OBTAIN ALL APPROVALS FROM PUBLIC AUTHORITIES HAVING JRISDICTION BEFORE COMMENCING WORK AND PAY ALL INSPECTION FEES AND ALL PERMITS. COMPLY WITH THE REQUIREMENTS OF THE ATEST EDITION OF THE APPLICABLE C.S.A. STANDARDS, BUILDING CODE LOCAL ELECTRICAL SAFETY CODE APPLICABLE TO AREA HAVING REQUIREMENTS. SUBMIT CERTIFICATE OF INSPECTION AND APPROVAL FROM ALL AUTHORITIES HAVING JURISDICTION.

DO NOT REDUCE THE STANDARDS ESTABLISHED BY THE PRAWINGS AND SPECIFICATIONS BY APPLYING ANY OF THE CODES

PROVIDE PROOF OF PUBLIC LIABILITY AND PROPERTY DAMAGE INSURANCE COVERAGE AND AMOUNT. SUBMIT WITH TENDER.

THE ELECTRICAL BID, THE ELECTRICAL QUOTATIONS FOR ADDITIONAL WORK, AND ALL SUBMISSIONS RELATED TO THE ELECTRICAL SCOPE SHALL BE BY THE ELECTRICAL CONTRACTOR. OR SUBCONTRACTOR ENGAGED ON THE PROJECT BASED ON THE ECTRICAL DRAWINGS SPECIFICATION. THE SUBMISSIONS SHALL BE ON THE FLECTRICAL OR SUBCONTRACTOR COMPANY LETTERHEAD SUPPLEMENTED BY A GENERAL CONTRACTOR LETTERHEAD DOCUMENTS SHALL BE SIGNED AND SEALED WHEN REQUIRED.

ALL ITEMS STIPULATED AND DESIGNATED AS INSTRUCTIONS TO THE ELECTRICAL CONTRACTOR SCOPE OF WORK SHALL BE APPLICABLE TO ANY SUBCONTRACTOR ENGAGED ON THE PROJECT WHICH SCOPE IS ASED ON THE HAMMERSCHLAG AND JOFFE ISSUED DRAWINGS.

EXAMINE ARCHITECTURAL, STRUCTURAL, AND MECHANICAL RAWINGS BEFORE PROCEEDING WITH THE WORK. 2 ANY DISCREPANCIES BETWEEN DRAWINGS AND/OR

SPECIFICATIONS MUST BE REFERRED TO THE CONSULTANT BEFORE ANY AFFECTED WORK IS COMMENCED. PREPARE INTERFERENCE DRAWINGS IN CONJUNCTION WITH ALL TRADES CONCERNED, SHOWING SLEEVES, CABLES AND CONDUIT,

ROUTES LIGHT FIXTURES AND OPENINGS FOR PASSAGE THROUGH TRUCTURE AND ALL INSERT SIZES AND LOCATIONS REFER TO ARCHITECTURAL DRAWINGS FOR EXACT MOUNTING OCATIONS OF ALL LIGHT FIXTURES AND DEVICES.

ELECTRICAL DRAWINGS SHALL NOT BE USED FOR EQUIPMENT LAYOUT. DO NOT SCALE ELECTRICAL DRAWINGS; OBTAIN ALL IMENSIONS FROM ARCHITECTURAL DIVISION

NOTE ELECTRICAL DRAWINGS ARE DIAGRAMMATIC IN NATURE CONTRACTOR IS RESPONSIBLE TO FAMILIARIZE WITH THE PROJECT INTENT BY REVIEWING ALL DRAWINGS RELATED TO THE PROJECT

IN CASE OF CONFLICT BETWEEN THE SPECIFICATION AND THE PRAWINGS THE GREATER REQUIREMENT SHALL PREVAIL. COMMON WORK REQUIREMENTS

ENSURE THAT ALL ELECTRICAL EQUIPMENT SUPPLIED BY OTHER RADES IS SUITABLE FOR THE RESPECTIVE VOLTAGE. CONFIRM POWER REQUIREMENTS OF ALL OWNER SUPPLIED EQUIPMENT

2 ALL CUTTING AND PATCHING REQUIRED FOR THE WORK OF THIS DIVISION SHALL BE CARRIED OUT BY THIS DIVISION. NO CHASING BLOCKWORK WILL BE ALLOWED. 3 ALLOW TO SCAN THE FLOOR PRIOR TO CUTTING IN LOCATION OF

EXISTING SERVICES. PROVIDE DUST CONTROL MEASURES DURING CUTTING. DO NOT LEAVE ANY FLOOR TRENCHES OPEN DURING THE DAY, USE TRIP FREE COVERS WITH BEVELED EDGES 3.4 COMPLY WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR EQUIPMENT AND MATERIAL SUPPLIED. CONTRACTOR SHALL OBTAIN MANUFACTURER'S INSTRUCTIONS. IF NOT PROVIDED WITH DUIPMENT SUPPLY. TORQUE ALL FASTENERS USING TORQUE WRENCH. ENSURE ALL EQUIPMENT IS LEVELED. MARK FASTENERS

ONCE SET, TIGHTEN. EMPLOY USE OF TORQUE MEASURING TOOL. 3.5 BE RESPONSIBLE AND PAY FOR ANY DAMAGE TO THE BUILDING INCURRED BY WORK OF THIS DIVISION.

6 SUBMIT THREE (3) - COPIES OF SHOP DRAWINGS FOR REVIEW AND RECORDS LINLESS ELECTRONIC SUBMISSION IS PROVIDED. CLEARLY MARK ALL EXPOSED CONDUIT, PULL BOXES, JUNCTION BOXES, ETC., TO INDICATE THE NATURE OF THE SERVICE. 8.8 PROVIDE LAMACOID NAMEPLATES FOR ALL DISTRIBUTION

EQUIPMENT INDICATING SOURCE OF POWER AND EQUIPMENT BEING ED. PROVIDE TYPEWRITTEN DIRECTORIES FOR ALL PANELS. 3.9 CONTRACTOR TO ENSURE THAT THE ELECTRICAL SYSTEMS ARE FUNCTIONAL AND IN GOOD WORKING ORDER AS PER THE ELECTRICAL

SPECIFICATIONS AND TO THE INTENT OF THE WORKING FLECTRICAL 3.10 ALL EQUIPMENT SUPPLIED BY THIS ELECTRICAL CONTRACTOR

SHALL CARRY CSA OR EQUIVALENT CANADIAN CERTIFICATION. 1 SHOP DRAWINGS AND EQUIPMENT SUPPLIED BY THE ELECTRICAL ONTRACTOR SHALL BE REVIEWED AND CONFIRMED IN COMPLIANCE WITH THE PROJECT DOCUMENTS. SUBMITTED SHOP DRAWINGS SHALL BE STAMPED AND REVIEWED BY THE ELECTRICAL CONTRACTOR AT TH

FINAL SUBMISSIONS:

TIME OF SUBMISSION.

4.1 AS-BUILT DRAWINGS

4.1.1 AFTER COMPLETION OF THE WORK, PROVIDE THE LANDLORD AND TENANT WITH A SET OF REPRODUCIBLE 'AS-BUILT" RECORD DRAWINGS. PROCEDURES, AUTOCAD 2007 OR LATER.

4.1.2 AFTER COMPLETION OF WORK, PROVIDE THE FOLLOWING

CERTIFICATE OF FIRE ALARM VERIFICATION HYDRO INSPECTION CERTIFICATE EMERGENCY LIGHTING TEST REPORT

TEST REPORT FOR ALL SPECIFIED TESTING 2 OPERATION AND MAINTENANCE MANUALS: 4.2.1 PROVIDE THREE (3) - SETS OF OPERATION AND MAINTENANCE

MANUALS SUBMITTED IN HARD COVER BINDERS. .2.2 OPERATIONS AND MAINTENANCE MANUALS SHALL INCLUDE IOWEVER NOT LIMITED TO THE FOLLOWING INFORMATION

DESCRIPTION OF ITEMS, AND PARTS LIST

NAMES AND ADDRESS OF LOCAL SUPPLIERS FOR THE ITEMS TECHNICAL DATA, PRODUCT DATA, SUPPLEMENTED BY BULLETINS

RECOMMENDED SCHEDULES, EXPLODED VIEWS, TECHNICAL

THE CONSULTANTS REVIEWED SHOP DRAWINGS CERTIFICATE(S) OF ACCEPTANCE FROM THE AUTHORITY'S INSPECTION DEPARTMENT

VERIFICATION REPORTS AND CERTIFICATE(S) FOR FIRE ALARM LOAD BALANCE REPORT AND WIRING

MEGGER TESTING REPORT IN GIGA OHM (G Ω) VALUES WRITTEN GUARANTEE OORDINATION STUDY FOR EQUIPMENT INCLUDING RELA

PROTECTION EQUIPMENT, SHORT CIRCUIT AND ARC FLASH EVALUATION IS MANDATORY FOR ALL PROJECTS CONTACT INFORMATION

ELECTRICAL SAFETY INSPECTION REPORT 4.2.3 OPERATION AND MAINTENANCE MANUALS SHALL FORM A COMPLETE DOCUMENTATION FOR THE SUBJECTED ELECTRICAL NSTALLATION AND WILL NOT BE LIMITED TO LINE VOLTAGE POWER

4.2.4 ANY SECURITY, TELEPHONE, OR OTHER MISCELLANEOUS SYSTEMS SHALL ALSO BE INCLUDED IN THE OPERATION AND MAINTENANCE

4.3 PROJECT SUBSTANTIAL COMPLETION AND PROJECT CLOSURE:

4.3.1 AFTER THE WORK IS COMPLETED. GIVE A WRITTEN GUARANTEE. FOR ONE (1) YEAR COVERING WORKMANSHIP AND MATERIALS. REPAIR OR REPLACE, WITHOUT EXPENSE TO THE OWNER, ANY DEFECTS DUE O WORKMANSHIP OR MATERIALS WHICH. IN THE OWNER'S OPINION. ARE NOT DUE TO MISUSE OR NEGLECT. LED LIGHTING SHALL HAVE

4.3.2 PROVIDE OWN LIST OF OUTSTANDING AND DEFICIENT WORK PRIOR TO SUBSTANTIAL COMPLETION. 4.3.3 ADJUST AND RECORD LEVELS OF EMERGENCY LIGHTING HROUGHOUT THE FACILITY. AIMING ADJUSTMENT SHALL BE COMPLETE AND ADJUSTED AS NECESSARY AND AS REQUIRED BY AHJ AND ONSULTANT. PROVIDE RECORD OF EMERGENCY LIGHTING TESTING AND

EMERGENCY LIGHT LEVEL MEASUREMENTS PRIOR TO REQUEST FOR

IREE (3) YEARS INSTALLATION AND MANUFACTURER'S WARRANT'

SUBSTANTIAL COMPLETION. 4.3.4 PRIOR TO COMPLETING FIRE ALARM SYSTEM PROGRAMMING OBTAIN APPROVAL FOR SEQUENCE OF OPERATION BY LOCAL AHJ. ALLOW TO COMPETE FIRE ALARM SYSTEM PROGRAMMIN

ADJUSTMENTS AS REQUESTED BY AHJ AT A LATER DATE.

4.3.5 CLEAN AND TEST ALL EQUIPMENT BEFORE FINAL ACCEPTANCE IS

1.3.6 ARRANGE FOR FINAL ELECTRICAL INSPECTION BY ELECTRICAL CONSULTANT FOR ONE WEEK PRIOR TO COMPLETION OF WORK. VALUATION OF CHANGES: 1 PROVIDE COMPLETE BREAKDOWN OF MATERIAL, LABOUR.

NOTICES ON THIS PROJECT THE HOURLY LABOUR RATE SHALL BE INCLUSIVE OF ALL CHARGES FOR SUPERVISION, VARIABLE LABOUR FACTORS, HAND TOOLS, PAYROLL BURDENS, HEIGHT FACTORS, WARRANTIES, STORAGE, RENTALS, DDITIONAL BONDING, PARKING, CLEAN-UP, AS-BUILD DRAWINGS HOISTING, FREIGHT AND DELIVERY, AND EXCLUSIVE OF OVERHEAD AND

VERHEAD, PROFIT, ETC., WHEN SUBMITTING QUOTATIONS FOR CHANGE

3 LABOUR HOURS SHALL BE BASED ON THE LATEST ISSUE OF THE ATIONAL ELECTRICAL CONTRACTOR'S ASSOCIATION (NECA) LABOUR UNITS. COLUMN ONE NORMAL FOR THE DURATION OF THIS CONTRACT LABOUR FOR SMALL ITEMS SUCH AS, HOWEVER NOT LIMITED TO. COUPLINGS, STRAPS, MARETTES, SCREWS, ETC., WILL NOT BE

5.4 THE MATERIAL PRICES SHALL BE BASED ON THE CURRENT NATIONAL PRICE SYSTEM (NPS) CATALOGUE LESS APPLICABLE TRADE

PROGRESS BILLING:

REIMBURSED

1 PROVIDE COMPLETE BREAKDOWN OF MATERIAL LABOUR AND GENERAL COSTS WHEN SUBMITTING PROGRESS DRAW REQUEST. 3.2 SEPARATE BILLING SECTION FOR EACH SYSTEM INSTALLED AS RT OF THE PROJECT, SEPARATE SECTION SHALL AT A MINIMUM INCLUDE, HOWEVER NOT BE LIMITED TO, THE FOLLOWING: LIGHTING POWER DISTRIBUTION FIRE ALARM RACEWAYS WIRING GENERAL OSTS, FINAL SUBMISSION (AS-BUILT, MANUALS, WARRANTY,

6.3 FINAL SUBMISSION COSTS SHALL BE FINE-TUNED PER VALUE OF PROJECT; SHALL INCLUDE A MINIMUM COST FOR THE BELOW PROJECT

PROJECT VALUE = < \$100,000, CLOSE OUT COST = \$5,000 PROJECT VALUE = < \$500.000, CLOSE OUT COST = \$7.500 PROJECT VALUE = < \$1,000,000, CLOSE OUT COST = \$10,000 PROJECT VALUE > \$1,000,000, CLOSE OUT COST = 1%

BASIC METALS AND MATERIALS ALL MATERIALS USED SHALL BE SUITABLE FOR THEIR

APPLICATION, ALL EXTERIOR FASTENERS AND SUPPORTING MATERIALS. ORMING A COMPLETE ELECTRICAL SYSTEM SHALL BE WEATHERPROOF IUTS, BOLTS, SCREWS ETC. MATERIAL SHALL BE STAINLESS STEEL OR PROVED EQUIVALENT ALL MATERIALS USED THROUGHOUT SHALL BE NEW, HIGHEST

QUALITY C.S.A. APPROVED AND OF ONE MANUFACTURER. WHEREVER TRADE NAMES ARE NOT USED TO DESCRIBE MATERIALS, THESE MATERIALS SHALL BE OF BEST AVAILABLE QUALITY AND MANUFACTURER. OBTAIN AND PAY FOR SPECIAL HYDRO INSPECTION OF SPECIFIED NON-C.S.A. ELECTRICAL EQUIPMENT.

