

MECHANICAL SPECIFICATION

- SCOPE OF WORK:
 - PROVIDE LABOUR, EQUIPMENT AND SERVICES NECESSARY TO PROPERLY COMPLETE THE MECHANICAL WORK INDICATED ON DRAWINGS.
- PERMITS AND FEES:
 - OBTAIN AND PAY FOR PERMITS AND FEES NECESSARY FOR THE EXECUTION OF THE MECHANICAL WORK. CONFORM TO ALL APPLICABLE CODES AND BY-LAWS. OBTAIN CERTIFICATES OF ACCEPTANCE FROM ALL THE INSPECTION AUTHORITIES.
- SITE VISIT:
 - ACQUIRE FULL WORKING KNOWLEDGE OF BUILDING SITE AND ANY EXISTING CONDITIONS WHICH MAY AFFECT THE WORK. VISIT SITE PRIOR TO TENDER SUBMISSION.
- PROTECTION:
 - TAKE PRECAUTIONS TO PROTECT THE OCCUPANTS AND BUILDING FROM INJURY OR DAMAGE DUE TO CONSTRUCTION ACTIVITIES.
- CONTRACT DRAWINGS:
 - CONTRACT DRAWINGS FOR MECHANICAL WORK ARE IN PART DIAGRAMMATIC, INTENDED TO CONVEY THE SCOPE OF WORK AND GENERAL ARRANGEMENT OF EQUIPMENT, COMPONENTS AND PIPING. BEFORE INSTALLATION, VERIFY THE PHYSICAL LOCATION OF ALL EQUIPMENT WITH OTHER TRADES AND REPORT ANY OBSTRUCTIONS OR INTERFERENCES. NO EXTRA PAYMENTS ARISING FROM FAILURE TO MAKE THIS VERIFICATION WILL BE CONSIDERED.
- EXISTING SERVICES:
 - GIVE THE OWNER AMPLE NOTICE OF EACH NECESSARY INTERRUPTION TO EXISTING MECHANICAL AND ELECTRICAL SYSTEMS DURING THE COURSE OF THE WORK. KEEP THE DURATION OF INTERRUPTIONS AS SHORT AS POSSIBLE. THE OWNER RESERVES THE RIGHT TO DENY APPROVAL FOR AN INTERRUPTION ON ANY SPECIFIC DATE OR TIME. IN THIS CASE, AN ALTERNATIVE TIME SHALL BE MUTUALLY SELECTED.
- CUTTING AND PATCHING:
 - CUTTING AND PATCHING NOT BY MECHANICAL DIVISION.
 - MECHANICAL CONTRACTOR TO LOCATE REQUIRED OPENINGS AND CO-ORDINATE WITH GENERAL CONTRACTOR AND STRUCTURAL ENGINEER.
- DEMOLITION:
 - REMOVE FROM THE CONSTRUCTION SITE EXISTING MECHANICAL EQUIPMENT WHICH BECOMES OBSOLETE AS A RESULT OF THE WORK EXCEPT AS OTHERWISE STATED. DISPOSE DEMOLITION MATERIAL IN A ENVIRONMENTAL FRIENDLY MANNER.
- SHOP DRAWINGS:
 - SUBMIT TO THE ENGINEER FOR APPROVAL ONE (1) COPY OF SHOP DRAWINGS FOR ALL NEW EQUIPMENT, PRODUCTS AND SYSTEMS INCLUDING WIRING DIAGRAMS AND CONTROL SCHEMATICS.
- WARRANTY:
