

KEY PLAN

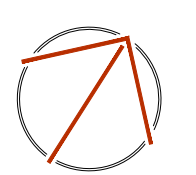


Waterloo Catholic District School Board
Quality, Inclusive, Faith Based Education

REVISIONS

NO.	ISSUED FOR	DATE
00	75% REVIEW	26.01.23
01	90% REVIEW	26.02.04
02	TENDER	26.03.09

NORTH



DESIGN	TW	DRAWN	TW
CHECKED	GM	REVIEWED	GM

PROJECT

ST. JOSEPH CES RENOVATIONS

ADDRESS

980 WESTMINSTER DR. S. CAMBRIDGE

PROJECT NO.

CE-6383

DRAWING TITLE

LEGENDS, KEY PLAN SCHEDULES, AND NOTES - MECHANICAL

DRAWING NUMBER

M1 OF 2

GENERAL NOTES: (APPLICABLE TO ALL DRAWINGS)

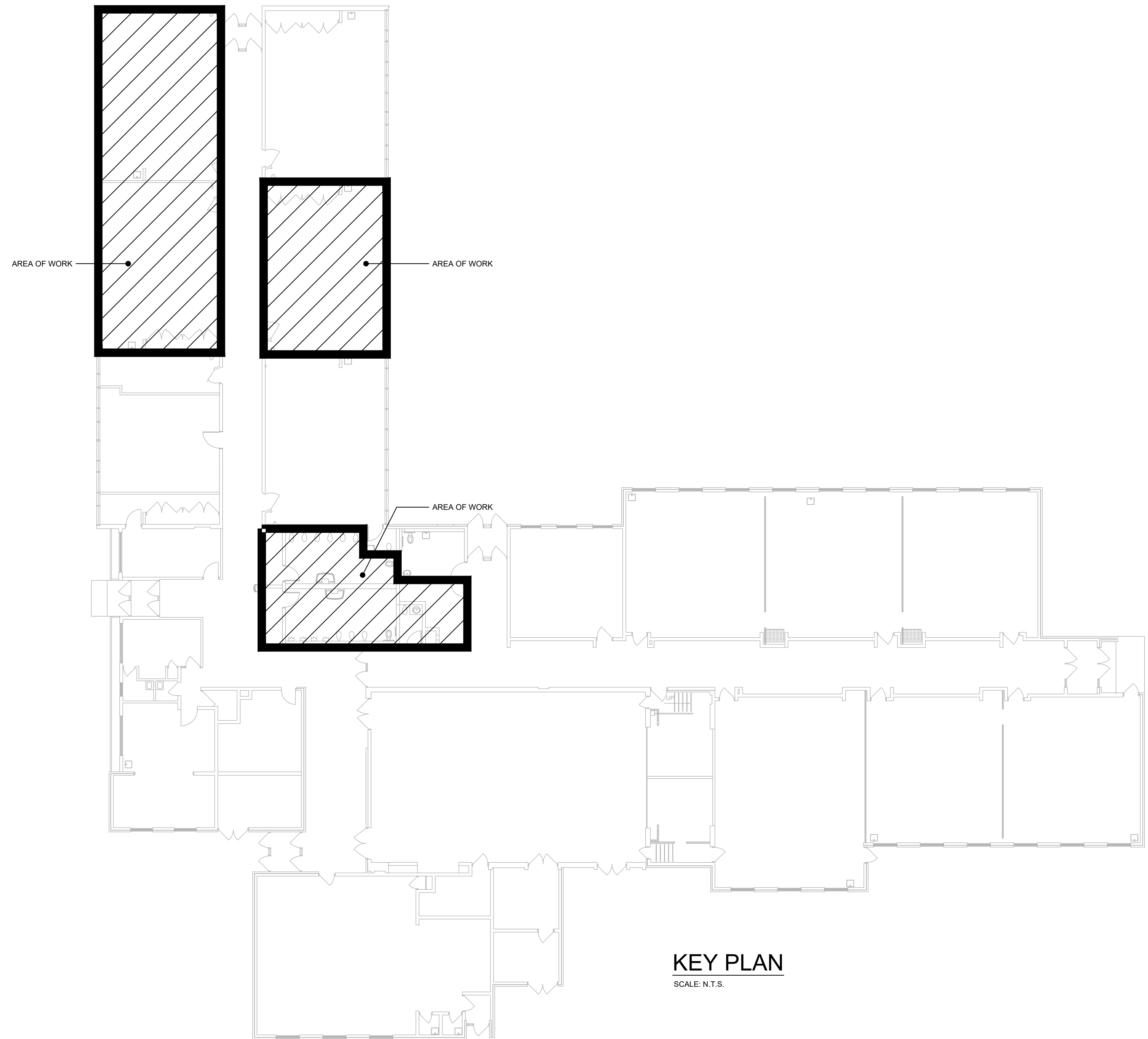
- THESE DRAWINGS ARE AN INTEGRAL PART OF THE SPECIFICATIONS WHICH ACCOMPANY THEM.
- ALL MATERIALS AND WORKMANSHIP SHALL BE NEW UNLESS NOTED OTHERWISE, FREE OF DEFECTS, AND COMPLY WITH ALL APPLICABLE STANDARDS.
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE
- INSTALL DUCTWORK TIGHT TO UNDERSIDE OF STRUCTURE UNLESS NOTED OTHERWISE.
- DO NOT SCALE DRAWINGS. OBTAIN ALL DIMENSIONS FROM EXISTING ARCHITECTURAL PLANS, SITE INSPECTIONS, AND MANUFACTURER'S SHOP DRAWINGS.
- REFER TO ARCHITECTURAL DRAWINGS FOR LOCATION OF FIRE RATED ASSEMBLIES.
- ALL MATERIALS WITHIN RETURN AIR PLENUMS SHALL HAVE A FLAME-SPREAD RATING NOT MORE THAN 25 AND A SMOKE DEVELOPED CLASSIFICATION NOT MORE THAN 50.
- OPENINGS IN EXTERIOR WALLS AND ROOF ARE TO BE PROPERLY FLASHED AND MADE WEATHERPROOF.
- ALL ROOF FLASHING FOR CURBS & PENETRATIONS TO COMPLY WITH ROOF WARRANTOR'S REQUIREMENTS.
- ALL NECESSARY CUTTING / PATCHING FOR MECHANICAL WORK SHALL BE PROVIDED BY APPROPRIATE TRADE(S) AT CONTRACTOR'S EXPENSE UNLESS NOTED OTHERWISE.
- MAKE GOOD ALL BUILDING COMPONENTS DAMAGED BY WORK OF THIS TRADE TO THE CONSULTANT'S SATISFACTION.
- PROVIDE ALL SLEEVES, INSERTS AND HANGERS REQUIRED FOR THE WORK. PATCH ALL OPENINGS AROUND INSTALLATIONS OF THIS DIVISION PIERCING FIRE OR SMOKE SEPARATIONS WITH AN APPROVED WATERTIGHT SMOKE AND FIRE STOP SEALANT.
- INSTALL ALL EQUIPMENT & ASSOCIATED DUCTWORK APPURTENANCES TO PROVIDE MAINTENANCE ACCESS. ALLOW FOR ALL ACCESS DOORS REQUIRED FOR EQUIPMENT INSTALLATIONS & SERVICE. ENSURE PROPER ACCESS DOOR SIZE, TYPE AND FIRE RATING.
- COORDINATE ALL WORK WITH OTHER TRADES AND SUPPLIERS/MANUFACTURERS TO AVOID INTERFERENCES AND CONFLICTS BETWEEN SERVICES. PLAN WORK WELL IN ADVANCE TO ELIMINATE INSTALLATION AND COORDINATE DIFFICULTIES. COOPERATE WITH OTHER TRADES ON SITE TO RESOLVE INTERFERENCES TO SATISFACTORILY COMPLETE THE PROJECT.
- DIFFUSERS / GRILLES IN VERTICAL BULKHEAD FACES TO BE CENTERED VERTICALLY UNLESS NOTED OTHERWISE.
- DEBRIS WILL BE KEPT TO A MINIMUM. ON COMPLETION OF CONSTRUCTION AND PRIOR TO THE FINAL INSPECTION AND ACCEPTANCE BY THE OWNER, SITE SHALL BE CLEANED AND ALL SCRAP MATERIALS RESULTING FROM THE WORK SHALL BE REMOVED.
- PRIOR TO THE FINAL INSPECTION, ALL EQUIPMENT SHALL BE CLEANED. ALL CONSTRUCTION DUST AND DIRT SHALL BE REMOVED FROM INSTALLED EQUIPMENT AT THE END OF THE JOB.
- EXISTING INSTALLATIONS SHOWN FOR GENERAL REFERENCE ONLY. ATTEND SITE TO ASSESS WORK PRIOR TO BID SUBMISSION. INCLUDE ALL COSTS TO MODIFY AND / OR EXTEND NEW WORK AS REQUIRED TO MEET DESIGN INTENT. VERIFY ALL EXISTING DUCT / PIPE SIZES & CLEARANCES ON SITE.
- ALL EXISTING MECHANICAL EQUIPMENT TO REMAIN UNLESS NOTED OTHERWISE
- OPERATION OF EXISTING MECHANICAL EQUIPMENT TO REMAIN SHALL BE VERIFIED. DEFICIENCIES SHALL BE REPORTED TO CONSULTANT.
- SCHEDULE AND PHASE WORK TO REDUCE INTERFERENCE AND DOWNTIME OF EXISTING SYSTEMS. NOTIFY OWNER'S REPRESENTATIVE OF ALL DOWNTIME PRIOR TO PROCEEDING WITH WORK.
- REMOVE EXISTING CEILING TILES AS REQUIRED TO PERFORM WORK. SAFELY STORE TILES FOR REINSTALLATION AFTER WORK & INSPECTIONS ARE COMPLETE. EXISTING DAMAGED TILES MUST BE IDENTIFIED & REPORTED TO OWNER'S REPRESENTATIVE BEFORE REMOVAL. REPLACE ANY DAMAGED TILES TO MATCH EXISTING.
- MEASURE & DOCUMENT EXISTING AIRFLOWS AT GRILLES / REGISTERS / DIFFUSERS TO BE REBALANCED. FINAL BALANCING REPORT MUST INCLUDE AS-FOUND AND FINAL AIRFLOW MEASUREMENTS.
- WHERE REPLACEMENT EQUIPMENT EXPOSES PREVIOUSLY UNFINISHED SURFACES, FINISH TO MATCH ADJACENT ASSEMBLIES.

GENERAL DEMOLITION NOTES: (APPLICABLE TO ALL DRAWINGS)

- ALL EXISTING EQUIPMENT TO REMAIN UNLESS IDENTIFIED OTHERWISE ON THE DRAWINGS, GENERAL NOTES OR SPECIFICATIONS.
- EXTENTS OF DEMOLITION SHOWN ARE APPROXIMATE AND THIS TRADE IS RESPONSIBLE FOR ALL DEMOLITION REQUIRED TO MEET DESIGN INTENT.
- REMOVE ALL UNUSED, ABANDONED OR REDUNDANT PIPING, HANGERS, & ACCESSORIES BACK TO SOURCE & CAP.
- COORDINATE WITH FACILITY MAINTENANCE DEPARTMENT FOR DISPOSAL OF REMOVED DEVICES. DISPOSE OF ALL UNWANTED DEVICES AS REQUIRED AS PER FACILITY STANDARDS.

