155 East Broad Street
20th Floor
Columbus, Ohio, 43215

o: 614-222-1330
f: 614-222-1337

November 30, 2020

Ms. Tanowa M. Troupe
Ohio Power Siting Board
PUCO Docketing Division
180 East Broad Street, 11th Floor
Columbus, OH 43215-3716

Re: Case No. 16-253-GA-BTX
Staff Report Condition Nos. 8 and 37 – Amberley Village SWPPP

Dear Ms. Troupe:

Please find attached the approval from Amberley Village for the Storm Water Pollution Prevention Plan for the Central Corridor Pipeline project.

Duke Energy Ohio sets forth this communication to certify our adherence with Condition Nos. 8 and 37 of the OPSB's Opinion, Order and Certificate pertaining to Case No. 16-253-GA-BTX.

Please contact me if you have any questions.

Sincerely,

Emily A. Olive, CP
Paralegal

BURNS McDONNELL

October 8, 2020

Wes Brown
Zoning Project Administrator
Amberley Village
7149 Ridge Road
Cincinnati, Ohio 45237

Re: C350 – Central Corridor Natural Gas Pipeline Project Storm Water Pollution Prevention Plan and Erosion & Sediment Control Plan Review

Dear Mr. Brown:

Duke Energy Ohio, Inc. (Duke Energy) is planning for the construction of the C350 – Central Corridor Natural Gas Pipeline Project (Project). The Project will include natural gas pipeline construction within Amberley Village corporate limits. The pipeline construction will not change contours and impacted areas will be restored to their previous condition. The Project is anticipated to include approximately 9.9 acres of land disturbance in Amberley Village. Chapter 153 of the Amberley Village Code of Ordinance requires a plan review by the Planning Commission or their duly authorized representative for compliance with the erosion and sediment control standards outlined in Chapter 153.

A Storm Water Pollution Prevention Plan (SWP3) has been prepared for the Project. An abbreviated version of the SWP3 showing only the activities to occur within Amberley Village has been prepared and included as an attachment to this submittal. The SWP3 describes the best management practices, housekeeping measures, and soil management practices that will be employed during the Project. It also includes the drawing packages for the pipeline. The SWP3 discusses two new stations and two main line valve sites, however, none of these features will be located within Amberley Village.

Duke Energy is seeking a written notification of approval of the Project's compliance with Chapter 153 of the Amberley Village Code of Ordinances. A form letter addressing this need that can be completed and returned is attached for your use if so desired.

Please find the enclosed abbreviated SWP3. Please direct any correspondence or requests for additional information for your review in this matter to Chad Shaffer with Duke Energy via email at Chad.Shaffer@duke-energy.com or via phone at (217) 494-2050, or James Olberding with Duke Energy via email at James.Olberding@duke-energy.com or by phone at (513) 287-3021. Thank you for your attention in this matter.

9400 Ward Parkway \ Kansas City, MO 64114
O 816-333-9400 \ F 816-333-3690 \ burnsmcd.com

BURNS McDONNELL

Date:

Chad Shaffer
Duke Energy Ohio, Inc.
139 East 4th Street
Cincinnati Ohio 45202

VIA EMAIL TO CHAD.SHAFFER@DUKE-ENERGY.COM

Re: Central Corridor Natural Gas Pipeline Project Storm Water Pollution Prevention Plan Review

Dear Mr. Shaffer:

I understand that Duke Energy Ohio, Inc., (Duke Energy) is planning to construct a pipeline that requires review in accordance with Chapter 153 of the Amberley Village Code of Ordinances, as described in your letter of October 8, 2020.

Amberley Village hereby grants its approval of the Storm Water Pollution Prevention Plan.

Signature

Scott Lahrman

Name and Title Village Manager

9400 Ward Parkway \ Kansas City, MO 64114
O 816-333-9400 \ F 816-333-3690 \ burnsmcd.com

BURNS McDONNELL

October 8, 2020

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Zoning Project Administrator
Amberley Village
7149 Ridge Road
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9400 Ward Parkway \ Kansas City, MO 64114
O 816-333-9400 \ F 816-333-3690 \ burnsmcd.com

Sincerely,

Staff Environmental Scientist, CPESC

MLH/MLH

Enclosure Attachment

cc: James Olberding – Duke Energy
Steve Lane – Duke Energy
Gary Hebbler – Duke Energy
Chad Shaffer – Duke Energy
Gabe Smith – Burns & McDonnell
Chris Siok – Burns & McDonnell
Chris Wilson – Burns & McDonnell

9400 Ward Parkway \ Kansas City, MO 64114
O 816-333-9400 \ F 816-333-3690 \ burnsmcd.com

BURNS McDONNELL

Date:

Chad Shaffer
Duke Energy Ohio, Inc.
139 East 4th Street
Cincinnati Ohio 45202

VIA EMAIL TO CHAD.SHAFFER@DUKE-ENERGY.COM

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_____
Signature

_____
Name and Title

9400 Ward Parkway \ Kansas City, MO 64114
O 816-333-9400 \ F 816-333-3690 \ burnsmcd.com

ATTACHMENT 1 – ABBREVIATED SWP3

BURNS McDONNELL

Storm Water Pollution Prevention Plan

DUKE ENERGY

Duke Energy Ohio, Inc.

C350 Central Corridor Pipeline Extension Project
Project No. 116892

IFB
7/28/2020

Storm Water Pollution Prevention Plan

prepared for

Duke Energy Ohio, Inc.
C350 Central Corridor Pipeline Extension Project
Hamilton County, Ohio

Project No. 116892

IFB
7/28/2020

prepared by

Burns & McDonnell Engineering Company, Inc.
Chicago, Illinois

Project Name and Location:

C350 Central Corridor Pipeline Extension
Sycamore Township, Sharonville, Blue Ash, Evendale, Reading, Amberley, Golf Manor, and Cincinnati; Hamilton County, OH

Project Owner / Site Operator:

Duke Energy Ohio, Inc
139 E 4th Street
Cincinnati, OH 45202
Phone: (800) 544-6900

Project Contact:

Tara Thomas
Duke Energy
Lead Environmental Professional
O - +1 (513) 287-1213
C - +1 (513) 314-8055

Anticipated Schedule:

10/11/2020 to 12/31/2021

SWP3 Preparation Date:

July 2020

Storm Water Pollution Prevention Plan Certification
C350 Central Corridor Pipeline Extension Project

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

_____

Signature of permittee or "duly authorized agent"

_____

Printed name

CONTRACTOR NOTIFICATION

"I understand the terms and conditions of this Storm Water Pollution Prevention Plan and the associated State and local regulations that authorize the storm water discharges associated with construction activity at the Project site identified as part of this notification."

Signature	For	Responsible for
(Name) (Position) (Signature) (Date)	(Company) (Street / P.O. Box) (City, State, Zip) (Phone)	(Activity)
(Name) (Position) (Signature) (Date)	(Company) (Street / P.O. Box) (City, State, Zip) (Phone)	(Activity)
(Name) (Position) (Signature) (Date)	(Company) (Street / P.O. Box) (City, State, Zip) (Phone)	(Activity)
(Name) (Position) (Signature) (Date)	(Company) (Street / P.O. Box) (City, State, Zip) (Phone)	(Activity)

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LIST OF ABBREVIATIONS

Abbreviation	Term/Phrase/Name
BMPs	best management practices
cfs	cubic feet per second
Duke Energy	Duke Energy Ohio, Inc.
ESC Plans	Erosion and Sediment Control Plans
HDD	horizontal directional drilling
MLV	main line valve
NOI	Notice of Intent
NOT	Notice of Termination
NPDES	National Pollutant Discharge Elimination System
Ohio EPA	Ohio Environmental Protection Agency
Permit	Ohio EPA General Permit No. OHC000005
Project	C350 Central Corridor Pipeline Extension Project
RRV	runoff reduction volume
SDS	Safety Data Sheet
STREAMS	Surface Water Tracking, Reporting, and Electronic Application Management System
SWP3	Storm Water Pollution Prevention Plan
TMDL	Total Maximum Daily Load
WQV	water quality volume

1.0 INTRODUCTION

The U.S. Environmental Protection Agency requires a National Pollutant Discharge Elimination System (NPDES) Permit for storm water discharges from construction activities that disturb 1 or more acres of land or from smaller sites that are part of a larger, common plan of development or sale which will disturb a cumulative total of 1 or more acres. For the purposes of the NPDES program, construction activities are defined as clearing, grubbing, grading, excavating, and filling.

In the State of Ohio, the NPDES program has been delegated to the Ohio Environmental Protection Agency (Ohio EPA). Construction projects that will disturb 1 or more acres of land are issued a certificate of permit coverage under Ohio Administrative Code Rule 3745-38-02 and Ohio EPA General Permit No. OHC000005 (Permit), which authorizes the discharge of storm water from construction activities into State waters. The Permit is provided in Appendix A.

Storm water discharges from construction activities associated with the C350 Central Corridor Pipeline Extension Project (Project) for Duke Energy Ohio, Inc. (Duke Energy) will be permitted under the 2018 Permit. Permit coverage is obtained by developing a Storm Water Pollution Prevention Plan (SWP3) and submitting a Notice of Intent (NOI) via the Ohio EPA Surface Water Tracking, Reporting, and Electronic Application Management System (STREAMS) at least 21 days prior to the construction start date.

The SWP3 described herein establishes a plan to manage the quality of storm water runoff from construction activities associated with the Project. This SWP3 was developed in accordance with the requirements and guidelines specified in Part III of the 2018 Permit and in accordance with the Ohio Department of Natural Resources' 2006 *Rainwater and Land Development, Third Edition*. Additionally, this SWP3 was prepared to comply with the requirements and guidelines of the Hamilton County Soil and Water Conservation District's Earthwork Regulations for unincorporated Hamilton County as well as soil erosion and sediment ordinances and/or storm water ordinances enforced by local municipalities.

This SWP3 is to be used by onsite construction personnel to reduce soil erosion and to limit the potential for sediment and other pollutants to leave the Project site and enter waters of the State of Ohio. The SWP3 must be updated and revised when storm water and sediment control best management practices (BMPs) are modified due to a change in design, construction method, operation, maintenance procedure, etc.

1.1 Project Location and Description

The Project will install approximately 13 miles of 20-inch, natural gas pipeline beginning at the Highpoint Station (39°17'18.17"N, 84°21'18.16"W) in Sycamore Township and terminating at the Norwood Station (39°10'45.12"N, 84°27'17.35"W) in the City of Cincinnati. The pipeline route crosses the jurisdictions of Sycamore Township, Sharonville, Blue Ash, Evendale, Reading, Amberley, Golf Manor, and the City of Cincinnati. The Highpoint and Norwood Stations will be newly constructed as part of the Project. The workspace dimensions vary along the Project route, much of which includes or parallels existing public right-of-way. Temporary laydown and staging areas will also be developed at strategic locations for use during the Project. Two small main line valve (MLV) sites will also be installed as part of the Project. A breakdown of the proposed land disturbance by jurisdiction is included in Table 1-1 below. A Vicinity Map showing the pipeline alignment and political jurisdictions is provided in Appendix B.

Table 1-1: Project Land Disturbance by Jurisdiction

Jurisdiction	Acres of Land Disturbance	Land-Disturbing Activity
Sycamore Township	4.6	Highpoint Station and Pipeline Construction
Sharonville	7.6	Pipeline Construction
Blue Ash	35.5	Pipeline Construction and MLV
Evendale	19.9	Pipeline Construction
Reading	21.5	Pipeline Construction and MLV
Amberley	9.9	Pipeline Construction
Golf Manor	3.5	Pipeline Construction
City of Cincinnati	10.2	Norwood Station and Pipeline Construction

The Project site is approximately 112.4 acres, all of which has the potential to be disturbed by Project-related construction activities including temporary workspaces, excavations, station and MLV site grading, and access roads. The Project area is heavily developed, and many of the workspaces include paved surfaces and previously disturbed soils. Highpoint Station is approximately 1.5 acres of disturbance, and Norwood Station is approximately 1.75 acres of disturbance. Construction activities are scheduled to begin in January 2021 and be completed in December 2021.

1.2 Project Owner/Operator Information

Contact information for Duke Energy, the Project owner and operator, is provided below:

Duke Energy Ohio, Inc.
139 E 4th Street,
Cincinnati, OH 45202
Phone: (800) 544-6900

Duke Energy or its contractor will have day-to-day operational control over the Project site and will be responsible for completing the Project. Onsite responsibilities include implementing the SWP3, directing the installation and maintenance of BMPs, inspecting the Project site, implementing and supervising housekeeping, documenting changes to the SWP3, keeping records of inspections and other activities, providing staff training, communicating changes in the SWP3 to onsite personnel, and periodic evaluation of the SWP3 provisions onsite.

1.3 Local Storm Water Jurisdictions and Permitting

The Project crosses eight political jurisdictions, many of which enforce their own storm water or erosion and sediment control ordinances and/or require SWP3 approval prior to construction, in addition to submitting an NOI to the Ohio EPA for approval under the Permit. This SWP3 will be submitted to and reviewed by all local authorities for compliance with local ordinances. Local authorities that will review the SWP3 are summarized in Table 1-2.

Table 1-2: Local Jurisdictions and Permit Requirements

Jurisdiction	Review Agency	Permit Requirements
Sycamore Township	Hamilton County SWCD	Earthwork Permit
Sharonville	Community Development Department	Plan Review and Approval
Blue Ash	Community Development Department	Site Work Permit
Evendale	Building Commissioner	Water Management and Sediment Control Permit
Reading	Building Commissioner	Plan Review and Approval
Amberley Village	Village Engineer	Plan Review and Approval
Golf Manor	Hamilton County SWCD	Earthwork Permit
City of Cincinnati	City of Cincinnati Building Department	Excavation and Fill Permit

1.4 Certifications and Notifications

The SWP3 certification, provided in Part V.H. of the Permit, must be signed in accordance with Part V.G. of the Permit. The certification statement form is provided at the front of this SWP3.

Additionally, Duke Energy's contractors and subcontractors must sign the Contractor Notification form (located near the front of this document, copy as needed), which signifies they have read, understand, and will adhere to the SWP3 before conducting any construction work that involves soil disturbance. The signed notification confirms that Duke Energy has notified its subcontractors that a SWP3 has been prepared for the Project, and the subcontractors must perform the necessary actions identified to comply with the SWP3 and the Permit.

1.5 Standard Permit Conditions

This section discusses State and Federal penalties for noncompliance with the Permit as well as standard Permit conditions. The staff responsible for implementation of the SWP3 must be familiar with the requirements of the SWP3 and the Permit.

1.5.1 Duty to Comply with Permit Conditions

The Ohio EPA and local jurisdictional authorities have substantial penalties for noncompliance with the Permit. Failure to comply with any Permit condition is a violation of the Permit and the statutes under which it was issued and is grounds for enforcement action including denial of Permit renewal application, fines, imprisonment, termination of coverage under the Permit, or requirement to obtain an Individual Ohio EPA Permit.

The Ohio EPA, or an authorized representative of the Ohio EPA, must be allowed onto the Project site and any location where records are kept under the conditions of the Permit. Local jurisdictional authorities may also require inspections of the Project site. The Ohio EPA and local jurisdictional authorities must also be allowed to inspect the Project site, sample or monitor storm water discharges, and access and copy any required records. Duke Energy must comply with any corrective actions required by the Ohio EPA or local jurisdictional authorities due to Permit violations discovered during an inspection.

1.5.2 Final Stabilization and Termination of Coverage

Final stabilization has been achieved when all soil-disturbing activities at the Project site have been completed and a uniform (i.e., evenly distributed, without large bare areas) perennial vegetative cover has been established on all unpaved areas. The vegetative cover density must be equal to or greater than 70 percent of the native background vegetative cover density for the area. For those areas not covered by

permanent structures or stabilized with vegetation, an equivalent permanent stabilization measure (such as riprap, crushed rock, gabions, or geotextiles) must be used.

When construction activities authorized by the Permit are complete and the site has achieved final stabilization, Permit coverage must be terminated. Permit coverage is terminated by submitting a Notice of Termination (NOT) via STREAMS within 45 days after cessation of construction activities and final stabilization.

1.5.3 Retention of Records

The SWP3 must be maintained at the appropriate Project site construction office from the date of Project initiation to the date of Project completion. Duke Energy must retain the following records for a minimum period of 3 years from the Permit expiration or termination date:

- SWP3 and any amendments to the SWP3
- NOI authorization
- Site inspection records
- Records of revision
- Corrective action logs
- Contractor certifications
- NOT acceptance from Ohio EPA
- Signed certification, in accordance with Part V.G. of the Permit, describing whether the Project is in compliance with the SWP3 and Permit and identifying any incidents of noncompliance.

2.0 CONSTRUCTION ACTIVITES AND SITE DESCRIPTION

The following sections include a description of the Project site construction activities as well as information regarding the natural and biological resources on and adjacent to the Project site.

2.1 Description of Construction Activities

The Project will install approximately 13 miles of 20-inch, natural gas pipeline beginning at the Highpoint Station (39°17'18.17"N, 84°21'18.16"W) in Sycamore Township and terminating at the Norwood Station (39°10'45.12"N, 84°27'17.35"W) in the City of Cincinnati. Project construction will result in approximately 140.2 acres of land disturbance. Construction activities will include tree clearing, site grading at station and MLV locations, vehicle access to workspaces, establishment of temporary workspaces for pipeline installation (laydown and staging areas), open trench pipeline installation, jack and bore pipeline installation, and horizontal directional drilling (HDD) pipeline installation. Appropriate erosion and sediment control BMPs must be in place prior to the start of any land-disturbing activities. These control measures, their locations, and installation and maintenance guidelines are described in detail in Chapter 3.0 of this document and shown on the Erosion and Sediment Control Plans (ESC Plans) and BMP detail sheets in Appendix C. Additional control measures may be installed as construction progresses. Erosion and sediment control BMPs must be kept in place and maintained, as needed, until work areas have been restored and permanently stabilized.

2.2 Sequence of Major Construction Activities

The following is an approximate chronological list of the planned sequence of activities and implementation of temporary BMPs for Project construction:

Pipeline

1. Discuss the SWP3 and BMPs to be implemented onsite during a pre-construction meeting with Project stakeholders.
2. Clearly mark the limits of disturbance.
3. Install temporary erosion & sediment control BMPs, including stabilized construction ingress/egress, stream crossing BMPs, inlet protection, and perimeter sediment controls.
4. Initiate temporary stabilization as needed using temporary seeding and mulching as needed throughout construction.
5. Clear trees and vegetation, as needed.
6. Establish temporary workspaces and any required traffic controls.

7. Rough and finish grade MLV sites.
8. Excavate bore pits at designed locations for jack and bore and HDD activities.
9. Begin open trench excavation.
10. Install 20-inch natural gas pipeline.
11. Backfill excavations.
12. Seed and mulch remaining disturbed soil to initiate final stabilization.
13. Re-pave surfaces disturbed during construction.
14. Maintain temporary BMPs until final stabilization is complete and a uniform 70-percent perennial vegetative cover is achieved.
15. Remove temporary BMPs upon final stabilization of the Project site.

Station

1. Discuss the SWP3 and BMPs to be implemented onsite during a pre-construction meeting with Project stakeholders.
2. Clearly mark the limits of disturbance.
3. Install temporary erosion & sediment control BMPs, including stable construction ingress/egress, inlet protection, rock check dams, concrete washouts, and perimeter controls.
4. Initiate temporary stabilization using temporary seeding and mulching, as needed throughout construction.
5. Clear trees and vegetation, as needed.
6. Establish temporary workspaces and any required traffic controls.
7. Rough grade the site.
8. Complete below grade work, including equipment foundations.
9. Finish grade the site.
10. Complete above grade work, including surfacing the station with crushed stone.
11. Seed and mulch remaining disturbed soil to initiate final stabilization.
12. Maintain temporary BMPs until final stabilization is complete and a uniform 70-percent perennial vegetative cover is achieved.
13. Remove temporary BMPs upon final stabilization of the Project site.

2.3 Soils

According to the U.S. Department of Agriculture, Natural Resources Conservation Service, Web Soil Survey for Hamilton County, Ohio, 17 soil types are present within the Project site. These soil types are depicted on the Soils Map provided in Appendix B and described in Table 2-1.

Table 2-1: Project Soils

Soil Map Unit	Map Unit Symbol	Erosion Factor K[1]
Casco loam, 15 to 25 percent slopes	CdD	0.43
Eden silty clay loam, 25 to 40 percent slopes	EcE	0.24
Genesee loam, occasionally flooded	Gn	0.28
Jonesboro-Rossmoyne silt loam, 0 to 2 percent slopes	JoR1A1	0.49
Jonesboro-Rossmoyne silt loam, 2 to 6 percent slopes, eroded	JoR1B2	0.55
Patton silty clay loam, 0 to 2 percent slopes	Pn	0.24
Stonelick fine sandy loam, 0 to 2 percent slopes, frequently flooded	St	0.24
Urban land-Alfic Udarents-Royssmoyne complex, 0 to 12 percent slopes	UAGXC	Not rated
Urban land-Alfic Udarents-Pate complex, 12 to 25 percent slopes	UATXD	Not rated
Urban land-Alfic Udarents complex, fragipan substratum over till, 0 to 12 percent slopes	UfAXC	Not rated
Urban land	Ur	Not rated
Urban land-Udorthents complex, 0 to 12 percent slopes	UrUXC	Not rated
Urban land-Udorthents complex, smoothed, 0 to 50 percent slopes	UsUXF	Not rated
Urban land-Alfic Udarents complex, loamy substratum over outwash, 0 to 12 percent slopes	UwAXC	Not rated
Wakeland silt loam, occasionally flooded	Wa	0.49
Westboro-Schaffer silt loams, 0 to 2 percent slopes	WsS1A1	0.49
Xenia silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes	XfA	0.43

Source: U.S. Department of Agriculture, Natural Resource Conservation Service, *Web Soil Survey*, Accessed April 20, 2020, at http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx.
(1) The erosion factor K, with possible values ranging from 0.02 to 0.69, signifies how susceptible a soil is to sheet and rill erosion by water. The larger the K value, the more susceptible the soil is to erosion. The K values associated with the upper horizons of the onsite soil types indicate moderate to high susceptibility to erosion. Many of the soils within the Project have not been rated for erosion factor because they are classified as urban land complexes that have been influenced by urban development. All soils encountered during the Project will be assumed susceptible to erosion by wind and water.

2.4 Estimate of Runoff Coefficient

The runoff coefficient "C" is the ratio of the volume of storm water runoff from a site compared to the total volume of precipitation that falls on the site. The Permit requires an estimate of "C" both before construction activities commence and after the area is stabilized.

The estimate of "C" is based on variables from three general terrain categories:

- Soil properties (porosity, density, etc.)
- Ground slope
- Type of vegetative cover (woodlands, pasture, grassland, etc.)

Other major variables affecting "C" are rainfall intensity and duration. For any given terrain, the ratio of runoff to rainfall is expected to increase as storm intensity or duration increases.

Storm water runoff from all construction areas will be managed temporarily by sediment control BMPs as described in Chapter 3.0. The pipeline portion of the Project will be restored to pre-construction conditions, and the "C" value is not anticipated to change as a result of construction. The Highpoint and Norwood Stations will require site grading and permanent altering of existing contours and, therefore, will have different "C" values post-construction.

Drainage analysis for the Norwood Station was completed using the rational method per City of Cincinnati guidelines. The 10- and 25-year storm events were used for the pre- and post-construction evaluations, respectively. The analysis concluded that construction of the station would increase the "C" value of the site from 0.45 to 0.70 and increase the peak discharge from 1.6 cubic feet per second (cfs) for the 10-year storm event to 2.97 cfs for the 25-year storm event. Underground detention is proposed at the Norwood Station to mitigate the increases in "C" value and peak discharge. The underground detention system is described in greater detail in Chapter 3.0 and is anticipated to provide up to 5,655 cubic feet of water storage to mitigate for the increase in runoff from the site development.

Drainage analysis at Highpoint Station was completed using a water quality volume (WQV) method. A subsurface sand reservoir and permeable pavement infiltration system will be installed to retain storm water onsite. This system is described in greater detail in Chapter 3.0. The WQV method uses drainage area, imperviousness, and a volumetric runoff coefficient to calculate the appropriate WQV and runoff reduction volume (RRV) for a given site. The volumetric runoff coefficient at the site is 0.11. At Highpoint Station, the WQV is 392 cubic feet and the RRV, when implementing the permeable pavement infiltration system, is 434 cubic feet, suggesting that the post-construction site will store 42 cubic feet of water more than it needs to in order to mitigate impacts to water quality. Results of the analyses conducted are included in Appendix B, and the ESC Plans and BMP detail sheets in Appendix C depict the pre- and post-construction drainage patterns at station sites and provide information regarding installation and maintenance details for the permanent BMPs proposed.

2.5 Potential Pollutants

The primary potential pollutant sources on the Project site are anticipated to be newly disturbed soils and minor storm water runoff. BMPs will be used to control erosion and sedimentation and are discussed in further detail in Chapter 3.0. Other potential pollutant sources include petroleum products needed for construction equipment, fertilizers for re-seeding (if needed), and miscellaneous chemicals needed for equipment maintenance. HDD fluid will be used onsite. HDD fluid generally contains water and bentonite clay, which is considered a pollutant. BMPs for product-specific practices are discussed in Chapters 4.0 and 5.0.

2.6 Site Maps and Drawings

The Vicinity Map and the Soils Map are provided in Appendix B along with a Site Map showing surrounding streams, wetlands, and floodplains. The ESC Plans for the pipeline and stations, which include erosion and sediment control BMPs, are provided in Appendix C.

2.7 Receiving Waters

The Project is located within three watersheds, the Sharon Creek-Mill Creek Watershed (HUC 050902030103), Sycamore Creek Watershed (HUC 050902021401), and Congress Run-Mill Creek Watershed (050902030104). The Project area is highly developed, residential and commercial land. Storm water will generally sheet flow from workspaces into nearby inlets via curb and gutter systems. In some instances, near stream crossings, water will sheet flow directly from workspaces into ditches, drainageways, or streams, which ultimately lead to either Mill Creek or Sycamore Creek.

Mill Creek (05090202 90 02) and Sycamore Creek are listed as impaired on the Ohio EPA Draft 2020 *Ohio Integrated Water Quality Monitoring and Assessment Report.* The impaired use listed for each is recreational use. The parameter listed for impairment to recreational use is *E. coli* bacteria, and the Total Maximum Daily Load (TMDL) priority for each impairment is listed as "high". A TMDL for phosphorus and nitrogen was established for Mill Creek in 2005, and a TMDL for *E. coli*, total phosphorus, chemical oxygen demand, sediment, total suspended solids, and carbonaceous biological oxygen demand was established for Sycamore Creek in 2011. Through the implementation of erosion and sediment control BMPs, as discussed in Chapter 3.0, storm water discharges from the Project site will not contribute to existing impairments for which TMDLs are being implemented or may be implemented for in the future.

3.0 BEST MANAGEMENT PRACTICES

The following sections detail the proposed BMPs to be used on the Project site during and after construction to manage storm water volume, flow, and quality.

Storm water BMPs are used to control storm water volume and flow and reduce the amount of soil particles carried from a land area and deposited elsewhere. Duke Energy or an authorized subcontractor is responsible for implementing and amending the erosion and sediment control BMPs in the SWP3, when necessary. Based on field conditions at the time of construction, Duke Energy or its subcontractor must adjust the locations and types of structural controls and stabilization measures so that erosion and sedimentation are controlled to the extent practicable. Installation and repairs of BMPs must be done in accordance with the manufacturer's specifications. Revisions to the SWP3 must be recorded on the Record of Revisions form provided in Appendix D.

Factors that should be considered in the selection of erosion and sediment control BMPs for site-specific areas may include, but not be limited to:

- Size of the area affected
- Type of proposed construction activities
- Soil type and texture
- Amount of rock present in existing soils
- Steepness and length of slope
- Amount of vegetative cover
- Proximity to watercourses or wetlands, particularly downslope from construction activities
- Sensitivity of nearby watercourses
- Date and intensity of the last major rain event
- Anticipated weather conditions and/or frozen ground

Prior to commencing field construction activities, soil erosion and sediment control BMPs must be implemented in accordance with this SWP3 and the Permit. BMPs must be maintained during and after the construction activity until final stabilization is completed. Upon final stabilization of disturbed areas, temporary soil erosion and sediment control BMPs must be removed, and a NOT must be submitted to the Ohio EPA via STREAMS.

3.1 Temporary Erosion and Sediment Control Measures

The temporary erosion and sediment control BMPs that must be used for the Project site are discussed in the following sections. Any alterations to the temporary erosion and sediment control measures on the ESC Plans in Appendix C must be red lined onto the Erosion and Sediment Control Plans, and a Record of Revision must be created (Appendix D).

3.1.1 Stabilized Construction Ingress/Egress

Offsite tracking of soils must be minimized by utilizing appropriately designed temporary construction ingress and egress points. Construction ingress/egress points may be constructed using crushed rock, timber matting, or other appropriate track-out reduction products, to limit rutting and provide a stable, non-erodible surface on which to enter and exit workspaces. Existing access drives are present along the Project route and may be utilized in accordance with landowner agreements, if permitted. Ingress/egress must be maintained throughout the duration of construction. If necessary, a culvert will be installed to allow storm water to pass under the entrance. The amount of sediment that is transported onto a public road surface or other paved areas by construction equipment or vehicles must be limited to the extent practicable and cleaned up at the end of each workday via dry sweeping or scraping, and not flushing. Location and installation details for construction ingress/egress are provided in Appendix C.

3.1.2 Perimeter Sediment Control

Perimeter sediment controls will be used to filter water prior to it leaving the construction area. Filter socks and silt fence are examples of appropriate perimeter sediment controls for use on the Project site. Perimeter sediment controls are placed downslope of disturbed areas to intercept sheet flow runoff.

Filter socks are a three-dimensional tubular sediment control and storm water runoff filtration device typically used for perimeter control of sediment and soluble pollutants (such as phosphorus and petroleum hydrocarbons), on and around construction activities. Filter socks trap sediment and other soluble pollutants by filtering runoff water as it passes through the matrix of the compost filter socks and by allowing water to temporarily pond behind the compost filter socks, allowing for deposition of suspended solids. Compost filter socks are also used to reduce runoff flow velocities on sloped surfaces. Build-up of sediment should be removed when the height of the sediment exceeds 1/3 of the height of the barrier. All filter socks must be composed of 12-inch compost filter sock, or a Duke-approved engineered equivalent measure.

Silt fence is used to intercept and retain sediment carried by sheet flow from disturbed areas and to prevent sediment-laden runoff from leaving the Project site. Silt fence is placed perpendicular to the

direction of water flow and as close to the contours as possible with the ends extending upslope (J-hooks). On slopes in excess of 10 percent, J-hooks must be used to dissipate velocity and capture sediment. Furthermore, to mitigate flooding behind silt fences, outlets may be installed between sections of silt fence consisting of either washed stone or filter socks. A specification for silt fence with an outlet is included in the construction details in Appendix C. Silt fence is to be checked and maintained on a regular basis. Build-up of sediment should be removed when the height of the sediment exceeds 50 percent of the height of the barrier.

The location and installation details for perimeter sediment controls are provided in Appendix C. Straw or hay bales are not to be used as a perimeter sediment control.

3.1.3 Dust Control

Preventive measures must be implemented during times when exposed soil is susceptible to wind erosion. In areas where bare soil is exposed, water or other dust palliatives must be applied to the soil to limit wind erosion. Precautions must be taken not to over-water and erode soils. In addition, appropriate speed limits should be established on the Project site to minimize the generation of dust.

3.1.4 Stream and Wetland Crossing BMPs

Some streams and wetlands crossed by the Project will be crossed using HDD or jack and bore methods; however, some will be crossed using open trench installation. Temporary construction matting will be used when working in delineated wetlands or other saturated areas to minimized rutting, soil compaction, and tracking of soils offsite. Matted areas must be gap free and underlain with a geotextile fabric. Fill must remain on matting and not within wetlands or streams, and matting must not be placed in a way that it would impede the flow of water. Location and installation details for wetland and stream crossing BMPs are included in Appendix C.

Access for vehicles and equipment across streams or channels may be accomplished using a temporary culvert stream crossing or a temporary span bridge crossing. Crossing methods must be consistent with all other permits obtained for the Project, including Section 404/401 Clean Water Act permits from the U.S. Army Corps and Ohio EPA for impacts to jurisdictional waters. Temporary culvert crossings must be constructed in a way that they can be completely removed, following the period for which their use is necessary. Appropriate perimeter controls must be used to limit transport of sediment/spoils to receiving waters. All material must be removed from the stream bed and bank. In crossing scenarios, flow must be maintained throughout the lifespan of the crossing.

