

Exhibit 2  
Site Plans

ENBRIDGE PIPELINES INC.  
1409 HAMMOND AVENUE  
SUPERIOR, WI 54880  
USA



LINE 5 STRAITS ANCHOR MONITORING  
BOIS BLANC ISLAND (MI) SITE  
AFE 20018380  
CIVIL/STRUCTURAL/ELECTRICAL  
ISSUED FOR CONSTRUCTION  
ENBRIDGE PROJECT MANAGER: EB SOWA  
LHB PROJECT MANAGER: BRIAN SANTORI  
CWP NUMBER  
LHB PROJECT NUMBER 200433

AFE: 20018380  
CWP NUMBER

LINE 5 STRAITS ANCHOR MONITORING  
BOIS BLANC ISLAND (MI) SITE

ISSUED FOR CONSTRUCTION  
CIVIL/STRUCTURAL/ELECTRICAL

SHT	DRAWING NUMBER	REV	DESCRIPTION	ISSUED FOR	ISSUED DATE	*
GENERAL						
1	COVER SHEET	0.0	COVER SHEET	CONSTRUCTION	2021/09/23	*
2	INDEX SHEET 1	0.0	INDEX SHEET 1	CONSTRUCTION	2021/09/23	*
3	TRACKING SHEET	0.0	TRACKING SHEET	CONSTRUCTION	2021/09/23	*
CIVIL						
4	D-5-1-0-104317-10033	0.0	BOIS BLANC ISLAND TOWER (M3) SITE NOTES & LEGENDS	CONSTRUCTION	2021/09/23	**
5	D-5-1-21-104318-10033	0.A	BOIS BLANC ISLAND TOWER (M3) SITE VICINITY MAP	CONSTRUCTION	2021/09/23	*
6	D-5-1-21-104311-10033	0.0	BOIS BLANC ISLAND TOWER (M3) SITE EROSION CONTROL PLAN	CONSTRUCTION	2021/09/23	*
7	D-5-1-21-104319-10033	0.0	BOIS BLANC ISLAND TOWER (M3) SITE SITE PLAN	CONSTRUCTION	2021/09/23	*
8	D-5-1-21-104320-10033	0.0	BOIS BLANC ISLAND TOWER (M3) SITE GRADING PLAN	CONSTRUCTION	2021/09/23	*
9	D-5-1-21-104321-10033	0.0	BOIS BLANC ISLAND TOWER (M3) SITE CIVIL DETAILS	CONSTRUCTION	2021/09/23	*
10	D-5-1-21-104322-10033	0.B	BOIS BLANC ISLAND TOWER (M3) SITE FENCE DETAILS	CONSTRUCTION	2021/09/23	*
11	D-5-1-21-104323-10033	0.B	BOIS BLANC ISLAND TOWER (M3) SITE FENCE DETAILS	CONSTRUCTION	2021/09/23	*
12	D-5-1-21-104324-10033	0.A	BOIS BLANC ISLAND TOWER (M3) SITE SITE ELEVATION	CONSTRUCTION	2021/09/23	*
13	D-5-1-21-104324-10033	0.A	BOIS BLANC ISLAND TOWER (M3) SITE BORING LOGS	REFERENCE	2021/09/23	*
STRUCTURAL						
14	D-5-2-0-104325-10033	0.C	BOIS BLANC ISLAND TOWER (M3) SITE LINE 5 STRAITS MONITORING STRUCTURAL GENERAL NOTES	CONSTRUCTION	2021/09/23	**
15	D-5-2-0-104326-10033	0.C	BOIS BLANC ISLAND TOWER (M3) SITE LINE 5 STRAITS MONITORING STRUCTURAL PLOT PLAN	CONSTRUCTION	2021/09/23	**
16	D-5-2-1-104327-10033	0.C	BOIS BLANC ISLAND TOWER (M3) SITE LINE 5 120-FT CAMERA POLE FOUNDATION DETAILS	CONSTRUCTION	2021/09/23	**
17	D-5-2-1-104328-10033	0.C	BOIS BLANC ISLAND TOWER (M3) SITE LINE 5 FOUNDATION DETAILS	CONSTRUCTION	2021/09/23	**
18	D-5-2-20-104329-10033	0.0	BOIS BLANC ISLAND TOWER (M3) SITE LINE 5 120-FT CAMERA POLE STEEL DETAILS	CONSTRUCTION	2021/09/23	**
ELECTRICAL						
19	D-5-4-0-127864-10033	0.0	BOIS BLANC ISLAND TOWER (M3) SITE LINE 5 ELECTRICAL SCOPE OF WORK	CONSTRUCTION	2021/09/23	*
20	D-5-4-0-127865-10033	0.C	BOIS BLANC ISLAND TOWER (M3) SITE LINE 5 STRAITS MONITORING BLOCK DIAGRAM	CONSTRUCTION	2021/09/23	*
21	D-5-4-0-127866-10033	0.C	BOIS BLANC ISLAND TOWER (M3) SITE LINE 5 GENERATOR SCHEMATIC AND DISTRIBUTION PANEL	CONSTRUCTION	2021/09/23	*
22	D-5-4-0-127869-10033	0.A	BOIS BLANC ISLAND TOWER (M3) SITE LINE 5 STRAITS MONITORING INTERCONNECT	CONSTRUCTION	2021/09/23	**
23	D-5-4-0-127869-10033	0.A	BOIS BLANC ISLAND TOWER (M3) SITE LINE 5 STRAITS MONITORING INTERCONNECT	CONSTRUCTION	2021/09/23	**
24	D-5-4-0-127869-10033	0.C	BOIS BLANC ISLAND TOWER (M3) SITE LINE 5 CABLE SPECIFICATIONS	CONSTRUCTION	2021/09/23	**
25	D-5-4-0-127869-10033	0.C	BOIS BLANC ISLAND TOWER (M3) SITE LINE 5 STRAITS MONITORING CABLE SCHEDULE	CONSTRUCTION	2021/09/23	**
26	D-5-4-20-127869-10033	0.C	BOIS BLANC ISLAND TOWER (M3) SITE LINE 5 840-VA/AC-1 & 840-AC-1 PANEL SCHEDULES	CONSTRUCTION	2021/09/23	**
27	D-5-4-24-127869-10033	0.C	BOIS BLANC ISLAND TOWER (M3) SITE LINE 5 GROUNDING DETAILS	CONSTRUCTION	2021/09/23	**
28	D-5-4-6-127867-10033	0.C	BOIS BLANC ISLAND TOWER (M3) SITE LINE 5 SKID BUILDING EQUIPMENT LAYOUT	CONSTRUCTION	2021/09/23	*

CIVIL ENGINEER  
LHB, INC  
ROBERT LISI



STRUCTURAL ENGINEER  
LHB, INC  
ALAN VORDERBRUGGEN



NOTE  
1 \* ASTERISK (\*) COLUMN DENOTES DRAWING HAS BEEN REVISED WITH THE RELEASE.

ISSUED FOR CONSTRUCTION

ELECTRICAL ENGINEER  
LHB, INC  
TREVOR DUPRAS



REV	REVISION DESCRIPTION	DATE	CHK	APP
0.A	ISSUED FOR REVIEW	08/23/21	RL	RL
0.B	ISSUED FOR REVIEW	08/23/21	RL	RL
0.C	ISSUED FOR REVIEW	08/23/21	RL	RL
0.D	ISSUED FOR CONSTRUCTION	08/23/21	RL	RL

AFE: 20018380  
CWP NUMBER

LINE 5 STRAITS ANCHOR MONITORING  
BOIS BLANC ISLAND TOWER (M) SITE

ISSUED FOR CONSTRUCTION  
CIVIL/STRUCTURAL/ELECTRICAL

DRAWING SET ISSUE RECORD					
AFE NUMBER(S) AFE# 20018380 PROJECT LINE 5 STRAITS ANCHOR MONITORING					
ISSUE	DATE OF MAILING				CONSULTANT'S DRAWING COORDINATOR
	CIVIL / STRUCTURAL	MECHANICAL	ELECTRICAL/ INSTRUMENTATION	MANUFACTURE'S DRAWINGS	
30% REVIEW	-	-	-	-	-
RE-ISSUED FOR 30% REVIEW	-	-	-	-	-
50% REVIEW	2021-01-18	-	2021-01-18	-	-
80% REVIEW	2021-03-05	-	2021-03-05	-	-
ISSUED FOR BID	2021-03-19	-	2021-03-19	-	-
RE-ISSUED FOR BID	-	-	-	-	-
ISSUED FOR CONSTRUCTION	2021-06-23	-	2021-06-23	-	-
RE-ISSUED FOR CONSTRUCTION	-	-	-	-	-
ISSUED FOR COMMISSIONING	-	-	-	-	-
AS-BUILT	-	-	-	-	-

PREPARED BY LHB

ALL DRAWINGS IN THIS ISSUE HAVE BEEN REVIEWED BY THE FOLLOWING

ENBRIDGE PROJECT MANAGER EB SOWA SIGNATURE \_\_\_\_\_

ENGINEERING SERVICE PROVIDER PROJECT MANAGER BRIAN SANTORI SIGNATURE \_\_\_\_\_

REDLINE MARKUP CHECKLIST				
AFE No. 20018380		Province/State	MICHIGAN	
Project Name L5 STRAITS ANCHOR MONITORING		Station Name		
Contractor/Vendor		Location		
Contract Ref. No.: e.g. (WO, PO, CWP)		Date: mm/dd/yyyy		
VERIFICATION CHECKLIST				
Verify the following items and indicate acceptance (A) or not applicable (NA) Use the comment section to provide reasoning indicating not applicable				
No	REQUIREMENTS	CONTRACTOR REP. A or NA	ENBRIDGE SITE REP. A or NA	ENBRIDGE QA REP. A or NA
1	Verify that the redline drawing package includes the Facility/Mainline Drawing List that specifies the issued for Construction (FC) drawings per EWP/CWP (Engineering Work Package/Construction Work Package)			
2	Confirm all drawings identified in the Facility/Mainline drawing list are included in the redline mark-up final turnover			
3	Verify all drawings identified in the Facility/Mainline drawing list are stamped as per ENBRIDGE-PROC-004 Redline Markup Procedure			
4	Confirm all changes/additions on redline mark-ups are marked in red, deletions are marked (hatched or crossed) in green, and comments are marked in blue			
5	Verify all redline changes to drawings have a reference to a management of change document such as an RFI (Request for Information), DCN (Design Change Notice), CO (change order), or FCN (Field Change Notice, etc.)			
6	All equipment functional tagging must be verified and marked up on drawings			
7	Dimensions/coordinates and elevations for all work are checked and referenced back to existing building, control monument and/or any equipment located with respect to an entire site			
8	Tie-in elevations and coordinates for new facilities to the existing control monuments are shown on the Control Survey plan			
9	Isometric drawings are marked up legibly with the correct information regarding head numbers, weld map information, hatched details, etc.			
10	All piping changes, including dimensions, in all directions are shown			
11	For congested drawings (i.e. P&IDs, isometrics), an attached redline drawing is acceptable. However, the attachment must possess a title block which references the original drawing			
12	Discrepancies and errors in the drawings, including ones that are not related to the scope of work, are marked up and identified with an MOC document			
13	When referencing a Vendor drawing on a construction drawing, verify the vendor drawing is attached			
Comments				
REPRESENTATIVES INFORMATION AND SIGNATURE INDICATING VERIFICATION COMPLETE				
Contractor Rep:	Print	Sign	Date	yyyy/mm/dd
Enbridge Site Rep:	Print	Sign	Date	yyyy/mm/dd
Enbridge QA Rep:	Print	Sign	Date	yyyy/mm/dd

ISSUED FOR CONSTRUCTION

REV	DESCRIPTION	DATE	CHK
00	PROJECT TITLE LINE 5 STRAITS ANCHOR MONITORING		
01	ISSUED FOR CONSTRUCTION	2021-06-23	EB
02	ISSUED FOR 30% REVIEW	2021-01-18	EB
03	ISSUED FOR 50% REVIEW	2021-01-18	EB
04	ISSUED FOR 80% REVIEW	2021-03-05	EB
05	ISSUED FOR BID	2021-03-19	EB
06	ISSUED FOR CONSTRUCTION	2021-06-23	EB

DRAWING SET ISSUE RECORD

REDLINE MARKUP CHECKLIST

PAGE 1 OF 1

**EXISTING LEGEND**

	EXIST PROPERTY LINE
	EXIST R.O.W.
	EXIST FENCE
	EXIST GRAVEL SURFACE
	EXIST WETLAND BOUNDARY
	EXIST WETLANDS
	EXIST RIP RAP
	EXIST PIPELINE
	EXIST CONTOUR (5' INTERVAL)
	EXIST CONTOUR (1' INTERVAL)
	EXIST CULVERT
	EXIST PERFORATED PIPE
	EXIST APRON
	EXIST SANITARY SEWER
	EXIST OVERHEAD ELECTRIC
	EXIST UNDERGROUND ELECTRIC
	EXIST LIGHT POLE
	EXIST POWER POLE
	EXIST ANCHOR
	EXIST ELECTRIC HAND HOLE
	EXIST TREE LINE
	EXIST BOLLARD
	EXIST CONTROL POINT
	SOL BORING

**GENERAL CONSTRUCTION NOTES**

- CONTRACTOR SHALL PROTECT FROM DAMAGE ALL EXISTING PAVEMENTS DESIGNATED TO REMAIN, INCLUDING IN THE PUBLIC R.O.W. ANY PAVEMENTS DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED BY THE CONTRACTOR AT NO COST TO THE OWNER.
- THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES SHOWN ARE APPROXIMATE ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES IN ACCORDANCE WITH THE ENBRIDGE GRADING DISTURBANCE POLICY PRIOR TO COMMENCING WORK, AND AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL UNDERGROUND UTILITIES UTILIZE THE ONE CALL EXCAVATION NOTICE SYSTEM OF "MICHIGAN ONE-CALL" CALL 1-800-482-7171 AND PRIVATE UTILITIES ON PRIVATE PROPERTY.
- GRADES SHOWN ARE FINISH SURFACE ELEVATIONS. THE CONTRACTOR SHALL MAKE APPROPRIATE ADJUSTIONS FOR VARIOUS SURFACES TO DETERMINE SUBGRADE ELEVATIONS.
- ALL EXISTING AND PROPOSED STRUCTURE ACCESS COVERS SHALL BE ADJUSTED TO FINISHED GRADE BY THE CONTRACTOR.
- THE CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION STAKING. THE ENGINEER WILL PROVIDE CONTROL POINTS, BENCHMARKS AND ELECTRONIC FILES.
- THE CONTRACTOR SHALL MAINTAIN THE EXISTING ACCESSWAY DURING CONSTRUCTION. COORDINATE ALL SHORT-TERM OUTAGES WITH ENBRIDGE OPERATIONS.
- ALL WORK SHALL BE CONTAINED WITHIN DESIGNATED CONSTRUCTION LIMITS. NO DISTURBANCE SHALL BE PERMITTED OUTSIDE THE DESIGNATED LIMITS.
- PREVENT ALL TRACKING INTO PUBLIC RIGHT OF WAYS AND PROVIDE SWEEPING AND CLEANING AS NECESSARY.
- GOVERNING SPECIFICATIONS ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE FOLLOWING SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE DRAWING:
  - ENBRIDGE STANDARD SPECIFICATIONS FOR CONSTRUCTION
  - MICHIGAN DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION 2012 EDITION

**ABOVE LEGEND**

	CONSTRUCTION LIMITS
	PROP ROCK BAGS SEE SHEET 10421
	CONSTRUCTION ENTRANCE SEE SHEET 10421
	PROP CONTOUR (5' INTERVAL)
	PROP CONTOUR (1' INTERVAL)
	PROP FENCE
	GATES
	BURIED ELECTRICAL
	LP PIPE
	6\"/>

**ABBREVIATIONS**

A.P.	ABANDON IN PLACE	PVC	POLYVINYL CHLORIDE
A.G.	ABOVE GROUND	PROP	PROPOSED
B.G.	BELOW GROUND	RCP	REINFORCED CONCRETE PIPE
DF	EXCISE FROM PIPE	R.O.W.	RIGHT OF WAY
EXIST	EXISTING	SDA	STANDARD
ELEV	ELEVATION	S.O.G.	SLAB ON GRADE
E.W.	EACH WAY	STAND	STAINLESS STEEL
FM	FORCE MAIN	STD	STANDARD
HDP	HIGH DENSITY POLYETHYLENE	TEMP	TEMPORARY
HMA	HOT MIX ASPHALT	TEMP	TEMPORARY
MAX	MAXIMUM	TPCL	TYPICAL
MIN	MINIMUM	V.F.T.	VERIFY IN FIELD
MOD	MODIFIED	W.D.M.T.	WISCONSIN DEPARTMENT OF TRANSPORTATION
ON CENTER	ON CENTER	W.M.	WELDED WIRE MESH

**EARTH WORK NOTES**

- ALL AREAS DISTURBED DUE TO CONSTRUCTION SHALL BE RESTORED TO PRECONSTRUCTION CONDITION UNLESS OTHERWISE NOTED ON THE DRAWINGS.
- SUBGRADE PREPARATION:
  - THE CONTRACTOR SHALL REMOVE THE TOP 2" OF EXISTING SOIL AND ALL ORGANICS, TOPSOIL, ROOTS, VEGETATION AND DEBRIS PRIOR TO GRADING AND COMPACTING SUBGRADES. REFER TO GEOTECHNICAL INVESTIGATION REPORT FOR TOPSOIL THICKNESS. THE CONTRACTOR SHALL SEGREGATE MATERIALS FOR REUSE TO THE MAXIMUM EXTENT PRACTICABLE.
  - SUBGRADE SOILS SHALL BE INSPECTED AND APPROVED BY THE GEOTECHNICAL ENGINEER OR REPRESENTATIVE AFTER THE OVERLIEING SOILS HAVE BEEN REMOVED AND PRIOR TO MOISTURE, CONDITIONING AND RECOMPACTION.
  - COMPACT ENTIRE EXCAVATION'S SUBGRADE SOILS WITH VIBRATORY SMOOTH DRUM ROLLER TO A MINIMUM 95 PERCENT OF MAXIMUM PROCTOR OR DENSITY.
  - PROOF ROLL ALL PREPARED SUBGRADE SOILS PRIOR TO THE PLACEMENT OF FILL MATERIALS. PROOF ROLLING SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 8.2.2 OF FCSD01, AND IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR REPRESENTATIVE.
- FILLING:
  - FILL TO CONTOURS AND ELEVATIONS INDICATED USING UNPROTCTED MATERIAL.
  - EMPLOY PLACEMENT METHOD THAT DOES NOT DISTURB OR DAMAGE OTHER WORK.
  - ENSURE FILL FITS INTO MATHE SOLES ON ALL SLOPED SURFACES 5:1 OR STEEPER.
  - THICKNESS HORIZONTAL LIFTS, NOT EXCEEDING 8 INCHES UNCOMPACTED THICKNESS.
  - REMOVE GRADE AWAY FROM BUILDING A MINIMUM OF 25 FEET FOR 10 FEET UNLESS OTHERWISE NOTED.
- REFER TO FCSD-001 FOR FILL MATERIAL SPECIFICATIONS.
- BASE COURSE NON-ORGANIC CRUSHED ROCK FREE FROM DEBRIS OR RECYCLED MATERIAL AND CONFORMING TO THE FOLLOWING GRADATION REQUIREMENTS:

MATERIAL	GRADEATION REQUIREMENTS	
BASE COURSE	SI-EV	100
	1-1/2"	95-100
	1"	70-92
	3/4"	50-70
	#4	35-55
	#20	10-25
#100	0-8	

- AGGREGATE BEDDING: CONFORMING TO MOOT 902.08 STRUCTURAL BACKFILL WOODPAST TO NO MORE THAN 50% PASSING THE #30 SIEVE.
- FIELD QUALITY CONTROL:
  - COMPACTION REQUIREMENTS SHALL CONFORM TO THE RECOMMENDATIONS IN THE GEOTECHNICAL REPORT UNLESS OTHERWISE NOTED IN THE DRAWINGS.
  - MAXIMUM DENSITY SHALL BE DETERMINED IN ACCORDANCE WITH ASTM D698.
  - STANDARD TEST METHOD FOR LABORATORY COMPACTION CHARACTERISTICS OF SOIL USING STANDARD EFFORT.
  - MINIMUM COMPACTION IN ALL AREAS SHALL BE 95% OF MAXIMUM DENSITY.
  - TEST FREQUENCY IN UTILITY TRENCHES SHALL BE ONE TEST PER 100 SF PER LIFT, AND IN ALL OTHER AREAS SHALL BE ONE TEST PER CLASS 50 SF PER LIFT.

