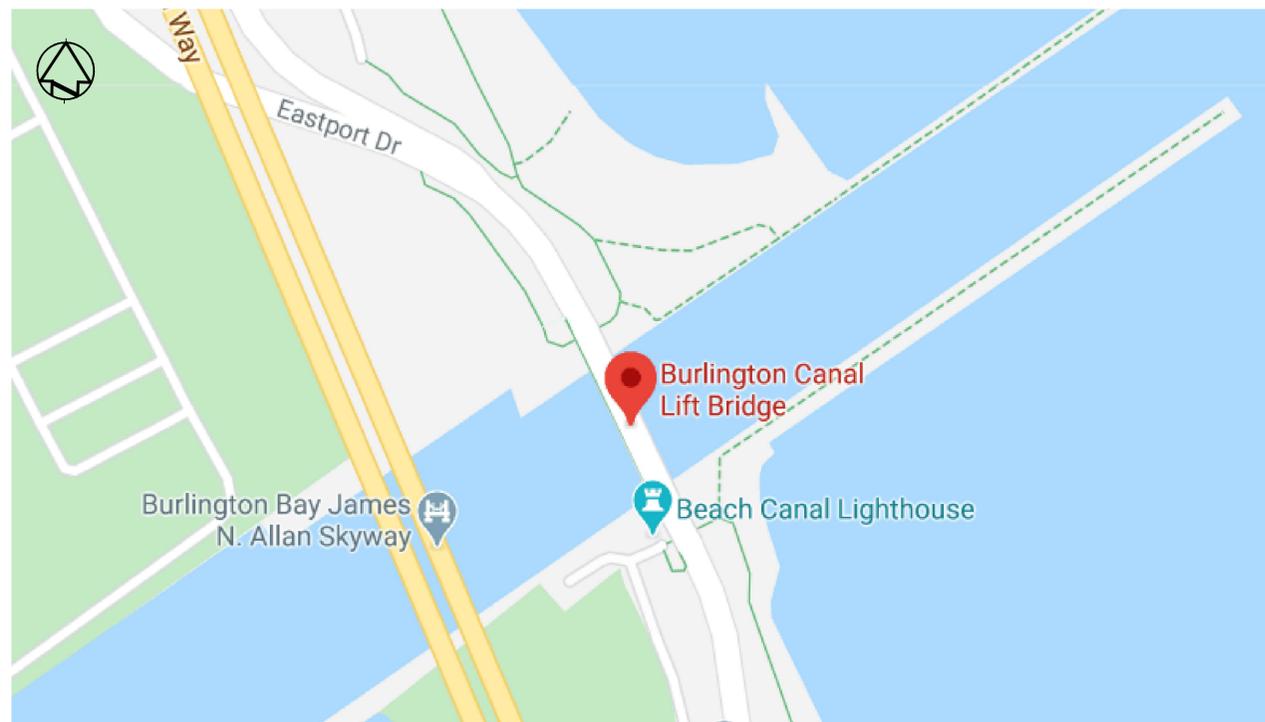


BURLINGTON CANAL BRIDGE SKEW CONTROL AND ELECTRICAL UPGRADES



LIST OF DRAWINGS	
DRAWING NUMBER	DRAWING TITLE
G01	COVER SHEET
E01	SKEW CONTROL AND AUXILIARY DRIVE CONTROL BLOCK DIAGRAM
E02	ELECTRICAL PLAN AND ELEVATION
E03	NORTH TOWER MACHINERY ROOM ELECTRICAL LAYOUT
E04	SOUTH TOWER MACHINERY ROOM ELECTRICAL LAYOUT
E05	AUXILIARY DRIVE CONTROL MODIFICATION
E06	AUXILIARY DRIVE CONTROL CONSOLE DETAILS
E07	AUXILIARY DRIVE CONTROL CONSOLE MOUNTING DETAILS
E08	UTILITY AND GENERATOR BREAKER MODIFICATION ONE-LINE DIAGRAM
E09	SWITCHBOARD #1 SCHEMATIC MODIFICATION
E10	UTILITY AND GENERATOR BREAKER MODIFICATION SWITCHBOARD #1 DETAILS
M01	ABSOLUTE ENCODER INSTALLATION ASSEMBLY AND DETAILS
M02	ABSOLUTE ENCODER INSTALLATION DETAILS
S01	TRANSFORMER OIL CONTAINMENT PLAN AND DETAILS

Public Works and Government Services Canada
Architectural and Engineering Services
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Services d'architecture et de génie
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PARSONS



revision	description	date
1	SIGNED AND SEALED	10/19/2020
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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
HAMILTON BURLINGTON CANAL VERTICAL LIFT BRIDGE ONTARIO
SKEW CONTROL AND ELECTRICAL UPGRADES

drawing title / titre du dessin
COVER SHEET

drawn by / dessiné par
LQX

designed by / conçu par
LQX

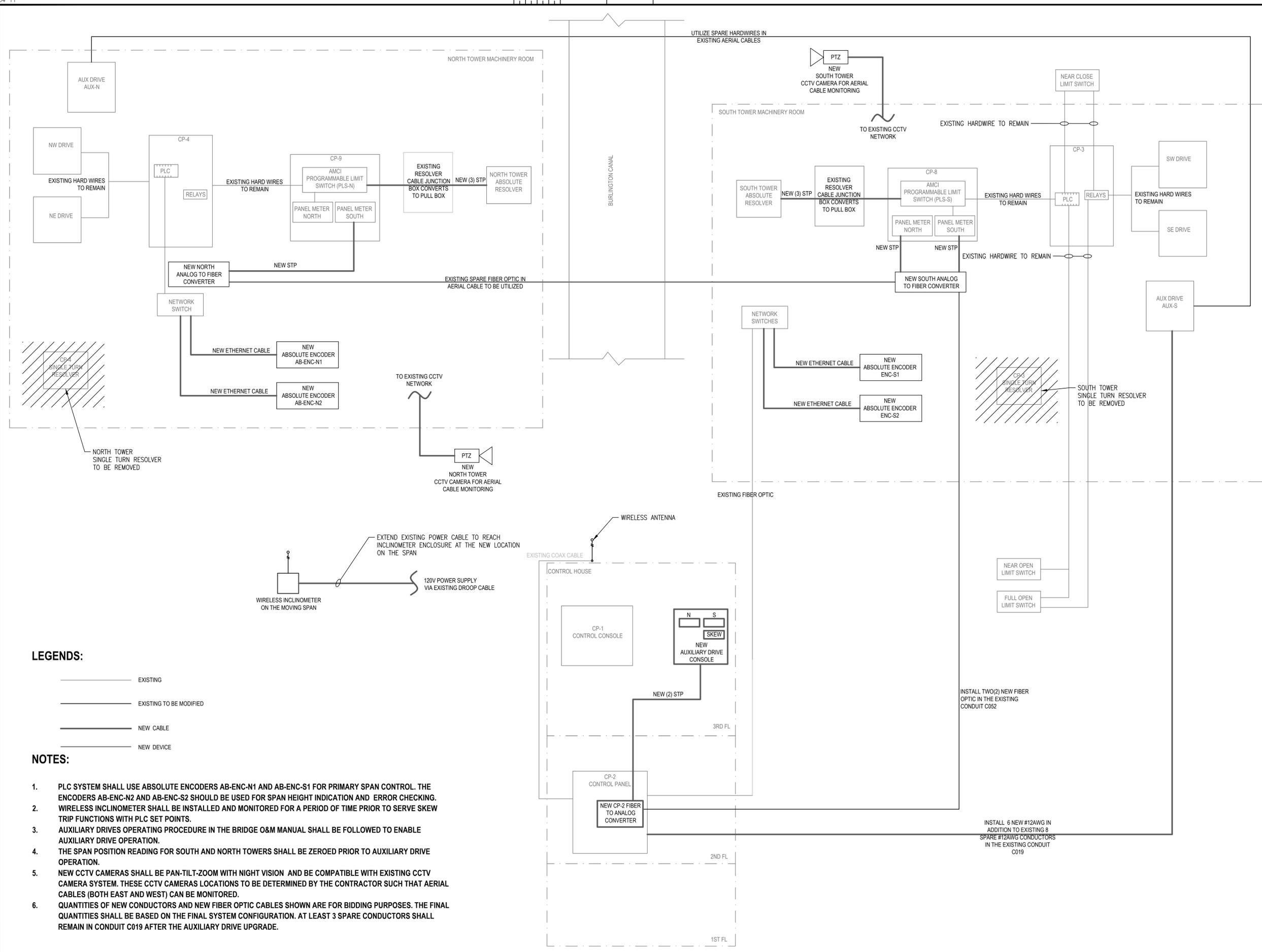
approved by / approuvé par
GTR

bid / soumission
project manager / administrateur de projets

project date / date du projet
2020-05-19

project no. / no. du projet
R.109141.001

drawing no. / dessiné no.
G01



LEGENDS:

- EXISTING
- EXISTING TO BE MODIFIED
- NEW CABLE
- NEW DEVICE

NOTES:

1. PLC SYSTEM SHALL USE ABSOLUTE ENCODERS AB-ENC-N1 AND AB-ENC-S1 FOR PRIMARY SPAN CONTROL. THE ENCODERS AB-ENC-N2 AND AB-ENC-S2 SHOULD BE USED FOR SPAN HEIGHT INDICATION AND ERROR CHECKING.
2. WIRELESS INCLINOMETER SHALL BE INSTALLED AND MONITORED FOR A PERIOD OF TIME PRIOR TO SERVE SKEW TRIP FUNCTIONS WITH PLC SET POINTS.
3. AUXILIARY DRIVES OPERATING PROCEDURE IN THE BRIDGE O&M MANUAL SHALL BE FOLLOWED TO ENABLE AUXILIARY DRIVE OPERATION.
4. THE SPAN POSITION READING FOR SOUTH AND NORTH TOWERS SHALL BE ZEROED PRIOR TO AUXILIARY DRIVE OPERATION.
5. NEW CCTV CAMERAS SHALL BE PAN-TILT-ZOOM WITH NIGHT VISION AND BE COMPATIBLE WITH EXISTING CCTV CAMERA SYSTEM. THESE CCTV CAMERAS LOCATIONS TO BE DETERMINED BY THE CONTRACTOR SUCH THAT AERIAL CABLES (BOTH EAST AND WEST) CAN BE MONITORED.
6. QUANTITIES OF NEW CONDUCTORS AND NEW FIBER OPTIC CABLES SHOWN ARE FOR BIDDING PURPOSES. THE FINAL QUANTITIES SHALL BE BASED ON THE FINAL SYSTEM CONFIGURATION. AT LEAST 3 SPARE CONDUCTORS SHALL REMAIN IN CONDUIT C019 AFTER THE AUXILIARY DRIVE UPGRADE.