Open cut pipeline installation within streams will be achieved using a temporary stream crossing pump diversion. A sandbag dam will be constructed upstream of the pipeline crossing to dam water. A pump will be used to dewater the ponded area upstream of the crossing to a downstream location. Dewatering BMPs described in Section 3.1.9 must be utilized. No in-stream work may occur between April 15th and June 30th to reduce impacts to indigenous aquatic species and their habitat. Furthermore, in-stream work must be conducted during periods of base flow, or slightly higher than base flow, and not excessively dry, or pooled conditions to minimize impacts to threatened and endangered species.

3.1.5 Inlet Protection

Inlets in the vicinity of the Project area may include paved inlets, non-paved inlets, and curb inlets. There are a variety of proprietary inlet protection products that can be utilized to limit sediment transport into storm sewer systems. Curb inlets may consist of a geotextile bag, properly sized to fit beneath the inlet grate. This type of inlet protection must include an overflow because if the bag becomes clogged, localized flooding may occur. Non-paved area inlet protection may consist of silt fence or filter sock installed around the inlet to pond and filter sediment from water prior to entering the inlet. Curb inlet protection may consist of a wire mesh covering the grate and curb inlet, covered with a geotextile fabric. Clean crushed stone is placed on the high side of the inlet to further filter storm water entering the inlet.

All inlet protection devices require regular maintenance and will need to be replaced throughout the life of the Project. Sediment backup behind non-paved inlet protection and curb inlet protection must be removed after storm events to keep the device functioning properly. Paved area inlet bags must be removed and cleaned out or replaced at regular intervals to avoid clogging. Inlet protection devices must be inspected for deficiencies prior to rainfall events to the extent practicable. Location and installation details for inlet protection devices are included in Appendix C.

3.1.6 Rock Check Dams

Rock check dams will be installed in drainage ditches at Highpoint and Norwood Stations during construction. Rock check dams will be placed so that the elevation of the outside channel edge is higher than the top of the barrier in the middle of the channel. These devices must be maintained to remain effective and the sediment removed from behind the device on a regular basis. Location and installation details for rock check dams are provided in Appendix C.

3.1.7 Erosion Control Blankets

Erosion control blankets are preformed rolled erosion control products consisting of protective blankets of straw, other plant residue, or plastic fibers formed into a mat, usually with a plastic mesh on one or both

sides. They protect the soil surface from raindrop impact and reduce overland flow during establishment of vegetation. They are most commonly used on steep embankments (10 percent slope or greater) or in the bottom of small channels/drainages. Erosion control blankets are installed with pegs or staples after all topsoiling, fertilizing, liming, and seeding operations have been completed. Erosion control blankets should be installed parallel to the slope. Location and installation details for the erosion control blankets can be found in Appendix C.

3.1.8 Concrete Washout

A concrete washout station is used to contain concrete waste that results from excess fresh concrete mix from trucks and equipment. Concrete washout stations should be located at least 50 feet from storm drains, open ditches, or water bodies. Any overflow of concrete wash-down water must be discharged into an area protected by one or more sediment removal BMPs and shall be completed in a manner which does not result in violation of groundwater or surface water quality standards. The concrete washout locations must be marked on the plans in Appendix C when locations are determined in the field. Concrete washouts will be needed for both stations and on the pipeline ROW. Example specifications for station concrete washouts are provided in Appendix C. On the pipeline ROW, in general, excess concrete will be washed into small excavations and buried to limit the potential for concrete washout runoff to leave the Project area.

3.1.9 Dewatering

The contractor will submit a dewatering plan including appropriate BMPs prior to any dewatering activities. Dewatering must be completed in such a way that minimizes turbidity, including the use of filter bags or other appropriate measures. Dewatering waters will not be discharged to any wetlands or streams in a way that could cause erosion or scouring. Under no circumstances will untreated dewatering water be discharged to receiving waters without first receiving treatment to reduce turbidity. Dewatering should not be conducted without approval from Duke Energy. Dewatering locations must be marked on the plans in Appendix C, and guidelines for dewatering are provided in Appendix C.

3.1.10 Run-on Controls

In areas where water will run across the pipeline workspace, run-on controls may be needed to divert, collect, and transport water across the Project workspace. Temporary diversion swales can be installed on the upslope side of the workspace to divert water to a collection point. The water is then transported through a drainpipe to the bottom of the slope and discharged to a stabilized outlet to limit the potential for erosion and scouring within the Project workspaces. Perimeter sediment controls may also be used as

temporary run-on controls with Duke approval. Example specifications for run-on controls and locations where they may be necessary are included in Appendix C.

3.1.11 Slope Breakers and Trench Plugs

Slope breakers and trench plugs will be installed in steep areas to slow water velocities both in the trench and at the ground surface in project workspaces. Trench plugs will be used to limit migration of soil material within the trench with slope breakers will be used to capture, divert, and discharge water from the Project workspaces in a non-erosive manner. Slope breakers must have a stabilized outlet to dissipate energy of water flowing along the breaker. Installation details and potential locations for slope breakers and trench plugs are included in Appendix C.

3.1.12 HDD Fluid Loss BMPs

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. However, HDD operations have the potential to release drilling fluids to the surface environment due to the pressure of the drill forcing fluids upward through fractured bedrock or unconsolidated soil materials. HDD drilling fluid typically consists of a bentonite slurry that is used to cool and lubricate the drill bit. Bentonite is an inert, naturally occurring, non-toxic clay material. Duke Energy has prepared a HDD Drilling Contingency Plan that prescribes appropriate procedures and BMPs for mitigating and responding to releases of HDD fluids. The objectives of the HDD Drilling Contingency Plan are as follows:

1. Minimize the potential for drilling fluid release associated with directional drilling activities.
2. Provide for timely detection of fluid release.
3. Protect environmentally sensitive areas and associated riparian vegetation.
4. Organize a timely and efficient response in the event of a release of drilling bentonite.
5. Verify that all appropriate notifications are made immediately to the client and regulatory personnel in the event of a release.

In general, in the event of a release, drilling must be stopped immediately while response procedures are implemented. The Duke Midwest Spill hotline must be called at (800) 527-3853, and the contractor must contact Duke Environmental Specialist Tara Thomas at (513) 314-8055. The contractor must have the necessary materials onsite to contain drilling fluid that has been released to the surface, including appropriate perimeter control BMPs. In the event of a release to a surface water, an instream BMP (e.g.,

coffer dam) may be necessary to remove released drilling fluid. Refer to the HDD Drilling Contingency Plan in Appendix E for more details about specific requirements.

In addition to Duke's HDD Drilling Contingency Plan, the contractor will be required to develop a site-specific plan for each planned HDD crossing. These plans must be filed with the HDD Drilling Contingency Plan in Appendix E. The site-specific plans must include provisions for monitoring, environmental specialist presence, containment measures, cleanups, and restoration.

3.2 Permanent Storm Water Management Practices

Permanent structural storm water management practices are those that are left in place after construction is finished and the site is stabilized to manage storm water quality, volume, and/or flow. The pipeline portion of Project will be restored to pre-construction conditions, and drainage patterns will remain the same. The pipeline portion of the Project will require no permanent storm water structures.

Highpoint and Norwood Stations will involve site grading and permanent changes to the existing topography. Permanent storm water management practices to be utilized at each site are described in the following sections.

3.2.1 Norwood Station Permanent Storm Water Management Practices

At the Norwood Station, a vegetated drainage ditch will be constructed along the east side of the property, as depicted in Appendix C, to direct water that would otherwise run onto the site from the east away from the site to a catch basin. The vegetation will provide long-term stabilization of the ditch. Surface water within the station footprint will flow to the west and enter a trench drain connected to an underground detention vault. The detention vault has a capacity of 5,655 cubic feet of water. The purpose of the detention vault is to reduce the peak discharge from the site that will result from the site's development. The underground detention system must be inspected every 6 months to verify it is in proper working order. For more information on the specifications of the underground detention system, refer to Appendix C.

3.2.2 Highpoint Station Permanent Storm Water Management Practices

At Highpoint Station, a permeable paver system will be used to infiltrate sheet flow from the site into an underground sand reservoir. This system has been designed to meet the WQV and RRV requirements of the site to mitigate negative impacts to water quality resulting from increased peak runoff due to site development. A curb will interrupt sheet flow and allow for infiltration of storm water through the crushed rock surfacing into a sand reservoir underlain by an impermeable liner. This system will retain

storm water during rain events, thus reducing the peak flow from the site to surrounding waters. For location and installation details, refer to Appendix C.

3.3 Stabilization Measures

Temporary and permanent stabilization measures for disturbed soils are necessary while conducting construction activities. Vegetative cover serves to reduce the erosion potential by absorbing the energy of raindrops, promoting infiltration in-lieu-of runoff, and reducing the velocity of runoff. Many of these practices can be utilized for both temporary and permanent stabilization measures; although, application methods, preparation, rates, and timing can vary. The timing requirements for various circumstances of permanent and temporary stabilization measures are specified in Table 3-1 and Table 3-2, respectively.

Table 3-1: Permanent Stabilization

Area Requiring Permanent Stabilization	Time Frame to Apply Erosion Controls
Any areas that will lie dormant for 1 year or more	Within 7 days of the most recent disturbance
Any areas within 50 feet of a surface water of the State and at final grade	Within 2 days of reaching final grade
Any other areas at final grade	Within 7 days of reaching final grade within that area

Table 3-2: Temporary Stabilization

Area Requiring Temporary Stabilization	Time Frame to Apply Erosion Controls
Any disturbed areas within 50 feet of a surface water of the State and not at final grade	Within 2 days of the most recent disturbance if the area will remain idle for more than 14 days
For all construction activities, any disturbed areas that will be dormant for more than 14 days, but less than 1 year, and not within 50 feet of a surface water of the State	Within 7 days of the most recent disturbance in that area
Disturbed areas that will be idle over winter	Prior to the onset of winter weather

The Highpoint and Norwood Station locations will be mostly stabilized using non-erodible crushed rock surfacing. Areas not surfaced with rock will be revegetated in accordance with the guidelines and timelines described in this section.

3.3.1 Seeding and Mulching

Temporary and permanent stabilization will be achieved through seeding and mulching. The seeding recommendations provided in Appendix C and timing requirements defined in Table 3-1 and Table 3-2 must be followed. The soil seedbed should not be blown, washed, or otherwise removed from the site. Repairs may be necessary (including replacement of lost topsoil and/or mulch) to the seedbed preparation

site in the event of heavy rain, wind, or other natural events that cause damage. Grading and stabilization activities must be documented on the Grading and Stabilization Activities Log provided in Appendix E.

3.4 Maintenance and Inspections

Erosion and sediment control BMPs must be inspected by qualified inspection personnel (as defined by Part VII.BB of the Permit) a minimum of once every 7 days and within 24 hours after any storm event greater than one-half inch of rain per 24-hour period.

During each inspection, the construction inspector must complete and sign a copy of the Inspection and Maintenance Report Form provided in Appendix D. These sheets will be copied and used, as necessary. If during an inspection, a BMP requires repair or maintenance, then Duke Energy or its subcontractor is required to repair the BMP within 3 calendar days of the inspection and in accordance with the ESC Plan and specifications provided in Appendix C. If during an inspection, it is noted that a BMP is not performing its intended function and another more appropriate BMP is required, then the SWP3 must be amended, and the new BMP must be installed within 10 days of the inspection that revealed the deficiency. If an inspection reveals that a BMP has not been implemented, then it must be implemented within 10 days of the inspection. The inspector must photograph the site during inspections to document the site conditions. Any corrective actions must be documented on the Corrective Action Log provided in Appendix D of this SWP3.

If inspection results indicate a need to modify the SWP3, then it must be revised, and all modifications must be noted on the Record of Revisions provided in Appendix D.

If inspections and maintenance are conducted by staff other than Duke Energy or its authorized subcontractor, then copies of all pertinent documentation (Inspection and Maintenance Reports, Record of Revisions, Corrective Action Logs, Grading and Stabilization Logs, etc.) must be provided to Duke Energy for review immediately following the inspection activity. Upon completion of the Project, all original SWP3 documentation must be provided to Duke Energy and then retained for at least 3 years following the submittal of the NOT.

3.5 Removal of Temporary Controls

Temporary structural BMPs must be removed after the Project site is stabilized with a uniform perennial vegetative cover of 70 percent density or more for all unpaved areas and areas not covered by permanent structures or equivalent stabilization measures. Following revegetation, Duke Energy or a designated representative must conduct periodic site visits to see that vegetation establishment is satisfactory. If sufficient vegetative cover has not been achieved, then additional restoration measures must be

implemented such as over-seeding, mulching, sodding, or the use of erosion control blankets. All temporary soil erosion and sediment control BMPs must be removed and disposed of after final stabilization is achieved and before submitting a NOT via STREAMS.

4.0 GOOD HOUSEKEEPING

The practices described below must be followed by Duke Energy and its subcontractors to protect storm water and surrounding surface waters from contamination by construction-related pollutants.

4.1 Material Handling

Construction materials that pose a potential contamination threat (e.g., petroleum products, solvents) must be managed to minimize exposure to storm water. Materials must be kept in secure containers and be properly labeled. Copies of each material's Safety Data Sheet (SDS) must be maintained onsite.

4.2 Solid and Liquid Waste Disposal

Solid and liquid waste (including sediment, asphalt, concrete millings, floating debris, paper, plastic, fabric, baling twine, and construction and demolition debris) and other wastes must be disposed of properly and in accordance with applicable Federal, State, and local disposal requirements as well as Duke Energy requirements. Waste materials must be collected and stored in a secure container and removed from the Project site. Waste containers should be inspected regularly. Asphalt slurry from pavement cuts is not permitted to enter storm drains and must be vacuumed or otherwise removed from the site in compliance with all applicable regulations and permits.

4.3 Hazardous Waste

Hazardous material must be used, stored, transported, and disposed of in the manner specified by the manufacturer and by Federal, State, and local regulations and Duke Energy requirements. Duke Energy and its subcontractors must alert site personnel of this requirement. Spill response procedures are discussed in Chapter 5.0.

4.4 Sanitary Waste

Duke Energy and its subcontractors must comply with portable toilet regulations. Duke Energy and its subcontractors must provide sanitary facilities for its crew throughout construction. Toilets must not be placed near drainage courses or in low areas and must be positioned so they are secure and cannot be tipped over. Sanitary facilities must be serviced regularly.

4.5 Non-Storm Water Discharges

All discharges covered by the Permit are to be composed entirely of storm water, with the exception of the following:

- Discharges from fire-fighting activities

- Fire hydrant flushings
- Potable water sources including water line flushing
- Irrigation drainage
- Lawn watering
- Routine external building wash-down which does not use detergents
- Concrete wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents were not used
- Air conditioning condensate
- Springs
- Uncontaminated groundwater from trench or well point dewatering
- Foundation or footing drains where flows are not contaminated with process materials such as solvents or contaminated ground water

4.6 Vehicle Washing

Vehicle washing should not be conducted on sites of active construction. If vehicle washing is required, then a designated area must be selected where runoff can be contained and properly disposed of. If necessary, this designated area is to be identified and approved by Duke Energy or a designated representative.

4.7 Concrete Washout

Concrete trucks are not allowed to washout or discharge surplus concrete or drum wash to waters of the State of Ohio. They are only allowed to washout or discharge surplus concrete or drum wash water in a dedicated concrete washout area. See Section 3.1.8 for more details. Location and installation details for the concrete washout area must be added to Appendix C.

5.0 SPILL PREVENTION AND CONTROL

This section describes measures to avoid, control, and minimize impacts from a spill of a hazardous, toxic, or petroleum substance during construction activities at the Project site. It also describes the transport, storage, and disposal procedures for any potentially hazardous or toxic materials to be used on the Project site and outlines the procedures to be followed in the event of a spill of a contaminating or toxic substance.

5.1 Material Management Practices

The proper use and storage of materials and equipment, along with the use of common sense, greatly reduce the potential for contaminating storm water runoff. The following list of good housekeeping practices should be implemented during construction:

- Hazardous materials, chemicals, fuels, and oils should not be stored in close proximity to any stream bank, wetland, water supply well, spring, or other waterbody.
- Fueling of construction equipment should not take place within 100 feet of any stream bank, wetland, water supply well, spring, or other waterbody.
- The minimum amount of hazardous or toxic materials should be stored onsite.
- Onsite materials should be stored in a neat, orderly manner, in appropriate containers, and under a roof or other enclosure to minimize exposure to precipitation.
- Products should be kept in original containers with the original manufacturer's label.
- Substances should not be mixed with one another unless recommended by the manufacturer.
- Whenever possible, a container's contents should be used completely prior to container disposal.
- If surplus product must be disposed of, then manufacturer's or local-, State-, and federally recommended methods for proper disposal, and Duke Energy's requirements must be followed.
- Removal of open or expired surplus liquid materials (opened paint cans, partially used containers of solvent, expired epoxy materials, etc.) from the Project site is the responsibility of Duke Energy and its subcontractors.
- Fueling and routine vehicle maintenance must be conducted within the designated areas as defined by Duke Energy.

5.2 Non-Petroleum Products

Due to the chemical makeup of specific products, certain handling and storage procedures are required to protect the safety of handlers and limit the possibility of pollution. Care should be taken to follow

directions and warnings for products used on the Project site. Pertinent information can be found on the SDS for each product. The SDS must be kept onsite.

5.3 Petroleum Products

Onsite vehicles should be monitored for leaks and receive regular maintenance to reduce the chance of leakage. Inspections for leaks or spillage must occur during the once-per-week inspection of BMPs.

Petroleum products must be stored in tightly sealed, clearly labeled containers. If feasible, the containers should be stored in a covered truck or trailer that provides secondary containment.

Bulk storage tanks having a capacity of 55 gallons or greater must have secondary containment. Containment can be provided by temporary earthen berms lined with plastic sheeting or other means approved by Duke Energy. After each rainfall event, the site inspector must inspect the contents of the secondary containment area for excess water. If no sheen is visible, then the collected water can be pumped to the ground in a manner that does not cause scouring. If any sheen is present, then the water must be treated prior to discharge or must be transported and disposed of offsite in accordance with Federal, State, and local requirements.

Bulk fuel or lubricating oil dispensers must not have a self-locking mechanism that allows for unsupervised fueling. Fueling operations should be observed to immediately detect and contain spills.

No waste oil or other petroleum-based products will be disposed of onsite (e.g., buried or poured), but must be taken offsite for proper disposal.

5.4 Spill Control and Cleanup

During construction, all non-sediment pollutants such as oils, fuels, hydraulic fluids, chemical cleaners, etc., shall be managed to avoid spills that could impact the site and waters of the State. If spills occur at the site, the spilled product will be contained and removed from the site in accordance with Duke Energy procedures. If not recoverable for reuse, the spilled product shall be disposed of properly per Federal and State regulatory requirements. In the event of a spill, Duke Energy must be notified using the Duke Energy Midwest Spill Hotline at (800) 527-3853.

APPENDIX A – GENERAL PERMIT

Issuance Date: April 23, 2018
Effective Date: April 23, 2018
Expiration Date: April 22, 2023

OHIO ENVIRONMENTAL PROTECTION AGENCY

GENERAL PERMIT AUTHORIZATION FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the federal Water Pollution Control Act, as amended (33 U.S.C. Section 1251 et. seq. hereafter referred to as "the Act") and the Ohio Water Pollution Control Act [Ohio Revised Code ("ORC") Chapter 6111], dischargers of storm water from sites where construction activity is being conducted, as defined in Part I.B of this permit, are authorized by the Ohio Environmental Protection Agency, hereafter referred to as "Ohio EPA," to discharge from the outfalls at the sites and to the receiving surface waters of the state identified in their Notice of Intent ("NOI") application form on file with Ohio EPA in accordance with the conditions specified in Parts I through VII of this permit.

It has been determined that a lowering of water quality of various waters of the state associated with granting coverage under this permit is necessary to accommodate important social and economic development in the state of Ohio. In accordance with OAC 3745-1-05, this decision was reached only after examining a series of technical alternatives, reviewing social and economic issues related to the degradation, and considering all public and intergovernmental comments received concerning the proposal.

This permit is conditioned upon payment of applicable fees, submittal of a complete NOI application form, development (and submittal, if applicable) of a complete Storm Water Pollution Prevention Plan (SWP3) and written approval of coverage from the director of Ohio EPA in accordance with Ohio Administrative Code ("OAC") Rule 3745-38-02.

Craig W. Butler
Director

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PART I. COVERAGE UNDER THIS PERMIT

A. Permit Area.

This permit covers the entire State of Ohio. Appendices A and B of this permit contain additional watershed specific requirements for construction activities located partially or fully within the Big Darby Creek Watershed and portions of the Olentangy River Watershed. Projects within portions of the Olentangy River watershed shall seek coverage under this permit following the expiration of OHCO00002 (May 31, 2019).

B. Eligibility.

1. Construction activities covered. Except for storm water discharges identified under Part I.B.2, this permit may cover all new and existing discharges composed entirely of storm water discharges associated with construction activity that enter surface waters of the state or a storm drain leading to surface waters of the state.

   For the purposes of this permit, construction activities include any clearing, grading, excavating, grubbing and/or filling activities that disturb one or more acres. Discharges from trench dewatering are also covered by this permit as long as the dewatering activity is carried out in accordance with the practices outlined in Part III.G.2.g.iv of this permit.

   Construction activities disturbing one or more acres of total land or will disturb less than one acre of land but are part of a larger common plan of development or sale that will ultimately disturb one or more acres of land are eligible for coverage under this permit. The threshold acreage includes the entire area disturbed in the larger common plan of development or sale.

   This permit also authorizes storm water discharges from support activities (e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas) provided:

   a. The support activity is directly related to a construction site that is required to have NPDES permit coverage for discharges of storm water associated with construction activity;

   b. The support activity is not a commercial operation serving multiple unrelated construction projects and does not operate beyond the completion of the construction activity at the site it supports;

   c. Appropriate controls and measures are identified in a storm water pollution prevention plan (SWP3) covering the discharges from the support activity; and

   d. The support activity is on or contiguous with the property defined in the NOI (offsite borrow pits and soil disposal areas, which serve only one project, do not have to be contiguous with the construction site).

2. Limitations on coverage. The following storm water discharges associated with construction activity are not covered by this permit:

a. Storm water discharges that originate from the site after construction activities have ceased, including any temporary support activity, and the site has achieved final stabilization. Industrial post-construction storm water discharges may need to be covered by an NPDES permit;

b. Storm water discharges associated with construction activity that the director has shown to be or may reasonably expect to be contributing to a violation of a water quality standard; and

c. Storm water discharges authorized by an individual NPDES permit or another NPDES general permit.

3. Waivers. After March 10, 2003, sites whose larger common plan of development or sale have at least one, but less than five acres of land disturbance, which would otherwise require permit coverage for storm water discharges associated with construction activities, may request that the director waive their permit requirement. Entities wishing to request such a waiver must certify in writing that the construction activity meets one of the two waiver conditions:

a. Rainfall Erosivity Waiver. For a construction site to qualify for the rainfall erosivity waiver, the cumulative rainfall erosivity over the project duration must be five or less and the site must be stabilized with a least a 70 percent vegetative cover or other permanent, non-erosive cover. The rainfall erosivity must be calculated according to the method in U.S. EPA Fact Sheet 3.1 Construction Rainfall Erosivity Waiver dated January 2001 and be found at: http://epa.ohio.gov/portals/35/permits/USEPAfact3-1_s.pdf. If it is determined that a construction activity will take place during a time period where the rainfall erosivity factor is less than five, a written waiver certification must be submitted to Ohio EPA at least 21 days before construction activity is scheduled to begin. If the construction activity will extend beyond the dates specified in the waiver certification, the operator must either: (a) recalculate the waiver using the original start date with the new ending date (if the R factor is still less than five, a new waiver certification must be submitted) or (b) submit an NOI application form and fee for coverage under this general permit at least seven days prior to the end of the waiver period; or

b. TMDL (Total Maximum Daily Load) Waiver. Storm water controls are not needed based on a TMDL approved or established by U.S. EPA that addresses the pollutant(s) of concern or, for non-impaired waters that do not require TMDLs, and equivalent analysis that determines allocations for small construction sites for the pollutant(s) of concern or that determines that such allocations are not needed to protect water quality based on consideration of existing in-stream concentrations, expected growth in pollutant contributions from all sources, and a margin of safety. The pollutant(s) of concern include sediment or a parameter that addresses sediment (such as total suspended solids, turbidity or siltation) and any other pollutant that has been identified as a cause of impairment of any water body that will receive a discharge from the construction activity. The operator must certify to the director of Ohio EPA that the construction activity will take place, and storm water discharges will occur, within the drainage area addressed by the TMDL or equivalent analysis. A written waiver certification must be submitted to Ohio EPA at least 21 days before the construction activity is scheduled to begin.

4. Prohibition on non-storm water discharges. All discharges covered by this permit must be composed entirely of storm water with the exception of the following: discharges from firefighting activities; fire hydrant flushings; potable water sources including waterline flushings; irrigation drainage; lawn watering; routine external building washdown which does not use detergents; pavement washwaters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used; air conditioning condensate; springs; uncontaminated ground water from trench or well point dewatering and foundation or footing drains where flows are not contaminated with process materials such as solvents. Dewatering activities must be done in compliance with Part II.C and Part III.G.2.g.iv of this permit. Discharges of material other than storm water or the authorized non-storm water discharges listed above must comply with an individual NPDES permit or an alternative NPDES general permit issued for the discharge.

   Except for flows from firefighting activities, sources of non-storm water listed above that are combined with storm water discharges associated with construction activity must be identified in the SWP3. The SWP3 must identify and ensure the implementation of appropriate pollution prevention measures for the non-storm water component(s) of the discharge.

5. Spills and unintended releases (Releases in excess of Reportable Quantities). This permit does not relieve the permittee of the reporting requirements of Title 40 of the Code of Federal Regulations ("CFR") Part 117 and 40 CFR Part 302. In the event of a spill or other unintended release, the discharge of hazardous substances in the storm water discharge(s) from a construction site must be minimized in accordance with the applicable storm water pollution prevention plan for the construction activity and in no case, during any 24-hour period, may the discharge(s) contain a hazardous substance equal to or in excess of reportable quantities.

   40 CFR Part 117 sets forth a determination of the reportable quantity for each substance designated as hazardous in 40 CFR Part 116. The regulation applies to quantities of designated substances equal to or greater than the reportable quantities, when discharged to surface waters of the state. 40 CFR Part 302 designates under section 102(a) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, those substances in the statutes referred to in section 101(14), identifies reportable quantities for these substances and sets forth the notification requirements for releases of these substances. This regulation also sets forth reportable quantities for hazardous substances designated under section 311(b)(2)(A) of the Clean Water Act (CWA).

C. Requiring an individual NPDES permit or an alternative NPDES general permit.

1. The director may require an alternative permit. The director may require any operator eligible for this permit to apply for and obtain either an individual NPDES permit or coverage under an alternative NPDES general permit in accordance with OAC Rule 3745-38-02. Any interested person may petition the director to take action under this paragraph.

The director will send written notification that an alternative NPDES permit is required. This notice shall include a brief statement of the reasons for this decision, an application form and a statement setting a deadline for the operator to file the application. If an operator fails to submit an application in a timely manner as required by the director under this paragraph, then coverage, if in effect, under this permit is automatically terminated at the end of the day specified for application submittal.

2. Operators may request an individual NPDES permit. Any owner or operator eligible for this permit may request to be excluded from the coverage of this permit by applying for an individual permit. The owner or operator shall submit an individual application with reasons supporting the request to the director in accordance with the requirements of 40 CFR 122.26. If the reasons adequately support the request, the director shall grant it by issuing an individual NPDES permit.

3. When an individual NPDES permit is issued to an owner or operator otherwise subject to this permit or the owner or operator is approved for coverage under an alternative NPDES general permit, the applicability of this permit to the individual NPDES permittee is automatically terminated on the effective date of the individual permit or the date of approval for coverage under the alternative general permit, whichever the case may be.

D. Permit requirements when portions of a site are sold

If an operator obtains a permit for a development, and then the operator (permittee) sells off lots or parcels within that development, permit coverage must be continued on those lots until a Notice of Termination (NOT) in accordance with Part IV.B is submitted. For developments which require the use of centralized sediment and erosion controls (i.e., controls that address storm water runoff from one or more lots) for which the current permittee intends to terminate responsibilities under this permit for a lot after sale of the lot to a new owner and such termination will either prevent or impair the implementation of the controls and therefore jeopardize compliance with the terms and conditions of this permit, the permittee will be required to maintain responsibility for the implementation of those controls. For developments where this is not the case, it is the permittee's responsibility to temporarily stabilize all lots sold to individual lot owners unless an exception is approved in accordance with Part III.G.4. In cases where permit responsibilities for individual lot(s) will be terminated after sale of the lot, the permittee shall inform the individual lot owner of the obligations under this permit and ensure that the Individual Lot NOI application is submitted to Ohio EPA.

E. Authorization

1. Obtaining authorization to discharge. Operators that discharge storm water associated with construction activity must submit an NOI application form and Storm Water Pollution Prevention Plan (SWP3) if located within the Big Darby Creek watershed or portions of the Olentangy watershed in accordance with the requirements of Part I.F of this permit to obtain authorization to discharge under this general permit. As required under OAC Rule 3745-38-06(E), the director, in response to the NOI submission, will notify the applicant in writing that he/she has or has not been granted general permit coverage to discharge storm water associated with construction activity under the terms and conditions of this permit or that the applicant must apply for an individual NPDES permit or coverage under an alternate general NPDES permit as described in Part I.C.1.

2. No release from other requirements. No condition of this permit shall release the permittee from any responsibility or requirements under other environmental statutes or regulations. Other permit requirements commonly associated with construction activities include, but are not limited to, section 401 water quality certifications, isolated wetland permits, permits to install sanitary sewers or other devices that discharge or convey polluted water, permits to install drinking water lines, single lot sanitary system permits and disturbance of land which was used to operate a solid or hazardous waste facility (i.e., coverage under this NPDES general permit does not satisfy the requirements of OAC Rule 3745-27-13 or ORC Section 3734.02(H)). The issuance of this permit is subject to resolution of an antidegradation review. This permit does not relieve the permittee of other responsibilities associated with construction activities such as contacting the Ohio Department of Natural Resources, Division of Water, to ensure proper well installation and abandonment of wells.

F. Notice of Intent Requirements

1. Deadlines for notification.

   a. Initial coverage: Operators who intend to obtain initial coverage for a storm water discharge associated with construction activity under this general permit must submit a complete and accurate NOI application form, a completed Storm Water Pollution Prevention Plan (SWP3) for projects within the Big Darby Creek and portions of the Olentangy river watersheds and appropriate fee at least 21 days (or 45 days in the Big Darby Creek watershed and portions of the Olentangy watershed) prior to the commencement of construction activity. If more than one operator, as defined in Part VII of this general permit, will be engaged at a site, each operator shall seek coverage under this general permit prior to engaging in construction activities. Coverage under this permit is not effective until an approval letter granting coverage from the director of Ohio EPA is received by the applicant. Where one operator has already submitted an NOI prior to other operator(s) being identified, the additional operator shall request modification of coverage to become a co-permittee. In such instances, the co-permittees shall be covered under the same facility permit number. No additional permit fee is required.

   b. Individual lot transfer of coverage: Operators must each submit an individual lot notice of intent (Individual Lot NOI) application form (no fee required) to Ohio EPA at least seven days prior to the date that they intend to accept responsibility for permit requirements for their portion of the original permitted development from the previous permittee. Transfer of permit coverage is not granted until an approval letter from the director of Ohio EPA is received by the applicant.

2. Failure to notify. Operators who fail to notify the director of their intent to be covered and who discharge pollutants to surface waters of the state without an NPDES permit are in violation of ORC Chapter 6111. In such instances, Ohio EPA may bring an enforcement action for any discharges of storm water associated with construction activity.

3. How to submit an NOI. Operators seeking coverage under this permit must submit a complete and accurate Notice of Intent (NOI) application using Ohio EPA's electronic application form which is available through the Ohio EPA eBusiness Center at: **https://ebiz.epa.ohio.gov/**. Submission through the Ohio EPA eBusiness Center will

require establishing an Ohio EPA eBusiness Center account and obtaining a unique Personal Identification Number (PIN) for final submission of the NOI. Existing eBusiness Center account holders can access the NOI form through their existing account and submit using their existing PIN. Please see the following link for guidance: **http://epa.ohio.gov/dsw/ebs.aspx#170669803-streams-guidance**. Alternatively, if you are unable to access the NOI form through the agency eBusiness Center due to a demonstrated hardship, the NOI may be submitted on a paper NOI form provided by Ohio EPA. NOI information shall be typed on the form. Please contact Ohio EPA, Division of Surface Water at (614) 644-2001 if you wish to receive a paper NOI form.

4. Additional notification. NOIs and SWP3s are considered public documents and shall be made available to the public in accordance with Part III.C.2. The permittee shall make NOIs and SWP3s available upon request of the director of Ohio EPA, local agencies approving sediment and erosion control plans, grading plans or storm water management plans, local governmental officials, or operators of municipal separate storm sewer systems (MS4s) receiving drainage from the permitted site. Each operator that discharges to an NPDES permitted MS4 shall provide a copy of its Ohio EPA NOI submission to the MS4 in accordance with the MS4's requirements, if applicable.