MATERIALS AND EQUIPMENT PROVIDED SHALL BE LISTED FOR HEAVY DUTY APPLICATION AND SHALL BE SUITABLE FOR THE INTENDED SE, COMMERCIAL, INDUSTRIAL OR RESIDENTIAL

4 PROVIDE ALL CONDUIT, WIRING, BOXES, SWITCHES, OUTLETS, DEVICES, ETC., AS REQUIRED. MAKE FINAL CONNECTIONS TO VIBRATING QUIPMENT WITH FLEXIBLE CONDUIT

.5 ELECTRICAL BOXES FOR SUPPORT OF EXTERIOR OR WALL LIGHT FIXTURES SHALL BE RIGID TYPE, C/W POINT SUPPORT, RATED FOR A MINIMUM OF 22.5KG WEIGHT

7.6 ALL LIGHT FIXTURES SHALL BE INDEPENDENTLY SUPPORTED ROM FINISHED DRY WALL OR T-BAR CEILING. INCLUDE FOR ALL HANGERS AND NECESSARY MISCELLANEOUS SUPPORTS FROM JOIST, 7 ANY LUMINAIRE INSTALLED IN SUSPENDED CEILING SHALL BE

WIRED BY A FLEXIBLE CORD NOT EXCEEDING 3M IN LENGTH.

8 PROVIDE ALL HANGERS INSERTS AND SUPPORTS OF APPROVED TYPES REQUIRED FOR THE WORK OF THIS DIVISION. PROVIDE CONDUIT OR ALL SERVICES PENETRATING THE FLOOR SLAB. SEAL ALL PENETRATIONS THROUGH FLOOR SLABS AND FIRE AND SMOKE SEPARATIONS WITH AN APPROVED NON-SHRINK, WATERPROOF AND

REPROOF SEALANT APPROVED BY CONSULTANT HILTI, 3M OR APPROVED ALTERNATE

CONDUITS: 3.1 ALL CONDUIT SHALL BE C.S.A. APPROVED, RIGID STEEL THICK WALLED OR EMT THINWALL WITH STEEL SET SCREW COUPLINGS AND INDUITS AND ELECTRICAL BOXES IN FINISHED AREAS ACCESSIBLE BY PUBLIC SHALL BE CONCEALED UNLESS OTHERWISE NOTED. EXPOSED NDUITS AND ELECTRICAL BOXES ARE ALLOWED ONLY IN UTILITY ROOMS AND BACK OF HOUSE CORRIDORS. EXPOSED CONDUITS AND OTHER RACEWAYS WHERE APPROVED SHALL BE NEAT IN APPEARANCE, JN PARALLEL TO BUILDING LINES AND CONCENTRIC RIGHT-ANGLE BENDS ONLY SHALL BE USED. CONDUIT WORK FOR ALL EXTERIOR.

DEVICES SHALL BE INSTALLED CONCEALED AND ON THE INTERIOR SIDE OF THE BUILDING ENVELOPE. 3.2 RIGID PVC CONDUIT TO CSA C22.2 NO. 211.1, RIGID TYPES EB1 AND DB2/ES2 PVC CONDUIT, FT-4 RATED, COMPLETE WITH SITE MADE HEAT GUN BENDS FOR CONDUIT TO AND INCLUDING 50 MM (2") DIAMETER FACTORY MADE FITTINGS FOR CONDUIT LARGER THAN 50 MM (2"). DIAMETER. SOLVENT WELD JOINTS, FACTORY MADE EXPANSION JOINTS WHERE REQUIRED, AND TERMINATIONS MADE WITH PROPER AND SUITABLE CONNECTORS AND ADAPTORS, PVC CONDUITS SHALL BE USED

JNDERGROUND AND WHERE APPROVED BY CONSULTANT UPON CONTRACTOR REQUEST. 8.3 CONNECTORS TO ELECTRICAL PANELS, FIRE ALARM PANEL

SWITCHBOARDS, ETC., HEAD-MAIN EQUIPMENT SHALL BE C/W RAIN FIGHT CONNECTORS TO ENSURE EQUIPMENT INTEGRITY IN CASE OF WATER SPILLAGE.

8.4 CONDUITS SHALL BE INSTALLED OVERHEAD AND SHALL NOT BE SUSPENDED FROM THE ROOF DECK. INSTALL ALL CONDUITS AT JOIST EVEL FROM TOP PART OF THE JOIST OR FROM THE BEAM. PROVIDE ALL REQUIRED CONDUIT SUPPORT HARDWARE.

3.5 LARGEST CONDUITS APPROVED TO BE USE FOR CONNECTION OF BRANCH CIRCUITS IS 1-1/4". ANY DEVIATION WILL TRIGGER REWORK OF

.1 ALL WIRING SHALL BE MINIMUM #12 GAUGE COPPER, EXCEPT AS HERWISE NOTED. ALL WIRING SHALL BE 600 VOLT TYPE RW90 FOR PANEL FEEDERS INSTALLED IN METALLIC CONDUIT, UNLESS OTHERWISE

3.6 EMPTY CONDUITS SHALL BE COMPLETE WITH NYLON PULL WIRE

NOTED. CIRCUIT BRANCH WIRING SHALL BE T-90 CU JACKETED CONDUCTOR. AC-90 CABLES MAY BE USED WHERE PERMITTED BY CODE IN CEILING SPACE FOR FINAL CONNECTION TO LIGHT FIXTURE AND FROM CEILING DISTRIBUTION BOXES DOWN HOLLOW PARTITIONS TO

9.2 MINIMUM SIZE WIRING FOR DC WIRING SHALL BE #10 GAUGE. MAXIMUM VOLTAGE DROP SHALL NOT EXCEED 2% AT ALL FINAL OUTLET

9.3 BRANCH CIRCUIT WIRING VOLTAGE DROP SHALL BE 2% FOR ALL EEDER CONDUCTORS AND TOTAL 4% TO FINAL OUTLET. MINIMUM WIRE SIZE DEPICTED ON ELECTRICAL DRAWINGS CONTRACTOR TO INCREASE TO ACCOMMODATE FOR ANY VOLTAGE DROP DUE TO LENGTHS OF WIRI 9.4 ALL WIRING SHALL BE SIZED COMPLIANT WITH 75°C RATED EQUIPMENT, SUBJECT TO DERATING AS PER TABLES 5A, 5B, 5C & 5D.

9.5 UNDERGROUND WIRING FEEDERS AND BRANCH WIRES SHALL BI RWU RATED FOR DIRECT BURIAL AND INSTALLED IN SPECIFIED JNDERGROUND CONDUITS AS NOTED ON THE ELECTRICAL DRAWINGS 9.6 CHANGE OF LOCATION OF WIRING DEVICES WITHIN 5M OF THE OTED LOCATION ON THE DRAWINGS SHALL BE AT NO COST TO THE

CLIENT PROVIDED THAT THE LOCATION IS CLARIFIED PRIOR TO .7 CALL FOR ROUGH-IN INSPECTION BY AUTHORITIES HAVING ICTION PRIOR TO CLOSING WALLS AND CEILNGS. PAY ALL FEES AND PROVIDE RECORDS OF INSPECTION COMPLETION.

9.8 UNDERGROUND WIRING FEEDERS AND BRANCH WIRES SHALL BE WU RATED FOR DIRECT BURIAL INSTALLED IN SPECIFIED UNDERGROUND CONDUITS AS NOTED ON THE ELECTRICAL DRAWINGS

1 ALL FEEDERS SHALL BE MEGGER TESTED WITH 1000VDC (FOR CABLES RATED 300V OR LESS MEGGER TEST IS 500VDC) APPROVED

10.2 HAND CRANKED INSTRUMENTS ARE NOT ALLOWED. SUBMIT MEGGER TEST RESULT READINGS IN G Ω (GIGA – OHM) PRIOR TO

GROUNDING AND BONDING PROVIDE GROUND/BOND WIRES WITH ALL FEEDERS INCLUDING TENANT SERVICES. GROUND/BOND WIRE IN CONDUITS SHALL BE NSULATED - GREEN STRANDED #6 AWG. MINIMUM.

1.2 PROVIDE BONDING GREEN INSULATED WIRE IN EACH CONDUIT ZE TO ONTARIO ELECTRICAL CODE REQUIREMENTS

ELECTRICAL SPECIFICATIONS

11.3 PROVIDE MAIN GROUND SYSTEM TO HYDRO UTILITY SUPPLY

OF TWO (2) 3/4." DIAMETER, 10' LONG CU GROUNDING RODS NTERCONNECTED WITH 2/0 BARE COPPER CONDUCTOR. NTERCONNECT MAIN ELECTRICAL ROOM GROUNDING TO THE POWER ANSFORMER. WHERE APPLICABLE. WITH BARE COPPER CONDUCTOR ROUND INTERCONNECTION SHALL BE COMPLETED, VISIBLE AND CCESSIBLE FOR INSPECTION IN APPROVED 10"X10" PVC JUNCTION BOX MBEDDED IN FINISHED FLOOR CONTRACTOR TO SUPPLY AND INSTALL I GROUND BUS ON THE WALL IN MAIN ELECTRICAL AND PROVIDE THE

.4 MAIN ELECTRICAL ROOM GROUNDING SHALL CONSIST OF MINIMUM

2/0 CU BARE TO MAIN BOARD OR SWITCH GROUNDING LUGS

2/0 CU BARE TO REBAR

GROUND/BOND WIRE TO GAS LINE.

DLLOWING GROUNDING CONNECTIONS:

2/0 CU BARE TO BUILDING STEEL 2/0 CU BARE TO WATER MAIN IF MADE OF METAL

#6 CU TO MAIN GAS PIPE WITH GROUNDING BRIDGE ACROSS THE #6 CU TO EACH TENANT SPACE GAS LINE AS IT ENTERS THE ENANT SPACE WHERE APPLICABLE-EXTEND TENANT SERVICE

#6 CU INSULATED TO 12 POSITION GROUND BUS (2"X6" - CU) FOR TELEPHONE SERVICE. 12 POSITION GROUND BUS ON INSULATORS TO BE PROVIDED AND INSTALLED BY THIS CONTRACTOR. USE CADWELD LUGS FOR FINAL CONNECTION AND TERMINATION

6 CO-ORDINATE WITH OTHER TRADES IN LAYING OUT OF THE WORK O AS NOT TO CONFLICT WITH THE WORK OF OTHER TRADES, CARRY

JT WORK PROMPTLY. FOR HIGH VOLTAGE SYSTEM REFER TO HIGH VOLTAGE PECIFICATION AND UTILITY STANDARDS.

MECHANICAL TRADES WIRING:

PROVIDE ALL CONDUIT, WIRING, SPLITTERS, OUTLET BOXES AND ISCONNECT SWITCHES AS SHOWN. FOR ALL MOTORS STARTERS, AND CONTROL WIRING PER BELOW, 120V CONTROL EQUIPMENT PROVIDED UNDER DIVISION 15. DIVISION 16 SHALL INSTALL ALL LINE VOLTAGE STARTERS, THERMOSTATS, AND WIRING. PROVIDE ALL LINE VOLTAGE WIRING AS REQUIRED.

IT. LV AND COMMUNICATIONS SYSTEM SUPPLY AND INSTALL THE REQUIRED DUCT BANKS EMPTY RACEWAY SYSTEM C/W HD PULL WIRES, PULL BOXES, TERMINATION ANELS, OUTLET BOXES, COVER PLATES, SUITABLE FOR THE ISTALLATION OF IT AND COMMUNICATIONS CABLES AND ASSOCIATED. EQUIPMENT, BY THE IT COMPANY AND UTILITY. THE COMPLETE CONDUIT

STALLATION SHALL MEET ALL THEIR REQUIREMENTS. 2 RACEWAYS SHALL BE RIGID, GALVANIZED STEEL CONDUIT WHERE EXPOSED TO MECHANICAL INJURY. IN ALL OTHER LOCATIONS, EMT MAY BE USED. MINIMUM CONDUIT SIZE TO BE 19MM. WORK TO BE DONE TO S.A T527 AND C.S.A T530 LATEST STANDARDS.

3.3 ALL DATA OUTLETS SHALL BE WIRED WITH EMPTY PULL STRINGS. 3.4 PVC DUCT SHALL BE USED FOR UNDERGROUND SERVICE 3.5 PROVIDE TWO DEDICATED 110V 15AMP 1POLE POWER OUTLET

ADJACENT TO THE IT EQUIPMENT LOCATIONS FOR UTILITY COMPANY 3.6 UNLESS OTHERWISE SHOWN, STEEL PULL BOXES SHALL BE NSTALLED EVERY 30M OR LESS OF STRAIGHT CONDUIT RUN; EVERY 5M OR LESS OF STRAIGHT CONDUIT RUN AND ONE 90 DEGREE BEND OR EQUIVALENT: EVERY TWO 90 DEGREE BENDS OR EQUIVALENT. 3.7 A #6 GROUND WIRE SHALL BE RUN FROM THE TELEPHONE SERVICE PANEL TO SERVICE GROUND TO PROVIDE A GROUND FOR THE

DISTRIBUTION FEEDERS FEEDERS SHALL BE SIZED AS DETAILED. SUBSTITUTION OF EEDERS EITHER IN MATERIAL OR ROUTING WILL NOT BE PERMITTED UNLESS ENGINEER'S WRITTEN APPROVAL IS OBTAINED. FEEDERS SHAL IAVE A MAXIMUM VOLTAGE DROP OF 2% AT FULL LOAD AT THE PANELS SUPPLIED, ALL FEEDERS SHALL BE BALANCED UNDER FULL LOAD CONDITIONS TO WITHIN 5% BETWEEN PHASES, ALL PHASES AND

NEUTRALS SHALL BE IDENTIFIED AND MAINTAINED IN THEIR CORREC ORDER WHEN READING LEFT TO RIGHT THROUGHOUT THE BUILDING 2 FEEDERS TO PANELS TRANSFORMER INCOMING SERVICE AND LOAD CENTERS SHALL BE BALANCED UNDER FULL LOAD CONDITIONS T WITHIN 5% BETWEEN PHASES. ALL PHASES AND NEUTRALS SHALL BE DENTIFIED AND MAINTAINED IN THEIR CORRECT ORDER WHEN READING FT TO RIGHT THROUGHOUT THE BUILDING.

4.3 ALL PHASES AND NEUTRALS SHALL BE IDENTIFIED AND INTAINED IN THEIR CORRECT ORDER WHEN READING LEFT TO RIGHT THROUGHOUT THE BUILDING. 14.4 MEGGER ALL FEEDERS TO MEET CODE AND LATEST NETA MANUAL. ALL FEEDERS SHALL BE MEGGER TESTED WITH 1000VDC APPROVED MEGGER TESTER, HAND CRANKED INSTRUMENTS ARE NOT

PERMITTED. SUBMIT TEST RESULTS FOR CONSULTANT REVIEW PRIOR 14.5 REPLACE AT NO COST ALL FEEDERS THAT DO NOT MEET MINIMUM INSULATION RESISTANCE.

