

MECHANICAL NOTES

MECHANICAL DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS FOR THIS PROJECT.

- 1 GENERAL:**
- CONFORM WITH APPLICABLE REQUIREMENTS OF THE MINISTRY OF LABOUR, AND THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS.
 - DO COMPLETE INSTALLATION IN ACCORDANCE WITH THE FOLLOWING:
 - ONTARIO BUILDING CODE (OBC);
 - NATURAL GAS AND PROPANE INSTALLATION CODE (GAS CODE)/INSTALLATION CODE FOR OIL BURNING EQUIPMENT;
 - ASHRAE;
 - SMACNA;
 - NFPA;
 - ALL OTHER RELEVANT CODES AND STANDARDS, AS APPLICABLE.
 - OBTAIN ALL PERMITS REQUIRED FOR THE INSTALLATION OF MECHANICAL TRADES WORK, ARRANGE FOR INSPECTIONS AND TESTS, AND PAY ALL FEES AND COSTS FOR THE PERMITS, INSPECTIONS AND FEES. OBTAIN PERMITS IMMEDIATELY AFTER NOTIFICATION OF AWARD OF CONTRACT.
 - PROVIDE THREE COPIES OF COMPLETE OPERATING AND MAINTENANCE INSTRUCTIONS FOR EQUIPMENT FURNISHED UNDER THIS CONTRACT. BIND INSTRUCTIONS IN 3-RING BINDERS, INCLUDE THE FOLLOWING:
 - SCHEMATIC DIAGRAM OF ELECTRICAL SYSTEMS.
 - CONTROL SHOP DRAWINGS AND OPERATING SEQUENCE INCLUDING WIRING OF COMPONENTS.
 - WIRING DIAGRAM OF CONTROL PANELS.
 - OPERATING INSTRUCTIONS, INCLUDING START-UP AND SHUT-DOWN PROCEDURE.
 - MAINTENANCE INSTRUCTIONS INCLUDING PREVENTIVE MAINTENANCE INSTRUCTIONS FOR COMPONENTS OF THE EQUIPMENT.
 - COMPLETE PARTS LIST OF ASSEMBLIES AND THEIR COMPONENT PARTS, SHOWING MANUFACTURER'S NAME, CATALOGUE NUMBER, AND NEAREST REPLACEMENT SOURCE.
 - LIST OF RECOMMENDED SPARE PARTS AND QUANTITY OF EACH ITEM TO BE STOCKED.
 - MANUFACTURERS' WARRANTIES AND GUARANTEES.
 - CLEAN ALL MECHANICAL SYSTEMS AT PROJECT COMPLETION.
 - COMPLETE AS-BUILT DRAWINGS SHOWING ALL CHANGES AS WORK PROGRESSES.

- 2 CONTRACTOR QUALIFICATIONS:**
- ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH THE "TRADE QUALIFICATION AND APPRENTICESHIP ACT" AND REGULATIONS, BY PERSONS WHO HOLD THE FOLLOWING CERTIFICATES OF QUALIFICATION (AS APPLICABLE):
 - PLUMBER;
 - REFRIGERATION & AIR CONDITIONING SYSTEMS MECHANIC;
 - RESIDENTIAL AIR CONDITIONING SYSTEMS MECHANIC;
 - SHEET METAL WORKER;
 - SPRINKLER & FIRE PROTECTION INSTALLER.
 - ALL FUELS-RELATED WORK TO BE CARRIED OUT IN ACCORDANCE WITH TSSA REQUIREMENTS AND ONTARIO REGULATION 215/01, "FUEL INDUSTRY CERTIFICATES" BY PERSONS WHO HOLD THE APPROPRIATE CERTIFICATES FOR THE WORK BEING PERFORMED.

- 3 EXISTING FACILITIES AND DEMOLITION:**
- LOCATE AND PROTECT ALL EXISTING EXTERIOR SITE SERVICES.
 - RETAIN AND PROTECT ALL EXISTING INTERIOR SERVICES AND BUILDING FABRIC. MAKE GOOD ANY AND ALL DAMAGE RESULTING FROM THIS WORK.
 - CONNECTIONS TO EXISTING SERVICES SHALL BE COORDINATED WITH THE OWNER.
 - EXECUTE WORK WITH LEAST POSSIBLE INTERFERENCE OR DISTURBANCE TO NORMAL USE OF THE EXISTING BUILDING.

- 4 FIXTURES AND EQUIPMENT:**
- ALL ALTERNATE PRODUCTS PROPOSED AS "APPROVED EQUALS" SHALL BE SUBMITTED FOR APPROVAL PRIOR TO TENDER CLOSING.
 - PROVIDE SHOP DRAWINGS AND PRODUCT DATA FOR ALL MECHANICAL FIXTURES AND EQUIPMENT FOR APPROVAL, PRIOR TO PROCEEDING WITH INSTALLATION.
 - INSTALL ALL MECHANICAL FIXTURES AND EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
 - LOCATE ALL EQUIPMENT WITH CLEARANCES, AS REQUIRED BY THE MANUFACTURER, THE FUEL CODES, AND ALL OTHER CODES, AND REGULATIONS, INCLUDING THE FOLLOWING CLEARANCES:
 - TO PERMIT PROPER EQUIPMENT OPERATION;
 - TO PERMIT SUFFICIENT AIRFLOW AROUND EQUIPMENT;
 - FOR EQUIPMENT SERVICE;
 - SUFFICIENT DISTANCE FROM COMBUSTIBLE MATERIAL;
 - WITH SUFFICIENT VENT CLEARANCES;
 - SUFFICIENT DISTANCE FROM ROOF EDGES OR OTHER HAZARDS.

- 5 EQUIPMENT SUPPLIED BY OTHERS:**
- MAKE ALL MECHANICAL SERVICE CONNECTIONS TO EQUIPMENT SUPPLIED BY OTHERS AS SHOWN ON DRAWINGS.
 - CONFIRM ALL SERVICE CONNECTIONS WITH MANUFACTURER AND SUPPLIER, PRIOR TO INSTALLATION. THIS SHALL INCLUDE ALL CONNECTION SIZES, LOCATIONS AND DETAILS, AND SHALL TAKE INTO ACCOUNT EQUIPMENT CLEARANCES AND INSTALLATION REQUIREMENTS.

- 6 PIPING AND ESCUTCHEONS:**
- PROVIDE DIELECTRIC UNIONS AT ALL PIPING LOCATIONS WHERE DISSIMILAR METALS ARE JOINED.
 - PROVIDE ESCUTCHEONS ON ALL PIPES PASSING THROUGH WALLS, PARTITIONS, FLOORS AND CEILINGS, CHROME, NICKEL PLATED BRASS OR TYPE 302 STAINLESS STEEL.

- 7 ACCESS DOORS:**
- SUPPLY ACCESS DOORS, AS REQUIRED IN DUCTWORK AND WALL/CEILING ASSEMBLIES, TO ALL CONCEALED MECHANICAL EQUIPMENT AND OPERATING DEVICES. ACCESS DOORS IN WALL/CEILING ASSEMBLIES TO BE INSTALLED BY OTHER TRADES.
 - ACCESS DOORS SHALL BE FIRE-RATED TYPE, WHERE USED IN FIRE-RATED ASSEMBLIES, AND SHALL MATCH THE RATING OF THE ASSEMBLY.

- 8 PIPE INSULATION:**
- INSTALL IN ACCORDANCE WITH THERMAL INSULATION ASSOCIATION OF CANADA (TIAC) NATIONAL STANDARDS.
 - MAX. FLAME SPREAD RATING: 25.
 - MAX. SMOKE DEVELOPED RATING: 50.
 - DOMESTIC COLD WATER (DCW):
 - 1" RIGID MOULDED MINERAL FIBRE WITH VAPOUR RETARDER JACKET.
 - INSULATE ALL PIPING IN FLOORS, WALLS AND CEILINGS, TO POINT OF FIXTURE CONNECTIONS.
 - DOMESTIC HOT WATER (DHW):
 - 1" RIGID MOULDED MINERAL FIBRE FOR PIPING UP TO 1-1/4" SIZE
 - 1-1/2" RIGID MOULDED MINERAL FIBRE FOR PIPING 1-1/2" TO 3" SIZE
 - INSULATE ALL PIPING IN FLOORS, WALLS AND CEILINGS, TO POINT OF FIXTURE CONNECTIONS.
 - ROOF DRAINS:
 - 1" RIGID MOULDED MINERAL FIBRE WITH VAPOUR RETARDER JACKET.
 - INSULATE ALL STORM PIPING ABOVE GROUND.
 - OUTER JACKET:
 - CONCEALED LOCATIONS: ALL SERVICE JACKET.
 - EXPOSED LOCATIONS: PVC JACKET.
 - MECHANICAL/SERVICE ROOMS: PVC JACKET.

- 9 WATER SERVICE AND WATER SUPPLY PIPING:**
- COORDINATE WATER SERVICE INSTALLATION WITH SUPPLY AUTHORITY:
 - MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLETE WATER ENTRY INSTALLATION, FROM A POINT 3M BEYOND THE BUILDING EXTERIOR.
 - OBTAIN, SUPPLY AND INSTALL ALL WATER METERS/IN ACCORDANCE WITH THE REQUIREMENTS OF THE MUNICIPALITY, INCLUDING REMOTE READING DEVICES AND WIRING.
 - SUPPLY AND INSTALL THRUST RESTRAINT (OBC 7.3.4.9.) FOR ALL WATER SERVICE PIPES 4" OR MORE IN SIZE.
 - SUPPLY AND INSTALL PREMISE ISOLATION BACKFLOW PREVENTER IN ACCORDANCE WITH OBC 7.6.2.6. AND CSA B64.10.
 - MONITORING HAZARD.
 - ABOVE GROUND COPPER TUBE, HARD DRAWN, TYPE L. CAN. OR US MANUFACTURE, INCLUDING FITTINGS, LEAD-FREE SOLDER.

- WATER SUPPLY PIPING IS SHOWN SCHEMATICALLY. INSTALL TUBING CLOSE TO BUILDING STRUCTURE TO MINIMIZE FURRING, CONSERVE HEADROOM AND SPACE. GROUP EXPOSED PIPING AND RUN PARALLEL TO WALLS.
- ISOLATE ALL EQUIPMENT, FIXTURES AND BRANCHES WITH VALVES.
- WATER SYSTEM AT 1/2" TEST SYSTEM OPERATING PRESSURE OR MINIMUM 860 KPA, WHICHEVER IS GREATER. TEST PRESSURE AND TIMEFRAME SHALL BE AS REQUIRED BY OBC 7.3.7.2.
- FLUSH OUT, DISINFECT AND RINSE SYSTEM, PRIOR TO CONSTRUCTION COMPLETION.
- WATER HEATERS:
 - SHALL BE PIPED WITH HEAT TRAPS ON THE INLET AND OUTLET PIPING, AS CLOSE AS PRACTICAL TO THE TANK, IN ACCORDANCE WITH OBC 12.3.1.4.
 - TEMPERATURE AND PRESSURE RELIEF VALVES:
 - MAXIMUM TEMPERATURE SETTING OF 210F (99F);
 - MAXIMUM PRESSURE SETTING OF 150 PSI;
 - DISCHARGE PER OBC 7.6.1.12.
 - TERMINATE WITH AN INDIRECT CONNECTION PIPED TO FLOOR DRAIN, SUMP OR OTHER SAFE LOCATION, WITH A 300MM AIR BREAK; OR
 - TERMINATE AT A DISTANCE NOT LESS THAN 150MM AND NOT MORE THAN 300MM FROM A FLOOR AND DISCHARGE VERTICALLY DOWN.
- TRAP SEAL PRIMERS AND ACCESS TO THEM, SHALL BE LOCATED IN THE WASHROOM OR AREA THAT THEY SERVE.
- SUPPLY AND INSTALL WATER HAMMER ARRESTORS AT THE MIDPOINT AND END OF RUNS OF WATER SUPPLY PIPING AS REQUIRED BY OBC 7.6.1.14.

- 10 DRAINAGE, WASTE AND VENT PIPING:**
- COORDINATE SANITARY AND STORM SERVICE INSTALLATIONS WITH SUPPLY AUTHORITY.
 - APPROXIMATE SUB-FLOOR PIPING ELEVATIONS HAVE BEEN INDICATED ON THE DRAWINGS. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR SETTING FINAL INVERTS BASED ON SITE CONDITIONS.
 - BELOW GROUND/FLOOR:
 - ABS DWV SOLID WALL SCHEDULE 40, CERTIFIED TO CAN/CSA STANDARD B181.1.
 - PVC DWV SOLID WALL SCHEDULE 40, CERTIFIED TO CAN/CSA STANDARD B181.2.
 - PVC DWV, TYPE SDR26 SDR35.
 - ABOVE GROUND:
 - CAST IRON, TYPE DWV.
 - COPPER, TYPE DWV.
 - PVC DWV SOLID WALL SCHEDULE 40, CERTIFIED TO CAN/CSA STANDARD B181.2, FOR NONCOMBUSTIBLE CONSTRUCTION (FLAME-SPREAD RATING NOT MORE THAN 25 PER CAN/ULC-S102.2).
 - PVC DWV SOLID WALL SCHEDULE 40, CERTIFIED TO CAN/CSA STANDARD B181.2, FOR NONCOMBUSTIBLE CONSTRUCTION (FLAME-SPREAD RATING NOT MORE THAN 25 AND SMOKE DEVELOPED CLASSIFICATION NOT MORE THAN 50 PER CAN/ULC-S102.2 - PLENUMS AND HIGH BUILDINGS).
 - PROVIDE CLEANOUTS AS REQUIRED BY THE ONTARIO BUILDING CODE.
 - VENT COMPLETE PLUMBING SYSTEM IN ACCORDANCE WITH THE ONTARIO BUILDING CODE.

- 11 NATURAL GAS PIPING:**
- COORDINATE NATURAL GAS SERVICE INSTALLATION WITH SUPPLY AUTHORITY.
 - STEEL PIPE, SCHEDULE 40, SEAMLESS, SCREWED FITTINGS.
 - PROVIDE SEISMICALLY ACTUATED SHUT-OFF VALVE (EARTHQUAKE VALVE) WHERE PIPING LEAVES NATURAL GAS METER.
 - SLOPE PIPING DOWN IN DIRECTION OF FLOW TO LOW POINTS.
 - TEST SYSTEM IN CONFORMANCE WITH NATURAL GAS AND PROPANE INSTALLATION CODE.

- 12 DUCTWORK:**
- RECTANGULAR DUCT:
 - RIGID GALVANIZED STEEL, LOCK FORMING QUALITY TO ASTM A653/A653M.
 - THICKNESS, FABRICATION, REINFORCEMENT AND SUPPORT/ATTACHMENT TO ASHRAE OR SMACNA.
 - ROUND DUCT:
 - RIGID GALVANIZED STEEL, LOCK FORMING QUALITY TO ASTM A653/A653M.
 - THICKNESS, FABRICATION, REINFORCEMENT AND SUPPORT/ATTACHMENT TO ASHRAE OR SMACNA.
 - FLEXIBLE BRANCH DUCT, PERMITTED WITH 2M/6FT FROM OUTLET, IN CONCEALED LOCATIONS:
 - ALL METAL TYPE: TRIPLE LOCK ALUMINUM CORRUGATED DUCT, MANUFACTURED USING AN ALUMINUM STRIP, WHICH IS SPIRALLY WOUND AND MECHANICALLY JOINED TOGETHER FORMING AN AIR TIGHT AND LEAKPROOF SEAM.
 - SEAL CLASSIFICATION:
 - CLASS A: LONGITUDINAL SEAMS, TRANSVERSE JOINTS, DUCT WALL PENETRATIONS AND CONNECTIONS MADE AIRTIGHT WITH SEALANT AND TAPE.
 - FITTINGS:
 - FABRICATION TO SMACNA.
 - RADIUS ED ELBOWS.
 - RECTANGULAR: STANDARD WITH CENTRELINE RADIUS 1.5 TIMES DUCT DIMENSION, WITH SINGLE THICKNESS TURNING VANES.
 - ROUND: FIVE PIECE WITH CENTRELINE RADIUS 1.5 TIMES DIAMETER.
 - MITRED ELBOWS, RECTANGULAR: WITH DOUBLE THICKNESS TURNING VANES.
 - BRANCHES:
 - RECTANGULAR MAIN AND BRANCH: WITH RADIUS ON BRANCH 1.5 TIMES WIDTH OF DUCT 45 DEGREES ENTRY ON BRANCH.
 - ROUND MAIN AND BRANCH: ENTER MAIN DUCT AT 45 DEGREES WITH CONICAL CONNECTION.
 - PROVIDE VOLUME CONTROL DAMPER IN BRANCH DUCT NEAR CONNECTION TO MAIN DUCT.
 - TRANSITIONS:
 - DIVERGING: 20 DEGREES MAXIMUM INCLUDED ANGLE.
 - CONVERGING: 30 DEGREES MAXIMUM INCLUDED ANGLE.
 - FIRE STOPPING:
 - RETAINING ANGLES AROUND DUCT, ON BOTH SIDES OF FIRE SEPARATION IN ACCORDANCE WITH SECTION.
 - FIRE STOPPING MATERIAL AND INSTALLATION MUST NOT DISTORT DUCT DAMPERS.
 - DAMPERS:
 - MANUFACTURE TO SMACNA STANDARDS.
 - SINGLE BLADE DAMPERS:
 - FABRICATE FROM SAME MATERIAL AS DUCT, BUT ONE SHEET METAL THICKNESS HEAVIER. V. GROOVE STIFFENER.
 - SIZE AND CONFIGURATION TO RECOMMENDATIONS OF SMACNA.
 - LOCKING QUADRANT (WITH SHAFT EXTENSION TO ACCOMMODATE INSULATION THICKNESS, IF REQUIRED).
 - INSIDE AND OUTSIDE NYLON END BEARINGS.
 - CHANNEL FRAME OF SAME MATERIAL AS ADJACENT DUCT, COMPLETE WITH ANGLE STOP.
 - DUCT LEAKAGE: IN ACCORDANCE WITH SMACNA HVAC AIR DUCT LEAKAGE TEST MANUAL.
 - ALL DUCT AND SEAL MATERIALS TO HAVE A FLAME SPREAD RATING OF LESS THAN 25 AND A SMOKE DEVELOPED CLASSIFICATION OF LESS THAN 50.
 - PROVIDE FLEXIBLE CONNECTIONS AT ALL EQUIPMENT DUCT CONNECTION POINTS.

