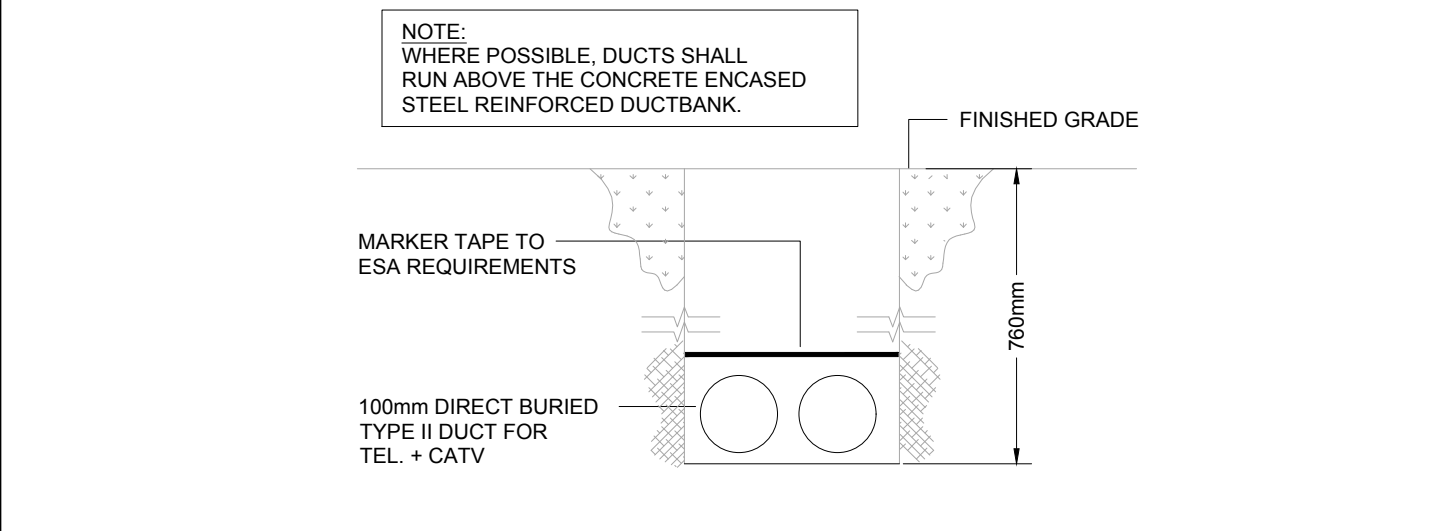


ELECTRICAL SPECIFICATIONS			
1. GENERAL REQUIREMENTS:	2. SEPARATE BILLING SECTION FOR EACH SYSTEM INSTALLED AS PART OF THE PROJECT. SEPARATE SECTION SHALL MINIMUM INCLUDE HOWEVER NOT BE LIMITED TO THE FOLLOWING: LIGHTING, POWER DISTRIBUTION, FIRE ALARM, RACEWAYS, WIRING, GENERAL COSTS, FINAL SUBMISSION (AS-BUILT, MANUALS, WARRANTY, CERTIFICATES).	3. ALL DATA OUTLETS SHALL BE WIRED WITH EMPTY PULL STRINGS.	4. 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 MID LIGHTING DUTY. TIME CLOCKS TO BE DIGITAL. COMPLETE ELECTRONIC CLOCK AND DAY LIGHT SAVING PROGRAMMABLE FEATURES.
1.1. COMPLY WITH ALL DIVISION 1 GENERAL CONDITIONS. THE ELECTRICAL CONTRACTOR SHALL FOLLOW REQUIREMENTS AS IDENTIFIED BY ARCHITECT AND OTHER CONSULTANTS. COORDINATE WITH ALL TRADES TO ENSURE PROPER INSTALLATION METHODS APPLICABLE TO ALL CONSULTANT SPECIFICATIONS OF THE PROJECT.	3.1. FINAL SUBMISSION COSTS SHALL BE FINE-TUNED PER VALUE OF PROJECT, SHALL INCLUDE A MINIMUM COST FOR THE BELOW PROJECT VALUES: - 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%	13.2. PVC DUCT SHALL BE USED FOR UNDERGROUND SERVICE ENTRANCE.	32. HAZARDOUS LOCATIONS: 32.1 ALL WIRING IN AREAZONES CLASSIFIED AS HAZARDOUS SHALL BE COMPLETED WITH RIGID STEEL PIPING AND IN ACCORDANCE TO SECTION 18 OF OESC. TECK WIRING WILL NOT BE ACCEPTED.
1.2. OBTAIN ALL APPROVALS FROM PUBLIC AUTHORITIES HAVING JURISDICTION BEFORE COMMENCING WORK AND PAY ALL INSPECTION FEES AND ALL PERMITS. COMPLY WITH THE REQUIREMENTS OF THE LATEST EDITION OF THE APPLICABLE C.S.A. STANDARDS, BUILDING CODE, LOCAL ELECTRICAL SAFETY CODE APPLICABLE TO AREA HAVING JURISDICTION, APPLICABLE U.L.C. STANDARDS, AND THE OWNERS REQUIREMENTS. SUBMIT CERTIFICATE OF INSPECTION AND APPROVAL FROM ALL AUTHORITIES HAVING JURISDICTION.	7. BASIC METALS AND MATERIALS: 7.1 ALL MATERIALS USED SHALL BE SUITABLE FOR THEIR APPLICATION. ALL EXTERIOR FASTENERS AND SUPPORTING MATERIALS FORMING A COMPLETE ELECTRICAL SYSTEM SHALL BE WEATHERPROOF. NUTS, BOLTS, SCREWS ETC. MATERIAL SHALL BE STAINLESS STEEL OR APPROVED EQUIVALENT. 7.2 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. 7.3 MATERIALS AND EQUIPMENT PROVIDED SHALL BE LISTED FOR HEAVY DUTY APPLICATION AND SHALL BE SUITABLE FOR THE INTENDED USE, COMMERCIAL, INDUSTRIAL OR RESIDENTIAL. 7.4 PROVIDE ALL CONDUIT, WIRING, BOXES, SWITCHES, OUTLETS, DEVICES, ETC., AS REQUIRED. MAKE FINAL CONNECTIONS TO VIBRATING EQUIPMENT WITH FLEXIBLE CONDUIT. 7.5 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 FROM FINISHED DRY WALL OR T-BAR CEILING. INCLUDE FOR ALL HANGERS AND NECESSARY MISCELLANEOUS SUPPORTS FROM JOIST, BEAM, OR DECK. 7.7 ANY LUMINAIRE INSTALLED IN SUSPENDED CEILING SHALL BE WIRED BY A FLEXIBLE CORD NOT EXCEEDING 3M IN LENGTH. 7.8 PROVIDE ALL HANGERS, INSERTS, AND SUPPORTS OF APPROVED TYPES REQUIRED FOR THE WORK OF THIS DIVISION. PROVIDE CONDUIT FOR ALL SERVICES PENETRATING THE FLOOR SLAB. SEAL ALL PENETRATIONS THROUGH FLOOR SLABS AND FIRE AND SMOKE SEPARATIONS WITH AN APPROVED NON-SHRINK, WATERPROOF AND FIREPROOF SEALANT APPROVED BY CONSULTANT. - HILTI, 3M OR APPROVED ALTERNATE.	13.3. PROVIDE TWO DEDICATED 110V 15AMP 1POLE POWER OUTLET ADJACENT TO THE IT EQUIPMENT LOCATIONS FOR UTILITY COMPANY REQUIREMENTS.	33. APPROVED MANUFACTURERS: 33.1 SWITCHBOARD AND ELECTRICAL PANELS: EATON, SQUARE D, GE AND SIEMENS. 33.2 METER CENTERS: EATON AND SQUARE D 33.3 LV TRANSFORMER: REX, MARCUS, SQUARE D, HAMMOND, SIEMENS AND GE.
1.3. DO NOT REDUCE THE STANDARDS ESTABLISHED BY THE DRAWINGS AND SPECIFICATIONS BY APPLYING ANY OF THE CODES REFERRED TO HEREIN.	14. DISTRIBUTION FEEDERS: 14.1 FEEDERS SHALL BE SIZED AS DETAILED. SUBSTITUTION OF FEEDERS EITHER IN MATERIAL OR ROUTING WILL NOT BE PERMITTED UNLESS ENGINEERS WRITTEN APPROVAL IS OBTAINED. FEEDERS SHALL HAVE 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 CORRECT ORDER WHEN READING LEFT TO RIGHT THROUGHOUT THE BUILDING. 14.2 FEEDERS TO PANELS, TRANSFORMER, INCOMING SERVICE AND LOAD CENTERS SHALL BE BALANCED UNDER FULL LOAD CONDITIONS TO WITHIN 5% BETWEEN PHASES. ALL PHASES AND NEUTRALS SHALL BE IDENTIFIED AND MAINTAINED IN THEIR CORRECT ORDER WHEN READING LEFT TO RIGHT THROUGHOUT THE BUILDING. 14.3 ALL PHASES AND NEUTRALS SHALL BE IDENTIFIED AND MAINTAINED 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 TO POWER ON. 14.5 REPLACE AT NO COST ALL FEEDERS THAT DO NOT MEET MINIMUM INSULATION RESISTANCE. 14.6 ALL DISTRIBUTION FEEDERS SHALL BE 90°C RATED.	13.4. FEEDERS SHALL BE SIZED AS DETAILED. SUBSTITUTION OF FEEDERS EITHER IN MATERIAL OR ROUTING WILL NOT BE PERMITTED UNLESS ENGINEERS WRITTEN APPROVAL IS OBTAINED. FEEDERS SHALL HAVE 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 CORRECT ORDER WHEN READING LEFT TO RIGHT THROUGHOUT THE BUILDING.	34. SPECIFICATION GUIDELINES: 34.1 ELECTRICAL SPECIFICATION IS APPLICABLE TO ALL ITEMS SHOWN ON THE ELECTRICAL DRAWINGS. 34.2 SPECIFICATION REFERENCING EQUIPMENT BEYOND THE SHOWN ON THE DRAWINGS SHALL BE DISCARDED.
1.4. PROVIDE PROOF OF PUBLIC LIABILITY AND PROPERTY DAMAGE INSURANCE COVERAGE AND AMOUNT. SUBMIT WITH TENDER.	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 THEIR ENVIRONMENT.	13.5. PROVIDE TWO DEDICATED 110V 15AMP 1POLE POWER OUTLET ADJACENT TO THE IT EQUIPMENT LOCATIONS FOR UTILITY COMPANY REQUIREMENTS.	35. APPROVED MANUFACTURERS: 35.1 SWITCHBOARD AND ELECTRICAL PANELS: EATON, SQUARE D, GE AND SIEMENS. 35.2 METER CENTERS: EATON AND SQUARE D 35.3 LV TRANSFORMER: REX, MARCUS, SQUARE D, HAMMOND, SIEMENS AND GE.
1.5. DRAWINGS:	16. ELECTRICAL PANEL BOARDS: 16.1 EACH PANEL BOARD SHALL BE C/W A KEY LOCKABLE HINGED DOOR AND A CIRCUIT DIRECTORY GIVING THE NUMBER AND DESCRIPTION OF EACH CIRCUIT CONTROLLED. THE DIRECTORY SHALL BE CLEARLY TYPED, LEGIBLE AND OF AMPLIE SIZE AND SHALL BE MOUNTED IN A METAL FRAME WITH A CLEAR PLASTIC COVER ON THE INSIDE OF THE DOOR. 16.2 THE CIRCUIT BREAKERS SHALL BE CONNECTED TO THE PANEL BY BOLTED CONNECTIONS. ALL BUS BARS, LUGS, AND BREAKER TERMINALS SHALL BE COPPER SILVER PLATED AT THE CONNECTION POINTS. THE INTERRUPTING CAPACITY OF EACH BOARD SHALL BE DETERMINED BY THE CO-ORDINATION STUDY AS PER THE LOCAL UTILITIES CURRENT AND POTENTIAL TRANSFORMERS. CURRENT TRANSFORMERS SHALL BE OBTAINED FROM THE UTILITY AND INSTALLED IN THE COMPARTMENT BY THE SERVICE ENTRANCE BOARD MANUFACTURER OR AS PER UTILITIES STANDARD REQUIREMENTS. 16.3 NOTWITHSTANDING THE ABOVE, PANEL BOARDS CONNECTED TO THE SECONDARY SIDE OF TRANSFORMERS, 600-120/208 VOLT AND 600-120/240 VOLT, SIZED 225KVA AND HIGHER SHALL BE RATED MINIMUM 22KAC. 16.4 ALL TWO OR THREE POLE BREAKERS SHALL OPERATE WITH A COMMON TRIP AND WITH A SINGLE HANDLE. CIRCUIT BREAKERS SHALL BE OF TWO SINGLE POLE BREAKERS WITH A TIE HANDLE, TWIN BREAKERS. 16.5 SELECTED PANEL BOARD AND BREAKER TYPE COMBINATION SHALL ALLOW FOR INSTALLATION OF THREE POLE BREAKERS WITH AMPERAGE RATING NO LESS THAN 50% OF THE PANEL AMPERAGE RATING WITHOUT USE OF SPECIAL PURPOSE BREAKER KIT AND NOT REQUIRING MORE THAN THREE SINGLE POLE BREAKER SPACES. 16.6 ALL PANEL BOARDS SHALL BE SPRINKLER PROOF AS REQUIRED TO MEET LOCAL AND HYDRO CODES. 16.7 ALL ELECTRICAL EQUIPMENT SHALL BE 75°C RATED OR HIGHER. 16.8 ALL PANEL BOARDS SHALL BE FULLY BUSSED AND COMPLETE WITH BREAKER MOUNTING HARDWARE FOR ALL BREAKER SPACES.	13.6. PROVIDE TWO DEDICATED 110V 15AMP 1POLE POWER OUTLET ADJACENT TO THE IT EQUIPMENT LOCATIONS FOR UTILITY COMPANY REQUIREMENTS.	36. METERS: 36.1 METERING CABINETS SHALL BE OF SIZE SHOWN ON DRAWING OR 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 TELEPHONE ENTRY POINT AS REQUIRED BY THE LOCAL DISTRIBUTION COMPANY METERING DEPARTMENT. 36.2 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 REQUIRED. 36.3 THE CABINET SHALL BE MOUNTED ON THE WALL AS SHOWN ON THE DRAWINGS AND TO THE SATISFACTION OF THE LOCAL UTILITY. METER SOCKETS SHALL BE TO APPROVAL OF UTILITY. 36.4 THE CONTRACTOR SHALL CONFIRM METERING REQUIREMENTS WITH LOCAL HYDRO METERING DEPARTMENT PRIOR TO WORK COMMENCEMENT AND METERING EQUIPMENT SUPPLY. 36.5 PROVIDE ALL REQUIRED NEUTRAL WIRES TO METER AS PER LOCAL HYDRO'S REQUIREMENT. 36.6 COORDINATE AND PAY FOR ANY HYDRO SERVICE COSTS AS REQUIRED. INCLUDE FOR COORDINATION AND MEETING WITH UTILITY DISTRIBUTION COMPANY. 36.7 METERING EQUIPMENT SHALL BE PRE-APPROVED BY LOCAL HYDRO METERING DEPARTMENT. OBTAIN APPROVAL BY AHJ.
