

CONSTRUCTION NOTICE

FOR THE

**Morgan 1689 Separation Project
PUCO Case No. 18-1650-EL-BNR**

Submitted to:

The Ohio Power Siting Board

Pursuant to O.A.C. 4906-06

Submitted by:

Duke Energy Ohio, Inc.

November 2018



CONSTRUCTION NOTICE

This Construction Notice has been prepared by Duke Energy Ohio, Inc., (hereafter "Duke Energy Ohio") in accordance with Ohio Administrative Code (O.A.C.) Section **4906-6-05** for the review of Accelerated Certificate Applications. The following sections correspond to the administrative code sections for the requirements of a Construction Notice.

4906-06-05: ACCELERATED APPLICATION REQUIREMENTS

4906-6-05(B): General Information

4906-6-05(B)(1): Name, Reference Number, Brief Description, and Construction Notice Requirement

Name of Project:

Duke Energy Ohio Morgan 1689 Separation Project (Project)

Brief Description of the Project:

Duke Energy Ohio requires the installation of a 138kV Ring Bus for the Morgan Substation as well as providing two (2) new distribution feeders. The Project includes reconfiguration of the substation exits and separation of the serving transmission feeders to Circuit 1689 and Circuit 5783. An outage is scheduled for 11/19/2018-12/31/2018 to continue above grade work inside the station and to separate Circuit 1689 from existing lattice tower and reroute to a new take-off structure inside the substation. This work will include the addition of three (3) new poles to south of the existing substation located in Whitewater Township within Hamilton County, Ohio. The entire Project is located on Duke Energy Ohio property.

Construction Notice Requirement:

This Project qualifies as a Construction Notice filing because it meets the requirements outlined in O.A.C. 4906-6-05, Appendix A, item (1)(a). Item (1)(a) allows the filing of a Construction Notice for "*New construction, extension, or relocation of single or multiple circuit electric power transmission line(s) or upgrading existing transmission or distribution line(s) for operation at a higher transmission voltage, as follows: (a) Line(s) not greater than 0.2 miles in length.*"

4906-6-05(B)(2): Need for the Project

The purpose and need for the Morgan 1689 Separation Project is to provide a power source for the new Silver Hawk Command Center as well as eliminate the risk of losing both feeds due to the 1689 and 5783 circuits currently being located on the same tower. The existing Morgan Substation provides 138 kV electric transmission service to residential and commercial/industrial facilities. Due to the increased customer load growth in Hamilton County, circuits may not be able to reliably operate for the base case of contingency condition, which may result in customer load being disrupted.

4906-6-05(B)(3): Location of the Project Relative to Existing or Proposed Lines

The location of the Project is depicted in Attachment A – Project Details. Figure 1 shows the general project vicinity depicted on a USGS quadrangle topographic map. Figure 2 depicts the planned transmission line location, compared to existing transmission lines in the Project vicinity and additional details depicted on an aerial imagery map.

4906-6-05(B)(4): Alternatives Considered

The proposed Project will occur entirely within Duke Energy Ohio property. No additional long-term impacts to adjacent properties are anticipated as a result of the Project. Therefore, the proposed separation and realignment is the only reasonable alternative available and no alternatives were considered.

4906-6-05(B)(5): Public Information Program

The Morgan 1689 Separation Project is located within existing property owned by Duke Energy Ohio. Property owners within 500-feet of the substation were notified via informational postcard, mailed on June 15, 2018 with respect to reconfiguration and other upgrades to the Morgan Substation. Further information on the ongoing status of this project and other Duke Energy Projects can be found at the following website: <https://www.duke-energy.com/our-company/about-us/electric-transmission-projects>.

4906-6-05(B)(6): Construction Schedule

Construction is planned to begin November 27, 2018, pending approval of this Construction Notice. The Project is anticipated to be completed and in-service by December 31, 2018.

4906-6-05(B)(7): Area Map

Attachment A – Project Details depicts the general location of the Project. Figure 1, shows the general Project vicinity depicted on a USGS quadrangle topographic map. Figure 2, shows the planned transmission line location and additional details depicted on an aerial imagery map.

4906-6-05(B)(8): Property Owner List

The Morgan 1689 Separation Project is located entirely within property owned by Duke Energy Ohio Parcel Number 063001700024. No new easements have been obtained for this Project.

4906-6-05(B)(9): Technical Features of the Project

The Project involves the installation of approximately 630 feet (0.10 miles) of 138 kV single circuit, electrical transmission line. The proposed transmission line will involve installing three (3) galvanized steel single-pole structures within existing Duke Energy Ohio property. Also, the installation of two (2) new distribution feeders and 138kV Ring Bus are involved in the expansion of the substation, necessary for the separation of the

transmission lines. Structure diagrams and design plans are provided in Attachment B – Design Plans and Structure Details.

4906-6-05(B)(9)(a): Operating Characteristics

Voltage:	138kV
Structure Type:	Three (3) new overhead support structures (direct embed and guyed (HL 204B 204C) and concrete foundation (HL 204A))
Conductors:	Three (3) spans of conductor (954 kcmil ACSR 45x7 "RAIL")
Static Wire:	7 STR 8 AWG Alum Weld F Trans Static
Insulators:	138kV Polymer post insulators and Porcelain suspension
ROW Land	
Requirements:	Property owned entirely by Duke Energy Ohio

4906-6-05(B)(9)(b): Electric and Magnetic Fields

Information concerning the electric and magnetic fields is included in Attachment C - Electric and Magnetic Fields Study, and is summarized below.

4906-6-05(B)(9)(b)(i): Calculated Electric and Magnetic Fields Strength Levels

Three load conditions were examined: (a) normal maximum loading, (b) emergency line loading, and (c) winter normal conductor rating. Normal maximum loading represents the peak flow expected with all system facilities in service; daily/hourly flows fluctuate below this level. Emergency loading is the maximum current flow during unusual (contingency) conditions, which exist only for short periods of time. Winter normal (WN) conductor rating represents the maximum current flow that a line, including its terminal equipment, can carry during winter conditions. The load currents modeled included the following:

1689 Circuit

Maximum normal: 640 Amperes

Summer Emergency: 1263 Amperes

Winter Normal: 1585 Amperes

Duke Energy Ohio designs its facilities according to the National Electric Safety Code (NESC), at a minimum. The structure height and configuration was chosen based on the NESC engineering parameters, and cost.

Electric and Magnetic Field (EMF) calculations were taken at the edge of Right-of-Way (EROW), assumed 50 feet from the pole center line, for a midspan cross-section between two steel poles (HL204B and HL204C). For this study, electric fields were calculated at an operating voltage of 145 kV (5% above nominal phase-to-phase voltage

of 138kV) at 5-foot intervals from directly beneath the line to the EROW at 50 feet, and continuing out to 200 feet from the pole center line. Calculations were made for all three load scenarios, per OPSB requirements. Results of the EMF calculation study can be found in the table below:

EMF CALCULATION SUMMARY (from EROW)		
Condition	Magnetic Field (mG)	Electric Field (kV/m)
(a) Normal Maximum Loading	12.2	0.10
(b) Emergency Line loading	24.1	
(c) Winter Normal Conductor Rating	30.3	

The two main issues for consideration, in terms of EMF impact, are human exposure and interference (EMI). Based on the calculated values, human Maximum Permissible Exposure (MPE) values are easily met even directly beneath the line, and the field levels fall off rapidly beyond the ROW. With respect to magnetic field interference, Alternating Current (AC) magnetic fields rarely cause interference with typical residential, office or retail uses, especially at the calculated levels detailed in the EMF report. Based on the calculated EMF values, no impacts are expected from the 1689 circuit reconfiguration with respect to exposure or interference. The full detailed EMF report is provided in Attachment C – Electric and Magnetic Fields Study.

4906-6-05(B)(9)(b)(ii): Alternative Design Consideration for Electric and Magnetic Fields

No additional long-term impacts to adjacent properties, or public health are anticipated as a result of the Project. Therefore, no alternatives were considered.

4906-6-05(B)(9)(c): Estimated Cost

The approximate cost for the proposed Morgan 1689 Separation Project is approximately \$5,500,000.

4906-6-05(B)(10): Social and Ecological Impacts

4906-6-05(B)(10)(a): Land Uses

The Project is located in Whitewater Township, Hamilton County, Ohio, approximately 23 miles northwest of Cincinnati. Whitewater Township, which covers 26.3 square miles, contains a population of 5,519 people based on the 2010 census data. The land use immediately surrounding the Project Area is predominantly actively farmed agricultural, residential, commercial, and industrial property.

4906-6-05(B)(10)(b): Agricultural Land

Due to the project being entirely on Duke Energy Ohio Property, no agricultural lands will be impacted.

4906-6-05(B)(10)(c): Archaeological or Cultural Resources

The Ohio History Connection, Ohio's Historic Preservation Office (OHPO) online mapping system, was consulted to identify previously recorded cultural resources within 1.6 km (1 mi) of the Project Area (the Study Area). The OHPO records check indicates that three archaeological sites, 21 historical structures, and two historical cemeteries have been previously recorded in the Study Area. No National Register of Historic Places (NRHP) listed resources are located within the Study Area. No previously identified archaeological sites are located in or adjacent to the Project Area. Sites 33-HA-0075, 33-HA-0746, and 33-HA-0511 vary in distance from the Project Area, ranging from 0.61 km (0.37 mi) to 1.59 km (0.98 mi). Two of the 21 previously recorded historical structures are eligible for listing in the NRHP: the William Jessup House (OHI# HAM0405052) and the Daniel Smith House (OHI# HAM0404052). Based on aerial photographs dating to 2018, both the William Jessup House and Daniel Smith House appear to have been demolished. The remaining 19 previously recorded historical structures have not been evaluated for NRHP eligibility. These resources are located approximately 316 m (1,036 ft) or greater from the Project Area. Two historical cemeteries are mapped approximately 0.81 km (0.5 mi) and 1.28 km (0.79 mi) from the Project Area, respectively. The Project Area has not been previously investigated for cultural resources. Two prior cultural resources surveys have been conducted within the Study Area (NADB# 11223 and 14957), none of which intersect the Project Area. Prior disturbance has occurred in approximately half of the Project Area. This disturbance is related to an existing substation, two existing overhead utility pole structures, and an existing access road extending from Dry Fork Road to the substation. The remaining half of the Project Area consists of a relatively level area covered in manicured grasses. The Project setting consists of commercial/industrial facilities, Whitewater Township administrative offices, agricultural fields, and remnant woodlots.

It does not appear that a Federal Nexus, requiring further coordination with the OPHO, will occur for the Project, as there are likely no impacts to wetlands or streams that would require Federal permitting.

Given that the Project involves primarily removal and replacement of existing and previously installed structures requiring little to no new ground disturbance, it does not appear that impacts to significant cultural resources will occur as a result of the Project. The minimal impacts associated with the Project do not warrant additional cultural resource surveys based on the proposed scope of work.

4906-6-05(B)(10)(d): Local, State, and Federal Requirements

As the Project is expected to disturb less than one acre, a National Pollutant Discharge Elimination System (NPDES) Construction Site General Permit from the Ohio Environmental Protection Agency (Ohio EPA) for the realignment is not required.

No other local, state or federal permit or other authorizations are required for the Project.

4906-6-05(B)(10)(e): Endangered, Threatened, and Rare Species Investigation

Coordination with the U.S. Fish and Wildlife Service (USFWS) was initiated on August 10, 2018, in an effort to identify the Project's potential effect on any federally listed threatened or endangered species or critical habitat within a one-mile radius of the Study Area. A response from USFWS was received October 1, 2018, regarding RTE species located within the Study Area vicinity. The response from USFWS indicated three (3) federally listed endangered, threatened, or candidate species, or their habitats, could potentially exist within the Project site or vicinity. A copy of the USFWS response can be found in Attachment D – Rare, Threatened, and Endangered Species Correspondence and is summarized below.

All projects in the State of Ohio lie within the range of the federally endangered Indiana bat (*Myotis sodalis*) and the federally threatened northern long-eared bat (*Myotis septentrionalis*). In Ohio, presence of the Indiana bat and northern long-eared bat is assumed wherever suitable habitat occurs unless a presence/absence survey has been performed to document absence. It is recommended by USFWS that any clearing of trees should occur between October 1 and March 31 in order to avoid incidental take of these species. Tree clearing will occur within this seasonal clearing timeframe, thus it is anticipated that there will be no adverse effect to these bat species.

According to USFWS, due to the project type, size, and location, there are no anticipated adverse effects to any other federally endangered, threatened, proposed, or candidate species.

Additionally, a request was submitted to the ODNR Environmental Review Program on August 10, 2018, in an effort to identify the Project's potential effect on any state-listed threatened or endangered species or critical habitat within the vicinity of the Study Area. A response from ODNR – Division of Wildlife (DOW) was received on October 1, 2018. This response can be found in Attachment D – Rare, Threatened, and Endangered Species Correspondence and is summarized below.

The ODNR-DOW noted the potential presence of the state-endangered Indiana bat (*Myotis sodalis*) and recommended the same seasonal tree clearing timeframe as the USFWS. ODNR-DOW also indicated that the Project is within the range of thirteen (13) state endangered and three (3) state threatened mussel species as well as five (5) state endangered and six (6) state threatened fish species and one (1) state threatened crayfish species. Due to the location, and that there is no in-water work proposed in a perennial stream, this Project is not going to impact these species. ODNR-DOW also indicated that the Project is within range of one (1) state threatened reptile, one (1) state-endangered amphibian, and two (2) state endangered bird species. Due to the location, the type of habitat present at the Project site and within the vicinity of the Project area, and the type of work proposed, this Project is not likely to impact these species.

4906-6-05(B)(10)(f): Areas of Ecological Concern

As a part of the investigation, GAI also conducted an investigation for areas of ecological concern. As a part of GAI's investigation, a request was submitted to the ODNR Natural Heritage Program on August 10, 2018, to research the presence of any unique ecological sites, geological features, animal assemblages, scenic rivers, state wildlife areas, nature preserves, parks or forest, national wildlife refuges, or other protected areas within one mile of the Project area, using the ODNR Natural Heritage Database.

A response from the ODNR – Office of Real Estate was received on October 1, 2018, indicated that there are no unique ecological sites, geological features, animal assemblages, scenic rivers, state wildlife areas, nature preserves, parks or forests, national wildlife refuges, or other protected areas within one mile of the Project Area.

As a part of the field investigation and ecological assessment, GAI conducted a Regulated Waters Assessment of the Project Area. GAI's investigation included approximately 0.1-mile by 100-foot wide Study Area around the proposed centerline, access roads, and additional workspace areas. During the investigation, GAI identified no potentially regulated waters within the Project's Study Area. No impacts to regulated waters or RTE habitat are anticipated by the Project. Results from GAI's field investigation can be found in Attachment E – Regulated Waters Assessment.

A review of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) revealed that the Project Area lies within an area of minimal flood hazard and crosses no 100-year floodplains and/or floodways. There are no proposed structures to be constructed within a regulatory floodway.

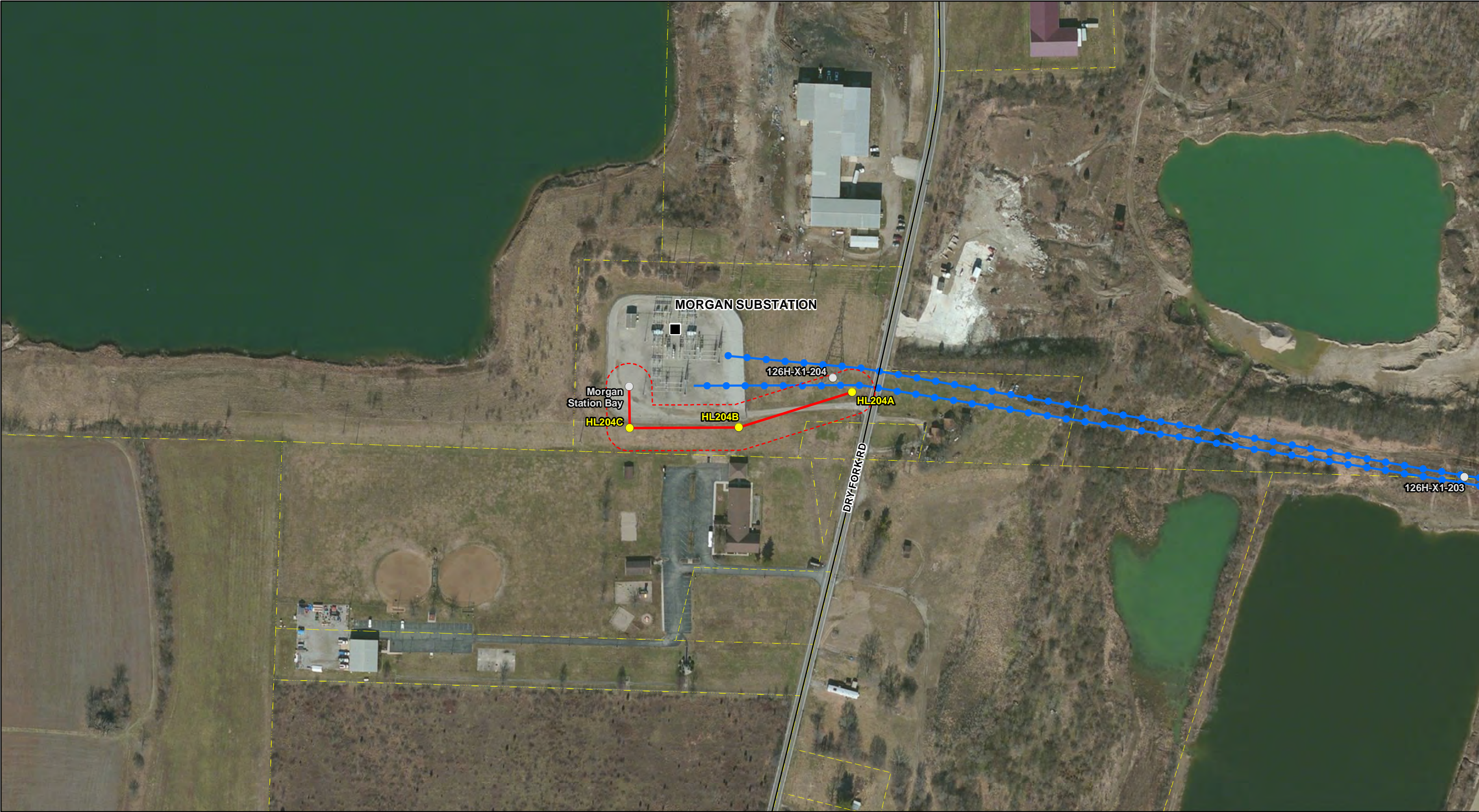
4906-6-05(B)(10)(g): Other Information

To the best of Duke Energy Ohio's knowledge, no unusual conditions exist that would result in environmental, social, health, or safety impacts. Construction and operation of the proposed Project will meet all applicable safety standards established by the Occupational Safety and Health Administration (OSHA) and will be in accordance with the requirements specified in the latest revision of the NESC, as adopted by the Public Utilities Commission of Ohio.

4906-6-07: SERVICE AND PUBLIC DISTRIBUTION OF ACCELERATED CERTIFICATE APPLICATIONS

Copies of this Construction Notice have been sent to the office of Whitewater Township Trustees, the Whitewater Township Administrator, the Hamilton County Commissioners and the Hamilton County Planning Commission. Additional copies of this Construction Notice will be made available at the Miami Township Branch Library and the Hamilton County and City of Cincinnati Main Library. Information on how to request an electronic or paper copy of the Construction Notice as well as additional information on the ongoing status of this project and other Duke Energy Projects can be found at the following website: www.duke-energy.com/morgansubstation.

ATTACHMENT A
Project Details


















PROJECT LOCATION

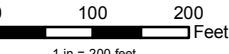


HAMILTON COUNTY, OH

REFERENCE:
AERIAL PHOTOGRAPH:
- ESRI's World Imagery, Accessed: 10/22/2018.
INCORPORATED AREA:
- Ohio Department of Transportation's Cities, 2018.
COUNTY BOUNDARY:
- Ohio Department of Transportation's Counties, 2018.
INTERSTATE AND HIGHWAY:
- ESRI's USA Major Roads, 05/10/2018.
LOCAL ROAD:
- Ohio Department of Transportation's Roads, 2017.
RAILWAY:
- Ohio Department of Transportation's Railways, 2017.
PARCEL BOUNDARY:
- Hamilton County Parcels, 2018.
PROJECT DETAILS:
- Duke Energy.

 Incorporated Area	 Existing Structure	 138 kV Transmission Line
 County Boundary	 Proposed Structure	
 Interstate Highway	 Existing Facility	
 US Highway	 Route Centerline	
 State Highway	 Parcel Boundary	
 Local Road		
 Railway		