- 13 ROOF CURBS:**
- ALL ROOF CURBS SHALL:
 - BE SEISMICALLY DESIGNED;
 - BE SLOPED TO ACCOMMODATE ROOF SLOPE, AS REQUIRED;
 - EXTEND A MINIMUM OF 14" ABOVE THE FINISHED ROOF SURFACE.

- 14 DUCT INSULATION:**
- REFER TO DRAWING FOR DUCT THAT IS IDENTIFIED TO BE INSULATED.
 - INSTALL IN ACCORDANCE WITH THERMAL INSULATION ASSOCIATION OF CANADA (TIAC) NATIONAL STANDARDS.
 - MAX. FLAME SPREAD RATING: 25.
 - MAX. SMOKE DEVELOPED RATING: 50.
 - THERMAL INSULATION - RECTANGULAR DUCT:
 - (R4-3) RIGID MINERAL FIBRE BOARD WITH VAPOUR RETARDER JACKET.
 - ALUMINUM JACKET WITH MOISTURE BARRIER.

- 15 MECHANICAL FIRE PROTECTION:**
- REFER TO ARCHITECTURAL DRAWINGS, TO VERIFY LOCATION OF ALL FIRE SEPARATIONS AND FIRE-RATED MEMBRANES.

- ALL PIPING SHALL BE TIGHTLY FITTED AND SEALED WITH FIRESTOPPING MATERIAL AT ALL FIRE SEPARATIONS AND FIRE-RATED MEMBRANES.
- FIRE DAMPERS:
 - FIRE DAMPERS SHALL BE CAN/ULC-S110 (STANDARD METHOD OF FIRE TEST OF FIRE DAMPER ASSEMBLIES) LISTED AND LABELED.
 - FIRE DAMPERS SHALL BE NFPA 80 (STANDARD FOR FIRE DOORS AND OTHER OPENING PROTECTIVES), NFPA 90A (STANDARD FOR THE INSTALLATION OF AIR-CONDITIONING AND VENTILATING SYSTEMS), AND NFPA 101 (LIFE SAFETY CODE) COMPLIANT.
- DUCTWORK SHALL BE FITTED WITH FIRE DAMPERS AT ALL FIRE SEPARATIONS AND FIRE-RATED MEMBRANES.
- SUPPLY AND INSTALL ACCESS DOORS IN ARCHITECTURAL FINISH (WALL, CEILING OR FLOOR) TO ACCESS DUCT, IN COMMON AREA WHERE POSSIBLE.
- SUPPLY AND INSTALL TIGHTLY-FITTED ACCESS DOOR IN DUCT TO ACCESS, INSPECT AND RESET FIRE DAMPER.
- TYPES: DYNAMIC - FOR USE IN AIR HANDLING SYSTEMS THAT DO NOT SHUTDOWN UPON FIRE ALARM.
- RATING: 1-1/2 HR (30MIN TO 2HR FIRE RESISTANCE RATING).
- FIRE DAMPER AND DUCT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS REQUIREMENTS, AND SHALL BE SEALED WITH FIRESTOPPING MATERIAL.
- ALL MECHANICAL MATERIALS USED WITH CEILING RETURN AIR PLENUMS SHALL FLAME-SPREAD RATING NOT MORE THAN 25 AND SMOKE DEVELOPED CLASSIFICATION NOT MORE THAN 50 PER CAN/ULC-S102.2.
- MOCK-UPS:
 - PREPARE MOCK-UPS OF TYPICAL FIRESTOP INSTALLATION OF THE FOLLOWING, FOR REVIEW AND APPROVAL BY THE OWNER, ENGINEER AND MUNICIPAL BUILDING INSPECTOR:
 - SANITARY PIPING - WALL AND CEILING/FLOOR FIRE SEPARATION;
 - STORM PIPING - WALL AND CEILING/FLOOR FIRE SEPARATION;
 - SPRINKLER PIPING - WALL AND CEILING/FLOOR FIRE SEPARATION;
 - DCW AND DHW PIPING - WALL AND CEILING/FLOOR FIRE SEPARATION;
 - FIRE DAMPER INSTALLATION - WALL AND CEILING/FLOOR FIRE SEPARATION.
 - ALL FIRESTOP INSTALLATIONS SHALL BE COMPLETED IN ACCORDANCE WITH THE APPROPRIATE PRODUCT INSTALLATION INSTRUCTIONS, AND THE REFERENCED UL/ULC LISTING AND/OR TEST STANDARD.
- SUPPLY A COPY OF THE PRODUCT INSTALLATION INSTRUCTIONS WITH UL LISTING AND/OR TEST STANDARD REFERENCE, FOR EACH INSTALLATION.
- MOCK-UP MAY REMAIN AS PART OF WORK.

- 16 COMMERCIAL KITCHEN EXHAUST AND FIRE PROTECTION:**
- SYSTEM SHALL BE CONFIGURED FOR COMMERCIAL KITCHEN EXHAUST SYSTEM. DESIGN AND INSTALLATION SHALL CONFORM TO NFPA 96 - STANDARD FOR VENTILATION CONTROL AND FIRE PROTECTION OF COMMERCIAL COOKING OPERATIONS.
 - HOOD TYPES (ASHRAE HVAC APPLICATIONS, CHAPTER 33):
 - DUTY: MEDIUM DUTY (400F).
 - CONFIGURATION:
 - WALL MOUNTED CANOPY: MEDIUM DUTY - 200 TO 300 CFM PER LINEAL FOOT.
 - HOOD:
 - SHALL BE UL/ULC LISTED: TYPE I - OVER EQUIPMENT THAT PRODUCES GREASE VAPORS OR SMOKE.
 - SHALL HAVE A 6" MINIMUM OVERHANG ON ALL SIDES OF COOKING EQUIPMENT.
 - SHALL HAVE A UL/ULC LISTED GREASE COLLECTOR AND GREASE FILTERS, LOCATED NOT LESS THAN 18" FROM THE COOKING SURFACE, OR NOT LESS THAN 48" FROM CHARCOAL TYPE COOKING SURFACES.
 - LIGHTING UNITS IN HOODS SHALL BE UL/ULC LISTED FOR USE OVER COMMERCIAL COOKING APPLIANCES.
 - EXHAUST DUCT AND FAN:
 - EXHAUST FANS SHALL BE UL/ULC LISTED, FOR COMMERCIAL KITCHEN / RESTAURANT EXHAUST USE.
 - EXHAUST FANS SHALL HAVE A MINIMUM OF 3.05M (10 FT.) OF CLEARANCE FROM THE OUTLET TO ADJACENT BUILDINGS, PROPERTY LINES, GRADE LEVEL PERMITTED TO BE LOWERED IN A SECURE AREA IF ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION OVER COMBUSTIBLE CONSTRUCTION, ELECTRICAL EQUIPMENT OR LINES, AND THE CLOSEST POINT OF ANY AIR INTAKE OR OPERABLE DOOR OR WINDOW.
 - EXHAUST DUCT AIR VELOCITY SHALL BE NOT LESS THAN 1200 FT./MIN. HOOD EXHAUST FANS SHALL CONTINUE TO OPERATE AFTER THE FIRE EXTINGUISHING SYSTEM HAS BEEN ACTIVATED UNLESS FAN SHUTDOWN IS REQUIRED BY A LISTED COMPONENT OF THE VENTILATION SYSTEM OR BY THE DESIGN OF THE EXTINGUISHING SYSTEM.
 - ALL DUCTWORK SHALL BE PITCHED TO DRAIN THE GREASE BACK INTO THE HOOD.
 - EXHAUST AND REPLACEMENT AIR FANS SHALL BE INTER-LOCKED, AND SHALL HAVE VARIABLE SPEED CONTROL.
 - ACCESS PANELS:
 - ACCESS OR ACCESS PANELS SHALL BE PROVIDED IN HOOD, DUCT, AND EXHAUST FAN FOR COMPLETE ACCESS, INSPECTION AND CLEANING OF THE SYSTEM.
 - OPENINGS SHALL BE PROVIDED AT THE SIDES OR AT THE TOP OF THE DUCT, WHICHEVER IS MORE ACCESSIBLE, AND AT CHANGES OF DIRECTION.
 - ACCESS PANELS SHALL BE OF THE SAME MATERIAL AND THICKNESS AS THE DUCT, WITH A GASKET OR SEALANT THAT IS RATED FOR 815.6C (1500F) AND SHALL BE GREASE-TIGHT.
 - FASTENERS, SUCH AS BOLTS, WELD STUDS, LATCHES, OR WING NUTS, USED TO SECURE THE ACCESS PANELS SHALL BE CARBON STEEL OR STAINLESS STEEL AND SHALL NOT PENETRATE DUCT WALLS.

- 17 REPLACEMENT AIR:**
- WHEN ITS FIRE-EXTINGUISHING SYSTEM DISCHARGES, MAKEUP AIR SUPPLIED INTERNALLY TO A HOOD SHALL BE SHUT OFF.
 - CLEARANCE REQUIREMENTS:
 - THE CLEARANCE REQUIREMENTS OR CLEARANCE REDUCTION SYSTEMS FOR HOODS, GREASE REMOVAL DEVICES, EXHAUST FANS AND DUCTS, OUTLINED IN CHAPTER 7 OF NFPA 96 SHALL BE FOLLOWED.
 - THE CLEARANCE REQUIREMENTS FROM DUCT TO THE INTERIOR SURFACE OF ENCLOSURES OUTLINED IN CHAPTER 7 OF NFPA 96 SHALL BE FOLLOWED.
 - AUTOMATIC FIRE-EXTINGUISHING SYSTEM:
 - GENERAL:
 - FIRE-EXTINGUISHING EQUIPMENT, WITH BOTH AUTOMATIC AND MANUAL ACTIVATION, SHALL BE INSTALLED IN THE COMMERCIAL KITCHEN EXHAUST HOOD.
 - THE AUTOMATIC FIRE-EXTINGUISHING SYSTEM SHALL COMPLY WITH STANDARD UL 300, STANDARD FOR FIRE TESTING OF FIRE EXTINGUISHING SYSTEMS FOR PROTECTION OF RESTAURANT COOKING AREAS OR OTHER EQUIVALENT STANDARDS AND SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF THE LISTING.
 - SYSTEM SHALL BE PRE-ENGINEERED TYPE, WITH A FIXED NOZZLE EXTINGUISHING AGENT DISTRIBUTION.
 - FUEL SHUT-OFF:
 - UPON ACTIVATION OF THE FIRE-EXTINGUISHING SYSTEM, ALL SOURCES OF FUEL AND ELECTRIC POWER TO ALL EQUIPMENT UNDER THE HOOD SHALL AUTOMATICALLY SHUT OFF.
 - SHUTOFF DEVICES SHALL REQUIRE MANUAL RESET.
 - ACTIVATION:
 - EXTINGUISHING AGENT SHALL BE DELIVERED THROUGH REGULATED RELEASE NOZZLES.
 - AUTOMATIC ACTIVATION SHALL BE BY FUSIBLE LINK DETECTION.
 - A READILY ACCESSIBLE MEANS FOR MANUAL ACTIVATION SHALL BE LOCATED BETWEEN 1067MM AND 1219MM (42IN AND 48IN) ABOVE THE FLOOR, BE ACCESSIBLE IN THE EVENT OF A FIRE, BE LOCATED IN A PATH OF EGRESS, AND CLEARLY IDENTIFY THE HAZARD PROTECTED.
 - THE AUTOMATIC AND MANUAL MEANS OF SYSTEM ACTIVATION EXTERNAL TO THE CONTROL HEAD OR RELEASING DEVICE SHALL BE SEPARATE AND INDEPENDENT OF EACH OTHER SO THAT FAILURE OF ONE WILL NOT IMPAIR THE OPERATION OF THE OTHER. THE MANUAL MEANS OF SYSTEM ACTIVATION SHALL BE PERMITTED TO BE COMMON WITH THE AUTOMATIC MEANS IF THE MANUAL ACTIVATION DEVICE IS LOCATED BETWEEN THE CONTROL HEAD OR RELEASING DEVICE AND THE FIRST FUSIBLE LINK.
 - THE MEANS FOR MANUAL ACTIVATION SHALL BE MECHANICAL. ELECTRICAL POWER SHALL BE PERMITTED TO BE USED FOR MANUAL ACTIVATION IF A STANDBY POWER SUPPLY IS PROVIDED OR IF SUPERVISION IS PROVIDED.

- SYSTEM ANNUNCIATION:
 - UPON ACTIVATION OF THE AUTOMATIC FIRE-EXTINGUISHING SYSTEM, AN AUDIBLE ALARM OR VISUAL INDICATOR SHALL BE PROVIDED TO SHOW THAT THE SYSTEM HAS ACTIVATED.
 - WHERE A FIRE ALARM SYSTEM IS INSTALLED, THE ACTIVATION OF THE AUTOMATIC FIRE-EXTINGUISHING SYSTEM SHALL ACTIVATE THE FIRE ALARM SYSTEM.
- SYSTEM SUPERVISION:
 - WHERE ELECTRICAL POWER IS REQUIRED TO OPERATE THE AUTOMATIC FIRE-EXTINGUISHING SYSTEM, IT SHALL BE MONITORED BY A SUPERVISORY ALARM, WITH A STANDBY POWER SUPPLY PROVIDED.
- SYSTEM SHALL BE TESTED TO VERIFY THAT THE EXHAUST AIR AND REPLACEMENT AIR VOLUMES, AND NEGATIVE PRESSURE CREATED IN THE COOKING AREA MEET THE REQUIREMENTS OF NFPA 96. TEST REPORT SHALL BE SUBMITTED UPON THE COMPLETION OF THE INSTALLATION.

- 17 SPRINKLER AND STANDPIPE SYSTEM:**
- SPRINKLER SYSTEM DESIGN AND INSTALLATION SHALL CONFORM TO NFPA 13 - INSTALLATION OF SPRINKLER SYSTEMS.
 - STANDPIPE SYSTEM DESIGN AND INSTALLATION SHALL CONFORM TO NFPA 14 - INSTALLATION OF STANDPIPE AND HOSE SYSTEMS.
 - SYSTEM INSPECTION AND TESTING SHALL CONFORM TO NFPA 25 - INSPECTION TESTING AND MAINTENANCE OF WATER-BASED FIRE PROTECTION SYSTEMS.
 - PROVIDE DESIGN, LAYOUT, DRAWINGS AND CALCULATIONS FOR COMPLETE SPRINKLER SYSTEM, SEALED BY PROFESSIONAL ENGINEER IN THE PROVINCE OF ONTARIO.
 - PROVIDE BACKFLOW FROM FIRE PROTECTION SYSTEMS IN ACCORDANCE WITH THE ONTARIO BUILDING CODE (OBC 7.6.2.4) AND CAN/CSA-B64 SERIES-07 - BACKFLOW PREVENTERS AND VACUUM BREAKERS.
 - SPRINKLER SYSTEM MONITORING STATION CONNECTION SHALL NOTIFY THE FIRE DEPARTMENT BY WAY OF SIGNALS TO A CENTRAL STATION CONFORMING TO CAN/ULC-S561 "INSTALLATION AND SERVICES FOR FIRE SIGNAL RECEIVING CENTRES AND SYSTEMS". FOR FIRE ALARM SYSTEM MONITORING, THE CONTRACTOR SHALL:
 - COORDINATE WITH OWNER'S MONITORING COMPANY;
 - SUPPLY AND INSTALL COMMUNICATION MODULE REQUIRED FOR MONITORING;
 - SUPPLY AND INSTALL CABLING AND TERMINATION BOX FROM COMMUNICATION MODULE TO BUILDING TELEPHONE SERVICE SPACE, OR OTHER SERVICE SPACE, AS IDENTIFIED BY THE OWNER'S MONITORING COMPANY.

- 18 MECHANICAL IDENTIFICATION:**
- IDENTIFY MECHANICAL EQUIPMENT WITH LAMICOID NAMEPLATES.
 - LABEL ALL PIPING AT LEAST ONCE IN EVERY ROOM, AND AT NO MORE THAN 25 FT CENTERS.
- 19 EARTHQUAKE LOAD:**
- ALL MECHANICAL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE EARTHQUAKE LOAD AND EFFECTS REQUIRED BY THE ONTARIO BUILDING CODE.
 - MECHANICAL ELEMENTS AND COMPONENTS (EQUIPMENT, PIPES, DUCTS, ETC.), AND THEIR CONNECTIONS TO THE BUILDING SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SMACNA/ANSI SEISMIC RESTRAINT MANUAL OR OTHER GUIDELINE REFERENCED IN THE ONTARIO BUILDING CODE.
 - PROVIDE SHOP DRAWINGS FOR SUPPORT, CONNECTIONS AND SEISMIC RESTRAINT OF ALL MECHANICAL EQUIPMENT, PIPES AND DUCTS, INCLUDING, BUT NOT LIMITED TO:
 - ROOFTOP HVAC EQUIPMENT;
 - TYPICAL DUCT SUPPORTING SYSTEM;
 - TYPICAL SAN, STM, DCW, DHW AND SPRINKLER PIPE SUPPORTING SYSTEM;
 - TYPICAL NATURAL GAS PIPE SUPPORTING SYSTEM.
 - THESE SHOP DRAWINGS SHALL BE DESIGNED AND SEALED BY A PROFESSIONAL ENGINEER IN THE PROVINCE OF ONTARIO, WITH EXPERIENCE IN SEISMIC ENGINEERING.
 - FOLLOWING PROJECT COMPLETION, SEISMIC ENGINEER SHALL PROVIDE A LETTER OF FINAL SITE REVIEW.