5. Re-notification. Existing permittees having coverage under the previous generations of this general permit shall have continuing coverage under OHC000005 with the submittal of a timely renewal application. Within 180 days from the effective date of this permit, existing permittees shall submit the completed renewal application expressing their intent for continued coverage. In accordance with Ohio Administrative Code (OAC) 3745-38-02(E)(2)(a)(i), a renewal application fee will only apply to existing permittees having general permit coverage for 5 or more years as of the effective date of this general permit. Permit coverage will be terminated if Ohio EPA does not receive the renewal application within this 180-day period.

Part II. NON-NUMERIC EFFLUENT LIMITATIONS

You shall comply with the following non-numeric effluent limitations for discharges from your site and/or from construction support activities. Part III of this permit contains the specific design criteria to meet the objectives of the following non-numeric effluent limitations. You shall develop and implement the SWP3 in accordance with Part III of this permit to satisfy these non-numeric effluent limitations.

A. Erosion and Sediment Controls. You shall design, install and maintain effective erosion controls and sediment controls to minimize the discharge of pollutants. At a minimum, such controls shall be designed, installed and maintained to:

1. Control storm water volume and velocity within the site to minimize soil and stream erosion;

2. Control storm water discharges, including both peak flowrates and total storm water volume, to minimize erosion at outlets and to minimize downstream channel and streambank erosion;

3. Minimize the amount of soil exposed during construction activity;

4. Minimize the disturbance of steep slopes;

5. Minimize sediment discharges from the site. The design, installation and maintenance of erosion and sediment controls shall address factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting storm water runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site;

6. If feasible, provide and maintain a 50-foot undisturbed natural buffer around surface waters of the state, direct storm water to vegetated areas to increase sediment removal and maximize storm water infiltration. If it is infeasible to provide and maintain an undisturbed 50-foot natural buffer, you shall comply with the stabilization requirements found in Part II.B for areas within 50 feet of a surface water; and

7. Minimize soil compaction and, unless infeasible, preserve topsoil.

B. Soil Stabilization. Stabilization of disturbed areas shall, at a minimum, be initiated in accordance with the time frames specified in the following tables.

Table 1: Permanent Stabilization

Area requiring permanent stabilization	Time frame to apply erosion controls
Any areas that will lie dormant for one year or more	Within seven days of the most recent disturbance
Any areas within 50 feet of a surface water of the state and at final grade	Within two days of reaching final grade
Other areas at final grade	Within seven days of reaching final grade within that area

Table 2: Temporary Stabilization

Area requiring temporary stabilization	Time frame to apply erosion controls
Any disturbed areas within 50 feet of a surface water of the state and not at final grade	Within two days of the most recent disturbance if the area will remain idle for more than 14 days
Any disturbed areas that will be dormant for more than 14 days but less than one year, and not within 50 feet of a surface water of the state	Within seven days of the most recent disturbance within the area For residential subdivisions, disturbed areas must be stabilized at least seven days prior to transfer of permit coverage for the individual lot(s).
Disturbed areas that will be idle over winter	Prior to the onset of winter weather

Where vegetative stabilization techniques may cause structural instability or are otherwise unobtainable, alternative stabilization techniques must be employed. Permanent and temporary stabilization are defined in Part VII.

C. **Dewatering.** Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, are prohibited unless managed by appropriate controls.

D. **Pollution Prevention Measures.** Design, install, implement and maintain effective pollution prevention measures to minimize the discharge of pollutants. At a minimum, such measures must be designed, installed, implemented and maintained to:

1. Minimize the discharge of pollutants from equipment and vehicle washing, wheel washwater, and other washwaters. Washwaters shall be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;

2. Minimize the exposure of construction materials, products, and wastes; landscape materials, fertilizers, pesticides, and herbicides; detergents, sanitary waste and other materials present on the site to precipitation and to storm water; and

3. Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures.

E. **Prohibited Discharges.** The following discharges are prohibited:

1. Wastewater from washout of concrete, unless managed by an appropriate control;

2. Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;

3. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance; and

4. Soaps or solvents used in vehicle and equipment washing or all other waste water streams which could be subject to an individual NPDES permit (Part III.G.2.g).

F. **Surface Outlets**. When discharging from sediment basins utilize outlet structures that withdraw water from the surface, unless infeasible. (Note: Ohio EPA believes that the circumstances in which it is infeasible to design outlet structures in this manner are rare. Exceptions may include time periods with extended cold weather during winter months. If you have determined that it is infeasible to meet this requirement, you shall provide documentation in your SWP3 to support your determination.)

G. **Post-Construction Storm Water Management Controls**. So that receiving stream's physical, chemical and biological characteristics are protected, and stream functions are maintained, post-construction storm water practices shall provide long-term management of runoff quality and quantity.

PART III. STORM WATER POLLUTION PREVENTION PLAN (SWP3)

A. Storm Water Pollution Prevention Plans.

A SWP3 shall be developed for each site covered by this permit. For a multi-phase construction project, a separate NOI shall be submitted when a separate SWP3 will be prepared for

subsequent phases. SWP3s shall be prepared in accordance with sound engineering and/or conservation practices by a professional experienced in the design and implementation of standard erosion and sediment controls and storm water management practices addressing all phases of construction. The SWP3 shall clearly identify all activities which are required to be authorized under Section 401 and subject to an antidegradation review. The SWP3 shall identify potential sources of pollution which may reasonably be expected to affect the quality of storm water discharges associated with construction activities. The SWP3 shall be a comprehensive, stand-alone document, which is not complete unless it contains the information required by Part III.G of this permit. In addition, the SWP3 shall describe and ensure the implementation of best management practices (BMPs) that reduce the pollutants and impact of storm water discharges during construction and pollutants associated with the post-construction land use to ensure compliance with ORC Section 6111.04, OAC Chapter 3745-1 and the terms and conditions of this permit.

B. Timing.

An acceptable SWP3 shall be completed and submitted to the applicable regulated MS4 entity (for projects constructed entirely within a regulated MS4 area) prior to the timely submittal of an NOI. Projects within the Big Darby Creek and portions of the Olentangy watersheds must submit a SWP3 with the NOI. The SWP3 shall be updated in accordance with Part III.D. Submission of a SWP3 does not constitute review and approval on the part of Ohio EPA. Upon request and good cause shown, the director may waive the requirement to have a SWP3 completed at the time of NOI submission. If a waiver has been granted, the SWP3 must be completed prior to the initiation of construction activities. The SWP3 must be implemented upon initiation of construction activities.

In order to continue coverage from the previous generations of this permit, the permittee shall review and update the SWP3 to ensure that this permit's requirements are addressed within 180 days after the effective date of this permit. If it is infeasible for you to comply with a specific requirement in this permit because (1) the provision was not part of the permit you were previously covered under, and (2) because you are prevented from compliance due to the nature or location of earth disturbances that commenced prior to the effective date of this permit, you shall include documentation within your SWP3 of the reasons why it is infeasible for you to meet the specific requirement.

Examples of OHC000005 permit conditions that would be infeasible for permittees renewing coverage to comply with include:

- OHC000005 post-construction requirements, for projects that obtained NPDES construction storm water coverage and started construction activities prior to the effective date of this permit;

- OHC000005 post-construction requirements, for multi-phase development projects with an existing regional post-construction BMP issued under previous NPDES post-construction requirements. This only applies to construction sites authorized under Ohio EPA's Construction Storm Water Permits issued after April 20, 2003;

- OHC000005 post-construction requirements, for renewing or initial coverage and you have a SWP3 approved locally and you will start construction within 180 days of the effective date of this permit;

- Sediment settling pond design requirements, if the general permit coverage was obtained prior to April 21, 2013 and the sediment settling pond has been installed; or

- Case-by-case situations approved by the Director.

C. SWP3 Signature and Review.

1. Plan Signature and Retention On-Site. The SWP3 shall include the certification in Part V.H, be signed in accordance with Part V.G., and be retained on site during working hours.

2. Plan Availability

   a. On-site: The plan shall be made available immediately upon request of the director or his authorized representative and MS4 operators or their authorized representative during working hours. A copy of the NOI and letter granting permit coverage under this general permit also shall be made available at the site.

   b. By written request: The permittee must provide the most recent copy of the SWP3 within 7 days upon written request by any of the following:

      i. The director or the director's authorized representative;

      ii. A local agency approving sediment and erosion plans, grading plans or storm water management plans; or

      iii. In the case of a storm water discharge associated with construction activity which discharges through a municipal separate storm sewer system with an NPDES permit, to the operator of the system.

   c. To the public: All NOIs, general permit approval for coverage letters, and SWP3s are considered reports that shall be available to the public in accordance with the Ohio Public Records law. The permittee shall make documents available to the public upon request or provide a copy at public expense, at cost, in a timely manner. However, the permittee may claim to Ohio EPA any portion of an SWP3 as confidential in accordance with Ohio law.

3. Plan Revision. The director or authorized representative may notify the permittee at any time that the SWP3 does not meet one or more of the minimum requirements of this part. Within 10 days after such notification from the director or authorized representative (or as otherwise provided in the notification), the permittee shall make the required changes to the SWP3 and shall submit to Ohio EPA the revised SWP3 or a written certification that the requested changes have been made.

D. Amendments.

The permittee shall amend the SWP3 whenever there is a change in design, construction, operation or maintenance, which has a significant effect on the potential for the discharge of pollutants to surface waters of the state or if the SWP3 proves to be ineffective in achieving the

general objectives of controlling pollutants in storm water discharges associated with construction activity. Amendments to the SWP3 may be reviewed by Ohio EPA in the same manner as Part III.C.

E. Duty to inform contractors and subcontractors.

The permittee shall inform all contractors and subcontractors not otherwise defined as "operators" in Part VII of this general permit who will be involved in the implementation of the SWP3 of the terms and conditions of this general permit. The permittee shall maintain a written document containing the signatures of all contractors and subcontractors involved in the implementation of the SWP3 as proof acknowledging that they reviewed and understand the conditions and responsibilities of the SWP3. The written document shall be created, and signatures shall be obtained prior to commencement of earth disturbing activity on the construction site.

F. Total Maximum Daily Load (TMDL) allocations.

If a TMDL is approved for any waterbody into which the permittee's site discharges and requires specific BMPs for construction sites, the director may require the permittee to revise his/her SWP3. Specific conditions have been provided in Appendix A (for the Big Darby Creek Watershed) and Appendix B (for portions of the Olentangy river watershed).

G. SWP3 Requirements.

Operations that discharge storm water from construction activities are subject to the following requirements and the SWP3 shall include the following items:

1. Site description. Each SWP3 shall provide:

    a. A description of the nature and type of the construction activity (e.g., low density residential, shopping mall, highway, etc.);

    b. Total area of the site and the area of the site that is expected to be disturbed (i.e., grubbing, clearing, excavation, filling or grading, including off-site borrow areas);

    c. A measure of the impervious area and percent imperviousness created by the construction activity (existing, new and total impervious area after construction);

    d. Storm water calculations, including the volumetric runoff coefficients for both the pre-construction and post- construction site conditions, and resulting water quality volume; design details for post-construction storm water facilities and pretreatment practices such as contributing drainage areas, capacities, elevations, outlet details and drain times shall be included in the SWP3; and if applicable, explanation of the use of existing post-construction facilities. Ohio EPA recommends the use of data sheets (see Ohio's Rainwater and Land Development manual and Ohio EPA resources for examples);

    e. Existing data describing the soil and, if available, the quality of any discharge from the site;

f. A description of prior land uses at the site;

g. A description of the condition of any on-site streams (e.g. prior channelization, bed instability or headcuts, channels on public maintenance, or natural channels);

h. An implementation schedule which describes the sequence of major construction operations (i.e., designation of vegetative preservation areas, grubbing, excavating, grading, utilities, infrastructure installation and others) and the implementation of erosion, sediment and storm water management practices or facilities to be employed during each operation of the sequence;

i. The name and/or location of the immediate receiving stream or surface water(s) and the first subsequent named receiving water(s) and the areal extent and description of wetlands or other special aquatic sites at or near the site which will be disturbed, or which will receive discharges from disturbed areas of the project. For discharges to an MS4, the point of discharge to the MS4 and the location where the MS4 ultimately discharges to a stream or surface water of the state shall be indicated;

j. For subdivided developments, a detail drawing of individual parcels with their erosion, sediment or storm water control practices and/or a typical individual lot showing standard individual lot erosion and sediment control practices.

   A typical individual lot drawing does not remove the responsibility to designate specific erosion and sediment control practices in the SWP3 for critical areas such as steep slopes, stream banks, drainage ways and riparian zones;

k. Location and description of any storm water discharges associated with dedicated asphalt and dedicated concrete plants covered by this permit and the best management practices to address pollutants in these storm water discharges;

l. A cover page or title identifying the name and location of the site, the name and contact information of all construction site operators, the name and contact information for the person responsible for authorizing and amending the SWP3, preparation date, and the estimated dates that construction will start and be complete;

m. A log documenting grading and stabilization activities as well as amendments to the SWP3, which occur after construction activities commence; and

n. Site map showing:

   i. Limits of earth-disturbing activity of the site including associated off-site borrow or spoil areas that are not addressed by a separate NOI and associated SWP3;

   ii. Soils types for all areas of the site, including locations of unstable or highly erodible and/or known contaminated soils;

iii. Existing and proposed contours. A delineation of drainage watersheds expected during and after major grading activities as well as the size of each drainage watershed, in acres;

iv. The location of any delineated boundary for required riparian setbacks;

v. Conservation easements or areas designated as open space, preserved vegetation or otherwise protected from earth disturbing activities. A description of any associated temporary or permanent fencing or signage;

vi. Surface water locations including springs, wetlands, streams, lakes, water wells, etc., on or within 200 feet of the site, including the boundaries of wetlands or stream channels and first subsequent named receiving water(s) the permittee intends to fill or relocate for which the permittee is seeking approval from the Army Corps of Engineers and/or Ohio EPA;

vii. Existing and planned locations of buildings, roads, parking facilities and utilities;

viii. The location of all erosion and sediment control practices, including the location of areas likely to require temporary stabilization during site development;

ix. Sediment traps and basins noting their sediment storage and dewatering (detention) volume and contributing drainage area. Ohio EPA recommends the use of data sheets (see Ohio EPA's Rainwater and Land Development manual and website for examples) to provide data for all sediment traps and basins noting important inputs to design and resulting parameters such as their contributing drainage area, disturbed area, detention volume, sediment storage volume, practice surface area, dewatering time, outlet type and dimensions;

x. The location of permanent storm water management practices (new and existing) including pretreatment practices to be used to control pollutants in storm water after construction operations have been completed along with the location of existing and planned drainage features including catch basins, culverts, ditches, swales, surface inlets and outlet structures;

xi. Areas designated for the storage or disposal of solid, sanitary and toxic wastes, including dumpster areas, areas designated for cement truck washout, and vehicle fueling;

xii. The location of designated construction entrances where the vehicles will access the construction site; and

xiii. The location of any areas of proposed floodplain fill, floodplain excavation, stream restoration or known temporary or permanent stream crossings.

2. Controls. In accordance with Part II.A, the SWP3 shall contain a description of the controls appropriate for each construction operation covered by this permit and the operator(s) shall implement such controls. The SWP3 shall clearly describe for each major construction activity identified in Part III.G.1.h: (a) appropriate control measures and the general timing (or sequence) during the construction process that the measures will be implemented; and (b) which contractor is responsible for implementation (e.g., contractor A will clear land and install perimeter controls and contractor B will maintain perimeter controls until final stabilization). The SWP3 shall identify the subcontractors engaged in activities that could impact storm water runoff. The SWP3 shall contain signatures from all of the identified subcontractors indicating that they have been informed and understand their roles and responsibilities in complying with the SWP3. Ohio EPA recommends that the primary site operator review the SWP3 with the primary contractor prior to commencement of construction activities and keep a SWP3 training log to demonstrate that this review has occurred.

   Ohio EPA recommends that the erosion, sediment, and storm water management practices used to satisfy the conditions of this permit should meet the standards and specifications in the most current edition of Ohio's Rainwater and Land Development (see definitions) manual or other standards acceptable to Ohio EPA. The controls shall include the following minimum components:

   a. Preservation Methods. The SWP3 shall make use of practices which preserve the existing natural condition as much as feasible. Such practices may include: preserving existing vegetation, vegetative buffer strips, and existing soil profile and topsoil; phasing of construction operations to minimize the amount of disturbed land at any one time; and designation of tree preservation areas or other protective clearing or grubbing practices. For all construction activities immediately adjacent to surface waters of the state, the permittee shall comply with the buffer non-numeric effluent limitation in Part II.A.6, as measured from the ordinary high water mark of the surface water.

   b. Erosion Control Practices. The SWP3 shall make use of erosion controls that provide cover over disturbed soils unless an exception is approved in accordance with Part III.G.4. A description of control practices designed to re-establish vegetation or suitable cover on disturbed areas after grading shall be included in the SWP3. The SWP3 shall provide specifications for stabilization of all disturbed areas of the site and provide guidance as to which method of stabilization will be employed for any time of the year. Such practices may include: temporary seeding, permanent seeding, mulching, matting, sod stabilization, vegetative buffer strips, phasing of construction operations, use of construction entrances and the use of alternative ground cover.

      i. **Stabilization.** Disturbed areas shall be stabilized in accordance with Table 1 (Permanent Stabilization) and Table 2 (Temporary Stabilization) in Part II.B of this permit.

      ii. **Permanent stabilization of conveyance channels**. Operators shall undertake special measures to stabilize channels and outfalls and prevent erosive flows. Measures may include seeding, dormant seeding (as defined in the most current edition of the Rainwater and Land

Development manual), mulching, erosion control matting, sodding, riprap, natural channel design with bioengineering techniques or rock check dams.

c. Runoff Control Practices. The SWP3 shall incorporate measures which control the flow of runoff from disturbed areas so as to prevent erosion from occurring. Such practices may include rock check dams, pipe slope drains, diversions to direct flow away from exposed soils and protective grading practices. These practices shall divert runoff away from disturbed areas and steep slopes where practicable. Velocity dissipation devices shall be placed at discharge locations and along the length of any outfall channel to provide non-erosive flow velocity from the structure to a water course so that the natural physical and biological characteristics and functions are maintained and protected.

d. Sediment Control Practices. The plan shall include a description of structural practices that shall store runoff allowing sediments to settle and/or divert flows away from exposed soils or otherwise limit runoff from exposed areas. Structural practices shall be used to control erosion and trap sediment from a site remaining disturbed for more than 14 days. Such practices may include, among others: sediment settling ponds, sediment barriers, earth diversion dikes or channels which direct runoff to a sediment settling pond and storm drain inlet protection. All sediment control practices must be capable of ponding runoff in order to be considered functional. Earth diversion dikes or channels alone are not considered a sediment control practice unless those are used in conjunction with a sediment settling pond.

The SWP3 shall contain detail drawings for all structural practices.

i. **Timing.** Sediment control structures shall be functional throughout the course of earth disturbing activity. Sediment basins and perimeter sediment barriers shall be implemented prior to grading and within seven days from the start of grubbing. They shall continue to function until the upslope development area is stabilized with permanent cover. As construction progresses and the topography is altered, appropriate controls shall be constructed, or existing controls altered to address the changing drainage patterns.

ii. **Sediment settling ponds.** A sediment settling pond is required for any one of the following conditions:

- Concentrated or collected storm water runoff (e.g., storm sewer or ditch);
- Runoff from drainage areas, which exceed the design capacity of silt fence or other sediment barriers; or
- Runoff from drainage areas that exceed the design capacity of inlet protection.

The permittee may request approval from Ohio EPA to use alternative controls if the permittee can demonstrate the alternative controls are equivalent in effectiveness to a sediment settling pond.

In accordance with Part II.F, if feasible, sediment settling ponds shall be dewatered at the pond surface using a skimmer or equivalent device. The sediment settling pond volume consists of both a dewatering zone and a sediment storage zone. The volume of the dewatering zone shall be a minimum of 1800 cubic feet (ft^3) per acre of drainage (67 yd^3/acre) with a minimum 48-hour drain time. The volume of the sediment storage zone shall be calculated by one of the following methods:

Method 1: The volume of the sediment storage zone shall be 1000 ft^3 per disturbed acre within the watershed of the basin. OR

Method 2: The volume of the sediment storage zone shall be the volume necessary to store the sediment as calculated with RUSLE or a similar generally accepted erosion prediction model.

Accumulated sediment shall be removed from the sediment storage zone once it exceeds 50 percent of the minimum required sediment storage design capacity and prior to the conversion to the post-construction practice unless suitable storage is demonstrated based upon over-design. When determining the total contributing drainage area, off-site areas and areas which remain undisturbed by construction activity shall be included unless runoff from these areas is diverted away from the sediment settling pond and is not co-mingled with sediment-laden runoff. The depth of the dewatering zone shall be less than or equal to five feet. The configuration between inlets and the outlet of the basin shall provide at least two units of length for each one unit of width (≥ 2:1 length:width ratio); however, a length to width ratio of 4:1 is recommended. When designing sediment settling ponds, the permittee shall consider public safety, especially as it relates to children, as a design factor for the sediment basin and alternative sediment controls shall be used where site limitations would preclude a safe design. Combining multiple sediment and erosion control measures in order to maximize pollutant removal is encouraged.

iii. **Sediment Barriers and Diversions.** Sheet flow runoff from denuded areas shall be intercepted by sediment barriers or diversions to protect adjacent properties and water resources from sediment transported via sheet flow. Where intended to provide sediment control, silt fence shall be placed on a level contour downslope of the disturbed area. For most applications, standard silt fence may be substituted with a 12-inch diameter sediment barrier. The relationship between the maximum drainage area to sediment barrier for a particular slope range is shown in the following table:

Table 3 Sediment Barrier Maximum Drainage Area Based on Slope

Maximum drainage area (in acres) to 100 linear feet of sediment barrier	Range of slope for a particular drainage area (in percent)
0.5	< 2%
0.25	≥ 2% but < 20%
0.125	≥ 20% but < 50%

Placing sediment barriers in a parallel series does not extend the size of the drainage area. Storm water diversion practices shall be used to keep runoff away from disturbed areas and steep slopes where practicable. Diversion practices, which include swales, dikes or berms, may receive storm water runoff from areas up to 10 acres.

iv. **Inlet Protection.** Other erosion and sediment control practices shall minimize sediment laden water entering active storm drain systems. All inlets receiving runoff from drainage areas of one or more acres will require a sediment settling pond.

v. **Surface Waters of the State Protection.** If construction activities disturb areas adjacent to surface waters of the state, structural practices shall be designed and implemented on site to protect all adjacent surface waters of the state from the impacts of sediment runoff. No structural sediment controls (e.g., the installation of silt fence or a sediment settling pond) shall be used in a surface water of the state. For all construction activities immediately adjacent to surface waters of the state, the permittee shall comply with the buffer non-numeric effluent limitation in Part II.A.6, as measured from the ordinary high water mark of the surface water. Where impacts within this buffer area are unavoidable, due to the nature of the construction (e.g., stream crossings for roads or utilities), the project shall be designed such that the number of stream crossings and the width of the disturbance within the buffer area are minimized.

vi. **Modifying Controls**. If periodic inspections or other information indicates a control has been used inappropriately or incorrectly, the permittee shall replace or modify the control for site conditions.

e. Post-Construction Storm Water Management Requirements. So that receiving stream's physical, chemical and biological characteristics are protected, and stream functions are maintained, post-construction storm water practices shall provide long-term management of runoff quality and quantity. To meet the post-construction requirements of this permit, the SWP3 shall contain a description of the post-construction BMPs that will be installed during construction for the site and the rationale for their selection. The rationale shall address the anticipated impacts on the channel and floodplain morphology, hydrology, and water quality. Post-construction BMPs cannot be installed within a surface water of the state (e.g., wetland or stream) unless it is authorized by a CWA 401 water quality certification, CWA 404 permit, or Ohio EPA non-jurisdictional wetland/stream program approval. Note: local jurisdictions may have more stringent post-construction requirements.

Detail drawings and maintenance plans shall be provided for all post-construction BMPs in the SWP3. Maintenance plans shall be provided by the permittee to the post-construction operator of the site (including homeowner associations) upon completion of construction activities (prior to termination of permit coverage). Maintenance plans shall ensure that pollutants collected within structural post-construction practices are disposed of in accordance with local, state, and federal regulations. To ensure that storm water management systems function as

designed and constructed, the post-construction operation and maintenance plan shall be a stand-alone document which contains: (1) a designated entity for storm water inspection and maintenance responsibilities; (2) the routine and non-routine maintenance tasks to be undertaken; (3) a schedule for inspection and maintenance; (4) any necessary legally binding maintenance easements and agreements; (5) construction drawings or excerpts showing the plan view, profile and details of the outlet(s); (6) a map showing all access and maintenance easements; and (7) for table 4a/4b practices, provide relevant elevations and associated volumes that dictate when removal of accumulated sediments must occur. Permittees are responsible for assuring all post-construction practices meet plan specifications and intended post-construction conditions have been met (e.g., sediment removed from, and sediment storage restored to, permanent pools, sediment control outlets removed and replaced with permanent post-construction discharge structures, and all slopes and drainageways permanently stabilized), but are not responsible under this permit for operation and maintenance of post-construction practices once coverage under this permit is terminated.

Post-construction storm water BMPs that discharge pollutants from point sources once construction is completed may in themselves need authorization under a separate NPDES permit (one example is storm water discharges from regulated industrial sites).

Construction activities that do not include the installation of any impervious surface (e.g., park lands), abandoned mine land reclamation activities regulated by the Ohio Department of Natural Resources, stream and wetland restoration activities, and wetland mitigation activities are not required to comply with the conditions of Part III.G.2.e of this permit. Linear construction projects (e.g., pipeline or utility line installation) which do not result in the installation of additional impervious surface are not required to comply with the conditions of Part III.G.2.e of this permit. However, linear construction projects shall be designed to minimize the number of stream crossings and the width of disturbance, and to achieve final stabilization of the disturbed area as defined in Part VII.M.1.

For all construction activities that will disturb two or more acres of land or will disturb less than two acres that are part of a larger common plan of development or sale which will disturb two or more acres of land, the post construction BMP(s) chosen shall be able to manage storm water runoff for protection of stream channels, stream stability, and water quality. The BMP(s) chosen must be compatible with site and soil conditions. Structural post-construction storm water treatment practices shall be incorporated into the permanent drainage system for the site. The BMP(s) chosen must be sized to treat the water quality volume (WQ_v) and ensure compliance with Ohio's Water Quality Standards in OAC Chapter 3745-1. The WQ_v shall be equivalent to the volume of runoff from a 0.90-inch rainfall and shall be determined using the following equations:

$$WQ_v = Rv * P * A / 12 \quad \text{(Equation 1)}$$

where:
WQ_v = water quality volume in acre-feet
Rv = the volumetric runoff coefficient calculated using equation 2
P = 0.90 inch precipitation depth
A = area draining into the BMP in acres

$$Rv = 0.05 + 0.9i \quad \text{(Equation 2)}$$

where i = fraction of post-construction impervious surface

An additional volume equal to 20 percent of the WQ_v shall be incorporated into the BMP for sediment storage. Ohio EPA recommends BMPs be designed according to the methodology described in the most current edition of the Rainwater and Land Development manual or in another design manual acceptable for use by Ohio EPA.

The BMPs listed in Tables 4a and 4b below are considered standard BMPs approved for general use. However, communities with a regulated MS4 may limit the use of some of these BMPs. BMPs shall be designed such that the drain time is long enough to provide treatment but short enough to provide storage for successive rainfall events and avoid the creation of nuisance conditions. The outlet structure for the post-construction BMP shall not discharge more than the first half of the WQv in less than one-third of the drain time. The WQv is the volume of storm water runoff that must be detained by a post-construction practice as specified by the most recent edition of the Rainwater and Land Development manual.

Post-construction practices shall be sized to treat 100% of the WQv associated with their contributing drainage area. If there is an existing post-construction BMP that treats runoff from the disturbed area and the BMP meets the post-construction requirements of this permit, no additional post-construction BMP will be required. A regional storm water BMP may be used to meet the post-construction requirement if: (1) the BMP meets the design requirements for treating the WQv; and (2) a legal agreement is established through which the regional BMP owner or operator agrees to provide this service in the long term. Design information for such facilities such as contributing drainage areas, capacities, elevations, outlet details and drain times shall be included in the SWP3.

Table 4a Extended Detention Post-Construction Practices with Minimum Drain Times

Extended Detention Practices	Minimum Drain Time of WQv
Wet Extended Detention Basin[1,2]	24 hours
Constructed Extended Detention Wetland[1,2]	24 hours
Dry Extended Detention Basin[1,3]	48 hours
Permeable Pavement – Extended Detention[1]	24 hours
Underground Storage – Extended Detention[1,4]	24 hours
Sand & Other Media Filtration - Extended Detention[1, 5]	24 hours

Notes:

1. The outlet structure shall not discharge more than the first half of the WQv in less than one-third of the drain time.
2. Provide a permanent pool with a minimum volume equal to the WQv and an extended detention volume above the permanent pool equal to 1.0 x WQv.
3. Dry basins must include a forebay and a micropool each sized at a minimum of 0.1 x WQv and a protected outlet, or include acceptable pretreatment and a protected outlet.
4. Underground storage must have pretreatment for removal of suspended sediments included in the design and documented in the SWP3. This pretreatment shall concentrate sediment in a location where it can be readily removed. For non-infiltrating, underground extended detention systems, pretreatment shall be 50% effective at capturing total suspended solids according to the testing protocol established in the Alternative Post-Construction BMP Testing Protocol.
5. The WQv ponding area shall completely empty between 24 and 72 hours.

Table 4b Infiltration Post-Construction Practices with Maximum Drain Times

Infiltration Practices	Maximum Drain Time of WQv
Bioretention Area/Cell[1,2]	24 hours
Infiltration Basin[2]	24 hours
Infiltration Trench[3]	48 hours
Permeable Pavement – Infiltration[3]	48 hours
Underground Storage – Infiltration[3,4]	48 hours

Notes:
1. Bioretention soil media shall have a permeability of approximately 1 – 4 in/hr. Meeting the soil media specifications in the Rainwater and Land Development manual is considered compliant with this requirement. Bioretention cells must have underdrains unless in-situ conditions allow for the WQv (surface ponding) plus the bioretention soil (to a depth of 24 inches) to drain completely within 48 hours.
2. Infiltrating practices with the WQv stored aboveground (bioretention, infiltration basin) shall fully drain the WQv within 24 hours to minimize nuisance effects of standing water and to promote vigorous communities of appropriate vegetation.
3. Subsurface practices designed to fully infiltrate the WQv (infiltration trench, permeable pavement with infiltration, underground storage with infiltration) shall empty within 48 hours to recover storage for subsequent storm events.
4. Underground storage systems with infiltration must have adequate pretreatment of suspended sediments included in the design and documented in the SWP3 in order to minimize clogging of the infiltrating surface. Pretreatment shall concentrate sediment in a location where it can be readily removed. Examples include media filters situated upstream of the storage or other suitable alternative approved by Ohio EPA. For infiltrating underground systems, pretreatment shall be 80% effective at capturing total suspended solids according to the testing protocol established in the Alternative Post-Construction BMP Testing Protocol.

Small Construction Activities. For all construction activities authorized under this permit which result in a disturbance less than 2 acres, a post-construction practice shall be used to treat storm water runoff for pollutants and to reduce adverse impacts on receiving waters. The applicant must provide a justification in the SWP3 why the use of table 4a and 4b practices are not feasible. The justification must address limiting factors which would prohibit the project going forward should table 4a and 4b practices be required. Please note that additional practices selected will require approval from the regulated MS4. The use of green infrastructure BMPs such as runoff reducing practices is also encouraged.

Transportation Projects. The construction of new roads and roadway improvement projects by public entities (i.e., the state, counties, townships, cities, or villages) may implement post-construction BMPs in compliance with the current version (as of the effective date of this permit) of the Ohio Department of Transportation's "Location and Design Manual, Volume Two Drainage Design" that has been accepted by Ohio EPA as an alternative to the conditions of this permit.

Offsite Mitigation of Post-Construction. Ohio EPA may authorize the offsite mitigation of the post-construction requirements of Part III.G.2.e of this permit on a case by case basis provided the permittee clearly demonstrates the BMPs listed in Tables 4a and 4b are not feasible and the following criteria are met: (1) a maintenance agreement or policy is established to ensure operations and treatment long-term; (2) the offsite location discharges to the same HUC-12 watershed unit; and (3) the mitigation ratio of the WQv is 1.5 to 1 or the WQv at the point of retrofit, whichever is greater. Requests for offsite mitigation must be received prior to receipt of the NOI application.