1 in = 200 feet




FIGURE 2
PROJECT LAYOUT

Ohio Power Siting Board Construction Notice

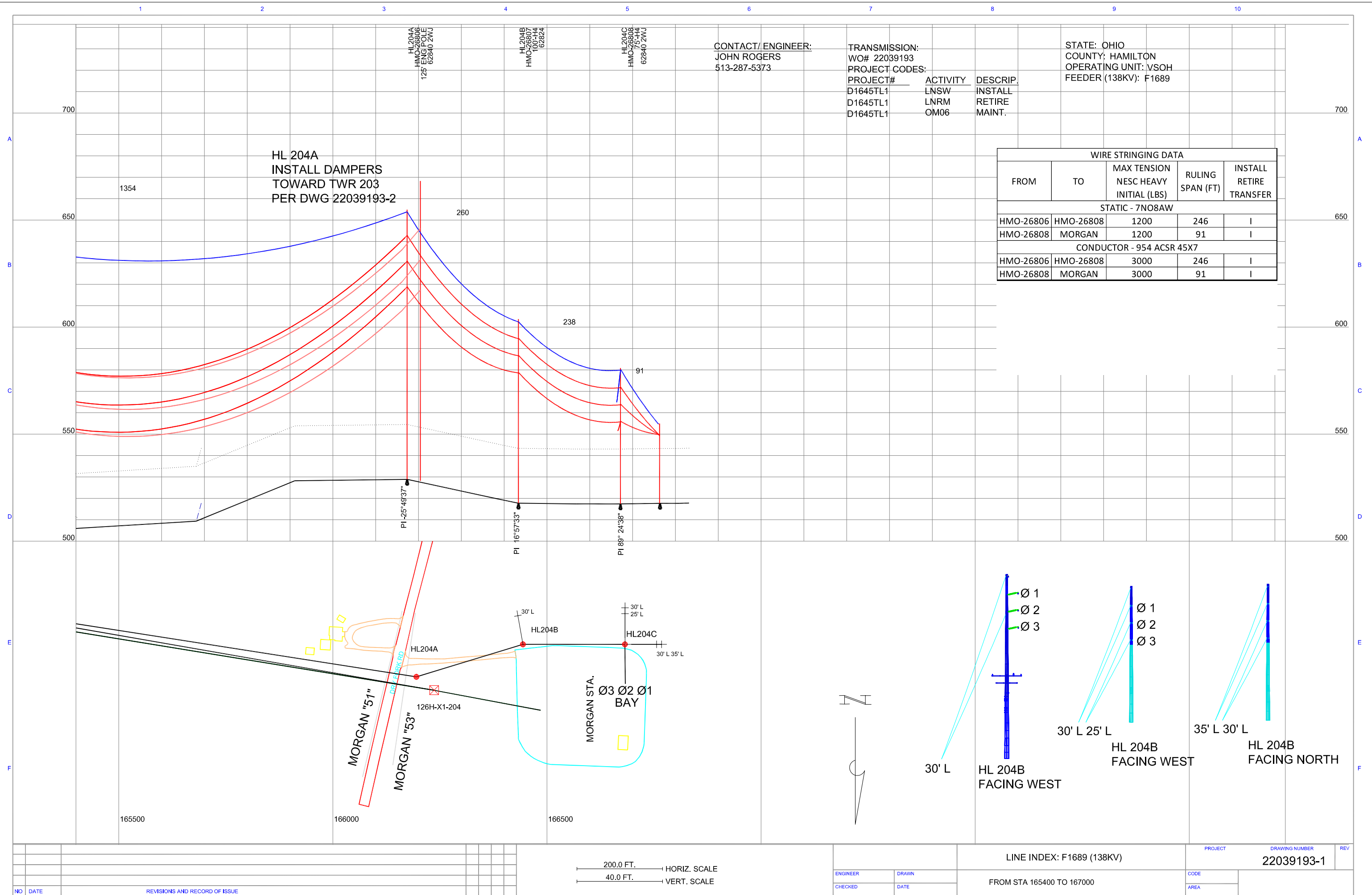
SHEET 1 of 1

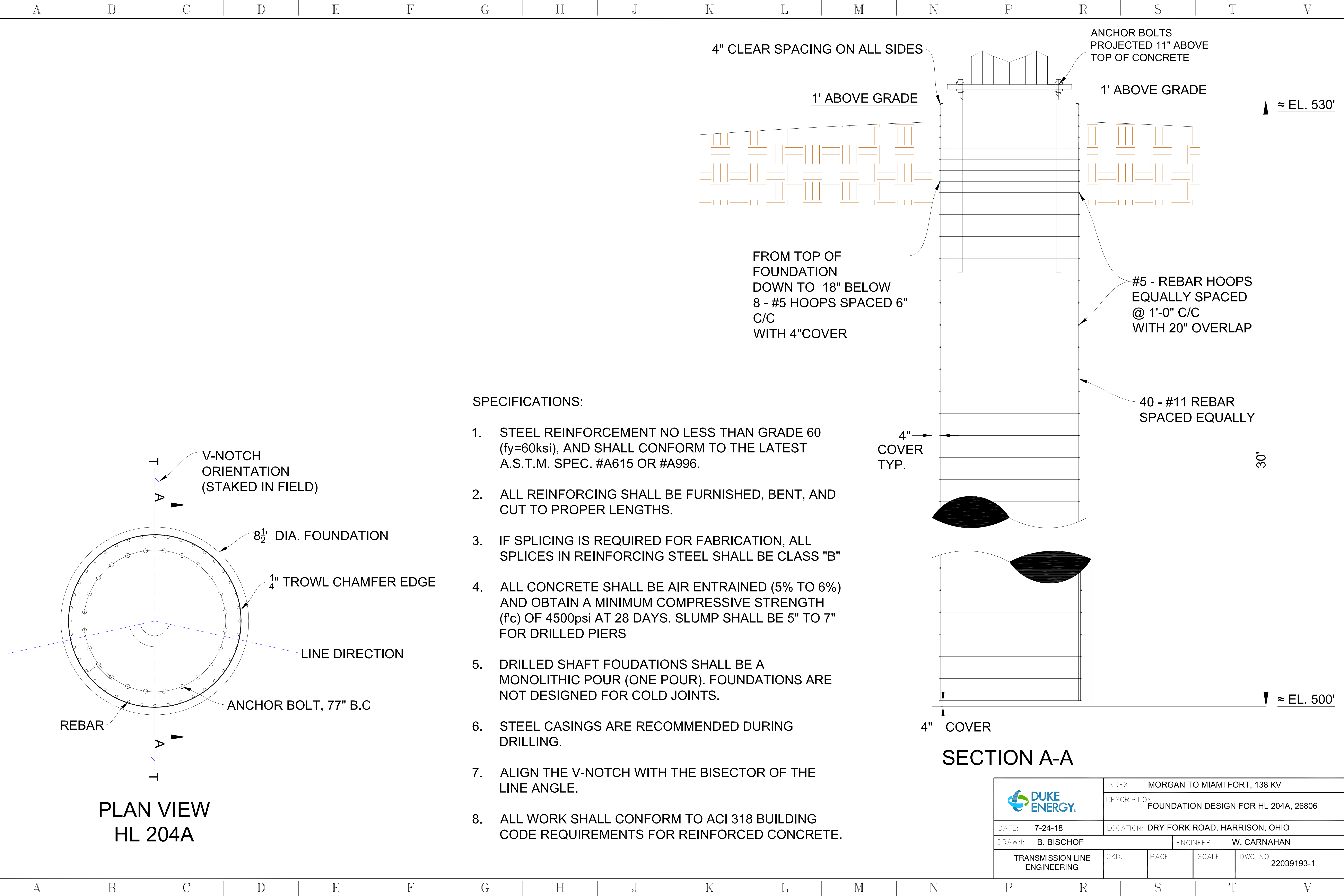
Morgan 1689 Separation Project

DRAWN BY: PPD
CHECKED: TDB

DATE: 10/22/2018
APPROVED: MRW

ATTACHMENT B
Design Plans and Structure Details




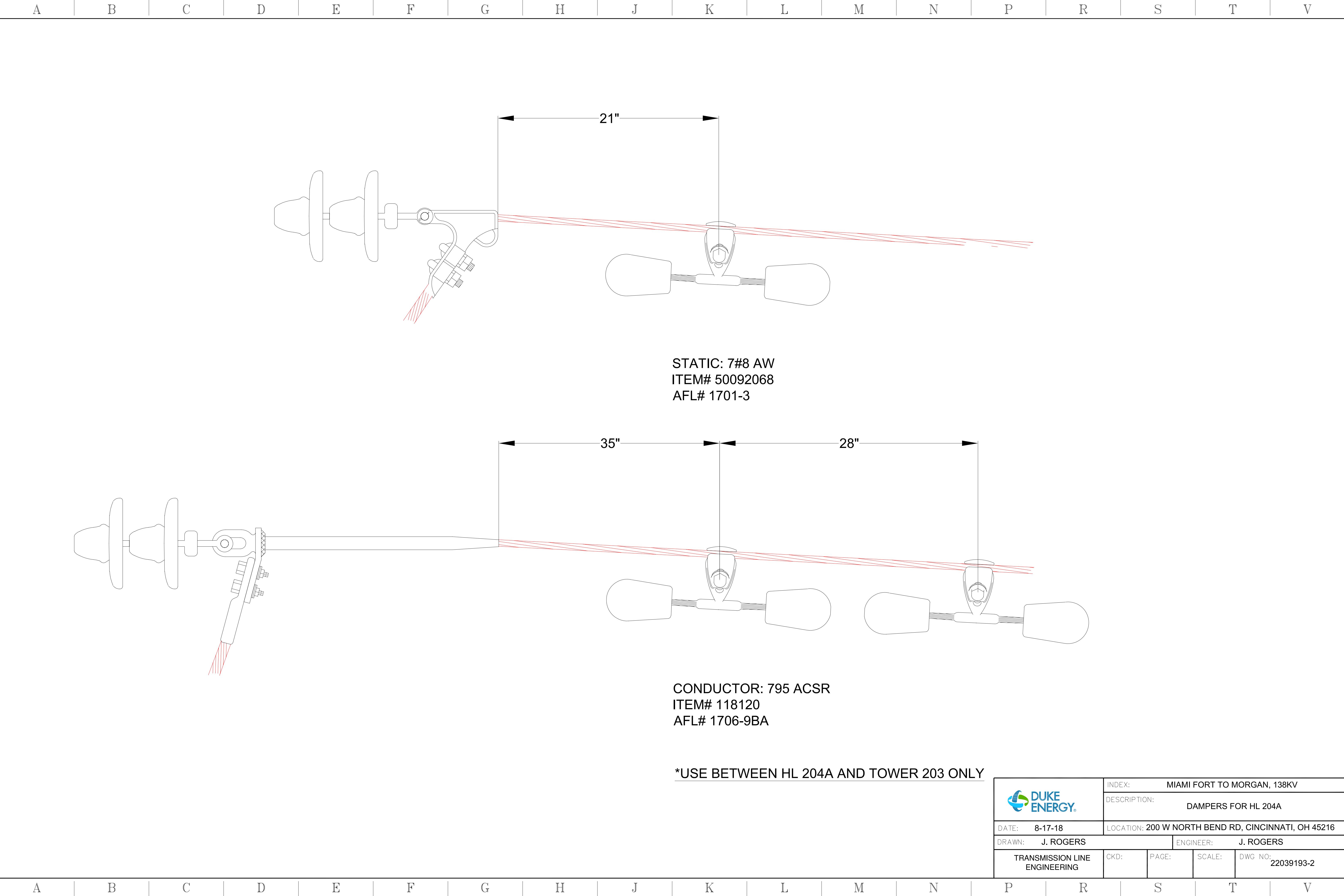


SPECIFICATIONS:

1. STEEL REINFORCEMENT NO LESS THAN GRADE 60 (fy=60ksi), AND SHALL CONFORM TO THE LATEST A.S.T.M. SPEC. #A615 OR #A996.
2. ALL REINFORCING SHALL BE FURNISHED, BENT, AND CUT TO PROPER LENGTHS.
3. IF SPLICING IS REQUIRED FOR FABRICATION, ALL SPLICES IN REINFORCING STEEL SHALL BE CLASS "B"
4. ALL CONCRETE SHALL BE AIR ENTRAINED (5% TO 6%) AND OBTAIN A MINIMUM COMPRESSIVE STRENGTH (f'c) OF 4500psi AT 28 DAYS. SLUMP SHALL BE 5" TO 7" FOR DRILLED PIERS
5. DRILLED SHAFT FOUADATIONS SHALL BE A MONOLITHIC POUR (ONE POUR). FOUNDATIONS ARE NOT DESIGNED FOR COLD JOINTS.
6. STEEL CASINGS ARE RECOMMENDED DURING DRILLING.
7. ALIGN THE V-NOTCH WITH THE BISECTOR OF THE LINE ANGLE.
8. ALL WORK SHALL CONFORM TO ACI 318 BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE.

SECTION A-A


	INDEX: MORGAN TO MIAMI FORT, 138 KV			
	DESCRIPTION: FOUNDATION DESIGN FOR HL 204A, 26806			
DATE: 7-24-18	LOCATION: DRY FORK ROAD, HARRISON, OHIO			
DRAWN: B. BISCHOF	ENGINEER: W. CARNAHAN			
TRANSMISSION LINE ENGINEERING	CKD:	PAGE:	SCALE:	DWG NO: 22039193-1



STATIC: 7#8 AW
ITEM# 50092068
AFL# 1701-3

CONDUCTOR: 795 ACSR
ITEM# 118120
AFL# 1706-9BA

*USE BETWEEN HL 204A AND TOWER 203 ONLY

	INDEX: MIAMI FORT TO MORGAN, 138KV			
	DESCRIPTION: DAMPERS FOR HL 204A			
DATE: 8-17-18	LOCATION: 200 W NORTH BEND RD, CINCINNATI, OH 45216			
DRAWN: J. ROGERS	ENGINEER: J. ROGERS			
TRANSMISSION LINE ENGINEERING	CKD:	PAGE:	SCALE:	DWG NO: 22039193-2

DUKE ENERGY - MIDWEST

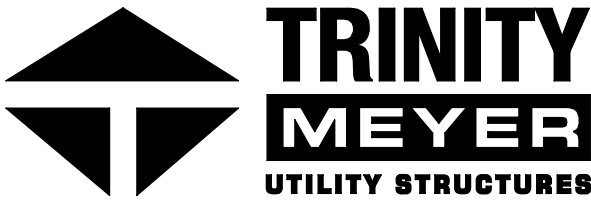
MORGAN REROUTE F1689

Job No. 38350

Release - A

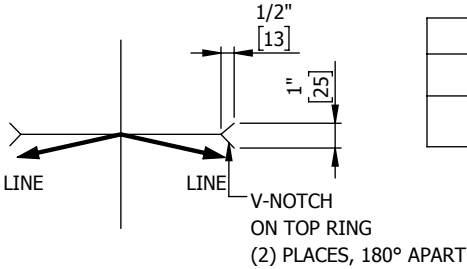
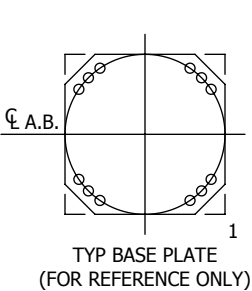
Trinity Meyer Utility Structures

6750 Lenox Center Court, Suite 400
Memphis, TN 38115
Phone: (901) 566-6500
Engr. Fax: (901) 566-6650

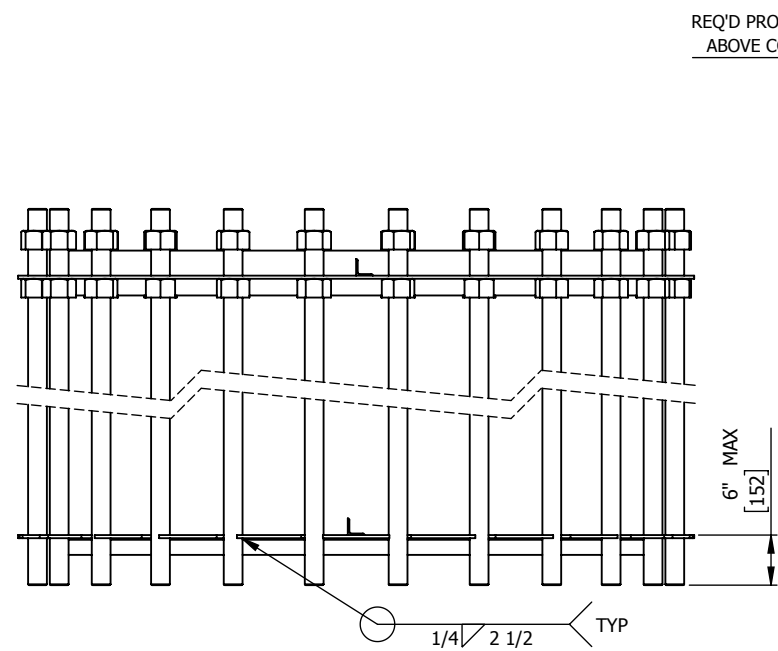
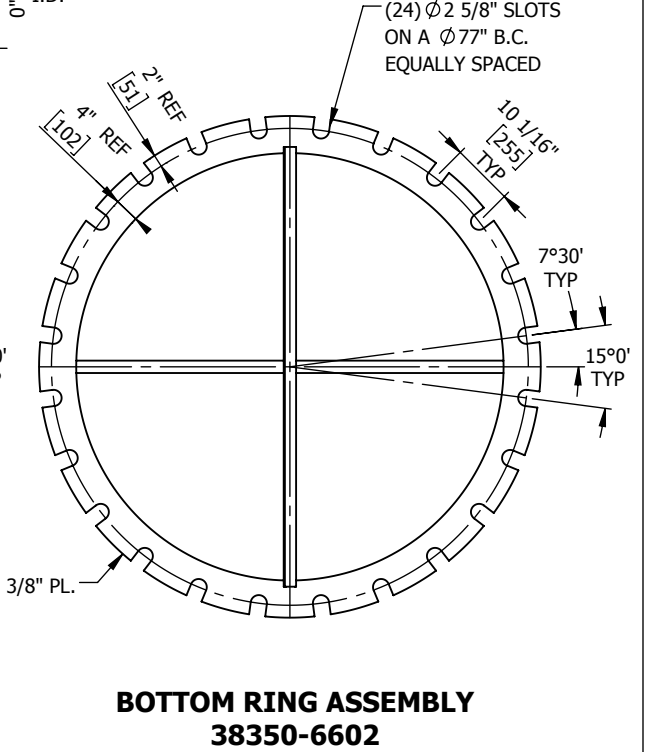
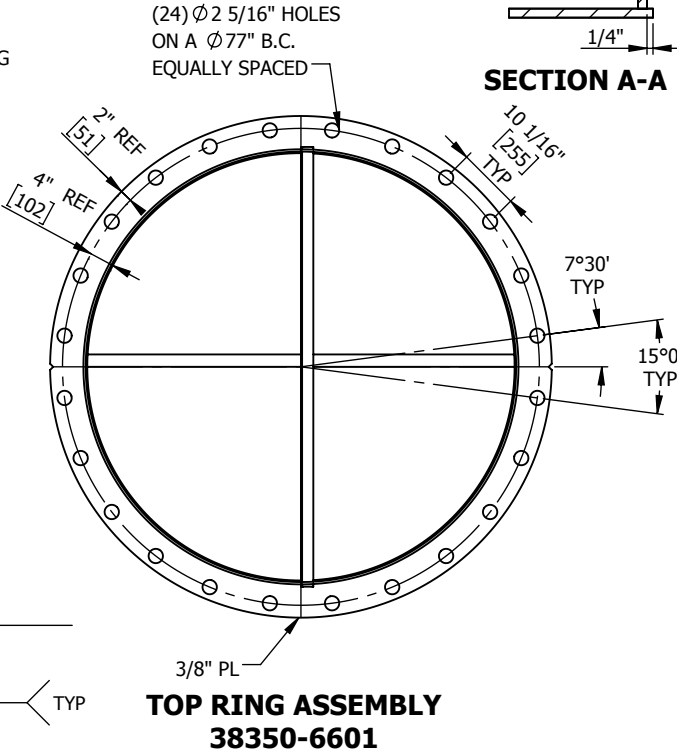
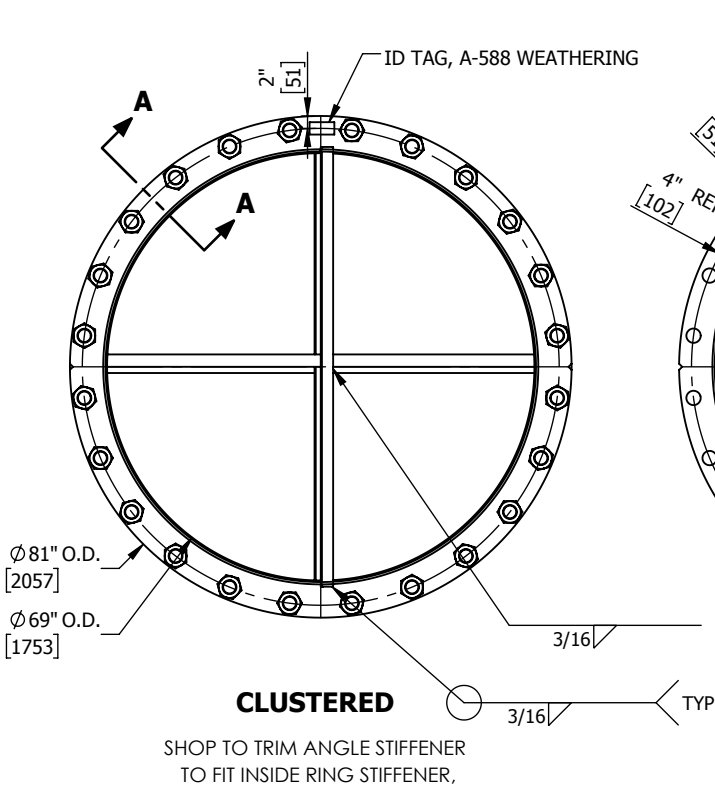
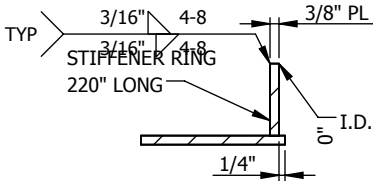


ANCHOR BOLT DRAWING INDEX																			
RELEASE	QTY	DESCRIPTION		POLE NO	ANCHOR BOLT DRAWING														
A	1	125'-0" DEADEND		HMO-25979	38350-STR125AA														
POLE DRAWING INDEX																			
RELEASE	QTY	STRUCTURE TYPE	STRUCTURE LENGTH	EMBEDMENT LENGTH	POLE NO	ERECTION DRAWING	POLE LAYOUT DRAWING	ARM LAYOUT DRAWING	CAMBER AMOUNT										
B	1	DEADEND	125'-0"	N/A	HMO-25979	38350-STR125AT	38350-3001, 38350-3002, 38350-3003	NONE	-										
	1	5% EXCESS FASTENERS	-	-	-	38350-EXCESSBT	-	-	-										
<table><tr><th colspan="2">SSG DRAWING INDEX</th></tr><tr><th>STANDARD DRAWINGS</th><th>DRAWING NO</th></tr><tr><td>GENERAL NOTES, ASSEMBLY AND ERECTION INFORMATION</td><td>SSG001</td></tr><tr><td>GALVANIZED POLE LIFTING REQUIREMENTS</td><td>SSG002</td></tr><tr><td>WELDING DETAILS</td><td>SSG007</td></tr></table>										SSG DRAWING INDEX		STANDARD DRAWINGS	DRAWING NO	GENERAL NOTES, ASSEMBLY AND ERECTION INFORMATION	SSG001	GALVANIZED POLE LIFTING REQUIREMENTS	SSG002	WELDING DETAILS	SSG007
SSG DRAWING INDEX																			
STANDARD DRAWINGS	DRAWING NO																		
GENERAL NOTES, ASSEMBLY AND ERECTION INFORMATION	SSG001																		
GALVANIZED POLE LIFTING REQUIREMENTS	SSG002																		
WELDING DETAILS	SSG007																		

PARTS AND ASSEMBLIES LIST							
ITEM NO.	PART NUMBER	QTY.	DESCRIPTION	MATERIAL DIMENSION	MATERIAL GRADE	WT. EACH	EXTD. WT.
1	38350-6601	1	TOP RING ASSEMBLY			238.06	238.06
	38350-6002	1	TOP RING	0.38 X 81.00 X 81.00	099-ASTM A36	139.56	
	38350-6005	1	STIFFENER RING	0.38 X 3.00 X 220.00	099-ASTM A36	70.02	
	38350-6004	2	ANGLE STIFFENER	72833, 2" X 2" X 3/16" ANGLE IRON	036-ASTM A36	14.24	
2	38350-6602	1	BOTTOM RING ASSEMBLY			158.55	158.55
	38350-6003	1	BOTTOM RING	0.38 X 81.00 X 81.00	099-ASTM A36	130.07	
	38350-6004	2	ANGLE STIFFENER	72833, 2" X 2" X 3/16" ANGLE IRON	036-ASTM A36	14.24	
3	38350-6001	24	ANCHOR BOLT, 2 1/4" DIA.	71070, Ø2 1/4" #18J REBAR	ASTM A615 Gr75	142.33	3415.92
4	76144	48	NUT, 2 1/4" DIA.		ASTM A-563 GRADE DH	4.19	201.12
5	78434	1	ID TAG, A-588 WEATHERING		ASTM A-588	0.57	0.57
TOTAL STRUCTURE FINISHED WEIGHT							4020.00



ANCHOR BOLT ASSEMBLY INFORMATION					
REL	BILLABLE	ANCHOR BOLT ASSY PART NO.	QTY	STRUCTURE NUMBER(S)	STRUCTURE DESCRIPTION
A	38350-STR125AA	38350-3101	1	HMO-25979	125'-0" DEADEND

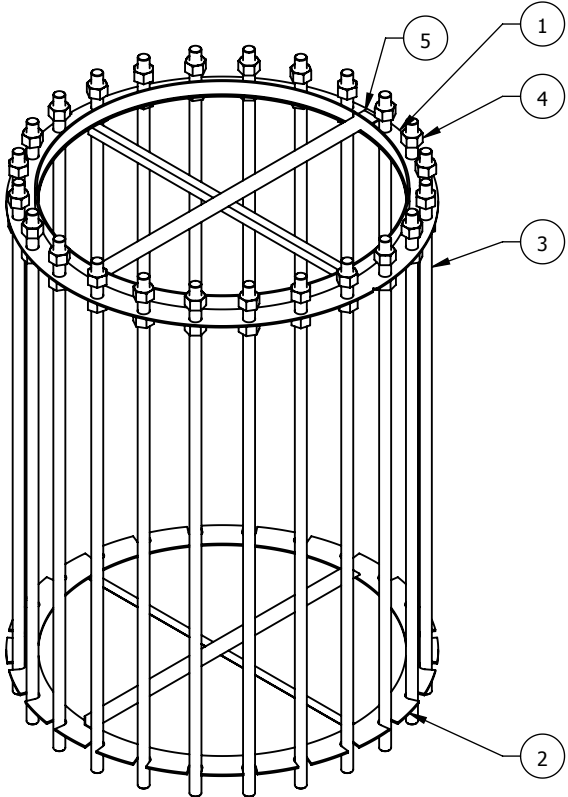
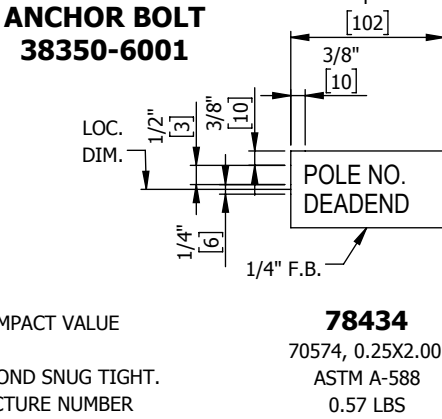
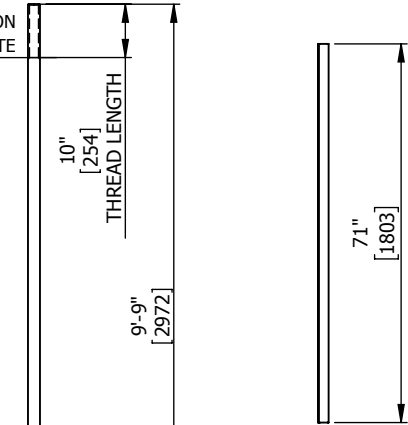


NOTES:

1. ALL THE DIMENSIONS SHOWN IN [XX] ARE IN mm.
2. IF TEMPLATE RINGS ARE FABRICATED FROM MORE THAN A SINGLE PLATE 80% PJP WELD IS TO BE USED TO SPLICE THE PLATES TOGETHER.
3. TOP 36"[914] OF ANCHOR BOLTS TO BE HOT DIP GALVNZANIZED PER ASTM A-153.
4. ALL ANCHOR BOLTS (ASTM A-615 GRADE 75 MOD) TO HAVE A CHARPY V-NOTCH IMPACT VALUE OF 15 FT-LBS. MINIMUM AT -20° F PER HEAT LOT TEST.
5. ANCHOR BOLT NUTS (ASTM A-563 GRADE DH) SHOULD BE TURNED 1/6 TURN BEYOND SNUG TIGHT.
6. ANCHOR BOLT ASSEMBLY IS TO BE MARKED WITH ASSEMBLY NUMBER AND STRUCTURE NUMBER ON TOP RING.

