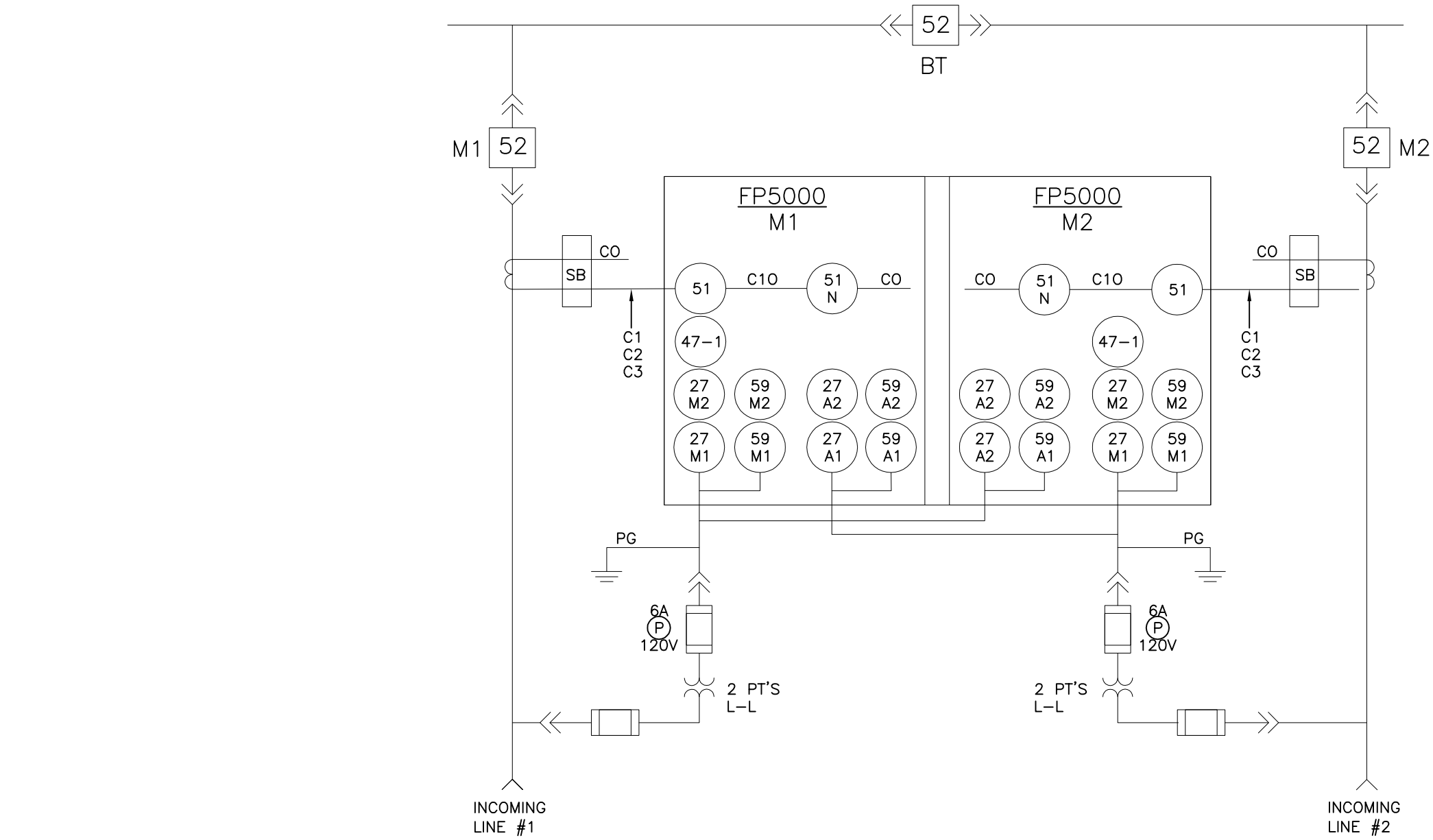


DETAIL NOTES:

- REPLACE EXISTING SWITCHGEAR WITH THE ONE SHOWN. LAYOUT BASED BY EATON APPROVED BY HYDRO OTTAWA. REFER TO SINGLE LINE DRAWING E200 FOR FURTHER INFORMATION.
- FUTURE SPACES.
- PROVIDE NEW INCOMING & OUTGOING 15KV CABLES TO SUIT NEW SWITCHBOARD LAYOUT. REMOVE EXISTING ALL PILC CABLES AND STOP AT BOTTOM OF EXISTING CABLE TRENCH. PROVIDE NEW XLPE CABLES FOR NEW SWITCHGEAR. ALL SPLICING TO BE MADE IN CABLE TRENCH. REFER TO ELECTRICAL SPECIFICATION FOR COMPLETE SCOPE AND CABLE TYPE. REMOVE REDUNDANT CABLING.
- EXISTING 44KV RELAY CABINET (DIAGRAMMATIC ONLY). RETAIN SWITCHGEAR CELL AND REPLACE ALL NEW RELAYS:
 - REPLACE EXISTING RELAYS WITH NEW SOLID-STATE TYPE:
 - GROUND FAULT RELAYS (FOR BOTH SOURCES)
 - REMOTE BREAKER OPERATION
 - OVERCURRENT, DIFFERENTIAL AND REVERSE POWER RELAYING FOR BOTH HYDRO SOURCES & TRANSFORMERS T1+T2
 - DECOMMISSION AND REMOVE ALL RELATED 44KV AUTOMATIC SOURCE TRANSFER SWITCHING SCHEME.
- PROVIDE AND IMPLEMENT NEW 13.2KV AUTOMATIC SOURCE TRANSFER SYSTEM. REFER TO DETAIL 1/E001 FOR MORE INFORMATION.
- PROVIDE ADDITIONAL INFRASTRUCTURE TO THE EXISTING RELAY CELL, HYDRO METERING AND TO THE NEW TRANSFER CONTROL SYSTEM.



13.2 kV AUTOMATIC TRANSFER SCHEME:

VTS ARE USED FOR VOLTAGE SENSING ON EACH INCOMING SUPPLY AT 13.2 kV USING FP5000 RELAY ON EACH MAIN BREAKER HAS BUILT IN TRANSFER CONTROL. THE TWO MAIN BREAKER RELAYS WILL INTERACT WITH ONE ANOTHER THROUGH VOLTAGE SENSING ON THE 13.2KV INCOMING SOURCE FEEDERS THROUGH THE VTS LOCATED ON THE LINE SIDE OF EACH MAIN BREAKER.

THE RELAYS HAVE BUILT IN TRANSFER FUNCTIONALITY AND CAN BE PROGRAMMED WITH VOLTAGE THRESHOLDS AND TIME DELAYS AS PER THE CUSTOMERS PREFERENCES AND WILL OPEN OR CLOSE THE APPROPRIATE BREAKER DEPENDENT ON CUSTOMER SOURCE SELECTION WILL TRANSFER BACK TO ORIGINAL SOURCE WHEN IT IS RESTORED WITH TIME DELAYS AS SELECTED IN THE PROGRAMMING.

AUTOMATIC TRANSFER FUNCTIONAL REQUIREMENTS:

MAIN-TIE-MAIN
OPEN TRANSITION - TIE BREAKER CLOSING
OPEN TRANSITION - TIE BREAKER OPENS (RESTORE)

INITIAL STARTUP
HYDRO PROVIDES TWO PARALLEL INCOMING FEEDS FROM NEPEAN AND SOUTH MARCH STEPPED DOWN TO 13.8KV INTO TWO MAIN BREAKERS.

PLACE SELECTOR SWITCH IN 'MANUAL' MODE. OPEN TIE BREAKER AND THEN CLOSE BOTH MAIN BREAKERS BY THEIR RESPECTIVE CONTROL SWITCH.
PLACE SELECTOR SWITCH IN 'AUTOMATIC' MODE.

NORMAL PLANT OPERATION IS WITH BOTH MAIN BREAKERS CLOSED, TIE BREAKERS OPEN, AND SELECTOR SWITCH IN 'AUTOMATIC' MODE.

ELECTRICAL INTERLOCK - APPLICABLE IN BOTH 'MANUAL' & 'AUTOMATIC' MODE. IN MANUAL MODE, HYDRO WILL BE ABLE TO HAVE ALL THREE (2 MAINS & TIE) BREAKERS CLOSED AT THE SAME TIME.
THE TWO INCOMING LINES ARE ELECTRICALLY INTERLOCKED SUCH THAT ALL THREE BREAKERS CAN NOT BE CLOSED AT THE SAME TIME.

IN EVENT OF THE PROTECTIVE RELAY TRIP VIA LOCKOUT RELAY, THE OPENED MAIN AND TIE CANNOT BE CLOSED UNTIL THE FAULT IS REMOVED, AND LOCKOUT RELAY IS RESET.

MANUAL MODE - (SELECTOR SWITCH IN 'MANUAL')
EACH MAIN AND TIE BREAKER CAN BE CLOSED BY THEIR RESPECTIVE BREAKER CONTROL SWITCH SUBJECT TO ELECTRICAL INTERLOCK ABOVE.