 - WARRANTY ALL WORK FOR TWELVE (12) MONTHS FROM DATE OF ACCEPTANCE, EXCEPT WHERE NOTED OTHERWISE.
- MATERIALS:
 - MATERIALS AND EQUIPMENT TO BE NEW, UNLESS OTHERWISE INDICATED, AND FREE FROM DAMAGE, BLEMISHES, OXIDATION, ETC. MATERIALS USED FOR SIMILAR PURPOSES AND FUNCTIONS SHALL BE THE PRODUCT OF ONE MANUFACTURER UNLESS SPECIFIED OTHERWISE.
- ACCESSORIES:
 - PROVIDE ACCESSORY ITEMS OR MATERIALS REQUIRED SUCH AS EQUIPMENT SUPPORTS, FABRICATED BASES, BRACKETS, CLEATS, CONNECTORS, SEALANTS, LUBRICANTS, CLEANERS, PROTECTION, ETC., TO ENSURE COMPLETE AND TOTALLY FUNCTIONAL SYSTEMS ARE PROVIDED TO THE OWNER.
- SEISMIC PROTECTION:
 - THE DESIGN AND CONSTRUCTION OF ALL MECHANICAL AND ELECTRICAL COMPONENTS AND THEIR CONNECTIONS, INCLUDING, BUT NOT LIMITED TO, MACHINERY, FIXTURES, DUCTS, AND PIPES (INCLUDING CONTENTS), TO BE IN ACCORDANCE WITH ONTARIO BUILDING CODE 2006, DESIGN OF STRUCTURAL SEISMIC ELEMENTS, INCLUDING CONNECTIONS, TO BE PERFORMED BY A REGISTERED STRUCTURAL ENGINEER ENGAGED BY THE CONTRACTOR AND LICENSED IN THE PROVINCE OF ONTARIO, WHO SHALL SEAL AND SIGN THE DESIGN DRAWINGS. THE SEALED DRAWINGS SHALL BE SUBMITTED ALONG WITH THE MECHANICAL AND ELECTRICAL SHOP DRAWINGS FOR REVIEW. THE STRUCTURAL ENGINEER WHO SEALS THE DRAWINGS SHALL CARRY OUT SUFFICIENT ON-SITE REVIEW OF THE MECHANICAL/ELECTRICAL WORK TO ENSURE AND TO CERTIFY IN WRITING THAT THE WORK IS IN GENERAL COMPLIANCE WITH HIS DESIGN.
- THERMAL INSULATION FOR PIPING:
 - THERMO-CANVAS JACKETS, C/W ULC S-102 LABEL:
 - HAZARD CLASSIFICATION NOT TO EXCEED FLAME-SPREAD RATING OF 25, SMOKE DEVELOPED 50.
 - USE 225G THERMO-CANVAS JACKET ON ALL INSULATED, EXPOSED VALVES, PIPING AND FITTINGS.
 - INSULATION:
 - PREFORMED MINERAL FIBRE INSULATION WITH INTEGRAL JACKET SHALL BE COMPOSED OF INCOMBUSTIBLE, FINE DIAMETER, GLASS FIBRES OR MINERAL WOOL FIBRES, BONDED TOGETHER WITH AN INERT THERMOSETTING RESIN AND HAVE A FACTORY-APPLIED, AIR-SERVICE TYPE VAPOUR BARRIER JACKET. INSULATION TO BE PERFORMED INTO 36-INCH CYLINDRICAL SECTIONS OR SEGMENTS TO SUIT STANDARD PIPE SIZES. REFER INSULATION THICKNESS SEE SCHEDULE HEREIN.
 - PIPE INSULATION SCHEDULE:

SERVICE	THICKNESS
DOMESTIC COLD WATER	25 mm
HOT WATER HEATING	25 mm

SERVICE	PIPE	JOINT	FITTING	PRESSURE RATING
DOMESTIC COLD WATER SUPPLIES	TYPE L COPPER	LEAD FREE SOLDER	WROUGHT OR CAST	ASTM B88
PLUMBING VENTS 50 MM OR LESS 62 MM OR MORE	DWV COPPER CAST IRON	LEAD FREE SOLDER MJ	COPPER DRAINAGE CAST IRON	PLUMBING CODE PLUMBING CODE
ABOVE GRADE SANITARY AND STORM DRAIN UP TO 40 MM 50 MM OR LARGER	DWV COPPER CAST IRON	LEAD FREE SOLDER MJ	COPPER DRAINAGE CAST IRON	PLUMBING CODE PLUMBING CODE
SPRINKLER	SCHEDULE 40 STEEL	WELDED OR VICTAULIC	MALLEABLE OR VICTAULIC	300 psi (2070 kPa)
NATURAL GAS 32 MM OR LESS 40 MM OR GREATER	TYPE K & L COPPER SCHEDULE 40 STEEL	FLARED BRASS CONNECTORS ALL WELDED	FLARED BRASS STEEL BUTT WELDED FITTINGS	ASTM-B88 125 psi (860 kPa)
HEATING PIPING	SCHEDULE 40 STEEL	SCREWED	MALLEABLE STEEL	1035kPa