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project title
titre du projet

HAMILTON BURLINGTON CANAL VERTICAL LIFT BRIDGE ONTARIO

SKEW CONTROL AND ELECTRICAL UPGRADES

drawing title
titre du dessin

SKEW CONTROL AND AUXILIARY DRIVE CONTROL BLOCK DIAGRAM

drawn by dessiné par	LQX
designed by conc par	LQX
approved by approuvé par	GTR
bid soumission	project manager administrateur de projets

project date
date du projet

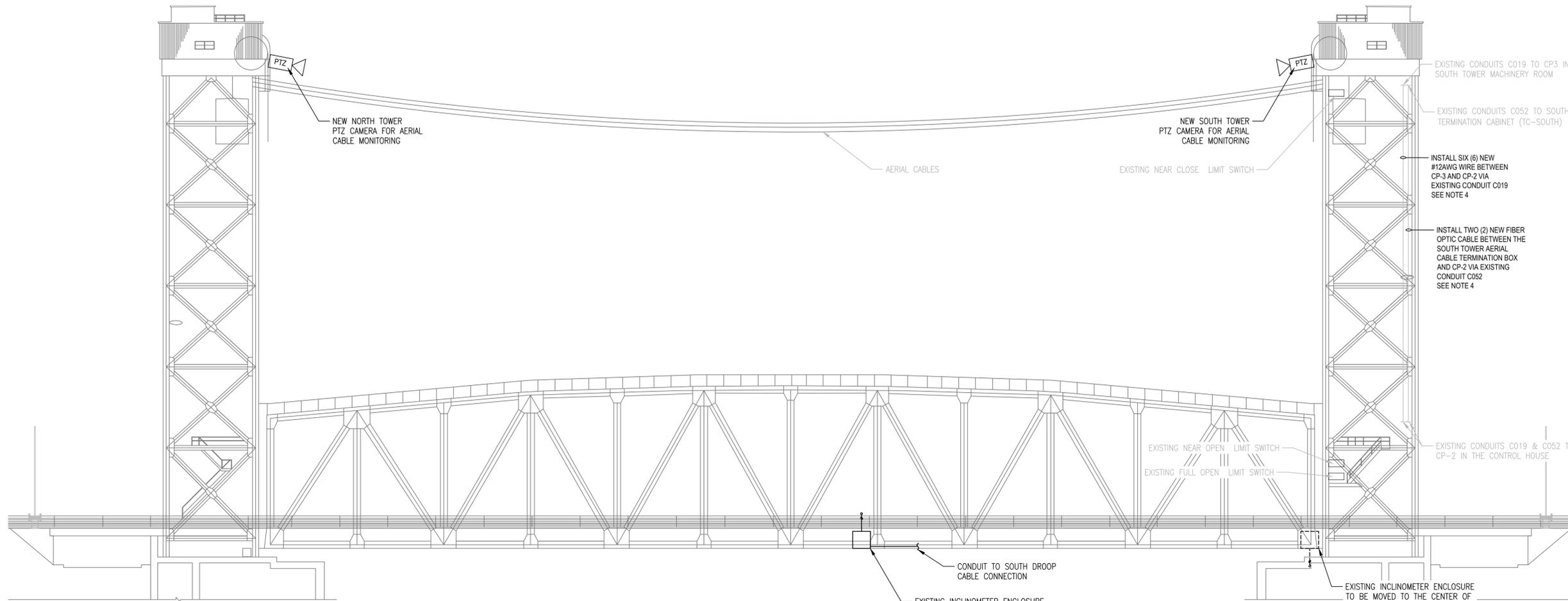
2020-05-19

project no.
no. du projet

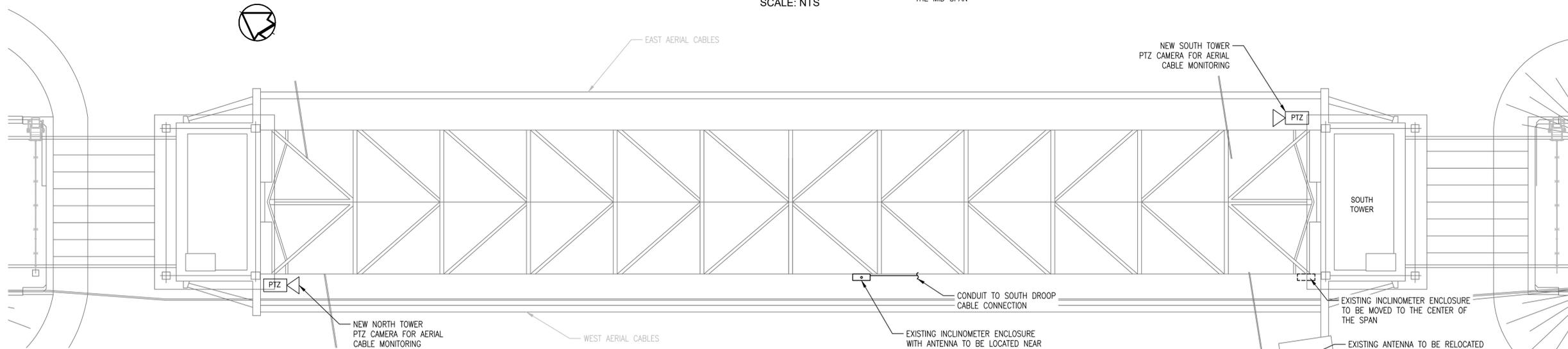
R.109141.001

drawing no.
dessiné no.

E01



ELEVATION
SCALE: NTS



PLAN
SCALE: NTS

NOTES:

1. ANTENNAS FOR WIRELESS INCLINOMETER SHALL BE IN LINE OF SIGHT WITHOUT OBSTRUCTIONS THROUGHOUT BRIDGE OPERATION.
2. THE INCLINOMETER LOCATION SHOWN IS APPROXIMATE, ACTUAL LOCATION TO BE DETERMINED DURING TESTING IN THE FIELD.
3. THE WIRELESS INCLINOMETER SIGNAL TO BE MONITORED BY BRIDGE PLC FOR A PERIOD OF TIME TO ENSURE STABILITY AND RELIABILITY PRIOR TO BE USED FOR TRIP FUNCTIONS. THE INCLINOMETER SIGNAL WILL BE UTILIZED FOR BRIDGE ULTIMATE SKEW TRIP.
4. THE FINAL NEW CONDUCTORS AND FIBER OPTIC CABLES TO BE INSTALLED SHALL BE BASED ON THE FINAL APPROVED SYSTEM CONFIGURATION AND SHOP DRAWINGS.



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project title
titre du projet

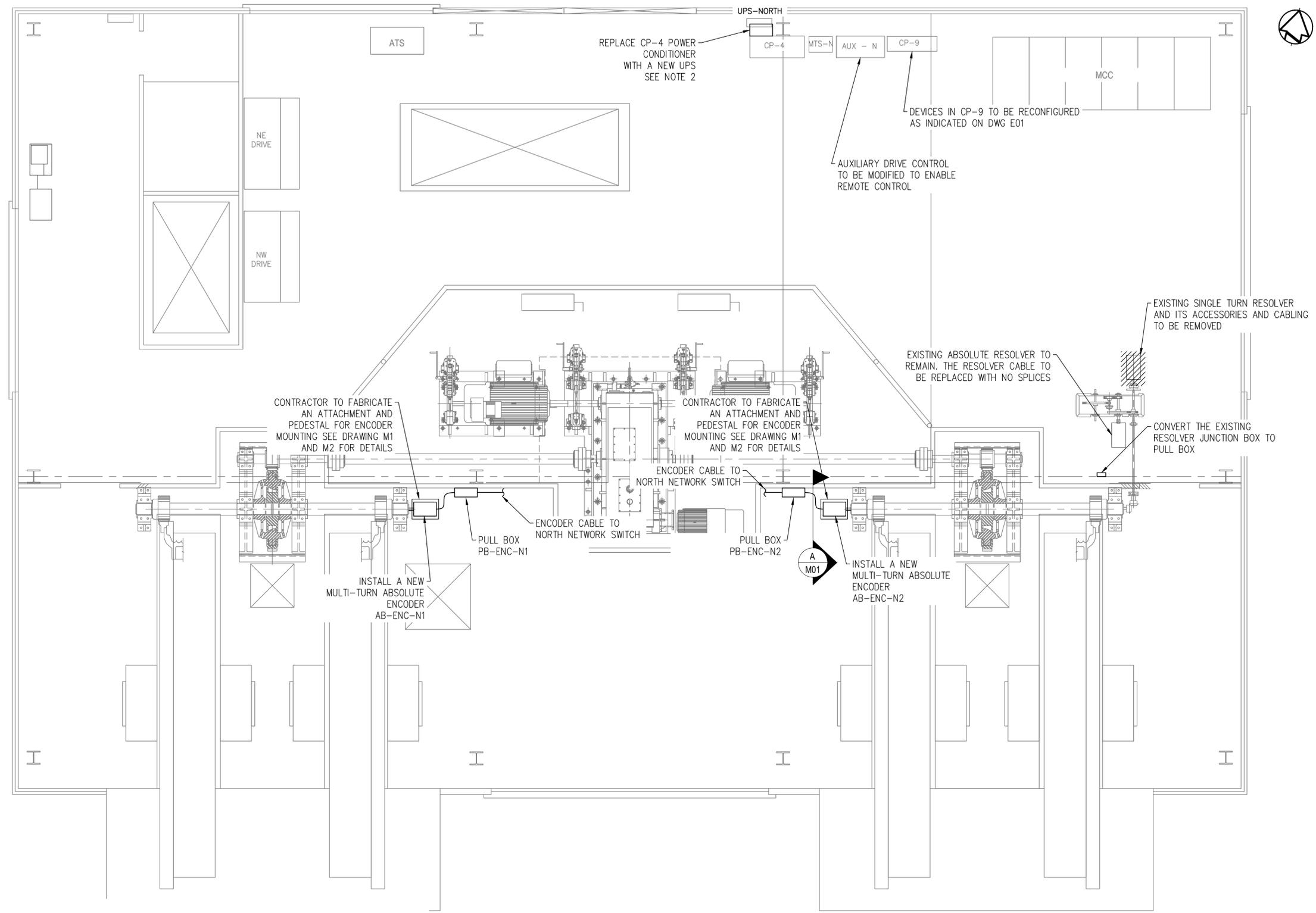
HAMILTON BURLINGTON CANAL VERTICAL LIFT BRIDGE ONTARIO

SKEW CONTROL AND ELECTRICAL UPGRADES

drawing title
titre du dessin

ELECTRICAL PLAN AND ELEVATION

drawn by dessiné par	LQX
designed by conçu par	LQX
approved by approuvé par	GTR
bid soumission	project manager administrateur de projets
project date date du projet	2020-05-19
project no. no. du projet	R.109141.001
drawing no. dessiné no.	E02



NOTES:

1. THE NEW MULTI-TURN ABSOLUTE ENCODER SHOULD BE SICK MANUFACTURER, THEIR AFM60 PROFINET ABSOLUTE ENCODER OR ENGINEER APPROVED EQUAL. FOR REFERENCE PURPOSES, THE TOTAL NUMBER OF TURNS AT THE PINION SHAFT FROM BRIDGE SEATED TO FULL OPEN POSITION IS 34.4, ACTUAL TOTAL ENCODER TURNS SHALL BE VERIFIED IN FIELD.
2. THE NEW UPS SHALL BE HARDWIRED.



revision	description	date
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A	Detail No. / No. du détail
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
HAMILTON BURLINGTON CANAL VERTICAL LIFT BRIDGE ONTARIO
SKUEW CONTROL AND ELECTRICAL UPGRADES

drawing title / titre du dessin
NORTH TOWER MACHINERY ROOM ELECTRICAL LAYOUT

drawn by / dessiné par: **LQX**
 designed by / conçu par: **LQX**
 approved by / approuvé par: **GTR**

