STRUCTURAL AND MECHANICAL CONDITIONS AND AVAILABLE DRAWINGS BEFORE PROCEEDING WITH THE WORK. ANY DISCREPANCIES BETWEEN DRAWINGS AND/OR SPECIFICATIONS MUST BE REFERRED TO THE PRIME CONSULTANT BEFORE ANY AFFECTED WORK IS COMMENCED.

ALL MATERIALS USED THROUGHOUT SHALL BE NEW, OF BEST QUALITY CSA APPROVED AND OF ONE MANUFACTURER.

OBTAIN AND PAY FOR APPROVALS AND PERMITS FROM AUTHORITIES HAVING JURISDICTION.

PROVIDE ALL CONDUIT, WIRING, BOXES, SWITCHES, OUTLETS, DEVICES, ETC, AS REQUIRED. MAKE UP TO THE LAST 3 FT OF FINAL CONNECTIONS TO ROTATING EQUIPMENT WITH LIQUID TIGHT FLEXIBLE CONDUIT.

CONTRACTORS SHALL NOTE THAT THIS CONTRACT IS AN ALTERATION TO AN EXISTING BUILDING AND SHALL THOROUGHLY INVESTIGATE THE EXISTING ELECTRICAL INSTALLATION AND CONDITIONS. DEMOLITION. REMOVE POWER CONNECTIONS AS SHOWN ON DRAWINGS C/W CONDUIT AND WIRING TO SOURCE.

CONDUCTORS AND CABLES

CONDUCTORS AND CABLES SHALL BE IN ACCORDANCE WITH NEMA WC-70 AND AS SPECIFIED HEREIN.

CONDUCTORS SHALL BE ANNEALED COPPER, STRANDED FOR SIZES NO. 8 AWG AND LARGER, SOLID FOR SIZES NO. 10 AWG AND SMALLER. CONDUCTORS SHALL BE MINIMUM SIZE NO. 12 AWG, EXCEPT WHERE SMALLER SIZES ARE SPECIFICALLY SHOWN ON THE DRAWINGS. MINIMUM SIZE WIRING FOR DC WIRING SHALL BE #10 GAUGE.

ALL WIRING SHALL BE 600 VOLT TYPE RW90 AND RUN IN METALLIC CONDUIT EXCEPT WHERE ALLOWED IN FLEXIBLE LIQUID-TIGHT FLEXIBLE ENCLOSURE (SEE SECTION 15241). MAXIMUM VOLTAGE DROP SHALL NOT EXCEED 2%. PROVIDE GROUND WIRES WITH ALL FEEDERS AND BRANCH CIRCUITS IN ACCORDANCE WITH APPLICABLE CODES AND ONTARIO ELECTRICAL SAFETY CODE REQUIREMENTS. PROVIDE MAIN GROUND TO ESA APPROVAL.

INSULATION:

THHN-THWN SHALL BE IN ACCORDANCE WITH NEMA WC-70, UL 44, AND UL 83.

CONDUITS

ALL CONDUIT SHALL BE RIGID ALUMINUM (OUTDOORS) OR EMT THINWALL (INDOORS) WITH STEEL SET SCREW COUPLINGS AND CONNECTORS WITH INSULATED THROATS UNLESS OTHERWISE NOTED. RUN CONDUITS PARALLEL TO BUILDING LINES AND CONCENTRIC RIGHT ANGLE BENDS ONLY SHALL BE USED.

SEAL ALL PENETRATIONS THROUGH FLOOR SLABS WITH AN APPROVED NON-SHRINK, WATERPROOF AND FIREPROOF SEALANT.

NEW CONDUIT HANGERS SHALL BE SUPPORTED FROM BUILDING STRUCTURE AND INDEPENDENTLY FROM OTHER EXISTING ELEMENTS SUCH AS DUCTWORK, CONDUITS, PIPING ETC.

POWER DISTRIBUTION SYSTEM

THE POWER DISTRIBUTION SYSTEM SHALL BE MODIFIED AS SHOWN ON THE PLANS AND AS HEREINAFTER SPECIFIED. BREAKERS RATING SHALL MATCH EXISTING EQUIPMENT TO WHICH THEY ARE INSTALLED.

