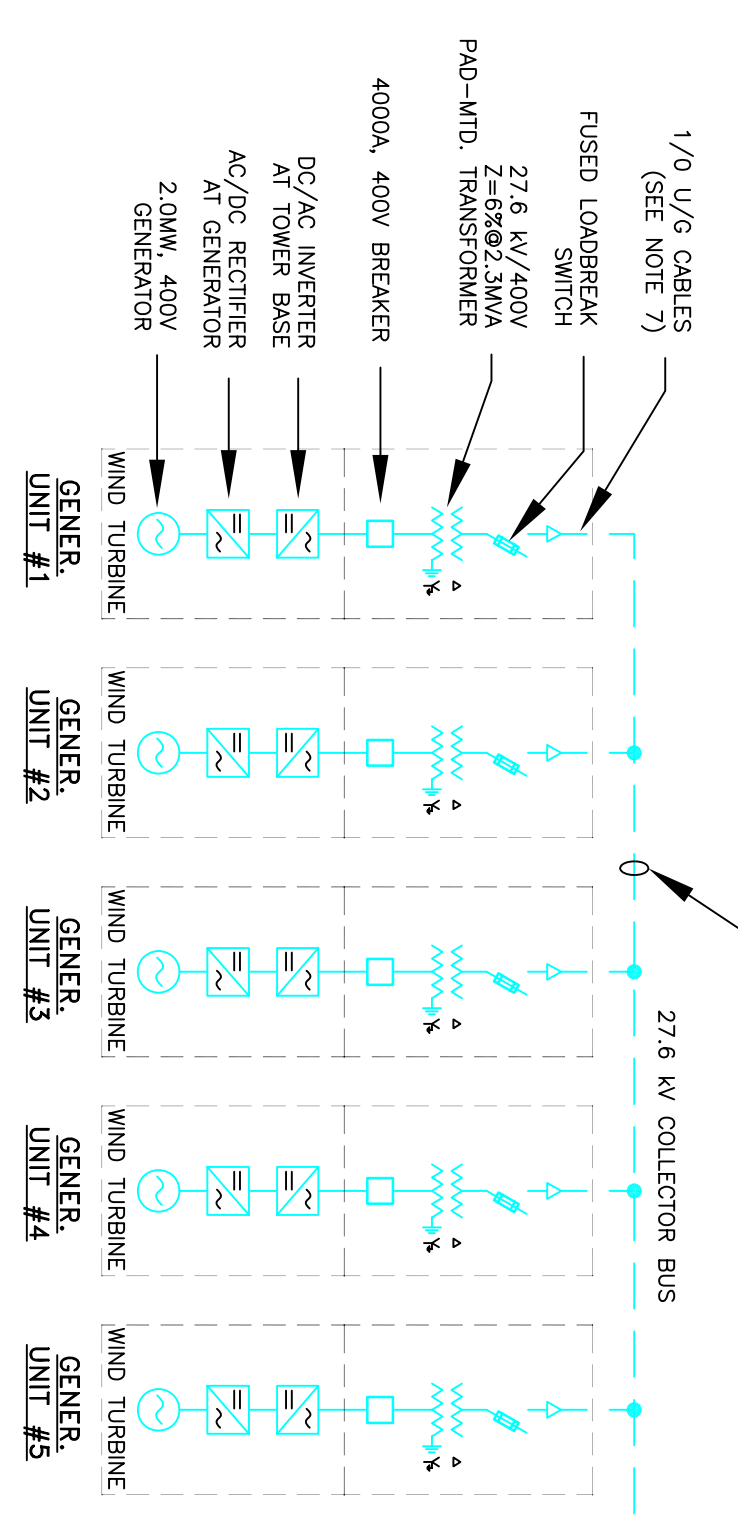
