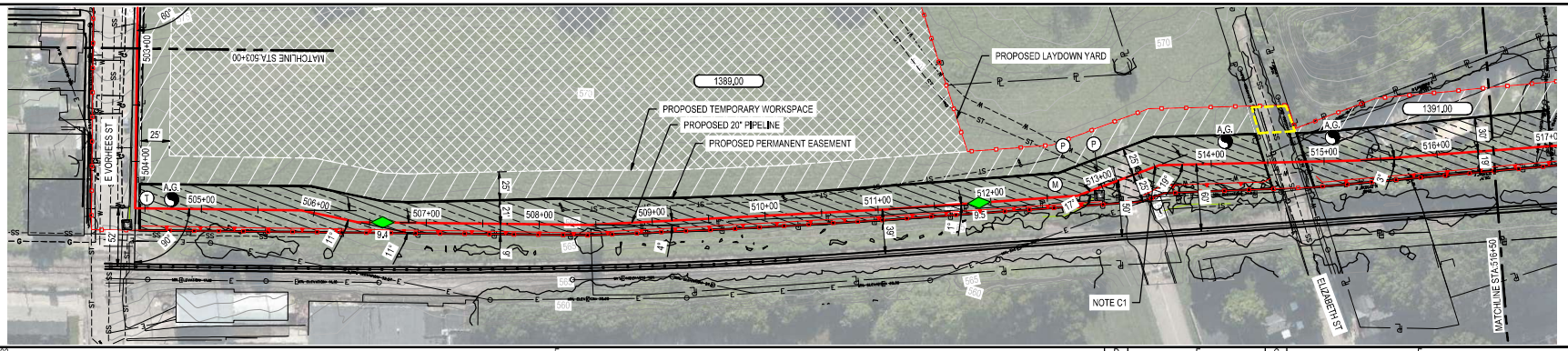
RIGHT-OF-WAY						
OWNERSHIP	ROW	1389.00		ROW	1391.00	
JURISDICTION	READING	READING		READING	READING	
ACREAGE		0.7998 ACRES			3.0466 ACRES	
EASEMENTS		VARIES			VARIES	
REF. DWG. NO.		PNG-C-350-0001171	PNG-C-350-0001312			

STATIONING

STA: 504+41 FTG 90° (H-L-T) 3° SAG BEND (V) | STA: 505+88 11° BEND (H-RT) | STA: 506+40 11° BEND (H-LT) | STA: 508+46.4° BEND (H-LT) | STA: 511+07.1° BEND (H-LT) | STA: 512+27.5° OVERBEND (V) | STA: 512+77 BEND 17° (H-L-T) 1.4° SAG BEND (V) | STA: 513+54.19° BEND (H-RT) | STA: 514+79.9° SAG BEND (V) | STA: 515+30 BEND 3° (H-L-T) 7.9° OVERBEND (V)

PLAN



RESTORE

TRENCH TYPE:	SEE DWG PNG-C-350-0001293 THROUGH PNG-C-350-0001295 FOR RESTORATION TYPE DETAIL	E	D	E	C	E		
SURFACE TYPE:		SEED - ROUGH	1	SEED - ROUGH	C	SEED - ROUGH		

PIPE DATA (SLOPE STA/BEND)

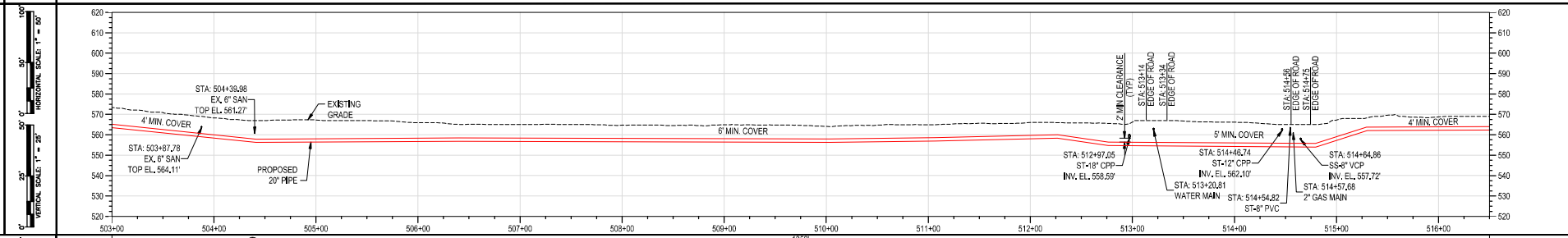
STA.	WELD #	JOINT LENGTH (CM)	JOINT WEIGHT	STA.	WELD #	JOINT LENGTH (CM)	JOINT WEIGHT

CONSTRUCTION NOTES:

C1. PIPELINE SHALL MAINTAIN 25-FOOT CLEARANCE FROM HIGH VOLTAGE OVERHEAD ELECTRIC WHERE POSSIBLE.

C2. CONTRACTOR SHALL GROUND PIPE PER DUKE STANDARDS IN PROXIMITY TO HIGH VOLTAGE OVERHEAD ELECTRIC LINES, SEE DRAWING PNG-350-0001312.

PROFILE



MATERIAL	(10)	1350' (1)						
CONST. METHOD		OPEN TRENCH						
CLASS / MAOP		CLASS 4 / MAOP 500 PSIG						

REF. DWG(S) SEE REFERENCE BAND

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION		APPROVALS		
AREA CODE	-	DATE -	INITIALS -	REGIONAL ENGINEER
ACCOUNT NUMBER	Q3680			
PROJECT NUMBER	1880115			MGR. TECH REC & STD
DRAWING BY	AKT	DATE -	INITIALS -	
STATION ID	C350			
CHECKER INITIALS	CNS	DATE 11/18/2020	INITIALS AMP	PRINCIPAL ENGINEER

STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
11/18/2020
PROFESSIONAL ENG/ARCH STAMP

DUKE ENERGY. | Piedmont Natural Gas

C350 PIPELINE
ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH

HAMILTON COUNTY, OH

SHEET(S) 48 OF 64	DWG SCALE AS NOTED		
DWG DATE 01/13/2020	SUPERSEDED —		
DRAWING NUMBER PNG -C-350-0001226	REVISION 0		

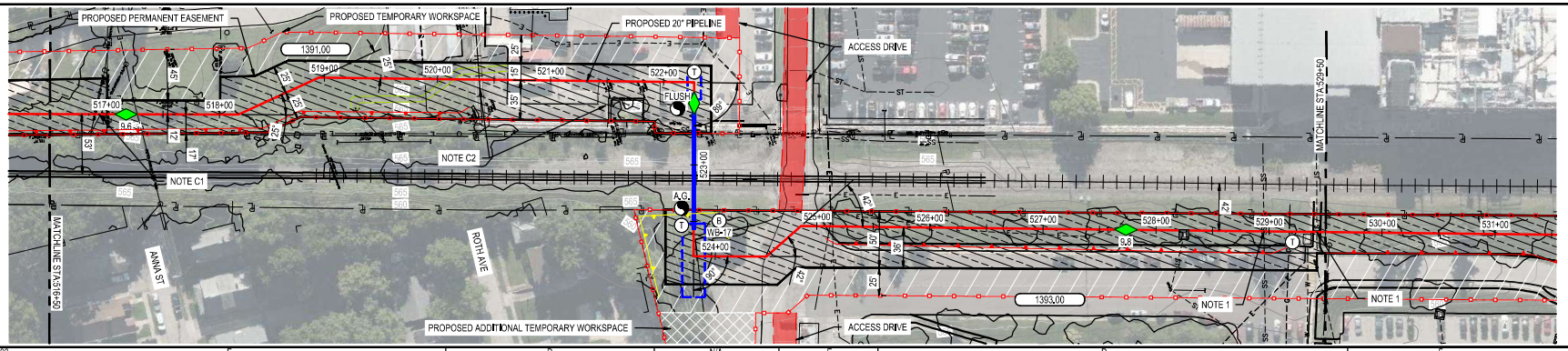
C:\HAMILTON COUNTY\C350

RIGHT-OF-WAY				
OWNERSHIP	1391.00	S.O.R.T.A. ROW	1393.00	
JURISDICTION	READING	READING	READING	
ACREAGE	3.0466 ACRES		3.0466 ACRES	
EASEMENTS	50' EASEMENT		50' EASEMENT	
REF. DWG. NO.	PNG-C-350-0001312	PNG-C-350-0001262	PNG-B-350-0001015 PNG-C-350-0001171	PNG-C-350-0001293

STATIONING

STA. 516+69.3° OVERBEND (V)
STA. 517+22.3° SAG BEND (V)
STA. 518+17 FTG. 25° (H-LT) 4° OVERBEND (V)
STA. 518+55.4° SAG BEND (V)
STA. 519+06 FTG. 25° (H-RT) 1° SAG BEND (V)
STA. 520+11.3° SAG BEND (V)
STA. 520+76.3° OVERBEND (V)
STA. 521+91.9° OVERBEND (V)
STA. 522+27 FTG. 89° (H-RT) 8° SAG BEND (V)
STA. 523+80 FTG. 90° (V-LT) 72° SAG BEND (V)
STA. 524+45.42° FTG (H-LT)
STA. 524+86 FTG. 42° (H-RT) 3° OVERBEND (V)
STA. 528+09.3° OVERBEND (V)
STA. 528+75.3° SAG BEND (V)
STA. 529+16.7° SAG BEND (V)

PLAN



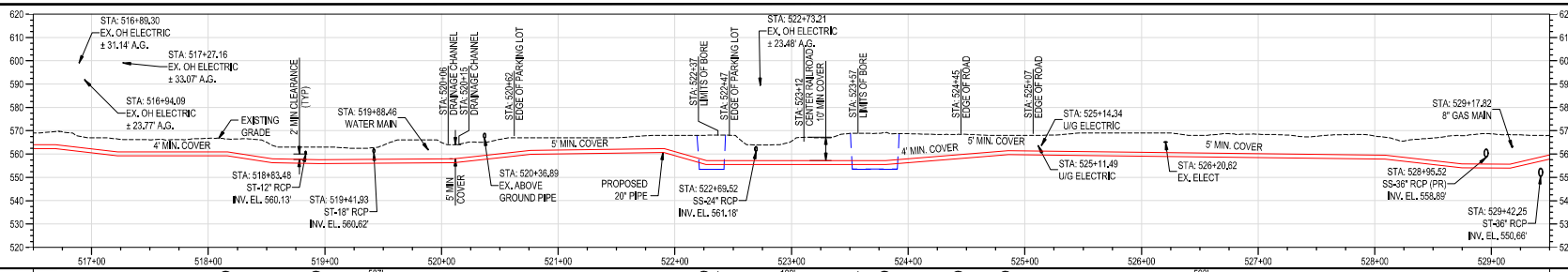
RESTORE

TRENCH TYPE:	SEE DWG PNG-C-350-0001293 THROUGH PNG-C-350-0001295 FOR RESTORATION TYPE DETAIL	E	D	N/A	E	D	F
SURFACE TYPE:		SEED - ROUGH	1	N/A	SEED - ROUGH	1	1

PIPE DATA (SLOPE STA'ING)

STA.	WELD #	JOINT LENGTH	JOINT #	STA.
	(CAN)		(CAN)	

PROFILE



NOTE:
1. USE FLOWABLE FILL AROUND PIPE BENEATH 36" PIPE TO PREVENT FLOW OF WATER ALONG PIPELINE, SEE BACKFILL DETAIL ON DWG PNG-C-350-0001293.

CONSTRUCTION NOTES:
C1. PIPELINE SHALL MAINTAIN 25-FOOT CLEARANCE FROM HIGH VOLTAGE OVERHEAD ELECTRIC WHERE POSSIBLE.

C2. ABOVE GROUND PIPING TO BE AVOIDED AND ACCESS TO THE PIPING SHALL BE MAINTAINED.

C3. CONTRACTOR SHALL GROUND PIPE PER DUKE STANDARDS IN PROXIMITY TO HIGH VOLTAGE OVERHEAD ELECTRIC LINES, SEE DRAWING PNG-C-350-0001312.

MATERIAL	(11)	(11)	587' (1)	(10)	120' (2)	(10)	(11)	(11)	593' (1)
CONST. METHOD			OPEN TRENCH		BORE				OPEN TRENCH
CLASS / MAOP	CLASS 4 / MAOP 500 PSIG								

REF. DWG(S) SEE REFERENCE BAND

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS	
	-	-	REGIONAL ENGINEER
	-	-	MGR. TECH REC & STD
	11/18/2020	AMP	PRINCIPAL ENGINEER

STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
11/18/2020
PROFESSIONAL ENG/ARCH STAMP

C350 PIPELINE
ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH

HAMILTON COUNTY, OH

SHEET(S) 49 OF 64	DWG SCALE AS NOTED
DWG DATE 01/13/2020	SUPERSEDED —
DRAWING NUMBER PNG -C-350-0001227	REVISION 0

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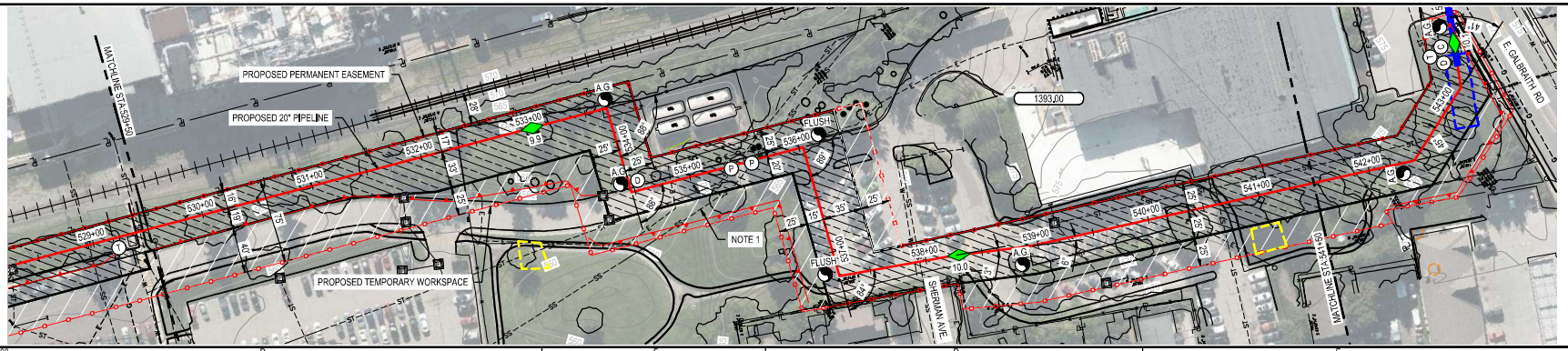
OWNERSHIP	1393.00
JURISDICTION	READING
ACREAGE	3.0466 ACRES
EASEMENTS	50' EASEMENT
REF. DWG. NO.	PNG-C-350-0001293 PNG-C-350-0001312

STATIONING

STA: 529+57.7° OVERBEND (V)
STA: 531+96.1° SAG BEND (V)
STA: 532+84.7° OVERBEND (V)
STA: 533+69 FTG 88° (H-HRT) 5° SAG BEND (V)
STA: 534+47 FTG 88° (H-L) 16° OVERBEND (V)
STA: 535+12.7° SAG BEND (V)
STA: 535+52.16° SAG BEND (V)
STA: 536+04 FTG 89° (H-RT) 14° OVERBEND (V)
STA: 537+22 FTG 84° (H-L) 5° OVERBEND (V)
STA: 537+78.3° SAG BEND (V)
STA: 538+24 BEND 3° (H-RT) 2° SAG BEND (V)
STA: 538+92 BEND 6° (H-LT) 1° OVERBEND (V)
STA: 540+74.2° SAG BEND (V)

PLAN



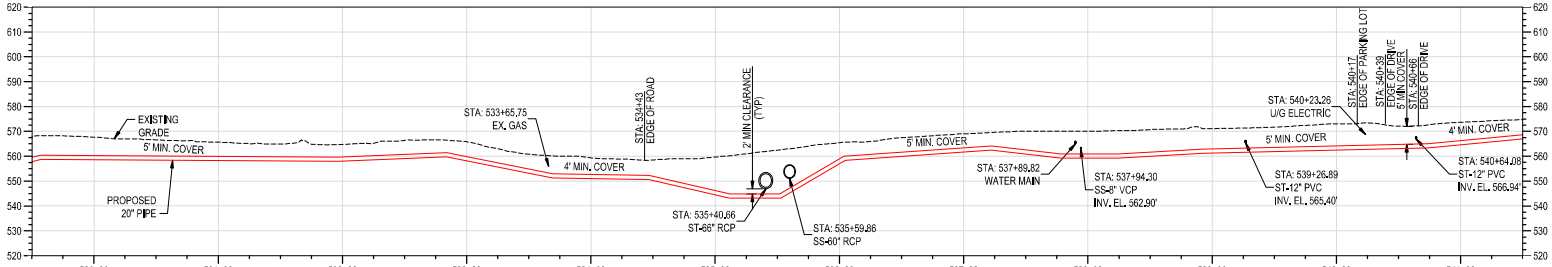
RESTORE

TRENCH TYPE:	D	F	D	E
SURFACE TYPE: SEE DWG PNG-C-350-0001293 THROUGH PNG-C-350-0001295 FOR RESTORATION TYPE DETAIL	1	SEED - FINE	1	SEED - FINE

PIPE DATA (SLOPE STATIONING)

STA.	WELD #	JOINT LENGTH	JOINT	STA.	WELD #
	(CAN)		HEAT		(CAN)

PROFILE



NOTE:
1. USE FLOWABLE FILL AROUND PIPE BENEATH 48" AND 60" PIPE TO PREVENT FLOW OF WATER ALONG PIPELINE. SEE BACKFILL DETAIL ON DWG PNG-C-350-0001293.

CONSTRUCTION NOTES:
C1. CONTRACTOR SHALL GROUND PIPE PER DUKE STANDARDS IN PROXIMITY TO HIGH VOLTAGE OVERHEAD ELECTRIC LINES. SEE DRAWING PNG-C-350-0001312.

C2. AC MITIGATION SITE. SEE DRAWING PNG-E-350-0001024.

MATERIAL	⑩ ⑩ 1200' ① ⑩ ⑩
CONST. METHOD	OPEN TRENCH
CLASS / MAOP	CLASS 4 / MAOP 500 PSIG

REF. DWG(S) SEE REFERENCE BAND

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS	
	-	-	REGIONAL ENGINEER
	-	-	MGR. TECH REC & STD
	11/18/2020	AMP	PRINCIPAL ENGINEER

STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
11/18/2020
PROFESSIONAL ENG/ARCH STAMP

DUKE ENERGY. | Piedmont Natural Gas

C350 PIPELINE
ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH

HAMILTON COUNTY, OH

SHEET(S) 50 OF 64	DWG SCALE AS NOTED
DWG DATE 01/13/2020	SUPERSEDED —
DRAWING NUMBER	REVISION
PNG -C-350-0001228	0

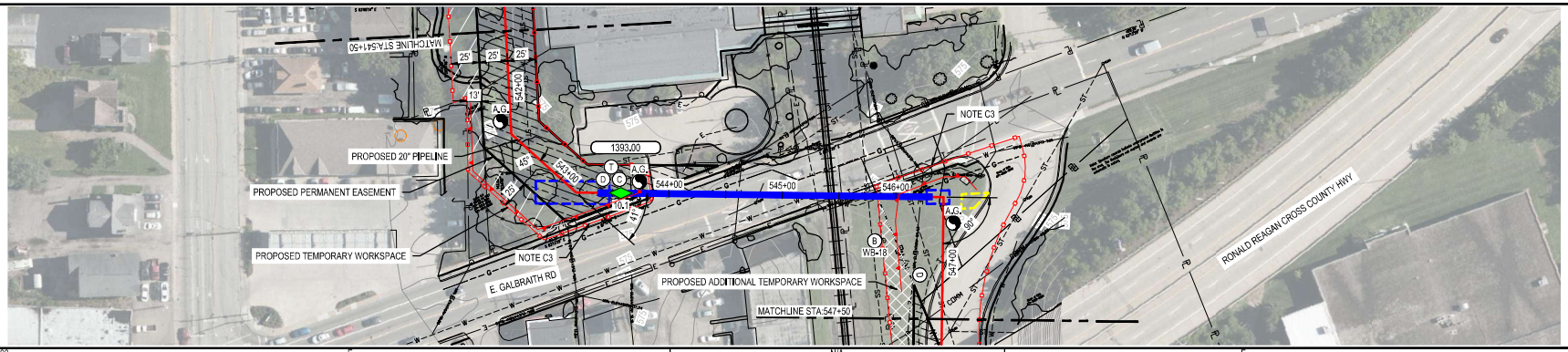
C:\HAMILTON COUNTY\C350

RIGHT-OF-WAY				
	OWNERSHIP		1393.00	ROW
	JURISDICTION		READING	READING
	ACREAGE		3.0466 ACRES	
	EASEMENTS		50' EASEMENT	
	REF. DWG. NO.		PNG-B-350-0001014	PNG-C-350-0001263 PNG-C-350-0001312

STATIONING

STA: 541+67.4° OVERBEND (V)
STA: 542+41.45° FTG (H-LT)
STA: 543+18 FTG 41° (H-LT) 2° SAG BEND (V)
STA: 546+42.90° FTG (H-RT)
STA: 547+21.7° OVERBEND (V)

PLAN

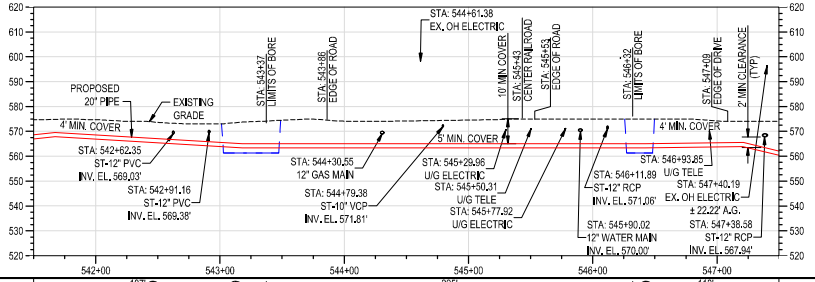


RESTORE				
	TRENCH TYPE:	SEE DWG PNG-C-350-0001293	E	N/A
	SURFACE TYPE:	THROUGH PNG-C-350-0001295 FOR RESTORATION TYPE DETAIL	SEED - FINE	N/A
				SEED - ROUGH

PIPE DATA (SLOPE STA TRENDING)

STA.	WELD #	JOINT LENGTH	WELD #	STA.
	(CAN)	JOINT	(CAN)	

PROFILE



CONSTRUCTION NOTES:

C1. CONTRACTOR SHALL GROUND PIPE PER DUKE STANDARDS IN PROXIMITY TO HIGH VOLTAGE OVERHEAD ELECTRIC LINES, SEE DRAWING PNG-C-350-0001312.

C2. AC MITIGATION SITE, SEE DRAWING PNG-E-350-0001024.

C3. WATER FILLED BARRIERS SHALL BE PLACED OUTSIDE BORE PITS FOR TRAFFIC PROTECTION.

MATERIAL				
CONST. METHOD	187' (11) OPEN TRENCH	(11)	295' (2) BORE	(10) 118' (1) OPEN TRENCH
CLASS / MAOP	CLASS 4 / MAOP 500 PSIG			

AMANDA PALM E-84075 REGISTERED PROFESSIONAL ENGINEER STATE OF OHIO 11/18/2020
PROFESSIONAL ENG/ARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION		APPROVALS		
AREA CODE	-	DATE -	INITIALS -	REGIONAL ENGINEER
ACCOUNT NUMBER	Q3680			MGR TECH REC & STD
PROJECT NUMBER	1880115	DATE -	INITIALS -	
DRAWING BY	AKT			PRINCIPAL ENGINEER
STATION ID	C350	DATE 11/18/2020	INITIALS AMP	
CHECKER INITIALS	CNS			

C350 PIPELINE
ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH

HAMILTON COUNTY, OH

REF. DWG(S) SEE REFERENCE BAND

SHEET(S) 51 OF 64	DWG SCALE AS NOTED
DWG DATE 01/13/2020	SUPERSEDED —

DRAWING NUMBER: PNG -C-350-0001229 | REVISION: 0

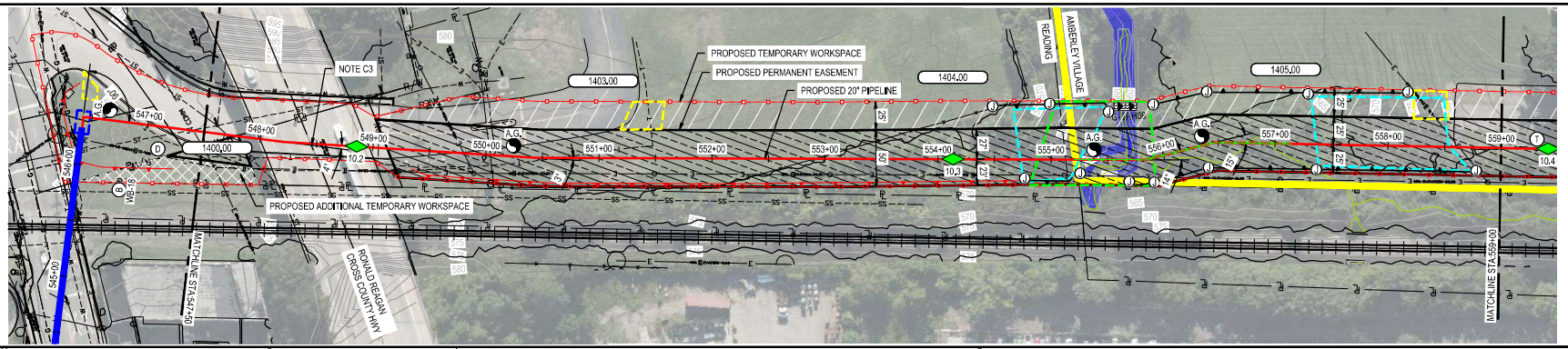
C:\HAMILTON COUNTY\C350

RIGHT-OF-WAY							
OWNERSHIP	ROW	1400.00	ROW	1403.00	1404.00	1405.00	
JURISDICTION	READING	READING	READING	READING	READING	AMBERLEY VILLAGE	
ACREAGE		0.7132 ACRES		0.7132 ACRES		1.4610 ACRES	
EASEMENTS		VARIES		50' EASEMENT		50' EASEMENT	
REF. DWG. NO.	PNG-C-350-0001312			PNG-C-350-0001303			

STATIONING

STA: 547+78.17° SAG BEND (V)
STA: 548+20 BEND 4° (H-LT) 10° OVERBEND (V)
STA: 550+45.3° BEND (H-LT)
STA: 550+85.1° SAG BEND (V)
STA: 551+48.1° OVERBEND (V)
STA: 553+59.1° OVERBEND (V)
STA: 554+73.9° OVERBEND (V)
STA: 555+38.12° SAG BEND (V)
STA: 555+83.14° BEND (H-LT)
STA: 556+47.15° BEND (H-RT)
STA: 557+46.5° SAG BEND (V)

PLAN



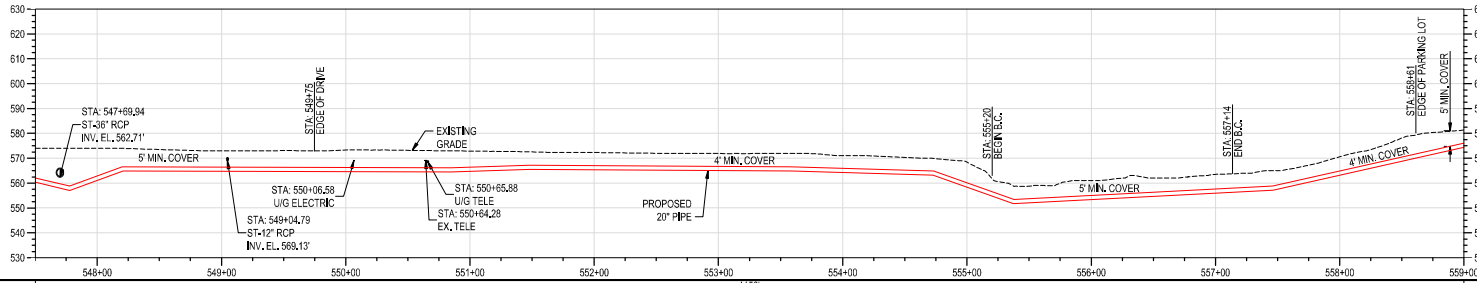
RESTORE

TRENCH TYPE:	SEE DWG PNG-C-350-0001293 THROUGH PNG-C-350-0001295 FOR RESTORATION TYPE DETAIL	D	E
SURFACE TYPE:		1	SEED - ROUGH

PIPE DATA (SLOPE STA TRENDING)

STA.	WELD #	JOINT LENGTH	WELD #	STA.
	(CON.)	JOINT	(CON.)	

PROFILE



CONSTRUCTION NOTES:

C1. CONTRACTOR SHALL GROUND PIPE PER DUKE STANDARDS IN PROXIMITY TO HIGH VOLTAGE OVERHEAD ELECTRIC LINES, SEE DRAWING PNG-C-350-0001312.

C2. AC MITIGATION SITE, SEE DRAWING PNG-E-350-0001024.

C3. CONTRACTOR SHALL NOT DISTURB OVERHEAD BRIDGE DECK OR APPURTENANCES.

MATERIAL	1150 (1)
CONST. METHOD	OPEN TRENCH
CLASS / MAOP	CLASS 4 / MAOP 500 PSIG

REF. DWG(S) SEE REFERENCE BAND

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION		APPROVALS	DATE	INITIALS	
AREA CODE	-		-	-	REGIONAL ENGINEER
ACCOUNT NUMBER	Q3680				
PROJECT NUMBER	1880115		-	-	MGR TECH REC & STD
DRAWING BY	AKT				
STATION ID	C350		11/18/2020	AMP	PRINCIPAL ENGINEER
CHECKER INITIALS	CNS				

STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
11/18/2020
PROFESSIONAL ENG/ARCH STAMP

DUKE ENERGY. | Piedmont Natural Gas

C350 PIPELINE
ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH

HAMILTON COUNTY, OH

SHEET(S) 52 OF 64	DWG SCALE AS NOTED
DWG DATE 01/13/2020	SUPERSEDED —
DRAWING NUMBER	REVISION
PNG -C-350-0001230	0

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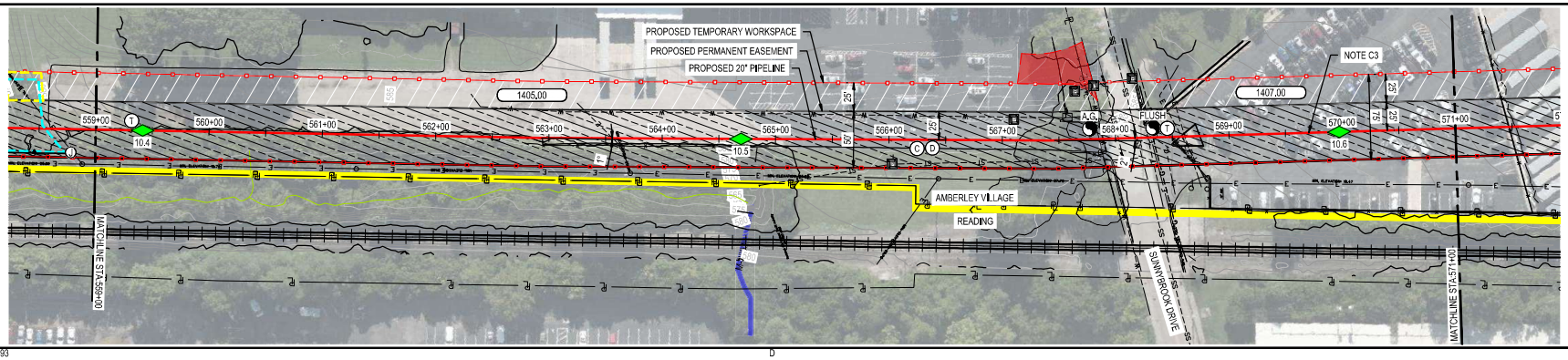
RIGHT-OF-WAY			
OWNERSHIP		1405.00	1407.00
JURISDICTION		AMBERLEY VILLAGE	AMBERLEY VILLAGE
ACREAGE		1.4610 ACRES	0.6564 ACRES
EASEMENTS		50' EASEMENT	50' EASEMENT
REF. DWG. NO.		PNG-C-350-0001312	PNG-C-350-0001293

STATIONING

STA: 559+01.6' OVERBEND (V)
STA: 562+90 BEND 1° (H-L/T) 1° OVERBEND (V)
STA: 563+67.3' OVERBEND (V)
STA: 564+35.3' SAG BEND (V)
STA: 565+20.3' SAG BEND (V)
STA: 566+91.3' OVERBEND (V)
STA: 567+43.2' BEND (H-L/T)
STA: 568+24.3' SAG BEND (V)
STA: 569+16.2' OVERBEND (V)

PLAN



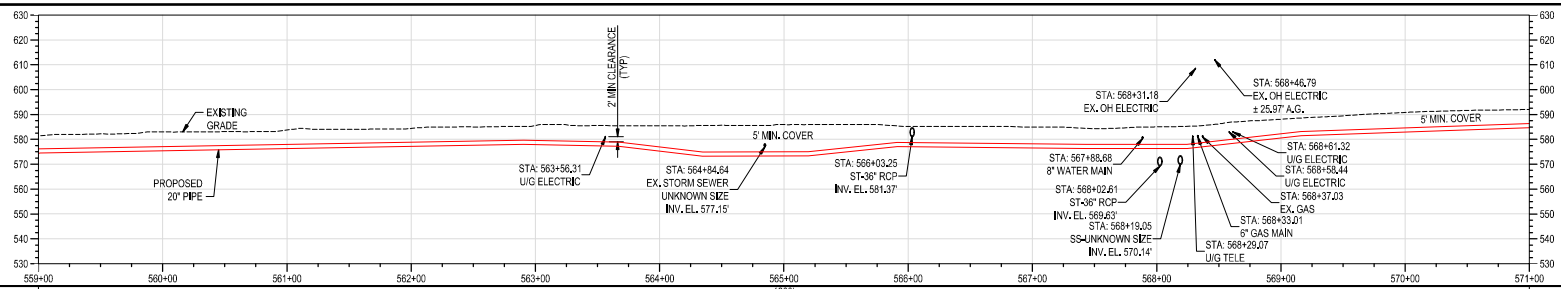
RESTORE

TRENCH TYPE:	SEE DWG PNG-C-350-0001293 THROUGH PNG-C-350-0001295
SURFACE TYPE:	FOR RESTORATION TYPE DETAIL

PIPE DATA (SLOPE STATIONING)

STA.	WELD #	JOINT LENGTH	JOINT	STA.	WELD #
		(CSA)	HEAVY		(CSA)

PROFILE



CONSTRUCTION NOTES:

C1. CONTRACTOR SHALL GROUND PIPE PER DUKE STANDARDS IN PROXIMITY TO HIGH VOLTAGE OVERHEAD ELECTRIC LINES. SEE DRAWING PNG-C-350-0001312.

C2. AC MITIGATION SITE. SEE DRAWING PNG-E-350-0001024.

C3. EMPLOYEE PARKING LOT SHALL BE COMPLETELY RESTORED BEFORE ANY EXCAVATION ACTIVITIES BEGIN IN THE TRACTOR TRAILER PARKING LOT.

C4. TRENCH BACKFILL TYPE F SHALL BE USED WHEN ALIGNMENT PASSES OVERTOP SANITARY SEWER LATERALS.

MATERIAL	
CONST. METHOD	1200' OPEN TRENCH
CLASS / MAOP	CLASS 4 / MAOP 500 PSIG

STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
11/18/2020
PROFESSIONAL ENG/ARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS	
	-	-	REGIONAL ENGINEER
	-	-	MGR. TECH REC & STD
	11/18/2020	AMP	PRINCIPAL ENGINEER

C350 PIPELINE
ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH

HAMILTON COUNTY, OH

REF. DWG(S) SEE REFERENCE BAND

SHEET(S) 53 OF 64	DWG SCALE AS NOTED
DWG DATE 01/13/2020	SUPERSEDED —
DRAWING NUMBER PNG -C-350-0001231	REVISION 0

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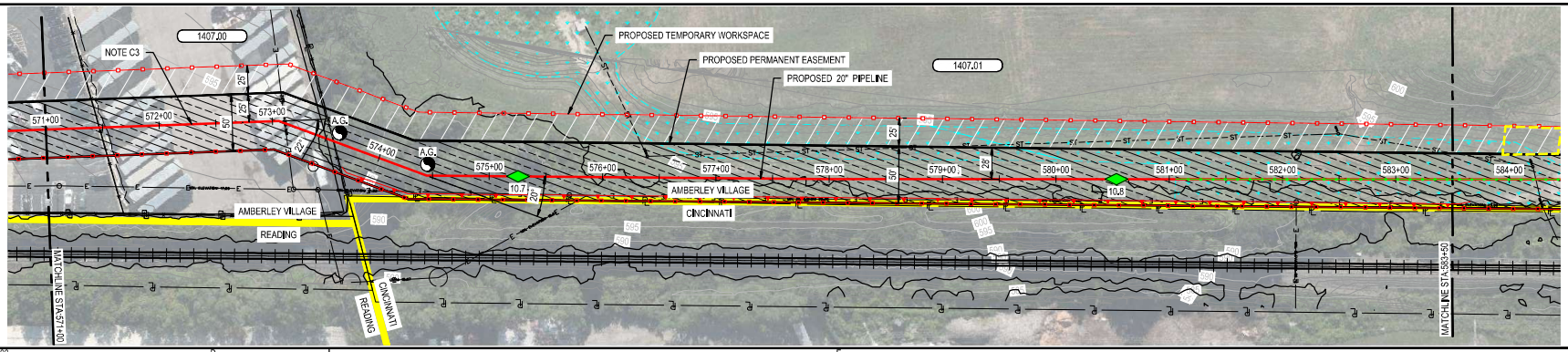
OWNERSHIP	1407.00	1407.01
JURISDICTION	AMBERLEY VILLAGE	AMBERLEY VILLAGE
ACREAGE	0.6564 ACRES	3.1226 ACRES
EASEMENTS	50' EASEMENT	50' EASEMENT
REF. DWG. NO.	PNG-C-350-0001312	PNG-C-350-0001303

STATIONING

STA: 573+06 BEND 22° (H-ANT) 1° SAG BEND (V)
STA: 573+65 10° OVERBEND (V)
STA: 574+05 7° SAG BEND (V)
STA: 574+45 BEND 20° (H-ANT) 3° SAG BEND (V)
STA: 575+88.2° OVERBEND (V)
STA: 579+82.1° OVERBEND (V)
STA: 582+99.1° SAG BEND (V)

PLAN



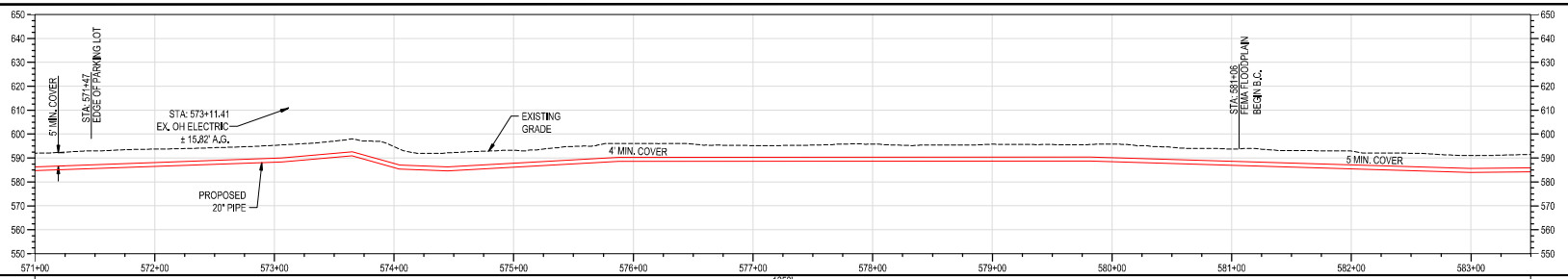
RESTORE

TRENCH TYPE:	SEE DWG PNG-C-350-0001293 THROUGH PNG-C-350-0001295	D	E
SURFACE TYPE	FOR RESTORATION TYPE DETAIL	1	SEED - ROUGH

PIPE DATA (SLOPE STATIONING)

STA.	WELD #	JOINT LENGTH	WELD #	STA.
	(CON.)	JOINT	(CON.)	

PROFILE



CONSTRUCTION NOTES:

C1. CONTRACTOR SHALL GROUND PIPE PER DUKE STANDARDS IN PROXIMITY TO HIGH VOLTAGE OVERHEAD ELECTRIC LINES. SEE DRAWING PNG-C-350-0001312.

C2. AC MITIGATION SITE. SEE DRAWING PNG-E-350-0001024.

C3. EMPLOYEE PARKING LOT SHALL BE COMPLETELY RESTORED BEFORE ANY EXCAVATION ACTIVITIES BEGIN IN THE TRACTOR TRAILER PARKING LOT.

MATERIAL	
CONST. METHOD	1250' (1) OPEN TRENCH
CLASS / MAOP	CLASS 4 / MAOP 500 PSIG

STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
11/18/2020
PROFESSIONAL ENG/ARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS	
	-	-	REGIONAL ENGINEER
	-	-	MGR. TECH REC & STD
	11/18/2020	AMP	PRINCIPAL ENGINEER

C350 PIPELINE
ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH

HAMILTON COUNTY, OH

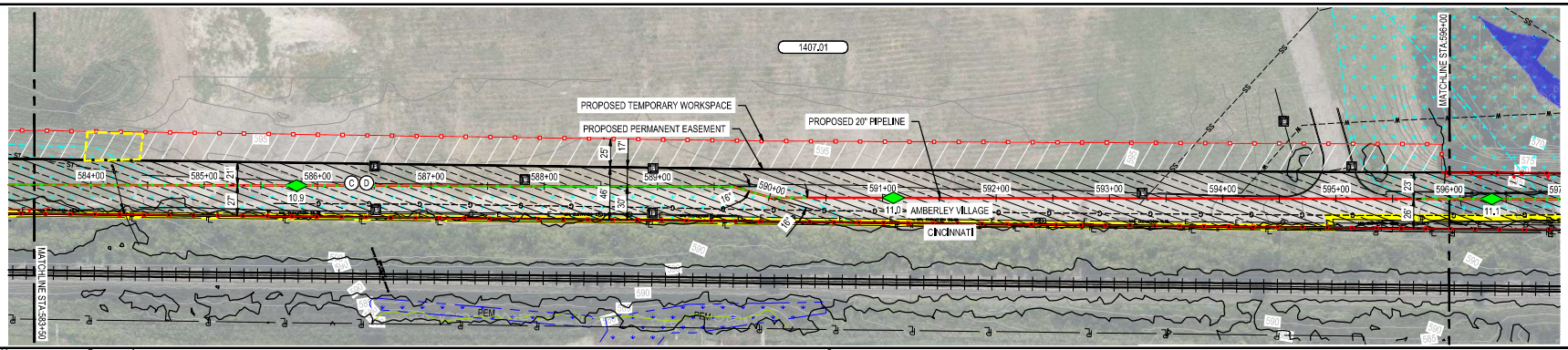
REF. DWG(S) SEE REFERENCE BAND

SHEET(S)	54 OF 64
DWG SCALE	AS NOTED
DWG DATE	01/13/2020
SUPERSEDED	—
DRAWING NUMBER	PNG -C-350-0001232
REVISION	0

C:\HAMILTON COUNTY\C350

OWNERSHIP	1407.01
JURISDICTION	AMBERLEY VILLAGE
ACREAGE	3.1226 ACRES
EASEMENTS	VARIES
REF. DWG. NO.	PNG-C-350-0001303 / PNG-C-350-0001312 / PNG-C-350-0001303

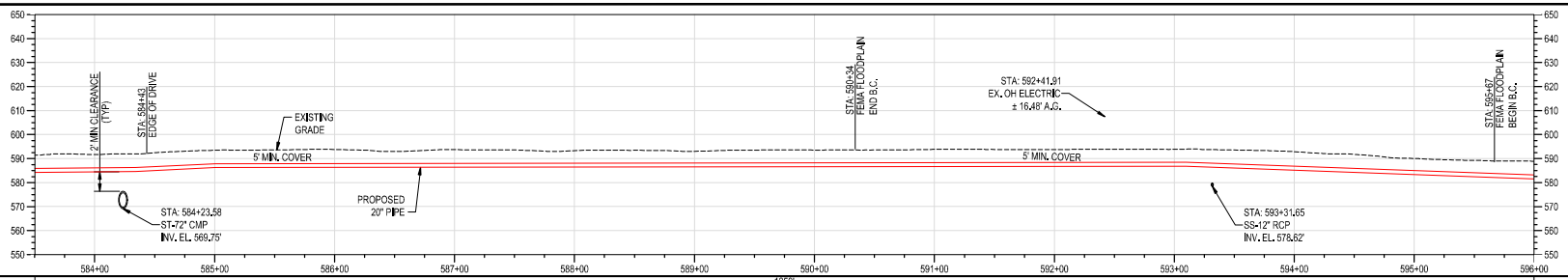
STA: 584+34.1° SAG BEND (V)
STA: 585+00.1° OVERBEND (V)
STA: 589+67.16° BEND (HHT)
STA: 590+01.16° BEND (HHT)
STA: 593+10.1° OVERBEND (V)



TRENCH TYPE:	SEE DWG PNG-C-350-0001293 THROUGH PNG-C-350-0001295	E	D
SURFACE TYPE	FOR RESTORATION TYPE DETAIL	SEED - ROUGH	1

PIPE DATA (SLOPE STATIONING)

STA.	WELD #	JOINT LENGTH (CM)	JOINT #	STA.



CONSTRUCTION NOTES:
C1. CONTRACTOR SHALL GROUND PIPE PER DUKE STANDARDS IN PROXIMITY TO HIGH VOLTAGE OVERHEAD ELECTRIC LINES, SEE DRAWING PNG-C-350-0001312.
C2. AC MITIGATION SITE. SEE DRAWING PNG-E-350-0001024.

MATERIAL	
CONST. METHOD	1250' OPEN TRENCH
CLASS / MAOP	CLASS 4 / MAOP 500 PSIG

REF. DWG(S) SEE REFERENCE BAND

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS	
	-	-	REGIONAL ENGINEER
	-	-	MGR. TECH REC & STD
	11/18/2020	AMP	PRINCIPAL ENGINEER

STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
11/18/2020
PROFESSIONAL ENG/ARCH STAMP

C350 PIPELINE
ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH

HAMILTON COUNTY, OH

SHEET(S)	55 OF 64
DWG SCALE	AS NOTED
DWG DATE	01/13/2020
SUPERSEDED	—
DRAWING NUMBER	PNG -C-350-0001233
REVISION	0

C:\HAMILTON COUNTY\C350

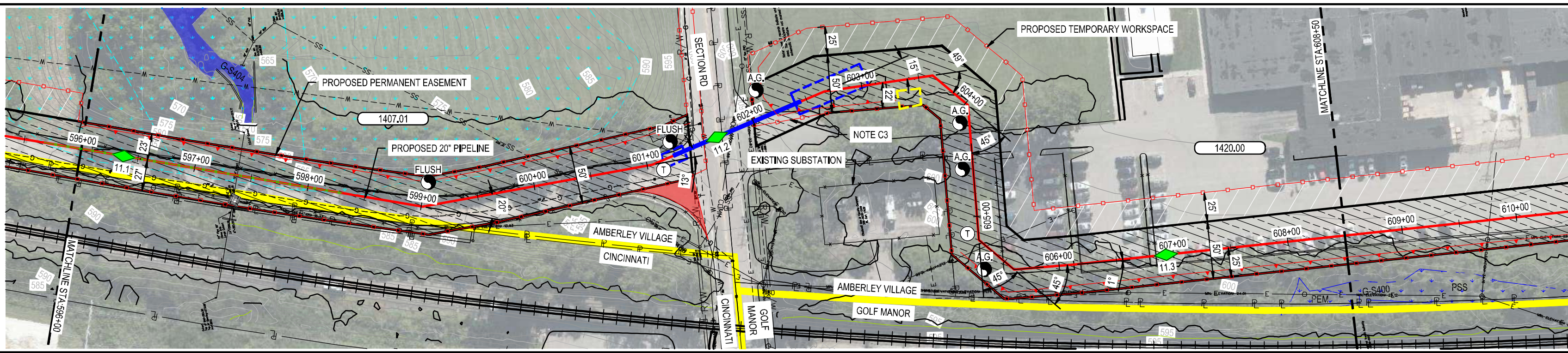
RIGHT-OF-WAY			
OWNERSHIP / JURISDICTION	1407.01 AMBERLEY VILLAGE	ROW AMBERLEY VILLAGE	1420.00 AMBERLEY VILLAGE
ACREAGE	3.1226 ACRES		1.2432 ACRES
EASEMENTS	50' EASEMENT		50' EASEMENT
REF. DWG. NO.	PNG-C-004-0001303, PNG-C-350-0001312	PNG-C-004-0001264	

STATIONING

STA: 596+99 1° SAG BEND (V)
STA: 597+94 2° SAG BEND (V)
STA: 599+01 20° BEND (H-LT)
STA: 600+57 6° OVERBEND (V)
STA: 601+06 BEND 13° (H-LT) 4° SAG BEND (V)
STA: 602+67 BEND 15° (H-RT) 10° SAG BEND (V)
STA: 603+23 10° OVERBEND (V)
STA: 603+63 49° FTG (H-RT)
STA: 604+03 FTG 45° (H-RT) 1° OVERBEND (V)
STA: 605+21 FTG 45° (H-LT) 1° SAG BEND (V)
STA: 605+61 FTG 45° (H-LT) 1° SAG BEND (V)
STA: 606+13 1° BEND (H-LT)
STA: 607+15 1° OVERBEND (V)

PLAN

HORIZONTAL SCALE: 1" = 50'



RESTORE						
TRENCH TYPE: SEE DWG PNG-C-350-0001293 THROUGH PNG-C-350-0001295	D	N/A	E	D	E	D
SURFACE TYPE: FOR RESTORATION TYPE DETAIL	1	N/A	SEED - FINE	1	SEED - FINE	1

PIPE DATA (SLOPE STATIONING)

STA. | WELD # | (COV.) | JOINT LENGTH | JOINT # | HEAT #

CONSTRUCTION NOTE:

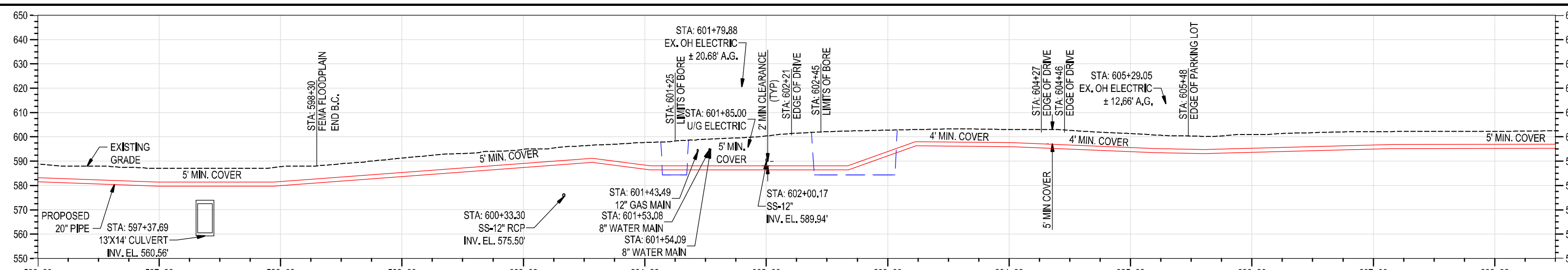
C1. PIPELINE SHALL MAINTAIN 25-FOOT CLEARANCE FROM HIGH VOLTAGE OVERHEAD ELECTRIC WHERE POSSIBLE.

C2. CONTRACTOR SHALL GROUND PIPE PER DUKE STANDARDS IN PROXIMITY TO HIGH VOLTAGE OVERHEAD ELECTRIC LINES. SEE DRAWING PNG-C-350-0001312.

C3. JERSEY BARRIER TO BE PLACED BETWEEN BORE PIT AND DRIVE AT LIMIT OF DISTURBANCE.

PROFILE

HORIZONTAL SCALE: 1" = 100' VERTICAL SCALE: 1" = 80'



MATERIAL	525' (1)	120' (2)	(10) (11) (11) 605' (1) (11)
CONST. METHOD	OPEN TRENCH	BORE	OPEN TRENCH
CLASS / MAOP	CLASS 4 / MAOP 500 PSIG		

STATE OF OHIO AMANDA PALM E-84075 REGISTERED PROFESSIONAL ENGINEER 11/18/2020
PROFESSIONAL ENG/ARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS
REGIONAL ENGINEER	-	-
MGR. TECH REC & STD	-	-
PRINCIPAL ENGINEER	11/18/2020	AMP

DUKE ENERGY. Piedmont Natural Gas
COPYRIGHT 2019

C350 PIPELINE
ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH
HAMILTON COUNTY, OH

REF. DWG(S) SEE REFERENCE BAND

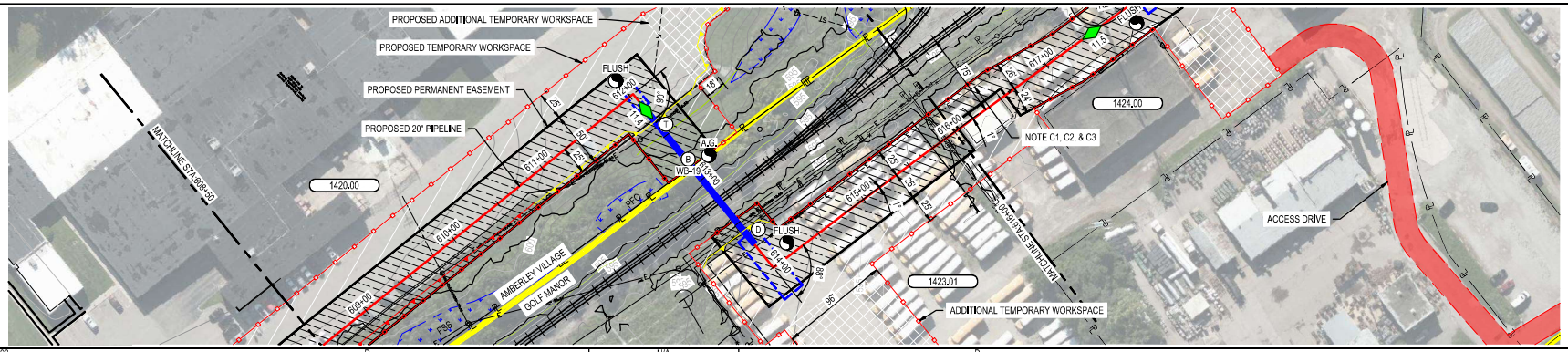
SHEET(S) 56 OF 64 | DWG SCALE AS NOTED
DWG DATE 01/13/2020 | SUPERSEDED —
DRAWING NUMBER PNG -C-350-0001234 | REVISION 0
C/HAMILTON COUNTY/C350

RIGHT-OF-WAY					
OWNERSHIP	1420.00	S.O.R.T.A. ROW	1423.01	1424.00	
JURISDICTION	AMBERLEY VILLAGE	GOLF MANOR	GOLF MANOR	GOLF MANOR	
ACREAGE	1.2432 ACRES		0.2795 ACRES	0.3642 ACRES	
EASEMENTS	50' EASEMENT		50' EASEMENT	VARIES	
REF. DWG. NO.	PNG-B-350-0001014	PNG-C-350-0001265	PNG-C-350-0001312	PNG-C-350-0001173	

STATIONING

STA: 610+41.1° OVERBEND (V)
STA: 611+27.6° OVERBEND (V)
STA: 612+03 FTG 90° (HDD) 7° SAG BEND (V)
STA: 614+00 FTG 88° (HDD) 4° SAG BEND (V)
STA: 614+77 BEND 1° (HDD) 6° OVERBEND (V)
STA: 615+70 BEND 1° (HDD) 2° SAG BEND (V)

PLAN

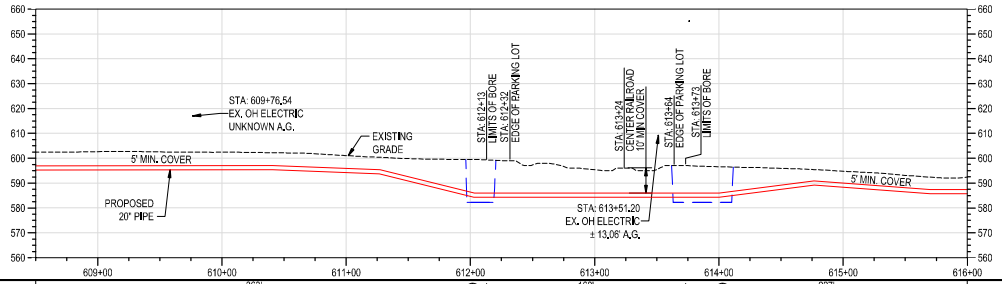


RESTORE				
TRENCH TYPE:	SEE DWG PNG-C-350-0001293 THROUGH PNG-C-350-0001295 FOR RESTORATION TYPE DETAIL	D	N/A	D
SURFACE TYPE		1	N/A	1

PIPE DATA (SLOPE STATIONING)

STA.	WELD #	JOINT LENGTH (CM)	JOINT #	WELD #	STA.

PROFILE



MATERIAL					
CONST. METHOD	363' (1) OPEN TRENCH	(10)	160' (2) BORE	(10)	227' (1) OPEN TRENCH
CLASS / MAOP	CLASS 4 / MAOP 500 PSIG				

CONSTRUCTION NOTES:

C1. PIPELINE SHALL MAINTAIN 25-FOOT CLEARANCE FROM HIGH VOLTAGE OVERHEAD ELECTRIC WHERE POSSIBLE.

C2. CONTRACTOR SHALL GROUND PIPE PER DUKE STANDARDS IN PROXIMITY TO HIGH VOLTAGE OVERHEAD ELECTRIC LINES. SEE DRAWING PNG-C-350-0001312.

C3. PIPELINE SHALL MAINTAIN A MINIMUM 25-FOOT CLEARANCE FROM CENTER OF RAILROAD TRACKS PER AREMA GUIDELINES. PIPELINE COVER SHALL BE 6-FEET WHEN LOCATED WITHIN 50-FEET OF RAILROAD CENTERLINE.

C4. AC MITIGATION SITE, SEE DRAWING PNG-E-350-0001024.

STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
11/18/2020
PROFESSIONAL ENG/ARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS	
	-	-	REGIONAL ENGINEER
	-	-	MGR. TECH REC & STD
	11/18/2020	AMP	PRINCIPAL ENGINEER

C350 PIPELINE
ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH

HAMILTON COUNTY, OH

REF. DWG(S) SEE REFERENCE BAND

SHEET(S) 57 OF 64	DWG SCALE AS NOTED
DWG DATE 01/13/2020	SUPERSEDED —
DRAWING NUMBER PNG -C-350-0001235	REVISION 0

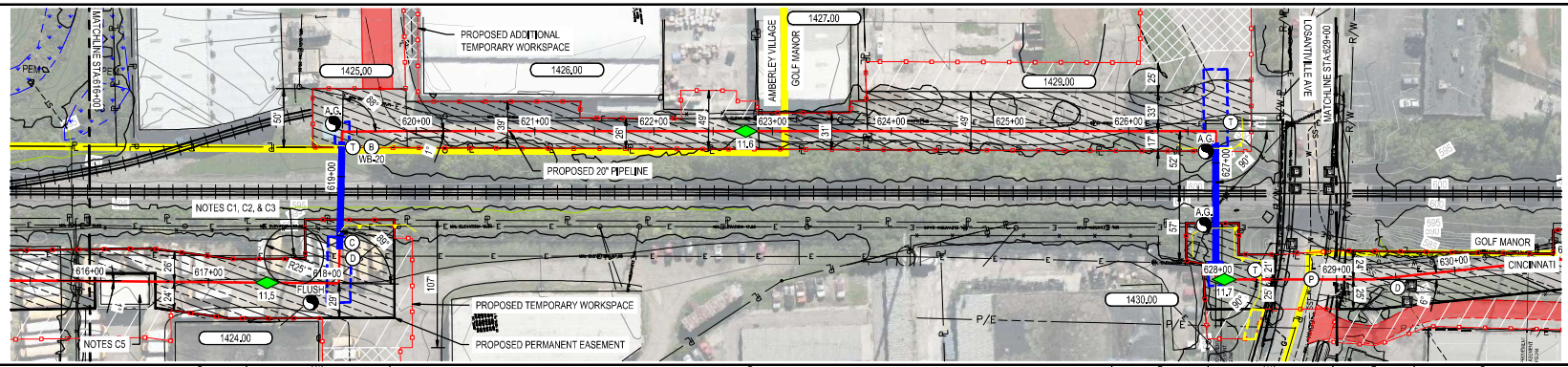
C:\HAMILTON COUNTY\C350

RIGHT-OF-WAY										
OWNERSHIP	1424.00	S.O.R.T.A. ROW	1425.00	1426.00	1427.00	1429.00	S.O.R.T.A. ROW	1430.00	ROW	
JURISDICTION	GOLF MANOR	GOLF MANOR	AMBERLEY VILLAGE	AMBERLEY VILLAGE	AMBERLEY VILLAGE	GOLF MANOR	GOLF MANOR	GOLF MANOR	GOLF MANOR / CINCINNATI	
ACREAGE	0.3642 ACRES		0.0906 ACRES	0.2881 ACRES		0.3553 ACRES		0.0889 ACRES		
EASEMENTS	VARIES		VARIES	VARIES		50' EASEMENT		VARIES		
REF. DWG. NO.	PNG-C-350-0001266			PNG-B-350-0001014		PNG-C-350-0001312		PNG-C-350-0001267	PNG-C-350-0001173	

STATIONING

STA: 618+10.89° FTG (H-LT)
STA: 619+38 FTG 88° (I-RT) (5° SAG BEND (V)
STA: 619+68 BEND 1° (I-RT) 5° OVERBEND (V)
STA: 625+43.5° OVERBEND (V)
STA: 626+43.5° SAG BEND (V)
STA: 626+73 90° FTG (I-RT)
STA: 627+98 FTG 90° (I-LT) 11° OVERBEND (V)
STA: 628+38.8° SAG BEND (V)

PLAN



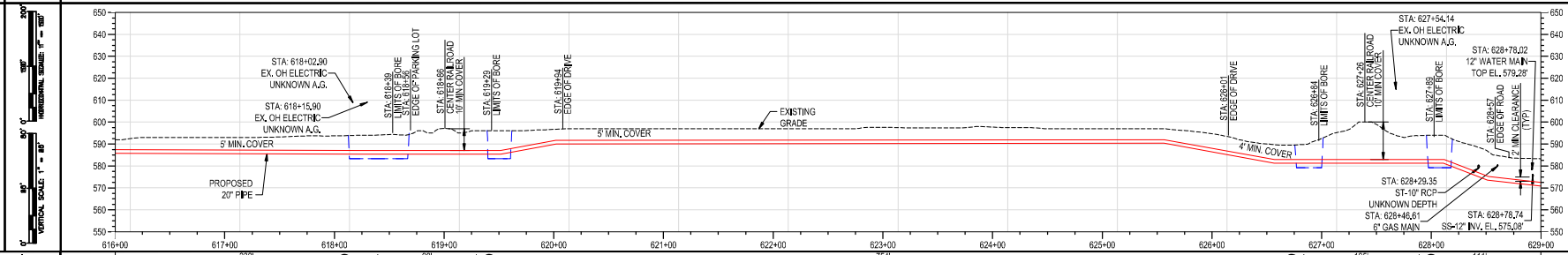
RESTORE

TRENCH TYPE: SEE DWG PNG-C-350-0001293 THROUGH PNG-C-350-0001295	D	N/A	D	E	N/A	E	D	
SURFACE TYPE: FOR RESTORATION TYPE DETAIL	1	N/A	1	SEED - ROUGH	N/A	SEED - ROUGH	4	

PIPE DATA (SLOPE STA TBDING)

STA.	WELD #	JOINT LENGTH	WELD #	STA.
		HEAVY		
		JOINT		
		LENGTH		
		(DIA)	(DIA)	

PROFILE



MATERIAL										
CONST. METHOD	239' (1) OPEN TRENCH	(10)	90' (2) BORE	(10)	754' (1) OPEN TRENCH	(10)	105' (2) BORE	(10)	111' (1) OPEN TRENCH	
CLASS / MAOP	CLASS 4 / MAOP 500 PSIG									

CONSTRUCTION NOTES:

C1. PIPELINE SHALL MAINTAIN 25-FOOT CLEARANCE FROM HIGH VOLTAGE OVERHEAD ELECTRIC WHERE POSSIBLE.

C2. CONTRACTOR SHALL GROUND PIPE PER DUKE STANDARDS IN PROXIMITY TO HIGH VOLTAGE OVERHEAD ELECTRIC LINES, SEE DRAWING PNG-C-350-0001312.

C3. PIPELINE SHALL MAINTAIN A MINIMUM 25-FOOT CLEARANCE FROM CENTER OF RAILROAD TRACKS PER AREMA GUIDELINES. PIPELINE COVER SHALL BE 6-FEET WHEN LOCATED WITHIN 50-FEET OF RAILROAD CENTERLINE.

C4. AC MITIGATION SITE. SEE DRAWING PNG-E-350-0001024.

C5. EXISTING BUILDING DEMOLITION UNDER NEGOTIATION. IF BUILDING STAYS. PIPELINE SHALL BE FIELD ADJUSTED TO THE EAST SIDE OF BUILDING.

STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
11/18/2020
PROFESSIONAL ENG/ARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION		APPROVALS		
AREA CODE	-	DATE -	INITIALS -	REGIONAL ENGINEER
ACCOUNT NUMBER	Q3680			MGR. TECH REC & STD
PROJECT NUMBER	1880115	DATE -	INITIALS -	
DRAWING BY	AKT			PRINCIPAL ENGINEER
STATION ID	C350	DATE 11/18/2020	INITIALS AMP	
CHECKER INITIALS	CNS			

DUKE ENERGY. | Piedmont Natural Gas

C350 PIPELINE
ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH

HAMILTON COUNTY, OH

REF. DWG(S) SEE REFERENCE BAND

SHEET(S) 58 OF 64	DWG SCALE AS NOTED
DWG DATE 01/13/2020	SUPERSEDED —

DRAWING NUMBER: PNG -C-350-0001236 | REVISION: 0

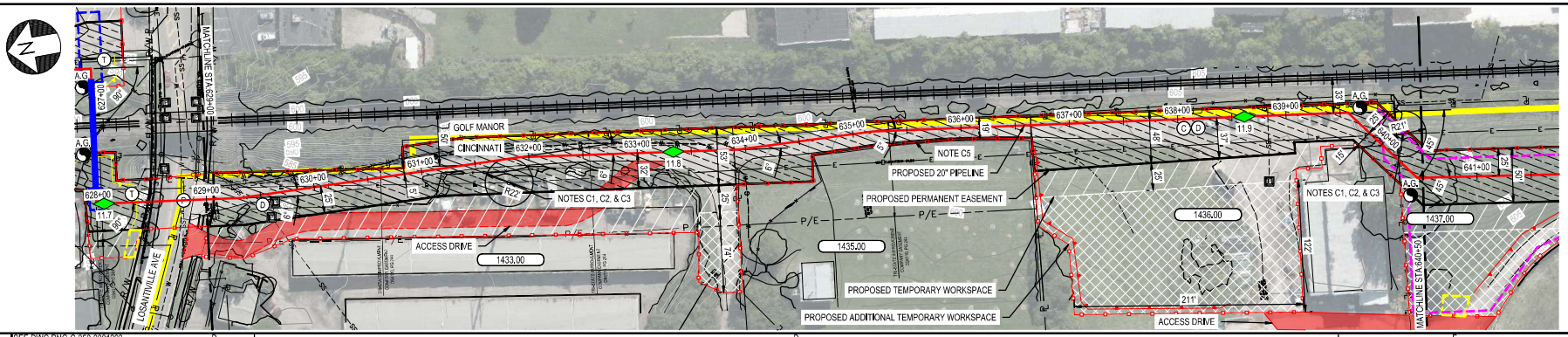
C:\HAMILTON COUNTY\C350

OWNERSHIP	ROW	1433.00	1435.00	1436.00	1437.00
JURISDICTION	GOLF MANOR / CINCINNATI	CINCINNATI	CINCINNATI	CINCINNATI	CINCINNATI
ACREAGE		0.5345 ACRES	0.1872 ACRES	1.8635 ACRES	
EASEMENTS		VARIES	VARIES	VARIES	
REF. DWG. NO.	PNG-C-350-0001312				

STATIONING

STA: 629+31 BEND 6° (H-LT) 8° SAG BEND (V)
STA: 630+99 3° OVERBEND (V)
STA: 631+91 BEND 6° (H-RT) 1° OVERBEND (V)
STA: 633+09 3° OVERBEND (V)
STA: 633+52 2° SAG BEND (V)
STA: 633+92 BEND 6° (H-LT) 5° SAG BEND (V)
STA: 634+38 3° OVERBEND (V)
STA: 635+18 BEND 5° (H-RT) 2° OVERBEND (V)
STA: 638+56 1° SAG BEND (V)
STA: 638+15 4° OVERBEND (V)
STA: 638+59 3° SAG BEND (V)
STA: 638+99 2° SAG BEND (V)
STA: 639+57 FTG 45° (H-RT) 2° OVERBEND (V)
STA: 640+45 45° FTG (H-LT)

PLAN



RESTORE

TRENCH TYPE:	SEE DWG PNG-C-350-0001293 THROUGH PNG-C-350-0001295 FOR RESTORATION TYPE DETAIL	D	D	E
SURFACE TYPE:		4	1	SEED - ROUGH

PIPE DATA (SLOPE STA/BEND)

STA.	WELD #	JOINT LENGTH	JOINT (CON.)	STA.	WELD #	JOINT LENGTH	JOINT (CON.)

CONSTRUCTION NOTES:

C1. PIPELINE SHALL MAINTAIN 25-FOOT CLEARANCE FROM HIGH VOLTAGE OVERHEAD ELECTRIC WHERE POSSIBLE. LOCATIONS WITH LESS CLEARANCE MUST BE APPROVED IN ADVANCE BY DUKE ELECTRIC ASSET PROTECTION.

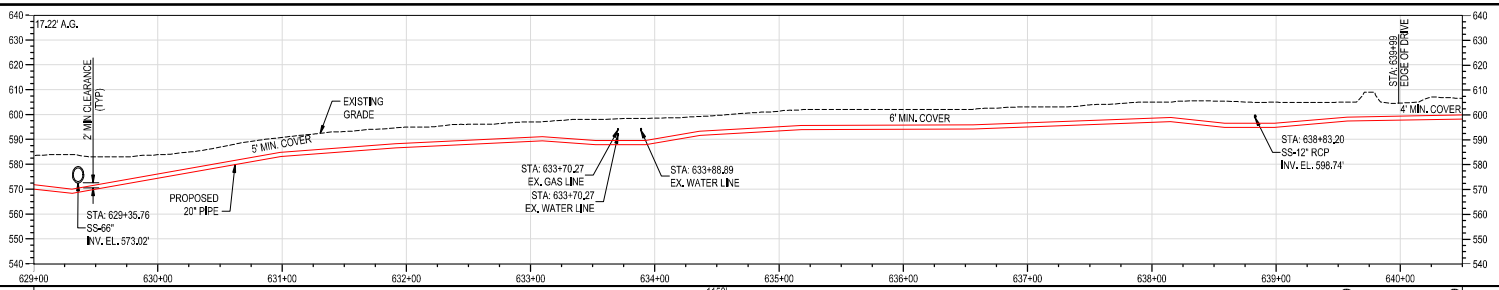
C2. CONTRACTOR SHALL GROUND PIPE PER DUKE STANDARDS IN PROXIMITY TO HIGH VOLTAGE OVERHEAD ELECTRIC LINES, SEE DRAWING PNG-C-350-0001312.

C3. PIPELINE SHALL MAINTAIN A MINIMUM 25-FOOT CLEARANCE FROM CENTER OF RAILROAD TRACKS PER AREMA GUIDELINES. PIPELINE COVER SHALL BE 6-FEET WHEN LOCATED WITHIN 50-FEET OF RAILROAD CENTERLINE.

C4. AC MITIGATION SITE, SEE DRAWING PNG-E-350-0001024.

C5. CONTRACTOR SHALL NOT DISTURB EXISTING GROUNDWATER SEEPAGE WALL.