Previously Developed Areas - Ohio EPA encourages the redevelopment of previously graded, paved or built upon sites through a reduction of the WQv treatment requirement. For a previously developed area, one or a combination of the following two conditions shall be met:

- A 20 percent net reduction of the site's volumetric runoff coefficient through impervious area reduction with soil restoration or replacing impervious roof area with green roof area (for these purposes green roofs shall be considered pervious surface) or
- Treatment of 20 percent of the WQv for the previously developed area using a practice meeting Table 4a/4b criteria.

Where there is a combination of redeveloped areas and new development, a weighted approached shall be used with the following equation:

$$WQv = P * A * [(Rv_1 * 0.2) + (Rv_2 - Rv_1)] / 12 \qquad \text{(Equation 3)}$$

where

P = 0.90 inches
A = area draining into the BMP in acres
Rv_1 = volumetric runoff coefficient for existing conditions (current site impervious area)
Rv_2 = volumetric runoff coefficient for proposed conditions (post-construction site impervious area)

Post-construction practices shall be located to treat impervious areas most likely to generate the highest pollutant load, such as parking lots or roadways, rather than areas predicted to be cleaner such as rooftops.

Runoff Reduction Practices. The size of structural post-construction practices used to capture and treat the WQv can be reduced by incorporating runoff

reducing practices into the design of the site's drainage system. The approach to calculate and document runoff reduction is detailed in the Rainwater and Land Development Manual. BMP-specific runoff reduction volumes are set by specifications in the Rainwater and Land Development Manual for the following practices:

- Impervious surface disconnection
- Rainwater harvesting
- Bioretention
- Infiltration basin
- Infiltration trench
- Permeable pavement with infiltration
- Underground storage with infiltration
- Grass swale
- Sheet flow to filter strip
- Sheet flow to conservation area

A runoff reduction approach may be used to meet the groundwater recharge requirements in the Big Darby Creek Watershed. The runoff reduction practices used for groundwater recharge may be used to reduce the WQv requirement, see appendix A for details on groundwater recharge requirements.

In order to promote the implementation of green infrastructure, the Director may consider the use of runoff reducing practices to demonstrate compliance with Part III.G.2.e of this permit for areas of the site not draining into a common drainage system of the site, e.g., sheet flow from perimeter areas such as the rear yards of residential lots, low density development scenarios, or where the permittee can demonstrate that the intent of pollutant removal and stream protection, as required in Part III.G.2.e of this permit is being addressed through non-structural post-construction BMPs based upon review and approval by Ohio EPA.

Use of Alternative Post-Construction BMPs. This permit does not preclude the use of innovative or experimental post-construction storm water management technologies. Alternative post-construction BMPs shall previously have been tested to confirm storm water treatment efficacy equivalent to those BMPs listed in Tables 4a and 4b using the protocol described in this section. BMP testing may include laboratory testing, field testing, or both.

Permittees shall request approval from Ohio EPA to use alternative post-construction BMPs on a case-by-case basis. To use an alternative post-construction BMP, the permittee must demonstrate that use of a BMP listed in Tables 4a and 4b is not feasible and the proposed alternative post-construction BMP meets the minimum treatment criteria as described in this section. The permittee shall submit an application to Ohio EPA for any proposed alternative post-construction BMP. Where the development project is located within a regulated municipal separate storm sewer system (MS4) community, the use of an alternative practice requires pre-approval by the MS4 before submittal of the

Ohio EPA permit application. Ohio EPA requires that approvals for alternative post-construction BMPs are finalized before permittees submit an NOI for permit coverage.

In addition to meeting sediment removal criteria, the discharge rate from the proposed alternative practice shall be reduced to prevent stream bed erosion and protect the physical and biological stream integrity unless there will be negligible hydrological impact to the receiving surface water of the state. Discharge rate is considered to have a negligible impact if the permittee can demonstrate that one of the following three conditions exist:

i. The entire WQv is recharged to groundwater;
ii. The larger common plan of development or sale will create less than one acre of impervious surface;
iii. The storm water drainage system of the development discharges directly into a large river with drainage area equal to 100 square miles or larger upstream of the development site or to a lake where the development area is less than 5 percent of the watershed area, unless a TMDL has identified water quality problems into the receiving surface waters of the state.

If the conditions above that minimize the potential for hydrological impact to the receiving surface water of the state do not exist, then the alternative post-construction BMP must prevent stream erosion by reducing the flow rate from the WQ_V. In such cases, discharge of the WQ_V must be controlled. A second storm water BMP that provides extended detention of the WQv may be needed to meet the post-construction criteria.

Alternative Post-Construction BMP Testing Protocol. For laboratory testing, the alternative BMP shall be tested using sediment with a specific gravity of 2.65, a particle size distribution closely matching the distribution shown in Table 5, and total suspended sediment (TSS) concentrations within 10% of 200 mg/L (180 mg/L – 220 mg/L TSS). For an alternative BMP to be acceptable, the test results must demonstrate that the minimum treatment rate is 80% TSS removal at the design flow rate for the tested BMP.

Table 5 Particle Size Distribution for Testing Alternative Post-Construction BMPs

Particle Size (microns)	Percent Finer (%)
1,000	100
500	95
250	90
150	75
100	60
75	50
50	45
20	35
8	20
5	10
2	5

- For field testing, the alternative BMP shall be tested using storm water runoff

from the field, not altered by adding aggregate or subjecting to unusually high sediment loads such as those from unstabilized construction disturbance. The storm water runoff used for field testing shall be representative of runoff from the proposed installation site for the alternative BMP after all construction activities have ceased and the ground has been stabilized. The influent and effluent TSS concentrations of storm water runoff must be collected in the field. For an alternative BMP to be acceptable, the test results must demonstrate the minimum treatment rate is 80% TSS removal for influent concentrations equal to or greater than 100 mg/L TSS. If the influent concentration to the proposed alternative BMP is less than 100 mg/L TSS in the field, then the BMP must achieve an average effluent concentration less than or equal to 20 mg/L TSS.

- Testing of alternative post-construction BMPs shall be performed or overseen by a qualified independent, third-party testing organization;

- Testing shall demonstrate the maximum flow rate at which the alternative post-construction BMP can achieve the necessary treatment efficacy, including consideration for the potential of sediment resuspension;

- Testing shall demonstrate the maximum volume of sediment and floatables that can be collected in the alternative post-construction BMP before pollutants must be removed to maintain 80% treatment efficacy;

- Testing shall indicate the recommended maintenance frequency and maintenance protocol to ensure ongoing performance of the alternative post-construction BMP.

The alternative post-construction BMP testing protocol described in this section is similar to testing requirements specified by the New Jersey Department of Environmental Protection (NJDEP) for storm water Manufactured Treatment Devices (MTD) and therefore testing results certified by NJDEP shall be accepted by Ohio EPA. For examples of BMPs that have been tested using New Jersey Department of Environmental Protection's procedures, see the website: www.njstormwater.org.

Another nationally recognized storm water product testing procedure is the Technology Assessment Protocol – Ecology (TAPE) administered by the State of Washington, Department of Ecology. The TAPE testing procedure describes testing to achieve 80% TSS removal using a sediment mix with a particle size distribution with approximately 75% of the mass of the aggregate with particle diameters less than 45 microns. Overall, this particle size distribution is finer than the distribution in Table 5. Therefore, if TAPE testing results are available for a proposed alternative post-construction BMP, those results shall be accepted by Ohio EPA. The State of Washington, Department of Ecology website is https://ecology.wa.gov/.

Alternative BMPs that utilize treatment processes such as filtering or centrifugal separation, rather than a detention and settling volume, must be designed to ensure treatment of 90 percent of the average annual runoff

volume. For the design of these BMPs, the water quality flow rate (WQF) considered equivalent to the Water Quality Volume (WQv) shall be determined utilizing the Rational Method (Equation 4) with an intensity (i) appropriate for the water quality precipitation event. This intensity shall be calculated using the table given in Appendix C.

$$WQF = C * i * A \qquad \text{(Equation 4)}$$

Where

WQF = water quality flow rate in cubic feet per second (cfs)
C = rational method runoff coefficient
i = intensity (in/hr)
A = area draining to the BMP (acres)

Alternative post-construction BMPs may include, but are not limited to: vegetated swales, vegetated filter strips, hydrodynamic separators, high-flow media filters, cartridge filters, membrane filters, subsurface flow wetlands, multi-chamber treatment trains, road shoulder media filter drains, wetland channels, rain barrels, green roofs, and rain gardens. The Director may also consider non-structural post-construction approaches.

f. Surface Water Protection. If the project site contains any streams, rivers, lakes, wetlands or other surface waters, certain construction activities at the site may be regulated under the CWA and/or state isolated wetland permit requirements. Sections 404 and 401 of the Act regulate the discharge of dredged or fill material into surface waters and the impacts of such activities on water quality, respectively. Construction activities in surface waters which may be subject to CWA regulation and/or state isolated wetland permit requirements include, but are not limited to: sewer line crossings, grading, backfilling or culverting streams, filling wetlands, road and utility line construction, bridge installation and installation of flow control structures. If the project contains streams, rivers, lakes or wetlands or possible wetlands, the permittee shall contact the appropriate U.S. Army Corps of Engineers District Office. (CAUTION: Any area of seasonally wet hydric soil is a potential wetland - please consult the Soil Survey and list of hydric soils for your County, available at your county's Soil and Water Conservation District. If you have any questions about Section 401 water quality certification, please contact the Ohio Environmental Protection Agency, Section 401 Coordinator.)

U.S. Army Corps of Engineers (Section 404 regulation):

- Huntington, WV District (304) 399-5210 (Muskingum River, Hocking River, Scioto River, Little Miami River, and Great Miami River Basins)
- Buffalo, NY District (716) 879-4330 (Lake Erie Basin)
- Pittsburgh, PA District (412) 395-7155 (Mahoning River Basin)
- Louisville, KY District (502) 315-6686 (Ohio River)

Ohio EPA 401/404 and non-jurisdictional stream/wetland coordinator can be contacted at (614) 644-2001 (all of Ohio)

Concentrated storm water runoff from BMPs to natural wetlands shall be converted to diffuse flow before the runoff enters the wetlands. The flow should be released such that no erosion occurs downslope. Level spreaders may need to be placed in series, particularly on steep sloped sites, to ensure non-erosive velocities. Other structural BMPs may be used between storm water features and natural wetlands, in order to protect the natural hydrology, hydroperiod, and wetland flora. If the applicant proposes to discharge to natural wetlands, a hydrologic analysis shall be performed. The applicant shall attempt to match the pre-development hydroperiods and hydrodynamics that support the wetland. The applicant shall assess whether their construction activity will adversely impact the hydrologic flora and fauna of the wetland. Practices such as vegetative buffers, infiltration basins, conservation of forest cover, and the preservation of intermittent streams, depressions, and drainage corridors may be used to maintain wetland hydrology.

g. Other controls.

i. **Non-Sediment Pollutant Controls.** In accordance with Part II.E, no solid (other than sediment) or liquid waste, including building materials, shall be discharged in storm water runoff. The permittee must implement all necessary BMPs to prevent the discharge of non-sediment pollutants to the drainage system of the site or surface waters of the state or an MS4. Under no circumstance shall wastewater from the washout of concrete trucks, stucco, paint, form release oils, curing compounds, and other construction materials be discharged directly into a drainage channel, storm sewer or surface waters of the state. Also, no pollutants from vehicle fuel, oils, or other vehicle fluids can be discharged to surface waters of the state. No exposure of storm water to waste materials is recommended. The SWP3 must include methods to minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, and sanitary waste to precipitation, storm water runoff, and snow melt. In accordance with Part II.D.3, the SWP3 shall include measures to prevent and respond to chemical spills and leaks. You may also reference the existence of other plans (i.e., Spill Prevention Control and Countermeasure (SPCC) plans, spill control programs, Safety Response Plans, etc.) provided that such plan addresses conditions of this permit condition and a copy of such plan is maintained on site.

ii. **Off-site traffic.** Off-site vehicle tracking of sediments and dust generation shall be minimized. In accordance with Part II.D.1, the SWP3 shall include methods to minimize the discharge of pollutants from equipment and vehicle washing, wheel washwater, and other washwaters. No detergents may be used to wash vehicles. Washwaters shall be treated in a sediment basin or alternative control that provides equivalent treatment prior to discharge.

iii. **Compliance with other requirements.** The SWP3 shall be consistent with applicable State and/or local waste disposal, sanitary sewer or septic system regulations, including provisions prohibiting waste disposal by

open burning and shall provide for the proper disposal of contaminated soils to the extent these are located within the permitted area.

iv. **Trench and ground water control**. In accordance with Part II.C, there shall be no turbid discharges to surface waters of the state resulting from dewatering activities. If trench or ground water contains sediment, it shall pass through a sediment settling pond or other equally effective sediment control device, prior to being discharged from the construction site. Alternatively, sediment may be removed by settling in place or by dewatering into a sump pit, filter bag or comparable practice. Ground water which does not contain sediment or other pollutants is not required to be treated prior to discharge. However, care must be taken when discharging ground water to ensure that it does not become pollutant-laden by traversing over disturbed soils or other pollutant sources.

v. **Contaminated Sediment.** Where construction activities are to occur on sites with contamination from previous activities, operators shall be aware that concentrations of materials that meet other criteria (is not considered a Hazardous Waste, meeting VAP standards, etc.) may still result in storm water discharges in excess of Ohio Water Quality Standards. Such discharges are not authorized by this permit. Appropriate BMPs include, but are not limited to:

- The use of berms, trenches, and pits to collect contaminated runoff and prevent discharges;
- Pumping runoff into a sanitary sewer (with prior approval of the sanitary sewer operator) or into a container for transport to an appropriate treatment/disposal facility; and
- Covering areas of contamination with tarps or other methods that prevent storm water from coming into contact with the material.

Operators should consult with Ohio EPA Division of Surface Water prior to seeking permit coverage.

h. Maintenance. All temporary and permanent control practices shall be maintained and repaired as needed to ensure continued performance of their intended function. All sediment control practices must be maintained in a functional condition until all up-slope areas they control are permanently stabilized. The SWP3 shall be designed to minimize maintenance requirements. The applicant shall provide a description of maintenance procedures needed to ensure the continued performance of control practices.

i. Inspections. The permittee shall assign "qualified inspection personnel" to conduct inspections to ensure that the control practices are functional and to evaluate whether the SWP3 is adequate and properly implemented in accordance with the schedule proposed in Part III.G.1.h of this permit or whether additional control measures are required. At a minimum, procedures in a SWP3 shall provide that all controls on the site are inspected:

- after any storm event greater than one-half inch of rain per 24-hour period by the end of the next calendar day, excluding weekends and holidays unless work is scheduled; and
- once every seven calendar days.

The inspection frequency may be reduced to at least once every month for dormant sites if:

- the entire site is temporarily stabilized or
- runoff is unlikely due to weather conditions for extended periods of time (e.g., site is covered with snow, ice, or the ground is frozen).

The beginning and ending dates of any reduced inspection frequency shall be documented in the SWP3.
Once a definable area has achieved final stabilization, the area may be marked on the SWP3 and no further inspection requirements shall apply to that portion of the site.

Following each inspection, a checklist must be completed and signed by the qualified inspection personnel representative. At a minimum, the inspection report shall include:

i. the inspection date;
ii. names, titles, and qualifications of personnel making the inspection;
iii. weather information for the period since the last inspection (or since commencement of construction activity if the first inspection) including a best estimate of the beginning of each storm event, duration of each storm event, approximate amount of rainfall for each storm event (in inches), and whether any discharges occurred;
iv. weather information and a description of any discharges occurring at the time of the inspection;
v. location(s) of discharges of sediment or other pollutants from the site;
vi. location(s) of BMPs that need to be maintained;
vii. location(s) of BMPs that failed to operate as designed or proved inadequate for a particular location;
viii. location(s) where additional BMPs are needed that did not exist at the time of inspection; and
ix. corrective action required including any changes to the SWP3 necessary and implementation dates.

Disturbed areas and areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of or the potential for pollutants entering the drainage system. Erosion and sediment control measures identified in the SWP3 shall be observed to ensure that those are operating correctly. Discharge locations shall be inspected to ascertain whether erosion and sediment control measures are effective in preventing significant impacts to the receiving waters. Locations where vehicles enter or exit the site shall be inspected for evidence of off-site vehicle tracking.

The permittee shall maintain for three years following the submittal of a notice of termination form, a record summarizing the results of the inspection, names(s) and qualifications of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the SWP3 and a certification as to whether the facility is in compliance with the SWP3 and the permit and identify any incidents of non-compliance. The record and certification shall be signed in accordance with Part V.G. of this permit.

i. **When practices require repair or maintenance.** If the inspection reveals that a control practice is in need of repair or maintenance, with the exception of a sediment settling pond, it shall be repaired or maintained within 3 days of the inspection. Sediment settling ponds shall be repaired or maintained within 10 days of the inspection.

ii. **When practices fail to provide their intended function.** If the inspection reveals that a control practice fails to perform its intended function and that another, more appropriate control practice is required, the SWP3 shall be amended and the new control practice shall be installed within 10 days of the inspection.

iii. **When practices depicted on the SWP3 are not installed.** If the inspection reveals that a control practice has not been implemented in accordance with the schedule contained in Part III.G.1.h of this permit, the control practice shall be implemented within 10 days from the date of the inspection. If the inspection reveals that the planned control practice is not needed, the record shall contain a statement of explanation as to why the control practice is not needed.

3. Approved State or local plans. All dischargers regulated under this general permit must comply, except those exempted under state law, with the lawful requirements of municipalities, counties and other local agencies regarding discharges of storm water from construction activities. All erosion and sediment control plans and storm water management plans approved by local officials shall be retained with the SWP3 prepared in accordance with this permit. Applicable requirements for erosion and sediment control and storm water management approved by local officials are, upon submittal of a NOI form, incorporated by reference and enforceable under this permit even if they are not specifically included in an SWP3 required under this permit. When the project is located within the jurisdiction of a regulated municipal separate storm sewer system (MS4), the permittee shall certify that the SWP3 complies with the requirements of the storm water management program of the MS4 operator.

4. Exceptions. If specific site conditions prohibit the implementation of any of the erosion and sediment control practices contained in this permit or site-specific conditions are such that implementation of any erosion and sediment control practices contained in this permit will result in no environmental benefit, then the permittee shall provide justification for rejecting each practice based on site conditions. Exceptions from implementing the erosion and sediment control standards contained in this permit will be approved or denied on a case-by-case basis.

The permittee may request approval from Ohio EPA to use alternative methods to satisfy conditions in this permit if the permittee can demonstrate that the alternative methods are sufficient to protect the overall integrity of receiving streams and the watershed. Alternative methods will be approved or denied on a case-by-case basis.

PART IV. NOTICE OF TERMINATION REQUIREMENTS

A. Failure to notify.

The terms and conditions of this permit shall remain in effect until a signed Notice of Termination (NOT) form is submitted. Failure to submit an NOT constitutes a violation of this permit and may affect the ability of the permittee to obtain general permit coverage in the future.

B. When to submit an NOT.

1. Permittees wishing to terminate coverage under this permit shall submit an NOT form in accordance with Part V.G. of this permit. Compliance with this permit is required until an NOT form is submitted. The permittee's authorization to discharge under this permit terminates at midnight of the day the NOT form is submitted. Prior to submitting the NOT form, the permittee shall conduct a site inspection in accordance with Part III.G.2.i of this permit and have a maintenance plan in place to ensure all post-construction BMPs will be maintained in perpetuity.

2. All permittees shall submit an NOT form within 45 days of completing all permit requirements. Enforcement actions may be taken if a permittee submits an NOT form without meeting one or more of the following conditions:

    a. Final stabilization (see definition in Part VII) has been achieved on all portions of the site for which the permittee is responsible (including, if applicable, returning agricultural land to its pre-construction agricultural use);

    b. Another operator(s) has assumed control over all areas of the site that have not been finally stabilized;

    c. A maintenance plan is in place to ensure all post construction BMPs are adequately maintained in the long-term;

    d. For non-residential developments, all elements of the storm water pollution prevention plan have been completed, the disturbed soil at the identified facility have been stabilized and temporary erosion and sediment control measures have been removed at the appropriate time, or all storm water discharges associated with construction activity from the identified facility that are authorized by the above referenced NPDES general permit have otherwise been eliminated. (i)For residential developments only, temporary stabilization has been completed and the lot, which includes a home, has been transferred to the homeowner; (ii) final stabilization has been completed and the lot, which does not include a home, has been transferred to the property owner; (iii) no stabilization has been implemented on a lot, which includes a home, and the lot has been transferred to the homeowner; or

e. An exception has been granted under Part III.G.4.

C. How to submit an NOT.

To terminate permit coverage, the permitee shall submit a complete and accurate Notice of Termination (NOT) form using Ohio EPA's electronic application form which is available through the Ohio EPA eBusiness Center at: https://ebiz.epa.ohio.gov/. Submission through the Ohio EPA eBusiness Center will require establishing an Ohio EPA eBusiness Center account and obtaining a unique Personal Identification Number (PIN) for final submission of the NOT. Existing eBusiness Center account holders can access the NOT form through their existing account and submit using their existing PIN. Please see the following link for guidance: **http://epa.ohio.gov/dsw/ebs.aspx#170669803-streams-guidance**. Alternatively, if you are unable to access the NOT form through the agency eBusiness Center due to a demonstrated hardship, the NOT may be submitted on paper NOT forms provided by Ohio EPA. NOT information shall be typed on the form. Please contact Ohio EPA, Division of Surface Water at (614) 644-2001 if you wish to receive a paper NOT form.

PART V. STANDARD PERMIT CONDITIONS.

A. Duty to comply.

The permittee shall comply with all conditions of this permit. Any permit noncompliance constitutes a violation of ORC Chapter 6111 and is grounds for enforcement action.

Ohio law imposes penalties and fines for persons who knowingly make false statements or knowingly swear or affirm the truth of a false statement previously made.

B. Continuation of an expired general permit.

An expired general permit continues in force and effect until a new general permit is issued.

C. Need to halt or reduce activity not a defense.

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

D. Duty to mitigate.

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

E. Duty to provide information.

The permittee shall furnish to the director, within 10 days of written request, any information which the director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee

shall also furnish to the director upon request copies of records required to be kept by this permit.

F. Other information.

When the permittee becomes aware that he or she failed to submit any relevant facts or submitted incorrect information in the NOI, SWP3, NOT or in any other report to the director, he or she shall promptly submit such facts or information.

G. Signatory requirements.

All NOIs, NOTs, SWP3s, reports, certifications or information either submitted to the director or that this permit requires to be maintained by the permittee, shall be signed.

1. These items shall be signed as follows:

    a. For a corporation: By a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:

        i. A president, secretary, treasurer or vice-president of the corporation in charge of a principal business function or any other person who performs similar policy or decision-making functions for the corporation; or

        ii. The manager of one or more manufacturing, production or operating facilities, provided, the manager is authorized to make management decisions that govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

    b. For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

    c. For a municipality, State, Federal or other public agency: By either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes (1) the chief executive officer of the agency or (2) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of U.S. EPA).

2. All reports required by the permits and other information requested by the director shall be signed by a person described in Part V.G.1 of this permit or by a duly authorized representative of that person. A person is a duly authorized representative only if:

a. The authorization is made in writing by a person described in Part V.G.1 of this permit and submitted to the director;

b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of manager, operator of a well or well field, superintendent, position of equivalent responsibility or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and

c. The written authorization is submitted to the director.

3. Changes to authorization. If an authorization under Part V.G.2 of this permit is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Part V.G.2 of this permit must be submitted to the director prior to or together with any reports, information or applications to be signed by an authorized representative.

H. Certification.

Any person signing documents under this section shall make the following certification:

> *"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."*

I. Oil and hazardous substance liability.

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities or penalties to which the permittee is or may be subject under section 311 of the CWA or 40 CFR Part 112. 40 CFR Part 112 establishes procedures, methods and equipment and other requirements for equipment to prevent the discharge of oil from non-transportation-related onshore and offshore facilities into or upon the navigable surface waters of the state or adjoining shorelines.

J. Property rights.

The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

K. Severability.

The provisions of this permit are severable and if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby.

L. Transfers.

Ohio NPDES general permit coverage is transferable. Ohio EPA must be notified in writing sixty days prior to any proposed transfer of coverage under an Ohio NPDES general permit. The transferee must inform Ohio EPA it will assume the responsibilities of the original permittee transferor.

M. Environmental laws.

No condition of this permit shall release the permittee from any responsibility or requirements under other environmental statutes or regulations.

N. Proper operation and maintenance.

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit and with the requirements of SWP3s. Proper operation and maintenance requires the operation of backup or auxiliary facilities or similar systems, installed by a permittee only when necessary to achieve compliance with the conditions of the permit.

O. Inspection and entry.

The permittee shall allow the director or an authorized representative of Ohio EPA, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit;

2. Have access to and copy at reasonable times, any records that must be kept under the conditions of this permit;

3. Inspect at reasonable times any facilities or equipment (including monitoring and control equipment); and

4. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

P. Duty to Reapply.

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit.

Q. Permit Actions.

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

R. Bypass.

The provisions of 40 CFR Section 122.41(m), relating to "Bypass," are specifically incorporated herein by reference in their entirety. For definition of "Bypass," see Part VII.C.

S. Upset.

The provisions of 40 CFR Section 122.41(n), relating to "Upset," are specifically incorporated herein by reference in their entirety. For definition of "Upset," see Part VII.GG.

T. Monitoring and Records.

The provisions of 40 CFR Section 122.41(j), relating to "Monitoring and Records," are specifically incorporated herein by reference in their entirety.

U. Reporting Requirements.

The provisions of 40 CFR Section 122.41(l), relating to "Reporting Requirements," are specifically incorporated herein by reference in their entirety.

PART VI. REOPENER CLAUSE

If there is evidence indicating potential or realized impacts on water quality due to any storm water discharge associated with construction activity covered by this permit, the permittee of such discharge may be required to obtain coverage under an individual permit or an alternative general permit in accordance with Part I.C of this permit or the permit may be modified to include different limitations and/or requirements.

Permit modification or revocation will be conducted according to ORC Chapter 6111.

PART VII. DEFINITIONS

A. "Act" means Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Pub. L. 92-500, as amended Pub. L. 95-217, Pub. L. 95-576, Pub. L. 96-483, Pub. L. 97-117 and Pub. L. 100-4, 33 U.S.C. 1251 et. seq.

B. "Bankfull channel" means a channel flowing at channel capacity and conveying the bankfull discharge. Delineated by the highest water level that has been maintained for a sufficient period of time to leave evidence on the landscape, such as the point where the natural vegetation changes from predominantly aquatic to predominantly terrestrial or

the point at which the clearly scoured substrate of the stream ends and terrestrial vegetation begins.

C. "Bankfull discharge" means the streamflow that fills the main channel and just begins to spill onto the floodplain; it is the discharge most effective at moving sediment and forming the channel.

D. "Best management practices (BMPs)" means schedules of activities, prohibitions of practices, maintenance procedures and other management practices (both structural and non-structural) to prevent or reduce the pollution of surface waters of the state. BMP's also include treatment requirements, operating procedures and practices to control plant and/or construction site runoff, spillage or leaks, sludge or waste disposal or drainage from raw material storage.

E. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility.

F. "Channelized stream" means the definition set forth in Section 6111.01 (M) of the ORC.

G. "Commencement of construction" means the initial disturbance of soils associated with clearing, grubbing, grading, placement of fill, or excavating activities or other construction activities.

H. "Concentrated storm water runoff" means any storm water runoff which flows through a drainage pipe, ditch, diversion or other discrete conveyance channel.

I. "Director" means the director of the Ohio Environmental Protection Agency.

J. "Discharge" means the addition of any pollutant to the surface waters of the state from a point source.

K. "Disturbance" means any clearing, grading, excavating, filling, or other alteration of land surface where natural or man-made cover is destroyed in a manner that exposes the underlying soils.

L. "Drainage watershed" means for purposes of this permit the total contributing drainage area to a BMP, i.e., the "watershed" directed to the practice. This would also include any off-site drainage.

M. "Final stabilization" means that either:

1. All soil disturbing activities at the site are complete and a uniform perennial vegetative cover (e.g., evenly distributed, without large bare areas) with a density of at least 70 percent cover for the area has been established on all unpaved areas and areas not covered by permanent structures or equivalent stabilization measures (such as the use of mulches, rip-rap, gabions or geotextiles) have been employed. In addition, all temporary erosion and sediment control practices are removed and disposed of and all trapped sediment is permanently stabilized to prevent further erosion; or

2. For individual lots in residential construction by either:

   a. The homebuilder completing final stabilization as specified above or

   b. The homebuilder establishing temporary stabilization including perimeter controls for an individual lot prior to occupation of the home by the homeowner and informing the homeowner of the need for and benefits of, final stabilization. (Homeowners typically have an incentive to put in the landscaping functionally equivalent to final stabilization as quick as possible to keep mud out of their homes and off sidewalks and driveways.); or

3. For construction projects on land used for agricultural purposes (e.g., pipelines across crop or range land), final stabilization may be accomplished by returning the disturbed land to its pre-construction agricultural use. Areas disturbed that were previously used for agricultural activities, such as buffer strips immediately adjacent to surface waters of the state and which are not being returned to their pre-construction agricultural use, must meet the final stabilization criteria in (1) or (2) above.

N. "General contractor" – for the purposes of this permit, the primary individual or company solely accountable to perform a contract. The general contractor typically supervises activities, coordinates the use of subcontractors, and is authorized to direct workers at a site to carry out activities required by the permit.

O. "Individual lot NOI" means a Notice of Intent for an individual lot to be covered by this permit (see Part I of this permit).

P. "Larger common plan of development or sale"- means a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under one plan.

Q. "MS4" means municipal separate storm sewer system which means a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels or storm drains) that are:

1. Owned or operated by the federal government, state, municipality, township, county, district(s) or other public body (created by or pursuant to state or federal law) including special district under state law such as a sewer district, flood control district or drainage districts or similar entity or a designated and approved management agency under section 208 of the act that discharges into surface waters of the state; and
2. Designed or used for collecting or conveying solely storm water,
3. Which is not a combined sewer and
4. Which is not a part of a publicly owned treatment works.

R. "National Pollutant Discharge Elimination System (NPDES)" means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits and enforcing pretreatment requirements, under sections 307, 402, 318 and 405 of the CWA. The term includes an "approved program."

S. "Natural channel design" means an engineering technique that uses knowledge of the natural process of a stream to create a stable stream that will maintain its form and function over time.

T. "NOI" means notice of intent to be covered by this permit.

U. "NOT" means notice of termination.

V. "Operator" means any party associated with a construction project that meets either of the following two criteria:

1. The party has day-to-day operational control of all activities at a project which are necessary to ensure compliance with a SWP3 for the site and all permit conditions including the ability to authorize modifications to the SWP3, construction plans and site specification to ensure compliance with the General Permit, or

2. Property owner meets the definition of operator should the party which has day to day operational control require additional authorization from the owner for modifications to the SWP3, construction plans, and/or site specification to ensure compliance with the permit or refuses to accept all responsibilities as listed above (Part VII.V.1).

Subcontractors generally are not considered operators for the purposes of this permit. As set forth in Part I.F.1, there can be more than one operator at a site and under these circumstances, the operators shall be co-permittees.

W. "Ordinary high water mark" means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

X. "Owner or operator" means the owner or operator of any "facility or activity" subject to regulation under the NPDES program.

Y. "Permanent stabilization" means the establishment of permanent vegetation, decorative landscape mulching, matting, sod, rip rap and landscaping techniques to provide permanent erosion control on areas where construction operations are complete or where no further disturbance is expected for at least one year.

Z. "Percent imperviousness" means the impervious area created divided by the total area of the project site.

AA. "Point source" means any discernible, confined and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or the floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

BB. "Qualified inspection personnel" means a person knowledgeable in the principles and practice of erosion and sediment controls, who possesses the skills to assess all conditions at the construction site that could impact storm water quality and to assess the effectiveness of any sediment and erosion control measures selected to control the quality of storm water discharges from the construction activity.

CC. "Rainwater and Land Development" is a manual describing construction and post-construction best management practices and associated specifications. A copy of the manual may be obtained by contacting the Ohio Department of Natural Resources, Division of Soil & Water Conservation.

DD. "Riparian area" means the transition area between flowing water and terrestrial (land) ecosystems composed of trees, shrubs and surrounding vegetation which serve to stabilize erodible soil, improve both surface and ground water quality, increase stream shading and enhance wildlife habitat.

EE. "Runoff coefficient" means the fraction of total rainfall that will appear at the conveyance as runoff.

FF. "Sediment settling pond" means a sediment trap, sediment basin or permanent basin that has been temporarily modified for sediment control, as described in the latest edition of the Rainwater and Land Development manual.

GG. "State isolated wetland permit requirements" means the requirements set forth in Sections 6111.02 through 6111.029 of the ORC.

HH. "Storm water" means storm water runoff, snow melt and surface runoff and drainage.

II. "Steep slopes" means slopes that are 15 percent or greater in grade. Where a local government or industry technical manual has defined what is to be considered a "steep slope," this permit's definition automatically adopts that definition.

JJ. "Stream edge" means the ordinary high water mark.