- 20 EQUIPMENT AND MATERIALS SUPPORT:**
- ALL MECHANICAL EQUIPMENT, PIPING, DUCTWORK, AND RELATED ITEMS SHALL BE SECURELY SUPPORTED, ATTACHED AND FASTENED TO BUILDING STRUCTURE.
 - PIPE HANGERS AND SUPPORTS SHALL BE FABRICATED AND INSTALLED IN ACCORDANCE WITH MSS STANDARD SP-58, PIPE HANGERS AND SUPPORTS - MATERIALS, DESIGN, MANUFACTURE, SELECTION, APPLICATION, AND INSTALLATION.

- 21 COORDINATION:**
- INFORMATION INVOLVING ACCURATE DIMENSIONING OF THE BUILDING SHALL BE TAKEN FROM SITE BY CONTRACTOR.
 - DRAWINGS ARE IN DIAGRAMMATIC FORM, INTENDED TO CONVEY THE SCOPE OF WORK AND GENERAL ARRANGEMENT FOR EQUIPMENT. COORDINATE PHYSICAL LOCATION OF ALL EQUIPMENT WITH OTHER TRADES AND ALLOW FOR ANY ADDITIONAL PIPING, DUCTING, FITTINGS, SUPPORTS, ETC., IN ORDER TO AVOID INTERFERENCE AND FACILITATE THE WORK.
 - SUPPLY TO MAKE ANY NECESSARY MODIFICATIONS OR ADDITIONS, WITHOUT CHARGE, TO ACCOMMODATE SITE CONDITIONS AND COORDINATION.
 - COORDINATE ALL MECHANICAL EQUIPMENT WIRING, INCLUDING LOW VOLTAGE CONTROL WIRING, WITH ELECTRICAL TRADES.
- 22 START-UP, COMMISSIONING AND TRAINING:**
- COMMISSIONING:
 - START-UP AND COMMISSION THE FOLLOWING SYSTEMS:
 - PLUMBING FIXTURES;
 - HVAC;
 - COMMERCIAL KITCHEN EXHAUST AND FIRE PROTECTION;
 - SPRINKLER SYSTEM.
 - PERFORM SYSTEMATIC TESTS, PROCEDURES AND CHECKS ON SYSTEMS, AS FOLLOWS:
 - VERIFY OPERATION IN ACCORDANCE WITH CONTRACT DOCUMENTS, DESIGN CRITERIA AND INTENT, AND MANUFACTURER'S REQUIREMENTS;
 - TO ENSURE APPROPRIATE DOCUMENTATION IS PROVIDED;
 - TO EFFECTIVELY TRAIN BUILDING OPERATIONAL STAFF.
 - SYSTEMS ARE TO BE OPERATED AT FULL CAPACITY, WITH CORRECTION OF ALL DEFICIENCIES AND ADJUSTMENTS TO MEET OPTIMUM PERFORMANCE.
 - PROVIDE WRITTEN REPORT AT END OF COMMISSIONING OUTLINING EQUIPMENT OPERATIONAL CONDITIONS AND PARAMETERS.
 - TESTING, ADJUSTING AND BALANCING:
 - TEST, ADJUST AND BALANCE (TAB) ALL PLUMBING AND HVAC EQUIPMENT AND SYSTEMS, INCLUDING THE FOLLOWING:
 - ROOFTOP PACKAGED HVAC UNITS.
 - TAB PROCEDURE SHALL BE COMPLETED IN ACCORDANCE WITH ASHRAE STANDARD 111, MEASUREMENT, TESTING, ADJUSTING AND BALANCING OF BUILDING HVAC SYSTEMS.
 - PROVIDE DETAILED REPORT AT END OF TAB, IN ACCORDANCE WITH THE REPORTING PROCEDURES OF ASHRAE STANDARD 111.
 - DEMONSTRATION AND TRAINING:
 - DEMONSTRATE OPERATION AND MAINTENANCE OF EQUIPMENT AND SYSTEMS TO OWNER'S PERSONNEL ONE WEEK PRIOR TO DATE OF FINAL INSPECTION.
 - PRIOR TO DEMONSTRATION AND TRAINING, ENSURE THAT EQUIPMENT HAS BEEN INSPECTED AND PUT INTO OPERATION, INCLUDING COMPLETION OF COMMISSIONING AND TESTING, ADJUSTING, AND BALANCING.
 - DEMONSTRATE START-UP, OPERATION, CONTROL, ADJUSTMENT, TROUBLE SHOOTING, SERVICING, AND MAINTENANCE OF EACH ITEM OF EQUIPMENT.
 - INSTRUCT PERSONNEL IN PHASES OF OPERATION AND MAINTENANCE USING OPERATION AND MAINTENANCE MANUALS AS BASIS OF INSTRUCTION. REVIEW CONTENTS OF MANUAL IN DETAIL TO EXPLAIN ASPECTS OF OPERATION AND MAINTENANCE.

PLUMBING LEGEND

SYMBOL	ABBREVIATION	DESCRIPTION
	SAN	SANITARY DRAIN ABOVE FLOOR/GRADE
	SAN	SANITARY DRAIN BELOW FLOOR/GRADE
	VENT	SANITARY VENT
	STM	STORM DRAIN ABOVE FLOOR/GRADE
	STM	STORM DRAIN BELOW FLOOR/GRADE
	WCO	WALL CLEANOUT
	FCO	FLOOR CLEANOUT
	LCO	LINE CLEANOUT
	GCO	GRADE CLEANOUT
	DCW	DOMESTIC COLD WATER
	DHW	DOMESTIC HOT WATER
	DHWR	DOMESTIC HOT WATER RETURN
	-	STANDPIPE
	GAS	NATURAL GAS

HVAC LEGEND

	SUPPLY AIR		RETURN AIR		EXHAUST AIR		MAKE-UP AIR		OUTDOOR AIR		EXISTING
	DUCT SIZE, RECTANGULAR, FIRST FIGURE IS SIDE SHOWN		DUCT SIZE, ROUND		CHANGE OF ELEVATION R - RISE, D - DROP		CHANGE OF ELEVATION R - RISE, D - DROP		SIZE		FIRE DAMPER
	ELBOW, WITH VANES, RECTANGULAR(= 1.5W)		ELBOW, WITH VANES, RECTANGULAR		WALL SUPPLY GRILLE OR REGISTER		WALL EXHAUST/RETURN GRILLE OR REGISTER		FLOOR OR CEILING SUPPLY GRILLE OR REGISTER		FLOOR OR CEILING EXHAUST/RETURN GRILLE OR REGISTER
	TRANSITIONS FOT - FLAT ON TOP, FOB - FLAT ON BOTTOM		TEE, RECTANGULAR MAIN AND TAP		TEE, RECTANGULAR MAIN AND TAP, WITH DAMPER		TEE RECTANGULAR		WYE, RECTANGULAR		VOLUME DAMPER
	ACOUSTICAL INSULATION LINING		ACOUSTICAL INSULATION LINING		FLEXIBLE CONNECTION		THERMOSTAT		THERMOSTAT REMOTE SENSOR		HUMIDISTAT
	CONTROLLER, AS INDICATED										

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PLUMBING FIXTURE SCHEDULE									
UNIT	DESCRIPTION	PIPE SIZE					ACCEPTABLE PRODUCT	NOTES	
		TRAP (in)	WASTE (in)	VENT (in)	DCV (in)	DHW (in)			
WC-1	WATERCLOSET - TANK BARRIER FREE	INT	3" 75	2" 50	1/2" 13	-	WATERCLOSET - AMERICAN STANDARD #2467 016 (CADET) SEAT - CENTOO #820STS OR APPROVED EQUAL	PRESSURE ASSISTED, ELONGATED WHITE HEAVY DUTY, OPEN FRONT SEAT & COVER, SS HINGE MAX WATER CONSUMPTION - 6.0 Lpf, 1.6 gpf DIM L x W x H - 768 x 521 x 781 mm, 30.25 x 20.5 x 30.75 in RIM HEIGHT - 419 mm, 16.5 in SEAT HEIGHT - 430 to 485 mm, 17 to 19 in (OBC 3.8.3.9)	
UR-1	URINAL FLUSH VALVE	INT	2" 50	1-1/2" 38	3/4" 19	-	AMERICAN STANDARD #6501 (WASHBROCK) URINAL #6045 MANUAL FLUSH VALVE (TOP SPUD) OR APPROVED EQUAL	WHITE, TOP/BACK SPUD MAX WATER CONSUMPTION - 1.9 Lpf, 0.5 gpf DIM H x W x D - 664 x 480 x 360 mm, 26.125 x 18.875 x 14-125 in RIM HEIGHT - 387 to 610 mm, 15.25 to 24 in SECOND URINAL - 430 mm, 16.9 in (OBC 3.8.3.10)	
LA-1	LAVATORY COUNTERTOP BARRIER FREE	1-1/2" 38	1-1/2" 38	1-1/4" 32	1/2" 13	1/2" 13	AMERICAN STANDARD #9494 LAVATORY #6405 FAUCET OR APPROVED EQUAL	WHITE, POP-UP DRAIN OVERALL DIM - W x FTB x D - 533 x 445 x 165mm, 21 x 17.5 x 6.5 in BOWL DIM - W x FTB x D - 441 x 279 x 133mm, 17.375 x 11 x 5.25 in MAX WATER CONSUMPTION - 8.35 Lpm, 2.2 gpm GOOSENECK FAUCET WITH LEVER HANDLES	
SK-1	KITCHEN SINK DOUBLE BOWL WITH LEDGE	1-1/2" 38	1-1/2" 38	1-1/4" 32	1/2" 13	1/2" 13	FRANKE KINDRED #QCLA2027R-8-3 SINK AMERICAN STANDARD #6270 FAUCET OR APPROVED EQUAL	STAINLESS STEEL, LEVER HANDLES OVERALL DIM - W x FTB x D - 27.25 x 20.5 x 7 in BOWL DIM - W x FTB x D - 14 x 16 x 7 in MAX WATER CONSUMPTION - 8.35 Lpm, 2.2 gpm	
SS-1	SERVICE SINK FLOOR MOUNTED	3" 75	3" 75	2" 50	1/2" 13	1/2" 13	FIAT #MSB-2424 SINK, #830-AA TRIM, #889-CC MOP BRACKET #E-77-AA BUMPER GUARDS #832-AA HOSE AND BRACKET OR APPROVED EQUAL	24"x24"x10" DP MOULDED STONE, WHITE MOP BRACKET VINYL BUMPER GUARDS HOSE AND BRACKET	
SH-1	SHOWER SURFACE MOUNTED	1-1/2" 38	1-1/2" 38	1-1/4" 32	1/2" 13	1/2" 13	SHOWER ENCLOSURE BY OTHER TRADES SYMMONS #1-801S	PRESSURE BALANCING MIXING VALVE SHOWER HEAD & VALVE STAINLESS STEEL COVER 7.6 L/min FLOW RESTRICTOR	
SH-2	SHOWER SURFACE MOUNTED WITH WALL HAND SHOWER	1-1/2" 38	1-1/2" 38	1-1/4" 32	1/2" 13	1/2" 13	SHOWER ENCLOSURE BY OTHER TRADES SYMMONS #1-801S	PRESSURE BALANCING MIXING VALVE SHOWER HEAD & VALVE WALL HAND SHOWER WITH SLIDE BAR STAINLESS STEEL COVER 7.6 L/min FLOW RESTRICTOR	
FD-1	FLOOR DRAIN ROUND HEAVY DUTY	3" 75	3" 75	1-1/2" 38	1/2" 13	-	WATTS FD-100 ZURN OR APPROVED EQUAL	SUIT FLOOR FINISH CAST IRON BODY NICKEL BRONZE STRAINER AUTOMATIC TRAP SEAL PRIMER/FLAP	
FCO	FLOOR CLEANOUT ROUND	-	SIZE PER PIPE	-	-	-	WATTS CO-200 ZURN OR APPROVED EQUAL	SUIT FLOOR FINISH CAST IRON BODY NICKEL BRONZE TOP, GASKET BRASS CLEANOUT PLUG, GASKET	
WCO	WALL CLEANOUT ROUND	-	SIZE PER PIPE	-	-	-	WATTS CO-380 ZURN OR APPROVED EQUAL	SUIT WALL FINISH CAST IRON FERRULE BRASS PLUG STAINLESS STEEL COVER	

COMMERCIAL KITCHEN EXHAUST SCHEDULE											
UNIT	DESCRIPTION	FAN			HEATING		ELECTRICAL		ACCEPTABLE PRODUCT	NOTES	
		CFM	ESP	DRIVE	INPUT (Mbtu/hr)	OUTPUT (Mbtu/hr)	VOLT	PH			HP
EF-1	EXHAUST FAN CENTRIFUGAL ROOF MOUNTED RESTAURANT MODEL	1200	0.6	BELT	-	-	240	1	1/2	CAPTIVEAIRE OR APPROVED EQUAL	EXHAUST FAN: - VARIABLE SPEED CONTROL - BACKDRAFT DAMPER - UL705 AND UL702 - AMCA SOUND AND AIR CERTIFIED - WIRING FROM ELECTRICAL DISCONNECT SWITCH TO MOTOR - WEATHERPROOF DISCONNECT SWITCH - HIGH HEAT OPERATION 300F (149C) - GREASE CLASSIFICATION TESTING - OPERATES WITH NORMAL AND ABNORMAL FLARE-UP TEMPERATURE TESTS - GREASE BOX - SAFETY DISCONNECT SWITCH
HOOD	COMMERCIAL KITCHEN EXHAUST HOOD	5' LENGTH	FIELD WRAPPER BACKSPASH END PANELS SUPPLY PLENUM							CAPTIVEAIRE OR APPROVED EQUAL	HOOD: - STAINLESS STEEL CONSTRUCTION 304SS - SUPPLY AIR PLENUM ALONG LENGTH OF HOOD AT FRONT - GREASE EXTRACTION FILTER AND GREASE TROUGH - UL LISTED PRE-WIRED LIGHTS - FIRE SUPPRESSION SYSTEM

NOTES:
1. SYSTEM SHALL BE CONFIGURED FOR COMMERCIAL KITCHEN EXHAUST SYSTEM, AND SHALL MEET ALL REQUIREMENTS OF ULC AND NFPA 96.
2. CONTROL SYSTEM:
- FAN SYSTEM - ON/OFF SWITCH
- LIGHTS - ON/OFF SWITCH
- DUCT TEMPERATURE SENSOR
- EXHAUST FAN - ON IN FIRE
- LIGHTS - OFF IN FIRE
- EXHAUST FAN MODULATES BASED ON DUCT TEMPERATURE

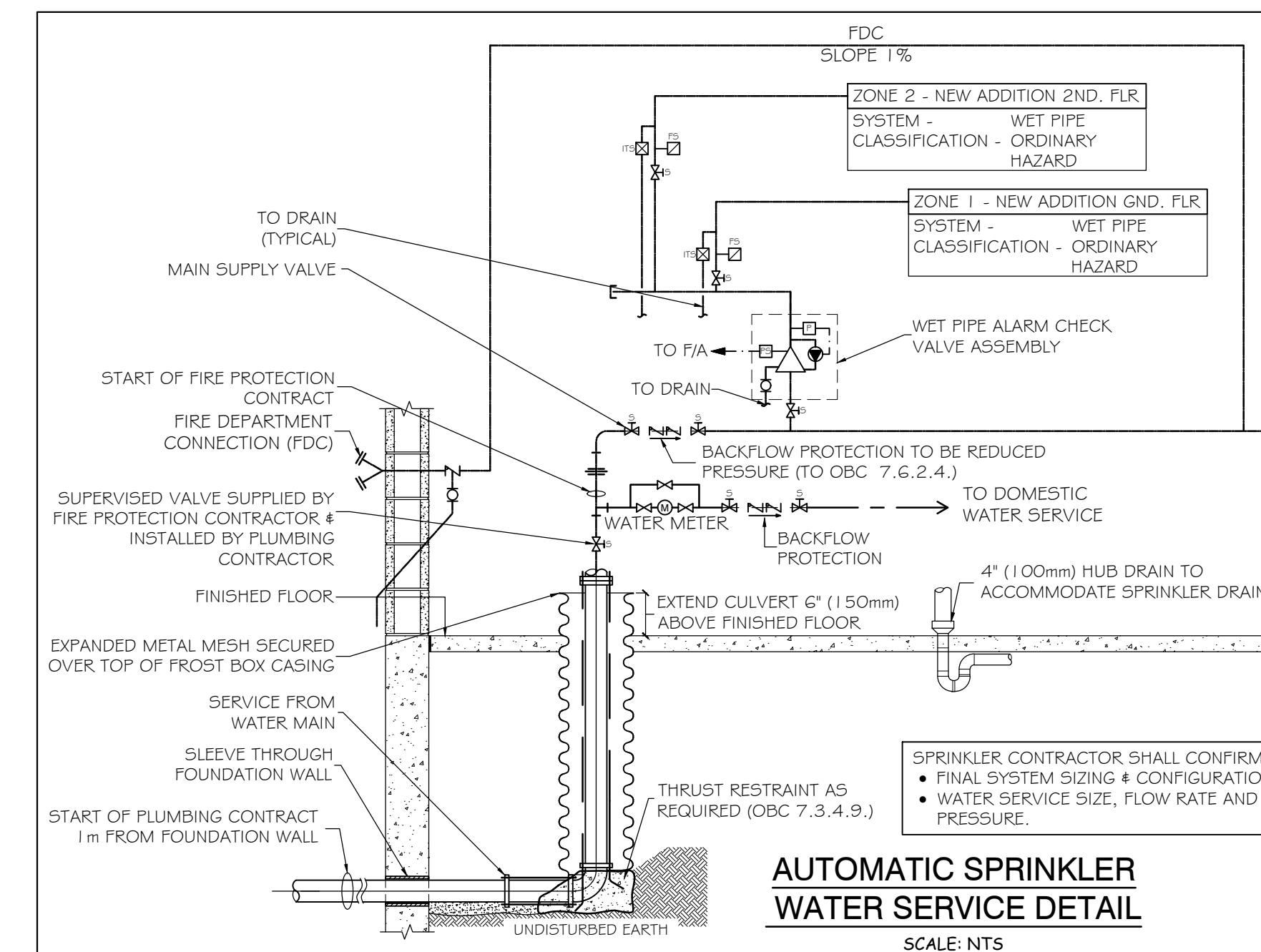
ROOFTOP HVAC UNIT SCHEDULE													
UNIT	DESCRIPTION	FAN			COOLING		HEATING		ELECTRICAL			ACCEPTABLE PRODUCT	NOTES
		HP	CFM	ESP	TEMP (deg F)	TC (Mbtu/hr)	INPUT (Mbtu/hr)	OUTPUT (Mbtu/hr)	VOLT	PHASE	MCA		
RTU-1	HVAC UNIT ELECTRIC COOLING NATURAL GAS HEAT 3 TON	0.75	1400	0.8	80 DB 67 WB 95 AMB	36.62	80	208	3	14	20	CARRIER #48FC OR APPROVED EQUAL	BASE UNIT: - HIGH SEISMIC CURB - ECONOMIZER - THROUGH THE BASE ELECTRICAL - POWER EXHAUST - FILTER RACK WITH CLEAN FILTERS
RTU-2	HVAC UNIT ELECTRIC COOLING NATURAL GAS HEAT 5 TON	1	2000	0.6	80 DB 67 WB 95 AMB	60	104	208	3	26	40	CARRIER #48FC OR APPROVED EQUAL	HEATING SECTION: - STAINLESS STEEL HEAT EXCHANGER COOLING SECTION: - VARIABLE SPEED COMPRESSOR - LOW AMBIENT OPERATION CONTROLS: - MICROPROCESSOR CONTROLS - BACnet COMMUNICATIONS INTERFACE - DEMAND CONTROL VENTILATION (CO2)