PROFILE



MATERIAL	
CONST. METHOD	1150' (1) OPEN TRENCH (11) (11)
CLASS / MAOP	CLASS 4 / MAOP 500 PSIG

AMANDA PALM E-84075 REGISTERED PROFESSIONAL ENGINEER STATE OF OHIO 11/18/2020
PROFESSIONAL ENG/ARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION		APPROVALS		
AREA CODE	-	DATE -	INITIALS -	REGIONAL ENGINEER
ACCOUNT NUMBER	Q3680			
PROJECT NUMBER	1880115	DATE -	INITIALS -	MGR TECH REC & STD
DRAWING BY	AKT			
STATION ID	C350	DATE 11/18/2020	INITIALS AMP	PRINCIPAL ENGINEER
CHECKER INITIALS	CNS			

C350 PIPELINE
ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH

HAMILTON COUNTY, OH

REF. DWG(S) SEE REFERENCE BAND

SHEET(S) 59 OF 64	DWG SCALE AS NOTED		
DWG DATE 01/13/2020	SUPERSEDED —		
DRAWING NUMBER PNG -C-350-0001237	REVISION 0		

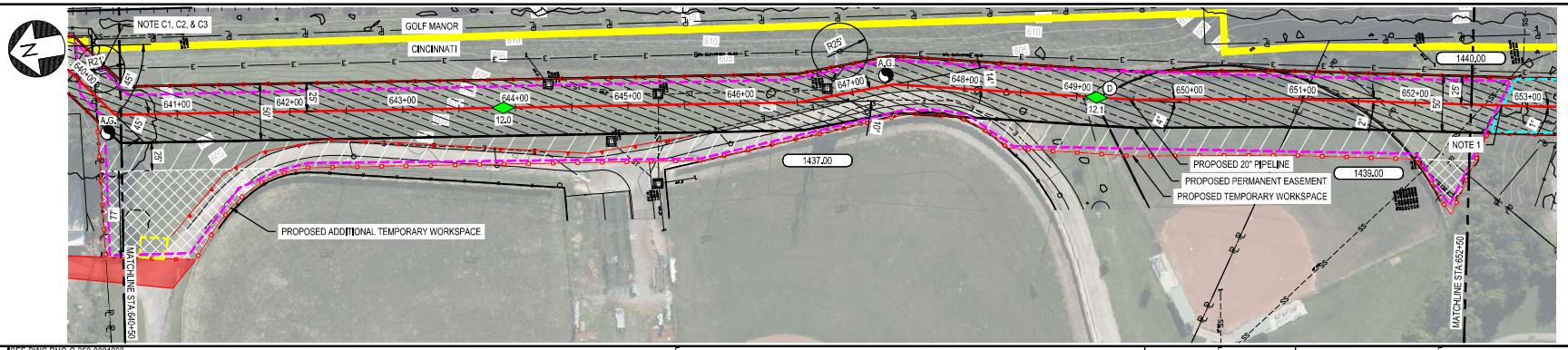
C:\HAMILTON COUNTY\C350

RIGHT-OF-WAY				
OWNERSHIP	1437.00		1439.00	1440.00
JURISDICTION	CINCINNATI		CINCINNATI	CINCINNATI
ACREAGE	1.8635 ACRES			
EASEMENTS	50' EASEMENT			
REF. DWG. NO.	PNG-C-350-0001312		PNG-C-350-0001305	

STATIONING

STA: 640+79.12° SAG BEND (V) | STA: 641+20.16° OVERBEND (V) | STA: 642+27.4° SAG BEND (V) | STA: 643+95.7° OVERBEND (V) | STA: 644+99.7° SAG BEND (V) | STA: 645+39.4° SAG BEND (V) | STA: 645+82.4° OVERBEND (V) | STA: 646+51.10° BEND (H-LT) | STA: 647+37.14° BEND (H-RT) | STA: 648+53.6° OVERBEND (V) | STA: 648+99.6° SAG BEND (V) | STA: 649+51.4° BEND (H-LT) | STA: 650+85.2° BEND (H-RT)

PLAN



RESTORE

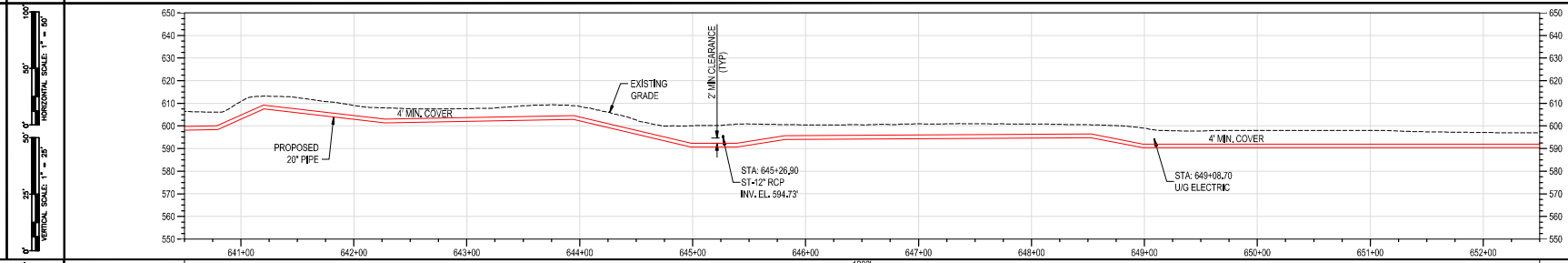
TRENCH TYPE:	SEE DWG PNG-C-350-0001293 THROUGH PNG-C-350-0001295 FOR RESTORATION TYPE DETAIL		
SURFACE TYPE:	SEED - ROUGH	SEED - FINE	SEED - ROUGH

PIPE DATA (SLOPE STATIONING)

STA.	WELD #	JOINT LENGTH (DIA.)	JOINT	WELD #	STA.

NOTES:
1. TRENCH PLUGS SHALL BE INSTALLED ON SLOPES AND TOE OF SLOPE TO MINIMIZE WATER SEEP ALONG PIPELINE FROM STA: 652+50 TO STA: 653+50.

PROFILE



CONSTRUCTION NOTES:
- C1. PIPELINE SHALL MAINTAIN 25-FOOT CLEARANCE FROM HIGH VOLTAGE OVERHEAD ELECTRIC WHERE POSSIBLE.
- C2. CONTRACTOR SHALL GROUND PIPE PER DUKE STANDARDS IN PROXIMITY TO HIGH VOLTAGE OVERHEAD ELECTRIC LINES. SEE DRAWING PNG-C-350-0001312.
- C3. PIPELINE SHALL MAINTAIN A MINIMUM 25-FOOT CLEARANCE FROM CENTER OF RAILROAD TRACKS PER AREMA GUIDELINES. PIPELINE COVER SHALL BE 6-FEET WHEN LOCATED WITHIN 50-FEET OF RAILROAD CENTERLINE.
- C4. AC MITIGATION SITE, SEE DRAWING PNG-E-350-0001024.

MATERIAL	1200' (1)
CONST. METHOD	OPEN TRENCH
CLASS / MAOP	CLASS 4 / MAOP 500 PSIG

REF. DWG(S) SEE REFERENCE BAND

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS	
	-	-	REGIONAL ENGINEER
	-	-	MGR TECH REC & STD
	11/18/2020	AMP	PRINCIPAL ENGINEER

STATE OF OHIO — AMANDA PALM — E-84075 — REGISTERED PROFESSIONAL ENGINEER — 11/18/2020
PROFESSIONAL ENG/ARCH STAMP

C350 PIPELINE
ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH

HAMILTON COUNTY, OH

SHEET(S) 60 OF 64	DWG SCALE AS NOTED
DWG DATE 01/13/2020	SUPERSEDED —
DRAWING NUMBER	REVISION
PNG -C-350-0001238	0

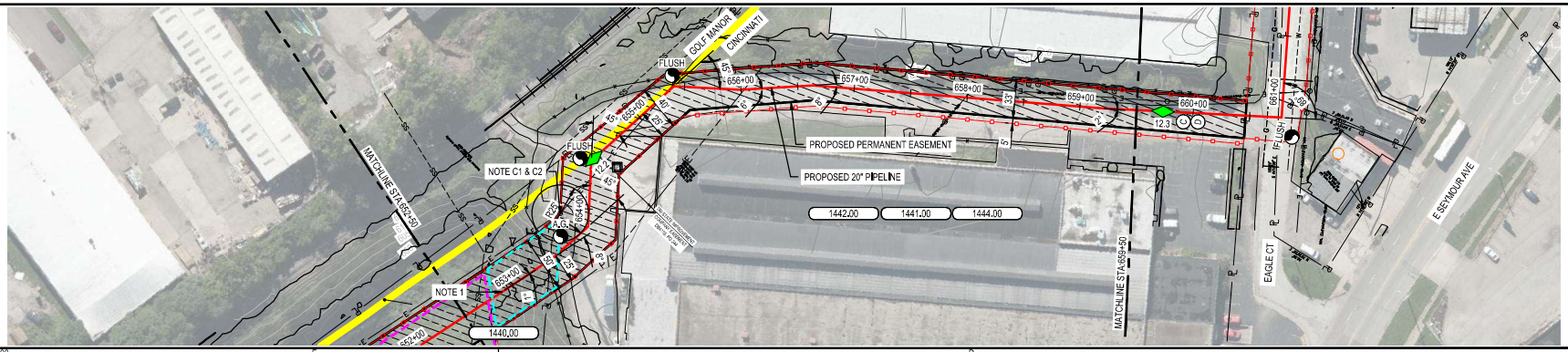
C:\HAMILTON COUNTY\C350

RIGHT-OF-WAY			
	OWNERSHIP	1440.00	1442.00 / 1441.00 / 1444.00
	JURISDICTION	CINCINNATI	CINCINNATI
	ACREAGE	1.8635 ACRES	0.5854 ACRES
	EASEMENTS	50' EASEMENT	VARIES
	REF. DWG. NO.	PNG-C-350-0001305	PNG-C-350-0001312

STATIONING

STA: 652+89 BEND 1° (H-LT) 20° SAG BEND (V)
STA: 653+44 BEND 8° (H-LT) 19° OVERBEND (V)
STA: 653+94 45° FTG (H-LT)
STA: 654+42 45° FTG (H-RT)
STA: 655+41 45° FTG (H-RT)
STA: 655+99 6° BEND (H-LT)
STA: 656+63 8° BEND (H-RT)
STA: 659+18.2° BEND (H-LT)

PLAN



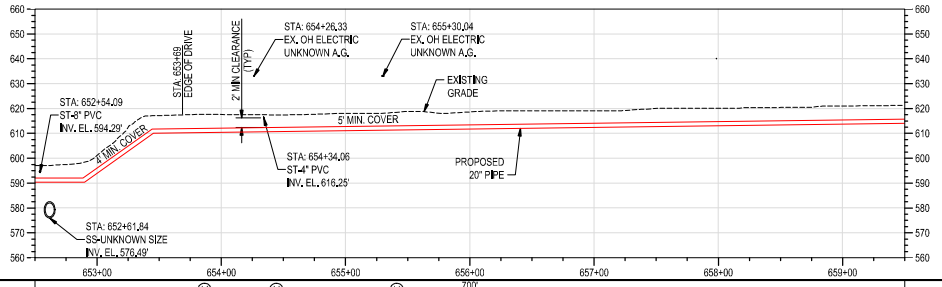
RESTORE

TRENCH TYPE:	SEE DWG PNG-C-350-0001293 THROUGH PNG-C-350-0001295 FOR RESTORATION TYPE DETAIL	E	D
SURFACE TYPE:	SEED - ROUGH		1

PIPE DATA (SLOPE STATIONING)

STA.	WELD #	JOINT LENGTH (DIA)	JOINT HEIGHT (DIA)	WELD #	STA.

PROFILE



NOTES:
1. TRENCH PLUGS SHALL BE INSTALLED ON SLOPES AND TOE OF SLOPE TO MINIMIZE WATER SEEP ALONG PIPELINE FROM STA: 652+50 TO STA: 653+50.

CONSTRUCTION NOTES:
C1. PIPELINE SHALL MAINTAIN 25-FOOT CLEARANCE FROM HIGH VOLTAGE OVERHEAD ELECTRIC WHERE POSSIBLE.

C2. CONTRACTOR SHALL GROUND PIPE PER DUKE STANDARDS IN PROXIMITY TO HIGH VOLTAGE OVERHEAD ELECTRIC LINES, SEE DRAWING PNG-C-350-0001312.

C3. AC MITIGATION SITE, SEE DRAWING PNG-E-350-0001024.

MATERIAL	
CONST. METHOD	
CLASS / MAOP	CLASS 4 / MAOP 500 PSIG

AMANDA PALM E-84075 REGISTERED PROFESSIONAL ENGINEER 11/18/2020
PROFESSIONAL ENG/ARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION		APPROVALS	DATE	INITIALS	
AREA CODE	-		-	-	REGIONAL ENGINEER
ACCOUNT NUMBER	Q3680				
PROJECT NUMBER	1880115		-	-	MGR TECH REC & STD
DRAWING BY	AKT				
STATION ID	C350		11/18/2020	AMP	PRINCIPAL ENGINEER
CHECKER INITIALS	CNS				

DUKE ENERGY. | Piedmont Natural Gas

C350 PIPELINE
ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH

HAMILTON COUNTY, OH

REF. DWG(S) SEE REFERENCE BAND

SHEET(S) 61 OF 64	DWG SCALE AS NOTED
DWG DATE 01/13/2020	SUPERSEDED —
DRAWING NUMBER PNG -C-350-0001239	REVISION 0

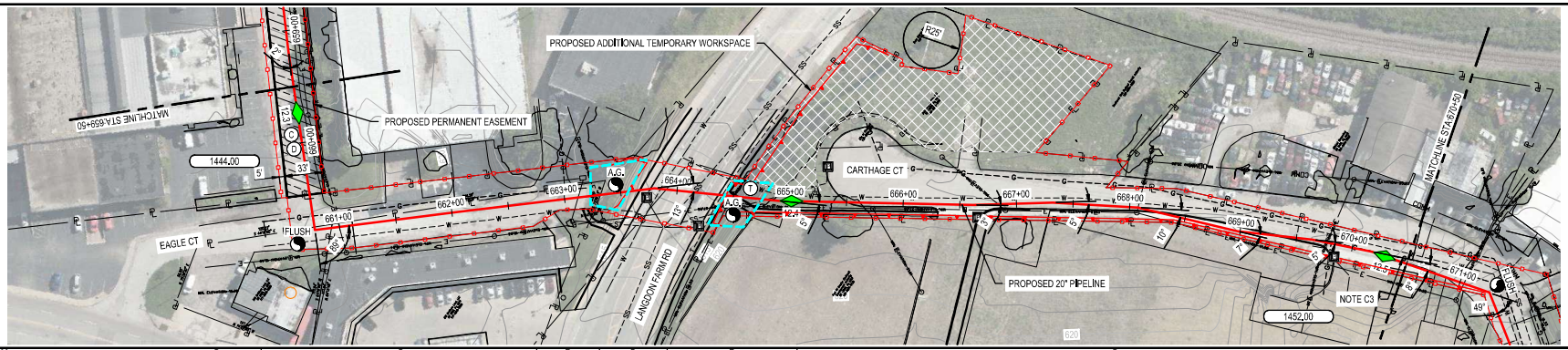
C:\HAMILTON COUNTY\C350

RIGHT-OF-WAY				
OWNERSHIP	1444.00	ROW	ROW	
JURISDICTION	CINCINNATI	CINCINNATI	CINCINNATI	
ACREAGE	0.5854 ACRES			
EASEMENTS	VARIES			
REF. DWG. NO.				

STATIONING

STA: 659+99.5° OVERBEND (V)
STA: 660+47.5° SAG BEND (V)
STA: 660+78.89° FTG (H–LT)
STA: 663+39.9 OVERBEND (V)
STA: 663+90 BEND 13° (H-RT) 9° SAG BEND (V)
STA: 664+46.15° SAG BEND (V)
STA: 664+90 BEND 5° (H–LT) 15° OVERBEND (V)
STA: 666+62.3° BEND (H–LT)
STA: 667+32.5° BEND (H-RT)
STA: 668+07 BEND 10° (H-RT) 1° OVERBEND (V)
STA: 668+97.7° BEND (H–LT)
STA: 669+64.5° BEND (H-RT)
STA: 670+17 BEND 8° (H-RT) 3° OVERBEND (V)

PLAN



HORIZONTAL SCALE: 1" = 50'

RESTORE

TRENCH TYPE: SEE DWG PNG-C-350-0001293 THROUGH PNG-C-350-0001295 FOR RESTORATION TYPE DETAIL	D	D	E	D	E	D
SURFACE TYPE:	1	4	SEED - ROUGH	4	SEED - ROUGH	4

PIPE DATA (SLOPE STA TRENDING)

STA.	WELD #	JOINT LENGTH (DIA)	JOINT WEIGHT
STA.	WELD #	JOINT LENGTH (DIA)	JOINT WEIGHT

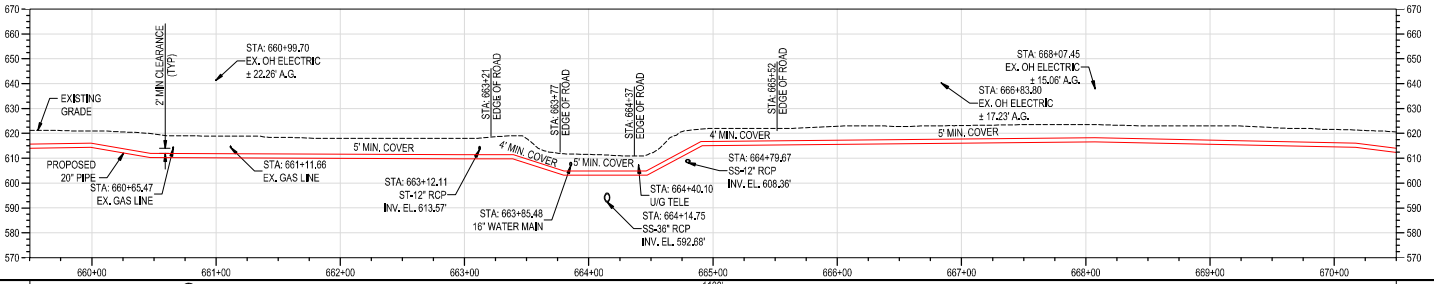
CONSTRUCTION NOTE:

C1. PIPELINE SHALL MAINTAIN 25-FOOT CLEARANCE FROM HIGH VOLTAGE OVERHEAD ELECTRIC WHERE POSSIBLE.

C2. CONTRACTOR SHALL GROUND PIPE PER DUKE STANDARDS IN PROXIMITY TO HIGH VOLTAGE OVERHEAD ELECTRIC LINES, SEE DRAWING PNG-C-350-0001312.

C3. CONTRACTOR SHALL REMOVE ABANDONED GAS MAIN BACK TO NEXT UPSTREAM SERVICE TAKEOFF TO ALLOW INSTALLATION OF C350 PIPELINE IN LOCATION PREVIOUSLY OCCUPIED BY GAS MAIN.

PROFILE



MATERIAL	10"	1100' 1"
CONST. METHOD		OPEN TRENCH
CLASS / MAOP	CLASS 4 / MAOP 500 PSIG	

REF. DWG(S) SEE REFERENCE BAND

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION		APPROVALS	DATE	INITIALS	
AREA CODE	-		-	-	REGIONAL ENGINEER
ACCOUNT NUMBER	Q3680				
PROJECT NUMBER	1880115		-	-	MGR TECH REC & STD
DRAWING BY	AKT				
STATION ID	C350		11/18/2020	AMP	PRINCIPAL ENGINEER
CHECKER INITIALS	CNS				

STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
11/18/2020
PROFESSIONAL ENG/ARCH STAMP

DUKE ENERGY. | Piedmont Natural Gas

C350 PIPELINE
ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH

HAMILTON COUNTY, OH

SHEET(S) 62 OF 64	DWG SCALE AS NOTED
DWG DATE 01/13/2020	SUPERSEDED —
DRAWING NUMBER PNG -C-350-0001240	REVISION 0

C:\HAMILTON COUNTY\C350

RIGHT-OF-WAY	OWNERSHIP	ROW	1462.00
	JURISDICTION	CINCINNATI	CINCINNATI
	ACREAGE		0.1657 ACRES
	EASEMENTS		VARIES
	REF. DWG. NO.	PNG-C-350-0001312	

STATIONING

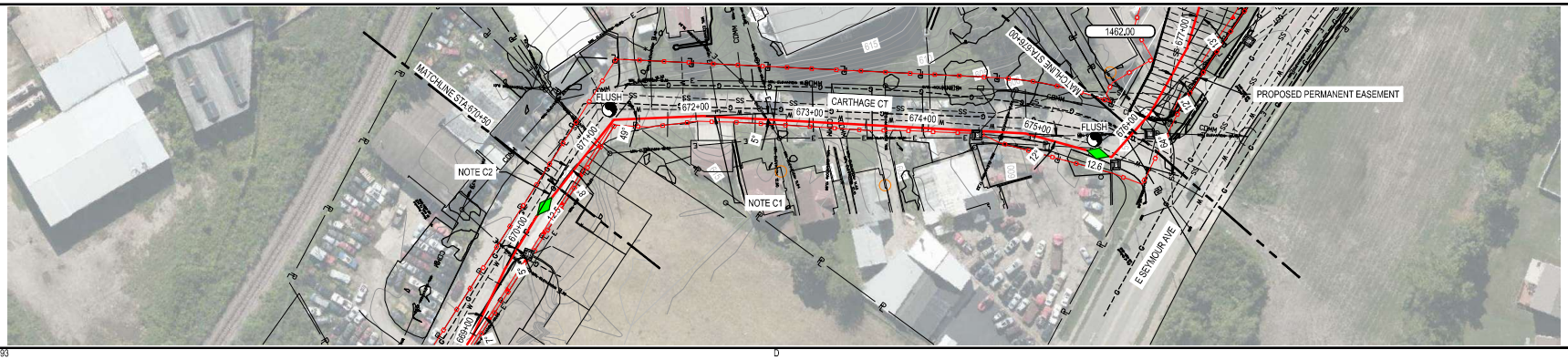
STA: 671+27.49° FTG (H-RT)

STA: 672+06 BEND 5° (H-RT) 1° SAG BEND (V)

STA: 674+91 12° BEND (H-RT)

STA: 675+70 FTG 64° (H-LT) 1.5° SAG BEND (V)

PLAN



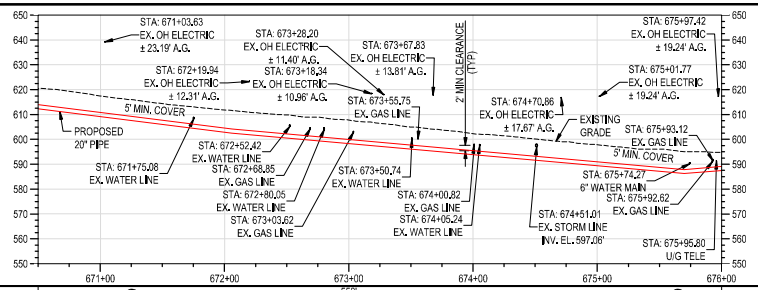
RESTORE

TRENCH TYPE:	SEE DWG PNG-C-350-0001293 THROUGH PNG-C-350-0001295
SURFACE TYPE:	FOR RESTORATION TYPE DETAIL

PIPE DATA (SLOPE STA. ENDING)

STA.	WELD #	JOINT LENGTH	JOINT	WELD #	STA.
	(CON.)		HEAVY	(CON.)	

PROFILE



CONSTRUCTION NOTES:

C1. PIPELINE SHALL BE INSTALLED AT LEAST 15-FEET FROM BUILDINGS, UNLESS APPROVED BY DUKE ENERGY.

C2. CONTRACTOR SHALL REMOVE ABANDONED GAS MAIN BACK TO NEXT UPSTREAM SERVICE TAKEOFF TO ALLOW INSTALLATION OF C350 PIPELINE IN LOCATION PREVIOUSLY OCCUPIED BY GAS MAIN.

MATERIAL	
CONST. METHOD	OPEN TRENCH
CLASS / MAOP	CLASS 4 / MAOP 500 PSIG

PROFESSIONAL ENG/ARCH STAMP

STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
11/18/2020

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS	
	-	-	REGIONAL ENGINEER
	-	-	MGR. TECH REC & STD
	11/18/2020	AMP	PRINCIPAL ENGINEER

C350 PIPELINE
ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH

HAMILTON COUNTY, OH

REF. DWG(S) SEE REFERENCE BAND

SHEET(S) 63 OF 64	DWG SCALE AS NOTED
DWG DATE 01/13/2020	SUPERSEDED —
DRAWING NUMBER	REVISION
PNG -C-350-0001241	0

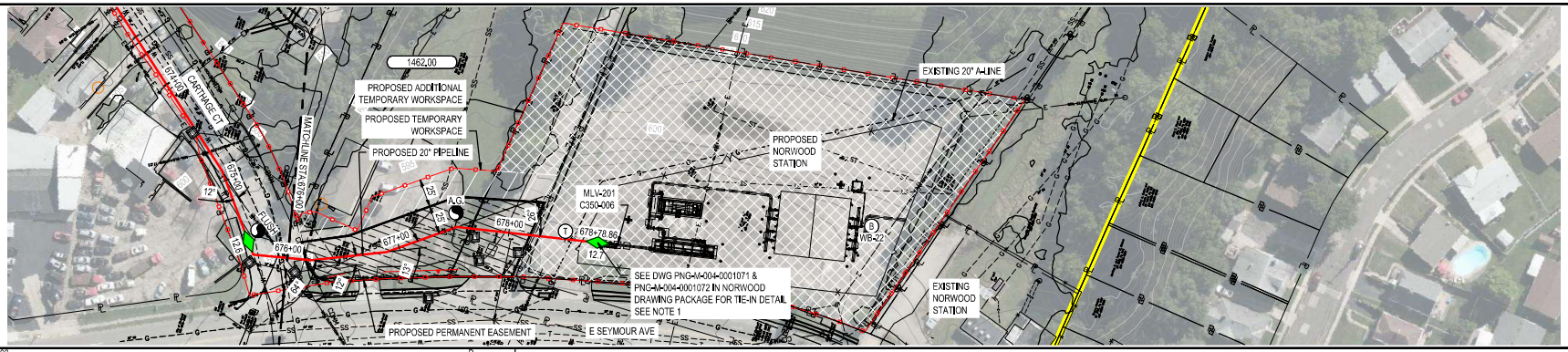
C:\HAMILTON COUNTY\C350

OWNERSHIP	1462.00
JURISDICTION	CINCINNATI
ACREAGE	0.1657 ACRES
EASEMENTS	VARIES
REF. DWG. NO.	PNG-C-350-0001312 PNG-B-350-0001015 PNG-M-004-0001071 PNG-M-004-0001072

STATIONING

STA. 676+21 BEND 12° (HA-LT) 5° OVERBEND (V)
STA. 676+68 13° BEND (HA-T)
STA. 677+54 FTG 26° (HA-RT) 7° SAG BEND (V)
STA. 677+96 7° SAG BEND (V)
STA. 678+60 FTG 15° SAG BEND (V) STA. 678+77 FTG 20° OVERBEND (V) STA. 678+79 TIE-IN LOCATION

PLAN



HORIZONTAL SCALE: 1" = 50'

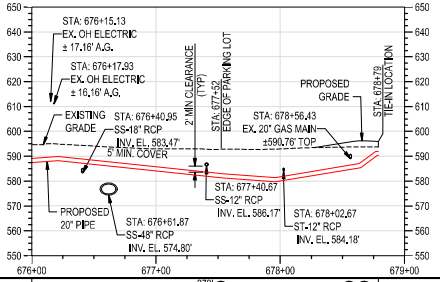
RESTORE

TRENCH TYPE: SEE DWG PNG-C-350-0001293 THROUGH PNG-C-350-0001295
SURFACE TYPE: FOR RESTORATION TYPE DETAIL

PIPE DATA (SLOPE STATIONING)

STA.	WELD #	JOINT LENGTH	JOINT	STA.	WELD #
	(CON.)		HEAT		(CON.)

PROFILE



HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 25'

NOTE:
1. TIE-IN INFORMATION TO NORWOOD STATION:
   LAT: 39.1790144
   LONG: -84.4547267
   TOP EL. 585.88'

CONSTRUCTION NOTES:
C1. STATION OUTLET VALVE IS PREFABRICATED FROM VENDOR, FOR DETAILS, SEE DWG PNG-M-004-0001072 IN NORWOOD C350 DRAWING PACKAGE.

MATERIAL	279 (1) (1) (1) (1)
CONST. METHOD	OPEN TRENCH
CLASS / MAOP	CLASS 4 / MAOP 500 PSIG

REF. DWG(S) SEE REFERENCE BAND

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS	
	-	-	REGIONAL ENGINEER
	-	-	MGR. TECH REC & STD
	11/18/2020	AMP	PRINCIPAL ENGINEER

STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
11/18/2020
PROFESSIONAL ENG/ARCH STAMP

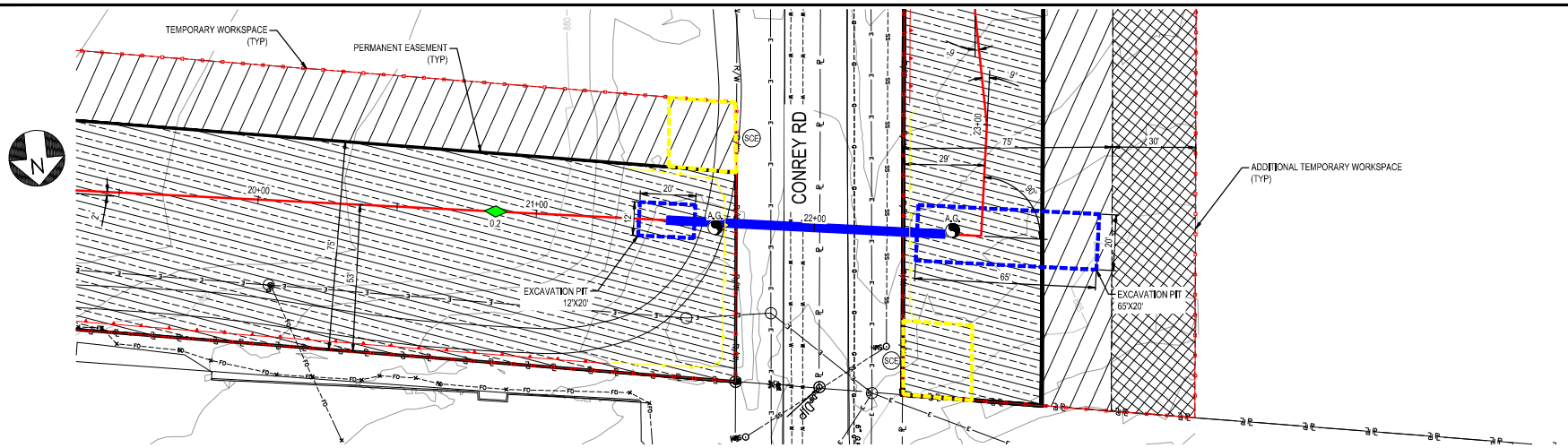
C350 PIPELINE
ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH

HAMILTON COUNTY, OH

SHEET(S)	64 OF 64
DWG SCALE	AS NOTED
DWG DATE	01/13/2020
SUPERSEDED	—
DRAWING NUMBER	PNG -C-350-0001242
REVISION	0

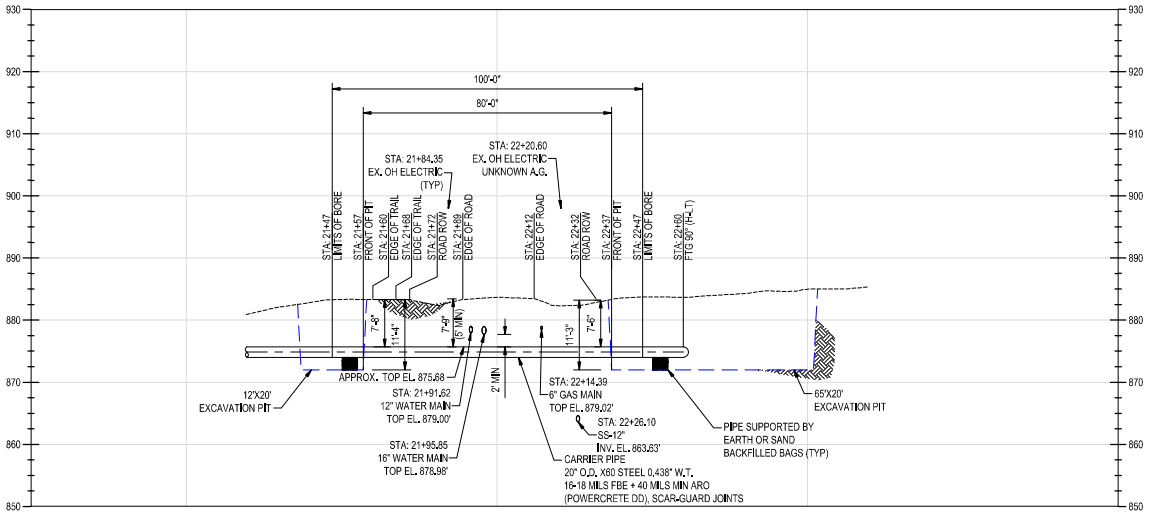
C:\HAMILTON COUNTY\C350

PLAN



PROFILE

PLAN/PROFILE VIEW SCALE
HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 10'



NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS
REGIONAL ENGINEER	-	-
MGR. TECH REC & STD	-	-
PRINCIPAL ENGINEER	11/18/2020	AMP

AMANDA PALM E-84075 REGISTERED PROFESSIONAL ENGINEER 11/18/2020
PROFESSIONAL ENGINEER STAMP

C350 PROJECT
BORE CROSSING DETAIL 1
HAMILTON COUNTY, OHIO

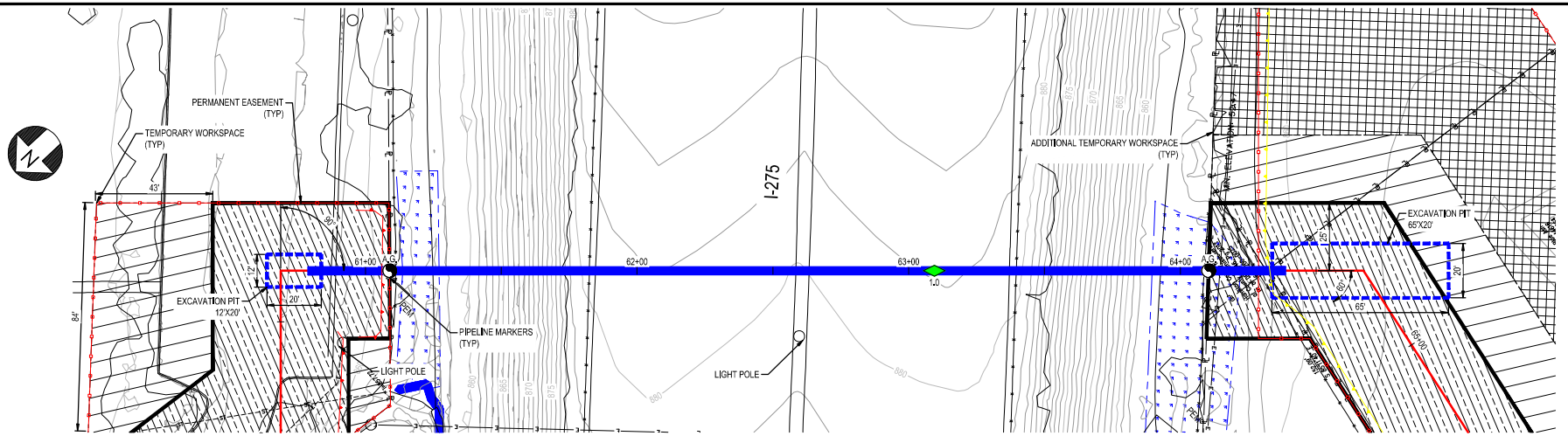
HAMILTON COUNTY, OH

REF. DWG(S): PNC-G-350-0001009
PNG-C-350-0001180

SHEET(S)	1 OF 19
DWG SCALE	AS NOTED
DWG DATE	09-05-2018
SUPERSEDED	—
DRAWING NUMBER	PNG -C-350-0001249
REVISION	0

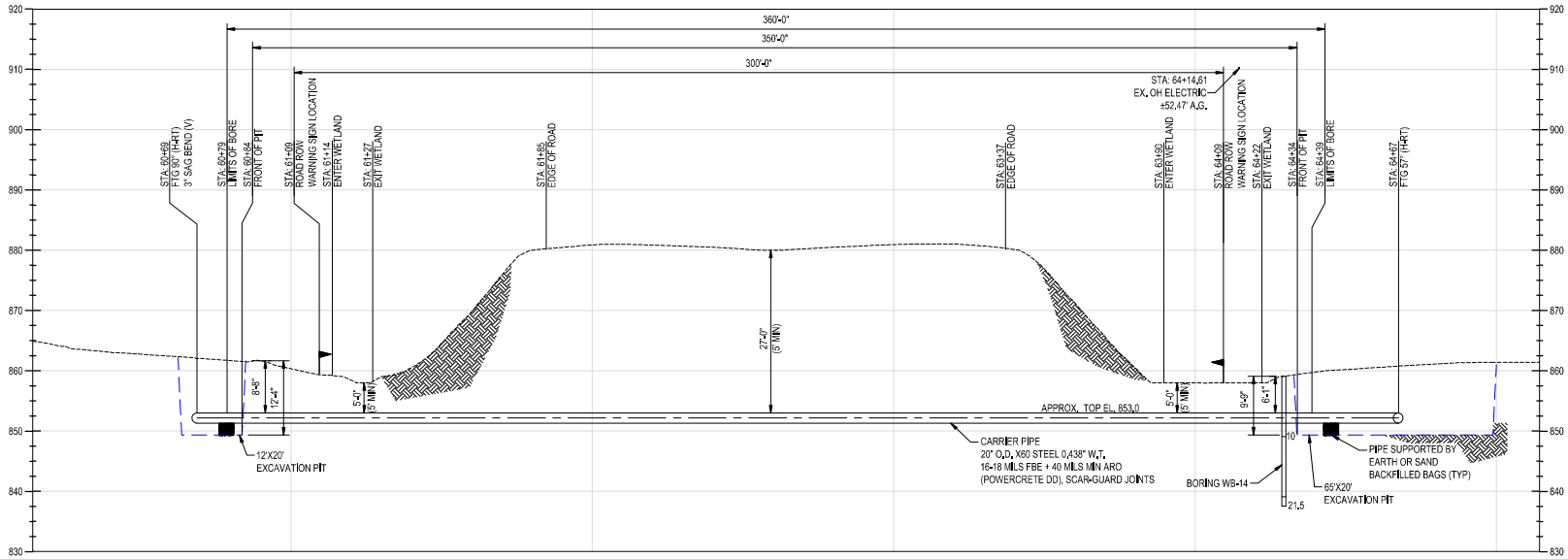
C:\HAMILTON COUNTY\C350

PLAN



PROFILE

PLAN/PROFILE VIEW SCALE
HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 10'



NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS	
	-	-	REGIONAL ENGINEER
	-	-	MGR. TECH REC & STD
	11/18/2020	AMP	PRINCIPAL ENGINEER

STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
11/18/2020
PROFESSIONAL ENG/ARCH STAMP

C350 PROJECT
BORE CROSSING DETAIL 2
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OH

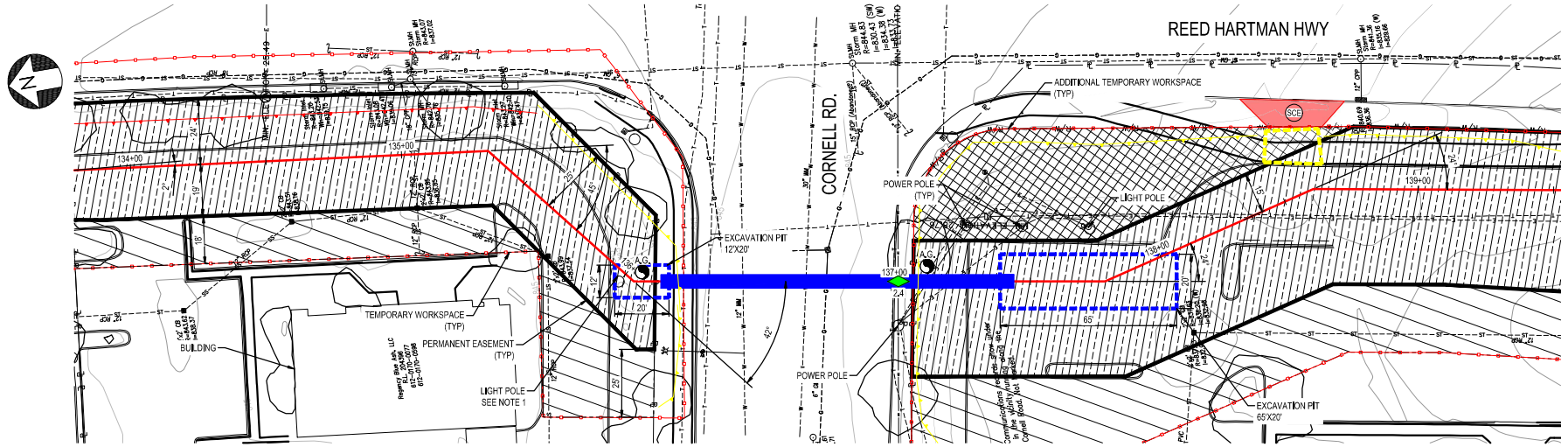
REF. DWG(S): PNG-G-350-0001009
PNG-B-350-0001014
PNG-C-350-0001184

SHEET(S)	2 OF 19	DWG SCALE	AS NOTED
DWG DATE	09-05-2018	SUPERSEDED	—

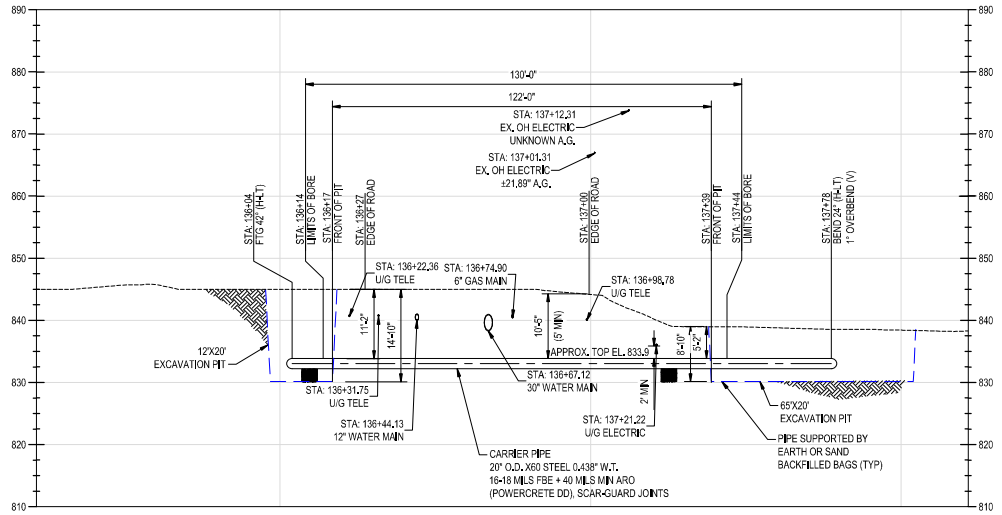
DRAWING NUMBER: PNG -C-350-0001250
REVISION: 0

C/HAMILTON COUNTY/C350

PLAN



PROFILE



PLAN/PROFILE VIEW SCALE

HORIZONTAL SCALE: 1" = 20'

VERTICAL SCALE: 1" = 10'

NOTES

1. LIGHT POLE SHALL BE REMOVED FOR BORE CONSTRUCTION.
2. CHARTER COMMUNICATIONS RECORDS SHOW UNDERGROUND UTILITIES IN THE VICINITY RUNNING ALONG THE SOUTH SIDE OF CORNELL ROAD, NOT MARKED.

STATE OF OHIO — AMANDA PALM — E-84075 — REGISTERED PROFESSIONAL ENGINEER — 11/18/2020

PROFESSIONAL ENG/ARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION		APPROVALS		
AREA CODE	-	DATE -	INITIALS -	REGIONAL ENGINEER
ACCOUNT NUMBER	Q3680			
PROJECT NUMBER	1880115			
DRAWING BY	AKT	DATE -	INITIALS -	MGR. TECH REC & STD
STATION ID	C350			
CHECKER INITIALS	CNS	DATE 11/18/2020	INITIALS AMP	PRINCIPAL ENGINEER

C350 PROJECT
BORE CROSSING DETAIL 3
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OH

REF. DWG(S): PNC-G-350-0001009
PNC-C-350-0001192

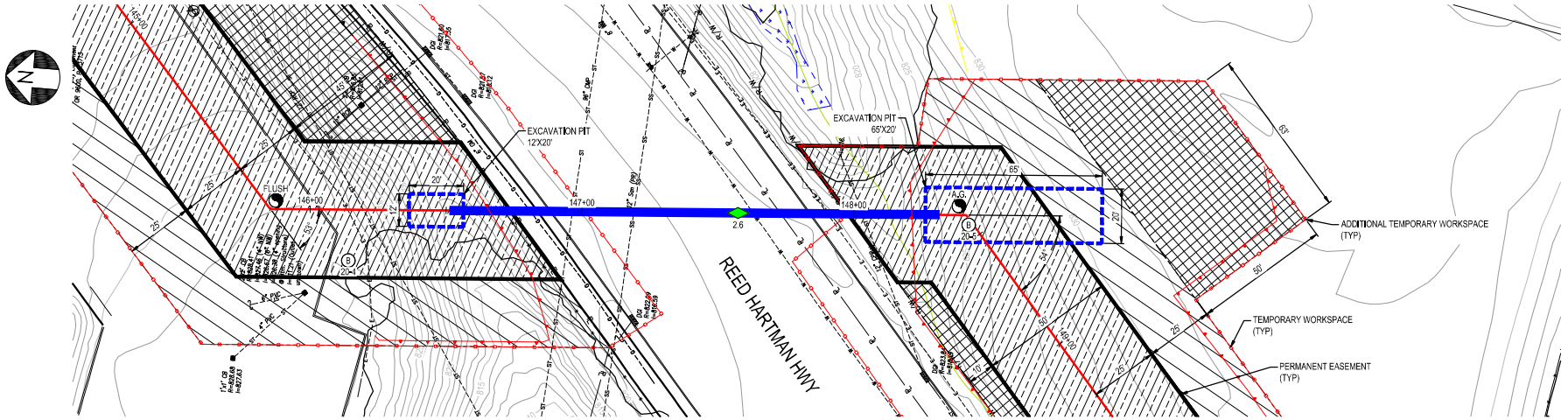
SHEET(S)	3 OF 19	DWG SCALE	AS NOTED
DWG DATE	09-05-2018	SUPERSEDED	—

DRAWING NUMBER: PNG -C-350-0001251

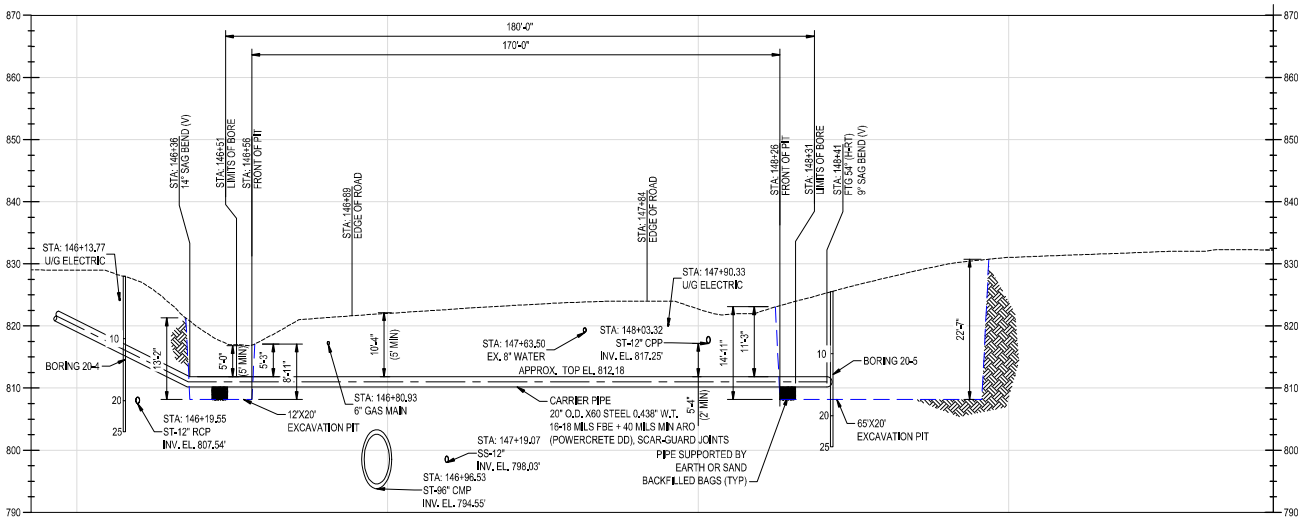
REVISION: 0

C/HAMILTON COUNTY/350

PLAN



PROFILE



PLAN/PROFILE VIEW SCALE

HORIZONTAL SCALE: 1" = 20'

VERTICAL SCALE: 1" = 10'

PROFESSIONAL ENGINEER STAMP

STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
11/18/2020

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS		
DATE	INITIALS	
-	-	REGIONAL ENGINEER
DATE	INITIALS	
-	-	MGR. TECH REC & STD
DATE	INITIALS	
11/18/2020	AMP	PRINCIPAL ENGINEER

C350 PROJECT
BORE CROSSING DETAIL 4
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OH

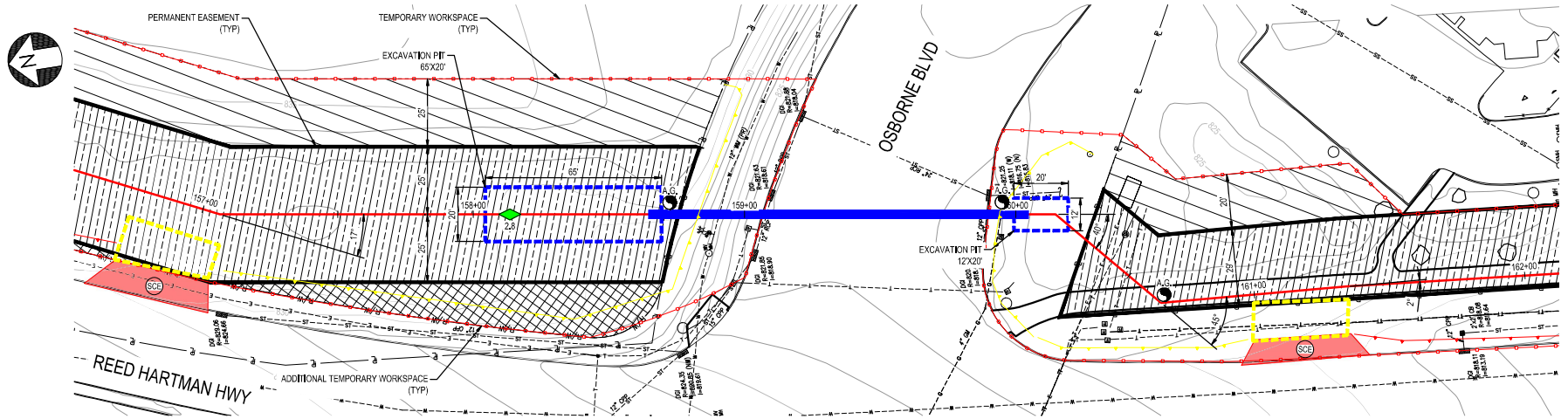
REF. DWG(S): PNG-G-350-0001009 PNG-B-350-0001010 PNG-C-350-0001192 PNG-C-350-0001193

SHEET(S)	4 OF 19	DWG SCALE	AS NOTED
DWG DATE	09-05-2018	SUPERSEDED	—

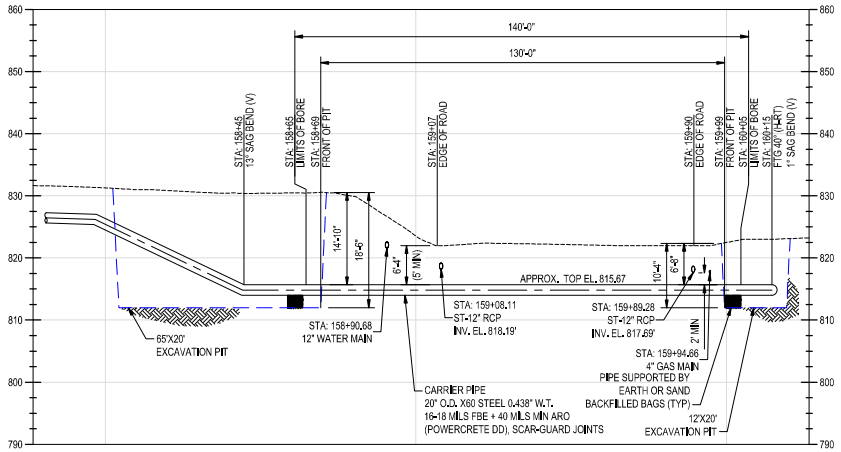
DRAWING NUMBER	REVISION
PNG -C-350-0001252	0

C:\HAMILTON COUNTY\C350

PLAN



PROFILE



PLAN/PROFILE VIEW SCALE

HORIZONTAL SCALE: 1" = 20'

VERTICAL SCALE: 1" = 10'

STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
11/18/2020
PROFESSIONAL ENGINEER STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS			
DATE	INITIALS		
-	-	REGIONAL ENGINEER	
DATE	INITIALS		
-	-	MGR. TECH REC & STD	
DATE	INITIALS		
11/18/2020	AMP	PRINCIPAL ENGINEER	

C350 PROJECT
BORE CROSSING DETAIL 5
HAMILTON COUNTY, OHIO

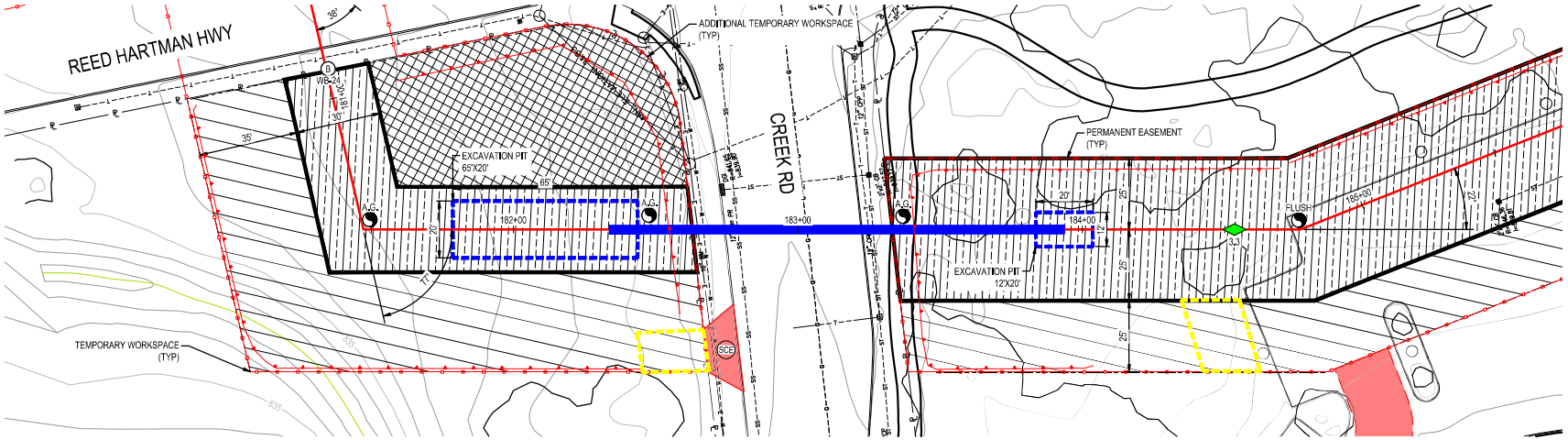
HAMILTON COUNTY, OH

REF. DWG(S): PNG-G-350-0001009
PNG-C-350-0001194

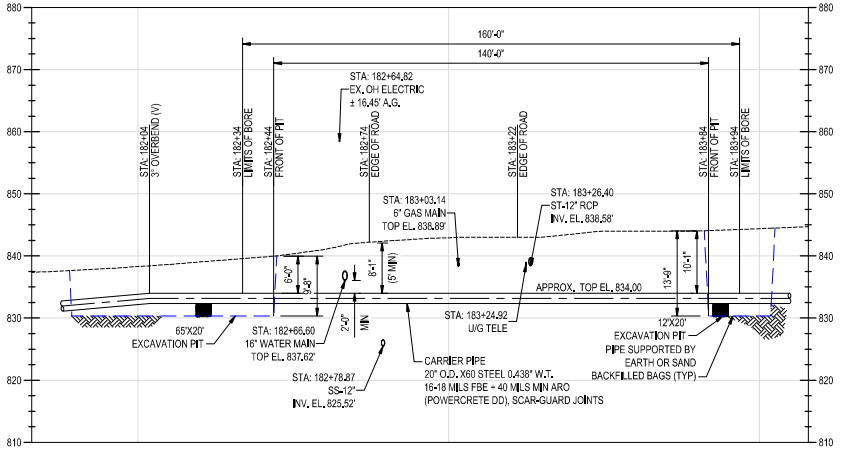
SHEET(S)	5 OF 19
DWG SCALE	AS NOTED
DWG DATE	09-05-2018
SUPERSEDED	—
DRAWING NUMBER	PNG -C-350-0001253
REVISION	0

C:\HAMILTON COUNTY\C350

PLAN



PROFILE



PLAN/PROFILE VIEW SCALE

HORIZONTAL SCALE: 1" = 20'

VERTICAL SCALE: 1" = 10'

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS	
	-	-	REGIONAL ENGINEER
	-	-	MGR. TECH REC & STD
	11/18/2020	AMP	PRINCIPAL ENGINEER

STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
11/18/2020
PROFESSIONAL ENGINEER STAMP

DUKE ENERGY. | Piedmont Natural Gas

C350 PROJECT
BORE CROSSING DETAIL 6
HAMILTON COUNTY, OHIO

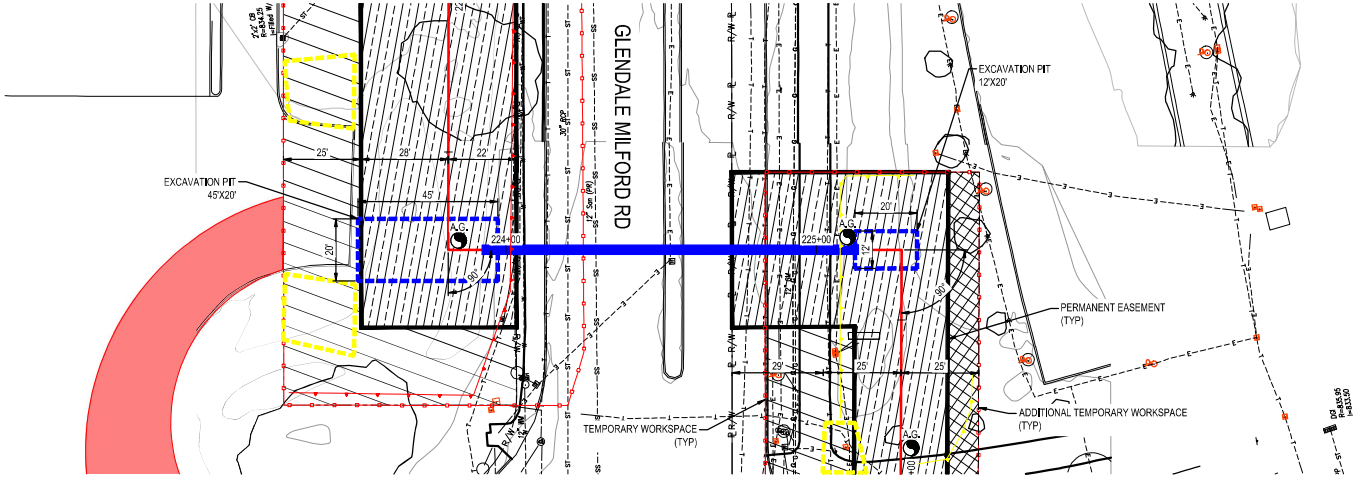
HAMILTON COUNTY, OH

REF. DWG(S): PNG-G-350-0001009
PNG-C-350-0001196

SHEET(S) 6 OF 19	DWG SCALE AS NOTED
DWG DATE 09-05-2018	SUPERSEDED —
DRAWING NUMBER	REVISION
PNG -C-350-0001254	0

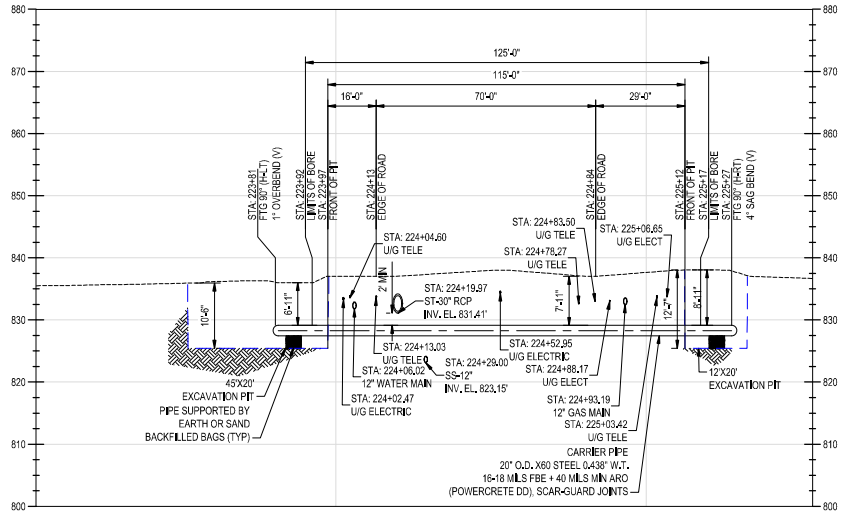
C/HAMILTON COUNTY/C350

PLAN



PROFILE

PLAN/PROFILE VIEW SCALE
HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 10'



NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS	
	-	-	REGIONAL ENGINEER
	-	-	MGR. TECH REC & STD
	11/18/2020	AMP	PRINCIPAL ENGINEER

STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
11/18/2020
PROFESSIONAL ENG/ARCH STAMP

C350 PROJECT
BORE CROSSING DETAIL 7
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OH

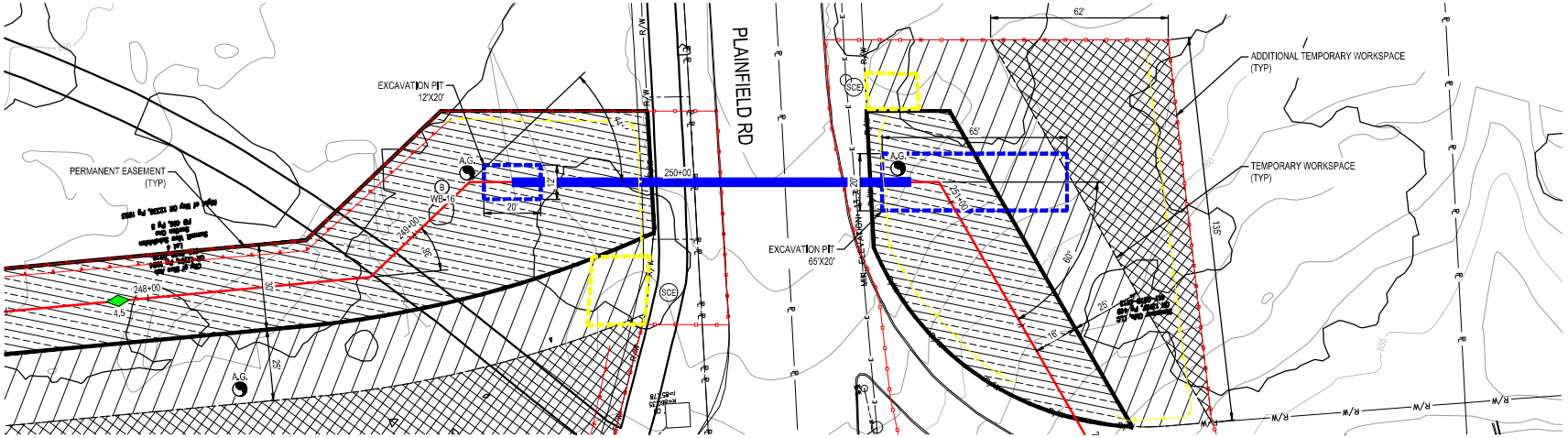
REF. DWG(S): PNG-G-350-0001009
PNG-C-350-0001200

SHEET(S)	7 OF 19	DWG SCALE	AS NOTED
DWG DATE	09-05-2018	SUPERSEDED	—

DRAWING NUMBER: PNG -C-350-0001255
REVISION: 0

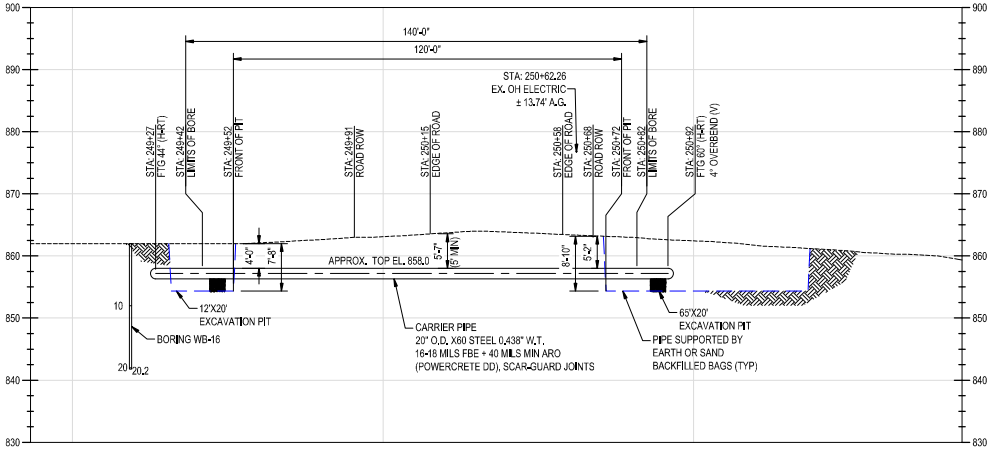
C/HAMILTON COUNTY/C350

PLAN



PROFILE

PLAN/PROFILE VIEW SCALE
HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 10'



PROFESSIONAL ENGINEER STAMP
STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
11/18/2020

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS		
DATE -	INITIALS -	REGIONAL ENGINEER
DATE -	INITIALS -	MGR. TECH REC & STD
DATE 11/18/2020	INITIALS AMP	PRINCIPAL ENGINEER

C350 PROJECT
BORE CROSSING DETAIL 8
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OH

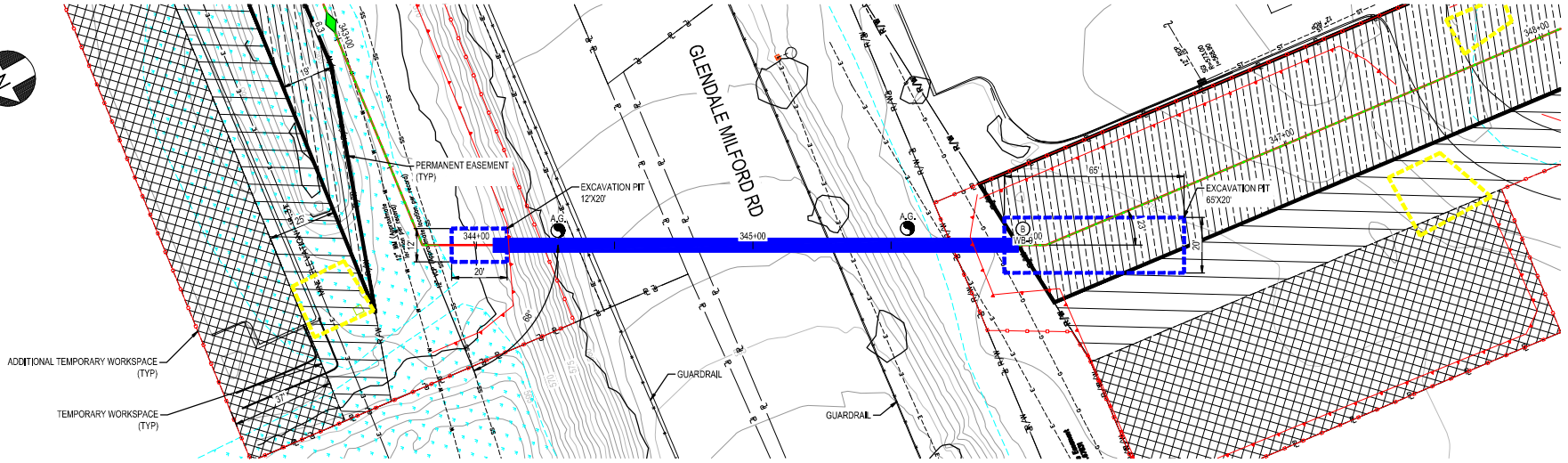
REF. DWG(S): PNG-G-350-0001009
PNG-B-350-0001014
PNG-C-350-0001202

SHEET(S) 8 OF 119	DWG SCALE AS NOTED
DWG DATE 09-05-2018	SUPERSEDED —

DRAWING NUMBER: PNG -C-350-0001256
REVISION: 0

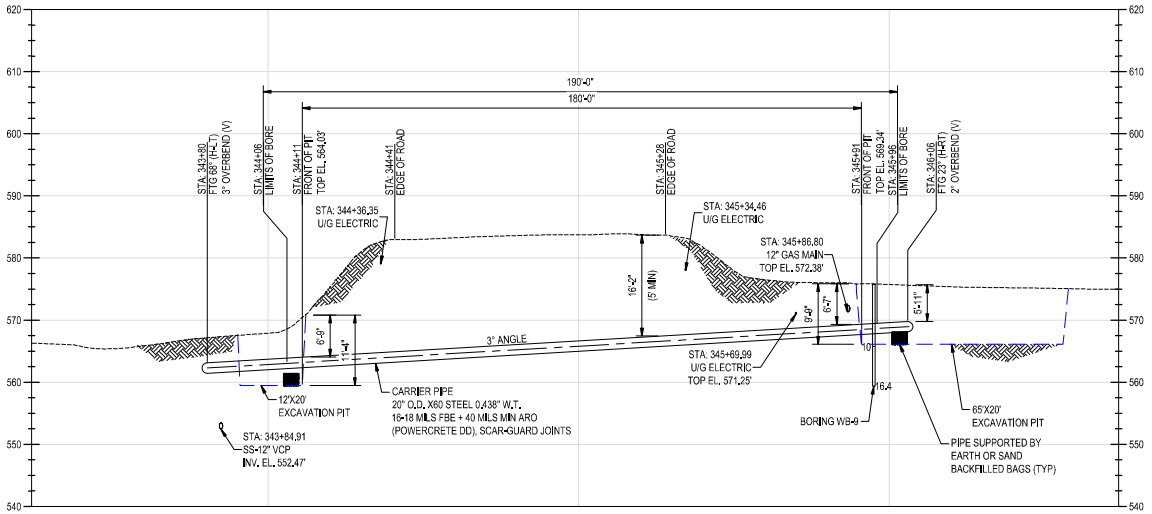
C:\HAMILTON COUNTY\C350

PLAN



PROFILE

PLAN/PROFILE VIEW SCALE
HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 10'



NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS			
DATE	INITIALS		
-	-	REGIONAL ENGINEER	
DATE	INITIALS		
-	-	MGR. TECH REC & STD	
DATE	INITIALS		
11/18/2020	AMP	PRINCIPAL ENGINEER	

STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
11/18/2020
PROFESSIONAL ENG/ARCH STAMP

C350 PROJECT
BORE CROSSING DETAIL 9
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OH

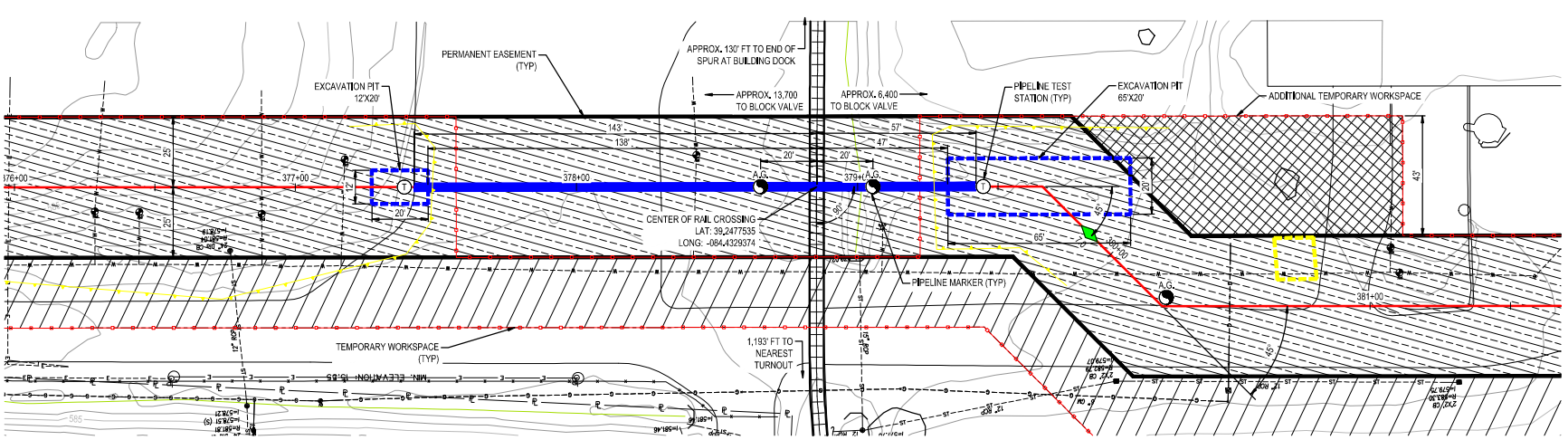
REF. DWG(S): PNG-G-350-0001009
PNG-B-350-0001012
PNG-C-350-0001210

SHEET(S)	9 OF 19	DWG SCALE	AS NOTED
DWG DATE	09-05-2015	SUPERSEDED	—

DRAWING NUMBER: PNG -C-350-0001257
REVISION: 0

C/HAMILTON COUNTY/C350

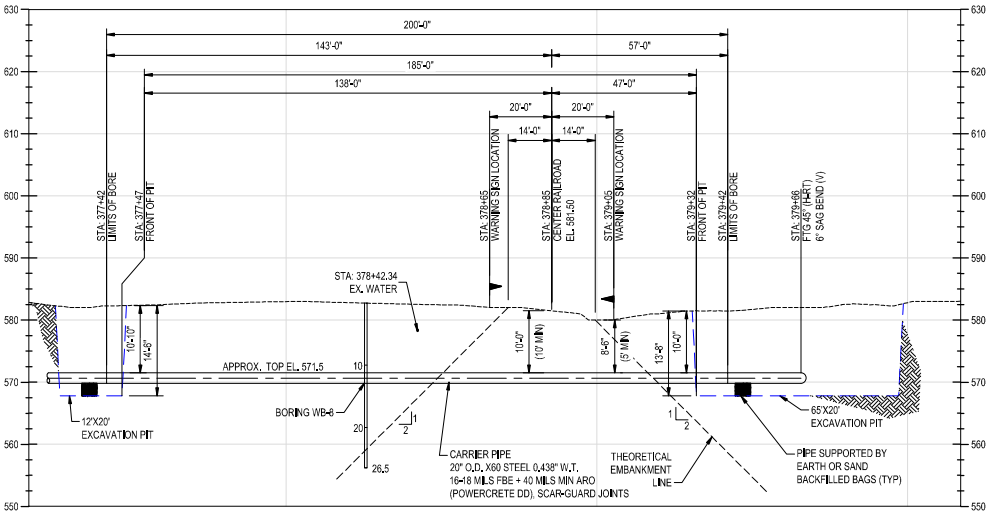
PLAN



PROFILE

NOTES:

1. ALL WORK ON NORFOLK SOUTHERN RIGHT-OF-WAY TO BE PERFORMED IN ACCORDANCE WITH NSCE-8 "SPECIFICATIONS FOR PIPELINE OCCUPANCY OF NORFOLK SOUTHERN CORPORATION PROPERTY" (CURRENT VERSION).
2. NO RAIL BRIDGES OR HIGHWAY GRADE CROSSING ON THIS RAIL SPUR.