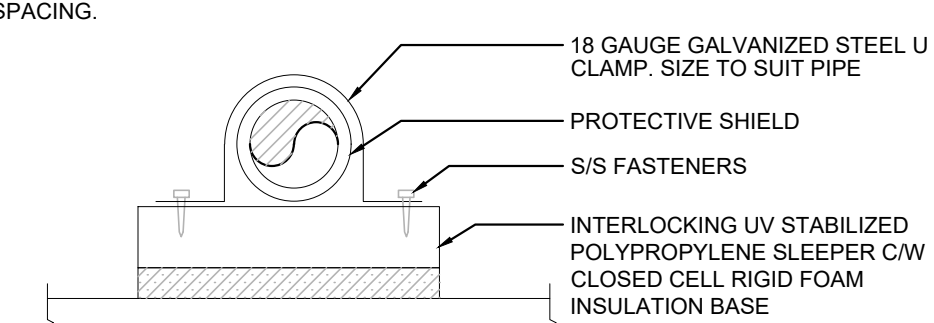
DUCTWORK LEGEND	
SYMBOL	DESCRIPTION
—	NEW ITEM
---	EXISTING ITEM TO REMAIN
-x-x-x-	EXISTING ITEM TO BE REMOVED
REL	EXISTING ITEM TO BE RELOCATED
ER	EXISTING ITEM IN RELOCATED POSITION
EX	EXISTING ITEM TO REMAIN
OED	OPEN ENDED DUCT
[Double Line]	DUCTWORK SHOWN DOUBLE LINE
FD	DYNAMIC FIRE DAMPER
J MD	MOTORIZED DAMPER
J	BALANCING DAMPER
J BDD	BACKDRAFT DAMPER
⊙ OC	OCCUPANCY SENSOR
⊙ CO2	CO2 SENSOR (-D DENOTES DUCT MOUNTED)
⊙ R	REVERSE ACTING THERMOSTAT
⊙ T	THERMOSTAT/TEMPERATURE SENSOR
⊕	NEW CONNECTION TO EXISTING
EA	EXHAUST AIR
OA	OUTSIDE AIR
RA	RETURN AIR
SA	SUPPLY AIR
BJ, TJ	BETWEEN JOIST, THROUGH JOIST
FA, FB	FROM ABOVE, FROM BELOW
108"	BOTTOM OF OBJECT HEIGHT AFF
□ TC	TIMELock
[Flex Line]	FLEXIBLE DUCT CONNECTION
[X]	DUCT DOWN - POSITIVE / NEGATIVE PRESSURE
[X]	DUCT UP - POSITIVE / NEGATIVE PRESSURE
[X]	SUPPLY AIR GRILLE
[X]	RETURN AIR GRILLE
[Grille]	SIDEWALL GRILLE C/W BALANCE DAMPER TYPICAL AT ALL SIDEWALL GRILLES
[Hatched]	INTERNALLY INSULATED DUCT
[Cross-hatched]	EXTERNALLY INSULATED DUCT
[Hexagon]	DRAWING NOTE TAG
[Circle]	DIFFUSER/GRILLE TAG
[Circle]	DIFFUSER/GRILLE SIZE (AND NECK SIZE WHERE APPLICABLE)
[Circle]	AIR VOLUME (CFM OR L/s AS INDICATED)
[Circle]	DIFFUSER/GRILLE DESIGNATION (REFER TO SCHEDULE FOR TYPE)
[Square]	EQUIPMENT TAG
[Square]	EQUIPMENT TYPE
[Square]	EQUIPMENT NUMBER (REFER TO SCHEDULES FOR INFO)

THIS IS A STANDARD LEGEND. ALL SYMBOLS MAY NOT NECESSARILY BE USED ON DRAWINGS.



KEY PLAN
SCALE: N.T.S.

- NOTES:
- PROVIDE EXTENSION KITS AS REQUIRED FOR ELEVATED PIPING
 - PROVIDE SUPPORT AT EVERY FITTING
 - PROVIDE ACCOMMODATION FOR PIPE MOVEMENT DUE TO EXPANSION/CONTRACTION AS REQUIRED FOR NATURAL GAS PIPING. COMPLY WITH CSA B149 FOR PIPE SUPPORT SPACINGS.



PIPE SUPPORT ON ROOF DETAIL
SCALE: N.T.S.

EXHAUST FAN SCHEDULE														
DWG REF.	MANUF.	SERVING	MODEL	TYPE	AIRFLOW [CFM] [L/s]	ESP [in. w.c.] [Pa]	FAN POWER [BHP]	MOTOR [HP]	RPM	SOUND [SONES]	ELECTRICAL [V / Ph / Hz]	CONTROL	ACCESSORIES	REMARKS
EF-101	COOK	EXISTING WASHROOMS	ACE-D 101C17D	ROOF MOUNTED DOWNBLAST	800 (378)	0.25 (62.2)	0.138	1/3	1725	10.8	120 / 1 / 60	TMR	5,8,10,13	CONNECT EXHAUST FAN AND MOTORIZED DAMPER TO BAS SYSTEM. INSTALL FAN ON EXISTING ROOF CURB. PROVIDE CURB ADAPTOR. COORDINATE ON SITE.

ALTERNATE MANUFACTURERS: AEROVENT, COOK, DELHI, FANTECH, GREENHECK, JENCO, PENN BARRY, TWIN CITY [, SOLAR & PALAU]

- ACCESSORIES:**
- HANGER RODS
 - HANGING VIBRATION ISOLATORS
 - BASE ISOLATOR KIT
 - FLEXIBLE CONNECTIONS - INLET AND/OR OUTLET
 - MOTORIZED BACKDRAFT DAMPER COORDINATE OPERATING VOLTAGE W/ DIV.16
 - ROOF CURB TO BE PROVIDED BY GENERAL CONTRACTOR AS DETAILED ON ARCHITECTURAL DWGS.

- 18" ROOF CURB BY FAN MANUFACTURER
- DISCONNECT SWITCH
- BELTS, DRIVES, AND PULLEYS
- BIRDSCREEN
- TRANSFORMER AND RELAY FOR 24V CONTROL
- WEATHER HOOD
- SPEED CONTROLLER
- WALL MOUNT CONTROL
- BELT DRIVE MOTOR COVERS

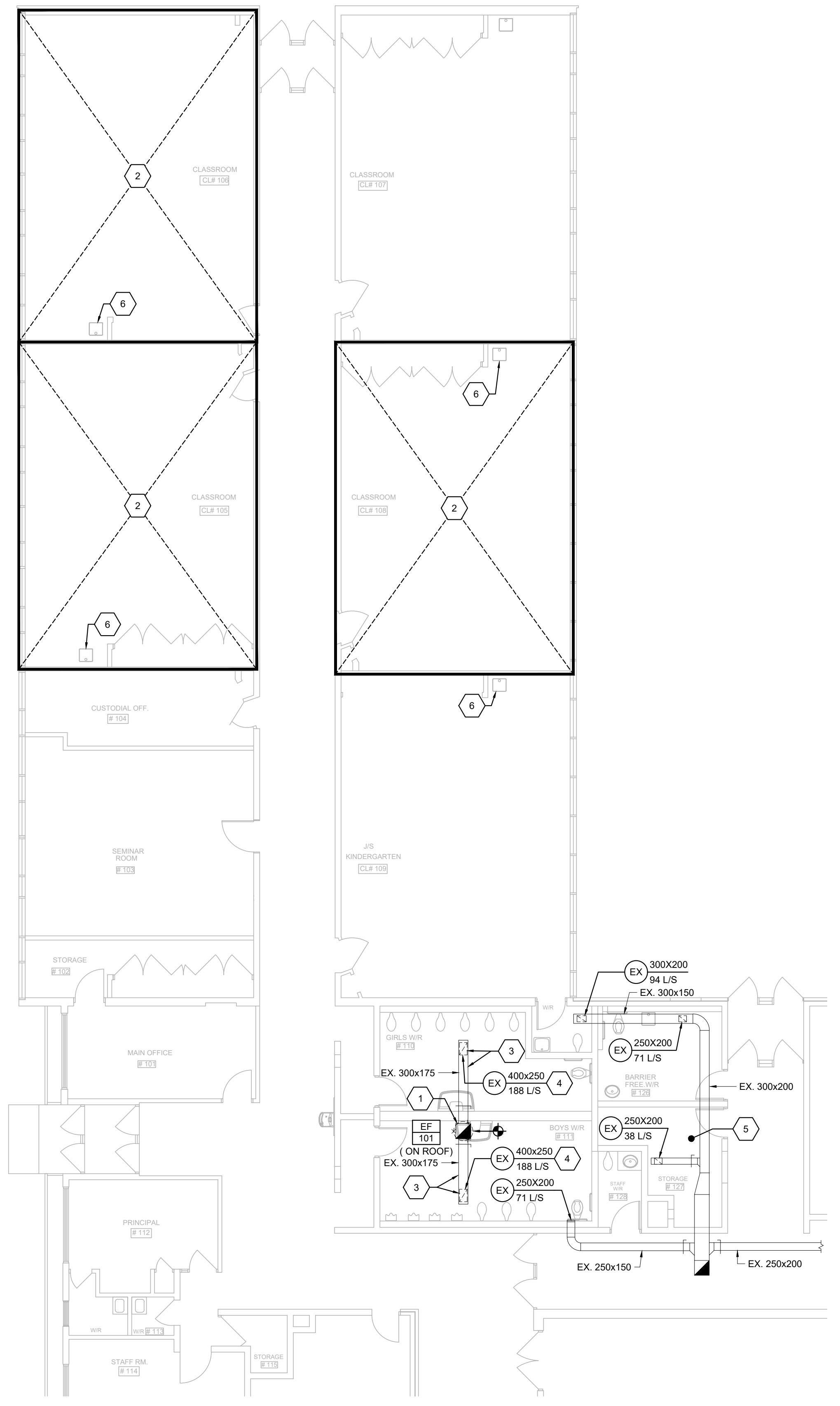
- CONTROL:**
- ENERGIZE WITH ROOM LIGHTING
 - TIME CLOCK
 - MANUAL SWITCH
 - BUILDING AUTOMATION SYSTEM
 - REVERSE ACTING THERMOSTAT, 120V
 - BY GAS DETECTION CONTROLLER
 - INTERLOCKED WITH REFERENCED EQMT
 - OTHER. SEE REMARKS