bid / soumission: _____ project manager / administrateur de projets: _____

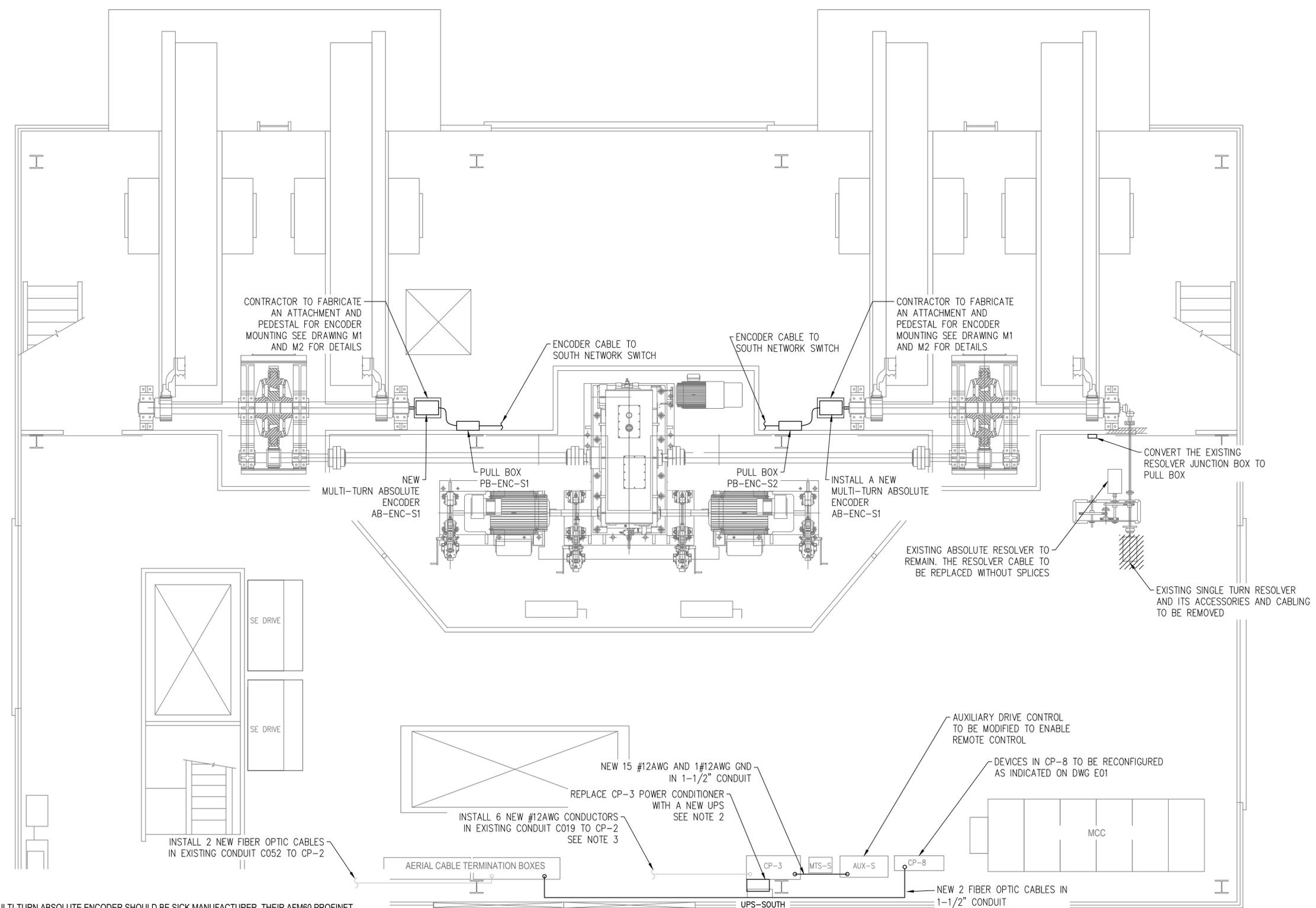
project date / date du projet: **2020-05-19**

project no. / no. du projet: **R.109141.001**

drawing no. / dessiné no.: **E03**



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A	Detail No. / No. du détail
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
HAMILTON BURLINGTON CANAL VERTICAL LIFT BRIDGE ONTARIO
SKEW CONTROL AND ELECTRICAL UPGRADES

drawing title / titre du dessin
SOUTH TOWER MACHINERY ROOM ELECTRICAL LAYOUT

drawn by / dessiné par: **LQX**
designed by / conçu par: **LQX**
approved by / approuvé par: **GTR**

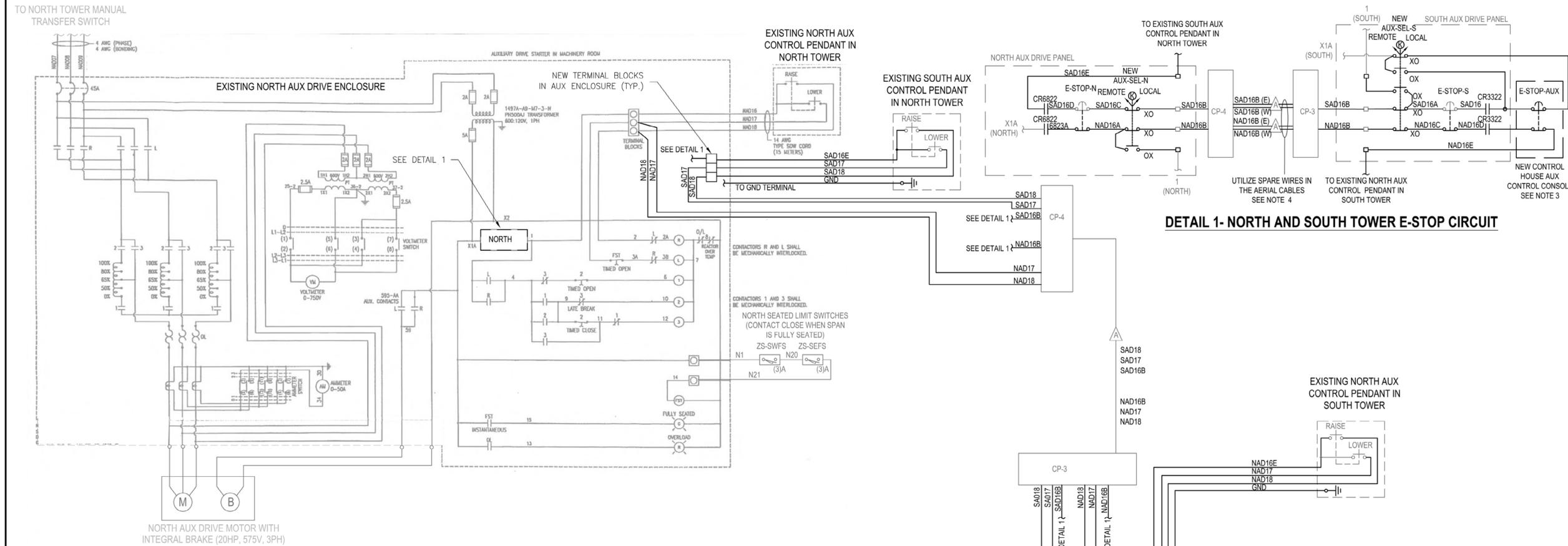
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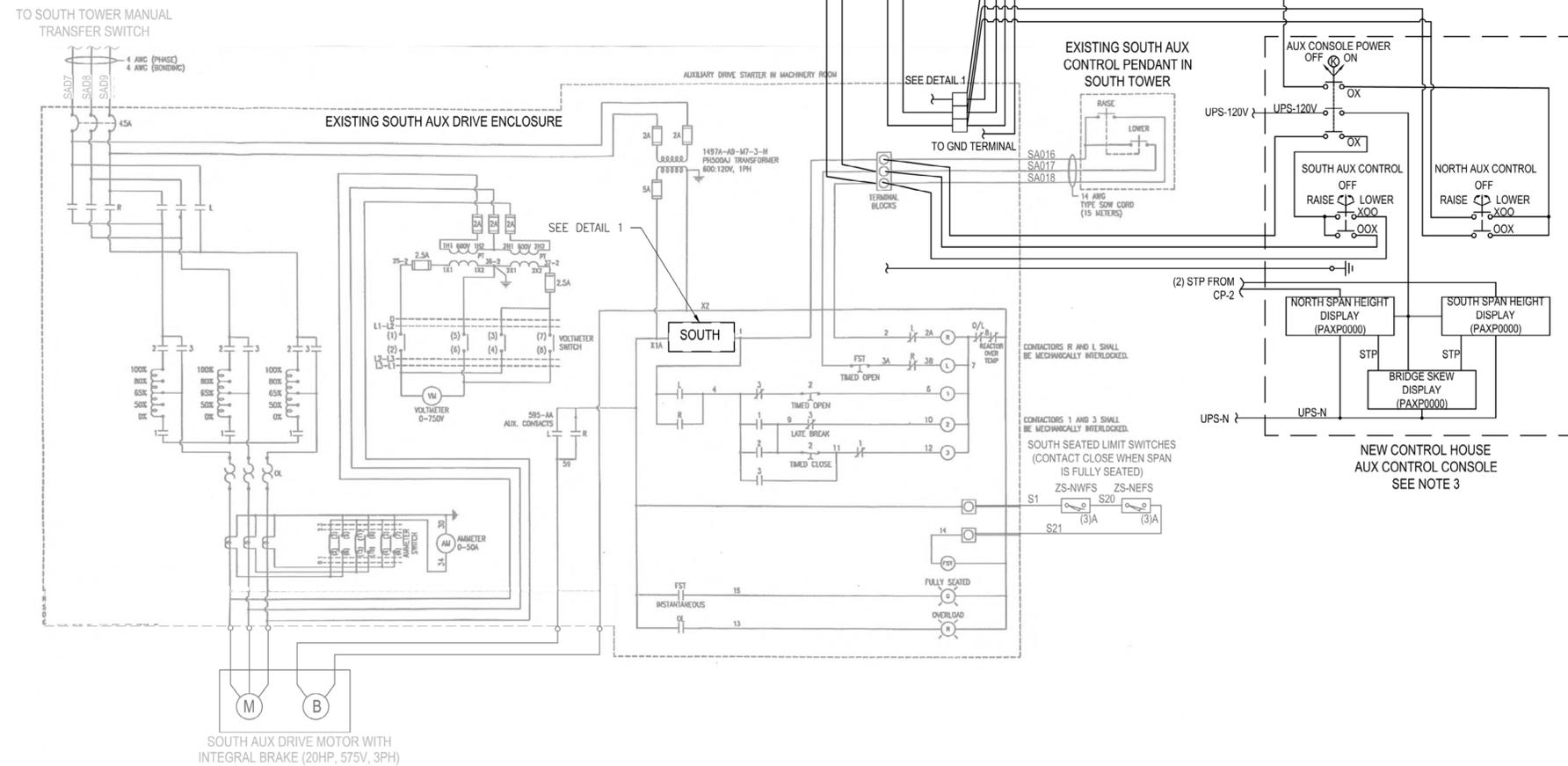
project no. / no. du projet: **R.109141.001**

drawing no. / dessin no.: **E04**

- NOTES:**
- THE NEW MULTI-TURN ABSOLUTE ENCODER SHOULD BE SICK MANUFACTURER, THEIR AFM60 PROFINET ABSOLUTE ENCODER OR ENGINEER APPROVED EQUAL. FOR REFERENCE PURPOSES, THE TOTAL NUMBER OF TURNS AT THE PINION SHAFT FROM BRIDGE SEATED TO FULL OPEN POSITION IS 34.4, ACTUAL TOTAL ENCODER TURNS SHALL BE VERIFIED IN FIELD.
 - THE NEW UPS SHALL BE HARDWIRED.
 - CONTRACTOR TO VERIFY THERE ARE AT LEAST 8 EXISTING SPARE #12AWG CONDUCTORS PRESENT IN THE EXISTING CONDUIT C019 PRIOR TO PULL ADDITIONAL CONDUCTORS. TOTAL CONDUCTORS REQUIRED FOR AUXILIARY DRIVE MODIFICATION SHALL BE BASED ON THE FINAL SYSTEM CONFIGURATION AND APPROVED SHOP DRAWINGS.



NORTH TOWER AUX CONTROL



SOUTH TOWER AUX CONTROL

NOTES:

1. SOUTH TOWER AUX DRIVE CONTROL PENDANT IN NORTH TOWER AND NORTH TOWER AUX DRIVE CONTROL PENDANT IN SOUTH TOWER WERE INSTALLED BUT NEVER PLACED IN SERVICE. CONTRACTOR TO VERIFY THE WIRING AND RECONNECT THESE PENDANTS TO ENABLE THE REMOTE CONTROL AS DESCRIBED.
2. REFER TO PANATROL BRIDGE CONTROL AS-BUILT DRAWINGS FOR THE LIMIT SWITCHES AND RELAY CONTACT NUMBERS SHOWN ON THIS DRAWING.
3. AUX CONTROL WIRES IN THE AERIAL CABLES SHOULD BE CONFIGURED AS REDUNDANT FOR EAST AERIAL AND WEST AERIAL CABLES AND BE CONNECTED TO THE AERIAL CABLE SELECTOR SWITCHES LOCATED IN CP-3 AND CP-4.
4. SPAN HEIGHT AND SKEW DISPLAY SHALL BE RED LION PANEL METER PAXP0000 OR ENGINEER APPROVED EQUIVALENT.
5. SEE DWG E06 FOR AUX CONTROL CONSOLE DETAILS.