PLAN/PROFILE VIEW SCALE
HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 10'

PROFESSIONAL ENGINEER STAMP
STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
11/18/2020

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS	
	-	-	REGIONAL ENGINEER
	-	-	MGR. TECH REC & STD
	11/18/2020	AMP	PRINCIPAL ENGINEER

C350 PROJECT
BORE CROSSING DETAIL 10
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OH

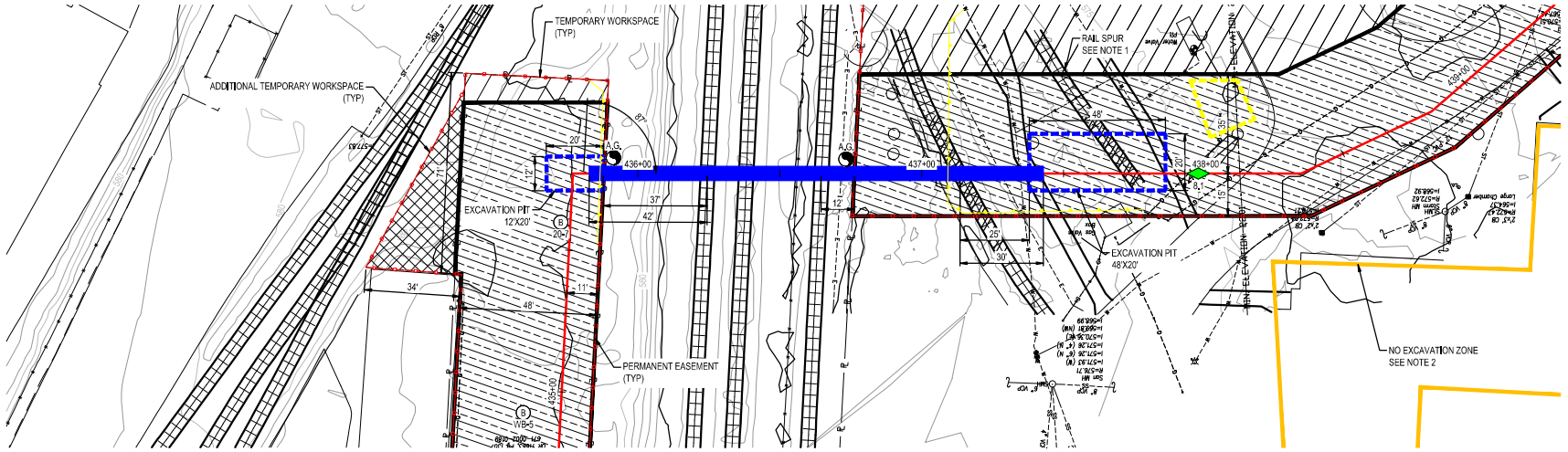
REF. DWG(S): PNG-G-350-0001009
PNG-B-350-0001012
PNG-C-350-0001213

SHEET(S)	10 OF 19	DWG SCALE	AS NOTED
DWG DATE	09-05-2018	SUPERSEDED	—

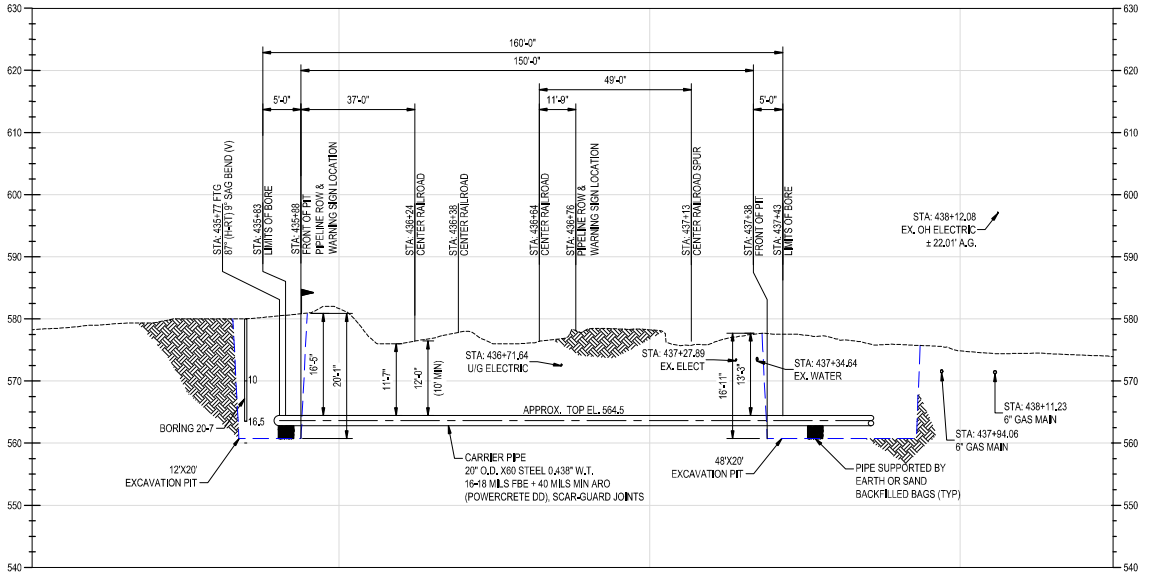
DRAWING NUMBER	REVISION
PNG -C-350-0001258	0

C:\HAMILTON COUNTY\C350

PLAN



PROFILE



PLAN/PROFILE VIEW SCALE

HORIZONTAL SCALE: 1" = 20'

VERTICAL SCALE: 1" = 10'

NOTES:
1. RAIL SPURS SHALL BE REMOVED WITHIN WORKSPACE AS INDICATED ON PLAN.
2. EXCAVATION PROHIBITED WITHIN AREAS INDICATED. AREA LOCATIONS APPROXIMATE. SEE "INSTITUTIONAL CONTROL" FORMER ROHM AND HAAS CHEMICALS LLC SITE READING, OHIO 000.72A.13.84.

PROFESSIONAL ENGINEER STAMP

STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
11/18/2020

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS			
DATE	INITIALS		
-	-	REGIONAL ENGINEER	
DATE	INITIALS	MGR. TECH REC & STD	
-	-		
DATE	INITIALS	PRINCIPAL ENGINEER	
11/18/2020	AMP		

C350 PROJECT
BORE CROSSING DETAIL 11
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OH

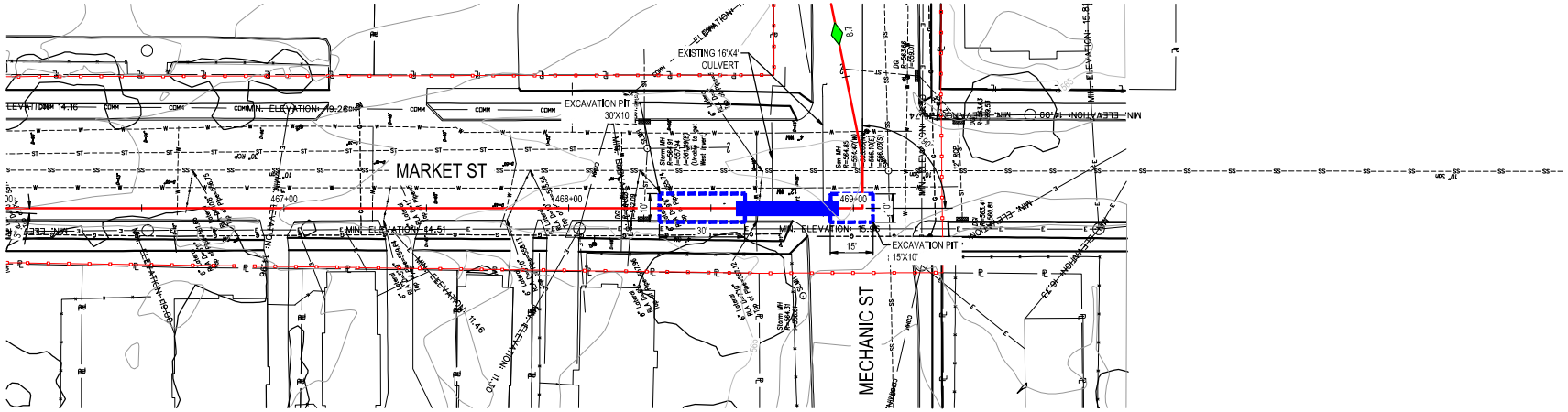
REF. DWG(S): PNG-G-350-0001009
PNG-B-350-0001010
PNG-C-350-0001219

SHEET(S) 11 OF 19	DWG SCALE AS NOTED
DWG DATE 09-05-2018	SUPERSEDED —

DRAWING NUMBER	REVISION
PNG -C-350-0001259	0

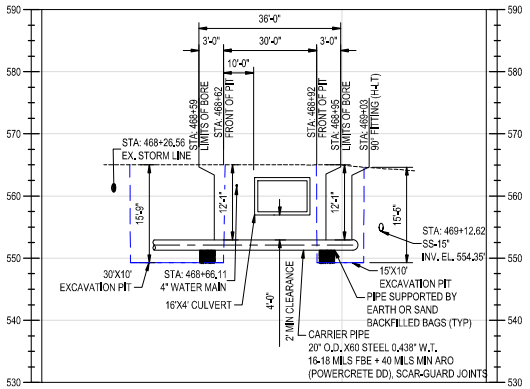
C:\HAMILTON COUNTY\C350

PLAN



PROFILE

PLAN/PROFILE VIEW SCALE
0 20' 40'
HORIZONTAL SCALE: 1" = 20'
0 10' 20'
VERTICAL SCALE: 1" = 10'



NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS	
	-	-	REGIONAL ENGINEER
	-	-	MGR. TECH REC & STD
	11/18/2020	AMP	PRINCIPAL ENGINEER

STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
11/18/2020
PROFESSIONAL ENG/ARCH STAMP

C350 PROJECT
BORE CROSSING DETAIL 12
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OH

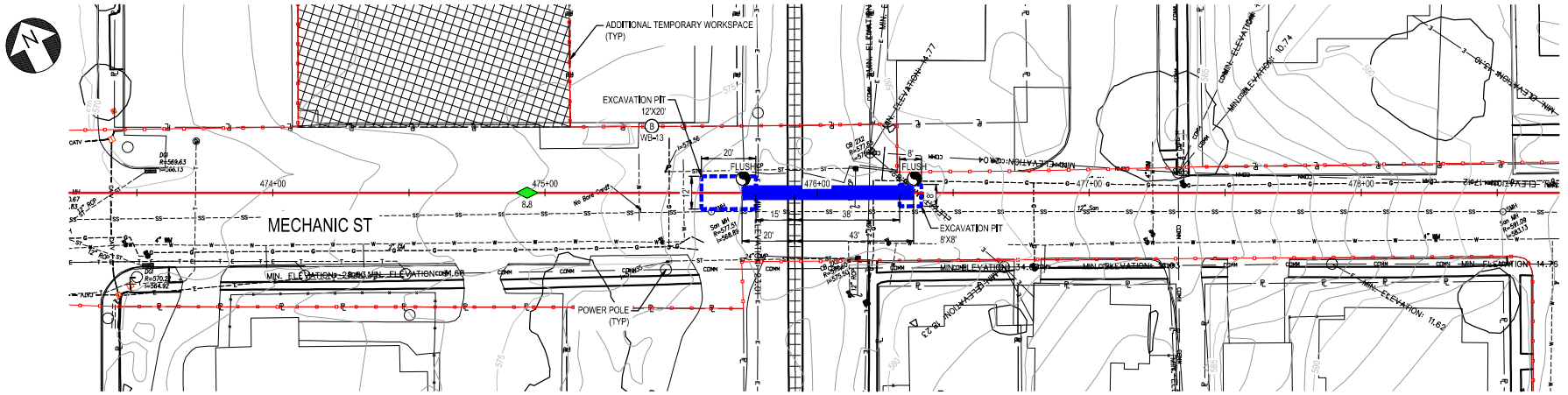
REF. DWG(S): PNG-G-350-0001009
PNG-C-350-0001222

SHEET(S)	12 OF 19	DWG SCALE	AS NOTED
DWG DATE	09-05-2018	SUPERSEDED	—

DRAWING NUMBER	REVISION
PNG -C-350-0001260	0

C:\HAMILTON COUNTY\C350

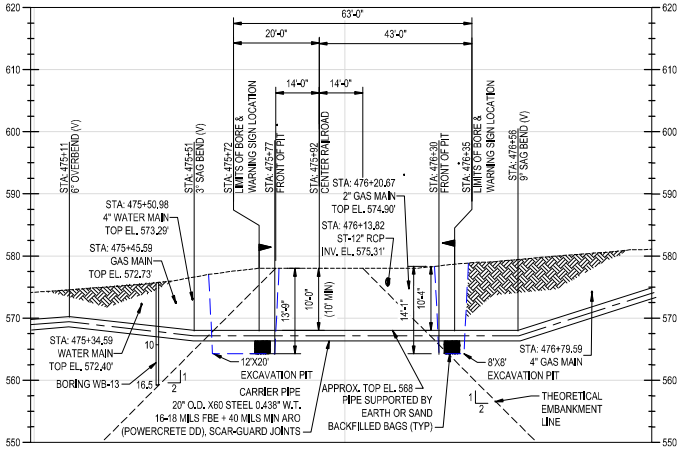
PLAN



PROFILE

NOTES:
1. PER I.O.R.Y. GENERAL SPECIFICATIONS FOR SUB-GRADE AND ABOVE GRADE UTILITY CROSSINGS OF RAILROAD'S RIGHT-OF-WAY: BORE PITS WILL BE PROTECTED WITH ADEQUATE SHEETING, BULKHEADS, AND SIDEWALLS TO PROTECT THE RAILROAD'S ROADBED.

PLAN/PROFILE VIEW SCALE
HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 10'



PROFESSIONAL ENGINEER STAMP
STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
11/18/2020

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION		APPROVALS		
AREA CODE	-	DATE -	INITIALS -	REGIONAL ENGINEER
ACCOUNT NUMBER	Q3680			
PROJECT NUMBER	1880115	DATE -	INITIALS -	MGR. TECH REC & STD
DRAWING BY	AKT			
STATION ID	C350	DATE 11/18/2020	INITIALS AMP	PRINCIPAL ENGINEER
CHECKER INITIALS	CNS			

C350 PROJECT
BORE CROSSING DETAIL 13
HAMILTON COUNTY, OHIO
HAMILTON COUNTY, OH

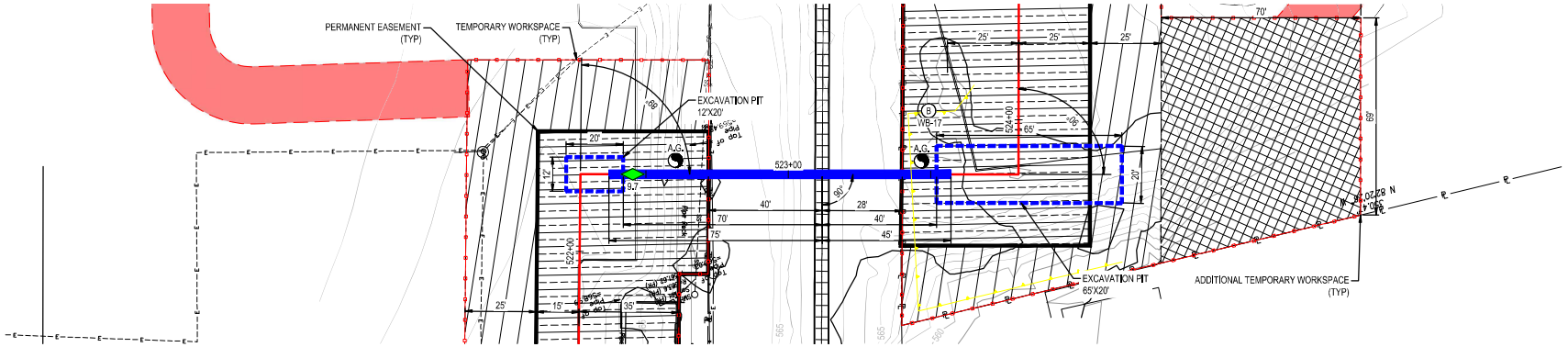
REF. DWG(S): PNG-G-350-0001009
PNG-B-350-0001014
PNG-C-350-0001223

SHEET(S) 13 OF 19	DWG SCALE AS NOTED
DWG DATE 09-05-2018	SUPERSEDED —

DRAWING NUMBER: PNG -C-350-0001261
REVISION: 0

C:\HAMILTON COUNTY\C350

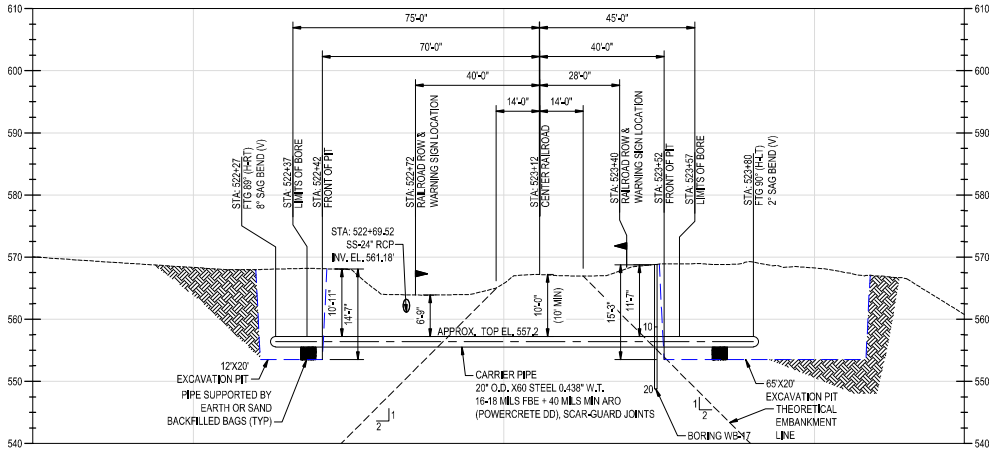
PLAN



PROFILE

NOTES:
1. PER I.O.R.Y. GENERAL SPECIFICATIONS FOR SUB-GRADE AND ABOVE GRADE UTILITY CROSSINGS OF RAILROAD'S RIGHT-OF-WAY: BORE PITS WILL BE PROTECTED WITH ADEQUATE SHEETING, BULKHEADS, AND SIDEWALLS TO PROTECT THE RAILROAD'S ROADBED.

PLAN/PROFILE VIEW SCALE
HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 10'



NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS		
DATE -	INITIALS -	REGIONAL ENGINEER
DATE -	INITIALS -	MGR. TECH REC & STD
DATE 11/18/2020	INITIALS AMP	PRINCIPAL ENGINEER

C350 PROJECT
BORE CROSSING DETAIL 14
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OH

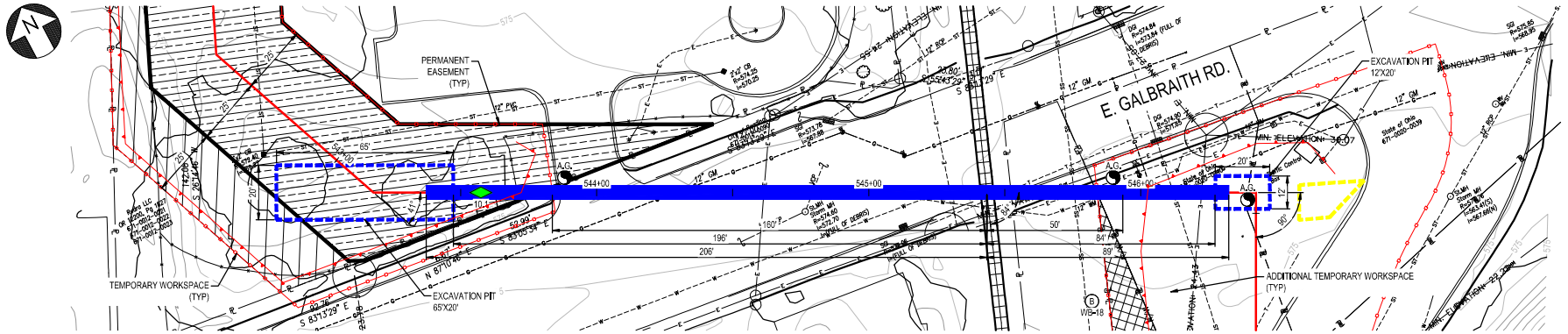
REF. DWG(S): PNG-G-350-0001009
PNG-B-350-0001015
PNG-C-350-0001227

SHEET(S) 14 OF 19	DWG SCALE AS NOTED
DWG DATE 09-05-2018	SUPERSEDED —

DRAWING NUMBER: PNG -C-350-0001262
REVISION: 0

C/HAMILTON COUNTY/C350

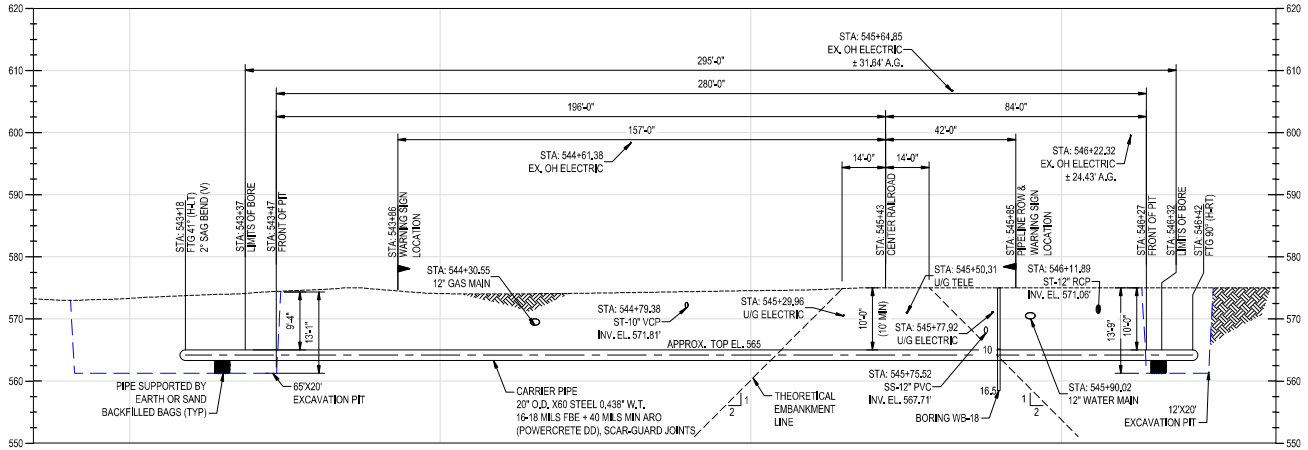
PLAN



PROFILE

NOTES:
1. PER I.O.R.Y. GENERAL SPECIFICATIONS FOR SUB-GRADE AND ABOVE GRADE UTILITY CROSSINGS OF RAILROAD'S RIGHT-OF-WAY: BORE PITS WILL BE PROTECTED WITH ADEQUATE SHEETING, BULKHEADS, AND SIDEWALLS TO PROTECT THE RAILROAD'S ROADBED.

PLAN/PROFILE VIEW SCALE
HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 10'



PROFESSIONAL ENGINEER STAMP
STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
11/18/2020

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS		
DATE	INITIALS	
-	-	REGIONAL ENGINEER
DATE	INITIALS	
-	-	MGR. TECH REC & STD
DATE	INITIALS	
11/18/2020	AMP	PRINCIPAL ENGINEER

C350 PROJECT
BORE CROSSING DETAIL 15
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OH

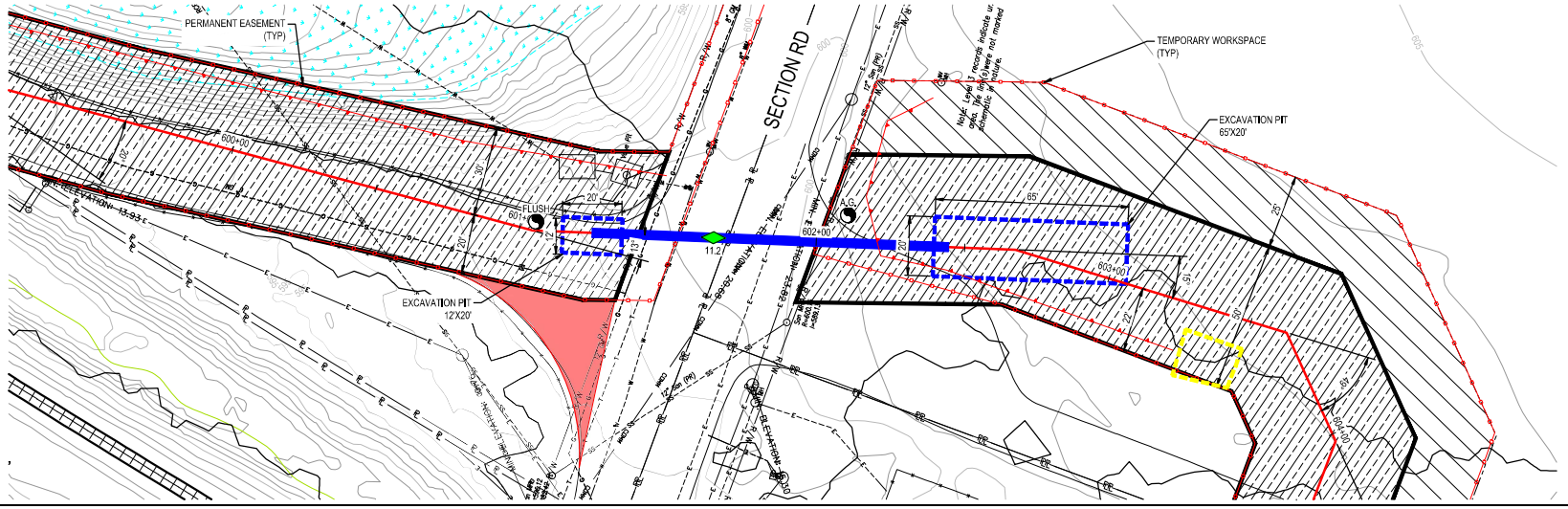
REF. DWG(S): PNG-G-350-0001009
PNG-B-350-0001014
PNG-C-350-0001229

SHEET(S)	15 OF 19	DWG SCALE	AS NOTED
DWG DATE	09-05-2018	SUPERSEDED	—

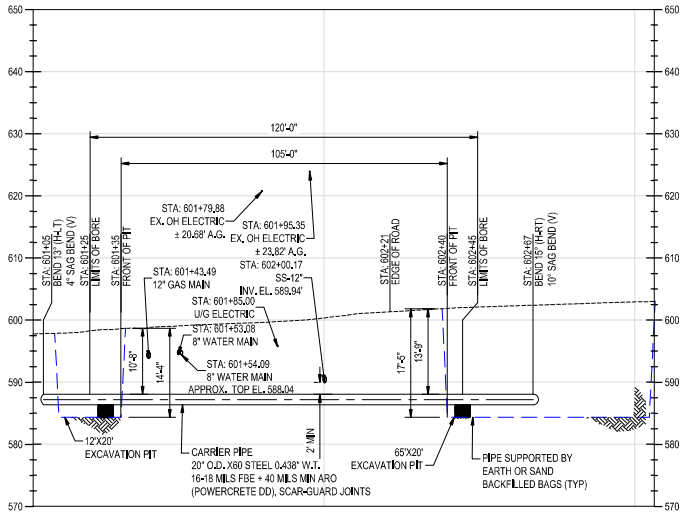
DRAWING NUMBER	REVISION
PNG -C-350-0001263	0

C:\HAMILTON COUNTY\C350

PLAN



PROFILE



PLAN/PROFILE VIEW SCALE

HORIZONTAL SCALE: 1" = 20'

VERTICAL SCALE: 1" = 10'

STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
11/18/2020
PROFESSIONAL ENGINEER STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS		
DATE	INITIALS	
-	-	REGIONAL ENGINEER
DATE	INITIALS	
-	-	MGR. TECH REC & STD
DATE	INITIALS	
11/18/2020	AMP	PRINCIPAL ENGINEER

C350 PROJECT
BORE CROSSING DETAIL 16
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OH

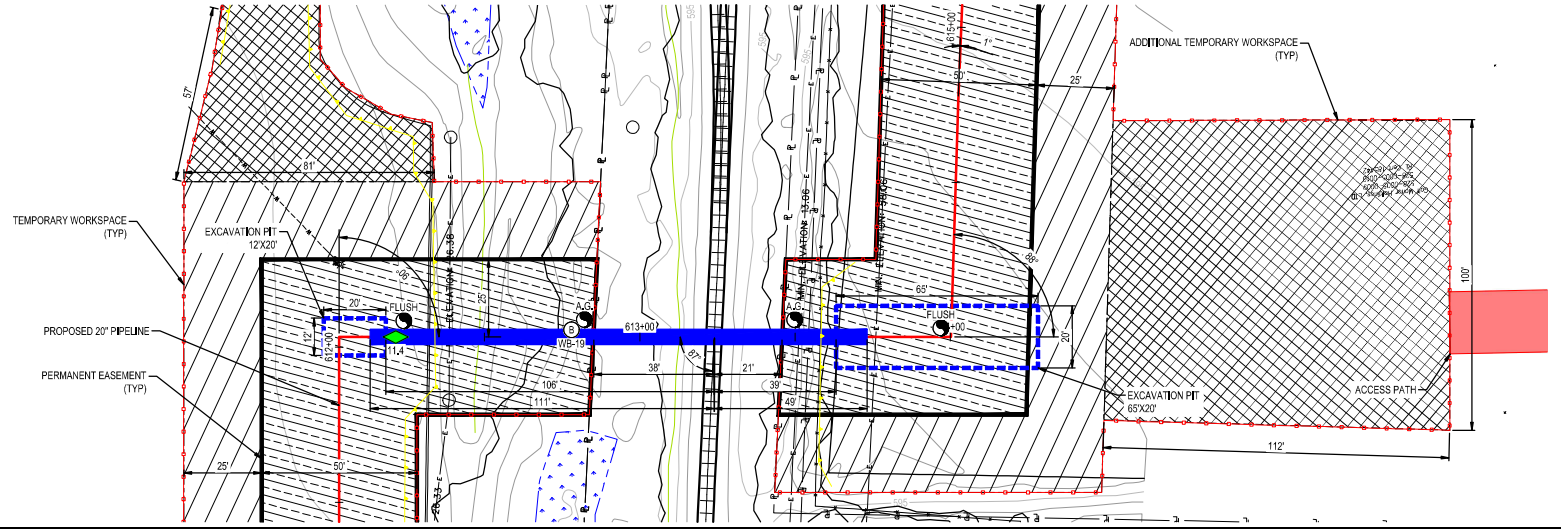
REF. DWG(S): PNG-G-350-0001009
PNG-C-350-0001234

SHEET(S)	16 OF 19	DWG SCALE	AS NOTED
DWG DATE	09-05-2018	SUPERSEDED	—

DRAWING NUMBER: PNG -C-350-0001264
REVISION: 0

C/HAMILTON COUNTY/C350

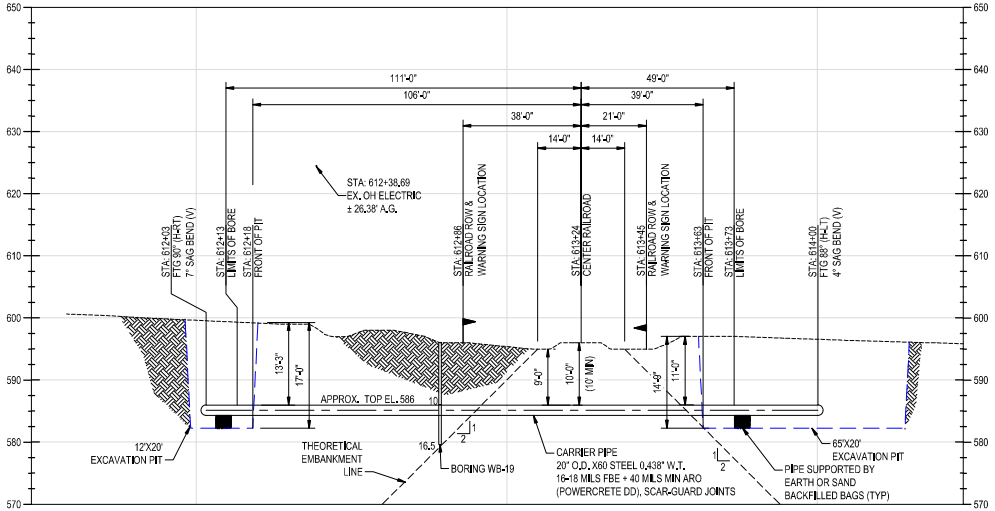
PLAN



NOTES:
1. PER I.O.R.Y. GENERAL SPECIFICATIONS FOR SUB-GRADE AND ABOVE GRADE UTILITY CROSSINGS OF RAILROAD'S RIGHT-OF-WAY: BORE PITS WILL BE PROTECTED WITH ADEQUATE SHEETING, BULKHEADS, AND SIDEWALLS TO PROTECT THE RAILROAD'S ROADBED.

PLAN/PROFILE VIEW SCALE
HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 10'

PROFILE



PROFESSIONAL ENGINEER STAMP
STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
11/18/2020

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS		
DATE	INITIALS	
-	-	REGIONAL ENGINEER
DATE	INITIALS	
-	-	MGR. TECH REC & STD
DATE	INITIALS	
11/18/2020	AMP	PRINCIPAL ENGINEER

C350 PROJECT
BORE CROSSING DETAIL 17
HAMILTON COUNTY, OHIO
HAMILTON COUNTY, OH

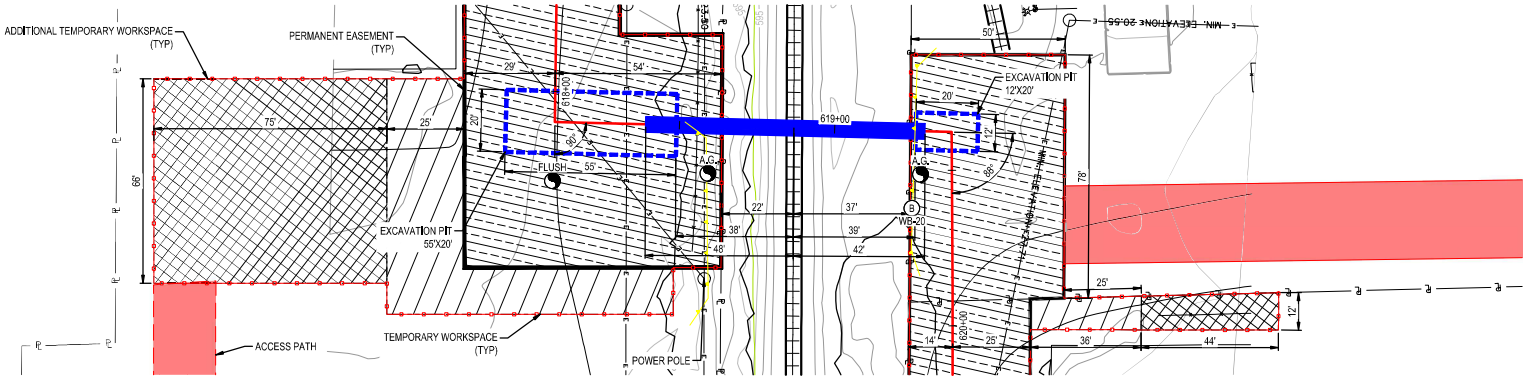
REF. DWG(S): PNC-G-350-0001009
PNC-B-350-0001014
PNC-C-350-0001235

SHEET(S) 17 OF 19	DWG SCALE AS NOTED
DWG DATE 09-05-2018	SUPERSEDED —

DRAWING NUMBER: PNG -C-350-0001265
REVISION: 0

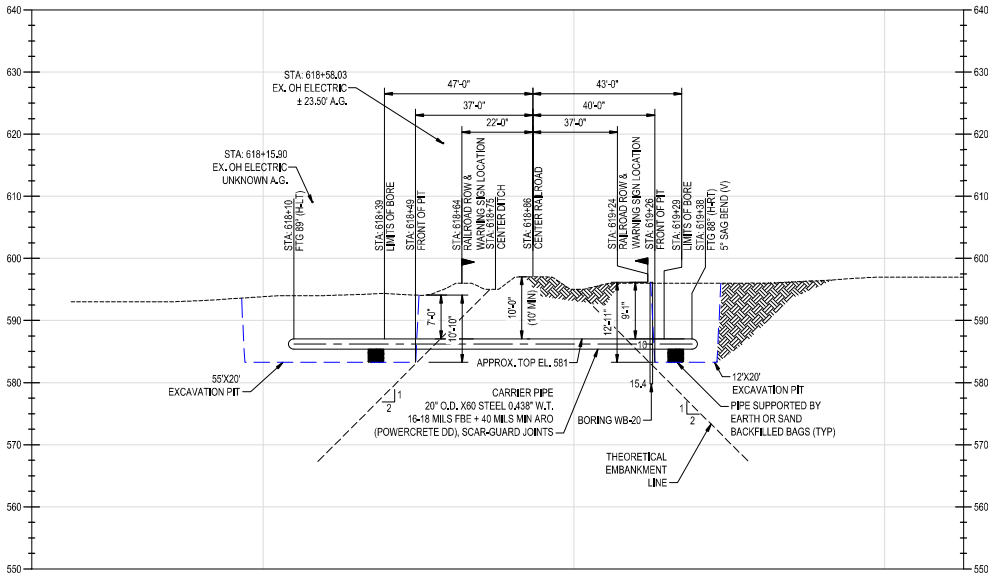
C/HAMILTON COUNTY/C350

PLAN



PROFILE

NOTES:
1. PER I.O.R.Y. GENERAL SPECIFICATIONS FOR SUB-GRADE AND ABOVE GRADE UTILITY CROSSINGS OF RAILROAD'S RIGHT-OF-WAY: BORE PITS WILL BE PROTECTED WITH ADEQUATE SHEETING, BULKHEADS, AND SIDEWALLS TO PROTECT THE RAILROAD'S ROADBED.



PLAN/PROFILE VIEW SCALE
HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 10'

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS	
	-	-	REGIONAL ENGINEER
	-	-	MGR. TECH REC & STD
	11/18/2020	AMP	PRINCIPAL ENGINEER

STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
11/18/2020
PROFESSIONAL ENGINEER STAMP

C350 PROJECT
BORE CROSSING DETAIL 18
HAMILTON COUNTY, OHIO
HAMILTON COUNTY, OH

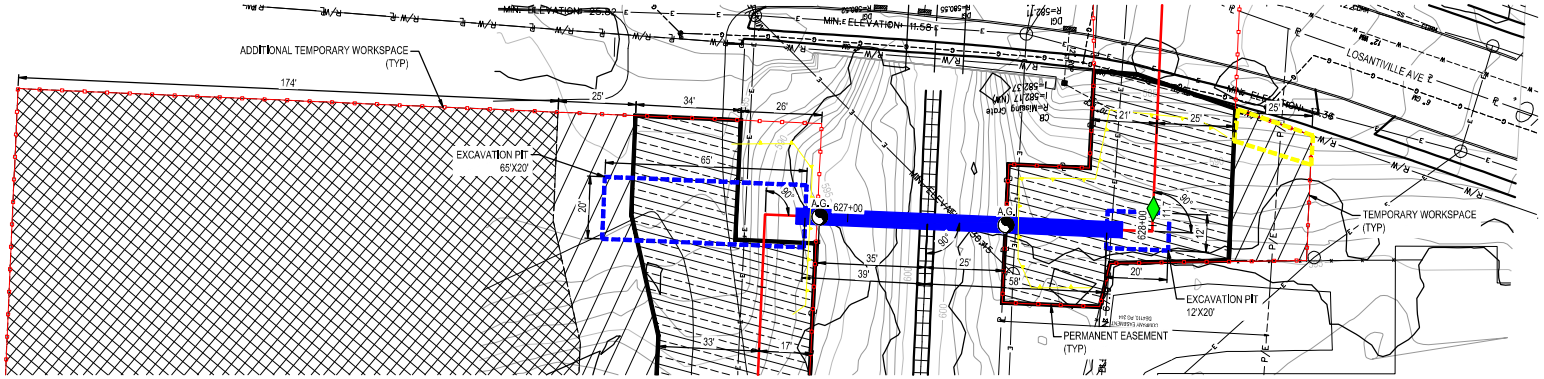
REF. DWG(S): PNG-G-350-0001009
PNG-B-350-0001014
PNG-C-350-0001236

SHEET(S)	18 OF 19	DWG SCALE	AS NOTED
DWG DATE	09-05-2018	SUPERSEDED	—

DRAWING NUMBER: PNG -C-350-0001266
REVISION: 0

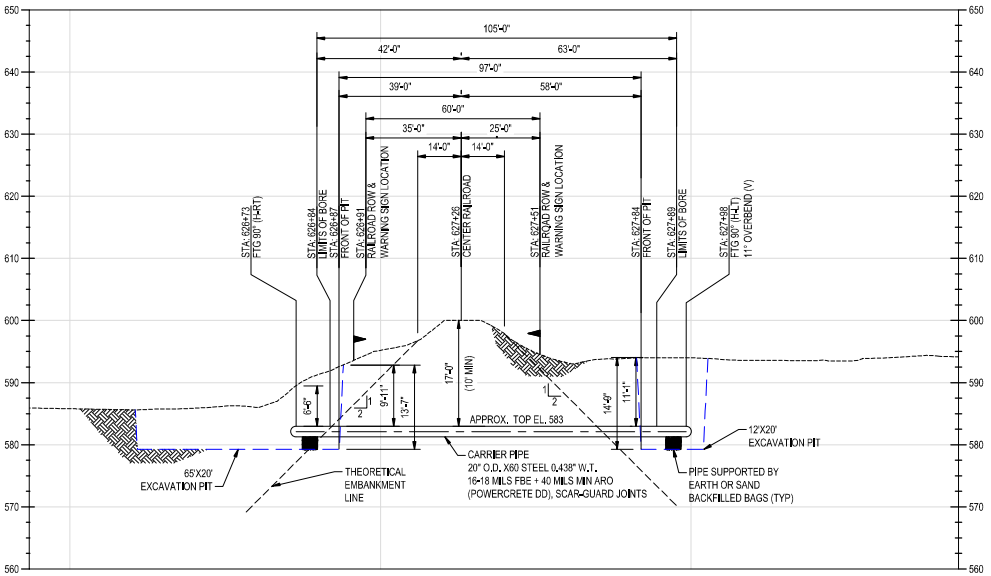
C/HAMILTON COUNTY/C350

PLAN



PROFILE

NOTES:
1. PER I.O.R.Y. GENERAL SPECIFICATIONS FOR SUB-GRADE AND ABOVE GRADE UTILITY CROSSINGS OF RAILROAD'S RIGHT-OF-WAY: BORE PITS WILL BE PROTECTED WITH ADEQUATE SHEETING, BULKHEADS, AND SIDEWALLS TO PROTECT THE RAILROAD'S ROADBED.



PLAN/PROFILE VIEW SCALE
HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 10'

PROFESSIONAL ENGINEER STAMP
STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
11/18/2020

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS		
DATE -	INITIALS -	REGIONAL ENGINEER
DATE -	INITIALS -	MGR. TECH REC & STD
DATE 11/18/2020	INITIALS AMP	PRINCIPAL ENGINEER

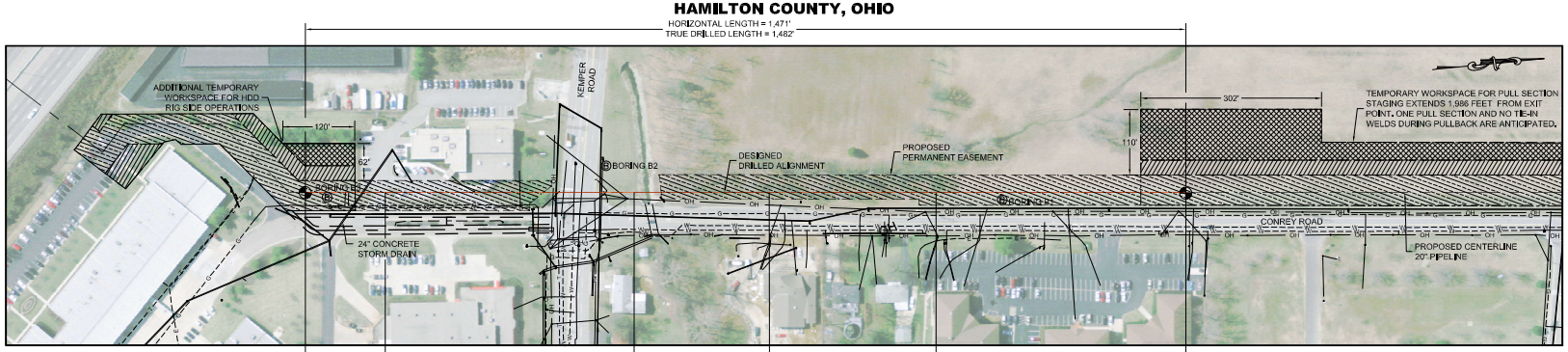
C350 PROJECT
BORE CROSSING DETAIL 19
HAMILTON COUNTY, OHIO
HAMILTON COUNTY, OH

REF. DWG(S): PNG-G-350-0001009
PNG-C-350-0001236

SHEET(S) 19 OF 19	DWG SCALE AS NOTED
DWG DATE 03-31-2020	SUPERSEDED —
DRAWING NUMBER PNG -C-350-0001267	REVISION 0

C:\HAMILTON COUNTY\C350

HAMILTON COUNTY, OHIO



PLAN

SCALE: 1"=100'

ENTRY POINT @ 12°
0+00.00, 860.00
N 471597.90, E 1441853.34

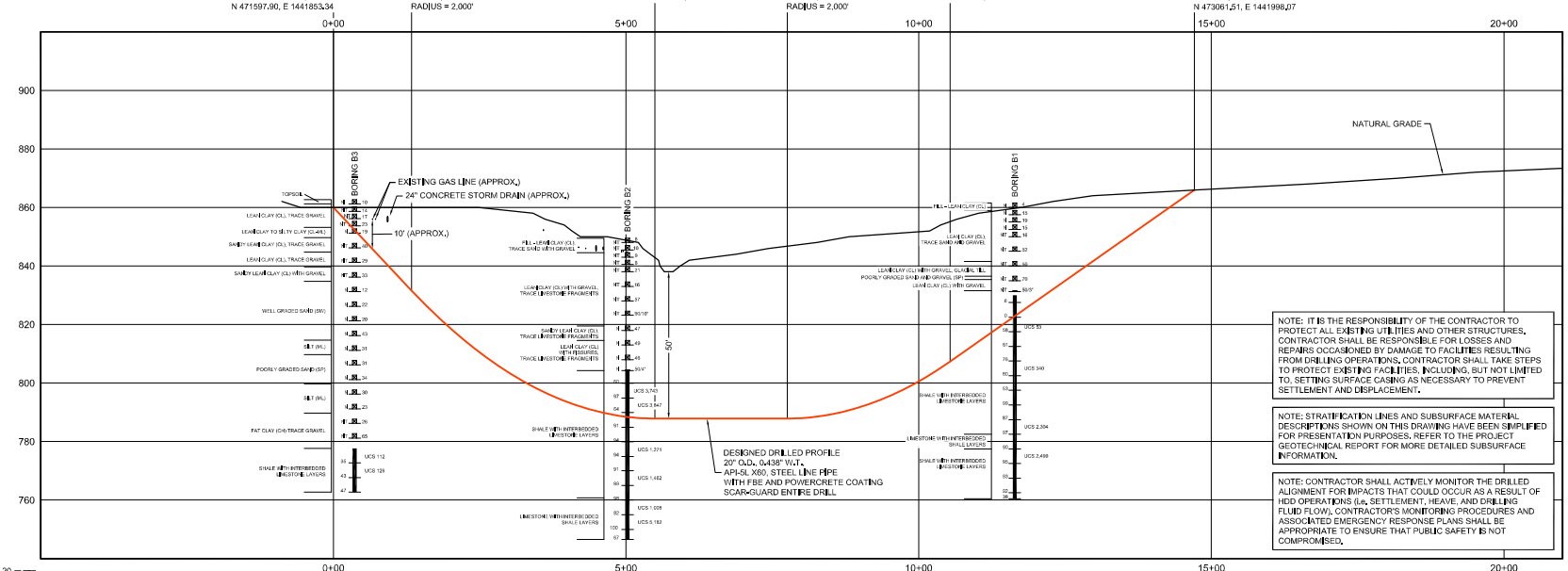
P.C. 12° SAG BEND
1+33.71, 831.58
RADIUS = 2,000'

P.T. 12° SAG BEND
5+49.54, 787.87

P.C. 8° SAG BEND
7+75.17, 787.87
RADIUS = 2,000'

P.T. 8° SAG BEND
10+53.52, 807.34

EXIT POINT @ 8°
14+70.75, 865.98
N 473061.51, E 1441998.07



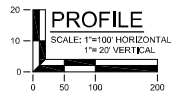
NOTE: IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROTECT ALL EXISTING UTILITIES AND OTHER STRUCTURES. CONTRACTOR SHALL BE RESPONSIBLE FOR LOSSES AND REPAIRS OCCASIONED BY DAMAGE TO FACILITIES RESULTING FROM DRILLING OPERATIONS. CONTRACTOR SHALL TAKE STEPS TO PROTECT EXISTING FACILITIES, INCLUDING, BUT NOT LIMITED TO, SETTING SURFACE CASING AS NECESSARY TO PREVENT SETTLEMENT AND DISPLACEMENT.

NOTE: STRATIFICATION LINES AND SUBSURFACE MATERIAL DESCRIPTIONS SHOWN ON THIS DRAWING HAVE BEEN SIMPLIFIED FOR PRESENTATION PURPOSES. REFER TO THE PROJECT GEOTECHNICAL REPORT FOR MORE DETAILED SUBSURFACE INFORMATION.

NOTE: CONTRACTOR SHALL ACTIVELY MONITOR THE DRILLED ALIGNMENT FOR IMPACTS THAT COULD OCCUR AS A RESULT OF HDD OPERATIONS (i.e., SETTLEMENT, HEAVE, AND DRILLING FLUID FLOW). CONTRACTOR'S MONITORING PROCEDURES AND ASSOCIATED EMERGENCY RESPONSE PLANS SHALL BE APPROPRIATE TO ENSURE THAT PUBLIC SAFETY IS NOT COMPROMISED.

PROFILE

SCALE: 1"=100' HORIZONTAL
1"= 20' VERTICAL



GENERAL LEGEND

DRILLED PATH ENTRY/EXIT POINT

GEOTECHNICAL LEGEND

B BORING LOCATION

SPLIT SPOON SAMPLE

53 N 23 — PENETRATION RESISTANCE IN BLOWS PER FOOT FOR A 140 POUND HAMMER FALLING 30 INCHES
PERCENTAGE OF GRAVEL BY WEIGHT FOR SAMPLES CONTAINING GRAVEL

CORE BARREL SAMPLE

UCS 6,250 — UNCONFINED COMPRESSIVE STRENGTH (PSI)
53 6 — MOHS HARDNESS
ROCK QUALITY DESIGNATION (PERCENT)

GEOTECHNICAL NOTES

1. GEOTECHNICAL DATA PROVIDED BY TERRACON CONSULTANTS, INC, CINCINNATI, OHIO. REFER TO THE PROJECT GEOTECHNICAL REPORT DATED OCTOBER 2020 FOR MORE DETAILED SUBSURFACE INFORMATION.
2. THE LETTER "N" TO THE LEFT OF A SPLIT SPOON SAMPLE INDICATES THAT NO GRAVEL WAS OBSERVED IN THE SAMPLE. THE LETTERS "NT" INDICATE THAT GRAVEL WAS OBSERVED BUT NO GRADATION TEST WAS PERFORMED.
3. THE GEOTECHNICAL DATA IS ONLY DESCRIPTIVE OF THE LOCATIONS ACTUALLY SAMPLED. EXTENSION OF THIS DATA OUTSIDE OF THE ORIGINAL BORINGS MAY BE DONE TO CHARACTERIZE THE SOIL CONDITIONS, HOWEVER, COMPANY DOES NOT GUARANTEE THESE CHARACTERIZATIONS TO BE ACCURATE. CONTRACTOR MUST USE HIS OWN EXPERIENCE AND JUDGMENT IN INTERPRETING THIS DATA.

TOPOGRAPHIC SURVEY NOTES

1. TOPOGRAPHIC SURVEY DATA PROVIDED BY XP-RS, LLC, OVERLAND PARK, KANSAS.
2. NORTHINGS AND EASTINGS ARE IN U.S. SURVEY FEET REFERENCED TO OHIO STATE PLANE COORDINATES, SOUTH ZONE, NAD 83.
3. ELEVATIONS ARE IN FEET REFERENCED TO NAVD 88.

DRILLED PATH NOTES

1. DRILLED PATH STATIONING IS IN FEET BY HORIZONTAL MEASUREMENT AND IS REFERENCED TO CONTROL ESTABLISHED FOR THE DRILLED SEGMENT.
2. DRILLED PATH COORDINATES REFER TO CENTERLINE OF PILOT HOLE AS OPPOSED TO TOP OF INSTALLED PIPE.

PILOT HOLE TOLERANCES

THE PILOT HOLE SHALL BE DRILLED TO THE TOLERANCES LISTED BELOW, HOWEVER, IN ALL CASES, RIGHT-OF-WAY RESTRICTIONS AND CONCERN FOR ADJACENT FACILITIES SHALL TAKE PRECEDENCE OVER THESE TOLERANCES.

1. ENTRY POINT: AT THE STAKED LOCATION
2. ENTRY ANGLE: INCREASE ANGLE UP TO 1-DEGREE (STEEPER), BUT NO DECREASE IN ANGLE ALLOWED
3. EXIT POINT: UP TO 5 FEET SHORT OR 10 FEET LONG RELATIVE TO THE DESIGNED EXIT POINT; UP TO 3 FEET RIGHT OR LEFT OF THE DESIGNED ALIGNMENT
4. EXIT ANGLE: NO INCREASE IN EXIT ANGLE, DECREASE UP TO 2-DEGREES (FLATTER)
5. ELEVATION: UP TO 2 FEET ABOVE AND 10 FEET BELOW THE DESIGNED PROFILE
6. ALIGNMENT: UP TO 5 FEET RIGHT, 0 FEET LEFT OF THE DESIGNED ALIGNMENT FROM STA. 0+00 TO 5+00. UP TO 5 FEET RIGHT OR LEFT BEYOND STA. 5+00
7. CURVE RADIUS: NO LESS THAN 1,200 FEET BASED ON A 3-JOINT AVERAGE

PROTECTION OF EXISTING FACILITIES

CONTRACTOR SHALL UNDERTAKE THE FOLLOWING STEPS PRIOR TO COMMENCING DRILLING OPERATIONS:

1. CONTACT THE UTILITY LOCATION/NOTIFICATION SERVICE FOR THE CONSTRUCTION AREA.
2. POSITIVELY LOCATE AND STAKE ALL EXISTING UNDERGROUND FACILITIES. ANY FACILITIES LOCATED WITHIN 10 FEET OF THE DESIGNED DRILLED PATH SHALL BE EXPOSED.
3. MODIFY DRILLING PRACTICES AND DOWNHOLE ASSEMBLIES AS NECESSARY TO PREVENT DAMAGE TO EXISTING FACILITIES.

MATERIAL	
CLASS / MAOP	1,471' / 500 PSIG

J.D. HAIR & ASSOCIATES, INC.
STATE LICENSE # COA 05060

STATE OF OHIO — JEFFREY M SCHOLL — 80894 — REGISTERED PROFESSIONAL ENGINEER

PROFESSIONAL ENGINEER STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/20	ISSUED FOR CONSTRUCTION	JMS	CNS	JMS

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	JMS
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS
REGIONAL ENGINEER		
MGR. TECH REC & STD		
PRINCIPAL ENGINEER	09/28/2020	JMS

DUKE ENERGY. | Piedmont Natural Gas

C350 PROJECT
KEMPER RD HDD ALIGNMENT SHEET
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

REF. DWG(S) PNG-C-350-0001182 PNG-B-350-0001008 PNG-C-350-0001183 PNG-B-350-0001009

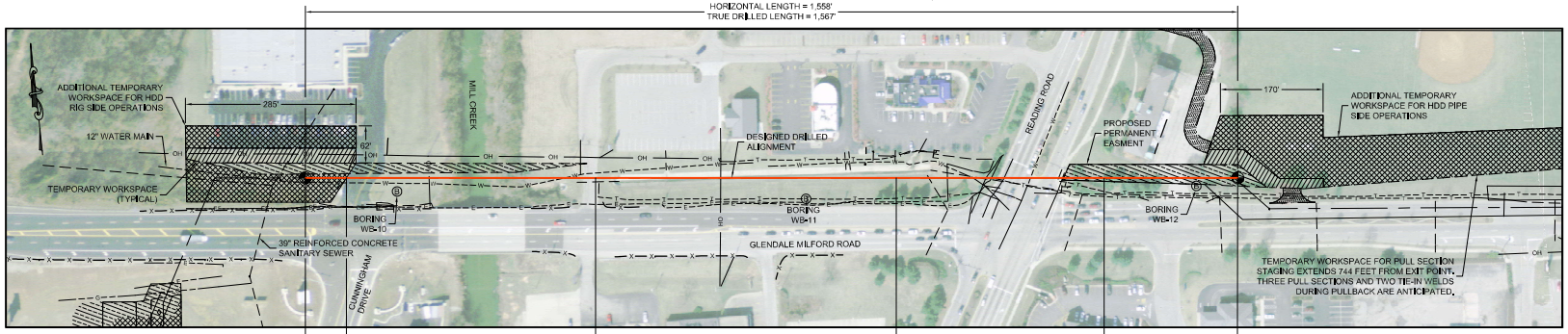
SHEET(S) 1 OF 4 | DWG SCALE AS NOTED

DWG DATE 09/05/18 | SUPERSEDED —

DRAWING NUMBER: PNG-C-350-0001272 | REVISION: 0

C/HAMILTON COUNTY/C350

HAMILTON COUNTY, OHIO



PLAN

SCALE: 1"=100'

ENTRY POINT @ 12°
0+00.00, 567.65
N 462765.21, E 1422952.83

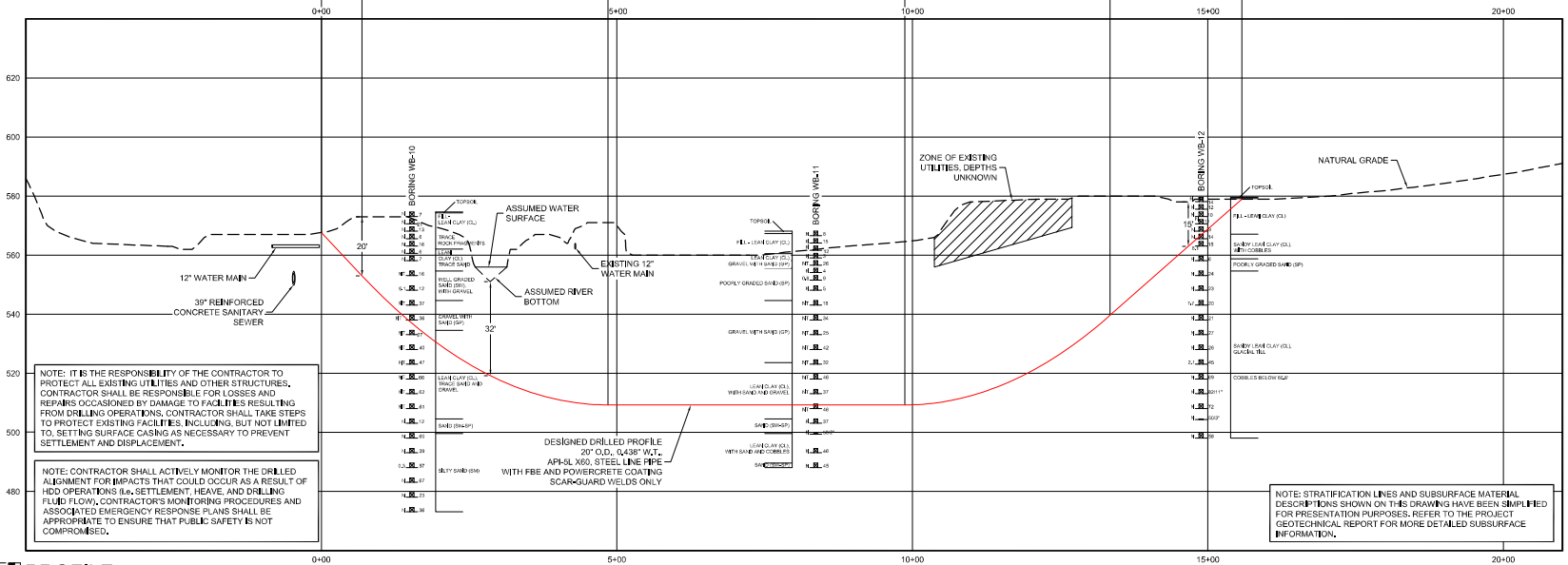
P.C. 12° SAG BEND
0+66.84, 553.00
RADIUS = 2,000'

P.T. 12° SAG BEND
4+84.76, 509.30

P.C. 10° SAG BEND
9+87.39, 505.30
RADIUS = 2,000'

P.T. 10° SAG BEND
13+34.69, 539.68

EXIT POINT @ 10°
15+57.69, 579.00
N 462596.45, E 1424501.14



NOTE: IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROTECT ALL EXISTING UTILITIES AND OTHER STRUCTURES. CONTRACTOR SHALL BE RESPONSIBLE FOR LOSSES AND REPAIRS OCCASIONED BY DAMAGE TO FACILITIES RESULTING FROM DRILLING OPERATIONS. CONTRACTOR SHALL TAKE STEPS TO PROTECT EXISTING FACILITIES, INCLUDING, BUT NOT LIMITED TO, SETTING SURFACE CASING AS NECESSARY TO PREVENT SETTLEMENT AND DISPLACEMENT.

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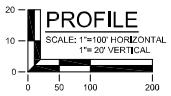
PROFILE

SCALE: 1"=100' HORIZONTAL
1"= 20' VERTICAL



GENERAL LEGEND

DRILLED PATH ENTRY/EXIT POINT

GEOTECHNICAL LEGEND

B — BORING LOCATION

SPLIT SPOON SAMPLE

53 / N / 23 — PENETRATION RESISTANCE IN BLOWS PER FOOT FOR A 140 POUND HAMMER FALLING 30 INCHES
PERCENTAGE OF GRAVEL BY WEIGHT FOR SAMPLES CONTAINING GRAVEL

CORE BARREL SAMPLE

UCS 6,250 — UNCONFINED COMPRESSIVE STRENGTH (PSI)
53 / 6 — MOHS HARDNESS
ROCK QUALITY DESIGNATION (PERCENT)

GEOTECHNICAL NOTES

1. GEOTECHNICAL DATA PROVIDED BY TERRACON CONSULTANTS, INC. CINCINNATI, OHIO. REFER TO THE GEOTECHNICAL ENGINEERING REPORT DATED OCTOBER 2020 FOR MORE DETAILED SUBSURFACE INFORMATION.
2. THE LETTER "N" TO THE LEFT OF A SPLIT SPOON SAMPLE INDICATES THAT NO GRAVEL WAS OBSERVED IN THE SAMPLE. THE LETTERS "NT" INDICATE THAT GRAVEL WAS OBSERVED BUT NO GRADATION TEST WAS PERFORMED.
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TOPOGRAPHIC SURVEY NOTES

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3. ELEVATIONS ARE IN FEET REFERENCED TO NAVD 88.

DRILLED PATH NOTES

1. DRILLED PATH STATIONING IS IN FEET BY HORIZONTAL MEASUREMENT AND IS REFERENCED TO CONTROL ESTABLISHED FOR THE DRILLED SEGMENT.
2. DRILLED PATH COORDINATES REFER TO CENTERLINE OF PILOT HOLE AS OPPOSED TO TOP OF INSTALLED PIPE.

PILOT HOLE TOLERANCES

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3. EXIT POINT: UP TO 5 FEET SHORT OR 10 FEET LONG RELATIVE TO THE DESIGNED EXIT POINT; UP TO 3 FEET RIGHT OR LEFT OF THE DESIGNED ALIGNMENT
4. EXIT ANGLE: NO INCREASE IN EXIT ANGLE. DECREASE UP TO 2-DEGREES (FLATTER)
5. ELEVATION: UP TO 2 FEET ABOVE AND 10 FEET BELOW THE DESIGNED PROFILE
6. ALIGNMENT: UP TO 5 FEET RIGHT OR LEFT OF THE DESIGNED ALIGNMENT
7. CURVE RADIUS: NO LESS THAN 1,200 FEET BASED ON A 3-JOINT AVERAGE

PROTECTION OF EXISTING FACILITIES

CONTRACTOR SHALL UNDERTAKE THE FOLLOWING STEPS PRIOR TO COMMENCING DRILLING OPERATIONS:

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2. POSITIVELY LOCATE AND STAKE ALL EXISTING UNDERGROUND FACILITIES. ANY FACILITIES LOCATED WITHIN 10 FEET OF THE DESIGNED DRILLED PATH SHALL BE EXPOSED.
3. MODIFY DRILLING PRACTICES AND DOWNHOLE ASSEMBLIES AS NECESSARY TO PREVENT DAMAGE TO EXISTING FACILITIES.

MATERIAL	
CLASS / MAOP	500 PSIG

1,558'

J.D. HAIR & ASSOCIATES, INC.
STATE LICENSE # COA 05060

STATE OF OHIO
JEFFREY M SCHOLL
80694
REGISTERED
PROFESSIONAL ENGINEER
11/18/20
PROFESSIONAL ENGINEER STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/20	ISSUED FOR CONSTRUCTION	JMS	CNS	JMS

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	JMS
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS
REGIONAL ENGINEER		
MGR TECH REC & STD		
PRINCIPAL ENGINEER	11/02/20	JMS

DUKE ENERGY. | Piedmont Natural Gas

C350 PROJECT
MILL CREEK 1 HDD ALIGNMENT SHEET
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

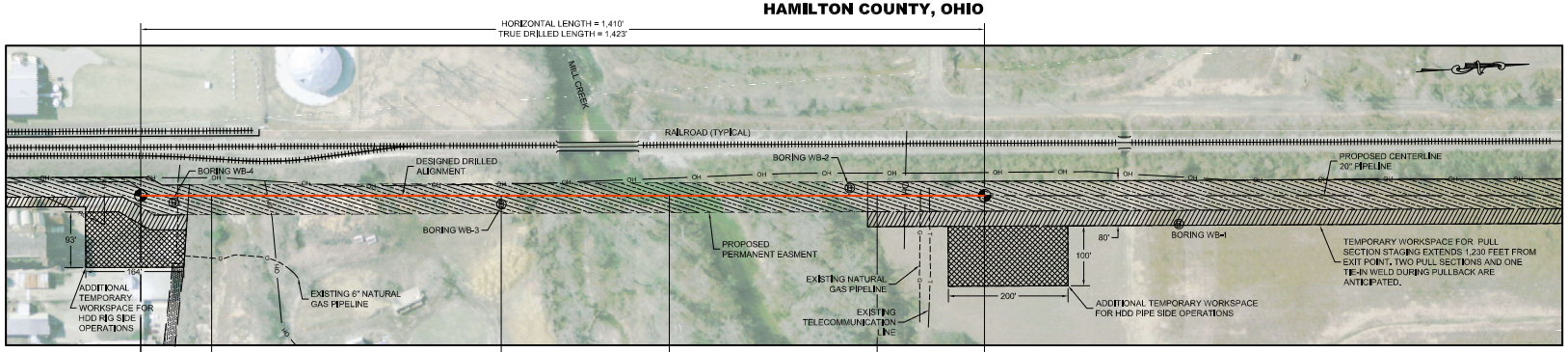
REF. DWG(S) PNG-C-350-0001208 PNG-B-350-0001013
PNG-C-350-0001209 PNG-B-350-0001014

SHEET(S) 2 OF 4 | DWG SCALE AS NOTED
DWG DATE 09/05/18 | SUPERSEDED

DRAWING NUMBER: PNG-C-350-0001273
REVISION: 0

C/HAMILTON COUNTY/C350

HAMILTON COUNTY, OHIO



PLAN

SCALE: 1"=100'

ENTRY POINT @ 14°
0+00.00, 585.00
N 456249.83, E 1420117.12

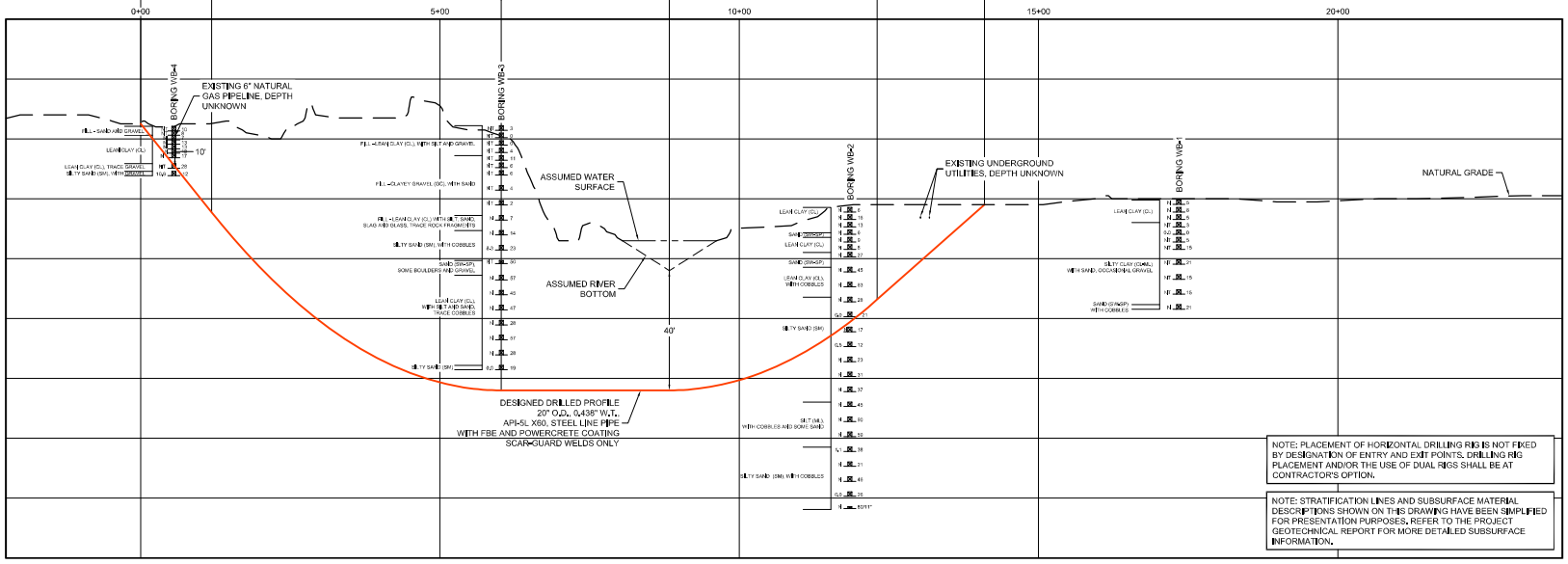
P.C. 14° SAG BEND
1+18.68 , 555.41
RADIUS = 2,000'

P.T. 14° SAG BEND
6+02.53, 496.00

P.C. 10° SAG BEND
8+83.28, 496.00
RADIUS = 2,000'

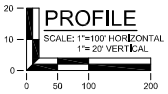
P.T. 10° SAG BEND
12+30.57, 526.39

EXIT POINT @ 10°
14+09.87, 556.00
N 457656.47, E 1420212.57



PROFILE

SCALE: 1"=100' HORIZONTAL
1"= 20' VERTICAL



GENERAL LEGEND

DRILLED PATH ENTRY/EXIT POINT

GEOTECHNICAL LEGEND

BORING LOCATION

SPLIT SPOON SAMPLE

53 / 23 — PENETRATION RESISTANCE IN BLOWS PER FOOT FOR A 140 POUND HAMMER FALLING 30 INCHES
PERCENTAGE OF GRAVEL BY WEIGHT FOR SAMPLES CONTAINING GRAVEL

CORE BARREL SAMPLE

UCS 6,250 — UNCONFINED COMPRESSIVE STRENGTH (PSI)
53 / 6 — MOHS HARDNESS
ROCK QUALITY DESIGNATION (PERCENT)

GEOTECHNICAL NOTES

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TOPOGRAPHIC SURVEY NOTES

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3. ELEVATIONS ARE IN FEET REFERENCED TO NAVD 88.

DRILLED PATH NOTES

1. DRILLED PATH STATIONING IS IN FEET BY HORIZONTAL MEASUREMENT AND IS REFERENCED TO CONTROL ESTABLISHED FOR THE DRILLED SEGMENT.
2. DRILLED PATH COORDINATES REFER TO CENTERLINE OF PILOT HOLE AS OPPOSED TO TOP OF INSTALLED PIPE.

PILOT HOLE TOLERANCES

THE PILOT HOLE SHALL BE DRILLED TO THE TOLERANCES LISTED BELOW, HOWEVER, IN ALL CASES, RIGHT-OF-WAY RESTRICTIONS AND CONCERN FOR ADJACENT FACILITIES SHALL TAKE PRECEDENCE OVER THESE TOLERANCES.

1. ENTRY POINT: AT THE STAKED LOCATION
2. ENTRY ANGLE: INCREASE ANGLE UP TO 1-DEGREE (STEEPER), BUT NO DECREASE IN ANGLE ALLOWED
3. EXIT POINT: UP TO 5 FEET SHORT OR 10 FEET LONG RELATIVE TO THE DESIGNED EXIT POINT; UP TO 3 FEET RIGHT OR LEFT OF THE DESIGNED ALIGNMENT
4. EXIT ANGLE: NO INCREASE IN EXIT ANGLE. DECREASE UP TO 2-DEGREES (FLATTER)
5. ELEVATION: UP TO 2 FEET ABOVE AND 10 FEET BELOW THE DESIGNED PROFILE
6. ALIGNMENT: UP TO 5 FEET RIGHT OR LEFT OF THE DESIGNED ALIGNMENT
7. CURVE RADIUS: NO LESS THAN 1,200 FEET BASED ON A 3-JOINT AVERAGE

PROTECTION OF EXISTING FACILITIES

CONTRACTOR SHALL UNDERTAKE THE FOLLOWING STEPS PRIOR TO COMMENCING DRILLING OPERATIONS:

1. CONTACT THE UTILITY LOCATION/NOTIFICATION SERVICE FOR THE CONSTRUCTION AREA.
2. POSITIVELY LOCATE AND STAKE ALL EXISTING UNDERGROUND FACILITIES. ANY FACILITIES LOCATED WITHIN 10 FEET OF THE DESIGNED DRILLED PATH SHALL BE EXPOSED.
3. MODIFY DRILLING PRACTICES AND DOWNHOLE ASSEMBLIES AS NECESSARY TO PREVENT DAMAGE TO EXISTING FACILITIES.