NOTAS:

1. TODAS LAS DIMENSIONES MOSTRADAS EN [XX] SON EN mm.
2. SI LOS ANILLOS DE PLANTILLA SON FABRICADOS EN MAS DE UNA SOLA PLACA SE REQUIERE DEL 80% DE PENETRACIÓN PARCIAL PARA UNIR LAS PLACAS.
3. TOP 36"[914] DE LOS PERNOS DE ANCLAJE PARA SER GALVANIZADO POR INMERSION EN CALIENTE DE ACUERDO A ASTM A-153.
4. TODOS LAS ANCLAS (ASTM A-615 GRADO 75 MOD) DEBERAN TENER UN VALOR DE IMPACTO CHARPY V-NOTCH DE 15 FT-LBS. MÍNIMO A -20° F POR PRUEBA DE LOTES DE CALOR.
5. LAS TUERCAS (ASTM A-563 GRADO DH) DE LAS ANCLAS DEBEN SER GIRADAS 1/6 MÁS ALLÁ DEL APRIETE.
6. EL ENSAMBLE DE LOS TORNILLOS DE ANCLAJE DEBE ESTAR MARCADO CON EL NÚMERO DE MONTAJE Y EL NÚMERO DE ESTRUCTURA EN EL ANILLO SUPERIOR.



A	INITIAL RELEASE	ZER/07-09-18
REV	DESCRIPTION	DRFT/DATE
	PROJECT: MORGAN REROUTE F1689	
	CUSTOMER: DUKE ENERGY - MIDWEST	
	CUSTOMER P.O. NO:	
	JOB NO: 38350	
	DRAWN/DATE: IZ 07/09/2018	
	CHECKED/DATE: RA 07/12/2018	
	ENGINEER: SHAUNA LEE	
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ANCHOR BOLT ASSEMBLY CLUSTERED		
SHEET 1 OF 1		38350-STR125AA
		REV. A

DUKE ENERGY - MIDWEST

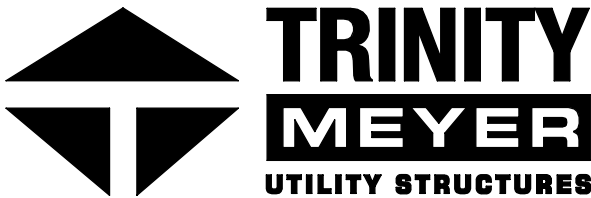
MORGAN REROUTE F1689

Job No. 38350

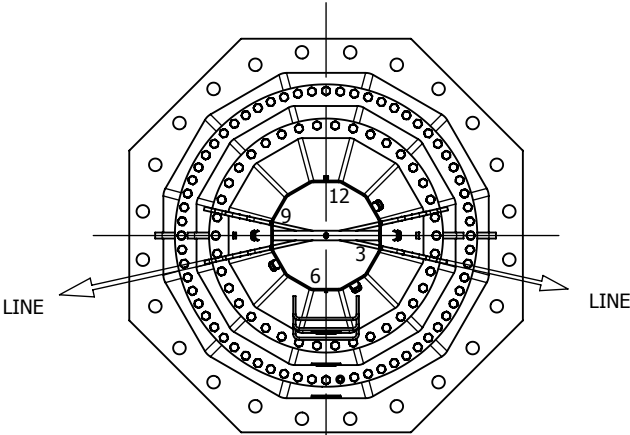
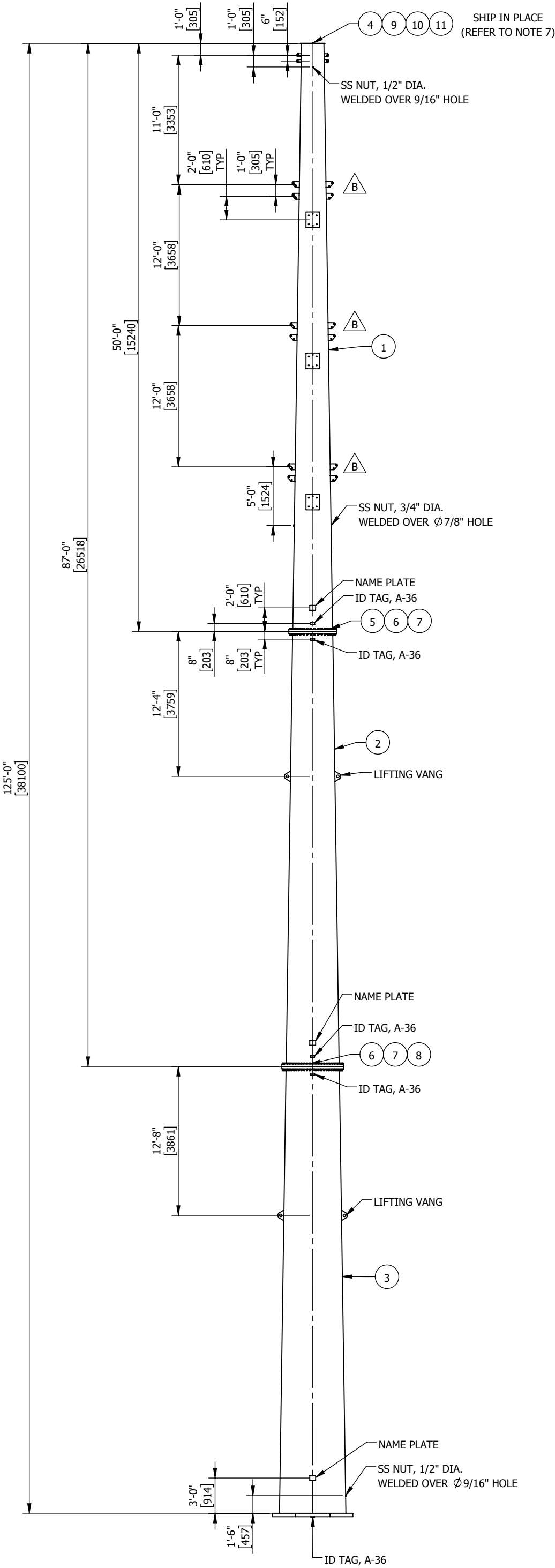
Release - B

Trinity Meyer Utility Structures

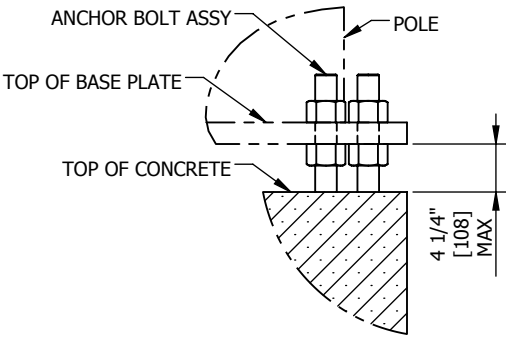
6750 Lenox Center Court, Suite 400
Memphis, TN 38115
Phone: (901) 566-6500
Engr. Fax: (901) 566-6650



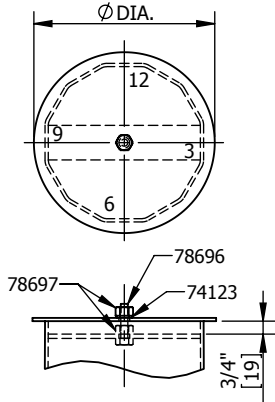
STRUCTURE INFORMATION					
BILLABLE	POLE NO	HGT. ABOVE GRND. LINE	TOP DIA. (PT-PT)	GRND. LINE DIA. (PT-PT)	TAPER IN./FT.
38350-STR125AT	HMO-25979	125'-0" [38100]	23 23/32" [602]	70 3/16" [1783]	0.36751



POLE ORIENTATION
POLE CAP REMOVED FOR CLARITY




FIELD ASSEMBLY DETAIL

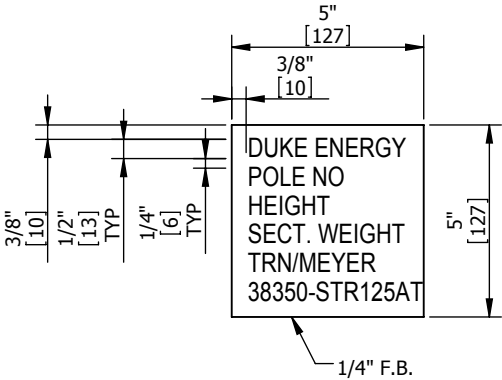


POLE CAP DETAIL

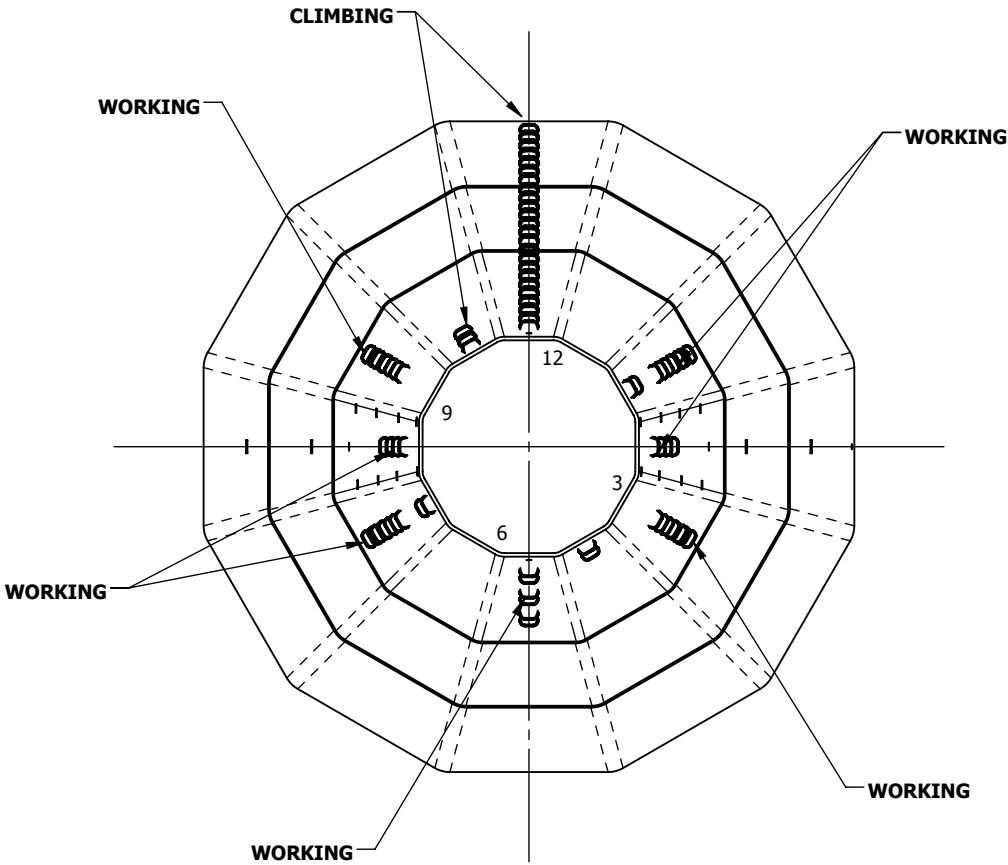
- NOTES:
1. ALL THE DIMENSIONS SHOWN IN [XX] ARE IN mm.
 2. ALL THE DIMENSIONS ARE FOR REFERENCE ONLY.
 3. UNLESS OTHERWISE NOTED REFER TMUS-EN-P-018 FOR TOLERANCES.
 4. PROVIDE PLASTIC PLUGS IN ALL THE TAPPED HOLES AND NUTS WELDED TO STRUCTURE.
 5. SHIP LOOSE HARDWARE ITEMS AND FASTENERS TO BE PACKAGED PER STRUCTURE.
 6. LADDERS ARE PROVIDED BY CUSTOMER.
 7. SHIP IN PLACE BOLTS TO BE SECURED WITH LOCTITE 242 OR EQUIVALENT.
- NOTAS:
1. TODAS LAS DIMENSIONES MOSTRADAS EN [XX] SON EN mm.
 2. TODAS LAS DIMENSIONES SON SOLO DE REFERENCIA.
 3. A MENOS QUE SE INDIQUE LO CONTRARIO CONSULTAR TMUS-EN-P-018 PARA TOLERANCIAS.
 4. COLOCAR TAPONES DE PLÁSTICO EN TODOS LOS AGUJEROS ROSCADOS Y TUERCAS SOLDADAS A LA ESTRUCTURA.
 5. ENVÍAR ARTICULOS, TORNILLERIA Y SUJETADORES SUELTOS EMPACADOS POR ESTRUCTURA.
 6. ESCALERAS SON PROVEIDOS POR EL CLIENTE.
 7. APLICAR LOCTITE 242 O EQUIVALENTE EN TORNILLOS DE PRE- ENSAMBLE.

B	REVISED THRU-VANGS TO BE DISTANCED FROM CENTER OF VANG.	ZER/08-01-18
A	INITIAL RELEASE	ZER/07-10-18
REV	DESCRIPTION	DRFT/DATE
PROJECT: MORGAN REROUTE F1689		
CUSTOMER: DUKE ENERGY - MIDWEST		
CUSTOMER P.O. NO:		
JOB NO: 38350		
DRAWN/DATE: IZ 07/10/2018		
CHECKED/DATE: RSA 07/19/2018		
ENGINEER: SHAUNA LEE		
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125'-0" DEADEND		
POLE NO: HMO-25979		
SHEET 1 OF 2	38350-STR125AT	REV. B

PARTS AND ASSEMBLIES LIST											
ITEM NO.	PART NUMBER	QTY.	DESCRIPTION	ADDITIONAL DESCRIPTION					MATERIAL GRADE	WT. EACH	EXTD. WT.
1	38350-3001	1	SHAFT ASSEMBLY, 50'-0" LONG	POLE-TOP	050.00	023.7	042.1	049		8630.00	8630.00
2	38350-3002	1	SHAFT ASSEMBLY, 37'-0" LONG	POLE-MID	037.00	042.4	056.0	063		13030.00	13030.00
3	38350-3003	1	SHAFT ASSEMBLY, 38'-0" LONG	POLE-BASE	038.00	056.2	070.2	082		23330.00	23320.00
4	R3PD0250	1	POLE CAP, 3/16" THK X 25" DIA						036-ASTM A36	26.08	26.08
5	78256	38	BOLT, 1" DIA. x 6 3/4"						ASTM A-354 GRADE BC GALV	1.85	70.30
6	74120	102	LOCK WASHER, 1" DIA. GALV						ANSI B18.21.1	0.08	8.16
7	73442	102	NUT, 1" DIA.						ASTM A-563 GRADE DH	0.43	43.86
8	76782	64	BOLT, 1" DIA. X 7 1/4"						ASTM A-354 GRADE BC GALV	1.92	122.88
9	78696	1	BOLT, 1/2" DIA. x 2"						ASTM A-307 GALV	0.15	0.15
10	78697	2	NUT, 1/2" DIA.						ASTM A-563 GRADE A	0.08	0.16
11	74123	1	LOCK WASHER, 1/2" DIA. GALV						ANSI B18.21.1	0.02	0.02
TOTAL STRUCTURE FINISHED WEIGHT											45260.00



NAME PLATE
38328-1401

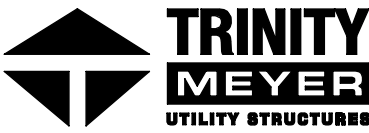


CLIMBING ORIENTATION

CLIMBING:
PROVIDE LADDER CLIPS AT APPROX. 2'-0"
BELOW TOP OF POLE TO APPROX. 8'-0" ABOVE
BASE PLATE.

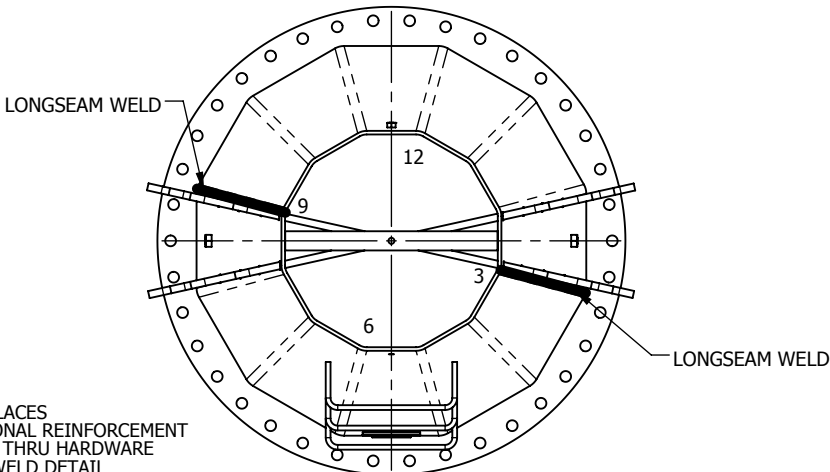
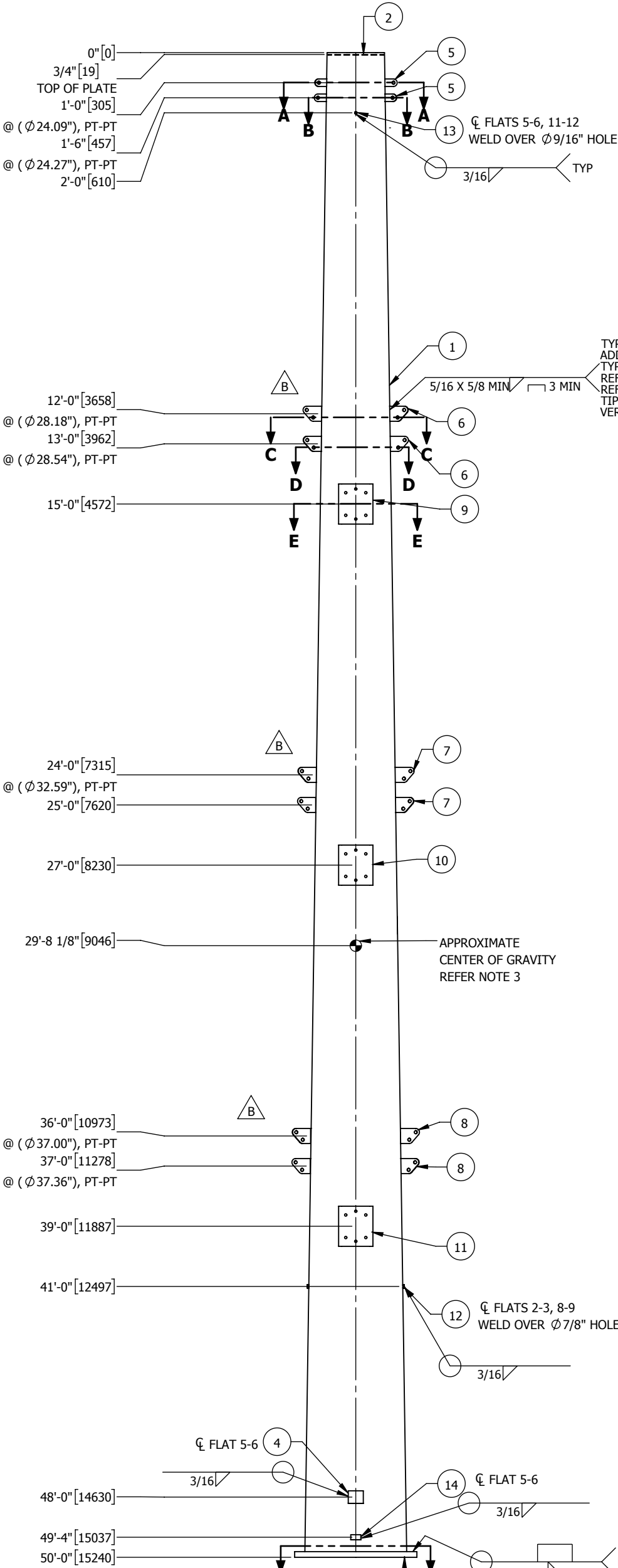
WORKING:
PROVIDE (1) SET OF LADDER CLIPS ABOVE
AND BELOW SHIELD WIRE AND CONDUCTOR
ATTACHMENTS.

- NOTES:
- ALL THE DIMENSIONS SHOWN IN [XX] ARE IN mm.
 - UNLESS OTHERWISE NOTED REFER TMUS-EN-P-018 FOR TOLERANCES.
- NOTAS:
- TODAS LAS DIMENSIONES MOSTRADAS EN [XX] SON EN mm.
 - A MENOS QUE SE INDIQUE LO CONTRARIO CONSULTAR TMUS-EN-P-018 PARA TOLERANCIAS.

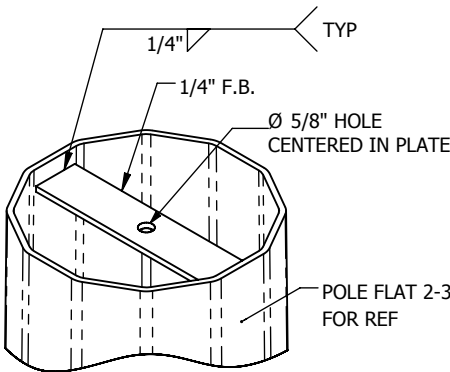
B	REVISED THRU-VANGS TO BE DISTANCED FROM CENTER OF VANG.	ZER/08-01-18
A	INITIAL RELEASE	ZER/07-10-18
REV	DESCRIPTION	DRFT/DATE
PROJECT: MORGAN REROUTE F1689		
CUSTOMER: DUKE ENERGY - MIDWEST		
CUSTOMER P.O. NO:		
JOB NO: 38350		
DRAWN/DATE: IZ 07/10/2018		
CHECKED/DATE: RSA 07/19/2018		
ENGINEER: SHAUNA LEE		
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125'-0" DEADEND		
POLE NO: HMO-25979		
SHEET 2 OF 2		REV. B
38350-STR125AT		

SHAFT INFORMATION						
TUBE NO.	MATERIAL	LENGTH	THICKNESS	TOP DIA (PT-PT)	BOTTOM DIA (PT-PT)	TAPER IN./FT.
38350-4001	065-ASTM A572 Gr65	49'-9 3/4" [15183]	3/8"	23 23/32" [602]	42 1/32" [1067]	0.36751

HOLE INFORMATION				
EL.	LOCATION FROM TOP	HOLE DIA	ORIENTATION	DESCRIPTION
1	2'-0" [610]	9/16"	11-12, 5-6	GROUNDING HOLE
2	41'-0" [12497]	7/8"	2-3, 8-9	GROUNDING HOLE



PLAN VIEW



SHAFT TOP DETAIL

- NOTES:
1. ALL THE DIMENSIONS SHOWN IN [XX] ARE IN mm.
 2. UNLESS OTHERWISE NOTED REFER TMUS-EN-P-018 FOR TOLERANCES.
 3. WELD "CG" AT APPROXIMATE CENTER OF GRAVITY. (ON LONGSEAM - ONLY FOR FABRICATOR USE).
 4. HOT DIP GALVANIZED PER ASTM A-123.
 5. PROVIDE PLASTIC PLUGS IN ALL THE TAPPED HOLES AND NUTS WELDED TO STRUCTURE.
- NOTAS:
1. TODAS LAS DIMENSIONES MOSTRADAS EN [XX] SON EN mm.
 2. A MENOS QUE SE INDIQUE LO CONTRARIO CONSULTAR TMUS-EN-P-018 PARA TOLERANCIAS.
 3. SOLDAR "CG" AL CENTRO DE GARAVEDAD APROXIMADO. (EN CUALQUIER CARA - SOLO PARA EL USO DEL FABRICANTE).
 4. GALVANIZADO POR INMERSION EN CALIENTE DE ACUERDO A ASTM A-123.
 5. COLOCAR TAPONES DE PLÁSTICO EN TODOS LOS AGUJEROS ROSCADOS Y TUERCAS SOLDADAS A LA ESTRUCTURA.