REGISTER, GRILLE & DIFFUSER SCHEDULE									
UNIT	DESCRIPTION	CONSTRUCTION	CONFIGURATION		DEFLECTION (deg)	FRAME	FINISH	ACCEPTABLE PRODUCT	NOTES
			PATTERN	BLADE SPACING					
S1	SA REGISTER HEAVY DUTY	STEEL	SINGLE DEFLECTION	19mm, 3/4 in PARALLEL TO LONG DIM	-	SCREW FASTEN TO DUCT	WHITE	EH PRICE #95	WITH DAMPER
S2	SA DIFFUSER CEILING SQUARE CONE	STEEL	4 CONE FIXED AIR PATTERN	-	-	LAY-IN INVERTED T	WHITE	EH PRICE #SCD STEEL	WITH DAMPER
R1	LOUVRE RA GRILLE HEAVY DUTY	STEEL	SINGLE DEFLECTION	19mm, 3/4 in PARALLEL TO LONG DIM	-	SCREW FASTEN TO DUCT	WHITE	EH PRICE #95	WITH DAMPER

EXHAUST FAN (CABINET) SCHEDULE											
UNIT	DESCRIPTION	FAN			DUCT CONN	ELECTRICAL			ACCEPTABLE PRODUCT	NOTES	
		FLOW	ESP	DRIVE		SONES	VOLT (V)	PHASE			POWER (W)
EF-1	EXHAUST FAN	39 L/s 83 CFM	3 mm 0.125 in	DIRECT	2.3	254 x 83 mm 10 x 3.25 in	120	1	39	PENN BARRY #Z3 GREENHECK OR APPROVED EQUAL	DIM - L x W x D - 316 x 232 x 232 mm, 12.5 x 9.125 x 9.125 in GRILLE - 280 x 337 mm, 11 x 13.25 in CONTROL - WALL SWITCH GRILLE - POLYMER, STEEL CAP - WALL, GALV STEEL PAINTED TO MATCH WALL FINISH LINED HOUSING, BACKDRAFT DAMPER
EF-2	EXHAUST FAN	117 L/s 247 CFM	3 mm 0.125 in	DIRECT	2.4	200 x 150 mm 8 x 6 in	120	1	77	PENN BARRY #Z8 GREENHECK OR APPROVED EQUAL	DIM - L x W x D - 352 x 289 x 289 mm, 13.875 x 11.375 x 11.375 in GRILLE - 337 x 378 mm, 13.25 x 14.875 in CONTROL - WALL SWITCH, VARIABLE SPEED GRILLE - WHITE POLYMER, STEEL CAP - WALL, GALV STEEL PAINTED TO MATCH WALL FINISH LINED HOUSING, BACKDRAFT DAMPER

CONDENSING UNIT SCHEDULE													
UNIT	DESCRIPTION	COOLING			SEER	CONNECTIONS		ELECTRICAL		ACCEPTABLE PRODUCT	NOTES		
		EWB (deg F)	OAT (deg F)	TC (Mbtu/hr)		SUCTION (in)	LIQUID (in)	VOLT	PHASE			MCA	MOCP
CU-1	CONDENSING UNIT	67	95	60	17.0	AS REQ'D TO SUIT LINE LENGTH	AS REQ'D TO SUIT LINE LENGTH	208	1	30.1	50	KEEPRITE #CA7	TWO STAGE - LOW AMBIENT COOLING - LONG LINE APPLICATION - COMPRESSOR START ASSIST - CRANKCASE HEATER - EVAPORATOR FREEZE THERMOSTAT - LOW AMBIENT PRESSURE SWITCH - SUPPORT FEET - THERMOSTATIC EXPANSION VALVE - WINTER START CONTROL

NOTES:
1. CONTRACTOR TO VERIFY THAT CONDENSING UNIT SELECTED MATCHES FURNACE AND AIR HANDLING UNITS.



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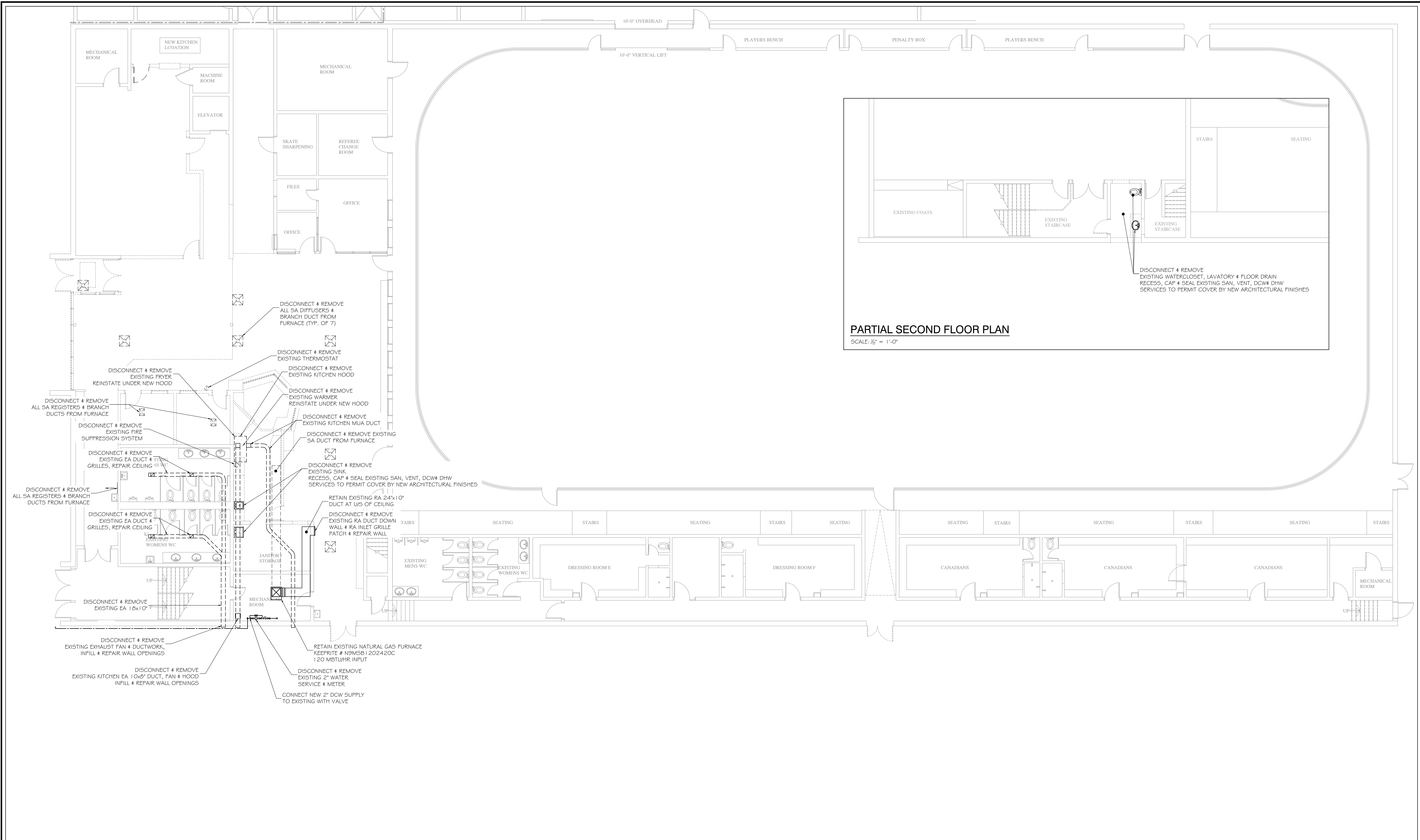
No.	By	Date	Revisions
3	GB	2020-05-01	REVISIONS, FOR TENDER
2	GB	2020-04-01	FOR PERMIT
1	GB	2020-03-23	REVISIONS, FOR REVIEW
0	GB	2020-02-20	FOR REVIEW

MECHANICAL SCHEDULES & DETAILS

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Design:	MM
Drawn:	GB
Approved:	MM
Date:	2020-02-16
Project No.:	9107
Scale:	1/8" = 1'-0"

M002
REV DATE: 9/4/2020



PARTIAL SECOND FLOOR PLAN
SCALE: 1/8" = 1'-0"

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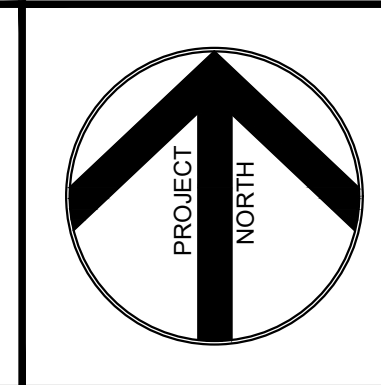
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Project Title: **CARLETON PLACE ARENA ADDITION**
75 Neelin St,
Carleton Place, Ontario

No.	By	Date	Revisions
3	GB	2020-05-01	REVISIONS, FOR TENDER
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1	GB	2020-03-23	REVISIONS, FOR REVIEW
0	GB	2020-02-20	FOR REVIEW

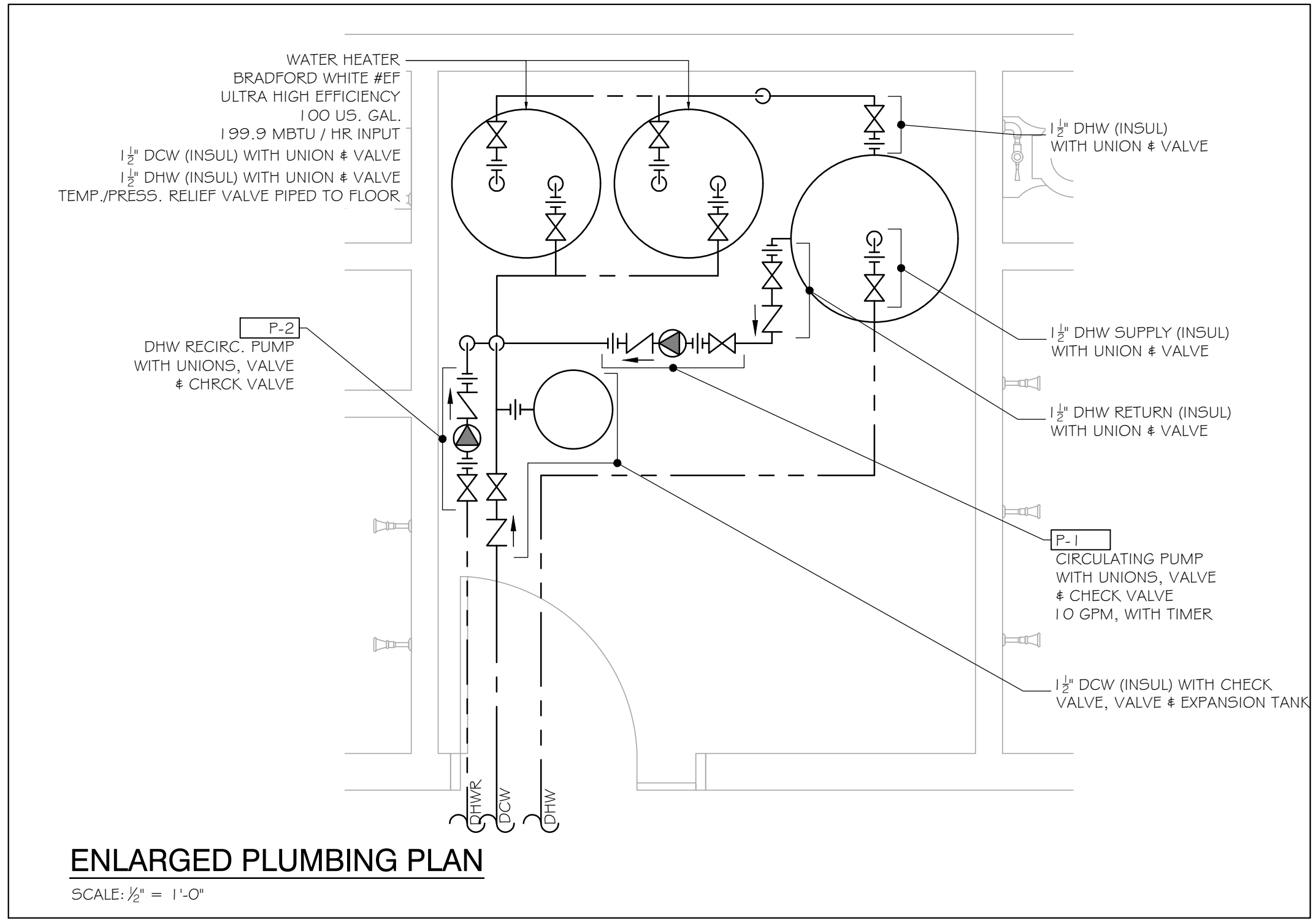
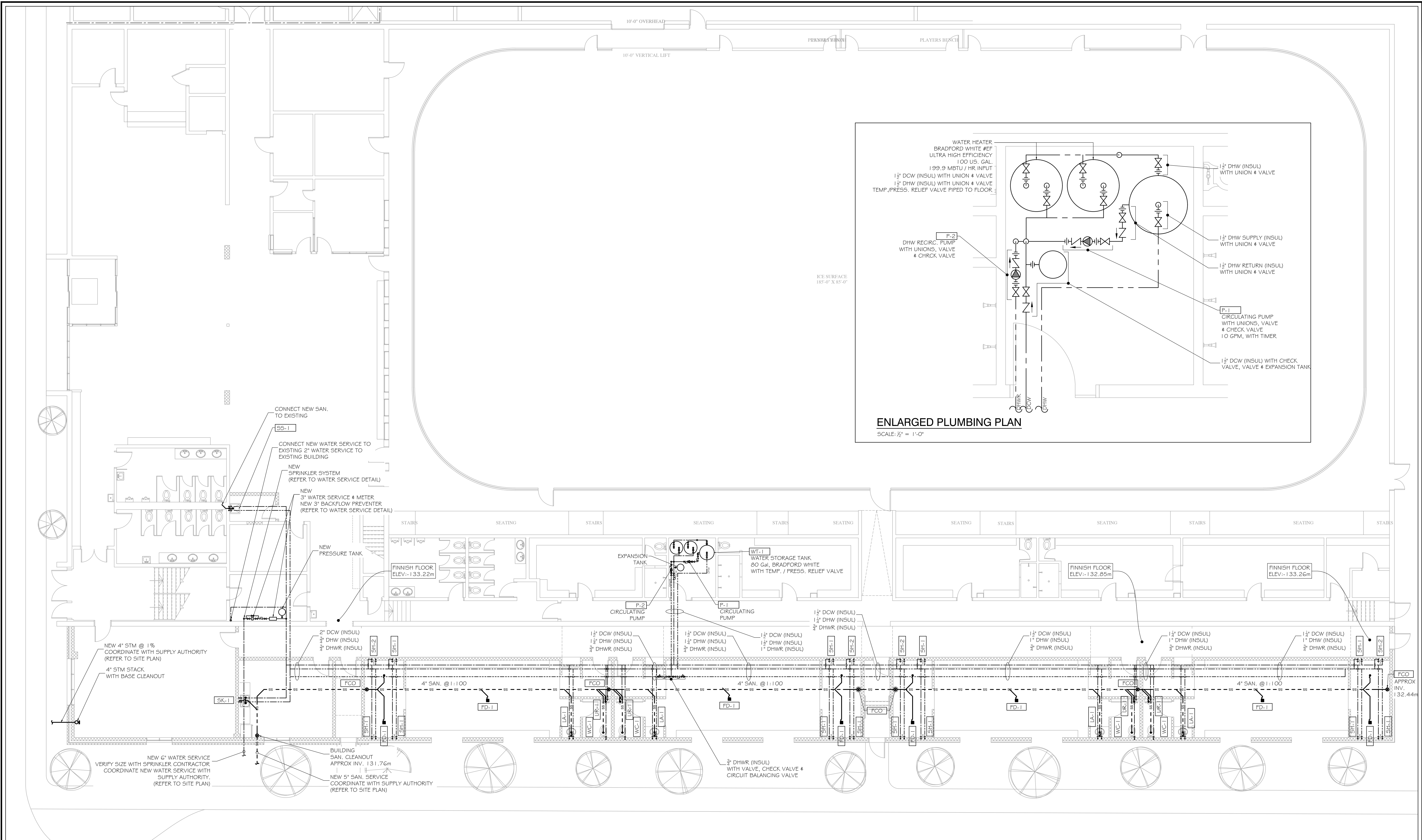
Drawing Title: **MECHANICAL GROUND FLOOR PLAN & SECOND FLOOR PLAN DEMOLITION**