MATERIAL	⌀1,410"
CLASS / MAOP	500 PSIG

J.D. HAIR & ASSOCIATES, INC.
STATE LICENSE # COA 05060

STATE OF OHIO
11/18/20
JEFFREY M SCHOLL
80894
REGISTERED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/20	ISSUED FOR CONSTRUCTION	JMS	CNS	JMS

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	JMS
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS	
			REGIONAL ENGINEER
			MGR. TECH REC & STD
	11/02/20	JMS	PRINCIPAL ENGINEER

C350 PROJECT
MILL CREEK 2 HDD ALIGNMENT SHEET
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

REF. DWG(S) PNG-C-350-0001216 PNG-B-350-0001010 PNG-C-350-0001217 PNG-B-350-0001011

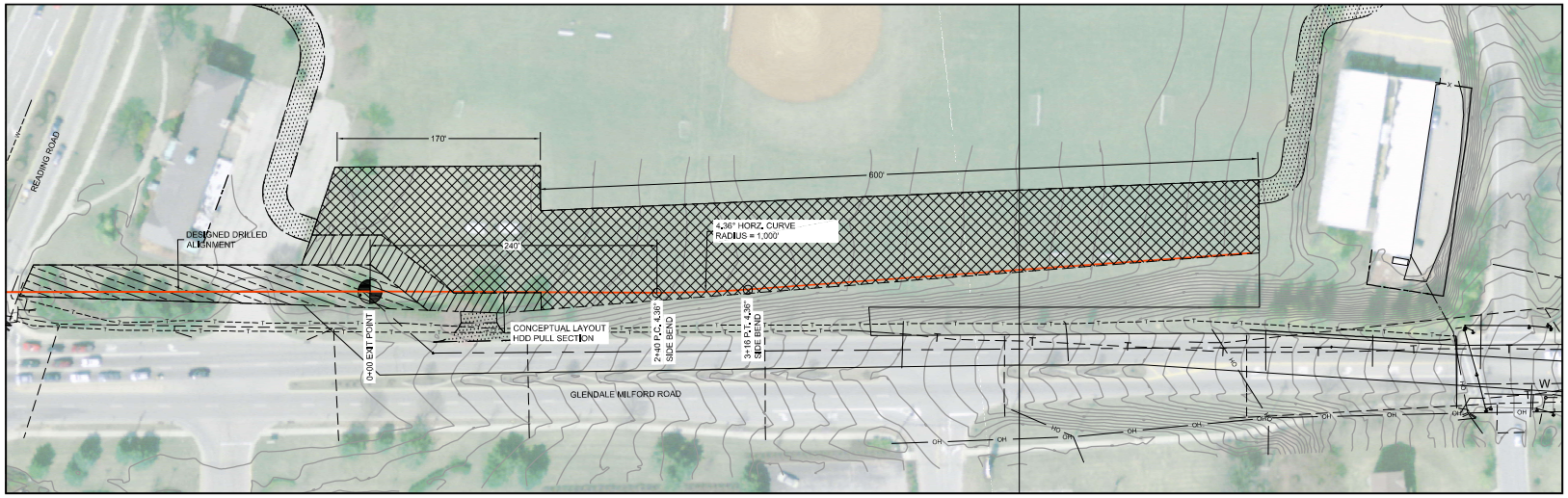
SHEET(S) 3 OF 4 | DWG SCALE AS NOTED

DWG DATE 09/05/18 | SUPERSEDED —

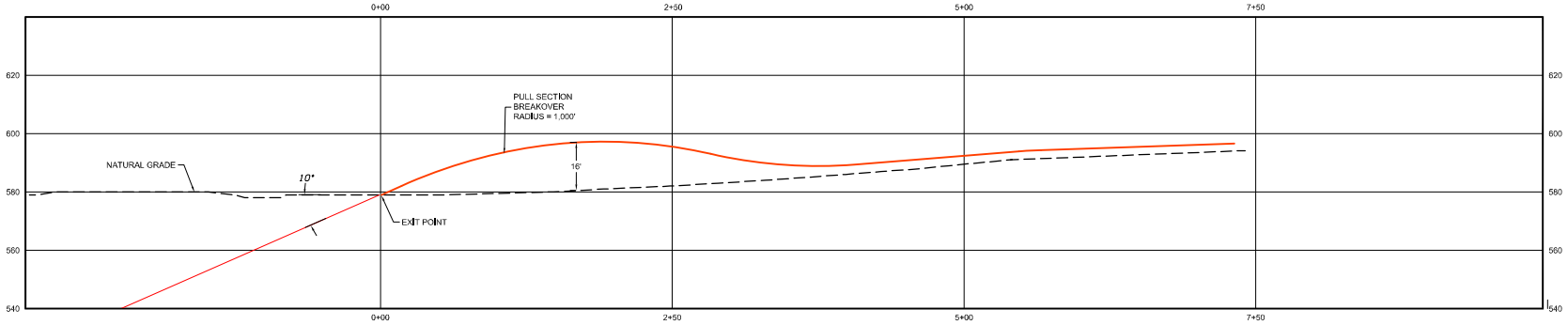
DRAWING NUMBER: PNG-C-350-0001274 | REVISION: 0

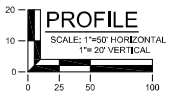
C:\HAMILTON COUNTY\C350

HAMILTON COUNTY, OHIO



PLAN
SCALE: 1"=100'





PROFILE
SCALE: 1"=50' HORIZONTAL
1"= 20' VERTICAL

GENERAL LEGEND

DRILLED PATH ENTRY/EXIT POINT

TOPOGRAPHIC SURVEY NOTES

1. TOPOGRAPHIC SURVEY DATA PROVIDED BY XP-RS, LLC, OVERLAND PARK, KANSAS.
2. ELEVATIONS ARE IN FEET REFERENCED TO NAVD 88.

GENERAL NOTES

1. CONCEPTUAL PULL SECTION GEOMETRY SHOWN IS FOR INFORMATIONAL PURPOSES ONLY. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THEIR OWN PULL SECTION GEOMETRY, LIFTING HEIGHTS, LIFT POINTS, AND OVERALL LIFTING PLAN TO SAFELY HANDLE THE PULL SECTION AND AVOID DAMAGING OR OVERSTRESSING THE PIPE.
2. PULL SECTION GEOMETRY SHOWN INVOLVES HORIZONTAL AND VERTICAL RADII SET TO 1,000 FEET, WHICH INDUCES A BENDING STRESS THAT IS 40% OF SMYS WHEN EVALUATED IN A SINGLE PLANE, AND 57% OF SMYS WHEN CONSIDERING THE COMBINED RADIUS IN BOTH PLANES.

MATERIAL	⌀1,558"
CLASS / MAOP	500 PSIG

J.D. HAIR & ASSOCIATES, INC.
STATE LICENSE # COA 05060

STATE OF OHIO — JEFFREY M SCHOLL — 80894 — REGISTERED PROFESSIONAL ENGINEER — 11/19/20
PROFESSIONAL ENGINEER STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/20	ISSUED FOR CONSTRUCTION	JMS	CNS	JMS

DESCRIPTION		APPROVALS		
AREA CODE	-	DATE	INITIALS	REGIONAL ENGINEER
ACCOUNT NUMBER	Q3680			
PROJECT NUMBER	1880115	DATE	INITIALS	MGR. TECH REC & STD
DRAWING BY	JMS			
STATION ID	C350	DATE	INITIALS	PRINCIPAL ENGINEER
CHECKER INITIALS	CNS	11/02/20	JMS	

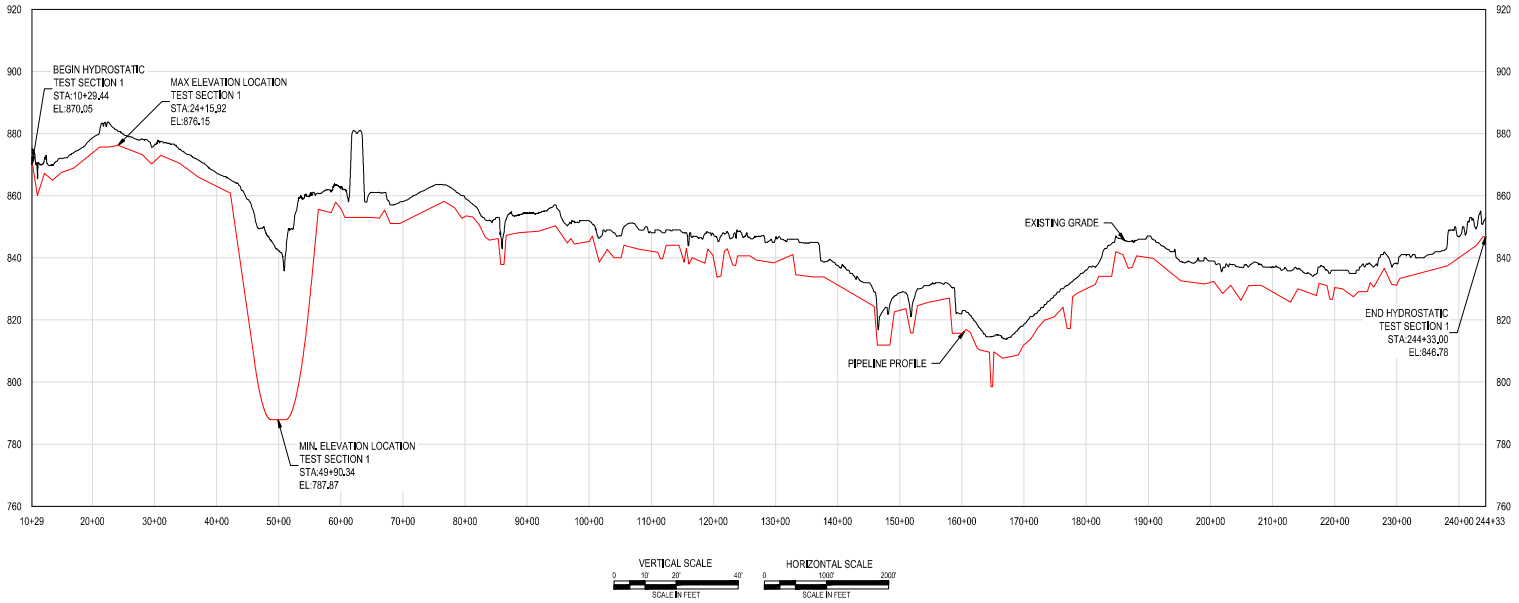
DUKE ENERGY. | Piedmont Natural Gas

C350 PROJECT
MILL CREEK 1 PIPESIDE DETAIL
HAMILTON COUNTY, OHIO
HAMILTON COUNTY, OHIO

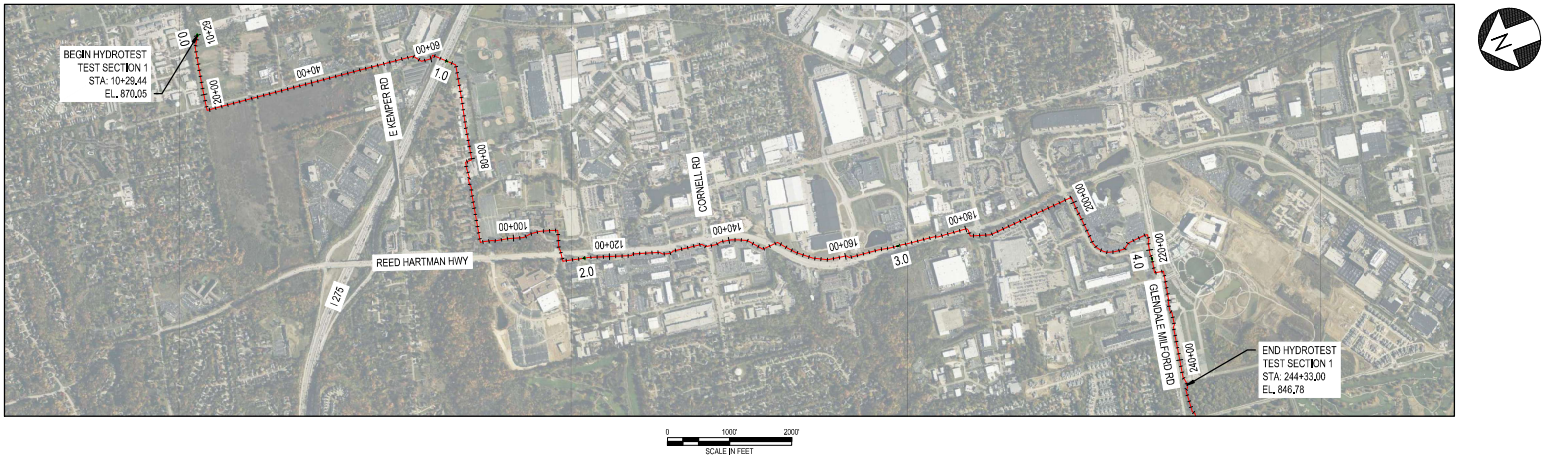
REF. DWG(S) PNG-C-350-0001208, PNG-C-350-0001273

SHEET(S) 4 OF 4	DWG SCALE AS NOTED
DWG DATE 07/03/20	SUPERSEDED
DRAWING NUMBER	REVISION
PNG-C-350-0001275	0

C/HAMILTON COUNTY/C350



Test Section 1, Hydrostatic Testing Summary							
Test Procedure	GD10.1003-1						
Source	Hydrant on Glendale Milford Road						
Discharge	Test Section 2						
Medium	Water			Duration (hours)		8	
Volume (gallons)	349,195			Length (ft)		23,404	
Description	Location	Station	Elevation (ft)	Static Pressure (psig)		Hoop Stress as % of SMYS	
				Minimum	Maximum	Minimum	Maximum
Test Head	MLV1	244+33	847	788	888	30%	42%
Start TS 1	HIGHPOINT	10+29	870	778	878	30%	41%
High Point	--	24+16	876	775	875	29%	41%
Low Point	--	49+90	788	813	913	31%	43%
End TS 1	MLV1	244+33	847	788	888	30%	42%
MINIMUM TEST PRESSURE 1.5 x MAOP + 100 PSIG FOR MAXIMUM							



NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS	
	-	-	REGIONAL ENGINEER
	-	-	MGR TECH REC & STD
	11/18/2020	AMP	PRINCIPAL ENGINEER

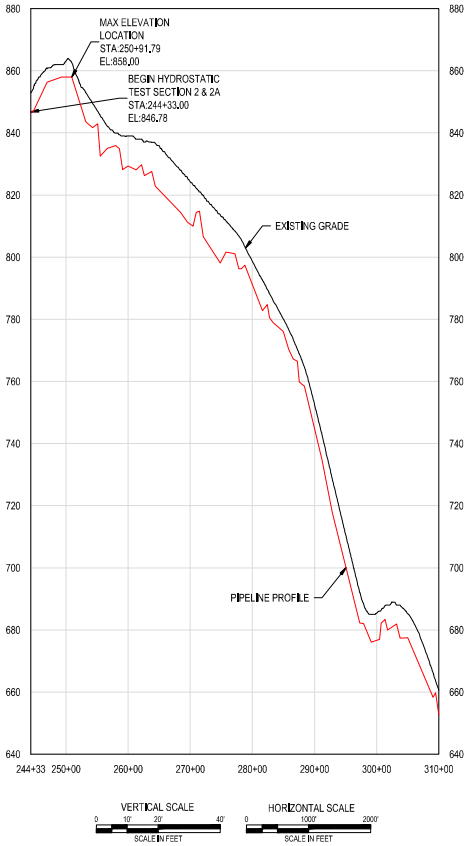
C350 PROJECT
TEST SEGMENT 1
HYDROTEST OVERVIEW

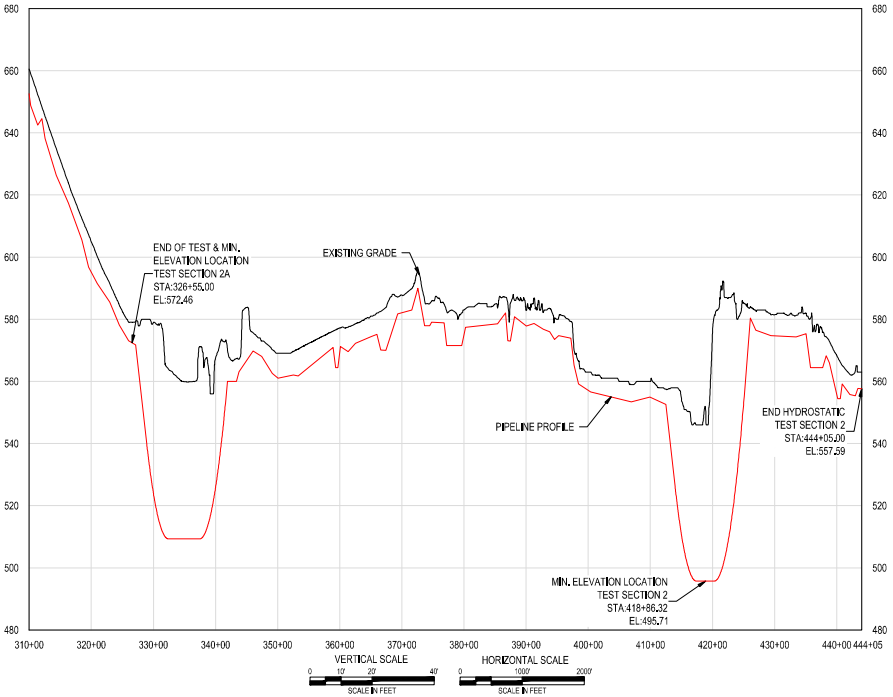
HAMILTON COUNTY, OHIO

REF. DWG(S) PNG-G-350-0001009

SHEET(S)	1 OF 3	DWG SCALE	AS NOTED
DWG DATE	09-05-2018	SUPERSEDED	—
DRAWING NUMBER	PNG -C-350-0001278	REVISION	0

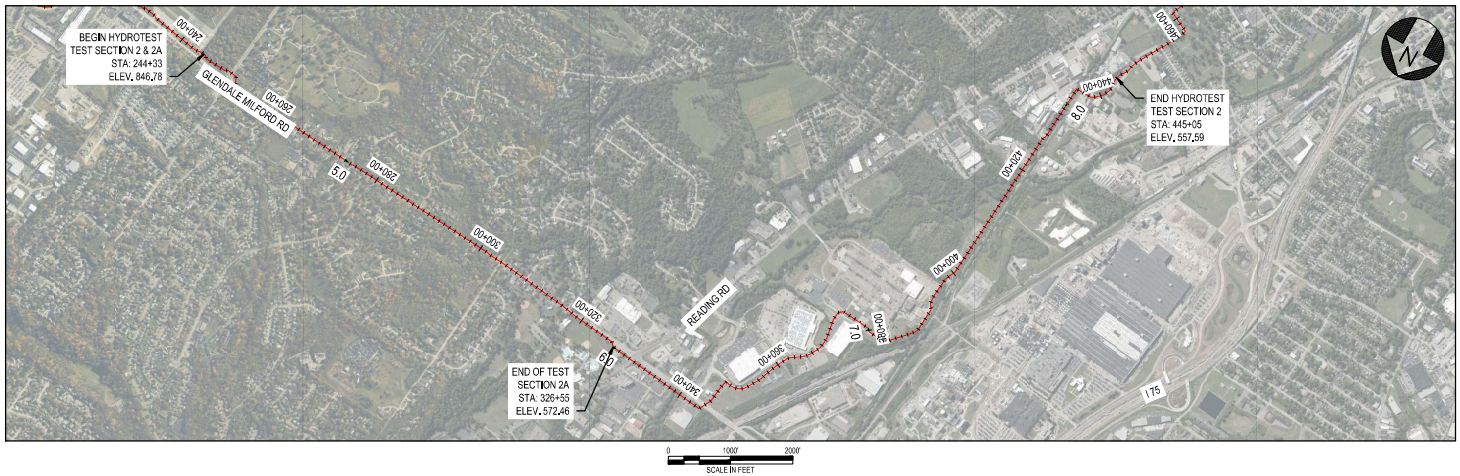
CHAMILTON COUNTY/C350





Test Section 2A, Hydrostatic Testing Summary							
Test Procedure	GD10.1003-1						
Source	TBD						
Discharge	TBD						
Medium	Water			Duration (hours)		8	
Volume (gallons)	122,584			Length (ft)		8,216	
Description	Location	Station	Elevation (ft)	Static Pressure (psig)		Hoop Stress as % of SMYS	
				Minimum	Maximum	Minimum	Maximum
Test Head	MLV1	244+33	847	780	880	30%	38%
Start TS 2A	MLV1	244+33	847	780	880	30%	38%
High Point	--	250+92	858	775	875	29%	38%
Low Point	--	326+55	572	899	999	34%	43%
End TS 2A	SOCCER FIELDS	326+55	572	899	999	34%	43%
MINIMUM TEST PRESSURE 1.5 x MAOP + 100 PSIG FOR MAXIMUM							

Test Section 2, Hydrostatic Testing Summary							
Test Procedure	GD10.1003-1						
Source	Test Section 1						
Discharge	Test Section 3						
Medium	Water			Duration (hours)		8	
Volume (gallons)	299,486			Length (ft)		20,072	
Description	Location	Station	Elevation (ft)	Static Pressure (psig)		Hoop Stress as % of SMYS	
				Minimum	Maximum	Minimum	Maximum
Test Head	MLV1	244+33	847	780	880	30%	37%
Start TS 2	MLV1	244+33	847	780	880	30%	37%
High Point	--	250+92	858	775	875	29%	37%
low Point	--	418+86	496	932	1032	35%	43%
End TS 2	MLV2	445+05	558	905	1,005	34%	42%
MINIMUM TEST PRESSURE 1.5 x MAOP + 100 PSIG FOR MAXIMUM							



REF. DWG(S) PNG-G-350-0001009

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS		
DATE	INITIALS	
-	-	REGIONAL ENGINEER
DATE	INITIALS	
-	-	MGR. TECH REC & STD
DATE	INITIALS	
11/18/2020	AMP	PRINCIPAL ENGINEER

STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
11/18/2020
PROFESSIONAL ENG/ARCH STAMP

C350 PROJECT
TEST SEGMENT 2
HYDROTEST OVERVIEW

HAMILTON COUNTY, OHIO

SHEET(S)	2 OF 3	DWG SCALE	AS NOTED
DWG DATE	09-05-2018	SUPERSEDED	—
DRAWING NUMBER	PNG -C-350-0001279	REVISION	0

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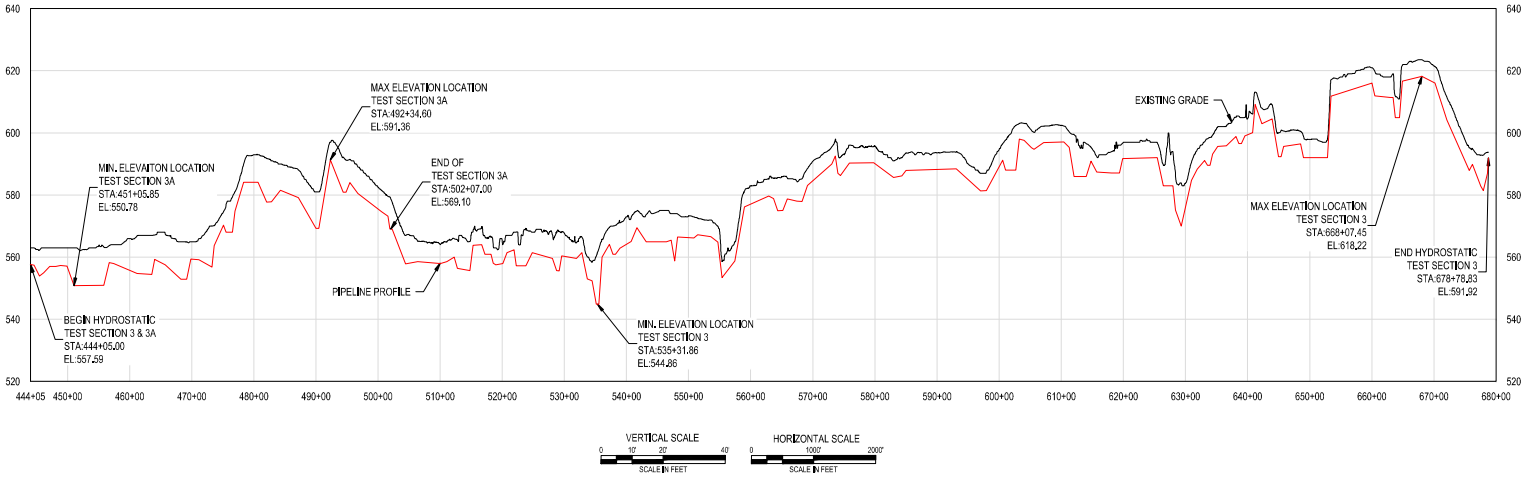
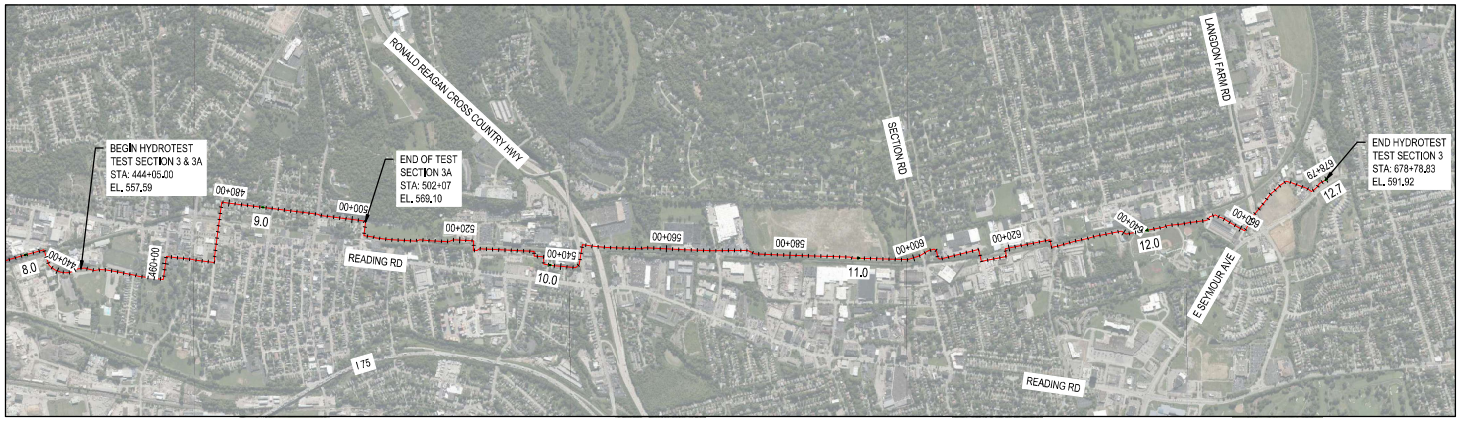


VERTICAL SCALE
0 10' 20' 40'
SCALE IN FEET

HORIZONTAL SCALE
0 1000' 2000'
SCALE IN FEET

Test Section 3A, Hydrostatic Testing Summary							
Test Procedure	GD10.1003-1						
Source	TBD						
Discharge	TBD						
Medium	Water			Duration (hours)		8	
Volume (gallons)	86,569			Length (ft)		5,802	
Description	Location	Station	Elevation (ft)	Static Pressure (psig)		Hoop Stress as % of SMYS	
				Minimum	Maximum	Minimum	Maximum
Test Head	MLV2	444+05	558	790	890	30%	43%
Start TS 3A	MLV2	444+05	558	790	890	30%	43%
High Point	–	492+35	591	775	875	29%	42%
Low Point	–	451+06	551	793	893	30%	43%
End TS 3A	3RD / VORHEES	502+07	569	785	885	30%	43%
MINIMUM TEST PRESSURE 1.5 x MAOP + 100 PSIG FOR MAXIMUM							

Test Section 3, Hydrostatic Testing Summary							
Test Procedure	GD10.1003-1						
Source	Test Section 2 / Hydrant at Dow Chemical						
Discharge	Sanitary Sewer Manhole near Carthage CT and Seymour Ave						
Medium	Water			Duration (hours)		8	
Volume (gallons)	350,244			Length (ft)		23,474	
Description	Location	Station	Elevation (ft)	Static Pressure (psig)		Hoop Stress as % of SMYS	
				Minimum	Maximum	Minimum	Maximum
Test Head	MLV2	444+05	558	801	901	30%	43%
Start TS 3	MLV2	444+05	558	801	901	30%	43%
High Point	–	668+07	618	775	875	29%	42%
Low Point	–	535+32	545	807	907	31%	43%
End TS 3	NORWOOD	678+79	592	786	886	30%	42%
MINIMUM TEST PRESSURE 1.5 x MAOP + 100 PSIG FOR MAXIMUM							



0 1000' 2000'
SCALE IN FEET

N

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS	
	-	-	REGIONAL ENGINEER
	-	-	MGR. TECH REC & STD
	11/18/2020	AMP	PRINCIPAL ENGINEER

STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
11/18/2020
PROFESSIONAL ENGINEER STAMP

C350 PROJECT
TEST SEGMENT 3
HYDROTEST OVERVIEW

HAMILTON COUNTY, OHIO

REF. DWG(S) PNG-G-350-0001009

SHEET(S)	3 OF 3	DWG SCALE	AS NOTED
DWG DATE	09-05-2018	SUPERSEDED	—

DRAWING NUMBER: PNG -C-350-0001280
REVISION: 0

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BORING LOG NO. S1

Page 1 of 1

PROJECT: Duke C314V- Central Corridor Pipeline | **CLIENT:** Duke Energy, Cincinnati, Ohio

SITE: 7660 School Road, Cincinnati, OH

LOCATION — Latitude: 39.288353° Longitude: -84.354237° Northing: 474626.293 Easting: 1443728.724 — Surface Elev.: 873.7 (Ft.)

Depth (ft)	Description	Elevation (ft)
0–3.0	**FILL - AGGREGATE BASE (36")**, gray crushed limestone with lean clay, medium dense, moist	870.5
3.0–4.5	**LEAN CLAY (CL)**, trace roo hairs, trace silt, gray, soft to medium stiff	869
4.5–12.0	**LEAN CLAY (CL)**, gray with red mottles, stiff, moist	861.5
12.0–18.0	**LEAN CLAY (CL)**, trace gravel, light gray with reddish and dark brown mottles, very stiff, moist	855.5
18.0–19.5	**LEAN CLAY (CL)**, trace gravel, brown with reddish-orange mottles, stiff, very moist	854
19.5–21.0	**SANDY LEAN CLAY (CL)**, trace gravel, grayish-brown, medium stiff, very moist to wet	852.5
21.0–22.5	**SANDY LEAN CLAY (CL)**, with gravel,(GLACIAL TILL), gray, very stiff, moist	851

Boring Terminated at 22.5 Feet

Recovery (%)	Field Test Results	Laboratory Torvane/HP (tsf)	Water Content (%)	LL-PL-PI
67	11-12-6 N=18			
33	13-11-6 N=17			
94	2-2-3 N=5	0.5 (HP)	24	30-19-11
100	2-3-4 N=7	1.0 (HP)	29	
100	3-5-6 N=11	2.5 (HP)	21	
67	3-6-6 N=12	2.25 (HP)	20	
72	3-5-7 N=12	2.5 (HP)	22	
100	3-6-8 N=14	2.75 (HP)	20	
100	3-5-7 N=12	3.0 (HP)	22	44-19-25
16	2-5-6 N=11	1.75 (HP)	21	
89	8-10-12 N=22	3.75 (HP)	12	
89	3-5-8 N=13	3.50 (HP)	15	
61	1-3-2 N=5	1.5 (HP)	16	
44	3-10-11 N=21		21	
50	1-7-12 N=19	4.5+ (HP)	10	

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic, 81.9%, 8/15/2016

Advancement Method: 3.25" Hollow Stem Auger. Abandonment Method: Boring backfilled with tremie placed grout.

See Exhibit A-3 for description of field procedures. See Appendix B for description of laboratory procedures and additional data (if any). See Appendix C for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS: Water observed @ 8.8' during drilling; Water observed @ 5.2' after 1 hour

Terracon, 611 Lunken Park Dr, Cincinnati, OH — Boring Started: 1/23/2017 — Boring Completed: 1/23/2017 — Drill Rig: Track — Driller: J. Mathis — Project No.: N1165468 — Exhibit: A4-1

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL N1165468.GPJ TERRACON2015.GDT 4/11/17

BORING LOG NO. B1

Page 1 of 4

PROJECT: Duke C350- Central Corridor Pipeline | **CLIENT:** Duke Energy, Cincinnati, Ohio

SITE: Cincinnati, OH

LOCATION See Exploration Plan — Latitude: 39.283118° Longitude: -84.360281° Northing: 472755.148 Easting: 1441979.264 — Surface Elev.: 861.5 (Ft.)

Depth (ft)	Description	Elevation (ft)
0–2.5	**FILL - LEAN CLAY (CL)**, with striations of dark brown, with silt, trace black concretions, light brown, soft	859
2.5–10.0	**LEAN CLAY (CL)**, trace sand, trace organics, dark reddish brown to brown, very stiff	851.5
10.0–15.0	**LEAN CLAY (CL)**, trace sand, trace gravel, light reddish brown with light gray, very stiff	846.5
15.0–20.0	**LEAN CLAY (CL)**, with silt, with gravel, dark grayish brown, (sample wet when retrieved)	841.5
20.0–25.0	**LEAN CLAY (CL)**, with silt, trace sand, with gravel, dark gray, hard, GLACIAL TILL (sample wet)	836.5
25.0–26.1	**POORLY GRADED SAND AND GRAVEL (SP)**, brown, dense, wet	835.5

Recovery (%)	Field Test Results	Laboratory HP (tsf)	Water Content (%)	LL-PL-PI
89	2-2-2 N=4	0.5 (HP)	26	
100	4-6-9 N=15	4.5+ (HP)	19	
100	6-8-11 N=19	3.75 (HP)	19	38-17-21
94	4-7-8 N=15	4.0 (HP)	20	
100	5-7-9 N=16	3.5 (HP)	19	
89	6-25-27 N=52		12	
94	15-24-26 N=50	4.5+ (HP)	11	
100	9-23-47 N=70	4.5+ (HP)	8	

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic, 81.9%, 8/15/2016

Advancement Method: 3.25" Hollow Stem Auger and NX Rock Core. Abandonment Method: Boring backfilled with tremie placed grout. See Supporting Information for explanation of symbols and abbreviations.

Notes: Water used below 31.5' to core rock.

WATER LEVEL OBSERVATIONS: Water observed @ 30.2' during drilling; Water observed @ 13.6' after 24 hours

Terracon, 611 Lunken Park Dr, Cincinnati, OH — Boring Started: 02-06-2016 — Boring Completed: 02-06-2016 — Drill Rig: Track — Driller: J. Mathis — Project No.: N1165468

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL N1165468.GPJ TERRACON_DATATEMPLATE.GDT 6/22/20

BORING LOG NO. B1

Page 2 of 4

PROJECT: Duke C350- Central Corridor Pipeline | **CLIENT:** Duke Energy, Cincinnati, Ohio

SITE: Cincinnati, OH

LOCATION See Exploration Plan — Latitude: 39.283118° Longitude: -84.360281° Northing: 472755.148 Easting: 1441979.264 — Surface Elev.: 861.5 (Ft.)

Depth (ft)	Description	Elevation (ft)
–30.0	**LEAN CLAY (CL)**, with gravel, trace sand and limestone fragments, dark gray, very hard to stiff, (sample is wet) *(continued)*	831.5
30.0–31.5	**SHALE**, trace limestone, gray, very weak	830
31.5–	**SHALE**, gray weak shale interbedded with thin strong gray limestone layers,	

Limestone layer: 4" @ 33.7'
Limestone layer: 6" @34.3'
Limestone layer: 2" @ 42'
Limestone layer: 1.75" @ 42.6'
Limestone layer: 1" @ 45.7'
Limestone layer: 2" @ 46.2'
Limestone layer: 2.25" @ 47.5'
Limestone layer: 2.25" @ 48.9'
Limestone layer: 4.25"@ 51.3'
Limestone layer: 1.50" @ 51.8'
Limestone layer: 1" @ 52.4'
Limestone layer: 3.75" @ 54.7'
Limestone layer: 1" @ 55.5'
Limestone layer: 1.75" @ 59.4'
Limestone layer: 2" @ 59.9'
Limestone layer: 1/4" @ 60.4'
Limestone layer: 1.5" @ 61.2'
Limestone layer: 2" @ 61.5'
Limestone layer: 1/2" @ 62.4'
Limestone layer: 1.25" @ 62.6'
Limestone layer: 1" @ 62.9'
Limestone layer: 1" @ 64.6'
Limestone layer: 2.50" @ 65.3'
Limestone layer: 3" @ 67'
Limestone layer: 10" @ 67.7'
Limestone layer: 5" @ 73.9'
Limestone layer: 3" @ 74.6'
Limestone layer: 2" @ 76.5'
Limestone layer: 3" @ 76.8'
Limestone layer: 4" @ 78.4'

Shale: 87% Limestone: 13%"

Recovery (%)	Field Test Results	RQD%	Unconfined Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)
100	50/3"			11	
42		6			
24		0			
93		58	3.79	9	139
100		61			
93		76			

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic, 81.9% 8/15/2016

Advancement Method: 3.25" Hollow Stem Auger and NX Rock Core. Abandonment Method: Boring backfilled with tremie placed grout. See Supporting Information for explanation of symbols and abbreviations. Notes:

WATER LEVEL OBSERVATIONS: Water observed @ 30.2' during drilling; Water observed @ 13.6' after 24 hours

Terracon, 611 Lunken Park Dr, Cincinnati, OH — Boring Started: 02-06-2016 — Boring Completed: 02-06-2016 — Drill Rig: Track — Driller: J. Mathis — Project No.: N1165468

BORING LOG NO. B1

Page 3 of 4

PROJECT: Duke C350- Central Corridor Pipeline | **CLIENT:** Duke Energy, Cincinnati, Ohio

SITE: Cincinnati, OH

LOCATION See Exploration Plan — Latitude: 39.283118° Longitude: -84.360281° Northing: 472755.148 Easting: 1441979.264 — Surface Elev.: 861.5 (Ft.)

SHALE, gray weak shale interbedded with thin strong gray limestone layers,

Limestone layer: 4" @ 33.7'
Limestone layer: 6" @34.3'
Limestone layer: 2" @ 42'
Limestone layer: 1.75" @ 42.6'
Limestone layer: 1" @ 45.7'
Limestone layer: 2" @ 46.2'
Limestone layer: 2.25" @ 47.5'
Limestone layer: 2.25" @ 48.9'
Limestone layer: 4.25"@ 51.3'
Limestone layer: 1.50" @ 51.8'
Limestone layer: 1" @ 52.4'
Limestone layer: 3.75" @ 54.7'
Limestone layer: 1" @ 55.5'
Limestone layer: 1.75" @ 59.4'
Limestone layer: 2" @ 59.9'
Limestone layer: 1/4" @ 60.4'
Limestone layer: 1.5" @ 61.2'
Limestone layer: 2" @ 61.5'
Limestone layer: 1/2" @ 62.4'
Limestone layer: 1.25" @ 62.6'
Limestone layer: 1" @ 62.9'
Limestone layer: 1" @ 64.6'
Limestone layer: 2.50" @ 65.3'
Limestone layer: 3" @ 67'
Limestone layer: 10" @ 67.7'
Limestone layer: 5" @ 73.9'
Limestone layer: 3" @ 74.6'
Limestone layer: 2" @ 76.5'
Limestone layer: 3" @ 76.8'
Limestone layer: 4" @ 78.4'

Shale: 87% Limestone: 13%" *(continued)*

79.0 — 782.5

Recovery (%)	RQD%	Unconfined Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)
100	80	24.5	6	147
100	53			
100	99			
100	87			
100	97	165.39	4	154

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic, 81.9% 8/15/2016

Advancement Method: 3.25" Hollow Stem Auger and NX Rock Core. Abandonment Method: Boring backfilled with tremie placed grout. See Supporting Information for explanation of symbols and abbreviations. Notes:

WATER LEVEL OBSERVATIONS: Water observed @ 30.2' during drilling; Water observed @ 13.6' after 24 hours

Terracon, 611 Lunken Park Dr, Cincinnati, OH — Boring Started: 02-06-2016 — Boring Completed: 02-06-2016 — Drill Rig: Track — Driller: J. Mathis — Project No.: N1165468

BORING LOG NO. B1

Page 4 of 4

PROJECT: Duke C350- Central Corridor Pipeline | **CLIENT:** Duke Energy, Cincinnati, Ohio

SITE: Cincinnati, OH

LOCATION See Exploration Plan — Latitude: 39.283118° Longitude: -84.360281° Northing: 472755.148 Easting: 1441979.264 — Surface Elev.: 861.5 (Ft.)

LIMESTONE, gray strong fossiliferous interbedded with thin gray very weak shale seams,

Shale layer: 1/2"@79.4'
Shale layer: 8"@79.8'
Shale layer: 2"@80.3'
Shale layer: 2"@81.6'
Shale layer: 2"@81.9'
Shale layer: 4.25"@83.1'

Limestone: 68% Shale: 32% *(continued)*

84.0 — 777.5

SHALE, weak shale interbedded with thin strong gray limestone layers,

Limestone layer: 3" @ 85.3'
Limestone layer: 4" @ 87.0'
Limestone layer: 1" @ 87.4'
Limestone layer: 1/2" @ 87.6'
Limestone layer: 3" @ 87.8'
Limestone layer: 1.5" @ 91.5'
Limestone layer: 1" @ 91.9'
Limestone layer: 2" @ 92.1'
Limestone layer: 2.5" @ 92.4'
Limestone layer: 2.75" @ 93.1'
Limestone layer: 1.25" @ 93.4'
Limestone layer: 1" @ 95.4'
Limestone layer: 3" @ 95.8'
Limestone layer: 4" @ 96.4'
Limestone layer: 6" @ 97.5'
Limestone layer: 3" @ 98.3'
Limestone layer: 2" @ 100.2'
Limestone layer: 4" @ 100.5'

Shale: 78% Limestone: 22%

101.0 — 760.5

Boring Terminated at 101 Feet

Recovery (%)	RQD%	Unconfined Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)
100	90			
100	95	179.93	3	154
100	93			
98	92			
44	38			

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic, 81.9% 8/15/2016

Advancement Method: 3.25" Hollow Stem Auger and NX Rock Core. Abandonment Method: Boring backfilled with tremie placed grout. See Supporting Information for explanation of symbols and abbreviations. Notes:

WATER LEVEL OBSERVATIONS: Water observed @ 30.2' during drilling; Water observed @ 13.6' after 24 hours

Terracon, 611 Lunken Park Dr, Cincinnati, OH — Boring Started: 02-06-2016 — Boring Completed: 02-06-2016 — Drill Rig: Track — Driller: J. Mathis — Project No.: N1165468

BORING LOG NO. B2

Page 1 of 9

PROJECT: Duke C350- Central Corridor Pipeline | **CLIENT:** Duke Energy, Cincinnati, Ohio

SITE: Cincinnati, OH

LOCATION See Exploration Plan — Latitude: 39.281319° Longitude: -84.360661° Northing: 472102.357 Easting: 1441858.16 — Surface Elev.: 849.5 (Ft.)

Depth (ft)	Description	Elevation (ft)
0–5.0	**FILL - LEAN CLAY (CL)**, trace silt, trace sand with gravel, brown with reddish brown, very stiff to hard, moist	844.5
5.0–10.0	**LEAN CLAY (CL)**, with silt, with gravel, trace limestone fragments, olive brown to blueish gray, stiff, moist	839.5
10.0–	**LEAN CLAY (CL)**, with iron concretions, with silt, trace sand, trace gravel trace limestone fragments, brown, very stiff to hard, moist	

Recovery (%)	Field Test Results	Laboratory HP (tsf)	Water Content (%)	LL-PL-PI
100	2-3-5 N=8	4.5 (HP)	14	
100	3-6-4 N=10	3.25 (HP)	15	
22	5-4-5 N=9	2.0 (HP)	18	
94	2-3-5 N=8	1.25 (HP)	27	
100	3-10-11 N=21	4.5+ (HP)	8	25-14-11

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic, 81.9%, 8/15/2016

Advancement Method: 3.25" Hollow Stem Auger and NX Rock Core. Abandonment Method: Boring backfilled with tremie placed grout. See Supporting Information for explanation of symbols and abbreviations.

Notes: Water added at 45' to core rock.

WATER LEVEL OBSERVATIONS: Water observed @ 10.1' during drilling; Water observed @ 10.7 upon completion of drilling

Terracon, 611 Lunken Park Dr, Cincinnati, OH — Boring Started: 02-08-2017 — Boring Completed: 02-09-2017 — Drill Rig: Track — Driller: J. Mathis — Project No.: N1165468

BORING LOG NO. B2

Page 2 of 9

PROJECT: Duke C350- Central Corridor Pipeline | **CLIENT:** Duke Energy, Cincinnati, Ohio

SITE: Cincinnati, OH

LOCATION See Exploration Plan — Latitude: 39.281319° Longitude: -84.360661° Northing: 472102.357 Easting: 1441858.16 — Surface Elev.: 849.5 (Ft.)

LEAN CLAY (CL), with iron concretions, with silt, trace sand, trace gravel, trace limestone fragments, brown, very stiff to hard, moist *(continued)*

Fine sand, water bearing seam encountered from 15' to 15.5'

Recovery (%)	Field Test Results	Laboratory HP (tsf)	Water Content (%)
100	6-8-8 N=16	4.5+ (HP)	10
100	16-15-42 N=57	4.5+ (HP)	25

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic, 81.9%, 8/15/2016

Advancement Method: 3.25" Hollow Stem Auger and NX Rock Core. Abandonment Method: Boring backfilled with tremie placed grout. See Supporting Information for explanation of symbols and abbreviations. Notes:

WATER LEVEL OBSERVATIONS: Water observed @ 10.1' during drilling; Water observed @ 10.7 upon completion of drilling

Terracon, 611 Lunken Park Dr, Cincinnati, OH — Boring Started: 02-08-2017 — Boring Completed: 02-09-2017 — Drill Rig: Track — Driller: J. Mathis — Project No.: N1165468

BORING LOG NO. B2

Page 3 of 9

PROJECT: Duke C350- Central Corridor Pipeline | **CLIENT:** Duke Energy, Cincinnati, Ohio

SITE: Cincinnati, OH

LOCATION See Exploration Plan — Latitude: 39.281319° Longitude: -84.360661° Northing: 472102.357 Easting: 1441858.16 — Surface Elev.: 849.5 (Ft.)

Depth (ft)	Description	Elevation (ft)
–30.0	**LEAN CLAY (CL)**, with iron concretions, with silt, trace sand, trace gravel, trace limestone fragments, brown, very stiff to hard, moist *(continued)*	819.5
30.0–35.0	**SANDY LEAN CLAY (CL)**, trace limestone fragments, bluish gray with olive brown mottles, very stiff, moist	814.5
35.0–	**LEAN CLAY (CL)**, trace fissures, laminations and limestone fragments, tannish brown with gray, very stiff to hard, (RESIDUAL)	

Recovery (%)	Field Test Results	Laboratory HP (tsf)	Water Content (%)	LL-PL-PI
100	15-40-50/4"	4.5+ (HP)	13	
39	11-22-25 N=47	2.5 (HP)	27	36-18-18
61	16-21-28 N=49	4.5+ (HP)		

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic, 81.9%, 8/15/2016

Advancement Method: 3.25" Hollow Stem Auger and NX Rock Core. Abandonment Method: Boring backfilled with tremie placed grout. See Supporting Information for explanation of symbols and abbreviations. Notes:

WATER LEVEL OBSERVATIONS: Water observed @ 10.1' during drilling; Water observed @ 10.7 upon completion of drilling

Terracon, 611 Lunken Park Dr, Cincinnati, OH — Boring Started: 02-08-2017 — Boring Completed: 02-09-2017 — Drill Rig: Track — Driller: J. Mathis — Project No.: N1165468

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS
REGIONAL ENGINEER	-	-
MGR TECH REC & STD	-	-
PRINCIPAL ENGINEER	11/18/2020	AMP

DUKE ENERGY. | Piedmont Natural Gas

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C350 PROJECT
GEOTECH BORE LOG 1
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

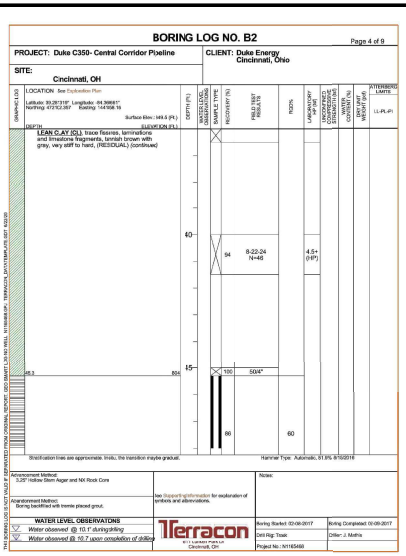
REF. DWG(S): PNG-G-350-0001009

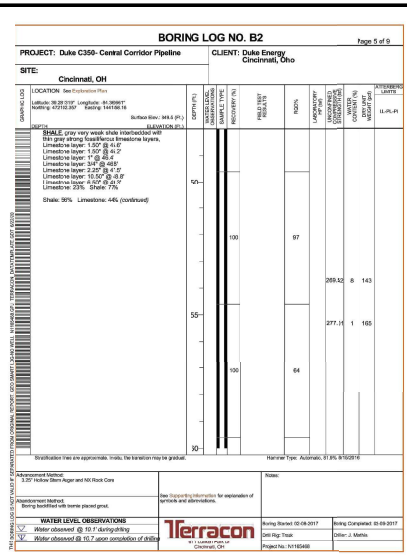
SHEET(S) 1 OF 8 — DWG SCALE NONE — DWG DATE 09-05-2018 — SUPERSEDED —

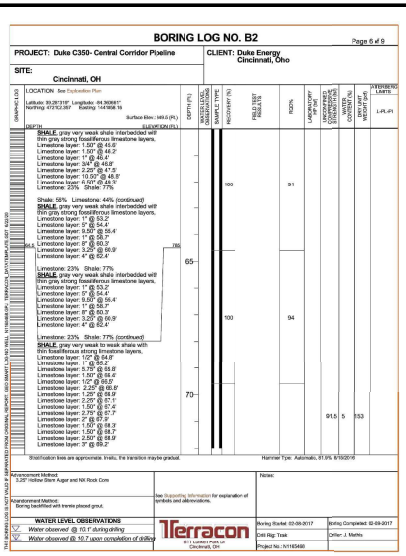
DRAWING NUMBER: PNG -B-350-0001008 — REVISION 0

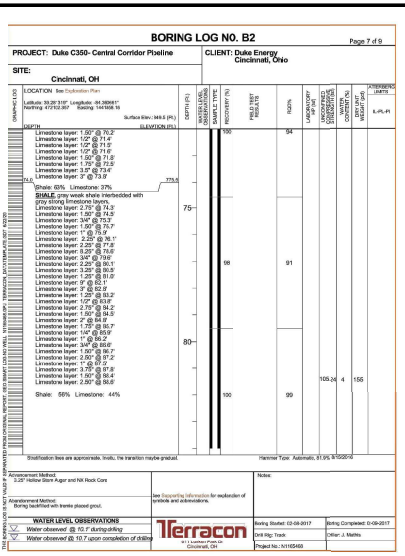
B/HAMILTON COUNTY/C350

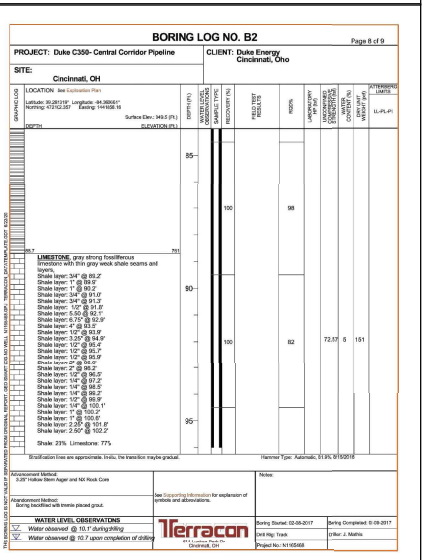
PROFESSIONAL ENG/ARCH STAMP

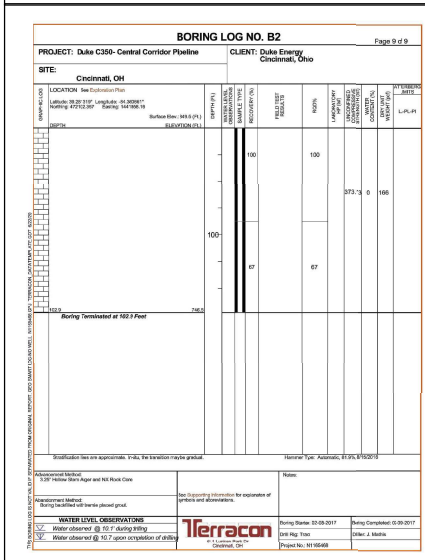


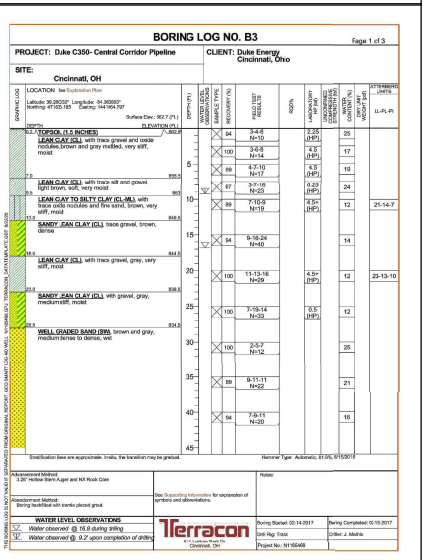


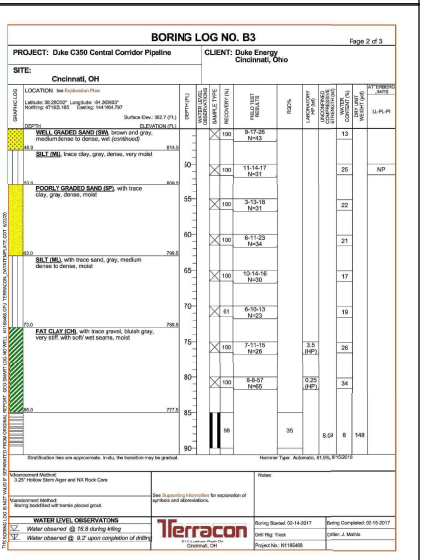












NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS		
DATE	INITIALS	
-	-	REGIONAL ENGINEER
-	-	MGR TECH REC & STD
11/18/2020	AMP	PRINCIPAL ENGINEER

REF. DWG(S): PNG-C-350-0001009

C350 PROJECT
GEOTECH BORE LOG 2
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

SHEET(S)	2 OF 8
DWG SCALE	NONE
DWG DATE	09-05-2018
SUPERSEDED	—
DRAWING NUMBER	PNG -B-350-0001009
REVISION	0

B/HAMILTON COUNTY/C350

PROFESSIONAL ENG/ARCH STAMP

BORING LOG NO. B3

Page 3 of 3

PROJECT: Duke C350- Central Corridor Pipeline | **CLIENT:** Duke Energy, Cincinnati, Ohio

SITE: Cincinnati, OH

LOCATION See Exploration Plan
Latitude: 39.280032° Longitude: -84.360603°
Northing: 471633.185 Easting: 1441864.797
Surface Elev.: 862.7 (Ft.)

SHALE, with interbedded hard limestone layers, gray, very weak to weak,
Limestone layer: 3" @ 85.0'
Limestone layer: 1" @ 85.5'
Limestone layer: 1" @ 85.7'
Limestone layer: 1.25" @ 86.6'
Limestone layer: 1.5" @ 86.9'
Limestone layer: 3.5" @ 87.2'
Limestone layer: 1.5" @ 87.8'
Limestone layer: 1" @ 89.9'
Limestone layer: 1.5" @ 90.4'
Limestone layer: 4" @ 91.4'
Limestone layer: 4" @ 92.0'
Limestone layer: 5" @ 94.0'
Limestone layer: 2.5" @ 96.1'
Limestone layer: 2.5" @ 97.8'
Limestone layer: 3" @ 98.7'

Limestone: 20% Shale: 80% *(continued)*

100.0 — 762.5

Boring Terminated at 100 Feet

RECOVERY (%)	RQD%	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)
100	43	9.27	6	144
100	47			

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic, 81.9%, 8/15/2016

Advancement Method: 3.25" Hollow Stem Auger and NX Rock Core
Abandonment Method: Boring backfilled with tremie placed grout.
See Supporting Information for explanation of symbols and abbreviations.
Notes:

WATER LEVEL OBSERVATIONS
Water observed @ 16.8 during drilling
Water observed @ 9.2' upon completion of drilling

Terracon, 611 Lunken Park Dr, Cincinnati, OH
Boring Started: 02-14-2017 | Boring Completed: 02-15-2017 | Drill Rig: Track | Driller: J. Mathis | Project No.: N1165468

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL N1165468.GPJ TERRACON_DATATEMPLATE.GDT 6/22/20

BORING LOG NO. 20-4

Page 1 of 1

PROJECT: Central Corridor Pipeline C350 | **CLIENT:** Duke Energy, Cincinnati, OH

SITE: Hamilton County, Cincinnati, Ohio

LOCATION See Exploration Plan
Latitude: 39.26796° Longitude: -84.377598°
Surface Elev.: 828.9 (Ft.)

0.5 — 6 inches — 828.5
FILL - LEAN CLAY, trace gravel, sand and brick fragments, brown
9.0 — 820
LEAN CLAY, trace sand and gravel, brownish gray, medium stiff
15.0 — 814
LEAN CLAY, trace sand and gravel, gray, hard
25.0 — 804

Boring Terminated at 25 Feet

RECOVERY (%)	FIELD TEST RESULTS	N_{60}	LABORATORY HP (tsf)	WATER CONTENT (%)	LL-PL-PI
83	2-2-3 N=5	7	1.5 (HP)	19	
100	2-2-3 N=5	7	0.5 (HP)	21	
27	1-3-4 N=7	10	1.0 (HP)	20	
100	4-5-7 N=12	18	2.0 (HP)	21	
83	3-4-3 N=7	10	2.0 (HP)	21	
78	2-2-3 N=5	7	2.0 (HP)	23	38-13-25
83	2-3-6 N=9	13	0.5 (HP)		
79	PUSH TUBE		0.5 (HP)	15	
100	4-4-4 N=8	12	1.5 (HP)	25	
100	4-7-8 N=15	22	4.5 (HP)	20	
100	4-5-9 N=14	21	4.0 (HP)	22	

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: 3.25-inch Continuous-Flight Hollow-Stem Augers; 2-inch Split-Barrel Sampler; 3-inch thin-walled tube sampler
Abandonment Method: Boring backfilled with auger cuttings and surface capped with concrete plug.
See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.
Notes:

WATER LEVEL OBSERVATIONS
No water observed during drilling
No water observed after drilling

Terracon, 611 Lunken Park Dr, Cincinnati, OH
Boring Started: 04-03-2020 | Boring Completed: 04-03-2020 | Drill Rig: CME 55X | Driller: KH | Project No.: N1175384

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. DUKE ENERGY-OH-KY N1175384 DUKE C350V PIPELINE.GPJ TERRACON_DATATEMPLATE.GDT 4/28/20

BORING LOG NO. 20-5

Page 1 of 1

PROJECT: Central Corridor Pipeline C350 | **CLIENT:** Duke Energy, Cincinnati, OH

SITE: Hamilton County, Cincinnati, Ohio

LOCATION See Exploration Plan
Latitude: 39.26734° Longitude: -84.377473°
Surface Elev.: 825.4 (Ft.)

0.4 — 3 inches — 825
FILL - LEAN CLAY, trace sand, brown
1.5 — 824
LEAN CLAY, trace sand, brown, hard
3.0 — 822.5
LEAN CLAY, with limestone fragments and relic bedding planes, brownish gray, hard (Residuum)
10.5 — 815
INTERBEDDED SHALE AND LIMESTONE: Shale: gray, slightly weathered, extremely weak to very weak; Limestone: light gray, unweathered, strong
15.0 — 810.5
INTERBEDDED SHALE AND LIMESTONE: Shale (75%): gray, slightly weathered to unweathered, very weak to weak, bed thickness varies from 1 inch to 8 inches; Limestone (25%): light gray, unweathered, strong, bed thickness varies from 1 inch to 5 inches
25.0 — 800.5

Boring Terminated at 25 Feet

RECOVERY (%)	FIELD TEST RESULTS	N_{60}	LABORATORY HP (tsf)	WATER CONTENT (%)	LL-PL-PI
89	2-4-5 N=9	13	2.5 (HP)	18	
61	4-9-11 N=20	30	4.0 (HP)	16	
83	8-28-12 N=40	59	4.5 (HP)	16	
89	9-11-16 N=27	40	4.5 (HP)	13	
100	13-14-16 N=30	44	4.5 (HP)	11	35-17-18
22	50/4"		4.5 (HP)		
94	20-43-48 N=91	135	4.5 (HP)		
50	34-50/3"				
83	23-31-50/3"				
51					
100					

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: 3.25-inch Continuous-Flight Hollow-Stem Augers; 2-inch Split-Barrel Sampler; NQ2 Rock Core Barrel
Abandonment Method: Boring backfilled with auger cuttings and surface capped with concrete plug.
See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.
Notes:

WATER LEVEL OBSERVATIONS
Water observed at 11' during drilling
Water observed at 9' after 1 hour
Water added to facilitate rock coring.

Terracon, 611 Lunken Park Dr, Cincinnati, OH
Boring Started: 04-03-2020 | Boring Completed: 04-03-2020 | Drill Rig: CME 55X | Driller: KH | Project No.: N1175384

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. DUKE ENERGY-OH-KY N1175384 DUKE C350V PIPELINE.GPJ TERRACON_DATATEMPLATE.GDT 4/28/20

BORING LOG NO. 20-6

Page 1 of 1

PROJECT: Central Corridor Pipeline C350 | **CLIENT:** Duke Energy, Cincinnati, OH

SITE: Hamilton County, Cincinnati, Ohio

LOCATION See Exploration Plan
Latitude: 39.252147° Longitude: -84.392191°
Surface Elev.: 846.3 (Ft.)

0.5 — 846
FILL - FAT CLAY (CH), with brick and wood fragments, grayish brown to gray
9.0 — 837.5
LEAN CLAY, with limestone fragments, grayish brown, hard (Residuum)
12.5 — 834
INTERBEDDED SHALE AND LIMESTONE: Shale: gray, slightly weathered, extremely weak to very weak; Limestone: light gray, unweathered, strong
15.0 — 831.5
INTERBEDDED SHALE AND LIMESTONE: Shale (20%): gray, slightly weathered to unweathered, very weak to weak, bed thickness varies from 1/2 inch to 4 inches; Limestone (80%): light gray, unweathered, strong, bed thickness varies from 1 inch to 4 inches
20.0 — 826.5

Boring Terminated at 20 Feet

RECOVERY (%)	FIELD TEST RESULTS	N_{60}	LABORATORY HP (tsf)	WATER CONTENT (%)	LL-PL-PI
50	4-2-5 N=7	10	4.5 (HP)	20	
67	2-3-3 N=6	9	2.0 (HP)	27	
89	3-3-5 N=8	12	1.25 (HP)	27	
94	3-5-7 N=12	18	1.5 (HP)	29	61-16-45
100	4-4-8 N=12	18	1.5 (HP)	27	
100	4-6-36 N=42	62	1.5 (HP)	27	
100	42-26-19 N=45	67	4.5 (HP)		
50	50/2"			4	
11	50/2"				
96					

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: 3.25-inch Continuous-Flight Hollow-Stem Augers; 2-inch Split-Barrel Sampler; NQ2 Rock Core Barrel
Abandonment Method: Boring backfilled with auger cuttings and surface capped with concrete plug.
See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.
Notes:

WATER LEVEL OBSERVATIONS
No water observed during drilling
Water observed at 4'9" after 1 hour

Terracon, 611 Lunken Park Dr, Cincinnati, OH
Boring Started: 04-06-2020 | Boring Completed: 04-06-2020 | Drill Rig: CME 55X | Driller: KH | Project No.: N1175384

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. DUKE ENERGY-OH-KY N1175384 DUKE C350V PIPELINE.GPJ TERRACON_DATATEMPLATE.GDT 4/28/20

BORING LOG NO. 20-7

Page 1 of 1

PROJECT: Central Corridor Pipeline C350 | **CLIENT:** Duke Energy, Cincinnati, OH

SITE: Hamilton County, Cincinnati, Ohio

LOCATION See Exploration Plan
Latitude: 39.234016° Longitude: -84.436445°
Surface Elev.: 580.3 (Ft.)

0.5 — 6 inches — 580
FILL - LEAN CLAY, with concrete and asphalt fragments, brown
7.5 — 573
LEAN CLAY, with cobbles, trace gravel, brownish gray, very siff to hard
13.5 — 567
LEAN CLAY, trace sand, gray, medium stiff to stiff
25.0 — 555.5

Boring Terminated at 25 Feet

RECOVERY (%)	FIELD TEST RESULTS	N_{60}	LABORATORY HP (tsf)	WATER CONTENT (%)	LL-PL-PI
67	2-3-3 N=6	9	0.5 (HP)	10	
89	4-5-4 N=9	13	1.0 (HP)	15	
56	3-2-2 N=4	6	1.5 (HP)	23	
56	2-1-1 N=2	3	0.5 (HP)	21	
33	1-2-5 N=7	10	0.75 (HP)	24	
83	PUSH TUBE		3.0 (HP)	19	
0	8-7-10 N=17	25			
67	4-5-9 N=14	21	4.5 (HP)	20	
78	4-3-3 N=6	9	0.75 (HP)	19	
100	3-3-5 N=8	12	2.75 (HP)	25	
100	4-3-5 N=8	12	2.5 (HP)	30	

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: 3.25-inch Continuous-Flight Hollow-Stem Augers; 2-inch Split-Barrel Sampler; 3-inch thin-walled tube sampler
Abandonment Method: Boring backfilled with auger cuttings and surface capped with concrete plug.
See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.
Notes: Bulk Sample collected from auger cuttings.

WATER LEVEL OBSERVATIONS
No water observed during drilling
No water observed after drilling
Water added to facilitate rock coring.

Terracon, 611 Lunken Park Dr, Cincinnati, OH
Boring Started: 04-06-2020 | Boring Completed: 04-06-2020 | Drill Rig: CME 55X | Driller: KH | Project No.: N1175384

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. DUKE ENERGY-OH-KY N1175384 DUKE C350V PIPELINE.GPJ TERRACON_DATATEMPLATE.GDT 4/28/20

BORING LOG NO. WB-1

Page 1 of 1

PROJECT: Central Corridor Pipeline C350 | **CLIENT:** Duke Energy, Cincinnati, OH

SITE: Hamilton County, Cincinnati, Ohio

LOCATION See Exploration Plan
Latitude: 39.2413° Longitude: -84.4358°
Surface Elev.: 559.6 (Ft.)

LEAN CLAY, some silt, trace root hairs, brown, soft to medium stiff
7.5 — 552
SILTY CLAY (CL-ML), with sand, occasional sand and gravel seams, grayish-brown with black mottles, very soft to medium stiff
15.0 — 544.5
SILTY CLAY (CL-ML), some sand, trace gravel, gray, very stiff to hard (Glacial Till)
35.0 — 524.5
SAND, with cobbles, tannish-brown, medium dense
36.5 — 523

Boring Terminated at 36.5 Feet

RECOVERY (%)	FIELD TEST RESULTS	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	LL-PL-PI
89	1-2-3 N=5	1.0 (HP)		17	
89	3-4-4 N=8	2.0 (HP)		16	
78	1-2-3 N=5			9	
100	1-2-1 N=3			24	
100	0-0-0 N=0			25	
89	0-0-5 N=5			22	
100	12-6-9 N=15	3.75 (HP)		16	23-16-7
67	4-9-12 N=21	4.25 (HP)		12	
100	3-6-9 N=15	4.0 (HP)		14	
100	3-4-11 N=15	3.25 (HP)		15	
53	6-9-12 N=21			10	

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: Hollow Stem Auger
Abandonment Method: Boring backfilled with cement-bentonite grout upon completion.
See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.
Notes: Gas pocket encountered at 34 feet.

WATER LEVEL OBSERVATIONS
Water observed at 12.5' during drilling
No water observed after drilling.

Terracon, 611 Lunken Park Dr, Cincinnati, OH
Boring Started: 11-15-2017 | Boring Completed: 11-16-2017 | Drill Rig: Track | Driller: R. Mann | Project No.: N1175384

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL N1175384 DUKE C350V PIPELINE.GPJ TERRACON_DATATEMPLATE.GDT 6/21/18

BORING LOG NO. WB-1A

Page 1 of 1

PROJECT: Central Corridor Pipeline C350 | **CLIENT:** Duke Energy, Cincinnati, OH

SITE: Hamilton County, Cincinnati, Ohio

LOCATION See Exploration Plan
Latitude: 39.2418° Longitude: -84.4339°
Surface Elev.: 554.4 (Ft.)

LEAN CLAY, with silt, trace root hairs, brown, very soft to medium stiff, moist
5.0 — 549.5
POORLY GRADED SAND (SP), with silty clay and gravel, olive-brown and gray, very loose to loose
10.0 — 544.5
LEAN CLAY (CL), some gravel and sand, trace silt, occasional sand seams, olive-brown, stiff to very stiff (Glacial Till)
--Auger cuttings identified granular soil @ 30'
31.5 — 523

Boring Terminated at 31.5 Feet

RECOVERY (%)	FIELD TEST RESULTS	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	LL-PL-PI
61	2-3-3 N=6	2.5 (HP)		28	
50	0-0-0 N=0	2.0 (HP)		27	
61	2-1-2 N=3	2.5 (HP)		12	
72	1-2-2 N=4	1.5 (HP)		17	
83	3-3-6 N=9	3.0 (HP)		9	
67	6-45-14 N=59	3.0 (HP)		11	
78	3-5-6 N=11	2.75 (HP)		12	
100	3-5-6 N=11			14	27-14-13
100	5-6-11 N=17	4.0 (HP)		12	

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: Hollow Stem Auger
Abandonment Method: Boring backfilled with cement-bentonite grout upon completion.
See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.
Notes:

WATER LEVEL OBSERVATIONS
No water observed during drilling
No water observed after drilling.

Terracon, 611 Lunken Park Dr, Cincinnati, OH
Boring Started: 11-16-2017 | Boring Completed: 11-16-2017 | Drill Rig: Track | Driller: R. Mann | Project No.: N1175384

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL N1175384 DUKE C350V PIPELINE.GPJ TERRACON_DATATEMPLATE.GDT 6/21/18

BORING LOG NO. WB-2

Page 1 of 3

PROJECT: Central Corridor Pipeline C350 | **CLIENT:** Duke Energy, Cincinnati, OH

SITE: Hamilton County, Cincinnati, Ohio

LOCATION See Exploration Plan
Latitude: 39.2398° Longitude: -84.4361°
Surface Elev.: 557.1 (Ft.)

LEAN CLAY, trace silt, sand and root hairs, brown with black mottles, stiff to very stiff
5.0 — 552
LEAN CLAY (CL), some silt and fine sand, gray with reddish-brown and black mottles, stiff
8.4 — 548.5
SAND, trace silt, brown, loose
10.0 — 547
LEAN CLAY (CL), with silt lenses, medium plasticity, gray, very stiff (Lacustrine)
13.3 — 544
LEAN CLAY, with silt lenses, brown, stiff (Lacustrine)
15.0 — 542
SAND, some silt, fine grained, brown, medium dense
20.0 — 537
LEAN CLAY, with cobbles, sand and silt, gray, very stiff (Glacial Till)
30.0 — 527
SILTY SAND (SM), fine to medium grained, brown, medium dense to dense

RECOVERY (%)	FIELD TEST RESULTS	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	LL-PL-PI
100	2-3-3 N=6	3.25 (HP)		27	
67	6-7-9 N=16	3.25 (HP)		22	
100	4-6-7 N=13	2.0 (HP)		23	36-19-17
100	2-3-3 N=6			16	
67	3-4-5 N=9	2.5 (HP)		27	49-20-29
89	2-2-6 N=8	1.75 (HP)		37	
100	8-11-16 N=27			23	
78	7-14-31 N=45	3.0 (HP)		12	
16	23-25-38 N=63			12	
94	6-11-17 N=28			19	
100	6-9-12 N=21			22	

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: Hollow Stem Auger
Abandonment Method: Boring backfilled with cement-bentonite grout upon completion.
See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.
Notes:

WATER LEVEL OBSERVATIONS
No water observed during drilling
Water observed at 14.7' after 20 hour.

Terracon, 611 Lunken Park Dr, Cincinnati, OH
Boring Started: 11-20-2017 | Boring Completed: 11-20-2017 | Drill Rig: Track | Driller: R. Mann | Project No.: N1175384

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL N1175384 DUKE C350V PIPELINE.GPJ TERRACON_DATATEMPLATE.GDT 6/21/18

BURNS & McDONNELL ENGINEERING COMPANY, INC. STATE LICENSE # COA_01557

PROFESSIONAL ENG/ARCH STAMP

REF. DWG(S): PNG-G-350-0001009

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS DATE	INITIALS	
-	-	REGIONAL ENGINEER
-	-	MGR TECH REC & STD
11/18/2020	AMP	PRINCIPAL ENGINEER

DUKE ENERGY. | Piedmont Natural Gas

C350 PROJECT
GEOTECH BORE LOG 3
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

SHEET(S) 3 OF 8 | DWG SCALE NONE | DWG DATE 09-05-2018 | SUPERSEDED —

DRAWING NUMBER: PNG -B-350-0001010 | REVISION: 0

B/HAMILTON COUNTY/C350

BORING LOG NO. WB-2

PROJECT: Central Corridor Pipeline C350 | CLIENT: Duke Energy, Cincinnati, OH

SITE: Hamilton County, Cincinnati, Ohio

LOCATION See Exploration Plan. Latitude: 39.2398° Longitude: -84.4361°. Surface Elev.: 557.1 (Ft.)

Depth / Elevation (Ft.)	Material Description	Depth (Ft.)	Recovery (%)	Field Test Results	Laboratory HP (tsf)	Water Content (%)	Atterberg Limits LL-PL-PI
	SILTY SAND (SM), fine to medium grained, brown, medium dense to dense *(continued)*	40	100	5-6-11 N=17		25	
		45	100	3-4-8 N=12		21	
		50	100	8-10-13 N=23		18	
		55	100	10-14-17 N=31		25	
		60	100	9-14-23 N=37		23	
65.0 / 492	**SILT (ML)**, with clay and cobbles, some sand, brownish-gray to brown, very dense (Glacial Till)	65	100	9-21-24 N=45	3.5 (HP)	10	
		70	67	26-42-48 N=90	4.0 (HP)	10	16-14-2
		75	94	36-32-27 N=59	4.5+ (HP)	13	

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: Hollow Stem Auger

Abandonment Method: Boring backfilled with cement-bentonite grout upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS: No water observed during drilling. Water observed at 14.7' after 20 hour.

Terracon, 611 Lunken Park Dr, Cincinnati, OH

Boring Started: 11-20-2017 | Boring Completed: 11-20-2017 | Drill Rig: Track | Driller: R. Mann | Project No.: N1175384

BORING LOG NO. WB-2

PROJECT: Central Corridor Pipeline C350 | CLIENT: Duke Energy, Cincinnati, OH

SITE: Hamilton County, Cincinnati, Ohio

LOCATION See Exploration Plan. Latitude: 39.2398° Longitude: -84.4361°. Surface Elev.: 557.1 (Ft.)

Depth / Elevation (Ft.)	Material Description	Depth (Ft.)	Recovery (%)	Field Test Results	Laboratory HP (tsf)	Water Content (%)	Atterberg Limits LL-PL-PI
	SILT (ML), with clay and cobbles, some sand, brownish-gray to brown, very dense (Glacial Till) *(continued)*						
80.0 / 477	**SILTY SAND (SM)**, with cobbles, fine to medium grained, brownish-gray, medium dense to very dense	80	100	11-16-22 N=38		18	
		85	100	14-11-10 N=21		20	
		90	94	17-16-30 N=46		12	
		95	100	7-10-16 N=26		17	
100.9 / 456		100	100	30-50/5"		10	

Boring Terminated at 100.9 Feet

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: Hollow Stem Auger

Abandonment Method: Boring backfilled with cement-bentonite grout upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS: No water observed during drilling. Water observed at 14.7' after 20 hour.