14.6 ALL DISTRIBUTION FEEDERS SHALL BE 90°C 15. ELECTRICAL EQUIPMENT ENCLOSURE RATING:

15.1 EQUIPMENT SHALL BE NEMA 2 RATED WHEN INDOOR AND NEMA 4 WHEN OUTDOOR, OUTDOOR DEVICES SHALL BE SUITABLY RATED FOR ELECTRICAL PANEL BOARDS

1 FACH PANEL BOARD SHALL BE C/W A KEY LOCKABLE HINGED DOOR AND A CIRCUIT DIRECTORY GIVING THE NUMBER AND SCRIPTION OF EACH CIRCUIT CONTROLLED. THE DIRECTORIES SHAL BE CLEARLY TYPED I EGIBLE AND OF AMPLE SIZE AND SHALL BE MOUNTED IN A METAL FRAME WITH A CLEAR PLASTIC COVER ON THE ISIDE OF THE DOOR

6.2 THE CIRCUIT BREAKERS SHALL BE CONNECTED TO THE PANEL BY OLTED CONNECTIONS, ALL BUS BARS, LUGS, AND BREAKER TERMINALS SHALL BE COPPER SILVER-PLATED AT THE CONNECTION OINTS. THE INTERRUPTING CAPACITY OF EACH BOARD SHALL BE DETERMINED BY THE CO-ORDINATION STUDY AS PER DRAWINGS MINIMUM 10KA FOR 208V PANELS AND 18KA FOR 347/600V PANELS. WHEN REMOTELY LOCATED FROM THE MAIN ELECTRICAL SERVICE. ECTRICAL PANELS INSIDE MAIN ELECTRICAL ROOM SHALL BE RATED NOT LESS THAN: 25KAIC FOR 347/600V PANELS AND MINIMUM 10KA FOR 208V PANELS. REFER TO COORDINATION STUDY FOR DETAILS OF FOLIIRED RATING. NOT WITHSTANDING THE ABOVE ALL SUPPLIED ELECTRICAL EQUIPMENT SHALL BE APPLICABLE FOR SERIES RATING

3 NOTWITHSTANDING THE ABOVE, PANEL BOARDS CONNECTED TO THE SECONDARY SIDE OF TRANSFORMERS, 600-120/208 VOLT AND 120/240 VOLT, SIZED 225KVA AND HIGHER SHALL BE RATED MINIMUM

STED WITH CLASS J FUSE

6.4 ALL TWO OR THREE POLE BREAKERS SHALL OPERATE WITH A MMON TRIP AND WITH A SINGLE HANDLE. TWO POLE CIRCUI BREAKERS CONSISTING OF TWO SINGLE POLE BREAKERS WITH A TIE

SELECTED PANELBOARD AND BREAKER TYPE COMBINATION SHALL ALLOW FOR INSTALLATION OF THREE POLE BREAKERS WITH ATING WITHOUT USE OF SPECIAL PURPOSE BREAKER KIT AND NOT REQUIRING MORE THAN THREE SINGLE POLE BREAKER SPACES. 6.6 ALL PANEL BOARDS SHALL BE SPRINKLER PROOF AS REQUIRED D MEET LOCAL AND HYDRO CODES.

7 ALL ELECTRICAL EQUIPMENT SHALL BE 75°C RATED OR HIGHER. 16.8 ALL PANELBOARDS SHALL BE FULLY BUSSED AND COMPLETE WITH BREAKER MOUNTING HARDWARE FOR ALL BREAKER SPACES. COVER PLATES

COVER PLATES FOR RECEPTACLES, SWITCHES, PILOT LIGHTS, ELEPHONE OUTLETS AND OTHER DEVICES REQUIRING COVER PLATES FOR FLUSH MOUNTED BOXES SHALL BE:

WHITE WHEN OUTLETS INSTALLED ON WHITE WALLS COLOURED MATCHING THE WALL COLOUR BASED ON AVAILABLE STANDARD COVER PLATES METAL, STAINLESS STEEL, #18-8, TYPE 302 WHEN OUTLETS INSTALLED IN BACK OF HOUSE CORRIDORS, UTILITY

ECTRICAL ROOMS, AND OTHER AREAS NOT ACCESSIBLE O THE PUBLIC NOTWITHSTANDING THE ABOVE, COVER PLATES IN PUBLIC AREAS SHALL BE BASED ON INTERIOR DESIGN OR ARCHITECTURAL DRAWINGS

17.2 WEATHERPROOF COVER PLATES SHALL BE DIECAST CORROSION SISTANT ALUMINUM TYPE WITH TWO SEPARATE LIDS FOR DUPLEX RECEPTACLES SUITABLE FOR MOUNTING ON E.S. TYPE BOXES, ALL WEATHERPROOF COVER PLATES SHALL HAVE RUBBER OR NEOPRENE

17.3 EXTERIOR COVER PLATES SHALL BE METAL IN-USE COVERS INTERMATIC WP1010MXD, WP1250MVXD, WP3110MXD, OR APPROVED **FOUIVALENT**

17.4 PLATES FOR SURFACE MOUNTED CAST BOXES SHALL BE GALVANIZED FORMED STEEL TYPE 7.5 COVER PLATES FOR FLUSH MOUNTED EQUIPMENT SHALL BE JPPLIED OF QUALITY AND PERFORMANCE SPECIFIED BY THE

ANUFACTURER OF THE EQUIPMENT. 7.6 COVER PLATES SHALL NOT CARRY MANUFACTURER'S NAME 7.7 COVER PLATES OF QUALITY SPECIFIED SHALL BE PASS AND SEYMOUR, BRYANT, LEVITON, OR HUBBELI SWITCHES:

LIGHTING 8.1 SWITCHES SHALL BE, UNLESS OTHERWISE NOTED, BRYANT QUIE TYPE WITH WHITE SPECIFICATION GRADE FOR 120V AND HEAVY-DUTY GRADE FOR 347V

BRYANT, P & S, LEVITON AND HUBBELL, SHALL BE CONSIDERED AS ACCEPTABLE AS SPECIFIED ALTERNATES 18.3 DIMMERS SHALL BE LUTRON SPECIFICATION GRADE OR APPROVED ALTERNATE. OCCUPANCY SENSORS SHALL BE WATTSTOPPER DUAL ECHNOLOGY OR APPROVED EQUIVALENT

8.2 LIGHT SWITCHES OF QUALITY AS MANUFACTURED BY

DISCONNECT SWITCHES: 8.4 DISCONNECT SWITCHES FOR MECHANICAL AND ALL OTHER EQUIPMENT SHALL BE HEAVY DUTY DOUBLE THROW SAFETY SWITCHES, DAD BREAK, WITH KA RATING EQUIVALENT TO THE UPSTREAM FUSE. IN CASE OF CIRCUIT BREAKER PROTECTION, AND NOT WITHSTANDING LINE

DIAGRAMS FUSIBLE DISCONNECT SWITCHES SHALL BE PROVIDED IF NO

CURRENT LIMITING DEVICE IS PROVIDED UPSTREAM IN THE ELECTRICAL

8.5 ELEVATOR DISCONNECT SWITCHES SHALL BE AS PER ABOVE SECTION AND COMPLETE WITH AUXILIARY CONTACTS IDENTIFYING PEN/CLOSE SWITCH STATUS AND WIRED TO THE ELEVATOR

8.6 FUSIBLE DISCONNECTS SWITCHES SHALL MATCH SPECIFICATION AS ITEM 18.4 HOWEVER FUSIBLE WITH CLASS J OR CLASS R FUSES AS REQUIRED.

9.1 RECEPTACLES SHALL BE, UNLESS OTHERWISE NOTED, U-GROUND 9.2 RECEPTACLES SHALL BE SPECIFICATION GRADE, MADE BY BBELL, LEVITON, T&B OR EQUIVALENT, 15 AMP, 120 VOLT UNLESS THERWISE NOTED.

9.3 ROOF/PARAPET RECEPTACLES SHALL BE VERTICALLY MOUNTED, CONDUIT WORK SHALL BE CONCEALED WITHIN THE STRUCTURE AVITY, ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR SEALING AND WATER PROOFING OWN PENETRATIONS. 19.4 HVAC RECEPTACLES SHALL BE 20 AMP AND COMPLETE WITH

HILE IN USE COVER, DIE-CAST ALUMINUM, MADE BY INTERMATIC.

D. DISTRIBUTION COORDINATION STUDY, SHORT CIRCUIT & OMMISSIONING REPORT: 20.1 PROVIDE A DISTRIBUTION COORDINATION, SHORT CIRCUIT AND ARC FLASH STUDY TO CONFIRM THAT ALL EQUIPMENT OFFERED IS SUITABLY RATED. THE REPORT TO BE SIGNED BY PROFESSIONAL NGINEER, PROVIDE THE COORDINATION SHORT CIRCUIT STUDY WITH THE DISTRIBUTION SHOP DRAWINGS. SUBMISSION OF ALL EQUIPMENT SHOW ALL SWITCHGEAR AND DISTRIBUTION FROM THE SERVICE ENTRY TO THE LAST PANEL. OBTAIN DETAILS FROM UTILITY AND INCORPORATE INTO STUDY. DETAILS FOR THE STUDY SHALL BE PROJECT SPECIFIC, DEFAULT ANSI AND NEMA EQUIPMENT DETAILS SHALL NOT BE

ACCEPTED, COORDINATION SHALL INCLUDE AND NOT BE LIMITED TO

INE DIAGRAMS C/W FAULT LEVELS, LINE DIAGRAMS C/W WIRE LENGTI ND WIRE SPECIFICATIONS, LINE DIAGRAMS C/W ARC FLASH LEVELS. SELECTIVE COORDINATION PLOTS AND TABLE WITH BREAKER SETTING 0.2 CONTRACTOR SHALL OBTAIN ALL DATA AS REQUIRED BY THE OWER SYSTEM STUDIES IN WRITING THE CONTRACTOR SHALL EXPEDITE COLLECTION OF THE DATA TO ELIMINATE UNNECESSARY DELAYS AND TO ASSURE COMPLETION OF THE STUDIES REQUIRED FOR INAL APPROVAL OF THE DISTRIBUTION SHOP DRAWINGS AND/OR PRIOR TO THE RELEASE OF THE EQUIPMENT FOR MANUFACTURING.

20.3 PROVIDE ALL REQUIRED ARC FLASH LABELS AS PER Z462. LABELS SHALL COMPLY WITH CSA Z462 Q4 STANDARD LABEL. THE PROJECT WORK TO BE DONE BY AN INDEPENDENT SPECIALIST CARRY OUT AN INFRARED SCAN OF THE ENTIRE DISTRIBUTION UNDER CONDITIONS. RETORQUE ALL EQUIPMENT CONNECTION INCLUDING HOWEVER NOT LIMITED TO BUSSING BREAKERS WIRE ERMINATIONS. COMPLETE ONSITE BREAKER TESTING TO CONFIRM BREAKER RELAY OPERATION. PROVIDE WRITTEN RECORDS OF TESTING

INCLUDING VISUAL INSPECTION OF RELAY CONTROL WIRING AND LOCATION OF ALL CT SENSORS. 20.5 PROVIDE AN ARC FLASH STUDY AND PROVIDE ARC FLASH RATING ABELS ON ALL ELECTRICAL DISTRIBUTION EQUIPMENT AND PANELS.

AUTOMATIC CONTROL OF EXTERIOR LIGHTS: 21.1 CONTACTORS, PHOTO-ELECTRIC CONTROLS AND TIME SWITCHES HALL BE USED TO CONTROL THE EXTERIOR LIGHTING INCLUDING POLE

1.2 THE PHOTO-ELECTRIC CELL AND TIME CLOCKS SHALL BE WIRED SO AS TO CONTROL A MAGNETIC CONTACTOR. EACH CONTACTOR SHALL HAVE AN 'ON-OFF-AUTO' SWITCH TO PERMIT MANUAL OPERATION OF THE INDIVIDUAL CONTACTOR, CONTACTORS TO BE MINIMUM 20A HID LIGHTING DUTY. TIME CLOCKS TO BE DIGITAL COMPLETE WITH ASTRONOMIC CLOCK AND DAY LIGHT SAVINGS PROGRAMMABLE

1.3 CONTACTORS SHALL HAVE LAMACOID NAMEPLATES INDICATING HAT CONTROL CIRCUIT IS SUPPLIED FROM A DIFFERENT SOURCE

SERVICE ENTRANCE SWITCHBOARD: .1 THE SERVICE ENTRANCE BOARD SHALL CONSIST OF A COMPLETE METAL ENCLOSED FREE-STANDING STRUCTURE CONSISTING OF A MAIN OVERCURRENT DEVICE COMPARTMENT, HYDRO METERING AS REQUIRED, METERING PANEL DISTRIBUTION SECTIONS AND THE HROUGH FLOOR/WALL BUS DUCT TO THE VAULT C/W FIRE BARRIER. DETAILS OF MAIN INCOMING SERVICE, VERIFY WITH LOCAL ISTRIBUTION COMPANY PRIOR TO SUBMISSION OF SHOP DRAWINGS.

2.2 BUS WORK SHALL BE COPPER SILVER-PLATED, BRACED TO WITHSTAND MAXIMUM AVAILABLE SHORT CIRCUIT IN THE SYSTEM. BREAKERS AND FUSES SHALL HAVE ADEQUATE INTERRUPTING AND JTY CAPACITY AND SHALL BE FULLY COORDINATED WITH THE ONNECTED EQUIPMENT ON THE LOAD AND LINE SIDE. INTERRUPTING ND DUTY CAPACITY NO LESS THAN 50KAI

2.3 FUSES PROVIDED SHALL BE CLASS J OR L MADE BY BUSSMANN OR UIVALENT CANADIAN MANUFACTURER. 2.4 MOTOR CIRCUITS SHALL HAVE RK CLASS FUSE - TIME DELAY STYLE 2.5 BALANCE OF FUSE SHALL BE SELECTED BASED ON COORDINATION STUDY AND SHALL BE DUAL ACTION CURRENT LIMITING STYLE 22.6 THE MAIN OVERCURRENT DEVICE COMPARTMENT SHALL CONTAIN. BREAKER OF TYPE FRAME AND SIZE OR FUSED DISCONNECT SWITCH

2.7 MAIN SWITCH OR BREAKERS SHALL BE EQUIPPED WITH GROUND AULT RELAYS AS REQUIRED BY CODE. IN ADDITION, ALL UNDERGROUND FEEDERS 400 AMP AND LARGER SHALL BE GROUND FAULT PROTECTED. PROVIDE GROUND FAULT EQUIPMENT WHERE INDICATED ON DRAWINGS AND AS REQUIRED BY CODE. 2.8 WHERE SPECIFIED ON THE DRAWINGS L-S-I-G BREAKERS: THESE SHALL BE FULLY ADJUSTABLE ACROSS ALL REGIONS. ADJUSTABLE TIM AND PICK UP SETTINGS FOR ALL L-S-I-G DOMAINS. INSTANTANEOUS AND

VITH FUSES OF TYPE AND SIZE AS INDICATED.

FOUIREMENTS

O ORDERING EQUIPMENT

SROUND FAULT SETTINGS SHALL BE FULLY COORDINATED WITH JPSTREAM DEVICES HAVING HIGHER WITHSTAND RATING THAN DWNSTREAM DEVICES. 2.9 THE HYDRO METERING CURRENT TRANSFORMER COMPARTMENT VHERE REQUIRED. SHALL HAVE A REMOVABLE STEEL MOUNTING PLATE AND SHALL BE EQUIPPED WITH ALL HARDWARE AND BUS DUCT TO RECEIVE THE LOCAL UTILITIES CURRENT AND POTENTIAL RANSFORMERS CURRENT TRANSFORMERS SHALL BE OBTAINED FROM THE UTILITY AND INSTALLED IN THE COMPARTMENT BY THE SERVICE NTRANCE BOARD MANUFACTURER OR AS PER UTILITIES STANDARD

2.10 THE ENTIRE PANEL, BUSWORK AND CONNECTIONS SHALL BE TO

ISTALLATION. SUBMIT METERING DETAILS TO THE LOCAL DISTRIBUTIO

COMPANY TO OBTAIN APPROVAL OF THE METERING EQUIPMENT PRIOR

THE UTILITIES APPROVAL. OBTAIN THEIR REQUIREMENTS PRIOR TO

22.11 MAIN SWITCHBOARD SHALL INCLUDE MAIN DIGITAL DEMAND MODEL IIR-D-5A-P1 OR FOLIVALENT THE DEMAND METER MAY BE SEPARATELY INSTALLED IN OWN ENCLOSURE NEXT TO THE MAIN ERVICE BOARD OR BE PART OF THE BOARD, INCLUDE FOR ENCLOSURE, CT'S, SEPARATE CONTROL POWER TRANSFORMER C/W

FUSE KIT AS REQUIRED. THE DIGITAL DEMAND METER SHALL BE A TURN EY PRODUCT BY THE ABOVE OR EQUIVALENT VENDORS 22.12 SWITCHBOARD SHALL BE VERMIN PROOF, SPRINKLERPROOF AND ON A MINIMUM 4" CONCRETE HOUSEKEEPING PAD AND UPSIZED AS REQUIRED FOR SEISMIC CONSTRUCTION.