B	REVISED THRU-VANGS TO BE DISTANCED FROM CENTER OF VANG.	ZER/08-01-18
A	INITIAL RELEASE	ZER/07-10-18
REV	DESCRIPTION	DRFT/DATE

PROJECT:	MORGAN REROUTE F1689
CUSTOMER:	DUKE ENERGY - MIDWEST
CUSTOMER P.O. NO:	
JOB NO:	38328
DRAWN/DATE:	IZ 07/10/2018
CHECKED/DATE:	RSA 07/19/2018
ENGINEER:	SHAUNA LEE

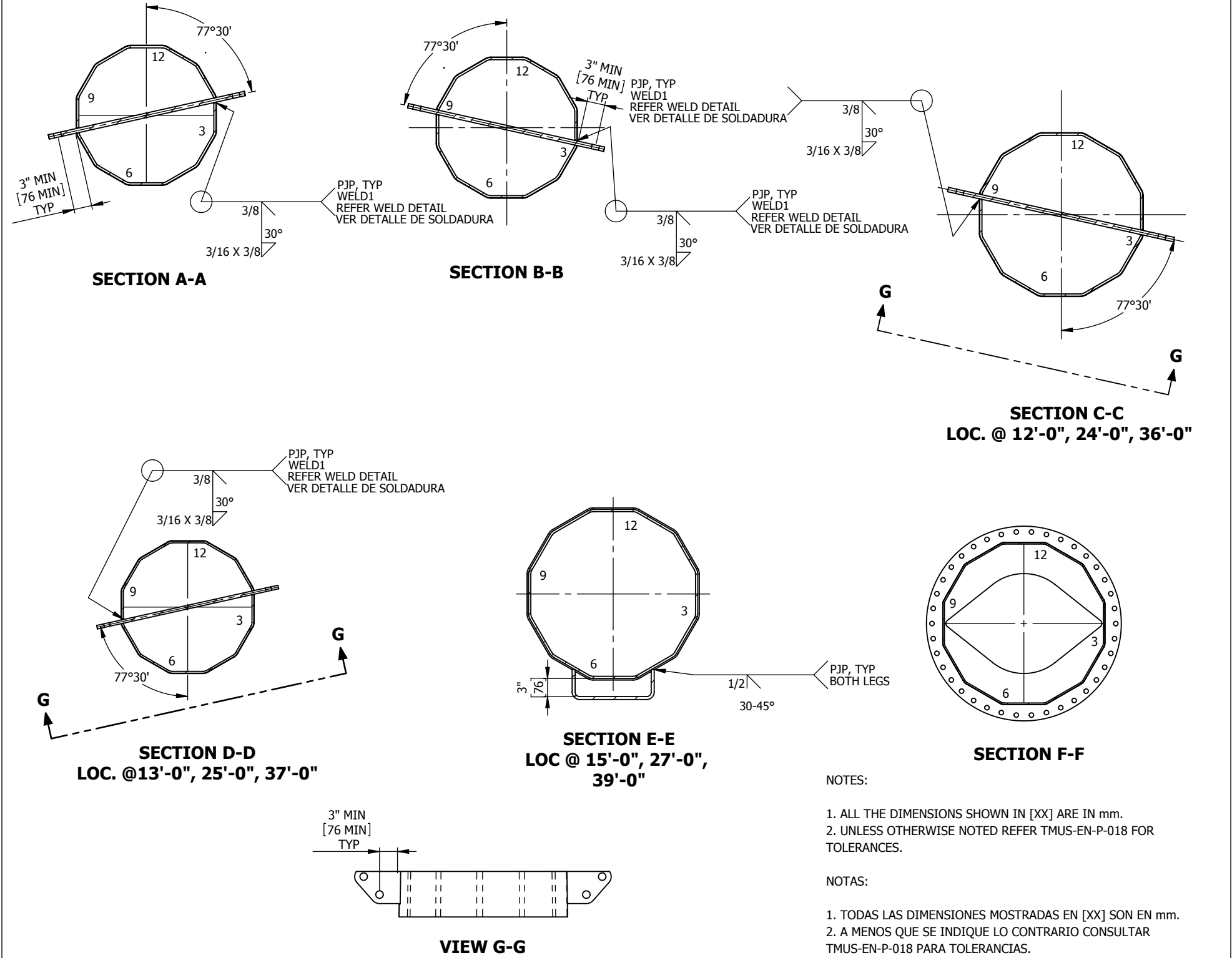
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SHAFT ASSEMBLY, 50'-0" LONG
PTOP

SHEET 1 OF 5	38350-3001	REV. B
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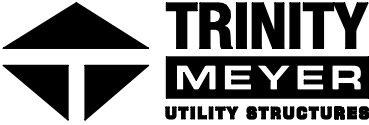
PARTS AND ASSEMBLIES LIST							
ITEM NO.	PART NUMBER	QTY.	DESCRIPTION	MATERIAL DIMENSION	MATERIAL GRADE	WT. EACH	EXTD. WT.
1	38350-4001	1	TOWER PLATE TUBE	(2) 0.38 X 36.13 X 597.75 X 64.56	065-ASTM A572 Gr65	6486.86	6486.86
2	PCA221	1	ANCHOR PLATE	70568, 0.25 X 2.00	036-ASTM A36	3.12	3.12
3	38350-4002	1	FLANGE PLATE	2.25 X 48.75 X 48.75	451-ASTM A572 Gr50	782.25	782.25
4	38350-1401	1	NAME PLATE	76946, 0.25 X 6.00	036-ASTM A36	2.13	2.13
5	38350-318	2	THROUGH VANG	0.75 X 3.00 X 33.50	065-ASTM A572 Gr65	20.44	40.88
6	38350-312	2	THROUGH VANG	0.75 X 6.00 X 42.81	065-ASTM A572 Gr65	50.44	100.88
7	38350-314	2	THROUGH VANG	0.75 X 6.00 X 47.31	065-ASTM A572 Gr65	56.18	112.36
8	38350-316	2	THROUGH VANG	0.75 X 6.00 X 51.81	065-ASTM A572 Gr65	61.92	123.84
9	38350-501	1	BRACKET	0.50 X 16.00 X 21.69	065-ASTM A572 Gr65	49.01	49.01
10	38350-502	1	BRACKET	0.50 X 16.00 X 21.06	065-ASTM A572 Gr65	47.59	47.59
11	38350-503	1	BRACKET	0.50 X 16.00 X 20.31	065-ASTM A572 Gr65	45.89	45.89
12	75632	2	SS NUT, 3/4" DIA.	-	STAINLESS STEEL TYPE 304	0.12	0.24
13	73515	2	SS NUT, 1/2" DIA.	-	ASTM A-194 GRADE 8	0.07	0.14
14	78433	1	ID TAG, A-36	70568, 0.25 X 2.00	036 ASTM A-36	0.57	0.57
15	76266	75	LADDER CLIP	74438, 0.19 X 2.00	ASTM A-606 TYPE 4	0.32	24.64
TOTAL MODEL WEIGHT							7820.40
TOTAL UNFINISHED WEIGHT							7840.00
TOTAL FINISHED WEIGHT							8630.00

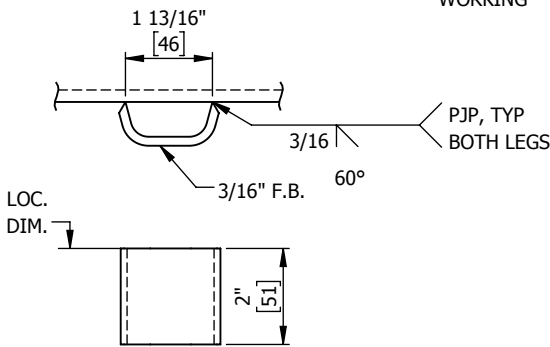
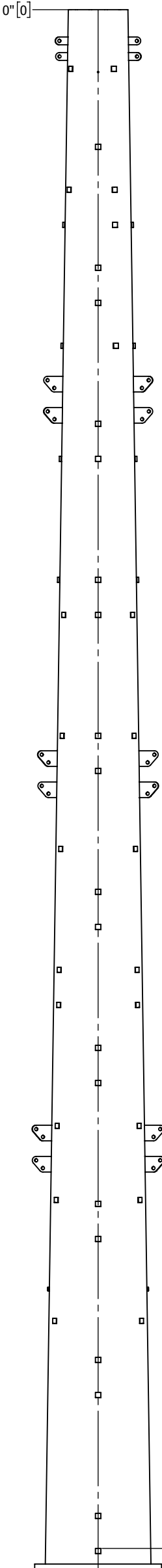
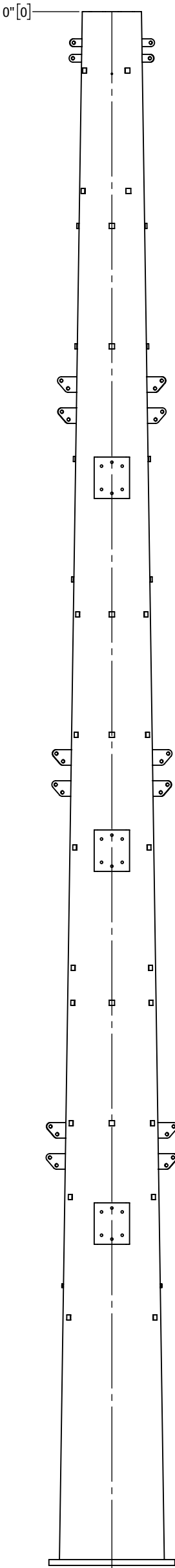


- NOTES:
1. ALL THE DIMENSIONS SHOWN IN [XX] ARE IN mm.

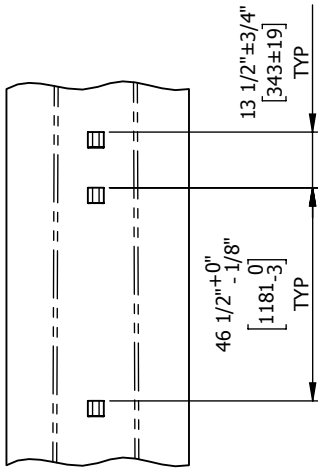
2. UNLESS OTHERWISE NOTED REFER TMUS-EN-P-018 FOR TOLERANCES.
- NOTAS:
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B	REVISED THRU-VANGS TO BE DISTANCED FROM CENTER OF VANG.	ZER/08-01-18
A	INITIAL RELEASE	ZER/07-10-18
REV	DESCRIPTION	DRFT/DATE
PROJECT: MORGAN REROUTE F1689		
CUSTOMER: DUKE ENERGY - MIDWEST		
CUSTOMER P.O. NO:		
JOB NO: 38328		
DRAWN/DATE: IZ 07/10/2018		
CHECKED/DATE: RSA 07/19/2018		
ENGINEER: SHAUNA LEE		
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<div></div>		
SHAFT ASSEMBLY, 50'-0" LONG PTOP		
SHEET 2 OF 5		38350-3001
		REV. B



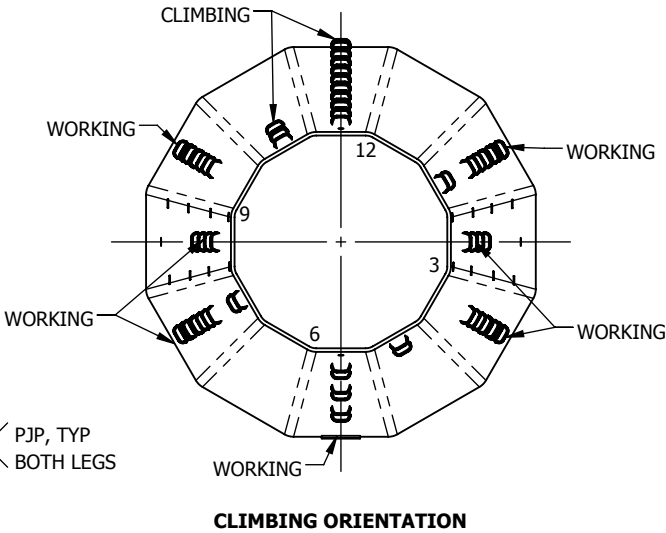
76266
74438, 0.19X2.00
ASTM A-606 TYPE 4
0.32 LBS



LADDER CLIP SPACING

CLIMBING/WORKING HARDWARE INFORMATION			
EL.	LOCATION FROM TOP*	PART NO.	ORIENTATION
1	1'-9 3/4" [552]	76266	1-2, 4-5, 7-8, 10-11
2	4'-3 3/4" [1314]	76266	11-12
3	5'-8 1/4" [1734]	76266	1-2, 4-5, 7-8, 10-11
4	6'-9 3/4" [2076]	76266	2-3, 5-6, 8-9, 10-11
5	8'-2 1/4" [2496]	76266	11-12
6	9'-3 3/4" [2838]	76266	11-12
7	10'-8 1/4" [3258]	76266	2-3, 5-6, 8-9, 10-11
8	13'-2 1/4" [4020]	76266	11-12
9	14'-3 3/4" [4362]	76266	2-3, 8-9, 11-12
10	18'-2 1/4" [5544]	76266	2-3, 8-9, 11-12
11	19'-3 3/4" [5886]	76266	1-2, 3-4, 5-6, 7-8, 9-10, 11-12
12	23'-2 1/4" [7068]	76266	1-2, 3-4, 5-6, 7-8, 9-10, 11-12
13	24'-3 3/4" [7410]	76266	11-12
14	26'-9 3/4" [8172]	76266	1-2, 3-4, 7-8, 9-10
15	28'-2 1/4" [8592]	76266	11-12
16	29'-3 3/4" [8934]	76266	11-12
17	30'-8 1/4" [9354]	76266	1-2, 3-4, 7-8, 9-10
18	31'-9 3/4" [9696]	76266	1-2, 3-4, 5-6, 7-8, 9-10
19	33'-2 1/4" [10116]	76266	11-12
20	34'-3 3/4" [10458]	76266	11-12
21	35'-8 1/4" [10878]	76266	1-2, 3-4, 5-6, 7-8, 9-10
22	38'-3/4" [11601]	76266	1-2, 3-4, 7-8, 9-10
23	38'-2 1/4" [11640]	76266	11-12
24	39'-3 3/4" [11982]	76266	11-12
25	41'-11 1/4" [12783]	76266	1-2, 3-4, 7-8, 9-10
26	43'-2 1/4" [13164]	76266	11-12
27	44'-3 3/4" [13506]	76266	11-12
28	48'-2 1/4" [14688]	76266	11-12
29	49'-3 3/4" [15030]	76266	11-12

* LOCATION DIMENSION FOR REFERENCE ONLY



NOTES:

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- UNLESS OTHERWISE NOTED REFER TMUS-EN-P-018 FOR TOLERANCES.

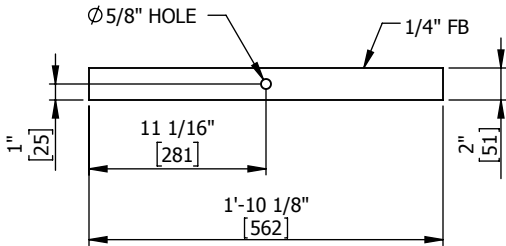
NOTAS:

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- A MENOS QUE SE INDIQUE LO CONTRARIO CONSULTAR TMUS-EN-P-018 PARA TOLERANCIAS.

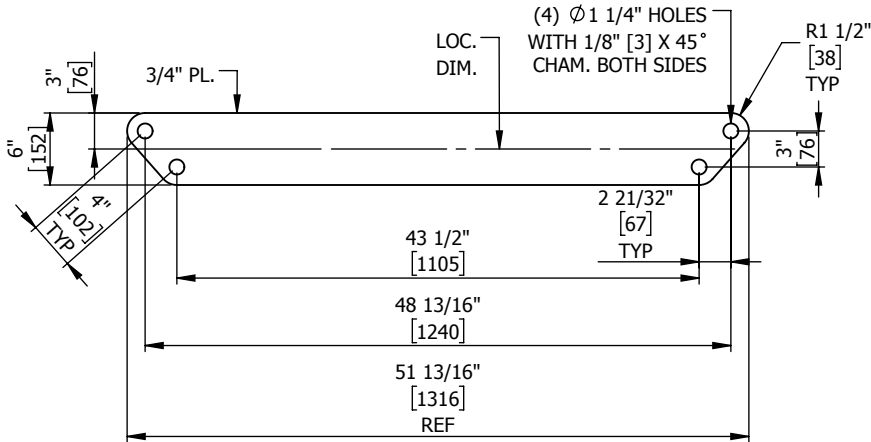
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ENGINEER: SHAUNA LEE		
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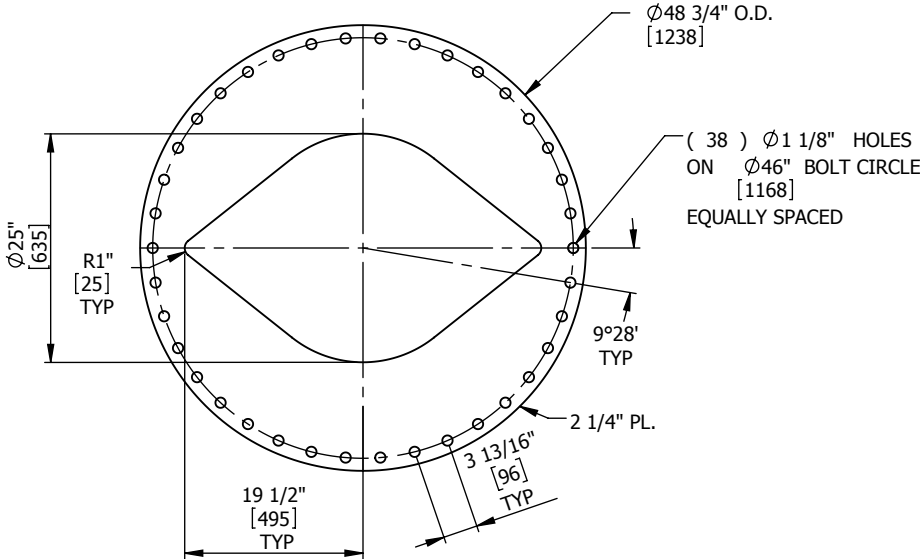
SHAFT ASSEMBLY, 50'-0" LONG
PTOP
CLIMBING DETAIL



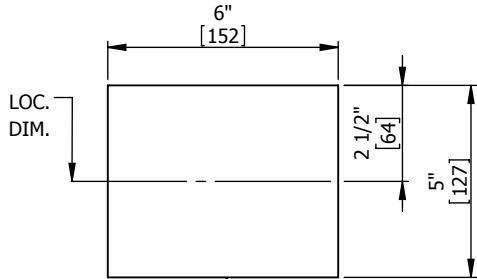
PCA221
70568, 0.25 X 2.00
036-ASTM A36
3.12 LBS



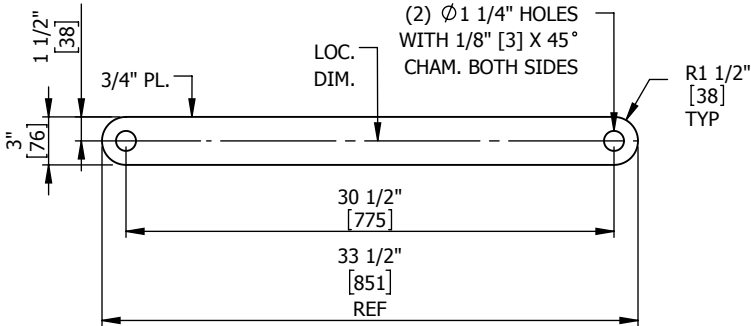
38350-316
0.75 X 6.00 X 51.81
065-ASTM A572 Gr65
61.92 LBS



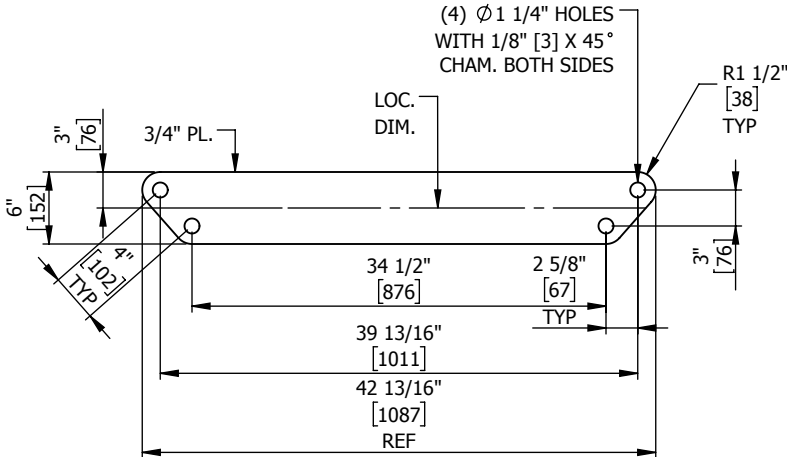
38350-4002
2.25 X 48.75 X 48.75
451-ASTM A572 Gr50
782.25 LBS



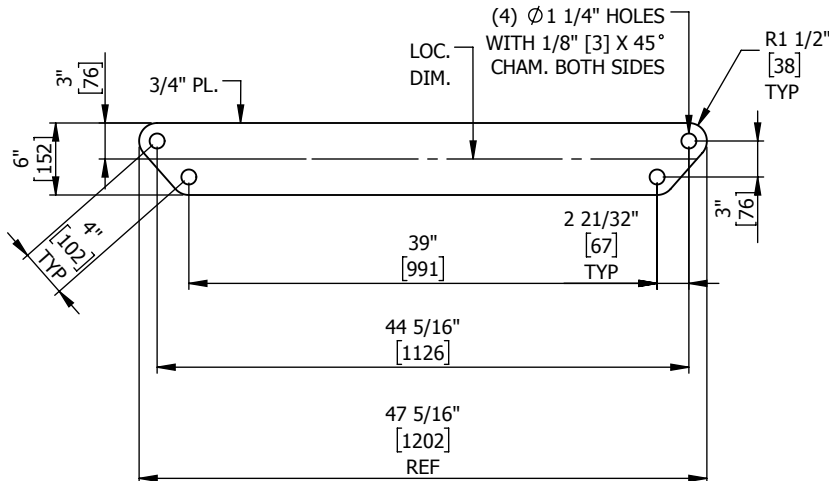
38350-1401
76946, 0.25 X 6.00
036-ASTM A36
2.13 LBS