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Design:	MM
Drawn:	GB
Approved:	MM
Date:	2020-02-16
Project No.:	9107
Scale:	1/8" = 1'-0"

M100
REV DATE: 9/4/2020



ENLARGED PLUMBING PLAN
SCALE: 1/2" = 1'-0"

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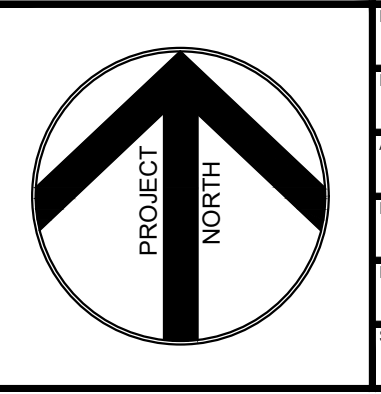
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3	GB	2020-05-01	REVISIONS, FOR TENDER
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1	GB	2020-03-23	REVISIONS, FOR REVIEW
0	GB	2020-02-20	FOR REVIEW

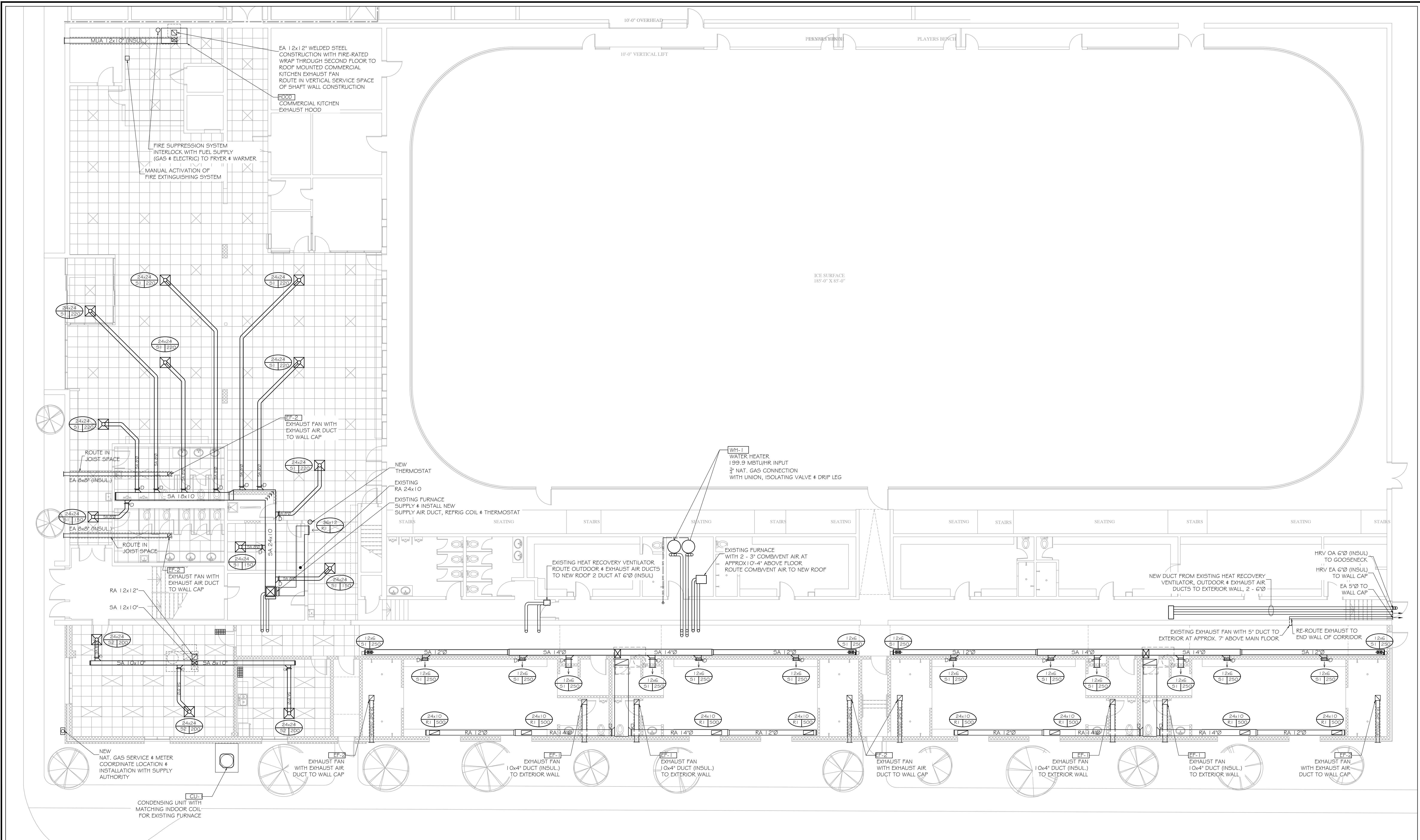
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Design: MM
Drawn: GB
Approved: MM
Date: 2020-02-16
Project No.: 9107
Scale: 1/8" = 1'-0"

M101
REV DATE: 5/4/2020



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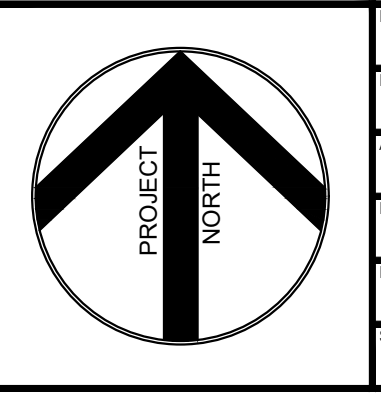
Professional Seal: **M.A. MORRIS**
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No.	By	Date	Revisions
3	GB	2020-05-01	REVISIONS, FOR TENDER
2	GB	2020-04-01	FOR PERMIT
1	GB	2020-03-23	REVISIONS, FOR REVIEW
0	GB	2020-02-20	FOR REVIEW

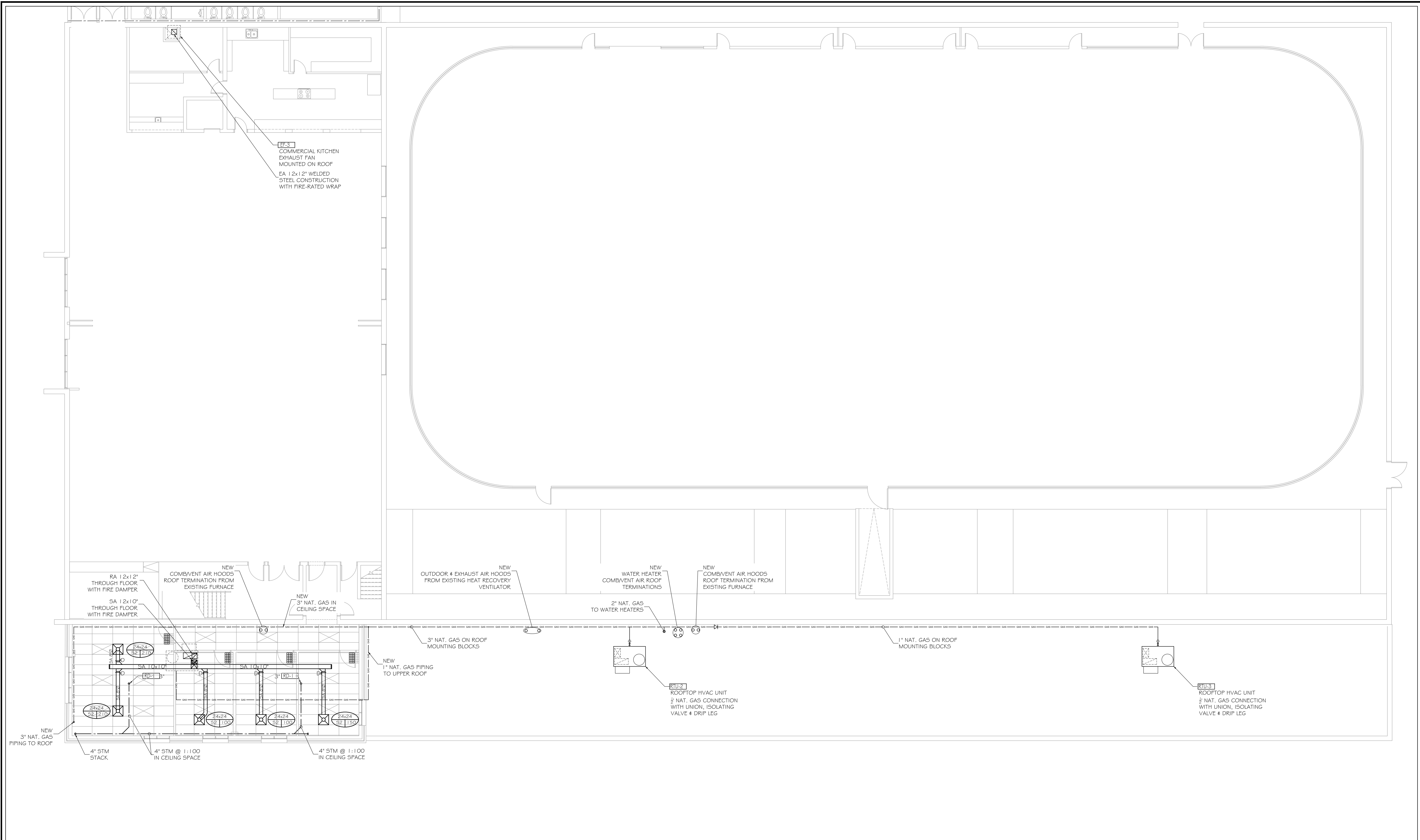
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Design: MM
 Drawn: GB
 Approved: MM
 Date: 2020-02-16
 Project No.: 9107
 Scale: 1/8" = 1'-0"

M102
 REV DATE: 5/4/2020



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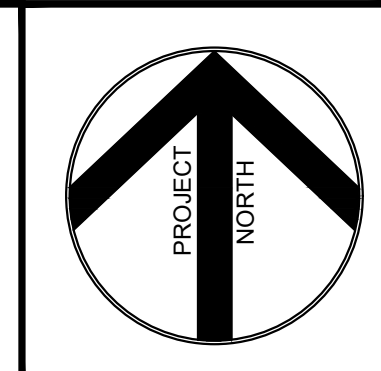
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 Carleton Place, Ontario

No.	By	Date	Revisions
3	GB	2020-05-01	REVISIONS, FOR TENDER
2	GB	2020-04-01	FOR PERMIT
1	GB	2020-03-23	REVISIONS, FOR REVIEW
0	GB	2020-02-20	FOR REVIEW

Drawing Title:
MECHANICAL PLUMBING & HVAC PROPOSED SECOND FLOOR PLAN

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Design:	MM
Drawn:	GB
Approved:	MM
Date:	2020-02-16
Project No.:	9107
Scale:	1/8" = 1'-0"

M103
 REV DATE: 5/4/2020

ELECTRICAL NOTES

ELECTRICAL DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS FOR THIS PROJECT.

- 1 GENERAL:**
- CONFORM WITH APPLICABLE REQUIREMENTS OF THE MINISTRY OF LABOUR, AND THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS
 - DO COMPLETE INSTALLATION IN ACCORDANCE WITH THE FOLLOWING:
 - ONTARIO ELECTRICAL SAFETY CODE;
 - ELECTRICAL SAFETY AUTHORITY;
 - SUBMIT TO ELECTRICAL SAFETY AUTHORITY AND SUPPLY AUTHORITY NECESSARY NUMBER OF DRAWINGS AND SPECIFICATIONS FOR APPROVAL PRIOR TO COMMENCEMENT OF WORK.
 - COORDINATE AND OBTAIN ELECTRICAL SERVICE LAYOUT FROM THE SUPPLY AUTHORITY.
 - PAY ALL ELECTRICAL PERMIT AND INSPECTION FEES.
 - GROUND COMPLETE SYSTEM IN ACCORDANCE WITH THE ONTARIO ELECTRICAL SAFETY CODE AND ELECTRICAL SAFETY AUTHORITY.
 - IDENTIFICATION AND LABELLING:
 - IDENTIFY ELECTRICAL EQUIPMENT WITH LAMICOID NAMEPLATES, INCLUDING AMPERAGE, VOLTAGE, PHASE AND POWER SOURCE.
 - PROVIDE TYPEWRITTEN PANEL DIRECTORIES.
 - PROVIDE ADHESIVE LABEL ON ALL SWITCH, RECEPTACLE AND DEVICE COVER PLATES INDICATING SUPPLY CIRCUIT DESIGNATION.
 - PROVIDE THREE COPIES OF COMPLETE OPERATING AND MAINTENANCE INSTRUCTIONS FOR EQUIPMENT FURNISHED UNDER THIS CONTRACT. BIND INSTRUCTIONS IN 3-RING BINDERS. INCLUDE THE FOLLOWING:
 - SCHEMATIC DIAGRAM OF ELECTRICAL SYSTEMS.
 - CONTROL SHOP DRAWINGS AND OPERATING SEQUENCE INCLUDING WIRING OF COMPONENTS.
 - WIRING DIAGRAM OF CONTROL PANELS.
 - OPERATING INSTRUCTIONS, INCLUDING START-UP AND SHUT-DOWN PROCEDURE.
 - MAINTENANCE INSTRUCTIONS INCLUDING PREVENTIVE MAINTENANCE INSTRUCTIONS FOR COMPONENTS OF THE EQUIPMENT.
 - COMPLETE PARTS LIST OF ASSEMBLIES AND THEIR COMPONENT PARTS, SHOWING MANUFACTURER'S NAME, CATALOGUE NUMBER, AND NEAREST REPLACEMENT SOURCE.
 - LIST OF RECOMMENDED SPARE PARTS AND QUANTITY OF EACH ITEM TO BE STOCKED.
 - MANUFACTURER'S WARRANTIES AND GUARANTEES.
 - CLEAN ALL ELECTRICAL SYSTEMS AT PROJECT COMPLETION.
 - COMPLETE AS-BUILT DRAWINGS SHOWING ALL CHANGES AS WORK PROGRESSES.

- 2 CONTRACTOR QUALIFICATIONS:**
- ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH THE "TRADES QUALIFICATION AND APPRENTICESHIP ACT" AND REGULATIONS, BY PERSONS WHO HOLD THE FOLLOWING CERTIFICATES OF QUALIFICATION (AS APPLICABLE):
 - ELECTRICIAN, CONSTRUCTION & MAINTENANCE.
 - ALL FIRE ALARM SYSTEMS WORK SHALL BE PERFORMED BY PERSONS WHO HOLD ELECTRICIAN QUALIFICATIONS (ABOVE), AND IN ADDITION, WHO HOLD THE FOLLOWING CURRENT REGISTRATION WITH THE CANADIAN FIRE ALARM ASSOCIATION (CFAA):
 - FIRE ALARM TECHNICIAN.
- 3 EXISTING FACILITIES AND DEMOLITION:**
- LOCATE AND PROTECT ALL EXISTING EXTERIOR SITE SERVICES.
 - RETAIN AND PROTECT ALL EXISTING INTERIOR SERVICES AND BUILDING FABRIC. MAKE GOOD ANY AND ALL DAMAGE RESULTING FROM THIS WORK.
 - CONNECTIONS TO EXISTING SERVICES SHALL BE COORDINATED WITH THE OWNER.
 - EXECUTE WORK WITH LEAST POSSIBLE INTERFERENCE OR DISTURBANCE TO NORMAL USE OF THE EXISTING BUILDING.
- 4 FIXTURES AND EQUIPMENT:**
- ALL ALTERNATE PRODUCTS PROPOSED AS "APPROVED EQUALS" SHALL BE SUBMITTED FOR APPROVAL PRIOR TO TENDER CLOSING.
 - PROVIDE SHOP DRAWINGS AND PRODUCT DATA FOR ALL ELECTRICAL FIXTURES AND EQUIPMENT FOR APPROVAL, PRIOR TO PROCUREMENT.
 - INSTALL ALL ELECTRICAL FIXTURES AND EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
 - EQUIPMENT AND MATERIAL TO BE CSA CERTIFIED. WHERE THERE IS NO ALTERNATIVE TO SUPPLYING EQUIPMENT WHICH IS NOT CSA CERTIFIED, OBTAIN SPECIAL APPROVAL FROM ELECTRICAL SAFETY AUTHORITY.

- 5 EQUIPMENT SUPPLIED BY OTHERS:**
- MAKE ALL ELECTRICAL SERVICE CONNECTIONS TO EQUIPMENT SUPPLIED BY OTHERS.
 - CONFIRM ALL SERVICE CONNECTIONS WITH MANUFACTURER AND SUPPLIER, PRIOR TO INSTALLATION. THIS SHALL INCLUDE ALL CONNECTION SIZES, LOCATIONS AND DETAILS, AND SHALL TAKE INTO ACCOUNT EQUIPMENT CLEARANCES AND INSTALLATION REQUIREMENTS.

- 6 CONDUITS:**
- RIGID GALVANIZED STEEL, WITH THREADED FITTINGS, WHERE SUBJECT TO MECHANICAL INJURY, IN SERVICE AREAS ONLY.
 - ELECTRICAL METALLIC TUBING (EMT), HOT DIPPED GALVANIZED STEEL, WITH THREADED CONNECTORS AND COUPLINGS, WHERE NOT SUBJECT TO MECHANICAL INJURY, IN SERVICE AREAS ONLY.
 - RIGID PVC CONDUIT BELOW FLOOR AND IN CORROSIVE AREAS.

- 7 WIRES AND CABLE:**
- VOLTAGE DROP:
 - FEEDER CONDUCTORS SHALL BE SIZED FOR A MAXIMUM VOLTAGE DROP OF 2% AT DESIGN LOAD.
 - BRANCH CIRCUIT CONDUCTORS SHALL BE SIZED FOR A MAXIMUM VOLTAGE DROP OF 3% AT DESIGN LOAD.
 - BUILDING WIRES:
 - COMMERCIAL PROJECTS - IN CONDUIT SYSTEMS TO BE STRANDED COPPER CONDUCTORS FOR 10 AWG AND LARGER, MINIMUM SIZE 12 AWG, TYPE RW90.
 - BUILDING WIRES IN CONCEALED LOCATIONS TO BE COPPER, MINIMUM SIZE 12 AWG, TYPE AC90.
 - ALL WIRING SHALL BE CONCEALED IN WALLS AND CEILINGS, UNLESS OTHERWISE NOTED OR APPROVED.