22.13 SERVICE ENTRANCE BOARD SHALL HAVE A MINIMUM OF 50KA (AIC 22.14 PROVIDE A LOCKABLE HINGED SPARE FUSE CABINET IN EACH ECTRICAL ROOM. PROVIDE A MINIMUM OF THREE (3) - SPARE FUSES OF EACH SIZE USED. PROVIDE INVENTORY, MOUNTED ON THE INSIDE OF THE CABINET.

23.1 DRY TYPE INDOOR DISTRIBUTION TRANSFORMERS SHALL BE OF COPPER WINDINGS, INDOOR AIR-COOLED TYPE RATED THREE PHASE YCLE, OF KVA, VOLT & AMP RATING AS SHOWN ON THE DRAWINGS 2KV CLASS AND CAPABLE OF WITHSTANDING A 10KV BASIC IMPULSE LEVEL (BIL). THEY SHALL HAVE STANDARD PRIMARY TAPS. THE INSFORMER SHALL BE DESIGNED WITH A CLASS B OR H INSULATION 23.2 THE SOUND LEVEL IN DECIBELS SHALL BE IN ACCORDANCE WITH

NEMA TRI CURRENT STANDARDS. THE TRANSFORMER SHALL BE

SOLDERLESS CONNECTORS AND SHALL HAVE A VENTILATED CODE

GAUGE STEEL ENCLOSURE COMPLETE WITH HINGED REMOVABLE

FOUIPPED WITH TERMINAL BOARDS, TAP CHANGING LINKS, SUITABLE

EXPANDED METAL SIDE PANELS AND MOUNTING BRACKETS FOR FLOOR

73 TRANSFORMERS:

OR WALL MOUNTING AS SHOWN. MOUNT ALL TRANSFORMERS 75KVA AND SMALLER AT HIGH LEVEL IN LOCATION SHOWN UNLESS OTHERWIS 23.3 TRANSFORMERS 112.5KVA OR LARGER SHALL BE PLACED ON A IINIMUM 4" HIGH CONCRETE HOUSEKEEPING PAD AND UPSIZED AS

REQUIRED FOR SEISMIC CONSTRUCTION

23.4 THE COMPLETED ASSEMBLY SHALL BE PAINTED WITH A PRIMER COAT AND A FINISH COAT OF ASA#61 GRAY, THE TRANSFORMER SHALL CONFORM TO C.S.A-0802.2, NEMA TRI AND CEMA L2 CURRENT STANDARDS EXCEPT WHERE NOTED AND SHALL BE APPROVED TO C.S.A CODE PART 2 SPECIFICATION 022.2 NO.47 WHERE APPLICABLE 23.5 TRANSFORMERS SHALL BE SPRINKLERPROOF AS REQUIRED TO

23.6 COMPLETE TRANSFORMER CONNECTION BY USE OF FLEXIBLE CONDUITS TO ALLOW FOR VIBRATION ISOLATION 24. METERING

24.1 METERING CABINETS SHALL BE OF SIZE SHOWN ON DRAWING OF

AS REQUIRED WITH REMOVABLE STEEL METER MOUNTING PLATE, TWO

DOORS AND SEALING HASPS TO UTILITY APPROVAL. PROVIDE A CAT.6 WIRED TELEPHONE LINE FROM EACH METER CABINET TO THE MAIN ELEPHONE ENTRY POINT AS REQUIRED BY THE LOCAL DISTRIBUTION COMPANY METERING DEPARTMENT 24.2 METER SOCKET BASE SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR, FOR ELECTRICAL SERVICES 400 AMP AND HIGHER.

COMBINATION OF METER CABINET AND SEPARATE METER BASE ARE 24.3 THE CABINET SHALL BE MOUNTED ON THE WALL AS SHOWN ON HE DRAWINGS AND TO THE SATISFACTION OF THE LOCAL UTILITY.

24.4 THE CONTRACTOR SHALL CONFIRM METERING REQUIREMENTS WITH LOCAL HYDRO METERING DEPARTMENT PRIOR TO WORK COMMENCEMENT AND METERING EQUIPMENT SUPPLY.

METER SOCKETS SHALL BE TO APPROVAL OF UTILITY.

LOCAL HYDRO'S REQUIREMEN

24.6 COORDINATE AND PAY FOR ANY HYDRO SERVICE COSTS AS REQUIRED, INCLUDE FOR COORDINATION AND MEETING WITH UTILITY

4.7 METERING EQUIPMENT SHALL BE PRE-APPROVED BY LOCAL

HYDRO METERING DEPARTMENT. OBTAIN APPROVAL BY AHJ.

24.5 PROVIDE ALL REQUIRED NEUTRAL WIRES TO METER AS PER

MISCELLANEOUS ELECTRICAL WORK: 1 PROVIDE ALL CONCRETE WORK REQUIRED FOR ELECTRICAL WORK IN ACCORDANCE WITH ELECTRICAL AND ARCHITECTURAL DIVISION OF SPECIFICATION. THIS INCLUDES HOUSEKEEPING PAD

ELOW ALL FLOOR STANDING EQUIPMENT PROVIDE ALL NECESSARY DUCT BANKS AS REQUIRED BY HYDRO ACCORDANCE WITH THEIR SPECIFICATIONS, SUBMIT ALL NECESSARY DRAWINGS TO HYDRO FOR THEIR APPROVAL. 25.3 CONFIRM ALL LOCATIONS AND OUTLETS PRIOR TO INSTALLATION.

ALLOW TO RELOCATE ANY OUTLET WITH 5 METERS OF SPECIFIED

25.5 PROVIDE ALL REQUIRED LUGS CONNECTORS REDUCERS.

PRE-ARRANGEMENT AT TIMES SUITABLE TO THE LANDLORD.

LOCATION PRIOR TO INSTALLATION. 25.4 COORDINATE LOCATION OF TENANT ELECTRICAL SERVICE WITH TENANT INTERIOR DETAILS PRIOR TO SERVICE INSTALLATION. REQUEST FROM GENERAL CONTRACTOR TENANT INTERIOR DRAWINGS FOR COORDINATION PURPOSES.

ENSURE CONDUCTORS COMPATIBLE WITH TERMINATOR REQUIREMENTS OF THE EQUIPMENT. INTERRUPTION AND CONTINUATION OF SERVICES: 26.1 INTERRUPTION OF FURCTRICAL SERVICES SHALL OCCUR ONLY BY

CRIMP, PIGTAIL, ADAPTERS. ANY REQUIRED CONNECTING MATERIAL TO

26.2 INTERRUPTIONS SHALL ONLY OCCUR DURING PREMIUM TIME PERIODS; ALL ALLOWANCES FOR THIS SHALL BE INCLUDED IN THE 26.3 WORK IDENTIFIED TO BE CARRIED OVER BY LOCAL HYDRO LITILITY SHALL BE COMPLETED WITH ASSISTANCE BY THIS ELECTRICAL

ONTRACTOR, AT A TIME CONVENIENT TO HYDRO COMPANY. INCLUDE FOR WORK AT PREMIUM TIME AS REQUIRED.

28. N/A

).1 PROVIDE ALL MATERIALS AND LABOUR NECESSARY TO SUPPLY ND INSTALL SEISMIC RESTRAINTS AND ANCHORAGE FOR ALL ELECTRICAL EQUIPMENT INCLUDING, AND NOT LIMITED TO. WITCHGEAR, TRANSFORMERS, STANDBY GENERATORS, LIGH IXTURES, BATTERY PACKS, CONDUITS, RACEWAYS, BUS DUCTS, ETC.

TO CONFIRM WITH LOCAL BUILDING CODE AND ALL OTHER APPLICABLE REGULATIONS 0.2 CONTRACTOR SHALL RETAIN AND PAY FOR A REGISTERED SEISMIC ENGINEER TO DESIGN AND INSPECT THE SEISMIC RESTRAINTS OF THE ELECTRICAL SYSTEM COMPONENTS COVERED

JNDER DIVISION 16 FOR THIS CONTRACT. 30.3 THE SEISMIC ENGINEER RETAINED BY CONTRACTOR SHALL ROVIDE FOR THE FOLLOWING: SIGNED AND SEALED LETTERS OF ASSURANCE OF

PROFESSIONAL DESIGN AND COMMITMENT FOR FIELD REVIEW AND SUMMARY OF DESIGN AND FIELD REVIEW AS REQUIRED BY AUTHORITIES HAVING JURISDICTION. CERTIFIED DETAILED DRAWINGS OF SEISMIC RESTRAINTS DETAILED SPECIFICATION FOR SEISMIC RESTRAINTS AND

HOUSEKEEPING PAD DESIGN REQUIREMENTS FOR

WRITTEN REPORTS OF SITE REVIEWS SIGNED AND SEALED LETTER OF ASSURANCE OF PROFESSIONAL REVIEW AND COMPLIANCE. 30.4 SUBSTANTIAL PERFORMANCE WILL NOT BE CONSIDEREI WITHOUT THE SUBMISSION OF THE ABOVE DOCUMENTS. ALL THE ABOVE DOCUMENTS SHALL BE SUBMITTED TO THE CONSULTANT FOR

EQUIPMENT SUPPORT

URTHER DISTRIBUTION AND FILES

RESTRAINT SYSTEM TO SUI

30.5 THE CONTRACTOR SHALL COOPERATE WITH THE SEISMIC NGINEER AND PROMPTLY SUPPLY SUCH INFORMATION, INCLUDING WEIGHTS OF EQUIPMENT AND BASE FRAME OR MOUNTING PLATE AYOUTS, AS REQUESTED BY THE SEISMIC ENGINEER NECESSARY TO SUPPORT THE DESIGN AND DETAILS FOR SEISMIC RESTRAINT. 30.6 THE CONTRACTOR SHALL NOT BE ENTITLED TO ANY ADDITIONAL COMPENSATION ARISING FROM THE TECHNICAL DIRECTION PROVIDED BY THE SEISMIC ENGINEER FOR SEISMIC RESTRAINT AND ANCHORAGE

0.7 CONTRACTORS AND SEISMIC RESTRAINT ENGINEER SHALL NOTE

SPECIFIC STRUCTURAL DESIGN AND CONSTRUCTION REQUIREMENTS

FOR THIS BUILDING AND SHALL DESIGN AND INSTALL THE SEISMIC

HAZARDOUS LOCATIONS:

SPECIFICATION GUIDELINES

THE DRAWINGS SHALL BE DISCARDED

ON THE ELECTRICAL DRAWINGS

DELTA AND GE

1 ALL WIRING IN AREAS/ZONES CLASSIFIED AS HAZARDOUS SHALL E COMPLETED WITH RIGID STEEL PIPING AND IN ACCORDANCE TO

ECTION 18 OF OESC. TECK WIRING WILL NOT BE ACCEPTED. APPROVED MANUFACTURERS:

3.3 LV TRANSFORMER: REX, MARCUS, HAMMOND, SIEMENS, BEMAG,

4.1 ELECTRICAL SPECIFICATION IS APPLICABLE TO ALL ITEMS SHOWN

.2 SPECIFICATION REFERENCING EQUIPMENT BEYOND THE SHOWN

.1 SWITCHBOARD AND ELECTRICAL PANELS: EATON, SQUARE D, GE AND SIEMENS 3.2 METER CENTERS: EATON AND SQUARE D

INTERNAL DIAMETER OF FOUR INCHES MINIMUM UNLESS OTHERWISE SHOWN ON THE DRAWINGS. BENDS SHALL GENERALLY BE AS FACTORY SUPPLIED OF APPROVED

THE DUCT LENGTHS SHALL BE JOINED TOGETHER WITH AN APPROVED COUPLING TO PROVIDE A SOUND JOINT. ADJACENT COUPLINGS SHAL WHERE TRENCH IS DRY AND FIRM, NO BED SHALL BE REQUIRED, WHERE

CONTAINING WATER. THE DUCTS SHALL BE LAID WITH A MINIM SPACING OF 150MM CENTER TO CENTER, BOTH HORIZONTALLY AND VERTICALLY FOR 100MM DIAMETER. FOR LARGER DUCTS, SPACING SHALL BE INCREASED CORRESPONDINGLY SPACERS SHALL BE INSTALLED ON 3M CENTERS.

PRIOR ENTRANCE INTO ELECTRICAL ROOM DUCTS SHALL BE DRAINED VIA FRENCH DRAIN IF SLOPE OPPOSITE TO ELECTRICAL ROOM IS NOT THE TOP SURFACE OF CONCRETE ENCASEMENT SHALL BE A MINIMUM OMM BELOW FINISHED GRADE, UNLESS OTHERWISE INDICATED ON

THE DUCTS SHALL BE ON EVEN GRADE SLOPED NOT LESS THAN 20MM IN

A 1000MM RUN IN DIRECTION OPPOSITE TO THE ELECTRICAL ROOM.

NO FERROUS METAL SHALL BE INSTALLED BETWEEN PRIMARY CABLE DUCTS. RE-ENFORCING SHALL BE INSTALLED ONLY NEAR THE BOTTOM OF THE DUCT UNLESS SPECIFICALLY INDICATED OTHER OR REQUIRED BY A LOCAL HYDRO AUTHORITY. WHERE THE DUCTBANK IS CONSTRUCTED OVER RECENT FILL OR UNSTABLE GROUND, OR PASSES THROUGH WALLS OR FOOTINGS. OR UNDER DRIVEWAYS OR PARKING LOTS. THE CONCRETE SHALL BE REINFORCED WITH 5/8" DIAMETER

2000MM. INDIVIDUAL LENGTHS OF REINFORCING RODS ARE TO BE OVERLAPPED BY A MINIMUM OF 300MM AND IS TO EXTEND AT LEAST 1000MM ONTO SOLID GROUND, IN ALL CASES WHERE THE DUCT BAN ENTERS A BUILDING, IT SHALL BE REINFORCED FOR A DISTANCE OF 2500MM OUTSIDE THE BUILDING. DUCTBANKS PASSING BENEATH OR THOUGH BUILDING FOOTINGS, UNDER HIGHWAYS, STREETS, ROADS, OR HEAVILY TRAVELED DRIVEWAYS SHALL BE REINFORCED, AND REINFORCING SHALL EXTEND A DISTANCE OF 1500MM BEYOND IN BOTH THE DUCTS SHALL BE ENCASED WITH A MINIMUM 24MPA CONCRETE

AGGREGATE. TO PREVENT ANY DISPLACEMENT OF THE DUCT STRUCTURE DURING POURING. THE DUCT STRUCTURE SHALL BE BRACED DOWN EVERY 3000MM AND THE CONCRETE SHALL BE DEFLECTED DOWN ALONGSIDE THE DUCTS TO THE BOTTOM AND UP THROUGH THE DUCT ASSEMBLY WHEN CROSSING OTHER UTILITIES. THE CONCRETE DUCT ENCASEMENT

HAVE A SLUMP OF 100MM TO 150MM AND BE OF A PEA GRAVE

BE INSTALLED IN THE SAME EXCAVATION. 2.10.4 WHEN COMPLETED, THE DUCTS SHALL BE CLEANED AND ENDS PLUGGED WITH DUCT PLUGS. THE DUCTS SHALL BE TESTED FOR CLEARANCE BY PULLING A STEEL WIRE BRUSH AND A 95MM MANDREL

MINIMUM OF 1500MM CLEAR OF SAID UTILITY BUT IN NO CASE SHALL IT

INSTALLED IN EACH DUCT TO FACILITATE THE INSTALLATION OF TH CABLES IN THE DUCT. TERMINATION POINTS, GRADES, AND ROUTE OF DUCT BANK SHALL BE CONFIRMED BY THE P.U.C ON-SITE.