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project title / titre du projet
HAMILTON BURLINGTON CANAL VERTICAL LIFT BRIDGE
SKEW CONTROL AND ELECTRICAL UPGRADES

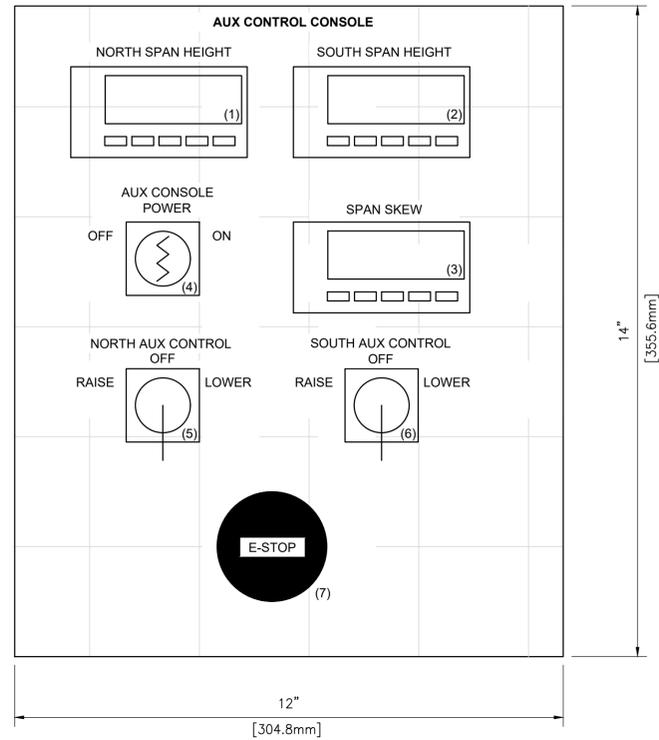
drawing title / titre du dessin
AUXILIARY DRIVE CONTROL MODIFICATION

drawn by / dessiné par: LQX
 designed by / conçu par: LQX
 approved by / approuvé par: GTR

project date / date du projet: 2020-05-19

project no. / no. du projet: R.109141.001

drawing no. / dessin no.: E05



AUXILIARY CONTROL CONSOLE
(12"X14"X6" OR 304.8mmX355.6mmX406.4mm)

NOTES:

- AUX CONTROL CONSOLE SHALL BE OF NEMA 4X ENCLOSURE WITH DIMENSIONS OF 12"X14"X6" OR LARGER.

AUX CONTROL CONSOLE DEVICE SCHEDULE		
ITEM NO	DEVICE	ENGRAVING
1	REDLION PANEL METER	NORTH SPAN HEIGHT
2	REDLION PANEL METER	SOUTH SPAN HEIGHT
3	REDLION PANEL METER	SPAN SKEW
4	KEYED SWITCH (2-POSITION MAINTAINED)	AUX CONSOLE POWER (OFF-ON)
5	SELECTOR SWITCH (3-POSITION SPRING RETURN)	NORTH AUX CONTROL
6	SELECTOR SWITCH (3-POSITION SPRING RETURN)	SOUTH AUX CONTROL
7	PUSHBUTTON (PUSH TO MAINTAIN, MUSHROOM TYPE, WITH RED ILLUMINATED INDICATOR)	EMERGENCY STOP

BILL OF MATERIAL FOR NEW EQUIPMENT REQUIRED FOR SKEW CONTROL AND AUX DRIVE MODIFICATION		
ITEM NO	QUANTITY	EQUIPMENT NAMES
1	2	PTZ CCTV CAMERA (WIRED OR WIRELESS)
2	4	ABSOLUTE ENCODER
3	3	REDLION PANEL METER
4	3	ANALOG AND FIBER OPTIC CONVERTER
5	1	AUX DRIVE CONTROL CONSOLE (CONSOLE DEVICES AS INDICATED ABOVE)
6	2	UPS
7	1	INCLINOMETER



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project title
titre du projet

HAMILTON BURLINGTON CANAL VERTICAL LIFT BRIDGE ONTARIO

SKEW CONTROL AND ELECTRICAL UPGRADES

drawing title
titre du dessin

AUXILIARY DRIVE CONTROL CONSOLE DETAILS

drawn by
dessiné par

LQX

designed by
conçu par

LQX

approved by
approuvé par

GTR

bid
soumission

project manager
administrateur de projets

project date
date du projet

2020-05-19

project no.
no. du projet

R.109141.001

drawing no.
dessiné no.

E06



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C	drawing no. - where detailed dessin no. - où détaillé

project title
titre du projet
HAMILTON BURLINGTON CANAL VERTICAL LIFT BRIDGE ONTARIO
SKEW CONTROL AND ELECTRICAL UPGRADES