1.6. EXAMINE ARCHITECTURAL, STRUCTURAL, AND MECHANICAL DRAWINGS BEFORE PROCEEDING WITH THE WORK.	17. COVER PLATES: 17.1 COVER PLATES FOR RECEPTACLES, SWITCHES, PILOT LIGHTS, TELEPHONE OUTLETS AND OTHER DEVICES REQUIRING COVER PLATES FOR FLUSH MOUNTED BOXES SHALL BE METAL, STAINLESS STEEL #16-8 TYPE 302. 17.2 WEATHERPROOF COVER PLATES SHALL BE DIECAST CORROSION RESISTANT ALUMINUM TYPE WITH TWO SEPARATE LUGS FOR DUPLEX RECEPTACLES SUITABLE FOR MOORE TYPE 30A TYPE BOXES. ALL WEATHERPROOF COVER PLATES SHALL HAVE RUBBER OR NEOPRENE GASKETS. 17.3 EXTERIOR COVER PLATES SHALL BE METAL IN USE COVERS, INTERMATIC WP1010MXD, WP1250MXD, WP310MXD, OR APPROVED EQUIVALENT. 17.4 PLATES FOR SURFACE MOUNTED CAST BOXES SHALL BE GALVANIZED FORMED STEEL TYPE. 17.5 COVER PLATES FOR FLUSH MOUNTED EQUIPMENT SHALL BE SUPPLIED OF QUALITY AND PERFORMANCE SPECIFIED BY THE MANUFACTURER OF THE EQUIPMENT. 17.6 COVER PLATES SHALL NOT CARRY MANUFACTURERS NAME. 17.7 COVER PLATES OF QUALITY SPECIFIED SHALL BE PASS AND SEYMOUR, BRYANT, LEVITON, OR HUBBELL.	13.7. PROVIDE TWO DEDICATED 110V 15AMP 1POLE POWER OUTLET ADJACENT TO THE IT EQUIPMENT LOCATIONS FOR UTILITY COMPANY REQUIREMENTS.	37. MISCELLANEOUS ELECTRICAL WORK: 37.1 PROVIDE ALL CONCRETE WORK REQUIRED FOR ELECTRICAL WORK IN ACCORDANCE WITH ELECTRICAL AND ARCHITECTURAL DIVISION OF SPECIFICATION. THIS INCLUDES HOUSEKEEPING PAD BELOW ALL FLOOR STANDING EQUIPMENT. 37.2 PROVIDE ALL NECESSARY DUCT BANKS AS REQUIRED BY HYDRO IN ACCORDANCE WITH THEIR SPECIFICATIONS. SUBMIT ALL NECESSARY DRAWINGS TO HYDRO FOR THEIR APPROVAL. 37.3 CONFIRM ALL LOCATIONS AND OUTLETS PRIOR TO INSTALLATION. ALLOW TO RELOCATE ANY OUTLET WITH 5 METERS OF SPECIFIED LOCATION PRIOR TO INSTALLATION. 37.4 COORDINATE LOCATION OF TENANT ELECTRICAL SERVICE WITH TENANT INTERIOR DETAILS PRIOR TO SERVICE INSTALLATION. REQUEST FROM GENERAL CONTRACTOR TENANT INTERIOR DRAWINGS FOR COORDINATION PURPOSES. 37.5 PROVIDE ALL REQUIRED LUGS, CONNECTORS, REDUCERS, CRIMP, PIGTAIL, ADAPTERS ANY REQUIRED CONNECTING MATERIAL TO ENSURE CONDUCTORS COMPATIBLE WITH TERMINATOR REQUIREMENTS OF THE EQUIPMENT. 37.6 INTERRUPTION AND CONTINUATION OF SERVICES: 37.6.1 INTERRUPTION OF ELECTRICAL SERVICES SHALL OCCUR ONLY BY PRE-ARRANGEMENT AT TIMES SUITABLE TO THE LANDLORD. 37.6.2 INTERRUPTIONS SHALL ONLY OCCUR DURING PREMIUM TIME PERIODS. ALL ALLOWANCES FOR THIS SHALL BE INCLUDED IN THE PRICE SUBMITTED. 37.6.3 WORK IDENTIFIED TO BE CARRIED OVER BY LOCAL HYDRO UTILITY, SHALL BE COMPLETED WITH ASSISTANCE BY THIS ELECTRICAL CONTRACTOR, AT A TIME CONVENIENT TO HYDRO COMPANY. INCLUDE FOR WORK AT PREMIUM TIME AS REQUIRED. 37.7. NA 37.8. NA 37.9. NA 37.10. NA
1.7. ANY DISCREPANCIES BETWEEN DRAWINGS AND/OR SPECIFICATIONS MUST BE REFERRED TO THE CONSULTANT BEFORE ANY AFFECTED WORK IS COMMENCED.	18. LIGHT SWITCHES: 18.1 SWITCHES SHALL BE, UNLESS OTHERWISE NOTED, BRYANT QUIET TYPE WITH WHITE SPECIFICATION GRADE FOR 120V AND HEAVY-DUTY GRADE FOR 347V. 18.2 LIGHT SWITCHES OF QUALITY AS MANUFACTURED BY BRYANT, P & S, LEVITON AND HUBBELL, SHALL BE CONSIDERED AS ACCEPTABLE ALTERNATES. 18.3 DIMMERS SHALL BE LUTRON SPECIFICATION GRADE OR APPROVED ALTERNATE. OCCUPANCY SENSORS SHALL BE WATTS/OPPER DUK, TECHNOLOGY OR APPROVED EQUIVALENT.	13.8. UNLESS OTHERWISE SHOWN, STEEL PULL BOXES SHALL BE INSTALLED EVERY 30M OR LESS OF STRAIGHT CONDUIT RUN, EVERY 25M OR LESS OF STRAIGHT CONDUIT RUN AND ONE 90 DEGREE BEND OR EQUIVALENT, EVERY TWO 90 DEGREE BENDS OR EQUIVALENT.	38. INTERRUPTION AND CONTINUATION OF SERVICES: 38.1 INTERRUPTION OF ELECTRICAL SERVICES SHALL OCCUR ONLY BY PRE-ARRANGEMENT AT TIMES SUITABLE TO THE LANDLORD. 38.2 INTERRUPTIONS SHALL ONLY OCCUR DURING PREMIUM TIME PERIODS. ALL ALLOWANCES FOR THIS SHALL BE INCLUDED IN THE PRICE SUBMITTED. 38.3 WORK IDENTIFIED TO BE CARRIED OVER BY LOCAL HYDRO UTILITY, SHALL BE COMPLETED WITH ASSISTANCE BY THIS ELECTRICAL CONTRACTOR, AT A TIME CONVENIENT TO HYDRO COMPANY. INCLUDE FOR WORK AT PREMIUM TIME AS REQUIRED. 38.4. NA 38.5. NA 38.6. NA 38.7. NA
1.8. PREPARE INTERFERENCE DRAWINGS IN CONJUNCTION WITH ALL TRADES CONCERNED, SHOWING SLEEVES, CABLES AND CONDUIT, ROUTES, LIGHT FIXTURES AND OPENINGS FOR PASSAGE THROUGH STRUCTURE AND ALL INSERT SIZES AND LOCATIONS	19. RECEPTACLES: 19.1 RECEPTACLES SHALL BE, UNLESS OTHERWISE NOTED, U-GROUND TYPE, WHITE SCREW TERMINAL TYPE. 19.2 RECEPTACLES SHALL BE SPECIFICATION GRADE, MADE BY HUBBELL, LEVITON, T&B OR EQUIVALENT, 15 AMP, 120 VOLT UNLESS OTHERWISE NOTED. 19.3 ROOF/PARAPET RECEPTACLES SHALL BE VERTICALLY MOUNTED, CONDUIT WORK SHALL BE CONCEALED WITH IN THE STRUCTURE CAVITY. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR SEALING AND WATER PROOFING OWN PENETRATIONS. 19.4 HVAC RECEPTACLES SHALL BE 20 AMP AND COMPLETE WITH WHILE IN USE COVER, DIE-CAST ALUMINUM, MADE BY INTERMATIC.	13.9. PROVIDE TWO DEDICATED 110V 15AMP 1POLE POWER OUTLET ADJACENT TO THE IT EQUIPMENT LOCATIONS FOR UTILITY COMPANY REQUIREMENTS.	39. SPECIFICATION GUIDELINES: 39.1 ELECTRICAL SPECIFICATION IS APPLICABLE TO ALL ITEMS SHOWN ON THE ELECTRICAL DRAWINGS. 39.2 SPECIFICATION REFERENCING EQUIPMENT BEYOND THE SHOWN ON THE DRAWINGS SHALL BE DISCARDED.
1.9. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT MOUNTING LOCATIONS OF ALL LIGHT FIXTURES AND DEVICES.	20. DISTRIBUTION COORDINATION STUDY, SHORT CIRCUIT & COMMISSIONING 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 ENGINEER. 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 BUT NOT BE LIMITED TO: LINE DIAGRAMS C/W FAULT LEVELS, LINE DIAGRAMS C/W WIRE LENGTHS AND WIRE SPECIFICATIONS, LINE DIAGRAMS C/W ARC FLASH LEVELS, SELECTIVE COORDINATION PLOTS AND TABLE WITH BREAKER SETTING. 20.2 CONTRACTOR SHALL OBTAIN ALL DATA AS REQUIRED BY THE POWER 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 FINAL 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 2462. LABELS SHALL COMPLY WITH CSA 2462 Q4 STANDARD LABEL. 20.4 ALLOW TO FULLY COMMISSION THE SWITCHGEAR AT THE END OF THE PROJECT. WORK TO BE DONE BY AN INDEPENDENT SPECIALIST. CARRY OUT AN INFRARED SCAN OF THE ENTIRE DISTRIBUTION UNDER LOAD CONDITIONS. RETORQUE ALL EQUIPMENT CONNECTIONS, INCLUDING BUT NOT LIMITED TO: BUSBARS, BREAKERS, WIRE TERMINATIONS, 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 LABELS ON ALL ELECTRICAL DISTRIBUTION EQUIPMENT AND PANELS.	14.0. 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 TO POWER ON.	40. INTERRUPTION AND CONTINUATION OF SERVICES: 40.1 INTERRUPTION OF ELECTRICAL SERVICES SHALL OCCUR ONLY BY PRE-ARRANGEMENT AT TIMES SUITABLE TO THE LANDLORD. 40.2 INTERRUPTIONS SHALL ONLY OCCUR DURING PREMIUM TIME PERIODS. ALL ALLOWANCES FOR THIS SHALL BE INCLUDED IN THE PRICE SUBMITTED. 40.3 WORK IDENTIFIED TO BE CARRIED OVER BY LOCAL HYDRO UTILITY, SHALL BE COMPLETED WITH ASSISTANCE BY THIS ELECTRICAL CONTRACTOR, AT A TIME CONVENIENT TO HYDRO COMPANY. INCLUDE FOR WORK AT PREMIUM TIME AS REQUIRED. 40.4. NA 40.5. NA 40.6. NA 40.7. NA
2. ELECTRICAL DRAWINGS SHALL NOT BE USED FOR EQUIPMENT LAYOUT. DO NOT SCALE ELECTRICAL DRAWINGS. OBTAIN ALL DIMENSIONS FROM ARCHITECTURAL DIVISION.	21. AUTOMATIC CONTROL OF EXTERIOR LIGHTS: 21.1 CONTACTORS, PHOTO-ELECTRIC CONTROLS AND TIME SWITCHES SHALL BE USED TO CONTROL THE EXTERIOR LIGHTING INCLUDING POLE LIGHTING.	14.1. FEEDERS SHALL BE SIZED AS DETAILED. SUBSTITUTION OF FEEDERS EITHER IN MATERIAL OR ROUTING WILL NOT BE PERMITTED UNLESS ENGINEERS WRITTEN APPROVAL IS OBTAINED. FEEDERS SHALL HAVE 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 CORRECT ORDER WHEN READING LEFT TO RIGHT THROUGHOUT THE BUILDING.	41. INTERRUPTION AND CONTINUATION OF SERVICES: 41.1 INTERRUPTION OF ELECTRICAL SERVICES SHALL OCCUR ONLY BY PRE-ARRANGEMENT AT TIMES SUITABLE TO THE LANDLORD. 41.2 INTERRUPTIONS SHALL ONLY OCCUR DURING PREMIUM TIME PERIODS. ALL ALLOWANCES FOR THIS SHALL BE INCLUDED IN THE PRICE SUBMITTED. 41.3 WORK IDENTIFIED TO BE CARRIED OVER BY LOCAL HYDRO UTILITY, SHALL BE COMPLETED WITH ASSISTANCE BY THIS ELECTRICAL CONTRACTOR, AT A TIME CONVENIENT TO HYDRO COMPANY. INCLUDE FOR WORK AT PREMIUM TIME AS REQUIRED. 41.4. NA 41.5. NA 41.6. NA 41.7. NA