**WARNING**

LOCATION OF UNDERGROUND UTILITIES TO BE VERIFIED BY CONTRACTOR - CALL 3 DAYS BEFORE DIGGING.

MISS DIG  
MICHIGAN'S ONE-CALL SYSTEM  
1-800-482-7171  
REQUIRED BY LAW

**ISSUED FOR CONSTRUCTION**

REV	DESCRIPTION	DATE	CHK
01	ISSUED FOR CONSTRUCTION	10/20/18	001

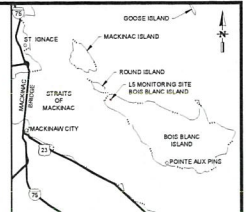
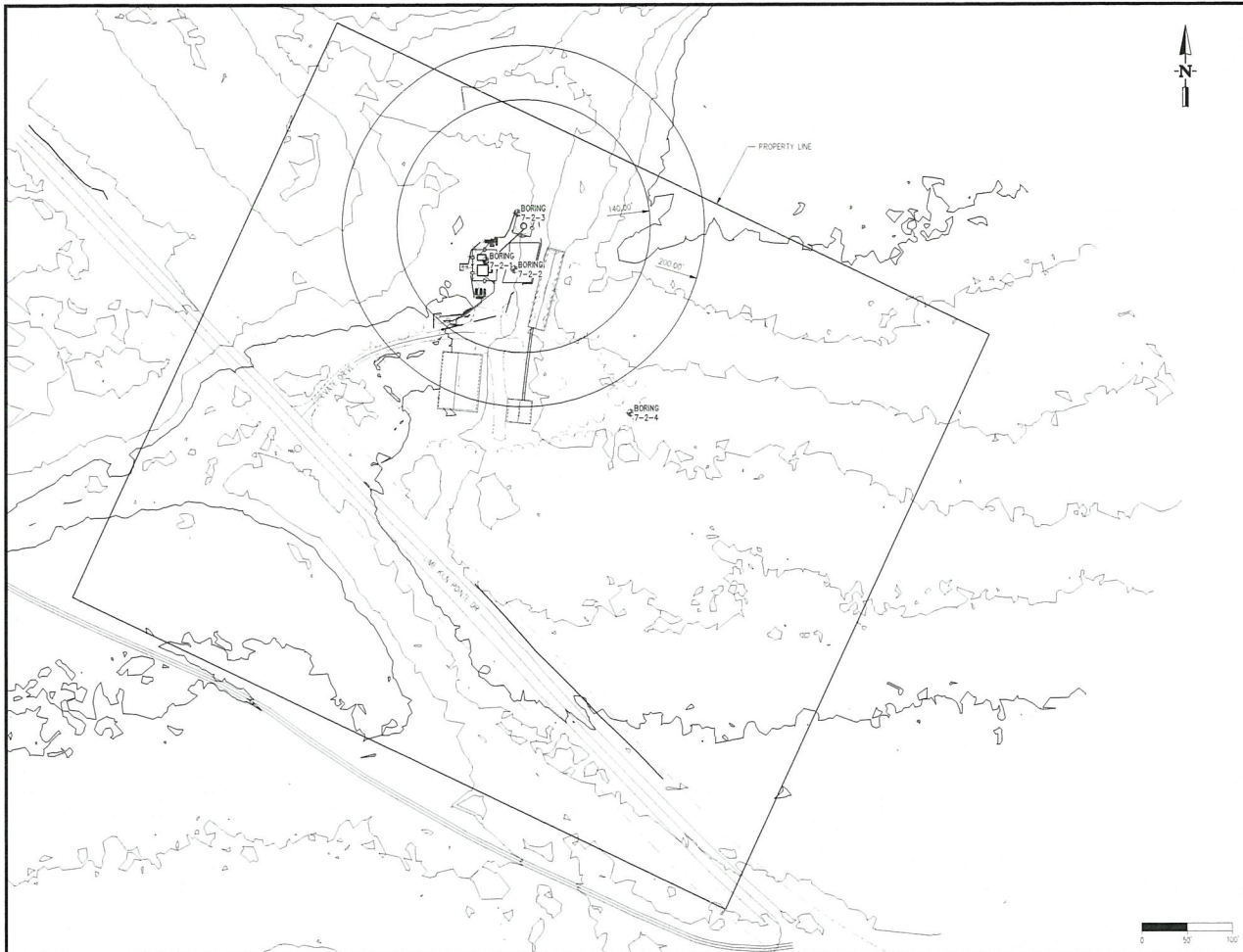
REFERENCE DRAWINGS:

NO.	DESCRIPTION

**ENBRIDGE**

BOIS BLANC ISLAND TOWER (MI) SITE  
NOTES & LEGEND

BY: JPH    DW: JFB    ENG: R. LES    DATE: 2018-11-16  
 DATE: 2018-11-16    SCALE: AS SHOWN    STATUS: CONSTRUCTION  
 SHEET: D-5-1-0-104317-10033    0.D



LOCATION PLAN  
SECTION 14, T-40N, R-20W BOIS BLANC TOWNSHIP  
MACKINAC COUNTY, MICHIGAN

**WARNING**  
LOCATION OF UNDERGROUND UTILITIES TO BE VERIFIED BY CONTRACTOR. CALL 3 DAYS BEFORE DIGGING.  
MISS DIG MICHIGAN'S ONE-CALL SYSTEM  
1-800-482-7171  
REQUIRED BY LAW

**ISSUED FOR CONSTRUCTION**

REV	REVISION DESCRIPTION	DATE	CHK
01	ISSUED FOR CONSTRUCTION	06/21/21	APP

DATE	REVISION DESCRIPTION	DATE	CHK	APP

**ENBRIDGE**  
BOIS BLANC ISLAND TOWER (M) SITE  
VICINITY MAP  
DATE: 2021-06-21  
SCALE: AS SHOWN  
STATUS: CONSTRUCTION  
D-5-1.21-104318-10033 O.A.

**EROSION CONTROL NOTES**

1. THE CONTRACTOR IS RESPONSIBLE FOR EROSION CONTROL ON THIS PROJECT. THE EROSION CONTROL DEVICES SHOWN IN THESE DRAWINGS ARE THE MINIMUM REQUIREMENTS. CONSTRUCT EROSION CONTROL DEVICES AS SHOWN AND AS NECESSARY TO PREVENT THE RUNOFF, BRACING OR LOSS OF SOIL MATERIALS FROM DISTURBED AREAS ON THE PROJECT SITE.
2. SEDIMENT AND EROSION CONTROL DEVICES SHALL BE FUNCTIONAL BEFORE ANY LAND IS OTHERWISE DISTURBED ON THE SITE.
3. PUBLIC AND PRIVATE DRIVES SHALL BE KEPT CLEAR AS NEEDED TO KEEP THE PAVEMENT CLEAR OF SEDIMENT AND CONSTRUCTION DEBRIS.
4. CONTRACTOR TO LOCATE CONCRETE WASTEWATER FACILITY ON SITE AND PROTECT SITE AND ADJACENT PROPERTY FROM CONCRETE WASTEWATER RUNOFF.



LOCATION PLAN  
SECTION 14, T40N, R32W BOIS BLANC TOWNSHIP,  
MACKINAC COUNTY, MICHIGAN

**WARNING**  
LOCATION OF UNDERGROUND  
UTILITIES TO BE VERIFIED BY  
CONTRACTOR - CALL 3 DAYS  
BEFORE DIGGING.  
MISS DIG  
MICHIGAN'S ONE-CALL SYSTEM  
1-800-482-7171  
REQUIRED BY LAW

**ISSUED FOR CONSTRUCTION**

REV	REVISION DESCRIPTION	DATE	BY	CHKD	APP'D
0.0	PROJECT TITLE				
0.1	LINE 5 STRAITS ANCHOR MONITORING				
0.2	PROJECT NO.				
0.3	DATE				
0.4	2011030				
0.5					
0.6					
0.7					
0.8	COLLECT FOR SOIL MONITORING	2011030			
0.9	COLLECT FOR SOIL MONITORING	2011030			
1.0	COLLECT FOR SOIL MONITORING	2011030			
1.1	COLLECT FOR SOIL MONITORING	2011030			
1.2	COLLECT FOR SOIL MONITORING	2011030			
1.3	COLLECT FOR SOIL MONITORING	2011030			
1.4	COLLECT FOR SOIL MONITORING	2011030			
1.5	COLLECT FOR SOIL MONITORING	2011030			
1.6	COLLECT FOR SOIL MONITORING	2011030			
1.7	COLLECT FOR SOIL MONITORING	2011030			
1.8	COLLECT FOR SOIL MONITORING	2011030			
1.9	COLLECT FOR SOIL MONITORING	2011030			
2.0	COLLECT FOR SOIL MONITORING	2011030			

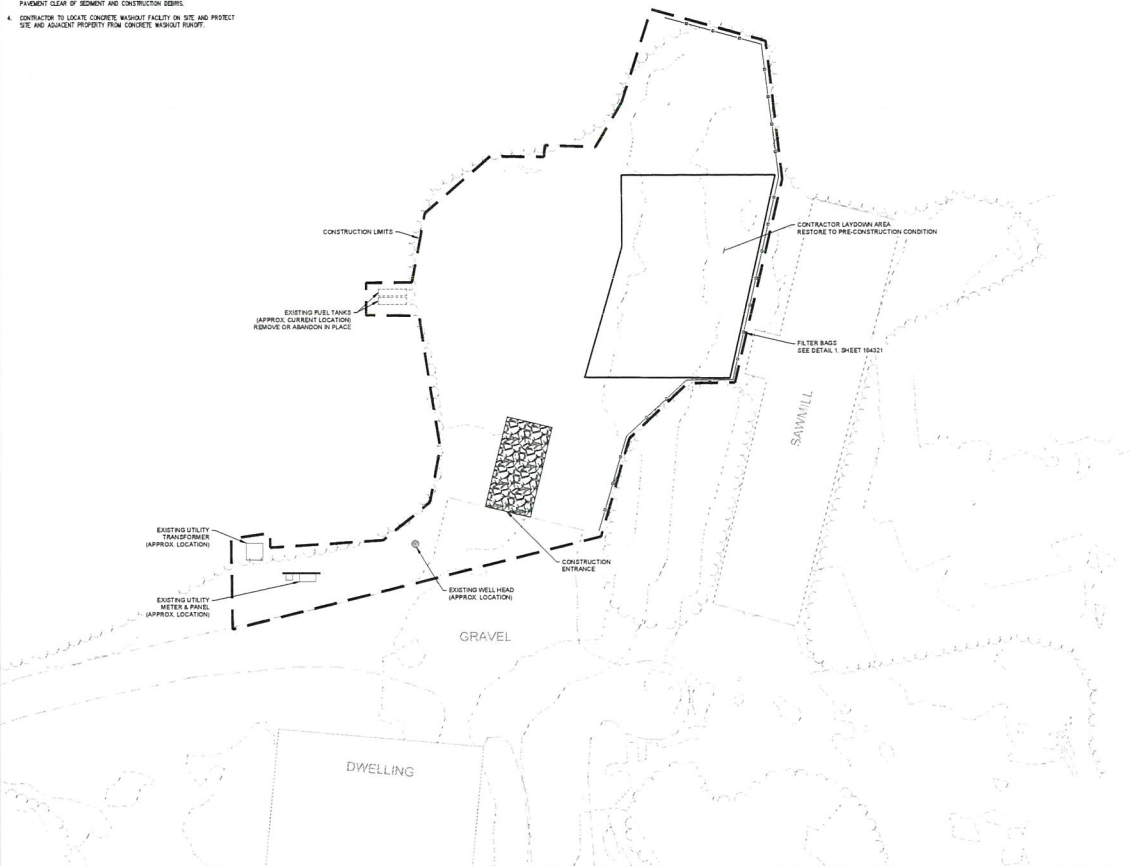
REFERENCE DRAWINGS

NO.	REVISION	DATE	CHKD	APP'D

**ENBRIDGE**

BOIS BLANC ISLAND TOWER (M) SITE  
EROSION CONTROL PLAN

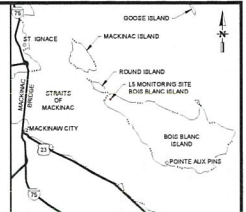
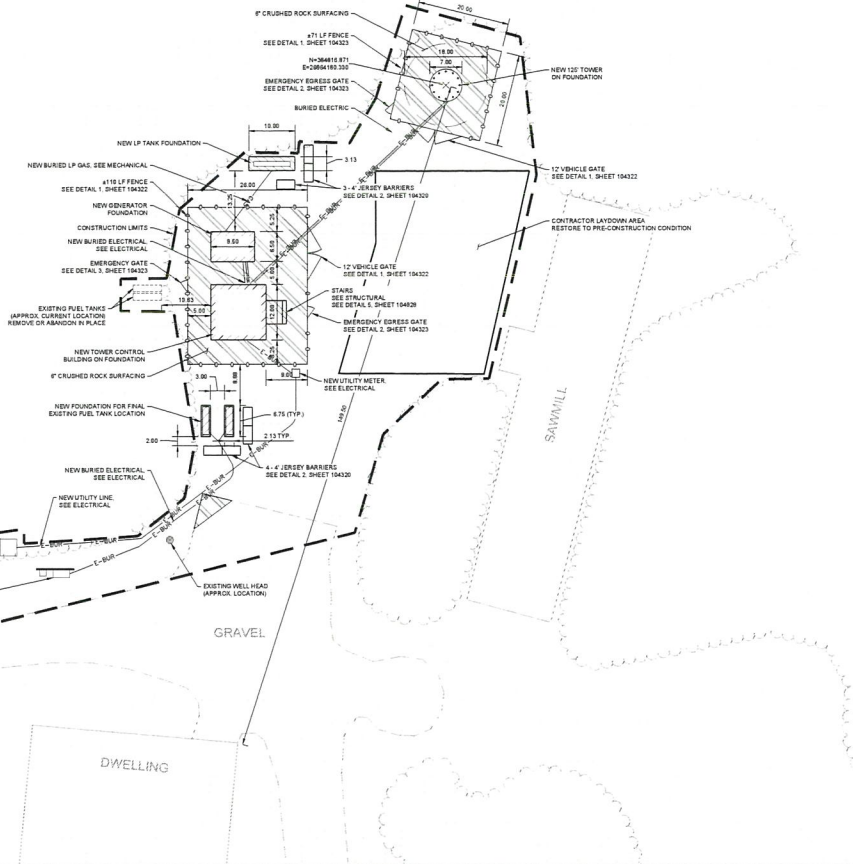
BY	CHKD	ENG. R. LEO	ENG. APPR. E. SOOFA
DATE 20110118	SCALE AS SHOWN	STATUS CONSTRUCTION	
PROJECT NO.			
DWG NO.	D-5-1.21-SKC11-10033		0.0



**GENERAL NOTES**

1. PREVENT FURTHER DAMAGE. ALL SURFACES OUTSIDE THE CONSTRUCTION LIMITS. RESTORE ALL DETERMINED AREAS. SIZE TO CONSTRUCTION ACTIVITIES TO PRE-CONSTRUCTION CONDITION UNLESS OTHERWISE NOTED IN THE DRAWINGS.
2. ADJUST ALL CASTINGS, VALVE BOXES AND JUNCTION BOXES TO FINISH GRADE.

SURFACING AREAS	
ELECTRICAL EQUIPMENT INSTALLATION	57
TOWER INSTALLATION	400
MISCELLANEOUS PADS	60
<b>TOTAL</b>	<b>1347</b>



SECTION 14. T-40N R-2W BOIS BLANC TOWNSHIP  
MACKINAC COUNTY, MICHIGAN

**WARNING**  
LOCATION OF UNDERGROUND UTILITIES TO BE VERIFIED BY CONTRACTOR. CALL 3 DAYS BEFORE DIGGING.  
MISS DIG MICHIGAN'S ONE-CALL SYSTEM  
1-800-482-7171  
REQUIRED BY LAW

**ISSUED FOR CONSTRUCTION**

REV	REVISION DESCRIPTION	DATE	CHK	APPR
A.A	ISSUED FOR REVIEW	01/24/18	WJ	WJ
B.B	ISSUED FOR REVIEW	02/22/18	WJ	WJ
B.C	ISSUED FOR B.C.	02/22/18	WJ	WJ
B.D	ISSUED FOR CONSTRUCTION	02/22/18	WJ	WJ

REV	REVISION DESCRIPTION	DATE	CHK	APPR

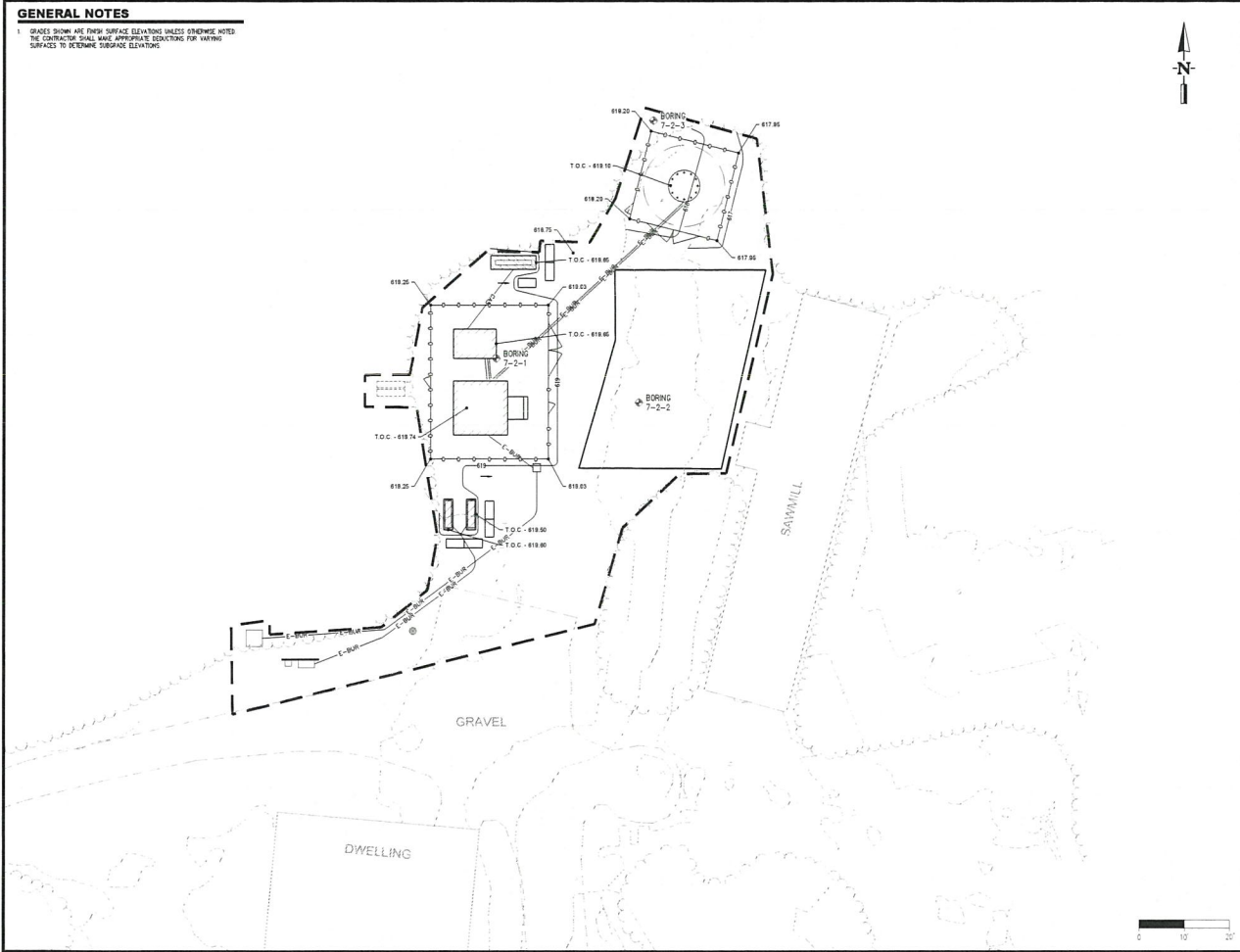
**ENBRIDGE**  
BOIS BLANC ISLAND TOWER (M) SITE  
SITE PLAN

DATE: 2018-01-18 SCALE: AS SHOWN STATUS: CONSTRUCTION  
D-5-1.21-104319-10033 O.D.