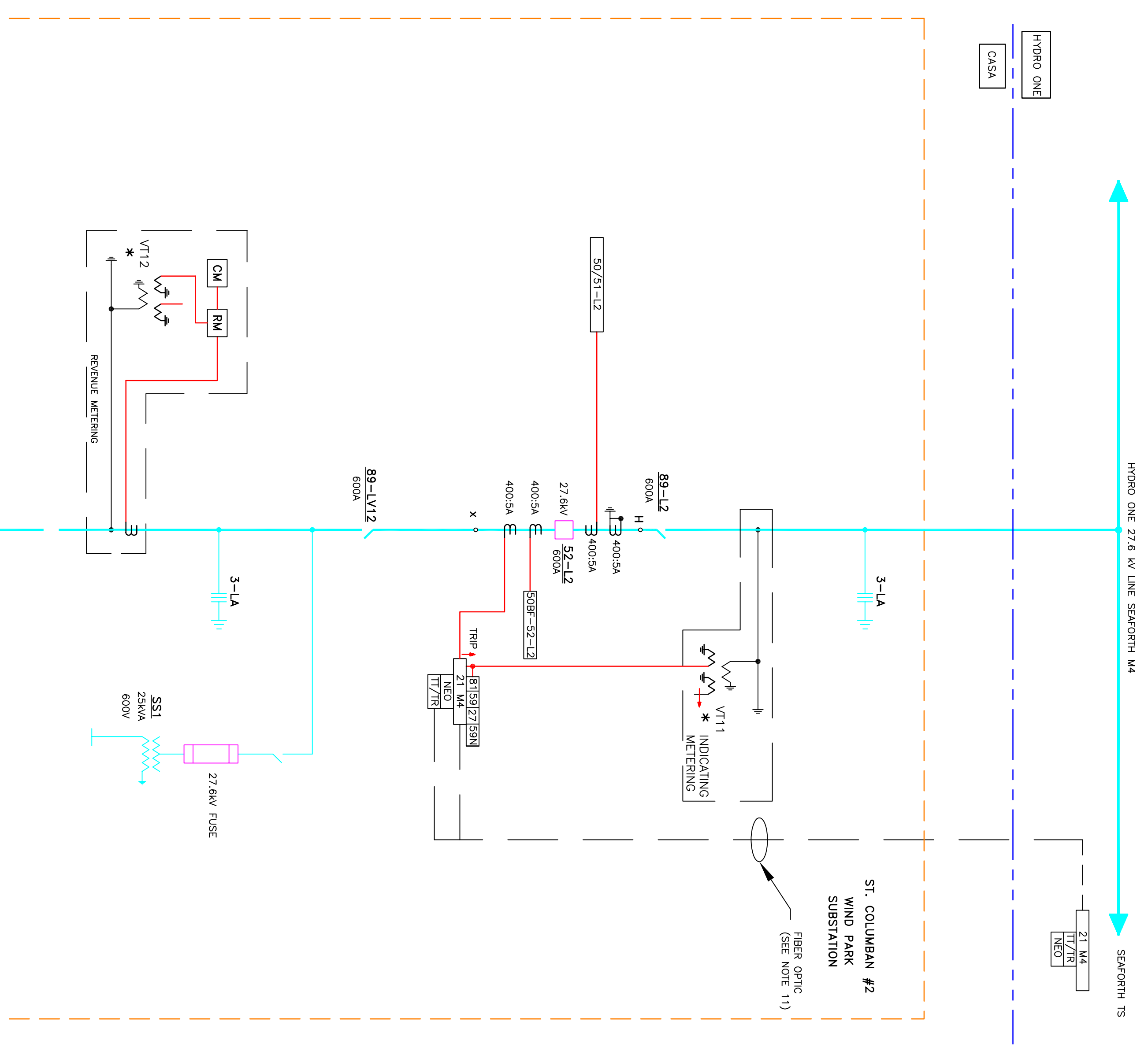