2.1. EXAMINE ARCHITECTURAL, STRUCTURAL, AND MECHANICAL DRAWINGS BEFORE PROCEEDING WITH THE WORK.	22. MECHANICAL TRADES WIRING: 22.1 PROVIDE ALL CONDUIT, WIRING, SPLITTERS, OUTLET BOXES AND DISCONNECT 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. 22.2. NA 22.3. NA 22.4. NA	14.2. FEEDERS SHALL BE SIZED AS DETAILED. SUBSTITUTION OF FEEDERS EITHER IN MATERIAL OR ROUTING WILL NOT BE PERMITTED UNLESS ENGINEERS WRITTEN APPROVAL IS OBTAINED. FEEDERS SHALL HAVE 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 CORRECT ORDER WHEN READING LEFT TO RIGHT THROUGHOUT THE BUILDING.	42. INTERRUPTION AND CONTINUATION OF SERVICES: 42.1 INTERRUPTION OF ELECTRICAL SERVICES SHALL OCCUR ONLY BY PRE-ARRANGEMENT AT TIMES SUITABLE TO THE LANDLORD. 42.2 INTERRUPTIONS SHALL ONLY OCCUR DURING PREMIUM TIME PERIODS. ALL ALLOWANCES FOR THIS SHALL BE INCLUDED IN THE PRICE SUBMITTED. 42.3 WORK IDENTIFIED TO BE CARRIED OVER BY LOCAL HYDRO UTILITY, SHALL BE COMPLETED WITH ASSISTANCE BY THIS ELECTRICAL CONTRACTOR, AT A TIME CONVENIENT TO HYDRO COMPANY. INCLUDE FOR WORK AT PREMIUM TIME AS REQUIRED. 42.4. NA 42.5. NA 42.6. NA 42.7. NA
2.2. ANY DISCREPANCIES BETWEEN DRAWINGS AND/OR SPECIFICATIONS MUST BE REFERRED TO THE CONSULTANT BEFORE ANY AFFECTED WORK IS COMMENCED.	23. IT, LV AND COMMUNICATIONS SYSTEMS: 23.1 SUPPLY AND INSTALL THE REQUIRED DUCT BANKS, EMPTY RACEWAY SYSTEM C/W HD PULL WIRES, PULL BOXES, TERMINATION PANELS, OUTLET BOXES, COVER PLATES, SUITABLE FOR THE INSTALLATION OF IT AND COMMUNICATIONS CABLES AND ASSOCIATED EQUIPMENT, BY THE IT COMPANY AND UTILITY. THE COMPLETE CONDUIT INSTALLATION SHALL MEET ALL THEIR REQUIREMENTS. 23.2 RACEWAYS SHALL BE RIGID, GALVANIZED STEEL CONDUIT WHERE EXPOSED TO MECHANICAL INJURY. IN	14.3. ALL PHASES AND NEUTRALS SHALL BE IDENTIFIED AND MAINTAINED IN THEIR CORRECT ORDER WHEN READING LEFT TO RIGHT THROUGHOUT THE BUILDING.	43. INTERRUPTION AND CONTINUATION OF SERVICES: 43.1 INTERRUPTION OF ELECTRICAL SERVICES SHALL OCCUR ONLY BY PRE-ARRANGEMENT AT TIMES SUITABLE TO THE LANDLORD. 43.2 INTERRUPTIONS SHALL ONLY OCCUR DURING PREMIUM TIME PERIODS. ALL ALLOWANCES FOR THIS SHALL BE INCLUDED IN THE PRICE SUBMITTED. 43.3 WORK IDENTIFIED TO BE CARRIED OVER BY LOCAL HYDRO UTILITY, SHALL BE COMPLETED WITH ASSISTANCE BY THIS ELECTRICAL CONTRACTOR, AT A TIME CONVENIENT TO HYDRO COMPANY. INCLUDE FOR WORK AT PREMIUM TIME AS REQUIRED. 43.4. NA 43.5. NA 43.6. NA 43.7. NA
2.3. PREPARE INTERFERENCE DRAWINGS IN CONJUNCTION WITH ALL TRADES CONCERNED, SHOWING SLEEVES, CABLES AND CONDUIT, ROUTES, LIGHT FIXTURES AND OPENINGS FOR PASSAGE THROUGH STRUCTURE AND ALL INSERT SIZES AND LOCATIONS	24. ALLOW TO FULLY COMMISSION THE SWITCHGEAR AT THE END OF THE PROJECT. WORK TO BE DONE BY AN INDEPENDENT SPECIALIST. CARRY OUT AN INFRARED SCAN OF THE ENTIRE DISTRIBUTION UNDER LOAD CONDITIONS. RETORQUE ALL EQUIPMENT CONNECTIONS, INCLUDING BUT NOT LIMITED TO: BUSBARS, BREAKERS, WIRE TERMINATIONS, 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.	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 TO POWER ON.	44. INTERRUPTION AND CONTINUATION OF SERVICES: 44.1 INTERRUPTION OF ELECTRICAL SERVICES SHALL OCCUR ONLY BY PRE-ARRANGEMENT AT TIMES SUITABLE TO THE LANDLORD. 44.2 INTERRUPTIONS SHALL ONLY OCCUR DURING PREMIUM TIME PERIODS. ALL ALLOWANCES FOR THIS SHALL BE INCLUDED IN THE PRICE SUBMITTED. 44.3 WORK IDENTIFIED TO BE CARRIED OVER BY LOCAL HYDRO UTILITY, SHALL BE COMPLETED WITH ASSISTANCE BY THIS ELECTRICAL CONTRACTOR, AT A TIME CONVENIENT TO HYDRO COMPANY. INCLUDE FOR WORK AT PREMIUM TIME AS REQUIRED. 44.4. NA 44.5. NA 44.6. NA 44.7. NA
2.4. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT MOUNTING LOCATIONS OF ALL LIGHT FIXTURES AND DEVICES.	25. PROVIDE AN ARC FLASH STUDY AND PROVIDE ARC FLASH RATING LABELS ON ALL ELECTRICAL DISTRIBUTION EQUIPMENT AND PANELS.	14.5. REPLACE AT NO COST ALL FEEDERS THAT DO NOT MEET MINIMUM INSULATION RESISTANCE.	45. INTERRUPTION AND CONTINUATION OF SERVICES: 45.1 INTERRUPTION OF ELECTRICAL SERVICES SHALL OCCUR ONLY BY PRE-ARRANGEMENT AT TIMES SUITABLE TO THE LANDLORD. 45.2 INTERRUPTIONS SHALL ONLY OCCUR DURING PREMIUM TIME PERIODS. ALL ALLOWANCES FOR THIS SHALL BE INCLUDED IN THE PRICE SUBMITTED. 45.3 WORK IDENTIFIED TO BE CARRIED OVER BY LOCAL HYDRO UTILITY, SHALL BE COMPLETED WITH ASSISTANCE BY THIS ELECTRICAL CONTRACTOR, AT A TIME CONVENIENT TO HYDRO COMPANY. INCLUDE FOR WORK AT PREMIUM TIME AS REQUIRED. 45.4. NA 45.5. NA 45.6. NA 45.7. NA
2.5. ELECTRICAL DRAWINGS SHALL NOT BE USED FOR EQUIPMENT LAYOUT. DO NOT SCALE ELECTRICAL DRAWINGS. OBTAIN ALL DIMENSIONS FROM ARCHITECTURAL DIVISION.	26. AUTOMATIC CONTROL OF EXTERIOR LIGHTS: 26.1 CONTACTORS, PHOTO-ELECTRIC CONTROLS AND TIME SWITCHES SHALL BE USED TO CONTROL THE EXTERIOR LIGHTING INCLUDING POLE LIGHTING.	14.6. ALL DISTRIBUTION FEEDERS SHALL BE 90°C RATED.	46. INTERRUPTION AND CONTINUATION OF SERVICES: 46.1 INTERRUPTION OF ELECTRICAL SERVICES SHALL OCCUR ONLY BY PRE-ARRANGEMENT AT TIMES SUITABLE TO THE LANDLORD. 46.2 INTERRUPTIONS SHALL ONLY OCCUR DURING PREMIUM TIME PERIODS. ALL ALLOWANCES FOR THIS SHALL BE INCLUDED IN THE PRICE SUBMITTED. 46.3 WORK IDENTIFIED TO BE CARRIED OVER BY LOCAL HYDRO UTILITY, SHALL BE COMPLETED WITH ASSISTANCE BY THIS ELECTRICAL CONTRACTOR, AT A TIME CONVENIENT TO HYDRO COMPANY. INCLUDE FOR WORK AT PREMIUM TIME AS REQUIRED. 46.4. NA 46.5. NA 46.6. NA 46.7. NA
2.6. NOTE ELECTRICAL DRAWINGS ARE DIAGRAMMATIC IN NATURE. CONTRACTOR IS RESPONSIBLE TO FAMILIARIZE WITH THE PROJECT INTENT BY REVIEWING ALL DRAWINGS RELATED TO THE PROJECT.	27. IT, LV AND COMMUNICATIONS SYSTEMS: 27.1 SUPPLY AND INSTALL THE REQUIRED DUCT BANKS, EMPTY RACEWAY SYSTEM C/W HD PULL WIRES, PULL BOXES, TERMINATION PANELS, OUTLET BOXES, COVER PLATES, SUITABLE FOR THE INSTALLATION OF IT AND COMMUNICATIONS CABLES AND ASSOCIATED EQUIPMENT, BY THE IT COMPANY AND UTILITY. THE COMPLETE CONDUIT INSTALLATION SHALL MEET ALL THEIR REQUIREMENTS. 27.2 RACEWAYS SHALL BE RIGID, GALVANIZED STEEL CONDUIT WHERE EXPOSED TO MECHANICAL INJURY. IN	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 THEIR ENVIRONMENT.	47. INTERRUPTION AND CONTINUATION OF SERVICES: 47.1 INTERRUPTION OF ELECTRICAL SERVICES SHALL OCCUR ONLY BY PRE-ARRANGEMENT AT TIMES SUITABLE TO THE LANDLORD. 47.2 INTERRUPTIONS SHALL ONLY OCCUR DURING PREMIUM TIME PERIODS. ALL ALLOWANCES FOR THIS SHALL BE INCLUDED IN THE PRICE SUBMITTED. 47.3 WORK IDENTIFIED TO BE CARRIED OVER BY LOCAL HYDRO UTILITY, SHALL BE COMPLETED WITH ASSISTANCE BY THIS ELECTRICAL CONTRACTOR, AT A TIME CONVENIENT TO HYDRO COMPANY. INCLUDE FOR WORK AT PREMIUM TIME AS REQUIRED. 47.4. NA 47.5. NA 47.6. NA 47.7. NA