KK. "Subcontractor" – for the purposes of this permit, an individual or company that takes a portion of a contract from the general contractor or from another subcontractor.

LL. "Surface waters of the state" or "water bodies" means all streams, lakes, reservoirs, ponds, marshes, wetlands or other waterways which are situated wholly or partially within the boundaries of the state, except those private waters which do not combine or effect a junction with natural surface or underground waters. Waters defined as sewerage systems, treatment works or disposal systems in Section 6111.01 of the ORC are not included.

MM. "SWP3" means storm water pollution prevention plan.

NN. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment

facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

OO. "Temporary stabilization" means the establishment of temporary vegetation, mulching, geotextiles, sod, preservation of existing vegetation and other techniques capable of quickly establishing cover over disturbed areas to provide erosion control between construction operations.

PP. "Water Quality Volume (WQ_v)" means the volume of storm water runoff which must be captured and treated prior to discharge from the developed site after construction is complete.

Appendix A
Big Darby Creek Watershed

CONTENTS OF THIS APPENDIX

A.1 Permit Area.

This appendix to Permit OHC00005 applies to the entire Big Darby Creek Watershed located within the State of Ohio. Please see Attachment A for permit area boundaries.

A.2 TMDL Conditions.

This general permit requires control measures/BMPs for construction sites that reflect recommendations set forth in the U.S. EPA approved Big Darby Creek TMDL.

A.3 Sediment Settling Ponds and Sampling

Sediment settling ponds additional conditions. The sediment settling pond shall be sized to provide a minimum sediment storage volume of 134 cubic yards of effective sediment storage per acre of drainage and maintain a target discharge performance standard of 45 mg/l Total Suspended Solids (TSS) up to a 0.75-inch rainfall event within a 24-hour period. Unless infeasible, sediment settling ponds must be dewatered at the pond surface using a skimmer or equivalent device. The depth of the sediment settling pond must be less than or equal to five feet. Sediment must be removed from the sediment settling pond when the design capacity has been reduced by 40 percent (This is typically reached when sediment occupies one-half of the basin depth).

Silt Fence and Diversions. For sites five or more acres in size, the use of sediment barriers as a primary sediment control is prohibited. Centralized sediment basins shall be used for sites 5 or more acres in size. Diversions shall direct all storm water runoff from the disturbed areas to the impoundment intended for sediment control. The sediment basins and associated diversions shall be implemented prior to the major earth disturbing activity.

The permittee shall sample in accordance with sampling procedures outlined in 40 CFR 136. Sampling shall occur as follows:

i. Occur at the outfall of each sediment settling pond associated with the site. Each associated outfall shall be identified by a three-digit number (001, 002, etc.);

ii. The applicable rainfall event for sampling to occur shall be a rainfall event of 0.25-inch to a 0.75-inch rainfall event to occur within a 24-hour period. Grab sampling shall be initiated at a site within 14 days, or the first applicable rainfall event thereafter, once upslope disturbance of each sampling location is initiated and shall continue on a quarterly basis. Quarterly periods shall be represented as January - March, April - June, July - September and October - December. Sampling results shall be retained on site and available for inspection.

If any sample is greater than the performance standard of 45 mg/l TSS, the permittee shall modify the SWP3 and install/implement new control practice(s) within 10 days to ensure the TSS performance standard is maintained. Within 3 days of improvement(s), or the first applicable rainfall event thereafter, the permittee shall resample to ensure SWP3 modifications maintain the TSS performance standard target.

For each sample taken, the permittee shall record the following information:

- the outfall and date of sampling;
- the person(s) who performed the sampling;
- the date the analyses were performed on those samples;
- the person(s) who performed the analyses;
- the analytical techniques or methods used; and
- the results of all analyses.

Both quarterly and sampling results following a discharge target exceedance shall be retained on site and available for inspection.

A.4 Riparian Setback Requirements.

The SWP3 shall clearly delineate the boundary of required stream setback distances. No construction activity shall occur, without appropriate mitigation, within the delineated setback boundary except activities associated with restoration or recovery of natural floodplain and channel form characteristics as described in Attachment B, storm water conveyances from permanent treatment practices and approvable utility crossings. Such conveyances must be designed to minimize the width of disturbance. If intrusion within the delineated setback boundary is necessary to accomplish the purposes of a project, then mitigation shall be required in accordance with Appendix A.5 of this permit. Streams requiring protection under this section are defined as perennial, intermittent or ephemeral streams with a defined bed, bank or channel. National Resources Conservation Service (NRCS) soil survey maps should be used as one reference and the presence of a stream requiring protection should also be confirmed in the field. Any required setback distances shall be clearly displayed in the field prior to any construction related activity.

Riparian setbacks distance shall be delineated based upon one of the following two methods:

i. The setback distance shall be sized as the greater of the following:

1. The regulatory 100-year floodplain based on FEMA mapping;

2. A minimum of 100 feet from the top of the streambank on each side; or

3. A distance calculated using the following equation:

$$W = 133DA^{0.43} \qquad \text{(Equation 1, Appendix A)}$$

where:
DA = drainage area (mi^2)
W = total width of riparian setback (ft)

W shall be centered over the meander pattern of the stream such that a line representing the setback width would evenly intersect equal elevation lines on either side of the stream.

If the DA remains relatively constant throughout the stretch of interest, then the DA of the downstream edge of the stretch should be used. Where there is a significant increase in the DA from the upstream edge to The downstream edge of the area of interest, the setback width shall increase accordingly.

ii. **Stream Restoration with 100 feet (each side) Riparian Setback**. Each stream segment within the proposed site boundaries can be assessed in accordance with Attachment B, Part 1. In the event the stream segment is classified as a "Previously Modified Low Gradient Headwater Stream", the permittee has the option to restore the stream segment in accordance with Attachment B and include a 100-foot water quality setback distance from the top of the streambank on each side. In the event the stream segment exceeds the minimum criteria in Attachment B to be classified as a "Previously Modified Low Gradient Headwater Stream," this Appendix A, Attachment B may be considered on a case-by-case basis.

No structural sediment controls (e.g., the installation of sediment barriers or a sediment settling pond) or structural post-construction controls shall be used in a surface water of the State or the delineated setback corridor.

Previously developed projects (as defined in Part III.G.2.e.) located within the delineated setback boundary are exempt from Riparian Setback Mitigation (A.5) provided the proposed project does not further intrude into the delineated setback boundary.

Linear transportation projects which are caused solely by correcting safety related issues, mandates of modern design requirements and/or resulting from other mitigation activities are exempt from Riparian Setback Mitigation (Appendix A, A.5) if less than one acre of total new right-of-way is associated with the project.

A.5 Riparian Setback Mitigation.

The mitigation required for intrusion into the riparian setback shall be determined by the horizontal distance the intrusion is from the stream. Up to three zones will be used in determining the required mitigation. Zone 1 extends from 0 to 25 feet from the stream edge. Zone 2 extends from 25 to 100 feet from the stream edge, and Zone 3 extends from 100 feet to the outer edge of the setback corridor. Intrusion into these zones will require the following mitigation within the same Watershed Assessment Unit (12-digit HUC scale):

i. Four times the total area disturbed in the stream and within Zone 1 of the site being developed shall be mitigated within Zone 1 of the mitigation location.

ii. Three times the area disturbed within Zone 2 of the site being developed shall be mitigated within Zones 1 and/or 2 of the mitigation location.

iii. Two times the area disturbed within Zone 3 of the site being developed shall be mitigated within any zone of the mitigation location.

In lieu of mitigation ratios found within in this section, linear transportation projects which result in total new right-of-way greater than one acre and less than two acres, which are caused solely by correcting safety related issues, mandates of modern design requirements and/or resulting from other mitigation activities, shall provide Riparian Setback Mitigation at a ratio of 1.5 to 1.

All mitigation shall, at a minimum, include conserved or restored setback zone and should be designed to maximize the ecological function of the mitigation. Including mitigation at the stream edge along with associated setback areas is one way to maximize ecological function. Mitigation shall be protected in perpetuity by binding conservation easements or environmental covenants which must be recorded within 6 months of receiving permit authorization. Granting of binding conservation easements or environmental covenants protected in perpetuity for land outside of disturbed area but within a required riparian setback counts towards required mitigation.

Mitigation may also be satisfied by approved pooled mitigation areas and in-lieu fee sponsored mitigation areas. Mitigation resulting from State or Federal environmental regulations may be adjusted in recognition of these requirements.

A.6 Groundwater Recharge Requirements.

The SWP3 shall ensure that the overall site post-development groundwater recharge equals or exceeds the pre-development groundwater recharge. The SWP3 shall describe the conservation development strategies, BMPs and other practices deemed necessary by the permittee to maintain or improve pre-development rates of groundwater recharge. Pre-development and post-development groundwater recharge shall be calculated using the following equation:

i. $Vre_x = A_x * Dre_x / 12$ (Equation 2, Appendix A)

where:
X = represents a land use and hydrologic soil group pair
Vre_x = volume of total annual recharge from land use-soil group X (in acre-ft)
Dre_x = depth of total annual recharge associated with land use-soil group X from Tables 1 or 2 (in inches)
A_x = area of land use-soil group X (in acres)

Table A-1 values should be used for land where the underlying geology indicates a potential for downward migration of groundwater. Table A-1 values represent the combined total groundwater recharge potential including groundwater contribution to stream baseflow and to the underlying bedrock aquifer. The potential for downward migration can be determined from a comparison of the potentiometric maps for the glacial and bedrock aquifers. Use Table A-2 when this potential is unlikely to exist. Detailed potentiometric maps for the Franklin county portion of the Darby watershed, and coarse potentiometric maps for the Darby watershed outside of Franklin County and hydrologic soil group data are available at: http://www.epa.state.oh.us/dsw/permits/GP_ConstructionSiteStormWater_Darby.aspx.

Table A-1 (Appendix A) Annual Average Expected Total Groundwater Recharge[3]

Land Use	Density (DU[1]/acre)	% Impervious	Recharge (inches) by Hydrologic Soil Group2			
			A	B	C	D
Woods / Forest	-	-	17.0	16.6	15.6	14.6
Brush	-	-	17.0	16.6	15.6	14.6
Meadow	-	-	17.0	16.5	15.4	14.4
Managed Wood	-	-	16.9	16.0	14.7	13.4
Pasture	-	-	16.5	15.9	14.4	13.0
Row Crop	-	-	15.8	14.2	11.9	8.1
Urban Grasses	-	-	15.7	15.7	14.2	12.7
Low Density Residential	0.5	12%	15.7	15.7	14.2	12.7
Low Density Residential	1	20%	14.8	14.8	13.7	12.2
Medium Density Residential	2	25%	11.5	11.5	11.5	11.5
Medium Density Residential	3	30%	11.2	11.2	11.2	11.2
Medium Density Residential	4	38%	9.6	9.6	9.6	9.6
High Density Residential	≥5	65%	7.3	7.3	7.3	7.3
Commercial & Road Right-of-Way[4]	-	90%	4.3	4.3	4.3	4.3

[1] DU = Dwelling Units
[2] Hydrologic soil group designations of A/D, B/D, and C/D should be considered as D soils for this application.
[3] These values apply when recharge of the aquifer is expected; recharge to the bedrock aquifer can be expected when the potentiometric head of the glacial aquifer is greater than the bedrock aquifer.
[4] The 4.3 infiltration value may only be used for an area as a whole (includes impervious and pervious areas) which includes a minimum of 10 percent pervious area. If all land uses (pervious and impervious) are tabulated separately, then impervious areas have 0 inches of recharge.

Table A-2 (Appendix A) Annual Average Expected Baseflow Recharge[3]

Land Use	Density (DU[1]/acre)	% Impervious	Recharge (inches) by Hydrologic Soil Group2			
			A	B	C	D
Woods / Forest	-	-	11.8	11.4	10.7	9.9
Brush	-	-	11.7	11.4	10.7	9..9
Meadow	-	-	11.8	11.3	10.6	9.8
Managed Wood	-	-	11.7	11.0	10.0	9.1
Pasture	-	-	11.3	11.0	9.9	8.9
Row Crop	-	-	11.1	10.1	9.0	6.2
Urban Grasses	-	-	11.2	11.2	10.3	9.3
Low Density Residential	0.5	12%	11.2	11.2	10.3	9.3
Low Density Residential	1	20%	9.5	9.5	9.0	8.6
Medium Density Residential	2	25%	7.8	7.8	7.8	7.8
Medium Density Residential	3	30%	7.6	7.6	7.6	7.6
Medium Density Residential	4	38%	6.5	6.5	6.5	6.5
High Density Residential	≥5	65%	5.0	5.0	5.0	5.0
Commercial & Road Right-of-Way[4]	-	90%	2.9	2.9	2.9	2.9

[1] DU = Dwelling Units
[2] Hydrologic soil group designations of A/D, B/D, and C/D should be considered as D soils for this application.
[3] These values apply when no recharge of the aquifer is expected.
[4] The 2.9 infiltration value may only be used for an area as a whole (includes impervious and pervious areas) which includes a minimum of 10 percent pervious area. If all land uses (pervious and impervious) are tabulated separately, then impervious areas have 0 inches of recharge.

Table A-3 (Appendix A) Land Use Definitions

Land Use	Definition
Woods / Forest	Areas dominated by trees. Woods are protected from grazing and litter and brush adequately cover the soil.
Brush	Brush, weeds, grass mixture where brush is the major element and more than 75% of the ground is covered.
Meadow	Continuous grass, protected from grazing, generally mowed for hay.
Managed Wood	Orchards, tree farms, and other areas planted or maintained for the production of fruits, nuts, berries, or ornamentals.
Pasture	Pasture, grassland, or range where at least 50% of the ground is covered and the area is not heavily grazed.
Row Crop	Areas used to produce crops, such as corn, soybeans, vegetables, tobacco, and cotton.
Urban Grasses	Vegetation (primarily grasses) planted in developed settings for recreation, erosion control, or aesthetic purposes. Examples include parks, lawns, golf courses, airport grasses, and industrial site grasses.
Residential	Areas with a mixture of constructed materials and vegetation; the average % imperviousness and number of dwelling units per acre to determine the appropriate density is specified.
Commercial	Includes infrastructure (e.g. roads, railroads, etc.) and all highly developed areas not classified as High Intensity Residential.

ii. The pre-development ground water recharge volume shall be calculated by determining the area of each land use-soil type pairing on the site of interest. The recharge associated with each such pairing multiplied by the area will give the pre-development volume of total groundwater

recharge. The same shall be done for the post-development land use-soil type pairings.

Any activity that is expected to produce storm water runoff with elevated concentrations of carcinogens, hydrocarbons, metals, or toxics is prohibited from infiltrating untreated storm water from the area affected by the activity. The groundwater recharge mitigation requirement for areas affected by such activities must be met by methods which do not present a risk of groundwater contamination. The following land uses and activities are typically deemed storm water hotspots:

Vehicle salvage yards and recycling facilities

- vehicle service and maintenance facilities (i.e. truck stops, gas stations)
- fleet storage areas (i.e. bus, truck)
- industrial sites subject to industrial storm water permitting requirements
- bulk terminals
- marinas
- facilities that generate or store hazardous materials
- other land uses and activities as designated by individual review

The following land uses and activities are not normally considered hotspots:

- residential streets and rural highways
- residential development
- institutional development
- commercial and office developments
- non-industrial rooftops
- pervious areas, except golf courses and nurseries

The applicant may use structural BMPs within drinking water source protection areas for community public water systems only to the extent that the structural BMP(s) does not cause contaminants in the recharge waters to impact the ground water quality at levels that would cause an exceedance of the drinking water Maximum Contaminant Levels (OAC Section 3745-81 and 3745-82). To obtain a map of drinking water source protection areas for community public water systems contact Ohio EPA's Division of Drinking and Ground Waters at (614) 644-2752.

Linear transportation projects which are caused solely by correcting safety related issues, mandates of modern design requirements and/or resulting from other mitigation activities are exempt from Groundwater Recharge Mitigation (Appendix B, A.7) if less than one acre of total new right-of-way is associated with the project.

Protection of open space (infiltration areas) shall be by binding conservation easements that identify a third-party management agency, such as a homeowners' association/condominium association, political jurisdiction or third-party land trust.

A.7 Groundwater Recharge Mitigation.

If the post-development recharge volume is less than the pre-development recharge volume, then mitigation will be required. Two options are available for most applications:

i. The preferred method is to convert additional land to land use with higher recharge potential. The difference in groundwater recharge between the existing and converted land use recharge is the amount which can be used as recharge credit. Off-site Groundwater Recharge Mitigation shall occur within the same Watershed Assessment Unit (12-digit HUC scale) as the permitted site and preferably up-gradient and within a 2-mile radius.

Mitigation shall be protected in perpetuity by binding conservation easements or environmental covenants which must be recorded within 6 months of receiving permit authorization. Granting of binding conservation easements or environmental covenants protected in perpetuity for land outside of the disturbed area, but within a required riparian setback counts towards required mitigation.

Mitigation may also be satisfied by approved pooled mitigation areas and in-lieu fee sponsored mitigation areas.

ii. On-site structural and non-structural practices may also be used to achieve groundwater mitigation requirements by retaining and infiltrating on-site a minimum volume of storm water runoff based on the area and hydrologic soil groups of disturbed soils. If these infiltrating practices are incorporated upstream of the water quality volume treatment practice, the volume of groundwater being infiltrated may be subtracted from the water quality volume for the purpose of meeting post-construction requirements. The on-site retention requirement is determined by the following formula:

$$V_{retention} = A_{HSG\text{-}A}*0.90 \text{ in} + A_{HSG\text{-}B}*0.75 \text{ in} + A_{HSG\text{-}C}*0.50 \text{ in} + A_{HSG\text{-}D}*0.25 \text{ in}$$

(Equation 3, Appendix A)

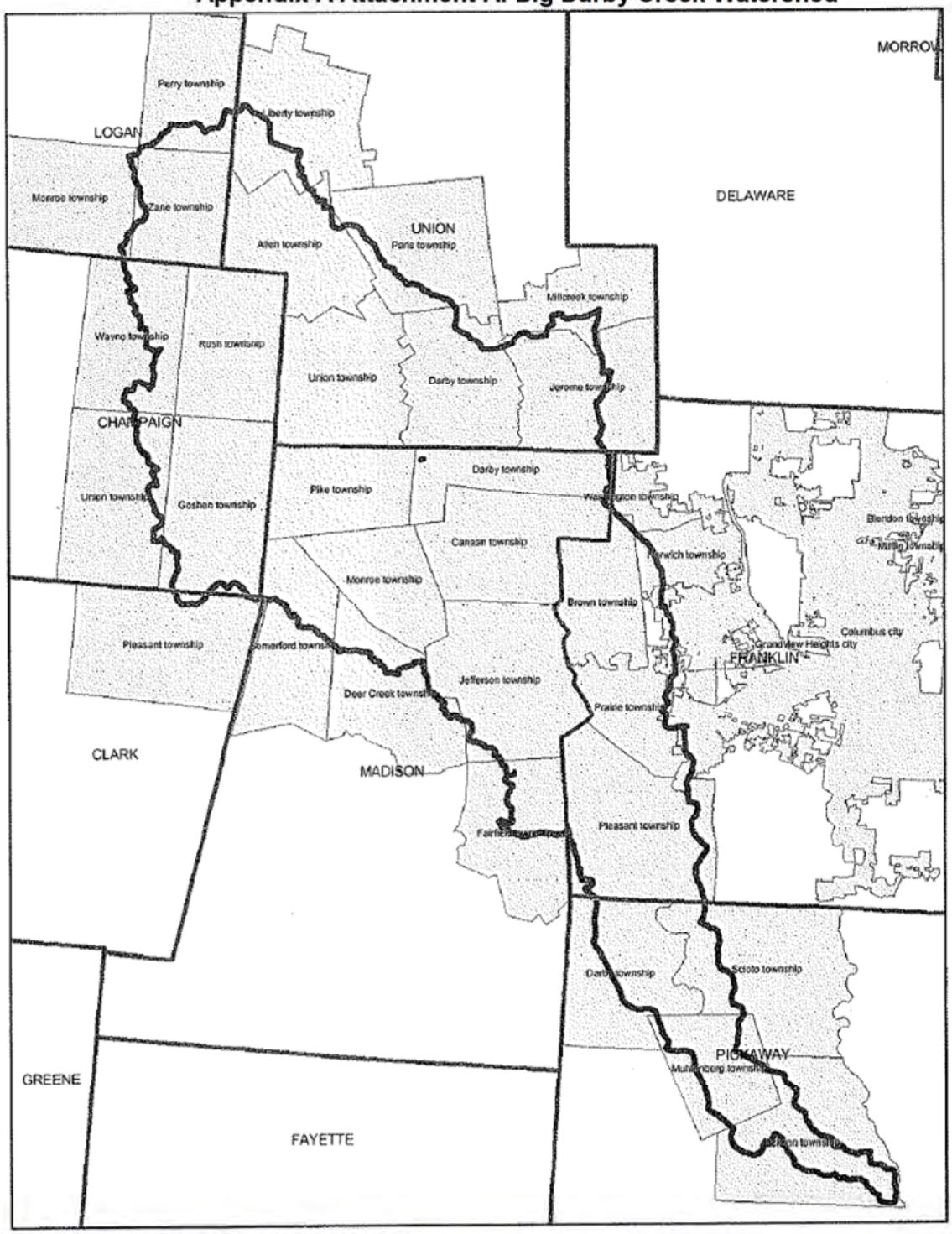
Where,
$V_{retention}$ = volume of runoff retained onsite using an approved infiltration practice
$A_{HSG\text{-}x}$ = area of each hydrologic soil group within the disturbed area

Table A-4: Hydrologic Soil Groups and On-site Retention Depth per Acre

Hydrologic Soil Group	HSG A	HSG B	HSG C	HSG D
Retention Depth (inches)	0.90	0.75	0.50	0.25

Retention volume ($V_{retention}$) provided by selected practices shall be determined using the runoff reduction method criteria as outlined in Part III.G.2.e, Ohio EPA's Runoff Reduction spreadsheet and supporting documentation in the Rainwater and Land Development manual. Hydrologic soil group (HSG) areas are to be determined by using the current version of SURRGO or Web Soil Survey soils information.

Appendix A Attachment A: Big Darby Creek Watershed



A more detailed map can be viewed at:
http://www.epa.state.oh.us/dsw/permits/GP_ConstructionSiteStormWater_Darby.aspx

Appendix A Attachment B

Part 1 Stream Assessment

This assessment will determine if a stream is considered a previously channelized, low-gradient headwater stream (a drainage ditch) which would be applicable for stream restoration in lieu of protecting a setback as per Appendix A. A.4.i and ii.

In the event the assessment of the stream, meets all the criteria listed below, restoration (provided 401/404 permits are authorized) as depicted in Part 2 of this attachment, may be a means of reducing the setback distance required by A.4.i. (Appendix A).

Previously Channelized Low-Gradient Headwater Streams (drainage ditches) shall for the purposes of this permit be defined as having all of the following characteristics:

- Less than 10 square miles of drainage area
- Low gradient and low stream power such that despite their straightened and entrenched condition incision (down-cutting) is not evident
- Entrenched, entrenchment ratio < 2.2
- Straight, sinuosity of the bankfull channel < 1.02

Part 2 Restoration

Restoration shall be accomplished by any natural channel design approach that will lead to a self-maintaining reach able to provide both local habitat and watershed services (e.g. self-purification and valley floodwater storage).

a. Construction of a floodplain, channel and habitat via natural channel design;
b. Floodplain excavation necessary to promote interaction between stream and floodplain;
c. Include a water quality setback of 100 feet from top of the streambank on each side.

The primary target regardless of design approach shall be the frequently flooded width, which shall be maximized, at 10 times the channel's self-forming width. Five times the self-forming channel width may still be acceptable particularly on portions of the site if greater widths are achieved elsewhere.

Appendix B
Olentangy River Watershed

CONTENTS OF THIS APPENDIX

B.1 Permit Area.

This appendix to Permit OHC00005 applies to specific portions of the Olentangy River Watershed located within the State of Ohio. The permit area includes the following 12-digit Hydrologic Unit Codes (HUC-12) within the Olentangy River Watershed:

12-Digit Hydrologic Unit Codes

12-Digit Hydrologic Unit Codes (HUC)	Narrative Description of Sub-Watershed
05060001 09 01	Shaw Creek
05060001 09 02	Headwaters Whetstone Creek
05060001 09 03	Claypool Run-Whetstone Creek
05060001 10 07	Delaware Run-Olentangy River
05060001 11 01	Deep Run-Olentangy River
05060001 11 02 (Only portion as depicted in Attachment A)	Rush Run-Olentangy River

Please see Attachment A (Appendix B) for permit area boundaries. An electronic version of Attachment A can be viewed at
http://epa.ohio.gov/dsw/permits/GP_ConstructionSiteStormWater_Olentangy.aspx

B.2 TMDL Conditions.

This general permit requires control measures/BMPs for construction sites that reflect recommendations set forth in the U.S. EPA approved Olentangy TMDL.

B.3 Riparian Setback Requirements.

The permittee shall comply with the riparian setback requirements of this permit or alternative riparian setback requirements established by a regulated MS4 and approved by Ohio EPA. The SWP3 shall clearly delineate the boundary of required stream setback distances. The stream setback shall consist of a streamside buffer and an outer buffer. No construction activity shall occur, without appropriate mitigation, within the streamside buffer except activities associated with storm water conveyances from permanent treatment practices, approvable utility crossings and restoration or recovery of floodplain and channel form characteristics as described in Attachment B. Storm water conveyances must be designed to minimize the width of disturbance.

Construction activities requiring mitigation for intrusions within the outer buffer for the Olentangy River mainstem and perennial streams are described in Appendix B.4.

If intrusion within the delineated setback boundary is necessary to accomplish the purposes of a project, then mitigation shall be required in accordance with Appendix B.3. of this permit. Streams requiring protection under this section have a defined bed and bank or channel and are defined as follows:

- The Olentangy River mainstem;
- Perennial streams have continuous flow on either the surface of the stream bed or under the surface of the stream bed;
- Intermittent streams flow for extended periods of time seasonally of a typical climate year; and
- Ephemeral streams are normally dry and only flow during and after precipitation runoff (episodic flow).

National Resources Conservation Service (NRCS) soil survey maps should be used as one reference and the presence of a stream requiring protection should also be confirmed in the field. Any required setback distances shall be clearly displayed in the field prior to any construction related activity.

Riparian setbacks shall be delineated based upon one of the following two methods:

i. The required setback distances shall vary with stream type as follows:

a. The setback distances associated with the mainstem of the Olentangy River shall consist of:

(1) A streamside buffer width of 100 feet as measured horizontally from the ordinary high water mark per side; and

(2) An outer buffer width sized to the regulatory 100-year floodplain based on FEMA mapping. No impervious surfaces shall be constructed without appropriate mitigation and moderate to substantial fill activities with no impervious surface may require appropriate mitigation pending an individual approval by Ohio EPA.

b. The setback distance associated with perennial streams, other than the Olentangy mainstem, shall consist of:

(1) A streamside buffer width of 80 feet per side measured horizontally from the ordinary high water mark; and

(2) An outer buffer width sized to the regulatory 100-year floodplain based on FEMA mapping. In the event the regulatory 100-year floodplain is not established, the outer buffer width shall be calculated using the following equation and measured horizontally from the ordinary high water mark. No impervious surfaces, structure, fill, or activity that would impair the floodplain or stream stabilizing ability of the outer buffer shall occur without appropriate mitigation:

$W = 143DA^{0.41}$ (Equation 1 Appendix B)

where:
DA = drainage area (mi^2)
W = total width of riparian setback (ft)

W shall be centered over the meander pattern of the stream such that a line representing the setback width would evenly intersect equal elevation lines on either side of the stream.

If the DA remains relatively constant throughout the stretch of interest, then the DA of the downstream edge of the stretch should be used. Where there is a significant increase in the DA from the upstream edge to the downstream edge of the area of interest, the setback width shall increase accordingly.

c. The setback distance associated with intermittent streams and ephemeral streams shall be a streamside buffer width of 30 feet per side measured horizontally from the centerline of the stream. No outer buffer is required for intermittent and ephemeral streams.

ii. Stream Restoration with 100 feet (each side) Riparian Setback. Each stream segment within the proposed site boundaries can be assessed in accordance with Attachment B. In the event the stream segment is classified as a "Previously Modified Low Gradient Headwater Stream", the permittee has the option to restore the stream segment in accordance with Attachment B and include a 100 feet water quality setback distance from the top of the streambank on each side. In the event the stream segment exceeds the minimum criteria in Attachment B to be classified as a "Previously Modified Low Gradient Headwater Stream", this may be considered on a case-by-case basis.

No structural sediment controls (e.g., the installation of sediment barriers or a sediment settling pond) or structural post-construction controls shall be used in a stream or the streamside buffer. Activities and controls that would not impair the floodplain or stream stabilizing ability of the outer buffer can be considered.

Redevelopment projects (i.e., developments on previously developed property) located within the delineated setback boundary is exempt from Riparian Setback Mitigation (B.3) provided the proposed project does not further intrude the delineated setback boundary.

B.4 Riparian Setback Mitigation.

The mitigation required for intrusion into the riparian setback of the **Olentangy River mainstem or perennial streams** shall be determined by the horizontal distance the intrusion is from the stream. Up to three zones will be used in determining the required mitigation. Zone 1 extends from 0 to 30 feet from the stream edge. Zone 2 extends

from 30 feet to the outer edge of the streamside buffer. Zone 3 extends from the outer edge of the streamside buffer to the outer edge of the outer buffer. Intrusion into these zones will require the following mitigation within the same Watershed Assessment Unit (12-digit HUC scale). Alternative mitigation, within the permit area, may be considered on a case-by-case basis:

1. Four (4) times the total area disturbed in the stream within Zone 1 of the site being developed shall be mitigated; or, two (2) times the total area disturbed in the stream within Zone 1 shall be mitigated within the watershed of the immediate receiving stream, and the entire required setback of the site shall be protected by binding conservation easements or environmental covenants.

2. Three (3) times the area disturbed within Zone 2 of the site being developed shall be mitigated within Zones 1 and/or 2 of the mitigation location; or, one and one-half (1.5) times the total area disturbed within Zone 2 shall be mitigated within the watershed of the immediate receiving stream, and the entire required setback of the site shall be protected in perpetuity by binding conservation easements or environmental covenants.

3. Two (2) times the area to be mitigated within Zone 3 of the site being developed shall be mitigated within any Zone of the mitigation location; or, one (1) times the total area to be mitigated within any zone shall be mitigated within the watershed of the immediate receiving stream, and the entire required setback of the site shall be protected in perpetuity by binding conservation easements or environmental covenants.

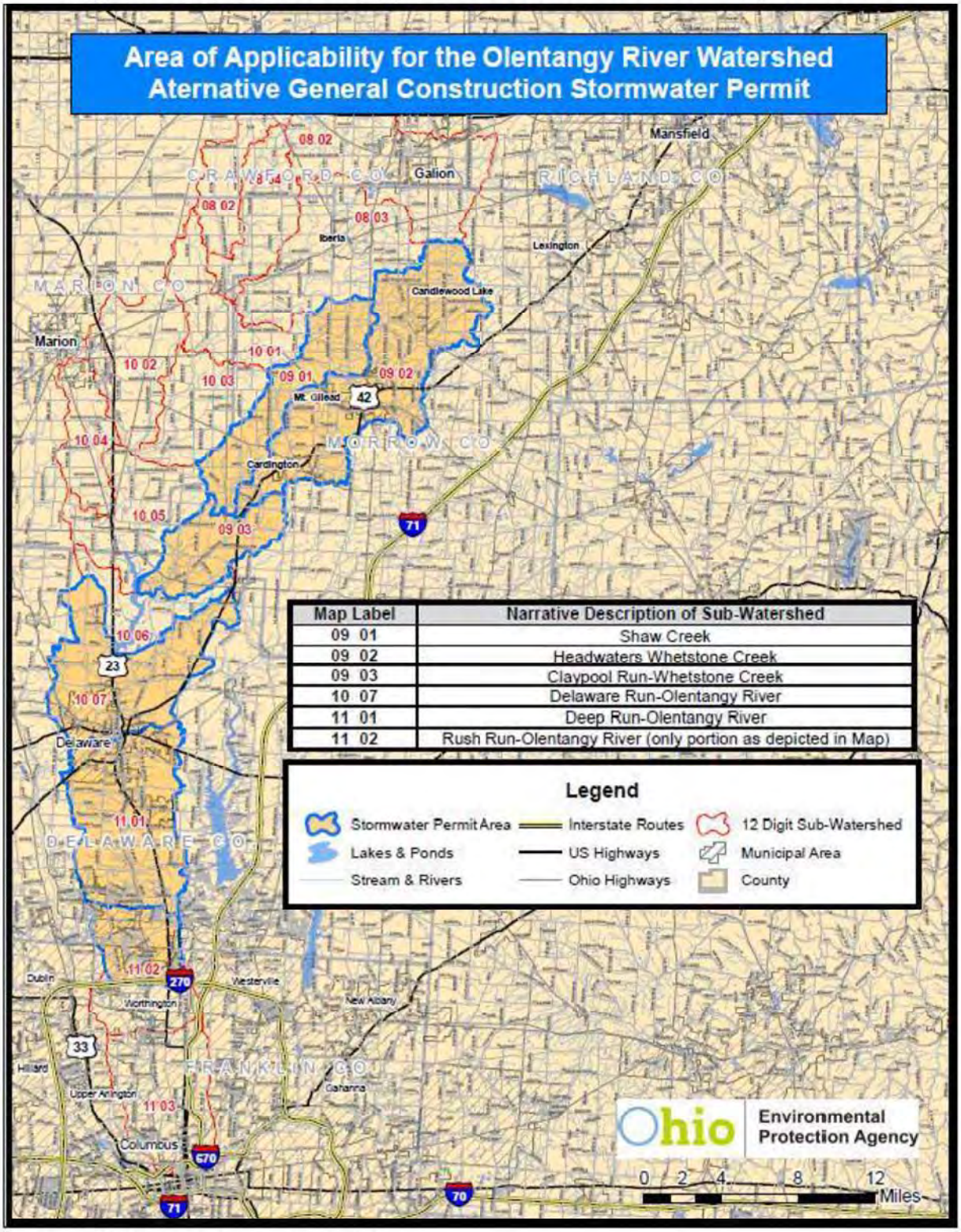
The mitigation required for intrusion into the riparian setback of an **intermittent stream** shall be four (4) times the total area disturbed within the riparian setback of the site being developed shall be mitigated; or two (2) times the total area disturbed within the riparian setback shall be mitigated within the watershed of the immediate receiving stream, and the entire required setback of the site shall be protected in perpetuity by binding conservation easements or environmental covenants.