**APPENDIX 10**  
**Electrical Diagrams**

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**LEGEND:**

- 21 - DIRECTIONAL DISTANCE PROTECTION
- 27 - UNDERVOLTAGE PROTECTION
- 59 - OVERVOLTAGE PROTECTION
- 81 - FREQUENCY PROTECTION
- 50/51 - INSTANT/TIME OVERCURRENT PROTECTION
- 50BF - BREAKER FAILURE PROTECTION
- 59N - GROUND RESIDUAL O/V
- \* - STATION SERVICE TRANSFORMERS 27.6kV:120-240V, 25kVA
- \* - 3 x 27.6kV/120V-120V VT
- \* - 3 x 27.6kV:120-120V VT REVENUE METERING
- RM / CM - REVENUE METERING / CHECK METERING



- NOTES**
1. 2 MW ENERCON E-82 WIND GENERATORS + 400V BREAKERS COMPLETE AS INTEGRATED PACKAGE WITH INSTRUMENT TRANSFORMERS/RELAYS (50/51+27+59+81) AND SCADA SYSTEM WERE USED FOR THIS VARIANT OF SINGLE LINE DIAGRAM.
  2. 400V/27.6kV, 2.3MVA PAD-MOUNTED, Z=6% COMPLETE WITH FUSED DISCONNECT SWITCHES AND CONNECTORS TO PLUG INTO GENERATOR.
  3. DYNAMIC VAR COMPENSATION MAY BE REQUIRED. THE AMOUNT OF VAR COMPENSATION INSTALLED WILL BE DETERMINED BY:
    - a) IMPEDANCE OF THE SELECTED TRANSFORMERS
    - b) COLLECTOR SYSTEM.
    - c) ENERCON'S STATION SYSTEM MAY BE USED.
  4. SITE AND LOCATION OF SC CAP BANK WILL BE DETERMINED LATER IF ADDED.
  5. FOR REVENUE METERING, THE INSTRUMENT TRANSFORMERS AND REVENUE METERS TO BE SPECIFIED BY THE METERING SERVICE PROVIDER (MSP).

6. 27.6kV, 600A BREAKER EQUIPPED WITH MULTIRATIO CTs 600/400/300/200:5A, 2.5:1:00 ACCURACY CLASS OR EQUAL ON EITHER SIDE OF THE BREAKER.
7. UNDERGROUND POWER CABLES: 1/0 AWG, 27.6KV ALUMINUM CONDUCTOR XLPF INSULATED, CONCENTRIC NEUTRAL, LDFE JACKET, DIRECT BURIED, R=0.27 OHM/KM, X=0.28 OHM/KM, Z=1.3844 OHM/KM APPROX. 20KM OF U/G CABLE WILL BE USED.
8. RELAY SYSTEM, BATTERY, CHARGER-TO BE HOUSED IN MODULAR RELAY ROOM.
9. NOT ALL TELECOMMUNICATION CIRCUITS ARE DRAWN ON THE SINGLE LINE DIAGRAM.
10. USE FIBER OPTIC (PREFERABLE) OR BELL CIRCUITS TO SEND/RECEIVE TRIP SIGNALS AT EACH TERMINAL (IF REQUIRED).
11. CONNECTION POINTS TO THE HYDRO ONE SYSTEM ARE IN THE VICINITY OF THE INTERSECTION OF HYDROLINE RD AND BEACHWOOD LINE.

PRELIMINARY

<p><b>Project:</b></p> <p style="text-align: center;"><b>CASA ENGINEERING AND CONSTRUCTION INC. ST. COLUMBAN 2 WIND PROJECT</b></p>	<p><b>Client:</b></p> <p style="text-align: center;"><b>ALGAL &amp; ASSOCIATES Ltd.</b> Engineering Services 250 Merton St., Suite 306 Toronto, Ontario, M4S 1R1 Tel: (416)484-4200 Fax: (416)484-8260 e-mail: algal@algal.ca</p>	<p><b>Drawing Title:</b></p> <p style="text-align: center;"><b>10 MW WIND PROJECT SINGLE LINE DIAGRAM- SCHEMATIC (27.6/0.4 KV)</b></p>	<p><b>Drawn By:</b> M.S.      <b>Date:</b> NOV. 22/07</p> <p><b>Designed By:</b> D.J.M.      <b>Prof. No:</b></p> <p><b>Checked By:</b> D.J.M.      <b>File No:</b></p> <p><b>Approved By:</b> F.A.      <b>Scale:</b> N.T.S.</p> <p><b>Drawing No:</b> AG-W05-02</p>	<p><b>Orientation:</b>      <b>Seal:</b></p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">01</td> <td style="width: 40%;">2.3MW SECTIONS REPLACED WITH ENERCON</td> <td style="width: 10%;">NOV. 27/07</td> </tr> <tr> <td><b>No.</b></td> <td><b>Revisions/Issues</b></td> <td><b>Date:</b></td> </tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </table>	01	2.3MW SECTIONS REPLACED WITH ENERCON	NOV. 27/07	<b>No.</b>	<b>Revisions/Issues</b>	<b>Date:</b>												
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