38350-318
0.75 X 3.00 X 33.50
065-ASTM A572 Gr65
20.44 LBS



38350-312
0.75 X 6.00 X 42.81
065-ASTM A572 Gr65
50.44 LBS



38350-314
0.75 X 6.00 X 47.31
065-ASTM A572 Gr65
56.18 LBS

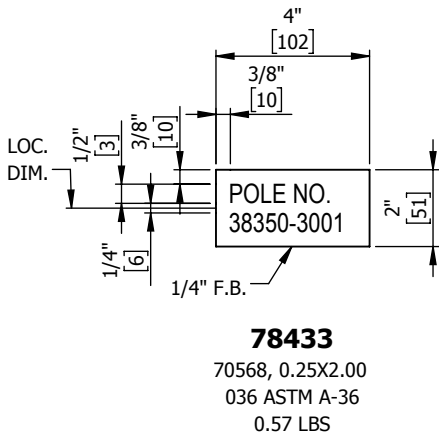
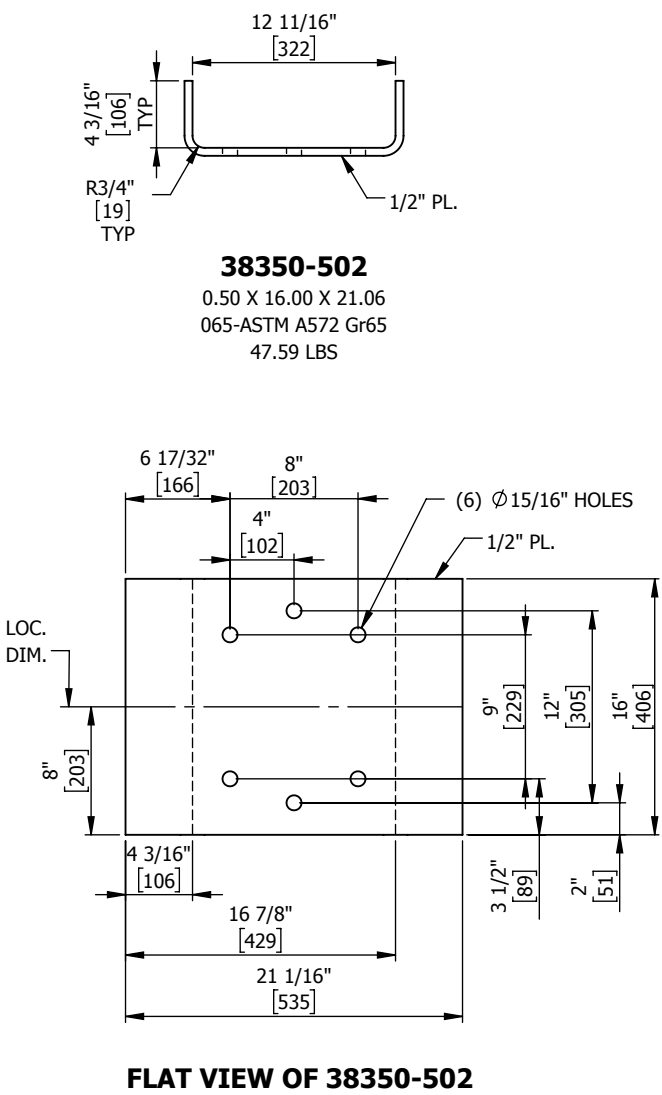
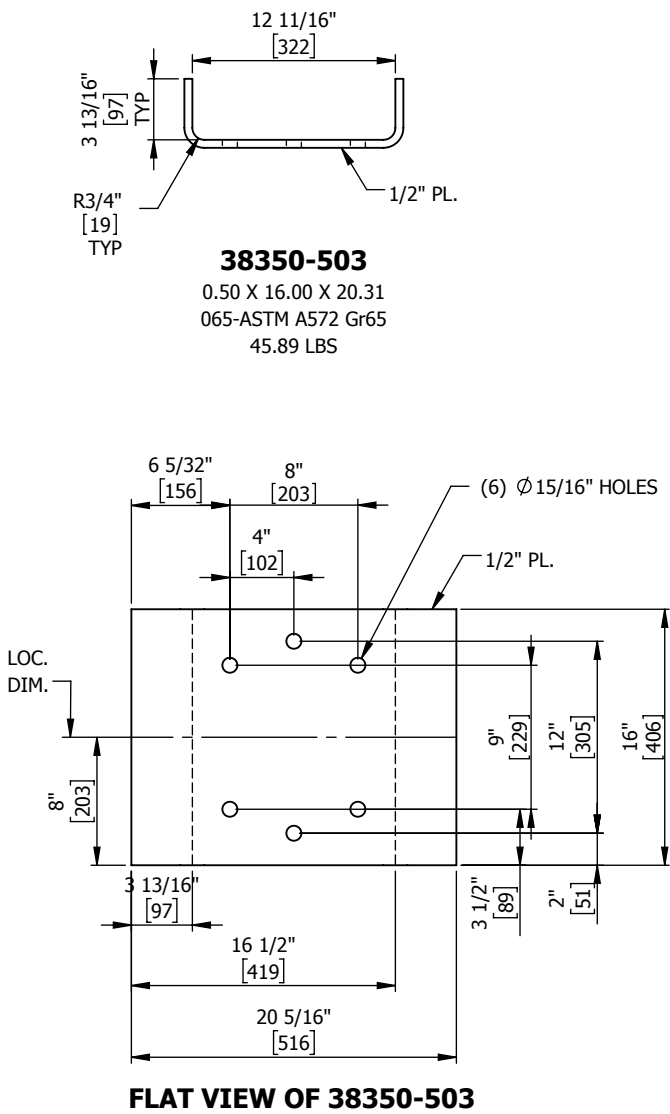
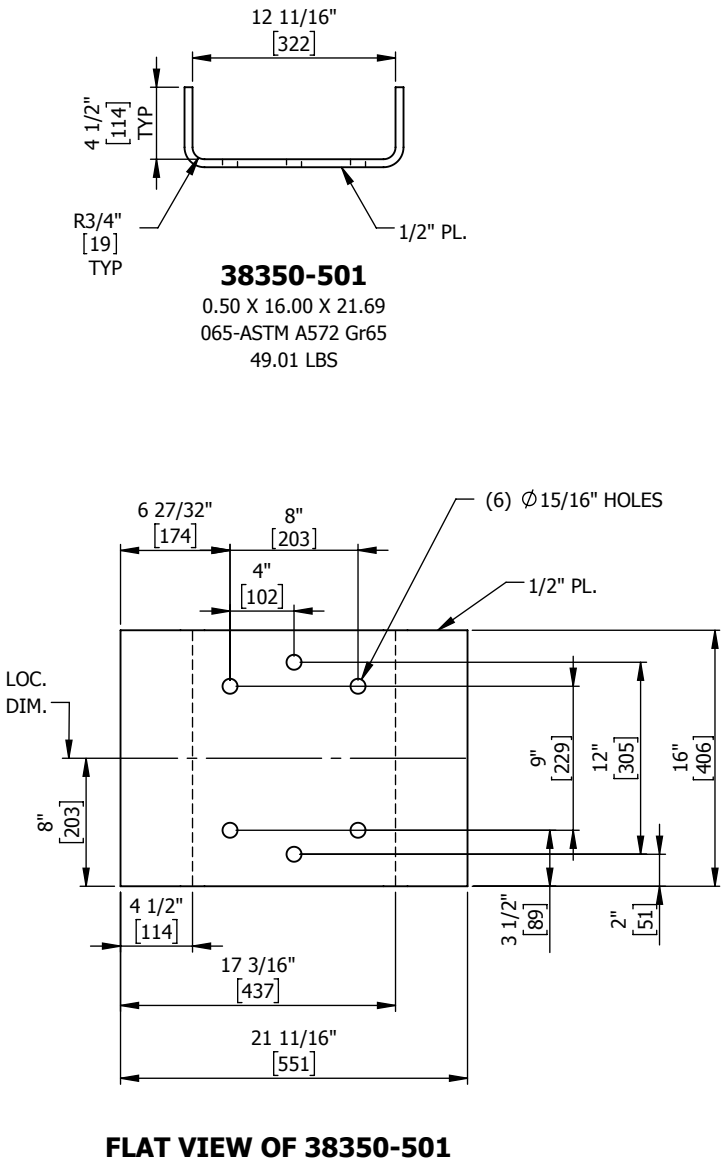
NOTES:

- 1. ALL THE DIMENSIONS SHOWN IN [XX] ARE IN mm.
- 2. UNLESS OTHERWISE NOTED REFER TMUS-EN-P-018 FOR TOLERANCES.

NOTAS:

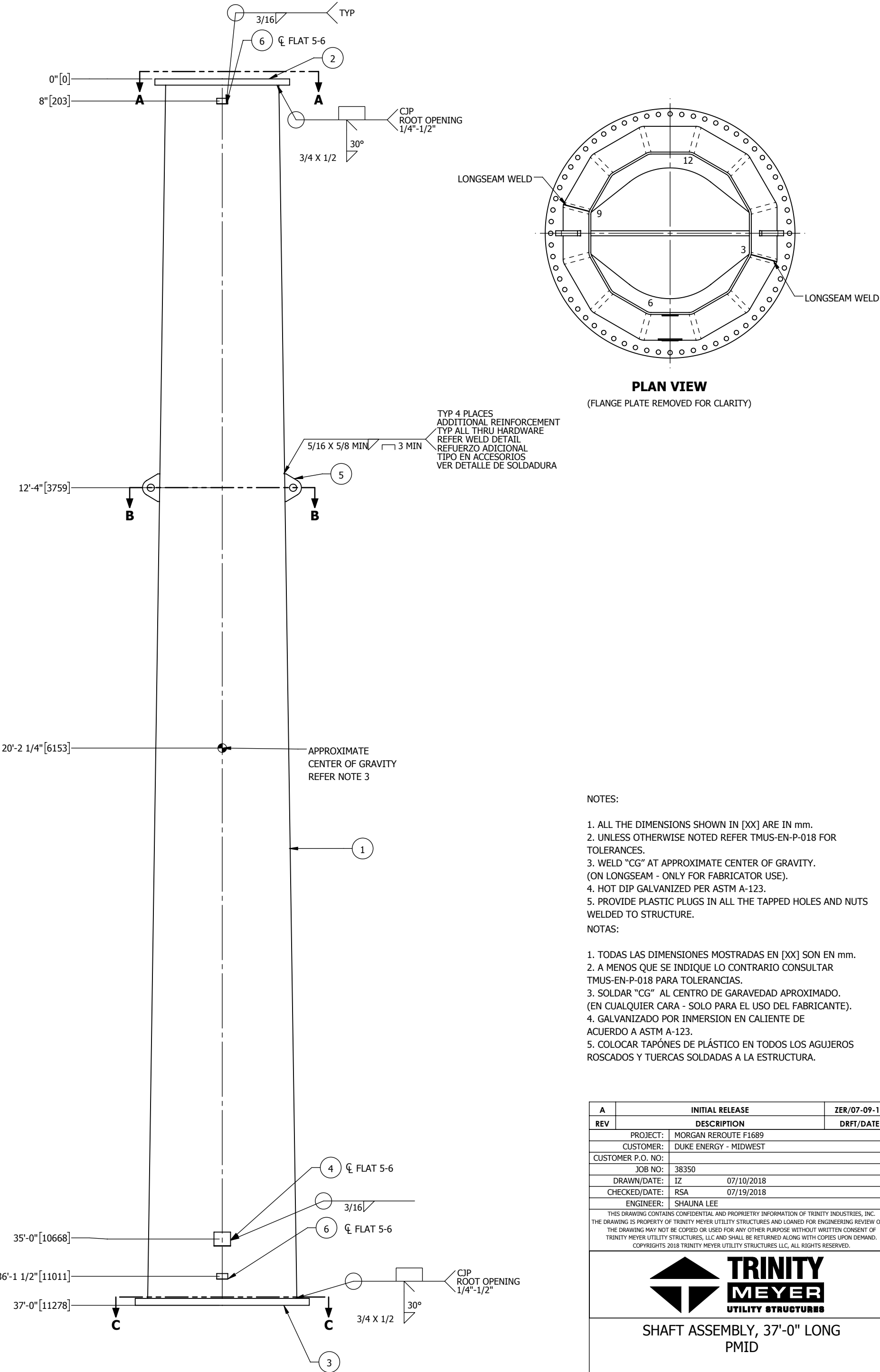
- 1. TODAS LAS DIMENSIONES MOSTRADAS EN [XX] SON EN mm.
- 2. A MENOS QUE SE INDIQUE LO CONTRARIO CONSULTAR TMUS-EN-P-018 PARA TOLERANCIAS.

B	REVISED THRU-VANGS TO BE DISTANCED FROM CENTER OF VANG.	ZER/08-01-18
A	INITIAL RELEASE	ZER/07-10-18
REV	DESCRIPTION	DRFT/DATE
PROJECT: MORGAN REROUTE F1689		
CUSTOMER: DUKE ENERGY - MIDWEST		
CUSTOMER P.O. NO:		
JOB NO: 38328		
DRAWN/DATE: IZ 07/10/2018		
CHECKED/DATE: RSA 07/19/2018		
ENGINEER: SHAUNA LEE		
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<div><div></div><div>TRINITY MEYER UTILITY STRUCTURES</div></div>		
SHAFT ASSEMBLY, 50'-0" LONG PTOP PARTS DETAIL		
SHEET 4 OF 5		REV. B

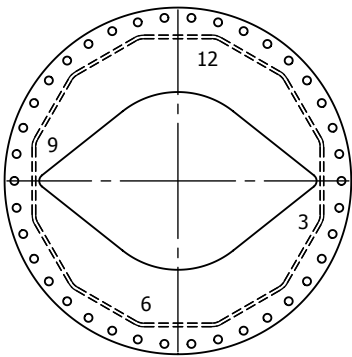


B	REVISED THRU-VANGS TO BE DISTANCED FROM CENTER OF VANG.	ZER/08-01-18
A	INITIAL RELEASE	ZER/07-10-18
REV	DESCRIPTION	DRFT/DATE
PROJECT: MORGAN REROUTE F1689		
CUSTOMER: DUKE ENERGY - MIDWEST		
CUSTOMER P.O. NO:		
JOB NO: 38328		
DRAWN/DATE: IZ 07/10/2018		
CHECKED/DATE: RSA 07/19/2018		
ENGINEER: SHAUNA LEE		
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<div><div></div><div>TRINITY MEYER UTILITY STRUCTURES</div></div>		
BRACKET BRKT PARTS DETAIL		
SHEET 5 OF 5		REV. B

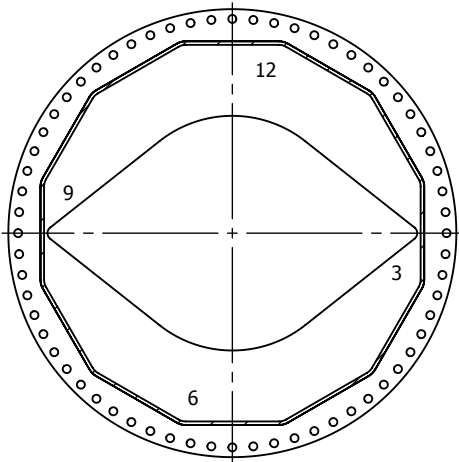
SHAFT INFORMATION						
TUBE NO.	MATERIAL	LENGTH	THICKNESS	TOP DIA (PT-PT)	BOTTOM DIA (PT-PT)	TAPER IN./FT.
38350-4003	065-ASTM A572 Gr65	36'-7 1/4" [11157]	1/2"	42 7/16" [1078]	55 7/8" [1419]	0.36751



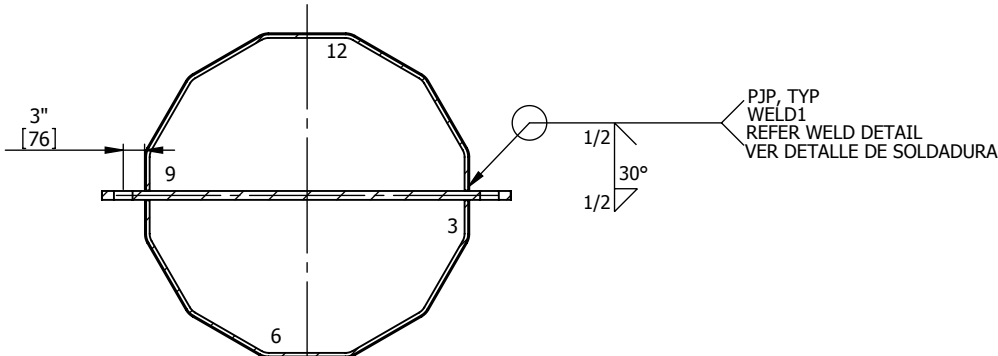
PARTS AND ASSEMBLIES LIST							
ITEM NO.	PART NUMBER	QTY.	DESCRIPTION	MATERIAL DIMENSION	MATERIAL GRADE	WT. EACH	EXTD. WT.
1	38350-4003	1	TOWER PLATE TUBE	(2) 0.50 X 64.88 X 439.25 X 85.75	065-ASTM A572 Gr65	9421.1	9421.10
2	38350-4002	1	FLANGE PLATE	2.25 X 48.75 X 48.75	451-ASTM A572 Gr50	782.25	782.25
3	38350-4004	1	FLANGE PLATE	2.50 X 63.00 X 63.00	451-ASTM A572 Gr50	1418.63	1418.63
4	38350-1401	1	NAME PLATE	76946, 0.25 X 6.00	036-ASTM A36	2.13	2.13
5	38350-319	1	THROUGH VANG	1.25 X 10.00 X 57.50	065-ASTM A572 Gr65	186.45	186.45
6	78433	2	ID TAG, A-36	70568, 0.25 X 2.00	036 ASTM A-36	0.57	1.14
7	76266	14	LADDER CLIP	74438, 0.19 X 2.00	ASTM A-606 TYPE 4	0.32	4.48
TOTAL MODEL WEIGHT							11816.18
TOTAL UNFINISHED WEIGHT							11850.00
TOTAL FINISHED WEIGHT							13030.00



SECTION A-A



SECTION C-C



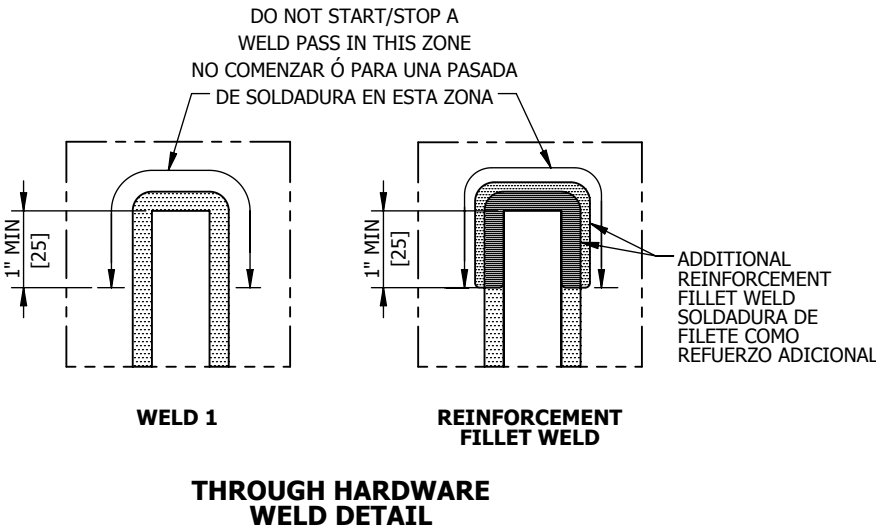
SECTION B-B

NOTES:

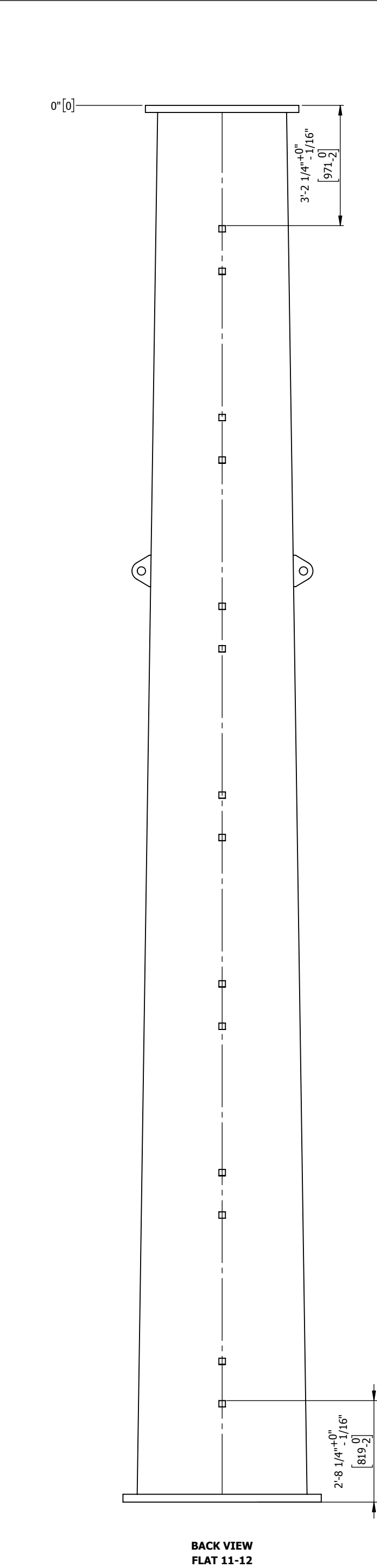
1. ALL THE DIMENSIONS SHOWN IN [XX] ARE IN mm.
2. UNLESS OTHERWISE NOTED REFER TMUS-EN-P-018 FOR TOLERANCES.

NOTAS:

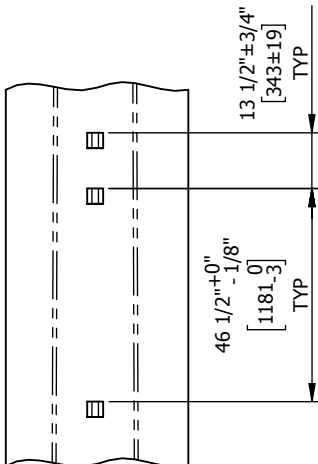
1. TODAS LAS DIMENSIONES MOSTRADAS EN [XX] SON EN mm.
2. A MENOS QUE SE INDIQUE LO CONTRARIO CONSULTAR TMUS-EN-P-018 PARA TOLERANCIAS.



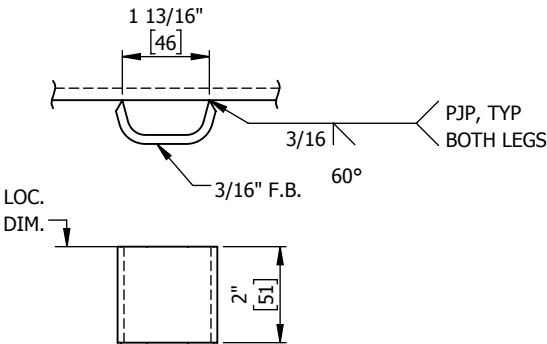
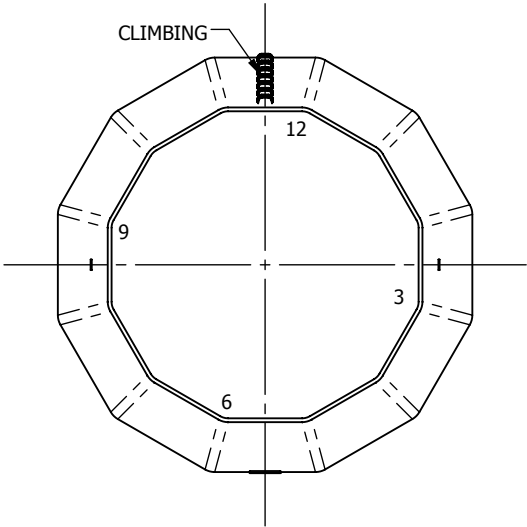
A	INITIAL RELEASE		ZER/07-09-18
REV	DESCRIPTION		DRFT/DATE
	PROJECT:	MORGAN REROUTE F1689	
	CUSTOMER:	DUKE ENERGY - MIDWEST	
	CUSTOMER P.O. NO:		
	JOB NO:	38350	
	DRAWN/DATE:	IZ 07/10/2018	
	CHECKED/DATE:	RSA 07/19/2018	
	ENGINEER:	SHAUNA LEE	
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<div><div></div><div>TRINITY MEYER UTILITY STRUCTURES</div></div>			
SHAFT ASSEMBLY, 37'-0" LONG PMID			
SHEET 2 OF 4		38350-3002	REV. A



LADDER CLIP SPACING



CLIMBING ORIENTATION




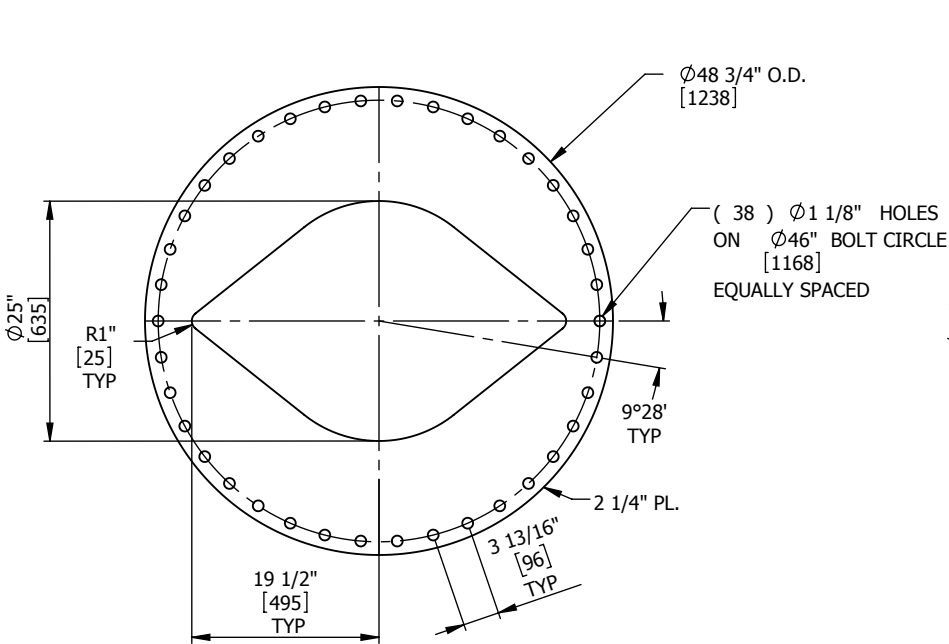
76266
74438, 0.19X2.00
ASTM A-606 TYPE 4
0.32 LBS

- NOTES:
1. ALL THE DIMENSIONS SHOWN IN [XX] ARE IN mm.
 2. UNLESS OTHERWISE NOTED REFER TMUS-EN-P-018 FOR TOLERANCES.
- NOTAS:
1. TODAS LAS DIMENSIONES MOSTRADAS EN [XX] SON EN mm.
 2. A MENOS QUE SE INDIQUE LO CONTRARIO CONSULTAR TMUS-EN-P-018 PARA TOLERANCIAS.

