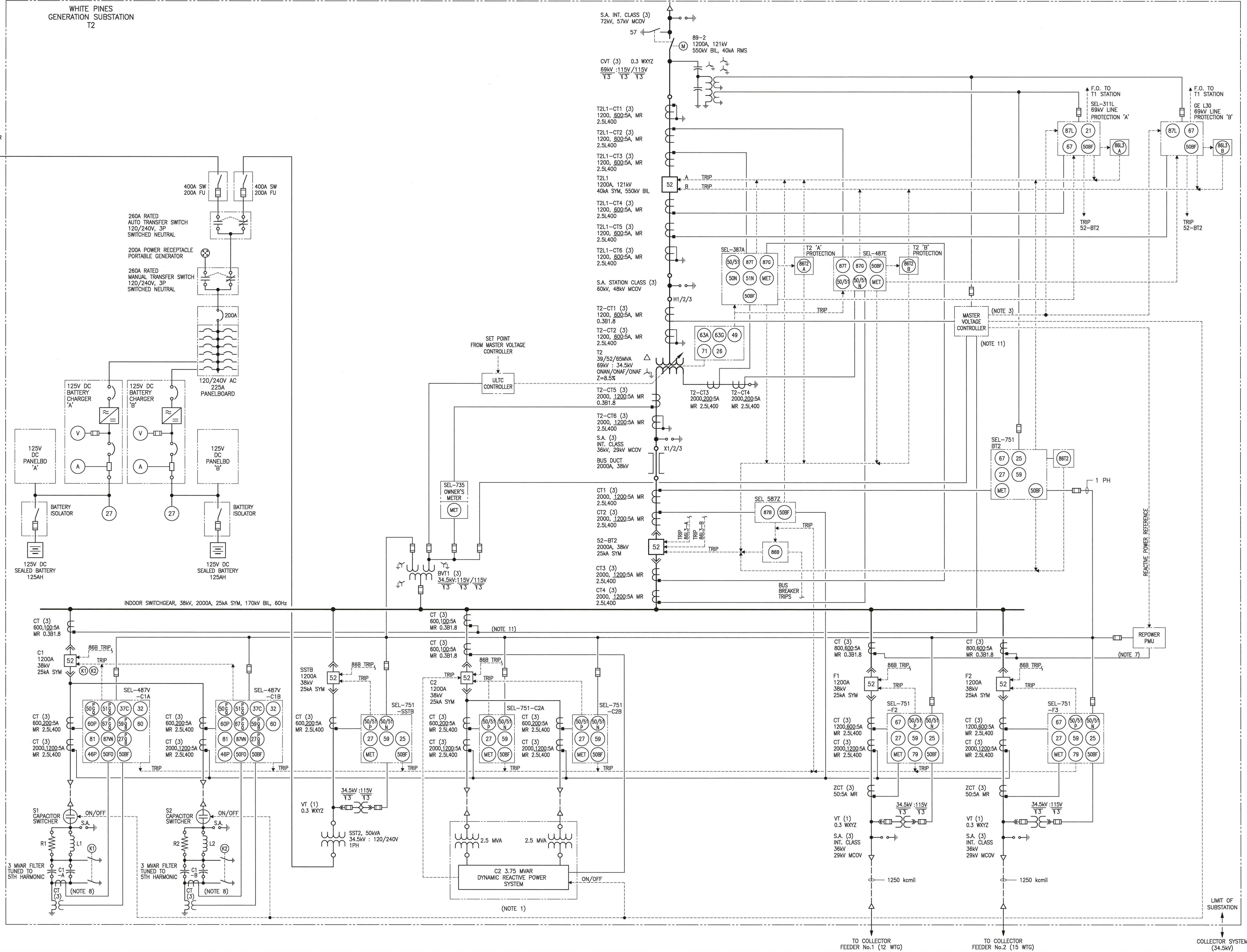
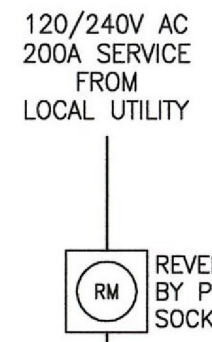


TO WHITE PINES 'T1' 230:69kV
INTERCONNECTING SUBSTATION
UNDERGROUND 1250 kcmil ALUMINUM
(115kV RATED CABLE) (28km) ←
FOR CONTINUATION, SEE DWG
H343554-0000-70-082-0001