Terracon, 611 Lunken Park Dr, Cincinnati, OH

Boring Started: 11-20-2017 | Boring Completed: 11-20-2017 | Drill Rig: Track | Driller: R. Mann | Project No.: N1175384

BORING LOG NO. WB-2A

PROJECT: Central Corridor Pipeline C350 | CLIENT: Duke Energy, Cincinnati, OH

SITE: Hamilton County, Cincinnati, Ohio

LOCATION See Exploration Plan. Latitude: 39.2402° Longitude: -84.4353°. Surface Elev.: 554.9 (Ft.)

Depth / Elevation (Ft.)	Material Description	Depth (Ft.)	Water Level	Recovery (%)	Field Test Results	Laboratory HP (tsf)	Water Content (%)	Atterberg Limits LL-PL-PI
	LEAN CLAY, with silt, trace to little sand, trace root hairs, brown to tannish-brown with black mottles, medium stiff			89	3-3-3 N=6	1.25 (HP)	23	
				100	3-3-4 N=7	1.25 (HP)	18	
6.0 / 549	**POORLY GRADED SAND (SP)**, trace gravel and silt, reddish-brown to brown, medium dense	5		78	3-2-2 N=4		16	
7.9 / 547	**LEAN CLAY (CL)**, with silt, little sand, trace gravel and cobbles, gray, stiff to hard (Glacial Till)			89	8-9-11 N=20	3.5 (HP)	14	
	-- Possible cobbles/boulder encountered from 10 feet to 14 feet.	10		16	8-12-12 N=24		13	
				89	8-10-14 N=24	3.25 (HP)	13	
		15	▽	100	6-8-9 N=17	4.5+ (HP)	13	26-14-12
		20		100	5-5-7 N=12	2.25 (HP)	14	
		25		100	2-4-5 N=9	0.75 (HP)	18	
		30		53	3-5-5 N=10	1.0 (HP)	15	
35.0 / 520	**SILT (ML)**, with sand, some clay, gray, medium dense	35	▽	94	3-8-13 N=21	2.75 (HP)	18	

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: Hollow Stem Auger

Abandonment Method: Boring backfilled with cement-bentonite grout upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS: Water observed at 35' during drilling. Water observed at 16.9' after 120 hours.

Terracon, 611 Lunken Park Dr, Cincinnati, OH

Boring Started: 11-21-2017 | Boring Completed: 11-22-2017 | Drill Rig: Track | Driller: R. Mann | Project No.: N1175384

BORING LOG NO. WB-2A

PROJECT: Central Corridor Pipeline C350 | CLIENT: Duke Energy, Cincinnati, OH

SITE: Hamilton County, Cincinnati, Ohio

LOCATION See Exploration Plan. Latitude: 39.2402° Longitude: -84.4353°. Surface Elev.: 554.9 (Ft.)

Depth / Elevation (Ft.)	Material Description	Depth (Ft.)	Recovery (%)	Field Test Results	Laboratory HP (tsf)	Water Content (%)	Atterberg Limits LL-PL-PI
40.0 / 515	**SILT (ML)**, with sand, some clay, gray, medium dense *(continued)*						
	SILTY SAND (SM), with coarse gravel and cobbles, brownish-gray, medium dense to dense	40	83	12-7-15 N=22		19	
		45	78	5-11-8 N=19		14	
		50	33	9-6-8 N=14		23	
		55	72	12-15-20 N=35		22	
		60	0	9-13-16 N=29			
65.0 / 490	**LEAN CLAY (CL)**, occasional silt lenses, varved structure, gray, very sitff (Lacustrine)	65	100	7-8-12 N=20	2.25 (HP)	21	
		70	100	7-10-14 N=24	3.0 (HP)	20	23-15-8
		75	100	6-9-14 N=23	3.25 (HP)	18	

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: Hollow Stem Auger

Abandonment Method: Boring backfilled with cement-bentonite grout upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS: Water observed at 35' during drilling. Water observed at 16.9' after 120 hours.

Terracon, 611 Lunken Park Dr, Cincinnati, OH

Boring Started: 11-21-2017 | Boring Completed: 11-22-2017 | Drill Rig: Track | Driller: R. Mann | Project No.: N1175384

BORING LOG NO. WB-2A

PROJECT: Central Corridor Pipeline C350 | CLIENT: Duke Energy, Cincinnati, OH

SITE: Hamilton County, Cincinnati, Ohio

LOCATION See Exploration Plan. Latitude: 39.2402° Longitude: -84.4353°. Surface Elev.: 554.9 (Ft.)

Depth / Elevation (Ft.)	Material Description	Depth (Ft.)	Recovery (%)	Field Test Results	Laboratory HP (tsf)	Water Content (%)	Atterberg Limits LL-PL-PI
	LEAN CLAY (CL), occasional silt lenses, varved structure, gray, very sitff (Lacustrine) *(continued)*						
80.0 / 475	**SILTY SAND (SM)**, trace coarse gravel, fine grained, gray, dense to very dense	80	100	8-12-29 N=41		15	
85.0 / 470	**POORLY GRADED SAND (SP)**, with silt, grayish brown, dense to very dense	85	100	19-26-33 N=59		22	
		90	100	18-29-34 N=63		14	
		95	67	9-23-25 N=48		24	
101.5 / 453.5		100	100	11-15-23 N=38		22	

Boring Terminated at 101.5 Feet

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: Hollow Stem Auger

Abandonment Method: Boring backfilled with cement-bentonite grout upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS: Water observed at 35' during drilling. Water observed at 16.9' after 120 hours.

Terracon, 611 Lunken Park Dr, Cincinnati, OH

Boring Started: 11-21-2017 | Boring Completed: 11-22-2017 | Drill Rig: Track | Driller: R. Mann | Project No.: N1175384

BORING LOG NO. WB-3

PROJECT: Central Corridor Pipeline C350 | CLIENT: Duke Energy, Cincinnati, OH

SITE: Hamilton County, Cincinnati, Ohio

LOCATION See Exploration Plan. Latitude: 39.2382° Longitude: -84.4361°. Surface Elev.: 584.4 (Ft.)

Depth / Elevation (Ft.)	Material Description	Depth (Ft.)	Recovery (%)	Field Test Results	Laboratory HP (tsf)	Water Content (%)	Atterberg Limits LL-PL-PI
	FILL, lean clay, with silt and gravel, trace sand, brown and black		39	3-2-1 N=3	3.25 (HP)	10	
	-- Possible void encountered at 2.5 feet to 6.5 feet (No recovery)		0	0-0-0 N=0			
		5	0	2-0-0 N=0			
			0	2-2-2 N=4			
10.0 / 574.5	**FILL**, clayey gravel, with silt and sand, glass and slag, brown with black	10	78	4-6-5 N=11	3.0 (HP)	22	
			39	2-2-4 N=6		14	
		15	44	3-3-3 N=6		21	
		20	11	5-3-1 N=4		25	
		25	39	3-1-1 N=2		24	
30.0 / 554.5		30					

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: Hollow Stem Auger

Abandonment Method: Boring backfilled with cement-bentonite grout upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS: Water observed at 31' during drilling. Water observed at 56.6' after 1 hour.

Terracon, 611 Lunken Park Dr, Cincinnati, OH

Boring Started: 11-07-2017 | Boring Completed: 11-08-2017 | Drill Rig: Track | Driller: R. Mann | Project No.: N1175384

BORING LOG NO. WB-3

PROJECT: Central Corridor Pipeline C350 | CLIENT: Duke Energy, Cincinnati, OH

SITE: Hamilton County, Cincinnati, Ohio

LOCATION See Exploration Plan. Latitude: 39.2382° Longitude: -84.4361°. Surface Elev.: 584.4 (Ft.)

Depth / Elevation (Ft.)	Material Description	Depth (Ft.)	Water Level	Recovery (%)	Field Test Results	Laboratory HP (tsf)	Water Content (%)	Atterberg Limits LL-PL-PI
	FILL, lean clay, with silt, sand, slag and glass, trace rock fragments, bluish gray to black		▽	94	3-4-3 N=7	2.5 (HP)	22	32-24-8
35.0 / 549.5	**SILTY SAND (SM)**, with cobbles, trace clay, tannish brown and dark gray, medium dense	35		72	6-8-6 N=14		12	
		40		94	5-11-12 N=23		15	
45.0 / 539.5	**SAND**, some boulder and gravel, brown, medium dense	45		100	21-50		5	
50.0 / 534.5	**LEAN CLAY (CL)**, with silt and sand, trace cobbles, gray, hard (Glacial Till)	50		16	21-20-37 N=57	4.5+ (HP)	12	
		55	▽	100	9-15-30 N=45	4.5+ (HP)	11	
		60						

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: Hollow Stem Auger

Abandonment Method: Boring backfilled with cement-bentonite grout upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS: Water observed at 31' during drilling. Water observed at 56.6' after 1 hour.

Terracon, 611 Lunken Park Dr, Cincinnati, OH

Boring Started: 11-07-2017 | Boring Completed: 11-08-2017 | Drill Rig: Track | Driller: R. Mann | Project No.: N1175384

BORING LOG NO. WB-3

PROJECT: Central Corridor Pipeline C350 | CLIENT: Duke Energy, Cincinnati, OH

SITE: Hamilton County, Cincinnati, Ohio

LOCATION See Exploration Plan. Latitude: 39.2382° Longitude: -84.4361°. Surface Elev.: 584.4 (Ft.)

Depth / Elevation (Ft.)	Material Description	Depth (Ft.)	Recovery (%)	Field Test Results	Laboratory HP (tsf)	Water Content (%)	Atterberg Limits LL-PL-PI
	LEAN CLAY (CL), with silt and sand, trace cobbles, gray, hard (Glacial Till) *(continued)*		100	9-20-27 N=47	4.5+ (HP)	12	
		65	100	10-12-16 N=28	4.5+ (HP)	18	29-16-13
		70	100	20-23-34 N=57	4.5+ (HP)	14	
		75	100	8-12-16 N=28	4.5+ (HP)	25	
80.0 / 504.5	**SILTY SAND (SM)**, trace silt, brown, medium dense	80	100	3-7-12 N=19		21	
81.5 / 503							

Boring Terminated at 81.5 Feet

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: Hollow Stem Auger

Abandonment Method: Boring backfilled with cement-bentonite grout upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS: Water observed at 31' during drilling. Water observed at 56.6' after 1 hour.

Terracon, 611 Lunken Park Dr, Cincinnati, OH

Boring Started: 11-07-2017 | Boring Completed: 11-08-2017 | Drill Rig: Track | Driller: R. Mann | Project No.: N1175384

REF. DWG(S): PNG-G-350-0001009

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS
REGIONAL ENGINEER	-	-
MGR TECH REC & STD	-	-
PRINCIPAL ENGINEER	11/18/2020	AMP

DUKE ENERGY | Piedmont Natural Gas

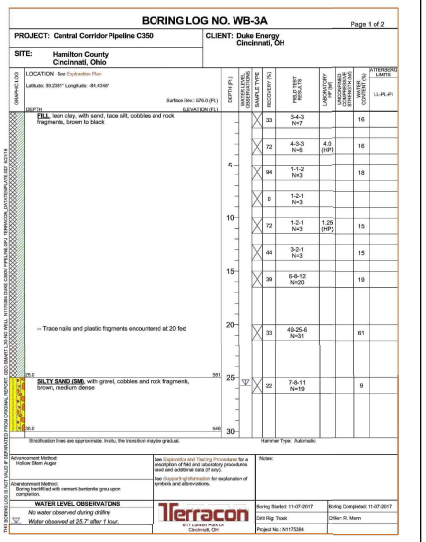
C350 PROJECT GEOTECH BORE LOG 4 HAMILTON COUNTY, OHIO

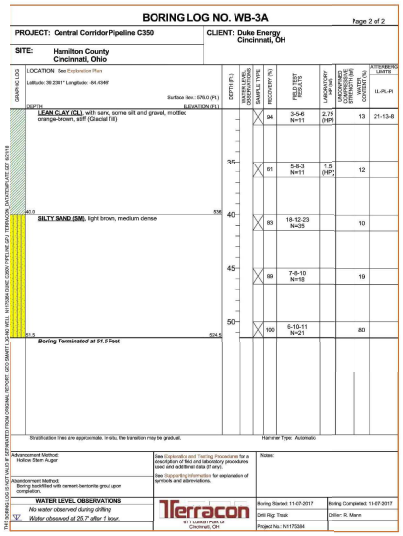
HAMILTON COUNTY, OHIO

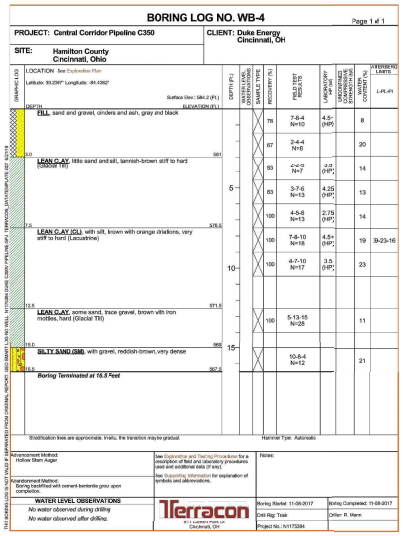
SHEET(S)	4 OF 8	DWG SCALE	NONE
DWG DATE	09-05-2018	SUPERSEDED	—
DRAWING NUMBER	PNG -B-350-0001011	REVISION	0

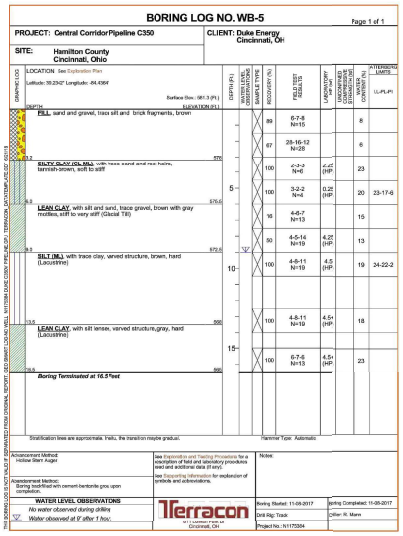
B/HAMILTON COUNTY/C350

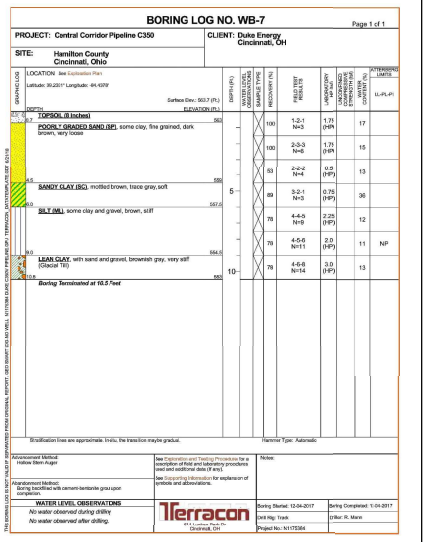
PROFESSIONAL ENG/ARCH STAMP

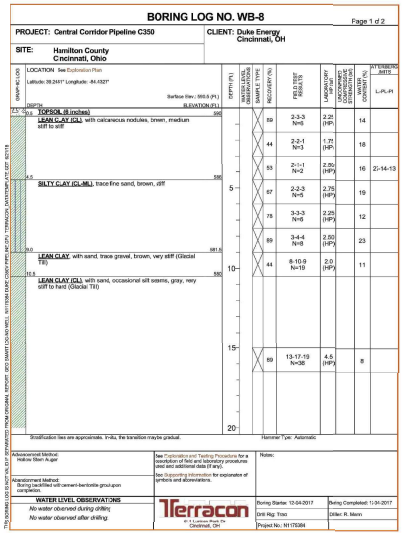


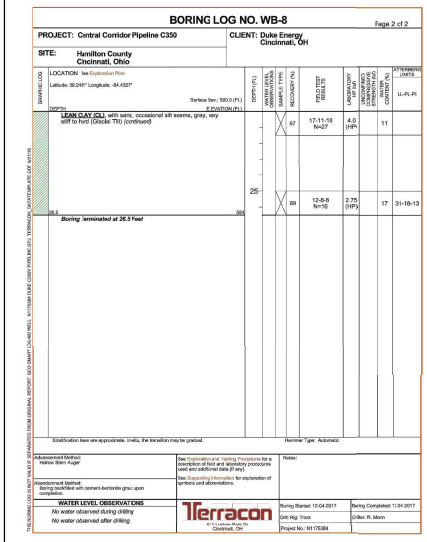


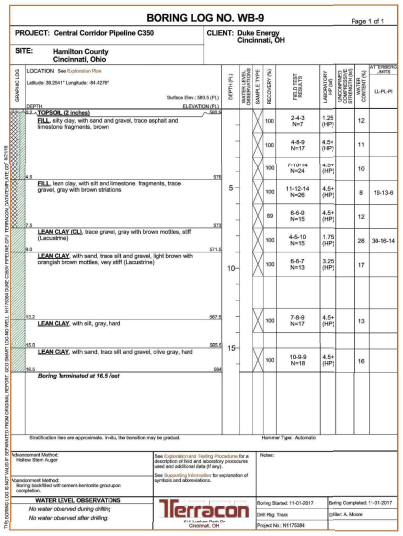












PROFESSIONAL ENG/ARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS		
DATE -	INITIALS -	REGIONAL ENGINEER
DATE -	INITIALS -	MGR TECH REC & STD
DATE 11/18/2020	INITIALS AMP	PRINCIPAL ENGINEER

REF. DWG(S): PNG-C-350-0001009

C350 PROJECT
GEOTECH BORE LOG 5
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

SHEET(S)	5 OF 8
DWG SCALE	NONE
DWG DATE	09-05-2018
SUPERSEDED	—
DRAWING NUMBER	PNG -B-350-0001012
REVISION	0

B/HAMILTON COUNTY/C350

BORING LOG NO. WB-10 — Page 1 of 3

PROJECT: Central Corridor Pipeline C350 **CLIENT:** Duke Energy, Cincinnati, OH
SITE: Hamilton County, Cincinnati, Ohio
LOCATION See Exploration Plan — Latitude: 39.2545° Longitude: -84.4262° — Surface Elev.: 574.6 (Ft.)

Depth	Description	Elevation (Ft.)
0.3	**TOPSOIL (3 inches)**	574.5
12.5	**FILL**, lean clay, with silt, sand and rock fragments, brown with dark brown striations	562
15.0	**LEAN CLAY**, with silt, dark olive brown, medium stiff (Loess)	559.5
20.0	**LEAN CLAY**, with silt, trace sand, dark brown, medium stiff	554.5
30.0	**WELL GRADED SAND (SW)**, with gravel, some silt, gray, medium dense to dense	544.5
	GRAVEL, some sand, gray, dense	

Recovery (%)	Field Test Results	Laboratory HP (tsf)	Water Content (%)	LL-PL-PI
44	3-2-5 N=7	1.75 (HP)	16	
100	6-8-13 N=21	3.0 (HP)	20	
5	6-7-6 N=13	3.5 (HP)	17	
39	2-2-4 N=6	1.5 (HP)	21	
39	1-7-9 N=16	2.75 (HP)	18	
67	4-3-3 N=6	0.5 (HP)	24	
39	2-3-4 N=7	1.5 (HP)	22	
78	6-8-8 N=16			
100	2-4-8 N=12			
50	10-13-24 N=37			
67	12-18-18 N=36			

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: Hollow Stem Auger
Abandonment Method: Boring backfilled with cement-bentonite grout upon completion.
See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations.
Notes:
WATER LEVEL OBSERVATIONS: No water observed during drilling. Water observed at 20.9' after 24 hours.
Terracon, 611 Lunken Park Dr, Cincinnati, OH
Boring Started: 10-30-2017 — Boring Completed: 10-31-2017 — Drill Rig: Track — Driller: A. Moore — Project No.: N1175384

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL N1175384 DUKE C350V PIPELINE.GPJ TERRACON_DATATEMPLATE.GDT 6/21/18

BORING LOG NO. WB-10 — Page 2 of 3

PROJECT: Central Corridor Pipeline C350 **CLIENT:** Duke Energy, Cincinnati, OH
SITE: Hamilton County, Cincinnati, Ohio
LOCATION See Exploration Plan — Latitude: 39.2545° Longitude: -84.4262° — Surface Elev.: 574.6 (Ft.)

Depth	Description	Elevation (Ft.)
40.0	**GRAVEL**, some sand, gray, dense *(continued)*	534.5
70.0	**LEAN CLAY**, with silt, trace coarse sand and gravel, gray, hard (Glacial Till) — No sample was recovered at 65' as possible boulders were encountered.	504.5
75.0	**SAND**, fine grained, brown, medium dense	499.5
	SILTY SAND (SM), fine grained, brown, dense to very dense	

Recovery (%)	Field Test Results	Laboratory HP (tsf)	Water Content (%)	LL-PL-PI
50	10-14-13 N=27	4.5+ (HP)	12	
39	15-18-22 N=40	4.5+ (HP)	14	
100	6-20-27 N=47	3.75 (HP)	14	
100	24-27-39 N=66	4.5+ (HP)	11	
27	17-26-36 N=62		18	
0	15-31-50 N=81			
100	13-6-6 N=12			
72	8-22-38 N=60			

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: Hollow Stem Auger
Abandonment Method: Boring backfilled with cement-bentonite grout upon completion.
See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations.
Notes:
WATER LEVEL OBSERVATIONS: No water observed during drilling. Water observed at 20.9' after 24 hours.
Terracon, 611 Lunken Park Dr, Cincinnati, OH
Boring Started: 10-30-2017 — Boring Completed: 10-31-2017 — Drill Rig: Track — Driller: A. Moore — Project No.: N1175384

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL N1175384 DUKE C350V PIPELINE.GPJ TERRACON_DATATEMPLATE.GDT 6/21/18

BORING LOG NO. WB-10 — Page 3 of 3

PROJECT: Central Corridor Pipeline C350 **CLIENT:** Duke Energy, Cincinnati, OH
SITE: Hamilton County, Cincinnati, Ohio
LOCATION See Exploration Plan — Latitude: 39.2545° Longitude: -84.4262° — Surface Elev.: 574.6 (Ft.)

Depth	Description	Elevation (Ft.)
101.5	**SILTY SAND (SM)**, fine grained, brown, dense to very dense *(continued)* — Medium dense at 95 feet.	473
	Boring Terminated at 101.5 Feet	

Recovery (%)	Field Test Results	Laboratory HP (tsf)	Water Content (%)	LL-PL-PI
94	9-17-22 N=39			
100	22-28-29 N=57			
83	20-31-36 N=67			
100	17-11-12 N=23			
83	6-14-22 N=36			

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: Hollow Stem Auger
Abandonment Method: Boring backfilled with cement-bentonite grout upon completion.
See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations.
Notes:
WATER LEVEL OBSERVATIONS: No water observed during drilling. Water observed at 20.9' after 24 hours.
Terracon, 611 Lunken Park Dr, Cincinnati, OH
Boring Started: 10-30-2017 — Boring Completed: 10-31-2017 — Drill Rig: Track — Driller: A. Moore — Project No.: N1175384

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL N1175384 DUKE C350V PIPELINE.GPJ TERRACON_DATATEMPLATE.GDT 6/21/18

BORING LOG NO. WB-11 — Page 1 of 3

PROJECT: Central Corridor Pipeline C350 **CLIENT:** Duke Energy, Cincinnati, OH
SITE: Hamilton County, Cincinnati, Ohio
LOCATION See Exploration Plan — Latitude: 39.2543° Longitude: -84.4238° — Surface Elev.: 568.1 (Ft.)

Depth	Description	Elevation (Ft.)
0.8	**TOPSOIL (10 inches)**	567.5
7.6	**FILL**, lean clay, with silt, trace root hairs, brown with orange mottles	560.5
10.0	-- Gray sand seam encountered at 7.5 feet. **LEAN CLAY**, with silt, trace sand and dark brown concretions, light olive brown with orange mottles, stiff to very stiff	558
12.5	**GRAVEL**, with sand, light brown, medium dense	555.5
23.5	**POORLY GRADED SAND (SP)**, light brown, very loose to loose	544.5
	GRAVEL, with sand, brown, medium dense to dense	

Recovery (%)	Field Test Results	Laboratory HP (tsf)	Water Content (%)	LL-PL-PI
67	2-3-5 N=8	3.25 (HP)	10	
78	9-7-8 N=15	2.5 (HP)	25	
100	4-5-7 N=12	1.5 (HP)	24	47-20-27
16	2-1-2 N=3	2.0 (HP)	26	
94	8-13-13 N=26			
94	4-2-2 N=4		10	
100	3-3-6 N=9			
100	4-2-3 N=5			
100	8-8-10 N=18			
100	4-11-23 N=34			

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: Hollow Stem Auger
Abandonment Method: Boring backfilled with cement-bentonite grout upon completion.
See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations.
Notes:
WATER LEVEL OBSERVATIONS: No water observed during drilling. Water observed at 11.6' after 1 hour.
Terracon, 611 Lunken Park Dr, Cincinnati, OH
Boring Started: 10-27-2017 — Boring Completed: 10-27-2017 — Drill Rig: Track — Driller: A. Moore — Project No.: N1175384

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL N1175384 DUKE C350V PIPELINE.GPJ TERRACON_DATATEMPLATE.GDT 6/21/18

BORING LOG NO. WB-11 — Page 2 of 3

PROJECT: Central Corridor Pipeline C350 **CLIENT:** Duke Energy, Cincinnati, OH
SITE: Hamilton County, Cincinnati, Ohio
LOCATION See Exploration Plan — Latitude: 39.2543° Longitude: -84.4238° — Surface Elev.: 568.1 (Ft.)

Depth	Description	Elevation (Ft.)
44.5	**GRAVEL**, with sand, brown, medium dense to dense *(continued)*	523.5
	LEAN CLAY, with sand and gravel, olive-brown to gray, hard (Glacial Till)	

Recovery (%)	Field Test Results	Laboratory HP (tsf)	Water Content (%)	LL-PL-PI
100	14-11-14 N=25			
100	22-21-21 N=42			
100	9-11-21 N=32	4.5+ (HP)		
94	24-22-24 N=46	4.5+ (HP)	11	
83	11-16-21 N=37	4.5+ (HP)	11	
89	16-22-24 N=46		14	

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: Hollow Stem Auger
Abandonment Method: Boring backfilled with cement-bentonite grout upon completion.
See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations.
Notes:
WATER LEVEL OBSERVATIONS: No water observed during drilling. Water observed at 11.6' after 1 hour.
Terracon, 611 Lunken Park Dr, Cincinnati, OH
Boring Started: 10-27-2017 — Boring Completed: 10-27-2017 — Drill Rig: Track — Driller: A. Moore — Project No.: N1175384

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL N1175384 DUKE C350V PIPELINE.GPJ TERRACON_DATATEMPLATE.GDT 6/21/18

BORING LOG NO. WB-11 — Page 3 of 3

PROJECT: Central Corridor Pipeline C350 **CLIENT:** Duke Energy, Cincinnati, OH
SITE: Hamilton County, Cincinnati, Ohio
LOCATION See Exploration Plan — Latitude: 39.2543° Longitude: -84.4238° — Surface Elev.: 568.1 (Ft.)

Depth	Description	Elevation (Ft.)
63.5	**LEAN CLAY**, with sand and gravel, olive-brown to gray, hard (Glacial Till) *(continued)*	504.5
68.5	**SAND**, trace silt, gray, dense	499.5
78.5	**LEAN CLAY**, with sand and cobbles, gray, hard (Glacial Till)	489.5
80.0	**SAND**, trace silt, fine grained, gray, dense	488
	Boring Terminated at 80 Feet	

Recovery (%)	Field Test Results	Laboratory HP (tsf)	Water Content (%)	LL-PL-PI
100	10-15-22 N=37		16	
75	50/2"		10	
100	21-23-23 N=46	3.5 (HP)	14	
100	25-20-25 N=45		31	

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: Hollow Stem Auger
Abandonment Method: Boring backfilled with cement-bentonite grout upon completion.
See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations.
Notes:
WATER LEVEL OBSERVATIONS: No water observed during drilling. Water observed at 11.6' after 1 hour.
Terracon, 611 Lunken Park Dr, Cincinnati, OH
Boring Started: 10-27-2017 — Boring Completed: 10-27-2017 — Drill Rig: Track — Driller: A. Moore — Project No.: N1175384

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL N1175384 DUKE C350V PIPELINE.GPJ TERRACON_DATATEMPLATE.GDT 6/21/18

BORING LOG NO. WB-12 — Page 1 of 3

PROJECT: Central Corridor Pipeline C350 **CLIENT:** Duke Energy, Cincinnati, OH
SITE: Hamilton County, Cincinnati, Ohio
LOCATION See Exploration Plan — Latitude: 39.2542° Longitude: -84.4215° — Surface Elev.: 579.6 (Ft.)

Depth	Description	Elevation (Ft.)
0.4	**TOPSOIL (4 inches)**	579
12.5	**FILL**, lean clay, with silt, tannish brown to dark brown with brown striations	567
20.8	**SANDY LEAN CLAY (CL)**, with cobbles, brown, medium stiff to very stiff (Glacial Till)	559
25.0	**SAND**, fine grained, olive-brown, loose	554.5
	SANDY LEAN CLAY (CL), with silt, occasional sand seams, gray, very stiff to hard (Glacial Till)	

Recovery (%)	Field Test Results	Laboratory HP (tsf)	Water Content (%)	LL-PL-PI
78	3-7-7 N=14		9	
94	9-6-6 N=12	4.0 (HP)	15	
100	4-4-6 N=10	2.5 (HP)	17	
44	4-6-5 N=11	4.5+ (HP)	14	
27	3-4-5 N=9	4.5+ (HP)	13	
67	4-6-8 N=14	0.75 (HP)	11	
100	5-6-9 N=15	3.5 (HP)	15	25-14-11
89	4-3-3 N=6	4.0 (HP)		
83	10-10-14 N=24	4.5+ (HP)		

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: Hollow Stem Auger
Abandonment Method: Boring backfilled with cement-bentonite grout upon completion.
See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations.
Notes:
WATER LEVEL OBSERVATIONS: No water observed during drilling. Water observed at 61.5' after 1 hour.
Terracon, 611 Lunken Park Dr, Cincinnati, OH
Boring Started: 10-25-2017 — Boring Completed: 10-26-2017 — Drill Rig: Track — Driller: A. Moore — Project No.: N1175384

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL N1175384 DUKE C350V PIPELINE.GPJ TERRACON_DATATEMPLATE.GDT 6/21/18

BORING LOG NO. WB-12 — Page 2 of 3

PROJECT: Central Corridor Pipeline C350 **CLIENT:** Duke Energy, Cincinnati, OH
SITE: Hamilton County, Cincinnati, Ohio
LOCATION See Exploration Plan — Latitude: 39.2542° Longitude: -84.4215° — Surface Elev.: 579.6 (Ft.)

Depth	Description	Elevation (Ft.)
	SANDY LEAN CLAY (CL), with silt, occasional sand seams, gray, very stiff to hard (Glacial Till) *(continued)*	

Recovery (%)	Field Test Results	Laboratory HP (tsf)	Water Content (%)	LL-PL-PI
100	6-9-14 N=23	4.5+ (HP)		
100	5-8-12 N=20	2.5 (HP)	13	24-13-11
100	4-8-13 N=21	3.0 (HP)		
39	11-12-15 N=27	1.5 (HP)		
89	9-12-14 N=26	2.0 (HP)		
100	16-15-30 N=45	4.5+ (HP)	10	21-12-9

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: Hollow Stem Auger
Abandonment Method: Boring backfilled with cement-bentonite grout upon completion.
See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations.
Notes:
WATER LEVEL OBSERVATIONS: No water observed during drilling. Water observed at 61.5' after 1 hour.
Terracon, 611 Lunken Park Dr, Cincinnati, OH
Boring Started: 10-25-2017 — Boring Completed: 10-26-2017 — Drill Rig: Track — Driller: A. Moore — Project No.: N1175384

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL N1175384 DUKE C350V PIPELINE.GPJ TERRACON_DATATEMPLATE.GDT 6/21/18

REF. DWG(S): PNG-G-350-0001009

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS
REGIONAL ENGINEER	-	-
MGR TECH REC & STD	-	-
PRINCIPAL ENGINEER	11/18/2020	AMP

DUKE ENERGY. Piedmont Natural Gas
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C350 PROJECT
GEOTECH BORE LOG 6
HAMILTON COUNTY, OHIO
HAMILTON COUNTY, OHIO

SHEET(S) 6 OF 8 — DWG SCALE NONE
DWG DATE 09-05-2018 — SUPERSEDED —
DRAWING NUMBER PNG -B-350-0001013 — REVISION 0
B/HAMILTON COUNTY/C350

PROFESSIONAL ENG/ARCH STAMP

BORING LOG NO. WB-12

Page 3 of 3

PROJECT: Central Corridor Pipeline C350 | CLIENT: Duke Energy, Cincinnati, OH
SITE: Hamilton County, Cincinnati, Ohio

LOCATION See Exploration Plan
Latitude: 39.2542° Longitude: -84.4215°
Surface Elev.: 579.6 (Ft.)

Depth	Description	Elevation (Ft.)
60.8–81.5	**SANDY LEAN CLAY**, with silt and cobbles, gray, very stiff to hard (Glacial Till). -- Cobbles/boulders encountered at 75 feet.	519–498

Boring Terminated at 81.5 Feet

Recovery (%)	Field Test Results	Laboratory HP (tsf)	Unconfined Compressive Strength (tsf)	Water Content (%)	Atterberg Limits LL-PL-PI
100	16-34-35 N=69	2.5+ (HP)			
100	27-32-50/5"	4.5+ (HP)			
100	24-27-45 N=72	4.5+ (HP)			
100	50/3"				
83	11-26-32 N=58	4.25 (HP)			

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: Hollow Stem Auger
Abandonment Method: Boring backfilled with cement-bentonite grout upon completion.
See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.
Notes:

WATER LEVEL OBSERVATIONS
No water observed during drilling
Water observed at 61.5' after 1 hour.

Terracon, 611 Lunken Park Dr, Cincinnati, OH
Boring Started: 10-25-2017 | Boring Completed: 10-26-2017
Drill Rig: Track | Driller: A. Moore
Project No.: N1175384

BORING LOG NO. WB-13

Page 1 of 1

PROJECT: Central Corridor Pipeline C350 | CLIENT: Duke Energy, Cincinnati, OH
SITE: Hamilton County, Cincinnati, Ohio

LOCATION See Exploration Plan
Latitude: 39.2263° Longitude: -84.438°
Surface Elev.: 573.5 (Ft.)

Depth	Description	Elevation (Ft.)
0–5.5	**FILL**, lean clay, trace sand, tannish brown with orangish brown mottles	568
5.5–8.5	**FILL**, trace gravel, with slag, black	565
8.5–12.5	**SILTY SAND (SM)**, trace gravel, light brown, very loose	561
12.5–16.5	**LEAN CLAY (CL)**, with sand, trace gravel, brown to brownish gray, hard (Glacial Till)	557

Boring Terminated at 16.5 Feet

Recovery (%)	Field Test Results	Laboratory HP (tsf)	Unconfined Compressive Strength (tsf)	Water Content (%)	Atterberg Limits LL-PL-PI
78	2-2-4 N=6	1.0 (HP)		22	
89	4-6-8 N=14	3.0 (HP)		23	
94	3-4-4 N=8	2.75 (HP)		23	36-19-17
33	5-3-4 N=7			19	
5	2-2-1 N=3			18	
100	0-2-1 N=3	0.25 (HP)		14	
100	6-11-12 N=23	4.5+ (HP)		12	28-15-13
100	10-29-29 N=58	4.5+ (HP)		7	

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: Hollow Stem Auger
Abandonment Method: Boring backfilled with cement-bentonite grout upon completion.
See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.
Notes:

WATER LEVEL OBSERVATIONS
No water observed during drilling
Water observed at 13.5' after 1 hour.

Terracon, 611 Lunken Park Dr, Cincinnati, OH
Boring Started: 12-03-2017 | Boring Completed: 12-03-2017
Drill Rig: Track | Driller: A. Moore
Project No.: N1175384

BORING LOG NO. WB-14

Page 1 of 1

PROJECT: Central Corridor Pipeline C350 | CLIENT: Duke Energy, Cincinnati, OH
SITE: Hamilton County, Cincinnati, Ohio

LOCATION See Exploration Plan
Latitude: 39.2781° Longitude: -84.3616°
Surface Elev.: 859.2 (Ft.)

Depth	Description	Elevation (Ft.)
0–0.7	**ASPHALT (8.75 inches)**	858.5
0.7–1.0	**AGGREGATE BASE (3.25 inches)**	858
1.0–2.5	**FILL**, lean clay, with sand and iron concretions, brown to olive-brown	856.5
2.5–5.5	**LEAN CLAY**, with silt, trace sand, light gray with olive-brown mottles, medium stiff	853.5
5.5–8.5	**LEAN CLAY**, with silt, trace sand, dark brown with gray, stiff to very stiff	850.5
8.5–12.5	**LEAN CLAY (CL)**, with silt and sand, trace root hairs, mottled brown and gray with iron mottles, stiff to very stiff	846.5
12.5–15.0	**LEAN CLAY**, with silt, trace sand, bluish-gray and brown, medium stiff	844
15.0–20.0	**LEAN CLAY**, with sand, silt and large iron concretions, trace gravel, reddish-brown, very stiff	839
20.0–21.5	**LEAN CLAY (CL)**, with sand, trace silt, medium plasticity, brown, stiff	837.5

Boring Terminated at 21.5 Feet

Recovery (%)	Field Test Results	Laboratory HP (tsf)	Unconfined Compressive Strength (tsf)	Water Content (%)	Atterberg Limits LL-PL-PI
100	3-4-6 N=10	3.0 (HP)		17	
100	4-4-4 N=8	4.5- (HP)		17	
100	3-3-4 N=7	2.0 (HP)		27	
100	7-7-8 N=15	4.25 (HP)		18	
94	4-8-10 N=18	3.75 (HP)		17	
100	5-5-7-9 N=12	3.0 (HP)		17	36-17-19
100	3-3-4 N=7	2.5 (HP)		26	
100	8-8-12 N=20	4.5+ (HP)		17	
100	4-4-5 N=9	4.5+ (HP)		24	48-19-29

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: Hollow Stem Auger
Abandonment Method: Boring backfilled with cement-bentonite grout upon completion. Surface capped with asphalt.
See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.
Notes:

WATER LEVEL OBSERVATIONS
No water observed during drilling
No water observed after drilling.

Terracon, 611 Lunken Park Dr, Cincinnati, OH
Boring Started: 10-23-2017 | Boring Completed: 10-23-2017
Drill Rig: Track | Driller: A. Moore
Project No.: N1175384

BORING LOG NO. WB-15

Page 1 of 1

PROJECT: Central Corridor Pipeline C350 | CLIENT: Duke Energy, Cincinnati, OH
SITE: Hamilton County, Cincinnati, Ohio

LOCATION See Exploration Plan
Latitude: 39.2686° Longitude: -84.3768°
Approximate Surface Elev: 835 (Ft.) +/-

Depth	Description	Elevation (Ft.)
0–0.6	**TOPSOIL (6 inches)**	834.5+/-
0.6–3.0	**LEAN CLAY (CL)**, with sand, trace gravel, brown, medium stiff	832+/-
3.0–6.0	**LEAN CLAY (CL)**, with sand, trace gravel, brown to olive-brown, stiff to very stiff (Glacial Till)	829+/-
6.0–14.0	**LEAN CLAY**, with sand, with iron oxide stains and concretions, brown to reddish brown, stiff to very stiff	821+/-
14.0–19.0	**LEAN CLAY (CL)**, medium plasticity, brown with gray mottles, very stiff to hard	816+/-
19.0–21.5	**LEAN CLAY**, with limestone fragments, medium plasticity olive-brown, hard (Residuum)	813.5+/-

Boring Terminated at 21.5 Feet

Recovery (%)	Field Test Results	Laboratory HP (tsf)	Unconfined Compressive Strength (tsf)	Water Content (%)	Atterberg Limits LL-PL-PI
89	0-3-3 N=6	2.0 (HP)		18	
67	1-2-4 N=6	2.0 (HP)		19	32-17-15
100	4-7-7 N=14	3.5 (HP)		16	
100	4-5-7 N=12	3.75 (HP)		17	34-18-16
100	5-6-8 N=14	4.0 (HP)		14	
100	4-6-9 N=15	4.5+ (HP)		19	
100	3-5-6 N=11	3.75 (HP)		21	
94	4-7-11 N=18	4.5+ (HP)		16	46-20-26
100	9-10-15 N=25	4.5+ (HP)		20	

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: Hollow Stem Auger
Abandonment Method: Boring backfilled with cement-bentonite grout upon completion.
See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.
Notes:

WATER LEVEL OBSERVATIONS
No water observed during drilling
No water observed after drilling

Terracon, 611 Lunken Park Dr, Cincinnati, OH
Boring Started: 01-19-2018 | Boring Completed: 01-19-2018
Drill Rig: Track | Driller: P. Pattison
Project No.: N1175384

BORING LOG NO. WB-16

Page 1 of 1

PROJECT: Central Corridor Pipeline C350 | CLIENT: Duke Energy, Cincinnati, OH
SITE: Hamilton County, Cincinnati, Ohio

LOCATION See Exploration Plan
Latitude: 39.2524° Longitude: -84.3944°
Surface Elev.: 862.1 (Ft.)

Depth	Description	Elevation (Ft.)
0–0.5	**TOPSOIL (6 inches)**	861.5
0.5–1.5	**LEAN CLAY**, with silt, trace sand and root hairs, tannish-brown, stiff	860.5
1.5–7.7	**LEAN CLAY (CL)**, with silt and sand, trace black concretions, brown with light gray striations, hard	854.5
7.7–13.4	**LEAN CLAY**, with silt and sand, trace iron concretions, tannish-brown and light gray striations, hard (Residuum)	848.5
13.4–15.0	**INTERBEDDED SHALE AND LIMESTONE** Shale: Moderately weathered, very weak, olive-brown. Limestone: Unweathered, strong, light gray	847
15.0–20.2	**INTERBEDDED SHALE AND LIMESTONE** Shale: Slightly weathered, very weak, olive-brown to gray. Limestone: Unweathered, strong, light gray	842

Boring Terminated at 20.2 Feet

Recovery (%)	Field Test Results	Laboratory HP (tsf)	Unconfined Compressive Strength (tsf)	Water Content (%)	Atterberg Limits LL-PL-PI
94	2-2-2 N=4	1.5 (HP)		27	
100	4-7-10 N=17	4.5+ (HP)		16	30-17-13
100	5-10-14 N=24	4.5+ (HP)		15	
94	7-8-7 N=15	4.25 (HP)		31	
89	5-7-11 N=18	4.0 (HP)		18	41-21-20
89	21-11-15 N=26	4.5+ (HP)		8	
72	13-15-14 N=29	4.5+ (HP)		14	
100	32-50/4"	4.5+ (HP)			
100	50/5"				
100	50/2"				

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: Hollow Stem Auger
Abandonment Method: Boring backfilled with cement-bentonite grout upon completion.
See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.
Notes:

WATER LEVEL OBSERVATIONS
No water observed during drilling
No water observed after drilling.

Terracon, 611 Lunken Park Dr, Cincinnati, OH
Boring Started: 10-25-2017 | Boring Completed: 10-25-2017
Drill Rig: Track | Driller: A. Moore
Project No.: N1175384

BORING LOG NO. WB-18

Page 1 of 1

PROJECT: Central Corridor Pipeline C350 | CLIENT: Duke Energy, Cincinnati, OH
SITE: Hamilton County, Cincinnati, Ohio

LOCATION See Exploration Plan
Latitude: 39.2112° Longitude: -84.4457°
Surface Elev.: 575.00 (Ft.)

Depth	Description	Elevation (Ft.)
0–6.0	**FILL**, lean clay, with gravel, trace brick fragments and cinders, brown and black	569
6.0–9.0	**POORLY GRADED SAND (SP)**, with silt and clay, brown trace gray, medium dense	566
9.0–16.5	**LEAN CLAY (CL)**, with sand, trace gravel, gray and brown, medium stiff to very stiff (Glacial Till)	558.5

Boring Terminated at 16.5 Feet

Recovery (%)	Field Test Results	Laboratory HP (tsf)	Unconfined Compressive Strength (tsf)	Water Content (%)	Atterberg Limits LL-PL-PI
100	6-24-23 N=47	2.0 (HP)		7	
78	6-20-16 N=36	4.0 (HP)		21	27-18-9
22	6-4-3 N=7	0.5 (HP)		12	
11	2-1-2 N=3	0.50 (HP)		18	
53	2-4-14 N=18			14	
44	8-7-11 N=18			16	
53	4-2-4 N=6	1.5 (HP)		15	
89	7-9-8 N=17	3.5 (HP)		14	26-15-11

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: Hollow Stem Auger
Abandonment Method: Boring backfilled with cement-bentonite grout upon completion.
See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.
Notes:

WATER LEVEL OBSERVATIONS
No water observed during drilling
No water observed at 2.5 hours after drilling

Terracon, 611 Lunken Park Dr, Cincinnati, OH
Boring Started: 12-05-2017 | Boring Completed: 12-07-2017
Drill Rig: Track | Driller: R. Mann
Project No.: N1175384

BORING LOG NO. WB-19

Page 1 of 1

PROJECT: Central Corridor Pipeline C350 | CLIENT: Duke Energy, Cincinnati, OH
SITE: Hamilton County, Cincinnati, Ohio

LOCATION See Exploration Plan
Latitude: 39.1946° Longitude: -84.4528°
Surface Elev.: 597.3 (Ft.)

Depth	Description	Elevation (Ft.)
0–0.5	**TOPSOIL (6 inches)**	597
0.5–4.5	**FILL**, lean clay, with sand, trace root hairs and cinders, dark gray	593
4.5–15.0	**LEAN CLAY (CL)**, with sand, orange-brown with gray mottles, stiff to very stiff	582.5
15.0–16.5	**LEAN CLAY (CL)**, with sand, gravel, iron oxide stains and cobbles, gray and orange-brown, hard (Glacial Till)	581

Boring Terminated at 16.5 Feet

Recovery (%)	Field Test Results	Laboratory HP (tsf)	Unconfined Compressive Strength (tsf)	Water Content (%)	Atterberg Limits LL-PL-PI
100	3-6-6 N=12	4.5+ (HP)		19	
83	4-4-5 N=9	2.25 (HP)		30	
89	5-4-4 N=8	1.0 (HP)		28	33-21-12
94	2-2-4 N=6	1.0 (HP)		30	
83	4-6-9 N=15	3.0 (HP)		25	
100	9-6-7 N=13	2.5 (HP)		23	
100	5-5-7 N=12	2.5 (HP)		24	48-20-28
72	4-5-6 N=11	3.5 (HP)		24	
89	4-4-20 N=24			23	26-17-9

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: Hollow Stem Auger
Abandonment Method: Boring backfilled with cement-bentonite grout upon completion.
See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.
Notes:

WATER LEVEL OBSERVATIONS
No water observed during drilling
No water observed after drilling.

Terracon, 611 Lunken Park Dr, Cincinnati, OH
Boring Started: 12-03-2017 | Boring Completed: 12-03-2017
Drill Rig: Track | Driller: A. Moore
Project No.: N1175384

BORING LOG NO. WB-20

Page 1 of 1

PROJECT: Central Corridor Pipeline C350 | CLIENT: Duke Energy, Cincinnati, OH
SITE: Hamilton County, Cincinnati, Ohio

LOCATION See Exploration Plan
Latitude: 39.1934° Longitude: -84.453°
Surface Elev.: 596.6 (Ft.)

Depth	Description	Elevation (Ft.)
0–12.5	**LEAN CLAY (CL)**, trace gravel and iron concretions, gray trace brown, medium stiff to stiff	584
12.5–13.3	**LEAN CLAY (CL)**, with sand, trace iron concretions, reddish-brown, stiff	583.5
13.3–15.4	**LEAN CLAY (CL)**, with sand, gravel and cobbles, brown with gray, hard (Glacial Till)	581

Boring Terminated at 15.4 Feet

Recovery (%)	Field Test Results	Laboratory HP (tsf)	Unconfined Compressive Strength (tsf)	Water Content (%)	Atterberg Limits LL-PL-PI
100	10-13-7 N=20	3.75 (HP)		21	
100	7-6-6 N=12	1.5 (HP)		25	
83	3-2-3 N=5	1.0 (HP)		26	45-21-24
100	4-5-6 N=11	2.0 (HP)		20	
100	4-4-6 N=10	2.75 (HP)		20	48-16-32
100	4-5-7 N=12	1.75 (HP)		21	
100	4-5-5 N=10	1.75 (HP)		21	
100	3-2-9 N=11	1.75 (HP)		21	39-16-23
100	50/5"			7	

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: Hollow Stem Auger
Abandonment Method: Boring backfilled with cement-bentonite grout upon completion.
See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.
Notes:

WATER LEVEL OBSERVATIONS
No water observed during drilling
Water observed at 2' after 1 hour.

Terracon, 611 Lunken Park Dr, Cincinnati, OH
Boring Started: 12-02-2017 | Boring Completed: 12-02-2017
Drill Rig: Track | Driller: A. Moore
Project No.: N1175384

BURNS & McDONNELL ENGINEERING COMPANY, INC.
PROFESSIONAL ENG/ARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS DATE	INITIALS	
-	-	REGIONAL ENGINEER
-	-	MGR TECH REC & STD
11/18/2020	AMP	PRINCIPAL ENGINEER

DUKE ENERGY. | Piedmont Natural Gas

C350 PROJECT
GEOTECH BORE LOG 7
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

REF. DWG(S): PNG-G-350-0001009
SHEET(S) 7 OF 8 | DWG SCALE NONE
DWG DATE 09-05-2018 | SUPERSEDED —
DRAWING NUMBER: PNG -B-350-0001014 | REVISION: 0
B/HAMILTON COUNTY/C350

BORING LOG NO. WB-22

Page 1 of 1

PROJECT: Central Corridor Pipeline C350
CLIENT: Duke Energy, Cincinnati, OH
SITE: Hamilton County, Cincinnati, Ohio

LOCATION See Exploration Plan
Latitude: 39.1784° Longitude: -84.4544°
Surface Elev.: 596.8 (Ft.)

Depth (Ft.)	Description	Elevation (Ft.)
0.2	**ASPHALT (3 inches)**	596.5
12.0	**FILL**, silt, with sand, gravel and cinders, some clay, grayish-brown	585
21.5	**LEAN CLAY (CL)**, with cobbles and sand, trace gravel, gray, hard (Glacial Till)	575.5

Boring Terminated at 21.5 Feet

Recovery (%)	Field Test Results	Laboratory HP (tsf)	Water Content (%)	Atterberg Limits LL-PL-PI
100	4-5-5 N=10	3.75 (HP)	18	
89	6-8-8 N=16	3.5 (HP)	17	
94	8-6-4 N=10	1.75 (HP)	22	
100	5-8-12 N=20	1.5 (HP)	14	25-15-10
100	4-4-4 N=8	0.5 (HP)	22	
67	2-2-4 N=6	0.5 (HP)	20	
100	11-12-17 N=29	4.5+ (HP)	12	
100	14-28-22 N=50	4.5+ (HP)	11	
100	11-15-19 N=34	3.75 (HP)	13	26-15-11

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: Hollow Stem Auger
Abandonment Method: Boring backfilled with cement-bentonite grout upon completion. Surface capped with asphalt.
See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.
Notes:

WATER LEVEL OBSERVATIONS
Water observed at 17' during drilling
Water observed at 7.2' after 1 hour.

Terracon, 611 Lunken Park Dr, Cincinnati, OH

Boring Started: 12-02-2017 | Boring Completed: 12-02-2017 | Drill Rig: Track | Driller: A. Moore | Project No.: N1175384

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL N1175384 DUKE C350V PIPELINE.GPJ TERRACON_DATATEMPLATE.GDT 6/21/18

BORING LOG NO. WB-24

Page 1 of 1

PROJECT: Central Corridor Pipeline C350
CLIENT: Duke Energy, Cincinnati, OH
SITE: Hamilton County, Cincinnati, Ohio

LOCATION See Exploration Plan
Latitude: 39.2592° Longitude: -84.3805°
Surface Elev.: 837.1 (Ft.)

Depth (Ft.)	Description	Elevation (Ft.)
0.3	**TOPSOIL (4 inches)**	837
0.5	**AGGREGATE (2 inches)**	836.5
9.8	**FAT CLAY (CH)**, with sand and silt, trace smal gravel, olive-brown with reddish iron mottles, stiff to very stiff	827.5
15.8	**FAT CLAY**, with silt, tannish-brown with gray and orange-brown striations, hard (Residuum)	821.5
16.4	**INTERBEDDED SHALE AND LIMESTONE** Shale: Slightly weathered, very weak, gray; Limestone: Unweathered, strong, light gray	820.5

Boring Terminated at 16.4 Feet

Recovery (%)	Field Test Results	Laboratory HP (tsf)	Water Content (%)	Atterberg Limits LL-PL-PI
78	7-5-5 N=10	3.75 (HP)	19	
89	4-6-6 N=12	2.75 (HP)	23	
100	6-7-10 N=17	3.25 (HP)	26	
100	4-5-8 N=13	3.0 (HP)	26	60-24-36
100	4-7-8 N=15	3.25 (HP)	27	
100	5-6-8 N=14	2.5 (HP)	23	57-21-36
100	11-8-12 N=20	4.5+ (HP)	19	
89	34-30-28 N=58	4.5+ (HP)	15	
64	16-35-50/5"			

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: Hollow Stem Auger
Abandonment Method: Boring backfilled with cement-bentonite grout upon completion.
See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.
Notes:

WATER LEVEL OBSERVATIONS
No water observed during drilling
Water observed at 16.1' after 1 hour.

Terracon, 611 Lunken Park Dr, Cincinnati, OH

Boring Started: 10-24-2017 | Boring Completed: 10-24-2017 | Drill Rig: Track | Driller: A. Moore | Project No.: N1175384

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL N1175384 DUKE C350V PIPELINE.GPJ TERRACON_DATATEMPLATE.GDT 6/21/18

BORING LOG NO. WB-17

Page 1 of 1

PROJECT: Central Corridor Pipeline C350
CLIENT: Duke Energy, Cincinnati, OH
SITE: Hamilton County, Cincinnati, Ohio

LOCATION See Exploration Plan
Latitude: 39.2158° Longitude: -84.4438°
Surface Elev.: 561 (Ft.)

Depth (Ft.)	Description	Elevation (Ft.)
7.0	**FILL**, lean clay, trace sand, with shale, rock and limestone fragments, gray with brown	554
13.5	**FILL**, sandy lean clay, with rock fragments, black to brown with iron concretions, black to brown with iron concretions	547.5
20.0	**SILTY CLAY (CL-ML)**, with sand, brown, medium stiff to very stiff; -- Rock fragments encountered at 18.5 feet	541

Boring Terminated at 20 Feet

Recovery (%)	Field Test Results	Laboratory HP (tsf)	Water Content (%)	Atterberg Limits LL-PL-PI
33	3-5-5 N=10			
100	3-3-3 N=6			
44	10-9-4 N=13			
50	4-3-4 N=7			
100	3-14-14 N=28			
100	7-6-3 N=9	3.5 (HP)	18	30-17-13
27	2-3-5 N=8			
100	3-5-8 N=13	3.0 (HP)	11	21-13-8

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method: Hollow Stem Auger
Abandonment Method: Boring backfilled with cement-bentonite grout upon completion.
See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.
Notes:

WATER LEVEL OBSERVATIONS
Water observed at 13.5' during drilling
No water observed after drilling.

Terracon, 611 Lunken Park Dr, Cincinnati, OH

Boring Started: 05-07-2018 | Boring Completed: 05-07-2018 | Drill Rig: Track | Driller: R. Mann | Project No.: N1175384

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL N1175384 DUKE C350V PIPELINE.GPJ TERRACON_DATATEMPLATE.GDT 6/21/18

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

Central Corridor Pipeline C350 ■ Cincinnati, Ohio
6/22/2018 ■ Terracon Project No. N1175384

Terracon GeoReport

SAMPLING	WATER LEVEL	FIELD TESTS
Standard Penetration Test	Water Initially Encountered; Water Level After a Specified Period of Time; Water Level After a Specified Period of Time. Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.	N Standard Penetration Test Resistance (Blows/Ft.); (HP) Hand Penetrometer; (T) Torvane; (DCP) Dynamic Cone Penetrometer; UC Unconfined Compressive Strength; (PID) Photo-Ionization Detector; (OVA) Organic Vapor Analyzer

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance

CONSISTENCY OF FINE-GRAINED SOILS (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance

Descriptive Term (Density)	Standard Penetration or N-Value Blows/Ft.	Descriptive Term (Consistency)	Unconfined Compressive Strength Qu, (tsf)	Standard Penetration or N-Value Blows/Ft.
Very Loose	0 - 3	Very Soft	less than 0.25	0 - 1
Loose	4 - 9	Soft	0.25 to 0.50	2 - 4
Medium Dense	10 - 29	Medium Stiff	0.50 to 1.00	4 - 8
Dense	30 - 50	Stiff	1.00 to 2.00	8 - 15
Very Dense	> 50	Very Stiff	2.00 to 4.00	15 - 30
		Hard	> 4.00	> 30

RELATIVE PROPORTIONS OF SAND AND GRAVEL: Descriptive Term(s) of other constituents	Percent of Dry Weight	RELATIVE PROPORTIONS OF FINES: Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	<15	Trace	<5
With	15-29	With	5-12
Modifier	>30	Modifier	>12

GRAIN SIZE TERMINOLOGY: Major Component of Sample	Particle Size	PLASTICITY DESCRIPTION: Term	Plasticity Index
Boulders	Over 12 in. (300 mm)	Non-plastic	0
Cobbles	12 in. to 3 in. (300mm to 75mm)	Low	1 - 10
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)	Medium	11 - 30
Sand	#4 to #200 sieve (4.75mm to 0.075mm	High	> 30
Silt or Clay	Passing #200 sieve (0.075mm)		

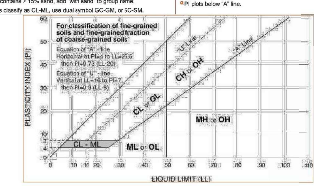
UNIFIED SOIL CLASSIFICATION SYSTEM

C350 Central Corridor Pipeline Expansion ■ Cincinnati, Hamilton County, Ohio
June 22, 2018 ■ Terracon Project No. N1175384

Terracon GeoReport

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]				Group Symbol	Group Name [B]
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	Gravels: More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels: Less than 5% fines [C]	$Cu \geq 4$ and $1 \leq Cc \leq 3$ [E]	GW	Well-graded gravel [F]
			$Cu < 4$ and/or $1 > Cc$ or $Cc > 3$ [E]	GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH	GM	Silty gravel [F, G, H]
			Fines classify as CL or CH	GC	Clayey gravel [F, G, H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	Clean Sands: Less than 5% fines [D]	$Cu \geq 6$ and $1 \leq Cc \leq 3$ [E]	SW	Well-graded sand [I]
			$Cu < 6$ and/or $1 > Cc > 3$ [E]	SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH	SM	Silty sand [G, H, I]
			Fines classify as CL or CH	SC	Clayey sand [G, H, I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	Silts and Clays: Liquid limit less than 50	Inorganic:	PI > 7 and plots on or above "A"	CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]	ML	Silt [K, L, M]
		Organic:	Liquid limit - oven dried / Liquid limit - not dried < 0.75	OL	Organic clay [K, L, M, N]; Organic silt [K, L, M, O]
	Silts and Clays: Liquid limit 50 or more	Inorganic:	PI plots on or above "A" line	CH	Fat clay [K, L, M]
			PI plots below "A" line	MH	Elastic Silt [K, L, M]
		Organic:	Liquid limit - oven dried / Liquid limit - not dried < 0.75	OH	Organic clay [K, L, M, P]; Organic silt [K, L, M, Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor			PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve
[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.
[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay
[E] $Cu = D_{60}/D_{10}$ $Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$
[F] If soil contains ≥ 15% sand, add "with sand" to group name.
[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.
[H] If fines are organic, add "with organic fines" to group name.
[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.
[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.
[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.
[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.
[N] PI ≥ 4 and plots on or above "A" line.
[O] PI < 4 or plots below "A" line.
[P] PI plots on or above "A" line.
[Q] PI plots below "A" line.



DESCRIPTION OF ROCK PROPERTIES

C350 Central Corridor Pipeline Expansion ■ Cincinnati, Hamilton County, Ohio
June 22, 2018 ■ Terracon Project No. N1175384

Terracon GeoReport

WEATHERING

Term	Description
Unweathered	No visible sign of rock material weathering, perhaps slight discoloration on major discontinuity surfaces.
Slightly weathered	Discoloration indicates weathering of rock material and discontinuity surfaces. All the rock material may be discolored by weathering and may be somewhat weaker externally than in its fresh condition.
Moderately weathered	Less than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discolored rock is present either as a continuous framework or as corestones.
Highly weathered	More than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discolored rock is present either as a discontinuous framework or as corestones.
Completely weathered	All rock material is decomposed and/or disintegrated to soil. The original mass structure is still largely intact.
Residual soil	All rock material is converted to soil. The mass structure and material fabric are destroyed. There is a large change in volume, but the soil has not been significantly transported.

STRENGTH OR HARDNESS

Description	Field Identification	Uniaxial Compressive Strength, psi (MPa)
Extremely weak	Indented by thumbnail	40-150 (0.3-1)
Very weak	Crumbles under firm blows with point of geological hammer, can be peeled by a pocket knife	150-700 (1-5)
Weak rock	Can be peeled by a pocket knife with difficulty, shallow indentations made by firm blow with point of geological hammer	700-4,000 (5-30)
Medium strong	Cannot be scraped or peeled with a pocket knife, specimen can be fractured with single firm blow of geological hammer	4,000-7,000 (30-50)
Strong rock	Specimen requires more than one blow of geological hammer to fracture it	7,000-15,000 (50-100)
Very strong	Specimen requires many blows of geological hammer to fracture it	15,000-36,000 (100-250)
Extremely strong	Specimen can only be chipped with geological hammer	>36,000 (>250)

DISCONTINUITY DESCRIPTION

Fracture Spacing (Joints, Faults, Other Fractures): Description	Spacing	Bedding Spacing (May Include Foliation or Banding): Description	Spacing
Extremely close	< ¾ in (<19 mm)	Laminated	< ½ in (<12 mm)
Very close	¾ in – 2-1/2 in (19 - 60 mm)	Very thin	½ in – 2 in (12 – 50 mm)
Close	2-1/2 in – 8 in (60 – 200 mm)	Thin	2 in – 1 ft. (50 – 300 mm)
Moderate	8 in – 2 ft. (200 – 600 mm)	Medium	1 ft. – 3 ft. (300 – 900 mm)
Wide	2 ft. – 6 ft. (600 mm – 2.0 m)	Thick	3 ft. – 10 ft. (900 mm – 3 m)
Very Wide	6 ft. – 20 ft. (2.0 – 6 m)	Massive	> 10 ft. (3 m)

Discontinuity Orientation (Angle): Measure the angle of discontinuity relative to a plane perpendicular to the longitudinal axis of the core. (For most cases, the core axis is vertical; therefore, the plane perpendicular to the core axis is horizontal.) For example, a horizontal bedding plane would have a 0-degree angle.

ROCK QUALITY DESIGNATION (RQD) [1]

Description	RQD Value (%)
Very Poor	0 - 25
Poor	25 – 50
Fair	50 – 75
Good	75 – 90
Excellent	90 - 100

1. The combined length of all sound and intact core segments equal to or greater than 4 inches in length, expressed as a percentage of the total core run length.

Reference: U.S. Department of Transportation, Federal Highway Administration, Publication No FHWA-NHI-10-034, December 2009 Technical Manual for Design and Construction of Road Tunnels – Civil Elements

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS: DATE	INITIALS	
-	-	REGIONAL ENGINEER
-	-	MGR TECH REC & STD
11/18/2020	AMP	PRINCIPAL ENGINEER

PROFESSIONAL ENG/ARCH STAMP

DUKE ENERGY. | Piedmont Natural Gas

C350 PROJECT
GEOTECH BORE LOG 8
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

REF. DWG(S): PNG-G-350-0001009

SHEET(S) 8 OF 8 | DWG SCALE NONE
DWG DATE 09-05-2018 | SUPERSEDED —
DRAWING NUMBER: PNG -B-350-0001015 | REVISION 0

B/HAMILTON COUNTY/C350

INSTALLATION:

1. AASHTO #2 (1.5-2.5 INCH) STONE OR RECYCLED CONCRETE EQUIVALENT SHALL BE PLACED AT A MINIMUM 6-INCH THICKNESS FOR LIGHT DUTY USE OR AT LEAST 10-INCH THICKNESS FOR HEAVY-DUTY USE.
2. THE ENTRANCE SHALL BE AS LONG AS REQUIRED TO STABILIZE HIGH TRAFFIC AREAS (30-FT MINIMUM ON A SINGLE RESIDENTIAL LOT; 70-FT MINIMUM ELSEWHERE).
3. A GEOTEXTILE SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING STONE. IT SHALL BE COMPOSED OF STRONG ROT-PROOF POLYMERIC FIBERS AND MEET THE FOLLOWING SPECIFICATIONS:

MINIMUM TENSILE STRENGTH	200 lbs.
MINIMUM PUNCTURE STRENGTH	80 psi.
MINIMUM TEAR STRENGTH	50 lbs.
MINIMUM BURST STRENGTH	320 psi.
MINIMUM ELONGATION	20%
EQUIVALENT OPENING SIZE	EOS < 0.6 mm
PERMEABILITY	1X10-3 cm/sec

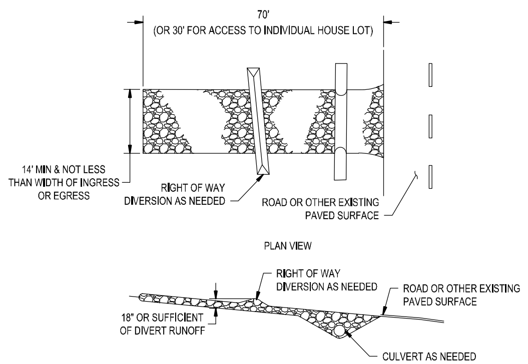
4. IF NEEDED, A PIPE OR CULVERT SHALL BE CONSTRUCTED UNDER THE ENTRANCE TO PREVENT SURFACE WATER FROM FLOWING ACROSS THE ENTRANCE OUT ONTO PAVED SURFACES.
5. IF NEEDED, A WATER BAR SHALL BE CONSTRUCTED TO PREVENT SURFACE WATER FROM FLOWING ALONG THE LENGTH OF THE ENTRANCE UT ONTO PAVED SURFACE.

MAINTENANCE:

1. TOP DRESS WITH ADDITIONAL STONE AS SITE CONDITIONS DEMAND.
2. REMOVE MUD TRACKED ONTO PUBLIC STREETS IMMEDIATELY VIA SCRAPING OR SWEEPING.
3. ENSURE THE ENDS OF A TEMPORARY CULVERT PIPE (IF UTILIZED) ARE NOT BLOCKED AND THAT THE PIPE IS FREE OF DEBRIS THROUGHOUT.

REMOVAL:

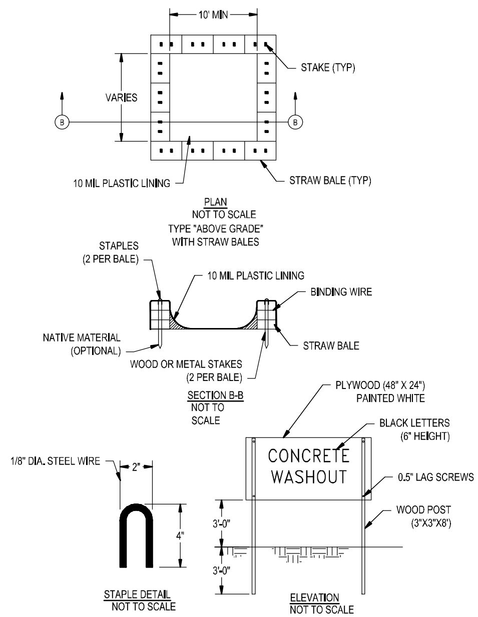
1. THE ENTRANCE SHALL REMAIN IN PLACE UNTIL THE DISTURBED AREA IS STABILIZED OR REPLACED WITH A PERMANENT ROADWAY OR ENTRANCE.
2. PULL OUT ALL CONSTRUCTION ENTRANCE MATERIAL AND PROPERLY DISPOSE OF OFF-SITE. STONE CAN BE BLENDED INTO THE SURROUNDING LANDSCAPE AS SITE CONDITIONS ALLOW.
3. RE-GRADE THE AREA AS NECESSARY AND ESTABLISH VEGETATION ON ANY RESULTING DISTURBED AREAS.



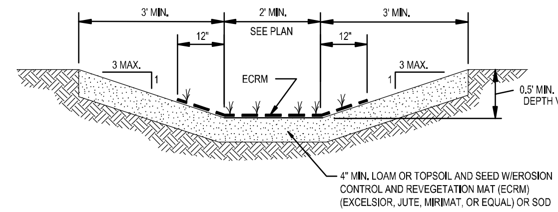
STABILIZING CONSTRUCTION ENTRANCE
SCALE:N.T.S.

NOTES:

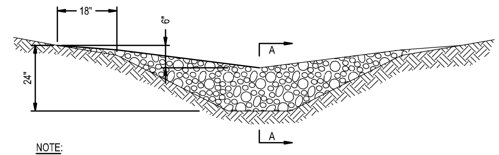
1. CONCRETE WASHOUT WATER SHALL NOT BE ALLOWED TO FLOW TO STREAMS, DITCHES, STORM DRAINS, OR ANY OTHER WASHOUT CONVEYANCE.
2. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED ADJACENT TO THE TEMPORARY CONCRETE WASHOUT FACILITY.
3. WASHOUT PIT MUST BE INSPECTED FREQUENTLY TO ENSURE LINER IS INTACT.
4. ONCE 75% OF ORIGINAL PIT VOLUME IS FILLED OR LINER IS TORN, MATERIAL MUST BE REMOVED AND PROPERLY DISPOSED OF ONCE HARDENED. LINER SHALL BE REPLACED IF TORN.



CONCRETE WASHOUT AREAS
SCALE:N.T.S.

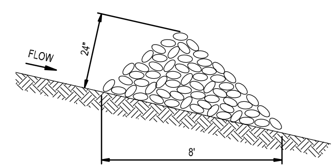


SWALE CROSS SECTION
SCALE: N.T.S.

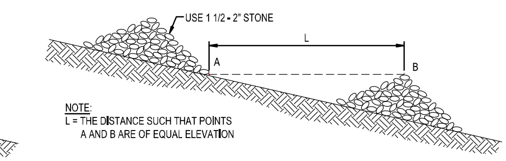


NOTE:
KEY STONE INTO CHANNEL BANKS AND EXTEND IT BEYOND THE ABUTMENTS A MINIMUM OF 18" TO PREVENT FLOW AROUND THE DAM.

VIEW LOOKING UPSTREAM



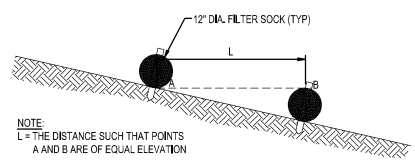
SECTION A



NOTE:
L = THE DISTANCE SUCH THAT POINTS A AND B ARE OF EQUAL ELEVATION

SIDE VIEW

ROCK DITCH CHECK
SCALE: N.T.S.



NOTE:
L = THE DISTANCE SUCH THAT POINTS A AND B ARE OF EQUAL ELEVATION

SIDE VIEW

NOTES:

1. FILTER SOCK SHALL CONFORM TO TO SPECIFICATIONS LISTED FOR STANDARD FILTER SOCKS ON DRAWING PNG-C-350-0001285.
2. SEDIMENT SHALL BE REMOVED FROM BEHIND THE SOCK WHEN IT REACHES 1/2 THE HEIGHT OF THE CHECK DAM.
3. COMPOST FILTER SOCKS SHALL COMPLETELY COVER THE WIDTH OF THE CHANNEL. FILTER SOCKS SHALL BE CONSIDERED UNSUITABLE AND IN NEED OF REPLACEMENT AFTER FALLING BELOW 80% OF THEIR MINIMUM REQUIRED HEIGHT (DIAMETER).
4. PLACE COMPOST SOCK CHECK DAMS SO THAT THE ENDS EXTEND TO THE TOP OF BANK. STAKING FOR COMPOST SOCK CHECK DAMS SHALL USE 2 INCH X 2 INCH WOODEN STAKES, PLACED 5 FOOT ON CENTER. STAKE LENGTH SHALL ALLOW THEM TO BE DRIVEN 12 INCHES INTO EXISTING SOIL AND ALLOW AT LEAST 2 INCHES ABOVE THE SOCK.
5. SPACE COMPOST SOCK CHECK DAMS SO THAT THE TOE OF THE UPSTREAM DAM IS AT THE SAME ELEVATION OR LOWER ELEVATION AS THE TOP OF THE DOWNSTREAM COMPOST SOCK CHECK DAM (AT THE CENTER OF THE CHANNEL).

FILTER SOCK DITCH CHECK
SCALE: N.T.S.