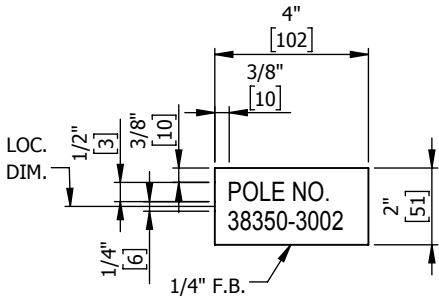
CLIMBING/WORKING HARDWARE INFORMATION			
EL.	LOCATION FROM TOP*	PART NO.	ORIENTATION
1	3'-2 1/4" [972]	76266	11-12
2	4'-3 3/4" [1314]	76266	11-12
3	8'-2 1/4" [2496]	76266	11-12
4	9'-3 3/4" [2838]	76266	11-12
5	13'-2 1/4" [4020]	76266	11-12
6	14'-3 3/4" [4362]	76266	11-12
7	18'-2 1/4" [5544]	76266	11-12
8	19'-3 3/4" [5886]	76266	11-12
9	23'-2 1/4" [7068]	76266	11-12
10	24'-3 3/4" [7410]	76266	11-12
11	28'-2 1/4" [8592]	76266	11-12
12	29'-3 3/4" [8934]	76266	11-12
13	33'-2 1/4" [10116]	76266	11-12
14	34'-3 3/4" [10458]	76266	11-12

* LOCATION DIMENSION FOR REFERENCE ONLY

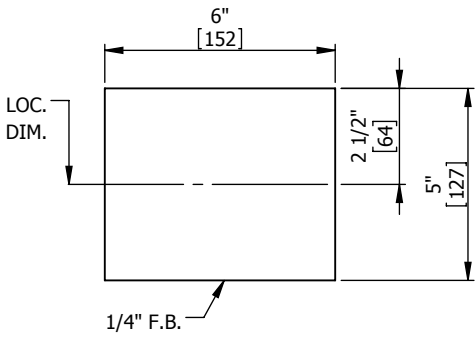
A	INITIAL RELEASE		ZER/07-09-18
REV	DESCRIPTION		DRFT/DATE
PROJECT:		MORGAN REROUTE F1689	
CUSTOMER:		DUKE ENERGY - MIDWEST	
CUSTOMER P.O. NO:			
JOB NO:		38350	
DRAWN/DATE:		IZ 07/10/2018	
CHECKED/DATE:		RSA 07/19/2018	
ENGINEER:		SHAUNA LEE	
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<div><div>TRINITY MEYER UTILITY STRUCTURES</div></div>			
SHAFT ASSEMBLY, 37'-0" LONG PMID CLIMBING DETAIL			
SHEET 3 OF 4		38350-3002	REV. A



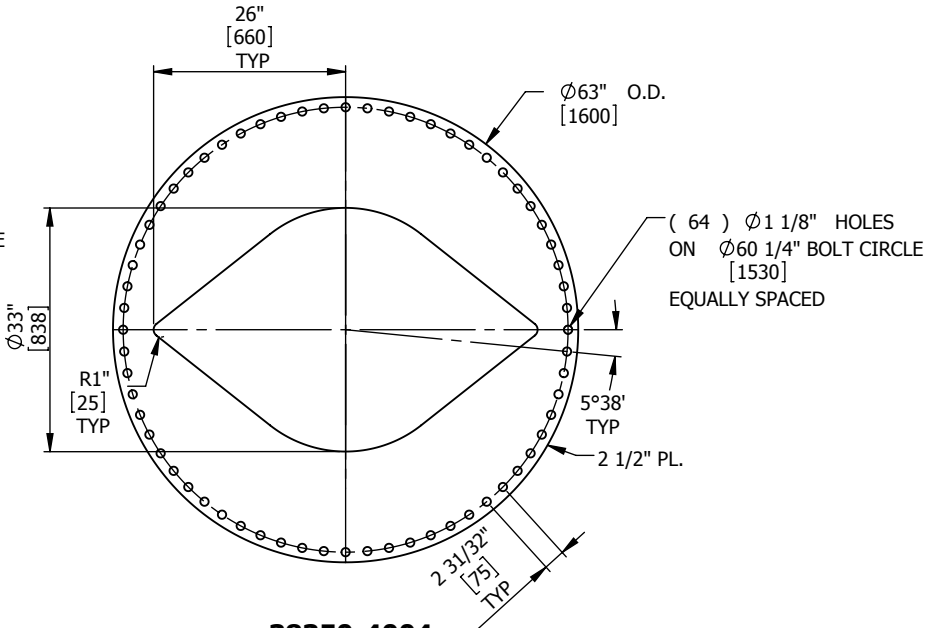
38350-4002
2.25 X 48.75 X 48.75
451-ASTM A572 Gr50
782.25 LBS



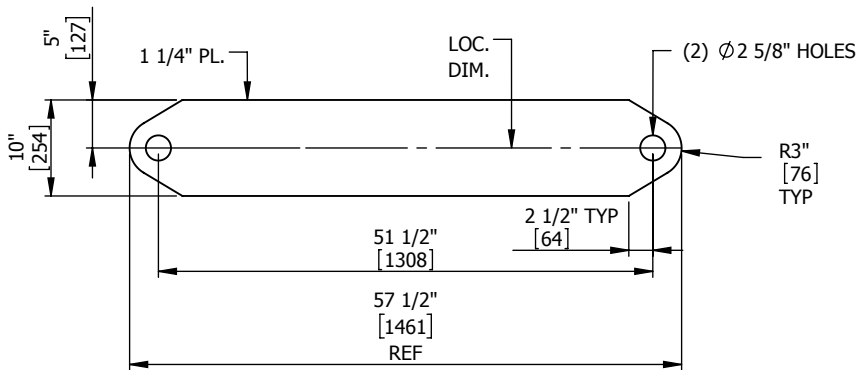
78433
70568, 0.25X2.00
036 ASTM A-36
0.57 LBS



38350-1401
76946, 0.25 X 6.00
036-ASTM A36
2.13 LBS



38350-4004
2.50 X 63.00 X 63.00
451-ASTM A572 Gr50
1418.63 LBS




38350-319
1.25 X 10.00 X 57.50
065-ASTM A572 Gr65
186.45 LBS

NOTES:

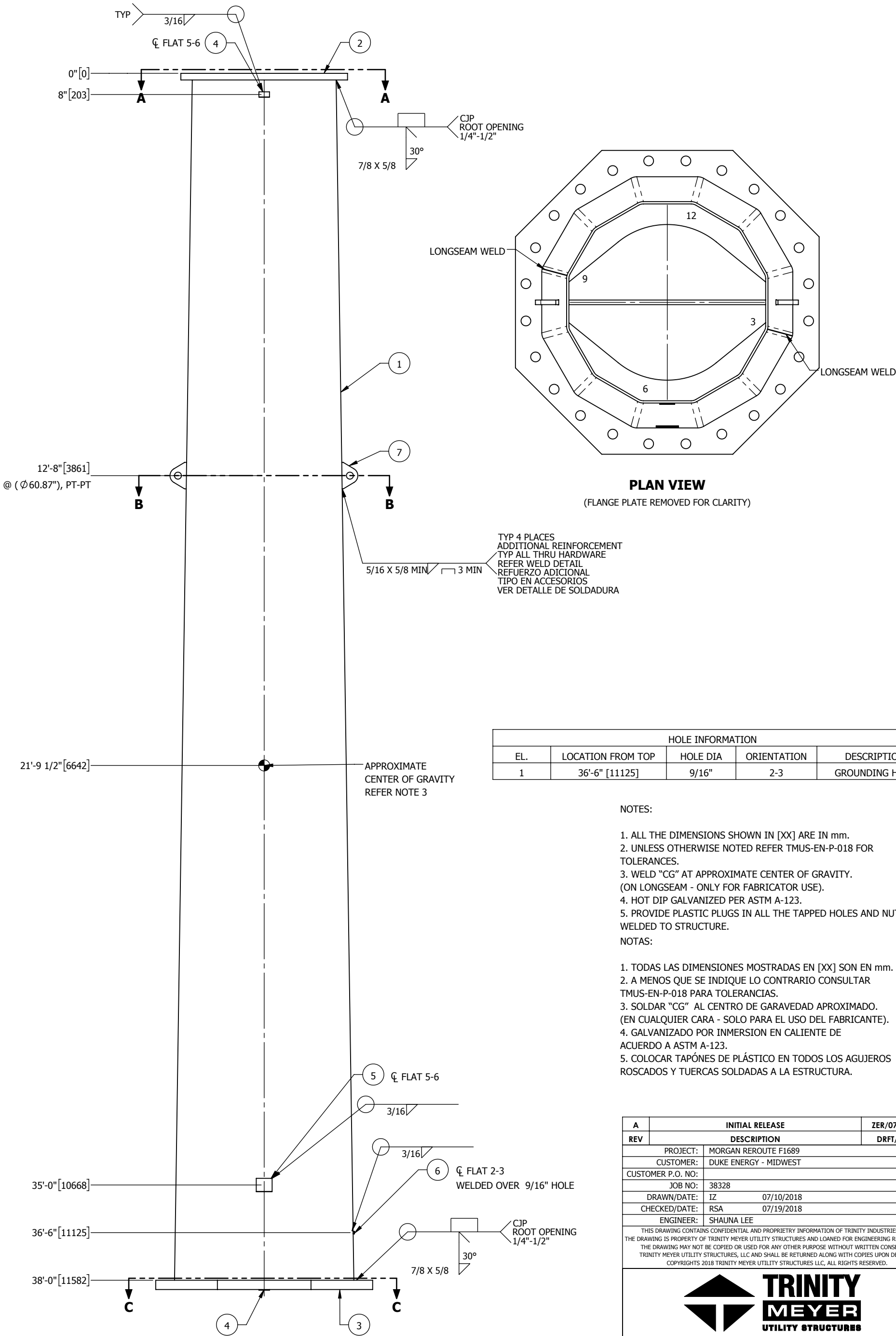
1. ALL THE DIMENSIONS SHOWN IN [XX] ARE IN mm.
2. UNLESS OTHERWISE NOTED REFER TMUS-EN-P-018 FOR TOLERANCES.

NOTAS:

1. TODAS LAS DIMENSIONES MOSTRADAS EN [XX] SON EN mm.
2. A MENOS QUE SE INDIQUE LO CONTRARIO CONSULTAR TMUS-EN-P-018 PARA TOLERANCIAS.

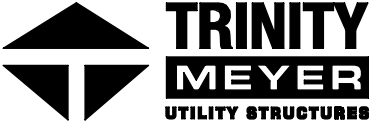
A	INITIAL RELEASE		ZER/07-09-18
REV	DESCRIPTION		DRFT/DATE
PROJECT:		MORGAN REROUTE F1689	
CUSTOMER:		DUKE ENERGY - MIDWEST	
CUSTOMER P.O. NO:			
JOB NO:		38350	
DRAWN/DATE:		IZ 07/10/2018	
CHECKED/DATE:		RSA 07/19/2018	
ENGINEER:		SHAUNA LEE	
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<div><div></div><div><div>TRINITY</div><div>MEYER</div><div>UTILITY STRUCTURES</div></div></div>			
SHAFT ASSEMBLY, 37'-0" LONG PMID PARTS DETAIL			
SHEET 4 OF 4		38350-3002	REV. A

SHAFT INFORMATION						
TUBE NO.	MATERIAL	LENGTH	THICKNESS	TOP DIA (PT-PT)	BOTTOM DIA (PT-PT)	TAPER IN./FT.
38350-4005	065-ASTM A572 Gr65	37'-9 1/2" [11519]	5/8"	56 9/32" [1430]	70 3/16" [1782]	0.36751

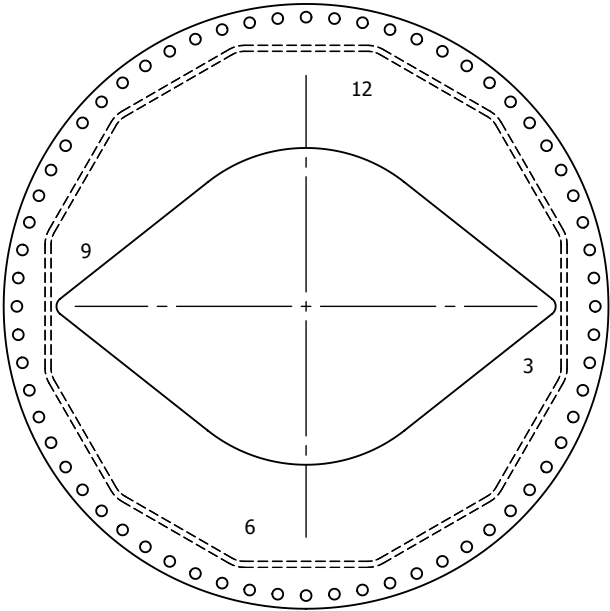


HOLE INFORMATION				
EL.	LOCATION FROM TOP	HOLE DIA	ORIENTATION	DESCRIPTION
1	36'-6" [11125]	9/16"	2-3	GROUNDING HOLE

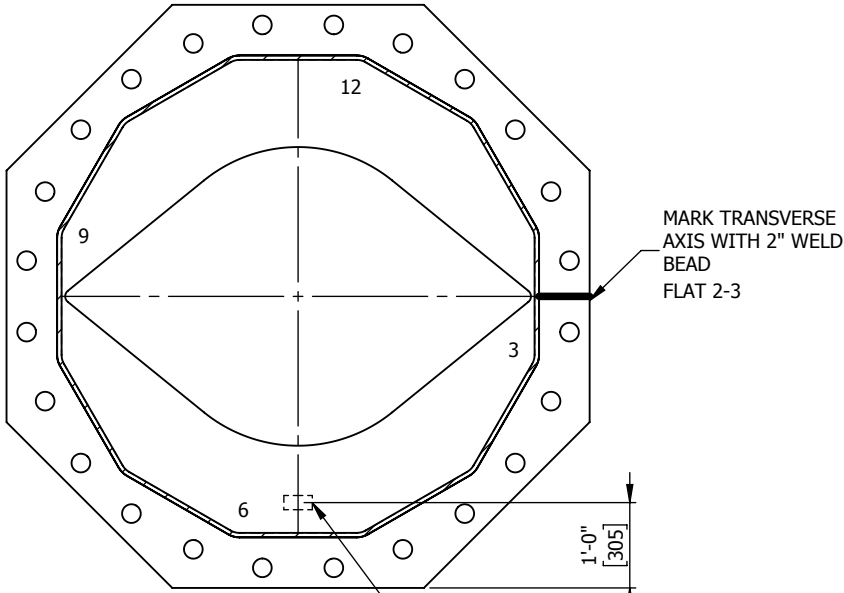
- NOTES:
1. ALL THE DIMENSIONS SHOWN IN [XX] ARE IN mm.
 2. UNLESS OTHERWISE NOTED REFER TMUS-EN-P-018 FOR TOLERANCES.
 3. WELD "CG" AT APPROXIMATE CENTER OF GRAVITY. (ON LONGSEAM - ONLY FOR FABRICATOR USE).
 4. HOT DIP GALVANIZED PER ASTM A-123.
 5. PROVIDE PLASTIC PLUGS IN ALL THE TAPPED HOLES AND NUTS WELDED TO STRUCTURE.
- NOTAS:
1. TODAS LAS DIMENSIONES MOSTRADAS EN [XX] SON EN mm.
 2. A MENOS QUE SE INDIQUE LO CONTRARIO CONSULTAR TMUS-EN-P-018 PARA TOLERANCIAS.
 3. SOLDAR "CG" AL CENTRO DE GARAVEDAD APROXIMADO. (EN CUALQUIER CARA - SOLO PARA EL USO DEL FABRICANTE).
 4. GALVANIZADO POR INMERSION EN CALIENTE DE ACUERDO A ASTM A-123.
 5. COLOCAR TAPÓNES DE PLÁSTICO EN TODOS LOS AGUJEROS ROSCADOS Y TUERCAS SOLDADAS A LA ESTRUCTURA.

A	INITIAL RELEASE		ZER/07-09-18
REV	DESCRIPTION		DRFT/DATE
	PROJECT:	MORGAN REROUTE F1689	
	CUSTOMER:	DUKE ENERGY - MIDWEST	
	CUSTOMER P.O. NO:		
	JOB NO:	38328	
	DRAWN/DATE:	IZ 07/10/2018	
	CHECKED/DATE:	RSA 07/19/2018	
	ENGINEER:	SHAUNA LEE	
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SHAFT ASSEMBLY, 38'-0" LONG PBAS			
SHEET 1 OF 4		38350-3003	REV. A

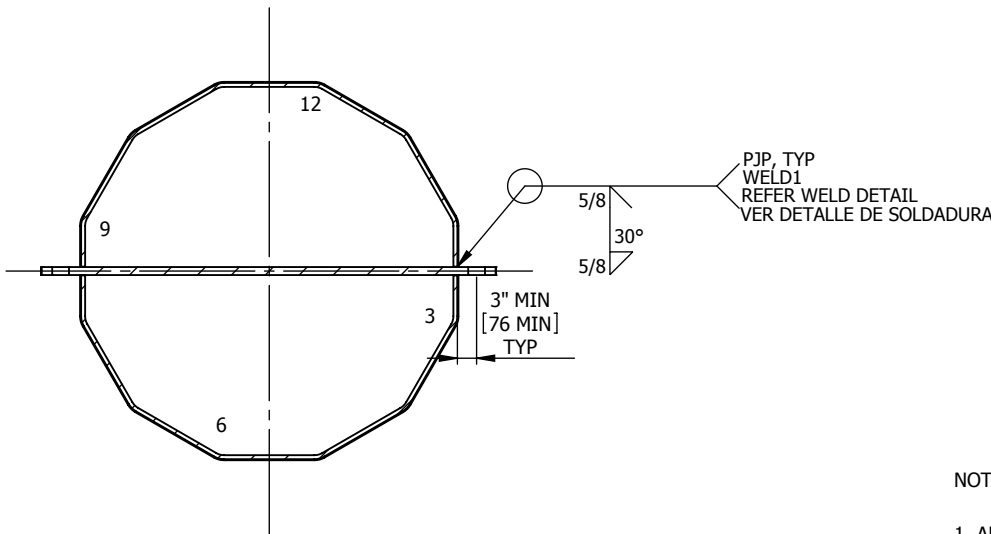
PARTS AND ASSEMBLIES LIST							
ITEM NO.	PART NUMBER	QTY.	DESCRIPTION	MATERIAL DIMENSION	MATERIAL GRADE	WT. EACH	EXTD. WT.
1	38350-4005	1	TOWER PLATE TUBE	(2) 0.63 X 86.06 X 453.50 X 107.63	065-ASTM A572 Gr65	15691.78	15691.78
2	38350-4004	1	FLANGE PLATE	2.50 X 63.00 X 63.00	451-ASTM A572 Gr50	1418.63	1418.63
3	38350-4006	1	BASE PLATE	3.50 X 82.00 X 82.00	451-ASTM A572 Gr50	3790.79	3790.79
4	78433	2	ID TAG, A-36	70568, 0.25 X 2.00	036 ASTM A-36	0.57	1.14
5	38350-1401	1	NAME PLATE	76946, 0.25 X 6.00	036-ASTM A36	2.13	2.13
6	73515	1	SS NUT, 1/2" DIA.	-	ASTM A-194 GRADE 8	0.07	0.07
7	38350-310	1	THROUGH VANG	1.25 X 10.00 X 71.00	065-ASTM A572 Gr65	234.3	234.30
8	76266	13	LADDER CLIP	74438, 0.19 X 2.00	ASTM A-606 TYPE 4	0.32	4.16
TOTAL MODEL WEIGHT							21143.00
TOTAL UNFINISHED WEIGHT							21200.00
TOTAL FINISHED WEIGHT							23320.00



SECTION A-A



SECTION C-C



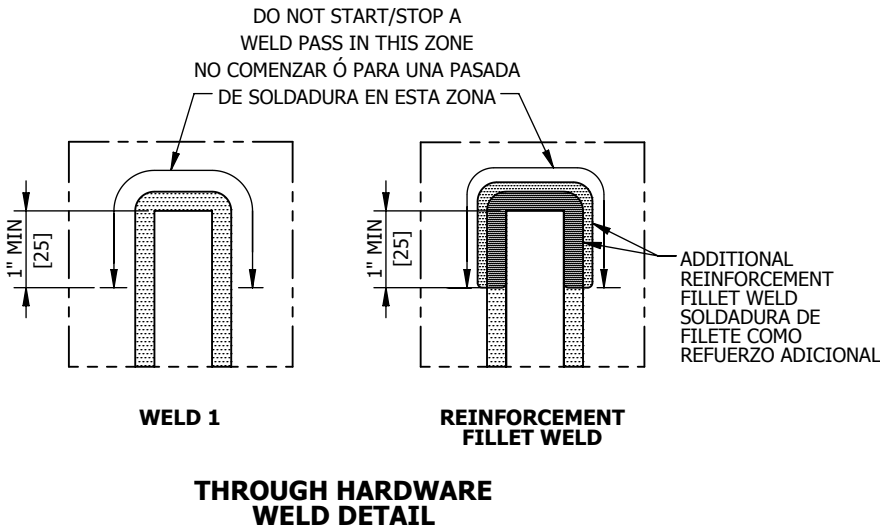
SECTION B-B

NOTES:

1. ALL THE DIMENSIONS SHOWN IN [XX] ARE IN mm.
2. UNLESS OTHERWISE NOTED REFER TMUS-EN-P-018 FOR TOLERANCES.

NOTAS:

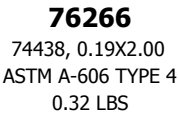
1. TODAS LAS DIMENSIONES MOSTRADAS EN [XX] SON EN mm.
2. A MENOS QUE SE INDIQUE LO CONTRARIO CONSULTAR TMUS-EN-P-018 PARA TOLERANCIAS.



THROUGH HARDWARE WELD DETAIL

A	INITIAL RELEASE		ZER/07-09-18
REV	DESCRIPTION		DRFT/DATE
	PROJECT:	MORGAN REROUTE F1689	
	CUSTOMER:	DUKE ENERGY - MIDWEST	
	CUSTOMER P.O. NO:		
	JOB NO:	38328	
	DRAWN/DATE:	IZ 07/10/2018	
	CHECKED/DATE:	RSA 07/19/2018	
	ENGINEER:	SHAUNA LEE	
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<div><div></div><div>TRINITY MEYER UTILITY STRUCTURES</div></div>			
SHAFT ASSEMBLY, 38'-0" LONG PBAS			
SHEET 2 OF 4		38350-3003	REV. A

* LOCATION DIMENSION FOR REFERENCE ONLY



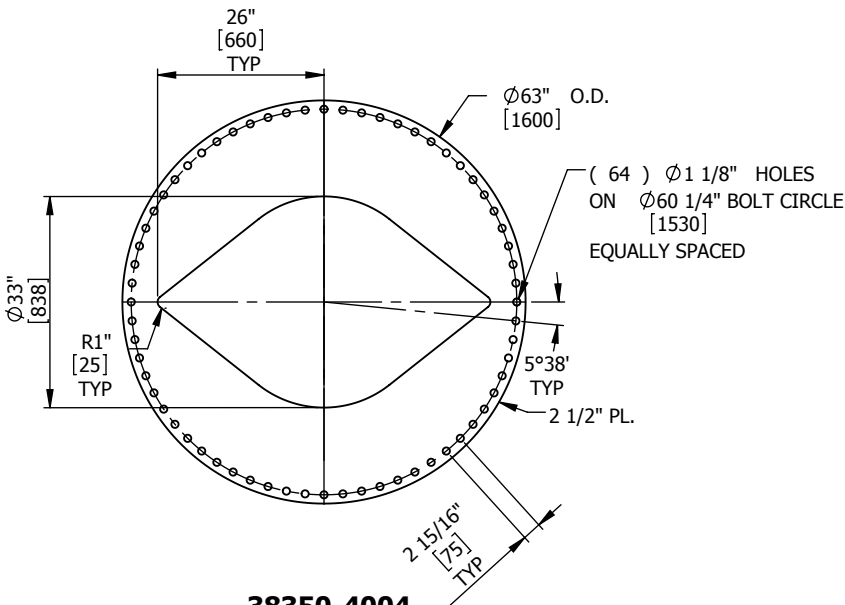
NOTES:

1. ALL THE DIMENSIONS SHOWN IN [XX] ARE IN mm.
2. UNLESS OTHERWISE NOTED REFER TMUS-EN-P-018 FOR TOLERANCES.

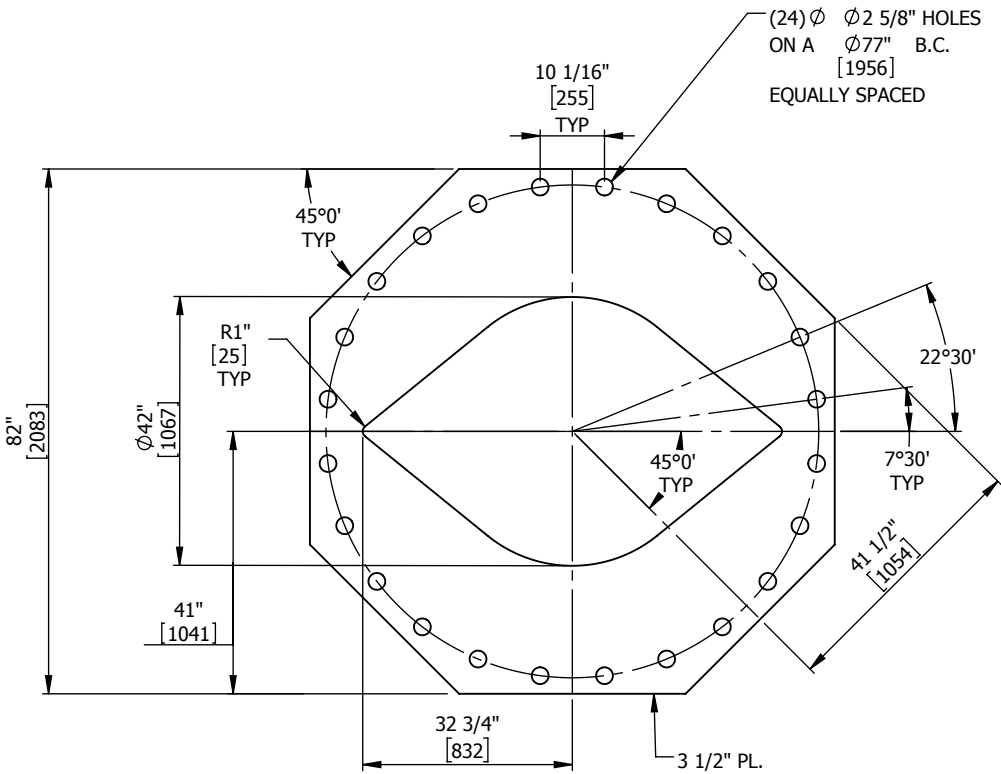
NOTAS:

1. TODAS LAS DIMENSIONES MOSTRADAS EN [XX] SON EN mm.
2. A MENOS QUE SE INDIQUE LO CONTRARIO CONSULTAR
TMUS-EN-P-018 PARA TOLERANCIAS.