AUTOMATIC MODE - (SELECTOR SWITCH IN 'AUTOMATIC')

(1)
LOSS OF VOLTAGE (LV OR OV OR NEG SEQ) ON EITHER INCOMING LINE WILL AFTER A TIME DELAY SET AT MIN. 3.5 SECONDS ON 27M1, 59M1 & 47-1) CAUSE IT'S MAIN BREAKER TO OPEN AND THEN THE TIE BREAKER WILL CLOSE, PROVIDED THAT VOLTAGE IS PRESENT ON THE OTHER INCOMING LINE (OPEN TRANSITION)

THE RESTORATION TO NORMAL CONFIGURATION WILL BE PERFORMED AND DIRECTED BY HYDRO OTTAWA EITHER MANUALLY ON SITE OR VIA HYDRO OTTAWA SCADA CONTROL. THERE IS NO AUTO RESTORATION. AFTER A FAULT ON THE INCOMING 44KV SUPPLY HAS BEEN CLEARED THE TIE BREAKER WILL OPEN AND THE CORRESPONDING MAIN WILL BE CLOSED PLACING THE TWO 44KV SUPPLIES IN PARALLEL AFTER A TIME DELAY SET AT MIN. 3.5 SECONDS (OPEN TRANSITION).

(2)
HOWEVER, IF THE VOLTAGE IS SUBSEQUENTLY LOST ON THE SECOND LINE AFTER THE TRANSFER HAS OCCURRED AS DESCRIBED IN (1) ABOVE, THE SECOND LINE WILL AFTER A TIME DELAY SET AT MIN. 3.5 SECS ON 27M1, 59M1 & 47-1 & 27A1) OPEN AND THEN THE TIE WOULD OPEN.

THE RESTORATION TO NORMAL CONFIGURATION WILL BE PERFORMED AND DIRECTED BY HYDRO OTTAWA EITHER MANUALLY ON SITE OR VIA HYDRO OTTAWA SCADA CONTROL. THERE IS NO AUTO RESTORATION. AFTER A FAULT ON THE INCOMING 44KV SUPPLY HAS BEEN CLEARED THE TIE BREAKER WILL OPEN AND THE CORRESPONDING MAIN WILL BE CLOSED PLACING THE TWO 44KV SUPPLIES IN PARALLEL AFTER A TIME DELAY SET AT MIN. 3.5 SECONDS (OPEN TRANSITION).

(3)
SIMULTANEOUS LOSS OF BOTH SOURCES OR RESTORATION WILL AFTER A TIME DELAY CAUSE BOTH MAIN BREAKERS TO OPEN, LEAVING THE TIE BREAKER OPEN.

(4)
BLOCK ENABLE SHALL BE IMPLEMENTED FOR THE AUTOMATIC TRANSFER SCHEME (OPERABLE BOTH LOCALLY AND FROM HYDRO OTTAWA SCADA). HYDRO WILL PROVIDE ON/OFF SWITCH VIA RTU/SCADA TO BE CONNECTED TO AUTOMATIC TRANSFER SCHEME FOR BLOCK ENABLE.

(5)
PROVIDE REMOTE AND LOCAL OPERATION SWITCHES ON BOTH MAINS AND THE TIE BREAKERS. HYDRO WILL OPEN THESE BREAKERS AND CUSTOMER WILL BE RESPONSIBLE FOR CLOSING THE BREAKERS. PROVIDE AUXILIARY TYPE FORM A CONTACT ON THESE BREAKERS AND RUN CONTROL WIRING FROM EACH BREAKERS TO HYDRO SUPPLIED RTU.

(6)
PROVIDE STATUS AND SCADA ON BOTH SECONDARY MAINS AND THE TIE BREAKERS INCLUDING THE EXISTING PRIMARY BREAKERS FOR THE OUTDOOR TRANSFORMERS FOR HYDRO. PROVIDE AUXILIARY TYPE FORM A CONTACT ON THESE BREAKERS AND RUN CONTROL WIRING FROM EACH BREAKERS TO HYDRO SUPPLIED RTU.

(7)
PROVIDE DIGITAL POWER QUALITY METERS (SEL-735) ON BOTH SECONDARY MAINS FOR TRANSFORMER LOADING.

2
E001
15KV SWITCHGEAR LAYOUT
N.T.S.

1
E001
13.2KV AUTOMATIC TRANSFER SCHEME
N.T.S.

Canada

Public Works and
Government Services
Canada
Real Property
Branch

Travaux publics et
services gouvernementaux
Canada
Direction générale
des biens immobiliers



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Contractor to verify all dimensions
& conditions on site and immediately
notify the engineer of all discrepancies.

1 ISSUED FOR TENDER 2016-04-11

revisions description date

A detail no.
no. du détail
B location drawing no.
sur dessin no.
C drawing no.
dessin no.

project project

SWITCHGEAR
UPGRADE, BELLS
CORNER COMPLEX

1 HAANEL RD, NEPEAN, ONTARIO

drawing dessin

ELECTRICAL DETAILS

Designed By Conçu par

Date (yyyy/mm/dd)

Drawn By Dessiné par

Date (yyyy/mm/dd)

Reviewed By Examiné par

Date (yyyy/mm/dd)

Approved By Approuvé par

Date (yyyy/mm/dd)

Tender Soumission

CORNEL SOCACI

Project Manager Administrateur de projets

Project no. No. du projet

R.080064.002

Drawing no. No. du dessin

E001