

Public Works and Government Services Canada
 Architectural and Engineering Services
 Ontario Region
 Travaux publics et Services gouvernementaux Canada
 Services d'architecture et de génie
 Région de l'Ontario



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Do not scale drawings. Verify all dimensions and conditions on site and immediately notify the engineer of all discrepancies.

A B C	A	Detail No.
	B	drawing no. - where detail required dessin no. - où détail exigé
	C	drawing no. - where detailed dessin no. - où détaillé

project title
titre du projet
BURLINGTON Ontario
ENVIRONMENT AND CLIMATE CHANGE CANADA
867 LAKESHORE RD.,
BURLINGTON ON, L7S 1A1
 CCIW TRANSFORMER
 RECAPITALIZATION

drawing title
titre du dessin
SITE PLAN -
MAIN ELECTRICAL
HV DUCT BANK

drawn by
dessiné par **MH**

designed by
conçue par **NS**

approved by
approuvée par **NS**

tender submission
soumission **---** project manager
administrateur de projets

project date
date du projet **2018/05/28**

project no.
no. du projet **KW405-180719/001/PWL**

drawing no.
dessiné no. **E-1**

1 SITE PLAN
E-1 NTS

DRAWING NOTES:

- 1 CONTRACTOR TO PROVIDE A DEAD INSULATOR FOR BURLINGTON HYDRO(BHI) TO TERMINATE NEW 1-1/0 AL.OIH NEUTRAL CONDUCTOR AT POLE LOCATION #P20832. CONFIRM THE CONDUCTOR SIZE WITH BHI PRIOR TO SUPPLY. CONTRACTOR TO PERFORM ALL REQUIRED BONDING OF THE NEUTRAL CONDUCTOR TO ESA SPECIFICATIONS AND AS PER BHI AND CSA REQUIREMENTS.
- 2 CONTRACTOR TO PROVIDE NEW NEUTRAL CONDUCTOR FROM THE DEMARCATION POINT POLE #P20832 TO THE HV SWITCHGEARS LOCATION. PROVIDE NEW NEUTRAL CONDUCTOR AS PER BURLINGTON HYDRO SPECIFICATIONS. TERMINATION OF NEUTRAL CONDUCTOR AT BOTH ENDS IS UNDER CONTRACTOR'S SCOPE OF WORK. CONTRACTOR TO APPROACH AND COORDINATE WITH BHI FOR TERMINATION OF NEUTRAL CONDUCTOR. CONTRACTOR TO CONNECT THE NEUTRAL CONDUCTOR TO THE NEW OUTDOOR STATION GROUNDING SYSTEMS AS PER ESA REQUIREMENT.
- 3 CONTRACTOR TO UTILIZE THE EXISTING UNDERGROUND HV DUCT BANK FOR THE NEW NEUTRAL CONDUCTOR INSTALLATION IN THE EXISTING UNDERGROUND DUCTBANK. CONTRACTOR TO INVOLVE AN UNDERGROUND SURVEY COMPANY APPROVED BY CCIW AND TO CONDUCT A DETAILED SITE SURVEY TO CHECK AND VERIFY THE CONDITION OF THE EXISTING DUCTS. ANY DISCREPANCIES, AMBIGUITIES OR OMISSIONS IN THE DRAWINGS AND SITE CONDITIONS OR HAVING DOUBT AS TO THE MEANING OR INTENT THEREOF SHALL IMMEDIATELY NOTIFY THE PRIME CONSULTANT WHO SHALL ISSUE INSTRUCTION OR/AND CLARIFICATION.
- 4 REMOVE EXISTING SPARE HV CONDUCTOR FROM DEMARCATION POINT TO THE HV SWITCHGEAR AND REPLACE WITH NEW ONE WITH SAME SPECIFICATION. NEW CABLE MUST BE AS PER BURLINGTON HYDRO SPECIFICATION. CONTRACTOR TO APPROACH AND COORDINATE WITH BHI FOR THE SPECIFICATION OF NEW HV CABLE CONDUCTOR.