- PIPING INSTALLATION:
 - INSTALL PIPING STRAIGHT AND PARALLEL WITH BUILDING LINES USING CORRECT PITCH FOR DRAINAGE AND VENTING. USE STANDARD FITTINGS FOR CHANGES IN DIRECTION.
 - USE DIELECTRIC COUPLINGS FOR JOINING PIPES OF DISSIMILAR METALS.
 - INSTALL UNIONS TO ALLOW THE REMOVAL OF EQUIPMENT.
 - PROVIDE SPRINKLER PIPING TO NFPA 13 (LATEST EDITION)
- BOILERS:
 - TWO GAS-FIRED, WALL-MOUNTED, CONDENSING TYPE WITH THE FOLLOWING:
 - BOILERS' CERTIFICATION:
 - ALL INDIVIDUAL COMPONENTS SHALL BE ACCEPTED AS PART OF THE SYSTEM UNDER THE GOVERNING BODY HAVING JURISDICTION. FIELD APPROVAL SHALL NOT BE REQUIRED FOR ANY COMPONENT. BOILER SHALL BE CSA APPROVED AND SHALL BE BUILT IN COMPLIANCE WITH ASME SECTION IV, CARRYING THE "I" STAMP
 - THE BOILER SHALL BE CERTIFIED BY A THIRD PARTY TO MEET OR EXCEED "ECOLOGO" PROGRAM ENVIRONMENTAL, QUALITY AND PERFORMANCE CRITERIA FOR BOILERS AS PUBLISHED BY THE GOVERNMENT OF CANADA. RELEVANT CERTIFICATION CRITERIA DOCUMENT: C0D-012: HOT WATER HEATING BOILER - GAS-FIRED CONDENSING.
 - THE BOILER SHALL HAVE THE FOLLOWING APPROVALS AND LISTING, OR BE IN COMPLIANCE:
 - CSA, CRN, ASME, I-B=R, MA STATE APPROVAL, AHRI (GAMA), ENERGY STAR.
 - ALL ELECTRICAL WIRING IS TO BE DONE IN ACCORDANCE WITH THE LATEST EDITIONS OF:
 - CSA C22.1 CANADIAN ELECTRICAL CODE AND/OR LOCAL ELECTRICAL CODE (FOR CANADA)
 - ANSI/NFPA 70 NATIONAL ELECTRICAL CODE (FOR U.S.)
 - CAPACITY: CSA INPUT 17.5-62 KW, CSA OUTPUT 16-57 KW.
BOILER WATER RANGE: 20 - 80°C, INDOOR/OUTDOOR CONTROLLER, LOW WATER CUT-OUT AND SAFETY RELIEF VALVE.
 - FLUE AND COMBUSTION AIR CONNECTION: 80 MM STAINLESS STEEL (CATEGORY IV) TO BE DESIGNED AND PROVIDED AS PART OF THE COMPLETE BOILER PACKAGE.
 - NEUTRALIZATION UNIT AND LITTLE GIANT CONDENSATE PUMP WITH POWER CORD (P-4).
 - BOILER PUMP P-1: 1.40 L/S AT 60 KPA - GRUNDFOS UPS26-99FC OR WIL0 EQUIVALENT.
 - LOW LOSS HEADER C/W INSULATED JACKET.