1. MECHANICAL GENERAL REQUIREMENTS:

- 1.1. GENERAL:**
- 1.1.1. MAKE SITE VISIT(S) AS NECESSARY BEFORE BID CLOSING TO ESTABLISH AND VERIFY ALL EXISTING CONDITIONS. MAKE ALLOWANCE FOR ANY NEW OR EXISTING SERVICE AND EQUIPMENT RELOCATIONS NECESSARY TO COMPLETE THE WORK AND INCLUDE IN THE BID PRICE. EXTRAS WILL NOT BE ALLOWED FOR FAILURE TO PROPERLY EVALUATE EXISTING CONDITIONS.
- 1.1.2. THE DRAWINGS SHOW THE GENERAL INTENT OF THE WORK, NOT THE DETAILS OF INSTALLATION. CO-ORDINATE THE ROUTING AND INSTALLATION OF ALL MECHANICAL SERVICES WITH ALL EXISTING CONDITIONS, STRUCTURE AND THE WORK OF ALL OTHER TRADES. PROVIDE INSTALLATION DRAWINGS AS REQUIRED.
- 1.1.3. DO NOT SCALE MECHANICAL DRAWINGS. TAKE FIELD DIMENSIONS PRIOR TO ANY INSTALLATION.
- 1.2. **DESCRIPTION:** PROVIDE WORK IN ACCORDANCE WITH FULL INTENT AND MEANING OF DRAWINGS AND SPECIFICATIONS. THE WORD "PROVIDE" WHERE USED IN THE CONTRACT DOCUMENTS, IS TO BE INTERPRETED AS "SUPPLY AND INSTALL" ALONG WITH ALL ASSOCIATED HARDWARE AND CONNECTIONS.
- 1.3. **WORKMANSHIP:** PROVIDE ALL NEW MATERIALS AND EQUIPMENT WITH THE APPROPRIATE LISTING (I.E. CSA ULC, CETL, ETC.) ALL WORKMANSHIP BY THIS TRADE SHALL BE FIRST CLASS, CONFORMING TO INDUSTRY STANDARD PRACTICES FOR SAFETY, ACCESSIBILITY, DURABILITY AND NEATNESS FOR ACCEPTANCE BY THE OWNER'S REPRESENTATIVES.
- 1.4. **SLEEVES, HANGERS, INSERTS:** PROVIDE ALL SLEEVES, INSERTS AND HANGERS REQUIRED FOR THE MECHANICAL WORK. PATCH ALL OPENINGS AROUND INSTALLATIONS OF THIS DIVISION PIERCING FIRE OR SMOKE SEPARATIONS WITH AN APPROVED WATERTIGHT SMOKE AND FIRE STOP SEALANT.
- 1.5. **FLASHING:**
- 1.5.1. FOR LOCATIONS WITH ROOF PENETRATIONS SERVING A PIECE OF EQUIPMENT, SUCH AS FOR ROOF MOUNTS PLUS, INC. ALUMI-FLASH SYSTEM CONSISTING OF 330 MM (13") HIGH, ONE PIECE SPUN ALUMINUM BASE WITH DECK FLANGE AND EPDM RUBBER CAP. USE CAPS SUITABLE FOR REQUIRED NUMBER AND DIAMETER OF SERVICE PENETRATIONS. FLASHING IS FOR MECHANICAL AND ELECTRICAL TRADES USE ONLY. COORDINATE WITH ELECTRICAL TRADE TO MINIMIZE THE NUMBER OF FLASHINGS REQUIRED.
- 1.6. **INTERPRETATION:** DIVISION OF THE WORK AMONG SUPPLIERS OR VENDORS AND SUBCONTRACTORS IS SOLELY THE CONTRACTOR'S RESPONSIBILITY. NEITHER THE OWNER NOR CONSULTANT ASSUMES ANY RESPONSIBILITY TO ACT AS AN ARBITER TO ESTABLISH SUBCONTRACT TERMS BETWEEN SECTORS OR DISCIPLINES OF WORK.
- 1.7. **COORDINATION BETWEEN TRADES:** CO-ORDINATE THE WORK OF THIS TRADE WITH ALL OTHER TRADES ON THE JOB SO THAT THE WORK MAY PROGRESS WITHOUT ANY DELAY. SCHEDULE AND PHASE DEMOLITION AND NEW WORK TO REDUCE INTERFERENCE AND DOWNTIME OF EXISTING SYSTEMS. NOTIFY OWNER'S REPRESENTATIVE OF ALL DOWNTIME PRIOR TO PROCEEDING WITH WORK.
- 1.8. **DISCREPANCY:** IF A DISCREPANCY IS FOUND IN THE SPECIFICATION OR ON THE DRAWINGS, REQUEST CLARIFICATION PRIOR TO THE END OF THE QUESTION PERIOD SO THAT CLARIFICATION CAN BE PROVIDED IN WRITING.
- 1.9. **REGULATORY REQUIREMENTS:** CONFORM TO GOVERNING MUNICIPAL AND PROVINCIAL CODES, RULES AND REGULATIONS AND/OR AUTHORITIES HAVING JURISDICTION.
- 1.10. **CODES AND STANDARDS:**
- 1.10.1. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE ONTARIO BUILDING CODE, THE ONTARIO FIRE CODE AND ANY OTHER LOCAL REGULATIONS HAVING JURISDICTION OVER THE WORK OF THIS TRADE.
- 1.10.2. WHERE A CODE OR STANDARD IS REFERENCED, THE LATEST VERSION OF THE CODE OR STANDARD REFERENCED IN THE APPLICABLE BUILDING CODE IS TO BE APPLIED.
- 1.11. **SAFETY:** COMPLY WITH ALL PROVINCIAL/FEDERAL AND/OR LOCAL SAFETY REGULATIONS, INCLUDING THE OCCUPATIONAL HEALTH AND SAFETY ACT. IN ADDITION, COMPLY WITH ALL OF THE OWNER'S HEALTH AND SAFETY REQUIREMENTS.
- 1.12. **PERMITS AND FEES:** OBTAIN ALL PERMITS REQUIRED FOR INSTALLATION OF MECHANICAL TRADES WORK. ARRANGE FOR INSPECTIONS TESTS THEREWITH AND PAY ALL COSTS FOR PERMITS, INSPECTIONS, AND ASSOCIATED FEES. THIS INCLUDES ANY TSSA INSPECTION AND/OR CERTIFICATION. OBTAIN PERMITS IMMEDIATELY AFTER NOTIFICATION OF AWARD OF CONTRACT.
- 1.13. **TAXES:** ENSURE THAT PROVINCIAL AND/OR FEDERAL TAXES ARE INCLUDED WHERE REQUIRED.
- 1.14. **WARRANTY:** PROVIDE A WRITTEN WARRANTY FOR ALL MATERIALS, EQUIPMENT AND LABOUR FOR A ONE-YEAR PERIOD TO BEGIN AT THE TIME OF SUBSTANTIAL COMPLETION. COMPLETE ALL WARRANTY REGISTRATION DOCUMENTATION ON BEHALF OF THE BUILDING OWNER. INCLUDE COPIES OF COMPLETED DOCUMENTATION IN OPERATIONS AND MAINTENANCE MANUALS.
- 1.15. **CERTIFICATION:** PROVIDE MANUFACTURER'S WRITTEN CERTIFICATION OF THE INSTALLATION AND OPERATION OF ALL SYSTEMS AND MAJOR EQUIPMENT.
- 1.16. **EXISTING SERVICE:**
- 1.16.1. DO NOT SHUT DOWN OR MAKE CONNECTIONS TO ANY EXISTING SERVICE WITHOUT WRITTEN PERMISSION OF THE OWNER.
- 1.16.2. BE RESPONSIBLE FOR DEMOLITION AND REMOVAL OF MECHANICAL EQUIPMENT AND SERVICES DESIGNATED FOR REMOVAL ON DRAWINGS.
- 1.17. **SITE PROTECTION AND CLEANLINESS:** PROTECT ALL WORK AND MATERIALS, BEFORE AND AFTER ERECTION, FROM WEATHER AND OTHER HAZARDS, AND KEEP IN A CLEAN AND ORDERLY MANNER. AVOID ACCUMULATION OF DEBRIS AS THE WORK PROGRESSES. ON COMPLETION OF THE CONSTRUCTION AND PRIOR TO THE FINAL INSPECTION AND ACCEPTANCE BY THE OWNER, CLEAN UP AND REMOVE FROM THE SITE ALL SCRAP MATERIALS RESULTING FROM THE WORK OF THIS TRADE.
- 1.18. **ADJUSTMENT AND OPERATION OF SYSTEMS:** WHEN WORK IS COMPLETE, ADJUST ALL EQUIPMENT ITEMS, OF VARIOUS SYSTEMS, FOR PROPER OPERATION WITHIN FRAMEWORK OF DESIGN INTENT, AND OPERATING CHARACTERISTICS AS PUBLISHED BY EQUIPMENT MANUFACTURER.
- 1.19. **MISCELLANEOUS STEEL:** SUPPLY AND INSTALL MISCELLANEOUS STRUCTURAL SUPPORTS, PLATFORMS, AND BRACES, AS REQUIRED TO HANG OR SUPPORT ALL EQUIPMENT, PIPING, DUCTWORK AND SIMILAR ITEMS.
- 1.20. **EQUIPMENT INSTALLATION:** INSTALL AND START UP ALL ITEMS OF EQUIPMENT, DEVICES AND SYSTEMS IN ACCORDANCE WITH MOST RECENT MANUFACTURER'S PUBLISHED GUIDELINES AND RECOMMENDATIONS. CONTRACTOR IS RESPONSIBLE FOR ASCERTAINING MANUFACTURERS INSTALLATION GUIDELINES AND RECOMMENDATIONS. TOUCH-UP ALL SHOP PAINTED EQUIPMENT DAMAGED IN TRANSIT OR DURING INSTALLATION TO MATCH ORIGINAL SHOP FINISH.
- 1.21. **CUTTING AND PATCHING:** PROVIDE ALL CUTTING AND PATCHING REQUIRED FOR THE WORK OF THIS TRADE. ALL CUTTING AND PATCHING SHALL BE PERFORMED BY TRADE SPECIALIZING IN THE MATERIAL TO BE PATCHED. INCLUDE ALL COSTS FOR CUTTING AND PATCHING RELATED TO THE WORK OF THIS TRADE IN THE BID PRICE. WIRS AND DUCTS ARE SHOWN PASSING THROUGH EXISTING WALLS, FLOORS, AND ROOF. CUT AND PATCH THE NECESSARY OPENINGS. SHOULD CUTTING, REPAIRING, AND PATCHING OF PREVIOUSLY FINISHED WORK, OF OTHER TRADES, BE REQUIRED TO ALLOW INSTALLATION OF MECHANICAL WORK, PAY ALL COSTS FOR TRADE SECTION CONCERNED TO PERFORM WORK.
- 1.22. **SPARE PARTS / TOOLS TO BE FURNISHED:**
- 1.22.1. ALL SPECIALTY TOOLS NECESSARY FOR EQUIPMENT INSTALLED IN THIS PROJECT.
- 1.23. **CHANGES IN THE WORK:** CHANGES TO THE CONTRACT REQUIRING ADDITIONS TO OR DELETIONS FROM THE WORK OF THIS DIVISION SHALL BE CARRIED OUT UPON WRITTEN REQUEST OF THE CONSULTANT. EXTRAS TO THE CONTRACT OR CREDITS SHALL BE SUBMITTED WITH A COMPLETE COST BREAKDOWN AS FOLLOWS:
- ITEMIZED MATERIAL LIST WITH QUANTITIES AND UNIT COSTS
 - ITEMIZED LABOUR COST BREAKDOWN
 - COPY OF QUOTATIONS FROM ALL SUPPLIERS FOR ALL EQUIPMENT
 - COPY OF QUOTATIONS FROM ALL SUBCONTRACTORS INCLUDING ALL OF THE REQUIREMENTS OF THIS SECTION
 - TOTAL MATERIAL COST
 - TOTAL HOURS
 - HOURLY RATE (REFER TO SUPPLEMENTARY CONDITIONS AND GENERAL CONTRACT)
 - TOTAL OVERHEAD AND PROFIT (REFER TO SUPPLEMENTARY CONDITIONS AND GENERAL CONTRACT)
- 1.24. **COMPLETION:** PRIOR TO THE FINAL INSPECTION, CLEAN ALL MECHANICAL EQUIPMENT. CLEAN ALL CONSTRUCTION DUST AND DIRT FROM INSTALLED EQUIPMENT AT THE END OF THE JOB. REPAIR ANY DAMAGE BY THE MECHANICAL TRADE TO EXISTING BUILDINGS OR EQUIPMENT, ETC TO THE CONSULTANTS SATISFACTION.
- 1.25. **SUBMITTALS:**
- 1.25.1. **SHOP DRAWINGS:**
- 1.25.1.1. SUBMIT SHOP DRAWINGS FOR ALL EQUIPMENT SUPPLIED BY MECHANICAL DIVISION. SUBMIT ELECTRONIC COPIES TO CONSULTANT FOR REVIEW.
- 1.25.1.2. SUBMIT UNITS OF MEASURE IN EITHER METRIC OR IMPERIAL THAT MATCH THOSE OF THE DRAWINGS.
- 1.25.1.3. PROVIDE TITLE SHEET INCLUDING PROJECT NAME, SHOP DRAWING NAME (INCLUDING SPECIFICATION CLAUSE REFERENCE).
- 1.25.1.4. EACH SHOP DRAWING MUST BEAR STAMP AND SIGNATURE OF RESPONSIBLE OFFICIAL IN CONTRACTOR'S AND SUBCONTRACTOR'S ORGANIZATION, FOR EACH SUBMISSION, AS EVIDENCE THAT DRAWING HAS BEEN CHECKED AGAINST REQUIREMENTS AS CALLED FOR IN SPECIFICATIONS AND DRAWINGS.
- 1.25.2. **OPERATION AND MAINTENANCE INSTRUCTION MANUALS:**
- 1.25.2.1. PROVIDE PDF COPIES OF COMPLETE OPERATION AND MAINTENANCE INSTRUCTIONS FOR EQUIPMENT FURNISHED UNDER THIS CONTRACT. MANUAL TO