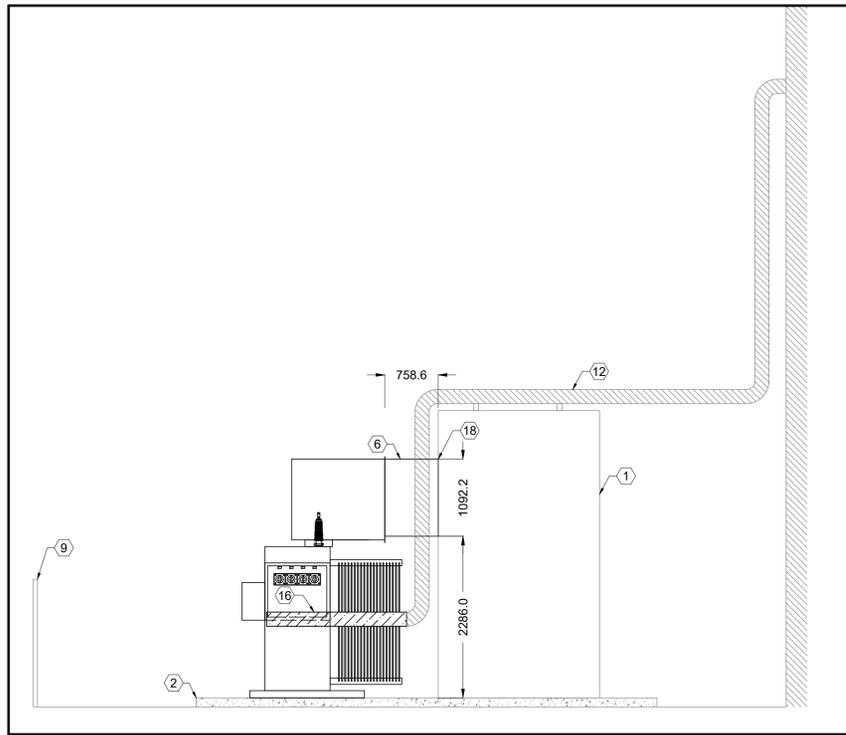
GENERAL NOTES:

- 1. CONTRACTOR IS TO PROVIDE ALL RESTORATION AS REQUIRED TO THE SATISFACTION OF CITY OF BURLINGTON AND CUSTOMER.
- 2. THE SUPPLY \ DEMARCATION POINT ARE THE DEAD-END INSULATORS ON THE CUSTOMER SUPPLIED AND INSTALLED DIP POLE LOCATION.
- 3. CONTRACTOR TO PROVIDE ALL REQUIRED APPROVALS \ PERMISSIONS WITH ANY ADJACENT PROPERTY PARTIES PRIOR TO CONSTRUCTION TO SUPPLY AND INSTALL PLANT ALONG THE EXISTING LANEWAY. PROVIDE AN EASEMENT WHERE REQUIRED FOR THE POLE. DUCT STRUCTURE ALONG THE EXISTING LANEWAY NAMING BURLINGTON HYDRO AS THE OCCUPANT \ OWNER OF THE EASEMENT. EASEMENT REQUIRED PRIOR TO ENERGIZATION OF THE NEW SERVICE. PLEASE CONTACT BHI ENGINEERING DEPARTMENT FOR DETAILS AND ASSISTANCE AS REQUIRED.
- 4. ALL INSTALLATIONS TO BE IN ACCORDANCE WITH THE MOST RECENT BURLINGTON HYDRO INC SPECIFICATIONS AND GUIDELINES.
- 5. EXISTING DUCT BANK RUN AND MANHOLE LOCATIONS ARE SHOWN ON THE DRAWINGS ARE ONLY DIAGRAMMATICALLY AS A GENERAL ARRANGEMENT AND CONTRACTOR IS TO VERIFY THE EXISTING SITE CONDITION AND REPORT ANY DISCREPANCIES. ANY NECESSARY CHANGE TO THE RUN TO ACCOMMODATE FIELDS CONDITIONS SHALL BE DONE WITHOUT ADDITIONAL CHARGE OR EXPENSE TO THE OWNER. NOTIFY THE ENGINEER IMMEDIATELY AND SECURE HIS AUTHORITY IN WRITING FOR SUCH REVISIONS BEFORE PROCEEDING WITH THE WORK.
- 6. CARE HAD BEEN TAKEN TO INDICATE ALL UNDERGROUND SERVICES HOWEVER, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY/LOCATE EXISTING UNDERGROUND SERVICES WITHIN THE PASSAGE.