The mitigation required for intrusion into the streamside buffer of an **ephemeral stream** shall be two (2) times the total area disturbed within the riparian setback of the site being developed shall be mitigated; or one (1) times the total area disturbed within the riparian setback shall be mitigated within the watershed of the immediate receiving stream, and the entire required setback of the site shall be protected in perpetuity by binding conservation easements or environmental covenants.

All mitigation shall, at a minimum, include conserved or restored setback zone, and should be designed to maximize the ecological function of the mitigation. Including mitigation at the stream edge along with associated setback areas is one way to maximize ecological function. Mitigation shall be protected in perpetuity by binding conservation easements or environmental covenants which must be recorded within 6 months of permit authorization. Granting of binding conservation easements or environmental covenants protected for land outside of disturbed area, but within a required riparian setback counts towards required mitigation.

Mitigation may also be satisfied by approved pooled mitigation areas and in-lieu fee sponsored mitigation areas. Mitigation resulting from State or Federal environmental regulations may be adjusted in recognition of these requirements.

Appendix B Attachment A Applicable Portions of the Olentangy Watershed



A more detailed map can be viewed at:
http://epa.ohio.gov/dsw/permits/GP_ConstructionSiteStormWater_Olentangy.aspx

Appendix B Attachment B

Part 1 Stream Assessment

This assessment will determine if a stream is considered a previously channelized, low-gradient headwater stream (a drainage ditch) which would be applicable for stream restoration in lieu of protecting an outer 'no build' setback as per Appendix B B.2i. and ii.

In the event the assessment of the stream meets all the criteria listed below, restoration as depicted in Part 2 of this attachment or natural channel design could be performed, provided 401/404 permits are authorized, and may be a means of reducing the setback distance required by B.2.i. (Appendix B).

Previously Modified, Low-Gradient Headwater Streams shall, for the purposes of this permit, be defined as having all of the following characteristics:

- Less than 10 square miles of drainage area;
- Low gradient and low stream power such that incision (down-cutting) is not evident;
- Entrenched such that the ratio of the frequently flooded width to the bankfull width is less than 2.2; and
- Straight with little or no sinuosity present such that the ratio of the bankfull channel length to the straight-line distance between two points is less than 1.02.

Part 2 Restoration

Restoration shall be accomplished by any natural channel design approach that will lead to a self-maintaining reach able to provide both local habitat and watershed services (e.g. self-purification and valley floodwater storage).

a. Construction of a floodplain, channel and habitat via natural channel design;
b. Floodplain excavation necessary to promote interaction between stream and floodplain;
c. Include a water quality setback of 100 feet from top of the streambank on each side.

The primary target shall be a frequently flooded width of 10 times the channel's self-forming width. Five times the self-forming channel width may be acceptable if sufficient elements of natural channel design are included in the restoration project.

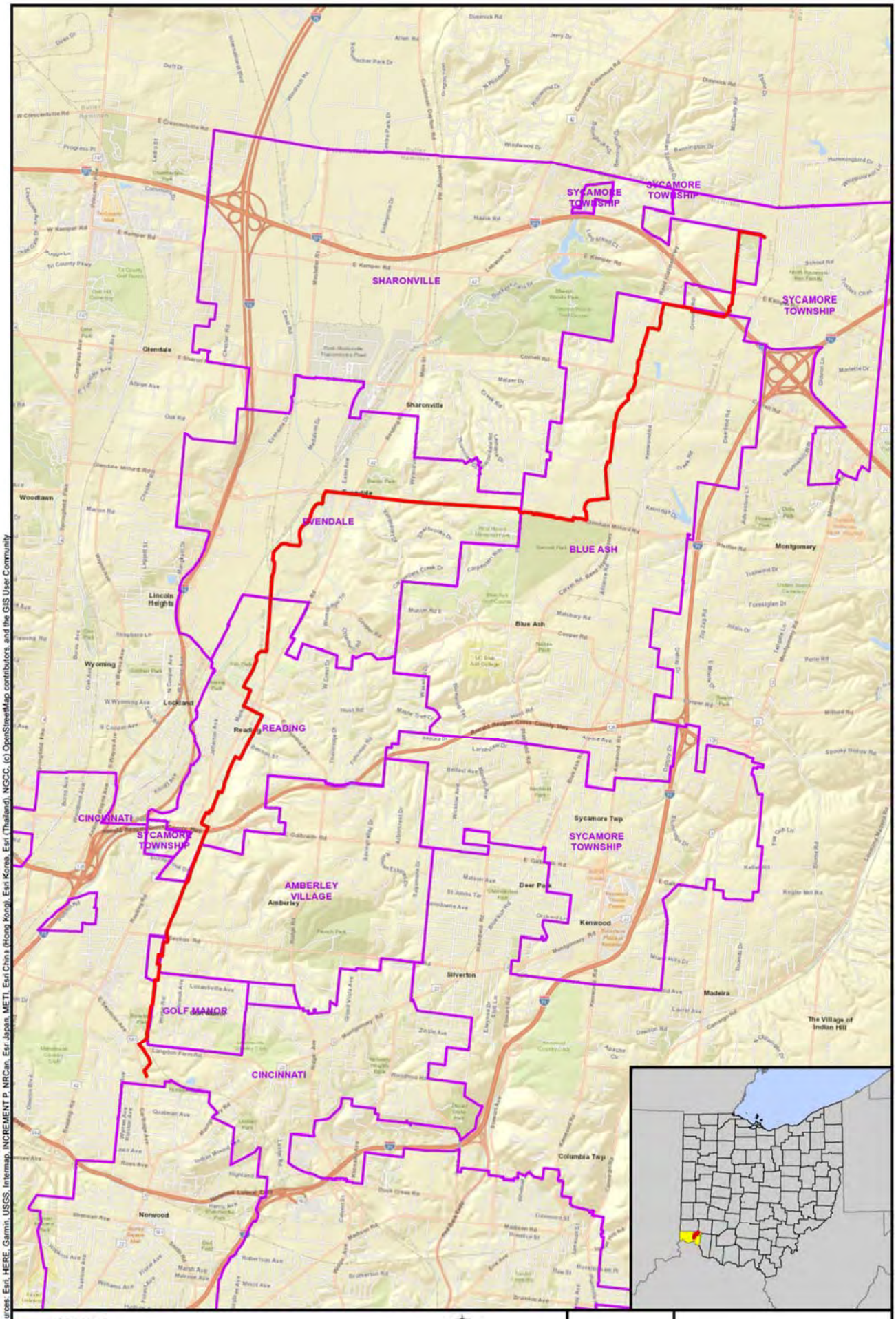
Appendix C Rainfall Intensity for Calculation of Water Quality Flow (WQF)

DURATION t_c (minutes)	WATER QUALITY INTENSITY [i_{wq}] (inches/hour)
5	2.37
6	2.26
7	2.15
8	2.04
9	1.94
10	1.85
11	1.76
12	1.68
13	1.62
14	1.56
15	1.51
16	1.46
17	1.41
18	1.37
19	1.33
20	1.29
21	1.26
22	1.22
23	1.19
24	1.16
25	1.13
26	1.10
27	1.07
28	1.05
29	1.03
30	1.01
31	0.99
32	0.97

DURATION t_c (minutes)	WATER QUALITY INTENSITY [i_{wq}] (inches/hour)
33	0.95
34	0.93
35	0.92
36	0.90
37	0.88
38	0.86
39	0.85
40	0.83
41	0.82
42	0.80
43	0.78
44	0.77
45	0.76
46	0.75
47	0.74
48	0.73
49	0.72
50	0.71
51	0.69
52	0.68
53	0.67
54	0.66
55	0.66
56	0.65
57	0.64
58	0.64
59	0.63
60	0.62

Note: For t_c < 5 minutes, use i = 2.37 in/hr; for t_c > 60 minutes, use i = 0.62 in/hr. For all other t_c, use the appropriate value from this table.

APPENDIX B – FIGURES AND RUNOFF COEFFICIENT ESTIMATE



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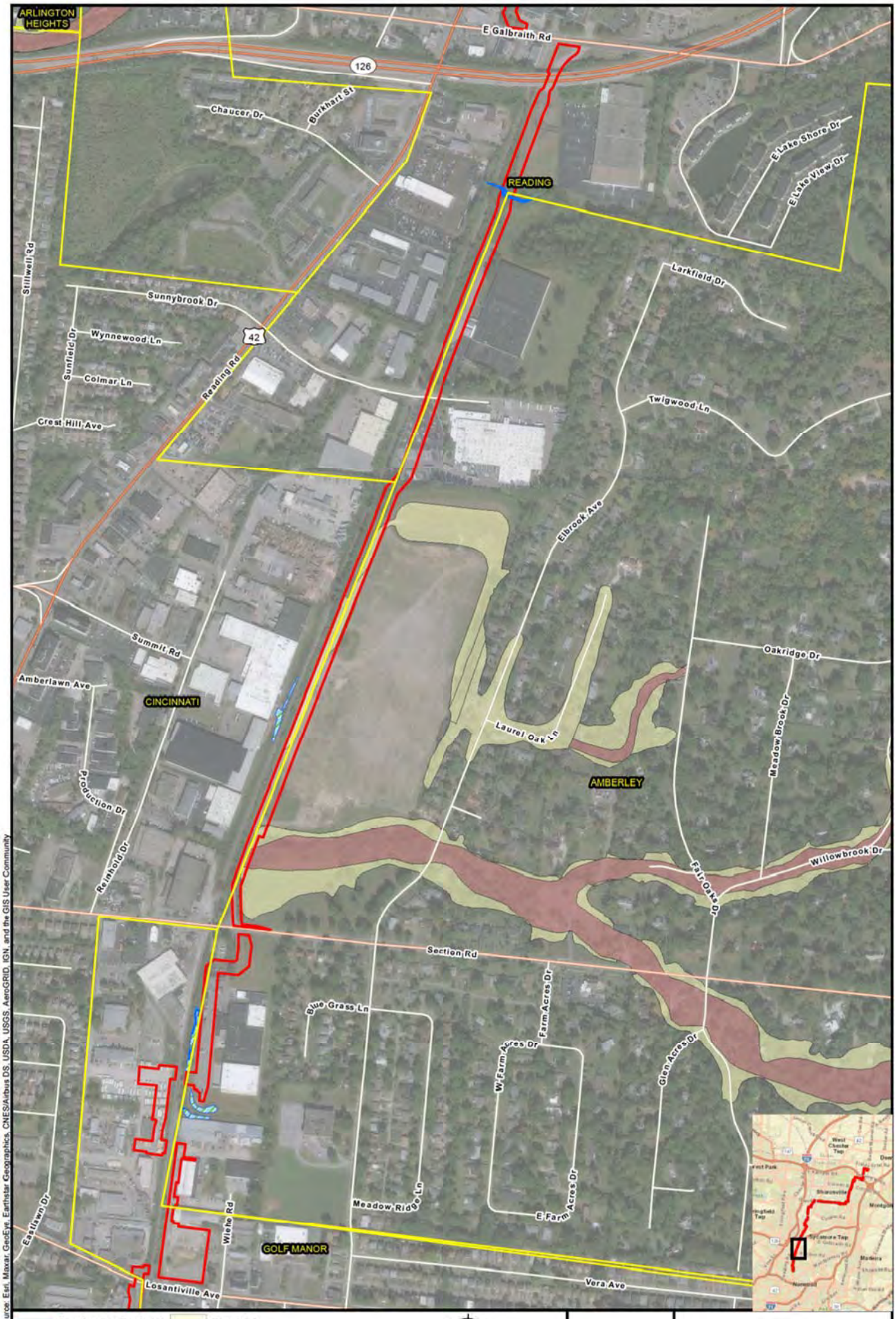
Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

Source: Esri, and Burns & McDonnell Engineering Company, Inc.

Issued: 9/17/2020


ARLINGTON HEIGHTS
E Galbraith Rd
126
Chaucer Dr
Burkhart St
READING
E Lake Shore Dr
E Lake View Dr
Stillwell Rd
Sunnybrook Dr
Larkfield Dr
Wynnewood Ln
42
Sunfield Dr
Colmar Ln
Reading Rd
Crest Hill Ave
Twigwood Ln
Elbrook Ave
Summit Rd
Amberlawn Ave
CINCINNATI
Oakridge Dr
Laurel Oak Ln
Meadow Brook Dr
AMBERLEY
Production Dr
Reinhold Dr
Willowbrook Dr
Fair Oaks Dr
Section Rd
Blue Grass Ln
W Farm Acres Dr
Farm Acres Dr
Glen Acres Dr
Eastlawn Dr
Wiehe Rd
Meadow Ridge Ln
E Farm Acres Dr
GOLF MANOR
Losantiville Ave
Vera Ave
Construction Footprint
City Limits
Stream
Wetland
Floodplain
Floodway
NORTH
500 250 0 500
Scale in Feet
BURNS McDONNELL
Figure 2
Site Map
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Page 1 of 1
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Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Source: Esri, FEMA, and Burns & McDonnell Engineering Company, Inc.
Issued: 9/17/2020


Construction Footprint
City Limits
Map Unit Symbol & Name
EcD- Eden silty clay loam, 15 to 25 % slopes
EcE- Eden silty clay loam, 25 to 40 % slopes
Gn- Genesee loam, occasionally flooded*
PfE- Pate silty clay loam, 25 to 35 % slopes
RpC2- Rossmoyne silt loam, 8 to 15 % slopes, eroded*
UABXD- Urban land-Alfic Udarents-Bonnell complex, 12 to 25 % slopes
UAGXC- Urban land-Alfic Udarents-Rossmoyne complex, 0 to 12 % slopes
UATXD- Urban land-Alfic Udarents-Pate complex, 12 to 25 % slopes
UATXE- Urban land-Alfic Udarents-Pate complex, 25 to 35 % slopes
UMLXAO- Urban land-Mollic Udarents-Lanier complex, 0 to 2 % slopes, occasionally flooded
UcAXD- Urban land-Alfic Udarents complex, clayey substratum over bedrock, 12 to 25 % slopes
UfAXC- Urban land-Alfic Udarents complex, fragipan substratum over till, 0 to 12 % slopes
Ur- Urban land
UrUXC- Urban land-Udorthents complex, 0 to 12 % slopes
UsUXF- Urban land-Udorthents complex, smoothed, 0 to 50 % slopes
W- Water
READING
CINCINNATI
AMBERLEY
GOLF MANOR
UfAXC
UrUXC
Ur
Gn
UATXD
UAGXC
UABXD
UMLXAO
RpC2
PfE
EcE
EcD
UcAXD
W
Construction Footprint
City Limits
SSURGO Soils Map Unit
North College Hill
Montgomery
Madeira
Milford
NORTH
500 250 0 500
Scale in Feet
BURNS McDONNELL
Figure 3
Soils Map
C350
Page 1 of 1
Path: Z:\Clients\TND\DukeEnr\b0786_DukeC314V\Studies\Geospatial\DataFiles\ArcDocs\SWPPP\DukeC314V_SWPPP_Fig3_Soils.mxd mhogan 9/17/2023
Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Source: Esri, SSURGO Soils Database, and Burns & McDonnell Engineering Company, Inc.
Issued: 9/17/2020

APPENDIX C – EROSION AND SEDIMENT CONTROL PLANS AND BMP DETAILS

C350 20" PIPELINE

SCALE: 1:2500

DRAWING INDEX			
PAGE #	DRAWING NUMBER	SHEET DESCRIPTION	REV.
1	PNG-G-350-0001009	COVER PAGE	B
2	PNG-G-350-0001010	SIGN OFF SHEET	B
3	PNG-G-350-0001011	GENERAL NOTES SHEET 1	B
4	PNG-G-350-0001012	GENERAL NOTES SHEET 2	B
5	PNG-G-350-0001013	LEGEND, SYMBOLS, & ABBREVIATIONS	B
6	PNG-D-350-0001001	MLV- 01 (C350-0004) P&ID	B
7	PNG-D-350-0001002	MLV- 02 (C350-0005) P&ID	B
8	PNG-C-350-0001337	PIPELINE BILL OF MATERIAL	B
9	PNG-C-350-0001163	ACCESS ROUTE OVERVIEW MAP	B
10	PNG-C-350-0001164	ACCESS ROUTES 1	B
11	PNG-C-350-0001165	ACCESS ROUTES 2	B
12	PNG-C-350-0001166	ACCESS ROUTES 3	B
13	PNG-C-350-0001167	ACCESS ROUTES 4	B
14	PNG-C-350-0001168	ACCESS ROUTES 5	B
15	PNG-C-350-0001169	ACCESS ROUTES 6	B
16	PNG-C-350-0001170	ACCESS ROUTES 7	B
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18	PNG-C-350-0001172	ACCESS ROUTES 9	B
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20	PNG-C-350-0001174	ACCESS ROUTES 11	B
21	PNG-C-350-0001175	ACCESS ROUTES 12	B
22	PNG-C-350-0001179	ALIGNMENT PLAN AND PROFILE SHT 1	B
23	PNG-C-350-0001180	ALIGNMENT PLAN AND PROFILE SHT 2	B
24	PNG-C-350-0001181	ALIGNMENT PLAN AND PROFILE SHT 3	B
25	PNG-C-350-0001182	ALIGNMENT PLAN AND PROFILE SHT 4	B
26	PNG-C-350-0001183	ALIGNMENT PLAN AND PROFILE SHT 5	B
27	PNG-C-350-0001184	ALIGNMENT PLAN AND PROFILE SHT 6	B
28	PNG-C-350-0001185	ALIGNMENT PLAN AND PROFILE SHT 7	B
29	PNG-C-350-0001186	ALIGNMENT PLAN AND PROFILE SHT 8	B
30	PNG-C-350-0001187	ALIGNMENT PLAN AND PROFILE SHT 9	B
31	PNG-C-350-0001188	ALIGNMENT PLAN AND PROFILE SHT 10	B
32	PNG-C-350-0001189	ALIGNMENT PLAN AND PROFILE SHT 11	B
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34	PNG-C-350-0001191	ALIGNMENT PLAN AND PROFILE SHT 13	B
35	PNG-C-350-0001192	ALIGNMENT PLAN AND PROFILE SHT 14	B
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37	PNG-C-350-0001194	ALIGNMENT PLAN AND PROFILE SHT 16	B
38	PNG-C-350-0001195	ALIGNMENT PLAN AND PROFILE SHT 17	B
39	PNG-C-350-0001196	ALIGNMENT PLAN AND PROFILE SHT 18	B
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45	PNG-C-350-0001202	ALIGNMENT PLAN AND PROFILE SHT 24	B
46	PNG-C-350-0001203	ALIGNMENT PLAN AND PROFILE SHT 25	B
47	PNG-C-350-0001204	ALIGNMENT PLAN AND PROFILE SHT 26	B
48	PNG-C-350-0001205	ALIGNMENT PLAN AND PROFILE SHT 27	B
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54	PNG-C-350-0001211	ALIGNMENT PLAN AND PROFILE SHT 33	B
55	PNG-C-350-0001212	ALIGNMENT PLAN AND PROFILE SHT 34	B
56	PNG-C-350-0001213	ALIGNMENT PLAN AND PROFILE SHT 35	B
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59	PNG-C-350-0001216	ALIGNMENT PLAN AND PROFILE SHT 38	B
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70	PNG-C-350-0001227	ALIGNMENT PLAN AND PROFILE SHT 49	B
71	PNG-C-350-0001228	ALIGNMENT PLAN AND PROFILE SHT 50	B
72	PNG-C-350-0001229	ALIGNMENT PLAN AND PROFILE SHT 51	B
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80	PNG-C-350-0001237	ALIGNMENT PLAN AND PROFILE SHT 59	B
81	PNG-C-350-0001238	ALIGNMENT PLAN AND PROFILE SHT 60	B
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85	PNG-C-350-0001242	ALIGNMENT PLAN AND PROFILE SHT 64	B
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87	PNG-C-350-0001250	CROSSING DETAILS 2	B
88	PNG-C-350-0001251	CROSSING DETAILS 3	B
89	PNG-C-350-0001252	CROSSING DETAILS 4	B
90	PNG-C-350-0001253	CROSSING DETAILS 5	B
91	PNG-C-350-0001254	CROSSING DETAILS 6	B
92	PNG-C-350-0001255	CROSSING DETAILS 7	B
93	PNG-C-350-0001256	CROSSING DETAILS 8	B
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95	PNG-C-350-0001258	CROSSING DETAILS 10	B
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97	PNG-C-350-0001260	CROSSING DETAILS 12	B
98	PNG-C-350-0001261	CROSSING DETAILS 13	B
99	PNG-C-350-0001262	CROSSING DETAILS 14	B
100	PNG-C-350-0001263	CROSSING DETAILS 15	B
101	PNG-C-350-0001264	CROSSING DETAILS 16	B
102	PNG-C-350-0001265	CROSSING DETAILS 17	B
103	PNG-C-350-0001266	CROSSING DETAILS 18	B
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105	PNG-C-350-0001272	KEMPER ROAD HDD	B
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108	PNG-C-350-0001275	MILL CREEK 1 PIPESIDE DETAIL	A
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110	PNG-C-350-0001279	HYDROSTATIC TEST PLAN & DETAILS 2	B
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112	PNG-B-350-0001008	GEOTECH BORE LOG 1	B
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115	PNG-B-350-0001011	GEOTECH BORE LOG 4	B
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117	PNG-B-350-0001013	GEOTECH BORE LOG 6	B
118	PNG-B-350-0001014	GEOTECH BORE LOG 7	B
119	PNG-B-350-0001015	GEOTECH BORE LOG 8	B
120	PNG-C-350-0001283	ENVIRONMENTAL NOTES & DETAILS 1	B
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122	PNG-C-350-0001285	ENVIRONMENTAL NOTES & DETAILS 3	B
123	PNG-C-350-0001286	ENVIRONMENTAL NOTES & DETAILS 4	B
124	PNG-C-350-0001293	RESTORATION DETAILS 1	B
125	PNG-C-350-0001294	RESTORATION DETAILS 2	B
126	PNG-C-350-0001295	RESTORATION DETAILS 3	B
127	PNG-C-350-0001303	CONSTRUCTION DETAILS 1	B
128	PNG-C-350-0001304	CONSTRUCTION DETAILS 2	B
129	PNG-C-350-0001305	CONSTRUCTION DETAILS 3	B
130	PNG-C-350-0001306	CONSTRUCTION DETAILS 4	B
131	PNG-C-350-0001307	CONSTRUCTION DETAILS 5	B
132	PNG-C-350-0001308	CONSTRUCTION DETAILS 6	B
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137	PNG-C-350-0001335	FENCE DETAILS 1	B
138	PNG-C-350-0001336	FENCE DETAILS 2	B
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140	PNG-C-350-0001339	MAINLINE VALVE 01 SITE GRADING PLAN	B
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144	PNG-L-350-0001000	MAINLINE VALVE 01 SITE LANDSCAPING PLAN	B
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146	PNG-S-350-0001002	MAINLINE VALVE STRUCTURAL DETAILS	B
147	PNG-E-350-0001010	MLV1 CATHODIC PROTECTION SITE PLAN	B
148	PNG-E-350-0001011	CP DEEP WELL GROUNDBED	B
149	PNG-E-350-0001012	CATHODIC PROTECTION RECTIFIER	B
150	PNG-E-350-0001013	TWO-WIRE TEST STATION	B
151	PNG-E-350-0001014	PIPELINE CROSSING TEST STATION	B
152	PNG-E-350-0001015	MONOLITHIC INSULATOR BOND	B
153	PNG-E-350-0001016	AC GROUNDING CABLE	B
154	PNG-E-350-0001017	AC COUPON TEST STATION	B
155	PNG-E-350-0001018	SOLID-STATE DECOUPLER	B
156	PNG-E-350-0001019	PROTECTIVE BOLLARDS	B
157	PNG-E-350-0001020	EXOTHERMIC WELDING	B
158	PNG-E-350-0001021	CP EQUIPMENT SCHEDULE	B
159	PNG-E-350-0001024	AC EQUIPMENT SCHEDULE	B
160	PNG-E-350-0001025	CP / AC BILL OF MATERIALS	B
161	PNG-E-350-0001026	ELECTRICAL GENERAL NOTES	B
162	PNG-E-350-0001027	ELECTRICAL LEGEND	B
163	PNG-E-350-0001028	MAINLINE VALVES TYPICAL INSTRUMENT PLAN	B
164	PNG-E-350-0001029	MAINLINE VALVES TYPICAL AC POWER DETAILS	B
165	PNG-E-350-0001030	MAINLINE VALVES TYPICAL INSTALLATION DETAILS	B
166	PNG-E-350-0001031	MAINLINE VALVES TYPICAL GROUNDING PLAN AND DETAILS	B
167	PNG-E-350-0001032	MAINLINE VALVES TYPICAL HAZARDOUS LOCATION SITE PLAN	B

PROPOSED REROUTE SUPPLEMENTAL SKETCHES	
SK-1	STATE OF OHIO / HAMILTON COUNTY COMMISSIONERS PROPOSED REROUTE EXHIBIT
SK-2	REGENCY BLUE ASH PROPOSED REROUTE EXHIBIT
SK-3	CITY OF READING FUTURE RAIL SPUR PROPOSED REROUTE EXHIBIT

NOTE:
PROPOSED REROUTE SUPPLEMENTAL SKETCHES SHALL BE USED FOR BIDDING PURPOSES ONLY. SKETCHES LACK COMPLETE SURVEY OR LANDOWNER AGREEMENT AND SHALL NOT BE USED FOR CONSTRUCTION.

FOR BID - NOT FOR CONSTRUCTION

BURNS & MCDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA: 01557

PROFESSIONAL ENGINEER STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
A	05/17/2020	ISSUED FOR 90% REVIEW	AKT	CNS	AMP
B	07/24/2020	ISSUED FOR BID	AKT	JMP	CNS

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

APPROVALS		
DATE	INITIALS	
-	-	REGIONAL ENGINEER
-	-	MGR TECH REG & STD
-	-	PRINCIPAL ENGINEER

DUKE ENERGY | Piedmont Natural Gas

C350 PROJECT
COVER SHEET
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

SHEET(S)	1 OF 5
DWG SCALE	AS NOTED
DWG DATE	09-05-2018
SUPERSEDED	
DRAWING NUMBER	PNG -G-350-0001009
REVISION	B

G:\HAMILTON COUNTY\C350\

DESIGN REVIEW OF COMPLETED CONSTRUCTION JOB

SPONSOR_____ DATE_____

FIELD CHANGE REQUEST DOCUMENT REQUIRED: YES☐ NO☐

TRANSMISSION DESIGN DOCUMENT REQUIRED: YES☐ NO☐

SYSTEMS OPERATION SUPERVISOR
VALVES AND NUMBERS REVIEWED

REVIEWED BY_____

DATE_____

VALVES THAT HAVE BEEN ABANDONED AND REMOVED

#_____	#_____
#_____	#_____
#_____	#_____
#_____	#_____
#_____	#_____
#_____	#_____

CORROSION ENGINEERING
CONDITION OF COATING WHEN DELIVERED TO JOB:

APPR. BY_____

COATING TYPE_____ GOOD☐ FAIR☐ POOR☐

INSPECT ON: INSULATION CHECKED
VISUAL☐ JEEP☐ NO. CHECKED_____

TYPE PATCH MATERIAL_____

TEST CONN. PER STD. 7.7.1
NO. PROPOSED_____
NO. INSTALLED_____
NO. TESTED OK_____
(PIS INDICATOR)
PLASTIC SEPARATIONS INSTALLED☐
CONTINUITY OF COUPLINGS CHECKED☐
CASING CHECKED FOR SHORT☐

SUPERVISOR BLOCK

SUPERVISOR OR CONTRACTOR_____

RECORDED BY_____

DATE STARTED_____ DATE PLACED IN SERVICE_____

DATE COMPLETED_____ PERMIT NO._____

TRACEABILITY OF PLASTIC MAIN AND SERVICES TESTED UPON COMPLEATION

COMPLETION CONTRACTOR_____

VERIFICATION INSPECTOR_____

FIELD PRESSURE LEAK TEST

ALL PIPELINES REQUIRE LEAK TESTING BEFORE PLACING INTO SERVICE. PRESSURE CHARTS AND FORMS SHOULD BE FORWARDED TO GAS ENGINEERING

REQUIRED TEST PRESSURE RANGE:

MIN. 90 PSIG TO MAX 100 PSIG

HOURS 24 MEDIUM AIR

TESTED BY_____ DATE_____

PERMIT(S) REQUIRED

ROW PERMIT SUMMARY PRESENTED BELOW.
SEE CONSTRUCTION BID FOR FULL PERMIT LIST.

PROJECT CONTACTS

CONSTRUCTION:
MATT WEBER
(W) 513-287-2988
(C) 513-310-9881

ENGINEERING SPONSOR:
JAMIE OLBERDING (W) 513-287-3021 (C) 513-544-9692
NICK WEIL (W) 513-287-2088 (C) 512-808-7862

PIPE INSTALLED ON JOB

	WO#	PROJECT	ACTIVITY	SIZE	KIND	WALL THICKNESS	EST. PIPE LENGTH	ACTUAL PIPE LENGTH	ACTUAL FITTING &VALVE LENGTH
INSTALLATION	-	-	-	20"	ERW	0.438"	67,179 FT		
ABANDONMENT				20"	ERW	0.500"	100 FT		
RENEW SERVICE M-C									
RENEW SERVICE C-M									
RELOCATE METER						TOTAL	67,279 FT		

HYDROSTATIC PRESSURE TEST

ALL LINES OPERATING ABOVE 60 PSIG REQUIRE STRENGTH TESTING BEFORE PLACING INTO SERVICE. PRESSURE CHARTS AND FORMS SHOULD BE FORWARDED TO GAS ENGINEERING. TEST PER PROCEDURE GD10.1003-1

REQUIRED TEST PRESSURE RANGE

MIN. 750 PSIG TO MAX 850 PSIG

HOURS 8 MEDIUM WATER

SIGNATURE_____ DATE_____

HYDROSTATIC TEST WATER DISCHARGE REQUIRMENTS

PERMIT REQUIRED FOR ALL DISCHARGE. CONTACT GAS OPERATION REGULATORY COMPLIANCE TO ARRANGE FOR DISCHARGE PERMIT. SAMPLING AND TESTING REQUIRED FOR ALL DISCHARGES TO SURFACE WATERS. CONTACT LOCAL POTW FOR OFFSITE DISCHARGE REQUIREMENTS AND LOCAL WATER DISTRICT. HYDROSTATIC TEST WATER DISCHARGE SHALL BE PER GAS STANDARD 10.3.

INSTALLED PIPE & FITTING MAOP VERIFICATION
C350
TO BE FILLED IN BY MAOP ENGINEER

SIZE	WALL THICKNESS	GRADE	% SYMS
20"	0.438"	X60	19.0%
20"	0.500"	X60	16.7%

DESIGN MAOP PER CLASS 4 500 PSIG. OPERATING OF LINE_____PSIG
MIN. PRESSURE RATING OF VALVE, FLANGE OR FITTING_____PSIG.

I HEREBY CERTIFY THAT ALL MATERIAL INSTALLED IS RATED HIGHER THAN THE DESIGN MAOP OF THIS LINE, AND THAT THE MATERIAL WAS INSTALLED AS DESIGNED UNLESS NOTED ON MATERIAL LIST.