- BE ORGANIZED WITH BOOKMARKS IN A FORMAT TO MATCH THE SPECIFICATION SECTIONS. ONCE MANUAL IS REVIEWED AND ACCEPTED, PROVIDE PDF VERSION ON ELECTRONIC MEDIA.
- 1.25.2.2. MANUALS SHALL INCLUDE THE FOLLOWING INFORMATION:
- CONTACT INFORMATION OF CONSULTANTS AND CONTRACTORS
 - COMPLETE SET OF FINAL PROJECT SHOP DRAWINGS
 - CONTROL SHOP DRAWINGS AND OPERATING SEQUENCE, INCLUDING WIRING OF COMPONENTS
 - OPERATING INSTRUCTIONS, INCLUDING START-UP AND SHUT-DOWN PROCEDURE
 - MAINTENANCE INSTRUCTIONS, INCLUDING PREVENTIVE MAINTENANCE INSTRUCTIONS FOR COMPONENTS OF EQUIPMENT
 - FINAL TESTING AND BALANCING REPORT
 - COPIES OF THE FINAL TSSA CERTIFICATES
 - MANUFACTURERS' WARRANTIES AND GUARANTEES
- 1.25.3. **AS-BUILT DRAWINGS:**
- 1.25.3.1. PRINT A FULL SCALE SET OF DRAWINGS FOR THE SITE THAT INCLUDE ALL ADDENDUM REVISIONS, MAINTAIN AN ACCURATE RECORD OF DEVIATIONS AND CHANGES FROM CONTRACT DRAWINGS WITH RED LINE MARKINGS ON SITE AS CONSTRUCTION PROGRESSES. TRANSFER AS-BUILT MARK-UPS TO DIGITAL DRAWING FORMAT AT THE COMPLETION OF THE PROJECT. THIS PROCESS SHOULD BE COMPLETED BEFORE TESTING, BALANCING AND/OR COMMISSIONING. SUBMIT TO THE CONSULTANT WITH THE O&M MANUALS AT COMPLETION OF PROJECT.
- 1.25.3.2. THE AS-BUILT DRAWINGS SHALL HAVE A VALUE OF \$5,000 UNLESS THE MECHANICAL CONTRACT VALUE IS LESS THAN \$100,000 WHICH SHALL HAVE A \$3,000 VALUE. ONCE AS-BUILT DRAWINGS HAVE BEEN COMPLETED, SUBMITTED AND REVIEWED, PAYMENT WILL BE RELEASED. THIS VALUE IS NOT INCLUDED IN THE AMOUNT REQUIRED BY THE CONSTRUCTION LIEN ACT.
- 1.26. **EQUIPMENT NAMEPLATES:** PROVIDE LAMINATED WHITE PHENOLIC PLASTIC NAMEPLATES WITH 10 MM HIGH BLACK LETTERS FOR EQUIPMENT INSTALLED UNDER THIS DIVISION. INCLUDE EQUIPMENT NUMBER AND NAME GENERALLY AS LISTED ON DRAWING SCHEDULES. SUBMIT LIST OF NAMEPLATES TO CONSULTANT FOR REVIEW PRIOR TO FABRICATION. IF THE OWNER HAS SPECIFIC STANDARDS, FOLLOW THESE STANDARDS.
- 1.27. **ACCESS DOORS:** MINIMUM 200 MM x 200 MM (8" x 8") IN SIZE AS REQUIRED IN WALLS AND CEILINGS FOR ACCESS TO ALL EQUIPMENT. VALVES OR APPURTENANCES. ACCESS DOORS SHALL BE COMPATIBLE WITH ADJACENT FINISHES AND WITH FIRE RATING EQUAL TO THE SURFACES TO WHICH INSTALLED WHERE APPLICABLE. WHERE ACCESS DOOR IS FIRE RATED, DOOR IS TO BE ULC LISTED. MINIMUM 18 GAUGE STEEL. ACCESS DOORS 450 MM X 450 MM (18"x18") OR LARGER SHALL BE HINGED. PROVIDE POSITIVE LATCHING SYSTEM.
- 1.28. **FIRESTOPPING AND SMOKE SEAL:**
- 1.28.1. PROVIDE ULC LISTED FIRESTOP SYSTEM TO SEAL AROUND ALL MECHANICAL SERVICES WHICH PENETRATE PART OF A BUILDING ASSEMBLY REQUIRED TO HAVE A FIRE RESISTANCE RATING.
- 1.29. **MATERIALS AND EQUIPMENT:**
- 1.29.1. **EQUALS AND ALTERNATES:**
- 1.29.1.1. USE MATERIALS AND EQUIPMENT AS SPECIFIED HEREIN, OR SPECIFIED EQUIVALENT. DESIGN OF MECHANICAL SYSTEMS HAS BEEN BASED ON FIRST LISTED SUPPLIER AND MODEL NUMBER/SIZE STATED IN EQUIPMENT SCHEDULES.
- 1.29.1.2. SOME ITEMS OF EQUIPMENT, ONE OR MORE ADDITIONAL NAMES OF ACCEPTABLE EQUAL MANUFACTURERS MAY BE LISTED. THE DESIGN, LAYOUT, SPACE ALLOCATION, CONNECTION DETAILS, ETC., BASED ON THE PRODUCTS NAMED FIRST IN THE DESCRIPTION AND/OR SCHEDULES. THE GENERAL APPROVAL INDICATED BY LISTING THE NAMES OF OTHER EQUAL MANUFACTURERS IS TO ESTABLISH THE QUALITY OF MANUFACTURE ONLY AND IS SUBJECT TO FINAL REVIEW OF SHOP DRAWINGS, PERFORMANCE DATA, TEST REPORTS BY CONSULTANT.
- 1.29.1.3. SUPPLIERS WISHING TO SUBMIT OTHER ITEMS OF EQUIPMENT FOR APPROVAL AS AN EQUAL TO THOSE SPECIFIED MUST APPLY TO THE CONSULTANT AT LEAST 10 CALENDAR DAYS BEFORE BID CLOSING DATE. REQUESTS MUST BE ACCOMPANIED BY COMPLETE DESCRIPTION AND TECHNICAL DATA ON THE ITEMS PROPOSED. DEVIATIONS FROM THE SPECIFICATIONS MUST BE STATED IN WRITING AT TIME OF APPLICATION FOR APPROVAL.
- 1.29.1.4. ITEMS OF EQUIPMENT BY MANUFACTURERS, NOT NAMED IN THE SPECIFICATIONS, MAY BE OFFERED AS ALTERNATIVES. PROPOSALS MUST BE ACCOMPANIED BY FULL DESCRIPTIVE AND TECHNICAL DATA, TOGETHER WITH THE STATEMENT OF AMOUNT OF ADDITION OR DEDUCTION FROM THE BASE BID.
- 1.29.1.5. AFTER EXECUTION OF THE CONTRACT, SUBSTITUTION OF EQUIPMENT WILL NOT BE CONSIDERED.
- 1.29.1.6. WHERE EQUIPMENT OTHER THAN THE EQUIPMENT USED AS A BASIS FOR DESIGN, LAYOUT AND SPACE ALLOCATION IS USED, PRODUCE AND SUBMIT REVISED LAYOUTS OF EQUIPMENT, DUCTS, ETC., IN THE AREAS AFFECTED. SUBMIT THESE DRAWINGS WITH THE SHOP DRAWINGS. FAILURE TO PRODUCE THESE DRAWINGS IS AN INDICATION BY THE CONTRACTOR THAT THEY ARE NOT REQUIRED AND THE ORIGINAL SPACE ALLOCATIONS ARE ADEQUATE FOR THE SUBSTITUTED EQUIPMENT.
- 1.30. **MECHANICAL PROJECT COMPLIANCE:**
- 1.30.1. THE FOLLOWING DOCUMENTS AND/OR CONFIRMATION IS REQUIRED TO ALLOW THE CONSULTANT TO ISSUE OUR LETTER OF GENERAL REVIEWS:
- AIR BALANCING REPORTS
2. **TESTING AND BALANCING:**
- 2.1. **AIR BALANCING:**
- 2.1.1. ASSUME RESPONSIBILITY FOR TESTING, BALANCING, AND PLACING ALL AIR HANDLING SYSTEMS IN OPERATION.
- 2.1.2. RETAIN INDEPENDENT BALANCING FIRM TO BALANCE AIR HANDLING SYSTEMS.
- 2.1.3. PROVIDE SHEAVES AND PULLEYS AND BELTS AS REQUIRED TO ACHIEVE AIR FLOWS INDICATED. CO-ORDINATE SUPPLY WITH EQUIPMENT MANUFACTURER.
- 2.1.4. ON COMPLETION OF TESTING AND BALANCING OF ALL SYSTEMS, SUBMIT TO CONSULTANT A PDF REPORT OF FINDINGS, INCLUDING COMPLETE DATA OF FAN PERFORMANCE, STATIC PRESSURES, AIR FLOW RATES, FINAL READINGS AT ALL INLETS, AND AMPERE READINGS OF ALL MOTORS. TAKE MOTOR TERMINALS WHEN EQUIPMENT IS OPERATING UNDER FULL LOAD CONDITIONS.
- 2.1.5. SUBMIT WITH EACH COPY OF REPORT, COMPLETE SETS OF DUCT LAYOUT PRINTS NEATLY MARKED IN RED INK, SHOWING ALL LOCATIONS AT WHICH TEST READINGS WERE TAKEN, AIR VOLUME, VELOCITY AND STATIC PRESSURE IN EACH EXHAUST DUCT, AND FINAL READING AT ALL INLETS. OBTAIN DUCT LAYOUT PRINTS FOR MARK-UP PURPOSES FROM CONSULTANT.
- 2.1.6. INSTALLATION TOLERANCES
- 2.1.6.1. AIR HANDLING SYSTEMS: ±5% OF DESIGN
- 2.1.6.2. AIR OUTLETS / INLETS: ±10% OF DESIGN
3. **MECHANICAL INSULATION:**
- 3.1. ALL PRODUCTS TO HAVE FLAME SPREAD RATING LESS THAN 25 AND SMOKE DEVELOPED CLASSIFICATION LESS THAN 50 IN COMPLIANCE WITH CANULC-S102.
- 3.2. PROVIDE A CONTINUOUS VAPOUR BARRIER ON ALL COLD SYSTEMS.
- 3.3. **DEFINITIONS:**
- INDIRECTLY CONDITIONED SPACE (IND COND SP.):** ENCLOSED SPACE THAT IS HEATED OR COOLED INDIRECTLY BY BEING CONNECTED TO ADJACENT SPACES INCLUDING RETURN AIR PLENUMS WITH OR WITHOUT EXPOSED ROOFS ABOVE
- UNCONDITIONED SPACE (UNCOND SP.):** AN ENCLOSED SPACE THAT IS NOT HEATED OR COOLED INCLUDING MECHANICAL CHASES / FURRED-IN SPACES.
- OUTSIDE:** EXPOSED TO OUTDOOR AMBIENT TEMPERATURES INCLUDING SOFFITS, PARKING GARAGES, UNHEATED ATTICS / PLENUMS ABOVE INSULATED CEILINGS, AND UNHEATED CRAWL SPACES.
- CONCEALED:** INSULATED MECHANICAL SERVICES AND EQUIPMENT ABOVE SUSPENDED CEILINGS, IN CHASES / BULKHEADS AND MECHANICAL / ELECTRICAL SERVICE ROOMS.
- EXPOSED:** NOT CONCEALED
- 3.4. **INSULATION TYPES:**
- 3.4.1. **FGF - FLEXIBLE GLASS FIBRE:** FLEXIBLE NON-COMBUSTIBLE BLANKET CONFORMING TO CANULC S102, WITH FACTORY APPLIED VAPOUR BARRIER JACKET TO CGSB 51-GP-52M. THERMAL CONDUCTIVITY TO ASTM C177.
- 3.5. **DUCTWORK:**
- SYSTEM / LOCATION TYPE THICKNESS, MM (MIN/M R-VALUE, K M² / W (H FT² / BTU))**
- EXHAUST AIR WITHIN 2M (6 FT) OF EXTERIOR FGF 50 (2) 1.06 (6.0)
4. **MECHANICAL EQUIPMENT:**
- 4.1. **EXHAUST FANS:**
- 4.1.1. **DOWNBLAST:** CENTRIFUGAL DIRECT DRIVE EXHAUST FAN WITH SPUN ALUMINUM HOUSING. MOUNT MOTOR AND DRIVE HOUSING ON VIBRATION ISOLATORS AND SEAL FROM EXHAUST