**GENERAL NOTES**

1. GRADES SHOWN ARE FINISH SURFACE ELEVATIONS UNLESS OTHERWISE NOTED.  
 THE CONTRACTOR SHALL MAKE APPROPRIATE CORRECTIONS FOR VARYING SURFACES TO DETERMINE SUBGRADE ELEVATIONS.



LOCATION PLAN  
 SECTION 14, T-40N, R-20W, BOIS BLANC TOWNSHIP  
 MACKINAC COUNTY, MICHIGAN

**WARNING**  
 LOCATION OF UNDERGROUND UTILITIES TO BE VERIFIED BY CONTRACTOR. CALL 3 DAYS BEFORE DIGGING.  
 MISS DIG MICHIGAN'S ONE-CALL SYSTEM  
 1-800-482-7171  
 REQUIRED BY LAW

**ISSUED FOR CONSTRUCTION**

REV	REVISION DESCRIPTION	DATE	CHK	APPR
0.0	ISSUED FOR CONSTRUCTION	2017.01.18	ENR	ENR
0.1	ISSUED FOR PERMITS	2017.01.18	ENR	ENR
0.2	ISSUED FOR PERMITS	2017.01.18	ENR	ENR
0.3	ISSUED FOR PERMITS	2017.01.18	ENR	ENR
0.4	ISSUED FOR PERMITS	2017.01.18	ENR	ENR

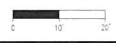
REV	REVISION DESCRIPTION	DATE	CHK	APPR

**ENBRIDGE**

BOIS BLANC ISLAND TOWER (MI) SITE  
 GRADING PLAN

BY: JPH    CHK: JFB    ENR: R. L.G.    DATE: 2017.01.18  
 SCALE: AS SHOWN    STATUS: CONSTRUCTION

D-5-1.21-104320-10033    0.0



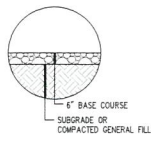


3 ROCK CONSTRUCTION ENTRANCE  
NOT TO SCALE

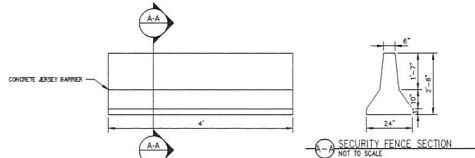
CONSTRUCTION ENTRANCE SPECIFICATIONS

- STONE SIZE: USE 1"-2" CRUSHED ROCK OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
- THICKNESS: NOT LESS THAN 6"
- FILTER CLOTH: SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING STONE.
- MAINTENANCE: THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHT-OF-WAY MUST BE REMOVED IMMEDIATELY.
- WASHING: WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
- PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN EVENT.

**WARNING**  
LOCATION OF UNDERGROUND UTILITIES TO BE VERIFIED BY CONTRACTOR. CALL 3 DAYS BEFORE DIGGING.  
MISS DIG MICHIGAN'S ONE-CALL SYSTEM  
1-800-482-7171  
REQUIRED BY LAW

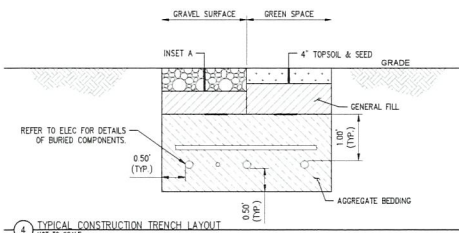


5 INSET A - CRUSHED ROCK  
NOT TO SCALE

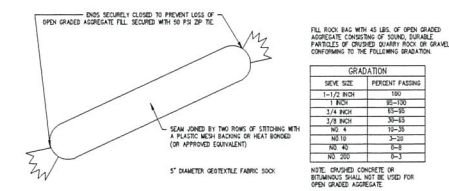


2 4' JERSEY BARRIER  
NOT TO SCALE

7 SECURITY FENCE SECTION  
NOT TO SCALE



4 TYPICAL CONSTRUCTION TRENCH LAYOUT  
NOT TO SCALE



1 FILTER BAGS  
NOT TO SCALE

FILL BAG WITH 45 LBS. OF OPEN GRADED AGGREGATE CONSISTING OF DUNN, DURABLE PARTICLES OF CRUSHED QUARRY ROCK OR GRAVEL CONFORMING TO THE FOLLOWING GRADATION.

GRADATION	
SEIVE SIZE	PERCENT PASSING
1 1/2" SIEVE	100
1" SIEVE	85-100
3/4" SIEVE	50-85
3/8" SIEVE	30-55
NO. 4	10-25
NO. 10	5-20
NO. 40	0-5
NO. 200	0-5

NOTE: CRUSHED CONCRETE OR BITUMINOUS SHALL NOT BE USED FOR OPEN GRADED AGGREGATE.

ISSUED FOR CONSTRUCTION

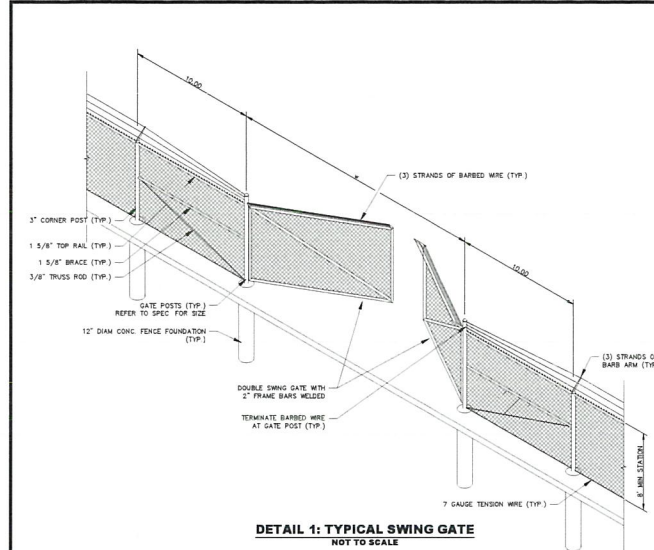
REV	REVISION DESCRIPTION	DATE	CHK	APP
A.A	ISSUED FOR BIDDING	04/11/16	APR	APR
B.B	ISSUED FOR BIDDING	04/11/16	APR	APR
B.C	ISSUED FOR BID	04/11/16	APR	APR
B.D	ISSUED FOR CONSTRUCTION	04/11/16	APR	APR

NO.	REVISION	DATE	CHK	APP

**ENBRIDGE**

BOIS BLANC ISLAND TOWER (M) SITE  
CIVIL DETAILS

DATE: 2016-01-16 SCALE: AS SHOWN STATUS: CONSTRUCTION  
D-5-1.21-104321-10033 O.D



**DETAIL 1: TYPICAL SWING GATE**  
NOT TO SCALE

**PART 1 GENERAL**  
**1.01 SECTION INCLUDES**  
 A Fabric, hardware, fabric, and accessories.  
 B Excavation for post bases; concrete foundation for posts.  
 C Manual gates and related hardware.  
**1.02 REFERENCE STANDARDS**  
 A ASTM A152 - Standard Specification for Metallic-Coated Carbon Steel Barbed Wire, 2015.  
 B ASTM A152/A153M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products, 2015.  
 C ASTM A152/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware, 2009.  
 D ASTM A302 - Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric, 2015.  
 E ASTM A428/A428M - Standard Test Method for Weight (Mass) of Coating on Aluminum-Coated Iron or Steel Articles, 2010 (Reapproved 2014).  
 F ASTM A481 - Standard Specification for Aluminum-Coated Steel Chain-Link Fence Fabric, 2015.  
 G ASTM A853/A853M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanneal) by the Hot-Dip Process, 2015.  
 H ASTM A1011/A1011M - Standard Specification for Steel, Hot-Dip, Hot-Dip-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High-Strength, 2014.  
 I ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete, 2015.  
 J ASTM F567 - Standard Practice for Installation of Chain-Link Fence, 2011.  
 K ASTM F868 - Standard Specification for Polyvinyl Chloride (PVC) and Other Organic Polymer-Coated Steel Chain-Link Fence Fabric, 2011.  
 L ASTM F1043 - Standard Specification for Strength and Protective Coatings on Steel Industrial Fencing Framework, 2014.  
 M ASTM F1143 - Standard Specification for Pipe, Steel, Hot-Dip-Zinc-Coated (Galvanized) Welded, for Fence Structures, 2013.  
 N ASTM F1665 - Standard Specification for Polyvinyl Chloride (PVC) and Other Containing Organic Polymer-Coated Steel Barbed Wire Used with Chain-Link Fence, 2008 (Reapproved 2013).  
 O CDMJ CLF 2445 - Product Manual, Chain Link Fence Manufacturers Institute, 1997.  
**1.03 SUBMITTALS**  
 A Product Data: Provide date on fabric, posts, accessories, fittings, hardware, gate operator, and card reader.  
 B Shop Drawings: Indicate plan layout, spacing of components, gate foundation dimensions, hardware envelope, schedule of components, gate operator foundation and layout, and core reader foundation and layout.  
 C Project Record Documents: Accurately record actual location of properly permitted posts relative to property lines and easements.

**PART 2 PRODUCTS**  
**2.01 MANUFACTURERS**  
 A Chain Link Fences and Gates.  
 1. Master-Fabrics, Inc. www.masterfabrics.com  
 2. Merchants Metals, www.merchantsmetals.com.  
**2.02 MATERIALS AND COMPONENTS**  
 A Materials and Components: Custom to CDMJ CLF 2445.  
 B Fabric Size: CDMJ CLF 2445 Heavy Industrial service.  
 C Intermediate Posts: Type II round.  
 D Terminal, Corner, Rail, Brace and Gate Posts: Type II round.  
**2.03 MATERIALS**  
 A Posts, Rails, and Frames: Formed from hot-dip galvanized steel sheet, ASTM A853/A853M, HSLAS, Grade 50, with G90 (Z275) zinc coating.  
 B Wire Fabric: ASTM A302 zinc coated steel chain link fabric.  
 C Barbed Wire: Zinc-coated steel, complying with ASTM A152, Type 2 Coating Class 3, 2 strands of 0.085 inch diameter wire with 4-pointed barbs at 6 inches on center.  
 D Concrete: Ready-mixed, complying with ASTM C94/C94M, normal Portland cement, 2500 psi strength at 28 days, 3 inch slump, 3/4 inch nominal size aggregate.  
**2.04 COMPONENTS**  
 A Line Posts: 2.5 inch diameter.  
 B Corner and Terminal Posts: 3 inch diameter.  
 C Gate Posts: 4 inch diameter.  
 D Top and Brace Rail: 1.56 inch diameter, plain end, steel coupled.  
 E Gate Frame: 2 inch diameter for welded fabrication.  
 F Fabric: 3 inch (51 mm) diamond mesh interweave wire, 8 eggs, 0.1144 inch thick, top serrage inlay and closed bottom serrage twisted tight.  
 G Tension Wire: 7 gauge thick steel, single strand.  
**2.05 ACCESSORIES**  
 A Clips: Cast steel galvanized, sized to post diameter, set screw retainer.  
 B Fittings: Slaves, cones, caps, rail ends, tension bars, fasteners and fittings, steel.  
 C Extension Arms: Cast steel galvanized, to accommodate 3 strands of barbed wire, single end, angled to 45 degrees.  
 D Hardware for Single Swinging Gates: 180 degree hinges, 2 for gates up to 160 inches (525 mm) high, 3 for taller gates, fork latch with gravity drop and lockable stop; levers to hold gates in fully open position.  
 E Hardware for Double Swinging Gates: 180 degree hinges, 2 for gates up to 50 inches (1255 mm) high, 3 for taller gates; drop bolt on inactive leaf engaging socket stop set in concrete, active leaf set into a passive leaf preventing raising of drop bolt; padlock hinge; levers to hold gates in fully open position.  
**2.06 EMERGENCY EVACUATIONS GATE**  
 A Components (Other than Fabric): Galvanized in accordance with ASTM A152/A153M, at 1.7 oz/ft<sup>2</sup> (530 g/ft<sup>2</sup>).  
 B Gate: Double swing gate, with manual lockable latch for outer gate and lockable panic bar for inner gate.  
 C Gate Frame: 2" galvanized steel tubing, welded.  
 D Panic Bar: Mounted on secure side of gate, rest only, and include 24" security mounting plate feature.  
 E Hardware: Hot-dip galvanized to weight required by ASTM A152/A153M.  
 F Accessories: Same finish as framing.  
 G Color(s): Medium gray.  
**2.07 VEHICLE GATES**  
 A Components (Other than Fabric): Galvanized in accordance with ASTM A152/A153M, at 1.7 oz/ft<sup>2</sup>.  
 B Hardware: Hot-dip galvanized to weight required by ASTM A152/A153M.  
 C Frame: 2" galvanized steel tube, welded.  
 D Swing Gate Bar Arms: 45 degree holding 3 strands of barbed wire, and having 12" min height.  
 E Accessories: Same finish as framing.  
 F Color(s): Medium gray.  
**2.08 FINISHES**  
 A Components (Other than Fabric): Galvanized in accordance with ASTM A152/A153M, at 1.7 oz/ft<sup>2</sup>.  
 B Hardware: Hot-dip galvanized to weight required by ASTM A152/A153M.  
 C Accessories: Same finish as framing.  
 D Color(s): Medium gray.  
**PART 3 EXECUTION**  
**3.01 INSTALLATION**  
 A Initial Framework, fabric, accessories and gates in accordance with ASTM F867.  
 B Place fabric on outside of posts and rails.  
 C Set intermediate, terminal, and gate posts plumb, in concrete footings with top of footing 2 inches above finish grade. Slope top of concrete top edge flush.  
 D Line Post: Drive set line posts to a minimum depth of 6 feet.  
 E Corner, Gate and Terminal Post: Footing Depth Below Finish Grade: 6 feet.  
 F Brace each gate and corner post to adjacent line post with horizontal center brace rail and diagonal brace rail. Install brace rail one bay from end of gate posts.  
 G Install top rail through line post tops and align with 6 inch long rail spacers.  
 H Install center brace rail on corner gate leaves.  
 I Do not stretch fabric until concrete foundation has cured 28 days.  
 J Stretch fabric between terminal posts or at intervals of 100 feet (30 m)

maximum, whichever is less.  
 K Position bottom of fabric 2 inches above finished grade.  
 L Fasten fabric to top rail, line posts, braces, and bottom terminal wire with tie wire of maximum 18 inches on centers.  
 M Attach fabric to end, corner, and gate posts with tension bars and tension bar clips.  
 N Install bottom tension wire stretched tight between terminal posts.  
 O Install support arms angled outward and attach barbed wire, tension and secure.  
 P Install gate with fabric and barbed wire overlying to match fence. Install hardware.  
 Q Provide concrete center stop to footing depth and drop rail retainers at center of double gate openings.  
**3.02 TOLERANCES**  
 A Maximum Variation From Plumb: 1/4 inch.  
 B Maximum Offset From True Position: 1 inch.  
 C Components and rail through adjacent property lines.

**WARNING**  
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 MISS DIG MICHIGAN'S ONE-CALL SYSTEM  
 1-800-482-7171  
 REQUIRED BY LAW

**ISSUED FOR CONSTRUCTION**

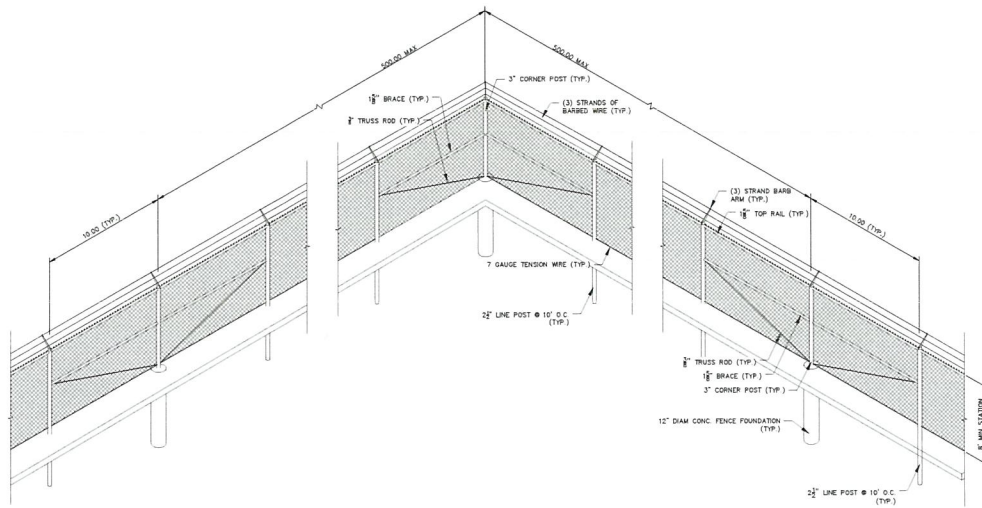
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0.2				
0.3				
0.4				
0.5				
0.6				
0.7				
0.8				
0.9				
1.0				

REFERENCE DRAWINGS

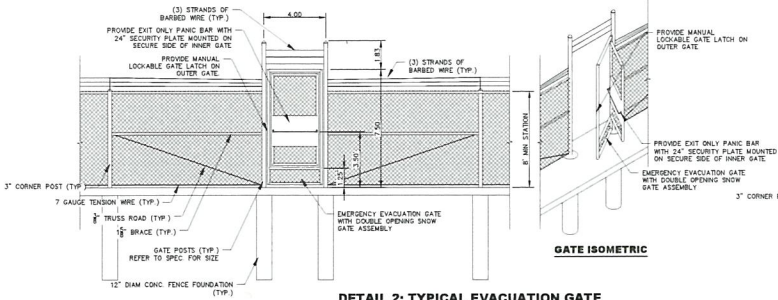
NO.	DESCRIPTION	DATE	CHK	APP

**ENBRIDGE**  
**BOIS BLANC ISLAND TOWER (M) SITE**  
**FENCE DETAILS**

D-5-1.21-104322-10033 0 B

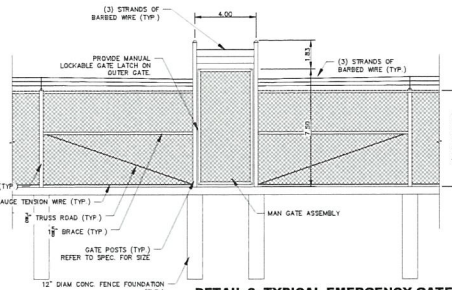


**DETAIL 1: TYPICAL STATION FENCE**  
N.T.S.



**DETAIL 2: TYPICAL EVACUATION GATE**  
N.T.S.

**GATE ISOMETRIC**



**DETAIL 3: TYPICAL EMERGENCY GATE**  
N.T.S.

**WARNING**  
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MISS DIG MICHIGAN'S ONE-CALL SYSTEM  
1-800-482-7171  
REQUIRED BY LAW

**ISSUED FOR CONSTRUCTION**

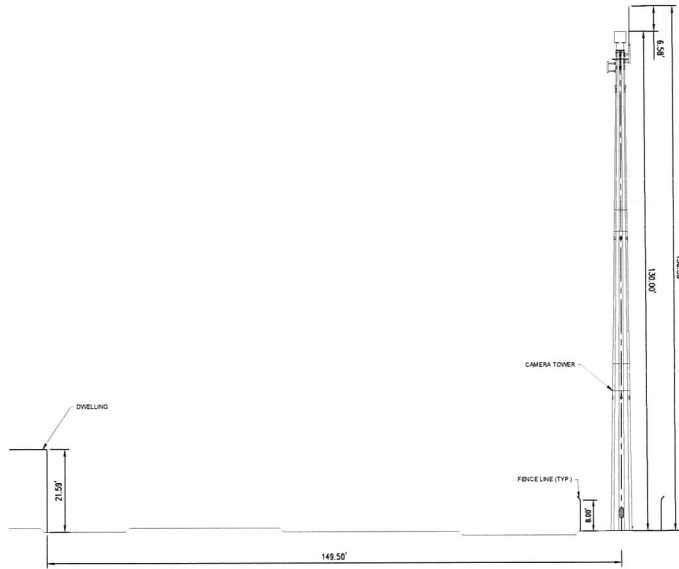
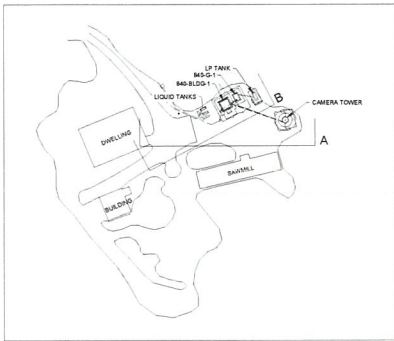
REV	DESCRIPTION	DATE	CHKD	APP'D
0.0	ISSUED FOR CONSTRUCTION	2023.03.19		