- ACCEPTABLE PRODUCT: VISSMANN B2HA 60, OR BODERUS, DEDIETRICH APPROVED EQUAL.
- PROVIDE VITOTRONIC SEQUENCING CONTROLLER.
- AIR SEPARATOR - EXPANSION TANK FITTING: ADJUSTABLE VENT PIPE AND BUILT-IN MANUAL VENT VALVE - AMTR0L OR APPROVED EQUAL.
- PIPE LINE STRAINER: BRONZE BODY.
- VORTEX DIRT AND AIR SEPARATOR: LINE SIZE SPIROVENT OR APPROVED EQUAL.
- SYSTEM FEEDER, PRESSURE PUMP IN STORAGE TANK C/W LOW LEVEL CUT-OUT WITH AUDIBLE ALARM. UNIT MOUNTED ON WALL SHELF. AXIOM MF-200 OR APPROVED EQUAL.
- DIELECTRIC COUPLINGS: USE WHERE CONNECTING DISSIMILAR METALS.
- HYDRONIC SPECIALTIES:
 - EXPANSION TANK: REUSE EXISTING.
 - NON-OVERLOADING MOTOR WITH THERMAL PROTECTION COOLED AND LUBRICATED BY THE PUMPED FLUID.
 - PUMPS P-1 AND P.2 TO BE PROVIDED AS PART OF THE BOILER PACKAGE.
 - PUMPS P-3A & P-3B: 1.76 L/S AT 66 KPA, 450 W, 120/1/60, WLO TOP S 1.5 X 30 OR APPROVED EQUAL .
 - ACCEPTABLE PRODUCTS: WLO, GRUNDFOS.
- THERMOMETERS AND GAUGES:
 - DIRECT READING, INDUSTRIAL, VARIABLE ANGLE TYPE, LIQUID FILLED, 125 MM SCALE LENGTH THERMOMETERS. INSTALL WHERE INDICATED.
 - 112 MM DIAL PRESSURE GAUGES, STAINLESS STEEL BOURDON TUBE WITH 0.5% ACCURACY FULL SCALE.
- IDENTIFICATION:
 - PROVIDE MANUFACTURED PERMANENT IDENTIFICATION LABELS ON PIPES AND ARROWS INDICATING DIRECTION OF FLOW.
 - BRADY OR APPROVED EQUAL.
- IN-LINE CIRCULATORS:
 - WET ROTOR TYPE.
 - CAST IRON VOLUTE, STAINLESS STEEL SHAFT, SEALING RING AND BEARING PLATE.
 - NON-OVERLOADING MOTOR WITH THERMAL PROTECTION COOLED AND LUBRICATED BY THE PUMPED FLUID.
 - PUMPS P-1 AND P.2 TO BE PROVIDED AS PART OF THE BOILER PACKAGE.
 - PUMPS P-3A & P-3B: 1.76 L/S AT 66 KPA, 450 W, 120/1/60, WLO TOP S 1.5 X 30 OR APPROVED EQUAL .
 - ACCEPTABLE PRODUCTS: WLO, GRUNDFOS.
- FIRE PROTECTION:
 - PORTABLE EXTINGUISHER:
 - EQUAL TO "FLAG" MULTI-PURPOSE DRY CHEMICAL UNITS RATED AT:
 - 2A-10BC (4" Ø - 16½" H)
 - WALL BRACKETS: TO SUIT EXTINGUISHER.
 - SPRINKLERS
 - PROVIDE SPRINKLER COVERAGE IN ACCORDANCE WITH NFPA 13 (LATEST EDITION).
 - HEAD: SIDEWALL C/W PROTECTIVE CAGE.
- RIGID DUCTWORK:
 - FABRICATE AND INSTALL LOW PRESSURE SHEET METAL DUCTWORK AND FITTINGS IN ACCORDANCE WITH SMACNA LOW PRESSURE DUCT CONSTRUCTION STANDARDS (LATEST EDITION). SIZES INDICATED ARE CLEAR INSIDE DIMENSIONS (FREE AREA).
- TRANSFER FAN:
 - CEILING FAN: CAPACITY 35 L/S AT 32 Pa. 35 WATTS 120/1/60 C/W WALL THERMOSTAT.
 - ACCEPTABLE PRODUCT: COOK MODEL GC-120 OR APPROVED EQUAL.
- FIRE DAMPER:
 - PROVIDE "OUT-OF-AIRSTREAM" FIRE DAMPER WITH LABELS, MEETING THE REQUIREMENTS OF NFPA-90A, CUA-90A AND THE ONTARIO BUILDING CODE IN LOCATIONS INDICATED. INSTALL ACCORDING TO SMACNA STANDARDS. PROVIDE DUCT ACCESS DOORS.
- CONTROLS:
 - ALL LOW VOLTAGE CONTROL WIRING TO BE PROVIDED UNDER THE MECHANICAL DIVISION.
 - REMOVE EXISTING WALL MOUNTED THERMOSTAT ON GROUND FLOOR AND REPLACE WITH REMOTE PANEL (SEE BOILERS). PROVIDE NEW CONTROL WIRING BETWEEN REMOTE PANEL AND BOILERS.
- FLUSHING AND CLEANING:
 - FLUSH AND CLEAN THE EXISTING PIPING/RADIATOR SYSTEM PRIOR TO CONNECTING TO THE NEW COMPONENTS.
 - FILL WITH A SOLUTION OF WATER AND 3% (BY WEIGHT) OF NON-FOAMING, PHOSPHATE FREE DETERGENT. CIRCULATE FOR A MINIMUM OF 8 HOURS. REGULARLY REMOVE AND CLEAN STRAINERS.
 - REFILL WITH CLEAN WATER AND CIRCULATE FOR AT LEAST 4 HOURS OR UNTIL THE WATER SAMPLES ARE CLEAR OF DEBRIS AND CONTAMINANTS. REGULARLY CLEAN STRAINERS.
 - AFTER ALL DEBRIS AND CONTAMINANTS HAVE BEEN REMOVED, DRAIN THE WATER AND FILL THE SYSTEM WITH DEMINERALIZED WATER. LEAVE AN ADDITIONAL 5 LITRES OF DEMINERALIZED WATER AT THE SITE AFTER COMPLETION OF THE WORK.
- OPERATION AND MAINTENANCE MANUAL:
 - INCORPORATE ALL THE EQUIPMENT OPERATING AND MAINTENANCE LITERATURE IN THREE SETS. SUBMIT TO THE NCC IN THREE RING BINDERS.
 - INCLUDE THE BOILER COMMISSIONING REPORT AND COMBUSTION TEST RESULTS.
 - PROVIDE COPIES OF THE WARRANTIES FOR ALL EQUIPMENT SUPPLIED IN ADDITION TO THE CONTRACTOR'S WARRANTY.