2.7. IN CASE OF CONFLICT BETWEEN THE SPECIFICATION AND THE DRAWINGS THE GREATER REQUIREMENT SHALL PREVAIL.	28. MECHANICAL TRADES WIRING: 28.1 PROVIDE ALL CONDUIT, WIRING, SPLITTERS, OUTLET BOXES AND DISCONNECT 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. 28.2. NA 28.3. NA 28.4. NA	16. ELECTRICAL PANEL BOARDS: 16.1 EACH PANEL BOARD SHALL BE C/W A KEY LOCKABLE HINGED DOOR AND A CIRCUIT DIRECTORY GIVING THE NUMBER AND DESCRIPTION OF EACH CIRCUIT CONTROLLED. THE DIRECTORY SHALL BE CLEARLY TYPED, LEGIBLE AND OF AMPLIE SIZE AND SHALL BE MOUNTED IN A METAL FRAME WITH A CLEAR PLASTIC COVER ON THE INSIDE OF THE DOOR. 16.2 THE CIRCUIT BREAKERS SHALL BE CONNECTED TO THE PANEL BY BOLTED CONNECTIONS. ALL BUS BARS, LUGS, AND BREAKER TERMINALS SHALL BE COPPER SILVER PLATED AT THE CONNECTION POINTS. THE INTERRUPTING CAPACITY OF EACH BOARD SHALL BE DETERMINED BY THE CO-ORDINATION STUDY AS PER THE LOCAL UTILITIES CURRENT AND POTENTIAL TRANSFORMERS. CURRENT TRANSFORMERS SHALL BE OBTAINED FROM THE UTILITY AND INSTALLED IN THE COMPARTMENT BY THE SERVICE ENTRANCE BOARD MANUFACTURER OR AS PER UTILITIES STANDARD REQUIREMENTS. 16.3 NOTWITHSTANDING THE ABOVE, PANEL BOARDS CONNECTED TO THE SECONDARY SIDE OF TRANSFORMERS, 600-120/208 VOLT AND 600-120/240 VOLT, SIZED 225KVA AND HIGHER SHALL BE RATED MINIMUM 22KAC. 16.4 ALL TWO OR THREE POLE BREAKERS SHALL OPERATE WITH A COMMON TRIP AND WITH A SINGLE HANDLE. CIRCUIT BREAKERS SHALL BE OF TWO SINGLE POLE BREAKERS WITH A TIE HANDLE, TWIN BREAKERS. 16.5 SELECTED PANEL BOARD AND BREAKER TYPE COMBINATION SHALL ALLOW FOR INSTALLATION OF THREE POLE BREAKERS WITH AMPERAGE RATING NO LESS THAN 50% OF THE PANEL AMPERAGE RATING WITHOUT USE OF SPECIAL PURPOSE BREAKER KIT AND NOT REQUIRING MORE THAN THREE SINGLE POLE BREAKER SPACES. 16.6 ALL PANEL BOARDS SHALL BE SPRINKLER PROOF AS REQUIRED TO MEET LOCAL AND HYDRO CODES. 16.7 ALL ELECTRICAL EQUIPMENT SHALL BE 75°C RATED OR HIGHER. 16.8 ALL PANEL BOARDS SHALL BE FULLY BUSSED AND COMPLETE WITH BREAKER MOUNTING HARDWARE FOR ALL BREAKER SPACES.	48. INTERRUPTION AND CONTINUATION OF SERVICES: 48.1 INTERRUPTION OF ELECTRICAL SERVICES SHALL OCCUR ONLY BY PRE-ARRANGEMENT AT TIMES SUITABLE TO THE LANDLORD. 48.2 INTERRUPTIONS SHALL ONLY OCCUR DURING PREMIUM TIME PERIODS. ALL ALLOWANCES FOR THIS SHALL BE INCLUDED IN THE PRICE SUBMITTED. 48.3 WORK IDENTIFIED TO BE CARRIED OVER BY LOCAL HYDRO UTILITY, SHALL BE COMPLETED WITH ASSISTANCE BY THIS ELECTRICAL CONTRACTOR, AT A TIME CONVENIENT TO HYDRO COMPANY. INCLUDE FOR WORK AT PREMIUM TIME AS REQUIRED. 48.4. NA 48.5. NA 48.6. NA 48.7. NA
2.8. IN CASE OF CONFLICT BETWEEN THE SPECIFICATION AND THE DRAWINGS THE GREATER REQUIREMENT SHALL PREVAIL.	29. IT, LV AND COMMUNICATIONS SYSTEMS: 29.1 SUPPLY AND INSTALL THE REQUIRED DUCT BANKS, EMPTY RACEWAY SYSTEM C/W HD PULL WIRES, PULL BOXES, TERMINATION PANELS, OUTLET BOXES, COVER PLATES, SUITABLE FOR THE INSTALLATION OF IT AND COMMUNICATIONS CABLES AND ASSOCIATED EQUIPMENT, BY THE IT COMPANY AND UTILITY. THE COMPLETE CONDUIT INSTALLATION SHALL MEET ALL THEIR REQUIREMENTS. 29.2 RACEWAYS SHALL BE RIGID, GALVANIZED STEEL CONDUIT WHERE EXPOSED TO MECHANICAL INJURY. IN	17. COVER PLATES: 17.1 COVER PLATES FOR RECEPTACLES, SWITCHES, PILOT LIGHTS, TELEPHONE OUTLETS AND OTHER DEVICES REQUIRING COVER PLATES FOR FLUSH MOUNTED BOXES SHALL BE METAL, STAINLESS STEEL #16-8 TYPE 302. 17.2 WEATHERPROOF COVER PLATES SHALL BE DIECAST CORROSION RESISTANT ALUMINUM TYPE WITH TWO SEPARATE LUGS FOR DUPLEX RECEPTACLES SUITABLE FOR MOORE TYPE 30A TYPE BOXES. ALL WEATHERPROOF COVER PLATES SHALL HAVE RUBBER OR NEOPRENE GASKETS. 17.3 EXTERIOR COVER PLATES SHALL BE METAL IN USE COVERS, INTERMATIC WP1010MXD, WP1250MXD, WP310MXD, OR APPROVED EQUIVALENT. 17.4 PLATES FOR SURFACE MOUNTED CAST BOXES SHALL BE GALVANIZED FORMED STEEL TYPE. 17.5 COVER PLATES FOR FLUSH MOUNTED EQUIPMENT SHALL BE SUPPLIED OF QUALITY AND PERFORMANCE SPECIFIED BY THE MANUFACTURER OF THE EQUIPMENT. 17.6 COVER PLATES SHALL NOT CARRY MANUFACTURERS NAME. 17.7 COVER PLATES OF QUALITY SPECIFIED SHALL BE PASS AND SEYMOUR, BRYANT, LEVITON, OR HUBBELL.	49. INTERRUPTION AND CONTINUATION OF SERVICES: 49.1 INTERRUPTION OF ELECTRICAL SERVICES SHALL OCCUR ONLY BY PRE-ARRANGEMENT AT TIMES SUITABLE TO THE LANDLORD. 49.2 INTERRUPTIONS SHALL ONLY OCCUR DURING PREMIUM TIME PERIODS. ALL ALLOWANCES FOR THIS SHALL BE INCLUDED IN THE PRICE SUBMITTED. 49.3 WORK IDENTIFIED TO BE CARRIED OVER BY LOCAL HYDRO UTILITY, SHALL BE COMPLETED WITH ASSISTANCE BY THIS ELECTRICAL CONTRACTOR, AT A TIME CONVENIENT TO HYDRO COMPANY. INCLUDE FOR WORK AT PREMIUM TIME AS REQUIRED. 49.4. NA 49.5. NA 49.6. NA 49.7. NA
2.9. IN CASE OF CONFLICT BETWEEN THE SPECIFICATION AND THE DRAWINGS THE GREATER REQUIREMENT SHALL PREVAIL.	30. IT, LV AND COMMUNICATIONS SYSTEMS: 30.1 SUPPLY AND INSTALL THE REQUIRED DUCT BANKS, EMPTY RACEWAY SYSTEM C/W HD PULL WIRES, PULL BOXES, TERMINATION PANELS, OUTLET BOXES, COVER PLATES, SUITABLE FOR THE INSTALLATION OF IT AND COMMUNICATIONS CABLES AND ASSOCIATED EQUIPMENT, BY THE IT COMPANY AND UTILITY. THE COMPLETE CONDUIT INSTALLATION SHALL MEET ALL THEIR REQUIREMENTS. 30.2 RACEWAYS SHALL BE RIGID, GALVANIZED STEEL CONDUIT WHERE EXPOSED TO MECHANICAL INJURY. IN	18. LIGHT SWITCHES: 18.1 SWITCHES SHALL BE, UNLESS OTHERWISE NOTED, BRYANT QUIET TYPE WITH WHITE SPECIFICATION GRADE FOR 120V AND HEAVY-DUTY GRADE FOR 347V. 18.2 LIGHT SWITCHES OF QUALITY AS MANUFACTURED BY BRYANT, P & S, LEVITON AND HUBBELL, SHALL BE CONSIDERED AS ACCEPTABLE ALTERNATES. 18.3 DIMMERS SHALL BE LUTRON SPECIFICATION GRADE OR APPROVED ALTERNATE. OCCUPANCY SENSORS SHALL BE WATTS/OPPER DUK, TECHNOLOGY OR APPROVED EQUIVALENT.	50. INTERRUPTION AND CONTINUATION OF SERVICES: 50.1 INTERRUPTION OF ELECTRICAL SERVICES SHALL OCCUR ONLY BY PRE-ARRANGEMENT AT TIMES SUITABLE TO THE LANDLORD. 50.2 INTERRUPTIONS SHALL ONLY OCCUR DURING PREMIUM TIME PERIODS. ALL ALLOWANCES FOR THIS SHALL BE INCLUDED IN THE PRICE SUBMITTED. 50.3 WORK IDENTIFIED TO BE CARRIED OVER BY LOCAL HYDRO UTILITY, SHALL BE COMPLETED WITH ASSISTANCE BY THIS ELECTRICAL CONTRACTOR, AT A TIME CONVENIENT TO HYDRO COMPANY. INCLUDE FOR WORK AT PREMIUM TIME AS REQUIRED. 50.4. NA 50.5. NA 50.6. NA 50.7. NA
3. COMMON WORK REQUIREMENTS	31. RACEWAYS SHALL BE RIGID, GALVANIZED STEEL CONDUIT WHERE EXPOSED TO MECHANICAL INJURY. IN	19. RECEPTACLES: 19.1 RECEPTACLES SHALL BE, UNLESS OTHERWISE NOTED, U-GROUND TYPE, WHITE SCREW TERMINAL TYPE. 19.2 RECEPTACLES SHALL BE SPECIFICATION GRADE, MADE BY HUBBELL, LEVITON, T&B OR EQUIVALENT, 15 AMP, 120 VOLT UNLESS OTHERWISE NOTED. 19.3 ROOF/PARAPET RECEPTACLES SHALL BE VERTICALLY MOUNTED, CONDUIT WORK SHALL BE CONCEALED WITH IN THE STRUCTURE CAVITY. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR SEALING AND WATER PROOFING OWN PENETRATIONS. 19.4 HVAC RECEPTACLES SHALL BE 20 AMP AND COMPLETE WITH WHILE IN USE COVER, DIE-CAST ALUMINUM, MADE BY INTERMATIC.	51. INTERRUPTION AND CONTINUATION OF SERVICES: 51.1 INTERRUPTION OF ELECTRICAL SERVICES SHALL OCCUR ONLY BY PRE-ARRANGEMENT AT TIMES SUITABLE TO THE LANDLORD. 51.2 INTERRUPTIONS SHALL ONLY OCCUR DURING PREMIUM TIME PERIODS. ALL ALLOWANCES FOR THIS SHALL BE INCLUDED IN THE PRICE SUBMITTED. 51.3 WORK IDENTIFIED TO BE CARRIED OVER BY LOCAL HYDRO UTILITY, SHALL BE COMPLETED WITH ASSISTANCE BY THIS ELECTRICAL CONTRACTOR, AT A TIME CONVENIENT TO HYDRO COMPANY. INCLUDE FOR WORK AT PREMIUM TIME AS REQUIRED. 51.4. NA 51.5. NA 51.6. NA 51.7. NA
3.1. ENSURE THAT ALL ELECTRICAL EQUIPMENT SUPPLIED BY OTHER TRADES IS SUITABLE FOR THE RESPECTIVE VOLTAGE. CONFIRM POWER REQUIREMENTS OF ALL OWNER SUPPLIED EQUIPMENT.	32. RACEWAYS SHALL BE RIGID, GALVANIZED STEEL CONDUIT WHERE EXPOSED TO MECHANICAL INJURY. IN	20. DISTRIBUTION COORDINATION STUDY, SHORT CIRCUIT & COMMISSIONING 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 ENGINEER. 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 BUT NOT BE LIMITED TO: LINE DIAGRAMS C/W FAULT LEVELS, LINE DIAGRAMS C/W WIRE LENGTHS AND WIRE SPECIFICATIONS, LINE DIAGRAMS C/W ARC FLASH LEVELS, SELECTIVE COORDINATION PLOTS AND TABLE WITH BREAKER SETTING. 20.2 CONTRACTOR SHALL OBTAIN ALL DATA AS REQUIRED BY THE POWER 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 FINAL 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 2462. LABELS SHALL COMPLY WITH CSA 2462 Q4 STANDARD LABEL. 20.4 ALLOW TO FULLY COMMISSION THE SWITCHGEAR AT THE END OF THE PROJECT. WORK TO BE DONE BY AN INDEPENDENT SPECIALIST. CARRY OUT AN INFRARED SCAN OF THE ENTIRE DISTRIBUTION UNDER LOAD CONDITIONS. RETORQUE ALL EQUIPMENT CONNECTIONS, INCLUDING BUT NOT LIMITED TO: BUSBARS, BREAKERS, WIRE TERMINATIONS, 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 LABELS ON ALL ELECTRICAL DISTRIBUTION EQUIPMENT AND PANELS.	52. INTERRUPTION AND CONTINUATION OF SERVICES: 52.1 INTERRUPTION OF ELECTRICAL SERVICES SHALL OCCUR ONLY BY PRE-ARRANGEMENT AT TIMES SUITABLE TO THE LANDLORD. 52.2 INTERRUPTIONS SHALL ONLY OCCUR DURING PREMIUM TIME PERIODS. ALL ALLOWANCES FOR THIS SHALL BE INCLUDED IN THE PRICE SUBMITTED. 52.3 WORK IDENTIFIED TO BE C