REV	DESCRIPTION	DATE	CHKD	APP'D
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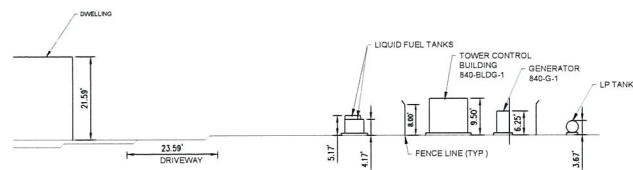
**ENBRIDGE**  
BOIS BLANC ISLAND TOWER (MI) SITE  
FENCE DETAILS

DATE: 2023.03.19  
SCALE: AS SHOWN  
STATUS: CONSTRUCTION  
PROJECT: BOIS BLANC ISLAND TOWER (MI) SITE

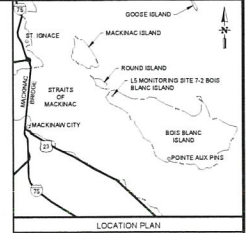
D-5-1-21-104323-10033 0.B



1 SECTION A  
1"=12'-0"



2 SECTION B  
1"=12'-0"



ISSUED FOR CONSTRUCTION

REV	REVISION DESCRIPTION	DATE	BY	CHK	APPR.
0.A	ISSUED FOR CONSTRUCTION	2021.09.21			

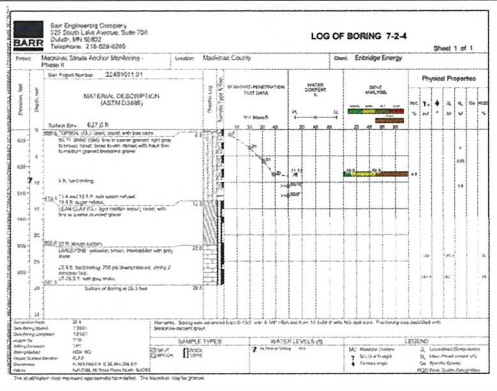
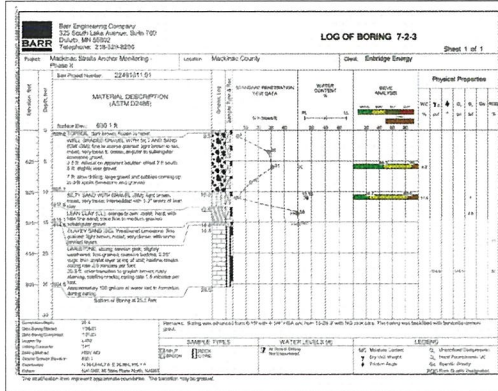
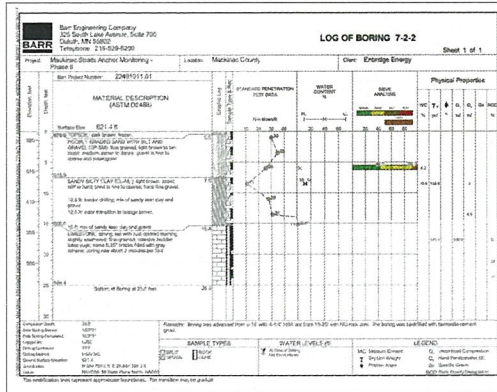
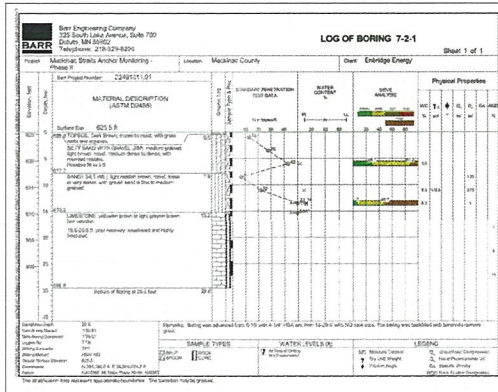
NO.	REVISION	DATE	BY	CHK	APPR.

**ENBRIDGE**

BOIS BLANC ISLAND TOWER (M) SITE  
SITE ELEVATION

DATE: 2021.09.21    SCALE: AS SHOWN    STATUS: CONSTRUCTION    PROJECT: D-5-1.21-SKC44-10033    0.A





**WARNING**  
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 MISS DIG MICHIGAN'S ONE-CALL SYSTEM  
 1-800-482-7171  
 REQUIRED BY LAW

FOR INFORMATION ONLY

REV	REVISION	DATE	CHK	APP
0A	REVISION TITLE			
0A	LINE 5 STRAITS ANCHOR MONITORING			
0A	2018030			
0A	REVISION DESCRIPTION			
0A	ISSUED FOR REFERENCE			

REFERENCE DRAWINGS

NO.	REVISION	DATE	CHK	APP

**ENBRIDGE**  
 BOIS BLANC ISLAND TOWER (M) SITE BORING LOGS

**GENERAL DESIGN DATA**

- A. BUILDING CODE
  1. 2015 INTERNATIONAL BUILDING CODE (IBC) WITH 2014 AMENDMENTS
  2. AISC 310 MINIMUM DESIGN LOADS FOR BUILDINGS & OTHER STRUCTURES, RISK CATEGORY II
- B. DESIGN LOADS
  1. LIVE AND COLLATERAL (DEAD) LOAD UNIFORM CONCENTRATED COLLATERAL (PSF) (LB) (PSF)
  2. ROOF LIVE LOAD 40 PSF MAX. REDUCIBLE (ENHANCE ITS MINIMUM) ROOF SHOW LOAD 80 PSF GRAVITY SHOW PLUS SNOW ACCUMULATION IN ACCORDANCE WITH ASCE 7-16, SECTIONS 7.6 & 7.7
  3. GROUND SHOW LOAD, S & S REF 100 1000 10
  4. SNOW EXPOSURE FACTOR,  $C_e = 1.0$
  5. SNOW IMPORTANCE FACTOR,  $I_s = 1.1$
  6. THERMAL FACTOR,  $C_t = 1.1$
  7. WIND LOAD 120 MPH ULTIMATE (1 SEC GUST), EXPOSURE D, INTERNAL PRESSURE COEFFICIENT = +0.18
- C. EARTHQUAKE DESIGN DATA
  1. SEISMIC IMPORTANCE FACTOR,  $I = 1.25$
  2. RISK CATEGORY, II
  3. MAPPED SPECTRAL RESPONSE ACCELERATIONS,  $S_{DS}$  &  $S_{D1}$
  4. SITE CLASS, S
  5. SPECTRAL RESPONSE COEFFICIENTS,  $C_{SDS}$  &  $C_{SD1}$
  6. SEISMIC DESIGN CATEGORY, I-A
  7. BASIC SEISMIC FORCE-RESISTING SYSTEMS - ORDINARY STEEL CENTRICALLY BRACED FRAME AND ORDINARY STEEL MOMENT FRAMES
  8. DESIGN BASE SHEAR,  $V$
  9. SEISMIC RESPONSE COEFFICIENT,  $C_s = 0.054$
  10. RESPONSE MODIFICATION FACTOR,  $R = 1.8$
  11. ANALYSIS PROCEDURE USED - EQUIVALENT LATERAL FORCE
- D. LOADS ARE UNFACTORED ALLOWABLE STRESS DESIGN LOADS - 1.3X ALLOWABLE STRESS INCREASE FOR SHORT-TERM LOADING IS NOT ALLOWED

**GENERAL CONSTRUCTION NOTES**

- A. FOOTINGS AND FOUNDATIONS
  1. SEE GEOTECHNICAL REPORT BY BARR ENGINEERING DATED MARCH 12, 2015. SOIL CONDITIONS SHALL BE REVIEWED BY A LICENSED GEOTECHNICAL ENGINEER.
  2. PROTECT FOOTING DEPTH FROM EXTERIOR GRADE TO BOTTOM OF HEATED BUILDING PERIMETER FOOTINGS AND ALL BRACED BUILDING OR OPEN AIR FOUNDATIONS SHALL BE A MINIMUM OF 8".
  3. BOTH SIDES OF FOUNDATION WALLS SHALL BE BACKFILLED SMALLLY TO PREVENT OVERTURNING OR LATERAL MOVEMENT OF WALLS.
  4. FOUNDATIONS SHALL BEAR ON UNDISTURBED UNFROZEN SURFACE. EXCEPT WHERE COMPACTED SURFACE OR FILL IS OTHERWISE SPECIFIED.
  5. NON-VOLATILE SHALL BE EXTRUDED POLYSTYRENE INSULATION (XPS) WITH A MINIMUM OF 1.5" PER MINIMUM COMPRESSIVE RESISTANCE MANUFACTURED FOR USE BELOW GRADE AN ACCEPTABLE PRODUCT IS DOWNSIDE DAD-4 PLACE ALL RIGID INSULATION IN TWO EQUAL THICKNESS LAYERS AND STAGGER JOINTS.
  6. DRAIN TILE SHALL BE MINIMUM 4" PERFORATED PVC PIPE CONFORMING TO ASTM 1518 SURROUND WITH DRAINAGE FILL CONFORMING TO ASTM 1163-20 CLASS 2 FILLER SUBGRADE AND M-DOOT TYPE 1 GEOTEXTILE FABRIC. SEE FOUNDATION PLAN & CIVIL DRAWINGS FOR DRAIN TILE FOOTING.
  7. FOUNDATIONS SHALL NOT BE CONSTRUCTED WITHIN 1 FOOT OF NEW OR EXISTING ABOVE OR BELOW GROUND UTILITIES. NOTIFY ENGINEER BEFORE PROCEEDING.
- B. FILL NOTES
  1. MATERIALS AND PLACEMENT COMPLY WITH FCS-801
  2. SEE GEOTECHNICAL REPORT BY BARR ENGINEERING DATED MARCH 12, 2015 FOR REQUIRED SUBGRADE PREPARATION
- C. CONSTRUCTION NOTES
  1. ALL DIMENSIONS INVOLVING COORDINATION OF NEW WORK WITH EXISTING CONSTRUCTION SHALL BE FIELD-CHECKED BY THE CONTRACTOR AND FURNISHED TO THE SUBCONTRACTOR PRIOR TO FABRICATION OF ANY WORK. THE VERIFIED DIMENSIONS SHALL APPEAR AND BE NOTED ON THE SHOP DRAWINGS SUBMITTED.
  2. ANY HOLES CUT THROUGH EXISTING CONSTRUCTION THAT ARE NOT DETAILED ON THE STRUCTURAL DRAWINGS SHALL BE REVIEWED WITH THE STRUCTURAL ENGINEER. COORDINATE ALL HOLES AND PENETRATIONS WITH OTHER DISCIPLINES.
  3. THE STRUCTURE SHALL BE ADEQUATELY BRACED AND SHORED DURING CONSTRUCTION AGAINST WIND, ERECTION AND OTHER LOADS. STRUCTURAL MEMBERS ARE DESIGNED FOR IN-PLACE LOADS BASED ON FINAL SUPPORT CONDITIONS.
  4. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF DISCREPANCIES FOUND BETWEEN CONSTRUCTION DOCUMENTS AND ACTUAL FIELD CONDITIONS.
- D. USE OF DRAWINGS
  1. DETAILS NOTED TYPICALLY APPLY TO ALL SIMILAR CONDITIONS WHERE NO SPECIFIC DETAILS ARE SHOWN. CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ELSEWHERE ON THE PROJECT.

**CAST-IN-PLACE CONCRETE, COMPLY WITH FCS-806 UNLESS NOTES OTHERWISE**

- A. MATERIAL PROPERTIES
 

CONCRETE PROPERTIES	F <sub>c</sub> (PSI)	28 DAYS	EXPOSURE	MAX SLUMP (IN)		MAX ENTR AIR (IN)	MAX W/C
				BEFORE ADJUSTMENTS	AFTER ADJUSTMENTS		
LEAN FILL	1500	20	102 x 1 1/4"	312 x 1 1/4"	34"	0	-
FOOTINGS	4500	20	314 x 3/4"	314 x 1 1/4"	34"	8	14.5
PIERS, WALLS, CRACK BEAMS	4500	20	314 x 3/4"	314 x 1 1/4"	34"	8	14.5
INTERIOR SLAB ON GRADE (I/O)	4500	20	314 x 3/4"	314 x 1 1/4"	34"	8	14.5
EXTERIOR SLAB ON GRADE (E/O)	4500	20	314 x 3/4"	314 x 1 1/4"	34"	8	14.5
CEILING	4500	20	314 x 3/4"	314 x 1 1/4"	34"	8	14.5
TERRACE CONCRETE	4500	20	314 x 3/4"	314 x 1 1/4"	34"	8	14.5
MASS CONCRETE	4500	20	314 x 3/4"	314 x 1 1/4"	34"	8	14.5
CONTROLLED-COMPRESSION MATERIAL (CCM)	150 (MAX)	0					
- NOTES
  1. COORDINATE AN ENTRANCE AS REQUIRED.
  2. CONTROLLED EXPOSURE CLASS IN ACCORDANCE WITH ACI 318.
  3. MASS CONCRETE MIX DESIGN IN ACCORDANCE WITH ACI 308.1 & ACI 207.
  4. C.S.F. SHALL BE DESIGNED IN ACCORDANCE WITH ACI 209 AND ONLY USED AS INDICATED ON THE DRAWINGS OR WHEN APPROVED BY ENGINEER. SEE FCS 801 FOR ADDITIONAL REQUIREMENTS.
- B. REINFORCING PROPERTIES
 

ALL BARS UNLESS NOTED OTHERWISE	F <sub>y</sub> (PSI)	ASTM
TEEL STRAP	60,000	A615
- C. THE FOLLOWING MATERIAL SHALL NOT EXCEED THE LISTED PERCENT OF TOTAL CEMENTITIOUS MATERIAL BY WEIGHT
 

FLY ASH IN SLABS	15% MAX
FLY ASH IN FOOTINGS, WALLS & PIERS	20% MAX
- D. PORTLAND CEMENT SHALL BE ASTM C150 TYPE I
- E. GROUT COMPLY WITH FCS-806
- F. WATERSTOP POLY(VINYL CHLORIDE) MINIMUM 150 PSI TENSILE STRENGTH, MINIMUM MODULUS 90 DEGREE F TO PLUS 150 DEGREE F WORKING TEMPERATURE RANGE, 4 INCH WIDE MAXIMUM POSSIBLE LENGTH, RIBBED PROFILE, PERFORMED CORNER SECTIONS, HEAT WELDED JOINTS. SEE CONSTRUCTION SPECIFICATION FOR ADDITIONAL REQUIREMENTS.
- G. EXPANSION JOINT MATERIAL SHALL BE FEE MOLED BUTYRANUM IMPREGATED FIBER OR RUBBER COMPOUNDING TO ASTM D1751 OR ASTM D1752 TYPE 1, 10 INCH THICKNESS AND DEPTH TO SUIT THE APPLICATION.
- H. JOINT FILLER SHALL BE A POLYETHYLENE CLOSED CELL EXPANSION JOINT FILLER.
- I. JOINT SEALANT SHALL BE MASTERSEAL NP 1 OR SHARPLEX-A JOINT SEALANT FOR HORIZONTAL JOINTS & ISOLATION JOINTS & SHARPLEX-V FOR VERTICAL JOINTS.
- J. EPOXY ADHESIVE SHALL BE MLT WITH WJ 200.
- K. VOID FORM SHALL BE ETHADOM-80A BRAND POLYETHYLENE FOAM.

**STRUCTURAL STEEL MATERIALS, FABRICATION AND INSTALLATION, COMPLY WITH FCS-810**

- A. STRUCTURAL NOTES
  1. STRUCTURAL STEEL DESIGN AND CONSTRUCTION SHALL CONFORM TO AISC 360.
  2. THE CONTRACTOR AND FABRICATOR SHALL REVIEW THE CONTRACT DOCUMENTS AND INCORPORATE ANY ADDITIONAL PROVISIONS NECESSARY TO MEET APPLICABLE SAFETY REGULATIONS.
  3. THE STRUCTURE IS A NON-Self-SUPPORTING STEEL FRAME REQUIRING INTERACTION WITH OTHER ELEMENTS TO PROVIDE THE REQUIRED STABILITY. THE STEEL ERECTOR SHALL PROVIDE TEMPORARY SUPPORTS UNTIL FINAL STABILITY IS PROVIDED. AT A MINIMUM, TEMPORARY SUPPORTS SHALL BE PROVIDED AT EACH GRID IN BOTH DIRECTIONS.
- B. MISCELLANEOUS METALS
  1. BRACING SHALL BE NOT SHIPPED GALVANIZED SAFETY GRATING MUST BE GALVANIZED SURFACE PLATE SHALL BE 2" DIAMETER, 10" MAX WIDE MAXIMUM, 21" GAP CHANNEL, 12 GAUGE AND STAIN TREAD SHALL BE 2" DIAMETER, 11" MAX WIDE 2" CHANNEL, 12 GAUGE WITH ABRASSIVE NOSING UNLESS NOTED OTHERWISE.
  2. ALL GRATING SHALL BE FASTENED WITH REMOVABLE GALVANIZED OR STAINLESS STEEL CLIPS.
  3. SIZE PLATE AT CORNERS SHALL BE 1/4" X 8" X 1/2".
  4. PROVIDE ABRASSIVE GRATING AT STAIR OPENINGS.
  5. HANDRAIL SHALL BE FABRICATED FROM STEEL ANGLE. POSTS SHALL BE SPACED AT 40" (MAX) CENTERS WITH TOP RAIL, ONE INTERMEDIATE RAIL AND HAND TIE PLATE. ALL HANDRAILS SHALL BE REMOVABLE UNLESS NOTED OTHERWISE.
  6. WHERE HANDRAIL TURNS A CORNER, PROVIDE A POST WITHIN 18" OF THE CORNER.
  7. HANDRAIL SHALL BE SHOP WELDED CONSTRUCTION WITH ROUND EDGES AND MILD GRIND SMOOTH.
  8. HANDRAIL AND BOLLARDS SHALL BE PAINTED SAFETY YELLOW.
- C. PAINTING AND COATING
  1. ALL STRUCTURAL STEEL MISCELLANEOUS METALS SHALL BE PAINTED IN ACCORDANCE WITH BURROUSE SPEC. #178. COATING SYSTEM SHALL BE FROM APPROVED PRODUCT MATERIALS PLC, PROD. LIST.
  2. ALL EXTERIOR STEEL SHALL BE HOT-DIPPED GALVANIZED.