- 8 DATA AND TELEPHONE:**
- DATA/TELEPHONE:
 - DATA AND TELEPHONE WIRES CAT 6.
 - DATA AND TELEPHONE OUTLETS SHALL BE PROVIDED IN SEPARATE OUTLET BOXES AND SEPARATE CONDUIT.
 - SUPPLY, INSTALL AND TERMINATE DATA AND TELEPHONE OUTLETS, AS FOLLOWS:
 - 1 PORT WALL PLATE - PANDUIT #C611WH;
 - FACE PLATE JACK - PANDUIT #CJSE88TG, 2 COLOURS, COLOURS SELECTED BY OWNER'S IT REPRESENTATIVE;
 - COVER PLATE - LEVITON #80401-W, 2 COLOURS, COLOURS SELECTED BY OWNER'S IT REPRESENTATIVE.
 - SUPPLY, INSTALL AND TERMINATE DATA AND TELEPHONE CABLES IN IT ROOM.

- 9 SERVICE EQUIPMENT:**
- ELECTRICAL SERVICE EQUIPMENT, PANELBOARDS AND DISCONNECT SWITCHES SHALL BE PRODUCT OF ONE MANUFACTURER THROUGHOUT PROJECT - CUTLER-HAMMER, SIEMENS OR SQUARE D.
 - LOW VOLTAGE DRY-TYPE DISTRIBUTION TRANSFORMERS SHALL MEET THE MINIMAL NOMINAL EFFICIENCY LEVELS OF ASHRAE 90.1 (TABLE 8.4.4).
 - CIRCUIT BREAKERS SHALL BE BOLT-ON TYPE.
 - WORKING SPACE ABOUT ELECTRICAL EQUIPMENT SHALL BE PROVIDED IN ACCORDANCE WITH THE ONTARIO ELECTRICAL SAFETY CODE, INCLUDING THE FOLLOWING:
 - WORKING SPACE OF 3'4" (1M) WITH SECURE FOOTING;
 - MINIMUM HEADROOM OF 7'3" (2.2M).
 - SPRINKLERED AREAS: SERVICE EQUIPMENT SHALL BE PROTECTED WITH NON-COMBUSTIBLE HOODS OR SHIELDS.

- 10 WIRING DEVICES:**
- WIRING DEVICES OF ONE MANUFACTURER THROUGHOUT PROJECT - HUBBELL OR LEVITON.
 - COMMERCIAL PROJECTS:
 - OUTLET BOXES:
 - GANG BOXES WHERE WIRING DEVICES ARE GROUPED.
 - BLANK COVER PLATES FOR BOXES WITHOUT WIRING DEVICES.
 - SWITCHES:
 - HEAVY DUTY, 20A/120V;
 - SINGLE POLE, AND THREE-WAY, AS APPLICABLE;
 - COLOUR: SELECTED BY OWNER/ARCHITECT.
 - DUPLEX RECEPTACLES:
 - EXTRA HARD USE, CSA TYPE 5-15-R, 15A/125V;
 - GFI (GROUND FAULT CIRCUIT INTERRUPTER) WITH DETECT AND TRIP ON GROUND FAULT, STATUS INDICATOR LIGHT AND TEST SWITCH;
 - COLOUR: SELECTED BY OWNER/ARCHITECT.
 - COVER PLATES:
 - STAINLESS STEEL.

- 11 LIGHTING:**
- GENERAL LIGHTING:
 - SUPPORT ALL LIGHTING IN ACCORDANCE WITH THE ONTARIO ELECTRICAL SAFETY CODE AND BULLETINS.
 - LIGHT FIXTURES SUPPORTED BY SUSPENDED CEILING SYSTEMS SHALL HAVE ADDITIONAL SUPPORT TO BUILDING STRUCTURE IN ACCORDANCE WITH ONTARIO ELECTRICAL SAFETY CODE BULLETIN #30-4-11.
 - FUNCTIONAL TESTING OF LIGHTING CONTROL, IN ACCORDANCE WITH ASHRAE 90.1 (9.4.3):
 - LIGHTING CONTROL DEVICES AND CONTROL SYSTEMS SHALL BE INSTALLED IN SUCH A MANNER THAT CONTROL HARDWARE AND SOFTWARE ARE CALIBRATED, ADJUSTED, PROGRAMMED, AND IN PROPER WORKING CONDITION IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS AND MANUFACTURER'S INSTALLATION INSTRUCTIONS.
 - EXIT AND EMERGENCY LIGHTING:
 - CONNECT DC CIRCUIT FROM EMERGENCY LIGHT BATTERY PACK TO ALL EXIT AND EMERGENCY LIGHTS.
 - SIZE EMERGENCY LIGHTING POWER PACK TO PROVIDE FULL LOAD POWER FOR 1 HR PERIOD.
 - EMERGENCY LIGHT BATTERY PACKS (UNIT EQUIPMENT) SHALL BE INSTALLED IN SUCH A MANNER THAT IT WILL BE AUTOMATICALLY ACTUATED UPON FAILURE OF THE POWER SUPPLY TO THE NORMAL LIGHTING IN THE AREA COVERED BY THAT UNIT EQUIPMENT PER OESC 46-304(4).

- 12 FIRE ALARM SYSTEM:**
- FIRE ALARM SYSTEM VERIFICATION CONTRACTOR SHALL REVIEW THE DRAWINGS AND SHALL NOTE ALL AREAS OF DEVICE DEFICIENCY, PRIOR TO COMPLETION OF EQUIPMENT AND WIRING ROUGH-IN.**
 - FIRE ALARM SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH CAN/ULC-5524, "INSTALLATION OF FIRE ALARM SYSTEMS".
 - FIRE ALARM SYSTEM SHALL BE VERIFIED IN ACCORDANCE WITH CAN/ULC-5537, "VERIFICATION OF FIRE ALARM SYSTEMS".
 - FIRE ALARM SYSTEM SHALL BE PROVIDED WITH AN EMERGENCY POWER SUPPLY, WITH IMMEDIATE AUTOMATIC TRANSFER, IN ACCORDANCE WITH OBC 3.2.7.8.
 - FIRE ALARM CONTROL AND ANNUNCIATOR PANEL SHALL HAVE SUFFICIENT POWER FOR UP TO 25% ADDITIONAL AUDIBLE DEVICES.

- 13 COMMERCIAL KITCHEN EXHAUST AND FIRE PROTECTION:**
- SYSTEM SHALL BE CONFIGURED FOR COMMERCIAL KITCHEN EXHAUST SYSTEM.
 - DESIGN AND INSTALLATION SHALL CONFORM TO NFPA 96 - STANDARD FOR VENTILATION CONTROL AND FIRE PROTECTION OF COMMERCIAL COOKING OPERATIONS.
 - REFER TO MECHANICAL DRAWINGS FOR ADDITIONAL DETAILS.

- 14 FIRE PROTECTION:**
- REFER TO ARCHITECTURAL DRAWINGS, TO VERIFY LOCATION OF ALL FIRE SEPARATIONS AND FIRE-RATED MEMBRANES.
 - ALL CABLING AND CONDUIT SHALL BE TIGHTLY FITTED AND SEALED WITH FIRESTOPPING MATERIAL AT ALL FIRE SEPARATIONS AND FIRE-RATED MEMBRANES.
 - THE FOLLOWING CONDUCTORS SHALL BE PROTECTED IN ACCORDANCE WITH OBC 3.2.7.10(2), AND SHALL CONFORM TO ULC-5139 "FIRE TEST EVALUATION OF INTEGRITY OF ELECTRICAL CABLES", TO PROVIDE A CIRCUIT INTEGRITY RATING OF NOT LESS THAN 1 HOUR (2 HOUR FOR TALL BUILDINGS OR CONTAINED USE AREAS OR INTERCONNECTED FLOOR SPACES):
 - ELECTRICAL FEEDER CONDUCTORS WHICH SERVE THE HOUSE AND COMMERCIAL ELECTRICAL PANELS;
 - BRANCH CIRCUIT CONDUCTORS WHICH SERVE THE FIRE ALARM SYSTEM;
 - BRANCH CIRCUIT CONDUCTORS WHICH SERVE EXIT AND EMERGENCY LIGHTING.
 - ALL MATERIALS WITHIN THE PLENUM SHALL A FLAME-SPREAD RATING NOT MORE THAN 25 AND A SMOKE DEVELOPED CLASSIFICATION NOT MORE THAN 50.
 - PREPARE MOCK-UPS OF TYPICAL FIRESTOP INSTALLATION OF THE FOLLOWING, FOR REVIEW AND APPROVAL BY THE OWNER, ENGINEER AND MUNICIPAL BUILDING INSPECTOR:
 - CONDUIT AND CABLING - WALL AND CEILING/FLOOR FIRE SEPARATION.
 - ALL FIRESTOP INSTALLATIONS SHALL BE COMPLETED IN ACCORDANCE WITH THE APPROPRIATE PRODUCT INSTALLATION INSTRUCTIONS, AND THE REFERENCED UL/ULC LISTING AND/OR TEST STANDARD.
 - SUPPLY A COPY OF THE PRODUCT INSTALLATION INSTRUCTIONS WITH ULC LISTING AND/OR TEST STANDARD REFERENCE, FOR EACH INSTALLATION.
 - MOCK-UP MAY REMAIN AS PART OF WORK.

- 15 EARTHQUAKE LOAD:**
- ALL ELECTRICAL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE EARTHQUAKE LOAD AND EFFECTS REQUIRED BY THE ONTARIO BUILDING CODE.
 - ELECTRICAL ELEMENTS AND COMPONENTS (FIXTURES, EQUIPMENT, CONDUIT, ETC.), AND THEIR CONNECTIONS TO THE BUILDING SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SMACNA/ANSI SEISMIC RESTRAINT MANUAL OR OTHER GUIDELINE REFERENCED IN THE ONTARIO BUILDING CODE.
 - PROVIDE SHOP DRAWINGS FOR SUPPORT, CONNECTIONS AND SEISMIC RESTRAINT OF ALL ELECTRICAL FIXTURES, EQUIPMENT, AND CONDUIT, INCLUDING, BUT NOT LIMITED TO:
 - SERVICE AND DISTRIBUTION EQUIPMENT;
 - TRANSFORMERS;
 - LIGHT FIXTURES;
 - TYPICAL CONDUIT AND CABLE SUPPORTING SYSTEM.
- THESE SHOP DRAWINGS SHALL BE DESIGNED AND SEALED BY A PROFESSIONAL ENGINEER IN THE PROVINCE OF ONTARIO, WITH EXPERIENCE IN SEISMIC ENGINEERING.
- FOLLOWING PROJECT COMPLETION, SEISMIC ENGINEER SHALL PROVIDE A LETTER OF FINAL SITE REVIEW.
 - CONTRACTOR SHALL CARRY THE COST OF THE SEISMIC ENGINEERING, INCLUDING SITE REVIEWS, DESIGN AND SHOP DRAWING PREPARATION.

- 16 LOAD BALANCE:**
- MEASURE PHASE CURRENT TO PANELBOARDS WITH NORMAL LOADS (LIGHTING) OPERATING AT TIME OF ACCEPTANCE. ADJUST BRANCH CIRCUIT CONNECTIONS AS REQUIRED TO OBTAIN BEST BALANCE OF CURRENT BETWEEN PHASES AND RECORD CHANGES.
 - SUBMIT, AT COMPLETION OF WORK, REPORT LISTING PHASE AND NEUTRAL CURRENTS ON PANELBOARDS, OPERATING UNDER NORMAL LOAD. STATE HOUR AND DATE ON WHICH EACH LOAD WAS MEASURED, AND VOLTAGE AT TIME OF TEST.

- 17 EQUIPMENT SUPPORT:**
- ALL ELECTRICAL EQUIPMENT, CONDUIT, WIRING, LIGHTING, DEVICES, AND RELATED ITEMS SHALL BE SECURELY SUPPORTED, ATTACHED AND FASTENED TO BUILDING STRUCTURE.
 - HANGERS AND SUPPORTS SHALL BE FABRICATED AND INSTALLED IN ACCORDANCE WITH MSS STANDARD SP-58, PIPE HANGERS AND SUPPORTS - MATERIALS, DESIGN, MANUFACTURE, SELECTION, APPLICATION, AND INSTALLATION.
 - PLATFORMS SHALL BE FABRICATED FROM STRUCTURAL GRADE STEEL MEETING THE REQUIREMENTS OF THE ONTARIO BUILDING CODE, INCLUDING CSA STANDARD W59 WELDED STEEL CONSTRUCTION, AND THE REQUIREMENTS OF THE CANADIAN WELDING BUREAU.

- 18 COORDINATION:**
- INFORMATION INVOLVING ACCURATE DIMENSIONING OF THE BUILDING SHALL BE TAKEN FROM SITE BY CONTRACTOR.
 - DRAWINGS ARE IN DIAGRAMMATIC FORM, INTENDED TO CONVEY THE SCOPE OF WORK AND GENERAL ARRANGEMENT FOR EQUIPMENT. COORDINATE PHYSICAL LOCATION OF ALL EQUIPMENT WITH OTHER TRADES AND ALLOW FOR ANY ADDITIONAL CONDUIT, WIRING, FITTINGS, SUPPORTS, ETC., IN ORDER TO AVOID INTERFERENCE AND FACILITATE THE WORK.
 - CONTRACTOR TO MAKE ANY NECESSARY MODIFICATIONS OR ADDITIONS, WITHOUT CHARGE, TO ACCOMMODATE SITE CONDITIONS AND COORDINATION.
 - COORDINATE AND VERIFY ALL ELECTRICAL BRANCH CIRCUIT REQUIREMENTS FOR EQUIPMENT SUPPLIED BY OTHERS, PRIOR TO MATERIAL PROCUREMENT OR INSTALLATION.
 - PROVIDE ALL WIRING TO ALL MECHANICAL EQUIPMENT, INCLUDING WIRING BELOW 50V. COORDINATE ALL MECHANICAL EQUIPMENT WIRING WITH MECHANICAL TRADES.
 - ALL DEVICE AND OUTLET LOCATIONS SHALL BE CAREFULLY COORDINATED WITH THE GENERAL CONTRACTOR OR OWNER, TO ACCOMMODATE ALL FEATURES, INCLUDING PLUMBING FIXTURES, EQUIPMENT AND MILLWORK.

- 19 START-UP, COMMISSIONING AND TRAINING:**
- START-UP AND COMMISSION THE FOLLOWING SYSTEMS:
 - ELECTRICAL SERVICE EQUIPMENT;
 - GENERAL LIGHTING;
 - EXIT AND EMERGENCY LIGHTING;
 - FIRE ALARM.
 - PERFORM SYSTEMATIC TESTS, PROCEDURES AND CHECKS ON SYSTEMS, AS FOLLOWS:
 - TO VERIFY OPERATION IN ACCORDANCE WITH CONTRACT DOCUMENTS, DESIGN CRITERIA AND INTENT, AND MANUFACTURER'S REQUIREMENTS.
 - TO ENSURE APPROPRIATE DOCUMENTATION IS PROVIDED;
 - TO EFFECTIVELY TRAIN BUILDING OPERATIONAL STAFF.
 - SYSTEMS ARE TO BE OPERATED AT FULL CAPACITY, WITH CORRECTION OF ALL DEFICIENCIES AND ADJUSTMENTS TO MEET OPTIMUM PERFORMANCE.
 - PROVIDE WRITTEN REPORT AT END OF COMMISSIONING OUTLINING EQUIPMENT OPERATIONAL CONDITIONS AND PARAMETERS.

ELECTRICAL LEGEND

NOTE: HEIGHT IS FROM FINISHED FLOOR TO CENTRE LINE OF EQUIPMENT, UNLESS OTHERWISE NOTED. HEIGHT

DESIGNATIONS

GFCI	GROUND FAULT CIRCUIT INTERRUPTER	
AFCI	ARC FAULT CIRCUIT INTERRUPTER	
AC	ABOVE COUNTER	
AFP	ABOVE FINISHED FLOOR	
WP	WEATHERPROOF	

DISTRIBUTION

	DISTRIBUTION PANEL	72"/1825mm (TOP)
	SINGLE POLE TOGGLE SWITCH - 20A/120V	35.5" / 900mm
	3-WAY TOGGLE SWITCH - 20A/120V	TO
	MOTION SENSOR CONTROL - (SWITCH)	43.3 / 1100mm
	MOTION SENSOR CONTROL - (CEILING)	
	DUPLEX RECEPTACLE (WALL) - 15A/120V	12"/300mm
	DUPLEX RECEPTACLE (SPLIT) - 15A/120V	12"/300mm
	DUPLEX RECEPTACLE (1/2 SWITCH) - 15A/120V	12"/300mm
	NON-STANDARD RECEPTACLE	AS NOTED
	DIRECT EQUIPMENT CONNECTION	AS NOTED
	NON-FUSED DISCONNECT SWITCH	54"/1370mm
	FUSED DISCONNECT SWITCH	54"/1370mm
	MOTOR STARTER	
	BRANCH CIRCUIT	
	BRANCH CIRCUIT, SWITCHED	
	BRANCH CIRCUIT, HOMERUNS TO PANEL	

LIGHTING

	FLUORESCENT LIGHT FIXTURE - RECESSED	
	FLUORESCENT LIGHT FIXTURE - SURFACE	
	LIGHT FIXTURE - FLUORESCENT	
	H - HIGH INTENSITY DISCHARGE	
	L - LED	

DATA COMMUNICATIONS

	TELEPHONE OUTLET (WALL)	12"/300mm
	TELEPHONE OUTLET (FLOOR)	
	DATA OUTLET (WALL)	12"/300mm
	DATA OUTLET (FLOOR)	
	DATA & TELEPHONE OUTLET (WALL)	12"/300mm

EXIT & EMERGENCY LIGHTING

	EXIT LIGHT, SURFACE MOUNTED, SINGLE FACE	90"/2300mm
	COMBINATION EXIT & EMERGENCY LIGHT	
	EMERGENCY LIGHT, BATTERY PACK	90"/2300mm
	EMERGENCY LIGHT, DOUBLE REMOTE	90"/2300mm
	EMERGENCY LIGHT, SINGLE REMOTE	90"/2300mm

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Professional Seal

Project Title:
CARLETON PLACE ARENA ADDITION
 75 Neelin St,
 Carleton Place, Ontario

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Approved:	MM
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E001
 REV DATE: 9/4/2020

ELECTRICAL LOAD CALCULATION

CARLETON PLACE ARENA ADDITION
Carleton Place, Ontario

MAIN SERVICE:						
BASIC LOAD - OTHER	AREA (sq.ft.)	AREA (sq.m.)	BASIC LOAD (W/sq.m.)	DEMAND FACTOR	TOTAL LOAD (W)	
OVERALL	5911	549				
GROUND FLOOR:						
- OFFICE	1173	109	50	0.90	4904	
- COMMERCIAL	4738	440	10	1.00	4402	
SECOND FLOOR:						
- OFFICE	1334	124	50	0.90	5577	
SPECIAL LOADS						
QTY	LOAD (W)	LOAD (Amp)	VOLTAGE (V)	PHASE FACTOR	DEMAND FACTOR	TOTAL LOAD (W)
AIR CONDITIONING:						
- RTU-1	1	14	208	1.73	1.00	5038
- RTU-2	1	26	208	1.73	1.00	9356
- RTU-3	1	26	208	1.73	1.25	11895
TOTAL LOAD:						
TOTAL LOAD					(W)	40971
AMPERAGE	VOLTAGE (V)	PHASE FACTOR			(A)	114
MAIN SERVICE SIZE (DE-RATED TO 80%)					(A)	142

NOTES:
1. ELECTRICAL LOAD CALCULATION IS BASED ON THE CALCULATION PROCEDURES FOR MINIMUM CIRCUIT AMPACITY OF THE SERVICE, AS OUTLINED IN THE ONTARIO ELECTRICAL SAFETY CODE, SECTION 8, SERVICE AND FEEDERS.