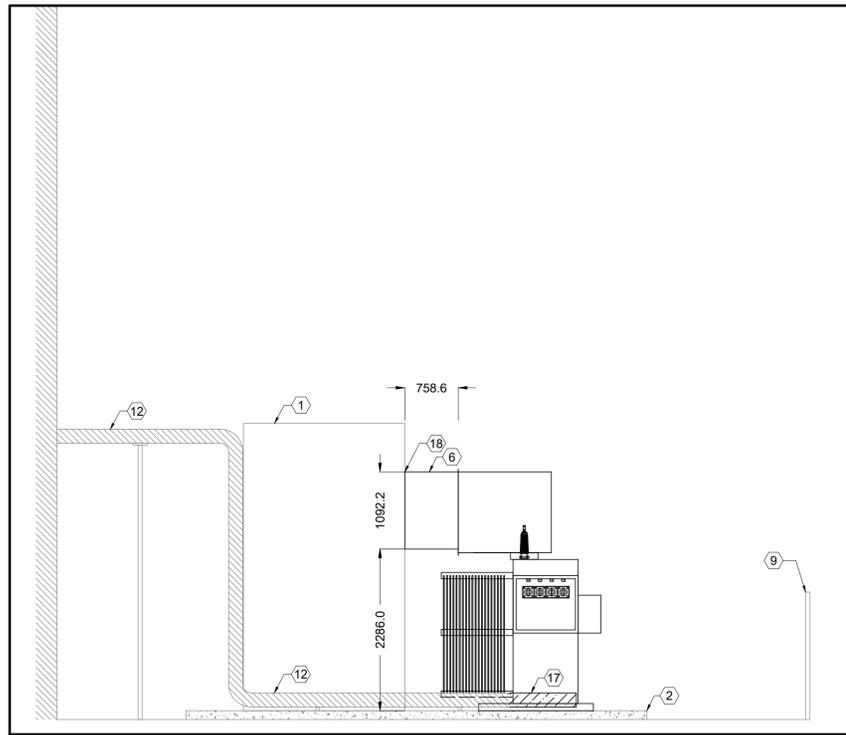
BURLINGTON HYDRO COORDINATION:

- 1. CONTRACTOR IS TO PROVIDE A COPY OF THE PROTECTION AND COORDINATION STUDY TO CONFORM THE EXISTING DISTRIBUTION TO REMAIN OR AS A RESULT OF AN UPGRADE, REPAIR OR MAINTENANCE REQUIRES REVISIONS, WHERE APPLICABLE MANUFACTURERS SUPPORTING SPECIFICATIONS AND DOCUMENTATION TO BE APPROVED BY BURLINGTON HYDRO IN ADVANCE OF SERVICE ENERGIZATION.
- 2. CONTRACTOR TO PROVIDE WHERE REQUIRED AS A RESULT OF MAINTENANCE, REPAIR, OR DEFECT ENGINEERS STAMPED AND APPROVED DRAWINGS INDICATING THE AIR BREAK SWITCH, FUSED SWITCH, GROUNDING, ALL ASSOCIATED MATERIAL AND MANUFACTURERS SUPPORTING SPECIFICATIONS FOR THE ADDITIONAL TRANSFORMER TO BE APPROVED BURLINGTON HYDRO IN ADVANCE TO ENERGIZATION.
- 3. CONTRACTOR TO PROVIDE WHERE REQUIRED AS A RESULT OF MAINTENANCE, REPAIR, OR DEFECT THE MANUFACTURERS \ ENGINEERS STAMPED AND APPROVED DRAWINGS FOR TRANSFORMER GROUNDING TO ESA SPECIFICATIONS APPROVED BY BURLINGTON HYDRO.
- 4. CONTRACTOR TO PROVIDE WHERE REQUIRED AS A RESULT OF MAINTENANCE, REPAIR, OR DEFECT SECONDARY \ PRIMARY REPLACEMENT CABLES. THE CUSTOMER IS TO PROVIDE CABLE TEST RESULTS TO THE MANUFACTURERS SPECIFICATIONS INCLUDING SUPPORTING SPECIFICATIONS PRIOR TO ENERGIZATION.
- 5. CONTRACTOR TO PROVIDE TRANSFORMER NAMEPLATE DATA INFORMATION AND SUPPORTING MANUFACTURERS SPECIFICATIONS INCLUDING THE ACTUAL FACTORY \ AND APPLICABLE FIELD TRANSFORMER TEST RESULTS PRIOR TO ENERGIZATION.
- 6. CONTRACTOR TO ENSURE ESA PLAN REVIEW AND CONNECTION AUTHORIZATION ARE AVAILABLE FOR BHI SUBMISSION.
- 7. BURLINGTON HYDRO TO SUPPLY AND INSTALL AT EXISTING WOOD POLE LOCATION P20838 3-200A, 25KV IN-LINE FUSED SWITCHES CW 3-200K, SMU 20K, 34.5K FUSE UNITS SWITCH LOCATION #F4430. BURLINGTON HYDRO TO REMOVE EXISTING SOLID BLADE IN-LINE SWITCH LOCATION #S3671.
- 8. BURLINGTON HYDRO TO SUPPLY AND INSTALL 2-SPANS OF 1/0 AL.OIH NEUTRAL CONDUCTOR FROM POLE P20838 TO P20832 AND TERMINATE ONTO CUSTOMERS DEAD END INSULATOR.
- 9. BURLINGTON HYDRO TO OPERATE ALL CUSTOMER OWNED HIGH VOLTAGE SWITCHES ASSOCIATED WITH THE ISOLATION OF LOAD FROM THE DISTRIBUTION SYSTEM.