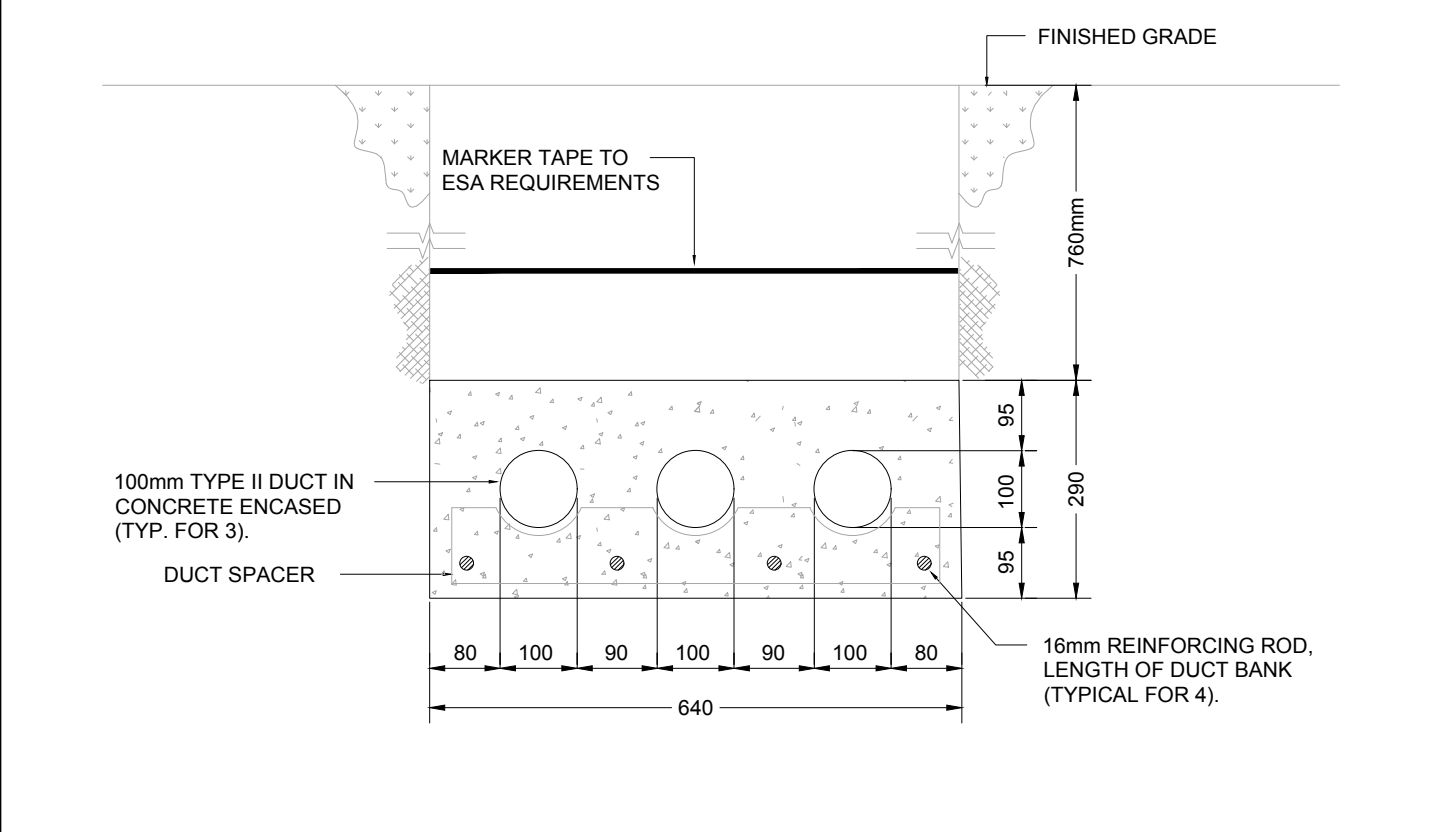
SITE SERVICE & DUCTBANK SPECIFICATIONS

1. UNDERGROUND DUCT BANKS:
- 1.1 SUPPLY AND INSTALL UNDERGROUND CONCRETE ENCASED DUCTBANKS FOR CABLES INDICATED. CONCRETE WORK AS DETAILED HEREIN SHALL BE PROVIDED BY THIS SECTION. TRENCHING AND BACKFILLING SHALL BE DONE BY THIS SECTION.
- 1.2 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.
- 1.3 THE DUCTBANK 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 DRP POLYMER FOR CONCRETE ENCASEMENT OR DIRECT BURIAL WITH AN INTERNAL DIAMETER OF FOUR INCHES MINIMUM UNLESS OTHERWISE SHOWN ON THE DRAWINGS.
- 1.4 BENDS SHALL, GENERALLY BE AS FACTORY SUPPLIED OF APPROVED RADIUS. RADIUS OF SUCH BENDS SHALL NOT BE LESS THAN STANDARD FOR THE 100MM DIAMETER DUCT 1M.
- 1.5 THE DUCT LENGTHS SHALL BE JOINED TOGETHER WITH AN APPROVED COUPLING TO PROVIDE A SOUND JOINT. ADJACENT COUPLINGS SHALL BE STAGGERED BY AT LEAST 200MM. JOINT SOLVENT SHALL BE USED TO SEAL THE COUPLINGS.
- 1.6 WHERE TRENCH IS DRY AND FIRM, NO BED SHALL BE REQUIRED. WHERE TRENCH IS WET, SUPPLY AND INSTALLED 150MM LAYER OF CRUSHED STONE IN THE BOTTOM. NO CONCRETE SHALL BE POURED IN TRENCHES CONTAINING WATER.
- 1.7 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 AND WITHIN 600MM OF EACH COUPLING USED. SPACERS SHALL BE SPECIALLY FORMED PLASTIC. WOOD SPACERS SHALL NOT BE USED.
- 1.8 THE DUCTS SHALL BE ON EVEN GRADE SLOPED NOT LESS THAN 20MM IN A 1000MM RUN IN DIRECTION OPPOSITE TO THE ELECTRICAL ROOM. PRIOR ENTRANCE INTO ELECTRICAL ROOM DUCTS SHALL BE DRAINED VIA FRENCH DRAIN IF SLOPE OPPOSITE TO ELECTRICAL ROOM IS NOT FEASIBLE.
- 1.9 THE TOP SURFACE OF CONCRETE ENCASEMENT SHALL BE A MINIMUM 760MM BELOW FINISHED GRADE, UNLESS OTHERWISE INDICATED ON 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 8% COMPACTED SOIL OR NATIVE MATERIAL OVER THEM.
- 1.10 NO FERROUS METAL SHALL BE INSTALLED BETWEEN PRIMARY CABLE DUCTS. REINFORCING 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 "D" DIAMETER H80000 STEEL #2 BARS LAID LONGITUDINALLY AT 150MM LATERAL SPACING AND SET AT 1/3 THE DEPTH OF THE CONCRETE ENVELOPE BELOW THE BOTTOM ROW OF DUCTS.
- 1.11 ALL REINFORCING RODS USED SHALL HAVE A MINIMUM LENGTH OF 2000MM. INDIVIDUAL LENGTHS OF REINFORCING RODS ARE TO BE OVERLAPPED BY A MINIMUM OF 300MM AND IS TO EXTEND AT LEAST 100MM ONTO SOLID GROUND. IN ALL CASES WHERE THE DUCT BANK ENTERS A BUILDING, IT SHALL BE REINFORCED FOR A DISTANCE OF 2500MM OUTSIDE THE BUILDING. DUCTBANKS PASSING BEHIND FOOTINGS, UNDER HIGHWAYS, STREETS, ROADS, OR HEAVILY TRAVELED DRIVEWAYS SHALL BE REINFORCED, AND REINFORCING SHALL EXTEND A DISTANCE OF 1500MM BEYOND IN BOTH DIRECTIONS.
- 1.12 THE DUCTS SHALL BE ENCASED WITH A MINIMUM 20MPA CONCRETE WITH A MINIMUM COVER OF 75MM ON ALL SIDES. THE CONCRETE SHALL HAVE A SLUMP OF 100MM TO 150MM AND BE OF A #4 GRAVEL AGGREGATE. TO PREVENT ANY DISPLACEMENT OF THE DUCT STRUCTURE DURING POURING, THE DUCT STRUCTURE SHALL BE BRACED DOWN EVERY 300MM AND THE CONCRETE SHALL BE DEFLECTED DOWN ALONGSIDE THE DUCTS TO THE BOTTOM AND UP THROUGH THE DUCT ASSEMBLY.
- 1.13 WHEN CROSSING OTHER UTILITIES, THE CONCRETE DUCT ENCASEMENT SHALL MAINTAIN A MINIMUM OF 450MM VERTICAL CLEARANCE. WHEN RUNNING PARALLEL TO ANOTHER UTILITY, THE DUCTBANK SHALL BE A MINIMUM OF 1500MM CLEAR OF SAID UTILITY BUT IN NO CASE SHALL IT BE INSTALLED IN THE SAME EXCAVATION.
- 1.14 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 50MM MANDREL THROUGH THEIR COMPLETE LENGTH.
- 1.15 DUCTS INSTALLED FOR P.U.C CABLES AND DUCTS LEFT AS SPARE SHALL HAVE ONE CONTINUOUS LENGTH 100MM POLYPROPYLENE ROPE INSTALLED IN EACH DUCT TO FACILITATE THE INSTALLATION OF THE CABLES IN THE DUCT. TERMINATION POINTS, GRADES, AND ROUTE OF DUCT BANK SHALL BE CONFIRMED BY THE P.U.C ON-SITE.
- 1.16 NOTIFY CONSULTANT AND P.U.C AT LEAST 48 HOURS BEFORE CONCRETE IS POURED TO PERMIT INSPECTION OF THE DUCT INSTALLATION.
- 1.17 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.
2. EXCAVATION AND BACKFILLING:
- 2.1 EXCAVATE AND BACKFILL AS REQUIRED FOR THIS WORK BOTH INSIDE AND OUTSIDE THE BUILDING. ALL TRENCH EXCAVATION SHALL BE CARRIED OUT IN STRICT CONFORMITY WITH THE TRENCH EXCAVATOR PROTECTION ACT AND AMENDMENTS, STATUTES OF ONTARIO AND REGULATIONS, AS REVISED AND AMENDED TO DATE.
- 2.2 ALL EXCAVATION AND BACKFILLING SHALL BE PROVIDED BY THIS ELECTRICAL CONTRACTOR.
- 2.3 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 DAMAGE.
- 2.4 UNDERGROUND SEWERS AND OTHER SERVICES ARE INDICATED 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 BEFORE PROCEEDING WITH ANY NEW WORK. ENGAGE THE SERVICES OF LOCAL P.U.C, HYDRO, TELEPHONE, AND GAS AUTHORITIES TO ACCURATELY DETERMINE LOCATION OF ANY UNDERGROUND UTILITIES.
- 2.5 EXCAVATION FOR ALL UNDERGROUND SERVICES SHALL BE OF THE REQUIRED DEPTH AND DIMENSION, AND SHALL BE:
- 2.5.1 PREPARED AS REQUIRED, SO THAT NO PORTION OF ANY DUCT SHALL BEAR DIRECTLY AGAINST ANY ROCK OR OTHER HARD SURFACE.
- 2.5.2 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.
- 2.5.4 BANKS OF EXCAVATIONS SHALL BE EVENLY CUT AND/OR TRIMMED AND THEY SHALL BE SHORED AS REQUIRED TO PREVENT CAVING IN, AND THE MATERIAL USED SHALL BE CAREFULLY DRAIN DURING BACKFILLING.
- 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.
- 2.5.6 EXCAVATING, DUCT LAYING, AND BACKFILLING SHALL BE EXECUTED IN LIMITED LENGTH AS DETERMINED BY PROJECT MANAGER TO ENABLE ALL PROTECTIVE MEASURES TO FUNCTION EFFICIENTLY AT ALL TIMES.
- 2.6 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 THE LEVEL OF THE TOP OF HIGHEST ADJACENT FOOTING.
- 2.7 ALL DUCTS ENTERING AND LEAVING THE BUILDING OR PASSING OTHER EXCAVATED AREAS SHALL BE SUPPORTED ON A REINFORCED CONCRETE PAD, RESTING AT BOTH ENDS ON AT LEAST 1800MM SOLID UNDISTURBED EARTH OR A CHECK IN CONCRETE FOUNDATION WALL.
- 2.8 IN AREAS WHERE REINFORCED SUSPENDED SLAB IS INDICATED ON STRUCTURAL DRAWINGS, DUCTS SHALL BE SUPPORTED FROM REINFORCING RODS.
- 2.9 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 BACKFILLING SHALL NOT BE COMMENCED UNTIL INSTALLATION IS INSPECTED AND APPROVED. BACKFILLING SHALL BE CARRIED OUT CAREFULLY TO AVOID INJURY TO THE WORK AND SUBSEQUENT SETTLEMENT AND SHALL BE EXECUTED AS FOLLOWS:
- 2.10.1 ALL BACKFILLING REQUIRED TO BRING LEVEL UP TO UNDERSIDE OF 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 FILL SHALL BE CLEAN, SHALL NOT HAVE PARTICLES OVER 60MM IN LARGEST DIMENSIONS, AND WITH NOT MORE THAN 8% PASSING A #200 SIEVE.
- 2.10.2 ALL BACKFILL PLACED UNDER PAVED AREAS (PARKING AREAS, DRIVEWAYS, SIDEWALKS, ETC.) SHALL BE COMPACTED IN 150MM TO 200MM LAYERS TO 98% SPD (REFER TO GENERAL REQUIREMENTS OUTLINED IN SPECIFICATION SECTION 0215 & SOIL REPORT). TESTING AND INSPECTION OF SAID BACKFILL, INCLUDING CHECKING THE PLACING AND COMPACTING OF FILL, SHALL BE DONE BY AN INDEPENDENT INSPECTION TESTING COMPANY. THE COST OF THE INSPECTION AND TESTING OF THIS FILL WILL BE PAID BY OTHERS. ONE TEST SHALL BE MADE EVERY 150MM LAYERS OF FILL FOR EACH 5,000 SQUARE FEET OR LESS OF FILLED AREAS FOR DRIVEWAYS, PARKING AREAS, AND SIDEWALKS.
- 2.10.3 EXTERIOR BACKFILL IN AREAS TO RECEIVE SOIL OR SEED SHALL BE CLEAN FILL, FREE FROM ORGANIC MATERIAL AND DEBRIS, PLACED IN A MAXIMUM 300MM LAYER AND COMPACTED TO ACHIEVE 90% DRY DENSITY AS DETERMINED BY THE STANDARD KASHT TEST. FROZEN EARTH SHALL NOT BE USED FOR BACKFILLING NOR SHALL ANY BACKFILLING BE PLACED ON OR AGAINST FROZEN GROUND.
- 2.10.4 BACKFILL TRENCHES WITHIN BUILDING AND GRANULAR B CRUSHED STONE IN LAYERS AND COMPACT TO 100% STANDARD PROCTOR DENSITY.
- 2.10.5 SUPPLY AND INSTALL A 150MM WIDE PLASTIC FILM 200MM BELOW 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 POWER LINES, AND GREEN FOR COMMUNICATIONS LINES.
- 2.10.6 IF SETTLEMENT OCCURS, IT SHALL BE MADE UP AS SOON AS POSSIBLE 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.
- 2.10.7 PATCHING OF ALL PAVED AREAS, ROADS, WALKS, SODDING, ETC. DAMAGED BY THE NEW WORK WILL BE DONE BY ANOTHER DIVISION AND PAID BY THIS ELECTRICAL CONTRACTOR.
- 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.
- 2.10.9 BACKFILLING TO SUBGRADE LEVEL BY THIS ELECTRICAL CONTRACTOR AND FINISH BACKFILLING SHALL BE DONE BY PAVING CONTRACTOR.
- 2.10.10 EXCAVATED MATERIALS SHALL BE PILED, STORED AND/OR DISPOSED OF AS FOLLOWS:
- 2.10.10.1 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.
- 2.10.10.2 ON COMPLETION OF WORK, ALL EXCAVATED MATERIAL SHALL BE REMOVED AND DEPOSED OF.