EXIT & EMERGENCY LIGHT FIXTURE SCHEDULE

UNIT	DESCRIPTION	LAMP	HOUSING COLOUR	VOLTAGE	ACCEPTABLE PRODUCT	NOTES
E1	EXIT LIGHT WITH WIRE GUARD	LED	WHITE	120VAC 12 VDC	EMERGI-LITE #EA PREMISE	EXTRUDED ALUMINUM HOUSING AND FACE PLATE GREEN PICTOGRAM DIRECTION ARROW (WHERE REQUIRED) END OR CEILING MOUNTED
E2	EXIT AND EMERGENCY LIGHT COMBINATION UNIT BATTERY PACK 2 LAMPHEADS WITH WIRE GUARD	2x6W LED	OFF-WHITE ALUMINUM	120VAC IN 12VDC OUT	EMERGI-LITE #EAC PREMISE	LONG LIFE SEALED LEAD LED EXIT PUSH TO TEST SWITCH AC "ON" PILOT LIGHT GREEN PICTOGRAM EXIT SIGN DIRECTION ARROW (WHERE REQUIRED)
EL1	EMERGENCY LIGHT BATTERY PACK WITH 2 LAMPHEADS WITH WIRE GUARD	2x6W LED	OFF-WHITE STEEL	120VAC IN 12VDC OUT	EMERGI-LITE #ESL PREMISE	LONG LIFE SEALED LEAD AC LINE CORD PUSH TO TEST SWITCH AC "ON" PILOT LIGHT
EL2	EMERGENCY LIGHT DOUBLE REMOTE HEAD WITH WIRE GUARD	2x6W LED	OFF-WHITE	12VDC	EMERGI-LITE #EF9D PREMISE	
EL3	EMERGENCY LIGHT SINGLE REMOTE HEAD WITH WIRE GUARD	1x6W LED	OFF-WHITE	12VDC	EMERGI-LITE #EF9 PREMISE	

ELECTRICAL PANEL 'P-1'

Location: CORRIDOR	Mounting: SURFACE MOUNTED
Rated Amp: 200	Mains Amp: 200
Voltage: 120/208	Phase: 3

Load		Description		Breaker		Breaker		Description		Load	
Watts	Description	Amp	Pole	No.	Amp	Pole	No.	Description	Description	Watts	
600	15F4	15	1	1	2	1	15	SPARE			
500	9F2,F3,EF	15	1	3	4	1	15	LIGHTS - DRESSING RM A	9F2,F3,EF	500	
500	9F2,F3,EF	15	1	5	6	1	15	LIGHTS - CHANGE ROOM	9F2,F3,EF	500	
400	8P2,2F4	15	1	7	8	1	15	LIGHTS - CORRIDOR	10F2	400	
320	8F4	15	1	9	10	1	15	LIGHTS - SEC FLR OFFICE, CORRIDOR	7F4	280	
800	4REC	15	1	11	12	1	15	RECEP - MEETING RM	3REC	600	
600	3REC	15	1	13	14	1	15	RECEP - STAFF RM REFRIG	REC REF	250	
600	3REC	15	1	15	16	1	15	RECEP - STAFF RM COUNTER	REC	250	
600	3REC	15	1	17	18	1	15	RECEP - STAFF RM COUNTER	REC	250	
600	3REC	15	1	19	20	1	15	RECEP - CORRIDOR	4REC	800	
800	4REC	15	1	21	22	1	15	RECEP - CORRIDOR	4REC	800	
800	4REC	15	1	23	24	1	15	RECEP - AT ROOFTOP H/A/C UNITS	3REC	600	
1000	5REC	15	1	25	26	1	15	SPARE			
				27	28						
				29	30						
				31	32						
				33	34						
				35	36						
				37	38						
				39	40	1	15	ELECTRIC UNIT HEATER	EUH-1	1500	
				41	42						
				43	44	1	15	ELECTRIC UNIT HEATER	EUH-1	1500	
6240	CU-1 (VERIFY)	50	3	45	46			CONDENSING UNIT			
				47	48	1	15	DHW RECIRC. PUMP	P-1	150	
5000	RTU-1 (VERIFY)	50	3	49	50	1	15	DHW RECIRC. PUMP	P-2	150	
				51	52	1	15	WATER HEATER	WH-1	150	
				53	54	1	15	WATER HEATER	WH-2	150	
10000	RTU-2 (VERIFY)	50	3	55	56	3	50	ROOFTOP UNIT	RTU-3	10000	
				57	58						
				59	60						
29.36	KW							CONNECTED LOAD	KW	18.83	
								TOTAL CONNECTED LOAD	KW	48.19	

NOTES:
1. DEVICE QUANTITIES ARE APPROXIMATE
2. DEVICES SHOWN ON FLOOR PLANS SHALL SUPERSEDE.
3. PROVIDE NEW PANEL LABEL AND TYPEWRITTEN CIRCUITING LEGEND.
4. EQUIPMENT SHALL BE SIEMENS, SQUARE D OR CUTLER-HAMMER.
5. PANEL SHALL BE COMPLETE WITH BOLT-ON BREAKERS, LOCKABLE DOOR, AND TRIM.
6. ELECTRICAL REQUIREMENTS FOR EQUIPMENT SUPPLIED BY OTHERS ARE APPROXIMATE.
7. COORDINATE ALL EQUIPMENT WIRING WITH OTHER TRADES.

LIGHTING CONTROL SCHEDULE

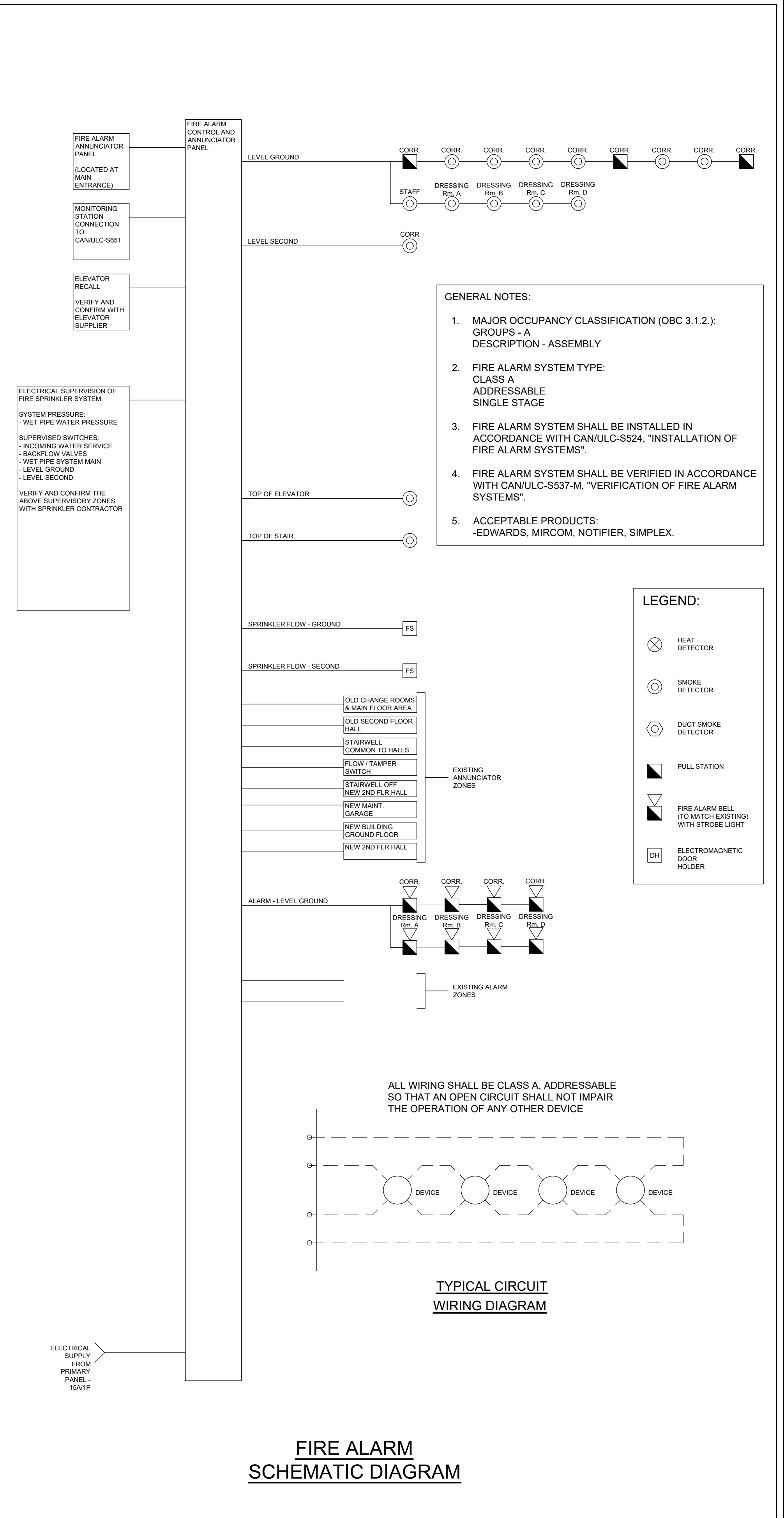
UNIT	DESCRIPTION	ELECTRICAL	ACCEPTABLE PRODUCT	NOTES
	MOTION SENSOR WALL SWITCH		LEVITON #OSSMT-MAW	PASSIVE INFRARED (PIR) AND ULTRASONIC (U/S) 120-240-347 VAC
	MOTION SENSOR CEILING MOUNTED		LEVITON #OSC05-MOW (500 SF) #OSC10-MOW (1,000 SF) #OSC20-MOW (2,000 SF)	PASSIVE INFRARED (PIR) AND ULTRASONIC (U/S) 24 VDC INFRARED SENSITIVITY, ULTRASONIC SENSITIVITY AND TIME DELAY CONTROL POWER PACK AS REQUIRED

LIGHT FIXTURE SCHEDULE

UNIT	DESCRIPTION	NOM. DIMN	LAMP	LENS	WATTS	MEAN LUMENS	VOLTAGE	ACCEPTABLE PRODUCT	NOTES
F1	FLUORESCENT SURFACE	3"x48"	LED	ACRYLIC	36	4500	120	BJ TAKE #BLSP PREMISE OR APPROVED EQUAL	
F2	FLUORESCENT SURFACE	3"x48"	LED	ACRYLIC WIRE	36	4500	120	BJ TAKE #BLSP PREMISE OR APPROVED EQUAL	WIRE GUARD
F3	FLUORESCENT SURFACE	5"x48"	LED	CLEAR POLYCARB LENS	36	4500	120	BJ TAKE #BLVN PREMISE OR APPROVED EQUAL	WET LOCATIONS
F4	FLUORESCENT RECESSED	24"x48"	LED	SMOOTH ACRYLIC LENS	37	4000	120	BJ TAKE #BLR PREMISE OR APPROVED EQUAL	
F5	FLUORESCENT RECESSED	24"x24"	LED	SMOOTH ACRYLIC LENS	37	4000	120	BJ TAKE #BLR PREMISE OR APPROVED EQUAL	
L1	WALL PACK LED	5"x2.5"x5"H	11W LED		11	663	120	ACCULITE #MSL2 OR APPROVED EQUAL	WITH PHOTOCONTROL

ELECTRIC HEATER SCHEDULE

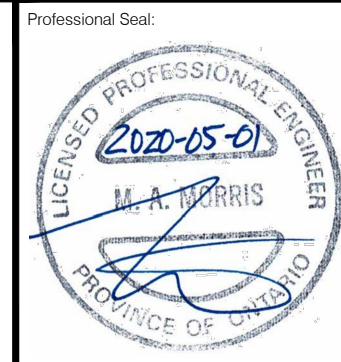
UNIT	DESCRIPTION	FAN CFM	DIMN	ELECTRICAL			ACCEPTABLE PRODUCT	NOTES
				WATTS	VOLT	PHASE		
EUH-1	FAN FORCED HEATER COMMERCIAL GRADE	160	16.75W 21.5H	1500	208	1	DIMPLEX #RFI STELPRO OR APPROVED EQUAL	WHITE CONTROL: - BUILT-IN TSTAT SURFACE MOUNT BOX



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CARLETON PLACE ARENA ADDITION
75 Neelin St.
Carleton Place, Ontario

No.	By	Date	Revisions
3	GB	2020-05-01	REVISIONS, FOR TENDER
2	GB	2020-04-01	FOR PERMIT
1	GB	2020-03-23	REVISIONS, FOR REVIEW
0	GB	2020-02-20	FOR REVIEW

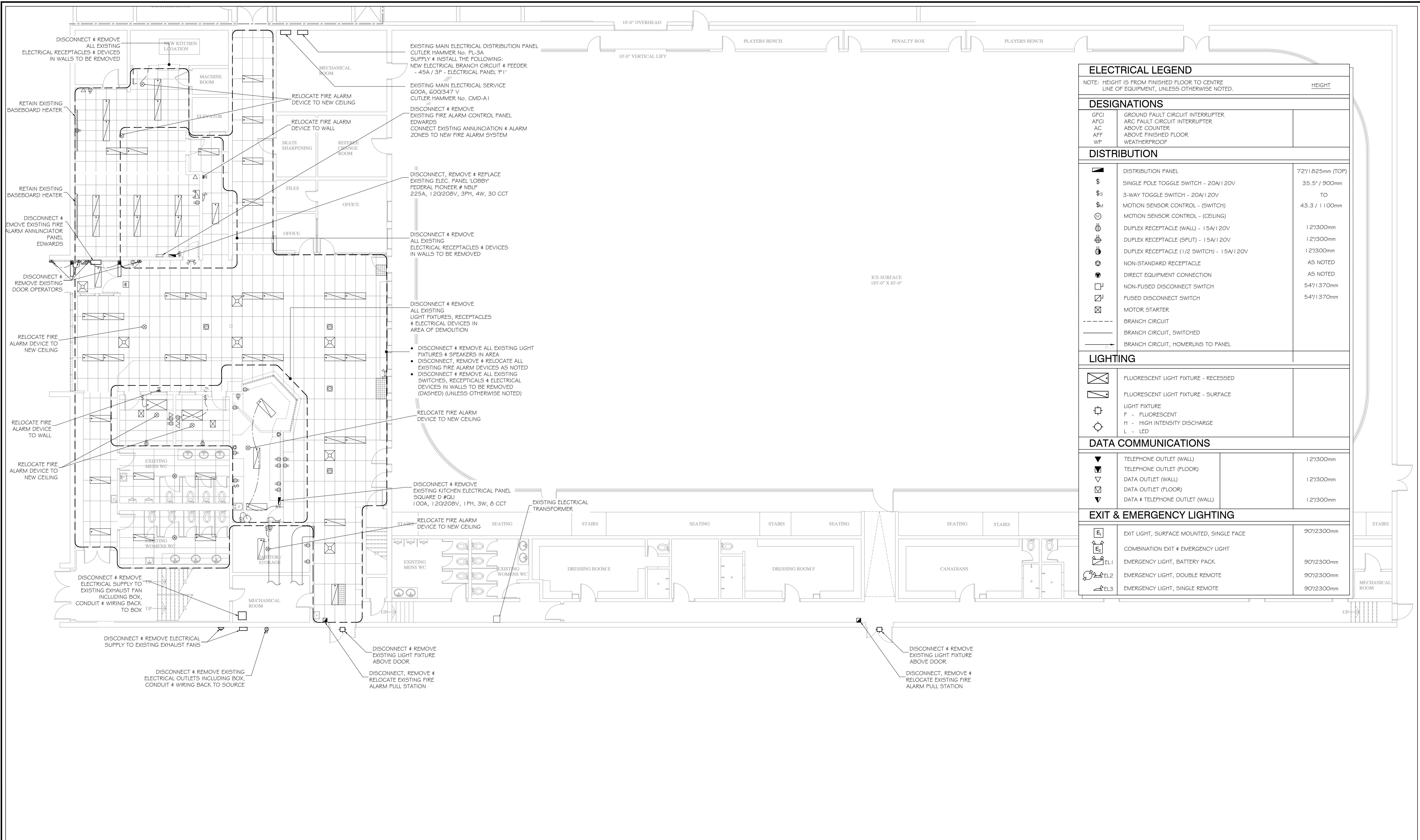
ELECTRICAL SCHEDULES, PANELS & DETAILS

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Drawn:	GB
Approved:	MM
Date:	2020-02-16
Project No.:	9107
Scale:	1/8" = 1'-0"