SPLICES AND JOINTS

IN ACCORDANCE WITH UL 486A, C, D, E, AND NEC.

CONNECTORS: SOLDERLESS, SCREW ON, REUSABLE PRESSURE CABLE TYPE, RATED 600 V, 220° F [105° C], WITH INTEGRAL INSULATION, APPROVED FOR COPPER CONDUCTORS. THE INTEGRAL INSULATOR SHALL HAVE A SKIRT TO COMPLETELY COVER THE STRIPPED WIRES. THE NUMBER, SIZE, AND COMBINATION OF CONDUCTORS, AS LISTED ON THE MANUFACTURER'S PACKAGING, SHALL BE STRICTLY FOLLOWED.

CONNECTORS SHALL BE INDENT, HEX SCREW, OR BOLT CLAMP TYPE OF HIGH CONDUCTIVITY AND CORROSION RESISTANT MATERIAL, LISTED FOR USE WITH COPPER AND ALUMINUM CONDUCTORS. FIELD-INSTALLED COMPRESSION CONNECTORS FOR CABLE SIZES 250 MCM AND LARGER SHALL HAVE NOT FEWER THAN TWO CLAMPING ELEMENTS OR COMPRESSION INDENTS PER WIRE.

INSULATE SPLICES AND JOINTS WITH MATERIALS APPROVED FOR THE PARTICULAR USE, LOCATION, VOLTAGE, AND TEMPERATURE. SPLICE AND JOINT INSULATION LEVEL SHALL BE NOT LESS THAN THE INSULATION LEVEL OF THE CONDUCTORS BEING JOINED. PLASTIC ELECTRICAL INSULATING TAPE: PER ASTM D2304, FLAME-RETARDANT, COLD AND WEATHER RESISTANT.

LOW VOLTAGE FUSED AND NON-FUSED DISCONNECT SWITCHES RATED 600 AMPERES AND LESS

IN ACCORDANCE WITH UL 98, NEMA KS1, AND NEC. SHALL HAVE NEMA CLASSIFICATION GENERAL DUTY (GD) FOR 240 V SWITCHES AND NEMA CLASSIFICATION HEAVY DUTY (HD) FOR 600 V SWITCHES. SHALL BE HP RATED.

LOCATE IN THE PROXIMITY OF THE EQUIPMENT SERVED, IN ACCORDANCE WITH NEC REQUIREMENTS.

SHALL HAVE THE FOLLOWING FEATURES:

- SWITCH MECHANISM SHALL BE THE QUICK-MAKE, QUICK-BREAK TYPE.
- COPPER BLADES, VISIBLE IN THE OFF POSITION.
- AN ARC CHUTE FOR EACH POLE.
- EXTERNAL OPERATING HANDLE SHALL INDICATE ON AND OFF POSITION AND HAVE LOCK OPEN PADLOCKING PROVISIONS.
- MECHANICAL INTERLOCK SHALL PERMIT OPENING OF THE DOOR ONLY WHEN THE SWITCH IS IN THE OFF POSITION, DEFEATABLE TO PERMIT INSPECTION.
- FUSE HOLDERS FOR THE SIZES AND TYPES OF FUSES SPECIFIED (WHERE APPLICABLE).
- WHERE APPLICABLE, FUSIBLE DISCONNECT SWITCHES SHALL BE FURNISHED COMPLETE WITH FUSES. ARRANGE FUSES SUCH THAT RATING INFORMATION IS READABLE WITHOUT REMOVING THE FUSE.
- SOLID NEUTRAL FOR EACH SWITCH BEING INSTALLED IN A CIRCUIT WHICH INCLUDES A NEUTRAL CONDUCTOR.
- GROUND LUGS FOR EACH GROUND CONDUCTOR.

ENCLOSURES:

SHALL BE THE NEMA TYPES SHOWN ON THE DRAWINGS FOR THE SWITCHES. WHERE THE TYPES OF SWITCH ENCLOSURES ARE NOT SHOWN, THEY SHALL BE THE NEMA TYPES MOST SUITABLE FOR THE AMBIENT ENVIRONMENTAL CONDITIONS. UNLESS OTHERWISE INDICATED ON THE PLANS, ALL OUTDOOR SWITCHES SHALL BE NEMA 3R. SHALL BE FINISHED WITH MANUFACTURER'S STANDARD GRAY BAKED ENAMEL PAINT OVER PRE-TREATED STEEL (FOR THE TYPE OF ENCLOSURE REQUIRED).