**ISSUED FOR CONSTRUCTION**

REV	DESCRIPTION	DATE	BY	CHK
1	ISSUED FOR CONSTRUCTION			

**SPECIFICATIONS**

- A. CONSTRUCTION SPECIFICATIONS
  1. ALL WORK SHALL CONFORM TO THE FOLLOWING ENBRIDGE SPECIFICATION FOR FACILITY CONSTRUCTION
    - a. FCS-501 SITE PREPARATION AND EARTHWORK
    - b. FCS-506 GROUTING
    - c. FCS-800 STRUCTURAL CONCRETE
    - d. FCS-807 CAST-IN-PLACE CONCRETE PILES
    - e. FCS-818 STRUCTURAL STEEL
    - f. F-210 SHOP AND FIELD PAINTING

REFERENCE DRAWINGS

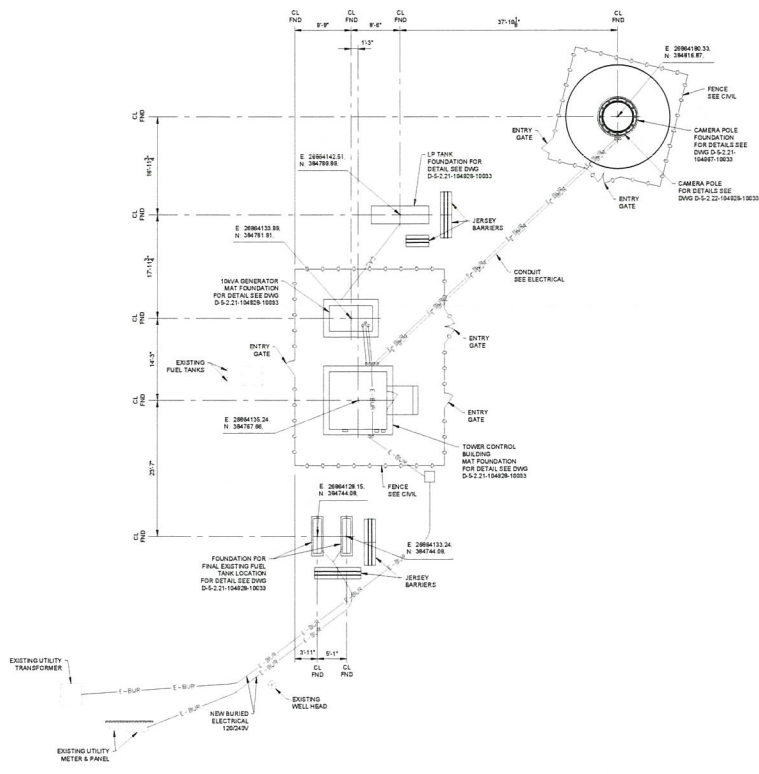
NO.	DESCRIPTION	DATE	BY	CHK

**ENBRIDGE**

BOIS BLANC ISLAND TOWER (M) SITE  
 STRAITS MONITORING  
 STRUCTURAL GENERAL NOTES

DATE: 2015-04-06  
 SCALE: 1/8" = 1'-0"  
 DRAWING NO: D-5-2.0-104925-10033

REV: 0.C



**ISSUED FOR CONSTRUCTION**

REV	DESCRIPTION	DATE	BY	CHK	APPR
0.C	ISSUED FOR CONSTRUCTION	2017-03-01	ENR	ENR	ENR
B.B	ISSUED FOR BID	2016-12-19	ENR	ENR	ENR
A.A	ISSUED FOR PER REVIEW	2016-12-09	ENR	ENR	ENR
0.C	ISSUED FOR CONSTRUCTION	2017-03-01	ENR	ENR	ENR

D-5-2-2-104926-10033 FOUNDATIONS DETAILS  
 D-5-2-2-104926-10033 10'-0" CAMERA POLE FOUNDATIONS  
 D-5-2-2-104926-10033 10'-0" CAMERA POLE FOUNDATIONS  
 REFERENCE TO DRAWINGS

REV	DESCRIPTION	DATE	BY	CHK	APPR

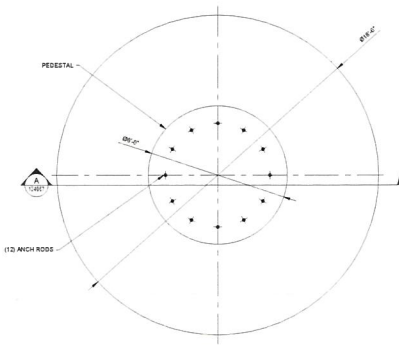
**ENBRIDGE**

BOIS BLANC ISLAND TOWER (MI) SITE  
 LINE 5  
 STRAITS MONITORING  
 STRUCTURAL PLOT PLAN

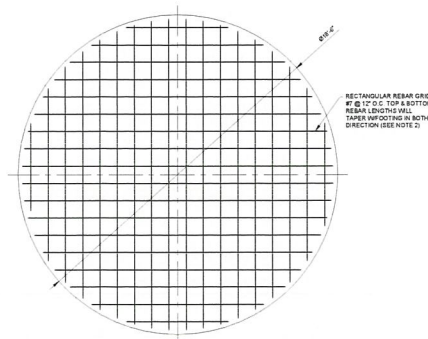
BY: AMR    CHK: PSC    ENG: VORGERBUSSEN    ENR: APRR    E: SOWA  
 DATE: 2017-03-01    SCALE: 1/8"=1'-0"    STATUS: CONSTRUCTION  
 DWG NO: **D-5-2-2-104926-10033**    SHEET NO: **0.C**



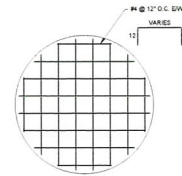




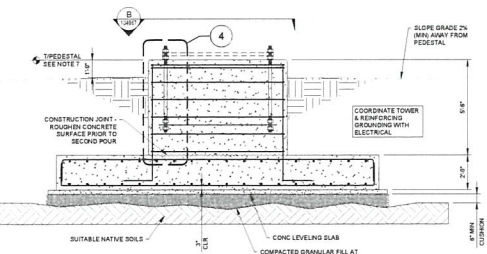
1 FOUNDATION PLAN  
3/8"=1'-0"  
FROM DWG D-5-2-104926-10033



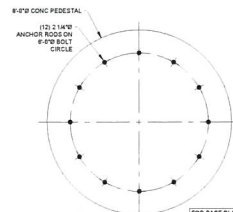
2 REINFORCING PLAN  
3/8"=1'-0"



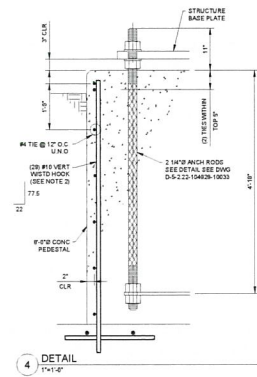
3 PLAN - PEDESTAL CAP REINFORCING  
3/8"=1'-0"



A SECTION  
3/8"=1'-0"



B SECTION  
1/2"=1'-0"



4 DETAIL  
1"=1'-0"



- NOTES
- SEE DRAWING D-5-2-104926-10033 FOR GENERAL NOTES
  - ALL REINFORCING STEEL FOR THIS FOUNDATION SHALL BE EPOXY-COATED
  - COLD JOINTS SHALL BE LIMITED TO THE EXTENT POSSIBLE, BUT MAY BE REQUIRED BASED ON CONCRETE SUPPLY CAPABILITIES. USE EPOXY BONDING AGENT AT ALL COLD JOINTS. Sika ANIMATEC 110 IS OK FOR EQUIVALENT
  - CONTRACTOR SHALL PROVIDE A CONCRETE MIX DESIGN FOR APPROVAL WITH APPROPRIATE COMPONENTS RATIOS AND ADMIXTURES FOR THE CONDITIONS, INCLUDING CONSIDERATION FOR POTENTIALLY LONG DELIVERY TIME
  - USE OF COLD JOINTS SHALL BE LIMITED. THREE COLD JOINTS ARE REQUIRED. BULKHEAD FIRST POUR. INSTALL APPROVED EPOXY BONDING AGENT AND CONSOLIDATE SECOND POUR THOROUGHLY AGAINST FIRST POUR
  - MAXIMUM UNFACTORED DESIGN REACTIONS ARE MOMENT = 7.84 KIPS-FT. & R.A. LOAD = 2.34 K
  - SEE DRAWING D-5-1-104303-10033 FOR TOP OF CONCRETE ELEVATIONS

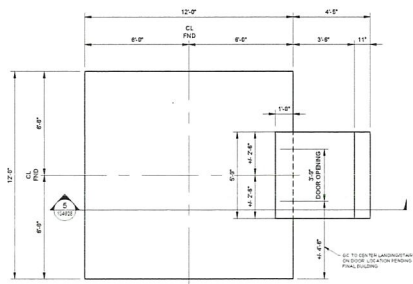
ISSUED FOR CONSTRUCTION

REV	DESCRIPTION	DATE	BY	CHK
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02	ISSUED FOR CONSTRUCTION	08/11/10	JAC	...
03	ISSUED FOR CONSTRUCTION	08/11/10	JAC	...
04	ISSUED FOR CONSTRUCTION	08/11/10	JAC	...

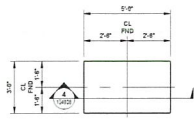
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D-5-2-104926-10033  
D-5-2-104926-10033  
D-5-2-104926-10033

REV	DESCRIPTION	DATE	BY	CHK
01	ISSUED FOR CONSTRUCTION	08/11/10	JAC	...
02	ISSUED FOR CONSTRUCTION	08/11/10	JAC	...
03	ISSUED FOR CONSTRUCTION	08/11/10	JAC	...
04	ISSUED FOR CONSTRUCTION	08/11/10	JAC	...

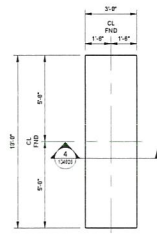
**ENBRIDGE**  
BOIS BLANC ISLAND TOWER (M) SITE  
LINE 5  
125-FT CAMERA POLE  
FOUNDATION DETAILS  
DATE: 2010-08-05 SCALE: AS SHOWN STATUS: CONSTRUCTION  
D-5-2-21-104967-10033



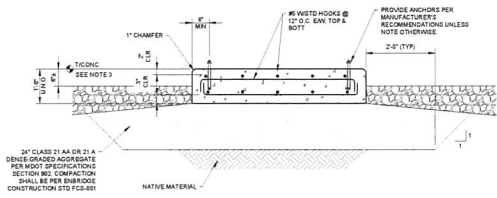
1 TOWER CONTROL BUILDING MAT FOUNDATION  
38"x1'-0"  
FROM DWG D-5-2-104928-10033



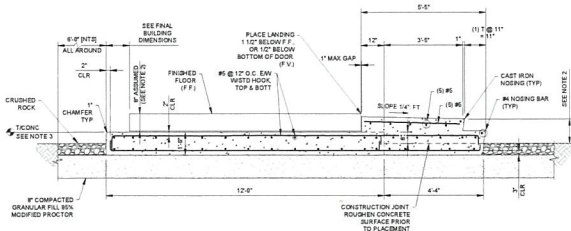
2 GENERATOR MAT FOUNDATION  
38"x1'-0"  
FROM DWG D-5-2-104928-10033



3 PROPANE MAT FOUNDATION  
38"x1'-0"  
FROM DWG D-5-2-104928-10033



4 TYPICAL MAT FOUNDATION  
38"x1'-0"



5 TOWER CONTROL BUILDING MAT FOUNDATION - SECTION  
12"x1'-0"  
FROM DWG D-5-2-104928-10033

- NOTES:
- 1 REFERENCE BARR ENGINEERING GEOTECHNICAL REPORT DATED MARCH 10, 2011 FOR SUBGRADE PREPARATION RECOMMENDATIONS
  - 2 GC SHALL COORDINATE LANDING HEIGHT, NUMBER OF STEPS AND RISERS WITH FINAL BUILDING DIMENSIONS. RISERS SHALL BE UNIFORM HEIGHT AND SHALL BE BETWEEN 17" AND 7"
  - 3 SEE DRAWING D-5-1-104935-10033 FOR TOP OF CONCRETE ELEVATIONS

ISSUED FOR CONSTRUCTION

REV	DESCRIPTION	DATE	BY	CHK
0	ISSUED FOR CONSTRUCTION	2/21/2012	PC	PC

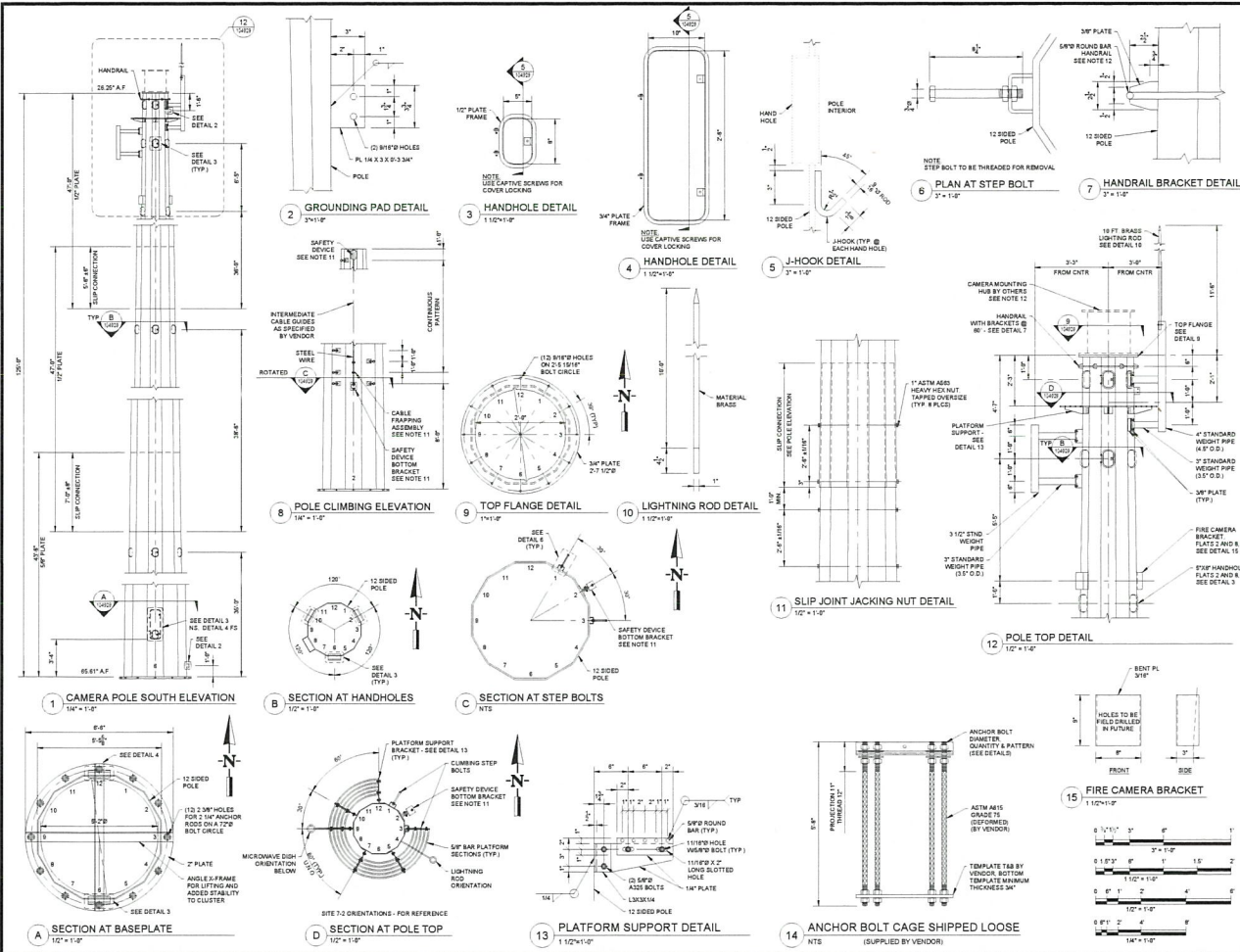
D-5-1-104928-10033  
D-5-2-104928-10033  
D-5-3-104928-10033

REV	DESCRIPTION	DATE	BY	CHK
0	ISSUED FOR CONSTRUCTION	2/21/2012	PC	PC

BOIS BLANC ISLAND TOWER (M) SITE  
LINE 5  
FOUNDATION DETAILS

DATE	BY	CHK	ENG	APPR	SCALE	STATUS
2/21/2012	PC	PC	PC	PC	AS SHOWN	CONSTRUCTION

D-5-2-21-104928-10033 0.C



**NOTES**

- DESIGN BASE: AUSTRIA-220-G-2006
- STRUCTURAL CLASS: 1
- WIND EXPOSURE: 3
- DESIGN LOAD COMBINATIONS:
  - LC 1: SERVICE LOADING - 80 MPH WIND (EXPOSURE D); NO ICE FOR DEFLECTION DESIGN.
  - LC 2: ICE AND WIND - 45 MPH WIND (EXPOSURE D); NO ICE FOR STRENGTH DESIGN.
  - LC 3: HIGH WIND - 80 MPH WIND (EXPOSURE D); NO ICE FOR STRENGTH DESIGN.
- DESIGN LIMIT STATE:
  - LC 1: 1.50 x 1.00 x 1.00 - LIMIT POLE TOP ROTATION TO 8.143 DEGREES.
  - LC 2: 1.50 x 1.00 x 1.00 - LIMIT ULTIMATE STRESS TO DESIGN STRENGTH.
  - LC 3: 1.25 x 1.00 x 1.00 - LIMIT ULTIMATE STRESS TO DESIGN STRENGTH.
  - LIMIT LATERAL FREQUENCY TO 1.30 HZ OR LESS.
- PROUREMENT BASE: TECHNICAL PROCUREMENT SPECIFICATION TO ENR. REV. 1: TUBULAR STEEL STRUCTURES - DESIGN AND FABRICATION.
- POLE SHAPE: REGULAR DOSECADON (12 SIDED).
- MATERIALS:
  - POLE SHAFT: ASTM A572 GRADE 50.
  - BASEPLATE AND FLANGE PLATE: ASTM A572 OR A583 GRADE 50/55.
  - WELDS/STRUCTURAL SECTIONS: ASTM A505 GRADE C.
  - STEEL PIPE: ASTM A53 GRADE B.
  - OTHER BRACKETS AND PLATES: ASTM A36 OR A572 GRADE 50.
- FINISH: HOT-DIP GALVANIZED PER ASTM A153.
- FABRICATOR TO PROVIDE ANCHOR RODS WITH TEMPLATES TAB.
- CLIMBING FALL PROTECTION SYSTEM BY VENDOR.
- FALL PROTECTION TIE-OFF POINTS ON HAIR SUPPLIED AND INSTALLED BY OTHERS. HANDRAIL IS NOT INTENDED FOR USE AS A TIE-OFF POINT.