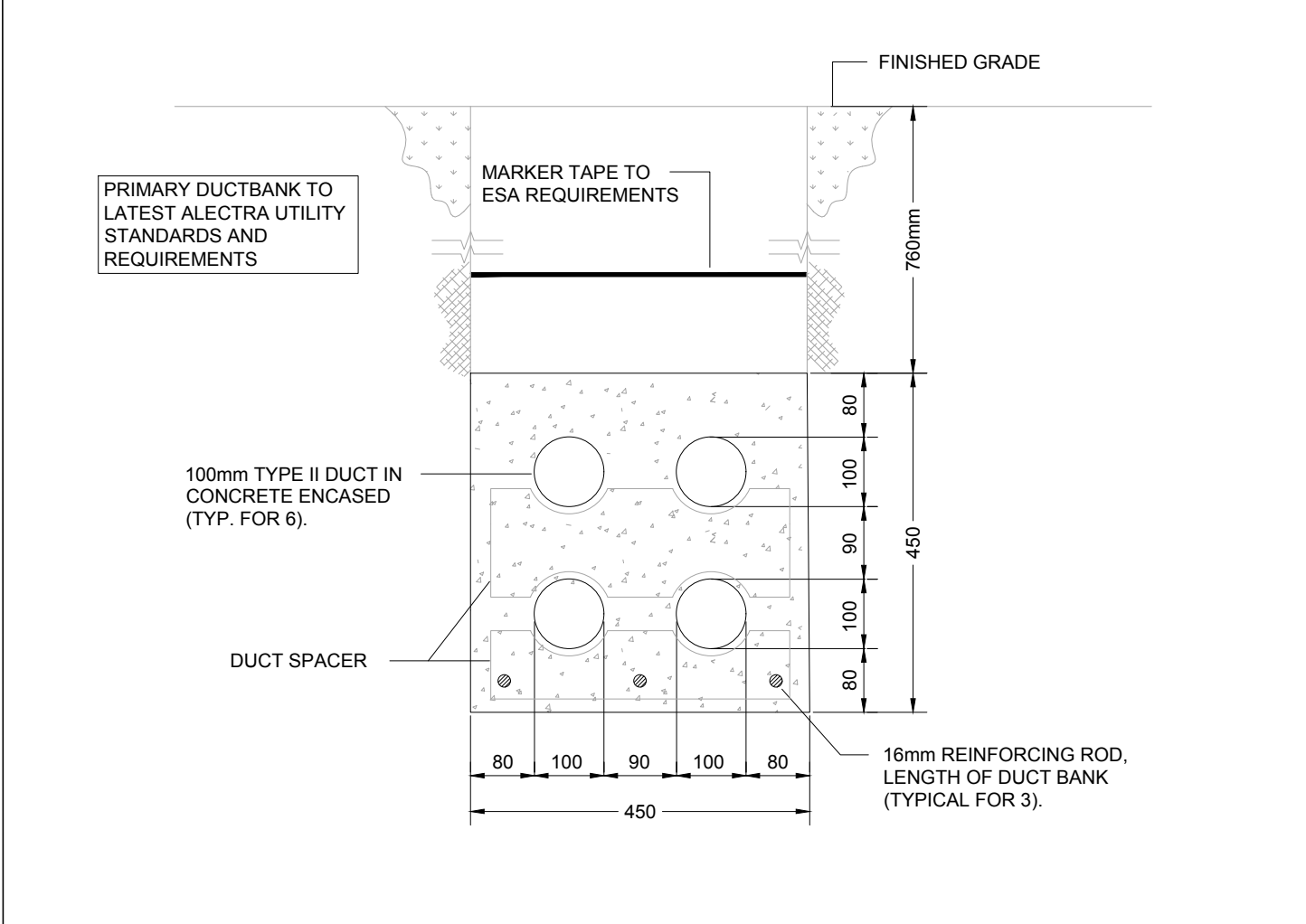
TEL./DATA + CATV DUCTS DETAIL



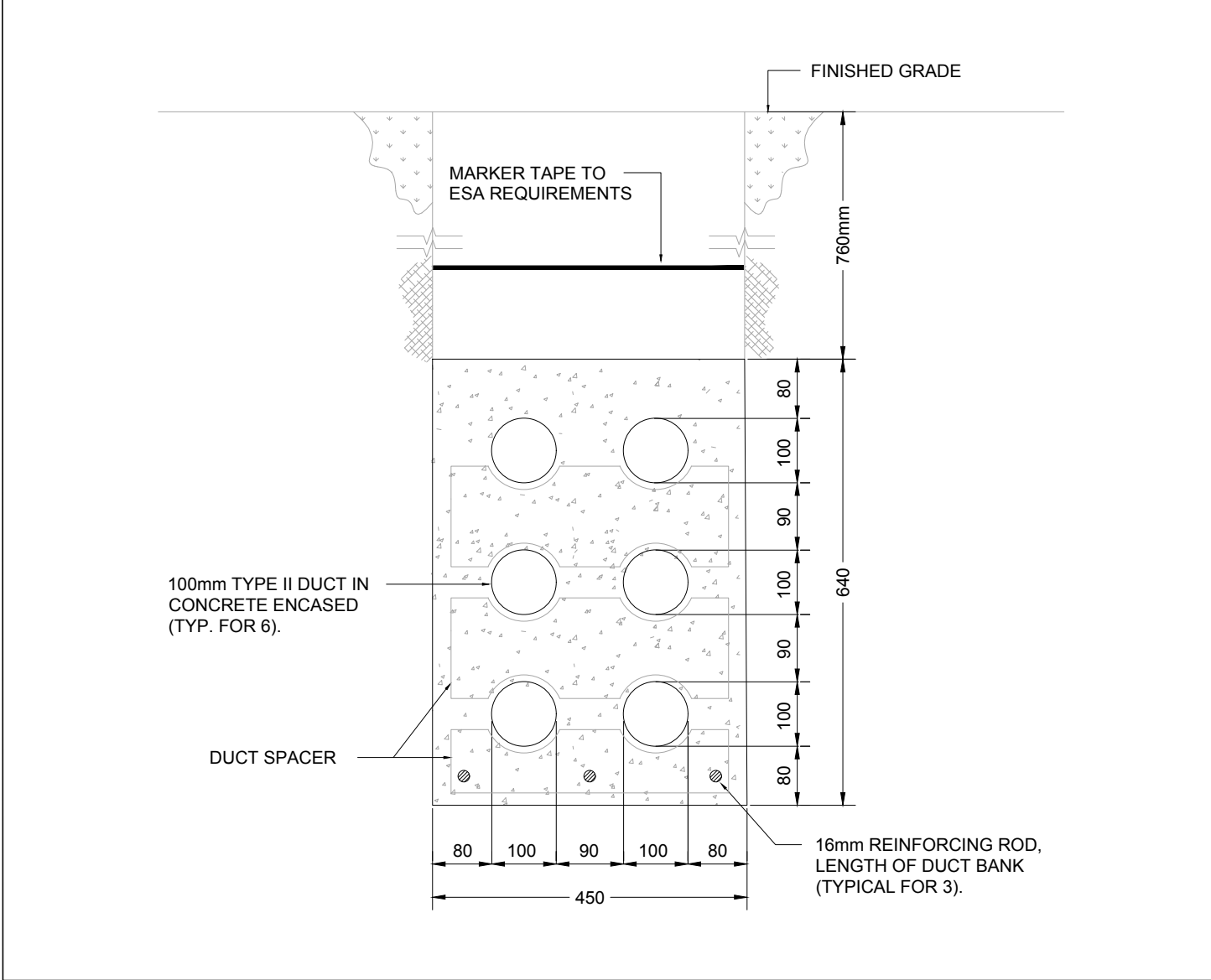
TYPICAL 3x100mmC DUCTBANK DETAIL



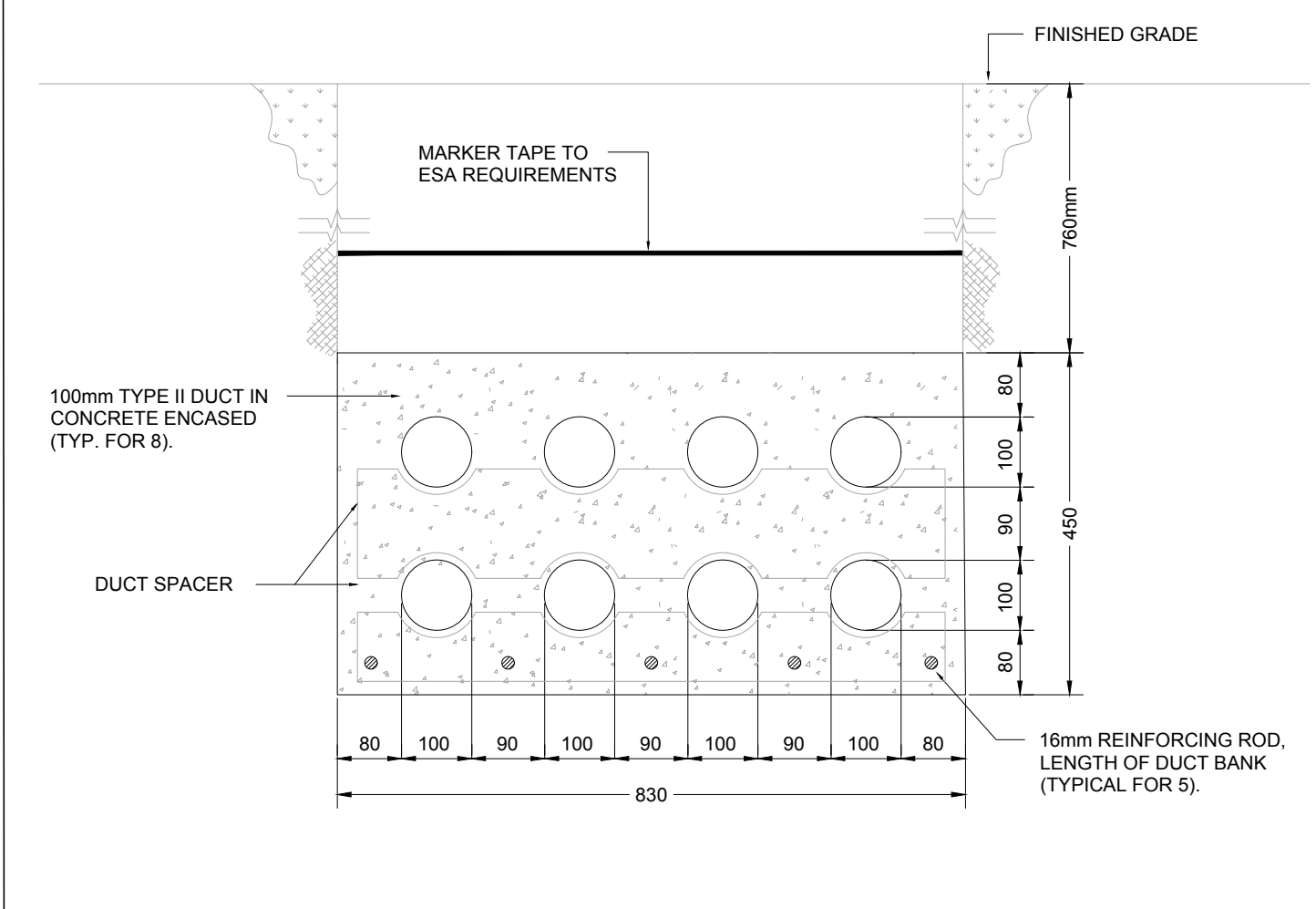
TYPICAL 4x100mmC DUCTBANK DETAIL



TYPICAL 6x100mmC DUCTBANK DETAIL



TYPICAL 8x100mmC DUCTBANK DETAIL



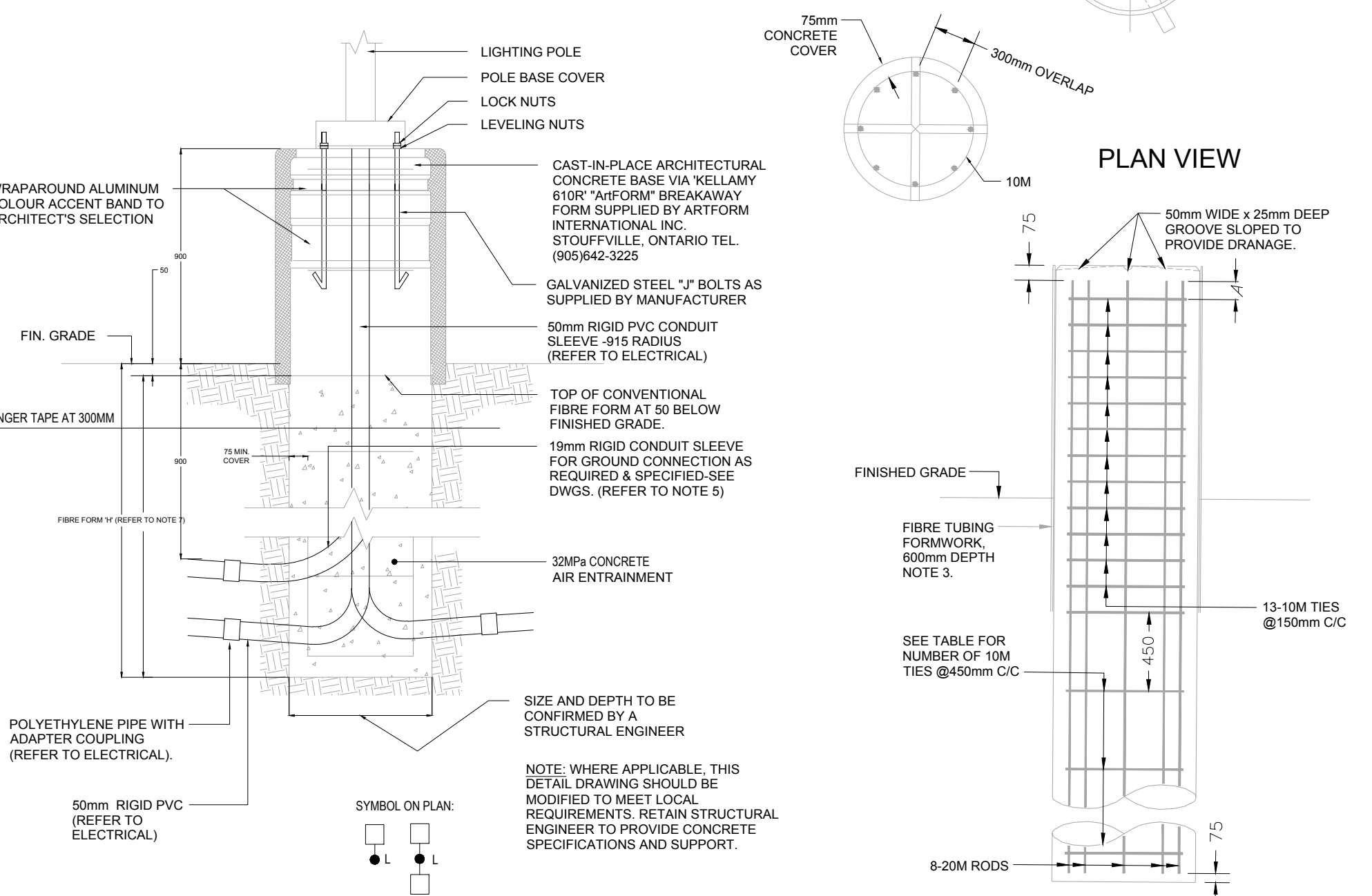
NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES.
2. CLASS OF CONCRETE SHALL BE 32MPa AIR ENTRAINMENT.
3. MINIMUM OF TWO SLEEVES REQUIRED FOR EACH CONC. FOUNDATION UNLESS OTHERWISE SHOWN.
4. CONTRACTOR TO VERIFY OPENING SIZE IN POLE BASE PLATE PRIOR TO SETTING CONDUIT SLEEVES. CONTRACTOR TO PROVIDE STRUCTURAL ENGINEER APPROVAL FOR BASE DESIGN.
5. SUBJECT TO SOIL CONDITIONS, REFER TO SOIL REPORT.
6. FORM RELEASE AGENT HAS BEEN FACTORY-APPLIED TO INSIDE SURFACE OF "WFORM".

POLE LENGTH m	BURIAL DEPTH H m	ROD LENGTH m	A mm	NO OF 10M TIES @405mm C/C	BOLT CIRCLE DIA FOR METAL POLES		
					ALUMINUM	STEEL	SECTIONAL STEEL
5.6	2.15	2.00	100	3	N/A	N/A	449
7.2	2.15	2.00	100	3	N/A	N/A	449
7.5	2.15	2.00	100	3	406	406	N/A
8.7	2.45	2.30	250	4	N/A	N/A	449
9.0	2.45	2.30	0	4	406	406	N/A
10.5	2.60	2.45	100	4	406	406	N/A
12.0	2.75	2.60	150	4	406	406	N/A
13.5	2.90	2.75	0	5	406	406	N/A
15.1	3.05	2.90	100	5	406	406	N/A

NOTE:

- CONCRETE BASES FOR LUMINAIRES TO BE SUPPLIED AND INSTALLED BY THIS ELECTRICAL CONTRACTOR.