REF. DWG(S): PNG-G-350-0001009

STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
12/03/2020
PROFESSIONAL ENG/ARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP
1	12/03/2020	ADDED FILTER SOCK CHECK DAM DETAIL AND NOTES	HEC	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS DATE	INITIALS	
-	-	REGIONAL ENGINEER
-	-	MGR TECH REC & STD
12/03/2020	AMP	PRINCIPAL ENGINEER

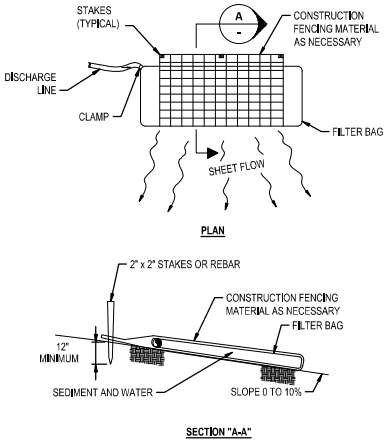
DUKE ENERGY. Piedmont Natural Gas

C350 PROJECT
ENVIRONMENTAL NOTES & DETAILS 1
HAMILTON COUNTY, OHIO
HAMILTON COUNTY, OHIO

SHEET(S)	1 OF 5	DWG SCALE	NONE
DWG DATE	09-05-2018	SUPERSEDED	—

DRAWING NUMBER: PNG -C-350-0001283 | REVISION: 1

C/HAMILTON COUNTY/C350

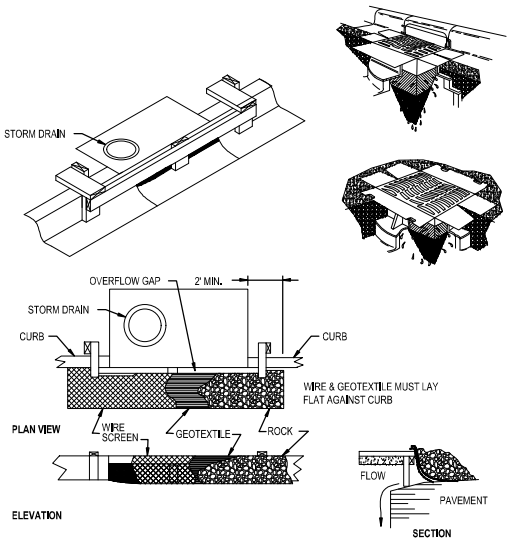


NOTES:

1. INSTALL A DEWATERING GEOTEXTILE FILTER BAG AS DIRECTED BY THE COMPANY'S INSPECTOR TO PREVENT THE FLOW OF HEAVILY SILT LADEN WATER INTO WATERBODIES OR WETLANDS.
2. DISCHARGE SITE SHALL BE WELL VEGETATED AND THE TOPOGRAPHY OF THE SITE SUCH THAT WATER WILL FLOW AWAY FROM ANY WORK AREAS. THE AREA DOWN SLOPE FROM THE DEWATERING SITE MUST BE REASONABLY PLANE OR STABILIZED BY VEGETATION OR OTHER MEANS TO ALLOW THE FILTERED WATER TO CONTINUE AS SHEET FLOW.
3. TO ATTACH THE DISCHARGE HOSE, CUT A CORNER OF THE BAG, INSERT DISCHARGE HOSE, AND SECURE THE HOSE TO THE BAG.
4. A SINGLE FILTER BAG SHOULD NOT BE USED FOR FLOWS GREATER THAN 600 GALLONS PER MINUTE.
5. REPLACE FILTER BAG BEFORE IT IS COMPLETELY FILLED WITH SEDIMENT. MONITOR DISCHARGE TO AVOID OVER PRESSURING DUE TO PLUGGING, WHICH MAY RESULT IN RUPTURE.
6. DISPOSE OF USED FILTER BAG AND SEDIMENT AT A SITE APPROVED BY THE COMPANY'S INSPECTOR.

TYPICAL GEOTEXTILE FILTER BAG FOR DEWATERING

SCALE:N.T.S.



CORRECT APPLICATION- RUNOFF PONDS AROUND INLET

PROFILE VIEW

ALLOW FOR PONDED RUNOFF

PLAN VIEW

INCORRECT APPLICATION- RUNOFF PONDS AROUND INLET

PROFILE VIEW

PLAN VIEW

FLOW SHOULD BE ROUTED TO A SETTLING POND

INLET PROTECTION FOR CURB DRAINS & YARD DRAINS SITUATED ON A SLOPE:

INSTALLATION:

1. REMOVE THE GRATE FROM THE CATCH BASIN.
2. INSERT THE FILTRATION SACK INTO OPENING OF CATCH BASIN. SOME PRODUCTS REQUIRE THE FILTRATION SACK BE SLIPPED OVER THE CATCH BASIN GRATE FIRST.
3. REINSERT GRATE INTO CATCH BASIN WHILE ENSURING ALL NECESSARY SUPPORT STRAPS TO PROVIDE SUPPORT AND ENSURE THE FILTRATION SACK DOES NOT FALL INTO CATCH BASIN AS IT FILLS WITH SEDIMENT.

MAINTENANCE:

1. THE FILTRATION SACK MUST BE EMPTIED WHEN IT IS 1/3RD FULL OF SEDIMENT AND DEBRIS. SACKS ARE TYPICAL MANUFACTURED WITH LIFTING STRAPS AND DUMPING STRAPS.
2. TO EMPTY THE SACK, REMOVE THE GRADE. LIFT THE SACK OUT OF THE CATCH BASIN VIA THE LIFTING STRAPS AND HAUL IT TO AN APPROPRIATE AREA. TURN IT INSIDE OUT WITH THE DUMPING STRAPS PROVIDED.
3. THE FILTRATION SACK MUST BE REPLACED IF IT IS TORN, OTHERWISE THE SAME SACK CAN BE USED MULTIPLE TIMES.
4. THE CONTRACTOR IS REQUIRED TO HAVE STAGED REDUNDANT CONTROLS ONSITE IN THE EVENT REPLACEMENTS ARE NEEDED.

INSPECTION:

1. INLET PROTECTION MEASURES MUST BE INSPECTED AT LEAST 12-HOURS PRIOR TO RAIN EVENTS, IN ADDITION TO THE WEEKLY AND POST-RAIN EVENT INSPECTIONS. NON-FUNCTIONAL DEVICES MUST BE REPLACED.

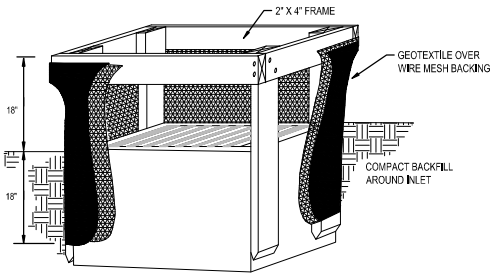
REMOVAL:

1. PULL OUT ALL INLET PROTECTION MATERIAL AND PROPERLY DISPOSE OF OFF-SITE.
2. RE-GRADE AREA WHERE ACCUMULATED SEDIMENT HAS BEEN PLACED AS NECESSARY AND ESTABLISH VEGETATION ON ANY RESULTING DISTURBED AREAS.

THE FOLLOWING DIAGRAMS PROVIDE A GENERAL IDEA OF HOW TO INSTALL AND MAINTAIN A VARIETY OF MANUFACTURED STORM DRAIN INLET PROTECTION PRACTICES. BE SURE TO IMPLEMENT FILTRATION SACKS THAT ARE APPROPRIATE FOR EITHER CURB INLETS OR FOR YARD DRAIN INLETS. MANUFACTURER'S SPECIFICATIONS FOR THE PRODUCT OF CHOICE SHOULD BE FOLLOWED.

CURB INLET PROTECTION

SCALE:N.T.S.



INSTALLATION:

1. CONSTRUCT PRIOR TO UPSLOPE LAND DISTURBANCE.
2. CONSTRUCT WOODEN FRAME FROM 2"X4" LUMBER. DRIVE POSTS 1' INTO THE GROUND AT EACH CORNER DIRECTLY AGAINST THE CONCRETE BOX AND ASSEMBLE THE TOP FRAME WITH AN OVERLAP JOINT SHOWN BELOW. THE TOP FRAME SHALL BE SET AT AN ELEVATION THAT DOES NOT CAUSE PONDED WATER TO BACKUP INTO UNWANTED AREAS.
3. THE WIRE MESH AND GEOTEXTILE SHALL BE TIGHTLY STRETCHED AND FASTENED TO THE FRAME.
4. THE GEOTEXTILE SHALL OVERLAP ACROSS ONE SIDE OF THE INLET SO THE ENDS OF THE CLOTH ARE NOT FASTENED TO THE SAME POST.
5. BACKFILL SHALL BE PLACED IN THE 18" TRENCH AROUND THE INLET IN COMPACTED 6" LAYERS UNTIL THE ELEVATION OF THE TOP OF THE GRATE IS REACHED.

MAINTENANCE:

1. REMOVE ACCUMULATED SEDIMENT WHEN IT REACHES ONE-HALF THE HEIGHT OF THE PRACTICE. THE REMOVED SEDIMENT MUST BE STABILIZED AND SHOULD NOT BE PLACED WHERE IT COULD EVENTUALLY BE CONVEYED BACK TO THE INLET VIA SURFACE RUNOFF.
2. REPLACE AND PROPERLY DISPOSE OF DAMAGED SILT FENCE MATERIAL.
3. AREA WHERE SURFACE FLOW HAS CUT UNDER THE SILT FENCE MATERIAL WITHIN THE TRENCH SHALL BE RE-COMPACTED WITH APPROPRIATE MATERIAL (I.E. HIGH CLAY CONTENT)

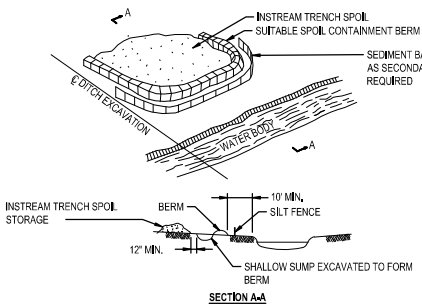
REMOVAL:

1. PULL OUT ALL SILT FENCE MATERIAL AND STAKES AND PROPERLY DISPOSE OF OFF-SITE.
2. RE-GRADE AREA SEDIMENT HAS ACCUMULATED AS NECESSARY AND ESTABLISH VEGETATION ON ANY RESULTING DISTURBED AREAS.

ALTERNATIVE MANUFACTURED YARD DRAIN INLET PROTECTION PRODUCTS ARE AVAILABLE AND CAN BE USED, SUBJECT TO PRIOR APPROVED BY THE COMMUNITY ENGINEER.

DROP INLET PROTECTION

SCALE:N.T.S.



NOTES:

1. SOIL CONTAINMENT BERMS ARE TO BE USED WHERE INSTREAM TRENCH SPOIL COULD REENTER THE WATERCOURSE DIRECTLY OR INDIRECTLY AND WITH SIMULTANEOUS UTILIZATION OF SEDIMENT BARRIERS IF REQUIRED.
2. MATERIAL USED FOR THE CONTAINMENT BERM SHOULD BE A MINIMUM OF 10 FT. FROM THE WATERS EDGE. IT SHOULD BE KEPT TO A HEIGHT WHICH REMAINS STABLE DURING THE CONSTRUCTION PERIOD.
3. CARE SHOULD BE TAKEN THAT THE SPOIL PILE DOES NOT OVERTOP THE CONTAINMENT BERM.
4. THE CONTAINMENT BERM SHOULD BE DISMANTLED AND THE SITE RESTORED TO THE ORIGINAL CONDITION UPON COMPLETION OF THE WATER CROSSING.
5. WHERE POSSIBLE, RIPARIAN VEGETATION SHALL BE LEFT IN PLACE.
6. STAGED MOVEMENT OF INSTREAM SPOIL MAY BE REQUIRED IF QUANTITIES ARE EXCESSIVE.
7. CARE AND ATTENTION MUST BE TAKEN TO ENSURE SPOIL CONTAINMENT BERMS ARE MAINTAINED.
8. FULL CONSIDERATION FOR OVERALL SLOPE STABILITY IS REQUIRED WHEN SELECTING A SPOIL CONTAINMENT LOCATION.

TYPICAL TEMPORARY SOIL CONTAINMENT BERM FOR WATERBODY TRENCH SPOILS

SCALE:N.T.S.

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS		
DATE -	INITIALS -	REGIONAL ENGINEER
DATE -	INITIALS -	MGR TECH REC & STD
DATE 11/18/2020	INITIALS AMP	PRINCIPAL ENGINEER

REF. DWG(S): PNG-G-350-0001009

C350 PROJECT
ENVIRONMENTAL NOTES & DETAILS 2
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

SHEET(S) 2 OF 5	DWG SCALE NONE
DWG DATE 09-05-2018	SUPERSEDED —
DRAWING NUMBER PNG -C-350-0001284	REVISION 0

C:\HAMILTON COUNTY\C350

INSTALLATION:

1. CONSTRUCT PRIOR TO UPSLOPE LAND DISTURBANCE.
2. PLACE CONTINUOUS LENGTHS OF SILT FENCE ALONG A CONSISTENT CONTOUR SO AS TO PREVENT THE CONCENTRATION OF RUNOFF AT LOW POINTS IN THE FENCE.
3. TO PREVENT FLOW AROUND ENDS, EXTEND EACH OF A CONTINUOUS LENGTH OF SILT FENCE UPSLOPE (90° TO THE CONTOUR) SO THE ENDS ARE AT A HIGHER ELEVATION OR 20-FEET IN HORIZONTAL DISTANCE, WHICHEVER IS ACHIEVED FIRST.
4. AT A MINIMUM, THE BOTTOM 8-INCHES OF THE SILT FENCE MATERIAL MUST BE PLACED IN A TRENCH (MINIMUM 6-INCH DEPTH) THAT IS CUT WITH A TRENCHER, CABLE LAYING MACHINE, OR OTHER SUITABLE DEVICE. THE TRENCH SHALL NOT BE CONSTRUCTED WITH THE TILT BLADE OF A BULLDOZER.
5. THE TRENCH MUST BE BACKFILLED WITH SOIL AND PROPERLY COMPACTED, WHEN AGGRESSIVELY PULLED UPWARD BETWEEN TWO CONSECUTIVE STAKES, THE MATERIAL SHOULD NOT PULL OUT OF THE GROUND.
6. STAKES (MIN. 32-INCH LENGTH, 2"X2" HARDWOOD OF GOOD QUALITY) MUST BE PALCED ON THE DOWNSLOPE SIDE OF THE SILT FENCE MATERIAL.
7. SILT FENCE MATERIAL MUST BE PULLED TIGHT BETWEEN CONSECUTIVE STAKES TO ENSURE THE FENCE DOES NOT SAG.
8. WHEN IT IS NECESSARY TO JOIN TWO SEPARATE LENGTHS OF SILT FENCE TO FORM A CONTINUOUS RUN, THE END OF TWO SEPARATE LENGTHS MUST BE JOINED TOGETHER BY FIRST OVERLAPPING THEM AND THEN TWISTING THEM TOGETHER AT LEAST 180° PRIOR TO DRIVING THE STAKES INTO THE GROUND.
9. GRADES IN EXCESS OF 10% REQUIRE SILT FENCE TO BE "J-HOOKED" AS DESCRIBED IN THE SWPPP DOCUMENT.

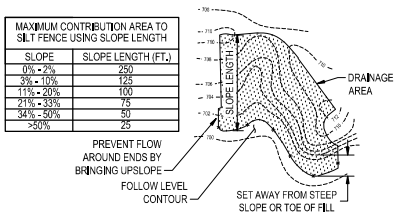
MAINTENANCE:

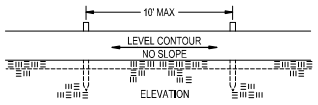
1. REMOVE ACCUMULATED SEDIMENT WHEN IT REACHES 1/3RD THE HEIGHT OF THE SILT FENCE. THE REMOVED SEDIMENT MUST BE STABILIZED AND SHOULD NOT BE PLACED WHERE IT COULD EVENTUALLY BE CONVEYED BACK TO THE SILT FENCE VIA SURFACE RUNOFF.
2. REPLACE AND PROPERLY DISPOSE OF DAMAGED SILT FENCE MATERIAL.
3. AREAS WHERE SURFACE FLOW HAS CUT UNDER THE SILT FENCE MATERIAL WITHIN THE TRENCH SHALL BE RE-COMPACTED WITH APPROPRIATE MATERIAL (I.E. HIGH CLAY CONTENT).

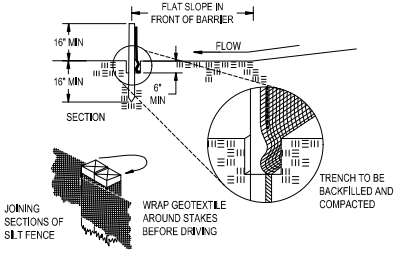
REMOVAL:

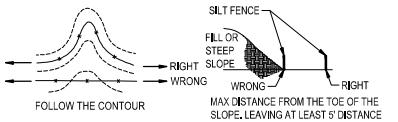
1. PULL OUT ALL SILT FENCE MATERIAL AND STAKES AND PROPERLY DISPOSE OF OFF-SITE.
2. RE-GRADE AREA WHERE SEDIMENT HAS ACCUMULATED AS NECESSARY AND ESTABLISH VEGETATION IN ANY RESULTING DISTURBED AREAS.

MAXIMUM CONTRIBUTION AREA TO SILT FENCE USING SLOPE LENGTH	
SLOPE	SLOPE LENGTH (FT.)
0% - 2%	250
3% - 10%	125
11% - 20%	100
21% - 33%	75
34% - 50%	50
>50%	25



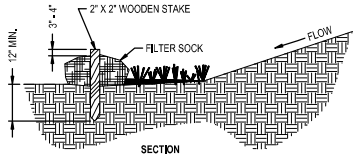






SILT FENCE

SCALE: N.T.S.



NOTES:

1. ALL FILTER SOCK MUST BE 12-INCH COMPOST FILTER SOCK OR THE ENGINEERED EQUIVALENT.
2. MATERIALS - COMPOST USED FOR FILTER SOCKS SHALL BE WEED, PATHOGEN AND INSECT FREE AND FREE OF ANY REFUSE, CONTAMINANTS OR OTHER MATERIALS TOXIC TO PLANT GROWTH, THEY SHALL BE DERIVED FROM A WELL-DECOMPOSED SOURCE OF ORGANIC MATTER AND CONSIST OF A PARTICLES RANGING FROM 3/8" TO 2".
3. FILTER SOCKS SHALL BE 3 OR 5 MIL CONTINUOUS, TUBULAR, HDPE 3/8" KNITTED MESH NETTING MATERIAL, FILLED WITH COMPOST PASSING THE ABOVE SPECIFICATIONS FOR COMPOST PRODUCTS.

INSTALLATION:

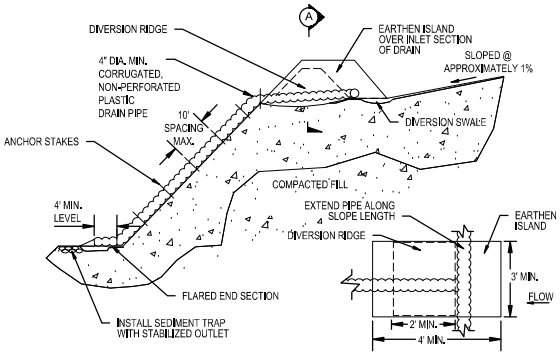
1. FILTER SOCKS WILL BE PLACED ON A LEVEL LINE ACROSS SLOPES, GENERALLY PARALLEL TO THE BASE OF THE SLOPE OR OTHER AFFECTED AREA, ON SLOPES APPROACHING 2:1, ADDITIONAL SOCKS SHALL BE PROVIDED AT THE TOP AND AS NEEDED MID-SLOPE.
2. FILTER SOCKS INTENDED TO BE LEFT AS A PERMANENT FILTER OR PART OF THE NATURAL LANDSCAPE, SHALL BE SEEDED AT THE TIME OF INSTALLATION FOR ESTABLISHMENT OF PERMANENT VEGETATION.
3. FILTER SOCKS ARE NOT TO BE USED IN CONCENTRATED FLOW SITUATIONS OR IN RUNOFF CHANNELS.

MAINTENANCE:

1. ROUTINELY INSPECT FILTER SOCKS AFTER EACH SIGNIFICANT RAIN, MAINTAINING FILTER SOCKS IN A FUNCTIONAL CONDITION AT ALL TIMES.
2. REMOVE SEDIMENTS COLLECTED AT THE BASE OF THE FILTER SOCKS WHEN THEY REACH 1/3 OF THE EXPOSED HEIGHT OF THE PRACTICE.
3. WHERE THE FILTER SOCK DETERIORATES OR FAILS, IT WILL BE REPAIRED OR REPLACED WITH A MORE EFFECTIVE ALTERNATIVE.
4. REMOVAL - FILTER SOCKS WILL BE DISPERSED ON SITE WHEN NO LONGER REQUIRED IN SUCH AS WAY AS TO FACILITATE AND NOT OBSTRUCT SEEDINGS.

FILTER SOCK

SCALE: N.T.S.

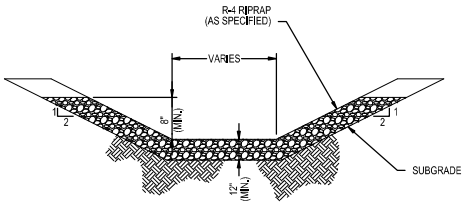


NOTES:

1. THE SLOPE DRAIN SHALL BE CONSTRUCTED/LENGTHENED WITH THE CONSTRUCTION OF THE FILL SLOPE, AS A RESULT, INLET ELEVATIONS WILL VARY ACCORDING TO GRADE ELEVATIONS AT THE TIME OF CONSTRUCTION.
2. INSPECT SLOPE DRAIN AND SUPPORTING DIVERSIONS AFTER EVERY RAINFALL EVENT AND MAKE NECESSARY REPAIRS FOR PROPER OPERATION OF THE SYSTEM.
3. UPON PROJECT COMPLETION, REMOVE THE SLOPE DRAIN AND PROPERLY STABILIZE ALL DISTURBED AREAS.

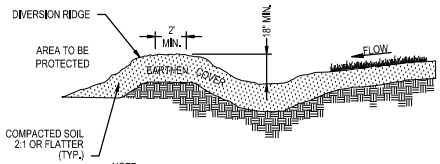
TEMPORARY SLOPE DRAIN

SCALE: N.T.S.



RIPRAPPED CHANNEL

SCALE: N.T.S.

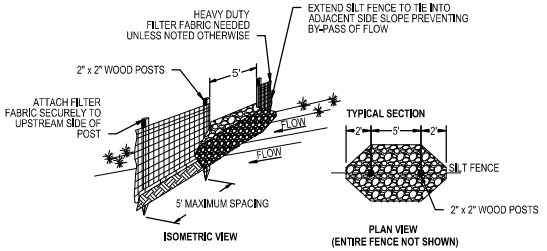


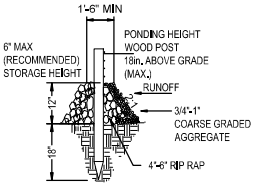
NOTE:

1. SWALE SHALL BE CONSTRUCTED WITH POSITIVE SLOPE ≤ 1% AND OUTLET TO A STABLE VEGETATED AREA OR SEDIMENT TRAP OR BASIN.

DIVERSION SWALE

N.T.S.





NOTES:

1. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.
2. INSPECT AND REPAIR AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN IT REACHES ONE-HALF HEIGHT OF FENCE OR FABRIC STARTS TO BULGE.
3. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE SEDIMENT OFF-SITE AND CAN BE PERMANENTLY STABILIZED.
4. TURN END OF SILT FENCE UP SLOPE TO PREVENT BYPASS FLOW AND ALLOW FOR PONDING.
5. SEE TYPICAL SILT FENCE DETAIL FOR ADDITIONAL INFORMATION.

SILT FENCE ROCK OUTLET

SCALE: N.T.S.

AMANDA PALM E-84075 REGISTERED PROFESSIONAL ENGINEER
STATE OF OHIO
11/18/2020
PROJECT MANAGER: CHRIS AMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS		
DATE -	INITIALS -	REGIONAL ENGINEER
DATE -	INITIALS -	MGR TECH REC & STD
DATE 11/18/2020	INITIALS AMP	PRINCIPAL ENGINEER

REF. DWG(S): PNG-G-350-0001009

C350 PROJECT
ENVIRONMENTAL NOTES & DETAILS 3
HAMILTON COUNTY, OHIO

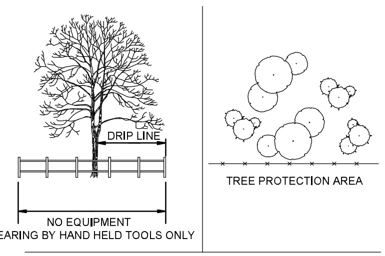
HAMILTON COUNTY, OHIO

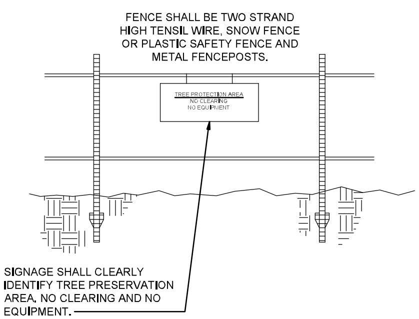
SHEET(S)	3 OF 5
DWG SCALE	NONE
DWG DATE	09-05-2018
SUPERSEDED	—
DRAWING NUMBER	PNG -C-350-0001285
REVISION	0

C:\HAMILTON COUNTY\C350

PRESERVATION OF NATURAL VEGETATION

1. AREAS WHERE NATURAL VEGETATION IS TO BE PRESERVED, INCLUDING TREES, SHALL BE FENCED PRIOR TO BEGINNING CLEARING OPERATIONS.
2. ACCEPTABLE FENCE MATERIALS INCLUDE PLASTIC FENCE OR SNOW FENCE ANCHORED TO METAL FENCE POSTS.
3. SIGNAGE SHALL CLEARLY IDENTIFY THE PROTECTION AREA AND STATE THAT NO CLEARING OR EQUIPMENT IS ALLOWED WITHIN IT.
4. FENCE SHALL REMAIN AROUND PROTECTION AREAS UNTIL AFTER FINAL GRADING HAS BEEN COMPLETED.
5. FENCE SHALL BE PLACED AS SHOWN ON PLANS AND BEYOND THE DRIP LINE OR CANOPY OF TREES TO BE PROTECTED.
6. IF ANY CLEARING IS DONE AROUND SPECIMEN TREES IT SHALL BE DONE BY CUTTING AT GROUND LEVEL WITH HAND TOOLS AND SHALL NOT BE GRUBBED OR PULLED OUT.

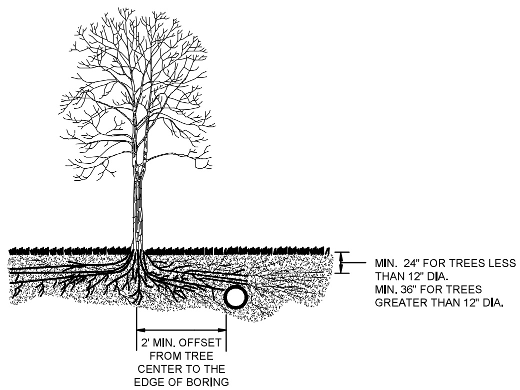




CROSS SECTION

TREE PRESERVATION AREA

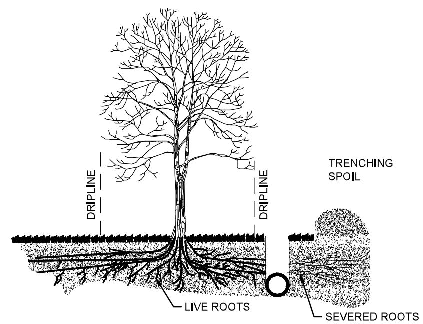
SCALE: N.T.S.



CROSS SECTION

TREE PRESERVATION AREA DURING BORING

SCALE: N.T.S.



CROSS SECTION

NOTE:
1. SPOIL TO BE LOCATED OUTSIDE THE DRIPLINE.

TREE PRESERVATION AREA BEFORE TRENCHING

SCALE: N.T.S.

GENERAL NOTE

CONSTRUCTION SPECIFIC NWP 39 CONDITIONS ARE PRESENTED HERE FOR CONVENIENCE. NUMBERING SCHEME MATCHES THE ORIGINAL NWP 39. CONTRACTOR SHALL REFER TO COMPLETE PERMIT DOCUMENTATION DURING EXECUTION OF THE WORK.

SPECIAL CONDITIONS FOR NATIONWIDE PERMIT NO. 39 VERIFICATION C314V CENTRAL CORRIDOR PIPELINE EXTENSION PROJECT CITY OF CINCINNATI, HAMILTON COUNTY, OHIO LRH-2020-351-OHR-MILL CREEK

1. ALL WORK WILL BE CONDUCTED IN ACCORDANCE WITH DRAWINGS TITLED "FIGURE 2 PROJECT PLAN AND WATER RESOURCES", PREPARED BY JACOBS ENGINEERING GROUP, INC., DATED JUNE 5, 2020, AND SUBMITTED WITH THE PCN MATERIALS.
2. A COPY OF NATIONWIDE PERMIT VERIFICATION, SPECIAL CONDITIONS, AND THE SUBMITTED CONSTRUCTION PLANS MUST BE KEPT AT THE SITE DURING CONSTRUCTION. THE PERMITTEE WILL SUPPLY A COPY OF THESE DOCUMENTS TO THEIR PROJECT ENGINEER RESPONSIBLE FOR CONSTRUCTION ACTIVITIES.
4. SHOULD NEW INFORMATION REGARDING THE SCOPE AND/OR IMPACTS OF THE PROJECT BECOME AVAILABLE THAT WAS NOT SUBMITTED TO THIS OFFICE DURING OUR REVIEW OF THE PROPOSAL, THE PERMITTEE MUST SUBMIT WRITTEN INFORMATION CONCERNING PROPOSED MODIFICATION(S) TO THIS OFFICE FOR REVIEW AND EVALUATION, AS SOON AS PRACTICABLE.
5. CONSTRUCTION ACTIVITIES WILL BE PERFORMED DURING LOW FLOW CONDITIONS TO THE MAXIMUM EXTENT PRACTICABLE. ADDITIONALLY, APPROPRIATE SITE SPECIFIC BEST MANAGEMENT PRACTICES FOR SEDIMENT AND EROSION CONTROL WILL BE FULLY IMPLEMENTED DURING CONSTRUCTION ACTIVITIES AT THE SITE.
6. NO AREA FOR WHICH GRADING HAS BEEN COMPLETED WILL BE UNSEEDED OR UNMULCHED FOR LONGER THAN 14 DAYS. ALL DISTURBED AREAS WILL BE SEEDED AND/OR REVEGETATED WITH NATIVE SPECIES AND APPROVED SEED MIXES (WHERE PRACTICABLE) AFTER COMPLETION OF CONSTRUCTION ACTIVITIES FOR STABILIZATION AND TO HELP PRECLUDE THE ESTABLISHMENT OF NON-NATIVE INVASIVE SPECIES.
8. IN THE EVENT ANY PREVIOUSLY UNKNOWN HISTORIC OR ARCHAEOLOGICAL SITES OR HUMAN REMAINS ARE UNCOVERED WHILE ACCOMPLISHING THE ACTIVITY AUTHORIZED BY THIS NATIONWIDE PERMIT AUTHORIZATION, THE PERMITTEE MUST CEASE ALL WORK IN WATERS OF THE UNITED STATES IMMEDIATELY AND CONTACT LOCAL, STATE AND COUNTY LAW ENFORCEMENT OFFICERS (ONLY CONTACT LAW ENFORCEMENT ON FINDINGS OF HUMAN REMAINS), THE CORPS AT 304-399-5210 AND OHIO STATE HISTORIC PRESERVATION OFFICE AT 614-298-2000.

NATIONWIDE PERMIT GENERAL CONDITIONS

2. ALL PERMANENT AND TEMPORARY CROSSINGS OF WATERBODIES SHALL BE SUITABLY CULVERTED, BRIDGED, OR OTHERWISE DESIGNED AND CONSTRUCTED TO MAINTAIN LOW FLOWS TO SUSTAIN THE MOVEMENT OF THOSE AQUATIC SPECIES.
6. MATERIAL USED FOR CONSTRUCTION OR DISCHARGED MUST BE FREE FROM TOXIC POLLUTANTS IN TOXIC AMOUNTS.
9. TO THE MAXIMUM EXTENT PRACTICABLE, THE PRE-CONSTRUCTION COURSE, CONDITION, CAPACITY, AND LOCATION OF OPEN WATERS MUST BE MAINTAINED FOR EACH ACTIVITY, INCLUDING STREAM CHANNELIZATION, STORM WATER MANAGEMENT ACTIVITIES, AND TEMPORARY AND PERMANENT ROAD CROSSINGS, EXCEPT AS PROVIDED BELOW. THE ACTIVITY MUST BE CONSTRUCTED TO WITHSTAND EXPECTED HIGH FLOWS. THE ACTIVITY MUST NOT RESTRICT OR IMPEDE THE PASSAGE OF NORMAL OR HIGH FLOWS, UNLESS THE PRIMARY PURPOSE OF THE ACTIVITY IS TO IMPOUND WATER OR MANAGE HIGH FLOWS.
10. THE ACTIVITY MUST COMPLY WITH APPLICABLE FEMA-APPROVED STATE OR LOCAL FLOODPLAIN MANAGEMENT REQUIREMENTS.
11. EQUIPMENT. HEAVY EQUIPMENT WORKING IN WETLANDS OR MUDFLATS MUST BE PLACED ON MATS, OR OTHER MEASURES MUST BE TAKEN TO MINIMIZE SOIL DISTURBANCE.
12. SOIL EROSION AND SEDIMENT CONTROLS. APPROPRIATE SOIL EROSION AND SEDIMENT CONTROLS MUST BE USED AND MAINTAINED IN EFFECTIVE OPERATING CONDITION DURING CONSTRUCTION, AND ALL EXPOSED SOIL AND OTHER FILLS, AS WELL AS ANY WORK BELOW THE ORDINARY HIGH WATER MARK OR HIGH TIDE LINE, MUST BE PERMANENTLY STABILIZED AT THE EARLIEST PRACTICABLE DATE. PERMITTEES ARE ENCOURAGED TO PERFORM WORK WITHIN WATERS OF THE UNITED STATES DURING PERIODS OF LOW-FLOW OR NO-FLOW, OR DURING LOW TIDES.
13. REMOVAL OF TEMPORARY FILLS. TEMPORARY FILLS MUST BE REMOVED IN THEIR ENTIRETY AND THE AFFECTED AREAS RETURNED TO PRE-CONSTRUCTION ELEVATIONS. THE AFFECTED AREAS MUST BE REVEGETATED, AS APPROPRIATE.
14. PROPER MAINTENANCE. ANY AUTHORIZED STRUCTURE OR FILL SHALL BE PROPERLY MAINTAINED, INCLUDING MAINTENANCE TO ENSURE PUBLIC SAFETY AND COMPLIANCE WITH APPLICABLE NWP GENERAL CONDITIONS, AS WELL AS ANY ACTIVITY-SPECIFIC CONDITIONS ADDED BY THE DISTRICT ENGINEER TO AN NWP AUTHORIZATION.
21. DISCOVERY OF PREVIOUSLY UNKNOWN REMAINS AND ARTIFACTS. IF YOU DISCOVER ANY PREVIOUSLY UNKNOWN HISTORIC, CULTURAL OR ARCHEOLOGICAL REMAINS AND ARTIFACTS WHILE ACCOMPLISHING THE ACTIVITY AUTHORIZED BY THIS PERMIT, YOU MUST IMMEDIATELY NOTIFY THE DISTRICT ENGINEER OF WHAT YOU HAVE FOUND, AND TO THE MAXIMUM EXTENT PRACTICABLE, AVOID CONSTRUCTION ACTIVITIES THAT MAY AFFECT THE REMAINS AND ARTIFACTS UNTIL THE REQUIRED COORDINATION HAS BEEN COMPLETED.

NATIONWIDE PERMITS REGIONAL GENERAL CONDITIONS

4. IN-WATER WORK EXCLUSION DATES: OTHER STREAMS C 4/15 - 6/30

GENERAL LIMITATIONS AND CONDITIONS FOR ALL OHIO EPA 401 CERTIFIED NATIONWIDE PERMITS

1. SEDIMENT AND EROSION CONTROL MEASURES AND BEST MANAGEMENT PRACTICES MUST BE DESIGNED, INSTALLED, AND MAINTAINED IN EFFECTIVE OPERATING CONDITION AT ALL TIMES DURING CONSTRUCTION ACTIVITIES AS REQUIRED BY APPLICABLE NPDES PERMITS. PROPER MAINTENANCE ENSURES CORRECTIVE MEASURES WILL BE IMPLEMENTED FOR FAILED CONTROLS WITHIN 48 HOURS OF DISCOVERY.
2. FOR PERENNIAL AND INTERMITTENT STREAMS, IN-STREAM SEDIMENT CONTROL MEASURES SHALL NOT BE UTILIZED, WITH THE EXCEPTION OF TURBIDITY CURTAINS PARALLEL TO THE STREAM BANK, FOR THE PURPOSE OF SEDIMENT COLLECTION. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE ENTIRELY REMOVED AND THE NATURAL GRADE OF THE SITE RESTORED ONCE CONSTRUCTION IS COMPLETED.
3. ALL AVOIDED WATER RESOURCES AND ASSOCIATED BUFFERS/RIPARIAN AREAS SHALL BE DEMARCATED IN THE FIELD AND PROTECTED WITH SUITABLE MATERIALS (E.G., SILT FENCING, SNOW FENCING, SIGNAGE, ETC.) PRIOR TO SITE DISTURBANCE. THESE MATERIALS SHALL REMAIN IN PLACE AND BE MAINTAINED THROUGHOUT THE CONSTRUCTION PROCESS AND SHALL BE ENTIRELY REMOVED ONCE CONSTRUCTION IS COMPLETED.
4. DISTURBANCE AND REMOVAL OF VEGETATION FROM THE PROJECT CONSTRUCTION AREA IS TO BE AVOIDED WHERE POSSIBLE AND MINIMIZED TO THE MAXIMUM EXTENT PRACTICABLE. ENTRY TO SURFACE WATERS SHALL BE THROUGH A SINGLE POINT OF ACCESS TO THE MAXIMUM EXTENT PRACTICABLE TO MINIMIZE DISTURBANCE TO RIPARIAN HABITAT. UNAVOIDABLE TEMPORARY IMPACTS TO FORESTED RIPARIAN HABITAT SHALL BE RESTORED AS SOON AS PRACTICABLE AFTER IN-WATER WORK IS COMPLETE USING TREE AND SHRUB SPECIES NATIVE TO THE SPECIFIC ECOREGION WHERE THE PROJECT IS LOCATED.
5. ALL DREDGED MATERIAL PLACED IN AN UPLAND SITE SHALL BE CONTROLLED SO THAT SEDIMENT RUNOFF TO ADJACENT SURFACE WATERS IS MINIMIZED TO THE MAXIMUM EXTENT PRACTICABLE.
6. STRAW BALES SHALL NOT BE USED AS A FORM OF SEDIMENT CONTROL UNLESS USED IN CONJUNCTION WITH ANOTHER STRUCTURAL CONTROL SUCH AS SILT FENCING. STRAW BALES MAY BE UTILIZED FOR PURPOSES OF EROSION CONTROL SUCH AS DITCH CHECKS.
7. HEAVY EQUIPMENT SHALL NOT BE PLACED BELOW ORDINARY HIGH WATER MARK OF ANY SURFACE WATER, EXCEPT WHERE NO OTHER ALTERNATIVE IS PRACTICABLE.
8. TEMPORARY FILL FOR PURPOSES OF ACCESS OR STAGING SHALL CONSIST OF SUITABLE NON-ERODIBLE MATERIAL AND SHALL BE MAINTAINED TO MINIMIZE EROSION.
9. CHROMATED COPPER ARSENATE (CCA) AND CREOSOTE TREATED LUMBER SHALL NOT BE USED IN STRUCTURES THAT COME INTO CONTACT WITH WATERS OF THE STATE.
10. ALL DEWATERING ACTIVITIES MUST BE CONDUCTED IN SUCH A MANNER THAT DOES NOT RESULT IN A VIOLATION OF WATER QUALITY STANDARDS.
11. ALL AREAS OF FINAL GRADE MUST BE PROTECTED FROM EROSION WITHIN SEVEN DAYS.
12. ALL DISTURBED AREAS WHICH REMAIN DORMANT IN EXCESS OF FOURTEEN DAYS MUST BE PROTECTED FROM EROSION WITHIN SEVEN DAYS FROM LAST EARTH DISTURBING ACTIVITY.
13. IN THE EVENT OF AUTHORIZED IN-STREAM ACTIVITIES, PROVISIONS MUST BE ESTABLISHED TO REDIRECT THE STREAM FLOW AROUND OR THROUGH ACTIVE AREAS OF CONSTRUCTION IN STABILIZED, NON-EROSIVE MANNER TO THE MAXIMUM EXTENT POSSIBLE.

STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
11/18/2020
PROFESSIONAL ENG/ARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS DATE	INITIALS	
-	-	REGIONAL ENGINEER
-	-	MGR TECH REC & STD
11/18/2020	AMP	PRINCIPAL ENGINEER

DUKE ENERGY. Piedmont Natural Gas

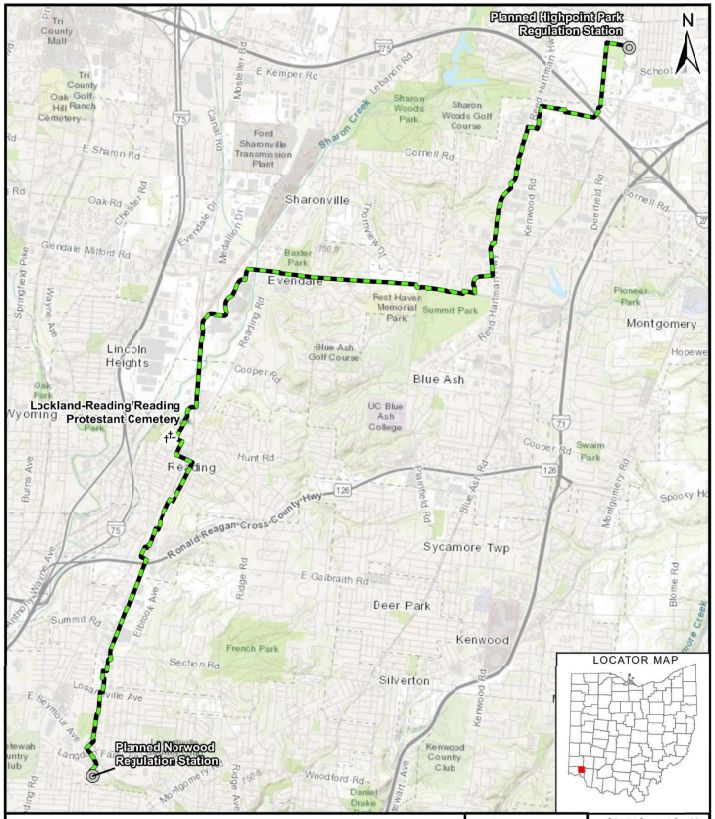
REF. DWG(S): PNG-G-350-0001009

C350 PROJECT
ENVIRONMENTAL NOTES & DETAILS 4
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

SHEET(S)	4 OF 5	DWG SCALE	NONE
DWG DATE	09-05-2018	SUPERSEDED	—
DRAWING NUMBER	PNG -C-350-0001286	REVISION	0

C/HAMILTON COUNTY/C350



DUKE ENERGY.

C314V Central Corridor Pipeline Extension Project Hamilton County, OH

FIGURE 1
PROJECT LOCATION MAP

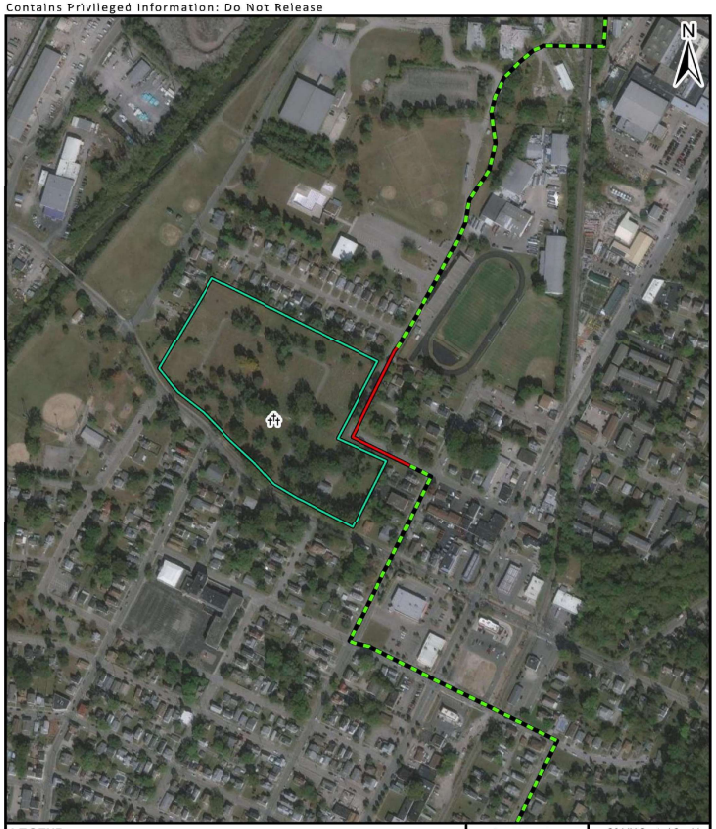
PN: 672247CH

DATE: 9/23/2020

Jacobs

I:\CTV\301\GIS\PROJ\DUKEENERGY\C314V\MAPS\CULTURAL\LOCKLAND_READING_CEM_MONITORING\FIG1_PROJECT_LOCATION.MXD A6017858 9/23/2020

Contains Privileged Information: Do Not Release



DUKE ENERGY.

C314V Central Corridor Pipeline Extension Project Hamilton County, OH

FIGURE 2
LOCKLAND-READING/READING PROTESTANT CEMETERY LOCATION MAP

PN: 672247CH

DATE: 9/24/2020

Jacobs

I:\CTV\301\GIS\PROJ\DUKEENERGY\C314V\MAPS\CULTURAL\LOCKLAND_READING_CEM_MONITORING\FIG2_CEMETERY_AERIAL.MXD A6017858 9/24/2020

NOTES

A SECRETARY OF THE INTERIOR (SOI)-QUALIFIED ARCHAEOLOGIST IS REQUIRED TO SUPERVISE AND MONITOR ALL GROUND-DISTURBING ACTIVITIES WITHIN 30.5 METERS (100 FEET) OF THE LOCKLAND-READING/READING PROTESTANT CEMETERY. ARCHAEOLOGICAL MONITORING IS REQUIRED WHENEVER GROUND DISTURBANCE IS PLANNED, INCLUDING DURING ANY EXCAVATION ACTIVITIES INVOLVING REMOVAL OF ASPHALT, REMOVAL OF FILL, OR ANY OTHER ACTIVITY THAT RESULTS IN PHYSICAL GROUND DISTURBANCE.

MONITORING ACTIVITIES INCLUDE THE FOLLOWING METHODOLOGY:

- VISUAL INSPECTION OF THE APE WITHIN 30.5 METERS (100 FEET) OF THE CEMETERY.
- MAPPING, GPS RECORDATION, AND PHOTO DOCUMENTATION OF THE APE WITHIN 30.5 METERS (100 FEET) OF THE CEMETERY, DURING GROUND-DISTURBING ACTIVITIES.
- ARCHAEOLOGICAL MONITORING OF ALL MANUAL AND MECHANICAL EXCAVATIONS WILL BE CONDUCTED DURING GROUND DISTURBANCE. WHEN ARTIFACTS ARE ENCOUNTERED, ARCHAEOLOGISTS WILL HALT EXCAVATIONS AND RECORD THE CULTURAL DEPOSITS THROUGH PHOTOGRAPHS, PROFILE MAPPING, AND PLAN VIEW MAPPING, AND WILL RECORD THE LOCATIONS OF ARTIFACTS WITH A GPS UNIT CAPABLE OF SUB-METER ACCURACY.
- ARCHAEOLOGICAL STAFF WILL MAINTAIN SYSTEMATIC RECORDS INCLUDING A DAILY MONITORING LOG. THE DAILY LOG WILL RECORD THE OBSERVATIONS MADE DURING MONITORING ACTIVITIES.

AMANDA M. PALM — STATE OF OHIO — E-84075 — REGISTERED PROFESSIONAL ENGINEER — 11/18/2020

PROFESSIONAL ENGINEER STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
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APPROVALS		
DATE -	INITIALS -	REGIONAL ENGINEER
DATE -	INITIALS -	MGR TECH REC & STD
DATE 11/18/2020	INITIALS AMP	PRINCIPAL ENGINEER

DUKE ENERGY. Piedmont Natural Gas

C350 PROJECT
ENVIRONMENTAL NOTES & DETAILS 5
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

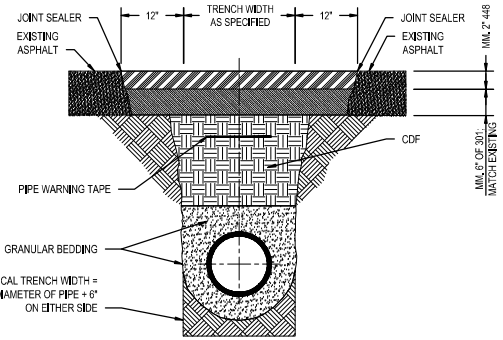
REF. DWG(S): PNG-G-350-0001009

SHEET(S) 5 OF 5	DWG SCALE NONE
DWG DATE 09-05-2018	SUPERSEDED —

DRAWING NUMBER: PNG -C-350-0001287

REVISION: 0

C:\HAMILTON COUNTY\C350

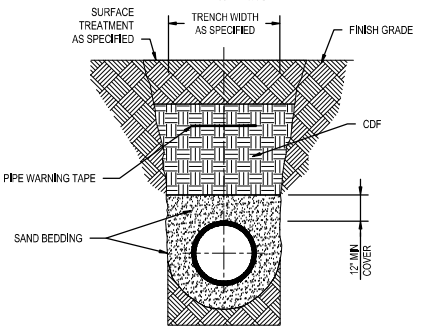


NOTES:

1. ALL RESTORATION IN BLUE ASH RIGHT OF WAY SHALL BE MILLED AND PAVED TO A WIDTH OF 12', SEE PNG C-350-0001294 FOR MILL AND PAVE DETAIL.
2. APPLY GRANULAR BEDDING AROUND PIPE AND BACKFILL TRENCH WITH A CONTROLLED DENSITY FILL (CDF) TO BOTTOM OF EXISTING ASPHALT.
3. MINIMUM 6" OF 301 ASPHALT IN 4" (MAXIMUM) LIFTS OR MATCH EXISTING ASPHALT CROSS SECTION. APPLY MINIMUM 2" OF ITEM 448 ASPHALT SURFACE COURSE.
4. APPLY ASPHALT IN SUCH A WAY THAT WHEN IT IS FULLY COMPACTED, THE EDGES ARE FLUSH, AND THE CENTER IS 1" HIGH, FOR FUTURE COMPACTION.
5. SEAL ALL EDGES OF THE TRENCH WITH ITEM 702.17 JOINT SEALER.
6. PIPE WARNING TAPE SHALL BE INSTALLED APPROXIMATELY 24"-36" ABOVE PIPELINE, OR AS OTHERWISE RECOMMENDED BY MANUFACTURER. MATERIALS SHALL BE SIGNALTAPE® OR APPROVED EQUIVALENT AND SHALL BE NON-TRACEABLE VARIETY.

TYPICAL UTILITY TRENCH AND SURFACE RESTORATION A: CITY OF BLUE ASH

SCALE: N.T.S.

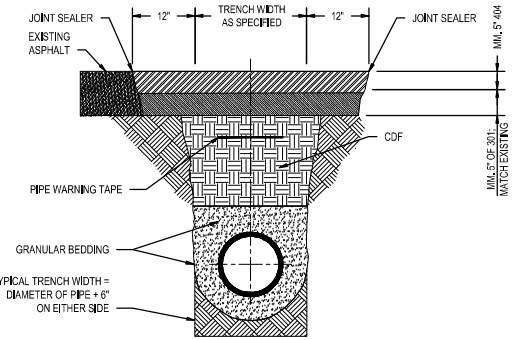


NOTES:

1. PIPE BEDDING SHALL BE CLEAN, GRADED SAND COMPACTED TO PROVIDE EVEN SUPPORT FOR PIPE. APPROVED MATERIALS INCLUDE M10 "STONE DUST" OR SIMILAR. BEDDING MATERIAL SHALL FULLY ENCIRCLE PIPE. CONTROLLED DENSITY FILL (CDF) SHALL BE INSTALLED IN SUCH A MANNER THAT MINIMIZES VOIDS AND DOES NOT DISTURB BEDDING OR PIPE.
2. PIPE WARNING TAPE SHALL BE INSTALLED APPROXIMATELY 24"-36" ABOVE PIPELINE, OR AS OTHERWISE RECOMMENDED BY MANUFACTURER. MATERIALS SHALL BE SIGNALTAPE® OR APPROVED EQUIVALENT AND SHALL BE NON-TRACEABLE VARIETY.

TYPICAL UTILITY TRENCH D

SCALE: N.T.S.

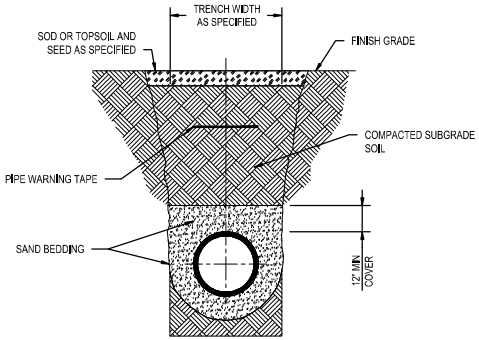


NOTES:

1. APPLY GRANULAR BEDDING AROUND PIPE AND BACKFILL TRENCH WITH FLASH FILL TO BOTTOM OF EXISTING ASPHALT.
2. MINIMUM 5" OF 301 ASPHALT OR MATCH EXISTING ASPHALT CROSS SECTION. APPLY MINIMUM 5" OF ITEM 404 ASPHALT SURFACE COURSE.
3. APPLY ASPHALT IN SUCH A WAY THAT WHEN IT IS FULLY COMPACTED, THE EDGES ARE FLUSH, AND THE CENTER IS 1/4" HIGH, FOR FUTURE COMPACTION.
4. SEAL ALL EDGES OF THE TRENCH WITH ITEM 702.17 JOINT SEALER.
5. PIPE WARNING TAPE SHALL BE INSTALLED APPROXIMATELY 24"-36" ABOVE PIPELINE, OR AS OTHERWISE RECOMMENDED BY MANUFACTURER. MATERIALS SHALL BE SIGNALTAPE® OR APPROVED EQUIVALENT AND SHALL BE NON-TRACEABLE VARIETY.

TYPICAL UTILITY TRENCH AND SURFACE RESTORATION B: SHARONVILLE

SCALE: N.T.S.

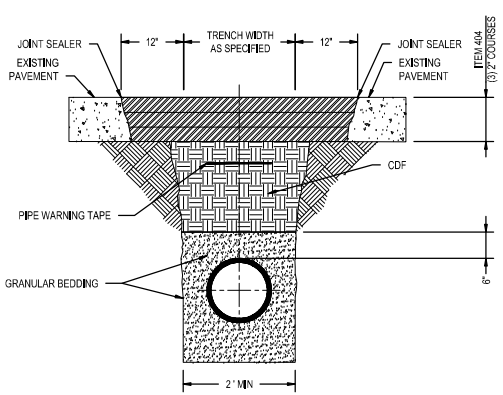


NOTES:

1. PIPE BEDDING SHALL BE CLEAN, GRADED SAND COMPACTED TO PROVIDE EVEN SUPPORT FOR PIPE. APPROVED MATERIALS INCLUDE M10 "STONE DUST" OR SIMILAR. BEDDING MATERIAL SHALL FULLY ENCIRCLE PIPE.
2. PIPE WARNING TAPE SHALL BE INSTALLED APPROXIMATELY 24"-36" ABOVE PIPELINE, OR AS OTHERWISE RECOMMENDED BY MANUFACTURER. MATERIALS SHALL BE SIGNALTAPE® OR APPROVED EQUIVALENT AND SHALL BE NON-TRACEABLE VARIETY.

TYPICAL UTILITY TRENCH E

SCALE: N.T.S.

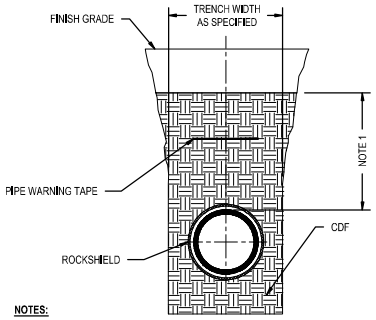


NOTES:

1. ALL RESTORATION IN CITY OF READING RIGHT OF WAY SHALL BE MILLED AND PAVED FROM CURB TO CURB. SEE PNG-C-350-0001294 FOR MILL AND PAVE DETAIL.
2. ALL CONCRETE TO BE CLASS C-4000 P.S.I.
3. SAW CUT EXISTING PAVEMENT FULL DEPTH ALL EDGES.
4. REPLACE PAVEMENT WITH (3) 2" LAYER OF 404.
5. BACKFILL SHALL BE CONTROL DENSITY FLOWABLE MATERIAL.
6. SEAL ALL PAVEMENT EDGES.
7. INSPECTOR MUST BE PRESENT DURING CONSTRUCTION.
8. COVER TRENCH WITH STEEL PLATE AS NEEDED.
9. STREET TO BE SWEPT CLEAN AT CONCLUSION OF CONSTRUCTION.
10. PIPE WARNING TAPE SHALL BE INSTALLED APPROXIMATELY 24"-36" ABOVE PIPELINE, OR AS OTHERWISE RECOMMENDED BY MANUFACTURER. MATERIALS SHALL BE SIGNALTAPE® OR APPROVED EQUIVALENT AND SHALL BE NON-TRACEABLE VARIETY.

TYPICAL UTILITY TRENCH AND SURFACE RESTORATION C: CITY OF READING

SCALE: N.T.S.



NOTES:

1. CDF BACKFILL SHALL EXTEND TO BOTTOM OF PIPE IF CROSSING EXISTING PIPE OR A MINIMUM OF 12 INCHES.
2. CDF SHALL BE PER HAMILTON COUNTY SPECIFICATION. CLSM SHALL BE EXCAVATABLE AND HAVE A COMPRESSIVE STRENGTH NO LESS THAN 100 PSI.

TYPICAL UTILITY TRENCH F

SCALE: N.T.S.

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS		
DATE -	INITIALS -	REGIONAL ENGINEER
DATE -	INITIALS -	MGR. TECH REC & STD
DATE 11/18/2020	INITIALS AMP	PRINCIPAL ENGINEER

AMANDA PALM E-84075 REGISTERED PROFESSIONAL ENGINEER 11/18/2020
PROFESSIONAL ENGINEER STAMP

REF. DWG(S): PNG-G-350-0001009

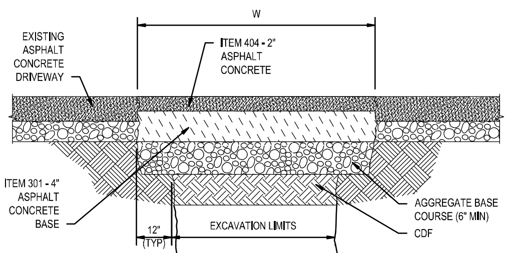
C350 PROJECT
RESTORATION DETAILS 1
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

SHEET(S)	1 OF 3	DWG SCALE	NONE
DWG DATE	02/04/2020	SUPERSEDED	—

DRAWING NUMBER: PNG -C-350-0001293 | REVISION: 0

C/HAMILTON COUNTY/C350

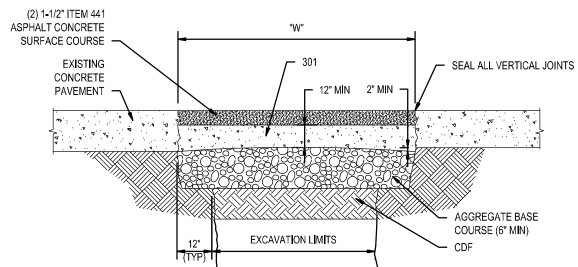


NOTES:

1. SEE MILL AND PAVE DETAIL ON THIS DRAWING. WIDTH SHALL BE 12'.
2. WHERE ASPHALT CONCRETE PAVEMENT IS REQUIRED, THE EDGES ARE TO BE CUT WITH A SAW IN A NEAT STRAIGHT LINE. ALL EDGES ARE TO BE SWEPT AND TACKED; AND ALL JOINTS, AFTER THE SURFACE HAS BEEN PLACED, ARE TO BE SEALED WITH AC-20 IN A MANNER TO AVOID TRACKING.

SURFACE TYPE 1 RESTORATION STANDARD: HAMILTON COUNTY ASPHALT CONC. DRIVEWAY

SCALE: N.T.S.

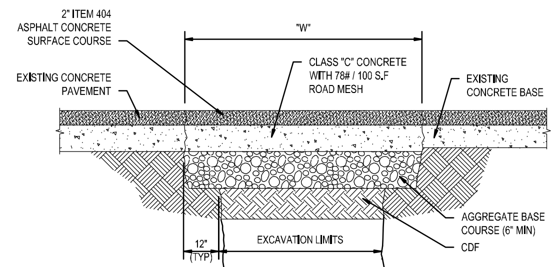


NOTES:

1. ALL RESTORATION IN VILLAGE OF EVENDALE RIGHT OF WAY SHALL BE MILLED AND PAVED TO THE ENTIRE WIDTH OF THE AFFECTED LANE(S). SEE MILL AND PAVE DETAIL ON THIS DRAWING.
2. EXCAVATION MUST BE REPLACED IN THE LIKE KIND OR BETTER.
3. IF PAVEMENT IS ASPHALT, REPLACE WITH NOT LESS THAN 12" - 301 - WITH NO LIFT TO EXCEED 5"; -441- FINAL COURSE TO BE TRIMMED AND ALL VERTICAL JOINTS TO BE SEALED. THE ABOVE IN ACCORDANCE WITH THE OHIO DEPARTMENT OF TRANSPORTATION SPECIFICATIONS.
4. IF PAVEMENT IS CONCRETE, REPLACE WITH NOT LESS THAN 10" OF CONCRETE PLUS 6" CONCRETE UNDEROUT AND KEYED IN ACCORDANCE WITH ITEM #452 OF THE OHIO DEPARTMENT OF TRANSPORTATION SPECIFICATIONS; OR LATEST SPECIFICATIONS ADOPTED BY THE SAME.
5. THE SERVICE DEPARTMENT SUPERINTENDENT MUST BE NOTIFIED A DAY IN ADVANCE OF RESTORATION WORK (563-4338).
6. PERMANENT RESTORATION MADE WITHIN 3 DAYS AFTER STREET IS OPENED.

SURFACE TYPE 2 RESTORATION STANDARD: VILLAGE OF EVENDALE

SCALE: N.T.S.

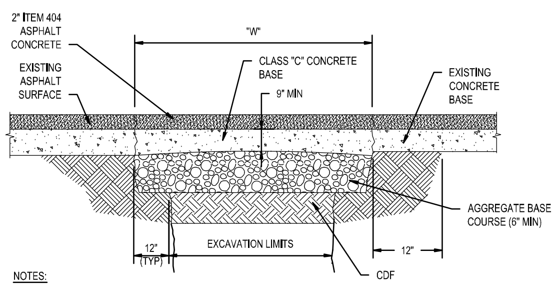


NOTES:

1. WHERE ASPHALT CONCRETE PAVEMENT IS REQUIRED, THE EDGES ARE TO BE CUT WITH A SAW IN A NEAT STRAIGHT LINE. ALL EDGES ARE TO BE SWEPT AND TACKED; AND ALL JOINTS, AFTER THE SURFACE HAS BEEN PLACED, ARE TO BE SEALED WITH AC-20 IN A MANNER TO AVOID TRACKING.
2. WHERE CONCRETE BASE IS REQUIRED, THE SURFACE SHALL BE FLOATED SMOOTH BY THE USE OF HAND FLOATS OR BULL FLOATS AND THE FINAL FINISH OR TEXTURING SHALL BE COMPLETED WITH A BROOM.

SURFACE TYPE 3 RESTORATION STANDARD: HAMILTON COUNTY ASPHALT CONC. SURFACE & CONC. BASE

SCALE: N.T.S.

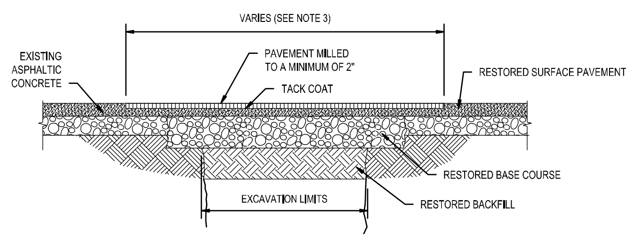


NOTES:

1. SEE MILL AND PAVE DETAIL ON THIS DRAWING. WIDTH SHALL BE THAT OF THE AFFECTED LANE(S).
2. THICKNESS OF ALL REPLACEMENT COURSES SHALL BE EQUAL TO EXISTING BUT SHALL NOT BE LESS THAN INDICATED.
3. CONCRETE PAVEMENT SHALL BE SAWCUT AND REMOVED TO NEAREST JOINT TO PREVENT PARTIAL PANEL REMOVAL. WIDTH OF PAVEMENT REMOVAL SHALL BE MINIMUM 2' EITHER SIDE OF UTILITY CENTERLINE AND UP TO NEXT PANEL LIMIT.
4. SAWCUTS THAT EXTEND OUTSIDE THE AREA OF REMOVAL AND REPLACEMENT SHALL BE FILLED WITH AN EPOXY-BASED GROUT APPROVED BY THE ENGINEER.
5. FULL DEPTH SAWCUTS SHALL BE MADE AROUND THE PERIMETER OF THE AREA TO BE PATCHED. THE CUT SHALL BE MADE AT A RIGHT ANGLE TO THE PAVEMENT EDGE AND TO THE CENTERLINE OF THE PAVEMENT.
6. LONGITUDINAL FULL DEPTH SAW CUTS SHALL BE AT EXISTING LONGITUDINAL JOINTS.
7. ADDITIONAL SAWCUTS MAY BE REQUIRED WITH THE AREA OF THE PATCH TO FACILITATE REMOVAL OF THE CONCRETE OR TO ALLEVIATE BINDING OF THE FULL DEPTH SAW CUT AT THE PATCH EDGE.
8. SEAL ALL EDGES OF RESTORATION WITH ITEM 702.01 - JOINT SEALER.

SURFACE TYPE 4 RESTORATION STANDARD: CINCINNATI, GOLF MANOR, AMBERLEY VILLAGE

SCALE: N.T.S.



NOTES:

1. THICKNESS OF ALL REPLACEMENT COURSES SHALL NOT BE LESS THAN THAT OF EXISTING COURSE.
2. OVERLAY MATERIAL USED TO REPLACE MILLED SURFACE SHALL MATCH MATERIAL USED DURING RESTORATION.
3. MILLING WIDTHS VARY BASED ON LOCATION/MUNICIPALITY. SEE THE SELECTED RESTORATION TYPE FOR SPECIFIED WIDTHS.

MILL AND PAVE

SCALE: N.T.S.

STATE OF OHIO — AMANDA PALM — E-84075 — REGISTERED PROFESSIONAL ENGINEER — 11/18/2020
PROFESSIONAL ENG/ARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS
REGIONAL ENGINEER	-	-
MGR TECH REC & STD	-	-
PRINCIPAL ENGINEER	11/18/2020	AMP

DUKE ENERGY. Piedmont Natural Gas

C350 PROJECT RESTORATION DETAILS 2 HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

REF. DWG(S): PNG-G-350-0001009

SHEET(S) 2 OF 3 | DWG SCALE NONE
DWG DATE 02/04/2020 | SUPERSEDED —
DRAWING NUMBER: PNG -C-350-0001294 | REVISION 0
C/HAMILTON COUNTY/C350

PERMANENT STABILIZATION

AREAS REQUIRING PERMANENT STABILIZATION	TIME FRAME TO APPLY EROSION CONTROLS:
ANY AREAS THAT WILL LIE DORMANT FOR ONE (1) YEAR OR MORE	WITHIN SEVEN (7) DAYS OF THE MOST RECENT DISTURBANCE
ANY DISTURBED ARE WITHIN FIFTY (50) FEET OF A STREAM AND AT FINAL GRADE.	WITHIN TWO (2) DAYS OF REACHING FINAL GRADE.
ANY OTHER AREAS AT FINAL GRADE	WITHIN SEVEN (7) DAYS OF REACHING FINAL GRADE WITHIN THAT AREA
NOTE: WHERE VEGETATIVE STABILIZATION TECHNIQUES MAY CAUSE STRUCTURAL INSTABILITY OR ARE OTHERWISE UNOBTAINABLE, ALTERNATIVE STABILIZATION TECHNIQUES MUST BE EMPLOYED. THESE TECHNIQUES MAY INCLUDE MULCHING OR EROSION MATTING.	

TEMPORARY STABILIZATION

AREAS REQUIRING TEMPORARY STABILIZATION	TIME FRAME TO APPLY EROSION CONTROLS:
ANY DISTURBED AREA WITHIN FIFTY (50) FEET OF A STREAM AND NOT AT FINAL GRADE.	WITHIN TWO (2) DAYS OF THE MOST RECENT DISTURBANCE IF THAT AREA WILL REMAIN IDLE FOR MORE THAN FOURTEEN (14) DAYS.
FOR ALL CONSTRUCTION ACTIVITIES, ANY DISTURBED AREA, INCLUDING SOIL STOCKPILES THAT WILL BE DORMANT FOR MORE THAN FOURTEEN (14) DAYS BUT LESS THAN ONE YEAR, AND NOT WITHIN FIFTY (50) FEET OF A STREAM.	WITHIN SEVEN (7) DAYS OF THE MOST RECENT DISTURBANCE WITHIN THE AREA.
DISTURBED AREA THAT WILL BE IDLE OVER WINTER.	PRIOR TO THE ONSET OF WINTER WEATHER/NOVEMBER 1ST.
NOTE: WHERE VEGETATIVE STABILIZATION TECHNIQUES MAY CAUSE STRUCTURAL INSTABILITY OR ARE OTHERWISE UNOBTAINABLE, ALTERNATIVE STABILIZATION TECHNIQUES MUST BE EMPLOYED. THESE TECHNIQUES MAY INCLUDE MULCHING OR EROSION MATTING.	

SEEDING SCHEDULE:

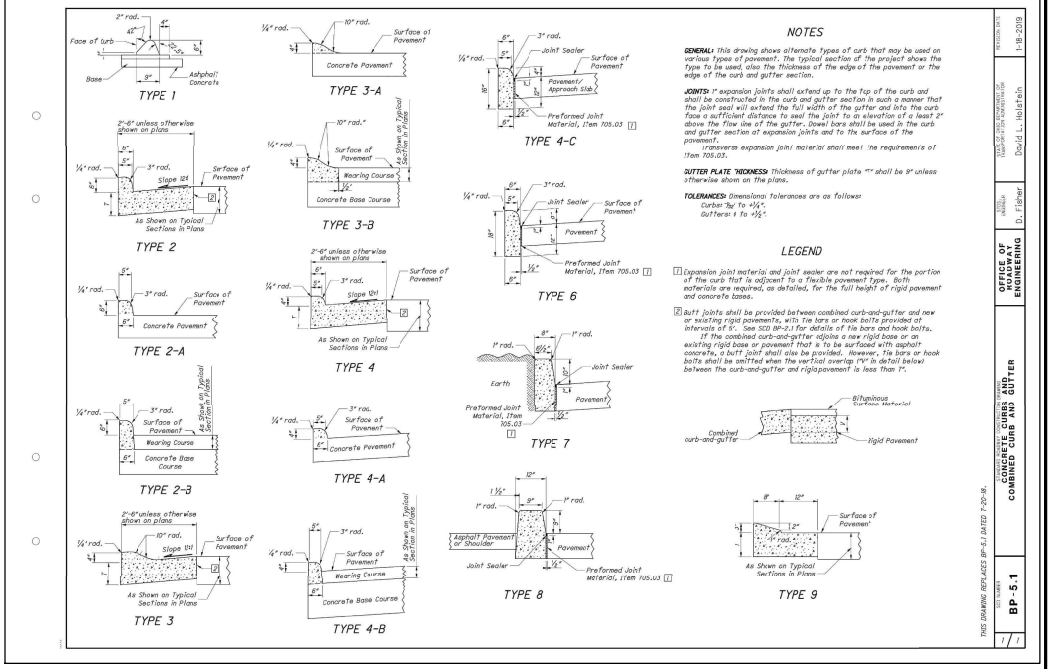
MIX TYPE	Name	Seeding rate lbs/acre	Seeding rate lbs/1,000 sq. ft	Notes
FINE	Kentucky Bluegrass	100-120	2	
	Pernenial Ryegrass		2	
FINE	Kentucky Bluegrass	100-120	2	For shaded areas
	Creeping Red Fescue		1.5	
ROUGH	FESTUCA ARUNDINACEA (TALL FESCUA)	40-50	N/A	SEE BELOW

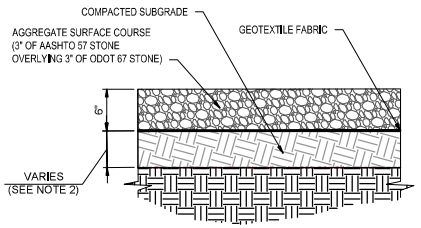
ROUGH MIX NOTES:

1. ALL ACTIVITIES, MATERIALS, EQUIPMENT AND PERFORMANCE IN CONNECTION WITH ESTABLISHING TURF SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.
2. PERMANENT SEEDING SPECIES AND RATES SHALL BE IN ACCORDANCE WITH THE SEEDING SPECIFICATION.
3. TEMPORARY TOPSOIL STOCKPILE SHALL BE SEEDED AT A RATE OF 150 POUNDS OF PURE LIVE SEED (PLS) PER ACRE IF LEFT UNDISTURBED FOR OVER 7 DAYS. SEEDING RATE SHALL BE 80 LBS/ACRE CEREAL RYE OR WHEAT PLUS 20 LBS/ACRE ANNUAL RYEGRASS.
4. ACTIVITIES ASSOCIATED WITH APPLICATION OF LIME, SEED, MULCH, COMPACTING, WATERING, MAINTENANCE AND PROTECTION SHALL BE IN ACCORDANCE WITH SPECIFICATIONS.
5. STABILIZATION SHALL BE IN ACCORDANCE WITH THE FOLLOWING TABLES.

PERMANENT/TEMPORARY SEEDING, FERTILIZING, & MULCHING

SCALE: N.T.S.





MLV GRAVEL SURFACING

SURFACE COURSE MATERIAL NOTES:

1. NON-WOVEN GEOTEXTILE SHALL BE MIRAFI 140N OR ENGINEER-APPROVED EQUAL.
2. CONTRACTOR SHALL REMOVE TOPSOIL AND ROOT MASSES FROM MLV AREA, THEN REPLACE WITH ACCEPTABLE FILL MATERIAL PER THE GEOTECHNICAL REPORT. COMPACT SUBGRADE AND FILL MATERIAL TO AT LEAST 95% MAXIMUM DRY DENSITY PER ASTM D698.

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
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DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS		
DATE -	INITIALS -	REGIONAL ENGINEER
DATE -	INITIALS -	MGR. TECH REC & STD
DATE 11/18/2020	INITIALS AMP	PRINCIPAL ENGINEER

DUKE ENERGY. | Piedmont Natural Gas

C350 PROJECT
RESTORATION DETAILS 3
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

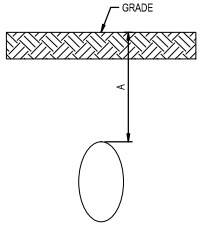
REF. DWG(S): PNG-G-350-0001009

SHEET(S)	3 OF 3	DWG SCALE	NONE
DWG DATE	02/04/2020	SUPERSEDED	—

DRAWING NUMBER: PNG -C-350-0001295 | REVISION: 0

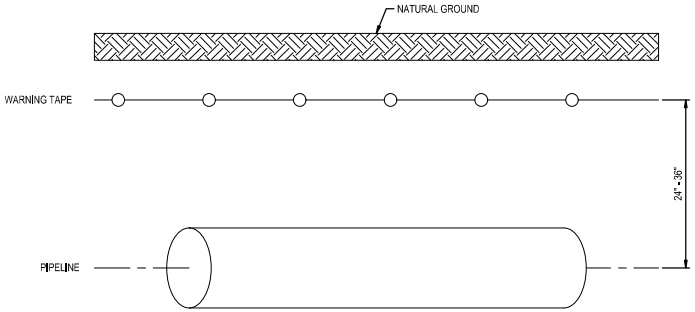
C/HAMILTON COUNTY/C350

PIPE LOCATION	MIN. DEPTH OF COVER (A)
NORMAL	4'-0"
STREAM/WETLAND CROSSING	5'-0"
ROAD CROSSING	5'-0"
RAILROAD CROSSING	10'-0"
WITHIN 50' OF RAILROAD	6'-0"



PIPELINE DEPTH OF COVER

SCALE: N.T.S.