**DEVICE & FUNCTION LIST:**

- | | |
|------|---|
| 21 | - DISTANCE PROTECTION RELAY (LINE IMPEDANCE) |
| 25 | - SYNCHRONOUS CHECK |
| 26 | - THERMAL CHECK |
| 27 | - UNDERVOLTAGE PROTECTION |
| 32 | - DIRECTIONAL POWER PROTECTION |
| 37 | - UNDERCURRENT |
| 46 | - CURRENT UNBALANCE |
| 49 | - TRANSFORMER THERMAL RELAY (WINDING TEMPERATURE) |
| 50BF | - BREAKER FAILURE RELAY |
| 50 | - PHASE INSTANTANEOUS OVERCURRENT PROTECTION |
| 61 | - SHORT TIME DELAY OVERCURRENT |
| 51N | - NEUTRAL TIME OVERCURRENT PROTECTION |
| 501N | - INSTANTANEOUS AND NEUTRAL TIME OVERCURRENT PROTECTION |
| 52P | - SHORT TIME DELAY PHASE TIME OVERCURRENT PROTECTION |
| 52 | - CIRCUIT BREAKER |
| 59 | - OVERVOLTAGE PROTECTION |
| 60 | - LOSS OF POTENTIAL |
| 63A | - TRANSFORMER OIL DRY OR GAS PRESSURE, LEVEL/FLOW RELAY |
| 63G | - COMBUSTIBLE GAS DETECTION |
| 67 | - DIRECTIONAL OVERCURRENT RELAY |
| 71 | - TRANSFORMER OIL LEVEL SWITCH |
| 79 | - AUTOMATIC RECLOSER |
| 79 | - FREQUENCY RELAY, O-OVER, U-UNDER |
| 86 | - LOCKOUT AUX RELAY |
| 86 | - DIFFERENTIAL PROTECTIVE RELAY |
| 87B | - BUS DIFFERENTIAL PROTECTIVE RELAY |
| 87B | - RESTRICTED EARTH GROUND |
| 87L | - LINE DIFFERENTIAL PROTECTIVE RELAY |
| 87T | - TRANSFORMER DIFFERENTIAL PROTECTION |
| 89 | - DISCONNECT SWITCH |

P-PHASE, Q-NEGATIVE SEQUENCE, G-GROUND, N-NEUTRAL

- | | |
|------|--|
| CT | — AMMETER |
| CT | — CURRENT TRANSFORMER |
| CVT | — CAPACITIVE VOLTAGE TRANSFORMER |
| GE | — GENERAL ELECTRIC |
| SA | — SURGE ARRESTER |
| MET | — METERING (MW, MWH, MVAR, MVARH, MVA, PF) |
| MR | — MULTI-RATIO CURRENT TRANSFORMER |
| MS | — MEGASIGMA |
| ULTC | — UNDERLOAD TAP CHANGER |
| RM | — REVENUE METERING |
| RTAC | — REAL TIME AUTOMATION CONTROLLER |
| SEL | — SCHWEITZER ENGINEERING LABORATORIES |
| V | — VOLT-METER |
| VT | — VOLTAGE TRANSFORMER |
| ZCT | — ZERO SEQUENCE CURRENT TRANSFORMER |

NOTES

1. DYNAMIC AND STATIC VAR COMPENSATION VALUES TO BE CONFIRMED BY FINAL REPORTS.
2. CT RATIO TYPE "1200, 60 : 5A", WHERE 1200 DESIGNATES OVER-ALL ANSI, MR CT AND 600 DESIGNATES THE WINDING TO BE USED.
3. OPEN & CLOSE COMMANDS FOR REACTOR INSERTION ARE TRANSFERRED FROM SUBSTATION T2 USING COMMUNICATION CHANNEL, DIGITAL PILOT CHANNELS OF SEL-311L AND GE L30 RELAYS.
4. ALL RELAY OUTPUTS SHALL BE PROVIDED WITH EITHER AUXILIARY TRIPPING OR LOCKOUT RELAYS TO MULTIPLY CONTACTS. (NOT SHOWN)
5. TRANSFORMER ALARM CONTACTS SHALL BE WIRED TO RTAC VIA SEL-241.
6. ALL TRANSFORMER TRIPS TO BE OPERATED THROUGH SEL-387 & SEL-487 RELAYS.
7. CT'S ARE SUMMED TO PROVIDE REPOWER POWER MEASUREMENT UNIT (PMU) WITH TOTAL OUTPUT OF WIND FARM.
8. FINAL REVIEW AND DESIGN OF TWO STAGE HARMONIC FILTER SHALL BE BY FILTER VENDOR.
9. TEST AND BLOCKING SWITCHES TO BE PROVIDED FOR EACH CT/PT INPUT TO EACH DEVICE AND FOR ALL L30 OR ALARM RELATED OUTPUTS FROM EACHIED DEVICE.
10. ALL VT'S AND CT'S SHALL BE RATED FOR MAXIMUM CONTINUOUS OPERATING VOLTAGE.
11. CT'S ARE SUMMED TO PROVIDE VOLTAGE MASTER WITH TOTAL REACTIVE POWER MEASUREMENT.

DO NOT USE FOR
CONSTRUCTION

WHITE PINES WIND FARM



WPD CANADA CORPORATION
2233 ARGENTIA RD., SUITE 102
MISSISSAUGA, ON, L5N 2X7

T.: 905-813-8400
F.: 905-813-7487

PROVIDED BY
BIOQUEST INC

GENERATION SUBSTATION
T2 (69:34.5 kV)
SINGLE LINE DIAGRAM

DOCUMENT STATUS

DRAFT

04-15-16