ELEVATION REINFORCEMENT

NOTE:

1. STUDS SHALL BE FACTORY SET WITH PRE-APPLIED THREAD LOCKING COMPOUND AND SHALL REMAIN IN PLACE DURING FOOTING AND POLE INSTALLATION.
2. ASSEMBLY NUTS SHALL BE SHIPPED HAND TIGHT ONLY.
3. THE WELDS SHALL DEVELOP THE STRENGTH OF THE STRUTS.
4. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.

ASSEMBLY DIMENSIONS						
STUD DIA	STUD LENGTH D	BOLT CIRC. DIA A	STUD DISTANCE B	FERRULE LENGTH E	ANCHORAGE DEPTH OF	
32mm (1-1/4")	230	406	287	75	20mm FOR STRUCTURES	
19mm (3/4")	180	190	135	38	457	

TYPICAL CONCRETE BASE FOR LUMINAIRE

N.T.S

LIGHT FIXTURE SCHEDULE

TYPE	DESCRIPTION
A	LUMINAIRE/POLE ASSEMBLY CONSISTING OF A DOUBLE (2) LED LUMINAIRE WITH A TYPE V DISTRIBUTION PATTERN. 347V OUTDOOR USE BALLAST ON A DECORATIVE ARM, ON A 27" SQUARE 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 BE FULL CUT OFF AND DARK SKY COMPLIANT. NLS LIGHTING: 2-NV-2-TS-96L-7-40K-HV-DPS6-CS
A1	LUMINAIRE/POLE ASSEMBLY CONSISTING OF A DOUBLE (2) LED LUMINAIRE WITH A TYPE III DISTRIBUTION PATTERN. 347V OUTDOOR USE BALLAST ON A DECORATIVE ARM, ON A 27" SQUARE 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 BE FULL CUT OFF AND DARK SKY COMPLIANT. NLS LIGHTING: 2-NV-2-TS-96L-7-40K-HV-DPS6-CS
B	LUMINAIRE/POLE ASSEMBLY CONSISTING OF A SINGLE (1) LED LUMINAIRE WITH A TYPE IV DISTRIBUTION PATTERN. HOUSE SIDE SHIELD. 347V OUTDOOR USE BALLAST ON A DECORATIVE ARM, ON A 27" SQUARE 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 BE FULL CUT OFF AND DARK SKY COMPLIANT. NLS LIGHTING: 1-NV-1-TA-112L-7-40K-HV-DPS6-CS-HSS
C	LUMINAIRE/POLE ASSEMBLY CONSISTING OF A SINGLE (1) LED LUMINAIRE WITH A TYPE III DISTRIBUTION PATTERN. HOUSE SIDE SHIELD. 347V OUTDOOR USE BALLAST ON A DECORATIVE ARM, ON A 27" SQUARE 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 BE FULL CUT OFF AND DARK SKY COMPLIANT. NLS LIGHTING: 1-NV-1-TS-112L-7-40K-HV-DPS6-CS-HSS

DO NOT SCALE DRAWINGS. OBTAIN INFORMATION INVOLVING ACCURATE DIMENSIONS TO STRUCTURE FROM DIMENSIONS SHOWN ON ARCHITECTURAL AND STRUCTURAL DRAWINGS, OR BY SITE MEASUREMENTS. SITE PLAN LAYOUT TO BE OBTAINED FROM ARCHITECT OR CIVIL ENGINEER. CONSULT GENERAL CONSTRUCTION DRAWINGS AS WELL AS DETAIL DRAWINGS TO BECOME FAMILIAR WITH ALL CONDITIONS AFFECTING THE WORK, AND VERIFY SPACES IN WHICH THE WORK WILL BE INSTALLED.

NO.	REVISION	DATE	BY

4.	ISSUED FOR SPA	2022.04.29	BK
3.	ISSUED FOR REVIEW	2022.04.26	BK
2.	ISSUED FOR COORDINATION	2022.04.21	BK
1.	ISSUED FOR COORDINATION	2022.04.13	BK
NO.	ISSUED FOR	DATE	BY

h HAMMERSCHLAG & JOFFE INC.
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STAMP:



PROJECT: **PARK PLACE - BARRIE INDUSTRIAL 410 BAYVIEW**

TITLE: **ELECTRICAL SITE SERVICE & DUCTBANK SPECIFICATION AND DETAILS**

PROJECT NO.: 22-050-002

DATE: 2022-04-05 DRAWN BY: BD

SCALE: N.T.S. CHK'D BY: BK

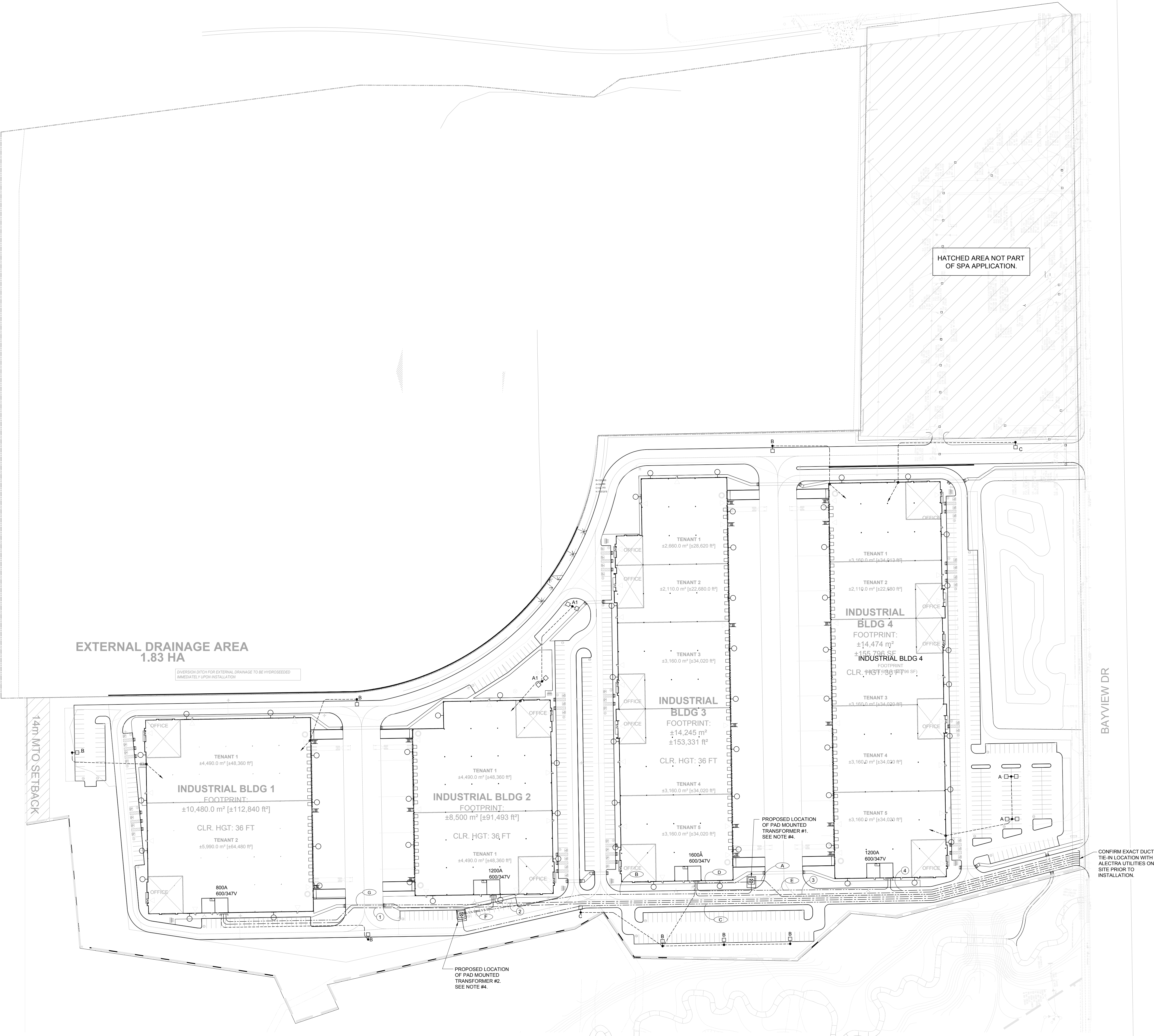
SHEET NO.:

ES2

NOTES RE: ELECTRICAL SERVICES	
A	4x100mmC IN CONCRETE ENCASED STEEL REINFORCED DUCTBANK C/W PULLSTRING FROM PROPERTY LINE TO PAD MOUNTED TRANSFORMER #1 TO ALECTRA UTILITIES STANDARD AND REQUIREMENTS. COORDINATE EXACT DUCT STUB LOCATIONS WITH ALECTRA UTILITIES PRIOR TO ROUGHING IN.
B	4x100mmC IN CONCRETE ENCASED STEEL REINFORCED DUCTBANK C/W PULLSTRING FROM PAD MOUNTED TRANSFORMER #1 TO PAD MOUNTED TRANSFORMER #2 TO ALECTRA UTILITIES STANDARD AND REQUIREMENTS.
C	4x100mmC IN CONCRETE ENCASED STEEL REINFORCED DUCTBANK C/W PULLSTRING FROM PROPERTY LINE TO PAD MOUNTED TRANSFORMER #2 TO ALECTRA UTILITIES STANDARD AND REQUIREMENTS. COORDINATE EXACT DUCT STUB LOCATIONS WITH ALECTRA UTILITIES PRIOR TO ROUGHING IN.
D	8 RUNS OF 4#500MCM RW90 NUAL CABLES IN 100mmC IN CONCRETE ENCASED STEEL REINFORCED DUCTBANK FROM PAD MOUNTED TRANSFORMER #1 TO BUILDING 3 ELECTRICAL ROOM. ALLOW TO MAKE CONNECTIONS AT BOTH ENDS AND PROVIDE 30' COIL OF CABLE IN TRANSFORMER FOUNDATION.
E	8 RUNS OF 4#500MCM RW90 NUAL CABLES IN 100mmC IN CONCRETE ENCASED STEEL REINFORCED DUCTBANK FROM BUILDING 3 ELECTRICAL ROOM TO BUILDING 4 ELECTRICAL ROOM. ALLOW TO MAKE CONNECTIONS AT BOTH ENDS AND PROVIDE 30' COIL OF CABLE IN TRANSFORMER FOUNDATION.
F	6 RUNS OF 4#500MCM RW90 NUAL CABLES IN 100mmC IN CONCRETE ENCASED STEEL REINFORCED DUCTBANK FROM PAD MOUNTED TRANSFORMER #2 TO BUILDING 2 ELECTRICAL ROOM. ALLOW TO MAKE CONNECTIONS AT BOTH ENDS AND PROVIDE 30' COIL OF CABLE IN TRANSFORMER FOUNDATION.
G	3 RUNS OF 4#500MCM RW90 NUAL CABLES IN 100mmC IN CONCRETE ENCASED STEEL REINFORCED DUCTBANK FROM BUILDING 2 ELECTRICAL ROOM TO BUILDING 1 ELECTRICAL ROOM. ALLOW TO MAKE CONNECTIONS AT BOTH ENDS AND PROVIDE 30' COIL OF CABLE IN TRANSFORMER FOUNDATION.

NOTES RE: TELEPHONE & CABLE TV	
1	2x100mmC IN DIRECT BURIED DUCTS FROM PROPERTY LINE TO BUILDING 1 ELECTRICAL ROOM TO APPROVAL OF BELL CANADA AND CATV COMPANY. DUCTS TO BE SEPARATED 1M AT PROPERTY LINE.
2	2x100mmC IN DIRECT BURIED DUCTS FROM PROPERTY LINE TO BUILDING 2 ELECTRICAL ROOM TO APPROVAL OF BELL CANADA AND CATV COMPANY. DUCTS TO BE SEPARATED 1M AT PROPERTY LINE.
3	2x100mmC IN DIRECT BURIED DUCTS FROM PROPERTY LINE TO BUILDING 3 ELECTRICAL ROOM TO APPROVAL OF BELL CANADA AND CATV COMPANY. DUCTS TO BE SEPARATED 1M AT PROPERTY LINE.
4	2x100mmC IN DIRECT BURIED DUCTS FROM PROPERTY LINE TO BUILDING 4 ELECTRICAL ROOM TO APPROVAL OF BELL CANADA AND CATV COMPANY. DUCTS TO BE SEPARATED 1M AT PROPERTY LINE.

GENERAL NOTES	
1.	THIS ELECTRICAL CONTRACTOR TO RUN CONCRETE ENCASED STEEL REINFORCED (CESR) PRIMARY DUCTBANKS (QUANTITY AND SIZE AS SHOWN ON DRAWING) TO APPROVAL OF ALECTRA UTILITIES. ALL DUCTS TO BE C/W PULLSTRINGS.
2.	THIS ELECTRICAL CONTRACTOR TO RUN CONCRETE ENCASED STEEL REINFORCED (CESR) SECONDARY FEEDER DUCTBANKS (QUANTITY AND SIZE AS SHOWN ON DRAWING) TO BUILDING ELECTRICAL ROOM. ALLOW TO COORDINATE WITH BUILDING ELECTRICAL CONTRACTOR FOR ALL CONNECTIONS TO MAIN SWITCHBOARD. PROVIDE 30' COIL OF CABLE IN TRANSFORMER FOUNDATION FOR CONNECTION BY ALECTRA UTILITIES. CONFIRM EXACT LENGTH OF SECONDARY CABLE ON SITE PRIOR TO ORDERING. COORDINATE CONNECTIONS AT TRANSFORMER WITH ALECTRA UTILITIES ON SITE.
3.	THIS ELECTRICAL CONTRACTOR TO VERIFY EXACT LOCATION OF ALL ELECTRICAL ROOMS PRIOR TO ROUGH-IN SECONDARY SERVICES.
4.	PROPOSED LOCATION OF PAD MOUNTED TRANSFORMER. PROVIDE FOUNDATION, LID, GROUNDING, PROTECTIVE BOLLARDS ETC. TO ALECTRA UTILITIES STANDARDS AND REQUIREMENTS. REFER TO DRAWING ESK FOR ALECTRA DETAILS.
5.	THIS ELECTRICAL CONTRACTOR TO COORDINATE WITH CIVIL DRAWINGS TO AVOID CONFLICT AND ADJUST ROUTING AS REQUIRED.
6.	ALL EMPTY DUCTS SHALL BE C/W NYLON PULL ROPES AND LABELED AT BOTH ENDS.
7.	THIS ELECTRICAL CONTRACTOR TO RUN BOTH CONDUIT/WIRING FOR SITE LIGHTING ALL THE WAY INTO EACH LANDLORD ELECTRICAL ROOM AS SHOWN 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 BUILDING CONTRACTOR.
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 PERFORM ALL REQUIRED VOLTAGE DROP CALCULATIONS AND INCREASE CONDUIT/WIRE SIZES AS NEEDED TO SUIT DISTANCE AND MAXIMUM BREAKER RATING.
11.	THIS ELECTRICAL CONTRACTOR TO ALLOW FOR AN ON SITE MEETING WITH ALECTRA UTILITIES PRIOR TO COMMENCING ANY WORK. CONTACT GRAHAM WIGLEY (xxxx) FOR MEETING ALONG WITH ANY ADDITIONAL ALECTRA UTILITIES 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 JACK MALCOLMSON (xxxx) TO ARRANGE FOR A MEETING ON SITE.