- AIR STREAM, CAPACITIES AND ACCESSORIES AS INDICATED IN SCHEDULE ON DRAWINGS. FAN SOUND SHALL NOT EXCEED SONES NOTED IN SCHEDULES.
5. **AIR DISTRIBUTION SYSTEM:**
- 5.1. **DUCTWORK:**
- 5.1.1. **GENERAL:**
- 5.1.1.1. PROVIDE DUCTWORK CONSTRUCTED TO SMACNA 250 PA (1" W.G.) PRESSURE CLASSIFICATION & SEAL CLASS A. FOLLOW ALL OF THE LATEST SMACNA REQUIREMENTS.
- 5.1.1.2. SEAL ALL DUCT JOINTS AND CONNECTIONS TO DIFFUSERS AND EQUIPMENT WITH HIGH VELOCITY WATER BASED DUCT SEALER.
- 5.1.1.3. PROVIDE DUCTS OF SIZES INDICATED ON DRAWINGS. WHERE DUCTS ARE TO BE FURNISHED WITH ACOUSTIC DUCT INSULATION, ADJUST DUCT SIZE TO ACCOMMODATE THICKNESS, WITH CLEAR INSIDE DIMENSIONS AS INDICATED ON DRAWINGS.
- 5.1.1.4. CONTINUOUSLY SOLDER OR SEAL JOINTS IN EXTERIOR AIR INTAKE DUCTS AND PLENUMS TO PREVENT DIPPING OF MOISTURE.
- 5.1.1.5. PROVIDE DUCTWORK OF GALVANIZED STEEL SHEET UNLESS INDICATED OTHERWISE.
- 5.1.1.6. DUCTWORK ASPECT RATIOS CAN BE ADJUSTED TO A MAXIMUM OF 4:1 WHILE KEEPING AT LEAST THE SAME CROSS SECTIONAL AREA, TO AVOID INTERFERENCES, AS REQUIRED.
- 5.1.2. **RECTANGULAR DUCTWORK:**
- 5.1.2.1. FOR LONGITUDINAL JOINTS ON RECTANGULAR DUCTWORK, FURNISH PITTSBURGH LOCK JOINTS TIGHTLY CLOSED ALONG FULL LENGTH OF SEAM.
- 5.1.2.2. CROSS-BREAK FLAT SURFACES BETWEEN JOINTS, OR BETWEEN JOINTS AND INTERMEDIATE REINFORCEMENTS, TO PREVENT VIBRATION OR BUCKLING.
- 5.1.3. **ACOUSTIC DUCT INSULATION:** FURNISH RIGID COATED DUCT LINER CONFORMING TO ANSINFFPA 90A AND 90B, OF 25 MM (1") THICKNESS AND 72 KG/M³ (4.5 LB/CU FT) DENSITY. FASTEN DUCT LINER WITH PLATE TYPE IMPALING PINS AND SELF-LOCKING WASHERS. SEAL EXPOSED ENDS OF LINER WITH AN EDGE TREATMENT OR DUCT SEAL TO PREVENT LIFTING. IN HIGH VELOCITY DUCTWORK FURNISH PERFORATED OR EXPANDED METAL INNER LINER OVER ACOUSTIC INSULATION.
- 5.1.4. **SUPPORTS AND HANGERS:**
- 5.1.4.1. DO NOT HANG ANY DUCTWORK FROM OTHER MECHANICAL EQUIPMENT OR FROM ROOF DECK, UNLESS SPECIFICALLY INDICATED ON DRAWINGS.
- 5.1.4.2. **RECTANGULAR DUCTWORK:**
- 5.1.4.2.1. FOR DUCTS UP TO 760 MM (30") WIDE: FURNISH STRAP HANGERS OF GALVANIZED SHEET STOCK WITH EDGES FOLDED OVER. BEND STRAP HANGER AROUND BOTTOM OF DUCT FOR MINIMUM OF 38 MM (1-1/2") AND ATTACH TO SIDES AND BOTTOM OF DUCT.
- 5.1.4.2.2. FOR DUCTS OVER 760 MM (30") WIDE: FURNISH MILD STEEL ROD HANGERS OF MINIMUM 10 MM (3/8") DIA SIZE AND FURNISH 38 MM X 38 MM X 3 MM (1-1/2" X 1-1/2" X 1/8") STEEL ANGLE ACROSS BOTTOM OF DUCT. ATTACH HANGER TO ANGLE (NOT DUCT).
- 5.2. **SHEET METAL SPECIALTIES:**
- 5.2.1. **BALANCING DAMPERS:**
- 5.2.1.1. LOCKING QUADRANT BALANCING DAMPERS, MANUALLY OPERATED OPPOSED BLADE TYPE, OR BUTTERFLY BLADE TYPE, FABRICATED FROM GALVANIZED STEEL SHEET, PROVIDE WHERE INDICATED ON DRAWINGS AND AS REQUIRED TO ALLOW FOR SYSTEM BALANCING.
- 5.2.2. **FIRE DAMPERS:** DYNAMIC FIRE DAMPERS OF HINGED, FUSIBLE LINK TYPE, CHANNEL FRAMES, BLADES AND HOUSING, ULC LABELED AND CONFORMING TO ANSINFFPA 90A. FURNISH "TYPE B" FIRE DAMPERS FOR RECTANGULAR OR SQUARE DUCTWORK AND "TYPE C" FIRE DAMPERS FOR ROUND DUCTWORK. FOR WALL GRILLES WITH INTEGRAL FIRE DAMPERS, "TYPE A" FIRE DAMPERS ARE ACCEPTABLE.
- 5.2.2.1. MINIMUM FIRE PROTECTION RATING - 1.5 HOUR FOR UP TO 2 HOUR FIRE RESISTANCE RATING, 3 HOUR FOR 3 & 4 HOUR FIRE RESISTANCE RATING
- 5.2.2.2. INSTALLATION SHALL CONFORM WITH NFPA 80.
- 5.2.3. **ACCESS DOORS:** PROVIDE ACCESS DOORS IN DUCTWORK AND PLENUMS TO ALLOW SERVICING, MAINTENANCE AND INSPECTION OF CONTROL DAMPERS, FIRE DETECTORS, BOTH SIDES OF FIRE AND FIRE/SMOKE DAMPERS, CONTROL ELEMENTS, BEARINGS AND AS INDICATED ON DRAWINGS. FURNISH ACCESS DOORS AT LEAST 300 MM X 150 MM (12" X 6") UNLESS DUCT DIMENSIONS PREVENT.
- 5.2.4. **FLEXIBLE DUCT CONNECTIONS:** 75 MM (3") WIDE LISTED FIRE RETARDANT NEOPRENE COATED WOVEN GLASS FIBRE FABRIC TO NFPA 701, CRIMPED INTO 75 MM (3") 24 GA (0.6MM) GALVANIZED STEEL EDGING STRIPS. MANUFACTURED TO SMACNA STANDARDS.



PART FLOOR PLAN - RENOVATION
SCALE: 1:100

- DRAWING NOTES (INDICATED WITH HEXAGONS):**
- DISCONNECT AND REMOVE EXISTING ROOF MOUNTED EXHAUST FAN. ROOF CURB TO REMAIN. INSTALL REPLACEMENT EXHAUST FAN EF-101 ON EXISTING CURB. PROVIDE CURB ADAPTOR AS REQUIRED. COORDINATE ON SITE
 - REMOVE PORTIONS EXISTING ABANDONED IN-SLAB PIPING. REFER TO ARCHITECTURAL DRAWINGS.
 - CLEAN EXISTING DUCTWORK AND GRILLE.
 - REBALANCE EXISTING EXHAUST GRILLE TO AIRFLOW NOTED ON PLAN.
 - REWORK EXISTING MECHANICAL SERVICES IN THIS SPACE AS REQUIRED TO SUIT NEW ROOF ACCESS HATCH. COORDINATE ON SITE. REROUTE EXISTING 500 GAS MAIN ON ROOF AS REQUIRED TO FACILITATE ROOF HATCH INSTALLATION.
 - PRIOR TO FLOOR SLAB REMOVAL DISCONNECT DRAIN SERVING EXISTING SINK. RECONNECT DRAIN ONCE REPLACEMENT FLOOR SLAB INSTALLATION IS COMPLETE. PROVIDE NEW SANITARY DRAIN TO RECONNECT AS REQUIRED.