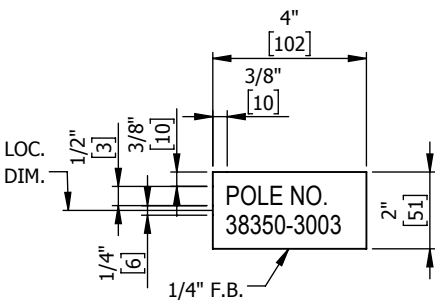
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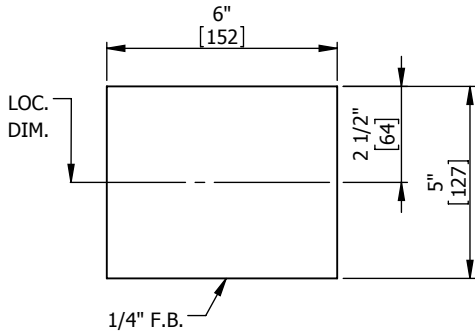
38350-4004
2.50 X 63.00 X 63.00
451-ASTM A572 Gr50
1418.63 LBS



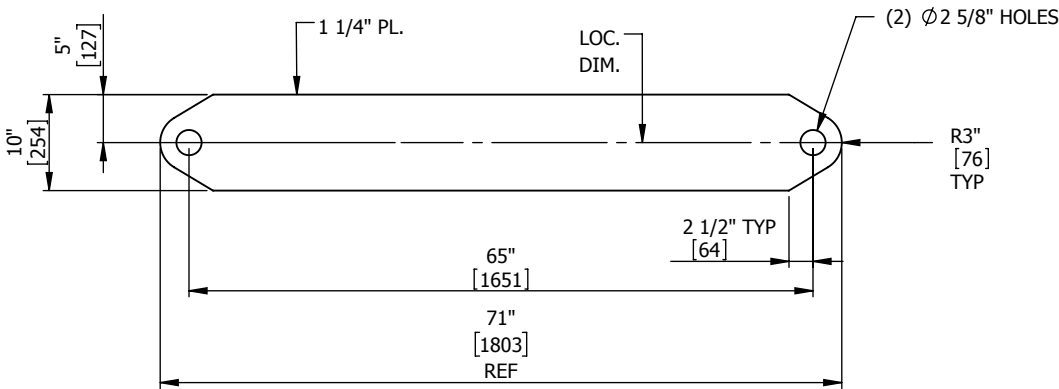
38350-4006
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451-ASTM A572 Gr50
3790.79 LBS



78433
70568, 0.25X2.00
036 ASTM A-36
0.57 LBS



38350-1401
76946, 0.25 X 6.00
036-ASTM A36
2.13 LBS



38350-310
1.25 X 10.00 X 71.00
065-ASTM A572 Gr65
234.3 LBS

NOTES:

1. ALL THE DIMENSIONS SHOWN IN [XX] ARE IN mm.
2. UNLESS OTHERWISE NOTED REFER TMUS-EN-P-018 FOR TOLERANCES.

NOTAS:

1. TODAS LAS DIMENSIONES MOSTRADAS EN [XX] SON EN mm.
2. A MENOS QUE SE INDIQUE LO CONTRARIO CONSULTAR TMUS-EN-P-018 PARA TOLERANCIAS.

A	INITIAL RELEASE		ZER/07-09-18
REV	DESCRIPTION		DRFT/DATE
	PROJECT:	MORGAN REROUTE F1689	
	CUSTOMER:	DUKE ENERGY - MIDWEST	
	CUSTOMER P.O. NO:		
	JOB NO:	38328	
	DRAWN/DATE:	IZ 07/10/2018	
	CHECKED/DATE:	RSA 07/19/2018	
	ENGINEER:	SHAUNA LEE	
THIS DRAWING CONTAINS CONFIDENTIAL AND PROPRIETRY INFORMATION OF TRINITY INDUSTRIES, INC. THE DRAWING IS PROPERTY OF TRINITY MEYER UTILITY STRUCTURES AND LOANED FOR ENGINEERING REVIEW ONLY. THE DRAWING MAY NOT BE COPIED OR USED FOR ANY OTHER PURPOSE WITHOUT WRITTEN CONSENT OF TRINITY MEYER UTILITY STRUCTURES, LLC AND SHALL BE RETURNED ALONG WITH COPIES UPON DEMAND. COPYRIGHTS 2018 TRINITY MEYER UTILITY STRUCTURES LLC, ALL RIGHTS RESERVED.			
<div><div></div><div>TRINITY MEYER UTILITY STRUCTURES</div></div>			
SHAFT ASSEMBLY, 38'-0" LONG PBAS PARTS DETAIL			
SHEET 4 OF 4		38350-3003	REV. A

ATTACHMENT C

Electric and Magnetic Fields Study

Electric and Magnetic Field Calculations for Duke Energy Morgan Station 138kV Circuit- 1689 Line Rebuild

For:

Marc R. Walters, MPA, CPESC
GAI Consultants, Inc.
201 N. Illinois Street, Suite 1700
Indianapolis, IN 46204

By:

David Fugate, PhD
Electric Research & Management, Inc.
1211 Cornplanter Rd.
Cabot, PA 16023

November 5, 2018

1.0 Introduction

This report describes electric and magnetic field (EMF) calculations for the planned rebuild of the circuit-1689 (138kV) connection into Morgan Station, which is located on the west side of Dry Fork Road. The new section of 1689 has three phase conductors in a vertical configuration and static wire on steel poles routed along the south side of the station as shown in Figure 1 (note that north is down in this figure).

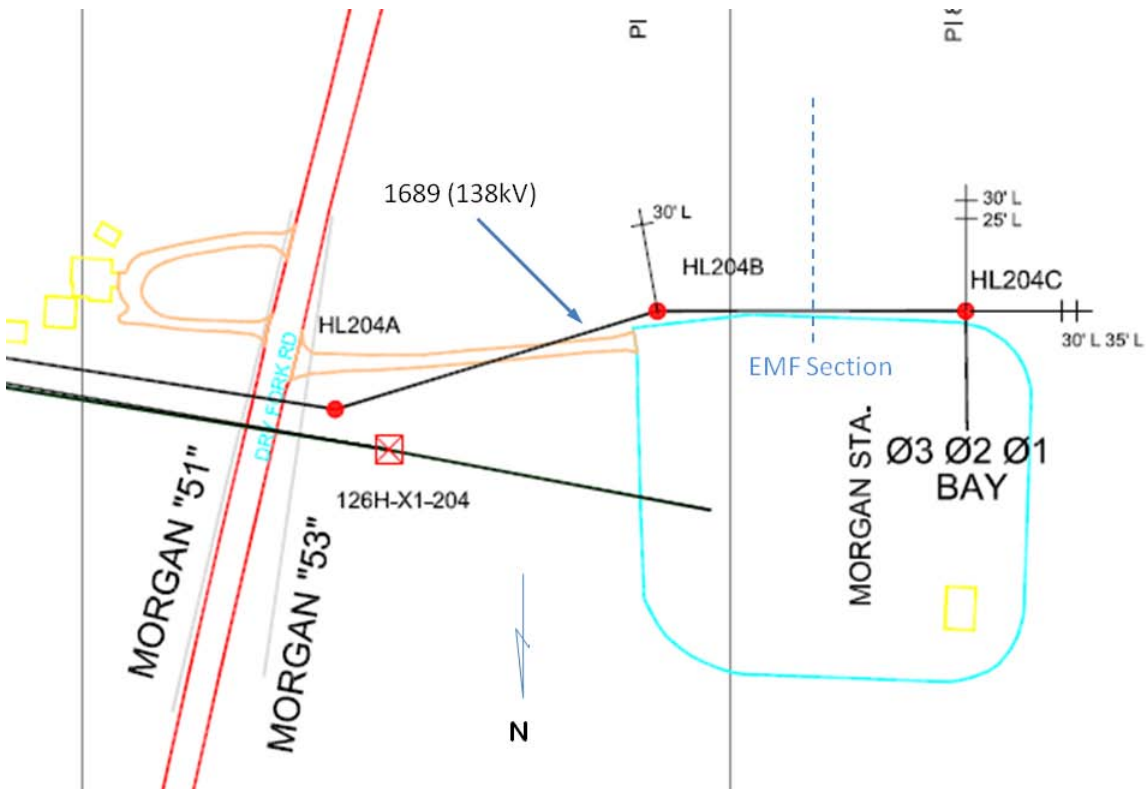


Figure 1. Morgan Station rebuild plan showing circuit 1689 (138kV) routed along the south side and down to a bay on the west side of the station (north is down).

The purpose of the EMF calculations is to determine electric and magnetic fields from the new line configuration. Specifically, EMF calculations were performed using a cross-section model of the 1689 circuit near midspan between poles HL204B and HL204C as indicated by the dashed line in Figure 1.

Calculations described in this report were performed using Corona and Field Effects software produced by engineers at the Bonneville Power Administration (BPA). The BPA software utilizes closed-form equations to calculate both electric and magnetic fields for any defined two-dimensional transmission line cross-section configuration. For this study, electric fields are calculated for an operating voltage of 145kV (5% above nominal phase-to-phase voltage of 138kV) and magnetic fields are calculated for three load scenarios per the OPSB requirements.

2.0 Modeled Cross-Section

As noted above, the EMF calculations are performed for a midspan cross-section between the two steel poles on the south side of the station. Phase conductors and static wire are arranged in a vertical configuration as shown by the Figure 2 line design profile used to determine conductor heights at the cross-section location.

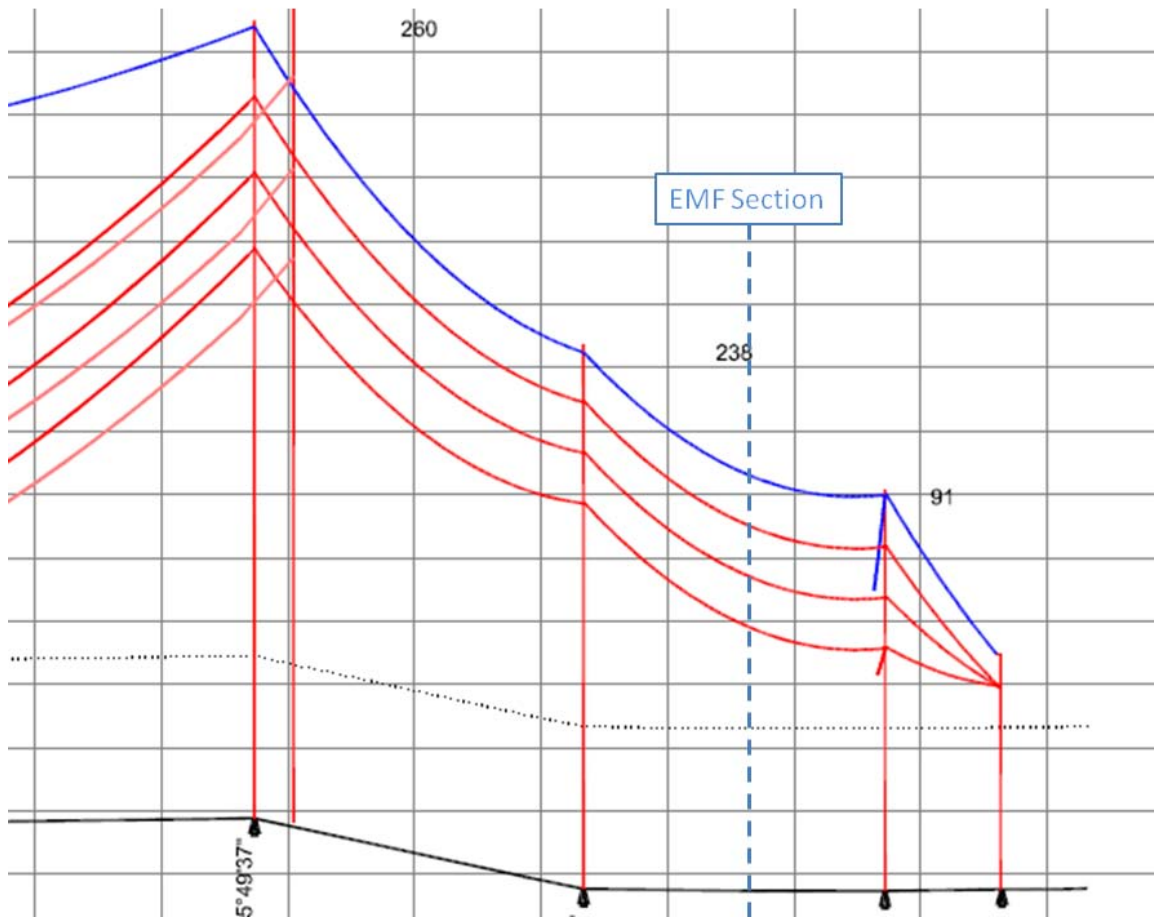


Figure 2. Line profile looking south showing three phase conductors (red) and static wire (blue).

Table 1 lists the lists the cross-section model conductor coordinates in feet, conductor diameters in inches, and the voltage and currents that are used to perform the EMF calculations. The x-coordinate zero is the pole center line, and the y-coordinates are relative to ground level. The conductor heights are determined from the Figure 2 profile.

Table 1. Transmission line parameters for 1689 cross-section model, consisting of three phase conductors and static wire in vertical configuration on steel poles.

Proposed 1689 Line, 138kV					Modeled Voltage (Phase-Neutral) 84kV			
Cross-Section Model between HL204B and HL204C								
		Position			Load Current (amperes)			
Conductors		Horiz. X (ft)	Height Y (ft)	Conductor Diameter (in)	Max Normal	Summer Emergency	Winter Normal	Conductor Type
Static Wire		0	66.9	0.385	NA	NA	NA	7#8 AW
A	Top	0	58.9	1.165	640	1263	1585	954 ACSR
B	Middle	0	50.9	1.165	640	1263	1585	954 ACSR
C	Bottom	0	42.9	1.165	640	1263	1585	954 ACSR

Both electric and magnetic fields are calculated at a height of one meter above ground level, at 5-foot intervals from directly beneath the line to the edge of right-of-way (EROW) at 50 feet, and continuing out to 200 feet from the pole center line.

The load currents listed in Table 1 are the maximum normal (640 amperes), summer emergency (1263 amperes), and winter normal (1585 amperes). Normal maximum loading represents the peak flow expected with all system facilities in service. Under normal operations, loads will vary below this level. Emergency loading is the maximum current flow during unusual (contingency) conditions, which exist only for brief periods of time. Winter normal conductor rating represents the maximum current flow that a line, including its terminal equipment, can carry during winter conditions. This loading value is highest based on a colder assumed winter ambient temperature, but like the summer emergency value, this represents an upper bound on load current that only be reached briefly, if ever. Balanced three-phase currents are assumed for each of the load scenarios used for the three sets of magnetic field calculations. EMF calculation results are provided in the next section.

3.0 Electric and Magnetic Field Results

Table 2 lists the electric and magnetic field values calculated using Table 1 model parameters that represent a cross-section of the 1689 circuit rebuild along the south side of Morgan Station. The field values are calculated at five foot intervals as a function of lateral distance from the pole center line at a height of one meter above ground level. Electric fields are listed in units of kilovolts per meter (kV/m) and magnetic fields are listed in units of milligauss (mG).

Figure 3 is a plot of the calculated electric field values and Figure 4 is a plot of the magnetic field for the three modeled load scenarios (normal maximum, summer emergency, and winter normal). The edge of right-of-way (EROW) is 50 feet from the pole center line.

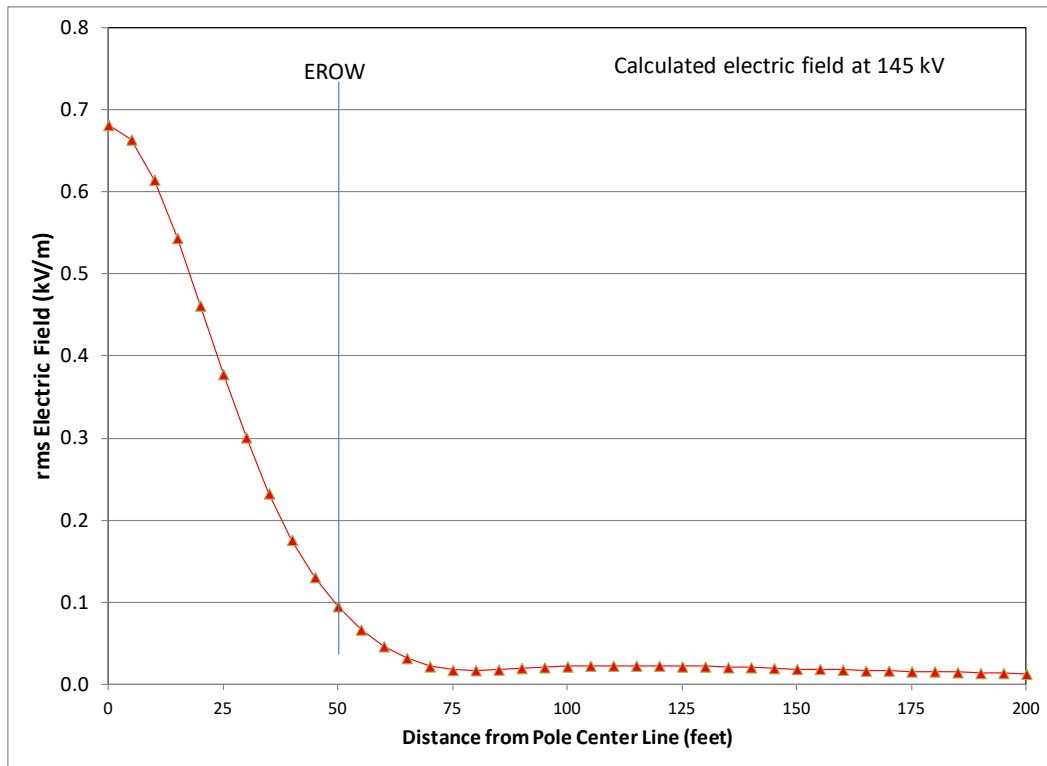


Figure 3. Calculated rms electric fields for planned 1689 138kV transmission line configuration, 1m above ground level as a function of distance (feet) from pole center line.

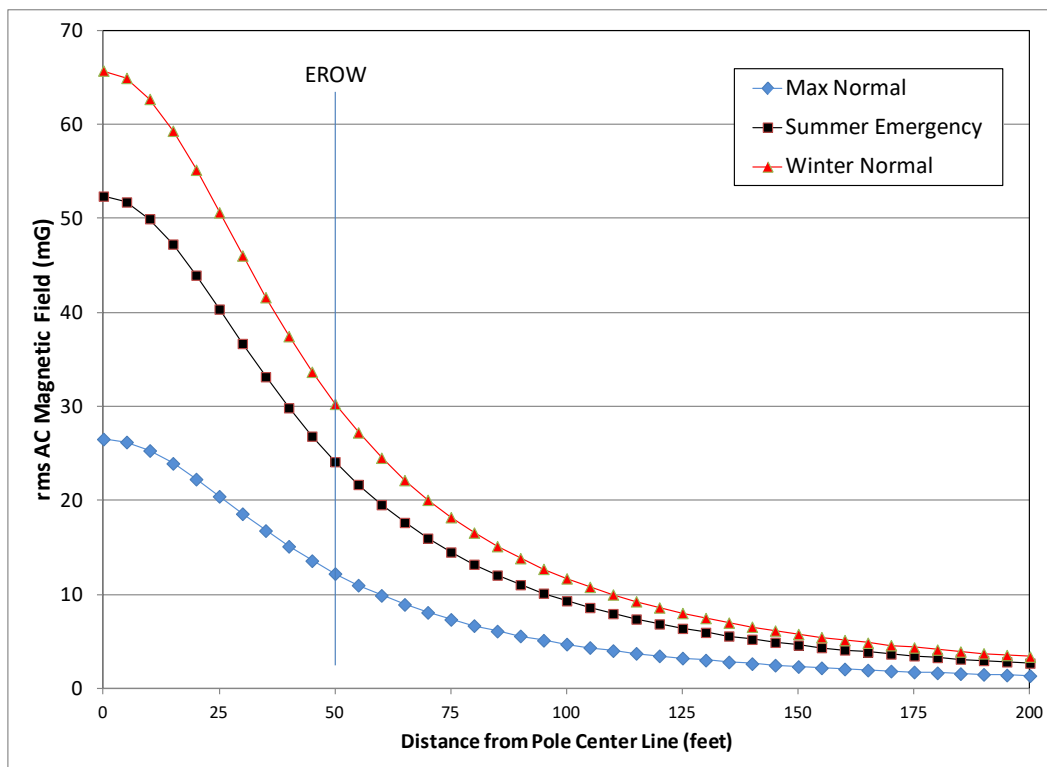


Figure 4. Calculated rms magnetic fields for planned 1689 138kV transmission line configuration, 1m above ground level as a function of distance (feet) from pole center line.

Table 2. Calculated electric and magnetic fields at one meter height above ground level.

Distance (ft)	Calculated Electric Field (kV/m)	Calculated Magnetic Field		
		(a) Normal Max (mG)	(b) Emergency (mG)	(c) Winter Normal (mG)
0	0.68	26.5	52.4	65.7
5	0.66	26.2	51.7	64.9
10	0.61	25.3	50.0	62.7
15	0.54	23.9	47.3	59.3
20	0.46	22.3	43.9	55.2
25	0.38	20.4	40.3	50.6
30	0.30	18.6	36.7	46.0
35	0.23	16.8	33.2	41.6
40	0.18	15.1	29.9	37.5
45	0.13	13.6	26.8	33.7
50	0.10	12.2	24.1	30.3
55	0.07	11.0	21.7	27.2
60	0.05	9.9	19.6	24.5
65	0.03	9.0	17.7	22.2
70	0.02	8.1	16.0	20.1
75	0.02	7.4	14.5	18.2
80	0.02	6.7	13.2	16.6
85	0.02	6.1	12.1	15.1
90	0.02	5.6	11.0	13.9
95	0.02	5.1	10.1	12.7
100	0.02	4.7	9.3	11.7
105	0.02	4.4	8.6	10.8
110	0.02	4.0	8.0	10.0
115	0.02	3.7	7.4	9.3
120	0.02	3.5	6.9	8.6
125	0.02	3.2	6.4	8.0
130	0.02	3.0	6.0	7.5
135	0.02	2.8	5.6	7.0
140	0.02	2.7	5.2	6.6
145	0.02	2.5	4.9	6.2
150	0.02	2.3	4.6	5.8
155	0.02	2.2	4.4	5.5
160	0.02	2.1	4.1	5.2
165	0.02	2.0	3.9	4.9
170	0.02	1.9	3.7	4.6
175	0.02	1.8	3.5	4.4
180	0.02	1.7	3.3	4.2
185	0.02	1.6	3.1	3.9
190	0.01	1.5	3.0	3.8
195	0.01	1.4	2.8	3.6
200	0.01	1.4	2.7	3.4

5.0 Results Summary

Table 3 summarizes the EMF calculations at EROW (50 feet from pole center line). The three magnetic field values correspond to 1689 circuit loads of 640, 1263, and 1585 amperes respectively. The electric field is evaluated at an operating voltage of 145kV (5% above nominal 138kV).

Table 3. Electric and magnetic fields at EROW, one meter above ground level.

EMF Calculation Summary (EROW)		
Condition	Magnetic Field (mG)	Electric Field (kV/m)
(a) Normal Maximum Loading	12.2	0.10
(b) Emergency Line Loading	24.1	
(d) Winter Normal Conductor Rating	30.3	

In terms of EMF impact, the main two issues for consideration are human exposure and interference (EMI). The issue of human exposure addresses whether or not the field levels are safe, and the issue of interference addresses the question of what equipment or systems might be adversely affected by the fields adjacent to the planned 138kV connection to the Morgan Station.