INSTALLATION.

ASSUME RESPONSIBILITY TO HAVE THE DUCTS INSPECTED BY THE INSPECTION OFFICE AND P.U.C (WHERE APPLICABLE) PRIOR TO POURING OF CONCRETE AND AGAIN PRIOR TO BACKFILLING. EXCAVATION AND BACKFILLING EXCAVATE AND BACKFILL AS REQUIRED FOR THIS WORK BOTH INSIDE

REGULATIONS, AS REVISED AND AMENDED TO DATE. ALL EXCAVATION AND BACKFILLING SHALL BE PROVIDED BY THIS

SITE SERVICE & DUCTBANK SPECIFICATIONS

SUPPLY AND INSTALL UNDERGROUND CONCRETE ENCASED DUCTBANKS 2.4 UNDERGROUND SEWERS AND OTHER SERVICES ARE INDICATED FOR CABLES INDICATED. CONCRETE WORK AS DETAILED HEREIN SHALL BE PROVIDED BY THIS SECTION. TRENCHING AND BACKFILLING SHALL BE DONE BY THIS SECTION

DUCTBANKS SHALL FOLLOW GENERAL ROUTE SHOWN ON THE DRAWINGS AND SHALL TERMINATE AT SPECIFIED LOCATIONS. EXACT LOCATION OF DUCTBANKS AND TERMINATING POINTS SHALL BE VERIFIED ON THE SITE PRIOR TO COMMENCEMENT OF WORK.

THE DUCTRANK SHALL CONSIST OF PARALLEL DUCTS ENCASED IN CONCRETE. THE NUMBER AND ARRANGEMENT OF DUCTS SHALL BE AS SHOWN ON THE DRAWINGS. DUCTS SHALL BE CSA CERTIFIED TYPE DB POLYVINYL FOR CONCRETE ENCASEMENT OR DIRECT BURIAL, WITH AN

RADIUS. RADIUS OF SUCH BENDS SHALL NOT BE LESS THAN STANDARD

FOR THE 100MM DIAMETER DUCT 1M BE STAGGERED BY AT LEAST 200MM. JOINT SOLVENT SHALL BE USED TO

TRENCH IS WET, SUPPLY AND INSTALLED 150MM LAYER OF CRUSHED

STONE IN THE BOTTOM. NO CONCRETE SHALL BE POURED IN TRENCHES

AND WITHIN 600MM OF EACH COUPLING USED. SPACERS SHALL BE SPECIALLY FORMED PLASTIC. WOOD SPACERS SHALL NOT BE USED.

THE DRAWING, BUT IN NO CASE SHALL IT BE LESS THAN 600MM TO THE FINISHED GRADE OR SURFACE. HIGH VOLTAGE DUCTS SHALL HAVE

MINIMUM 1000MM OF 98% COMPACTED SOIL OR NATIVE MATERIAL OVER SPACING AND SET AT 3/3 THE DEPTH OF THE CONCRETE ENVELOPE BELOW THE BOTTOM ROW OF DUCTS.

ALL REINFORCING RODS USED SHALL HAVE A MINIMUM LENGTH OF WITH A MINIMI IM COVER OF 75MM ON ALL SIDES. THE CONCRETE SHALL

SHALL MAINTAIN A MINIMUM OF 450MM VERTICAL CLEARANCE, WHEN RUNNING PARALLEL TO ANOTHER UTILITY. THE DUCTBANK SHALL BE

5 DUCTS INSTALLED FOR P.U.C CABLES AND DUCTS LEFT AS SPARE SHALL

NOTIFY CONSULTANT AND P.U.C AT LEAST 48 HOURS BEFORE CONCRETE IS POURED TO PERMIT INSPECTION OF THE DUCT

DTECTION ACT AND AMENDMENTS, STATUTES OF ONTARIO AND

CAREFULLY CHECK AND AVOID DISTURBING OR DAMAGING ANY

EXISTING UNDERGROUND PIPING CONDUIT OR OTHER SERVICES

UNCOVERED DURING CARRYING OUT OF THE WORK. MAKE GOOD ANY

AND OUTSIDE THE BUILDING. ALL TRENCH EXCAVATION SHALL BE

CARRIED OUT IN STRICT CONFORMITY WITH THE TRENCH EXCAVATOR

APPROXIMATELY ON THE MECHANICAL ELECTRICAL OR ARCHITECTURAL SITE PLANS. THE LOCATION OF SUCH SERVICES HAS BEEN DETERMINED FROM AVAILABLE INFORMATION BUT HAS NOT BEEN VERIFIED IN THE FIELD. CAREFULLY CHECK SUCH DISCREPANCY

REQUIRED DEPTH AND DIMENSION, AND SHALL BE

OF LOCAL PLUC HYDRO TELEPHONE AND GAS AUTHORITIES TO ACCURATELY DETERMINE LOCATION OF ANY UNDERGROUND UTILITIES. 2.5 EXCAVATION FOR ALL UNDERGROUND SERVICES SHALL BE OF THE

2.5.1 PREPARED AS REQUIRED, SO THAT NO PORTION OF ANY DUCT SHALL BEAR DIRECTLY AGAINST ANY ROCK OR OTHER HARD SURFACE.

KEPT DRY AT ALL TIMES BY BAILING, PUMPING, OR OTHER MEANS. SIDES

AND BOTTOMS SHALL BE KEPT FROM FREEZING 2.5.3 BOTTOMS OF EXCAVATION SHALL BE GRADED AS REQUIRED BANKS OF EXCAVATIONS SHALL BE EVENLY CUT AND/OR TRIMMED AND HEY SHALL BE SHORED AS REQUIRED TO PREVENT CAVING IN, AND

THE MATERIAL USED SHALL BE CAREFULLY DRAWN DURING

2.5.5 WIDTH OF EXCAVATION SHALL BE CAREFULLY CONTROLLED AND SHALL BE LIMITED TO TWICE THE O.D OF DUCTS, CONDUITS OR DUCTBANK, AND AS SHOWN ON THE DRAWINGS.

EXCAVATING, DUCT LAYING, AND BACKFILLING SHALL BE EXECUTED IN IMITED LENGTH AS DETERMINED BY PROJECT MANAGER TO ENABLE ALL PROTECTIVE MEASURES TO FUNCTION EFFICIENTLY AT ALL TIMES

ALL DUCTS ENTERING AND LEAVING THE BUILDING OR PASSING OTHER

CONCRETE PAD. RESTING AT BOTH ENDS ON AT LEAST 1800MM SOLID

WHERE EXCAVATING IS NECESSARY IN CLOSE PROXIMITY TO AND BELOW ANY FOOTING LEVEL. BACKFILLING SHALL BE DONE WITH REINFORCED CONCRETE FURNISHED UNDER THIS SECTION TO THI LEVEL OF THE TOP OF HIGHEST ADJACENT FOOTING.

UNDISTURBED EARTH OR A CHECK IN CONCRETE FOUNDATION WALL. IN AREAS WHERE REINFORCED SUSPENDED SLAB IS INDICATED ON STRUCTURAL DRAWINGS, DUCTS SHALL BE SUPPORTED FROM

REINFORCING RODS.

EXCAVATED AREAS SHALL BE SUPPORTED ON A REINFORCED

SHOULD THE EXCAVATION BY NEGLIGENCE OR ERROR BE CARRIED TO GREATER DEPTH THAN SHOWN OR AUTHORIZED, SUCH EXTRA EXCAVATION SHALL BE REPLACED WITH WELL-COMPACTED GRANULAR B CRUSHED STONE FILL OR REINFORCED CONCRETE, AS REQUIRED TO GIVE A BEARING VALUE EQUAL TO THAT PROVIDED BY ADJACENT SOIL

2.10 BACKELLING SHALL NOT BE COMMENCED UNTIL INSTALLATION IS NSPECTED AND APPROVED. BACKFILLING SHALL BE CARRIED OUT CAREFULLY TO AVOID INJURY TO THE WORK AND SUBSEQUENT SETTLEMENT AND SHALL BE EXECUTED AS FOLLOWS: ALL BACKFILLING REQUIRED TO BRING LEVEL UP TO UNDERSIDE OF

FILL SHALL BE CLEAN, SHALL NOT HAVE PARTICLES OVER 65MM IN LARGEST DIMENSIONS, AND WITH NOT MORE THAN 8% PASSING A #200 ALL BACKELL PLACED UNDER PAVED AREAS (PARKING AREAS DRIVEWAYS, SIDEWALKS, ETC.) SHALL BE COMPACTED IN 150MM TO 200MM LAYERS TO 98% SPDD (REFER TO GENERAL REQUIREMENTS OUTLINED IN SPECIFICATION SECTION 02315 & SOIL REPORT). TESTING AND INSPECTION OF SAID BACKFILL INCLUDING CHECKING THE PLACING AND COMPACTION OF FILL, SHALL BE DONE BY AN INDEPENDENT INSPECTION TESTING COMPANY. THE COST OF THE INSPECTION AND

STONE FILL (UNDER PARKING AREAS, AND ROADS), AND TO UNDERSIDE

OF SIDEWALK SHALL BE GRANULAR B MATERIAL, SUPPLIED UNDER THIS

SECTION AND TAMPED EVERY 150MM IN DEPTH TO CONSOLIDATE. SAID

LESS OF FILLED AREAS FOR DRIVEWAYS, PARKING AREAS, AND EXTERIOR BACKELL IN AREAS TO RECEIVE SOD OR SEED SHALL BE CLEAN FILL, FREE FROM ORGANIC MATERIAL AND DEBRIS, PLACED IN A MAXIMUM 300MM LAYER AND COMPACTED TO ACHIEVE 90% DR DENSITY AS DETERMINED BY THE STANDARD AASHO TEST, FROZEN EARTH SHALL NOT BE USED FOR BACKFILLING NOR SHALL ANY

BACKFILLING BE PLACED ON OR AGAINST FROZEN GROUND.

MADE (EVERY 2 LAYERS OF FILL) FOR EACH 5 000 SQUARE FEET OR

STING OF THIS FILL WILL BE PAID BY OTHERS. ONE TEST SHALL BE

SUPPLY AND INSTALL A 150MM WIDE PLASTIC FILM 200MM BELOV FINISHED SURFACE OR GRADE TO MARK THE LOCATION OF DUCTS. CABLES AND CONDUITS. FILM SHALL BE MANUFACTURED BY GRIFFOLYN OR EQUAL, AND SHALL CONTAIN CONTINUOUS PRINTED WARNING AND

MESSAGE DESIGNATING SERVICE BURIED. FILM SHALL BE ORANGE FOR

BACKFILL TRENCHES WITHIN BUILDING AND GRANULAR B CRUSHED

STONE IN LAYERS AND COMPACT TO 100% STANDARD PROCTOR

SO THAT REGULAR TRAFFIC IN AND AROUND THE WORK WILL NOT BE INCONVENIENCED. AFTER A PERIOD ADEQUATE TO REVEAL THAT SETTLEMENT HAS PASSED, FILL ALL DEPRESSIONS TO RESTORE THE CORRECT GRADE.

DAMAGED BY THE NEW WORK WILL BE DONE BY ANOTHER DIVISION AN

2.10.6 IF SETTLEMENT OCCURS IT SHALL BE MADE UP AS SOON AS POSSIBLE

2.10.8 BE RESPONSIBLE FOR MAKING GOOD ANY SUBSEQUENT SETTLEMENT OF FILL AND PAY ALL COSTS INVOLVED IN MAKING GOOD PAVING. CURBS, AND ALL OTHER SURFACE RESTORATIONS. BACKFILLING TO SUBGRADE LEVEL BY THIS ELECTRICAL CONTRACTOR

AND FINISH BACKFILLING SHALL BE DONE BY PAVING CONTRACTOR

2.10.7 PATCHING OF ALL PAVED AREAS ROADS WALKS SODDING ETC

PAID BY THIS ELECTRICAL CONTRACTOR.

REMOVED AND DEPOSED OF.

2.10.10 EXCAVATED MATERIALS SHALL BE PILED, STORED AND/OR DISPOSED OF 2.10.9.1 DURING THE PROCESS OF THE CONTRACT, IN SUCH PLACES AND IN SUCH A MANNER THAT A MINIMUM OF DAMAGE OR DISFIGUREMENT OF EXISTING GROUND WILL RESULT.

2.10.9.2 ON COMPLETION OF WORK, ALL EXCAVATED MATERIAL SHALL BE

DRAWING LIST

DESCRIPTION DRAWING No. ELECTRICAL SPECIFICATIONS ELECTRICAL SITE PLAN, NOTES AND LIGHT FIXTURE SCHEDULE **ELECTRICAL DETAILS**

HAMMERSCHLAG & JOFFE INC 43 Lesmill Road Toronto, Ontario Canada M3B 2T8 **T**: (416) 444.9263

Drawing are not to be scaled. Contractor must check and verify all dimensions and conditions on the project; and must report any discrepancies to the consultants before proceeding with the work The use of this drawing or part thereof is forbidden without the written approval of the consultants.

F: (416) 444.1463

LEGAL DESCRIPTION: TBD

RETAIL SITE C2	±3.37 ACRES	±1.36 H
BUILDING C4 AREA	±4,876 S.F.	±453 S.N
RETAIL AREA (RESTAURANT)	±4,876 S.F.	±453 S.N
BUILDING C5 AREA	±7,120 S.F.	
RETAIL AREA	±2,000 S.F.	
OFFICE AREA	±4,680 S.F.	
M/E ROOM AREA GARBAGE ROOM AREA	±200 S.F.	
GARBAGE ROOM AREA	±240 S.F.	±22 S.N
TOTAL RETAIL/LEASABLE AREA (GLA)	±11,556 S.F.	±1,074 S.N
TOTAL SERVICE AREA	±440 S.F.	±41 S.N
TOTAL BUILDING AREA	±11,996 S.F.	±1,114 S.N
TOTAL PARKING REQUIRED		64 SPACE
RESTAURANT (C4)	±453 S.M.	41 SPACE
RETAIL (C5)	±186 S.M.	8 SPACE
OFFICE (C5)	±435 S.M.	16 SPACI
BARRIER FREE PARKING SPACES	2 TYPE A	2 TYPE
PARKING PROVIDED		78 SPACE
BARRIER FREE PARKING SPACES	2 TYPE A	2 TYPE
	6.5/1,000 S.F.	7./100 S.N
FSI		0.1
COVERAGE	AREA	
		1112
	±1,114 S.M.	14.42
BUILDING AREA		8.89
PROPOSED PAVED AREA	±687 S.M.	
	±687 S.M. ±1,429 S.M.	18.48

±1.91 ACRES

±0.77 HA.