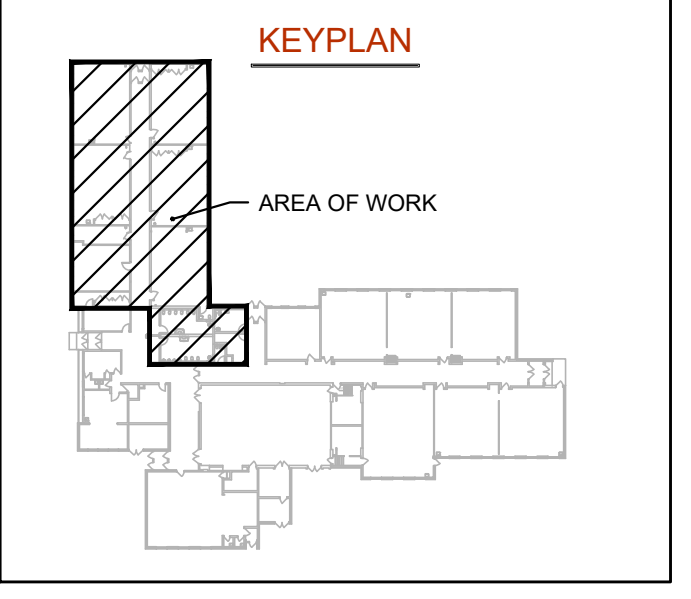
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Waterloo Catholic District School Board
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REVISIONS

NO.	ISSUED FOR	DATE
00	75% REVIEW	26.01.23
01	90% REVIEW	26.02.04
02	TENDER	26.03.09

NORTH

PROFESSIONAL ENGINEER
MAR 9, 2010
CE-6383
G.J. MacDONALD
PROVINCE OF ONTARIO

DESIGN	TW	DRAWN	TW
CHECKED	GM	REVIEWED	GM

PROJECT
ST. JOSEPH CES RENOVATIONS

ADDRESS
980 WESTMINSTER DR. S. CAMBRIDGE

PROJECT NO.
CE-6383

DRAWING TITLE
PLANS AND SPECIFICATION MECHANICAL

DRAWING NUMBER
M2 OF 2

ELECTRICAL GENERAL REQUIREMENTS

GENERAL CONDITIONS:

- ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE ONTARIO ELECTRICAL SAFETY CODE, THE LOCAL ELECTRICAL SAFETY AUTHORITY INSPECTION OFFICE, THE ONTARIO BUILDING CODE, THE ONTARIO FIRE CODE AND ANY OTHER LOCAL REGULATIONS HAVING JURISDICTION OVER THE WORK OF THIS TRADE.
- BEFORE TENDERING, EXAMINE THE SITE AND ALL DRAWINGS AND SPECIFICATIONS OF ALL TRADES AND BE FAMILIAR WITH THE WORK OF THIS TRADE. NO EXTRAS WILL BE ALLOWED FOR THE FAILURE TO DO SO.
- ALL ELECTRICAL WORK SHALL COMPLY WITH CSA ELECTRICAL BULLETIN APPLICABLE AT TENDER CLOSE. WHERE SPECIFIC BULLETINS ARE NOT NAMED THEY ARE STILL CONSIDERED AN INTEGRAL PART OF THIS SPECIFICATION.
- PROVIDE ALL GROUNDING AND BONDING TO GROUND REQUIRED, REGARDLESS IF NOT SHOWN ON THE DRAWINGS. GROUNDING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE ONTARIO ELECTRICAL SAFETY CODE.
- PROVIDE ALL NEW MATERIALS HAVING CSA, CUL, WARNOCK HERSEY OR OTHER APPROVAL AGENCY LABEL AND LISTING. ALL WORKMANSHIP BY THIS TRADE SHALL BE FIRST CLASS, CONFORMING TO INDUSTRY STANDARD PRACTICES FOR SAFETY, ACCESSIBILITY, DURABILITY AND NEATNESS FOR ACCEPTANCE BY THE OWNERS' REPRESENTATIVES.
- ARRANGE AND PAY FOR ALL PERMITS AND INSPECTION FEES REQUIRED FOR THE WORK OF THIS TRADE. SUBMIT TO THE LOCAL ELECTRICAL INSPECTION DEPARTMENT AND/OR ELECTRICAL SUPPLY AUTHORITY ANY AND ALL DRAWINGS REQUIRED FOR PERMITS, FEES, APPROVALS, EXAMINATIONS AND SERVICES.
- PROVIDE ALL CUTTING AND PATCHING REQUIRED FOR THE WORK OF THIS TRADE. ALL CUTTING AND PATCHING SHALL BE PERFORMED BY QUALIFIED TRADES PERSONS. INCLUDE ALL COSTS FOR CUTTING AND PATCHING RELATED TO THE WORK OF THIS TRADE IN THE TENDER PRICE.
- PROVIDE ALL SLEEVES, INSERTS AND HANGERS REQUIRED FOR THE ELECTRICAL WORK. TREAT ALL SLEEVES OR HOLES PIERCING ACOUSTICAL SEPARATIONS FOR INSTALLATIONS OF THE DIVISION TO MAINTAIN ACOUSTICAL RATING. ALL GAPS SHALL BE PACKED WITH ACOUSTICAL INSULATION AND SEALED AT BOTH ENDS WITH ACOUSTICAL CAULKING. PATCH ALL OPENINGS AROUND INSTALLATIONS OF THIS DIVISION PIERCING FIRE OR SMOKE SEPARATIONS WITH AN APPROVED WATERTIGHT SMOKE AND FIRE STOP SEALANT.
- PROVIDE DRIP SHIELDS FOR ALL EQUIPMENT INCLUDING PANELS, TRANSFORMERS, DATA RACK, ETC MOUNTED IN SPRINKLERED AREAS.
- TOUCH-UP ALL SHOP PAINTED EQUIPMENT DAMAGED IN TRANSIT OR DURING INSTALLATION TO MATCH ORIGINAL SHOP FINISH.
- AVOID ACCUMULATION OF DEBRIS AS THE WORK PROGRESSES. ON COMPLETION OF THE CONSTRUCTION AND PRIOR TO THE FINAL INSPECTION AND ACCEPTANCE BY THE OWNER, CLEAN UP AND REMOVE FROM THE SITE ALL SCRAP MATERIALS RESULTING FROM THE WORK OF THIS TRADE.
- CO-ORDINATE THE WORK OF THIS TRADE WITH ALL OTHER TRADES ON THE JOB SO THAT THE WORK MAY PROGRESS WITHOUT ANY DELAY. SCHEDULE AND PHASE DEMOLITION AND NEW WORK TO REDUCE INTERFERENCE AND DOWNTIME OF EXISTING SYSTEMS. NOTIFY OWNER'S REPRESENTATIVE OF ALL DOWNTIME PRIOR TO PROCEEDING WITH WORK.
- IN AREAS WHERE SPACE IS LIMITED AND MULTIPLE TRADES ARE INSTALLING SERVICES, COORDINATE INSTALLATION OF SERVICES. PREPARE INTERFERENCE DRAWINGS PRIOR TO CONSTRUCTION TO ENSURE INSTALLATION OF ALL SERVICES IS COORDINATED.
- PRIOR TO THE FINAL INSPECTION, CLEAN ALL ELECTRICAL EQUIPMENT, CLEAN ALL CONSTRUCTION DUST AND DIRT FROM INSTALLED EQUIPMENT AT THE END OF THE JOB. REPAIR ANY DAMAGE CAUSED BY THE ELECTRICAL TRADE TO EXISTING BUILDINGS OR EQUIPMENT, ETC TO THE CONSULTANTS SATISFACTION.
- UPON COMPLETION OF THE WORK, PROVIDE THE FINAL UNCONDITIONAL CERTIFICATE OF ACCEPTANCE FROM THE LOCAL ELECTRICAL SAFETY AUTHORITY INSPECTION OFFICE.
- PROVIDE A ONE YEAR GUARANTEE ON ALL MATERIALS, AND LABOUR FROM THE DATE OF ACCEPTANCE BY THE OWNER. COMPLETE ALL WARRANTY REGISTRATION DOCUMENTATION ON BEHALF OF THE BUILDING OWNER. SUBMIT COPIES OF COMPLETED DOCUMENTATION IN OPERATIONS AND MAINTENANCE MANUALS.
- SUBMIT SHOP DRAWINGS IN ELECTRONIC PDF FORMAT FOR THE FOLLOWING EQUIPMENT: BREAKERS, DISCONNECTS, ETC. THE SHOP DRAWINGS SHALL BEAR THE NAME OF THE MANUFACTURER, THE MANUFACTURER'S CATALOGUE NUMBER, AND THE CONSULTANT'S DESIGNATION, ALONG WITH ALL PERTINENT INFORMATION PERTAINING TO THAT SPECIFIC PIECE OF EQUIPMENT.
- ALL ELECTRICAL EQUIPMENT SHALL BE MOUNTED PLUMBED TRUE.
- WHERE THE WORD PROVIDE IS USED IN THESE SPECIFICATIONS OR ON THE DRAWINGS, IT HAS THE MEANING "PROVIDE AND INSTALL COMPLETE WITH ALL ASSOCIATED MOUNTING HARDWARE AND CONNECTIONS".
- CHANGES IN THE WORK
 - CHANGES TO THE CONTRACT REQUIRING ADDITIONS TO OR DELETIONS FROM THE WORK OF THIS DIVISION SHALL BE CARRIED OUT UPON WRITTEN REQUEST OF THE CONSULTANT. EXTRAS TO THE CONTRACT OR CREDITS SHALL BE SUBMITTED WITH A COMPLETE COST BREAKDOWN AS FOLLOWS:
 - ITEMIZED MATERIAL LIST WITH QUANTITIES AND UNIT COSTS
 - ITEMIZED LABOUR COST BREAKDOWN
 - COPY OF QUOTATIONS FROM ALL SUPPLIERS FOR ALL EQUIPMENT
 - COPY OF QUOTATIONS FROM ALL SUBCONTRACTORS INCLUDING ALL OF THE REQUIREMENTS OF THIS SECTION
 - TOTAL MATERIAL COST
 - TOTAL HOURS
 - HOURLY RATE (REFER TO SUPPLEMENTARY CONDITIONS AND GENERAL CONTRACT)
 - TOTAL OVERHEAD AND PROFIT (REFER TO SUPPLEMENTARY CONDITIONS AND GENERAL CONTRACT).