SYMBOL LIST

	DEMOLITION
	DIRECT POWER OUTLET FOR USE AS NOTED INCLUDING FINAL CONNECTION.
	DISCONNECT SWITCH
	DISCONNECT SWITCH WITH OVER-CURRENT PROTECTION
	COMBINATON MAGNETIC MOTOR STARTER WITH DISCONNECT SWITCH
	MAGNETIC MOTOR STARTER
	COMBINATON MAGNETIC MOTOR STARTER WITH DISCONNECT SWITCH & OVERCURRENT PROTECTION
	SINGLE POLE TOGGLE SWITCHES WITH ONE GANG
	MUSHROOM STYLE PUSH BUTTON
VFD	VARIABLE FREQUENCY DRIVE
EX	DENOTES EXISTING TO REMAIN
R	DENOTES EXISTING TO BE REMOVED ENTIRELY U.N.O.
N	DENOTES NEW

GENERAL NOTES

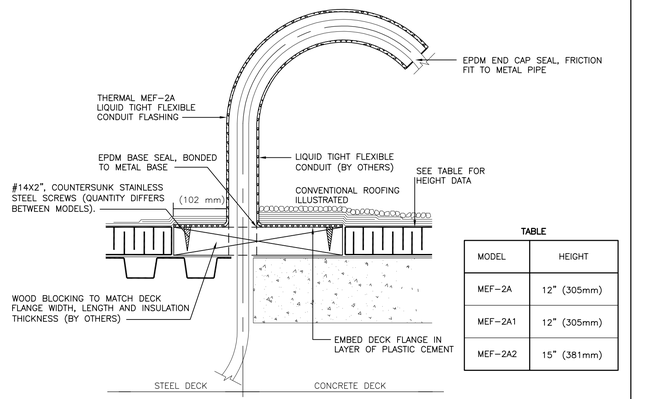
1. IT IS MANDATORY FOR THE ELECTRICAL CONTRACTOR TO VISIT SITE AND REVIEW EXISTING CONDITIONS AND DEMOLITION SCOPE OF WORK TO SUIT EXISTING ARCHITECTURAL AND STRUCTURAL CONDITIONS AND MECHANICAL DRAWINGS.
2. CAREFULLY EXAMINE OTHER EXISTING UTILITY LINES SUCH AS GAS, WATER ETC. PRIOR TO START THE ELECTRICAL CONSTRICTION WORKS AND COORDINATE WITH OTHER TRADES AND REPORT OF ANY DISCREPANCY PRIOR TO PROCEEDING.
3. REFER TO ELECTRICAL AND MECHANICAL LAYOUTS FOR EXACT LOCATION OF ALL EQUIPMENT.
4. LOCATIONS OF ALL NEW DISCONNECT SWITCHES, VFDS AND STARTERS SHALL BE CONFIRMED WITH DIVISION 15 PRIOR TO INSTALLATION.