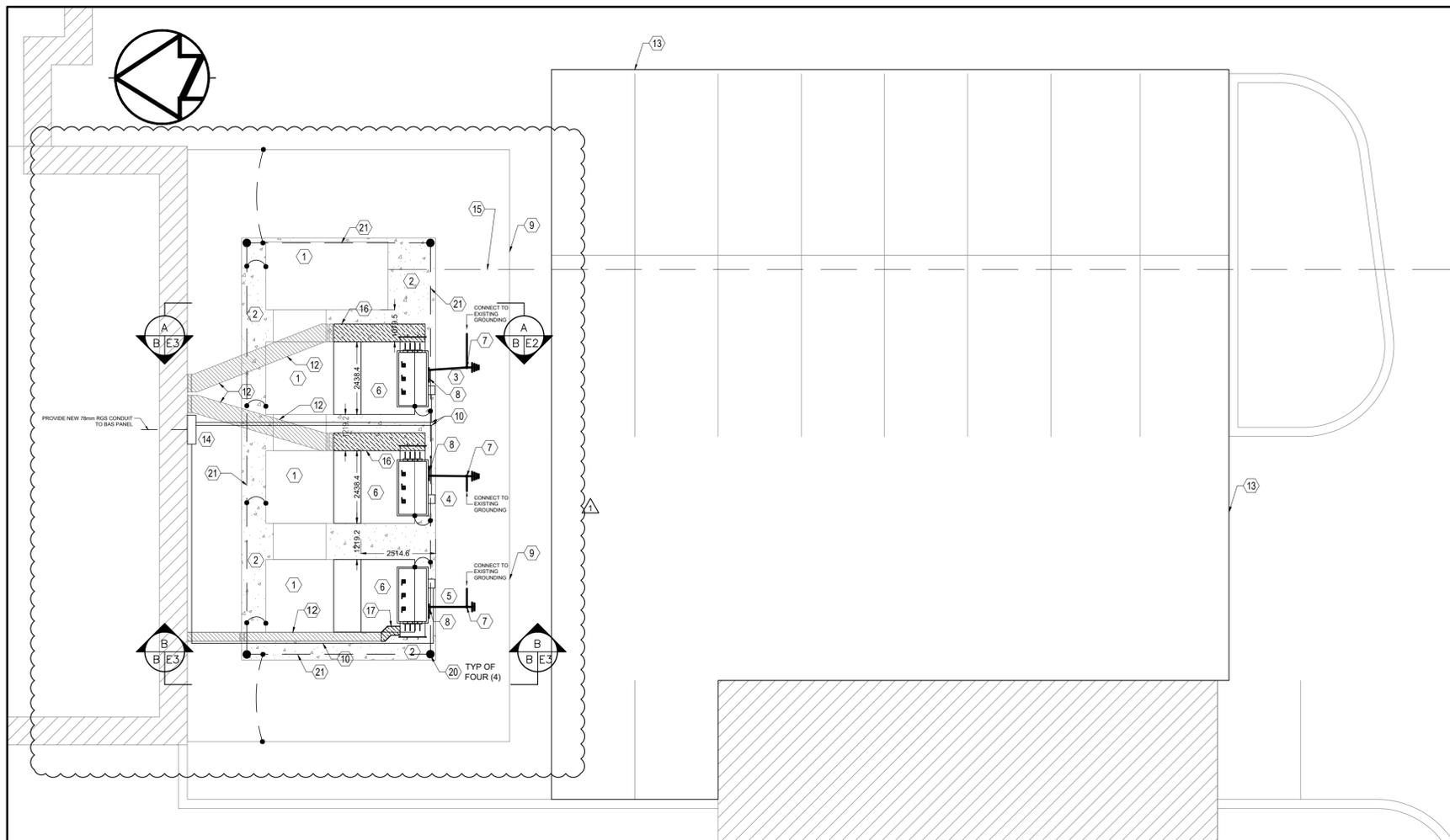




2 SECTION A-A
E-3 1:100



3 SECTION B-B
E-3 1:100



1 PARTIAL SITE PLAN - NEW
E-3 1:100

GENERAL NOTES:

- A. THE DIMENSIONS AND EQUIPMENT LAYOUT SHOWN ON THE DRAWINGS ARE ONLY TO SHOW THE INTENT OF DESIGN CONCEPT. ELECTRICAL CONTRACTOR TO VERIFY THE DIMENSIONS, RATINGS AND ARRANGEMENTS ONSITE PRIOR TO ORDERING EQUIPMENTS.
- B. ELECTRICAL CONTRACTOR TO COORDINATE WITH BURLINGTON HYDRO (BHI) FOR SHUT DOWN. OBTAIN BURLINGTON HYDRO APPROVAL ON ANY WORK ON HIGH VOLTAGE SWITCHGEARS AND TRANSFORMERS PRIOR TO START. REFER TO BHI "CONDITIONS OF SERVICE" FOR MORE DETAILS.
- C. ELECTRICAL CONTRACTOR TO SUBMIT SHOP DRAWINGS FOR BHI'S REVIEW AND APPROVAL ON NEW EQUIPMENT INCLUDING TRANSFORMERS, HOOD, THROAT AND GROUNDING.
- D. PROVIDE #2/0 AWG BARE COPPER CONDUCTORS TO CONNECT ALL THE METAL (METAL FENCE, BOLLARDS, PROTECTIVE BARRIER ETC.) AND BOND TO THE STATION GROUNDING ELECTRODES IN ACCORDANCE WITH OESC RULE 36-308 AND ESA BULLETIN 36-10.
- E. CONTRACTOR TO VERIFY AND TEST THE EXISTING GROUNDING SYSTEM AND CONNECT THE NEW STATION GROUNDING SYSTEM TO EXISTING GROUNDING SYSTEM.
- F. CONTRACTOR TO PROVIDE THE GROUNDING POTENTIAL STUDY SHOP DRAWINGS FOR CONSULTANT REVIEW AS PER ESA REQUIREMENT AND ELECTRICAL SPECIFICATIONS.

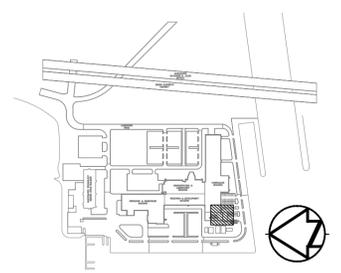
DRAWING NOTES:

- 1 EXISTING 27.6kV SWITCHGEARS TO REMAIN.
- 2 EXISTING TRANSFORMERS CONCRETE PAD TO REMAIN.
- 3 SUPPLY AND INSTALL NEW POWER TRANSFORMER T1.
- 4 SUPPLY AND INSTALL NEW POWER TRANSFORMER T2.
- 5 SUPPLY AND INSTALL NEW POWER TRANSFORMER T3.
- 6 SUPPLY AND INSTALL NEW NEMA 4X HIGH VOLTAGE THROAT 27.6KV, 150A, 25KA, BIL 200KV WITH COPPER BUSING. NEW THROAT TO MATCH THE EXISTING HV SWITCHGEAR BUSBAR SIZE AND ARRANGEMENT ON SWITCHGEAR SIDE AND HV HOOD AND BUSING SIZE AND ARRANGEMENT ON TRANSFORMER SIDE. SITE VERIFY EXISTING CONDITIONS PRIOR TO ORDER.
- 7 VERIFY AND MEASURE THE EXISTING GROUNDING SYSTEM RESISTANCE AND SUBMIT THE RESULT TO ECCC AND BHI. PROVIDE THREE (3) NEW GROUND ROD WITH INSPECTION BOXES AND #4/0 AWG COPPER GROUND CONDUCTOR AND EXOTHERMIC CONNECTIONS AND CONNECT TO THE EXISTING GROUND LOOP. FINALIZE LOCATION OF THE NEW ROD AND INSPECTION BOXES ONSITE. PROVIDE "T1" AND "T2" NEUTRAL POINT GROUND CONNECTION TO GROUND BAR WITH #4/0 AWG RW90XLPE COPPER GROUND CONDUCTORS. PROVIDE "T3" NEUTRAL POINT GROUND CONNECTION TO NEW GROUND BAR WITH #4/0 AWG RW90XLPE COPPER GROUND CONDUCTOR. INCLUDE COST FOR PROVIDING EXTRA NEW THREE (3) GROUND RODS AND 100mm OF #4/0 AWG RW90XLPE COPPER GROUND CONDUCTOR AND EXOTHERMIC AND C-CLAMP CONNECTIONS AS REQUIRED. CONTRACTOR TO PROVIDE ALL MATERIAL AS REQUIRED TO FINISH THE GROUNDING.
- 8 PROVIDE NEW THREE (3) COPPER GROUNDING BARS WITH MIN. 500mm LENGTH IN ADJACENT OF TRANSFORMERS. PROVIDE GROUNDING AND BONDING CONNECTION FROM GROUND BAR TO TRANSFORMER, HV HOOD AND BUSDUCT. CONNECT THE GROUND BAR TO THE UNDERGROUND GROUNDING LOOP. PROVIDE #4/0 AWG COPPER GROUND CONDUCTOR AS REQUIRED. PROVIDE EXOTHERMIC CONNECTIONS AND ABOVE-GROUND CONNECTIONS AS REQUIRED.
- 9 EXISTING METALLIC FENCE REMAIN AND BE BONDED TO THE EXISTING GROUNDING LOOP. SUPPLY AND INSTALL #4/0 COPPER BONDING CONDUCTOR AND CONNECTIONS AS REQUIRED. PROVIDE BRAIDED GROUND CONNECTORS AS REQUIRED FOR DOORS.