- BALANCING:
 - DURING THE FIRST HEATING SEASON ADJUST THE INDOOR/OUTDOOR TEMPERATURE CONTROL SYSTEM AND THE FLOW TO EACH ZONE TO ENSURE EVEN TEMPERATURE THROUGHOUT THE BUILDING. ALLOW FOR MINIMUM OF TWO VISITS.
- AS BUILT DRAWINGS:
 - AT THE COMPLETION OF THE PROJECT SUBMIT "AS BUILT" DRAWINGS SHOWING ALL DEVIATIONS FROM THE ORIGINAL DESIGN.

ELECTRICAL SPECIFICATION

GENERAL PROVISIONS

- GENERAL CONDITIONS
 - CONFORM TO REQUIREMENTS OF THE GENERAL CONDITIONS. PROVIDE ALL LABOUR, MATERIALS, PRODUCTS, EQUIPMENT, SERVICES AND ALL IDENTICALS REQUIRED TO COMPLETE, TEST AND COMMISSION ALL ELECTRICAL WORK SHOWN ON THE DRAWINGS AND/OR NOTED HEREUNDER.
 - ELECTRICAL WORK SHALL BE CARRIED OUT BY A CONTRACTOR HOLDING A VALID CONTRACTOR'S LICENSE AND QUALIFIED ELECTRICIANS WHO HOLD VALID ONTARIO CERTIFICATES OF QUALIFICATION.
 - CODES AND STANDARDS
 - DO COMPLETE INSTALLATION IN ACCORDANCE WITH APPLICABLE CODES, INCLUDING BUT NOT NECESSARILY LIMITED TO CURRENT ELECTRICAL CODE CSA C22.1, PERTINENT ESA (ELECTRICAL SAFETY AUTHORITY) BULLETINS AND THE REQUIREMENTS OF ALL AUTHORITIES HAVING JURISDICTION.
 - EXISTING SERVICES
 - GIVE THE OWNER/TENANT AMPLE NOTICE OF EACH NECESSARY INTERRUPTION OF ELECTRICAL SERVICE DURING THE COURSE OF THE WORK. UNAVOIDABLE INTERRUPTIONS TO EXISTING SYSTEMS/INSTALLATIONS, IF ANY, SHALL BE OF THE SHORTEST POSSIBLE DURATION AND EACH SUCH INTERRUPTION SHALL REQUIRE THE SPECIFIC APPROVAL OF THE OWNER/TENANT. SUBMIT A SCHEDULE OF ALL ANTICIPATED INTERRUPTIONS, IDENTIFYING EXACTLY WHAT THE INTERRUPTION IS, HOW LONG IT WILL BE, WHEN IT IS PLANNED TO OCCUR AND WHICH AREA(S) WILL BE AFFECTED. GIVE THE OWNER A MINIMUM OF 24 HOURS NOTICE RELATED TO EACH NECESSARY INTERRUPTION. THE OWNER/TENANT RESERVES THE RIGHT TO DENOY APPROVAL FOR AN INTERRUPTION ON ANY SPECIFIC DATE OR TIME. IN THIS CASE, AN ALTERNATIVE TIME SHALL BE MUTUALLY SELECTED. REFER ALSO TO PHASING/ WORK SCHEDULE OF THE PROJECT.
 - DEMOLITION
 - REFER TO DEMOLITION NOTES ON DRAWING. RENDER SAFE THE INSTALLATIONS AT LOCATIONS FROM WHICH THE EXISTING INSTALLATIONS AND EQUIPMENT HAS BEEN REMOVED AS PART OF THIS WORK. REMOVE FROM THE SITE ALL EXISTING EQUIPMENT AND MATERIALS, WHICH BECOMES OBSOLETE AS A RESULT OF THIS WORK EXCEPT WHERE SPECIFICALLY NOTED OTHERWISE.
- ### GENERAL MATERIALS
- MATERIALS AND EQUIPMENT
 - EQUIPMENT AND MATERIAL SUPPLIED AS PART OF THE ELECTRICAL WORK SHALL BE NEW AND CSA APPROVED FOR THE APPLICATION.
 - CONDUIT
 - WIRING SHALL BE IN CONDUIT UNLESS SPECIFICALLY INDICATED OTHERWISE. PROVIDE EMT THROUGHOUT EXCEPT WHERE SPECIFIED OTHERWISE. CONCEAL IN CEILING SPACE OR WALL CAVITIES CONDUITS/RACEWAYS IN ALL AREAS EXCEPT IN MECHANICAL AND ELECTRICAL ROOMS OR WHERE SPECIFICALLY INDICATED OTHERWISE. SURFACE MOUNTED RACEWAY IN FINISHED AREAS ONLY AS PERMITTED BY CONSULTANT. INSTALL CONDUITS PARALLEL TO BUILDING LINES. INSTALL MINIMUM 600MM AND MAXIMUM 1000MM LENGTH OF FLEXIBLE GALVANIZED STEEL CONDUIT FOR CONNECTIONS TO EQUIPMENT WHICH MAY VIBRATE (SUCH AS EQUIPMENT WITH MOTORS), AND TO EQUIPMENT NOT PERMANENTLY FIXED OR WHICH MUST BE MOVED FOR SERVICING. INSTALL LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT FOR SUCH APPLICATIONS IN DAMP LOCATIONS.
 - FASTENING AND SUPPORTS