CONDUCTORS & RACEWAYS:

- USE RW90 COPPER CONDUCTORS CSA APPROVED FOR THE APPLICATION. CONDUCTORS IN UNDERGROUND RACEWAYS TO BE RWU90. SIZE THE CONDUCTORS SO THAT THE MAXIMUM BRANCH CIRCUIT VOLTAGE DROP DOES NOT EXCEED 3%. MINIMUM CONDUCTOR SIZE IS #12 AVG UNLESS OTHERWISE INDICATED.
- DESIGN IS BASED ON COPPER CONDUCTORS. ALUMINUM CONDUCTORS ARE NOT PERMITTED ON THIS PROJECT.
- ALL CONDUCTORS ARE TO BE INSTALLED IN RACEWAYS AS DESCRIBED BELOW:
 - PVC CONDUIT: IN CONCRETE SLAB, UNDERGROUND BURIED, BELOW SLAB ON GRADE OR EXTERIOR EXPOSED SURFACE RACEWAYS.
 - EMT RACEWAYS: INTERIOR SURFACE RACEWAYS, BRANCH CIRCUIT WIRING FROM PANELS, CONCEALED IN ACCESSIBLE CEILINGS AND INTERIOR WALLS OR IN INTERIOR CONCRETE BLOCK CONSTRUCTION.
 - SURFACE METAL RACEWAYS (SMR): FOR EXISTING CONSTRUCTION WHERE EXISTING WALLS AND FINISHES ARE TO REMAIN OR NEW SERVICES CANNOT BE FISHED IN EXISTING WALL.
 - OBTAIN PERMISSION FROM THE CONSULTANT PRIOR TO INSTALLATION. COLOUR AND SIZE OF RACEWAYS TO BE CONFIRMED WITH CONSULTANT FOR THE SPECIFIC APPLICATION.
- ALL CONDUIT AND WIRING IS TO BE CONCEALED IN ALL FINISHED AREAS.

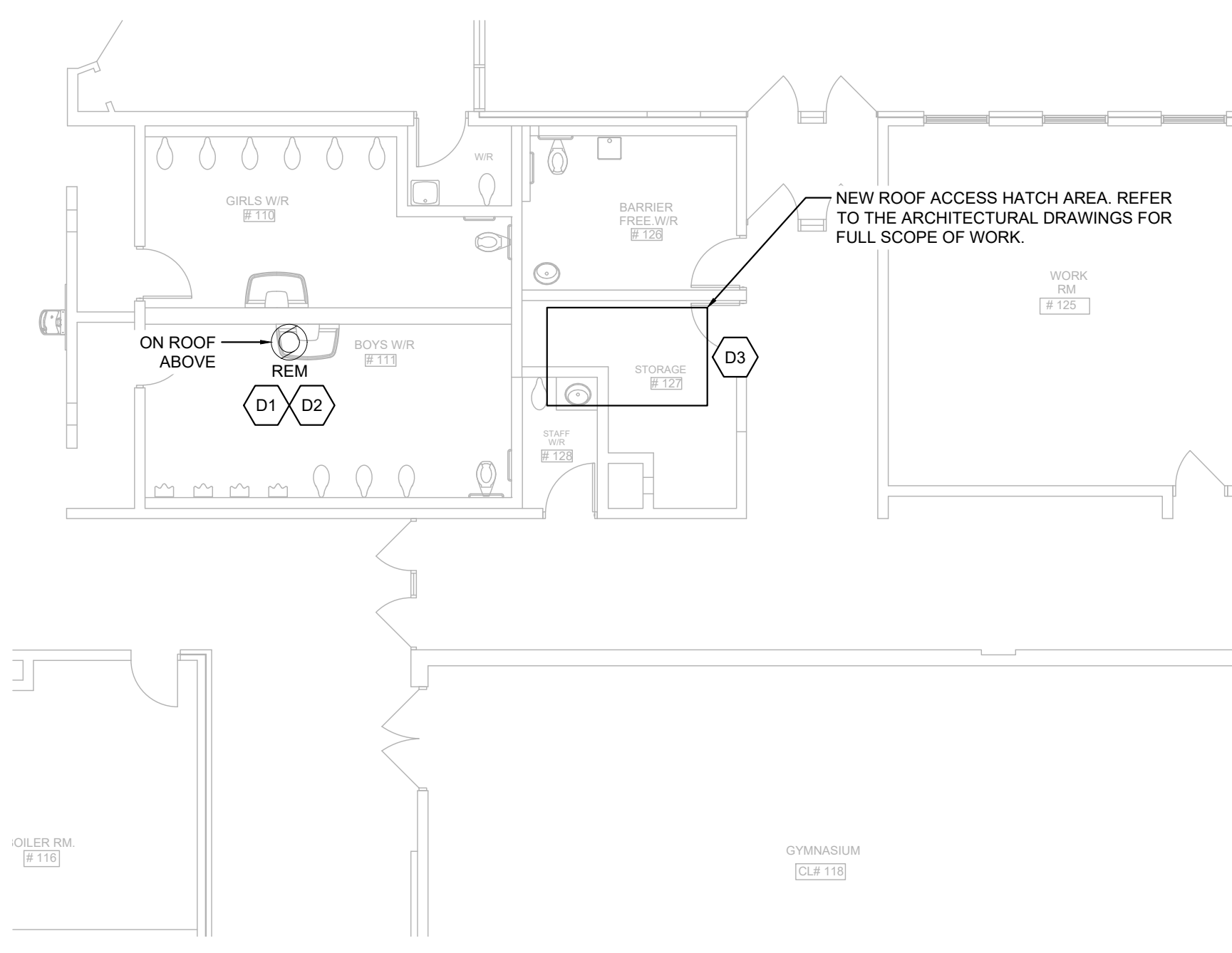
DEVICES:

- EQUIPMENT ISOLATING DISCONNECTS: SIZE DISCONNECTING DEVICES FOR THE CURRENT CARRYING CAPACITIES OF THE EQUIPMENT TO BE ISOLATED. PROVIDE NUMBER OF ISOLATING POLES AS REQUIRED BY EQUIPMENT TO BE ISOLATED. TYPE OF ENCLOSURE AS INDICATED BELOW:
 - OUTDOOR OR DAMP LOCATION - EEMAC TYPE 3R.
 - MANUFACTURERS: CUTLER HAMMER - EATON, SCHNEIDER CANADA, SIEMENS
- ALL DEVICES OF THE SAME TYPE, SIZE AND RATING ARE TO BE OF THE SAME MANUFACTURER THROUGHOUT THE PROJECT.

EQUIPMENT DISPOSAL AND DECOMMISSIONING:

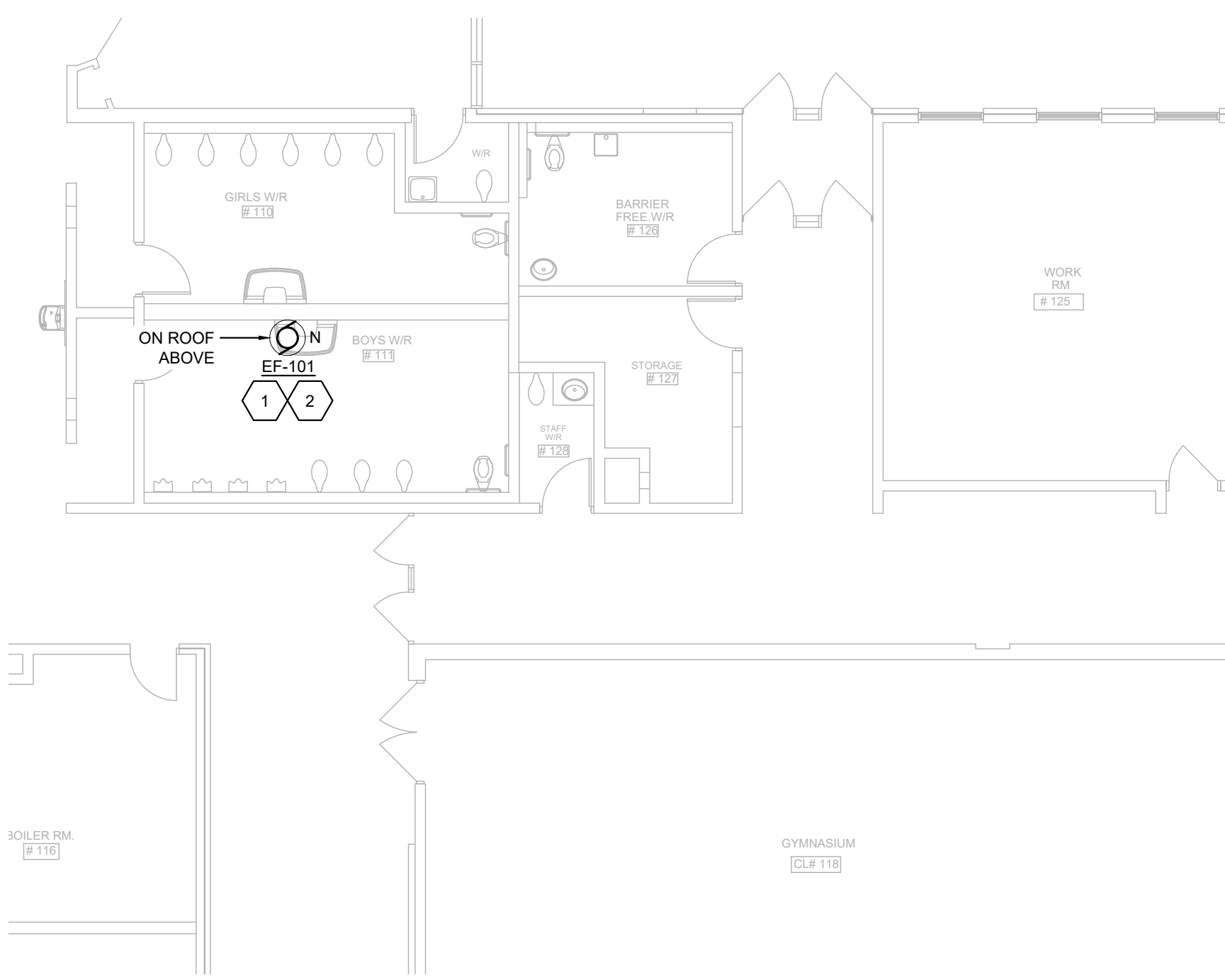
- THE CONTRACTOR WILL TAKE ALL NECESSARY STEPS TO HAVE ELECTRICAL EQUIPMENT THAT WAS REMOVED OR REPLACED AS PART OF ANY WORK DISPOSED OF OR DECOMMISSIONED IN ACCORDANCE WITH APPROPRIATE DISPOSAL OR DECOMMISSIONING PROCESSES, APPLICABLE LAWS, AND IN ACCORDANCE WITH COMMERCIALY REASONABLE ENVIRONMENTAL PRACTICES.
 - THE CONTRACTOR MUST SUBMIT WRITTEN PROOF OR EVIDENCE OR ACKNOWLEDGEMENT THAT THE DISPOSAL OF ALL MATERIALS WAS COMPLETED IN ACCORDANCE WITH ALL CURRENT DISPOSAL REQUIREMENTS.
 - ACCEPTABLE DOCUMENTS:
 - INVOICE OR DISPOSAL CERTIFICATES FROM THE DISPOSAL FACILITY.
 - THIS DOCUMENTATION MUST BE ON THE DISPOSAL FACILITY'S LETTERHEAD, INVOICE OR CERTIFICATE.
 - MINIMUM INFORMATION REQUIRED:
 - BUILDING NAME AND ADDRESS
 - EQUIPMENT DESCRIPTION (LAMPS, MOTORS, COOLING EQUIPMENT, ETC.)
 - EQUIPMENT QUANTITIES
 - DISPOSAL FACILITY NAME
 - THE CONTRACTOR MUST SUBMIT A COMPLETED RETROFIT PROGRAM DISPOSAL FORM IF THE DISPOSAL INVOICES OR CERTIFICATES DO NOT PROVIDE ENOUGH INFORMATION TO VERIFY THE EQUIPMENT DETAILS AS REPORTED IN THE INCENTIVE APPLICATION. REFER TO ATTACHED EXAMPLE: APPENDIX C, FOR AN EXAMPLE OF A DISPOSAL FORM.