drawing title
titre du dessin
AUXILIARY DRIVE CONTROL CONSOLE MOUNTING DETAILS

drawn by
dessiné par
LQX

designed by
conçu par
LQX

approved by
approuvé par
GTR

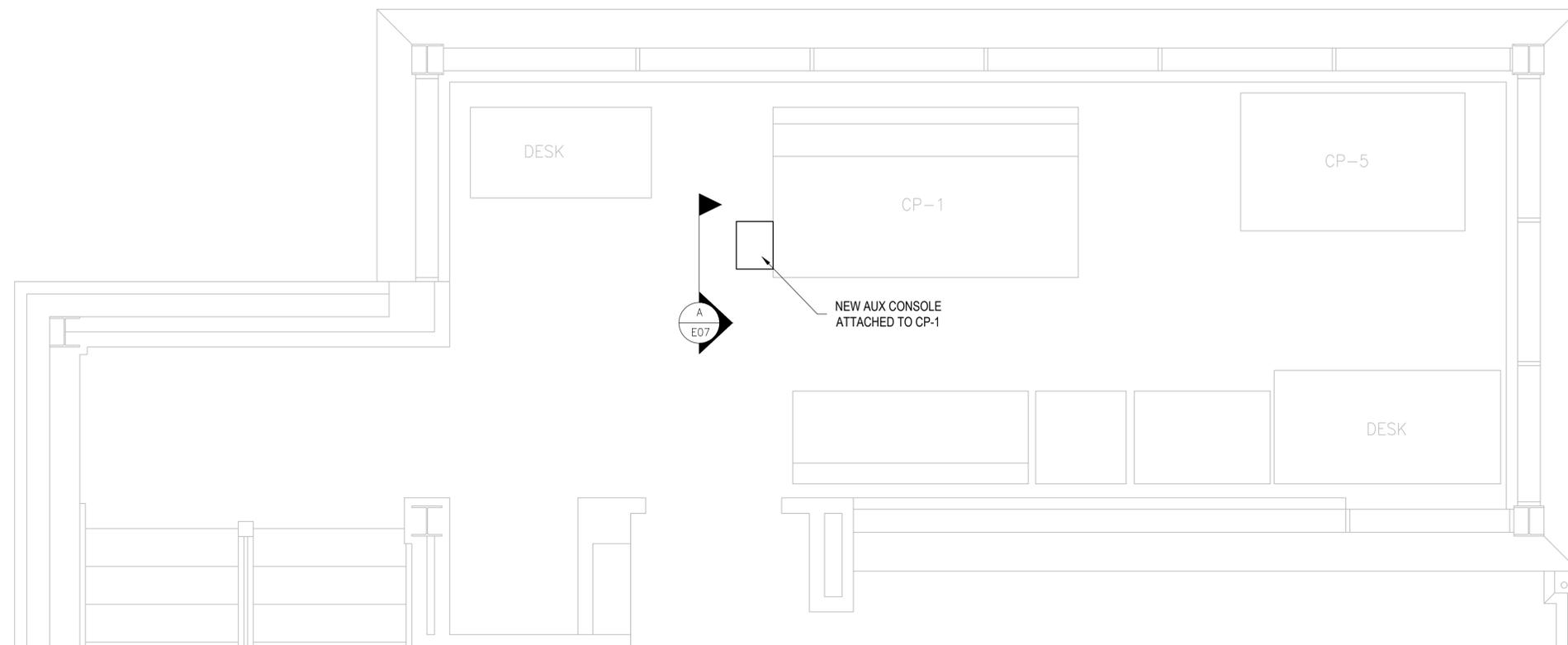
bid
soumission

project manager
administrateur de projets

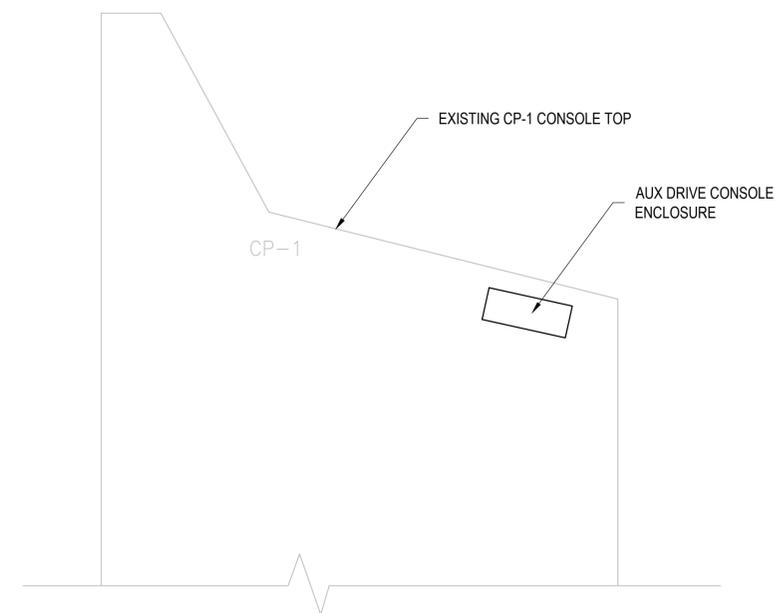
project date
date du projet
2020-05-19

project no.
no. du projet
R.109141.001

drawing no.
dessiné no.
E07



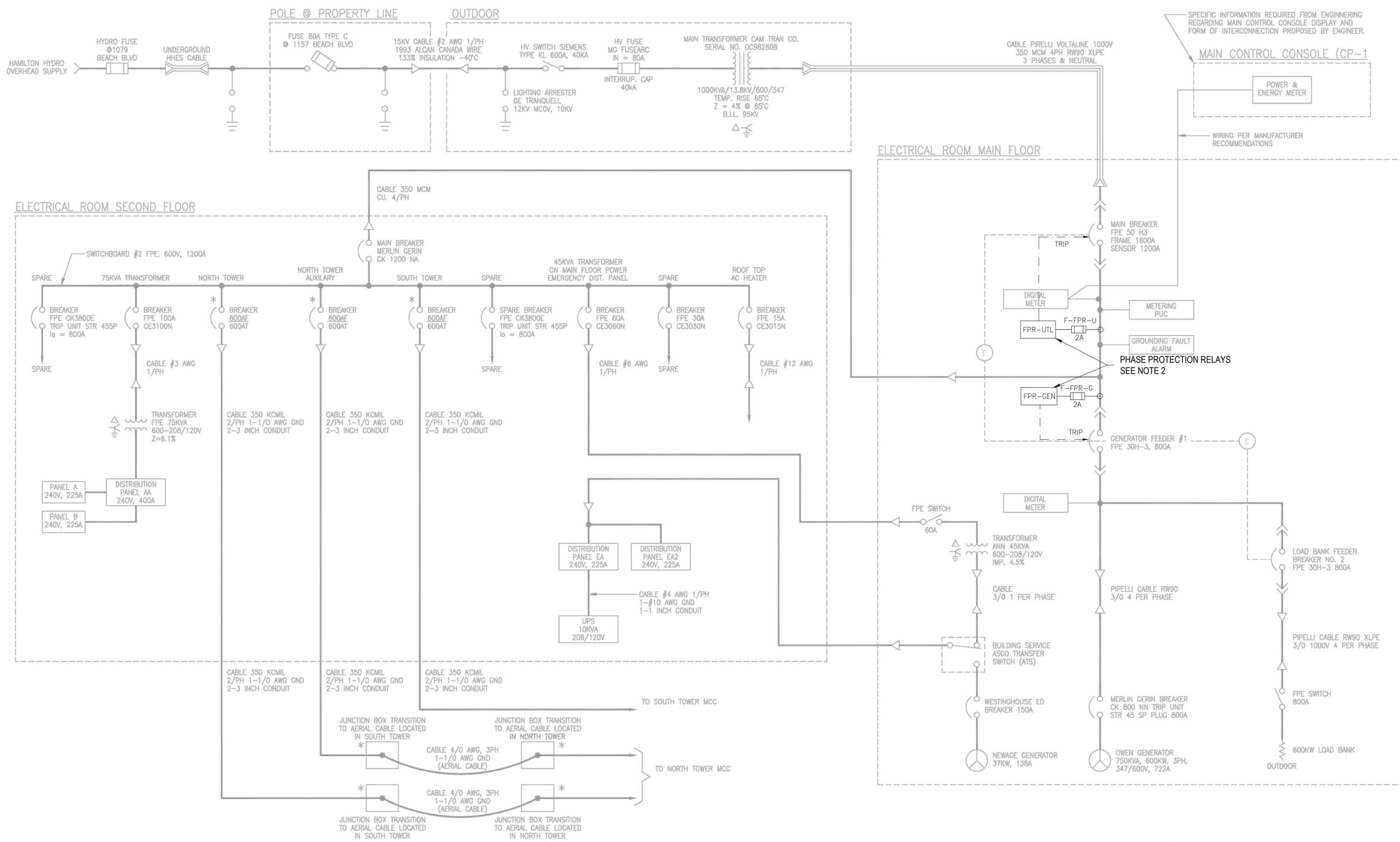
OPERATORS ROOM LAYOUT
SCALE: NTS



AUX CONTROL CONSOLE MOUNTING DETAILS
SCALE: NTS

NOTES:

1. AUX CONTROL CONSOLE SHALL BE OF NEMA 4X ENCLOSURE WITH DIMENSIONS (12"X14"X6").
2. AUX CONTROL CONSOLE TO BE IN THE SAME SLOPE AS THE CP-1 CONSOLE TOP. THE MOUNTING OF THE AUX CONSOLE SHALL NOT INTERFERE WITH THE CP-1 CONSOLE TOP OPENING AND DEVICE OPERATION.



UTILITY BREAKER AND GENERATOR BREAKER MODIFICATION

NOTES:

1. PROVIDE NEW PHASE PROTECTION RELAYS. THE RELAY(S) SHALL TRIP THE INCOMING MAIN AND GENERATOR BREAKERS FOR PHASE LOSS, PHASE FAILURE, PHASE REVERSAL, UNDER AND OVER FREQUENCY CONDITIONS.
2. PLEASE REFER TO DWG E09 FOR DETAILED MODIFICATION SCHEMATIC.

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project title / titre du projet
HAMILTON BURLINGTON CANAL VERTICAL LIFT BRIDGE ONTARIO
SKUEW CONTROL AND ELECTRICAL UPGRADES

UTILITY AND GENERATOR BREAKER MODIFICATION
 ONE-LINE DIAGRAM

drawn by / dessiné par
 LQX

designed by / conçu par
 LQX

approved by / approuvé par
 GTR

bid / soumission project manager / administrateur de projets

project date / date du projet
 2020-05-19

project no. / no. du projet
 R.109141.001

drawing no. / dessiné no.
 E08

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project title
titre du projet

HAMILTON ONTARIO
BURLINGTON CANAL
VERTICAL LIFT BRIDGE
SKUEW CONTROL AND ELECTRICAL UPGRADES

drawing title
dessin

SWITCHBOARD #1 SCHEMATIC MODIFICATION

drawn by
dessiné par **LQX**

designed by
conçu par **LQX**

approved by
approuvé par **GTR**

bid soumission project manager administrateur de projets

project date
date du projet **2020-05-19**

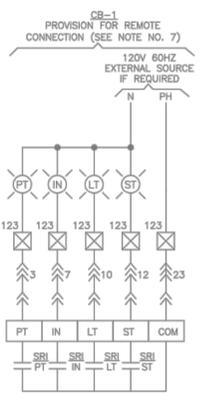
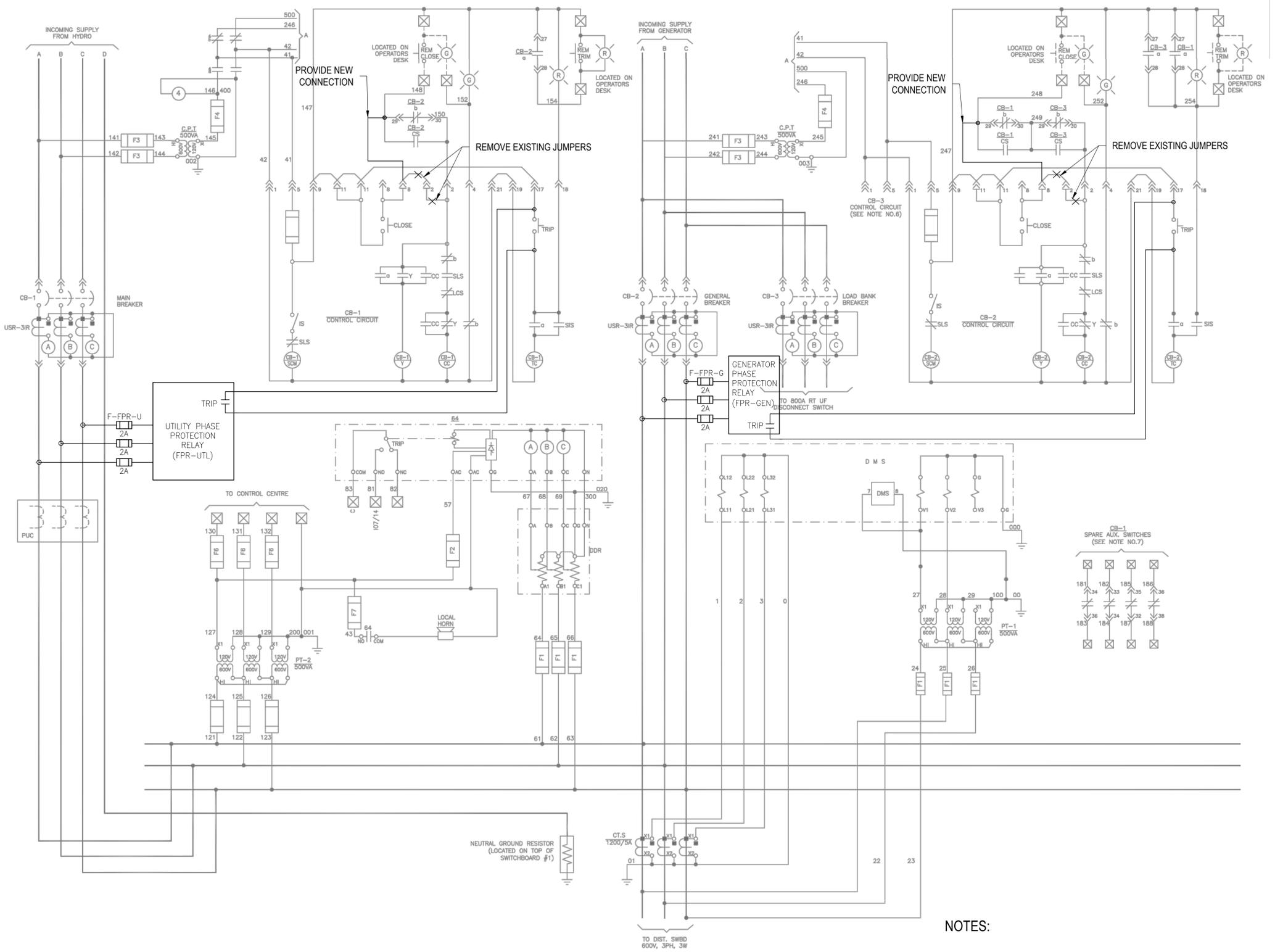
project no.
no. du projet **R.109141.001**

drawing no.
dessin no. **E09**

ACB DRAWOUT CONTACT	ENGAGED IN OPERATING POSITION ONLY
	ENGAGED IN TEST POSITION ONLY
	ENGAGED IN OPERATING AND TEST POSITIONS

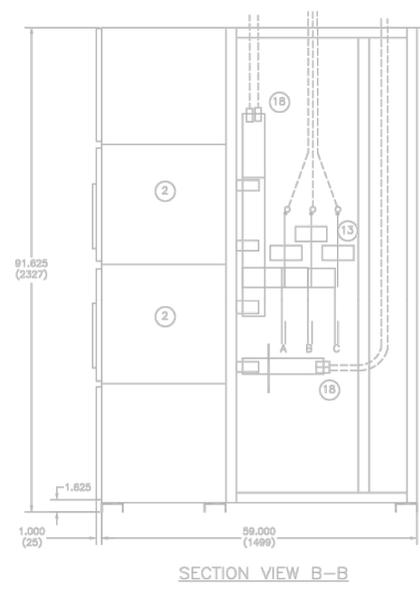
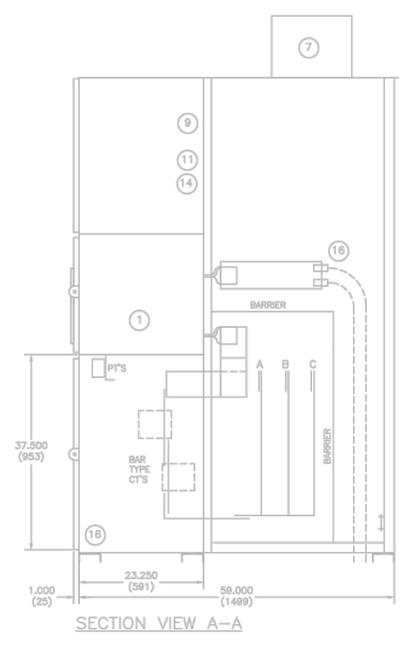
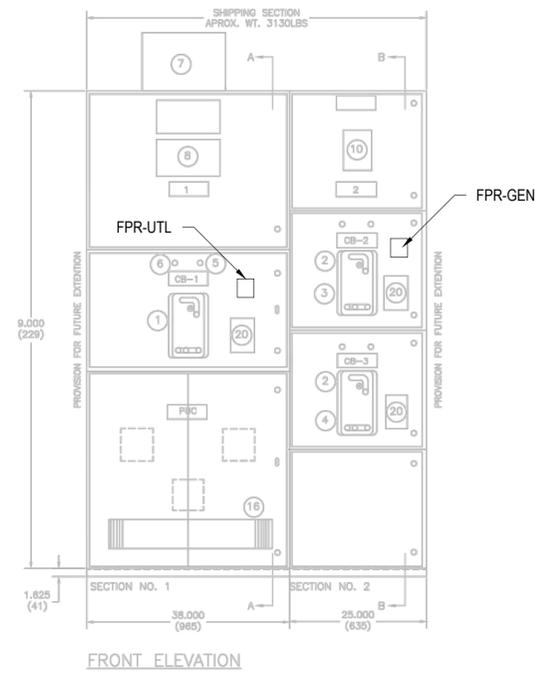
LEGEND

- 52 AIR CIRCUIT BREAKER
- USR31R SOLID STATE OVERCURRENT RELAY WITH LONG TIME SHORT TIME AND INSTANTANEOUS PROTECTION WITH LOCAL AND REMOTE INDICATION
- a NORMALLY OPEN AUX. SWITCH
- b NORMALLY CLOSED AUX. SWITCH
- IS ISOLATING SWITCH
- SLS SPRING LIMIT SWITCH
- LCS LATCH CHECKING SWITCH
- SIS SAFETY INTERLOCK SWITCH
- Y ANTI PUMP RELAY
- CC CLOSING COIL
- SCM SPRING CHARGING MOTOR
- TC TRIP COIL
- CT CURRENT TRANSFORMER
- PT POTENTIAL TRANSFORMER
- CPT CONTROL POWER TRANSFORMER
- 64 GDD MKII GROUND ALARM RELAY
- DMS DIGITAL METERING SYSTEM
- DDR DDR2 ALARM RESISTOR UNIT
- G GREEN INDICATING LIGHT
- R RED INDICATING LIGHT
- F1 PRIMARY POTENTIAL FUSE 600V HRC1A FPL TYPE MCL-1
- F2 SECONDARY POTENTIAL FUSE 120V 0.11A FPL TYPE NRN-1
- F3 PRIMARY CONTROL FUSE 600V HRC 10A FPL TYPE MCL-10
- F4 SECONDARY CONTROL FUSE 120V 0.110A FPL TYPE NRN-10
- F5 PRIMARY POTENTIAL FUSE 600V HRC 5A FPL TYPE MCL-5
- F6 SECONDARY POTENTIAL FUSE 120V 0.15A FPL TYPE NRN-5
- F7 SECONDARY POTENTIAL FUSE 120V 0.15A FPL TYPE NRN-3
- CS CELL SWITCH



- NOTES:**
1. THE EXISTING SWITCHBOARD WIRING SHALL BE FIELD VERIFIED PRIOR TO THE MODIFICATION.
 2. ENTIRE SWITCHBOARD SHALL BE DE-ENERGIZED PRIOR TO THE WORK.
 3. THE BREAKER CONTROL TO BE MODIFIED AS SHOWN TO ENABLE THE ELECTRICAL INTERLOCK FOR BOTH LOCAL AND REMOTE CLOSE OF UTILITY AND GENERATOR BREAKERS.