 - USE LEAD ANCHORS TO SECURE EQUIPMENT TO SOLID MASONRY, TILE AND PLASTER SURFACES. USE EXPANDABLE INSERTS TO SECURE EQUIPMENT TO POURED CONCRETE. USE TOGGLE BOLTS TO SECURE EQUIPMENT TO HOLLOW MASONRY WALLS OR SUSPENDED CEILINGS. SUPPORT GROUPS OF CONDUITS AND CABLES, AND EQUIPMENT ON 41MM X 41MM X 2.5MM THICK GALVANIZED CHANNELS EQUAL TO UNISTRUT P-SERIES, USING CLIPS, SPRING LOADED BOLT, CABLE CLAMPS AND THE LIKE, DESIGNED AS ACCESSORIES TO BASIC CHANNEL MEMBERS. FOR SURFACE MOUNTING OF TWO OR MORE CONDUITS USE CHANNELS AT 1.5 M OR LESS ON CENTRE SPACING.
 - WIRING
 - TYPE RW-90 COPPER, 600V TO MAXIMUM #10 AWG AND 1000V #8 AND LARGER, XLPE INSULATION, SOLID CONDUCTORS TO #10 AWG, STRANDED CONDUCTORS #8 AWG AND LARGER. MINIMUM BRANCH CIRCUIT CONDUCTORS SHALL BE #12 AWG EXCEPT FOR 120V CONTROL CIRCUITS. MINIMUM SIZE OF WIRE SHALL BE #14 AWG. WIRING FOR BRANCH CIRCUITS SHALL BE SIZED TO LIMIT THE VOLTAGE DROP FROM THE PANELBOARD TO THE FURTHEST OUTLET TO 2% WHEN CARRYING 80% OF THE BRANCH CIRCUIT BREAKER RATED CURRENT.
 - FOR 120V CIRCUITS USING SHARED NEUTRALS, MINIMUM WIRE SIZES SHALL BE:
 - #12 AWG FOR CIRCUITS UP TO 30 M.
 - #10 AWG FOR RUNS IN EXCESS OF 30 M UP TO A DISTANCE THAT ENSURES COMPLIANCE WITH ITEM 1. ABOVE. #10 AWG SHALL BE USED FOR THE ENTIRE LENGTH OF RUN, STARTING FROM THE PROTECTION DEVICE.
 - ALL SHARED NEUTRALS SHALL BE OVERSIZED, #10 AWG OR LARGER FOR #12 AWG PHASE CONDUCTORS. THIS APPLIES TO POWER AS WELL AS LIGHTING CIRCUITS.
 - TWIST-ON PRESSURE TYPE WIRE CONNECTORS FOR #10 AWG AND SMALLER AND COMPRESSION SLEEVE TYPE FOR #8 AWG AND LARGER.
 - TYPE AC-90 WILL BE PERMITTED FROM CONDUIT SYSTEM JUNCTION BOXES TO WIRING DEVICE EQUIPEMENT MAX. HORIZONTAL 3 METERS FROM JUNCTION BOX TO WALL.
 - MOULDLED CASE BREAKERS (TO MATCH EXISTING)
 - BOLT-ON MOULDLED CASE CIRCUIT BREAKER: QUICK-MAKE, QUICK-BREAK TYPE, FOR MANUAL AND AUTOMATIC OPERATION WITH TEMPERATURE COMPENSATION FOR 40°C AMBIENT. COMMON-TRIP BREAKERS: WITH SINGLE HANDLE FOR MULTI-POLE APPLICATIONS. MOULDLED CASE CIRCUIT BREAKER TO OPERATE AUTOMATICALLY BY MEANS OF THERMAL AND MAGNETIC TRIPPING DEVICES TO PROVIDE INVERSE TIME CURRENT TRIPPING AND INSTANTANEOUS TRIPPING FOR SHORT CIRCUIT PROTECTION.
 - INTERRUPTING CAPACITY OF NEW BREAKERS MUST BE GREATER THAN OR EQUAL TO THE INTERRUPTING RATING OF BREAKERS WITHIN EXISTING PANELS AFFECTED BY WORK. IF INTERRUPTING RATINGS DIFFER BETWEEN BREAKERS THE HIGHEST INTERRUPTING RATING MUST BE SELECTED. IF A SERIES RATING IS INDICATED ON PANEL CONTRACTOR IS RESPONSIBLE FOR PURCHASING BREAKERS, WHICH MAINTAIN THE SERIES RATING. BREAKERS SUPPLIED BY CONTRACTOR MUST MATCH THE MANUFACTURER OF PANEL.
 - DISCONNECT SWITCHES
 - HEAVY DUTY DISCONNECT SWITCHES, EEMAC 1 IN DRY LOCATIONS, EEMAC 3R IN DAMP LOCATIONS, QUICK-MAKE/QUICK-BREAK MECHANISMS, VISIBLE BLADES, ARC QUENCHER FOR SWITCHES RATED 600V, MECHANICALLY INTERLOCKED COVER TO PREVENT OPENING IN 'ON' POSITION, EXCEPT BY DEFEAT MECHANISM. ON-OFF SWITCH POSITION INDICATION ON SWITCH ENCLOSURE COVER. PROVISION FOR PADLOCKING IN BOTH 'ON' AND 'OFF' POSITIONS.
 - MANUAL MOTOR CONTROLLER SUITABLE FOR MOTOR DISCONNECT; MEETING REQUIREMENTS OF CSA C22.2-NO.14, CEC RULE 28-602 (3)(b) AND UL 508 SUITABLE FOR MOTOR DISCONNECT.