**ISSUED FOR CONSTRUCTION**

REV	REVISION DESCRIPTION	DATE	BY	CHK	APPR
0.0	PROJECT TITLE				
0.1	LINE STRAITS ANCHOR MONITORING				
0.2	REVISED FOR BIR REVIEW	2/20/20	PLC		
0.3	REVISED FOR BIR REVIEW	2/20/20	PLC		
0.4	REVISED FOR BIR REVIEW	2/20/20	PLC		
0.5	REVISED FOR BIR REVIEW	2/20/20	PLC		
0.6	REVISED FOR BIR REVIEW	2/20/20	PLC		
0.7	REVISED FOR BIR REVIEW	2/20/20	PLC		
0.8	REVISED FOR BIR REVIEW	2/20/20	PLC		
0.9	REVISED FOR BIR REVIEW	2/20/20	PLC		
1.0	ISSUED FOR CONSTRUCTION	2/20/20	PLC		

BOIS BLANC ISLAND TOWER (MI) SITE  
LINE 5  
125-FT CAMERA POLE  
STEEL DETAILS

DATE: 2021-02-22  
SCALE: AS SHOWN  
STATUS: CONSTRUCTION

D-5-2.22-104929-10033

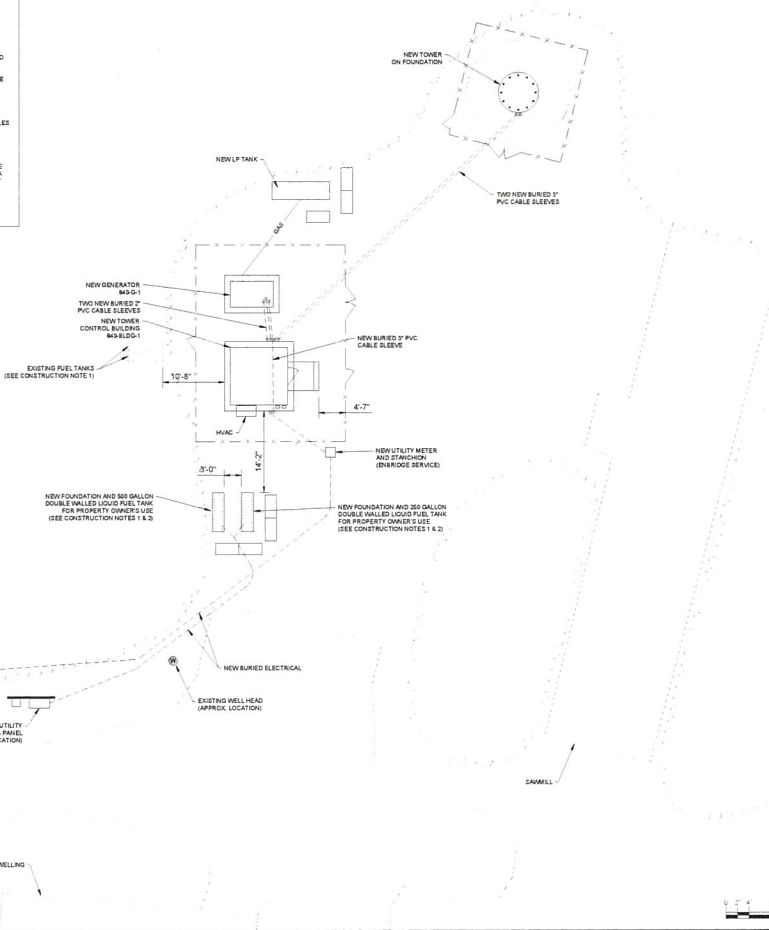
**SCOPE OF WORK**

- NEW INFRASTRUCTURE
- CAMERA AND MICROWAVE DISH (SUPPLIED BY VENDOR, INSTALLED BY CONTRACTOR)
- TOWER (SUPPLIED BY VENDOR, INSTALLED BY CONTRACTOR)
- TOWER CONTROL BUILDING, COMPLETE WITH HVAC (SUPPLIED BY VENDOR, INSTALLED BY CONTRACTOR)
- PERMANENT STANDBY GENERATOR WITH ENOUGH CAPACITY (SUPPLIED AND INSTALLED BY CONTRACTOR)
- LP FUEL TANK WITH TANK LEVEL MONITOR (SUPPLIED BY VENDOR, INSTALLED BY CONTRACTOR)
- BURIED COORDINATE AND CABLE FROM EXISTING UTILITY TRANSFORMER TO NEW UTILITY METERS AS WELL AS A NEW UTILITY METER AND STATIONING (SUPPLIED AND INSTALLED BY UTILITY)
- BURIED CABLES ROUTE FROM BUILDING TO GENERATOR, UTILITY METERS, AND FROM EXISTING UTILITY SERVICE TO LIQUID FUEL TANK REPLACEMENT (SUPPLIED AND INSTALLED BY CONTRACTOR)
- LIPE SYSTEM WITH ETHERNET COMMUNICATION CAPABILITY (SUPPLIED AND INSTALLED BY CONTRACTOR)
- LIPE SYSTEM WITH ETHERNET COMMUNICATION CAPABILITY, MAINTENANCE BYPASS SWITCH, AND DISTRIBUTION FUSE PANEL (SUPPLIED AND INSTALLED BY CONTRACTOR)
- AUTOMATIC TRANSFER SWITCH WITH ETHERNET CAPABILITY (SUPPLIED AND INSTALLED BY CONTRACTOR)
- MONITORING CONTROL PANEL (SUPPLIED AND INSTALLED BY CONTRACTOR), COMPLETE WITH:
  - 4 AMP SPECIFIED NETWORK SWITCHES (SUPPLIED AND INSTALLED BY CONTRACTOR)
  - MICROWAVE X-COUPLER AND POE INJECTORS (SUPPLIED AND INSTALLED BY VENDOR)
- INTERNAL BUILDING CABLES FOR LIFE SYSTEM, SITE MONITORING CONTROL PANEL, HVAC, LIGHTING AND RECEPTACLES (SUPPLIED AND INSTALLED BY CONTRACTOR)
- REPLACE EXISTING LIQUID FUEL TANKS WITH NEW IN A DIFFERENT LOCATION TO ALLOW CONTINUED ACCESS (CONTRACTOR TO SUPPLY AND INSTALL)

**DESCRIPTION:**  
 A NEW MONITORING CAMERATOWER WILL BE INSTALLED TO GAIN ADVANCE WARNING OF SHIPS TRAVELING TOWARD THE BRIDGE PIPERLIFE BRIDGE WITH AN ANCHOR EMPLOYED. THE SCOPE OF THIS SITE WILL INCLUDE INSTALLATION OF A NEW CAMERA, MICROWAVE DISH, AND TOWER SYSTEM POWERED FROM A COMBINATION OF UTILITY POWER, PERMANENT STANDBY GENERATOR, AND LP. CAMERA COMMUNICATIONS WILL BE BY GATE CABLE TO THE MONITORING CONTROL PANEL WHERE ALL SITE COMMUNICATIONS WILL GATHER AND BE TRANSMITTED TO THE MICROWAVE DISH FOR COMMUNICATION THROUGH STRAITS AND BOIS BLANC FUEL TANKS.

**REVISION NOTES**

1. SITE LAYOUT HAS BEEN SIGNIFICANTLY MODIFIED
2. SCOPE OF WORK ENTRIES 3, 5, 8, 11B, AND 12 HAVE BEEN MODIFIED
3. REMOVED HOLD NOTE



SECTION 14.140N, R.20E, BOIS BLANC TWP  
 MACKINAC COUNTY, MICHIGAN

- CONSTRUCTION NOTES**
1. CONTRACTOR TO REMOVE AND DISPOSE OF OR ABANDON EXISTING FUEL TANKS IN PLACE AT THE PROPERTY OWNER'S DISCRETION. NEW TANKS WILL BE INSTALLED TO REPLACE THE OLD TANKS IN A NEW LOCATION. ENGINEER SHALL LOCATE OF TANKS REMAIN A MINIMUM OF 3' AWAY FROM OTHER LIQUID TANKS, 10' AWAY FROM BUILDINGS OR STRUCTURES, AND 30' AWAY FROM LP TANKS PER NFPA 30 SECTION 22.4.2 AND NFPA SECTION 4.1
  2. CONTRACTOR TO SUPPLY AND INSTALL DOUBLE WALL STEEL ABOVEGROUND STORAGE TANKS AS DESCRIBED BELOW
  3. TANKS SHALL BE MANUFACTURED IN ACCORDANCE WITH STEEL TANK INSTITUTE (STI) D, STANDARD FOR DOUBLE WALL ABOVEGROUND STORAGE TANKS
  4. ABOVEGROUND TANK PRIMARY AND SECONDARY CONTAINMENT INNER AND OUTER WALLS SHALL BE MANUFACTURED IN ACCORDANCE AND LISTED BY UNDERWRITERS LABORATORIES (UL) 142 STANDARD FOR STEEL ABOVEGROUND TANKS FOR FLAMMABLE AND COMBUSTIBLE LIQUIDS
  5. TANKS SHALL BE SUPPLIED WITH ALL NECESSARY ACCESSORIES INCLUDING POSITIVE DISPLACEMENT TANK PUMP
  6. TANKS SHALL BE DOUBLE WALL WITH A STEEL INNER WALL FOR PRIMARY CONTAINMENT AND PROVIDE INTERNAL SECONDARY CONTAINMENT BY AN IMPERVIOUS STEEL OUTER WALL
  7. INTERNAL SECONDARY CONTAINMENT SHALL BE TESTABLE AND PROVIDE ACCESS FOR INTERSTITIAL LEAK DETECTION MONITORING
  8. LISTED SUPPORTS SHALL BE USED FOR ALL HORIZONTAL, RECTANGULAR AND VERTICAL DOUBLE WALL TANKS

**ISSUED FOR CONSTRUCTION**

REV	DESCRIPTION	DATE	CHK	APP
0.0	LINE 5 STRAITS ANCHOR MONITORING			
0.1				
0.2				
0.3				
0.4	ISSUED FOR REVIEW	2023-01-10	DL	
0.5	ISSUED FOR REVIEW	2023-01-10	DL	
0.6	ISSUED FOR REVIEW	2023-01-10	DL	
0.7	ISSUED FOR REVIEW	2023-01-10	DL	
0.8	ISSUED FOR CONSTRUCTION	2023-01-10	DL	

REFERENCE DRAWINGS

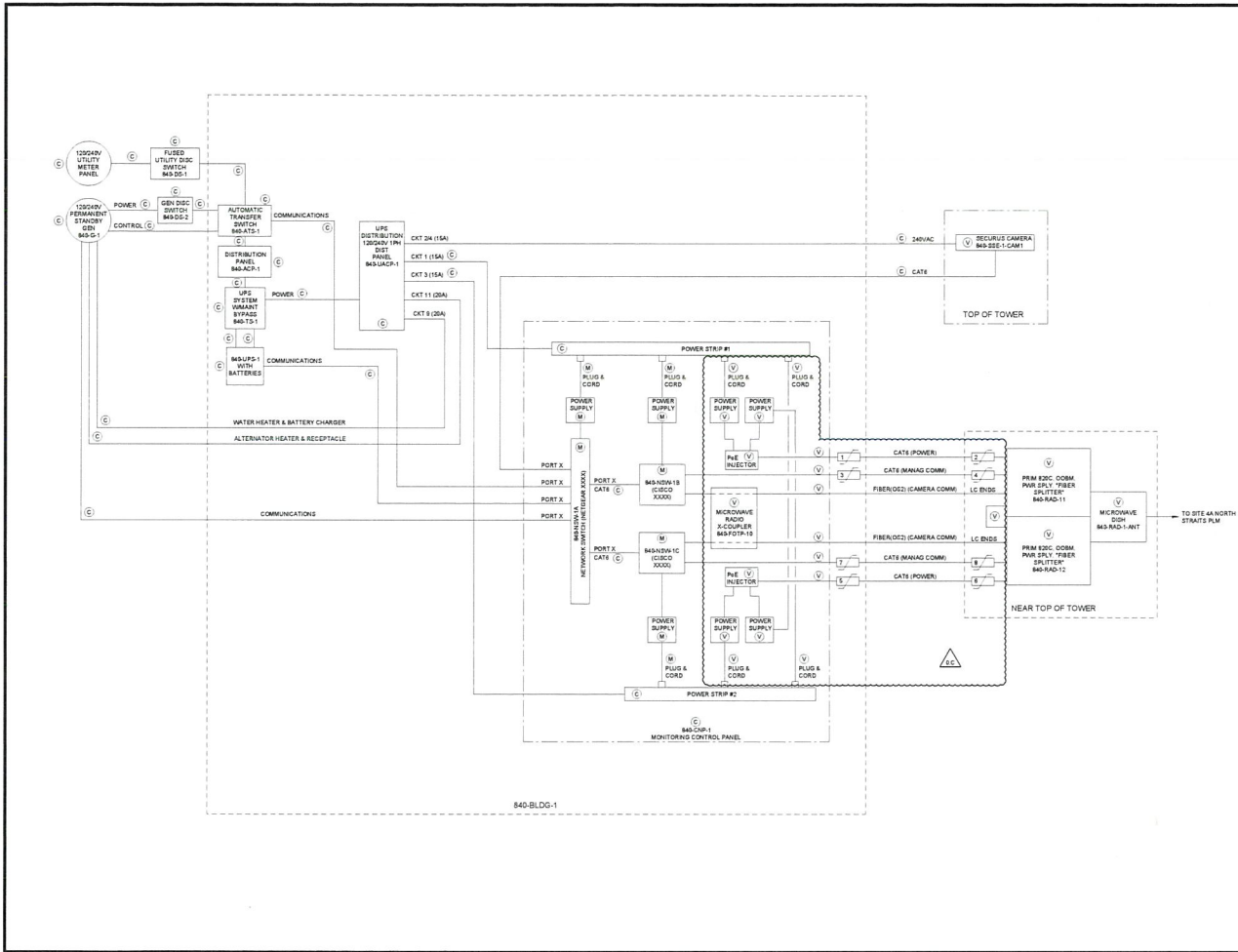
NO.	REVISION	DATE	CHK	APP

**ENBRIDGE**

BOIS BLANC ISLAND TOWER (M) SITE  
 LINE 5  
 ELECTRICAL SCOPE OF WORK

DATE: 2023-01-10  
 SCALE: 1/8" = 1'-0"  
 STATUS: CONSTRUCTION

D-5-4.2-127994-10033 0.0



- CONSTRUCTION LEGEND**
- (C) = FIELD CONTRACTOR SUPPLY
  - (V) = VENDOR SUPPLY
  - (R) = RELOCATED EXISTING
  - (E) = ENBRIDGE SUPPLY
  - (M) = MFC SUPPLY

- NOTES**
1. PORT NUMBERS TO BE CONFIRMED WITH MFC AND REVISIONS OR DRAWINGS FOR FINAL AS-BUILT.
  2. CONTRACTOR TO WORK WITH MFC TO SPECIFY NETWORK SWITCHES AND REDLINE DRAWINGS FOR FINAL AS-BUILT.

- REVISION NOTES**
1. REMOVED GENERATOR HOLD

**ISSUED FOR CONSTRUCTION**

REV	PROJECT FILE	DATE	BY	CHK	APPV
01	LINE 5 STRAITS ANCHOR MONITORING				
02					
03					
04					
05					
06					
07					
08					
09					
10					

REFERENCE DRAWINGS

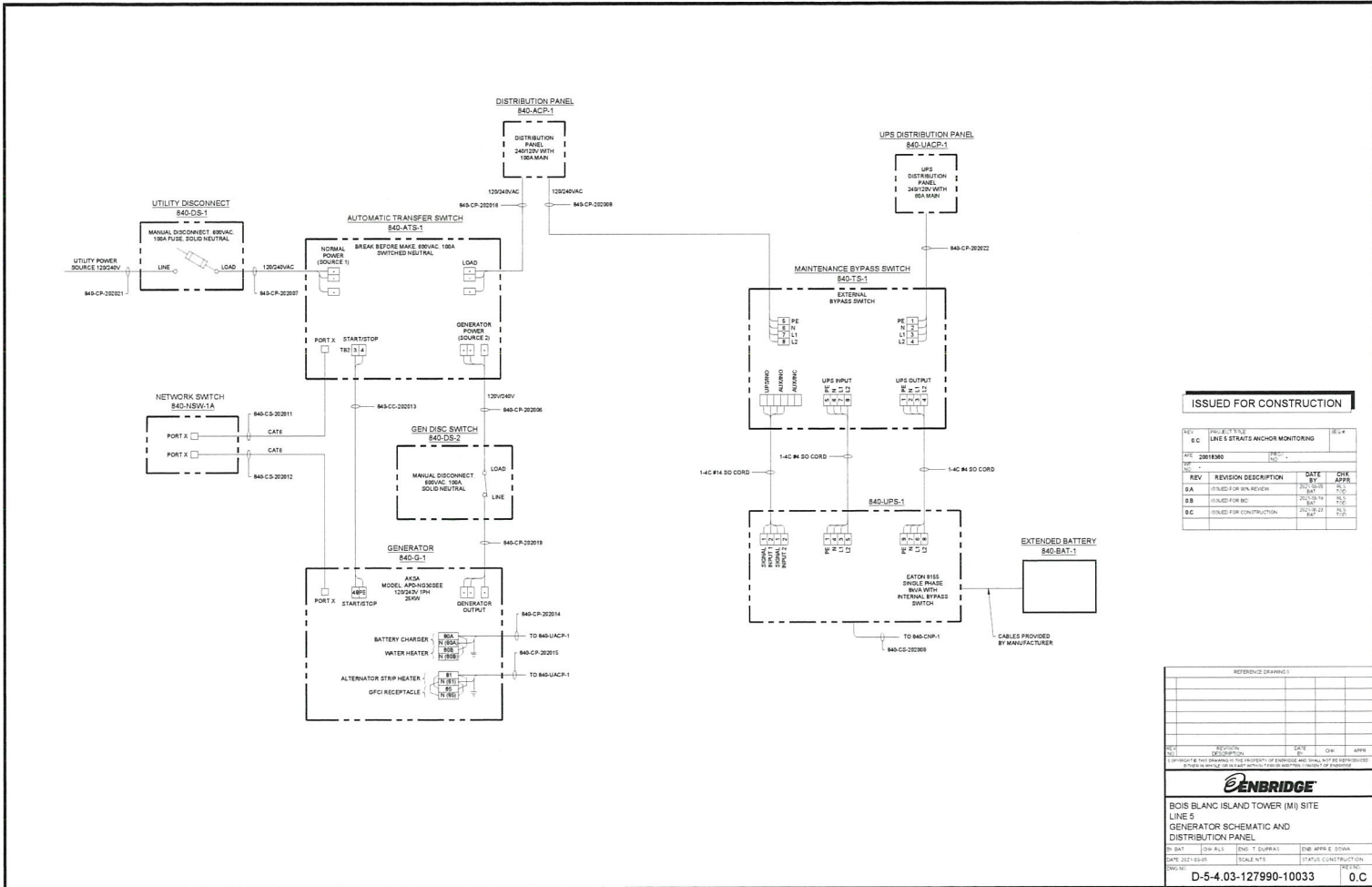
NO.	DESCRIPTION

ENBRIDGE

BOIS BLANC ISLAND TOWER (M) SITE  
LINE 5  
STRAITS MONITORING  
BLOCK DIAGRAM

DATE: 2024-03-05  
SCALE: A7.5  
STATUS: CONSTRUCTION

D-5-4.02-127989-10033 0.C



**ISSUED FOR CONSTRUCTION**

REV	DESCRIPTION	DATE	CHK	APPR
0.1	ISSUED FOR CONSTRUCTION	2023-03-01	...	...
0.2	ISSUED FOR CONSTRUCTION	2023-03-01	...	...
0.3	ISSUED FOR CONSTRUCTION	2023-03-01	...	...
0.4	ISSUED FOR CONSTRUCTION	2023-03-01	...	...

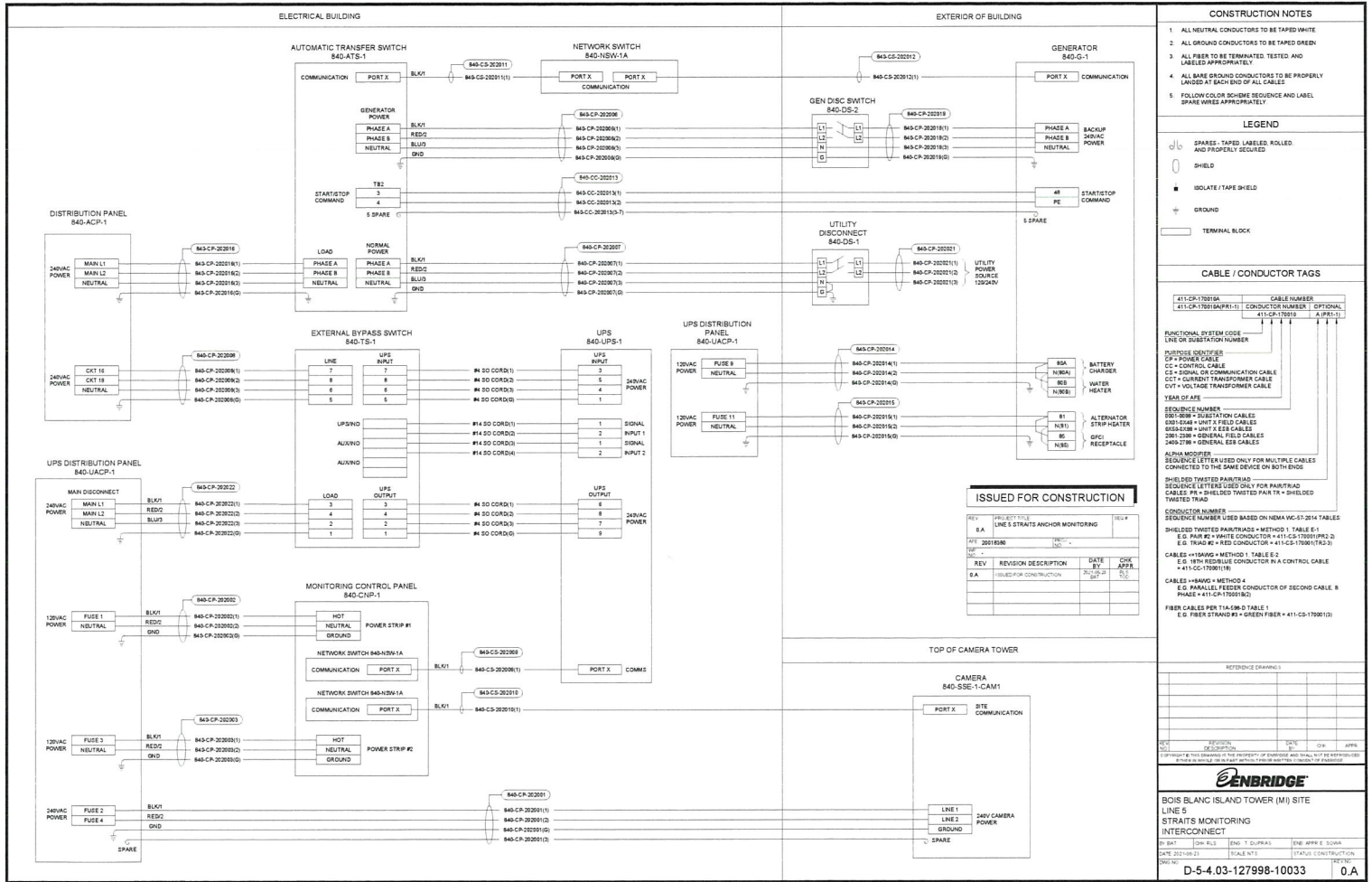
REFERENCE DRAWINGS

REV	REVISION	DATE	CHK	APPR
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0.2	ISSUED FOR CONSTRUCTION	2023-03-01	...	...
0.3	ISSUED FOR CONSTRUCTION	2023-03-01	...	...
0.4	ISSUED FOR CONSTRUCTION	2023-03-01	...	...