- 10 SUPPLY AND INSTALL 27mmC RIGID HOT DIP GALVANIZED STEEL CONDUIT FROM EACH TRANSFORMER CONTROL BOX TO THE NEW JUNCTION BOX ON THE ELECTRICAL ROOM EXTERIOR WALL. SUPPLY AND INSTALL EIGHT (8) #12AWG COPPER RW90XLPE CONDUCTORS FROM EACH TRANSFORMER TO THE BUILDING AUTOMATION SYSTEM (BAS) FOR TRANSFORMER GAS DETECTION AND OIL HIGH TEMPERATURE ALARMS. PROVIDE EQUIPMENT AND UPDATE SOFTWARE ASSOCIATED WITH THE BAS SYSTEM AS REQUIRED TO ACCEPT NEW SIGNALS. INVOLVE BASE BUILDING BAS CONTRACTOR AS REQUIRED. INCLUDE ALL ASSOCIATED COSTS IN THE CONTRACT PRICE.
- 11 NOT USED.
- 12 ADJUST THE EXISTING CABLE TRAY TO SUIT THE NEW INSTALLATION AND LOCATION OF LV TERMINAL BOX. SUPPLY AND INSTALL CABLE TRAY, ACCESSORIES AND SUPPORTS AS REQUIRED. ALL ACCESSORIES TO BE HOT-DIP GALVANIZED STEEL TYPE. INSTALL THE EXISTING POWER CABLES ON THE CABLE TRAY AND MAKE TERMINATION. INCLUDE ALL REQUIRED ACCESSORIES FOR CABLE INSTALLATION AND TERMINATION.
- 13 COORDINATE WITH CCIW TO CLEAR PARKING LOT AREA FOR CONSTRUCTION ACTIVITIES AND CRANE ACCESS. CONTRACTOR IS TO PROVIDE CONSTRUCTION HOARDING AS REQUIRED FOR PROJECT EXECUTION.
- 14 PROVIDE NEW NEMA 4X STAINLESS STEEL JUNCTION BOX ON THE ELECTRICAL ROOM EXTERIOR WALL.
- 15 EXISTING 28kV UNDERGROUND FEEDER FROM UTILITY TO REMAIN.
- 16 PROVIDE HOT DIP GALVANIZED STEEL CABLE TRAY AS REQUIRED WITH 1000mm WIDTH, 150mm HEIGHT AND ALL ACCESSORIES AND BENDS TO SUIT THE NEW TRANSFORMER LV TERMINAL BOX AND EXISTING CABLE TRAY. CONTRACTOR TO VERIFY THE EXISTING CONDITION PRIOR TO ORDER.
- 17 PROVIDE HOT DIP GALVANIZED STEEL CABLE TRAY AS REQUIRED WITH 300mm WIDTH, 150mm HEIGHT AND ALL ACCESSORIES AND BENDS TO SUIT THE NEW TRANSFORMER LV TERMINAL BOX AND EXISTING CABLE TRAY. CONTRACTOR TO VERIFY THE EXISTING CONDITION PRIOR TO ORDER.
- 18 PROVIDE GASKET AND DRIP HOOD ON ALL CONNECTIONS TO THE EXISTING SWITCHGEAR TO PROVIDE ACCEPTABLE SEALING.
- 19 CONTRACTOR TO INCLUDE ALL REQUIRED SERVICES AND VERIFICATIONS LIKE PHASE ROTATION, ORIENTATION ETC. TO BE COMPLETED WITH THE EXISTING ELECTRICAL SYSTEM IN ORDER TO SUCCESSFULLY REPLACE AND OPERATE THE NEW TRANSFORMERS.
- 20 PROVIDE AND INSTALL FOUR (4) NEW (19MM DIA. X 3000MM L) GROUND RODS.
- 21 PROVIDE AND INSTALL #2/0 AWG BARE COPPER GROUND LOOP CONDUCTOR.