2023-07-14 ISSUED FOR PERMIT & TENDER ISSUED FOR COORDINATION 2023-06-14 ISSUED FOR COORDINATION ISSUED TO UTILITY DESCRIPTION

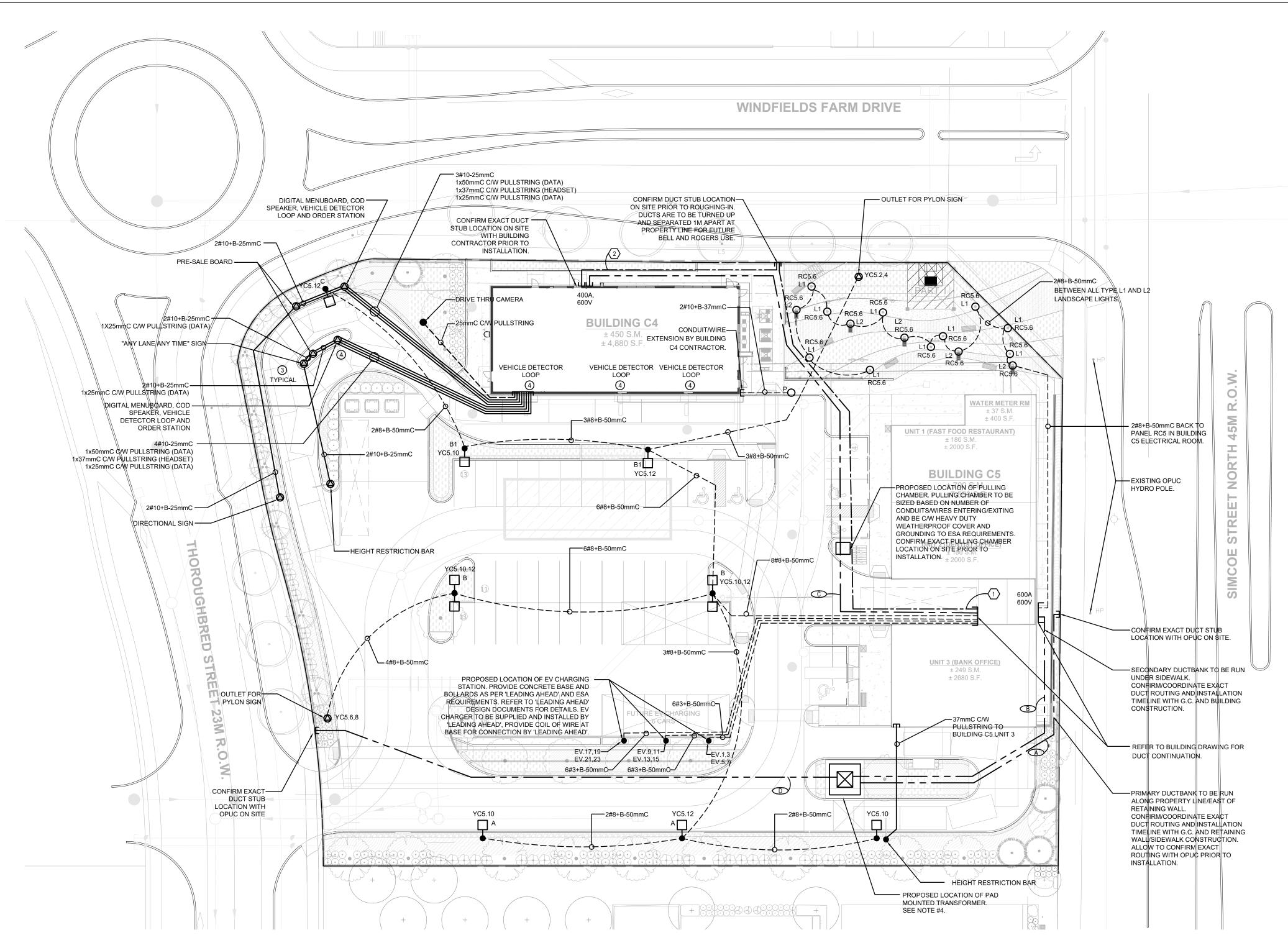
BLOCK C2

PROPOSED SITE PLAN

RIO * CAN

22-000-176 ROJECT DATE 2022-08-29

WINCHESTER ROAD & SIMCOE STREET OSHAWA, ONTARIO **ELECTRICAL SPECIFICATIONS**



1 ELECTRICAL SITE PLAN

ES2 SCALE: 1:300

LIGHT FIXTURE SCHEDULE TYPE LUMINAIRE/POLE ASSEMBLY CONSISTING OF A SINGLE (1) LED LUMINARE WITH A TYPE III DISTRIBUTION PATTERN, HOUSE SIDE SHIELD, 347V OUTDOOR USE BALLAST ON A DECORATIVE ARM, ON A 20-10" ROUND STEEL POLE WITH POLE BASE COVE ON 36" HIGH CONCRETE BASE (DIAMETER AS REQUIRED). COLOUR OF FINISHED OF POLE/HEAD TO ARCHITECT'S SELECTION. LAMPS SHALL BE SUPPLIED WITH FIXTURE. FIXTURE TO HAVE FLAT LENS BE FULL CUT OFF AND DARK SKY COMPLIANT. LUMINAIRE/POLE ASSEMBLY CONSISTING OF A DOUBLE (2) LED LUMINAIRES WITH A TYPE V DISTRIBUTION PATTERN, 347V OUTDOOR USE BALLAST ON A DECORATIVE ARM, ON A 20'-0" ROUND STEEL POLE WITH POLE BASE COVER ON 36" HIGH CONCRETE BASE (DIAMETER AS REQUIRED). COLOUR OF FINISH OF POLE/HEAD TO ARCHITECT'S SELECTION. LAMPS SHALL BE SUPPLIED WITH THE FIXTURE. FIXTURE TO HAVE FLAT LENS AND BE FULL CUT OFF. NLS LIGHTING CAT.# 2-NV-2-T5-96L-7-40K-HV-DP6-CS LUMINAIRE/POLE ASSEMBLY CONSISTING OF A SINGLE (1) LED LUMINARE WITH A TYPE V DISTRIBUTION PATTERN, 347V OUTDOOR USE BALLAST ON A DECORATIVE ARM, ON A 20'0" ROUND STEEL POLE WITH POLE BASE COVER ON 36" HIGH CONCRETE BASE (DIAMETER AS REQUIRED). COLOUR OF FINISHED OF POLE/HEAD TO ARCHITECT'S SELECTION. LAMPS SHALL BE SUPPLIED WITH FIXTURE. FIXTURE TO HAVE FLAT LENS BE FULL CUT OFF AND DARK SKY COMPLIANT. NLS LIGHTING CAT.# 1-NV-2-T5-96L-7-40K-HV-DPS6-CC LUMINAIRE/POLE ASSEMBLY CONSISTING OF A SINGLE (1) LED LUMINARE WITH A TYPE IV DISTRIBUTION PATTERN, HOUSE SIDE SHIELD, 347V OUTDOOR USE BALLAST ON A DECORATIVE ARM, ON A 20'0" ROUND STEEL POLE WITH POLE BASE COVER ON 36" HIGH CONCRETE BASE (DIAMETER AS REQUIRED). COLOUR OF FINISHED OF POLE/HEAD TO ARCHITECT'S SELECTION. LAMPS SHALL BE SUPPLIED WITH FIXTURE. FIXTURE TO HAVE FLAT LENS BE FULL CUT OFF AND DARK SKY COMPLIANT. NLS LIGHTING CAT.# 1-NV-2-T4-96L-1-40K-HV-DPS6-CC-HSS LUMINAIR CONSISTING OF A DECORATIVE PATH LIGHT, 120V OUTDOOR USE BALLAST.LIGHTING BASE BY LANDLORD, COLOUR OF FINISH OF HEAD/FIXTURE TO ARCHITECT'S SELECTION. CREE LIGHTING: PWY-EDG-5M-P4-02-E-12-BK-350-40K LED LANDSCAPE BOLLARD LIGHT FIXTURE C/W 120V BALLAST SUITABLE FOR OUTDOOR USE. CONCRETE BASE TO BE PROVIDED UNDER LANDSCAPE CONTRACT. ALLOW TO COORDINATE FOR INSTALLATION OF CONDUITS OR ANCHOR BOLTS ON SITE PRIOR TO CONCRETE BASED BEING POURED. COLOUR OF FIXTURE FINISH TO BE SELECTED BY OWNER/LANDSCAPE ARCHITECT PRIOR TO RELEASE FOR MANUFACTURE. LANDSCAPE FORMS SKYLINE CAT.#: BR-80-DB-004L4-30K-UV1-FM-CC "L2" LED LANDSCAPE COLUMN LIGHT FIXTURE C/W 120V BALLAST SUITABLE FOR OUTDOOR USE AND ASYMETRIC FORWARD THROW BEAM (A60) OPTION AND COLUMN FITTER FOR MOUNTING ON LANDSCAPE COLUMN. CONFIRM EXACT FIXTURE MOUNTING HEIGHT WITH LATEST LANDSCAPE DRAWINGS. COLOUR OF FIXTURE FINISH TO BE SELECTED BY OWNER/LANDSCAPE ARCHITECT PRIOR TO RELEASE FOR MANUFACTURE. WE-EF CAT.#: VLS420 LED 620-5368 620-9341

NOTES RE: ELECTRICAL SERVICES

- 2x100mmC C/W PULLSTRING IN CONCRETE ENCASED STEEL REINFORCED DUCTBANK FROM PROPERTY LINE TO PAD MOUNTED TRANSFORMER TO OSHAWA PUC STANDARDS AND REQUIREMENTS. COORDINATE EXACT DUCT TERMINATION LOCATION ON SITE WITH OSHAWA PUC.
- 2 RUNS OF 4#600MCM RWU90 NUAL-100mmC IN CONCRETE ENCASED STEEL REINFORCED DUCTBANK FROM PAD MOUNTED TRANSFORMER TO BUILDING 'C5' ELECTRICAL ROOM. ALLOW TO COORDINATE WITH OSHAWA PUC FOR RUNNING DUCTBANK AND CABLES INTO TRANSFORMER ALONG WITH TERMINATIONS
- 2 RUNS OF 4#250MCM RWU90 NUAL + BOND WIRE-100mmC IN CONCRETE ENCASED STEEL REINFORCED DUCTBANK FROM BUILDING 'C5' ELECTRICAL ROOM TO BUILDING 'C4' ELECTRICAL ROOM. NOTE DUCTS AND CABLES ARE TO PASS THROUGH A METER CABINET IN BUILDING C5 BEFORE TERMINATING IN MAIN SWITCHBOARD. DUCT AND CABLE TO PASS THROUGH A PULLING CHAMBER WITHIN SITE.
- 2x100mmC C/W PULLSTRING IN CONCRETE ENCASED STEEL REINFORCED DUCTBANK FROM PROPERTY LINE TO PAD MOUNTED TRANSFORMER TO OSHAWA PUC STANDARDS AND REQUIREMENTS. COORDINATE EXACT DUCT TERMINATION LOCATION ON SITE WITH OSHAWA PUC.

NOTES RE: TELEPHONE SERVICES

- 2x100mmC C/W PULLSTRING IN DIRECT BURIED DUCTS FROM PROPERTY LINE TO BUILDING "C5" ELECTRICAL ROOM TO APPROVAL OF BELL & ROGERS.
- 2x100mmC C/W PULLSTRING IN DIRECT BURIED DUCTS FROM PROPERTY LINE TO BUILDING "C4" ELECTRICAL SERVICE AREA TO APPROVAL OF BELL & ROGERS.

GENERAL NOTES

- THIS ELECTRICAL CONTRACTOR TO RUN CONCRETE ENCASED STEEL REINFORCED (CESR) PRIMARY DUCTBANKS (QUANTITY AND SIZE AS SHOWN ON DRAWING) TO OSHAWA PUC REQUIREMENT. ALLOW TO COORDINATE WITH OSHAWA PUC FOR INSPECTION OF ALL PRIMARY DUCTBANKS PRIOR TO BACK FILLING.
- 2. THIS ELECTRICAL CONTRACTOR TO RUN CONCRETE ENCASED STEEL REINFORCED (CESR)
 SECONDARY/FEEDER DUCTBANKS (QUANTITY AND SIZE AS SHOWN ON DRAWING) TO 5' OUTSIDE EACH
 BUILDING ELECT/MECH ROOM OR SERVICE AREA. BUILDING ELECTRICAL CONTRACTOR SHALL RUN DUCTS
 FROM BUILDING ELECT/MECH ROOM OR SERVICE AREA TO TIE INTO THESE DUCTS; WHEREAFTER THIS
 SITE ELECTRICAL CONTRACTOR TO COME BACK AT A LATER DATE AND RUN SECONDARY WIRING AS
 NOTED FROM TRANSFORMER TO A FUTURE FUSED SWITCHBOARD OR DISCONNECT SWITCH AND
 COORDINATE CONNECTIONS AT TRANSFORMER WITH OPUC. LEAVE APPROXIMATELY 15' COIL OF CABLES
 AT BOTH ENDS FOR FUTURE CONNECTION. CONNECTION AT INSIDE BUILDING SHALL BE DONE BY
 BUILDING CONTRACTOR. CONNECTION AT TRANSFORMER TO BE DONE BY OPUC. ALLOW FOR ALL CABLES
 TO REACH BUILDING SERVICE LOCATIONS AS NECESSARY. CONFIRM EXACT CABLE LENGTH ON SITE
 PRIOR TO ORDERING. ALLOW TO RETURN TO SITE MULTIPLE TIMES DURING CONSTRUCTION TO SUIT
 BUILDING ENERGIZATION TIMELINES. COORDINATE ALL TIMING WITH GENERAL CONTRACTOR AND
 PROJECT MANAGER ON SITE.
- 3. THIS ELECTRICAL CONTRACTOR TO VERIFY EXACT LOCATION OF ALL ELECTRICAL ROOMS AND TENANT SERVICE LOCATIONS PRIOR TO ROUGH-IN SECONDARY SERVICES.
- 4. PROPOSED LOCATION OF PAD MOUNTED TRANSFORMER. PROVIDE FOUNDATION, LID, GROUNDING, PROTECTIVE BOLLARDS TO OSHAWA PUC STANDARDS AND REQUIREMENTS. CONFIRM ALL TIMING FOR INSTALLATION WITH OPUC.
- 5. THIS ELECTRICAL CONTRACTOR TO RUN BOTH CONDUIT/WIRING FOR ALL SITE LIGHTING AND PYLON SIGNS ALL THE WAY INTO LANDLORD ELECTRICAL ROOM AS SHOWN ON DRAWINGS AND TERMINATE IN J-BOX UNDER HOUSE SERVICE 347/600V PANEL. LEAVE 15' COIL OF CABLES IN J-BOX FOR FUTURE CONNECTION TO PANEL BY BASEBUILDING CONTRACTOR. ALLOW TO COORDINATE EXACT CONDUIT/WIRE ROUTING ON SITE AS REQUIRED.
- 6. ALL EMPTY DUCTS SHALL BE C/W NYLON PULL ROPES.
- 7. THIS ELECTRICAL CONTRACTOR TO COORDINATE WITH CIVIL AND LANDSCAPE DRAWINGS TO AVOID CONFLICT AND ADJUST ROUTING AS REQUIRED.
- 8. ALL UNDERGROUND WIRING IS TO BE RWU (UNLESS OTHERWISE NOTED) NO ALTERNATES WILL BE ACCEPTABLE.
- 9. MEGGER ALL LIGHTING AND POWER CIRCUITS TO MEET CODES AND LATEST NETA MANUAL. ALL SECONDARY FEEDER CABLES SHALL BE MEGGER TESTED WITH 1000VDC (FOR CABLE RATED 300V OR LESS MEGGER TEST IS 500VDC) APPROVED MEGGER TEST. HAND CRANKED INSTRUMENTS ARE NOT ALLOWED. SUBMIT MEGGER TEST RESULTS TO ENGINEER PRIOR TO POWER ON.
- 10. THIS ELECTRICAL CONTRACTOR TO PROVIDE ALL REQUIRED CONDUIT C/W PULLSTRING/WIRING FOR BUILDING 'C4' AND 'C5' DRIVE THRU EQUIPMENT AS NOTED ON DRAWINGS. ALL CONDUITS/WIRES ARE TO BE LABELLED FOR FUTURE TENANT USE. PROVIDE ALL REQUIRED CONCRETE BASES TO LATEST TENANT REQUIREMENT FOR DIRECTION SIGNS/PRE SALE BOARDS/ MEUNBOARD/SPEAKER POST/ETC. CONFIRM EXACT LOCATION OF ALL EQUIPMENT ON SITE AND WITH P.M./TENANT PRIOR TO ROUGHING -IN. COORDINATE AND CONFIRM EXACT CONDUIT SIZE REQUIRED FOR DRIVE THRU EQUIPMENT WITH DETAILS ON DRAWINGS AND TENANT APPROVED DRAWING. ALLOW TO RECEIVE DETECTOR LOOPS, ANCHOR BOLTS, ETC. FROM TENANT FOR INSTALLATION PRIOR TO POURING BASES OR INSTALLING CONDUITS. COORDINATE TIMING FOR RECEIVING ALL TENANT SUPPLIED EQUIPMENT WITH G.C. AND P.M. ON SITE AS
- 11. THIS ELECTRICAL CONTRACTOR TO ALLOW FOR AN ON SITE MEETING WITH OSHAWA PUC PRIOR TO COMMENCING ANY WORK. CONTACT MATT HUDEBINE (mhudebine@opuc.on.ca, 905-723-4626 XT.5287) FOR MEETING ALONG WITH ANY ADDITIONAL OSHAWA PUC DETAILS AND REQUIREMENTS.
- 12. THIS ELECTRICAL CONTRACTOR TO ARRANGE FOR A PRE-CONSTRUCTION MEETING WITH BELL CANADA PRIOR TO STARTING ANY WORK ON SITE. CONTACT JEN PIITZ (jennifer.piitz@bell.ca, 905.433.3146) TO ARRANGE FOR A MEETING ON SITE.
- 13. N/A
- 14. ALL CONCRETE BASES FOR LANDSCAPE LIGHTS ARE TO BE SUPPLIED AND INSTALLED BY G.C. OR LANDSCAPE CONTRACTOR. THIS ELECTRICAL CONTRACTOR TO ALLOW TO COORDINATE FOR INSTALLATION OF CONDUITS OR ANCHOR BOLT ON SITE PRIOR TO CONCRETE BASES BEING POURED.