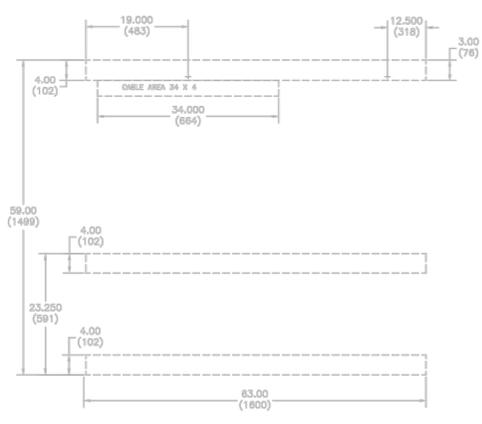
SWITCHBOARD #1 SCHEMATIC



FRONT ELEVATION

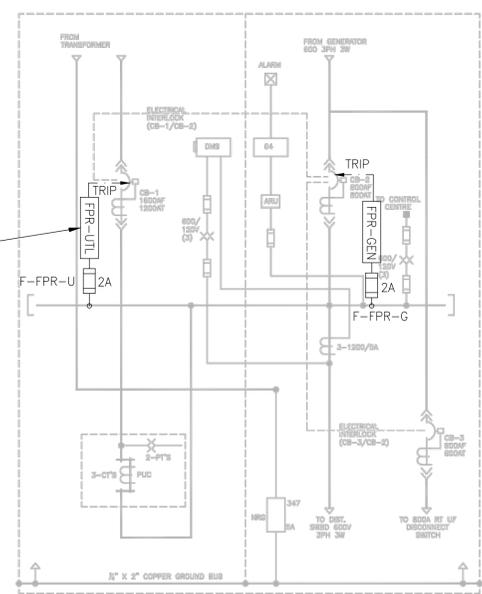
SECTION VIEW A-A

SECTION VIEW B-B



BASE PLAN

PHASE PROTECTION RELAY
 SEE NOTE 1



SWITCHBOARD #1 ONE-LINE DIAGRAM

NAMEPLATE SCHEDULE				
ITEM	QTY.	WITE LAMICOID NAMEPLATES WITH BLACK LETTERS	PLATE SIZE	LETTER SIZE
S-W	1	SWITCHBOARD 600V 3 PHASE 3 WIRE	2" X 8"	3/8"
CB-1	1	MAIN BREAKER	1" X 4"	1/4"
CB-2	1	FEEDER #1 (GENERATOR 600KW)	1" X 4"	1/4"
CB-3	1	FEEDER #2 (LOAD BANK 600KW)	1" X 4"	1/4"
1	1	DIGITAL METERING SYSTEM	1" X 4"	1/4"
2	1	GROUND ALARM RELAY	1" X 4"	1/4"
PUC	1	POWER UTILITY METERING	1" X 4"	1/4"

NAMEPLATES TO BE FASTENED WITH SELF TAPPING SCREWS

NOTES:

1. PROVIDE NEW PHASE PROTECTION RELAYS. THE RELAY(S) SHALL TRIP THE INCOMING MAIN AND GENERATOR BREAKERS FOR PHASE LOSS, PHASE FAILURE, PHASE REVERSAL, UNDER AND OVER FREQUENCY CONDITIONS.

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project title
 titre du projet
HAMILTON ONTARIO
BURLINGTON CANAL
VERTICAL LIFT BRIDGE
SKUEW CONTROL AND
ELECTRICAL UPGRADES

drawing title
 titre du dessin
UTILITY AND GENERATOR
BREAKER MODIFICATION
SWITCHBOARD #1 DETAILS

drawn by
 dessiné par **LQX**

designed by
 conçu par **LQX**

approved by
 approuvé par **GTR**

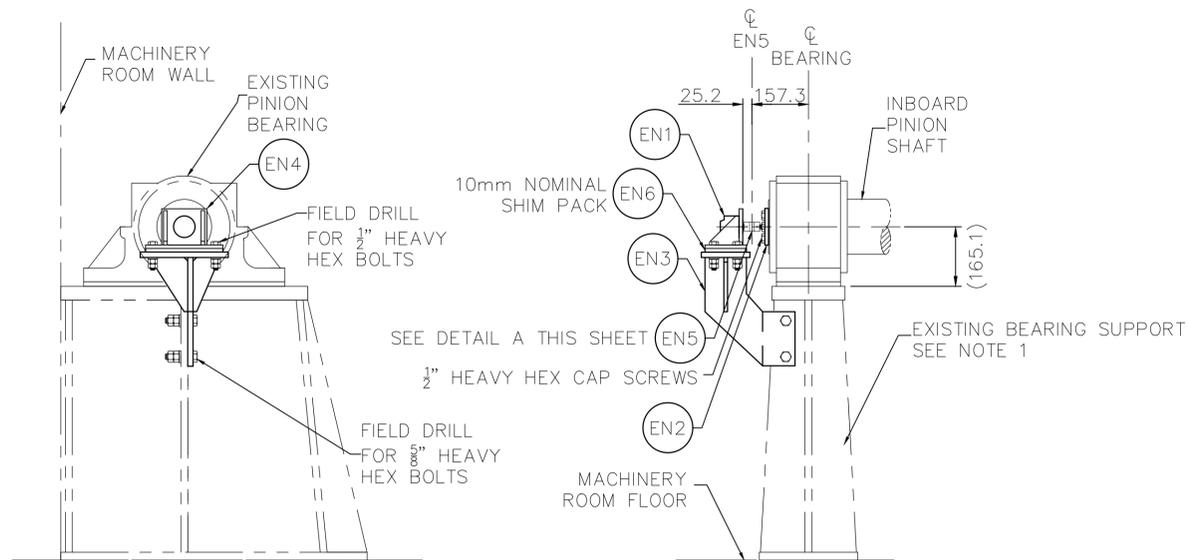
bid
 soumission

project manager
 administrateur de projets

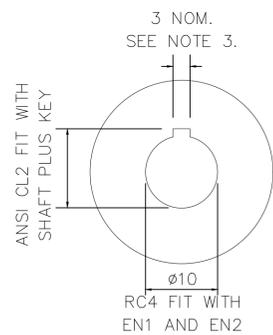
project date
 date du projet **2020-05-19**

project no.
 no. du projet **R.109141.001**

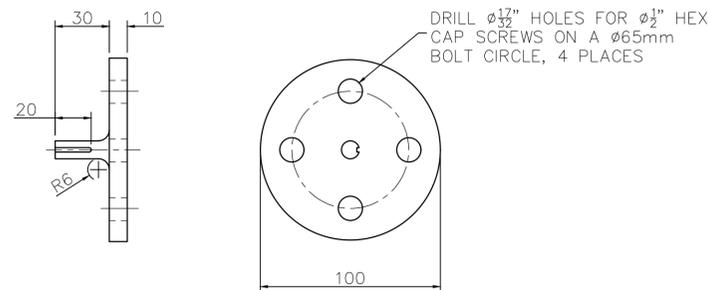
drawing no.
 dessiné no. **E10**



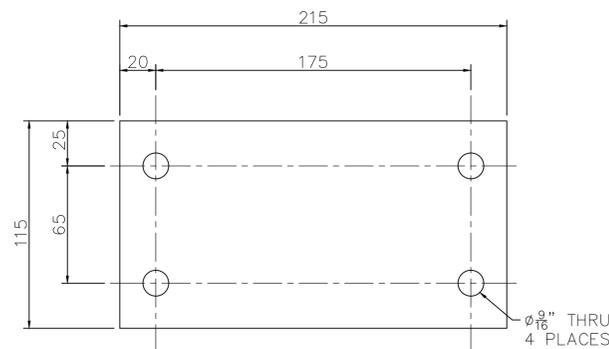
A
E03
ENCODER AND SUPPORT ASSEMBLY
ELEVATION VIEW
TYPICAL, TWO LOCATIONS PER TOWER, FOUR LOCATIONS TOTAL
AB-ENC-N2 SHOWN, OTHERS SIMILAR
SCALE: 1:10



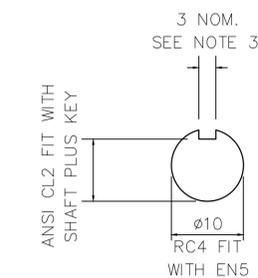
A
COUPLING HUB DETAIL
SCALE: 2:1



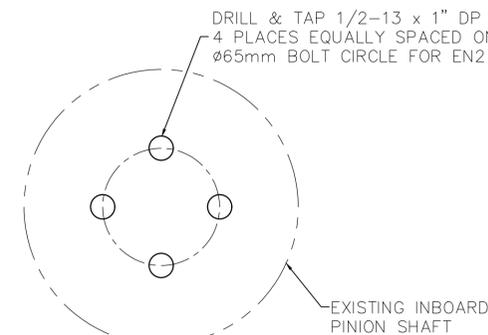
EN2
SHAFT ADAPTOR
SCALE: 1:2
MATERIAL: CSA G40.21 GRADE 300W
PROVIDE 3.2 MICRON FINISH U.O.N.
SEE DETAIL B AND C THIS SHEET



EN6
SHIM PACK
SCALE: 1:2
MATERIAL: STAINLESS STEEL
QUANTITY PER LOCATION:
1 - 10mm THICK
1 - 5mm THICK
2 - 1mm THICK
4 - 0.5mm THICK
4 - 0.25mm THICK
3 - 0.1mm THICK



B
SHAFT ADAPTOR DETAIL
SCALE: 2:1



C
PINION SHAFT DETAIL
SCALE: 1:2

BILL OF MATERIALS			
MARK NO.	QTY	COMPONENT	DESCRIPTION
EN1	4	ENCODER	SICK AFM60 PROFINET ABSOLUTE ENCODER (WITH SOLID SHAFT, FACE MOUNT FLANGE, Ø10mm, LENGTH 19mm)
EN2	4	SHAFT ADAPTOR	MACHINE FROM CSA G40.21 GRADE 300W
EN3	4	ENCODER SUPPORT	STEEL PLATE WELDMENT, CSA G40.21 GRADE 300W
EN4	4	ENCODER MOUNT	STEEL PLATE WELDMENT, CSA G40.21 GRADE 300W
EN5	4	COUPLING	LOVEJOY L050 JAW COUPLING WITH NBR SPIDER OR EQUAL
EN6	4	SHIM PACK	STAINLESS STEEL