MAOP ENGINEER SIGNATURE_____ DATE_____

HYDROSTATIC TEST PROJECT CONTACTS

CONSTRUCTION MANAGER___MATT WEBER (C) 513-310-9881

CONTRACTOR CONSTRUCTION MANAGEMENT SUPERVISOR___JAMIE OLDBERDING (C) 513-544-9692

PROJECT MANAGER___JAMIE OLBERDING (C) 513-544-9692

CORROSION ENGINEER___MICKEY HARGROVE (C) 615-872-2382

CONSTRUCTION & MAINTENANCE (C&M) MANAGER___JAMIE OLBERDING (C) 513-544-9692

WELD PROCEDURE(S) REQUIRED

SPEC #_____ SPEC #_____

SPEC #_____ SPEC #_____

SPEC #_____ SPEC #_____

SPEC #_____ SPEC #_____

COUNTY OF	ITEM NO.	SHEET NO.
-	-	-

CONFORMING TO THE OFFICE OF PIPELINE SAFETY'S REGULATIONS (SECTION 192.243, PARAGRAPH F), WELDING FOR PIPELINE IS REQUIRED TO BE MAINTAINED AS A PART OF THE PIPELINE'S PERMANENT RECORD.

TO MEET THIS REQUIREMENT, THE INSPECTOR SHALL IDENTIFY EACH WELD OF THIS PIPELINE BY NUMBERING AND LOCATING THE WELD ON THE CONSTRUCTION DRAWING AND COMPLETING THE INFORMATION BLOCK BELOW. NUMBERS MUST MATCH THOSE ON X-RAY SHEET. ALL WELDS MUST BE IN ACCORDANCE WITH COMPANY SPECIFICATION GD 55.500.

TO BE FILLED OUT BY DESIGN ENGINEER

PIPE SIZE	20"	20"			
PIPE WALL THK.	0.438"	0.500"			
PIPE GRADE	X60	X60			
SYMS PER MAOP	19.0%	16.7%			
WELDING SPEC.					
% XRAY	100%	100%			

TO BE FILLED OUT BY INSPECTOR

TOTAL NO. OF WELDS MADE					
TOTAL NO. OF WELDS X-RAYED					
TOTAL NO. OF WELDS REJECTED					
TOTAL NO. OF WELDS REPAIRED					
TOTAL NO. OF WELDS REPLACED					

NOTE: TOTAL OF REPAIRED PLUS REPLACED WELDS SHOULD EQUAL AMOUNT OF REJECTED WELDS

ROW PERMIT SUMMARY

Agency	Permit/Approval	Location
Hamilton County	Building Permit	Highpoint Park Station
Hamilton County	Road Bore	Conrey Rd.
Hamilton County	Road HDD	Kemper Rd.
Sharonville	Road HDD	Kemper Rd.
ODOT	Road Boring	I-275
Blue Ash	Road Open Cut	Grooms Rd.
Blue Ash	Road Open Cut	Reed Hartman Hwy
Blue Ash	Road Bore	Cornell Rd
Blue Ash	Road Bore	Reed Hartman Hwy
Blue Ash	Road Bore	Osborne Blvd
Blue Ash	Parallel & Road Open Cut	Reed Hartman Hwy
Blue Ash	Road Bore	Creek Rd
Blue Ash	Road Open Cut	Lake Forest Dr
Blue Ash	Road Open Cut	Lake Forest Dr
Blue Ash	Road Bore	Glendale Milford Rd
Blue Ash	Road Bore	Plainfield Rd
Evendale	Road Bore	Plainfield Rd
Evendale	Road Open Cut	Glendale Milford Rd
Evendale	Road HDD	US 42 (Reading Rd)
Evendale	Road Bore	Glendale Milford Rd
Evendale	Road Open Cut	Evendale Commons Dr
Reading	Road Open Cut	West St., W. Pleasant St., Market St., W. Columbia Ave, Market St., W. Mechanic St., 3rd St., E. Vine St., E. Benson St., E. Vorhees St., E. Galbraith Rd. (bore), US42 (open cut)
ODOT	Work under Hwy ROW	Ronald Reagan Cross Country Hwy
Amberley Village	Road Open Cut	Sunnybrook Dr
Amberley Village	Road Bore	Section Rd.
Cincinnati	Road Open Cut	Losantiville Ave
Golf Manor	Road Open Cut	Losantiville Ave
Cincinnati	Road Open Cut	Eagle Ct.
Cincinnati	Road Open Cut	Langdon Farm Rd.
Cincinnati	Road Open Cut	Carthage Ct.
Hamilton County	Building Permit	Norwood Station

BURNS & MCDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA, 01557

PROFESSIONAL ENGINEER STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
A	05/17/2020	ISSUED FOR 90% REVIEW	AKT	CNS	AMP
B	07/24/2020	ISSUED FOR BID	AKT	JMP	CNS

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	Q3580
PROJECT NUMBER	1680115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	JMP

APPROVALS		
DATE	INITIALS	
-	-	REGIONAL ENGINEER:
-	-	MGR TECH REG & STD
-	-	PRINCIPAL ENGINEER

DUKE ENERGY. Piedmont Natural Gas

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

C350 PROJECT SIGN OFF SHEET HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

SHEET(S)	2 OF 5
DWG SCALE	AS NOTED
DWG DATE	09-05-2018
SUPERSEDED	
DRAWING NUMBER	PNG -G-350-0001010
REVISION	B

G:\HAMILTON COUNTY\C350

GENERAL NOTES:

1. INSTALLER SHALL FURNISH ALL MATERIALS NOT PROVIDED BY THE COMPANY (UNLESS OTHERWISE NOTED ON DRAWINGS OR SPECIFICATIONS), INCLUDING EQUIPMENT, TRANSPORTATION, SERVICES, AND PERFORM ALL NECESSARY WORK AS SHOWN ON THE DRAWINGS AND SPECIFIED HEREINAFTER.
2. IT SHALL BE THE RESPONSIBILITY OF THE INSTALLER TO VERIFY ALL DIMENSIONS GIVEN ON THE DRAWINGS. ANY ITEM IN QUESTION SHALL BE BROUGHT TO THE ATTENTION OF THE PROJECT MANAGER IN WRITING VIA RFI PROCESS PRIOR TO PROCEEDING WITH THE WORK.
3. INSTALLER SHALL BE RESPONSIBLE FOR PROTECTION OF ALL SURROUNDING AREAS. CONTRACTOR SHALL NOT UNNECESSARILY DISTURB EXISTING CONDITIONS WITHIN CONSTRUCTION LIMITS. DISCRETION SHALL BE PER COMPANY REPRESENTATIVE.
4. PROPOSED ELEVATIONS AND DIMENSIONS INDICATE TOP OF PIPE, UNLESS OTHERWISE NOTED. UNLESS SPECIFICALLY NOTED, DEPTHS OF EXISTING FACILITIES ARE ESTIMATED ONLY. CONTRACTOR IS RESPONSIBLE FOR VERIFYING DEPTH AND LOCATION OF ALL FACILITIES PRIOR TO COMMENCING WORK.
5. ALL BELOW GROUND WELDS SHALL BE COATED WITH DENSO 7200 PER PERTINENT DESIGN AND CONSTRUCTION STANDARDS OR AS APPROVED OTHERWISE. SURFACE PREPARATION AND BLASTING SHALL ADHERE TO PERTINENT DESIGN AND CONSTRUCTION STANDARDS AND COATING MATERIAL SPECIFICATIONS.
6. UPON BACKFILLING IN AREAS OF ROCK, BURIED PIPE SHALL HAVE MINIMUM 6" OF SAND PAD FILL PLACED AROUND THE PIPE'S CIRCUMFERENCE.
7. PRESSURE TESTING SHALL MEET THE REQUIREMENTS OF DUKE'S PRESSURE TESTING STANDARD, PER PERTINENT DESIGN AND CONSTRUCTION STANDARDS.
8. INSTALLER SHALL DEWATER ALL HYDROSTATICALLY TESTED PIPING, USING CLEANING PIGS AS REQUIRED, AND DRY TO A DEWPOINT OF -40 °F PER PERTINENT DESIGN AND CONSTRUCTION STANDARDS.
9. ALL DISTANCES SHOWN ARE GRID DISTANCES BASED ON OHIO STATE PLANE COORDINATE SOUTH ZONE (3402) NAD 83.
10. ABOVE GROUND FEATURES AND CONTOURS PROVIDED BY XF-RS, LLC FROM OVERLAND PARK, KS 66225.
11. BELOW GROUND SURVEY PROVIDED BY G.J. BERDING SURVEYING FROM MILFORD, OH 45150. SURVEY SUBS INCLUDE RLA UTILITIES FROM CINCINNATI, OH 45215 AND THE UNDERGROUND DETECTIVE® FROM CINCINNATI, OH 45251.
12. ANY CHANGES TO THE DESIGN SHOWN ON DRAWINGS SHALL BE APPROVED BY COMPANY REPRESENTATIVE IN WRITING VIA RFI PROCESS.

CONSTRUCTION NOTES:

1. EXISTING OVERHEAD AND BELOWGROUND FACILITIES MAY BE IN THE WORK AREA VICINITY. INSTALLER IS RESPONSIBLE FOR HAVING SUCH FACILITIES LOCATED AND IS RESPONSIBLE FOR MAINTENANCE AND PRESERVATION OF THESE FACILITIES.
2. PER PERTINENT DESIGN AND CONSTRUCTION STANDARDS, INSTALLER IS REQUIRED TO CALL 811 FOR UTILITY LOCATES A MINIMUM OF 72 HOURS PRIOR TO COMMENCEMENT OF WORK. NO EXTRA COMPENSATION WILL BE ALLOWED FOR DELAYS FROM ANY WORK PROVIDED BY OTHER UTILITIES.
3. IF EXISTING UTILITIES OF ANY TYPE ARE ENCOUNTERED IN THE FIELD AND DEEMED TO BE IN CONFLICT WITH INSTALLATION OF FACILITIES, INSTALLER SHALL NOTIFY THE PROJECT MANAGER IN WRITING VIA RFI PROCESS IMMEDIATELY SO THE CONFLICT MAY BE RESOLVED.
4. WHEN EXISTING DRAINAGE FACILITIES ARE DISTURBED, INSTALLER SHALL PROVIDE AND MAINTAIN TEMPORARY OUTLETS AND CONNECTIONS FOR PRIVATE DRAINS OR SEWERS. RESTORATION OF THESE FACILITIES IS TO BE PERFORMED ONCE CONSTRUCTION IS COMPLETE AND ARE CONSIDERED INCIDENTAL COSTS OF THE PROJECT.
5. ALL DRAWING MEASUREMENTS ARE TO BE TAKEN FROM EXISTING GRADE. FINAL GRADE SHALL BE MATCHED TO SURROUNDING GRADE AS PER PERTINENT DESIGN AND CONSTRUCTION STANDARDS.
6. INSTALLER IS TO REMAIN WITHIN CONSTRUCTION WORKING LIMITS. ACCESS TO AREAS OUTSIDE WORKING LIMITS MUST BE COORDINATED WITH THE OWNER OR DUKE ENERGY PROJECT MANAGER.
7. ALL EXCESS EXCAVATION, CONSTRUCTION DEMOLITION DEBRIS AND UNSUITABLE MATERIALS THAT DO NOT CONTAIN ASBESTOS SHALL BE REMOVED FROM THE SITE AND PROPERLY DISPOSED.
8. STANDARD SPECIFICATIONS REFERENCED ON THIS SHEET AND CONSTRUCTION PLANS ARE CONSIDERED AS PART OF THE CONTRACT DOCUMENTS. INCIDENTAL ITEMS OR ACCESSORIES NECESSARY TO COMPLETE THIS WORK MAY NOT BE SPECIFICALLY NOTED, BUT ARE CONSIDERED TO BE A PART OF THIS CONTRACT.
9. BEFORE ACCEPTANCE BY THE OWNER AND FINAL PAYMENT, ALL WORK SHALL BE INSPECTED AND APPROVED BY DUKE OR COMPANY REPRESENTATIVE. FINAL PAYMENT SHALL BE MADE AFTER ALL OF THE INSTALLER'S WORK HAS BEEN ACCEPTED AND APPROVED AND IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
10. DURING CONSTRUCTION, ALL LOOSE MATERIAL THAT ARE DEPOSITED IN THE FLOW LINE OF GUTTERS, DRAINAGE STRUCTURES, DITCHES, ETC. SUCH THAT THE NATURAL FLOW LINE OF WATER IS OBSTRUCTED, SHALL BE REMOVED AT THE END OF EACH WORK DAY.
11. ALL FIELD TILE ENCOUNTERED DURING CONSTRUCTION SHALL BE EXTENDED TO OUTLET INTO AN EXISTING DRAINAGE WAY. A RECORD OF ALL FIELD TILE FOR ONSITE DRAIN PIPE ENCOUNTERED SHALL BE KEPT BY THE INSTALLER AND TURNED OVER TO THE PROJECT MANAGER UPON COMPLETION OF THE PROJECT.
12. INSTALLER IS REQUIRED TO MAINTAIN A SET OF ISSUED FOR CONSTRUCTION DRAWINGS AND ALL PERMITS AT THE JOB SITE. ANY MODIFICATIONS OR ALTERATIONS TO THE PLANS OR SPECIFICATIONS SHALL BE APPROVED BY THE PROJECT MANAGER.
13. INSTALLER IS SOLELY RESPONSIBLE FOR EXECUTION OF HIS/HER WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND SPECIFICATIONS. INSTALLER IS RESPONSIBLE FOR THE CONSTRUCTION METHODS AND TECHNIQUES, SEQUENCES, TIME OF PERFORMANCE, AND ALL SAFETY PRECAUTIONS.
14. MINIMUM DEPTH OF BURIAL SHALL BE PER PERTINENT DESIGN AND CONSTRUCTION STANDARDS.
15. ALL PIPELINES BEING CROSSED ARE TO BE PROTECTED WITH A MINIMUM OF (3) 4 FEET X 18 FEET WOODEN MATS.
16. CONTRACTOR TO PROTECT SIDEWALKS AND BIKE PATHS FROM VEHICLE TRAFFIC UTILIZING STEEL PLATING, TIMBER MATTING OR SIMILAR. EXISTING SIDEWALK, BITUMINOUS SHOULDER, CURB/GUTTER AND/OR ROADWAY PAVEMENT DISTURBED OR DAMAGED DUE TO THE PERMITTED WORK SHALL BE REPLACED IN KIND UP TO THE LIMITS AS DETERMINED AND DIRECTED BY THE CITY REPRESENTATIVE IN WHICH DAMAGE WAS DONE.
17. PER PERTINENT DESIGN AND CONSTRUCTION STANDARDS, FOR OPEN DITCH EXCAVATION, A MINIMUM OF TWO FEET OF SEPARATION SHALL BE MAINTAINED BETWEEN ALL CROSSING STRUCTURES. SEPARATION BETWEEN CROSSING STRUCTURES AND PIPELINES THAT ARE INSTALLED VIA DIRECTIONAL DRILLING METHODS IS AT THE DISCRETION OF ENGINEERING.
18. DURING BACKFILLING, A SIX INCH CROWN SHALL BE PLACED ON ALL DISTURBED AREAS. COMPACTION REQUIREMENTS SHALL BE PER PERTINENT DESIGN AND CONSTRUCTION STANDARDS.
19. BOLTS FOR FLANGES TO BE TORQUED PER PERTINENT DESIGN AND CONSTRUCTION STANDARDS.
20. MAINLINE GIRTH WELDS SHALL BE 100% X-RAYED PER PERTINENT WELDING PROCEDURES. ALL OTHER WELDS SHALL BE NON DESTRUCTIVELY TESTED PER PERTINENT WELDING PROCEDURES.

SURVEY INVESTIGATION NOTES:

1. BEARINGS AND COORDINATES ARE RELATIVE TO NAD83 OHIO STATE PLANE, SOUTH ZONE (3402), US FOOT. VERTICAL DATUM IS NAVD88.

GEOTECHNICAL DATA

1. THE GEOTECHNICAL INFORMATION PROVIDED ON THIS DRAWING IS A GENERAL SUMMARY. REFER TO THE APPLICABLE GEOTECHNICAL REPORT IN THE CONTRACT DOCUMENTS FOR MORE DETAILED INFORMATION INCLUDING:
   - GEOTECHNICAL ENGINEERING REPORT C350 CENTRAL CORRIDOR PIPELINE EXPANSION, CINCINNATI, HAMILTON COUNTY, OHIO DATED JULY 11, 2018, REVISED JULY 6, 2020, TERRACON PROJECT NUMBER N1175384.
   - LETTER REGARDING GEOTECHNICAL SERVICES K.L. NEW CONSTRUCTION SITE EVALUATION, READING, OHIO, TERRACON PROJECT NUMBER N1175384 ADDRESSED TO MR. JAMES OLBERDING DATED MAY 22, 2020.
   - LETTER REGARDING GEOTECHNICAL SERVICES A/A REAL ESTATE SITE EVALUATION, BLUE ASH, OHIO, TERRACON PROJECT NUMBER N1175384 ADDRESSED TO MR. JAMES OLBERDING DATED JUNE 22, 2020.

CATHODIC PROTECTION & AC MITIGATION NOTES:

1. CONTRACTOR SHALL PROVIDE AND INSTALL ALL NON-STOCK CP AC MATERIALS AND ALL MISCELLANEOUS PARTS TO COMPLETE PROJECT PER CONTRACT DRAWINGS, CONTRACT SPECIFICATIONS, ELECTRICAL CODES, STATE AND LOCAL CODES AND STANDARDS, AND LOCAL ELECTRICAL DISTRIBUTION COMPANY REQUIREMENTS. CONTRACTOR SHALL ALSO INSTALL ALL OWNER PROVIDED CP AND AC MATERIALS AND EQUIPMENT. PARTS INCLUDE, BUT ARE NOT LIMITED TO, WIRING AND MOUNTING MATERIALS, METER SOCKET, DISCONNECT EQUIPMENT, ENCLOSURES, TRANSIENT VOLTAGE SURGE SUPPRESSORS, AC MAIN BUSS TERMINATION, CIRCUIT BREAKERS, AND OTHER ELECTRICAL EQUIPMENT REQUIRED, ACTUAL LENGTH OF WIRING IS DEPENDENT ON DISTANCE FROM INSTALLATION.

DESIGN NOTES:

1. DESIGN MAOP: 500 PSIG.
2. FOR 20" PIPE, FIELD BEND SHALL BE LIMITED TO 25 DEGREES OR LESS PER 40' STICK OF PIPE. ALL FIELD BENDS REQUIRE MINIMUM 6' TANGENTS. CUT SEGMENTABLE FITTINGS REQUIRED FOR ALL ANGLES ABOVE 25 DEGREES.
3. MINIMUM ROPING RADIUS FOR 20" PIPE: 1200' BASED ON 3-JOINT RADIUS.
4. UNLESS NOTED OTHERWISE MINIMUM DESIGN CLEARANCE BETWEEN PIPELINE AND FOREIGN STRUCTURES IS 2' (24"). FIELD ADJUSTMENT MAY BE REQUIRED TO LESS THAN DESIGNED CLEARANCE, BUT IN NO CIRCUMSTANCES WILL CLEARANCE BE LESS THAN 1' (12").
5. CONTRACTOR SHALL ADHERE TO DUKE OHIO HDD GUIDELINES AS APPLIES TO HDD DRILLING WASTES AND PROTECTION OF WATER RESOURCES.

PERMITTING AND WORK HOURS:

1. SPECIFIC PERMIT REQUIREMENTS ARE LARGELY OMITTED FROM THESE DRAWINGS. FOR DETAILED REQUIREMENTS REFER TO INDIVIDUAL PERMITS AND THE "DUKE ENERGY C350 PROJECT PERMIT MATRIX".
2. TWO WEEKS NOTIFICATION SHALL BE PROVIDED TO ALL LANDOWNERS PRIOR TO COMMENCING CONSTRUCTION ACTIVITY.
3. WORKING HOURS SHALL BE 7AM TO 7PM UNLESS OTHERWISE SPECIFIED. WORK HOURS SPECIFIED IN THE APPLICABLE PERMITS SHALL GOVERN.

TRAFFIC CONTROL AND TRAFFIC MANAGEMENT:

1. TRAFFIC CONTROL AND TRAFFIC MANAGEMENT IS OMITTED FROM THESE DRAWINGS. FOR DETAILED REQUIREMENTS REFER TO ACCOMPANYING BID DOCUMENT "DUKE ENERGY C350 PROJECT TRAFFIC MANAGEMENT PLAN".

RESTORATION:

1. RESTORATION SHALL BE CONTROLLED BY APPLICABLE PERMITS AND AS DIRECTED BY COMPANY'S INSPECTOR.
2. RESTORATION LIMITS AND DETAILS PROVIDED IN THE DRAWINGS SHALL BE SUBJECT TO FIELD MODIFICATIONS TO MEET VARYING CONDITIONS.
3. ADDITIONAL RESTORATION REQUIREMENTS AND QUALIFICATIONS SHALL BE AS DESCRIBED IN THE BID DOCUMENTS.
4. MATERIAL REQUIREMENTS SHALL MEET ODOT CONSTRUCTION AND MATERIAL SPECIFICATIONS. WHERE CONFLICT EXISTS BETWEEN THESE DRAWINGS, ODOT SPECIFICATIONS, LOCAL REQUIREMENTS, OR OTHER BID DOCUMENTS REQUIREMENTS, CLARIFICATION SHALL BE SOUGHT IN ADVANCE FROM THE PROJECT MANAGER IN WRITING VIA RFI PROCESS.

BURNS & MCDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA: 01557

PROFESSIONAL ENGINEER STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
A	05/17/2020	ISSUED FOR 90% REVIEW	AKT	CNS	AMP
B	07/24/2020	ISSUED FOR BID	AKT	JMP	CNS

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

APPROVALS		
DATE	MICHAEL	REGIONAL ENGINEER
DATE	MICHAEL	MGR TECH REC & STD
DATE	MICHAEL	PRINCIPAL ENGINEER

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

C350 PROJECT
GENERAL NOTES SHEET 1
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

SHEET(S)	3 OF 5
DWG SCALE	AS NOTED
DWG DATE	09-05-2018
SUPERSEDED	
DRAWING NUMBER	PNG -G-350-0001011
REVISION	B

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CIVIL AND STRUCTURAL NOTES:

1. ADDITIONAL EXCAVATIONS BELOW FOOTINGS MAY BE NECESSARY TO REACH UNDISTURBED SOIL. ANY SUBGRADES FOR MLV PAD GRADING, FILLS REQUIRED TO GRADE THE MLV SITES, OR THE EXCAVATION SHALL BE BROUGHT TO THE BOTTOM OF THE FOOTING ELEVATION WITH COMPACTED SAND FILL MEETING THE REQUIREMENTS OF MODIFIED PROCTOR COMPACTION TEST (ASTM D1557) TO 95% IN SIX INCH LIFTS.
2. ALL EXPOSED CONCRETE EDGES SHALL HAVE A 1" X 1" 45° CHAMFER.
3. CONCRETE SHALL BE MIXED AND POURED PER PERTINENT DESIGN AND CONSTRUCTION STANDARDS. TESTING SHALL CONFORM TO ACI 318. INSTALLER TO SUPPLY ALL CONCRETE AND TESTING.
4. ALL STRUCTURAL STEEL SHALL CONFORM TO ASTM A36 SPECIFICATION. STEEL REINFORCING BAR SHALL CONFORM TO ASTM A615 GRADE 60 AND WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185. TIE WIRE SHALL CONFORM TO ASTM A82.
5. UNSUITABLE OR EXCESS EARTH SPOIL SHALL BE DISPOSED OF AT AN APPROVED WASTE LOCATION. SOIL BEING TRANSPORTED ONTO THE JOBSITE SHALL BE APPROVED BY EITHER THE PROJECT MANAGER OR CONSTRUCTION MANAGER.
6. ROCKSHIELD OR SIMILAR COMPANY APPROVED PRODUCT MUST BE INSTALLED BETWEEN ALL PIPE AND FITTINGS THAT COME INTO CONTACT WITH CONCRETE. A LAYER OF NON ABRASIVE MATERIAL SUCH AS FRP SHALL BE INSTALLED BETWEEN ALL PIPE SUPPORTS AND PIPING.
7. ALL FIELD BENDING OF REBAR SHALL BE DONE COLD.
8. ALL GRADING, PAVEMENT WORK, AND ANY OTHER MISCELLANEOUS WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE CURRENT ODOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION AND SUPPLEMENTAL SPECIFICATIONS.
9. THE GRAVEL SURFACE COURSE SHALL BE CONSTRUCTED IN ACCORDANCE WITH ITEM 411 OF THE ODOT CONSTRUCTION AND MATERIAL SPECIFICATIONS.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR GRADING INCLUDING EXCAVATION EMBANKMENT, AND BACKFILLING AS NECESSARY TO CONSTRUCT ALL AGGREGATE ACCESS ROADS, AS OUTLINED IN THESE TECHNICAL SPECIAL PROVISIONS AND AS DIRECTED BY THE CLIENT REPRESENTATIVE.
11. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY DAMAGE DONE TO STORM MANHOLES OR OTHER UTILITIES DURING GRADING.
12. DISTRIBUTE EXCESS SOIL ON SITE AT THE DIRECTION OF THE CLIENT REPRESENTATIVE. DO NOT ALTER DIRECTION OF SURFACE DRAINAGE PATTERNS.
13. THE TOLERANCE OF THIS WORK SHALL BE TO WITHIN TO 0.1 FT OF THE EXISTING GROUND SURFACE ELEVATIONS.
14. THE ACCESS ROAD SUBGRADE SHALL HAVE SUFFICIENT STABILITY TO ACCOMMODATE CONSTRUCTION TRAFFIC WITHOUT EXCESSIVE SUBGRADE RUTTING OR SHOVING, AT THE TIME OF PLACEMENT OF THE PAVEMENT, THE IN SITU SUBGRADE SHALL HAVE A CALIFORNIA BEARING RATIO (CBR) OF AT LEAST 6 PERCENT IN THE TOP 12 INCHES OF SUBGRADE. THE CBR PERCENTAGE WILL BE ASCERTAINED BY THE CONTRACTOR.
15. THE QUALITY OF THE SOIL TO BE USED AS FILL MATERIAL SHALL BE AS SPECIFIED IN THIS DOCUMENT. ALL BACKFILL SHALL BE SPREAD IN LOOSE LIFTS NOT EXCEEDING 8 INCHES IN THICKNESS WHEN SELF-PROPELLED EQUIPMENT IS USED AND NOT EXCEEDING 6 INCHES WHEN HAND GUIDED EQUIPMENT IS USED. ALL ROOTS, WOOD, AND VEGETATION SHALL BE REMOVED FROM THE LAYER OF FILL PRIOR TO COMPACTION. ALL FILL AND EXPOSED SOIL IN CUT AREAS SHALL BE COMPACTED AS SPECIFIED IN THIS DOCUMENT. SOIL COMPACTION TEST WILL BE REQUESTED BY THE OWNER AT APPROPRIATE INTERVALS DURING GRADING OPERATIONS.
16. ALL HAUL-IN MATERIAL SHALL BE FREE OF ROCKS 3 INCHES IN DIAMETER AND LARGER. THE OWNER'S CONSTRUCTION INSPECTOR SHALL APPROVE ALL HAUL-IN MATERIAL TO ENSURE THE QUALITY AND THE ABSENCE OF ENVIRONMENTAL HAZARDS.
17. THE FILL AREA SHALL BE CONSTRUCTED TO THE LINES AND GRADES SHOWN ON THE DESIGN DRAWINGS WITH MATERIAL SPECIFIED IN THIS DOCUMENT. THE OWNER'S CONSTRUCTION INSPECTOR WILL PROVIDE ALL NECESSARY BENCHMARKS, SURVEY MONUMENTS, AND BASE LINES REQUIRED FOR THE WORK. THE CONTRACTOR SHALL LAY OUT ALL LINES AND GRADES FOR THE BACKFILL AREAS. ANY PROPOSED CHANGES TO THE SLOPES AND GRADES SHALL REQUIRE THE APPROVAL OF THE OWNER'S CONSTRUCTION INSPECTOR IN ADVANCE. THE CONTRACTOR SHALL BE REQUIRED TO REMOVE, AT HIS OWN EXPENSE, ANY COMPACTED MATERIAL PLACED OUTSIDE OF THE APPROVED LINES OR GRADES.
18. SPOIL MATERIAL SHALL BE TOPSOIL AND OTHER SOIL MATERIALS CONTAINING GRATER THAN 5 PERCENT ORGANIC MATERIAL, SOIL WHICH IS TOO WET, SOIL WHICH DOES NOT MEET THE PLASTICITY AND/OR GRADATION LIMITS FOR SELECT MATERIAL AS SPECIFIED IN THIS DOCUMENT, OR OTHER SOIL MATERIAL DESIGNATED BY THE OWNER'S CONSTRUCTION INSPECTOR TO BE UNSUITABLE FOR SELECT MATERIAL.
19. SELECT SOIL MATERIAL SHALL BE THAT MATERIAL CLASSIFIED AS SM, SP, SC, SW AND CL, OR SW AND SC IN ACCORDANCE WITH ASTM D2487, AND SHALL HAVE A MAXIMUM LIQUID LIMIT OF 30, A MAXIMUM PLASTICITY INDEX OF 8, AND A MAXIMUM OF 35 PERCENT PASSING THE #200 SIEVE.
20. COMPACTION TESTING WILL BE PROVIDED AT THE EXPENSE OF THE CONTRACTOR. COMPACTION REQUIREMENTS OF SOIL BACKFILL SHALL BE AS INDICATED IN THE FOLLOWING TABLE:

LOCATION OF FILL	MINIMUM REQUIRED COMPACTION LEVEL STANDARD PROCTOR
A. GENERAL YARD AREA	98% (ASTM D698)
B. UPPER 18 INCHES OF SOIL TO BE USED AS ROAD SUBGRADE MATERIAL AND EXTENDING A MINIMUM OF 5 FEET BEYOND THE EDGE OF DEFINED ROADWAYS (IMMEDIATELY UNDER BASE MATERIAL)	98% (ASTM D698)

21. APPROVAL SHALL BE RECEIVED FROM THE CLIENT REPRESENTATIVE FOR EACH FILL TYPE TO BE USED PRIOR TO PROCEEDING WITH BACKFILL OPERATIONS WITH THE MATERIAL IN QUESTION.
22. BACKFILL TO BE IMPORTED SHALL BE TESTED IN ACCORDANCE WITH THIS DOCUMENT AND APPROVED BY THE PROJECT MANAGER PRIOR TO DELIVERY OF MATERIAL TO THE SITE. THE OWNER'S CONSTRUCTION INSPECTOR ACCEPTS NO LIABILITY FOR ANY OUT OF SPECIFICATION MATERIAL ACCEPTED AND STOCKPILED BY THE CONTRACTOR.
23. INSPECTION AND TESTING OF MATERIAL SHALL BE PERFORMED AS REQUIRED BY THIS DOCUMENT AT THE EXPENSE OF THE CONTRACTOR.
24. TEST AND ANALYSIS OF MATERIAL SHALL BE PERFORMED IN ACCORDANCE WITH THE APPLICABLE STANDARDS REFERENCED IN THIS DOCUMENT FOR THE SPECIFIC TEST. FIELD INSPECTION SHALL BE PERFORMED AS REQUIRED BY THIS DOCUMENT.
25. THE BACKFILL AND EXPOSED SOIL IN CUT AREAS SHALL BE COMPACTED AS SPECIFIED ON THIS DOCUMENT. FIELD DENSITY TEST SHALL BE PERFORMED BY THE CONTRACTOR TO VERIFY COMPACTION REQUIREMENTS HAVE BEEN ACHIEVED. IN-PLACE FIELD DENSITY TESTING OF THE COMPACTED BACKFILL SHALL BE CONDUCTED ACCORDING TO THE PROCEDURES OF THE SAND CONE METHOD (ASTM 1556), NUCLEAR METHOD (ASTM D3017), OR ACCORDING TO THE PROVISIONS OF THIS DOCUMENT. TEST RESULTS REPORTED SHALL INCLUDE BOTH THE MOISTURE CONTENT AND DRY DENSITY, ALONG WITH OTHER PERTINENT DATA SUCH AS LOCATION, ELEVATION, PROCTOR CURVE USED FOR COMPARISON, ETC. THE TESTING FREQUENCY SHALL BE ONE TEST FOR EACH 5,000 SQUARE FEET OF LIFT AREA OR PORTION THEREOF FOR EACH LIFT. IN ISOLATED AREAS OF LESS THAN 5,000 SQUARE FEET, TEST AT LEAST EVERY THIRD LIFT. WHEN BACKFILL OPERATIONS ARE CONCENTRATED IN SMALL AREAS USING LIGHT MANUALLY-GUIDED EQUIPMENT AND RELATIVELY THIN LIFTS, THE FREQUENCY OF DENSITY TESTING MAY BE REVISED AS DIRECTED BY THE OWNER'S CONSTRUCTION INSPECTOR. TEST LOCATION SHALL BE THE WEAKEST APPEARING AREA OF THE TOP LIFT DETERMINED BY TRACKING ACTION OF THE EQUIPMENT.
26. TESTING OF IN-PLACE DENSITY AND MOISTURE CONTENT BY NUCLEAR METHODS IN ACCORDANCE WITH ASTM D2922 AND AST D3017, RESPECTIVELY, WILL BE ALLOWED PROVIDED:
    A. ACCEPTABLE CORRELATION WITH SAND CONE DENSITY AND LABORATORY DETERMINED MOISTURE CONTENT TEST RESULTS CAN BE OBTAINED ACCORDING TO THE GUIDELINES OF "CALIBRATION" SECTIONS OF ASTM D2922 AND ASTM D3017.
    B. THE INITIAL CORRELATION RESULTS ARE REVIEWED AND USE OF THE NUCLEAR DEVICE IS APPROVED BY THE OWNER'S CONSTRUCTION INSPECTOR.
    C. THE CONTRACTOR INSURES THAT THE REPRESENTATIVE FROM THE TESTING AGENCY OPERATION THE NUCLEAR DENSITY TESTING HAS THE NECESSARY STATE AND/OR FEDERAL LICENSES TO OPERATE THE DEVICE AND CARRY A NUCLEAR ENERGY SOURCE.
27. EMBANKMENT FILL SHALL CONSIST OF AN INORGANIC, NON-PLASTIC, GRANULAR SOIL CONTAINING LESS THAN 12 PERCENT MATERIAL PASSING THE #200 MESH SIEVE WITH UNIFIED SOIL CLASSIFICATION OF SP, SP-SC, OR SP-SM. EMBANKMENT FILL SHALL BE PLACED IN LIFTS NOT EXCEEDING 8 INCHES WHEN USING A STATIC DRUM ROLLER WITH A MINIMUM OPERATING WEIGHT OF 5 TONS WITH A DRUM DIAMETER OF 3 TO 4 FEET. WHERE LIGHTWEIGHT VIBRATOR COMPACTION METHODS ARE UTILIZED MAXIMUM LOOSE LIFT THICKNESS SHALL BE 6 INCHES. COMPACTION TO MEET A MAXIMUM DRY DENSITY OF 98 PERCENT STANDARD PROCTOR DRY DENSITY.
28. ANY GRADING TO CORRECT SLOPES SHALL BE COMPACTED PER THIS DOCUMENT.