NOTES: DRIVE THRU BUILDING C4

- THIS ELECTRICAL CONTRACTOR SHALL ALLOW TO SUPPLY AND INSTALL ALL POWER CONDUITS C/W WIRING FOR ALL SIGNS (MENUBOARD, PRESALE, DIRECTIONAL, HEIGHT, CAMERAS, ETC.) C/W 20' COIL OF CABLE AT BOTH ENDS FOR CONNECTION/EXTENSION BY McDONALDS ELECTRICAL CONTRACTOR. THIS ELECTRICAL CONTRACTOR SHALL ALLOW TO SUPPLY AND INSTALL ALL CONDUIT C/W PULLSTRINGS FOR FUTURE DATA WIRING.
- 2 MCD ELECTRICAL CONTRACTOR SHALL PROVIDE FINAL CONNECTIONS FOR ALL DRIVE THRU EQUIPMENT AND DIRECTIONAL SIGN AS REQUIRED.
- 3 ALL CONCRETE BASES ARE TO BE SUPPLIED AND INSTALLED BY ELECTRICAL CONTRACTOR TO LATEST McDONALDS STANDARDS. CONFIRM EXACT BASE LOCATIONS AND SIZES WITH McDONALDS P.M. PRIOR TO INSTALLATION.
- THIS ELECTRICAL CONTRACTOR SHALL ALLOW TO INSTALL ALL DETECTOR LOOPS AT ORDER STATIONS AND DRIVE THRU WINDOWS TO LATEST MANUFACTURE/McDONALDS STANDARDS AND REQUIREMENTS. DETECTOR LOOPS TO BE SUPPLIED BY McDONALDS. ALLOW TO PROVIDE 1.5"C STUBBED INTO BUILDING FOR DETECTOR LOOPS AT DRIVE THRU WINDOW.

HAMMERSCHLAG & JOFFE INC. 43 Lesmill Road Toronto, Ontario Canada M3B 2T8 T: (416) 444.9263

F: (416) 444.1463

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LEGAL DESCRIPTION: TBD

STATIST	ics	
SITE C2	±1.91 ACRES	±0.7
RETAIL SITE C2	±3.37 ACRES	±1.36
BUILDING C4 AREA	±4,876 S.F.	±453
RETAIL AREA (RESTAURANT)	±4,876 S.F.	±453
BUILDING C5 AREA	±7,120 S.F.	±662
RETAIL AREA	±2,000 S.F.	
OFFICE AREA	±4,680 S.F.	
M/E ROOM AREA	±200 S.F.	±19
GARBAGE ROOM AREA	±240 S.F.	±22
TOTAL RETAIL/LEASABLE AREA (GLA)	±11,556 S.F.	±1,074
TOTAL SERVICE AREA	±440 S.F.	
TOTAL BUILDING AREA	±11,996 S.F.	±1,114
TOTAL PARKING REQUIRED		64 SP
RESTAURANT (C4)	±453 S.M.	41 SP.
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OFFICE (C5)	±435 S.M.	16 SP.
BARRIER FREE PARKING SPACES	2 TYPE A	2 T\
PARKING PROVIDED		78 SP
BARRIER FREE PARKING SPACES	2 TYPE A	2 T\
	6.5/1,000 S.F.	7./100
FSI		
COVERAGE	AREA	
BUILDING AREA	±1,114 S.M.	14
PROPOSED PAVED AREA	±687 S.M.	- 8
	_00, 0.111.	U

±1,429 S.M.

±4.308 S.M.

18.48%

55.73%

PROPOSED LANDSCAPE AREA

PROPOSED PAVEMENT

 2023-07-14
 ISSUED FOR PERMIT & TENDER
 BK

 2023-07-06
 ISSUED FOR COORDINATION
 BK

 2023-06-14
 ISSUED FOR COORDINATION
 BK

 2023-03-27
 ISSUED TO UTILITY
 BK

 DATE
 DESCRIPTION
 BY



PROJECT

BLOCK C2
PROPOSED SITE PLAN
WINCHESTER ROAD & SIMCOE STREET

OSHAWA, ONTARIO

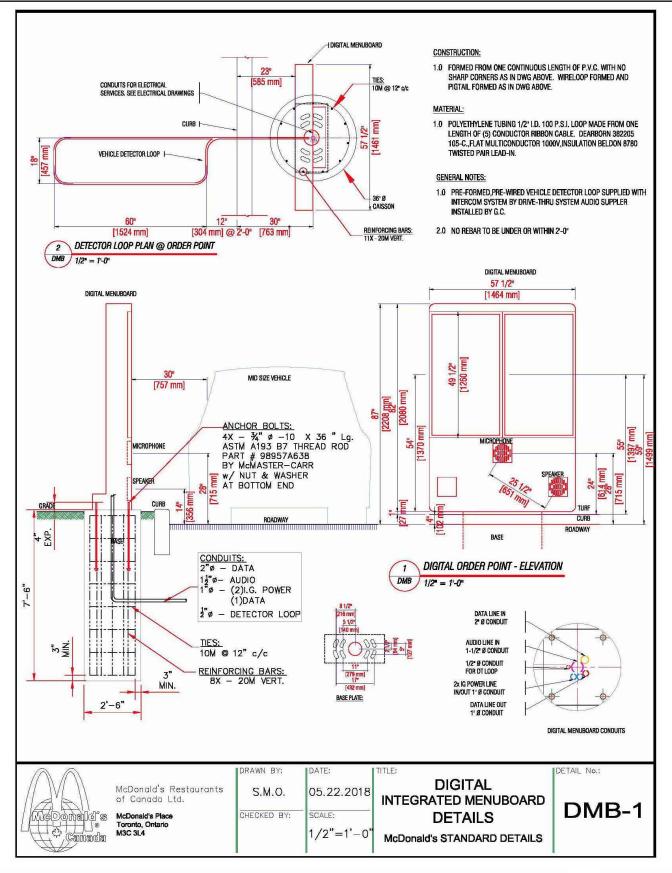
ELECTRICAL SITE PLAN, NOTES
AND LIGHT FIXTURE SCHEDULE

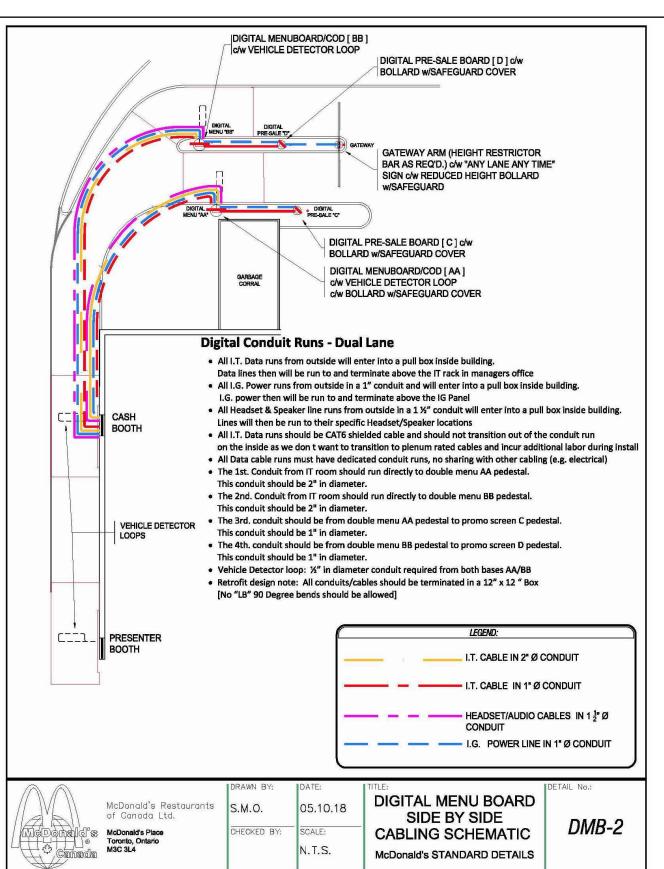
PROJECT NO.
22-000-176
PROJECT DATE
2022-08-29
DRAWN BY
BD
CHECKED BY