MECHANICAL EQUIPMENT WIRING SCHEDULE

EQUIPMENT DESCRIPTION	POWER SOURCE	STARTER TYPE	MCA/FLA	VOLTS/PH./ FREQUENCY	BREAKER SIZE OR FUSE SIZE	FEEDER SIZE	REMARKS	CONNECTED TO FIRE ALARM	CONNECTED TO BAS
AHU-1	GROUND FLOOR MECH. ROOM SPLITTER #1	INTEGRAL	96/90	208/1/60	110A-2P	2xAWG#2+G-35mmC	PROVIDE NEW FUSED DISCONNECT AND CONNECT TO NEW 200A/208V/1PH SPLITTER. PROVIDE ALL WIRING BETWEEN THE SPLITTER, DISSCONNECT, WEATHERPROOF DISSCONNECT AND EQUIPMENT. ALL WIRING TO BE IN RIGID METAL CONDUIT. LAST 900 MM. MAY BE FLEXIBLE LIQUID TIGHT CONDUIT.	YES	YES
AHU-2	GROUND FLOOR MECH. ROOM SPLITTER #1	INTEGRAL	91/85	208/1/60	110A-2P	2xAWG#2/0+G-35mmC	PROVIDE NEW FUSED DISCONNECT AND CONNECT TO NEW 200A/208V/1PH SPLITTER. PROVIDE ALL WIRING BETWEEN THE SPLITTER, DISSCONNECT, WEATHERPROOF DISSCONNECT AND EQUIPMENT. ALL WIRING TO BE IN RIGID METAL CONDUIT. LAST 900 MM. MAY BE FLEXIBLE LIQUID TIGHT CONDUIT.	YES	YES
MUA-1	GROUND FLOOR MECH. ROOM MCC-QMB	INTEGRAL	43/39	208/1/60	60A-2P	2xAWG#8+G-27mmC	REMOVE EXISTING SPARE SLOT IN MCC-QMB AND PROVIDE NEW FUSE DISCONNECT. PROVIDE NEW WIRING FROM THE DISCONNECT TO WEATHERPROOF DISCONNECT TO UNIT. ALL WIRING TO BE IN RIGID METAL CONDUIT. LAST 900 MM. MAY BE FLEXIBLE LIQUID TIGHT CONDUIT.	YES	YES
MUA-2	GROUND FLOOR MECH. ROOM MCC-QMB	INTEGRAL	43/39	208/1/60	60A-2P	2xAWG#8+G-27mmC	REMOVE EXISTING NOT USED DISCONNECT IN MCC-QMB AND PROVIDE NEW FUSE DISCONNECT. PROVIDE NEW WIRING FROM THE DISCONNECT TO WEATHERPROOF DISCONNECT TO UNIT. ALL WIRING TO BE IN RIGID METAL CONDUIT. LAST 900 MM. MAY BE FLEXIBLE LIQUID TIGHT CONDUIT.	YES	YES
NEW SPLITTER #1	GROUND FLOOR MECH. ROOM MCC-QMB	–	–	208/1/60	200A-2P	2xAWG#3/0+G-53mmC	PROVIDE NEW FUSED DISCONNECT IN MCC QMB AND CONNECT TO THE NEW SPLITTER #1. PROVIDE ALL WIRING BETWEEN THE MCC AND THE SPLITTER. ALL WIRING TO BE IN RIGID METAL CONDUIT. LAST 900 MM. MAY BE FLEXIBLE LIQUID TIGHT CONDUIT.	NO	NO
ROOFTOP RECIPTCLE (X4)	LPB1	–	–	115/1/60	20A-1P	1xAWG#12+G-21mmC	PROVIDE POWER FROM EXISTING BREAKER PANEL 'LPB1' THROUGH NEW 20A-1P BREAKER. PROVIDE NEW WIRING BETWEEN PANEL 'LPB1', AND ROOFTOP RECIPTCLES. ALL WIRING TO BE IN RIGID METAL CONDUIT.	NO	NO
ROOFTOP RECIPTCLE (X4)	LPB1	MAGNETIC	1.7FLA	115/1/60	15A-1P	1xAWG#12+G-21mmC	PROVIDE POWER FROM EXISTING BREAKER PANEL 'LPB1' THROUGH NEW 15A-1P BREAKER. PROVIDE NEW STARTER LOCATED IN THE MECHANICAL ROOM. PROVIDE NEW WIRING BETWEEN PANEL 'LPB1', STARTER AND EXHAUST. PROVIDE LOCAL DISCONNECT. ALL WIRING TO BE IN RIGID METAL CONDUIT. PROVIDE NEW TIMMER FOR THE OPERATION OF THE FAN.	NO	NO

NOTES:

1. PROVIDE CONNECTION TO ALL EQUIPMENT TO ENABLE FULL OPERATION. FOR LOCATION OF MECHANICAL EQUIPMENT REFER TO MECHANICAL LAYOUTS.
2. PROVIDE SEPARATE BREAKERS FOR INDIVIDUAL MECHANICAL EQUIPMENT. SIZE TO MATCH EQUIPMENT SCHEDULE DATA.
3. ALL MAGNETIC STARTER SHALL BE C/W OVERLOCAD PROTECTION, H/O/A SWITCH AND GREEN-RUN AND RED-STOP PILOT LAMPS.
4. ALL NEW UNITS TO BE CONNECTED TO THE FIRE ALARM SYSTEM AND SHUT DOWN IN CASE OF A FIRE. ALL SMOKE SENSORS, NEW OR RELOCATED, ARE TO BE CONNECTED TO THE FIRE ALARM SYSTEM.