ELECTRICAL GENERAL NOTES:

- THESE DRAWINGS TO BE READ IN CONJUNCTION WITH ARCHITECTURAL AND MECHANICAL DRAWINGS. COORDINATE ALL REMOVALS AFFECTED BY OTHER TRADES.
- CONTRACTOR TO TRACE AND VERIFY ALL EXISTING CIRCUITS. VERIFY EXACT ROUTING OF CONDUITS AND LOCATION OF BOXES ON SITE PRIOR TO REMOVAL. THE CONTRACTOR IS TO MAINTAIN THE INTEGRITY OF CIRCUITS BY EXTENDING WIRING AND CONDUIT AS REQUIRED TO RETAIN POWER TO RECEPTACLES, LIGHTING THAT MAY BE ON THE SAME CIRCUIT.
- UNLESS OTHERWISE NOTED, MATERIALS FOR REMOVAL BECOME THE CONTRACTOR'S PROPERTY AND SHALL BE TAKEN FROM SITE AND DISPOSED OF IN ACCORDANCE WITH BUILDING STANDARDS.
- MAINTAIN EXISTING REMAINING CIRCUITS AND ALL SYSTEMS WHICH PASS THROUGH ALL AREAS OF CONSTRUCTION. PROVIDE NECESSARY MATERIALS TO MAINTAIN SYSTEMS THAT ARE REMAINING.
- REINSTATE ALL EXISTING SYSTEMS REMAINING IMMEDIATELY THAT ARE INTERRUPTED DURING CONSTRUCTION. PROVIDE MATERIALS AS NECESSARY TO MAINTAIN SYSTEMS THAT ARE INTERRUPTED.
- ELECTRICAL CONTRACTOR SHALL REMOVE ALL REDUNDANT WIRING AND CONDUITS BACK TO SOURCE AND MAKE ELECTRICALLY SAFE. ELECTRICAL CONTRACTOR SHALL DISPOSE OF THE EXISTING REDUNDANT CONDUIT AND WIRING.
- ELECTRICAL CONTRACTOR SHALL TEST AND ENSURE ALL EQUIPMENT IS WORKING AT THE END OF EACH DAY.
- ELECTRICAL SHALL CONFIRM THE EXISTING AND NEW REQUIREMENTS TO ENSURE CORRECT RATINGS AND SYSTEM SIZES, BEFORE PLACING ORDER.
- COORDINATE WITH BUILDING MANAGEMENT FOR ANY/ ALL SYSTEM SHUTDOWNS DURING THE DEMOLITION OR CONSTRUCTION PHASE OF CONTRACT FOR COORDINATION PURPOSES. ALLOW FOR ALL REQUIRED SHUTDOWNS TO BE PERFORMED OUTSIDE OF NORMAL WORKING HOURS. SHUTDOWN OF SYSTEM TO BE RE-ENERGIZED AND FULLY OPERATIONAL AT THE END OF SAME DAY'S WORK SHIFT.
- THESE DRAWINGS INDICATE KNOWN CONDITIONS AND MAY NOT INDICATE ALL DEMOLITION REQUIREMENTS. THE ELECTRICAL CONTRACTOR SHALL VISIT THE SITE DURING THE TENDER PERIOD TO BECOME FAMILIAR WITH THE SITE.
- PROVIDE ALL TEMPORARY SERVICES THROUGHOUT DEMOLITION AND CONSTRUCTION OF CONTRACT AREA. THESE TEMPORARY SERVICES INCLUDE POWER, LIGHTING COVERAGE WHERE REQUIRED. ALL TEMPORARY SYSTEMS ARE TO BE REMOVED AT THE END OF CONTRACT.
- FIRESTOP (ULC LISTED) ALL NEW FIRE RATED PENETRATIONS.



Real Estate Management, Design and Construction Branch
Direction de la gestion de l'immobilier, design et construction

Design and Construction Division
Division design et construction

director - Claude Robert - directeur

consultant
expert-conseil



300-2611 QUEENSVIEW DRIVE
OTTAWA, ONTARIO CANADA K2B 8K2
TELEPHONE: (613) 829-2800
FAX: (613) 829-8299



issued or revised
émis ou révisé

no.	description	date
3	ISSUED FOR TENDER	2014.05.30
2	RE-ISSUED FOR CLIENT REVIEW	2014.05.16
1	ISSUE FOR CLIENT REVIEW	2014.03.31

project
projet

MAPLELAWN 529 RICHMOND
ROAD OTTAWA

PHASE 2

drawing
dessin

SPECIFICATIONS

approved by approuvé par	J.M.	scale échelle	AS SHOWN
designed by conçu par	N.B.	sheet no. no. de la feuille	ME02
drawn by dessiné par	M.B.		
date	2014.05.16		
NCC project no. no. du projet de la CCN			
RD-5155-05			