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NO.	REVISION	DATE	BY

4.	ISSUED FOR SPA	2022.04.29	BK	
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1.	ISSUED FOR COORDINATION	2022.04.13	BK	
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h HAMMERSCHLAG & JOFFE INC.
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STAMP:

2022-04-29
H. HAMMERSCHLAG
Professional Engineer
Ontario

PROJECT: **PARK PLACE - BARRIE INDUSTRIAL 410 BAYVIEW**

TITLE: **ELECTRICAL SITE PLAN**

PROJECT NO.:	22-050-002		
DATE:	2022-04-05	DRAWN BY:	BD
SCALE:	AS NOTED	CHK'D BY:	BK

SHEET NO.:

37

#B4427-26
CERTIFIED
BRAHMAN

NOTES:

1. ALL DIMENSIONS ARE SHOWN IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.
2. FOUNDATIONS TO BE PRECAST CONCRETE PAD. MANUFACTURER WILL DELIVER THE UNIT TO THE SITE.
3. COMPLETE THE EXCAVATION AND PROVIDE BRICKING CONSISTENT WITH FACE OF WALL UP TO BASE OF 200mm CLEAR BEDDING SYSTEM.
4. PLACE BACKFILL CONSISTING OF CLEAN FINE SAND OR PEA GRAVEL IN TIGHTLY COMPACTED LAYERS.
5. PARASITIC STOP ROPE KEPT CLEAR OF OBSTRUCTIONS FOR ACCESS BY ALCTRA UTILITIES PERSONNEL OR EQUIPMENT.
6. THE CARE IS TO PROTECT WALL OF FOUNDATION AT KNOCKOUT AS SPECIFIED BY ALCTRA UTILITIES PERSONNEL INSTALL BELL END ON PVC DUCTS.
7. REMOVE KNOCKOUT IF NEED TO ALLOW FOR BRIDGE.
8. INSTALL <30mm x 12mm GALVANIZED STEEL MIN. CLASS STRANDED COPPER GROUND WIRE.
9. REFER TO STD. 4-LI FOR GROUNDING DETAIL.
10. CONTRACTOR WILL BE RESPONSIBLE FOR SEALING DUCT ENDS.
11. POSITION LID OPENING SO THAT IT TRANSFORMER DO NOT PLACING DIRECTLY OVER PARKING LOT. MAKE SURE DOOR IS NOT FACING ANY WALL STRUCTURE.
12. REFER TO STD. 17-27, STD. 37-500 AND STD. 41-25 FOR GROUND POST INSTALLATION.

APPROVED FOR FOUNDATION DESIGN		
DATE	R E V I S I O N	A P P R O V
#B4427	SUPPLEMENTAL FOUNDATION BASE ABOVE PER GRID LINE	[Signature]

CHECKED [Signature]
APPROVED [Signature]

INSTALLATION OF PRECAST FOUNDATION FOR 3PH PADMOUNT TRANSFORMER (75-1500 KVA)

ORIGINAL ISSUE: OCTOBER 6, 1999

37-125
PAGE NO.
CITY OF
BIRMINGHAM

3 PH PADMOUNT TRANSFORMER

PLANTATION	BASEMENT	BASEMENT			
		1	2	3	4
1. 115V. BUS	1. 115V. BUS	1. 115V. BUS	1. 115V. BUS	1. 115V. BUS	1. 115V. BUS
2. 115V. BUS	2. 115V. BUS	2. 115V. BUS	2. 115V. BUS	2. 115V. BUS	2. 115V. BUS
3. 115V. BUS	3. 115V. BUS	3. 115V. BUS	3. 115V. BUS	3. 115V. BUS	3. 115V. BUS
4. 115V. BUS	4. 115V. BUS	4. 115V. BUS	4. 115V. BUS	4. 115V. BUS	4. 115V. BUS

RECOMMENDED	
1. 115V. BUS	2. 115V. BUS
3. 115V. BUS	4. 115V. BUS
5. 115V. BUS	6. 115V. BUS
7. 115V. BUS	8. 115V. BUS
9. 115V. BUS	10. 115V. BUS
11. 115V. BUS	12. 115V. BUS
13. 115V. BUS	14. 115V. BUS
15. 115V. BUS	16. 115V. BUS
17. 115V. BUS	18. 115V. BUS
19. 115V. BUS	20. 115V. BUS
21. 115V. BUS	22. 115V. BUS
23. 115V. BUS	24. 115V. BUS
25. 115V. BUS	26. 115V. BUS
27. 115V. BUS	28. 115V. BUS
29. 115V. BUS	30. 115V. BUS
31. 115V. BUS	32. 115V. BUS
33. 115V. BUS	34. 115V. BUS
35. 115V. BUS	36. 115V. BUS
37. 115V. BUS	38. 115V. BUS
39. 115V. BUS	40. 115V. BUS
41. 115V. BUS	42. 115V. BUS
43. 115V. BUS	44. 115V. BUS
45. 115V. BUS	46. 115V. BUS
47. 115V. BUS	48. 115V. BUS
49. 115V. BUS	50. 115V. BUS
51. 115V. BUS	52. 115V. BUS
53. 115V. BUS	54. 115V. BUS
55. 115V. BUS	56. 115V. BUS
57. 115V. BUS	58. 115V. BUS
59. 115V. BUS	60. 115V. BUS
61. 115V. BUS	62. 115V. BUS
63. 115V. BUS	64. 115V. BUS
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153. 115V. BUS	154. 115V. BUS
155. 115V. BUS	156. 115V. BUS
157. 115V. BUS	158. 115V. BUS
159. 115V. BUS	160. 115V. BUS
161. 115V. BUS	162. 115V. BUS
163. 115V. BUS	164. 115V. BUS
165. 115V. BUS	166. 115V. BUS

[illegible][illegible]

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37-217
16-08-27-012
CERTIFIED
BRAMPTON

LOCATION	EQUIPMENT	W (mm)	DEP (mm)
SUB DIVISION	3-PH PAD MOUNTED TRANSFORMER	600	100
	3-PH PAD MOUNTED TRANSFORMER	1200	150
PARKING LOT	3-PH PAD MOUNTED TRANSFORMER	600	150
	3-PH PAD MOUNTED TRANSFORMER	1200	150

NOTE:

1. REFER TO STD. 37-144 AND STD. 37-214 FOR TRANSFORMER INSTALLATION.
2. REFER TO STD. 37-380 AND STD. 41-25 FOR GUARD POST INSTALLATION AND/OR GROUNDING.
3. FOR HIGH TRAFFIC AREAS, INSTALL A. B. C. GUARD POST AS SHOWN.

CHECKED: *12. R...*
APPROVED: *12. R...*

REFERENCE

MATERIAL
GROUNDING

SECTION

11

APPROVED IN ACCORDANCE WITH REGULATION 2386		
DATE	REVISED	APPROVED
16-08-27	- CIRCULAR CLEARANCE OF IRON GUARD POST FROM 600mm TO 800mm AS PER CSA C22.3 NO. 5-18 - ADDED NOTE 3	<i>AR</i>

**GUARD POST INSTALLATION FOR
3 PH PADMOUNTED TRANSFORMER**

ORIGINAL ISSUE: MARCH 15, 2004

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37-380
12-07-05: A11
CERTIFIED
BRAMPTON

FIG. 1

FIG. 2

LOCATION	EQUIPMENT	"X"	"Y"	"A"	"B"	COLOUR
SUBDIVISION	MINIPAD TRANSFORMER (RESIDENTIAL DRIVEWAY)	600	915	100	150	YELLOW
	MINI-PAD TRANSFORMER (OTHER 1/2 BLOCK LANE)	600	915	100	150	
	1/2 PADMOUNT TRANSFORMER PADMOUNT SWITCHGEAR	1200	915	150	150	
PARKING LOT	MINI-PAD TRANSFORMER	600	915	100	150	YELLOW
	1/2 PADMOUNT TRANSFORMER PADMOUNT SWITCHGEAR	1200	915	150	150	

NOTE#

1. TRANSFORMER BOLLARD TO BE CONSTRUCTED OF STANDARD WEIGHT BLACK SEAMLESS STRUCTURAL GRADE STEEL PIPE FILLED WITH 20MPa CONCRETE.
2. TRANSFORMER BOLLARD TO BE CONSTRUCTED OF HIGH DENSITY POLYETHYLENE YELLOW PIPE (HDPE) COMPLETELY WITH 4:15mm x 1.8 REBARs AND FILLED WITH 20 MPa CONCRETE.
3. REFER TO STD. 41-25 FOR TRANSFORMER STEEL BOLLARD GROUNDING DETAIL.
4. GROUNDING NOT REQUIRED.

CHECKED: *[Signature]*

APPROVED: *[Signature]*

APPROVED IN ACCORDANCE WITH REG. A.P. 2204	
DATE	APPROVED
12-07-03	<i>[Signature]</i>
SHOWED NEW SIZE FOR THE TUBE CONCRETE FOOTING	

**TRANSFORMER BOLLARD
INSTALLATION DETAIL**

ORIGINAL ISSUE: JUNE 8, 1992

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41-11
16-06-12: 02
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60mm to FIN. GRID.

50 (C10)

AMP WEDGE CONNECTOR (C10)

OR

AMP WRENCHLOK GIRD

28 STR. CU BARS GRID

DETAIL 'A'

NOTE 3

SEE DETAIL 'A' FOR GRID, ROD CONNECTION

NOTE:

- GROUNDING SHALL COMPLY WITH ONTARIO ELECTRICAL SAFETY CODE - LATEST EDITION.
- LEAVE 2.8 METRES OF GROUND CONDUCTOR WIRE COILED IN TRANSFORMER BASE.
- GROUND GRID RESISTANCE MUST NOT EXCEED 10 OHMS.

- 28 STR. STRANDED BARE, GROUND GRID (60mm BELOW GRADE).
- PRE-CAST CONCRETE FOUNDATION FOR 3 PHASE PADMOUNT TRANSFORMER AS PER ALECTRA UTILITIES STD. 375-114.
- TYPICAL WALL OPENING FOR DUCT/CABLE INSTALLATION.

- OUTLINE OF PROPOSED TRANSFORMER.
- CONNECTION TO GROUNDING BAR IN TRANSFORMER.
- GROUND ROD 20mm (3/8") x 3.0m (98") LONG (400 mm BELOW GRADE).
- SUITABLE GROUNDING CONNECTORS FOR 28 STR. CU TO 3/4" ROD - AMP WEDGE W/ CONNECTOR AMP WRENCHLOK.

CONCENTRIC NEUTRAL

TO TX NEUTRAL

TO GROUNDING GRID

GROUNDING SCHEMATIC

CHECKED: *[Signature]*
APPROVED: *[Signature]*

OPERATION ACCORDANCE WITH REGULATION 524		
DATE	BY	APPROVED
16-06-12	W. J. J. J.	<i>[Signature]</i>

3 PHASE PADMOUNT TRANSFORMER GROUNDING DETAIL

ORIGINAL ISSUE: OCTOBER 6, 1989

alcraft
utilities

41-25
14-05-28 262
CERTIFIED
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LOCATION	EQUIPMENT	GROUND WIRE
SUBDIVISION	MINI-PAD TRANSFORMER (RESIDENTIAL DRIVE WAY)	20 CU
	MINI-PAD TRANSFORMER (STREET SIDE LEVARD)	20 CU
	3 PH-PAD TRANSFORMER (PARKING SWITCHGEAR)	20 CU
PARKING LOT	MINI-PAD TRANSFORMER	20 CU
	3 PH-PAD TRANSFORMER (PARKING SWITCHGEAR)	20 CU

NOTE:

1. GROUND CONNECTOR MUST BE CLAMPED TO NON-PAINTED SURFACE OF THE GUARD POST.
2. REFER TO STD. 37-380 FOR GUARD POST INSTALLATION.

CHECKED *[Signature]*

APPROVED *[Signature]*

ORIGINAL ISSUE: FEBRUARY 18, 2005

APPROVED IN ACCORDANCE WITH REGULATION 504		
DATE:	BY:	APPROVED:
14-05-28	REMOVED MANUFACTURER NAME FOR THE GROUND CONNECTOR	<i>[Signature]</i>

GUARD POST
GROUNDING DETAIL

DO NOT SCALE DRAWINGS. OBTAIN INFORMATION INVOLVING ACCURATE DIMENSIONS TO STRUCTURE FROM DIMENSIONS SHOWN ON ARCHITECTURAL AND STRUCTURAL DRAWINGS, OR BY SITE MEASUREMENTS. SITE PLAN LAYOUT TO BE OBTAINED FROM ARCHITECT OR CIVIL ENGINEER. CONSULT GENERAL CONSTRUCTION DRAWINGS AS WELL AS DETAIL DRAWINGS TO BECOME FAMILIAR WITH ALL CONDITIONS AFFECTING THE WORK, AND VERIFY SPACES IN WHICH THE WORK WILL BE INSTALLED.

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4.	ISSUED FOR SPA	2022.04.29	BK
3.	ISSUED FOR REVIEW	2022.04.26	BK
2.	ISSUED FOR COORDINATION	2022.04.21	BK
1.	ISSUED FOR COORDINATION	2022.04.13	BK
NO.	ISSUED FOR	DATE	BY

h **HAMMERSCHLAG & JOFFE INC.**
43 Lesmill Road Toronto,
Ontario Canada M3B 2T8
T: (416) 444.9263
F: (416) 444.1463

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.

STAMP:



PROJECT: PARK PLACE - BARRIE
INDUSTRIAL
410 BAYVIEW

TITLE:
ALECTRA ELECTRICAL DETAILS

PROJECT NO.: 22-050-002

DATE: 2022-04-05 DRAWN BY: BD

SCALE: N.T.S. CHK'D BY: BK

SHEET NO.:

ES4