NOTES

- CONTRACTOR TO HAND DRESS EXISTING BEARING SUPPORT STIFFENER SURFACE TO PROVIDE SUITABLE MOUNTING SURFACE.
- LOCATION OF HOLES IN ENCODER SUPPORT AND EXISTING BEARING SUPPORT STIFFENER TO BE DETERMINED IN THE FIELD. THE FOLLOWING PROCEDURE IS RECOMMENDED:
 - INSTALL THE SHAFT ADAPTOR ON THE PINION SHAFT.
 - SECURE NEW ENCODER SUPPORT TO THE EXISTING BEARING SUPPORT STIFFENER WITH BRIDGE CLAMPS TO THE APPROXIMATE FINAL LOCATION.
 - INSTALL ONE COUPLING HUB TO THE SHAFT ADAPTOR.
 - INSTALL THE ENCODER TO THE ENCODER MOUNT.
 - INSTALL ONE COUPLING HUB TO THE ENCODER SHAFT.
 - CLAMP THE ENCODER MOUNT ONTO THE ENCODER SUPPORT TO THE APPROXIMATE FINAL LOCATION. ADJUST THE LOCATION OF THE ENCODER SUPPORT AS NEEDED TO ACHIEVE PROPER COUPLING ALIGNMENT.
- MARK THE HOLES ON THE ENCODER SUPPORT TOP PLATE USING THE ENCODER MOUNT AS A TEMPLATE.
- REMOVE THE ENCODER MOUNT, DRILL THE ENCODER SUPPORT TOP PLATE.
- INSTALL THE ENCODER MOUNT WITH FINAL MOUNTING BOLTS AND COUPLING WITH COUPLING INSERT.
- ADJUST THE SHIMS AND THE LOCATION OF THE ENCODER SUPPORT AS NECESSARY IN ORDER TO PROPERLY ALIGN THE COUPLING PER THE MANUFACTURER'S RECOMMENDATIONS.
- DRILL FOR, AND INSTALL, THE ENCODER SUPPORT LOWER MOUNTING BOLTS BEFORE REMOVAL OF TEMPORARY BRIDGE CLAMPS.
- CONFIRM PROPER ALIGNMENT OF COUPLING AND PROVIDE SHIM ADJUSTMENTS IF NECESSARY.
- KEYS AND SET SCREWS TO BE PROVIDED WITH THE COUPLING. PROVIDE ANSI CL2 FIT AT ALL KEYS AND KEYWAYS.
- ALL BOLTS TO BE HIGH STRENGTH HEAVY HEX ASTM F3125 GRADE A325 BOLTS WITH HEAVY HEX ASTM A563 DOUBLE NUTS, AND ASTM F436 WASHERS.
- THE ENCODER MOUNTING FASTENERS SHALL BE TYPE 316 STAINLESS STEEL HEX HEAD SCREWS WITH TYPE 316 STAINLESS STEEL SPLIT LOCK WASHERS.
- ALL DIMENSIONS ARE FINAL DIMENSIONS AFTER MACHINING. ADD STOCK AS REQUIRED.



revision	description	date
1	SIGNED AND SEALED	10/19/2020
0	ISSUED FOR TENDER	5/19/2020

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project title / titre du projet
HAMILTON BURLINGTON CANAL VERTICAL LIFT BRIDGE ONTARIO
SKEW CONTROL AND ELECTRICAL UPGRADES

drawing title / titre du dessin
ABSOLUTE ENCODER INSTALLATION ASSEMBLY AND DETAILS

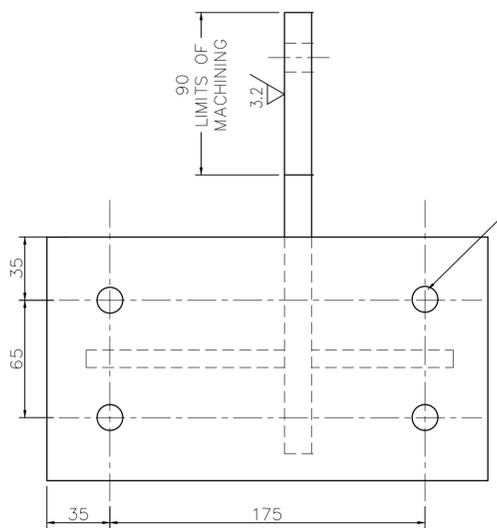
drawn by / dessiné par: **ABM**
designed by / conçu par: **ABM**
approved by / approuvé par: **RGG**

bid / soumission: _____ project manager / administrateur de projets: _____

project date / date du projet: **2020-05-19**

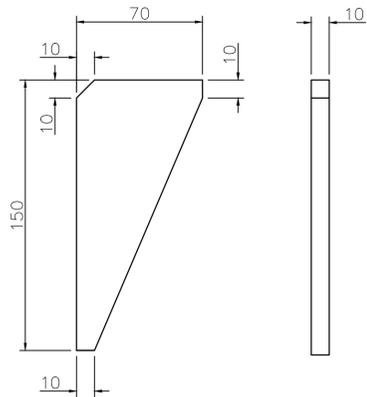
project no. / no. du projet: **R.109141.001**

drawing no. / dessin no.: **M01**

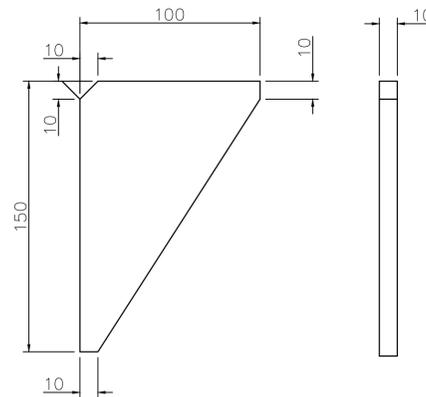


FIELD DRILL $\frac{17}{32}$ " HOLES FOR $\frac{1}{2}$ " BOLTS USING EN4 AS A TEMPLATE 4 PLACES

A ENCODER SUPPORT STIFFENER "A"
SCALE: 1:2
MATERIAL: CSA G40.21 GRADE 300W

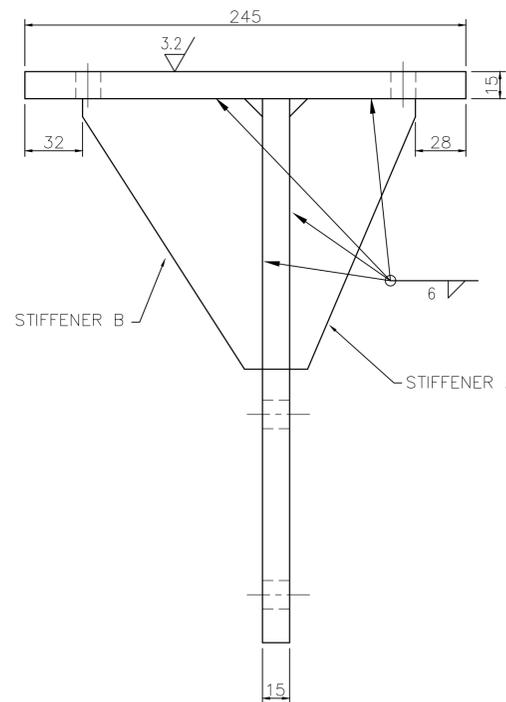


B ENCODER SUPPORT STIFFENER "B"
SCALE: 1:2
MATERIAL: CSA G40.21 GRADE 300W

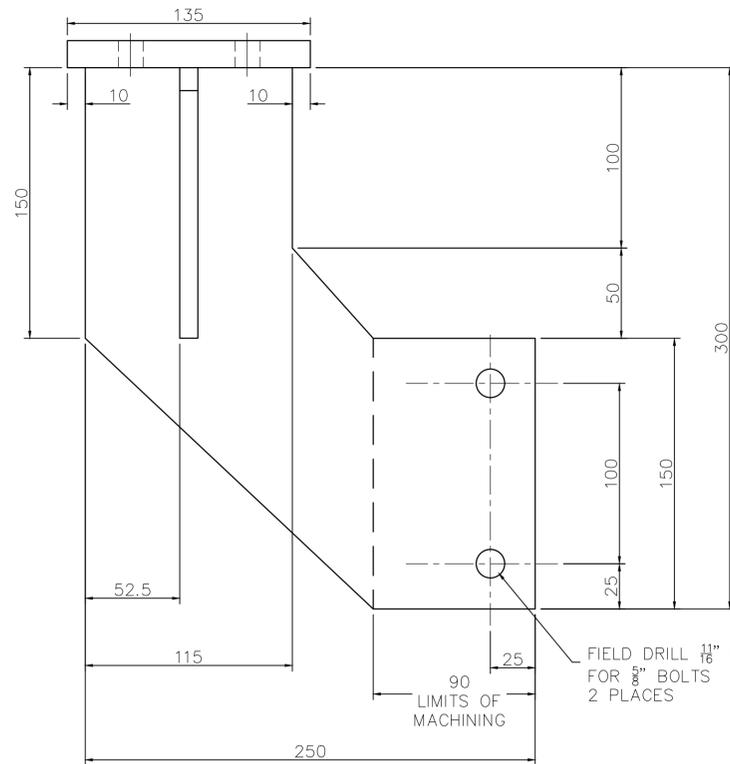


NOTES

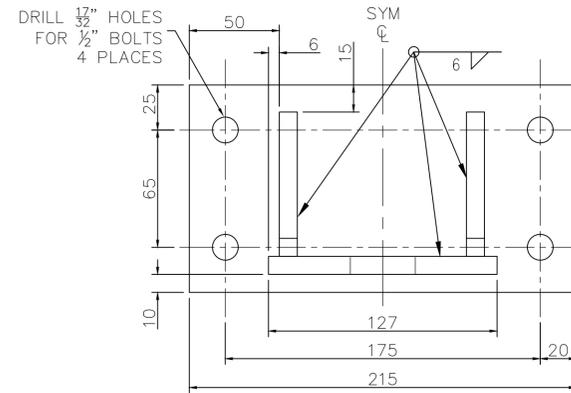
1. SEE M1 FOR GENERAL NOTES.
2. PERFORM WELDING PER CSA W59.
3. ALL MACHINING WORK TO BE PERFORMED FOLLOWING WELDING AND HEAT TREATMENT.
4. ALL DIMENSIONS ARE FINAL DIMENSIONS AFTER MACHINING. ADD STOCK AS REQUIRED.



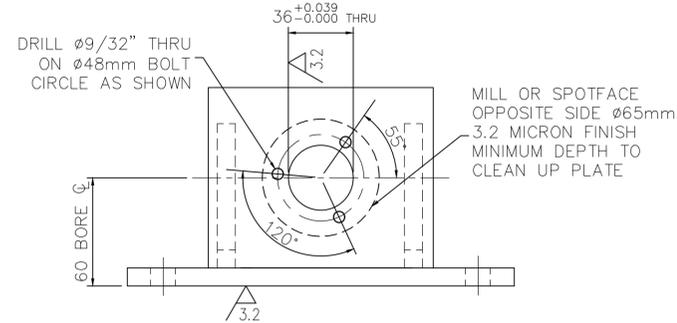
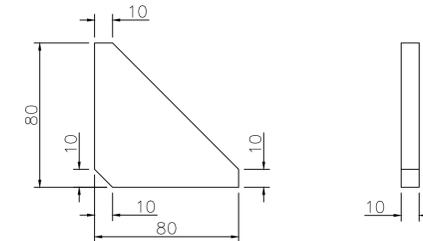
EN3 ENCODER SUPPORT
SCALE: 1:2
MATERIAL: CSA G40.21 GRADE 300W



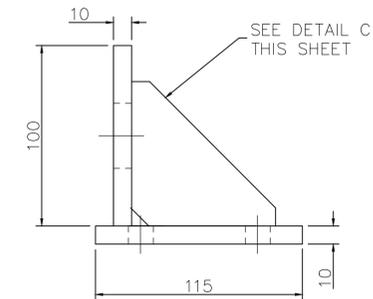
FIELD DRILL $\frac{11}{16}$ " HOLES FOR $\frac{5}{8}$ " BOLTS 2 PLACES