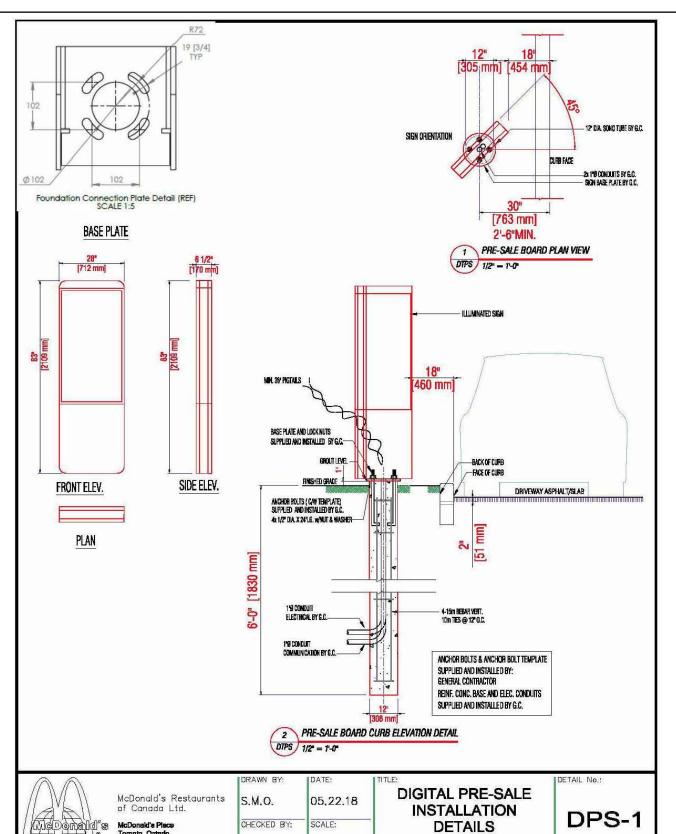




ES2





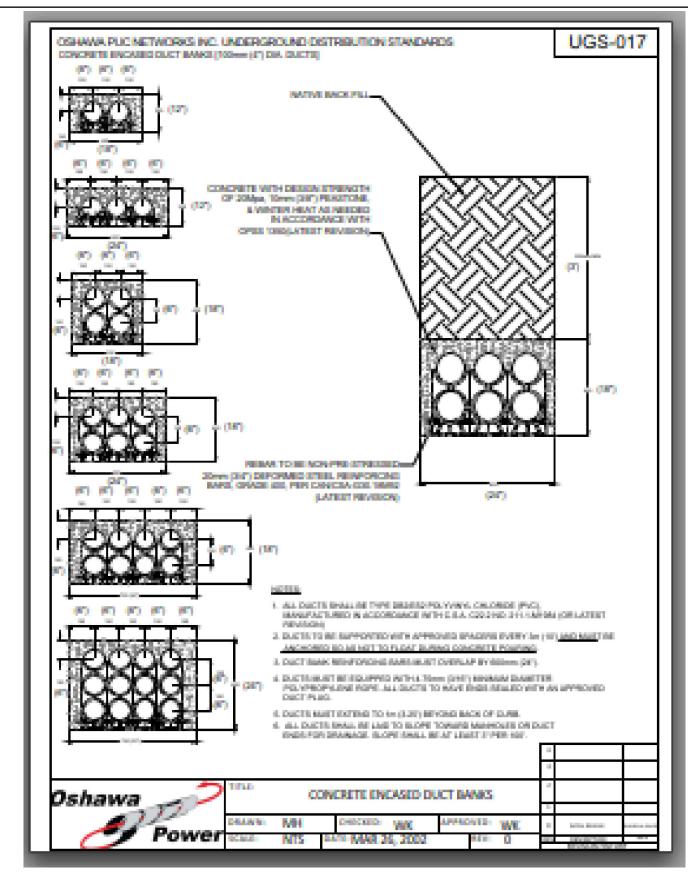


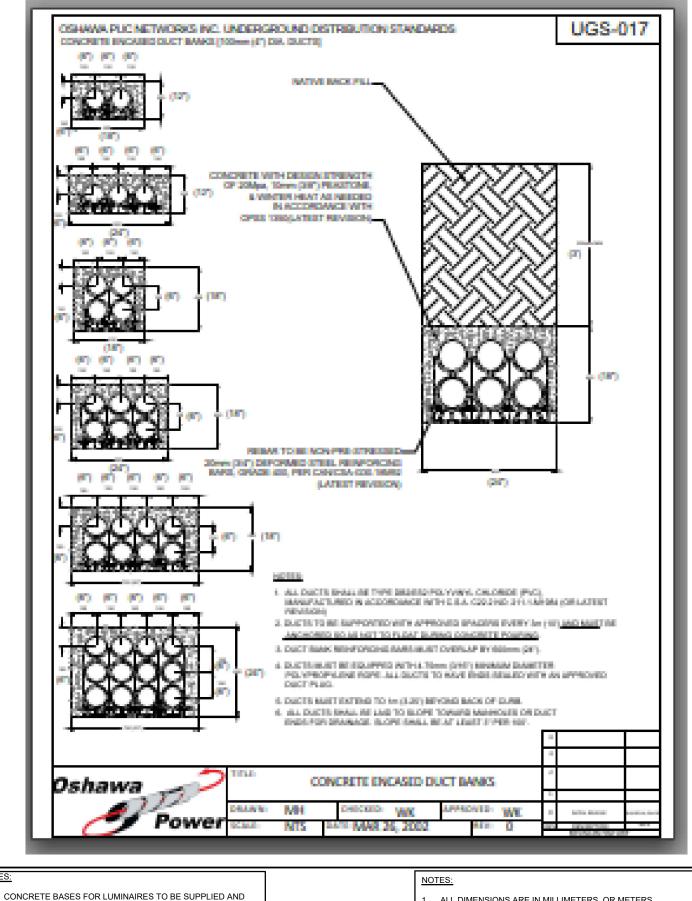
McDonald's STANDARD DETAILS

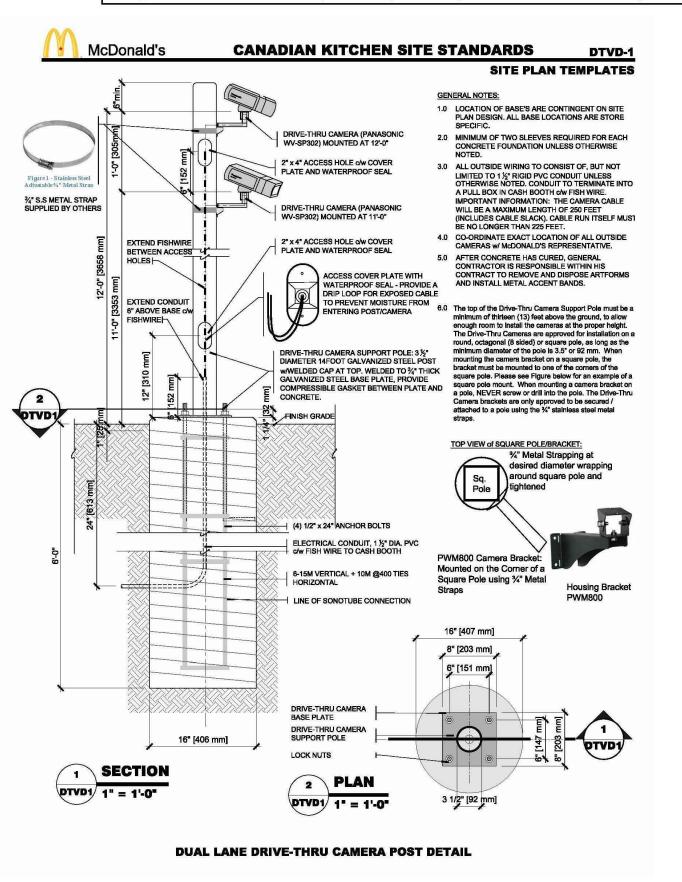
INSTALLED BY THIS ELECTRICAL CONTRACTOR.

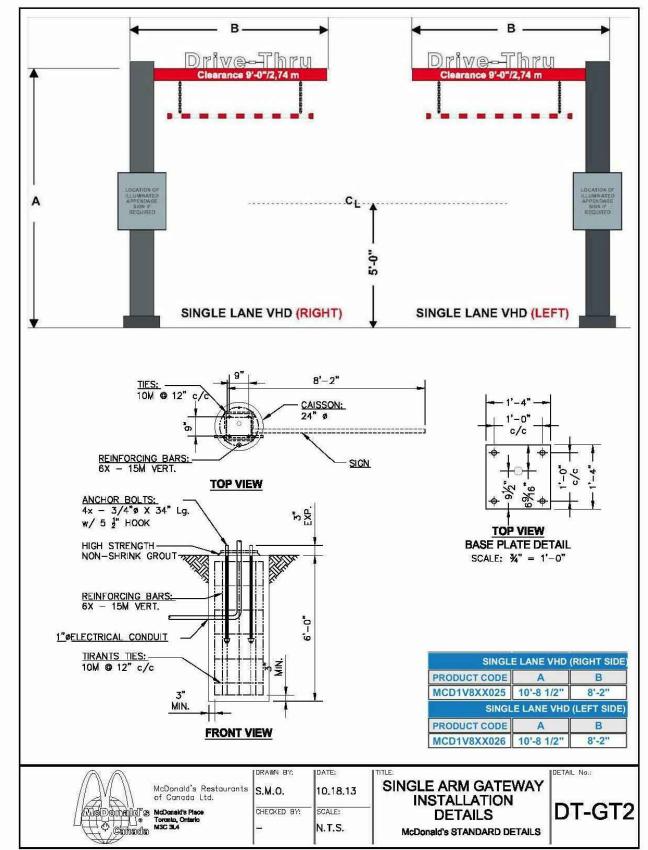
WHERE APPLICABLE, THIS DETAIL DRAWING SHOULD BE

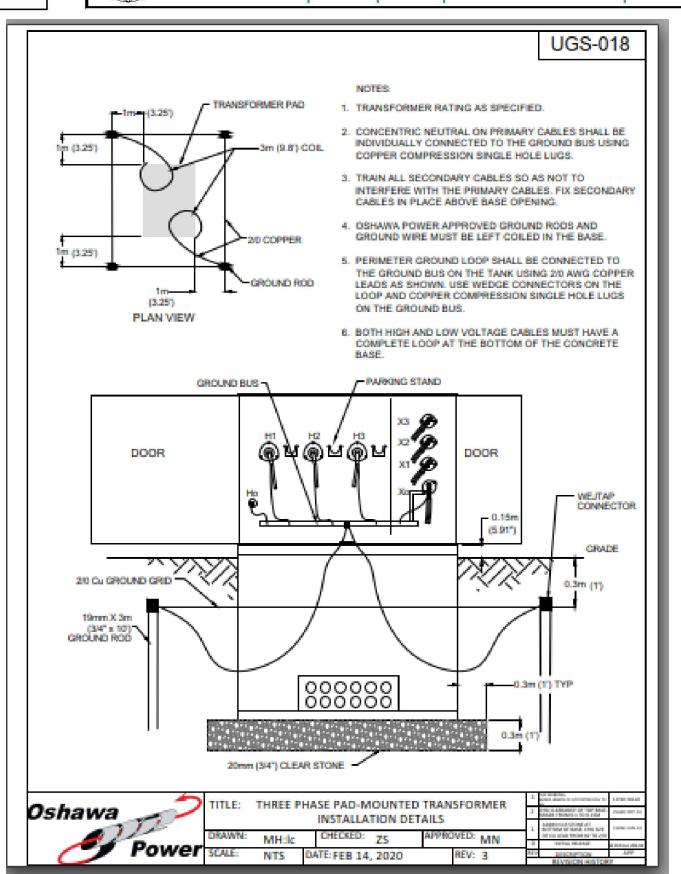
MODIFIED TO MEET LOCAL REQUIREMENTS. RETAIN

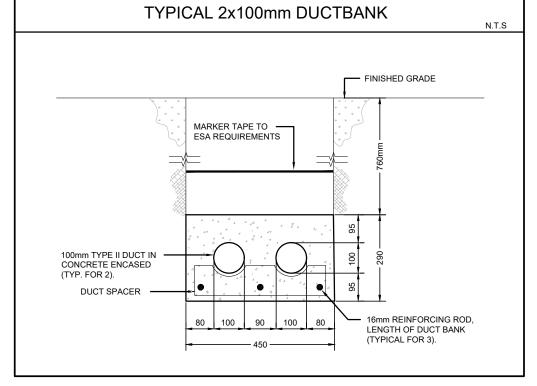


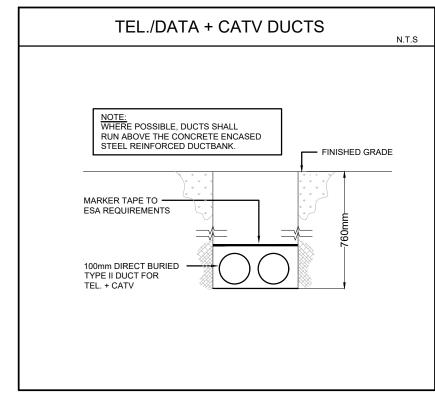


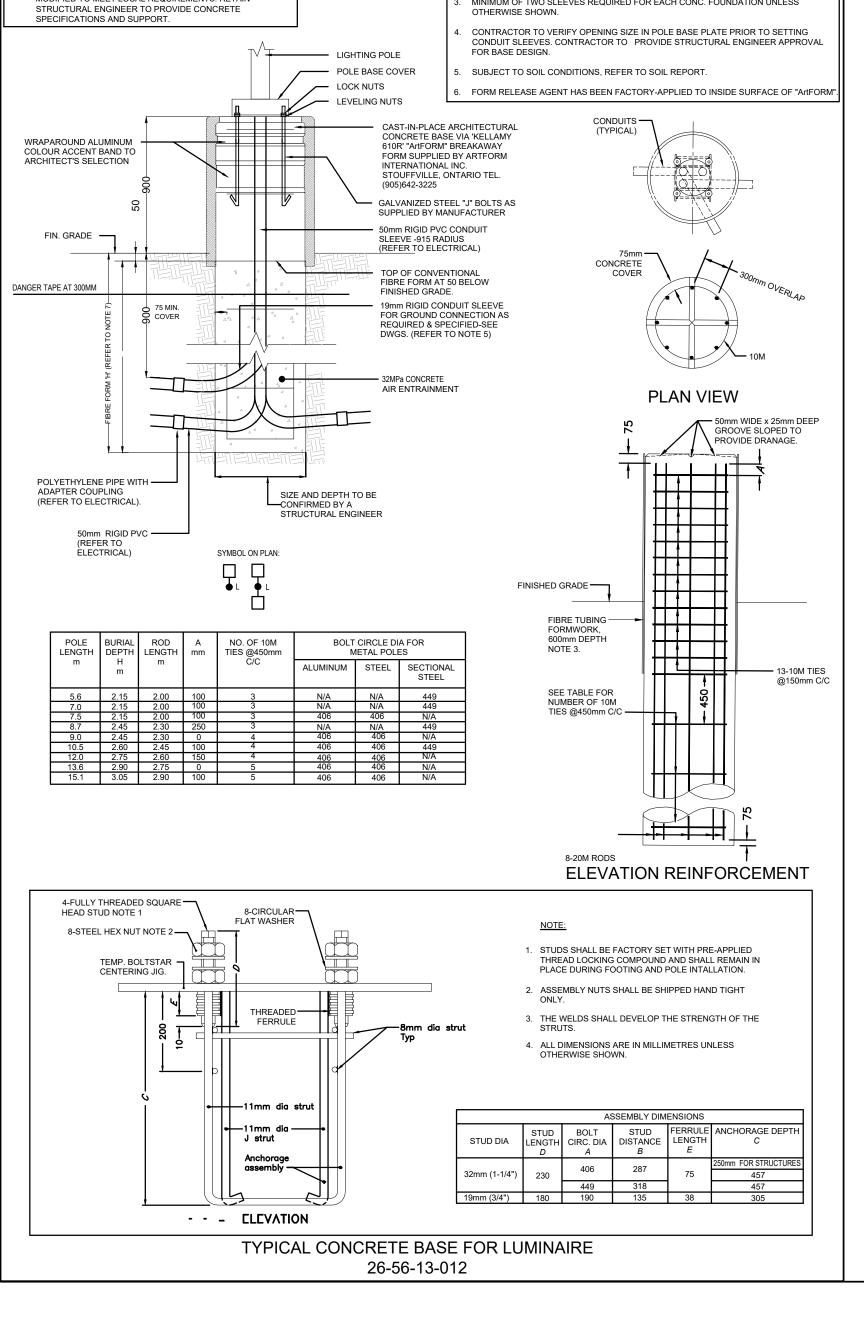






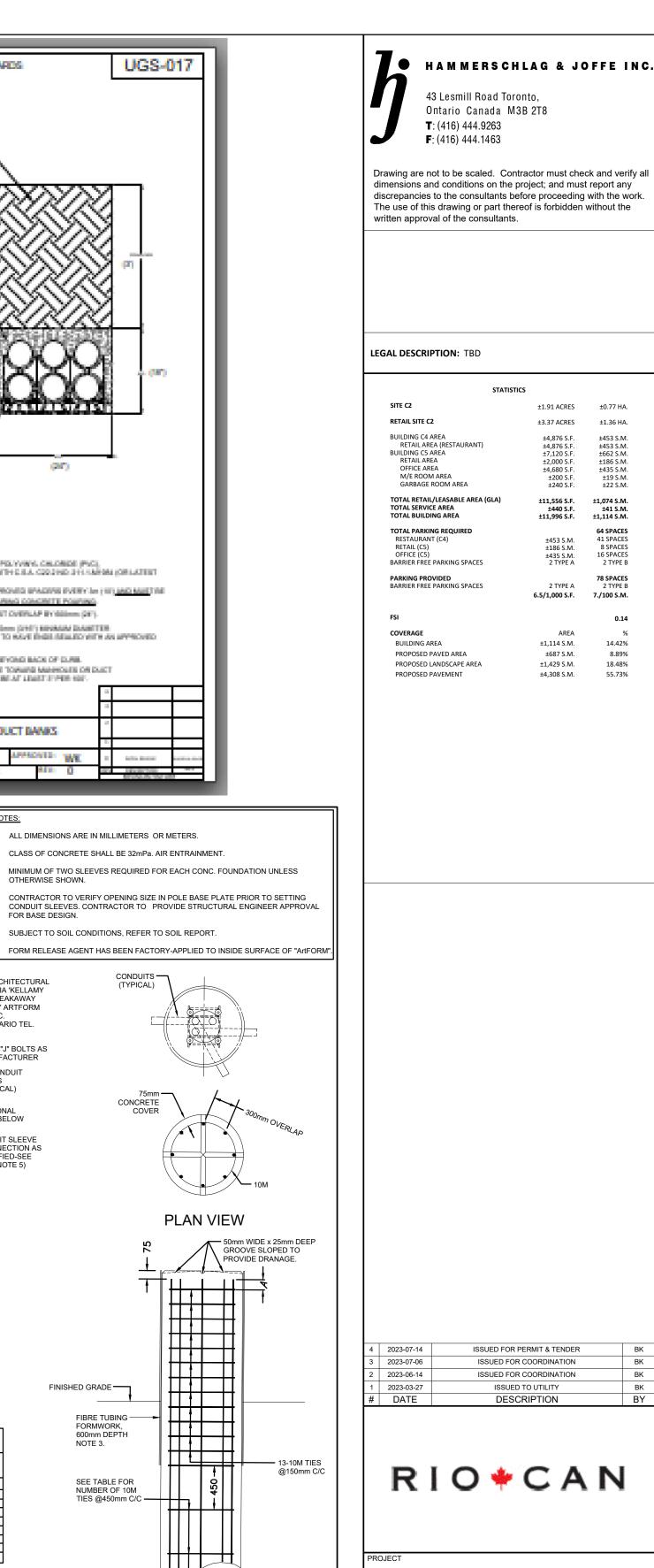






ALL DIMENSIONS ARE IN MILLIMETERS OR METERS.

. CLASS OF CONCRETE SHALL BE 32mPa. AIR ENTRAINMENT.

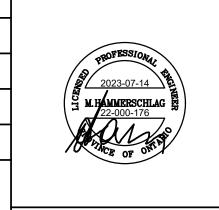




BLOCK C2 PROPOSED SITE PLAN WINCHESTER ROAD & SIMCOE STREET OSHAWA, ONTARIO

ELECTRICAL DETAILS

22-000-176



N.T.S

PROJECT DATE

2022-08-29

ES3