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5	ISSUED FOR ADDENDUM 01	2021/08/13
5	FOR ESA REVIEW	2020/11/12
4	ISSUED FOR 100% REVIEW	2020/11/19
3	ISSUED FOR 100% REVIEW	2019/02/08
2	ISSUED FOR 90% REVIEW	2018/11/02
1	ISSUED FOR 50% REVIEW	2018/07/19

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project title / titre du projet
BURLINGTON Ontario ENVIRONMENT AND CLIMATE CHANGE CANADA 867 LAKESHORE RD., BURLINGTON ON, L7S 1A1 CCIW TRANSFORMER RECAPITALIZATION

drawing title / titre du dessin
NEW PLAN

drawn by / dessiné par **SW**

designed by / conçu par **AM**

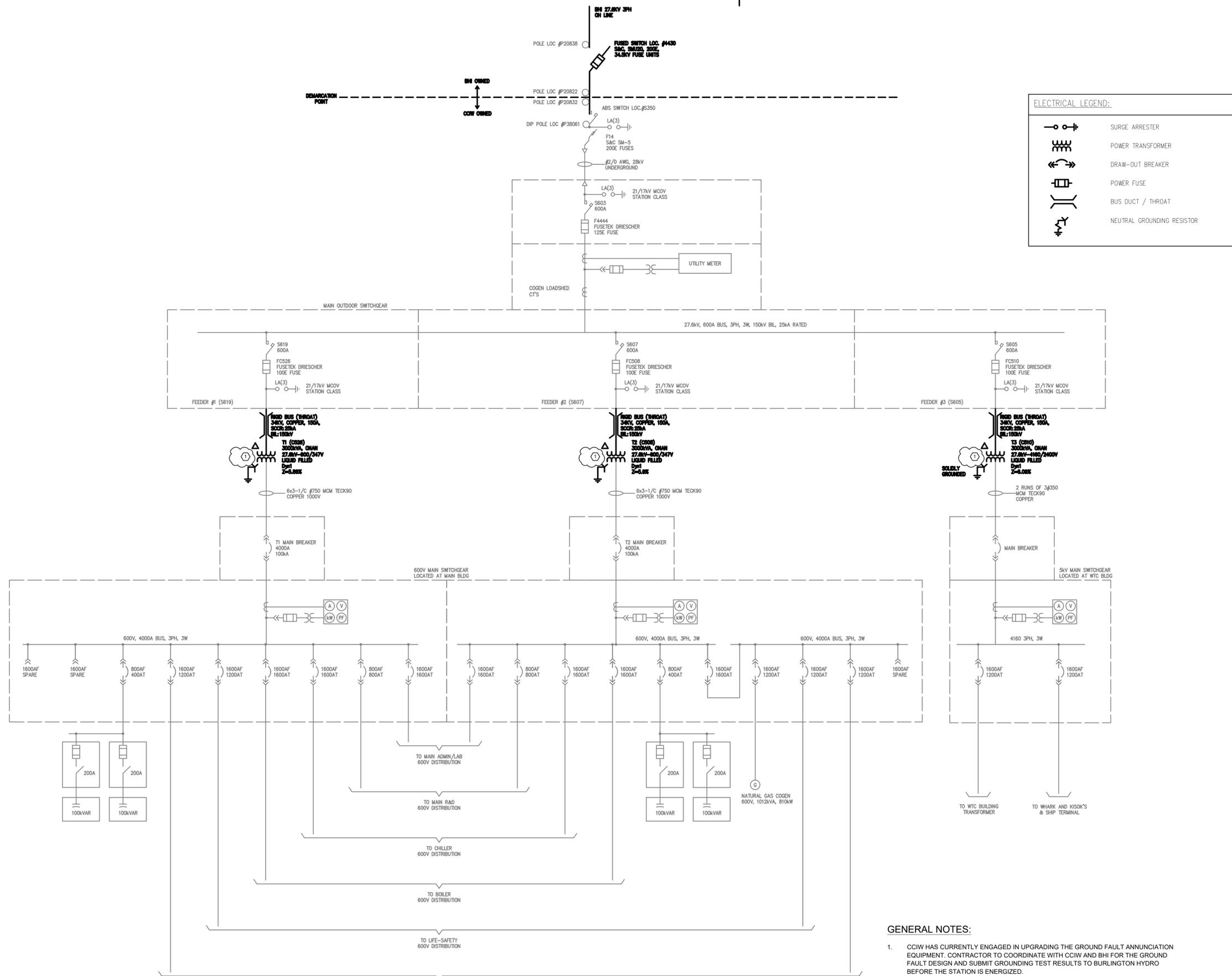
approved by / approuvé par **OB**

tender submission / soumission --- project manager / administrateur de projets

project date / date du projet **2018/05/28**

project no. / no. du projet **KW405-180719/001/PWL**

drawing no. / dessiné no. **E-3**



ELECTRICAL LEGEND:

	SURGE ARRESTER
	POWER TRANSFORMER
	DRAW-OUT BREAKER
	POWER FUSE
	BUS DUCT / THROAT
	NEUTRAL GROUNDING RESISTOR

- GENERAL NOTES:**