TABLE

MODEL	HEIGHT
MEF-2A	12" (305mm)
MEF-2A1	12" (305mm)
MEF-2A2	15" (381mm)

MEF-2A/MEF-2A1/MEF-2A2 LIQUID TIGHT FLEXIBLE CONDUIT FLASHING

No.	DATE	DESCRIPTION
1	MAY, 2021	ISSUED FOR TENDER

ISSUED

SEAL

LICENSED PROFESSIONAL ENGINEER
APRIL, 2021
G. STRASHUN
PROVINCE OF ONTARIO

TRUE NORTH | BLDG. NORTH

trillium Lakelands DISTRICT SCHOOL BOARD

GENERAL NOTES :

CONTRACTORS SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS AND CONDITIONS ON THE JOB AND THE ENGINEER SHALL BE INFORMED OF ANY VARIATIONS FROM THE DIMENSIONS AND CONDITIONS SHOWN ON THE DRAWINGS. DO NOT SCALE DRAWINGS. SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE PROCEEDING WITH FABRICATION. THIS DRAWING IS THE PROPERTY OF SAB ENGINEERING INC. AND SHALL NOT BE REPRODUCED WITHOUT THEIR PERMISSION AND UNLESS THE REPRODUCTION CARRIES THEIR NAME. ALL INFORMATION SHOWN ON THIS DRAWING IS FOR USE ON THE SPECIFIED PROJECT ONLY AND SHALL NOT BE USED OTHERWISE WITHOUT WRITTEN PERMISSION OF SAB ENGINEERING INC.

ADDRESS

FENELON TOWNSHIP PUBLIC SCHOOL

HVAC SYSTEMS UPGRADE

50 Cameron Rd. R.R.#1, Cameron, ON. K0M 1G0

DRAWING TITLE

EQUIPMENT WIRING SCHEDULE, LEGEND & NOTES – ELECTRICAL

DATE	SCALE
MAY/2021	N.T.S.
DRAWN BY: P.C.	DWG. No.: E-1
JOB No.: 2021-48	

NOTES:

REMOVE EXISTING EXHAUST FANS. DISCONNECT ROM POWER AND CONTROLS. REMOVE THE WIRING AND CONDUITS BACK TO THE SOURCE AND MAKE SAFE.

PROVIDE NEW WIRING IN CONDUIT FROM THE BOILER ROOM UP TO THE ROOFTOP UNITS.

PROVIDE NEW WEATHER PROOF DISCONNECTS.

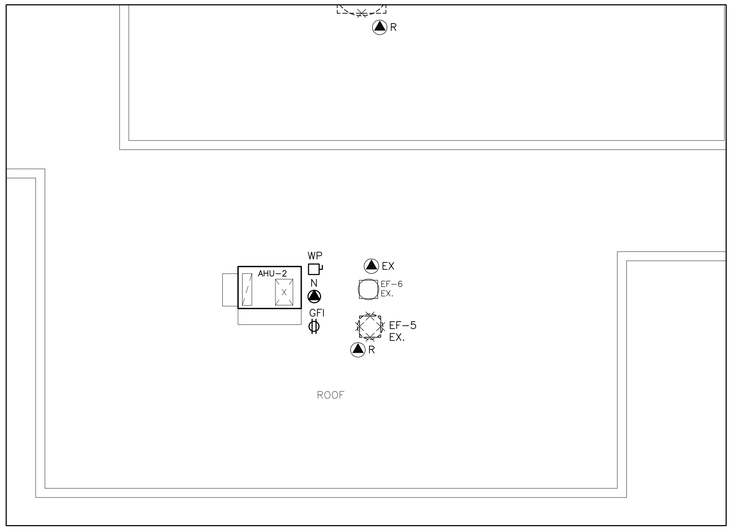
PROVIDE 20A, 1PH/120V SERVICE RECEPTACLE NEXT TO EACH ROOFTOP UNIT. PROVIDE POWER FROM THE NEAREST AVAILABLE SOURCE.