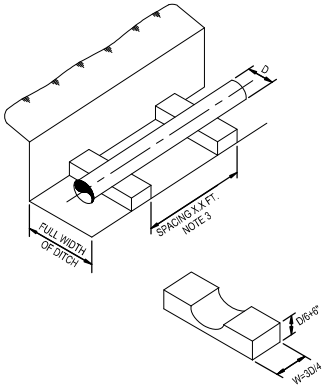


NOTES:

1. WARNING TAPE DEPTH MAY VARY BASED ON MANUFACTURER RECOMMENDATIONS OR AS OTHERWISE DIRECTED BY COMPANY.
2. WARNING TAPE INSTALLATION NOT APPLICABLE FOR TRENCHLESS INSTALLATIONS.
3. PIPE WARNING TAPE SHALL BE INSTALLED APPROXIMATELY 24"-36" ABOVE PIPELINE, OR AS OTHERWISE RECOMMENDED BY MANUFACTURER. MATERIALS SHALL BE SIGNALTAPE® OR APPROVED EQUIVALENT AND SHALL BE NON-TRACEABLE VARIETY.

UNDERGROUND WARNING TAPE INSTALLATION DETAIL

SCALE: N.T.S.

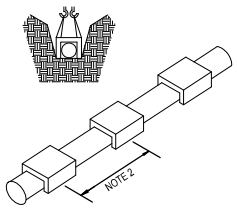


NOTES:

1. ALL MATERIALS SHALL BE SUPPLIED BY CONTRACTOR.
2. WIDTH SHALL BE INCREASED PROPORTIONAL TO SPACING INCREASE IF REQUIRED.
3. SPACING TO BE 20' FOR 20" PIPE.

TYPICAL PIPELINE SUPPORT PILLOWS

SCALE: N.T.S.



NOTES:

1. GEOTEXTILE PIPELINE WEIGHT TO BE 5000 POUNDS.
2. GEOTEXTILE PIPELINE WEIGHT TO BE SPACED EVERY 34'.
3. GEOTEXTILE PIPELINE WEIGHT TO BE FILLED WITH SAND OR GRAVEL.
4. GEOTEXTILE PIPELINE WEIGHT VENDORS TO BE PIPESAK OR ECOBAG OR APPROVED BY OWNER.
5. ROCK SHIELD SHALL BE APPLIED IN ALL LOCATIONS WITH BUOYANCY CONTROL.
6. SPACING REQUIREMENTS SHALL ROUND CONSERVATIVELY OR EXTEND BEYOND PLANS DELINEATED WIDTH.

GEOTEXTILE PIPELINE WEIGHT

SCALE: N.T.S.

AMANDA PALM E-84075 REGISTERED PROFESSIONAL ENGINEER STATE OF OHIO
11/18/2020
PROFESSIONAL ENGINEER: AMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
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DRAWING BY	AKT
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APPROVALS		
DATE -	INITIALS -	REGIONAL ENGINEER
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DATE 11/18/2020	INITIALS AMP	PRINCIPAL ENGINEER

C350 PROJECT CONSTRUCTION DETAILS 1 HAMILTON COUNTY, OHIO

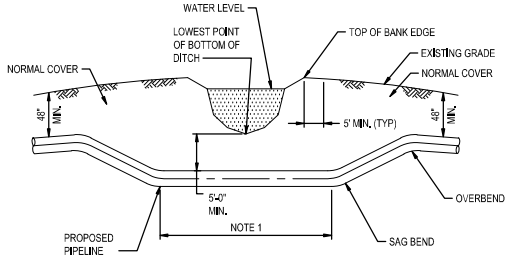
HAMILTON COUNTY, OHIO

REF. DWG(S): PNG-G-350-0001009

SHEET(S) 1 OF 10	DWG SCALE NONE
DWG DATE 09-05-2018	SUPERSEDED —

DRAWING NUMBER: PNG -C-350-0001303 REVISION: 0

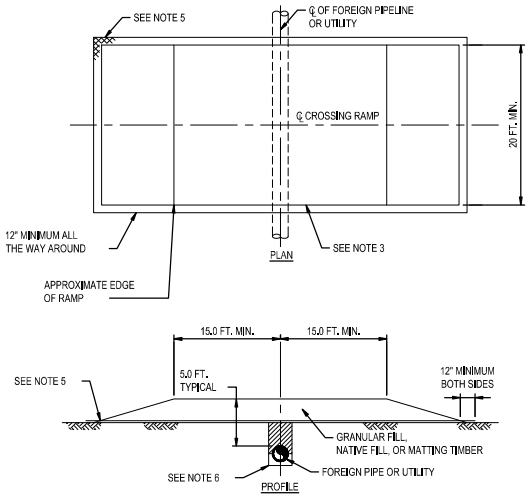
C/HAMILTON COUNTY/C350



NOTE:
1. PIPELINE WEIGHTS OR ANCHORS TO BE INSTALLED PER PLANS OR AS DIRECTED BY COMPANY.

TYPICAL OPEN CUT STREAM CROSSING

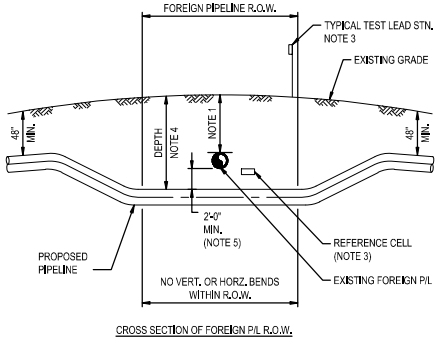
SCALE: N.T.S.



TEMPORARY RAMP CROSSING

SCALE: N.T.S.

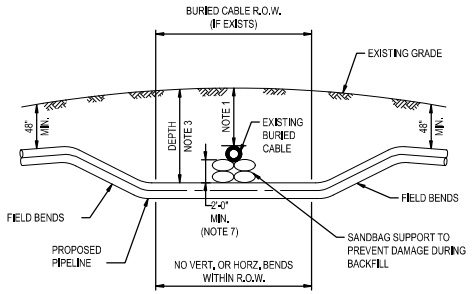
NOTES:
1. CONTRACTOR TO NOTIFY EXISTING PIPELINE/UTILITY COMPANY PRIOR TO INSTALLATION OF CROSSING RAMP.
2. LENGTH OF RAMP TO VARY IN ACCORDANCE WITH CROSSING ANGLE MINIMUM CROSSING ANGLE TO BE 45 DEGREES.
3. VEHICLES OR EQUIPMENT USING CROSSINGS SHALL PROCEED SLOWLY AND WITH CAUTION TO MINIMIZE IMPACT LOADING AND REDUCTION ON DEPTH OF COVER OVER PIPE/UTILITY.
4. ON COMPLETION OF CONSTRUCTION. CONTRACTOR TO REMOVE COMPLETE RAMP AND RESTORE AREA TO THE SATISFACTION OF THE EXISTING PIPELINE/UTILITY COMPANY AND THE COMPANY'S INSPECTOR.
5. GEOTEXTILE FABRIC (AND GEOTEXTILE GRID WHERE REQUIRED) SHALL BE INSTALLED TO PROTECT NATIVE TOP SOIL AS DIRECTED BY COMPANY'S INSPECTOR WHEN IMPORTED GRANULAR FILL OR NATIVE SUBSOIL FILL MATERIAL IS UTILIZED. IMPORTED GRANULAR FILL MATERIAL OR NATIVE SUBSOIL FILL MATERIAL TO BE REMOVED AND DISPOSED OF AS DIRECTED BY COMPANY'S REPRESENTATIVE.
6. IN ROCK TERRAIN THE CONTRACTOR SHALL, UNDER THE EXISTING PIPELINE COMPANY'S SUPERVISION, EXPOSE THE TOP HALF OF THE PIPE AND BACKFILL WITH COMPACTED SAND OR APPROVED SOIL.



NOTES:
1. FOREIGN PIPELINE LOCATIONS & DEPTHS TO BE DETERMINED BY ELECTRONIC MEANS IN ADVANCE OF PIPELINE CONSTRUCTION AND CONFIRMED BY CAREFULLY EXPOSING BY HAND DIGGING WHERE WITHIN 24" IN ANY DIRECTION FROM THE PIPELINE.
2. OWNER OF FOREIGN PIPELINE(S) SHALL BE NOTIFIED 48 HOURS IN ADVANCE OF EXCAVATION OF CROSSING.
3. TEST LEAD STATION TO BE INSTALLED WHERE PRACTICAL AT THE NEAREST FENCE, HEDGE ROW OR FIELD EDGE, AND WHERE READILY ACCESSIBLE. INSTALL PERMANENT REFERENCE CELL AND EXTEND CELL LEAD TO TEST LEAD STATION.
4. DEPTH OF PIPELINE INCLUDING 2'-0" MIN. CLEARANCE SHALL BE MAINTAINED FOR ALL FULL ANGULAR WIDTH OF FOREIGN PIPELINE R.O.W.
5. PROPOSED PIPELINE MAY ONLY CROSS ABOVE THE FOREIGN PIPELINE(S) WHERE REQUESTED BY OR APPROVED BY FOREIGN OWNER IN WRITING.

CROSSING FOREIGN PIPELINE

SCALE: N.T.S.



CROSS SECTION OF BURIED CABLE R.O.W.

SCALE: N.T.S.

NOTES:
1. BURIED CABLE LOCATIONS & PIPE DEPTHS TO BE DETERMINED BY ELECTRONIC MEANS IN ADVANCE OF PIPELINE CONSTRUCTION AND CONFIRMED BY CAREFULLY EXPOSING BY HAND DIGGING WHEN WITHIN 24" IN ANY DIRECTION FROM THE PIPELINE.
2. OWNER OF BURIED CABLE(S) SHALL BE NOTIFIED 48 HOURS IN ADVANCE OF EXCAVATION OF CROSSING.
3. DEPTH OF PIPELINE INCLUDING 2'-0" MIN. CLEARANCE SHALL BE MAINTAINED FOR THE FULL ANGULAR WIDTH OF BURIED CABLE R.O.W.
4. PROPOSED PIPELINE MAY ONLY CROSS ABOVE BURIED CABLE(S) WHERE APPROVED IN WRITING BY BURIED CABLE OWNER.
5. CONTRACTOR TO SUPPORT EXPOSED CABLE WITH WOOD PLANK OR STRUCTURAL STEEL DURING CONSTRUCTION.
6. CONTRACTOR TO UTILIZE CAUTION WITH PLACEMENT OF BACKFILL TO MINIMIZE POSSIBLE DAMAGE TO THE CABLE.

REF. DWG(S): PNG-G-350-0001009

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS		
DATE -	INITIALS -	REGIONAL ENGINEER
DATE -	INITIALS -	MGR TECH REC & STD
DATE 11/18/2020	INITIALS AMP	PRINCIPAL ENGINEER

C350 PROJECT
CONSTRUCTION DETAILS 2
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

SHEET(S) 2 OF 10	DWG SCALE NONE
DWG DATE 09-05-2018	SUPERSEDED —
DRAWING NUMBER	REVISION
PNG -C-350-0001304	0

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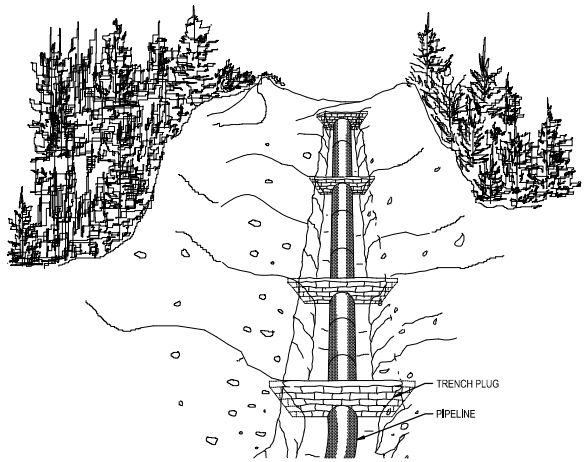
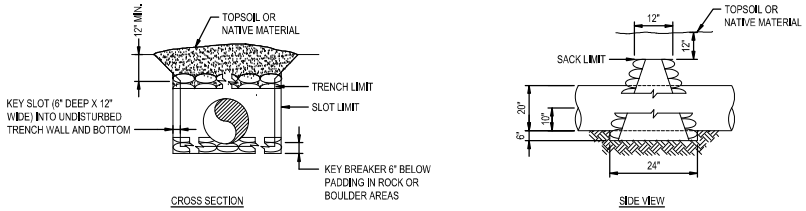


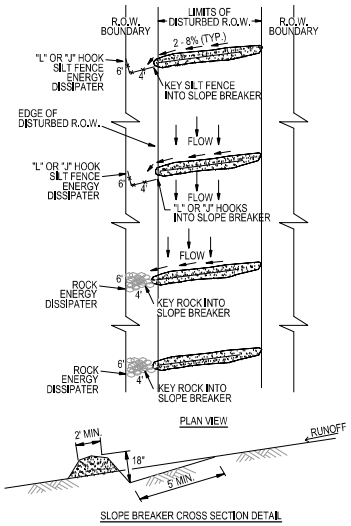


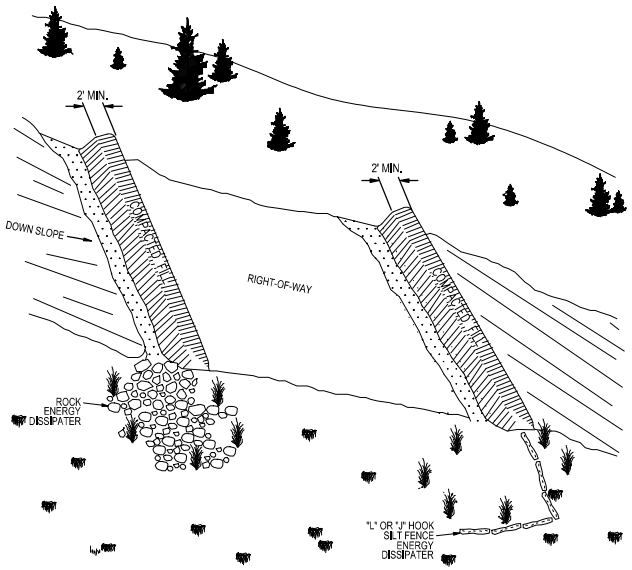
NOTES:

1. TRENCH PLUGS SHALL BE INSTALLED:
   - ON SLOPES ALONG THE TRENCH LINE WHERE THE NATURAL DRAINAGE PATTERN, PROFILE, AND TYPE OF BACKFILL MATERIAL MAY RESULT IN LOSS OF BACKFILL MATERIAL OR ALTERATION OF THE NATURAL PATTERN;
   - AT THE BASE OF SLOPES ADJACENT TO WATERBODIES AND WETLANDS;
   - WHERE NEEDED TO AVOID DRAINING A WETLAND;
   - ON UPLAND SLOPES, AT THE SAME SPACING AS SLOPE BREAKERS AND UP SLOPE OF SLOPE BREAKERS;
   - IN CULTIVATED LAND AND RESIDENTIAL AREAS WHERE PERMANENT SLOPE BREAKERS ARE NOT TYPICALLY INSTALLED, AT THE SAME SPACING AS IF PERMANENT SLOPE BREAKERS WERE REQUIRED
2. PLUGS SHALL BE INSTALLED IN ACCORDANCE WITH DUKE CONSTRUCTION STANDARDS AND AS DIRECTED
   - BY COMPANY'S INSPECTOR, SACK BREAKS SHALL UTILIZE OPEN WEAVE HEMP OR JUTE SACKS FILLED WITH MINIMUM OF 55LBS OF SUBSOIL, SAND OR A MIXTURE OF 1 PART CEMENT TO 6 PARTS SAND OR SUBSOIL AS DETERMINED BY COMPANY'S INSPECTOR
   - POLYURETHANE FOAM BREAKERS MAY BE USED IN-LIEU-OF SACK BREAKERS, WHEN APPROVED BY COMPANY'S REPRESENTATIVE.
3. PLUG SPACING AND CONFIGURATION MAY BE CHANGED AS DIRECTED BY COMPANY. DEPTH OF DITCH MAY VARY WITH SITE CONDITIONS.
4. ALL MATERIALS SHALL BE SUPPLIED BY CONTRACTOR.

TYPICAL TRENCH PLUG

SCALE: N.T.S.





NOTES:

1. SLOPE BREAKERS SHALL BE CONSTRUCTED OF COMPACTED NATIVE SOIL AND INSTALLED AT LOCATIONS AS REQUIRED BY DUKE CONSTRUCTION STANDARDS OR AS DIRECTED BY THE COMPANY'S REPRESENTATIVE.
2. SLOPE BREAKERS SHALL BE ORIENTED AS SHOWN OR OTHER PATTERN AS DIRECTED BY THE COMPANY'S REPRESENTATIVE TO DIRECT THE WATER OFF THE RIGHT-OF-WAY.
3. SLOPE BREAKERS SHALL BE CONSTRUCTED AT 2-8% GRADIENT ACROSS THE SLOPE.
4. THE SLOPE BREAKERS SHALL BE 18" DEEP (AS MEASURED FROM THE TROUGH TO THE TOP OF THE SLOPE BREAKER). THE THROUGH WILL BE A MINIMUM OF 5' WIDE ACROSS THE WIDTH OF THE RIGHT-OF-WAY.
5. THE OUTLET OF THE SLOPE BREAKER MUST FREELY DISCHARGE ALL RUNOFF OFF THE DISTURBED RIGHT-OF-WAY INTO AN ENERGY DISSIPATER.
6. WHERE SLOPE BREAKERS EXTEND BEYOND THE EDGE OF THE CONSTRUCTION RIGHT-OF-WAY TO DIRECT RUNOFF INTO STABLE, WELL VEGETATED AREAS, THESE LOCATIONS MUST BE APPROVED BY THE COMPANY'S REPRESENTATIVE.

FLOW ENERGY DISSIPATER NOTES:

1. THE OUTLET SHALL CONTAIN AN ENERGY DISSIPATER IF THE COMPANY'S INSPECTOR DETERMINES EXISTING VEGETATION IS NOT SUFFICIENTLY STABLE TO PREVENT EROSION. THE ENERGY DISSIPATER SHALL BE CONSTRUCTED AS FOLLOWS:
   - OUTFALL END OF DISSIPATER SHOULD BE LOWER THAN SLOPE BREAKER END.
   - SILT FENCE OR ROCK DISSIPATERS SHOULD BE KEYED INTO THE END OF THE SLOPE BREAKER.
   - PROVIDE ENOUGH AREA INSIDE "L" TO CAPTURE AND HOLD SEDIMENT.

TYPICAL SLOPE BREAKER

SCALE: N.T.S.

STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
11/18/2020

PROJECT MANAGER: JHS/AMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS		
DATE -	INITIALS -	REGIONAL ENGINEER
DATE -	INITIALS -	MGR TECH REC & STD
DATE 11/18/2020	INITIALS AMP	PRINCIPAL ENGINEER

C350 PROJECT
CONSTRUCTION DETAILS 3
HAMILTON COUNTY, OHIO

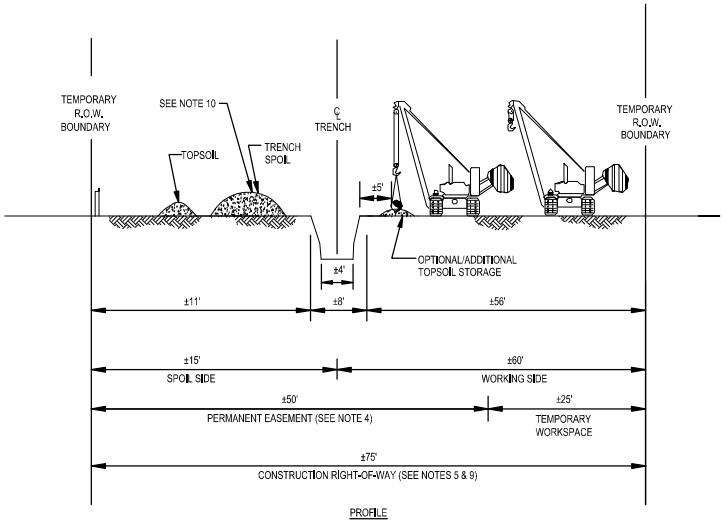
HAMILTON COUNTY, OHIO

REF. DWG(S): PNG-G-350-0001009

SHEET(S) 3 OF 10	DWG SCALE NONE
DWG DATE 09-05-2018	SUPERSEDED —

DRAWING NUMBER: PNG -C-350-0001305
REVISION: 0

C/HAMILTON COUNTY/C350



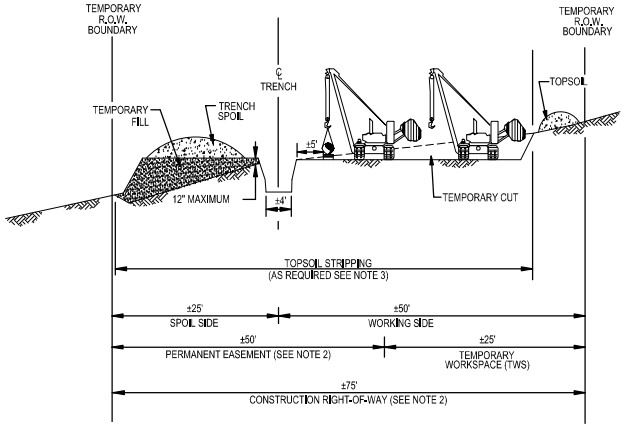
PROFILE

NOTES:

1. UTILIZE THE "TRENCH ONLY" TOPSOIL SALVAGE METHOD AT LOCATIONS SUCH AS RIPARIAN AREAS OR UNMANAGED WOODLAND, WHERE IDENTIFIED ON THE CONSTRUCTION DRAWINGS, OR AS DIRECTED BY THE COMPANY'S REPRESENTATIVE.
2. THE TRENCH ONLY METHOD IS NOT TO BE USED ON AGRICULTURAL LAND EXCEPT AS DIRECTED BY THE COMPANY INSPECTOR (PER LANDOWNER REQUEST).
3. FOR TRENCH ONLY STRIPPING, THE STRIPPED AREA SHALL BE WIDE ENOUGH TO ACCOMMODATE TRENCHING EQUIPMENT.
4. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 80 FEET WIDE CONSISTING OF 50 FEET OF PERMANENT EASEMENT AND 25 FEET OF TEMPORARY WORKSPACE. EXTRA TEMPORARY WORK SPACE WILL BE NECESSARY AT MAJOR ROAD, RAIL AND RIVER CROSSINGS AND OTHER SPECIAL CIRCUMSTANCES, AS REQUIRED. CERTAIN SITUATIONS MAY REQUIRE A NARROWER WIDTH.
5. STOCKPILE TOPSOIL AS SHOWN OR IN ANY CONFIGURATION APPROVED BY THE COMPANY'S INSPECTOR. KEEP TOPSOIL CLEAN OF ALL CONSTRUCTION DEBRIS.
6. LEAVE GAPS IN TOPSOIL AND SPOIL PILES AT OBVIOUS DRAINAGES. DO NOT PUSH TOPSOIL INTO CREEKS OR WETLANDS, DO NOT USE TOPSOIL FOR PADDING.
7. AVOID SCALPING VEGETATED GROUND SURFACE WHEN BACKFILLING SPOIL AND TOPSOIL PILES.
8. SAME LAYOUT APPLIES WHERE CONSTRUCTION R.O.W. DOES NOT ABUT EXISTING R.O.W.
9. TEMPORARILY SUSPEND TOPSOIL HANDLING OPERATIONS DURING INORDINATELY WINDY CONDITIONS UNTIL MITIGATIVE MEASURES TO MINIMIZE WIND EROSION CAN BE IMPLEMENTED.
10. TOPSOIL AND TRENCH SPOIL RELATIVE POSITIONS CAN, AS DIRECTED BY THE COMPANY'S INSPECTOR, BE REVERSED.

TYPICAL 75' WORKSPACE TOPSOIL SEPARATION

SCALE: N.T.S.



PROFILE

NOTES:

1. SIDE HILL CONSTRUCTION CUT AND FILL SHALL BE ALLOWED WHENEVER, IN THE OPINION OF THE CONTRACTOR, STEEP SIDE HILL CONSTRUCTION IS WARRANTED FOR PERSONNEL AND/OR EQUIPMENT SAFETY CONSIDERATIONS.
2. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 75 FEET WIDE CONSISTING OF 50 FEET OF PERMANENT EASEMENT AND 25 FEET OF TEMPORARY WORKSPACE. EXTRA TEMPORARY WORK SPACE WILL BE NECESSARY AT MAJOR ROAD, RAIL AND RIVER CROSSINGS AND OTHER SPECIAL CIRCUMSTANCES, AS REQUIRED. CERTAIN SITUATIONS MAY REQUIRE A NARROWER WIDTH.
3. THIS DRAWING REFLECTS "TRENCH, SPOIL, AND WORKING SIDE" TOPSOIL STRIPPING PROCEDURE AS NEEDED FOR HILL SIDE LEVELING. SALVAGE TOPSOIL OVER TRENCH UNDER THE SPOIL PILE AND FROM TEMPORARY CUT AND FILL AREAS AT LOCATIONS IDENTIFIED OF THE CONSTRUCTION ALIGNMENT SHEETS OR AS DIRECTED BY THE COMPANY'S REPRESENTATIVE.
4. STOCKPILE TOPSOIL AS SHOWN OR IN ANY CONFIGURATION APPROVED BY THE COMPANY'S REPRESENTATIVE. KEEP TOPSOIL CLEAN OF ALL CONSTRUCTION DEBRIS.
5. LEAVE GAPS IN TOPSOIL AND SPOIL PILES AT OBVIOUS DRAINAGES. DO NOT PUSH TOPSOIL INTO CREEKS OR WETLANDS. DO NOT USE TOPSOIL FOR PADDING. AVOID SCALPING VEGETATED GROUND SURFACE WHEN BACKFILLING TOPSOIL PILE.

TYPICAL SIDE HILL CONSTRUCTION

SCALE: N.T.S.

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS	
	-	-	REGIONAL ENGINEER
	-	-	MGR TECH REC & STD
	11/18/2020	AMP	PRINCIPAL ENGINEER

C350 PROJECT
CONSTRUCTION DETAILS 4
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

REF. DWG(S): PNG-G-350-0001009

SHEET(S) 4 OF 10	DWG SCALE NONE
DWG DATE 09-05-2018	SUPERSEDED —
DRAWING NUMBER	REVISION
PNG -C-350-0001306	0

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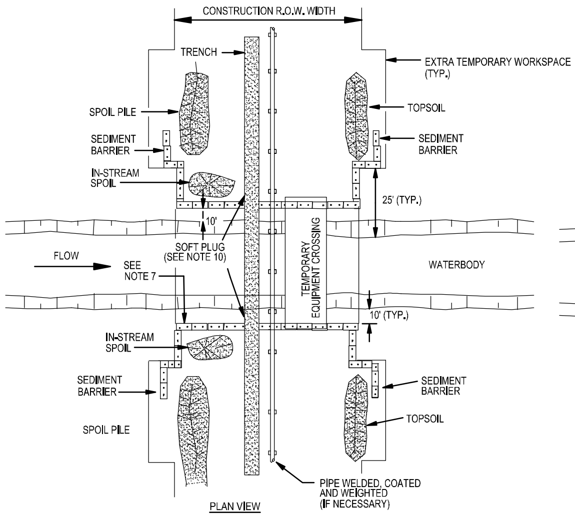
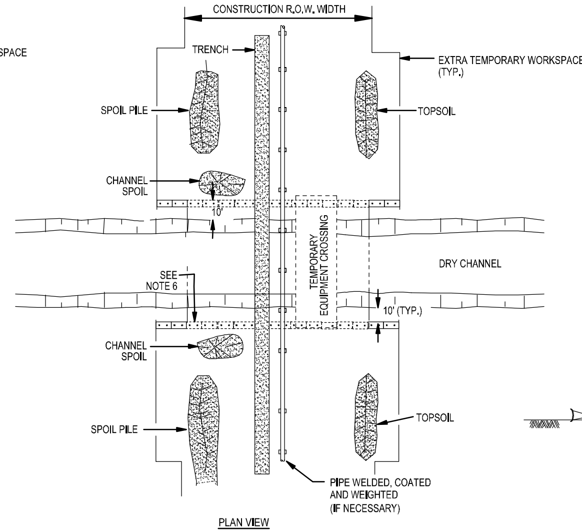


NOTES:
1. METHOD APPLIES TO WATERBODIES THAT ARE NOT STATE-DESIGNATED FISHERIES WHERE FLUME CROSSINGS ARE NOT REQUIRED.
 1.1. IF TOPOGRAPHY PERMITS TEMPORARY EQUIPMENT BRIDGE INSTALLATION, THE CONTRACTOR SHALL TRENCH, STRING, WELD, COAT, WEIGHT (IF NECESSARY), LOWER IN AND BACKFILL UTILIZING THE MAIN LINE CREW TRAVELING OVER THE BRIDGE.
 1.2. IF TOPOGRAPHY PROHIBITS INSTALLATION OF A TEMPORARY EQUIPMENT BRIDGE, CONTRACTOR SHALL TRENCH UP TO BOTH SIDES OF CROSSING; STRING, WELD, COAT AND WEIGHT (IF NECESSARY) USING THE MAINLINE CREW. IN STREAM EXCAVATION, LOWER IN, AND BACKFILL WILL UTILIZES A CLAM OR HOES WORKING FROM THE BANKS.
2. SCHEDULE CROSSING DURING LOW FLOW PERIOD IF POSSIBLE. NO IN-STREAM WORK BETWEEN APRIL 15 AND JUNE 30.
3. COMPLETE ALL IN-STREAM ACTIVITIES WITHIN 24 HOURS IF FEASIBLE.
4. NO REFUELING OF MOBILE EQUIPMENT WITHIN 100 FEET OF WATERBODY. REFUEL STATIONARY EQUIPMENT AS PER THE SPCC PLAN.
5. INSTALLATION OF TEMPORARY EQUIPMENT CROSSING IS REQUIRED AT ALL STATE-DESIGNATED FISHERIES AND STREAM CROSSINGS. IF A TEMPORARY EQUIPMENT CROSSING IS INSTALLED, IT MUST BE BUILT IN ACCORDANCE WITH SECTION PERMITS.
6. IN AGRICULTURAL LAND, STRIP TOPSOIL FROM SPOIL STORAGE AREA.
7. CONSTRUCT SEDIMENT BARRIERS ALONG THE SIDES OF STOCKPILES AND ACROSS THE ENTIRE CONSTRUCTION R.O.W. TO PREVENT SILT LADEN WATER AND SPOIL FROM FLOWING BACK INTO WATERBODY. BARRIERS MAY BE TEMPORARILY REMOVED TO ALLOW CONSTRUCTION ACTIVITIES BUT MUST BE REPLACED BY THE END OF EACH WORK DAY.
8. IN-STREAM SPOIL TO BE STORED OUT OF THE STREAM CHANNEL A MINIMUM OF 10 FEET FROM THE WATERS EDGE AND WITHIN THE CONSTRUCTION R.O.W. UNLESS DEPICTED OTHERWISE IN SITE SPECIFIC CROSSING PLANS. TEMPORARY WORKSPACE MUST BE A MINIMUM OF 25' FROM THE WATERS EDGE.
9. TRENCH THROUGH WATERCOURSE USING MAINLINE EXCAVATION EQUIPMENT WHERE PRACTICAL.
10. INSTALL SOFT PLUGS AT THE EDGE OF STREAM BANKS UNTIL JUST PRIOR TO PIPE INSTALLATION TO CONTROL. WATER FLOW & TRENCH SLOUGHING.
11. MAINTAIN STREAM FLOW THROUGHOUT CROSSING CONSTRUCTION.
12. BACKFILL WITH NATIVE MATERIAL.
13. RESTORE WATERBODY CHANNEL TO APPROXIMATE PRE-CONSTRUCTION PROFILE AND SUBSTRATE.
14. RESTORE STREAM BANKS TO APPROXIMATE ORIGINAL CONDITION AND STABILIZE, AS REQUIRED.
15. ALL DIMENSIONS INDICATED SHALL BE DETERMINED BY ACTUAL CONSTRUCTION CONDITIONS.
16. NO FORD CROSSINGS ARE PERMITTED.

TYPICAL FLOWING WATERBODY CROSSING OPEN CUT TRENCHED

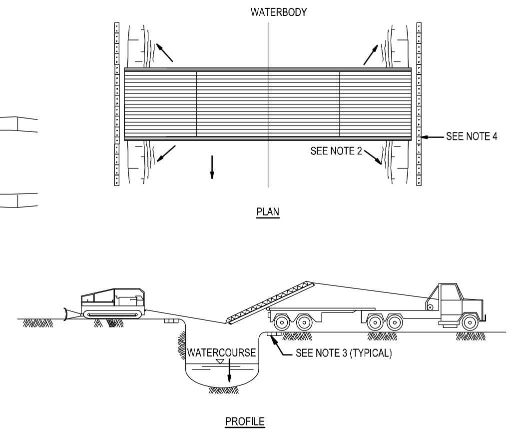
SCALE: N.T.S.



NOTES:
1. METHOD APPLIES TO CROSSINGS WHERE NO FLOWING WATER IS PRESENT AT THE TIME OF CROSSING.
2. CONTRACTOR MAY "MAINLINE THROUGH" THE CROSSING OR UP TO BOTH SIDES OF THE CROSSING; STRING, WELD, COAT, AND WEIGHT (IF NECESSARY), USING THE MAINLINE CREW WITH THE PIPE SKIDDED OVER THE CROSSING.
3. NO REFUELING OF MOBILE EQUIPMENT WITHIN 100 FEET OF DRY CHANNEL. REFUEL STATIONARY EQUIPMENT AS PER THE SPCC PLAN.
4. INSTALLATION OF TEMPORARY EQUIPMENT CROSSING IS REQUIRED AT ALL STREAM CROSSINGS. EQUIPMENT CROSSING MUST BE BUILT IN ACCORDANCE WITH THE TYPICAL PORTABLE WATERBODY BRIDGE DETAIL.
5. IN AGRICULTURAL LAND, STRIP TOPSOIL FROM SPOIL STORAGE AREA. STOCKPILE TOPSOIL AND SPOIL SEPARATELY. TOPSOIL AND SPOIL WILL NOT BE STOCKPILED IN THE CROSSING CHANNEL AND WILL BE PLACED A MINIMUM OF 10 FEET FROM CROSSING BANKS WITHIN THE CONSTRUCTION R.O.W.
6. CONSTRUCT SEDIMENT BARRIERS ACROSS THE ENTIRE CONSTRUCTION R.O.W. FOLLOWING CLEARING AND GRADING AND MAINTAIN UNTIL CONSTRUCTION OF THE CROSSING. EROSION CONTROL MEASURES SHALL BE REINSTALLED IMMEDIATELY FOLLOWING BACKFILLING OF TRENCH AND STABILIZATION OF BANKS. BARRIERS MAY BE TEMPORARILY REMOVED TO ALLOW CONSTRUCTION ACTIVITIES BUT MUST BE REPLACED BY THE END OF EACH WORK DAY.
7. IN-STREAM SPOIL TO BE STORED OUT OF THE STREAM CHANNEL A MINIMUM OF 10 FEET FROM HIGH BANK AND WITHIN THE CONSTRUCTION R.O.W. UNLESS DEPICTED OTHERWISE IN SITE SPECIFIC CROSSING PLANS.
8. BACKFILL WITH NATIVE MATERIAL.
9. RESTORE CROSSING CHANNEL TO APPROXIMATE PRE-CONSTRUCTION PROFILE AND SUBSTRATE.
10. RESTORE CROSSING BANKS TO APPROXIMATE ORIGINAL CONDITION AND STABILIZE, AS REQUIRED.
11. ALL DIMENSIONS INDICATED SHALL BE DETERMINED BY ACTUAL CONSTRUCTION CONDITIONS.

TYPICAL NON-FLOWING WATERBODY CROSSING OPEN CUT TRENCHING

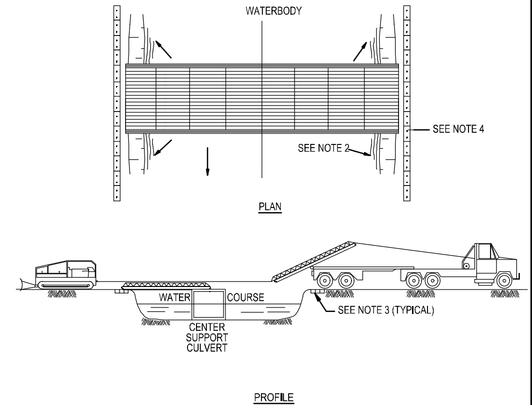
SCALE: N.T.S.



NOTES:
1. THIS TYPE OF BRIDGE IS GENERALLY USED ON NARROW, DEEP CROSSINGS.
2. BRIDGE IS ANCHORED AND/OR TIED OFF TO ANCHOR BLOCKS FOR STABILITY.
3. UTILIZE APPROACH FILLS OF CLEAN GRANULAR MATERIAL, SWAMP MATS, SKIDS OR OTHER SUITABLE MATERIALS TO AVOID CUTTING THE BANKS WHEREVER FEASIBLE. ENSURE ADEQUATE FREEBOARD. AS REQUIRED, ENSURE THAT FILL MATERIAL USED DOES NOT SPILL INTO WATERCOURSE.
4. CONSTRUCT SEDIMENT BARRIERS ACROSS THE ENTIRE CONSTRUCTION R.O.W. TO PREVENT SILT LADEN WATER AND SPOIL FROM FLOWING BACK INTO WATERBODY. BARRIERS MAY BE TEMPORARILY REMOVED TO ALLOW CONSTRUCTION ACTIVITIES BUT MUST BE REPLACED BY THE END OF EACH WORK DAY. SILT FENCE, OR SANDBAGS MAY BE USED INTERCHANGEABLY.
5. REMOVE PORTABLE BRIDGES AS SOON AS POSSIBLE AFTER PERMANENT SEEDING UNLESS OTHERWISE DIRECTED BY COMPANY REPRESENTATIVE. THE STRUCTURE IS TO BE REMOVED IF THERE IS MORE THAN ONE MONTH BETWEEN FINAL GRADING AND SEEDING, AND ALTERNATIVE ACCESS TO THE CONSTRUCTION R.O.W. IS AVAILABLE.
6. DISPOSE OF ANY ROCK AS DIRECTED BY THE COMPANY REPRESENTATIVE.
7. RESTORE AND STABILIZE BED AND BANKS TO APPROXIMATE PRE-CONSTRUCTION CONDITIONS.

TYPICAL PORTABLE WATERBODY BRIDGE

SCALE: N.T.S.



NOTES:
1. THIS TYPE OF BRIDGE IS GENERALLY USED FOR CROSSINGS THAT ARE TOO WIDE FOR A SINGLE BRIDGE SECTION AND RELATIVELY SHALLOW.
2. BRIDGE IS ANCHORED AND/OR TIED OFF TO ANCHOR BLOCKS FOR STABILITY.
3. UTILIZE APPROACH FILLS OF CLEAN GRANULAR MATERIAL, SWAMP MATS, SKIDS OR OTHER SUITABLE MATERIALS TO AVOID CUTTING THE BANKS WHEREVER FEASIBLE. ENSURE ADEQUATE FREEBOARD. AS REQUIRED, ENSURE THAT FILL MATERIAL, IF USED, DOES NOT SPILL INTO WATERCOURSE.
4. CONSTRUCT SEDIMENT BARRIERS ACROSS THE ENTIRE CONSTRUCTION R.O.W. TO PREVENT SILT LADEN WATER AND SPOIL FROM FLOWING BACK INTO WATERBODY. BARRIERS MAY BE TEMPORARILY REMOVED TO ALLOW CONSTRUCTION ACTIVITIES BUT MUST BE REPLACED BY THE END OF EACH WORK DAY. SILT FENCE OR SANDBAGS MAY BE USED INTERCHANGEABLY.
5. REMOVE PORTABLE BRIDGES AS SOON AS POSSIBLE AFTER PERMANENT SEEDING UNLESS OTHERWISE DIRECTED BY COMPANY REPRESENTATIVE THE STRUCTURE IS TO BE REMOVED IF THERE IS MORE THAN ONE MONTH BETWEEN FINAL GRADING AND SEEDING, AND ALTERNATIVE ACCESS TO THE CONSTRUCTION R.O.W. IS AVAILABLE.
6. DISPOSE OF ANY ROCK AS DIRECTED BY COMPANY REPRESENTATIVE.
7. RESTORE AND STABILIZE BED AND BANKS TO APPROXIMATE PRE-CONSTRUCTION CONDITIONS.

TYPICAL PORTABLE WATERBODY BRIDGE WITH CULVERT SUPPORT

SCALE: N.T.S.

STATE OF OHIO
AMANDA PALM
E-84075
REGISTERED PROFESSIONAL ENGINEER
11/18/2020
PROFESSIONAL ENG/ARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
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APPROVALS DATE	INITIALS	
-	-	REGIONAL ENGINEER
-	-	MGR TECH REC & STD
11/18/2020	AMP	PRINCIPAL ENGINEER

DUKE ENERGY. Piedmont Natural Gas

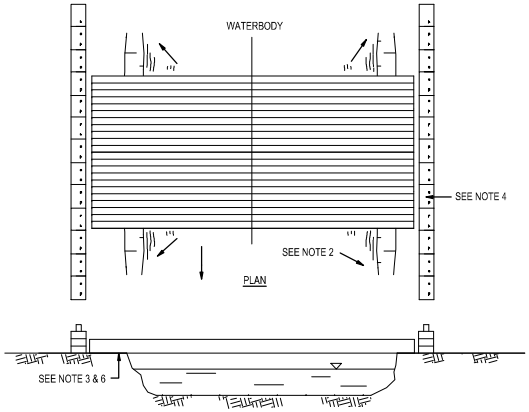
C350 PROJECT CONSTRUCTION DETAILS 5 HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

REF. DWG(S): PNG-G-350-0001009

SHEET(S) 5 OF 10	DWG SCALE NONE
DWG DATE 09-05-2018	SUPERSEDED —
DRAWING NUMBER PNG -C-350-0001307	REVISION 0

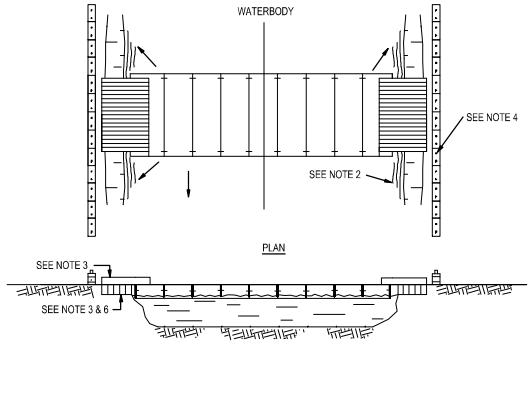
C/HAMILTON COUNTY/C350



1. THIS TYPE OF BRIDGE IS GENERALLY USED ON NARROW CROSSINGS, LESS THAN 20 FEET WIDE WITH APPROPRIATE BANK CONFIGURATION. MULTIPLE MATS MAY BE LAYERED FOR HEAVIER EQUIPMENT CROSSINGS.
2. BRIDGE IS ANCHORED AND/OR TIED OFF TO ANCHOR BLOCKS FOR STABILITY. BRIDGE SHOULD BE TEMPORARILY REMOVED IF HIGH WATER RENDERS IT UNSAFE TO USE.
3. IF REQUIRED, UTILIZE APPROACH FILLS OF CLEAN GRANULAR MATERIAL, SWAMP MATS, SKIDS OR OTHER SUITABLE MATERIALS TO AVOID CUTTING THE BANKS WHEREVER FEASIBLE. ENSURE ADEQUATE FREEBOARD. AS REQUIRED, ENSURE THAT FILL MATERIAL IF USED DOES NOT SPILL INTO WATERCOURSE INCLUDING REMOVAL OF DIRT FROM DECK DURING OPERATION.
4. CONSTRUCT SEDIMENT BARRIERS ACROSS THE ENTIRE CONSTRUCTION R.O.W. TO PREVENT SILT LADEN WATER AND SPOIL FROM FLOWING BACK INTO WATERBODY. BARRIERS MAY BE TEMPORARILY REMOVED TO ALLOW CONSTRUCTION ACTIVITIES BUT MUST BE REPLACED BY THE END OF EACH WORK DAY. SILT FENCE, HAY BALES OR SANDBAGS MAY BE USED INTERCHANGEABLY.
5. REMOVE BRIDGES AS SOON AS POSSIBLE AFTER PERMANENT SEEDING UNLESS OTHERWISE DIRECTED BY COMPANY REPRESENTATIVE. THE STRUCTURE IS TO BE REMOVED IF THERE IS MORE THAN ONE MONTH BETWEEN FINAL GRADING AND SEEDING, AND ALTERNATIVE ACCESS TO THE CONSTRUCTION R.O.W. IS AVAILABLE.
6. DISPOSE OF ANY ROCK AS DIRECTED BY COMPANY REPRESENTATIVE.
7. RESTORE AND STABILIZE BED AND BANKS TO APPROXIMATE PRE-CONSTRUCTION CONDITIONS.

TYPICAL TIMBER MAT WATERBODY BRIDGE

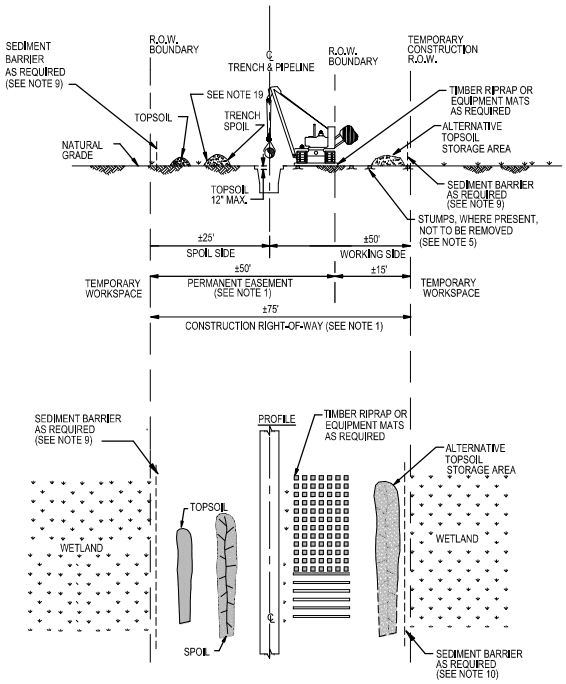
SCALE: N.T.S.



1. THIS TYPE OF BRIDGE IS GENERALLY USED ON WIDE, DEEP CROSSINGS.
2. BRIDGE IS ANCHORED AND/OR TIED OFF TO ANCHOR BLOCKS FOR STABILITY.
3. UTILIZE APPROACH FILLS OF CLEAN GRANULAR MATERIAL, SWAMP MATS, SKIDS OR OTHER SUITABLE MATERIALS TO AVOID CUTTING THE BANKS WHEREVER FEASIBLE. ENSURE ADEQUATE FREEBOARD. AS REQUIRED, ENSURE THAT FILL MATERIAL IF USED, DOES NOT SPILL INTO WATERCOURSE.
4. CONSTRUCT SEDIMENT BARRIERS ACROSS THE ENTIRE CONSTRUCTION R.O.W. TO PREVENT SILT LADEN WATER AND SPOIL FROM FLOWING BACK INTO CONSTRUCTION ACTIVITIES BUT MUST BE REPLACED BY THE END OF EACH WORK DAY. SILT FENCE, HAY BALES OR SANDBAGS MAY BE USED INTERCHANGEABLY.
5. REMOVE FLOATING BRIDGES AS SOON AS POSSIBLE AFTER PERMANENT SEEDING UNLESS OTHERWISE DIRECTED BY COMPANY REPRESENTATIVE. THE STRUCTURE IS TO BE REMOVED IF THERE IS MORE THAN ONE MONTH BETWEEN FINAL GRADING AND SEEDING AND ALTERNATIVE ACCESS TO THE CONSTRUCTION R.O.W. IS AVAILABLE.
6. DISPOSE OF ANY ROCK AS DIRECTED BY COMPANY REPRESENTATIVE.
7. RESTORE AND STABILIZE BED AND BANKS TO APPROXIMATE PRE-CONSTRUCTION CONDITIONS.

TYPICAL FLEXI-FLOAT WATERBODY BRIDGE

SCALE: N.T.S.



PLAN VIEW

1. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 75 FEET WIDE CONSISTING OF 50 FEET OF PERMANENT EASEMENT AND UP TO 25 FEET OF TEMPORARY WORKSPACE.
2. THE SAME LAYOUT APPLIES WHETHER CONSTRUCTION R.O.W. DOES OR DOES NOT ABUT A FOREIGN R.O.W.
3. LOCATE ANY EXTRA TEMPORARY WORK SPACE AREAS AT LEAST 25 FEET FROM EDGE OF WETLAND AND WITHIN THE APPLICABLE FULL WIDTH CONSTRUCTION R.O.W.
4. CLEARING OF VEGETATION AND TREES IS PROHIBITED BETWEEN TEMPORARY EXTRA WORK SPACE AND THE EDGE OF THE WETLAND
5. CUT VEGETATION AND TREES OFF AT GROUND LEVEL, LEAVING EXISTING ROOT SYSTEMS IN PLACE WHEREVER PRACTICABLE, AND REMOVE CUTTINGS FROM THE WETLAND FOR DISPOSAL.
6. LIMIT CONSTRUCTION EQUIPMENT TO ONE PASS THROUGH WETLANDS TO THE EXTENT PRACTICABLE.
7. NO REFUELING OF EQUIPMENT WITHIN 100 FEET OF WETLAND EXCEPT IN ACCORDANCE WITH THE SPCC PLAN.
8. IF SATURATED AT TIME OF CONSTRUCTION, REDUCE SOIL COMPACTION BY UTILIZING WIDE-TRACK OR BALLOON TIRE CONSTRUCTION EQUIPMENT OR NORMAL EQUIPMENT OPERATED ON TIMBER RIPRAP OR EQUIPMENT MATS.
9. AVOID ADJACENT WETLANDS. INSTALL SEDIMENT BARRIERS IMMEDIATELY AFTER INITIAL GROUND DISTURBANCE AND AT THE EDGE OF THE CONSTRUCTION R.O.W. ALONG THE WETLAND AS DIRECTED BY THE COMPANY'S INSPECTOR.
10. THIS DRAWING REFLECTS "TRENCH ONLY" TOPSOIL STRIPPING PROCEDURE FOR AREAS WHERE STANDING WATER OR SATURATED SOIL ARE NOT PRESENT.
11. SALVAGE UP TO 12" OF TOPSOIL OVER TRENCH AT LOCATIONS IDENTIFIED ON THE CONSTRUCTION DRAWINGS OR AS DIRECTED BY THE COMPANY'S INSPECTOR. MAINTAIN SEPARATION BETWEEN TOPSOIL AND TRENCH SPOIL.
12. LEAVE GAPS IN TOPSOIL AND SPOIL PILES AT OBVIOUS DRAINAGES. DO NOT USE TOPSOIL FOR PADDING. AVOID SCALPING VEGETATED GROUND SURFACE WHEN BACKFILLING SPOIL PILE.
13. IN UNSATURATED CONDITIONS, SPOIL MAY BE USED TO STABILIZE THE WORKING SIDE.
14. IF SATURATED AT TIME OF CONSTRUCTION, LEAVE HARD PLUGS AT THE EDGE OF WETLAND UNTIL JUST PRIOR TO TRENCHING.
15. TRENCH THROUGH WETLANDS.
16. LOWER-IN PIPE. INSTALL TRENCH BREAKERS AT WETLAND EDGES AS DIRECTED BY THE COMPANY'S INSPECTOR TO PREVENT DRAINAGE. BACKFILL UPON COMPLETION OF CONSTRUCTION.
17. REMOVE ALL TIMBER, RIPRAP OR EQUIPMENT MATS FROM WETLANDS UPON COMPLETION OF CONSTRUCTION.
18. RESTORE GRADE TO NEAR PRE-CONSTRUCTION TOPOGRAPHY AND REPLACE TOPSOIL, WHERE SALVAGED, WITHOUT A CROWN OVER THE TRENCH.
19. IF STANDING WATER IS NOT PRESENT, SEED AS SPECIFIED.
20. TOPSOIL AND TRENCH SPOIL RELATIVE POSITIONS CAN, AS DIRECTED BY THE COMPANY'S INSPECTOR, BE REVERSED.

TYPICAL WETLAND CROSSING

SCALE: N.T.S.

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS			
DATE	INITIALS		
-	-	REGIONAL ENGINEER	
DATE	INITIALS		
-	-	MGR TECH REC & STD	
DATE	INITIALS		
11/18/2020	AMP	PRINCIPAL ENGINEER	

C350 PROJECT
CONSTRUCTION DETAILS 6
HAMILTON COUNTY, OHIO

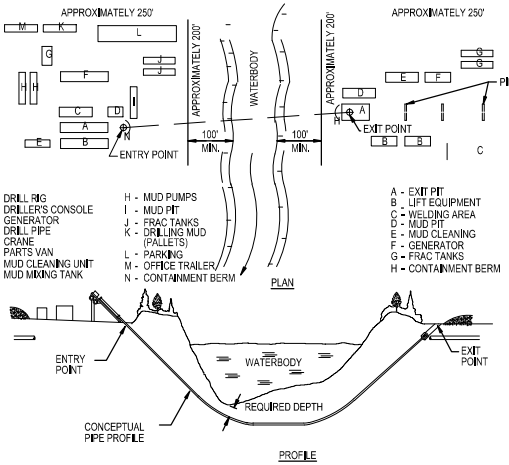
HAMILTON COUNTY, OHIO

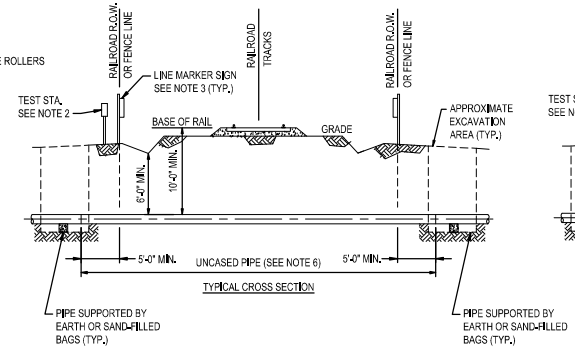
REF. DWG(S): PNG-G-350-0001009

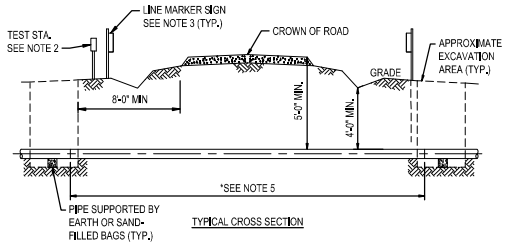
SHEET(S) 6 OF 10	DWG SCALE NONE
DWG DATE 09-05-2018	SUPERSEDED —

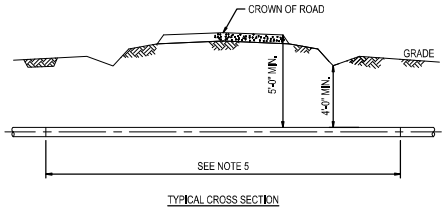
DRAWING NUMBER: PNG -C-350-0001308 | REVISION: 0

C:\HAMILTON COUNTY\C350









NOTES:

1. SET UP DRILLING EQUIPMENT A MINIMUM OF 100 FEET FROM THE EDGE OF THE WATERCOURSE. DO NOT CLEAR OR GRADE WITHIN THE 100 FOOT ZONE.
2. ENSURE THAT ONLY BENTONITE BASED DRILLING MUD IS USED. DO NOT ALLOW THE USE OF ANY ADDITIVES TO THE DRILLING MUD WITHOUT THE APPROVAL OF COMPANY'S INSPECTOR.
3. INSTALL SUITABLE DRILLING MUD TANKS OR SUMPS TO PREVENT CONTAMINATION OF WATERCOURSE.
4. INSTALL BERMS DOWNSLOPE FROM THE DRILL ENTRY AND ANTICIPATED EXIT POINTS TO CONTAIN ANY RELEASE OF DRILLING MUD.
5. DISPOSE OF DRILLING MUD IN ACCORDANCE WITH THE APPROPRIATE REGULATORY AUTHORITY REQUIREMENTS.

CONCEPTUAL CROSSING METHOD FOR HORIZONTAL DIRECTIONAL DRILL

SCALE: N.T.S.

NOTES:

1. WHERE CONFLICTS MAY EXIST, PERMIT SPECIFICATIONS SHALL ALWAYS GOVERN THIS DRAWING.
2. CATHODIC TEST STATION TO BE INSTALLED (IF REQUIRED), SEE TYPICAL DRAWING PNG-E-350-0001013.
3. PIPELINE MARKER TO BE INSTALLED PER TYPICAL DRAWING, PNG-C-350-0001311 (IF REQUIRED).
4. ANY EXCAVATION WITHIN THE LIMITS OF THE R.O.W. SHALL BE REPLACED WITH BACKFILL SPECIFIED BY THE ENGINEER AND COMPACTED IN 6-INCH LAYERS.
5. SAND BAG SUPPORT SHALL BE PLACED ON UNDISTURBED SOIL UNDER THE CARRIER PIPE TO AVOID SAGGING WHEN BACKFILLED.
6. PIPE TO BE IN ACCORDANCE WITH SPECIFIC STATE REQUIREMENTS.
7. THE ANGLE OF INTERSECTION BETWEEN A PIPELINE CROSSING AND THE RAILROAD TO BE CROSSED SHOULD BE AS NEAR TO 90 DEGREES AS PRACTICABLE. IN NO CASE SHOULD IT BE LESS THAN 30 DEGREES.
8. UNCASED GAS PIPELINES, SHALL NOT BE LESS THAN 10 FEET FROM THE BASE OF RAIL TO THE TOP OF THE PIPE AT ITS CLOSEST POINT. AT ALL OTHER LOCATIONS WHERE CROSSING THE RIGHT-OF-WAY, THE MINIMUM GROUND COVER MUST BE 6 FEET.

CONCEPTUAL UNCASED BORED RAILROAD CROSSING

SCALE: N.T.S.

NOTES:

1. CARRIER PIPE IS TO BE COATED WITH APPROVED EXTERNAL PROTECTIVE COATING.
2. CATHODIC TEST STATION TO BE INSTALLED (IF REQUIRED), SEE TYPICAL DRAWING PNG-E-350-0001013.
3. PIPELINE MARKER TO BE INSTALLED PER TYPICAL DRAWING, PNG-C-350-0001311 (IF REQUIRED).
4. INSTALL PIPELINE MARKER & TEST STATIONS ON ROW LINE NEXT TO FENCE IF POSSIBLE.
5. CROSSING SHALL BE INSTALLED BY BORING.
6. PIPE WALL THICKNESS AND GRADE SHALL BE AS SPECIFIED ON ALIGNMENT DRAWINGS.
7. CROSSING TO BE AS NEAR TO 90 DEGREES TO THE CENTERLINE OF ROADWAY AS PRACTICAL.
8. CONTRACTOR TO FURNISH AND THOROUGHLY COMPACT SAND BACK FILL AT ALL BELL HOLES TO CENTERLINE OF PIPE.
9. IN WET CONDITIONS, USE SAND BAG SUPPORTS AT 10 FEET INTERVALS IN LIEU OF CONTINUOUS SAND BACK FILL, AT THE DISCRETION OF THE COMPANY REPRESENTATIVE.

CONCEPTUAL UNCASED BORED ROAD CROSSING

SCALE: N.T.S.

NOTES:

1. CARRIER PIPE IS TO BE COATED WITH APPROVED EXTERNAL PROTECTIVE COATING.
2. CATHODIC TEST STATION TO BE INSTALLED (IF REQUIRED), SEE TYPICAL DRAWING PNG-E-350-0001013.
3. PIPELINE MARKER TO BE INSTALLED PER TYPICAL DRAWING, PNG-C-350-0001311 (IF REQUIRED).
4. INSTALL PIPELINE MARKER & TEST STATIONS ON ROW LINE NEXT TO FENCE IF POSSIBLE.
5. CROSSING SHALL BE INSTALLED BY OPEN CUTTING.
6. PIPE WALL THICKNESS AND GRADE SHALL BE AS SPECIFIED ON ALIGNMENT DRAWINGS.
7. CROSSING TO BE AS NEAR TO 90 DEGREES TO THE CENTERLINE OF ROADWAY AS PRACTICAL.
8. EXCAVATION WITHIN THE LIMITS OF THE ROAD EASEMENT SHALL BE REPLACED WITH BACKFILL SPECIFIED BY THE ENGINEER AND COMPACTED IN 6-INCH LAYERS.

CONCEPTUAL OPEN CUT ROAD CROSSING

SCALE: N.T.S.

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS			
DATE	INITIALS		
-	-	REGIONAL ENGINEER	
DATE	INITIALS		
-	-	MGR TECH REC & STD	
DATE	INITIALS		
11/18/2020	AMP	PRINCIPAL ENGINEER	

AMANDA PALM E-84075 REGISTERED PROFESSIONAL ENGINEER STATE OF OHIO
11/18/2020
PROJECT MANAGER: CHS/AMP

C350 PROJECT
CONSTRUCTION DETAILS 7
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

REF. DWG(S): PNG-G-350-0001009

SHEET(S)	7 OF 10
DWG SCALE	NONE
DWG DATE	09-05-2018
SUPERSEDED	—
DRAWING NUMBER	PNG -C-350-0001309
REVISION	0

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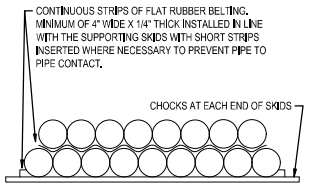
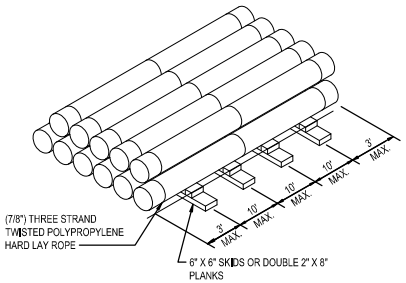
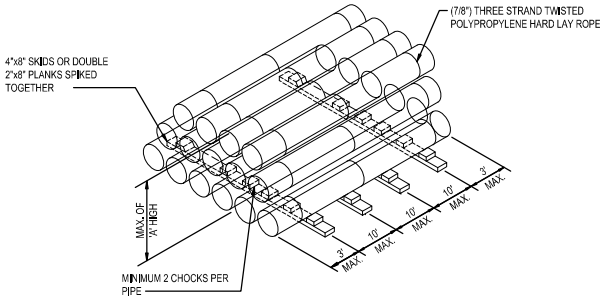
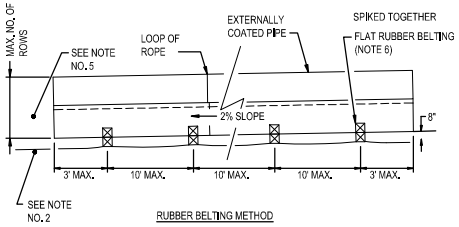
SIZE	'A' (NO. OF ROWS)	CIRCUMFERENCE OF FINISHED LOOPS	SIZE	'A' (NO. OF ROWS)	CIRCUMFERENCE OF FINISHED LOOPS	
4"	12	16"	18"	5	60"	* PIPE GREATER THAN 20" WILL BE 4 ROWS.
6"	10	24"	20"	4 *	66"	
8"	8	30"	24"	4	72"	
10"	6	37"	32"	4	80"	
12"	6	43"	36"	4	92"	
16"	5	54"	42"	4	98"	

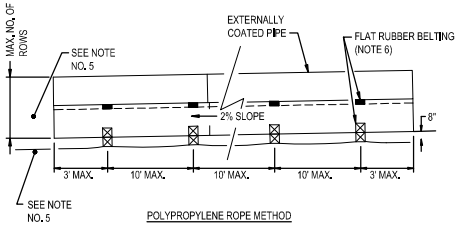








RUBBER BELTING METHOD



POLYPROPYLENE ROPE METHOD

CIRCUMFERENCE OF LOOPS									
THE CIRCUMFERENCE OF LOOPS (MINIMUM) SHALL BE IN ACCORDANCE WITH THE FOLLOWING TABLE									
PIPE O.D.	30"	24"	20"	16"	12"	10"	8"	6"	4"
CIRCUMFERENCE OF FINISHED LOOPS	98"	80"	66"	54"	43"	37"	30"	34"	34"

NOTES:

1. ALL PIPE THAT IS SURPLUS AFTER A CONSTRUCTION PROJECT MUST BE PERMANENTLY STOCKPILED.
2. THE USE OF ALTERNATE METHODS FOR STOCKPILING PIPE AND/OR THE USE OF ALTERNATE MATERIALS FOR PREVENTING PIPE TO PIPE CONTACT SHALL REQUIRE THE APPROVAL OF THE COMPANY REPRESENTATIVE.
3. NUMBER OF ROWS TO BE SPECIFIED BY COMPANY.
4. ALL MATERIALS SHALL BE FURNISHED BY CONTRACTOR.
5. EARTHEN BERMS WILL BE ACCEPTABLE ALTERNATIVES AS APPROVED BY COMPANY REPRESENTATIVE.

ROPE INSTALLATION

ROPE SPACING SHOULD BE A MAXIMUM OF 6 FEET FROM THE PIPE ENDS AND A MAXIMUM OF 6 FEET FROM GIRTH WELDS. THE INTERVALS BETWEEN RINGS SHOULD BE BETWEEN 10 FEET AND 25 FEET WITH A MINIMUM OF FOUR LOOPS SPACED OVER A STANDARD DOUBLE RANDOM LENGTH (40 FEET). THE INTERVALS MUST BE ADJUSTED TO INSURE THERE IS NO PIPE TO PIPE CONTACT. ROPE ENDS SHALL BE FUSED WITH A BLOW TORCH PRIOR TO SLIPPING THE LOOP OVER THE PIPE.

TYPICAL TEMPORARY PIPE STOCKPILE

SCALE: N.T.S.

NOTES:

1. THE USE OF THE RUBBER BELTING METHOD OR THE POLYPROPYLENE ROPE METHOD TO PREVENT PIPE TO PIPE CONTACT IN THE STOCKPILE SHALL BE AS DIRECTED BY THE COMPANY.
2. SITE TO BE GRADED TO 2% SLOPE AND PADDED WITH 8" OF PIT RUN GRAVEL.
3. SKIDS TO BE CAREFULLY LEVELED TO MAINTAIN 2% SLOPE. PIPES TO MAINTAIN CLOSE CONTACT THROUGHOUT ENTIRE LENGTH TO PREVENT SPLITTING AND ROLLING OF THE STOCKPILE.
4. LONGITUDINAL WELDS TO BE ARRANGED AT TOP OF PIPE TO ALIGN WITH SPACES BETWEEN NESTED PIPES.
5. PIPE 4.5" TO 6.625" TO BE STOCKPILED A MAXIMUM OF 4 ROWS HIGH. PIPE 8.625" TO 18" TO BE STOCKPILED A MAXIMUM OF 3 ROWS HIGH. PIPE LARGER THAN 18" TO BE STOCKPILED A MAXIMUM OF 2 ROWS HIGH.
6. THE BOTTOM ROW OF PIPE SHALL REST ON SKIDS PROTECTED BY A CONTINUOUS STRIP OF FLAT RUBBER BELTING.
7. ALL MATERIAL TO BE SUPPLIED BY CONTRACTOR.

ROPE INSTALLATION:

ROPE SPACING SHOULD BE A MAXIMUM OF 6 FEET FROM THE PIPE ENDS AND A MAXIMUM OF 6 FEET FROM GIRTH WELDS. THE INTERVAL BETWEEN RINGS SHOULD BE BETWEEN 10 FEET AND 25 FEET WITH A MINIMUM OF FOUR LOOPS SPACED OVER A STANDARD DOUBLE RANDOM LENGTH (40 FEET). THE INTERVALS MUST BE ADJUSTED TO INSURE THERE IS NO PIPE TO PIPE CONTACT. ROPE ENDS SHALL BE FUSED WITH A BLOW TORCH PRIOR TO SLIPPING THE LOOP OVER THE PIPE.

TYPICAL PERMANENT PIPE STOCKPILE

SCALE: N.T.S.

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS			
DATE	INITIALS		
-	-	REGIONAL ENGINEER	
DATE	INITIALS		
-	-	MGR TECH REC & STD	
DATE	INITIALS		
11/18/2020	AMP	PRINCIPAL ENGINEER	

C350 PROJECT
CONSTRUCTION DETAILS 8
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

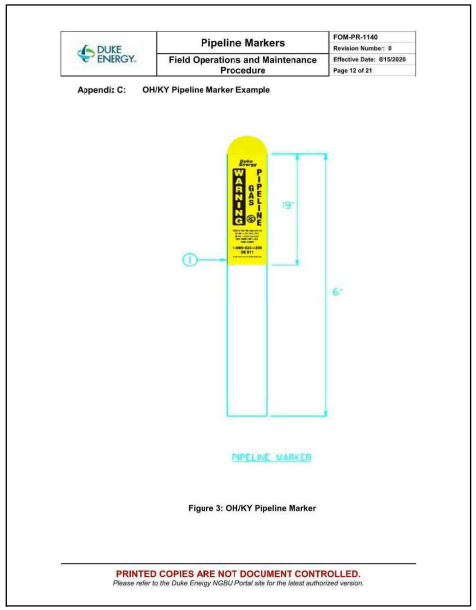
REF. DWG(S): PNG-G-350-0001009

SHEET(S) 8 OF 10	DWG SCALE NONE
DWG DATE 09-05-2018	SUPERSEDED —

DRAWING NUMBER: PNG -C-350-0001310

REVISION: 0

C/HAMILTON COUNTY/C350



DUKE ENERGY. | Pipeline Markers | FOM-PR-1140
Field Operations and Maintenance Procedure | Revision Number: 0 | Effective Date: 6/15/2020 | Page 12 of 21

Appendix C: OH/KY Pipeline Marker Example

Figure 3: OH/KY Pipeline Marker

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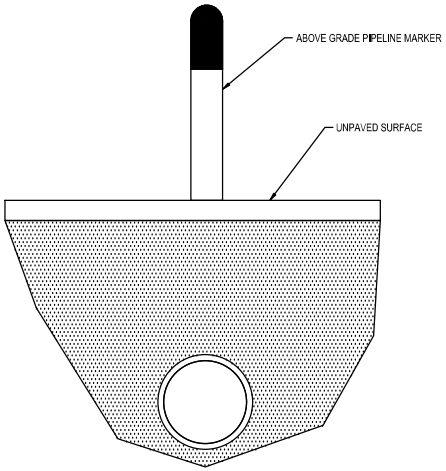
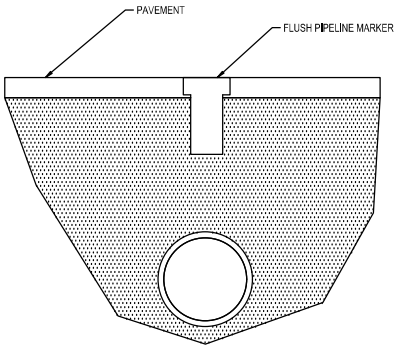
Please refer to the Duke Energy NGBU Portal site for the latest authorized version.



NOTE:
1. ABOVE GRADE PIPELINE MARKERS TO BE INSTALLED IN GRASS OR UNPAVED AREAS WHEN PIPELINE MARKER IS REQUIRED.
2. PIPELINE MARKERS SHALL BE INSTALLED PER FOM-PR-1140.

ABOVE GRADE PIPELINE MARKER

SCALE: N.T.S.



NOTE:
1. FLUSH PIPELINE MARKERS TO BE INSTALLED IN PAVEMENT WHEN PIPELINE MARKER IS REQUIRED.

FLUSH PIPELINE MARKER

SCALE: N.T.S.

NOTES:
1. PIPELINE MARKERS SHALL BE PLACED AT:
   - IN LINE-OF-SIGHT INTERVALS AND TURNING POINTS
   - ALL PUBLIC ROAD CROSSINGS
   - ALL RAILROAD CROSSINGS
   - RIVER, STREAM, CREEK, DITCH AND CANAL CROSSINGS
   - UTILITY CROSSINGS (PER DUKE DISCRETION)
   - SWAMPS OR WETLANDS (ENTRY AND EXIT)
   - ROAD MEDIANS
   - ABOVE GROUND FACILITIES SUCH AS VALVE SETTINGS, BORDER STATIONS, REGULATOR STATIONS, AND PIPELINE INTERCONNECTS
   - UNDERGROUND VALVES
   - HDD ENTRY AND EXIT POINTS
2. PIPELINE MARKERS SHALL BE PLACED DIRECTLY ON TOP OR WITHIN 24 INCHES OF THE PIPELINE.
3. SET MARKERS AS SOON AS PRACTICAL AFTER THE INSTALLATION OF THE PIPELINE. MAKE EVERY EFFORT TO PROVIDE MARKERS BEFORE VEGETATION IS RE-ESTABLISHED AFTER CONSTRUCTION.

PIPELINE MARKER LOCATIONS

NOTES:
1. CONSTRUCTION FENCE SHALL BE INSTALLED ALONG THE CONSTRUCTION BOUNDARY EXCEPT FOR THE FOLLOWING LOCATIONS:
   A. NO FENCE REQUIRED ACCESS DRIVES.
   B. CONSTRUCTION BOUNDARY IN ROAD SHALL BE BARRICADED IN ACCORDANCE WITH TRAFFIC PLANS AND MUTCD REQUIREMENTS.
   C. OTHER BOUNDARY SPECIFIED ON PLANS.
2. FENCE SHALL BE REMOVABLE FOR RESIDENTIAL AND COMMERCIAL DRIVE ACCESS.