**ENBRIDGE**

BOIS BLANC ISLAND TOWER (MI) SITE  
LINE 5  
GENERATOR SCHEMATIC AND  
DISTRIBUTION PANEL

D: B4T    DW: ALI    DW: T. DUPRAI    DW: APPR. E. DOWA  
DATE: 2023-03-01    SCALE: NTS    STATUS: CONSTRUCTION  
DWG NO: D-5-4.03-127990-10033    0.C



### CONSTRUCTION NOTES

- ALL NEUTRAL CONDUCTORS TO BE TAPED WHITE
- ALL GROUND CONDUCTORS TO BE TAPED GREEN
- ALL WIRES TO BE TERMINATED, TESTED AND LABELED APPROPRIATELY
- ALL BARE GROUND CONDUCTORS TO BE PROPERLY LANDED AT EACH END OF ALL CABLES
- FOLLOW COLOR SCHEME REFERENCE AND LABEL SPARE WIRES APPROPRIATELY

### LEGEND

SPARE, TAPED, LABELED, ROLLED AND PROPERLY SECURED  
 SHIELD  
 ISOLATE / TAPE SHIELD  
 GROUND  
 TERMINAL BLOCK

### CABLE / CONDUCTOR TAGS

FUNCTIONAL SYSTEM CODE	CABLE NUMBER
411-CR-170016A	411-CR-170016A
411-CR-170016A(PP1)	411-CR-170016A (A, PP1)

FUNCTIONAL SYSTEM CODE - LINE OR SUBSTATION NUMBER  
 CR = CONTROL CABLE  
 CC = CONTROL CABLE  
 CC = SIGNAL OR COMMUNICATION CABLE  
 CCT = CURRENT TRANSFORMER CABLE  
 CVT = VOLTAGE TRANSFORMER CABLE  
 YEAR OF AFE  
 SEQUENCE NUMBER - 0001-0008 = DISTRIBUTION CABLES  
 0001-0008 = UNIT X FIELD CABLES  
 0009-0016 = UNIT Y FIELD CABLES  
 2001-2008 = GENERAL FIELD CABLES  
 2400-2499 = GENERAL EER CABLES  
 ALPHA MODIFIER  
 SEQUENCE LETTERS USED ONLY FOR MULTIPLE CABLES CONNECTED TO THE SAME DEVICE ON BOTH ENDS  
 SHIELDED TWISTED PAIR/TRAD - SEQUENCE LETTERS USED ONLY FOR PAIR/TRAD CABLES - FR = SHIELDED TWISTED PAIR TR = SHIELDED TWISTED TRAD  
 CONDUCTOR NUMBER  
 SEQUENCE NUMBER USED BASED ON NEMA IEC-61204 TABLES  
 E.G. PAIR #2 = WHITE CONDUCTOR + 411-CS-170011(PS 2)  
 E.G. TRAD #3 = RED CONDUCTOR + 411-CS-170011(PS 3)  
 CABLES ++(N)AVG = METHOD 1, TABLE 2  
 E.G. 16M RED/BLUE CONDUCTOR IN A CONTROL CABLE + 411-CS-170011(PS)  
 CABLES ++(N)AVG + METHOD 4  
 E.G. PARALLEL FEEDER CONDUCTOR OF SECOND CABLE B PHASE + 411-CR-170011(PS)  
 FIBER CABLES PER IEC 60303 TABLE 1  
 E.G. FIBER STRAND #1 = GREEN FIBER + 411-CS-170011(PS)

### ISSUED FOR CONSTRUCTION

REV	DESCRIPTION	DATE	CHK	APP
0.1	ISSUED FOR CONSTRUCTION	2018-01-21		

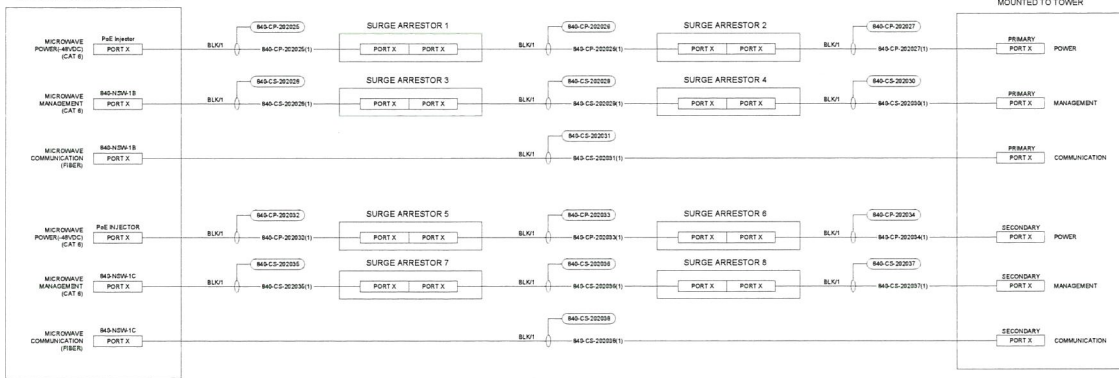
### TOP OF CAMERA TOWER

CAMERA 840-SSE-1-CAM1

PORT X SITE COMMUNICATION

LINE 1 24V CAMERA POWER  
LINE 2  
GROUND  
SPARE

840-GNP-1A  
MONITORING COMMUNICATION PANEL



CONSTRUCTION NOTES

1. ALL NEUTRAL CONDUCTORS TO BE TAPED WHITE
2. ALL GROUND TO BE TAPED GREEN
3. ALL FIBER TO BE TERMINATED TESTED AND LABELED APPROPRIATELY
4. ALL BARE GROUND CONDUCTORS TO BE PROPERLY LAPPED AT EACH END OF ALL CABLES
5. FOLLOW COLOR SCHEME SEQUENCE AND LABEL SPARE WIRES APPROPRIATELY

LEGEND

- SPARES: TAPED, LABELED, ROLLED AND PROPERLY SECURED
- SHIELD
- ISOLATE / TAPE SHIELD
- ⊕ GROUND

CABLE / CONDUCTOR TAGS

411-CP-170010	CABLE NUMBER	411-CP-170010(PR:1)	CONDUCTOR NUMBER	OPTIONAL	411-CP-170010	AL (PR:1)
FUNCTIONAL SYSTEM CODE						
LINE OR SUBSTATION NUMBER						
PURPOSE IDENTIFIER						
CP = POWER CABLE						
CC = CONTROL CABLE						
CS = SIGNAL OR COMMUNICATION CABLE						
CT = CONTROL TRANSFORMER CABLE						
CV = VOLTAGE TRANSFORMER CABLE						
YEAR OF ASSESSMENT						
SEQUENCE NUMBER						
800-0999 = SUBSTATION CABLES						
800-9000 = UNIT / FIELD CABLES						
800-9099 = UNIT / FIELD CABLES						
800-9999 = UNIT / FIELD CABLES						
900-0000 = GENERAL FIELD CABLES						
900-0999 = GENERAL ESB CABLES						
ALPHA MODIFIER						
SEQUENCE LETTER USED ONLY FOR MULTIPLE CABLES CONNECTED TO THE SAME SERVICE ON BOTH ENDS						
SHIELDED TWISTED PAIR/TRIAD						
SEQUENCE LETTERS USED ONLY FOR PAIR/TRIAD CABLES: PA = SHIELDED TWISTED PAIR TR = SHIELDED TWISTED TRIAD						
CONDUCTOR NUMBER						
SEQUENCE NUMBER USED BASED ON NEMA WG-57-2014 TABLE 1						
SHIELDED TWISTED PAIR/TRIAD - METHOD 1: TABLE 1						
E.G. PAIR #2 = WHITE CONDUCTOR + 411-CS-170010(PR:2)						
E.G. TRIAD #1 = RED CONDUCTOR + 411-CS-170010(TR:2)						
CABLES: #+HWG+METHOD+TABLE E-2						
E.G. 18TH RED/BLUE CONDUCTOR IN A CONTROL CABLE + 411-CS-170010(R:18)						
CABLES: #+HWG+METHOD+TABLE 4						
E.G. PARALLEL FIBER CONDUCTOR OF SECOND CABLE, B PHASE + 411-CP-170010(B:2)						
FIBER CABLES PER TIA 598-D TABLE 1						
E.G. FIBER STRAND #2 = GREEN FIBER + 411-CS-170010(S:2)						

- CONSTRUCTION NOTES
1. PORT NUMBERS TO BE CONFIRMED WITH MPC AND REDLINED ON DRAWINGS FOR FINAL AS-BUILTS

ISSUED FOR CONSTRUCTION

REV	DESCRIPTION	DATE	CHK	APPR
01	ISSUED FOR CONSTRUCTION	2023-01-21	DA	

REV	DESCRIPTION	DATE	CHK	APPR

**ENBRIDGE**

BOIS BLANC ISLAND TOWER (MI) SITE  
LINE 5  
STRAITS MONITORING  
INTERCONNECT

DATE: 2023-01-21 SCALE: NTS STATUS: CONSTRUCTION  
D-5-4.03-127999-10033 0.A



CABLE TAG	***CS*****		***CC*****				***CP*****		***CP*****	
	INSTRUMENTATION		CONTROL		POWER - LESS THAN 600V		POWER - 60V CABLE		POWER - 60V CABLE	
CABLE TYPE	ARMORED	NON-ARMORED	ARMORED	NON-ARMORED	ARMORED	NON-ARMORED	ARMORED	NON-ARMORED	ARMORED	NON-ARMORED
ARMOR	MC-HL CONTINUOUSLY CORRUGATED WELDED	NOT APPLICABLE	MC-HL CONTINUOUSLY CORRUGATED WELDED	NOT APPLICABLE	MC-HL CONTINUOUSLY CORRUGATED WELDED	NOT APPLICABLE	MC-HL CONTINUOUSLY CORRUGATED WELDED	NOT APPLICABLE	MC-HL CONTINUOUSLY CORRUGATED WELDED	NOT APPLICABLE
MINIMUM BEND RADIUS	LESS THAN 24"	LESS THAN 24"	LESS THAN 24"	LESS THAN 24"	LESS THAN 24"	LESS THAN 24"	LESS THAN 24"	LESS THAN 24"	LESS THAN 24"	LESS THAN 24"
VOLTAGE RATING	600 V		600 V		600 V		60V		60V	
CABLE ASSEMBLY	TWISTED PAIRS OR TRIADS		MULTI-CONDUCTOR (WITH GROUNDS)		MULTI-CONDUCTOR (WITH GROUNDS)		SPLIT GROUNDS		SPLIT GROUNDS	
CONDUCTOR TYPE	COPPER		COPPER		COPPER		COPPER		COPPER	
CONDUCTOR INSULATION	CLASS B, STRANDED		CLASS B		CLASS B, COMPRESSED, DR COMPACT		CLASS B, COMPRESSED, DR COMPACT		CLASS B, COMPRESSED, DR COMPACT	
INSULATION LEVEL	PVC OR XLPE		XHHW-2		XHHW-2		EPA		EPA	
IDENTIFICATION METHOD	COLOR CODE (METHOD 1, TABLE E1)		COLOR CODE (CABLES >=10AWG) + METHOD 1		METHOD 1 TABLE E-2, METHOD 3, OR METHOD 4		VENDOR STANDARD (TYPICALLY BLACK, RED, BLUE TRACER)		VENDOR STANDARD (TYPICALLY BLACK, RED, BLUE TRACER)	
SHIELDING	INDIVIDUAL WITH DRAIN WIRE/OVERALL (D/S) WITH DRAIN WIRE		NA		NA		5 MIL COPPER TAPE WITH AT LEAST 10% OVERLAP		5 MIL COPPER TAPE WITH AT LEAST 10% OVERLAP	
GROUNDING CONDUCTOR	NA		INSULATED OR BARE		INSULATED OR BARE		BARE		BARE	
JACKET	NA		COPPER		COPPER		PVC		PVC	
TEMPERATURE RATING	90°C		90°C		90°C		105°C		90°C	
STANDARDS	UL 1569		UL 1569		UL 1569		UL 1072		UL 1072	
TESTING REQUIREMENTS	IEEE 1202		IEEE 1202		IEEE 1202		IEEE 1202		IEEE 1202	
SPECIAL REQUIREMENTS	-40° F INSTALLATION RATING		-40° F INSTALLATION RATING		-40° F INSTALLATION RATING		-40° F INSTALLATION RATING		-40° F INSTALLATION RATING	
	DIRECT BURIAL RATED		DIRECT BURIAL RATED		DIRECT BURIAL RATED		DIRECT BURIAL RATED		DIRECT BURIAL RATED	
	INDOOR/OUTDOOR RATED		INDOOR/OUTDOOR RATED		INDOOR/OUTDOOR RATED		INDOOR/OUTDOOR RATED		INDOOR/OUTDOOR RATED	
	CABLE TRAY RATED		CABLE TRAY RATED		CABLE TRAY RATED		CABLE TRAY RATED		CABLE TRAY RATED	
	OZONE & UV LIGHT RESISTANT		OZONE & UV LIGHT RESISTANT		OZONE & UV LIGHT RESISTANT		OZONE & UV LIGHT RESISTANT		OZONE & UV LIGHT RESISTANT	

CABLE TAG	***CS*****					
	CATE	FIBER-ARMORED		FIBER - PATCH CABLE		
MANUFACTURER	BEIDEN	CORNING		CORNING		
MODEL NUMBERS AND DESCRIPTIONS	121872A	ARMORED (OUTDOOR)	012KUZ-741300AN	12 F, 62.5 μM MULTIMODE (OM3)	050502X5120001M	LC TO LC, DUPLEX, 62.5 μM MM (OM3), 1 M
	2422F	NON-ARMORED (INDOOR)	024KUZ-741300AN	24 F, 62.5 μM MULTIMODE (OM3)	050502X5120002M	LC TO LC, DUPLEX, 62.5 μM MM (OM3), 2 M
			0121UZ-741800AN	12 F, 90 μM MULTIMODE (OM3)	050502X5120003M	LC TO ST, DUPLEX, 62.5 μM (OM3), 2 M
			0241UZ-741800AN	24 F, 90 μM MULTIMODE (OM3)	050502X5120004M	LC TO ST, DUPLEX, 90 μM MM (OM3), 1 M
			012EUZ-741010AN	12 F, SINGLE MODE (OS2)	040402X5120005M	LC TO LC, DUPLEX, 9 μM SM (OS2), 2 M
		024EUZ-741010AN	24 F, SINGLE MODE (OS2)			

- CONSTRUCTION NOTES**
- CABLE SPECIFICATION SHOULD APPLY TO NEW CABLES WITHIN THIS CONSTRUCTION SET UNLESS NOTED OTHERWISE
  - CONTRACTOR TO SUBMIT CABLE CUT SHEETS AND SEEK ENGINEER APPROVAL FOR ALL EQUIVALENT CABLES THAT DEVIATE FROM THESE SPECIFICATIONS

REV	REVISION DESCRIPTION	DATE	CHK	APPR
1.0	ISSUED FOR CONSTRUCTION	2012-03-01	TS	
1.1	ISSUED FOR BID	2012-03-01	TS	
1.2	ISSUED FOR CONSTRUCTION	2012-03-01	TS	

REV	DESCRIPTION	DATE	CHK	APPR

**ENBRIDGE**

BOIS BLANC ISLAND TOWER (M1) SITE  
LINE 5  
CABLE SPECIFICATIONS

BY: BAA	CHK: RL3	ENG: T. DURRAS	ENR APPROV: D30AK
DATE: 2012-03-01	SCALE: NTS	STATUS: CONSTRUCTION	PROJECT:

D-5-4.05-127992-10033      0.C

CABLE NUMBER	CONDUCTORS					DESCRIPTION	ROUTE			DRAWING REFERENCE
	NO. OF CABLES	NO. OF CONDUCTORS	SIZE	INSULATION	T-PE		SYSTEM VOLTAGE	FROM	VIA	
						72 AXRIBIT				
840-CF-202001	1	3C-G	#12	800V	MC-HL	240VAC	UPS DISTRIBUTION PANEL 840-UACR-1 CIRCUIT 24	TRY		CAMERA 840-SEE-1-CAM1
840-CF-202002	1	2C-G	#12	800V	TC	120VAC	POWER FEED #1	CONDUIT		MONITORING CONTROL PANEL 840-MCP-1
840-CF-202003	1	2C-G	#12	800V	TC	120VAC	POWER FEED #2	CONDUIT		MONITORING CONTROL PANEL 840-MCP-1
840-CF-202004	1	2C-G	#12	800V	TC	120VAC	BUILDING INTERIOR LIGHTING	CONDUIT		BUILDING INTERIOR LIGHTING
840-CF-202005	1	2C-G	#12	800V	TC	120VAC	BUILDING INTERIOR RECEPTACLES	CONDUIT		DISTRIBUTION PANEL 840-ACP-1 CIRCUIT 3
840-CF-202006	1	3C-G	#2	800V	TC	240VAC	POWER FEED ATS GENERATOR SOURCE	CONDUIT		GENERATOR DISCONNECT SWITCH 840-DS-1
840-CF-202007	1	3C-G	#2	800V	TC	240VAC	POWER FEED ATS NORMAL SOURCE	CONDUIT		UTILITY 100 DISCONNECT 840-DS-1
840-CF-202008	1	3C-G	#6	800V	TC	240VAC	POWER FEED	CONDUIT		DISTRIBUTION PANEL 840-ACP-1 CIRCUIT 1618
840-CF-202009	1	CATE	#23	800V	TC	COMM	COMMUNICATION MONITORING CONTROL PANEL	CONDUIT		MONITORING CONTROL PANEL 840-MCP-1, SWITCH 840-NSW-1A
840-CF-202010	1	CATE	#23	800V	COMM	COMM	COMMUNICATION TO CAMERA	TRAY & CONDUIT		CAMERA 840-SEE-1-CAM1
840-CF-202011	1	CATE	#23	800V	TC	COMM	COMMUNICATION TO ATS	CONDUIT		MONITORING CONTROL PANEL 840-MCP-1, SWITCH 840-NSW-1A
840-CF-202012	1	CATE	#23	800V	COMM	COMM	COMMUNICATION TO GENERATOR	CONDUIT		MONITORING CONTROL PANEL 840-MCP-1, SWITCH 840-NSW-1A
840-CF-202013	1	2C-G	#14	800V	MC-HL	120VAC	GENERATOR START/STOP	CONDUIT		PERMANENT STANDBY GENERATOR 840-G-1
840-CF-202014	1	2C-G	#12	800V	MC-HL	120VAC	WATER HEATER & BATTERY CHARGER	CONDUIT		BUILDING DISTRIBUTION PANEL 840-UACR-1 CIRCUIT 8
840-CF-202015	1	2C-G	#12	800V	MC-HL	120VAC	ALT HEATER & RECEPTACLE	CONDUIT		BUILDING DISTRIBUTION PANEL 840-UACR-1 CIRCUIT 11
840-CF-202016	1	3C-G	#2	800V	TC	240VAC	POWER FEED (DISTRIBUTION PANEL)	CONDUIT		UTILITY 100 DISCONNECT 840-DS-1
840-CF-202017	1	2C-G	#12	800V	TC	120VAC	BUILDING EXTERIOR LIGHTING	CONDUIT		DISTRIBUTION PANEL 840-ACP-1 CIRCUIT 4
840-CF-202018	1	2C-G	#12	800V	TC	120VAC	BUILDING EXTERIOR RECEPTACLES	CONDUIT		DISTRIBUTION PANEL 840-ACP-1 CIRCUIT 2
840-CF-202019	1	3C-G	#2	800V	MC-HL	240VAC	GENERATOR SUPPLIED POWER	CONDUIT		GENERATOR DISCONNECT SWITCH 840-DS-2
840-CF-202020							NOT USED			
840-CF-202021	1	3C-G	#2	800V	MC-HL	240VAC	UTILITY METERING	DIR BUR		UTILITY DISCONNECT 840-DS-1
840-CF-202022	1	3C-G	#6	800V	TC	240VAC	UPS DISTRIBUTION PANEL POWER	CONDUIT		UPS DISTRIBUTION PANEL 840-UACR-1
840-CF-202023	1	3C-G	#12	800V	MC-HL	120VAC	LIQUID FUEL TANK POWER	DIR BUR		EXISTING DISTRIBUTION PANEL
840-CF-202024	1	3C-G	#12	800V	MC-HL	120VAC	LIQUID FUEL TANK POWER	DIR BUR		EXISTING DISTRIBUTION PANEL
840-CF-202025	1	CATE	#23	800V	AMRLSHLD	48VDC	POWER TO MICROWAVE (PRIMARY)	TRAY/CONDUIT		MONITORING CONTROL PANEL - P&E INJECTOR (PRIMARY)
840-CF-202026	1	CATE	#23	800V	AMRLSHLD	48VDC	POWER TO MICROWAVE (PRIMARY)	TRAY/CONDUIT		SURGE ARRESTOR 1
840-CF-202027	1	CATE	#23	800V	AMRLSHLD	48VDC	POWER TO MICROWAVE (PRIMARY)	TRAY/CONDUIT		SURGE ARRESTOR 2
840-CF-202028	1	CATE	#23	800V	AMRLSHLD	COMM	MANAGEMENT OF MICROWAVE (PRIMARY)	TRAY/CONDUIT		MICROWAVE DSH-PRIMARY RADIO
840-CF-202029	1	CATE	#23	800V	AMRLSHLD	COMM	MANAGEMENT OF MICROWAVE (PRIMARY)	TRAY/CONDUIT		MONITORING CONTROL PANEL - 840-NSW-1B (MICROWAVE)
840-CF-202030	1	CATE	#23	800V	AMRLSHLD	COMM	MANAGEMENT OF MICROWAVE (PRIMARY)	TRAY/CONDUIT		SURGE ARRESTOR 3
840-CF-202031	1	CATE	#23	800V	AMRLSHLD	COMM	MANAGEMENT OF MICROWAVE (PRIMARY)	TRAY/CONDUIT		SURGE ARRESTOR 4
840-CF-202032	1	CATE	#23	800V	AMRLSHLD	COMM	MANAGEMENT OF MICROWAVE (PRIMARY)	TRAY/CONDUIT		MICROWAVE DSH-PRIMARY RADIO
840-CF-202033	1	CATE	#23	800V	AMRLSHLD	48VDC	POWER TO MICROWAVE (SECONDARY)	TRAY/CONDUIT		MONITORING CONTROL PANEL - P&E INJECTOR (SECONDARY)
840-CF-202034	1	CATE	#23	800V	AMRLSHLD	48VDC	POWER TO MICROWAVE (SECONDARY)	TRAY/CONDUIT		SURGE ARRESTOR 5
840-CF-202035	1	CATE	#23	800V	AMRLSHLD	48VDC	POWER TO MICROWAVE (SECONDARY)	TRAY/CONDUIT		SURGE ARRESTOR 6
840-CF-202036	1	CATE	#23	800V	AMRLSHLD	COMM	MANAGEMENT OF MICROWAVE (SECONDARY)	TRAY/CONDUIT		MICROWAVE DSH-SECONDARY RADIO
840-CF-202037	1	CATE	#23	800V	AMRLSHLD	COMM	MANAGEMENT OF MICROWAVE (SECONDARY)	TRAY/CONDUIT		MONITORING CONTROL PANEL - 840-NSW-1C (MICROWAVE)
840-CF-202038	1	CATE	#23	800V	AMRLSHLD	COMM	MANAGEMENT OF MICROWAVE (SECONDARY)	TRAY/CONDUIT		SURGE ARRESTOR 7
840-CF-202039	1	CATE	#23	800V	AMRLSHLD	COMM	MANAGEMENT OF MICROWAVE (SECONDARY)	TRAY/CONDUIT		SURGE ARRESTOR 8
840-CF-202040	1	CATE	#23	800V	AMRLSHLD	COMM	MANAGEMENT OF MICROWAVE (SECONDARY)	TRAY/CONDUIT		MICROWAVE DSH-SECONDARY RADIO
840-CF-202041	1	CATE	#23	800V	AMRLSHLD	COMM	MANAGEMENT OF MICROWAVE (SECONDARY)	TRAY/CONDUIT		MONITORING CONTROL PANEL - 840-NSW-1C (MICROWAVE)
840-CF-202042	1	CATE	#23	800V	AMRLSHLD	COMM	MANAGEMENT OF MICROWAVE (SECONDARY)	TRAY/CONDUIT		SURGE ARRESTOR 9
840-CF-202043	1	CATE	#23	800V	AMRLSHLD	COMM	MANAGEMENT OF MICROWAVE (SECONDARY)	TRAY/CONDUIT		MICROWAVE DSH-SECONDARY RADIO
840-CF-202044	1	CATE	#23	800V	AMRLSHLD	COMM	MANAGEMENT OF MICROWAVE (SECONDARY)	TRAY/CONDUIT		MONITORING CONTROL PANEL - 840-NSW-1C (MICROWAVE)
840-CF-202045	1	2C-G	#12	800V	TC	240VAC	BUILDING HVAC	CONDUIT		DISTRIBUTION PANEL 840-ACP-1 CIRCUIT 99

**CABLE NUMBER BREAKDOWN**  
 411-CP-17 0001 A  
 FUNCTIONAL SYSTEM CODE  
 LINE OR SUBSTATION NUMBER  
 PURPOSE IDENTIFIER  
 C-SIGNAL OR COMMUNICATION CABLE  
 YEAR OF CONSTRUCTION  
 SEQUENCE NUMBER  
 001-000-REGULATION CABLES  
 001-004-MINUT X FIELD CABLES  
 000-000-GENERAL FIELD CABLES  
 000-000-GENERAL FIBER CABLES  
 ALPHA MODIFIER  
 SEQUENCE LETTERS USED FOR MULTIPLE CABLES CONNECTED TO THE SAME DEVICES ON BOTH ENDS THAT USE THE SAME SEQUENCE NUMBERS

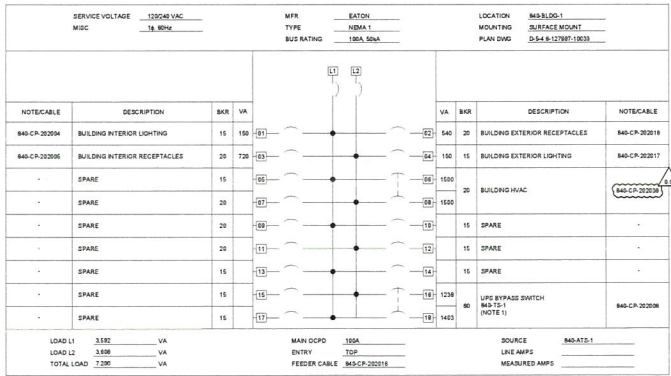
**ISSUED FOR CONSTRUCTION**

REV	DESCRIPTION	DATE	BY	CHK
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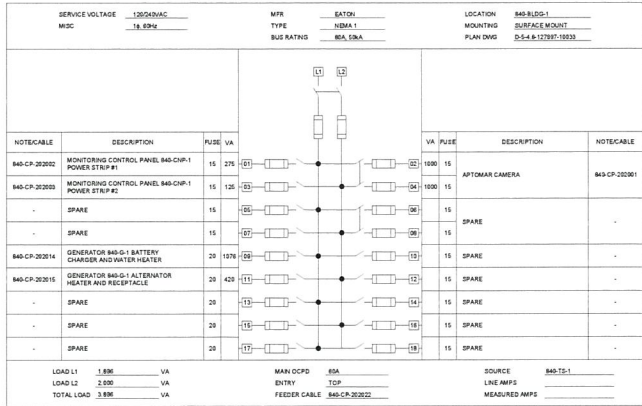
REV	DESCRIPTION	DATE	BY	CHK
1	ISSUED FOR CONSTRUCTION	2023-01-05	J. DUPRAS	ENR

**ENBRIDGE**  
 BOIS BLANC ISLAND TOWER (MI) SITE  
 STRAIT'S MONITORING  
 CABLE SCHEDULE  
 D-5-4.05-127993-10033 O.C

### 840-ACP-1



### 840-UACP-1



**CONSTRUCTION NOTES**

- SYSTEM REQUIRES A MINIMUM UPS SIZE OF 3.250VA
- 2.00VA = 30% SPARE WITH A MINIMUM HOLD TIME OF 3HRS
- CONTRACTOR TO SUPPLY AND INSTALL AN EATON P115 SERIES BRANT 20W 240V UPS WITH INTERNAL MAINTENANCE BYPASS AND EXTERNAL MAINTENANCE BYPASS



ISSUED FOR CONSTRUCTION			
REV	DESCRIPTION	DATE	CHK
01	2018/08/01	10/15/18	10/15/18
02	REVISED FOR RISK REVIEW	10/15/18	10/15/18
03	REVISED FOR BID	10/15/18	10/15/18
04	REVISED FOR CONSTRUCTION	10/15/18	10/15/18

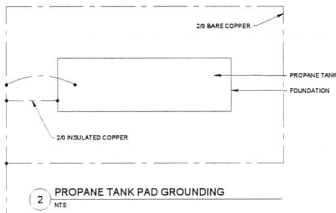
REV	DESCRIPTION	DATE	CHK	APPR

**ENBRIDGE**

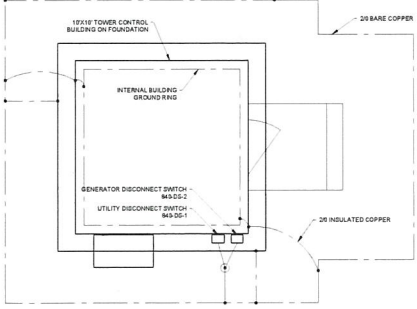
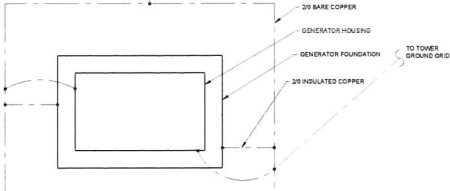
BOIS BLANC ISLAND TOWER (MI) SITE  
 LINE 5  
 840-UACP-1 & 840-ACP-1  
 PANEL SCHEDULES

DR: BAT    CHK: PLS    ENG: T. DURRAS    ENR: APPR: E. SOARA  
 DATE: 2018-08-01    SCALE: NTS    STATUS: CONSTRUCTION    PROJECT: 127995

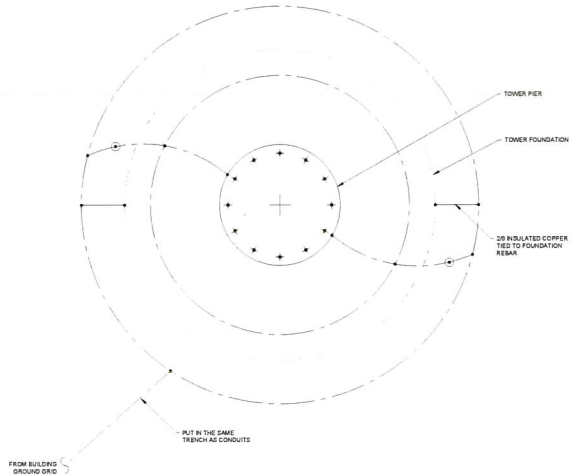
D-5-4.22-127995-10033    0.C



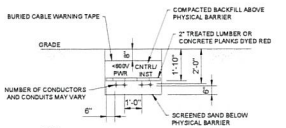
2 PROpane TANK PAD GROUNDING  
NTS



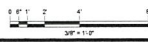
2 GENERATOR/BUILDING GROUNDING  
NTS



1 TOWER GROUNDING  
NTS



3 TYPICAL CONSTRUCTION TRENCH LAYOUT  
3/8" = 1'-0"



LOCATION PLAN

SECTION 14. T&E, R.2W, BOIS BLANC TWP  
MACKINAC COUNTY, MICHIGAN

LEGEND

○	3/8" x 12'-0" COPPER CLAD STEEL GROUND ROD
---	GROUND CONDUCTOR
---	COMPRESSION OR EXOTHERMIC CONNECTION

NOTE  
1 GROUND ROD AND GROUND RING TO BE BURIED 30" BELOW GRADE

CONSTRUCTION NOTE  
1 GROUND WIRE TO GROUND WIRE AND GROUND WIRE TO ROD CONNECTIONS SHALL BE MADE BY EITHER PERMANENT COMPRESSION OR EXOTHERMIC WELD

ISSUED FOR CONSTRUCTION

REV	REVISION	DATE	BY	CHK	APP
0.C	LINE 5 STRAITS ANCHOR MONITORING	06-11-20			
0.B	REVISED FOR PER REVIEW	07-23-20	AM	ES	
0.A	REVISED FOR BIDDING	07-23-20	AM	ES	
0.C	ISSUED FOR CONSTRUCTION	07-23-20	AM	ES	

REFERENCE DRAWINGS

NO.	DESCRIPTION	DATE	CHK	APP

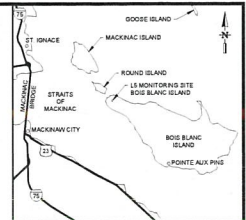
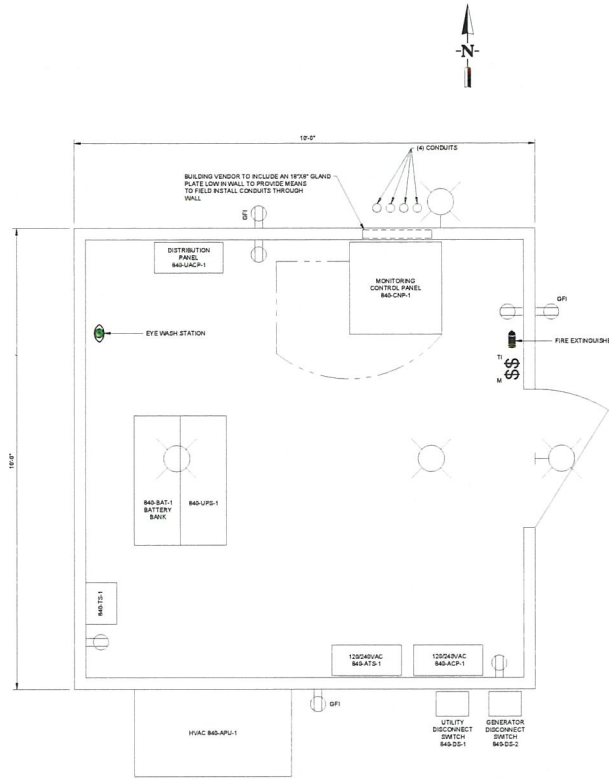
**ENBRIDGE**

BOIS BLANC ISLAND TOWER (MI) SITE  
LINE 5  
GROUNDING DETAILS

BY: BAY	CHK: RLS	ENG: J. DUPRAS	ENG APPR: E. SIOBAK
DATE: 2020-03-01	SCALE: AS SHOWN	STATUS: CONSTRUCTION	PROJECT:

D-5-4.24-127996-10033 0.C

BILL OF MATERIAL		
QUANTITY	SUPPLIED BY	DESCRIPTION
1	BUILDING VENDOR	BUILDING - 19'x29'x8" EXTERIOR DIMENSIONS (SEE ENBRIDGE SPECS)
1	CONTRACTOR	MANUAL UTILITY SERVICE DISCONNECT, 600VAC, 100A FUSE, SOLID NEUTRAL
1	CONTRACTOR	AUTOMATIC TRANSFER SWITCH, 600VAC, 100A SWITCHED NEUTRAL
1	CONTRACTOR	MANUAL GENERATOR DISCONNECT, 600VAC, 100A, SOLID NEUTRAL
1	CONTRACTOR	EXTERNAL BYPASS SWITCH COMPATIBLE WITH EATON S155 UPS
1	CONTRACTOR	EATON S155 UPS WITH 2HR BATTERY BANK, 80VA, 240V SINGLE PHASE W/ETHERNET
1	CONTRACTOR	240/120V DISTRIBUTION PANEL WITH 100A MAIN
1	CONTRACTOR	240/120V UPS DISTRIBUTION PANEL WITH 100A MAIN
1	BUILDING VENDOR	BUILDING HVAC - 1 TON COOLING / 3/1W HEATING (240VAC SINGLE PHASE)
1	BUILDING VENDOR	COVER MOUNTING CONTROL PANEL
2	CONTRACTOR	EXTERIOR LED LIGHTS - LITRONIA LIGHTING, D50X3 LED P1 40x 1MM MVOLT, EQUIPPED WITH AN INTERNAL PHOTOCELL AND VANDAL GUARD
2	CONTRACTOR	INTERIOR LED LIGHTS - LITRONIA LIGHTING, ST14-60, 80VOLT E21, LF840 4000K
3	CONTRACTOR	20A, 120V, GFCI WIR. DUPLEX RECEPTACLE HUBBELL #GFTF020W
3	CONTRACTOR	SINGLE GANG BOX WEATHERPROOF COVER INTERMATIC #WPP1010M4D
3	CONTRACTOR	2X3 WEATHERPROOF BXD CROUSE HINDS #TF7078
4	CONTRACTOR	20A, 120V, 5/16" DUPLEX RECEPTACLE HUBBELL #HBL592
4	CONTRACTOR	4" SQUARE BOX RACO #231
4	CONTRACTOR	DUPLEX RECEPTACLE COVER RACO #972
1	CONTRACTOR	EMERGENCY EYE WASH STATION (PLUMBING FREE) DYNAMIC BIOMED FAC908050M5P
1	CONTRACTOR	20LB ABC TYPE FIRE EXTINGUISHER (WALL MOUNT) SENTRY AA20-1
1	CONTRACTOR	WALL SWITCH OCCUPANCY SENSOR - WSK PDT EZ D 120V WH
1	CONTRACTOR	WALL SWITCH COUNTDOWN TIMER - FT5 60 WH



SECTION 14, T.40N. R. 20W. BOIS BLANC TWP. MACQUINAC COUNTY, MICHIGAN

**LEGEND:**

- SINGLE POLE LIGHT SWITCH WITH MOTION SENSOR
- SINGLE POLE LIGHT SWITCH WITH TIMER
- CEILING MOUNTED LIGHT
- WALL MOUNTED LIGHT
- DUPLEX RECEPTACLE
- GFCI DUPLEX RECEPTACLE
- EYE WASH STATION
- FIRE EXTINGUISHER

**ISSUED FOR CONSTRUCTION**

REV	PROJECT TITLE	DATE	BY	CHK	APP
0.0	LINE 5 STRAITS ANCHOR MONITORING				
0.1					
0.2					
0.3					
0.4					
0.5					
0.6					
0.7					
0.8					
0.9					
1.0					

REFERENCE OR REVISED

REV	DESCRIPTION	DATE	BY	CHK	APP

**ENBRIDGE**

BOIS BLANC ISLAND TOWER (M) SITE  
LINE 5  
SKID BUILDING  
EQUIPMENT LAYOUT

D: BAK    CHK: RL-1    ENG: T. DUPREAU    ENG APPR: E. SHAW

DATE: 2018-08-08    SCALE: 1" = 1'-0"    PROJECT: STRAITS ANCHOR MONITORING

D-5-4-6-127997-10033    0.C