PROVIDE ROOF SUPPORT FOR ALL THE CONDUITS. REFER TO DETAIL.

PROVIDE ROOF CONES FOR ELECTRICAL CONDUITS AS REQUIRED BY THE UNIT MANUFACTURER. REFER TO DETAIL ON E-1.

RELOCATE THE EXISTING GAS LINE CONNECTION TO THE LAST BOILER IF REQUIRED TO PROVIDE SPACE FOR THE NEW SPLITTER.

TEMPORARY REMOVE LIGHTS AND OTHER DEVICES INSTALLED IN THE EXISTING CEILING TO ALLOW FOR THE REMOVAL OF THE T-BAR AND TILES TO INSTALL THE NEW DUCTWORK. REINSTATE ALL DEVICES AT THE COMPLETION OF THE WORK.



ROOF– LIBRARY – EXISTING, DEMOLITION & NEW WORK – ELECTRICAL
SCALE: 1:100



BOILER ROOM – EXISTING & NEW WORK – ELECTRICAL
SCALE: 1:100

EXISTING / DEMOLITION WORK

EXISTING QMB
400A, 120/208V 1ø 3 WIRES

	SPARE
	LP A 200A EX.
	PP-1 200A EX.
	LP B 200A EX.
	SPARE — LP C 100A
MAIN 400A	NOT USED 175A — EXIT LIGHTS 30A
	EXIST. LOAD 30A — FIRE EX.
	LP B 100A — LP A 100A

NEW WORK

EXISTING QMB
400A, 120/208V 1ø 3 WIRES

	200A
	LP A 200A EX.
	PP-1 200A EX.
	LP B 200A EX.
MAIN 400A	MAU-2 60A — LP C 100A
	MAU-1 60A — EXIT LIGHTS 30A
	EXIST. LOAD 30A — FIRE EX.
	LP B 100A — LP A 100A

2xAWG#3/0+G-53mmC — NEW 200A, 208V, 1PH, 3 WIRE SPLITTER 1

AHU-1: WP, 2xAWG1+G 53mmC, 110A-2P, N
AHU-2: WP, 2xAWG1+G 53mmC, 110A-2P, N

No.	DATE	DESCRIPTION
1	MAY, 2021	ISSUED FOR TENDER

ISSUED

SEAL

LICENSED PROFESSIONAL ENGINEER
APRIL 2021
G. STRASHUN
PROVINCE OF ONTARIO

TRUE NORTH

BLDG. NORTH

Trillium Lakelands DISTRICT SCHOOL BOARD

GENERAL NOTES :

CONTRACTORS SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS AND CONDITIONS ON THE JOB AND THE ENGINEER SHALL BE INFORMED OF ANY VARIATIONS FROM THE DIMENSIONS AND CONDITIONS SHOWN ON THE DRAWINGS. DO NOT SCALE DRAWINGS. SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE PROCEEDING WITH FABRICATION. THIS DRAWING IS THE PROPERTY OF SAB ENGINEERING INC. AND SHALL NOT BE REPRODUCED WITHOUT THEIR PERMISSION AND UNLESS THE REPRODUCTION CARRIES THEIR NAME. ALL INFORMATION SHOWN ON THIS DRAWING IS FOR USE ON THE SPECIFIED PROJECT ONLY AND SHALL NOT BE USED OTHERWISE WITHOUT WRITTEN PERMISSION OF SAB ENGINEERING INC.

ADDRESS

FENELON TOWNSHIP PUBLIC SCHOOL

HVAC SYSTEMS UPGRADE

50 Cameron Rd, R.R.#1, Cameron, ON. K0M 1G0

DRAWING TITLE

GROUND FLOOR MECH. ROOM & ROOF – EXISTING, DEMOLITION & NEW WORK – ELECTRICAL

DATE	SCALE
MAY/2021	1:100
DRAWN BY: P.C.	DWG. No.: E-2
JOB No.: 2021–48	