CONSTRUCTION BOUNDARY BARRIER

PROFESSIONAL ENGINEER STAMP
AMANDA PALM E-84075 REGISTERED PROFESSIONAL ENGINEER STATE OF OHIO 11/18/2020

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

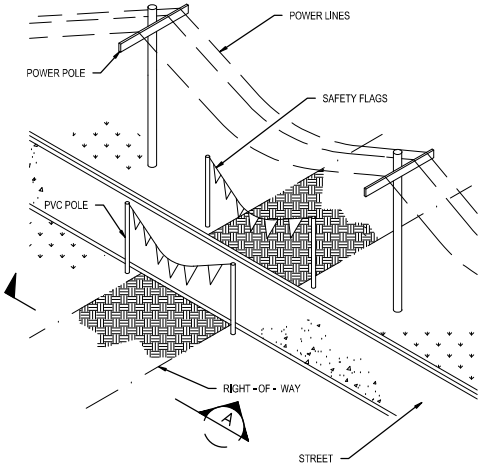
APPROVALS		
DATE -	INITIALS -	REGIONAL ENGINEER
DATE -	INITIALS -	MGR TECH REC & STD
DATE 11/18/2020	INITIALS AMP	PRINCIPAL ENGINEER

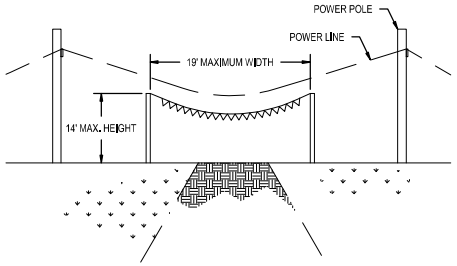
REF. DWG(S): PNG-G-350-0001009

C350 PROJECT
CONSTRUCTION DETAILS 9
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

SHEET(S) 9 OF 10 | DWG SCALE NONE
DWG DATE 09-05-2018 | SUPERSEDED —
DRAWING NUMBER PNG -C-350-0001311 | REVISION 0
C/HAMILTON COUNTY/C350





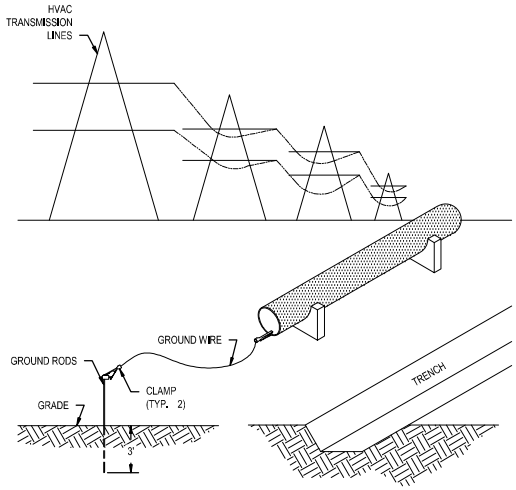
SECTION A-A

SCALE: N.T.S.

NOTE:
1. FLAG HEIGHT AND WIDTH MAY BE ADJUSTED BASED ON SITE CONDITIONS OR AS DIRECTED BY COMPANY REPRESENTATIVE.

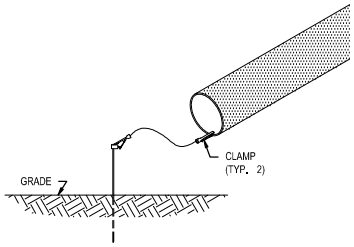
OVERHEAD ELECTRICAL WARNING FLAGS

SCALE: N.T.S.



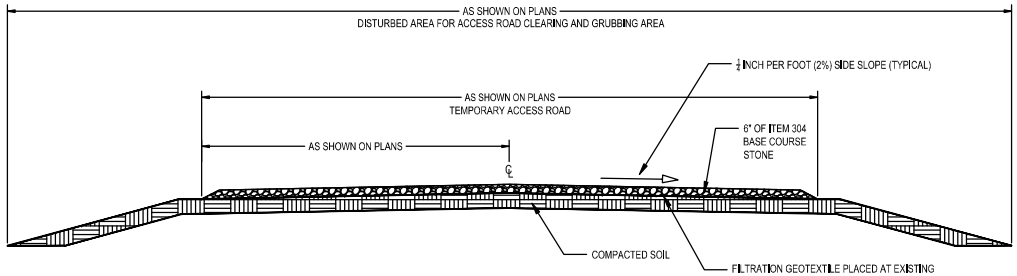
SAFETY GROUNDING

SCALE: N.T.S.



CLIP CONNECTION

SCALE: N.T.S.



INSTALLATION NOTES:

- USE 6" OF COMPACTED ITEM 304 BASE COURSE STONE AS SHOWN ON PLANS.

MAINTENANCE NOTES:

- MONITOR TO SUPPLEMENT STONE OR BLADE TO MAINTAIN UNIFORM RIDING SURFACE.

TEMPORARY ACCESS ROAD DETAIL

SCALE: N.T.S.

SCALE: N.T.S.

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
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PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS		
DATE -	INITIALS -	REGIONAL ENGINEER
DATE -	INITIALS -	MGR TECH REC & STD
DATE 11/18/2020	INITIALS AMP	PRINCIPAL ENGINEER

C350 PROJECT
CONSTRUCTION DETAILS 10
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

REF. DWG(S): PNG-G-350-0001009

SHEET(S) 10 OF 10	DWG SCALE NONE
DWG DATE 09-05-2018	SUPERSEDED —
DRAWING NUMBER	REVISION
PNG -C-350-0001312	0

C/HAMILTON COUNTY/C350

REF. DWG(S): G-350-0001009
C-350-0001338
L-350-0001000

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	HEC	CNS	CDW

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	HEC
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS	
	-	-	REGIONAL ENGINEER
	-	-	MGR. TECH REC & STD
	11/18/2020	CDW	PRINCIPAL ENGINEER

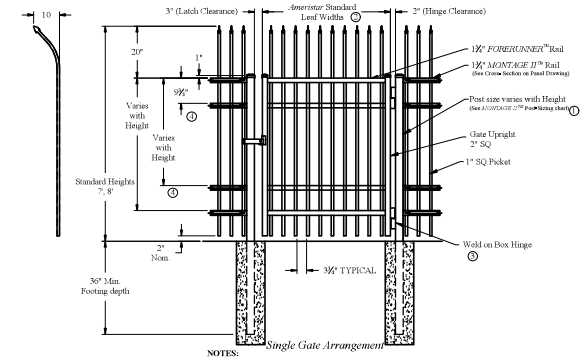
REGISTERED PROFESSIONAL ENGINEER
STATE LICENSE COUNCIL CORP

STATE OF OHIO
CHRISTOPHER D. WILSON
82217
REGISTERED PROFESSIONAL ENGINEER
11/18/2020
PROFESSIONAL ENG/ARCH STAMP

C350 PROJECT
MAINLINE VALVE
SCREENING WALL DETAILS 01

HAMILTON COUNTY, OHIO

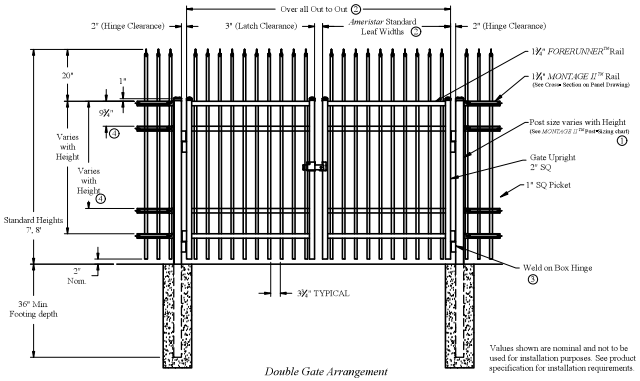
SHEET(S) 1 OF 7 | DWG SCALE AS NOTED
DWG DATE 07/26/2019 | SUPERSEDED —
DRAWING NUMBER PNG -C-350-0001335 | REVISION 0
C / HAMILTON COUNTY / 350



Single Gate Arrangement

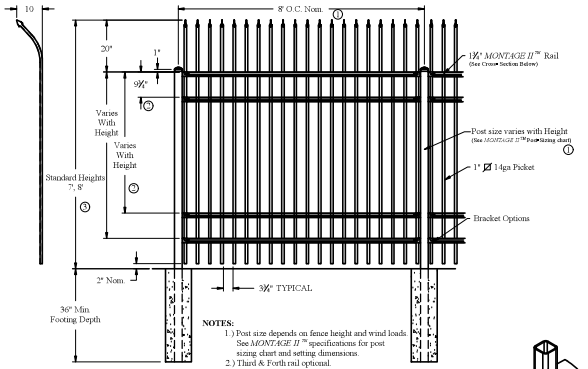
NOTES:

1.) Post size depends on fence height, weight and wind loads. See *MONTAGE II* ™ specifications for post sizing chart.
2.) See *Ameristar* gate table for standard out to outs. Custom gate openings available for special out to out/leaf widths.
3.) Additional styles of gate hardware are available on request. This could change the Latch & Hinge Clearance.
4.) Third & Forth rail optional.



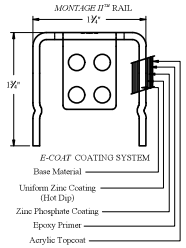
Double Gate Arrangement

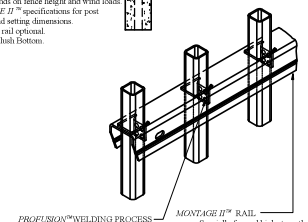
DETAIL 1
SCALE: NTS
FENCE GATE

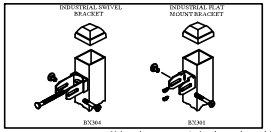


NOTES:

1.) Post size depends on fence height and wind loads. See *MONTAGE II* ™ specifications for post sizing chart and setting dimensions.
2.) Third & Forth rail optional.
3.) Available in Flush Bottom.

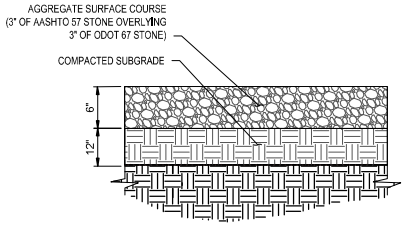






Values shown are nominal and not to be used for installation purposes. See product specification for installation requirements.

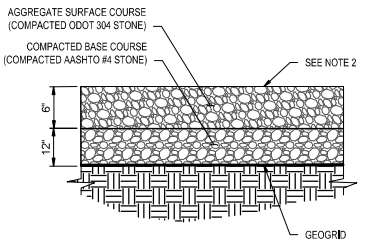
DETAIL 2
SCALE: NTS
FENCE



GRAVEL SURFACE COURSE

SURFACE COURSE MATERIAL NOTES:

1. GEOGRID SHALL BE TENSAR FG30 OR ENGINEER APPROVED EQUAL.
2. ACCESS ROAD SURFACE COURSE DETAIL APPLIES TO MLV 2 ONLY. SEE DRAWING C-350-0001342 FOR MLV 1 ACCESS PATH DETAILS.



ACCESS ROAD SURFACE COURSE

DETAIL 3
SCALE: NTS
SURFACE COURSE MATERIAL

CHRISTOPHER D. WILSON — 82217 — REGISTERED PROFESSIONAL ENGINEER — 11/18/2020
PROFESSIONAL ENG/ARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	HEC	CNS	CDW

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	HEC
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS		
DATE	INITIALS	
-	-	REGIONAL ENGINEER
DATE	INITIALS	
-	-	MGR TECH REC & STD
DATE	INITIALS	
11/18/2020	CDW	PRINCIPAL ENGINEER

C350 PROJECT MAINLINE VALVE SURFACING AND FENCE DETAILS

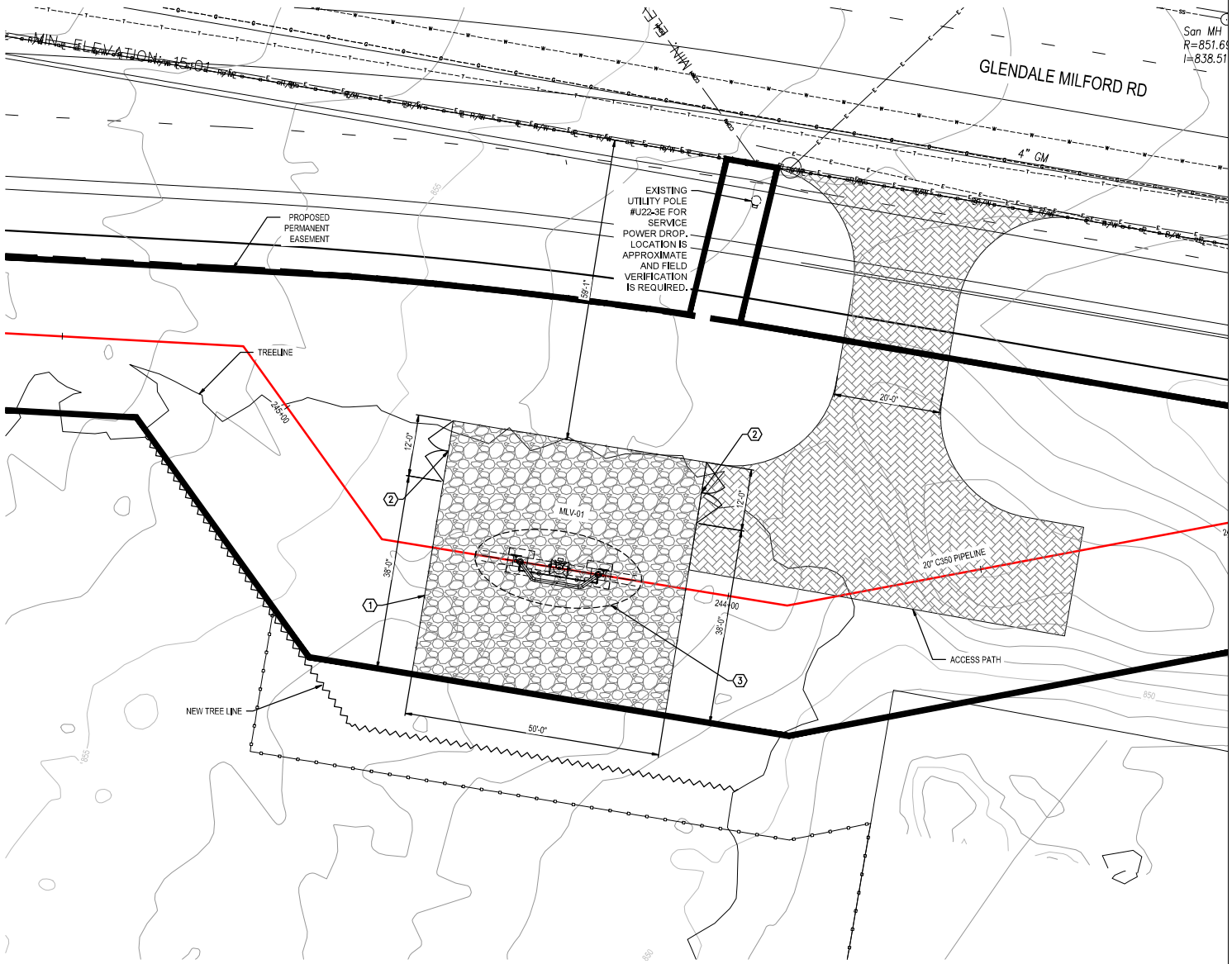
HAMILTON COUNTY, OHIO

REF. DWG(S): G-350-0001009, L-350-0001000, C-350-0001338, L-350-0001001, C-350-0001340

SHEET(S)	2 OF 7	DWG SCALE	AS NOTED
DWG DATE	07/26/2019	SUPERSEDED	—

DRAWING NUMBER	REVISION
PNG -C-350-0001336	0

C / HAMILTON COUNTY / 350



NOTES:

1. THE EXISTING SITE UTILITIES AND FEATURES SHOWN ARE BASED ON A FIELD RUN TOPOGRAPHIC SURVEY PERFORMED BY BERDING SURVYEING IN FEBRUARY 2020.
2. ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE NOTED.
3. SEE DRAWINGS PNG-G-350-0001009 THRU 0001013 FOR LEGEND, ABBREVIATIONS, AND GENERAL NOTES.

KEY NOTES:

1. 10' SCREENING WALL — C-350-0001335
2. 12' DOUBLE SWING GATE — C-350-0001335
3. MLV-01 (C350-0004) SECTION VIEW — M-350-0001009

LEGEND:

- PROPOSED GRAVEL SURFACE COURSE — C-350-0001336
- POROUS PAVEMENT — C-350-0001342

CHRISTOPHER D. WILSON — 82217 — REGISTERED PROFESSIONAL ENGINEER — STATE OF OHIO — 11/18/2020
PROFESSIONAL ENGINEER'S STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	HEC	CNS	CDW

DESCRIPTION		APPROVALS		
AREA CODE	-	DATE -	INITIALS -	REGIONAL ENGINEER
ACCOUNT NUMBER	Q3680			
PROJECT NUMBER	1880115			MGR. TECH REC & STD
DRAWING BY	HEC	DATE -	INITIALS -	
STATION ID	C350			
CHECKER INITIALS	CNS	DATE 11/18/2020	INITIALS CDW	PRINCIPAL ENGINEER

C350 PROJECT
MLV-01 SITE PLAN
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OH

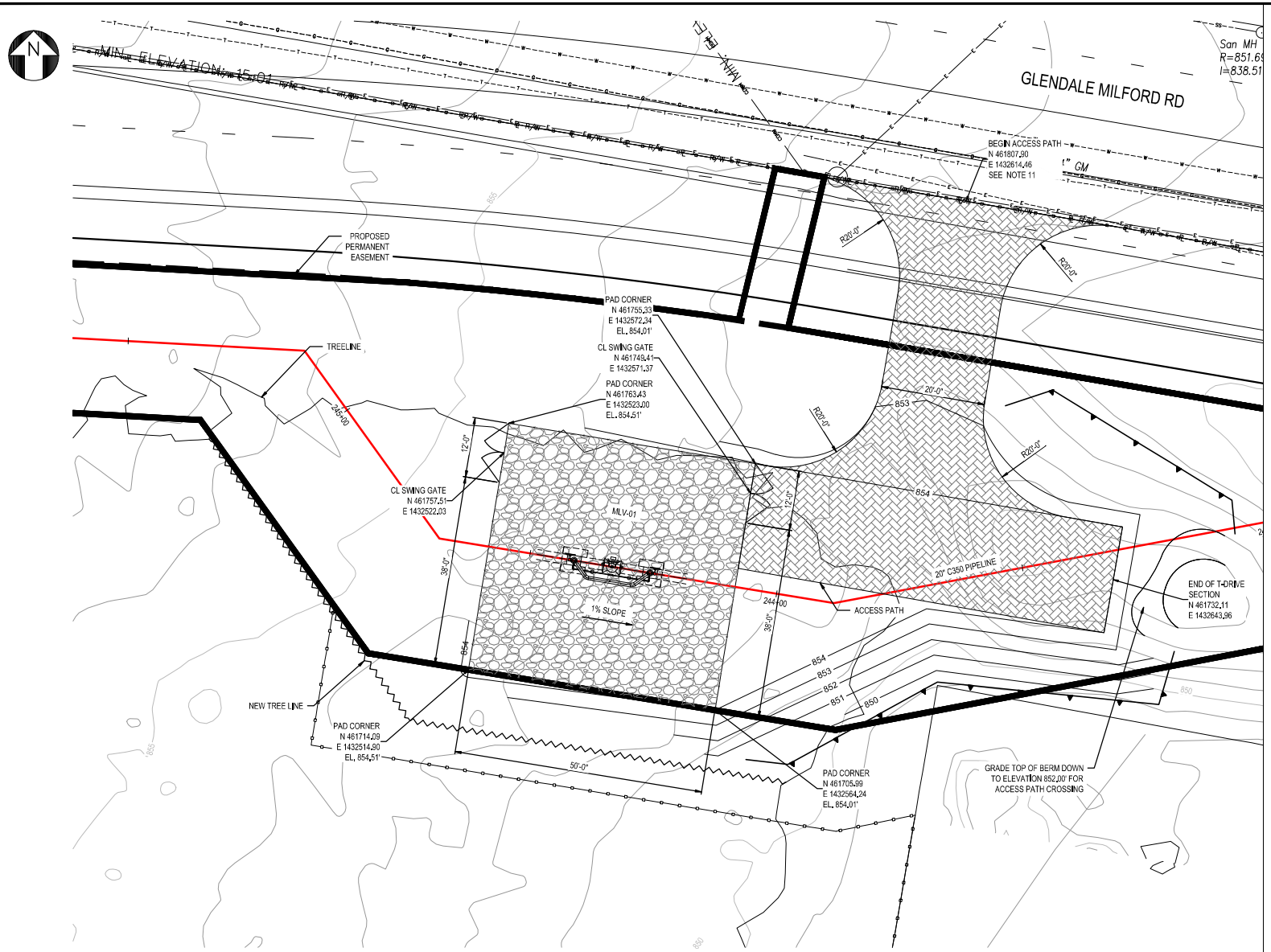
REF. DWG(S) G-350-0001009, C-350-0001339

SHEET(S) 3 OF 7 | DWG SCALE 1"=10'

DWG DATE 08-21-2018 | SUPERSEDED —

DRAWING NUMBER: PNG C-350-0001338 | REVISION: 0

C:\HAMILTON COUNTY\C350



NOTES:

1. THE EXISTING SITE UTILITIES AND FEATURES SHOWN ARE BASED ON A FIELD RUN TOPOGRAPHIC SURVEY PERFORMED BY BERDING SURVYEING IN FEBRUARY 2020.
2. ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE NOTED.
3. SEE DRAWINGS PNG-G-350-0001009 THRU 0001013 FOR LEGEND, ABBREVIATIONS, AND GENERAL NOTES.
4. COORDINATES SHOWN ARE IN OHIO STATE PLANE SOUTH, ZONE 3402, NAD83 AND NAVD88 HORIZONTAL AND VERTICAL DATA, RESPECTIVELY.
5. CALLOUTS WITH NO ELEVATION DESIGNATED SHALL MATCH EXISTING GRADE.
6. ALL ELEVATIONS INDICATED ARE TO FINISHED GRADE (TOP OF STONE SURFACE).
7. ALL SIDE SLOPES ARE 3:1 (HORIZONTAL TO VERTICAL) UNLESS OTHERWISE NOTED.
8. STRIP AND GRUB ALL EXISTING TOPSOIL AND VEGETATION PRIOR TO GRADING. REPLACE WITH APPROVED FILL MATERIAL PER THE GEOTECHNICAL REPORT.
9. TOPSOIL ALL SIDE SLOPES NOT RECEIVING CRUSHED STONE SURFACING.
10. POROUS PAVERS SHALL BE INSTALLED ALONG THE ACCESS PATH PER GEOBLOCK DETAILS ON SHEET c-004-00010XX. SEED AND SOD OVER PAVERS.
11. ACCESS PATH SHALL CONNECT TO CURRENT ALIGNMENT OF GLENDALE MILFORD ROAD. ADJUST TIE IN LOCATION AS NEEDED IF ROAD ALIGNMENT DIFFERS FROM THAT SHOWN ON THIS DRAWING.

LEGEND:

- PROPOSED GRAVEL SURFACE COURSE — 3 / C-350-0007336
- POROUS PAVEMENT — - / C-350-0007342
- SILT FENCE

CHRISTOPHER D. WILSON 82217 REGISTERED PROFESSIONAL ENGINEER
11/18/2020
PROFESSIONAL ENG/ARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	HEC	CNS	CDW

DESCRIPTION		APPROVALS	DATE	INITIALS	
AREA CODE	-		-	-	REGIONAL ENGINEER
ACCOUNT NUMBER	Q3680				
PROJECT NUMBER	1880115				MGR. TECH REC & STD
DRAWING BY	HEC		-	-	
STATION ID	C350				PRINCIPAL ENGINEER
CHECKER INITIALS	CNS		11/18/2020	CDW	

C350 PROJECT
MLV-01 GRADING PLAN
HAMILTON COUNTY, OHIO

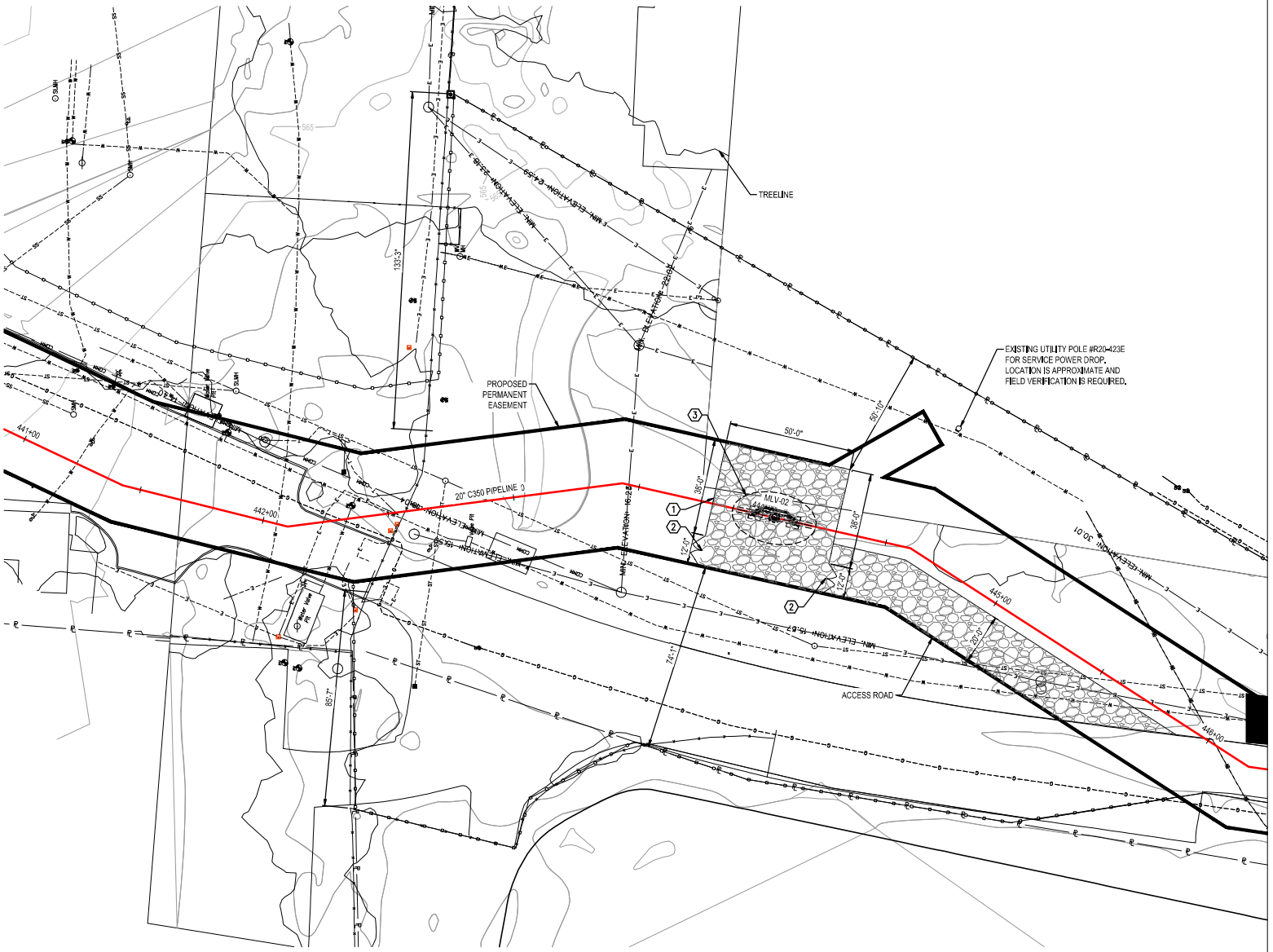
HAMILTON COUNTY, OH

REF. DWG(S) G-350-0001009, C-350-0001338

SHEET(S)	4 OF 7	DWG SCALE	1"=10'
DWG DATE	08-21-2018	SUPERSEDED	—

DRAWING NUMBER: PNG C-350-0001339 | REVISION: 0

C:\HAMILTON COUNTY\C350



NOTES:

1. THE EXISTING SITE UTILITIES AND FEATURES SHOWN ARE BASED ON A FIELD RUN TOPOGRAPHIC SURVEY PERFORMED BY BERDING SURVYEING IN FEBRUARY 2020.
2. ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE NOTED.
3. SEE DRAWINGS PNG-G-350-0001009 THRU 0001013 FOR LEGEND, ABBREVIATIONS, AND GENERAL NOTES.

KEY NOTES:

1. 9' BLACK METAL LANDSCAPING FENCE — 2 / C-350-0007336
2. 12' DOUBLE SWING GATE — 1 / C-350-0007336
3. MLV-02 (C35-0004) SECTION VIEW — 1 / M-350-0007010

LEGEND:

PROPOSED GRAVEL SURFACE COURSE — 2 / C-350-0007336

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	HEC	CNS	CDW

DESCRIPTION		APPROVALS		
AREA CODE	-	DATE -	INITIALS -	REGIONAL ENGINEER
ACCOUNT NUMBER	Q3680			
PROJECT NUMBER	1880115	DATE -	INITIALS -	MGR. TECH REC & STD
DRAWING BY	HEC			
STATION ID	C350	DATE 11/18/2020	INITIALS CDW	PRINCIPAL ENGINEER
CHECKER INITIALS	CNS			

STATE OF OHIO — CHRISTOPHER D. WILSON — 82217 — REGISTERED PROFESSIONAL ENGINEER — 11/18/2020
PROFESSIONAL ENG/ARCH STAMP

DUKE ENERGY. | Piddmont Natural Gas

C350 PROJECT
MLV-02 SITE PLAN
HAMILTON COUNTY, OHIO

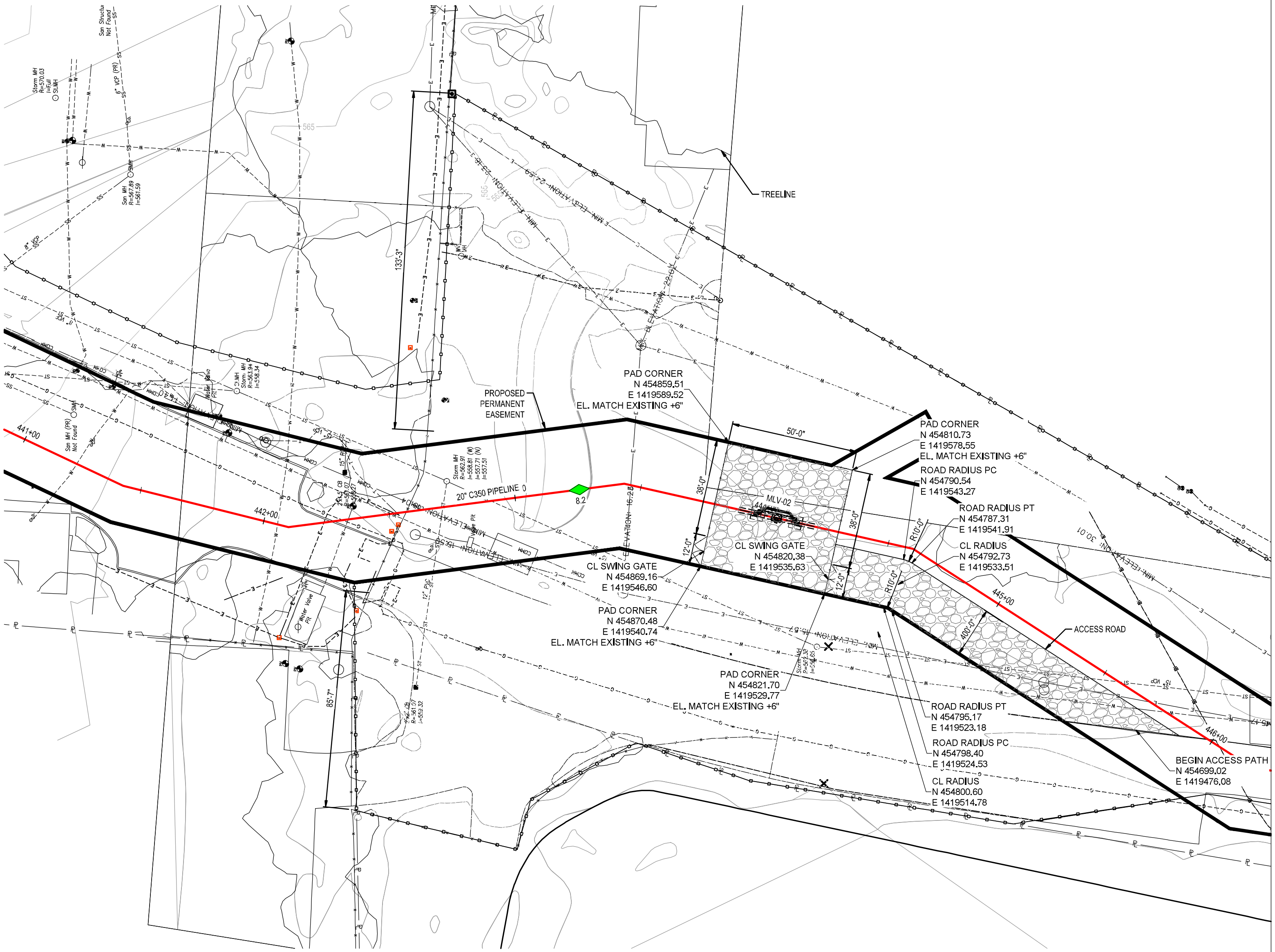
HAMILTON COUNTY, OH

REF. DWG(S) C-350-0001009, C-350-0001341

SHEET(S)	5 OF 7	DWG SCALE	1"=40'
DWG DATE	08-21-2018	SUPERSEDED	—

DRAWING NUMBER: PNG C-350-0001340 — REVISION: 0

C/HAMILTON COUNTY/C350



NOTES:

1. THE EXISTING SITE UTILITIES AND FEATURES SHOWN ARE BASED ON A FIELD RUN TOPOGRAPHIC SURVEY PERFORMED BY BERDING SURVYEING IN FEBRUARY 2020.
2. ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE NOTED.
3. SEE DRAWINGS PNG-G-350-0001009 THRU 0001013 FOR LEGEND, ABBREVIATIONS, AND GENERAL NOTES.
4. COORDINATES SHOWN ARE IN OHIO STATE PLANE SOUTH, ZONE 3402, NAD83 AND NAVD88 HORIZONTAL AND VERTICAL DATA, RESPECTIVELY
5. CALLOUTS WITH NO ELEVATION DESIGNATED SHALL MATCH EXISTING GRADE.
6. ALL ELEVATIONS INDICATED ARE TO FINISHED GRADE (TOP OF ROCK SURFACING).
7. STRIP AND GRUB ALL EXISTING TOPSOIL AND VEGETATION PRIOR TO GRADING. REPLACE WITH APPROVED FILL MATERIAL PER THE GEOTECHNICAL REPORT.

LEGEND:

PROPOSED GRAVEL SURFACE COURSE — 3 / C-350-0001336

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	HEC	CNS	CDW

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	HEC
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS		
DATE -	INITIALS -	REGIONAL ENGINEER
DATE -	INITIALS -	MGR TECH REC & STD
DATE 11/18/2020	INITIALS CDW	PRINCIPAL ENGINEER

DUKE ENERGY. Piedmont Natural Gas

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C350 PROJECT
MLV-02 GRADING PLAN
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OH

REF. DWG(S) G-350-0001009, C-350-0001340

SHEET(S) 6 OF 7 | DWG SCALE 1"=40'

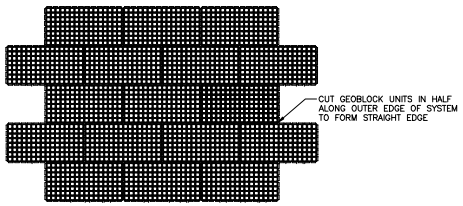
DWG DATE 08-21-2018 | SUPERSEDED —

DRAWING NUMBER: PNG C-350-0001341 | REVISION 0

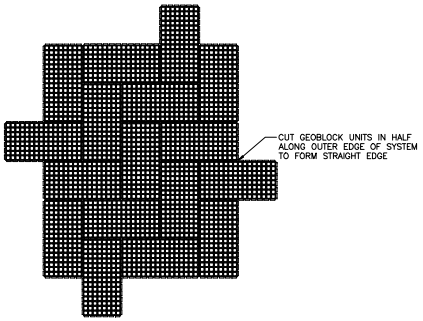
C/HAMILTON COUNTY/C350

STATE OF OHIO CHRISTOPHER D. WILSON 82217 REGISTERED PROFESSIONAL ENGINEER 11/18/2020

PROFESSIONAL ENG/ARCH STAMP

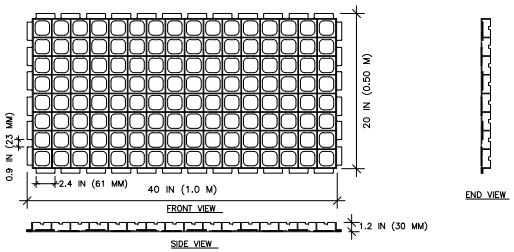


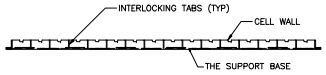
TYPICAL LAYOUT – BRICKLAYER PATTERN



TYPICAL LAYOUT – HERRINGBONE PATTERN

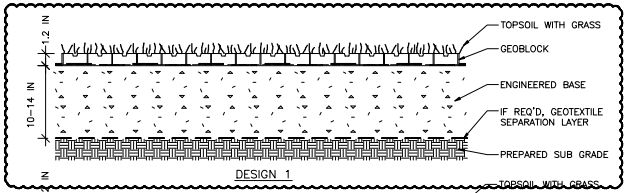
GEOBLOCK MATERIAL SPECIFICATION	
MATERIAL	UP TO 100% RECYCLED POLYETHYLENE
COLOR	RANGES DARK SHADES GRAY TO BLACK
CHEMICAL RESISTANCE	SUPERIOR
CARBON BLACK FOR UV STABILIZATION, %	1.5 TO 2.0%
UNIT MIN CRUSH STRENGTH – EMPTY @ 70F (21C)	420 PSI (2,900 KPa)
UNIT MIN CRUSH STRENGTH – SAND FILLED @ 70F (21C)	5,980 PSI (41,285 KPa)
FLEXURAL MODULUS @ 73F (21C)	35,000 PSI (240,000 KPa)
NOMINAL DIMENSIONS – WIDTH X LENGTH	20 X 40 IN (0.5 X 1.0 M)
NOMINAL UNIT DEPTH	1.2 IN (30 MM)
NOMINAL AREA	5.3 SQFT (0.5 SQMTR)
CELLS PER UNIT	128
CELL SIZE	2.25 X 2.25 IN (57 X 57 MM)
TOP OPEN AREA PER UNIT	88%
BOTTOM OPEN AREA PER UNIT	56%
INTERLOCKING OFFSET SHEAR TRANSFER PINS	12 TABS PER 40 IN (PER 1 M)
NOMINAL WEIGHT PER UNIT	4.7 LBS (2.1 KG)
RUNOFF COEFFICIENT @ 2.5 IN/HR (64 MM) RAIN	0.15
UNITS PER PALLET	92



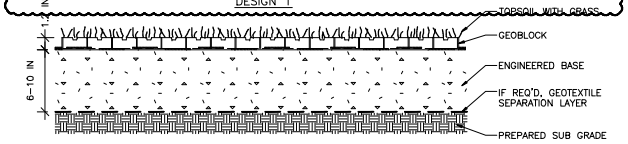


GEOBLOCK® COMPONENTS

DESIGN GUIDELINES – BASE DEPTH		
LOAD DESCRIPTION	CBR 2 – 4%	CBR > 4%
Heavy Fire Truck Access & H/HS25 loading. Typical 110 psi (758 kPa) tire pressure. Single axle loadings of 40 kips (178 kN). Gross vehicle weight of 90,000 lbs) (40.1 MT).	Design 1 – 14" Base	Design 1 – 10" Base
Heavy Fire Truck Access & H/HS20 loading. Typical 110 psi (758 kPa) tire pressure. Single axle loadings of 32 kips (145 kN). Gross vehicle weight of 80,000 lbs) (36.3 MT).	Design 1 – 14" Base	Design 1 – 10" Base
Light Fire Truck Access & H/HS15 loading. Typical 85 psi (586 kPa) tire pressure. Single axle loadings of 24 kips (110 kN). Gross vehicle loads of 60,000 lbs (27.2 MT).	Design 2 – 10" Base	Design 2 – 6–10" Base
Utility & Delivery Truck Access & H/HS10 loading. Typical 60 psi (414 kPa) tire pressure. Single axle loadings of 16 kips (75 kN). Gross vehicle loads of 40,000 lbs (18.1 MT).	Design 2 – 6–10" Base	Design 3 – 4–8" Base
Cars & Pick–up Truck Access. Typical 45 psi (310 kPa) tire pressure. Single axle loadings of 4 kips (18 kN). Gross vehicle loads of 8,000 lbs (3.6 MT).	Design 3 – 4–8" Base	Design 4 – 2–4" Base
Trail Use. Loading for pedestrian, wheelchair, equestrian, bicycle, motorcycle and ATV traffic.	Design 4 – 2–4" Base	Design 4 – 0–2" Base



DESIGN 1



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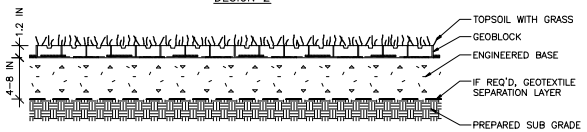
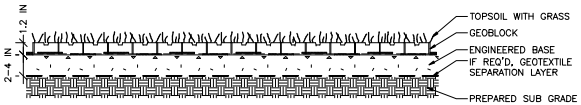


DESIGN 3



DESIGN 4

Notes:

1. This information is based on the use of Geoblock manufactured by Reynolds Presto Products, Inc. All rights reserved. Any use of this information for any rigid porous paver product other than that manufactured by Reynolds Presto Products, Inc. is strictly prohibited and makes this information invalid.
2. Engineered base is a homogenous mixture consisting of open graded crushed aggregate having an AASHTO # 5 or similar designation blended with pulverized topsoil and a void component generally containing air and/or water. This homogenous mixture will promote vegetative growth and provide required structural support. The aggregate portion shall have a particle range from 9.5 mm to 25 mm (0.375 to 1.0 in) with a D50 of 13 mm (0.5 in). The percentage void–space of the aggregate portion when compacted shall be at least 30%. The pulverized topsoil portion shall equal 33% +/– of the total volume and be added and blended to produce a homogenous mixture prior to placement.
3. Provide a non–woven geotextile separation layer and install in accordance with Manufacturer recommendations including overlaps based on sub grade CBR. Geotextile shall be TENCATE MIRAFI 140N or engineer–approved equivalent.
4. Connect Geoblock panels with the interlocking offset tab so that adjacent sections have horizontally level profiles.
5. Refer to the Geoblock Design and Construction Overview for a complete description of the design and construction methods.
6. Prior to geotextile placement, wet or dry subgrade to within 2% of optimum moisture content as determined by ASTM D698. Compact subgrade to within 95% of maximum dry density per ASTM D698 or 85% of relative density per ASTM D5253/D4254. In place compaction testing shall be per ASTM D2167, D6938, or D3017.

NOTE: DESIGN 1 SHALL BE USED.

STATE OF OHIO
CHRISTOPHER D. WILSON
82217
REGISTERED PROFESSIONAL ENGINEER
11/18/2020
PROFESSIONAL ENGINEER'S STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	HEC	CNS	CDW

DESCRIPTION		APPROVALS		
AREA CODE	-	DATE -	INITIALS -	REGIONAL ENGINEER
ACCOUNT NUMBER	Q3680			
PROJECT NUMBER	1880115			MGR TECH REC & STD
DRAWING BY	HEC	DATE -	INITIALS -	
STATION ID	C350			
CHECKER INITIALS	CNS	DATE 11/18/2020	INITIALS CDW	PRINCIPAL ENGINEER

C350 PROJECT
MLV-01 ACCESS PATH DETAILS
HAMILTON COUNTY, OHIO

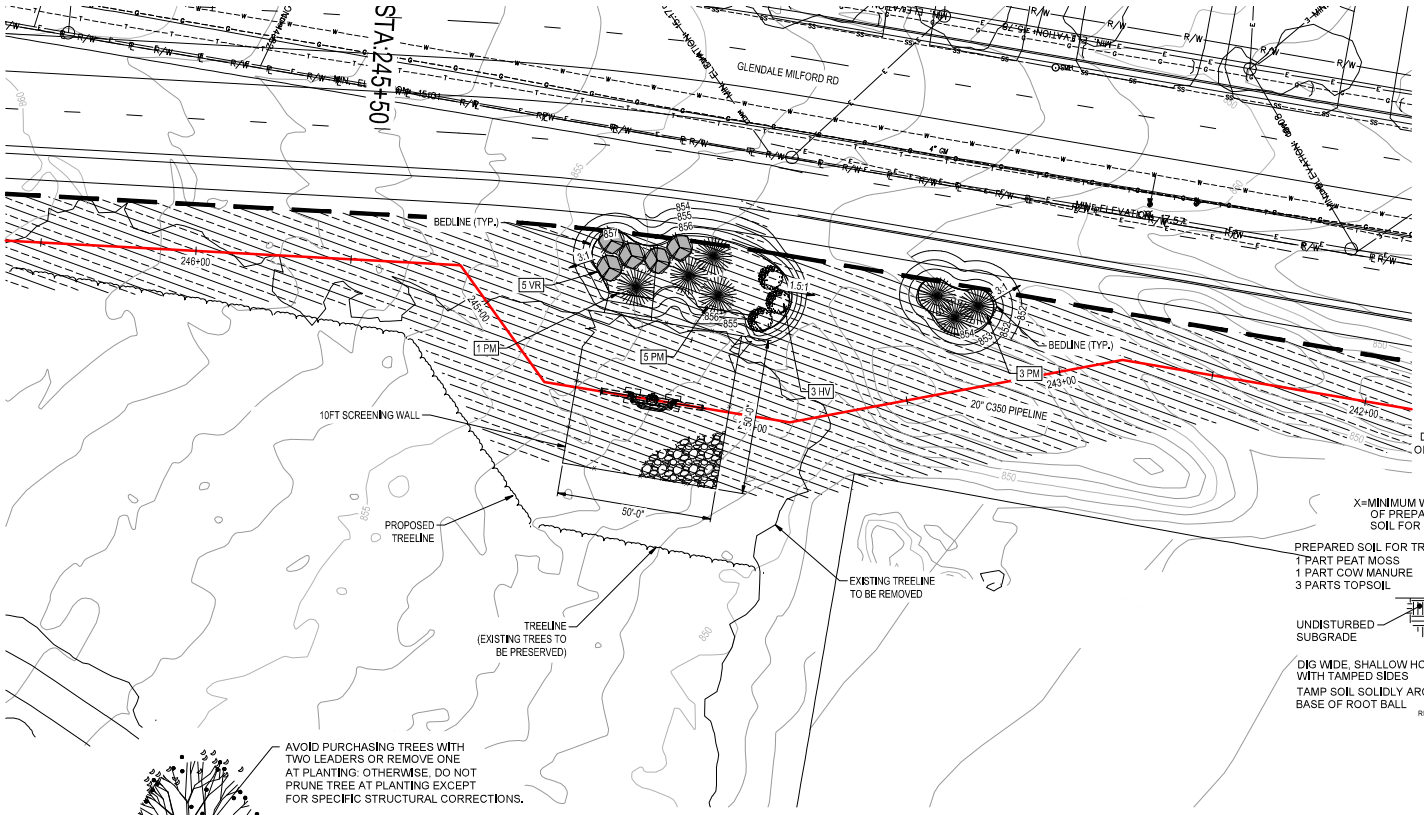
HAMILTON COUNTY, OH

REF. DWG(S) C-350-0001009, C-350-0001338, C-350-0001339

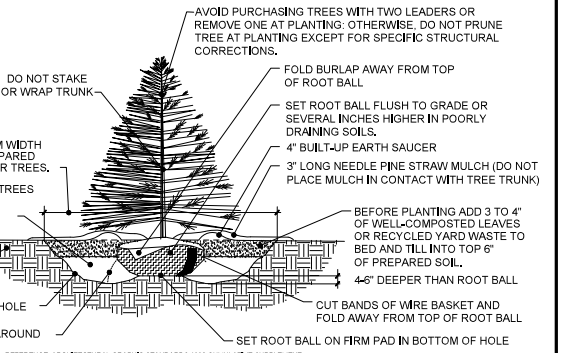
SHEET(S)	7 OF 7	DWG SCALE	NONE
DWG DATE	06-01-2020	SUPERSEDED	—

DRAWING NUMBER: PNG C-350-0001342 | REVISION: 0

C:\HAMILTON COUNTY\C350

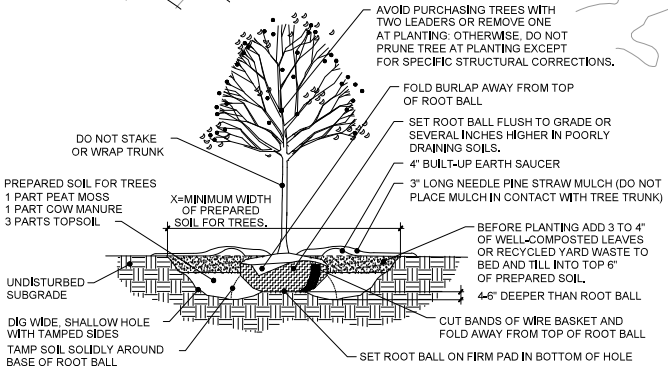


LANDSCAPE SCHEDULE					
SYMBOL	QTY	BOTANICAL NAME	COMMON NAME	SIZE	ROOT
EVERGREEN TREES					
PM	7	PSUDOTSUGA MENSIESII	DOUGLAS FIR	6' - 8'	B & B
EVERGREEN SHRUBS					
VR	5	VIBURNUM RHYTIDOPHYLLUM	LEATHERLEAF VIBURNUM	3' - 4'	B & B
DECIDUOUS SHRUB					
HV	3	HAMMEMELIS VIRGINIANA	COMMON WITCHHAZLE	3' - 4'	B & B
TOTAL	15				
ANY DISCREPANCIES BETWEEN QUANTITIES ON THE PLAN AND SCHEDULE, THE PLAN SHALL DICTATE.					



REFERENCE: ARCHITECTURAL GRAPHIC STANDARDS 1998 CUMULATIVE SUPPLEMENT.

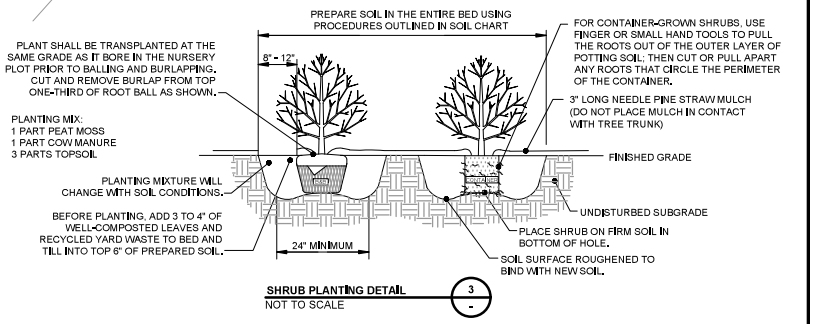
EVERGREEN PLANTING DETAIL 2
NOT TO SCALE



REFERENCE: ARCHITECTURAL GRAPHIC STANDARDS 1998 CUMULATIVE SUPPLEMENT.

DECIDUOUS PLANTING DETAIL 1
NOT TO SCALE

GENERAL RANGE OF SOIL MODIFICATIONS & VOLUMES FOR VARIOUS SOIL CONDITIONS		
POST-CONSTRUCTION SOIL CONDITION	MIN./ WIDTH PREPARED SOIL FOR TREES (X)	TYPE OF PREPARATION
GOOD SOIL (NOT PREVIOUSLY GRADED OR COMPACTED, TOPSOIL LAYER INTACT)	6 FT. OR TWICE THE WIDTH OF THE ROOT BALL, WHICHEVER IS GREATER	GENERAL RANGE OF SOIL MODIFICATIONS & VOLUMES FOR VARIOUS SOIL CONDITIONS
COMPACTED SOIL (NOT PREVIOUSLY GRADED, TOPSOIL LAYER DISTURBED BUT NOT ELIMINATED)	15 Ft	LOOSEN THE EXISTING SOILS TO THE WIDTHS AND DEPTHS SHOWN IN DETAILS ABOVE; ADD COMPOSTED ORGANIC CONTENT UP TO 5% DRY WEIGHT.
GRADED SUBSOILS AND CLEAN FILLS WITH CLAY CONTENT BETWEEN 5 & 35%	20 Ft	MINIMUM TREATMENT: LOOSEN EXISTING SOIL TO WIDTHS AND DEPTHS SHOWN, ADD COMPOSTED ORGANIC MATTER TO BRING ORGANIC CONTENT UP TO 5% DRY WEIGHT. OPTIMUM TREATMENT : REMOVE TOP 8-10 IN, OR THE EXISTING SOILS TO THE WIDTHS AND DEPTHS SHOWN, ADD 8-10 IN. OF LOAM TOPSOIL.
POOR QUALITY FILLS, HEAVY CLAY SOILS, SOILS CONTAMINATED WITH RUBBLE OR TOXIC MATERIAL	20 Ft	REMOVE EXISTING SOILS TO THE WIDTHS AND DEPTHS CONTAMINATED WITH RUBBLE OR TOXIC MATERIAL



SHRUB PLANTING DETAIL 3
NOT TO SCALE

BURNS & MCDONNELL ENGINEERING COMPANY, INC. KANSAS CITY, MISSOURI

STATE OF OHIO
CHRISTOPHER D. WILSON
82217
REGISTERED PROFESSIONAL ENGINEER
11/18/2020
PROFESSIONAL ENGINEER STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	TLV	CNS	CDW

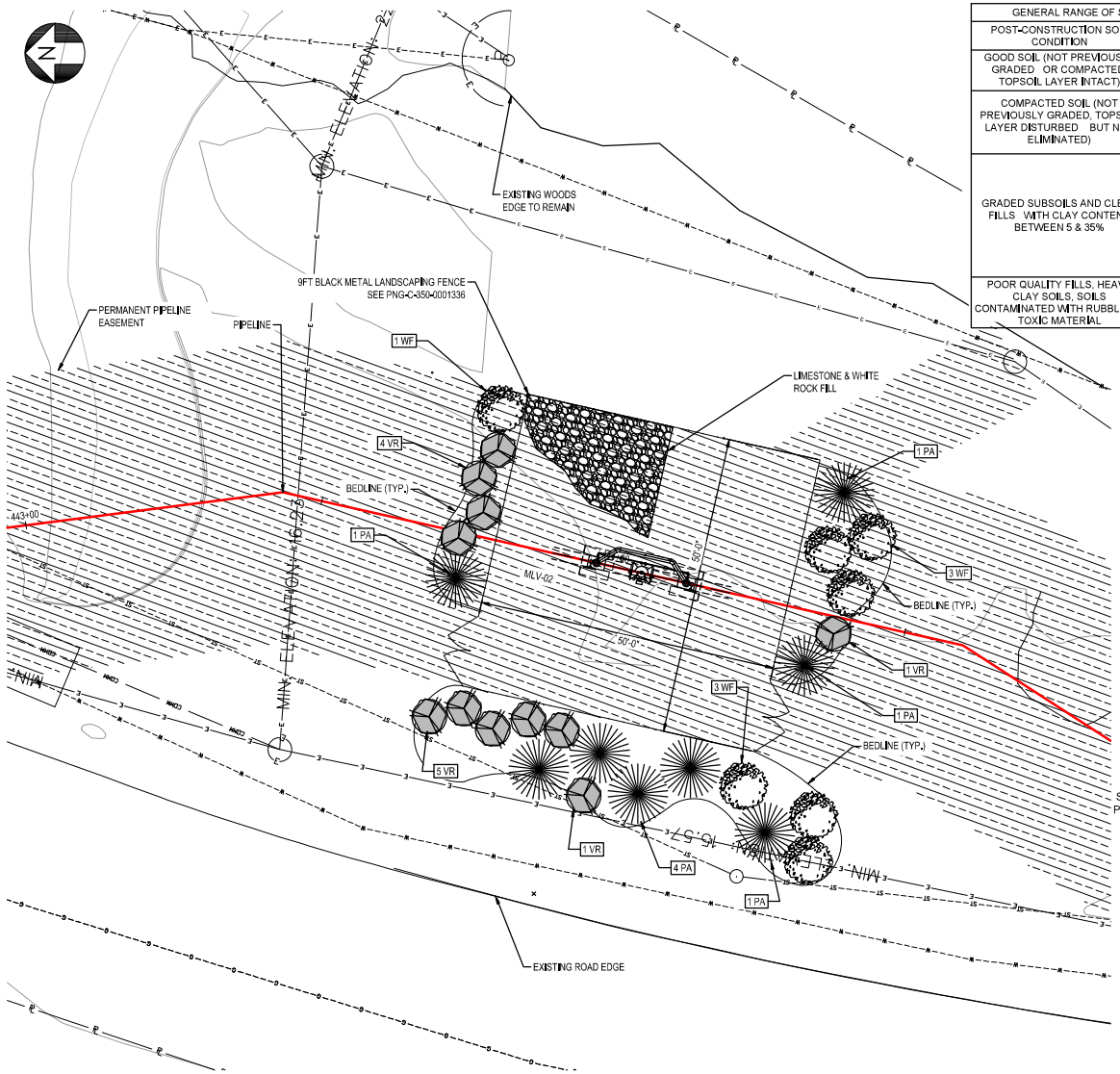
DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	TLV
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS		
DATE -	INITIALS -	REGIONAL ENGINEER
DATE -	INITIALS -	MGR. TECH REC & STD
DATE 11/18/2020	INITIALS CDW	PRINCIPAL ENGINEER

C350 PROJECT
MLV-01 LANDSCAPING
HAMILTON COUNTY, OHIO
HAMILTON COUNTY, OH

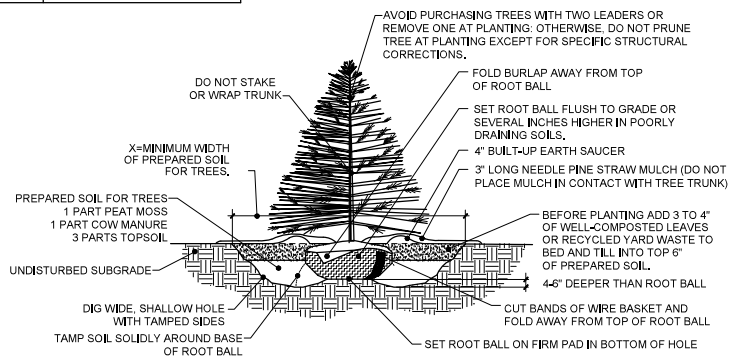
REF. DWG(S) C-350-0001338

SHEET(S) 1 OF 2 | DWG SCALE 1"=40'
DWG DATE 01-09-2020 | SUPERSEDED —
DRAWING NUMBER: PNG L-350-0001000 | REVISION: 0
C:\HAMILTON COUNTY\C350



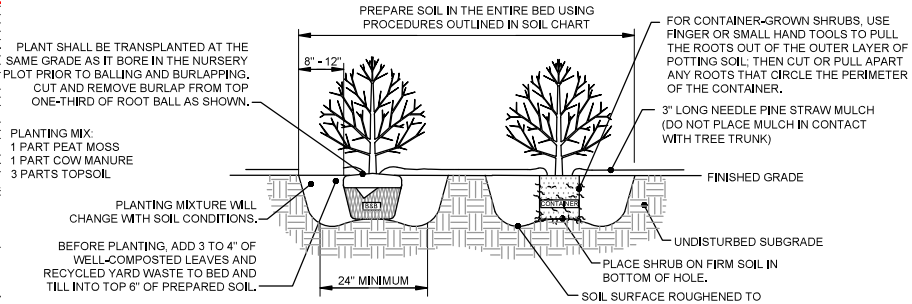
GENERAL RANGE OF SOIL MODIFICATIONS & VOLUMES FOR VARIOUS SOIL CONDITIONS		
POST-CONSTRUCTION SOIL CONDITION	MIN./ WIDTH PREPARED SOIL FOR TREES (X)	TYPE OF PREPARATION
GOOD SOIL (NOT PREVIOUSLY GRADED OR COMPACTED, TOPSOIL LAYER INTACT)	6 FT. OR TWICE THE WIDTH OF THE ROOT BALL, WHICHEVER IS GREATER	GENERAL RANGE OF SOIL MODIFICATIONS & VOLUMES FOR VARIOUS SOIL CONDITIONS
COMPACTED SOIL (NOT PREVIOUSLY GRADED, TOPSOIL LAYER DISTURBED BUT NOT ELIMINATED)	15 Ft	LOOSEN THE EXISTING SOILS TO THE WIDTHS AND DEPTHS SHOWN IN DETAILS ABOVE; ADD COMPOSTED ORGANIC CONTENT UP TO 5% DRY WEIGHT.
GRADED SUBSOILS AND CLEAN FILLS WITH CLAY CONTENT BETWEEN 5 & 35%	20 Ft	MINIMUM TREATMENT: LOOSEN EXISTING SOIL TO WIDTHS AND DEPTHS SHOWN, ADD COMPOSTED ORGANIC MATTER TO BRING ORGANIC CONTENT UP TO 5% DRY WEIGHT. OPTIMUM TREATMENT : REMOVE TOP 8-10 IN. OR THE EXISTING SOILS TO THE WIDTHS AND DEPTHS SHOWN, ADD 8-10 IN. OF LOAM TOPSOIL.
POOR QUALITY FILLS, HEAVY CLAY SOILS, SOILS CONTAMINATED WITH RUBBLE OR TOXIC MATERIAL	20 Ft	REMOVE EXISTING SOILS TO THE WIDTHS AND DEPTHS CONTAMINATED WITH RUBBLE OR TOXIC MATERIAL

LANDSCAPE SCHEDULE					
SYMBOL	QTY	BOTANICAL NAME	COMMON NAME	SIZE	ROOT
EVERGREEN TREES					
PA	8	PICEA ABIES	NORWAY SPRUCE	6' - 8'	B & B
EVERGREEN SHRUBS					
VR	11	VIBURNUM RHYTIDOPHYLLUM	LEATHERLEAF VIBURNUM	3' - 4'	B & B
DECIDUOUS SHRUB					
WF	7	HAMMEMELIS VIRGINIANA	COMMON WITCHHAZLE	3' - 4'	B & B
TOTAL	26				
ANY DISCREPANCIES BETWEEN QUANTITIES ON THE PLAN AND SCHEDULE, THE PLAN SHALL DICTATE.					



REFERENCE: ARCHITECTURAL GRAPHIC STANDARDS 1998 CUMULATIVE SUPPLEMENT.

EVERGREEN PLANTING DETAIL 1
NOT TO SCALE -



SHRUB PLANTING DETAIL 2
NOT TO SCALE -

CHRISTOPHER D. WILSON 82217 REGISTERED PROFESSIONAL ENGINEER 11/18/2020
PROFESSIONAL ENG/ARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	11/18/2020	ISSUED FOR CONSTRUCTION	TLV	CNS	CDW

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	TLV
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS		
DATE	INITIALS	
-	-	REGIONAL ENGINEER
DATE	INITIALS	
-	-	MGR TECH REC & STD
DATE	INITIALS	
11/18/2020	CDW	PRINCIPAL ENGINEER

C350 PROJECT
MLV-02 LANDSCAPING PLAN
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OH

REF. DWG(S) C-350-0001340

SHEET(S)	2 OF 2	DWG SCALE	1"=10'
DWG DATE	01-09-2020	SUPERSEDED	—

DRAWING NUMBER: PNG L-350-0001001 REVISION: 0

C:\HAMILTON COUNTY\C350

APPENDIX D – INSPECTION, CORRECTIVE ACTION, AND RECORD OF REVISIONS FORMS

C350 Central Corridor Pipeline Extension Project

Storm Water Pollution Prevention Plan

INSPECTION AND MAINTENANCE REPORT FORM

Name of Permittee: Duke Energy, Ohio

Construction Site Name: C350 Central Corridor Pipeline Extension Project

Inspector: _____ Date: _____ Time: _____

Present Phase of Construction: _____

Site Conditions: _____

Inspection Event:

☐ ROUTINE WEEKLY STORM EVENT SINCE LAST INSPECTION (record all events > 0.5 inches):___inches
☐ RAIN EVENT TIME EVENT STARTED: _____ DURATION OF EVENT: _____
☐ OTHER EXPLANATION OF DISCHARGES: _____

Measures & Controls	Location	In Conformance with Typical Standard	Effective Pollutant Control Practice
Construction Ingress/Egress		☐ YES ☐ NO	☐ YES ☐ NO
Perimeter Sediment Controls		☐ YES ☐ NO	☐ YES ☐ NO
Stream Crossing BMPs		☐ YES ☐ NO	☐ YES ☐ NO
Inlet Protection		☐ YES ☐ NO	☐ YES ☐ NO
HDD Sites		☐ YES ☐ NO	☐ YES ☐ NO
Rock Check Dams		☐ YES ☐ NO	☐ YES ☐ NO
Erosion Control Blankets		☐ YES ☐ NO	☐ YES ☐ NO
Concrete Washout		☐ YES ☐ NO	☐ YES ☐ NO
Vegetated Swale		☐ YES ☐ NO	☐ YES ☐ NO
Temporary Stabilization		☐ YES ☐ NO	☐ YES ☐ NO
Permanent Stabilization		☐ YES ☐ NO	☐ YES ☐ NO
Slope Controls		☐ YES ☐ NO	☐ YES ☐ NO
Run-on Controls		☐ YES ☐ NO	☐ YES ☐ NO

NON-CONFORMANCE/INEFFECTIVE POLLUTANT CONTROL PRACTICES NOTED DURING INSPECTION: (Explain each "NO" circled above)

RECOMMENDED REMEDIAL ACTIONS AND SCHEDULE OF THOSE EVENTS:

LIST OF AREAS WHERE CONSTRUCTION OPERATIONS HAVE PERMANENTLY OR TEMPORARILY CEASED:

OBSERVATIONS AT STORM WATER DISCHARGE LOCATIONS:

ADDITIONAL COMMENTS:

Signature:_____ Printed Name: _____

Environmental Inspector

C350 Central Corridor Pipeline Extension Project

Storm Water Pollution Prevention Plan

RECORD OF REVISIONS

Name of Permittee: Duke Energy, Ohio

Construction Site Name: C350 Central Corridor Pipeline Extension Project

Inspector: _____ Date: _____

Date	Sections Modified	Description of Modification	Approval Signature/Title

C350 Central Corridor Pipeline Extension Project

Storm Water Pollution Prevention Plan

CORRECTIVE ACTION LOG

Name of Permittee: Duke Energy, Ohio

Construction Site Name: C350 Central Corridor Pipeline Extension Project

Inspector: _____ Date: _____

Inspection Date	Inspector(s)	Description of BMP Deficiency	Corrective Action Needed (planned date/responsible person)	Date Action Taken/Responsible Person

C350 Central Corridor Pipeline Extension Project

Storm Water Pollution Prevention Plan

GRADING AND STABILIZATION ACTIVITIES LOG

Name of Permittee: Duke Energy, Ohio

Construction Site Name: C350 Central Corridor Pipeline Extension Project

Date Grading Activity Initiated	Description of Grading Activity	Date Grading Activity Ceased (Indicate Temporary or Permanent)	Date When Stabilization Measures are Initiated	Description of Stabilization Measure and Location

APPENDIX E – HDD FLUID LOSS AND CONTINGENCY PLAN

HORIZONTAL DIRECTION DRILLING (HDD) CONTINGENCY PLAN
PIEDMONT NATURAL GAS

HDD is a common method used to install pipeline through heavily developed areas, roadways, waterways and environmentally sensitive areas to minimize the surface disturbance that traditional open-cut trenching methods typically require. The use of HDD construction limits disturbances to the drilling site and temporary accesses if required.

Directional bore operations have the potential to release drilling fluids into the surface environment through fractured bedrock. The drilling mud typically will flow into the surrounding rock and sand and travel toward the ground surface. The drilling fluid, a bentonite slurry, is used as a lubricant during the drilling of the bore hole, enabling the rock and soil cuttings from the drilling process to be carried back up to a containment bay at the ground surface at the drilling site. It also works as a seal to enhance the integrity of the bore hole. Bentonite is a non-toxic, naturally occurring clay commonly used for agricultural purposes such as decreasing water loss in ponds and soils. Note that there will be no hydraulic fracturing associated with this method of drilling on the site.

While drilling, fluid seepage is most likely to occur near the bore entry and exit points where the drill head is shallow, seepage can occur in any location along a directional bore. This Horizontal Direction Drilling Contingency Plan establishes operational procedures and responsibilities for the prevention, containment, and cleanup of fluid loss incidents associated with this project. The project specifications also reference the HDD portion of the project.

All personnel and Sub-Contractors responsible for the work must adhere to this plan during the directional drilling process.

The specific objectives of this plan are to:

1. Minimize the potential for a drilling fluid release associated with directional drilling activities;
2. Provide for the timely detection of fluid releases;
3. Protect the environmentally sensitive areas and associated riparian vegetation;
4. Ensure an organized, timely, and efficient response in the event of a release of drilling bentonite; and
5. Ensure that all appropriate notifications are made immediately to the client and regulatory personnel.

Pre-Construction Measures

Before any HDD occurs, a safety meeting will take place. This contingency plan will be discussed and any questions will be answered. The Site Supervisor shall ensure that a copy of this plan is available (onsite) and accessible to all construction personnel. The Site Supervisor shall ensure that all workers are properly trained and familiar with the necessary procedures for response to a drilling fluid release, prior to commencement of drilling operations. Other best-management measures are listed below.

1. Prior to construction, the work areas will be flagged and the limits defined. Erosion and sediment controls will be placed near the drilling rig location and around the drilling fluid containment bays as a preventative measure against drilling fluid leaving the site.
2. A spill kit shall be kept onsite and used if a drilling fluid loss occurs. Other containment materials, such as straw bales, shall also be kept on-site prior to and during all HDD drilling operations.

Fluid Loss Response and Measures

The response of the field crew to a drilling fluid loss shall be immediate and in accordance with procedures identified in this Plan. All appropriate emergency actions that do not pose additional threats to sensitive resources will be taken, as follows:

1. The pressure and volume of drilling fluid will be closely observed by the drilling contractor during HDD activities to watch for indications of fluid loss.

2. Drilling operations will be halted by the drill rig operators immediately upon detection of a drop in drilling pressure or any other indicator of fluid loss. The loss of drilling fluid to the surface is greatest at shallow locations, typically near the entry and exit points of the HDD.

3. Containment bays will be in place at both the drill entry and exit points to prevent drilling fluid from leaving the site at the entry and exit points, in addition to silt fence placed along the perimeter of the drilling area.

4. The HDD bores have been designed to provide sufficient depth below water crossings to reduce the risk of drilling fluid reaching the ground surface.

5. The clean-up of all spills and fluid loss shall begin immediately.

6. The Site Supervisor will notify Piedmont Natural Gas and the project inspector immediately at any time during drilling operations that the drilling contractor observed a loss of drilling fluid.

7. In the event of a loss of drilling fluid, the Site Supervisor shall be notified immediately and will conduct an evaluation of the situation and direct recommended mitigation actions, based on the following guidelines of the severity of the fluid loss.

    a. If the loss of drilling fluid is minor, easily contained, has not reached the surface and is not threatening sensitive resources, drilling operations may resume after use of a leak stopping compound or redirection of the bore.

    b. If drilling fluid reaches the surface, the area will be isolated with silt fence or similar measures to contain drilling fluid.

        i. A containment or relief bay may be installed, if possible, to keep drilling fluid from reaching environmentally sensitive areas and removal will begin by vac-truck or hand tools.

        ii. In areas that cannot be reached by a vac-truck for drilling fluid removal, a tiered system of contained areas will relay drilling fluid to a location accessible by a vac-truck and removed.

iii. If it is not possible to relay drilling fluid to a suitable location for removal by a vac-truck, drilling contractor workers will use hand tools and vacuums to remove the drilling fluid from contained areas.

iv. Any material contaminated with Bentonite shall be removed by hand to a depth of 2-feet, contained and properly disposed of, as required by law. The drilling contractor shall be responsible for ensuring that the bentonite is either properly disposed of at an approved disposal facility or properly recycled in an approved manner. Contractor must provide Piedmont with documented proof of disposal.

c. If drilling fluid reaches the surface in flowing waters, the following actions should be initiated.

i. A coffer dam will be installed downstream.

ii. Drilling fluid removal will begin by hand tools immediately. If the fluid loss is widespread, the Site Supervisor may discuss the use of the vac-truck with the regulatory agencies.

iii. Any material contaminated with Bentonite shall be removed by hand to a depth of 2-feet, contained and properly disposed of, as required by law. The drilling contractor shall be responsible for ensuring that the bentonite is either properly disposed of at an approved disposal facility or properly recycled in an approved manner. Contractor must provide Piedmont with documented proof of disposal.

iv. Piedmont's Environmental Department and environmental regulatory agencies will be notified.

During drilling activities, the pressure of the drilling fluid in the bore hole is greatest at the end of the drill. If there is a drilling fluid loss, the danger of it occurring again at the same location will be significantly reduced as the drilling continues and the bore hole is advanced beyond the location of the original fluid loss. The pressure at the original loss location will be reduced and drilling fluids will be more likely to resume their path through the bore hole and out to the containment bay at the drill site.

Response Close-out Procedures

When the release has been contained and cleaned up, response closeout activities will be conducted at the direction of the Site Supervisor and shall include the following:

1. The recovered drilling fluid will either be recycled or hauled to an approved facility for disposal. Contractor must provide Piedmont with documented proof of disposal. No recovered drilling fluids will be discharged into streams, storm drains or any other water source;
2. All spilled drilling fluid excavation and clean-up sites will be returned to pre-project contours using clean fill, as necessary; and
3. All containment measures (fiber rolls, straw bale, etc.) will be removed, unless otherwise specified by the Site Supervisor/Foremen.

The Site Supervisor shall record the drilling fluid loss in their daily log. The log will include the following: Details on the release event, including an estimate of the amount of bentonite released, the location and time of release, the size of the area impacted, and the success of the clean-up action. The log report shall also include the: name and telephone number of person reporting; date; how the release occurred; type of activity that was occurring around the area of the drilling fluid loss; description of any sensitive areas and their location in relation to the drilling fluid loss; description of the methods used to clean up or secure the site; and a listing of the current permits obtained for the project.

In the event the drilling fluid loss results in drilling fluid entering the creek, the Site Supervisor will notify Piedmont's Environmental Department and environmental regulatory agencies will be notified. All notifications will occur within 24 hours of the discovery of the release and proper documentation will be prepared within a timely manner.

Construction Re-start

For small releases, drilling may continue, if 100 percent containment is achieved through the use of a leak stopping compound or redirection of the bore and the clean-up crew remains at the drilling fluid loss location throughout the remainder of the drilling of that bore.

For all other releases, construction activities will not restart without prior approval from Piedmont Natural Gas and the project engineer's inspector.

Bore Abandonment

Abandonment of the bore will only be required when all efforts to control the drilling fluid loss within the existing directional bore have failed. The borehole will be completely abandoned and a new location determined. Any borehole abandonment locations will be documented and shown on any as-built documents.

The following steps will be implemented during abandonment of the borehole:

1. Determine the new location for the HDD crossing.
2. Insert casing, as necessary to remove the pilot string.
3. Pump a thick grout plug into the borehole to securely seal the abandoned borehole.

BURNS McDONNELL

CREATE AMAZING.

Burns & McDonnell World Headquarters
9400 Ward Parkway
Kansas City, MO 64114
O 816-333-9400
F 816-333-3690
www.burnsmcd.com

Summary: Correspondence Conditions 8 37 NPDES Permit (File 3 of 3) electronically filed by Mrs. Debbie L Gates on behalf of Duke Energy Ohio Inc. and D'Ascenzo, Rocco O. Mr. and Vaysman, Larisa