C ENCODER MOUNT STIFFENER
SCALE: 1:2
MATERIAL: CSA G40.21 GRADE 300W



EN4 ENCODER MOUNT
SCALE: 1:2
MATERIAL: CSA G40.21 GRADE 300W



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HAMILTON BURLINGTON CANAL VERTICAL LIFT BRIDGE ONTARIO
SKUEW CONTROL AND ELECTRICAL UPGRADES

drawing title / titre du dessin
ABSOLUTE ENCODER INSTALLATION DETAILS

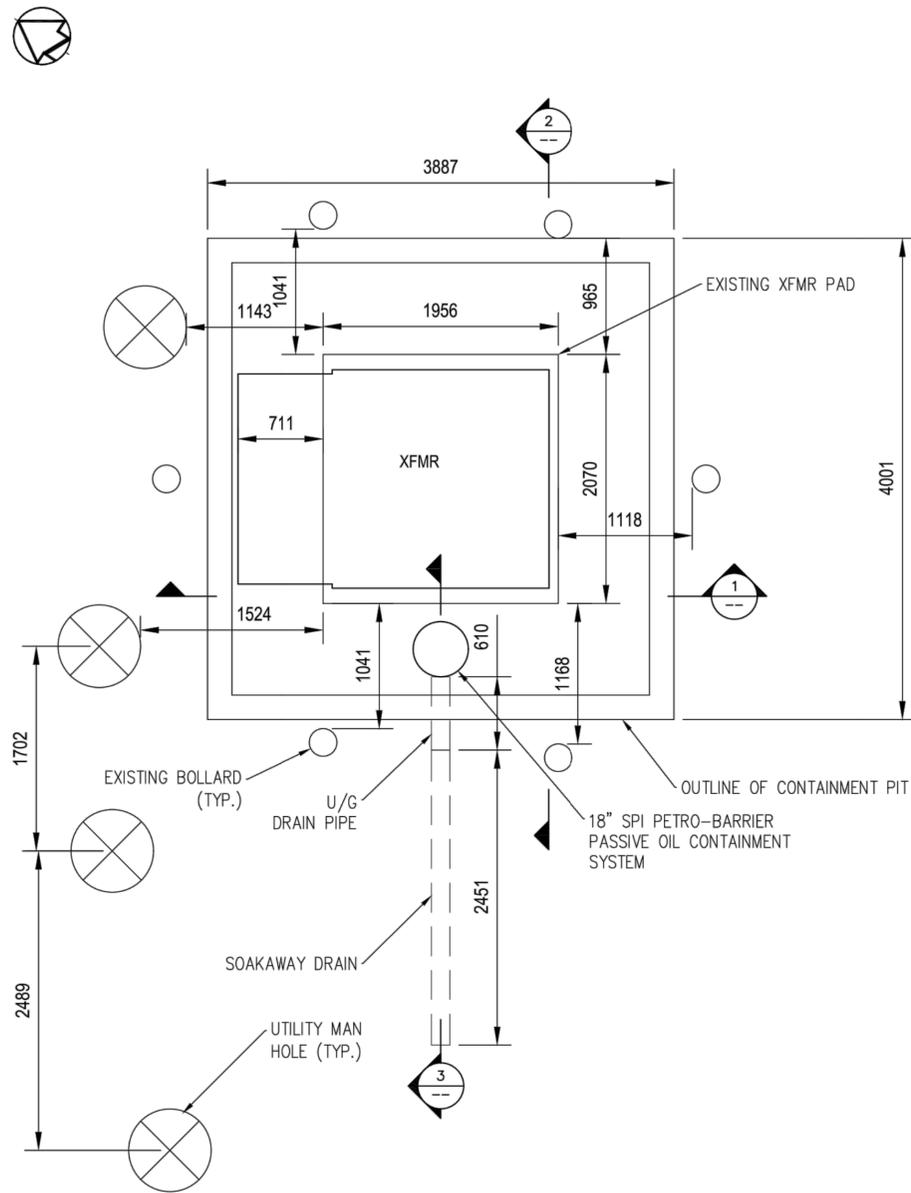
drawn by / dessiné par **ABM**
designed by / conçu par **ABM**
approved by / approuvé par **RGG**

bid / soumission
project manager / administrateur de projets

project date / date du projet **2020-05-19**

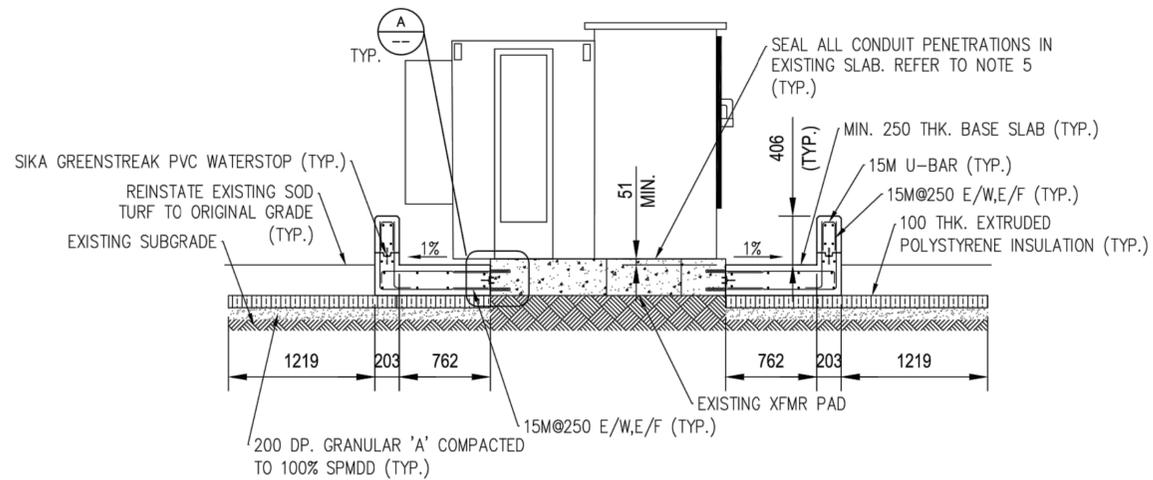
project no. / no. du projet **R.109141.001**

drawing no. / dessin no. **M02**

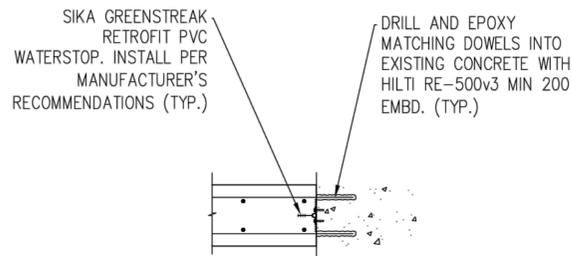


PLAN
1:30

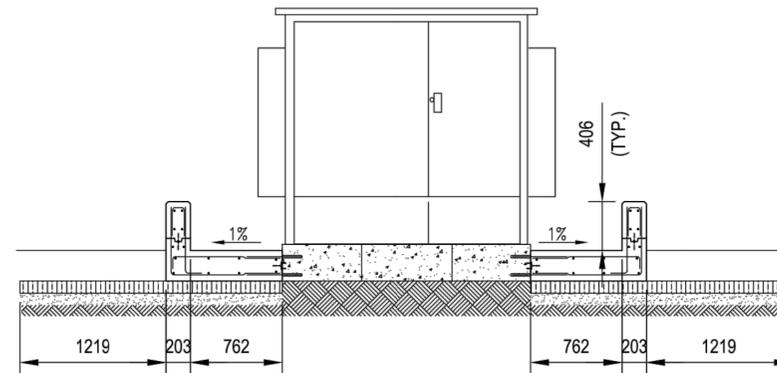
- NOTES:
- CONCRETE CONSTRUCTION IS TO CONFORM TO THE FOLLOWING CSA STANDARDS, INCLUDING THE LATEST REVISIONS:
 - CSA-A23.1 CONCRETE MATERIALS AND METHODS OF CONSTRUCTION
 - CSA-A23.2 TEST METHODS AND STANDARD PRACTICE FOR CONCRETE
 - CSA-A23.3 CODE FOR THE DESIGN OF CONCRETE STRUCTURES
 - CSA-G30.18 CARBON STEEL BARS FOR CONCRETE REINFORCEMENT
 - CONCRETE SHALL CONFORM TO EXPOSURE CLASS C-1
 - PROVIDE MINIMUM CONCRETE COVER:
 - 40 mm FOR EXTERIOR FORMED SURFACES
 - 75 mm FOR CONCRETE CAST AGAINST EARTH
 - SLOPE CONTAINMENT PIT BASE SLAB TO PROVIDE POSITIVE DRAINAGE TO PETRO-BARRIER PASSIVE OIL-CONTAINMENT SYSTEM.
 - THE INSTALLATION OF THE PRE-FAB PETRO-BARRIER SHALL BE PER MANUFACTURER'S RECOMMENDATIONS.
 - ALL PENETRATIONS/HOLES/CRACKS ON THE EXISTING TRANSFORMER CONCRETE PAD SHALL BE SEALED WITH FIRE RESISTANT WATERTIGHT SEALANT CONFORMING TO CAN/ULC S115.
 - ALL UNDERGROUND UTILITY AND DRAIN SYSTEM SHALL REMAIN UNDISTURBED. ALL PROJECT CONCERNED UNDERGROUND UTILITY SHALL BE IDENTIFIED ON THE SHOP DRAWINGS AND BE MARKED PRIOR TO THE EXCAVATION.
 - EXISTING BOLLARDS TO BE REMOVED DURING EARTH WORK IF NECESSARY AND BE REINSTATED AFTER CONSTRUCTION.



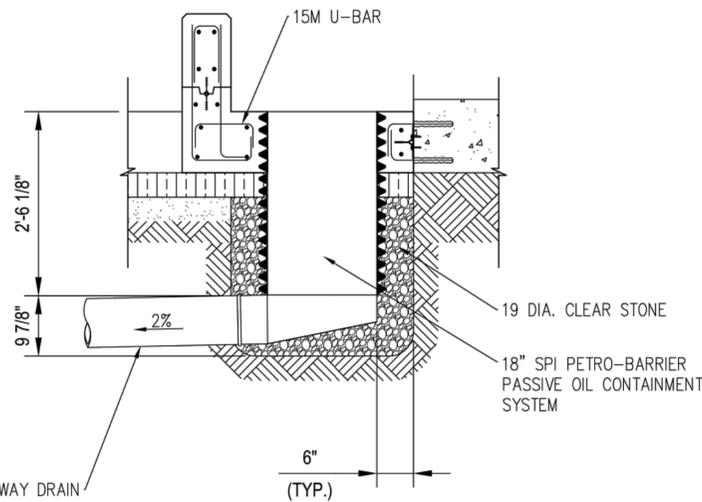
SECTION 1
1:30



DETAIL A
1:15

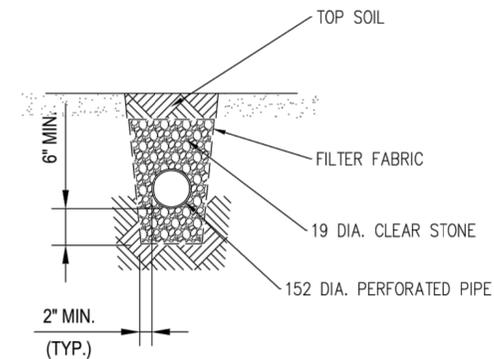


SECTION 2
1:30



CONNECT TO SOAKAWAY DRAIN
REFER TO SECTION 4 FOR DETAILS

SECTION 3
1:15



SECTION 4
1:15

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titre du projet
HAMILTON BURLINGTON CANAL VERTICAL LIFT BRIDGE ONTARIO
SKUEW CONTROL AND ELECTRICAL UPGRADES

drawing title
titre du dessin
TRANSFORMER OIL CONTAINMENT PLAN AND DETAILS

drawn by
dessiné par
A. LUK

designed by
conc par
A. LUK

approved by
approuvé par
J. AJRAB

bid soumission
project manager
administrateur de projets

project date
date du projet
2020-05-19

project no.
no. du projet
R.109141.001

drawing no.
dessiné no.
S01