E002

REV DATE: 9/4/2020



ELECTRICAL LEGEND		
NOTE: HEIGHT IS FROM FINISHED FLOOR TO CENTRE LINE OF EQUIPMENT, UNLESS OTHERWISE NOTED.		HEIGHT
DESIGNATIONS		
GFCI	GROUND FAULT CIRCUIT INTERRUPTER	
AFCI	ARC FAULT CIRCUIT INTERRUPTER	
AC	ABOVE COUNTER	
AFF	ABOVE FINISHED FLOOR	
WP	WEATHERPROOF	
DISTRIBUTION		
■	DISTRIBUTION PANEL	72" / 1825mm (TOP)
⌚	SINGLE POLE TOGGLE SWITCH - 20A / 120V	35.5" / 900mm
⌚	3-WAY TOGGLE SWITCH - 20A / 120V	TO
⌚	MOTION SENSOR CONTROL - (SWITCH)	43.3" / 1100mm
⌚	MOTION SENSOR CONTROL - (CEILING)	
⌚	DUPLEX RECEPTACLE (WALL) - 15A / 120V	12" / 300mm
⌚	DUPLEX RECEPTACLE (SPLIT) - 15A / 120V	12" / 300mm
⌚	DUPLEX RECEPTACLE (1/2 SWITCH) - 15A / 120V	12" / 300mm
⌚	NON-STANDARD RECEPTACLE	AS NOTED
⌚	DIRECT EQUIPMENT CONNECTION	AS NOTED
⌚	NON-FUSED DISCONNECT SWITCH	54" / 1370mm
⌚	FUSED DISCONNECT SWITCH	54" / 1370mm
⌚	MOTOR STARTER	
---	BRANCH CIRCUIT	
---	BRANCH CIRCUIT, SWITCHED	
---	BRANCH CIRCUIT, HOMERUNS TO PANEL	
LIGHTING		
⌚	FLUORESCENT LIGHT FIXTURE - RECESSED	
⌚	FLUORESCENT LIGHT FIXTURE - SURFACE	
⌚	LIGHT FIXTURE	
F	FLUORESCENT	
H	HIGH INTENSITY DISCHARGE	
L	LED	
DATA COMMUNICATIONS		
▼	TELEPHONE OUTLET (WALL)	12" / 300mm
▼	TELEPHONE OUTLET (FLOOR)	
▼	DATA OUTLET (WALL)	12" / 300mm
▼	DATA OUTLET (FLOOR)	
▼	DATA + TELEPHONE OUTLET (WALL)	12" / 300mm
EXIT & EMERGENCY LIGHTING		
E1	EXIT LIGHT, SURFACE MOUNTED, SINGLE FACE	90" / 2300mm
E2	COMBINATION EXIT + EMERGENCY LIGHT	
E1	EMERGENCY LIGHT, BATTERY PACK	90" / 2300mm
E2	EMERGENCY LIGHT, DOUBLE REMOTE	90" / 2300mm
E3	EMERGENCY LIGHT, SINGLE REMOTE	90" / 2300mm

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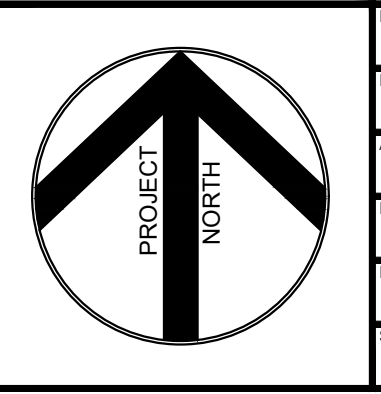
Professional Seal: **M.A. MORRIS**
 2020-05-01
 LICENSED PROFESSIONAL ENGINEER
 PROVINCE OF ONTARIO

Project Title: **CARLETON PLACE ARENA ADDITION**
 75 Neelin St.
 Carleton Place, Ontario

No.	By	Date	Revisions
3	GB	2020-05-01	REVISIONS, FOR TENDER
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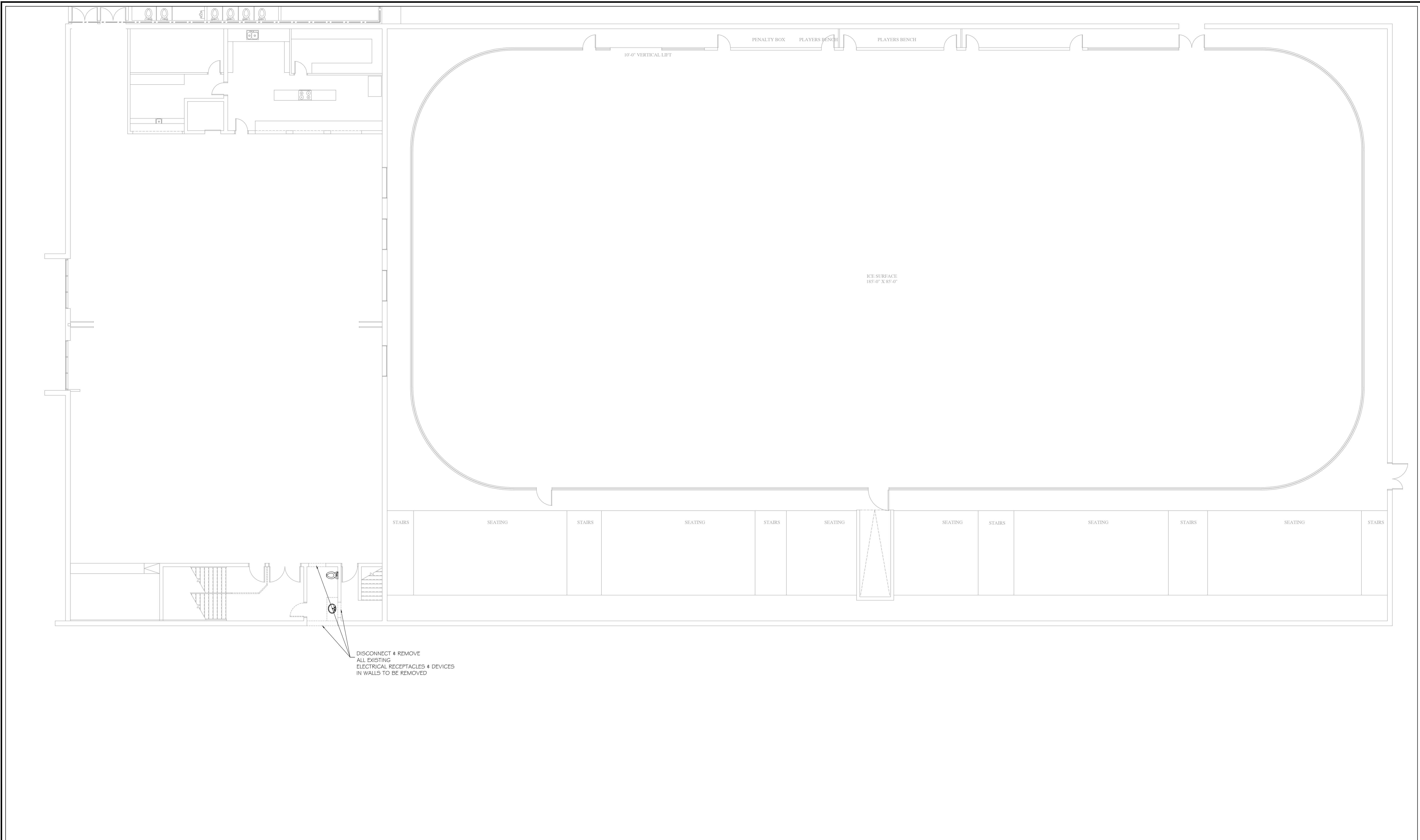
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Design:	MM
Drawn:	GB
Approved:	MM
Date:	2020-02-16
Project No.:	9107
Scale:	1/8" = 1'-0"

E100
 REV DATE: 9/4/2020



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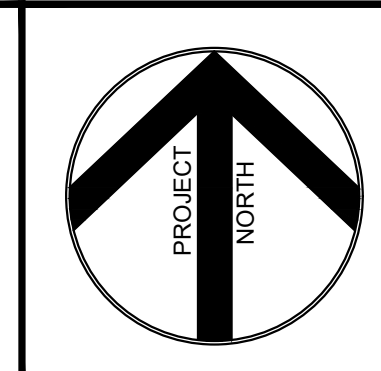
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 M.A. PARIS
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Project Title:
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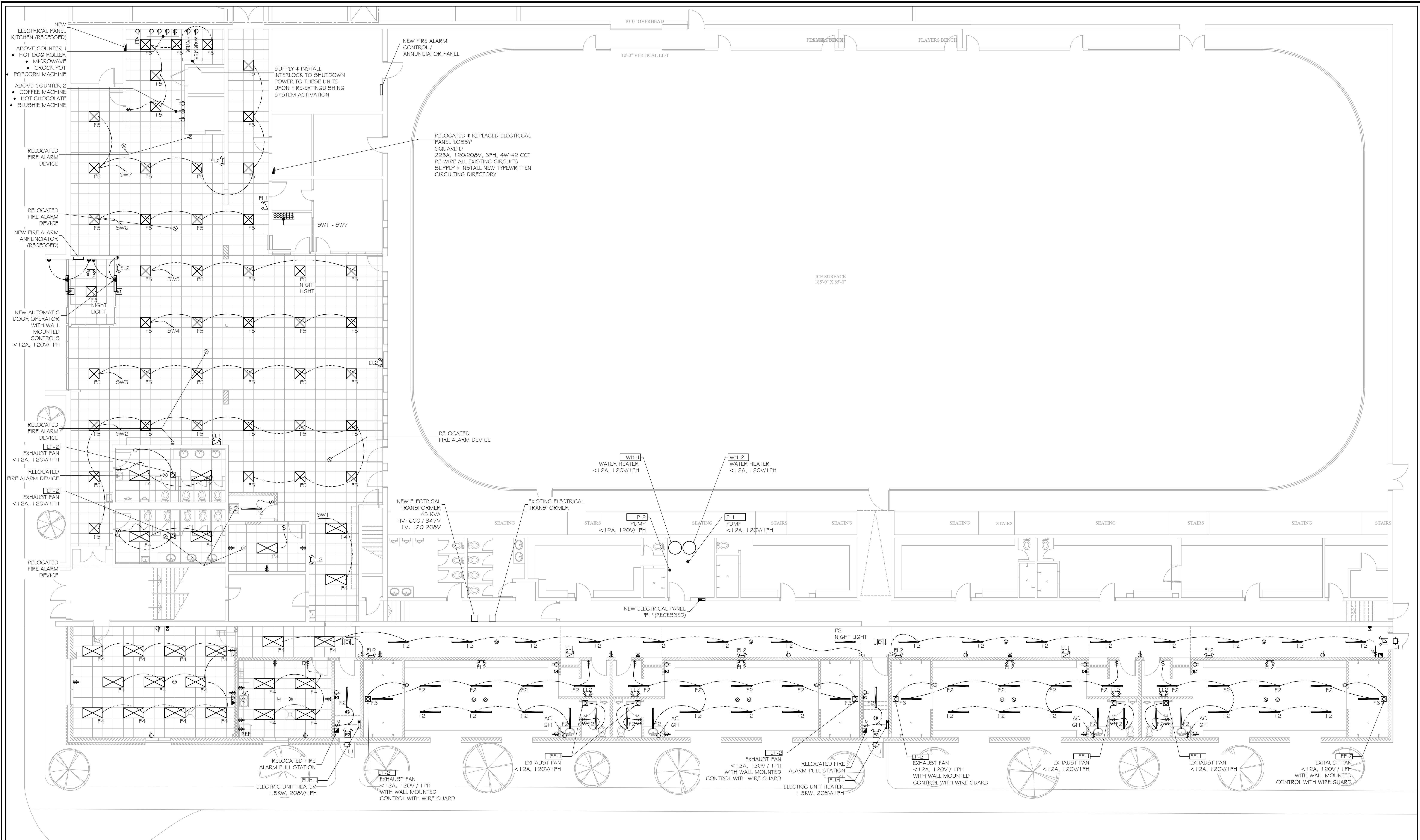
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Design:	MM
Drawn:	GB
Approved:	MM
Date:	2020-02-16
Project No.:	9107
Scale:	1/8" = 1'-0"

Drawing No.: **E101**
 REV DATE: 5/4/2020



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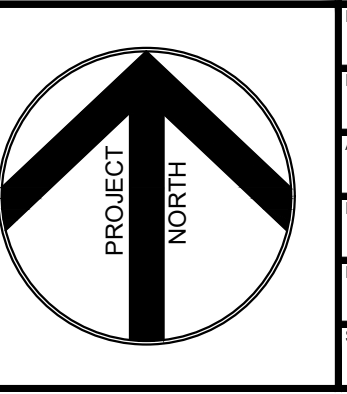
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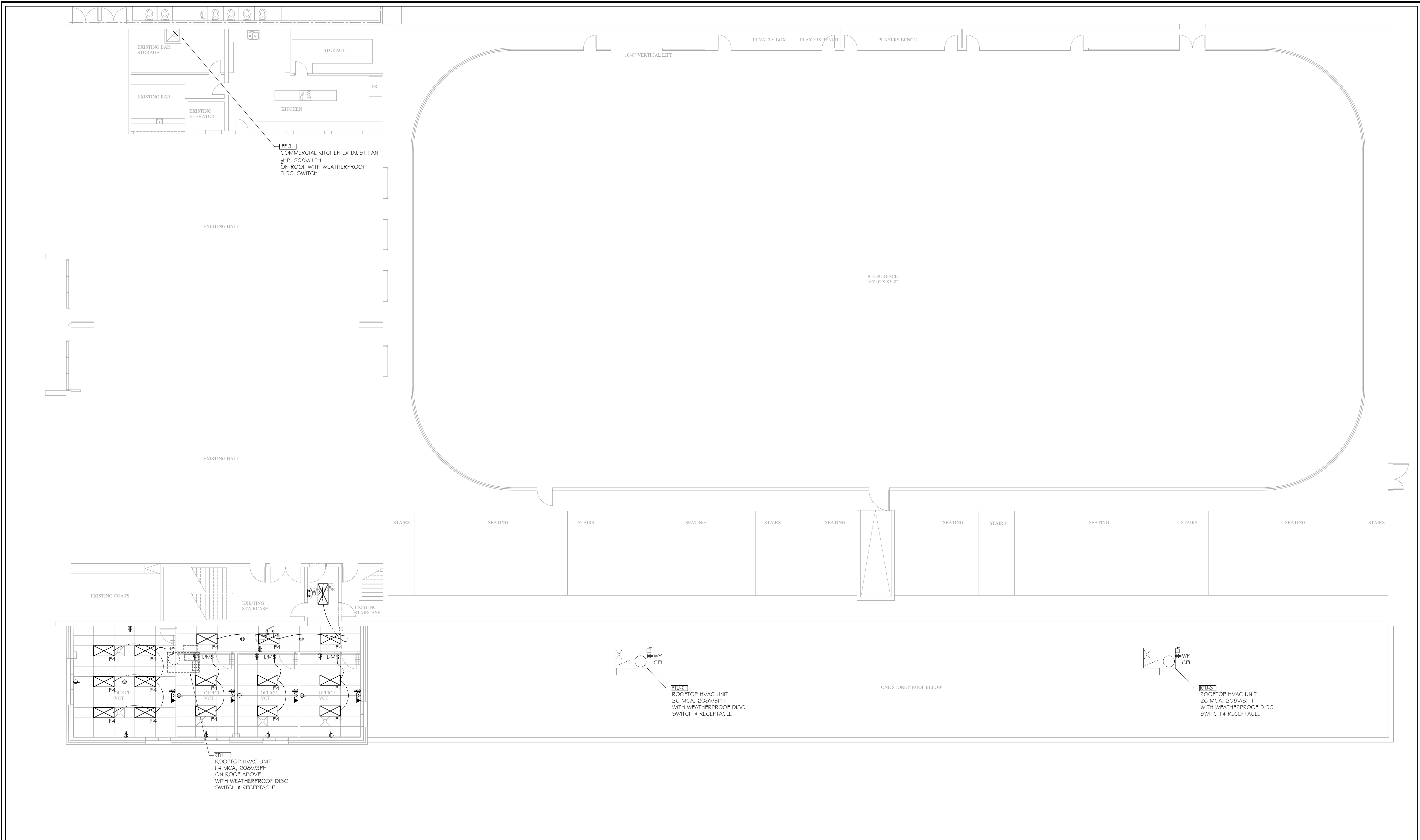
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Design: MM
 Drawn: GB
 Approved: MM
 Date: 2020-02-16
 Project No.: 9107
 Scale: 1/8" = 1'-0"

E102
 REV DATE: 5/4/2020



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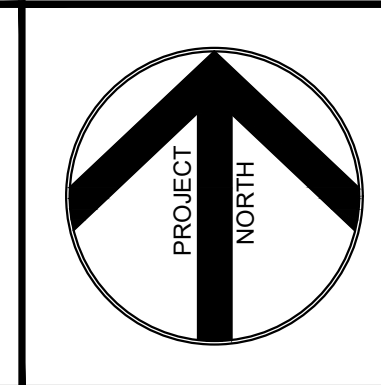
 M.A. HARRIS
 202-05-0
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Project Title:
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0	GB	2020-02-20	FOR REVIEW

Drawing Title:
ELECTRICAL PROPOSED SECOND FLOOR PLAN

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Design: MM
 Drawn: GB
 Approved: MM
 Date: 2020-02-16
 Project No.: 9107
 Scale: 1/8" = 1'-0"

Drawing No.: **E103**
 REV DATE: 5/4/2020