WIRING FOR MECHANICAL EQUIPMENT SCHEDULE																	
LABEL	DESCRIPTION	LOCATION	VOLT	PH	HP	WATTS	MCA	ISO. SW.	P	POWER WIRING	CTRL BY ELEC	SOURCE PNL	DISC AMP	FUSE	BRK	P	REMARKS
EF-101	EXHAUST FAN	WASHROOMS (ON ROOF)	120	1	1/3	-	-	EX	1	EX	-	EX	-	-	EX	1	NOTE 1 AND 2
ABBREVIATIONS:			NOTES:														
CONT	- CONTACTOR, SIZE AS INDICATED	OS	- OCCUPANCY SENSOR	1. INSTALL ALL WIRING IN CONDUIT WITH SHORT LENGTH LIQUID TIGHT FLEX TO MOTOR OR VIBRATING EQUIPMENT. 2. EXISTING FEEDER AND CIRCUIT BREAKER ASSUMED TO BE ADEQUATE FOR NEW EXHAUST FAN BASED ON EXISTING EQUIPMENT INFORMATION. ELECTRICAL TRADE TO CONFIRM ON SITE AND PROVIDE NEW FEEDER/RACEWAY AND CIRCUIT BREAKER IF REQUIRED. COORDINATE EXACT REQUIREMENTS WITH EQUIPMENT SHOP DRAWINGS AND PROVIDE ACCORDINGLY.													
COMB	- COMBINATION DISCONNECT & STARTER	RAT	- REVERSE ACTING THERMOSTAT														
FVNR	- FULL VOLTAGE NON REVERSING STARTER	R	- RELAY														
HOA	- HAND OFF AUTO SWITCH C/W PILOT LIGHT	RFB	- REMOTE PUSH BUTTON OFF														
MAN	- MANUAL MOTOR SWITCH C/W PILOT LIGHT	SW	- LIGHT SWITCH														
		TC	- 7 DAY PROGRAMMABLE TIMECLOCK														
		TS	- TIMER SWITCH														
		WP	- WEATHER PROOF														



PARTIAL FLOOR PLAN - ELECTRICAL DEMO

SCALE: 1:100



PARTIAL FLOOR PLAN - ELECTRICAL NEW

SCALE: 1:100

ELECTRICAL LEGEND	
SYMBOL	DESCRIPTION
(Symbol: Dashed line)	DEMOLITION
(Symbol: Solid line)	EXISTING
(Symbol: Solid line with dots)	NEW
(Symbol: Solid line with 'EX')	EXISTING TO REMAIN
(Symbol: Solid line with 'REM')	REMOVE EXISTING
(Symbol: Solid line with 'N')	NEW FIXTURE OR DEVICE / EQUIPMENT
(Symbol: Circle with 'G')	CONNECTION TO MOTOR OR MOTORIZED PIECE OF EQUIPMENT

GENERAL DEMOLITION NOTES: (APPLICABLE TO ALL DRAWINGS)

- ALL FIXTURES AND DEVICES ARE EXISTING TO REMAIN UNLESS IDENTIFIED OTHERWISE ON THE DRAWINGS, GENERAL NOTES OR SPECIFICATIONS.
- REMOVE ALL UNUSED, ABANDONED OR REDUNDANT WIRING AND CONDUIT BACK TO SOURCE.
- EXTEND CONDUIT AND WIRING AS REQUIRED. TRACE EXISTING CIRCUITS PRIOR TO DEMOLITION. CONSULT WITH OWNERS REPRESENTATIVE FOR ANY INTERRUPTIONS THIS MAY CAUSE DURING REMOVAL AND REINSTALLATION.
- COORDINATE WITH FACILITY MAINTENANCE DEPARTMENT FOR DISPOSAL OF REMOVED DEVICES. DISPOSE OF ALL UNWANTED DEVICES AS REQUIRED AS PER FACILITY STANDARDS.
- PROTECT ALL INTERIOR AND EXTERIOR FINISHES, CEILINGS, WALLS, FLOORS, ETC FROM DAMAGE DUE TO THE WORK OF THIS DIVISION.
- INFORMATION RELATED TO EXISTING CONDITIONS IS TAKEN FROM LIMITED VISUAL SITE REVIEW. CONFIRM EXISTING INFORMATION ON SITE AND REPORT ANY DISCREPANCIES WITH THE CONSULTANT.
- REPAIR ANY DAMAGE CAUSED BY THE ELECTRICAL TRADE TO EXISTING BUILDINGS OR EQUIPMENT, ETC. TO THE CONSULTANT SATISFACTION. UPON COMPLETION OF THE WORK, CLEAN ALL EQUIPMENT AND REMOVE FROM THE SITE ALL ELECTRICAL DEBRIS.

GENERAL NOTES: (APPLICABLE TO ALL DRAWINGS)

- PROVIDE LEGIBLE SIGNS AND BARRIERS ON OR AROUND ALL LIVE PANELS AND EQUIPMENT DURING CONSTRUCTION TO PREVENT INJURY OR SHOCK. DISCONNECT AND/OR ISOLATE ALL ELECTRICAL EQUIPMENT EFFECTED BY WORK OF THIS DIVISION. PROVIDE AND COORDINATE DANGER TAGS WITH OWNER FOR ALL EQUIPMENT THAT WILL REMAIN ENERGIZED DURING CONSTRUCTION.
- SCHEDULE AND PHASE DEMOLITION AND NEW WORK TO REDUCE INTERFERENCE AND DOWNTIME OF EXISTING SYSTEMS. NOTIFY OWNER'S REPRESENTATIVE OF ALL DOWNTIME PRIOR TO PROCEEDING WITH WORK. MAINTAIN SERVICES TO ALL AREAS NOT UNDER CONSTRUCTION. MODIFY OR EXTEND WIRING AND CONDUIT AS REQUIRED.
- DO NOT SCALE DRAWINGS. OBTAIN ALL DIMENSIONS FROM EXISTING ARCHITECTURAL PLANS, SITE INSPECTIONS, AND MANUFACTURER'S SHOP DRAWINGS.
- CONTRACTORS SHALL VISIT THE SITE TO DETERMINE THE FULL EXTENT OF THE WORK BEFORE SUBMITTING PRICING. MAKE ALL ALLOWANCES FOR SITE CONDITIONS.
- EXISTING WIRING AND CONDUIT MAY BE REUSED WHERE IN VERY GOOD CONDITION - SUBJECT TO CODE COMPLIANCE AND MEGGER TEST.

DEMOLITION NOTES (INDICATED WITH HEXAGONS):

- DISCONNECT POWER FROM EXISTING EXHAUST FAN AND MAKE SAFE FOR REMOVAL BY THE MECHANICAL TRADE. MAINTAIN EXISTING EXHAUST FAN DISCONNECT MEANS FOR REUSE WITH NEW EXHAUST FAN.
- VERIFY WIRE GAUGE AND MAINTAIN EXISTING WIRES FOR CONNECTION TO NEW EXHAUST FAN.
- THE ELECTRICAL TRADE SHALL DISCONNECT, ISOLATE, PROTECT, STORE AND REINSTALL ALL ELECTRICAL DEVICES AFFECTED BY THIS WORK. THIS INCLUDES BUT IS NOT LIMITED TO LIGHTING FIXTURES, SWITCHES, RECEPTACLES, CONDUITS, ELECTRICAL COMMUNICATION WIRE AND FIRE ALARM DEVICES. REROUTE ALL EXISTING ELECTRICAL AND COMMUNICATION RACEWAYS THAT MAY TRAVERSE THE PROPOSED ROOF HATCH AREA. PROVIDE JUNCTION BOXES ON EITHER SIDE OF PROPOSED OPENING AND THEN CONDUIT PATH AROUND THE ROOF HATCH OPENING. EXTEND CIRCUIT WIRING TO SUIT. FOR COMMUNICATION WIRING/RACEWAYS COORDINATE WITH THE IT REPRESENTATIVE FROM THE SCHOOL BOARD AND PROVIDE PULL BOXES AND RACEWAYS WITH PULL WIRES FOR IT REPS TO INSTALL NEW CONTINUOUS WIRING FROM POINT OF SOURCE TO POINT OF USE AS ONE CONTINUOUS, UNINTERRUPTED PATHWAY. COORDINATE EXACT LOCATION OF NEW ROOF ACCESS HATCH ON SITE.

DRAWING NOTES (INDICATED WITH HEXAGONS):

- PROVIDE CONNECTION TO NEW EXHAUST FAN. MODIFY AND EXTEND EXISTING WIRING AND CONDUIT AS REQUIRED. COORDINATE EXACT REQUIREMENTS ON SITE WITH THE MECHANICAL TRADE. MAINTAIN EXISTING FAN CONTROL DEVICE(S).
- ELECTRICAL TRADE SHALL CONFIRM IF EXISTING POWER CIRCUIT IS ADEQUATE FOR NEW UNIT AND PROVIDE NEW TO SUIT OR MODIFY/EXTEND EXISTING AS REQUIRED. COORDINATE EXACT REQUIREMENTS WITH NEW EXHAUST FAN SHOP DRAWINGS AND PROVIDE ACCORDINGLY. ON/OFF CONTROLS FOR EXHAUST FAN TO REMAIN.

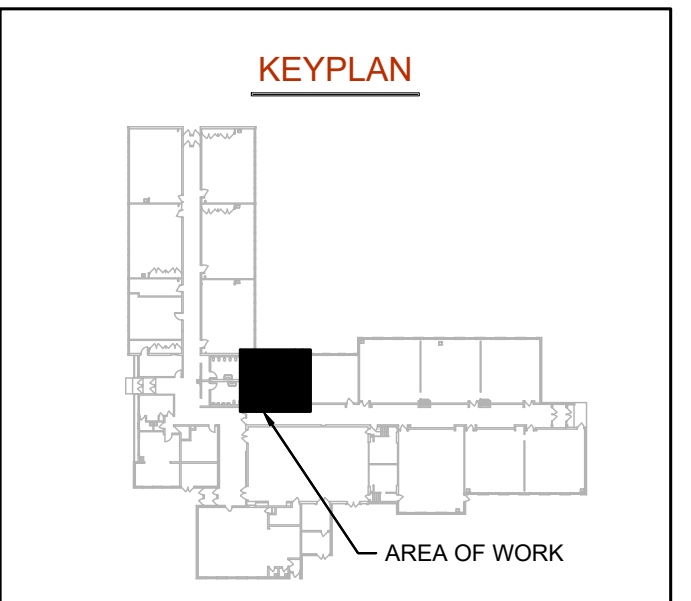
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Waterloo Catholic District School Board
Quality, Inclusive, Faith Based Education

REVISIONS

NO.	ISSUED FOR	DATE
00	75% REVIEW	26.01.23
01	90% REVIEW	26.02.04
02	TENDER	26.03.09

NORTH

S. Grant Hall
17879602
26.03.09
CE-6383

DESIGN	GP	DRAWN	GP
CHECKED	SGH	REVIEWED	SGH

PROJECT

ST. JOSEPH CES RENOVATIONS

ADDRESS

980 WESTMINSTER DR. S. CAMBRIDGE

PROJECT NO.

CE-6383

DRAWING TITLE

ELECTRICAL LEGEND, SCHEDULES, SPECIFICATIONS, AND FLOOR PLANS

DRAWING NUMBER

E1 OF 1