- CCIW HAS CURRENTLY ENGAGED IN UPGRADING THE GROUND FAULT ANNUNCIATION EQUIPMENT. CONTRACTOR TO COORDINATE WITH CCIW AND BHI FOR THE GROUND FAULT DESIGN AND SUBMIT GROUNDING TEST RESULTS TO BURLINGTON HYDRO BEFORE THE STATION IS ENERGIZED.
- DRAWING NOTES:**
- THE HIGH VOLTAGE TRANSFORMERS SUPPLY 3 PHASE 3 WIRE UNGROUNDED SYSTEM AND THE XO SHALL NOT BE CONNECTED TO THE TRANSFORMER CASES AND SHALL NOT BE UTILIZED AS NEUTRALS. PROVIDE THE SIGNAGES TO CLEARLY INDICATING THIS.

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BURLINGTON Ontario
ENVIRONMENT AND CLIMATE CHANGE CANADA
867 LAKESHORE RD.,
BURLINGTON ON, L7S 1A1
CCIW TRANSFORMER
RECAPITALIZATION

drawing title / titre du dessin
SINGLE LINE DIAGRAM

drawn by / dessiné par **SW**

designed by / conçu par **AM**

approved by / approuvé par **OB**

tender / soumission --- project manager / administrateur de projets

project date / date du projet **2018/05/28**

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drawing no. / dessiné no. **E-4**