The applicable exposure standard in the United States for power-frequency magnetic fields (60Hz) is IEEE C95.6 “Safety Levels with Respect to Human Exposure to Electromagnetic Fields, 0-3kHz”. In IEEE C95.6, the general public Maximum Permissible Exposure (MPE) limit for 60Hz magnetic fields is 9040 mG, and the 60Hz electric field MPE is 5kV/m. Based on the Table 2 calculated values, these MPE values are easily met even directly beneath the line, and the field levels fall off rapidly moving beyond the right-of-way.

It should be noted that the MPE limits in the C95.6 safety standard are based on well-established immediate adverse affects, namely stimulation of the nervous system, and not on chronic, or long-term effects that have been researched, tested, and reviewed for nearly three decades. After significant reviews of the entire range of research results by independent health organizations—including the International Council on Non-Ionizing Radiation Protection (ICNIRP), the World Health Organization (WHO), and the US National Cancer Institute—the conclusions in exposure standards state that there is insufficient evidence to establish lower limits than those presently listed in the voluntary safety guidelines. There are no Federal or State regulatory limits for 60Hz magnetic fields. Some states have set limits for transmission line electric and magnetic fields on the right-of-way or at edge of right-of-way (EROW). These transmission line limits are not based on health effects per se, but are levels that will generally maintain

status quo (i.e., new transmission lines should in general not produce higher fields than the fields associated with existing transmission lines).

With respect to magnetic field interference, our experience is that AC magnetic fields rarely cause interference with typical residential, office, or retail uses, especially at the calculated levels listed in this report. Interference does occur frequently with specialized facilities that utilize highly sensitive instrumentation such as medical imaging, university research, and high-tech industry such as semiconductor, biology, nano-fabrication, or pharmaceutical facilities. Otherwise, our experience is that at the levels shown in this report, magnetic field interference would not occur with consumer appliances, electronics, communications, telecom, internet, Wi-Fi, cellular service, and other typical uses.

With respect to medical implants, the American Conference of Governmental Industrial Hygienists occupational safety guideline (ACGIH Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices) lists a recommended threshold limit of 1000 mG for 50/60 Hz magnetic fields. Manufacturers of medical implants always provide guidelines for patients and these guidelines name appliances, tools, and equipment to avoid with recommended separation distances (as opposed to a single magnetic field threshold value). The ACGIH guideline explains that the 1000 mG threshold for medical implants is a target level for use in the absence of specific manufacturer's recommendations. Calculated magnetic field levels are orders of magnitude lower than this 1000 mG recommendation.

With respect to exposure and interference, no EMF impacts are expected from the proposed 1689 circuit configuration.

6.0 References

- [1] Transmission Line Reference Book, Electric Power Research Institute, 2nd Edition, 1982, p.269.
- [2] Corona and Field Effects of AC Overhead Transmission Lines, IEEE Power Engineering Society, July 1985.
- [3] IEEE Standard 644-1994, IEEE Standard Procedure for Measurements of Power Frequency Electric and Magnetic Fields from AC Power Lines (ANSI).
- [4] IEEE Standard C95.6, Safety Levels with Respect to Human Exposure to Electromagnetic Fields, 0–3 kHz.

ATTACHMENT D

Endangered and Threatened Species Correspondence



Ohio Department of Natural Resources

JOHN R. KASICH, GOVERNOR

JAMES ZEHRINGER, DIRECTOR

Office of Real Estate
Paul R. Baldrige, Chief
2045 Morse Road – Bldg. E-2
Columbus, OH 43229
Phone: (614) 265-6649
Fax: (614) 267-4764

October 1, 2018

Tyler Rankin
GAI Consultants
3720 Dressler Road NW
Canton, Ohio 44718

Re: 18-934; Duke Energy Morgan Substation Expansion Loop Project

Project: The proposed project involves the construction of a new re-alignment of the transmission line loop/tap to accommodate the expansion of the Morgan Substation.

Location: The proposed project is in Whitewater Township, Hamilton County, Ohio.

The Ohio Department of Natural Resources (ODNR) has completed a review of the above referenced project. These comments were generated by an inter-disciplinary review within the Department. These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the National Environmental Policy Act, the Coastal Zone Management Act, Ohio Revised Code and other applicable laws and regulations. These comments are also based on ODNR's experience as the state natural resource management agency and do not supersede or replace the regulatory authority of any local, state or federal agency nor relieve the applicant of the obligation to comply with any local, state or federal laws or regulations.

Natural Heritage Database: The Natural Heritage Database has the following records at or within a one-mile radius of the project area:

Pale umbrella-sedge (*Cyperus acuminatus*), P
Northern madtom (*Noturus stigmosus*), E
Sloan's crayfish (*Orconectes sloanii*), T

The review was performed on the project area you specified in your request as well as an additional one-mile radius. Records searched date from 1980. This information is provided to inform you of features present within your project area and vicinity. Additional comments on some of the features may be found in pertinent sections below.

Please note that Ohio has not been completely surveyed and we rely on receiving information from many sources. Therefore, a lack of records for any particular area is not a statement that rare species or unique features are absent from that area. Although all types of plant communities have been surveyed, we only maintain records on the highest quality areas.

Statuses are defined as: E = state endangered; T = state threatened; P = state potentially threatened; SC = state species of concern; SI = state special interest; A = species recently added to state inventory, status not yet determined; X = presumed extirpated in Ohio; FE = federal

endangered, FT = federal threatened, FSC = federal species of concern, FC = federal candidate species.

Fish and Wildlife: The Division of Wildlife (DOW) has the following comments.

The DOW recommends that impacts to streams, wetlands and other water resources be avoided and minimized to the fullest extent possible, and that best management practices be utilized to minimize erosion and sedimentation.

The project is within the vicinity of records for the Indiana bat (*Myotis sodalis*), a state endangered and federally endangered species. Presence of the Indiana bat has been established in the area, and therefore additional summer surveys would not constitute presence/absence in the area. The following species of trees have relatively high value as potential Indiana bat roost trees to include: shagbark hickory (*Carya ovata*), shellbark hickory (*Carya laciniosa*), bitternut hickory (*Carya cordiformis*), black ash (*Fraxinus nigra*), green ash (*Fraxinus pennsylvanica*), white ash (*Fraxinus americana*), shingle oak (*Quercus imbricaria*), northern red oak (*Quercus rubra*), slippery elm (*Ulmus rubra*), American elm (*Ulmus americana*), eastern cottonwood (*Populus deltoides*), silver maple (*Acer saccharinum*), sassafras (*Sassafras albidum*), post oak (*Quercus stellata*), and white oak (*Quercus alba*). Indiana bat roost trees consists of trees that include dead and dying trees with exfoliating bark, crevices, or cavities in upland areas or riparian corridors and living trees with exfoliating bark, cavities, or hollow areas formed from broken branches or tops. However, Indiana bats are also dependent on the forest structure surrounding roost trees. If suitable habitat occurs within the project area, the DOW recommends trees be conserved. If suitable habitat occurs within the project area and trees must be cut, the DOW recommends cutting occur between October 1 and March 31. If no tree removal is proposed, this project is not likely to impact this species.

The project is within the range of the sheepsnose (*Plethobasus cyphus*), a state endangered and federally endangered mussel, the fanshell (*Cyprogenia stegaria*), a state endangered and federally endangered mussel, the pink mucket (*Lampsilis orbiculata*), a state endangered and federally endangered mussel, the rayed bean (*Villosa fabalis*), a state endangered and federally endangered mussel, the snuffbox (*Epioblasma triquetra*), a state endangered and federally endangered mussel, the ebonyshell (*Fusconaia ebena*), a state endangered mussel, the long-solid (*Fusconaia maculata maculata*), a state endangered mussel, the butterfly (*Ellipsaria lineolata*), a state endangered mussel, the washboard (*Megaloniais nervosa*), a state endangered mussel, the elephant-ear (*Elliptio crassidens crassidens*), a state endangered mussel, the Ohio pigtoe (*Pleurobema cordatum*), a state endangered mussel, the monkeyface (*Quadrula metanevra*), a state endangered mussel, the wartyback (*Quadrula nodulata*), a state endangered mussel, the black sandshell (*Ligumia recta*), a state threatened mussel, the fawnsfoot (*Truncilla donaciformis*), a state threatened mussel, and the threehorn wartyback (*Obliquaria reflexa*), a state threatened mussel. Due to the location, and that there is no in-water work proposed in a perennial stream, this project is not likely to impact these species.

The project is within the range of the shortnose gar (*Lepisosteus platostomus*), a state endangered fish, the shoal chub (*Macrhybopsis hyostoma*), a state endangered fish, the shovelnose sturgeon (*Scaphirhynchus platyrhynchus*), a state endangered fish, the lake sturgeon (*Acipenser fulvescens*), a state endangered fish, the northern madtom (*Noturus stigmosus*), a state endangered fish, the bigeye shiner (*Notropis boops*) a state threatened fish, the mountain madtom (*Noturus eleutherus*), a state threatened fish, the river darter (*Percina shumardi*) a state threatened fish, the channel darter (*Percina copelandi*), a state threatened fish, the blue sucker (*Cycleptus elongatus*), a state threatened fish, and the paddlefish (*Polyodon spathula*) a state threatened fish. Due to the

location, and that there is no in-water work proposed in a perennial stream, this project is not likely to impact these species.

The project is within the range of the Kirtland's snake (*Clonophis kirtlandii*), a state threatened species. This secretive species prefers wet meadows and other wetlands. Due to the location, the type of habitat present at the project site and within the vicinity of the project area, and the type of work proposed, this project is not likely to impact this species.

The project is within the range of the cave salamander (*Eurycea lucifuga*), a state endangered species. Due to the location, the type of habitat present at the project site and within the vicinity of the project area, and the type of work proposed, this project is not likely to impact this species.

The project is within the range of the American bittern (*Botaurus lentiginosus*), a state endangered bird. Nesting bitterns prefer large undisturbed wetlands that have scattered small pools amongst dense vegetation. They occasionally occupy bogs, large wet meadows, and dense shrubby swamps. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 1 to July 31. If this type of habitat will not be impacted, this project is not likely to impact this species.

The project is within the range of the lark sparrow (*Chondestes grammacus*), a state endangered bird. This sparrow nests in grassland habitats with scattered shrub layers, disturbed open areas, as well as patches of bare soil. These summer residents normally migrate out of Ohio shortly after their young fledge or leave the nest. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 1 to June 30. If this habitat will not be impacted, this project is not likely to impact this species.

The project is within the range of the Sloan's crayfish (*Orconectes sloanii*), a state threatened species. Due to the location, and that there is no in-water work proposed, this project is not likely to impact this species.

Due to the potential of impacts to federally listed species, as well as to state listed species, we recommend that this project be coordinated with the U.S. Fish & Wildlife Service.

Water Resources: The Division of Water Resources has the following comment.

The local floodplain administrator should be contacted concerning the possible need for any floodplain permits or approvals for this project. Your local floodplain administrator contact information can be found at the website below.

http://water.ohiodnr.gov/portals/soilwater/pdf/floodplain/Floodplain%20Manager%20Community%20Contact%20List_8_16.pdf

ODNR appreciates the opportunity to provide these comments. Please contact John Kessler at (614) 265-6621 if you have questions about these comments or need additional information.

John Kessler
ODNR Office of Real Estate
2045 Morse Road, Building E-2
Columbus, Ohio 43229-6693
John.Kessler@dnr.state.oh.us

Bradley Rolfes

From: susan_zimmermann@fws.gov on behalf of Ohio, FW3 <ohio@fws.gov>
Sent: Wednesday, August 22, 2018 3:05 PM
To: Tyler Rankin
Subject: Duke Energy Morgan Sub Expansion Loop Project, Hamilton Co.



UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. Fish and Wildlife Service
Ecological Services Office
4625 Morse Road, Suite 104
Columbus, Ohio 43230
(614) 416-8993 / Fax (614) 416-8994



TAILS #03E15000-2018-TA-1839

Dear Mr. Rankin,

We have received your recent correspondence requesting information about the subject proposal. There are no Federal wilderness areas, wildlife refuges or designated critical habitat within the vicinity of the project area.

FEDERALLY LISTED, PROPOSED, AND CANDIDATE SPECIES COMMENTS: Due to the project, type, size, and location, we do not anticipate adverse effects to federally endangered, threatened, proposed, or candidate species. Should the project design change, or during the term of this action, additional information on listed or proposed species or their critical habitat become available, or if new information reveals effects of the action that were not previously considered, consultation with the U.S. Fish and Wildlife Service should be initiated to assess any potential impacts.

If you have questions, or if we can be of further assistance in this matter, please contact our office at (614) 416-8993 or ohio@fws.gov.

Sincerely,

A handwritten signature in blue ink, appearing to read "Scott Pruitt".

Scott Pruitt
Acting Field Office Supervisor

ATTACHMENT E
Regulated Waters Assessment



Indianapolis Office
201 North Illinois Street
Suite 1700
Indianapolis, Indiana 46204

T 317.570.6800
F 317.570.6810

October 31, 2018

GAI Project No. D180902.00

Mr. Dustin Geisler
Permitting Specialist
Duke Energy
139 East 4th Street
Cincinnati, OH 45202

**Regulated Waters Assessment
Morgan 1689 Separation Project
Duke Energy Project No. D1645TL1
Hamilton County, Ohio**

Dear Mr. Geisler:

This report presents the findings of the regulated waters assessment and identifies the resulting anticipated regulatory permitting compliance requirements for the Morgan 1689 Separation Project (Project), located in Hamilton County, Ohio (**Appendix A, Figure 1**).

This field survey effort was done in support of due diligence as required for a Construction Notice (CN), submitted to The Ohio Power Sitting Board (OPSB). Results from the regulated waters field survey are summarized below:

Project Summary

The Project will require a separation and new realignment of the 1689 transmission line entry into the Morgan Substation to accommodate expansion and upgrades. The proposed alignment will be approximately 0.10 miles of new 138 kV transmission line on Duke Energy property and consist of three new overhead support structures (**Appendix A, Figure 2**). Photos of the Project area can be found in **Appendix B**.

Work Summary

A remote environmental screening review followed by an on-site field survey was completed by GAI Consultants Inc. (GAI) on August 14, 2018 in order to evaluate potential regulated waters impacts associated with the Project. These investigations were limited to an approximate 100-foot-wide review corridor of the proposed transmission line and associated structure locations.

During the field survey, it was determined that all areas of the existing right-of-way (ROW) are accessible by construction equipment without grade improvements and are all located within maintained Duke Energy substation property.

Environmental Survey Results

National Wetland Inventory (NWI)

The United States Fish and Wildlife Service's (USFWS) National Wetland Inventory (NWI) maps were reviewed for potential wetland locations within the Project area. The NWI maps were prepared from high altitude photography and, in most cases, were not field verified. As a result, wetlands are sometimes erroneously identified, missed, or misidentified within this data set. The presence of an NWI wetland

does not necessarily constitute the presence of a wetland meeting USACE criteria. The NWI map of the area identified no NWI features in the study area.

100-Year Floodplain and Floodway

A review of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) revealed that the Project area lies within an area of minimal flood hazard and crosses no 100-year floodplains and/or floodways.

Wetlands

No likely jurisdictional wetlands were identified within the Project study area.

Waterbodies

No likely jurisdictional waterbodies were identified within the Project study area.

It is GAI's opinion that construction activities as a result of this this Project will not affect any regulated waters and no additional permitting will be required.

Sincerely,

GAI Consultants, Inc.

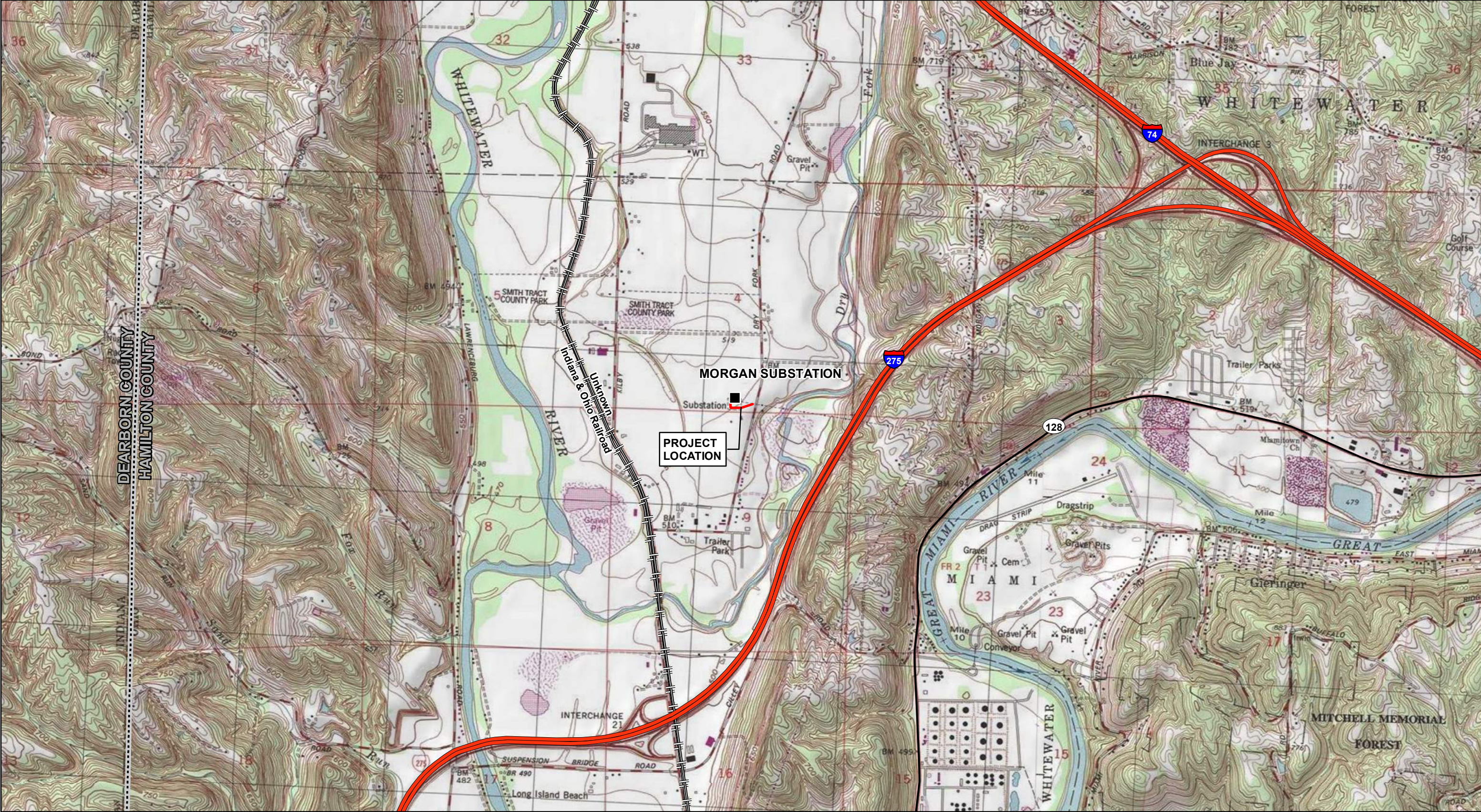
A handwritten signature in black ink that reads "Bradley J. Rolfes". The signature is written in a cursive, flowing style.

Brad Rolfes
Environmental Specialist

Attachments: Appendix A- Figures
Appendix B- Photographs

APPENDIX A

Figures



REFERENCE:
AERIAL PHOTOGRAPH:
ESRI's World Imagery, Accessed: 10/22/2018.
INCORPORATED AREA:
Ohio Department of Transportation's Cities, 2018.
COUNTY BOUNDARY:
Ohio Department of Transportation's Counties, 2018.
INTERSTATE AND HIGHWAY:
ESRI's USA Major Roads, 05/10/2018.
RAILWAY:
Ohio Department of Transportation's Railways, 2017.
PROJECT DETAILS:
Duke Energy.

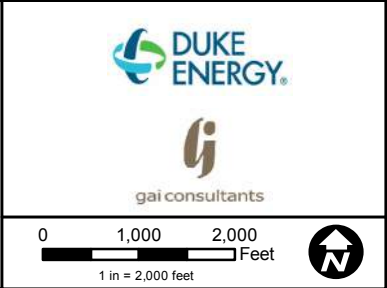
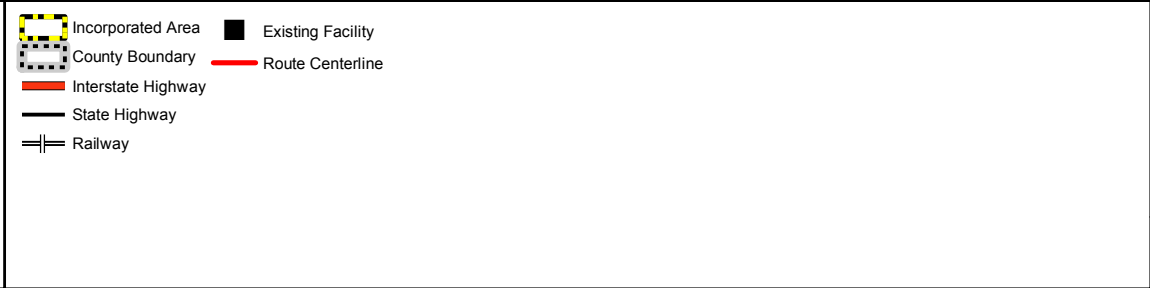


FIGURE 1
PROJECT LOCATION

Ohio Power Siting Board Regulated Waters Assessment Report

Morgan 1689 Separation Project

DRAWN BY: PPD
CHECKED: TDB

DATE: 10/22/2018
APPROVED: MRW






PROJECT LOCATION



HAMILTON COUNTY, OH

REFERENCE:
AERIAL PHOTOGRAPH:
- ESRI's World Imagery, Accessed: 10/22/2018.
INCORPORATED AREA:
- Ohio Department of Transportation's Cities, 2018.
COUNTY BOUNDARY:
- Ohio Department of Transportation's Counties, 2018.
FLOODPLAIN AND FLOODWAY:
- Federal Emergency Management Agency's National Flood Hazard Layer, 2018.
INTERSTATE AND HIGHWAY:
- ESRI's USA Major Roads, 05/10/2018.
LOCAL ROAD:
- Ohio Department of Transportation's Roads, 2017.
RAILWAY:
- Ohio Department of Transportation's Railways, 2017.
NHD FLOWLINE:
- United States Geological Survey's National Hydrography Dataset Best Resolution, 2018.
NWI WETLAND:
- United States Fish and Wildlife Service's National Wetland Inventory, 2018.
PARCEL BOUNDARY:
- Hamilton County Parcels, 2018.
PROJECT DETAILS:
- Duke Energy.

 Incorporated Area	 Existing Structure	 NHD Flowline
 County Boundary	 Proposed Structure	 NWI Wetland
 Interstate Highway	 Existing Facility	 100-Year Floodplain
 US Highway	 Route Centerline	 Floodway
 State Highway	 Parcel Boundary	
 Local Road		
 Railway		







FIGURE 2
RESOURCE LOCATION

Ohio Power Siting Board Regulated Waters Assessment Report

SHEET 1 of 1

Morgan 1689 Separation Project

DRAWN BY: PPD
CHECKED: TDB

DATE: 10/22/2018
APPROVED: MRW

APPENDIX B

Photographs

Photographs



**Photograph 1. Structure 1 (HL204A) looking North.
(August 14, 2018)**



**Photograph 2. Structure 1 (HL204A) looking South.
(August 14, 2018)**



**Photograph 3. Structure 1 (HL204A) looking West.
(August 14, 2018)**



**Photograph 4. Structure 1 (HL204A) looking Southeast –
Whitewater Township Building. (August 14, 2018)**



**Photograph 5. Structure 2 (HL204B) looking West.
(August 14, 2018)**



**Photograph 6. Structure 2 (HL204B) looking East –
Whitewater Township Building. (August 14, 2018)**



**Photograph 7: Structure 2 (HL204B) looking South.
(August 14, 2018)**



**Photograph 8: Structure 2 (HL204B) looking North.
(August 14, 2018)**



**Photograph 9: Structure 3 (HL204C) looking East.
(August 14, 2018)**



**Photograph 10: Structure 3 (HL204C) looking North.
(August 14, 2018)**



**Photograph 11: Structure 3 (HL204C) looking South.
(August 14, 2018)**



**Photograph 12: Structure 3 (HL204C) looking West.
(August 14, 2018)**



**Photograph 13. Mine Equipment & Design LLC
(Due West from Substation). (August 14, 2018)**



**Photograph 14. Whitewater Township Building.
(August 14, 2018)**

This foregoing document was electronically filed with the Public Utilities

Commission of Ohio Docketing Information System on

11/6/2018 10:30:45 AM

in

Case No(s). 18-1650-EL-BNR

Summary: Notification CONSTRUCTION NOTICE FOR THE Morgan 1689 Separation Project
electronically filed by Carys Cochern on behalf of Duke Energy