ENVIRONMENTAL NOTES:

1. INSTALLER IS TO CONSTRUCT ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES AT THE COMMENCEMENT OF THE PROJECT, PROVIDE MAINTENANCE AND ASSURE EFFECTIVENESS THROUGHOUT THE DURATION OF THE PROJECT.
2. CARE SHALL BE TAKEN TO MINIMIZE DOWNSTREAM SILTATION. RAW BANKS MAY BE SEEDED AND MULCHED TO PREVENT EROSION.
3. ALL SPOILS INCLUDING ORGANIC SOILS, VEGETATION AND DEBRIS SHALL BE REMOVED FROM THE SITE AND PROPERLY DISPOSED OF IN SUCH A MANNER AS TO NOT ERODE INTO ANY BODY OF WATER OR WETLAND UNLESS APPROVED OTHERWISE BY DUKE ENVIRONMENTAL INSPECTOR.
4. EROSION AND SEDIMENT CONTROLS SHALL BE PLACED WHERE NECESSARY TO PREVENT SEDIMENT FROM LEAVING THE WORK AREA.
5. CATCH ALL INLET FILTERS ARE REQUIRED AT ALL SEWER INLETS, GRATES AND MANHOLES FOR SEDIMENT CONTROL.
6. TOPSOIL STOCKPILES SHALL BE LOCATED TO AVOID EROSION OF SAID STOCKPILE ONTO OFFSITE AREAS.
7. ALL ENVIRONMENTAL MEASURES SHALL BE PER PERTINENT DESIGN AND CONSTRUCTION STANDARDS.
8. NO ASPHALT SLURRY OR CUTTING MAY ENTER STORM DRAINS. MATERIALS MUST BE VACUUMED OR OTHERWISE REMOVED FROM THE SITE AND PROPERLY DISPOSED OF.
9. THE CONSTRUCTION CONTRACTOR SHALL NOT CONDUCT IN-WATER WORK IN PERENNIAL STREAMS FROM APRIL 15 THROUGH JUNE 30 TO REDUCE IMPACTS ON INDIGENOUS AQUATIC SPECIES AND THEIR HABITAT.
10. DUKE ENERGY SHALL CONTACT OPSB STAFF, ODNR, AND USFWS WITHIN 24 HOURS IF STATE OR FEDERAL THREATENED OR ENDANGERED SPECIES ARE ENCOUNTERED DURING CONSTRUCTION ACTIVITIES. CONSTRUCTION ACTIVITIES THAT COULD ADVERSELY IMPACT THE IDENTIFIED PLANTS OR ANIMALS SHALL BE IMMEDIATELY HALTED UNTIL AN APPROPRIATE COURSE OF ACTION HAS BEEN AGREED UPON BY DUKE ENERGY, OPSB STAFF, AND THE APPROPRIATE REGULATORY AGENCIES.
11. OPEN CUT CONSTRUCTION IN ALL PERENNIAL AND INTERMITTENT STREAMS IS TO BE CONDUCTED DURING BASE FLOW PERIODS OR PERIODS OF SLIGHTLY ABOVE NORMAL FLOW TO ALLOW ANY SLOAN'S CRAYFISH THAT MAY BE PRESENT TO RELOCATE OUT OF THE AREAS AS IN-WATER WORK BEGINS. IN ADDITION, DURING BASE FLOW CONSTRUCTION PERIODS IF THERE ARE ANY POOLS DISCONNECTED FROM THE MAIN STREAM FLOW THESE POOLS ARE REQUIRED TO BE CLEARED OF THE SLOAN'S CRAYFISH BY AN ODNR APPROVED BIOLOGIST USING A SWEEP SEINE TECHNIQUE BEFORE ANY IMPACT OCCURS. DUKE ENERGY WILL COORDINATE THIS ADDITIONAL SURVEY EFFORT IF REQUIRED.
12. THE CONSTRUCTION CONTRACTOR SHALL COMPLY WITH FUGITIVE DUST RULES BY THE USE OF WATER SPRAY OR OTHER APPROPRIATE DUST SUPPRESSANT MEASURES WHENEVER NECESSARY.
13. THE CONSTRUCTION CONTRACTOR SHALL NOT CROSS STREAMS BY FORDING FOR CONSTRUCTION ACCESS AND SHALL INSTEAD EMPLOY TIMBER MATTING OR OTHER METHODS THAT AVOID OR MINIMIZE STREAM BED DISTURBANCES.
14. AT LEAST 30 DAYS PRIOR TO THE PRE-CONSTRUCTION CONFERENCE, DUKE ENERGY SHALL FILE A DRILLING MUD INADVERTENT RELEASE CONTINGENCY PLAN DETAILING: MONITORING, CONTAINMENT MEASURES, CLEANUP, AND RESTORATION. DUKE ENERGY WILL PROVIDE AN ENVIRONMENTAL SPECIALIST ON SITE TO MONITOR HDD OPERATIONS. DUKE ENERGY SHALL RETAIN AN INDEPENDENT AND QUALIFIED ENVIRONMENTAL SPECIALIST, AS MUTUALLY AGREED BY OPSB STAFF AND DUKE ENERGY, TO BE ON SITE DURING THE HDD, INCLUDING PREPARATION AND POST-DRILLING ACTIVITIES. THE ENVIRONMENTAL SPECIALIST SHALL HAVE THE AUTHORITY TO DIRECT DUKE ENERGY AND THE CONSTRUCTION CONTRACTORS TO REVISE OR HALT CONSTRUCTION, ON THE BASIS THAT HDD CONSTRUCTION ACTIVITIES DO NOT COMPLY WITH THE REGULATIONS, DUKE ENERGY SHALL INFORM STAFF AND, IF REQUIRED, THE APPROPRIATE BOARD ENTITY (ODNR, OHIO DEPARTMENT OF HEALTH (ODH, OEPA, OR OHIO DEPARTMENT OF AGRICULTURE (ODA)) OF INSTANCES WHERE CONSTRUCTION WAS REQUIRED TO BE REVISED OR HALTED AND COULD NOT BE RESUMED WITHIN A REASONABLE PERIOD AT THE DIRECTION OF THE ENVIRONMENTAL SPECIALIST. THE ENVIRONMENTAL SPECIALIST SHALL BE FAMILIAR WITH THE LAWS AND REGULATIONS REGARDING HDD IN OHIO AND SHALL BE PRESENT AT THE PRE-CONSTRUCTION CONFERENCE WITH OPSB STAFF.
15. THE CONSTRUCTION CONTRACTOR SHALL REMOVE ALL TEMPORARY GRAVEL AND OTHER CONSTRUCTION STAGING AREA AND ACCESS ROAD MATERIALS AFTER COMPLETION OF CONSTRUCTION ACTIVITIES, AS WEATHER PERMITS, UNLESS OTHERWISE DIRECTED BY THE LANDOWNER OR DUKE ENERGY. IMPACTED AREAS SHALL BE RESTORED TO PRE-CONSTRUCTION CONDITIONS IN COMPLIANCE WITH THE OHIO EPA GENERAL NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMITS OBTAINED FOR THE PROJECT AND THE APPROVED STORMWATER POLLUTION PREVENTION PLAN (SWPPP) CREATED FOR THE PROJECT.
16. CONTRACTOR SHALL TEMPORARILY STABILIZE ANY DISTURBED AREAS LEFT UNATTENDED FOR 14 DAYS OR MORE, OR AS OTHERWISE DIRECTED IN THE PROJECT SWPPP.
17. CONTRACTOR SHALL MAINTAIN EROSION CONTROL MEASURES UNTIL UPSLOPE STABILIZATION HAS DEVELOPED AS DIRECTED IN THE PROJECT SWPPP.

DEWATERING:

1. ALL DEWATERING SHALL BE PERFORMED IN ACCORDANCE WITH THE SWPPP.
2. CONTROL GRADING AROUND EXCAVATIONS TO PREVENT SURFACE WATER FROM FLOWING INTO EXCAVATION AREAS.
3. DRAIN OR PUMP AS REQUIRED TO MAINTAIN, INCLUDING DAYS NOT NORMALLY WORKED, ALL EXCAVATIONS FREE OF WATER OR MUD FROM ANY SOURCE, AND DISCHARGE TO APPROVED DRAINS OR CHANNELS. COMMENCE WHEN WATER FIRST APPEARS AND CONTINUE AS REQUIRED TO KEEP EXCAVATION FREE OF STANDING WATER DURING ENTIRE TIME EXCAVATION IS OPEN.
4. USE PUMPS OF ADEQUATE CAPACITY TO ENSURE RAPID DRAINAGE OF AREA, AND CONSTRUCTION AND USE DRAINAGE CHANNELS TO SUBDRAINS WITH SUMPS AS REQUIRED BY QUANTITY OF INFLOW.
5. WHEN WATER IS FOUND IN THE EXCAVATION DUE TO CONTRACTOR NEGLIGENCE, REMOVE UNSUITABLE EXCESSIVELY WET SUBGRADE MATERIALS AND REPLACE WITH APPROVED COMPACTED EMBANKMENT MATERIAL AS DIRECTED BY OWNER AND AT NO ADDITIONAL COST TO OWNER.
6. RIVER/STREAM CROSSINGS EXIST AS INDICATED ALONG THIS PROJECT, REQUIRING EXCAVATION BELOW POTENTIAL STREAM OR RIVER PHREATIC LEVELS. DEWATERING METHODS SHALL INCORPORATE MEANS TO ACCOUNT FOR RISING OR VARYING WATER LEVELS ASSOCIATED WITH THESE BODIES OF WATER AND THEIR INTERCONNECTED WATERWAYS, WHETHER SURFACE OR SUBSURFACE, TO PREVENT THREATENING THE INTEGRITY OF THE EXCAVATION, EXISTING FACILITIES, AND WORK UNDER CONSTRUCTION.
7. MAINTAIN AREA DRAINAGE DURING CONSTRUCTION.
8. COMPLETE CHANNEL PROTECTION EXPEDITIOUSLY FOLLOWING EXCAVATION.

BURNS & MCDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA: 01557

PROFESSIONAL ENGINEER STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
A	05/17/2020	ISSUED FOR 90% REVIEW	AKT	CNS	AMP
B	07/24/2020	ISSUED FOR BID	AKT	JMP	CNS

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	Q3580
PROJECT NUMBER	1680115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	JMP

APPROVALS		
DATE	INITIALS	REGIONAL ENGINEER:
DATE	INITIALS	MGR TECH REL & STD
DATE	INITIALS	PRINCIPAL ENGINEER

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

C350 PROJECT
GENERAL NOTES SHEET 2
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

SHEET(S)	4 OF 5
DWG SCALE	AS NOTED
DWG DATE	09-05-2018
SUPERSEDED	
DRAWING NUMBER	PNG -G-350-0001012
REVISION	B

G:\HAMILTON COUNTY\C350

GENERAL RESTRICTIONS

1. STAY IN ROW/EASEMENTS OR WITHIN PREDETERMINED WORKSPACE AREAS.
2. ONLY USE DESIGNATED POINTS OF ACCESS AS APPROVED BY DUKE.
3. NO DIGGING, WORK, OR STORAGE WITHIN 25' OF POWER LINE OR EQUIPMENT INCLUDING GUY WIRES, EXCEPT AT CROSSINGS OF POWER RIGHT OF WAY DESIGNATED ON PLANS.
4. ANY DOT CROSSING NOTIFICATIONS TO BE MADE AS DICTATED BY THE PERMIT OR STATE DOT PERMIT.
5. INSTALLER IS RESPONSIBLE FOR KNOWING LOCATION OF ALL ENVIRONMENTALLY SENSATIVE AREA RESTRICTIONS PERTAINING TO THIS PROJECT.

ABBREVIATIONS

APPROX.	APPROXIMATE
B.C.	BUOYANCY CONTROL
C/L	CENTERLINE
CDF	CONTROLLED DENSITY FILL
CLSM	CONTROLLED LOW STRENGTH MATERIAL
CMP	CORRUGATED METAL PIPE
COMM	COMMUNICATIONS
CP	CATHODIC PROTECTION
DI	DROP INLET
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
E	EASTING
EA	EACH
EL / ELEV	ELEVATION
EX	EXISTING
FLC	FOREIGN LINE CROSSING
FM	FORCE MAIN
FT	FEET
FTG	FITTING
H / HORIZ	HORIZONTAL
HDD	HORIZONTAL DIRECTIONAL DRILL
H-LT	HORIZONTAL LEFT TURN
H-RT	HORIZONTAL RIGHT TURN
IN / INV	INVERT
JAB	JACK AND AUGER BORE
L	LENGTH
LAT	LATITUDE
LF	LINEAR FEET
LONG	LONGITUDE
MAX	MAXIMUM
MIN	MINIMUM
MH	MANHOLE
N	NORTHING
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
OC	OPEN CUT
O.D.	OUTSIDE DIAMETER
PCC	PORTLAND CEMENT CONCRETE
PIV	POST INDICATOR VALVE
PL	PROPERTY LINE
PSI	POUNDS PER SQUARE INCH
PVC	POLY VINYL CHLORIDE
R	RADIUS
RD	ROAD
R/W / ROW	RIGHT-OF-WAY
RCP	REINFORCED CONCRETE PIPE
SD	STORM DRAIN
SS	SANITARY SEWER
SSD	SOLID STATE DECOUPLER
STA	STATION
TOP	TOP OF PIPE
TWE	TEMPORARY WORKSPACE
T.C.E.	TEMPORARY CONSTRUCTION EASEMENT
TYP	TYPICAL
UGE	UNDERGROUND ELECTRIC
UGT	UNDERGROUND TELEPHONE/COMMUNICATIONS
V / VERT	VERTICAL
W	WIDTH
W.T.	WALL THICKNESS
X-ING	CROSSING

LEGEND

- PROPOSED TEMPORARY WORKSPACE
- PROPOSED PERMANENT EASEMENT
- ADDITIONAL TEMPORARY WORKSPACE
- CONSTRUCTION MATTING
- TRACKING CONTROL
- UPSLOPE RUNON CONTROL
- SLOPE BREAKER
- DELINEATED WETLAND
- FEMA 100 YEAR FLOOD AREA
- ACCESS PATH
- STREAM
- DITCH
- TREE LINE
- EX. COMMUNICATION LINE
- EX. OVERHEAD LINE
- EX. ELECTRIC LINE
- FENCE
- EX. GAS LINE
- RIGHT-OF-WAY
- RAILROAD
- EX. SANITARY SEWER
- EX. STORM WATER LINE
- EX. WATER LINE
- PROPERTY LINE
- SILT FENCE
- FILTER SOCK
- CONSTRUCTION BOUNDARY
- EX. MAJOR CONTOUR
- EX. MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- JURISDICTIONAL LINE
- BUOYANCY CONTROL
- PROPOSED GAS LINE
- HORIZONTAL DIRECTIONAL DRILL
- AUGER BORE
- EXCAVATION PIT

- POTHOLE LOCATION
- BORING LOCATION
- FLUSH PIPELINE MARKER
- A.G. ABOVE GRADE PIPELINE MARKER
- MILE MARKER
- INLET PROTECTION
- J-HOOK
- NO IN-WATER WORK FROM APRIL 15TH THROUGH JUNE 30TH ON PERENNIAL STREAMS
- ROCK DITCH CHECK
- CONSTRUCTION ENTRANCE
- TEST STATION (SEE EQUIPMENT SCHEDULES ON PNG-E-350-0001021)
- SOLID STATE DECOUPLER (SEE EQUIPMENT SCHEDULES ON PNG-E-350-0001024)
- COUPON TEST STATION (SEE EQUIPMENT SCHEDULES ON PNG-E-350-0001024)
- MONOLITHIC INSULATOR JUNCTION BOX (SEE EQUIPMENT SCHEDULES ON PNG-E-350-0001021)

BURNS & MCDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA: 01557

PROFESSIONAL ENGINEER STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
A	05/17/2020	ISSUED FOR 90% REVIEW	AKT	CNS	AMP
B	07/24/2020	ISSUED FOR BID	AKT	JMP	CNS

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

APPROVALS	DATE	INITIALS	
	-	-	REGIONAL ENGINEER
	-	-	MGR. TECH REC & STD
	-	-	PRINCIPAL ENGINEER

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

C350 PROJECT
LEGEND, SYMBOLS, & ABBREVIATIONS
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

SHEET(S)	5 OF 5
DWG SCALE	AS NOTED
DWG DATE	09-05-2018
SUPERSEDED	—
DRAWING NUMBER	PNG -G-350-0001013
REVISION	B

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BILL OF MATERIAL

GROUP	MARK	QTY (FT OR EA)	SIZE	LINE	ITEM NUMBER	DESCRIPTION	AS BUILT QTY
PIPE	1	60,000	20"	C350 / CENTRAL CORRIDOR	1597626	PIPE, 20", DBL RANDOM LG, BEVELED ENDS, ELECTRIC RESISTANCE WELD, 0.438" WALL THK, STL, API 5L PSL-2, GR X60, NO JOINTERS, W/ FUSION BONDED EPOXY COATING (16-18 MILS)	
	2	7,120	20"	C350 / CENTRAL CORRIDOR	1597627	PIPE, 20", DBL RANDOM LG, BEVELED ENDS, ELECTRIC RESISTANCE WELD, 0.438" WALL THK, STL, API 5L PSL-2, GR X60, NO JOINTERS, W/ FUSION BONDED EPOXY (16-18 MILS)/POWERCRETE COATING (40 MILS MINIMUM)	
SEGMENTABLE ELBOWS	10	43	20"	C350 / CENTRAL CORRIDOR	1597631	ELBOW, PIPE, 20", BW, 90 DEG, 5D RADIUS, 0.438" WALL, CS, MSS SP-75, GR Y60, FULLY SEGMENTABLE, FBE (16-18 MILS), MACHINE BEVEL ENDS PER ASME B31.8 APPENDIX I, FIGURE I-4	
	11	67	20"	C350 / CENTRAL CORRIDOR	1597629	ELBOW, PIPE, 20", BW, 45 DEG, 5D RADIUS, 0.438" WALL, CS, MSS SP-75, GR Y60, FULLY SEGMENTABLE, FBE (16-18 MILS), MACHINE BEVEL ENDS PER ASME B31.8 APPENDIX I, FIGURE I-4	
	-	SEE NOTE 5	20"	C350 / CENTRAL CORRIDOR	1597633	ELBOW, PIPE, 20", BW, 90 DEG, 3D RADIUS, 0.438" WALL, CS, MSS SP-75, GR Y60, FULLY SEGMENTABLE, FBE (16-18 MILS), MACHINE BEVEL ENDS PER ASME B31.8 APPENDIX I, FIGURE I-4	
	-	SEE NOTE 5	20"	C350 / CENTRAL CORRIDOR	1597632	ELBOW, PIPE, 20", BW, 45 DEG, 3D RADIUS, 0.438" WALL, CS, MSS SP-75, GR Y60, FULLY SEGMENTABLE, FBE (16-18 MILS), MACHINE BEVEL ENDS PER ASME B31.8 APPENDIX I, FIGURE I-4	

NOTES:
1 THE 20" FBE PIPE INCLUDES 0% CONTINGENCY. THE PIPE LENGTH HAS BEEN ROUNDED UP TO THE NEAREST FORTY FOOT INCREMENT.
2 THE 20" FBE + ARO PIPE INCLUDES 0% CONTINGENCY. THE PIPE LENGTH HAS BEEN ROUNDED UP TO THE NEAREST FORTY FOOT INCREMENT.
3 DOMESTIC MATERIALS ONLY.
4 FITTING QUANTITIES SHOWN DO NOT INCLUDE CONTINGENCY.
5 NO 3D FITTINGS ARE REQUIRED BY DESIGN. WHERE VARYING FIELD CONDITIONS REQUIRE USE OF 3D FITTINGS FOR SPACE OR SAFETY CONSTRAINTS, CONTRACTOR MUST RECEIVE ADVANCE APPROVAL FROM COMPANY PRIOR TO INSTALLATION.

C350 POWERCRETE SUMMARY				C350 POWERCRETE SUMMARY			
Length	Start Station	End Station	Crossing Type	Length	Start Station	End Station	Crossing Type
100	21+45	22+45	BORE	200	381+95	383+95	BORE
1471	41+82	56+53	HDD	1406	416+72	430+78	HDD
360	60+75	64+35	BORE	134	440+34	441+68	BORE
130	137+89	139+19	BORE	36	473+10	473+46	BORE
180	148+26	150+06	BORE	63	480+24	480+87	BORE
140	160+39	161+79	BORE	120	526+97	528+17	BORE
160	184+08	185+68	BORE	295	546+33	549+28	BORE
125	228+51	229+76	BORE	120	604+19	605+39	BORE
140	253+97	255+37	BORE	160	615+10	616+70	BORE
1556	331+26	346+82	HDD	90	621+74	622+64	BORE
190	348+59	350+49	BORE	105	630+00	631+05	BORE

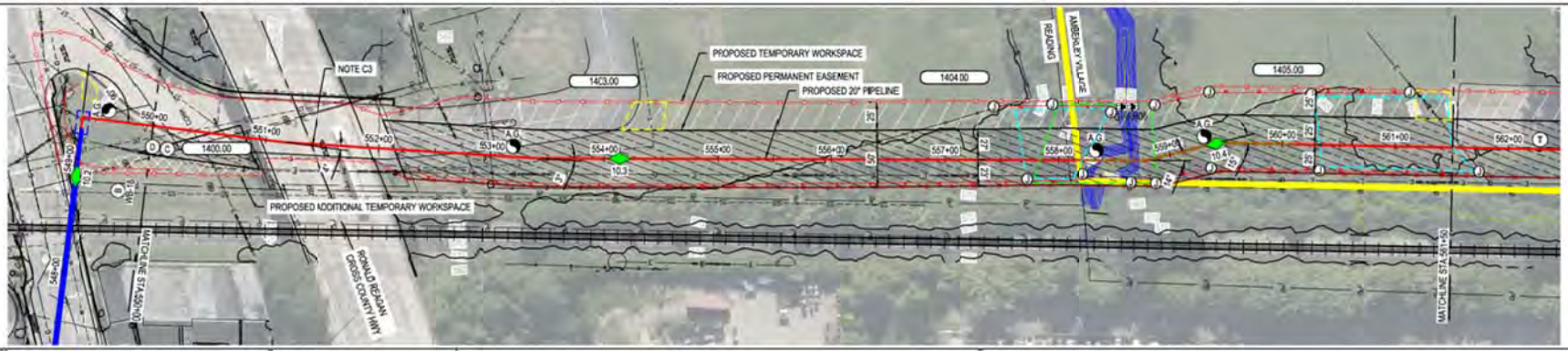
POWERCRETE SUMMARY TABLE PRESENTED FOR CONVENIENCE AND PLANNING PURPOSES ONLY. TRUE LENGTHS SHOWN ON DRAWINGS SHALL CONTROL.

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-350-0001303			

STATIONING

STA. 550+32.10' OVERBEND (V)
STA. 550+73.14° SAG BEND (V)
STA. 551+18.4° BEND (H-LT)
STA. 551+76.5' OVERBEND (V)
STA. 553+40.3° BEND (H-LT)
STA. 553+80.1° SAG BEND (V)
STA. 554+43.1° OVERBEND (V)
STA. 556+54.1° OVERBEND (V)
STA. 557+89.9° OVERBEND (V)
STA. 558+33.12° SAG BEND (V)
STA. 558+79.14° BEND (H-LT)
STA. 559+42.15° BEND (H-RT)
STA. 560+42.5° SAG BEND (V)

PLAN

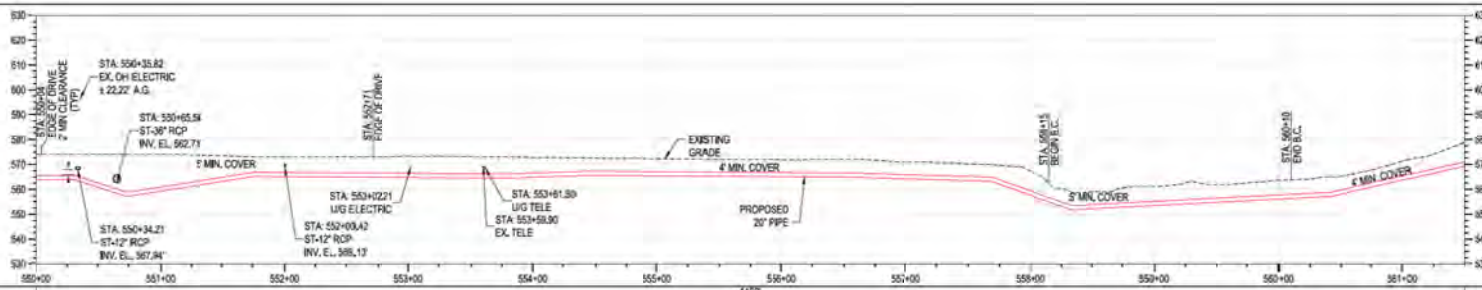


RESTORE

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

PIPE DATA (SLOPE STATIONING)

PROFILE



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

BURNS & MCDONNELL ENGINEERING COMPANY, INC. STATE LICENSE # COA: 01557

PROFESSIONAL ENGINEER / STAMP

REF. DWG(S): SEE REFERENCE BAND

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
A	05/17/2020	ISSUED FOR 90% REVIEW	AKT	CNS	AMP
B	07/24/2020	ISSUED FOR BID	AKT	JMP	CNS

DESCRIPTION		APPROVALS		
AREA CODE	-	DATE -	INITIALS -	REGIONAL ENGINEER
ACCOUNT NUMBER	Q3680			
PROJECT NUMBER	180115	DATE -	INITIALS -	MGR. TECH REC & STD
DRAWING BY	AKT			
STATION ID	C350	DATE -	INITIALS -	PRINCIPAL ENGINEER
CHECKER INITIALS	JMP			

DUKE ENERGY | Piedmont Natural Gas

C350 PIPELINE
ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH

HAMILTON COUNTY, OH

SHEET(S) 52 OF 84	DWG SCALE AS NOTED
DWG DATE 01/13/2020	SUPERSEDED
DRAWING NUMBER	REVISION
PNG -C-350-0001230	B

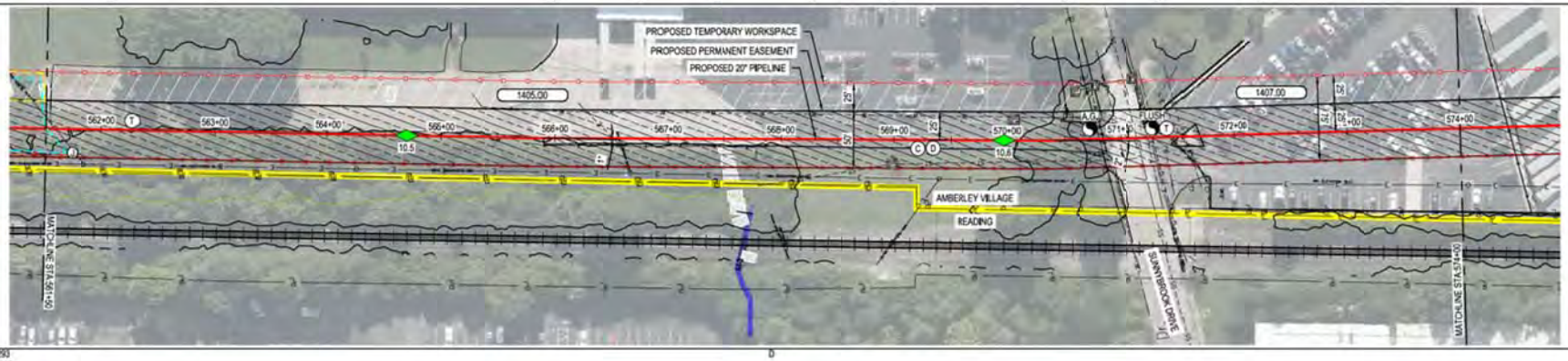
C:\HAMILTON COUNTY\C350

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.		

STATIONING

STA: 561+97.6° OVERBEND (V)
STA: 565+66 BEND 1° (HL7) 1° OVERBEND (V)
STA: 566+63.3° OVERBEND (V)
STA: 567+20.3° SAG BEND (V)
STA: 568+15.3° SAG BEND (V)
STA: 568+87.3° OVERBEND (V)
STA: 570+39.2° BEND (HL7)
STA: 571+20.3° SAG BEND (V)
STA: 572+12.2° OVERBEND (V)

PLAN

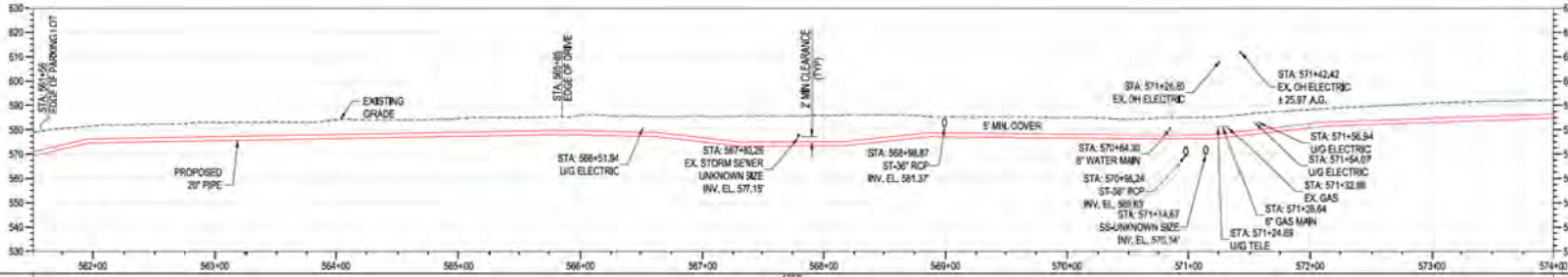


RESTORE

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

PIPE DATA (SLOPE STATIONING)

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.

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

BURNS & MCDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA: 01557

PROFESSIONAL ENGINEER / STAMP

REF. DWG(S): SEE REFERENCE BAND

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
A	05/17/2020	ISSUED FOR 90% REVIEW	AKT	CNS	AMP
B	07/24/2020	ISSUED FOR BID	AKT	JMP	CNS

DESCRIPTION	
AREA CODE	-
PROJECT NUMBER	188015
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	JMP

APPROVALS

	DATE	INITIALS
REGIONAL ENGINEER	-	-
MGR. TECH REC & STD	-	-
PRINCIPAL ENGINEER	-	-

DUKE ENERGY | Piedmont Natural Gas

C350 PIPELINE
ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH

HAMILTON COUNTY, OH

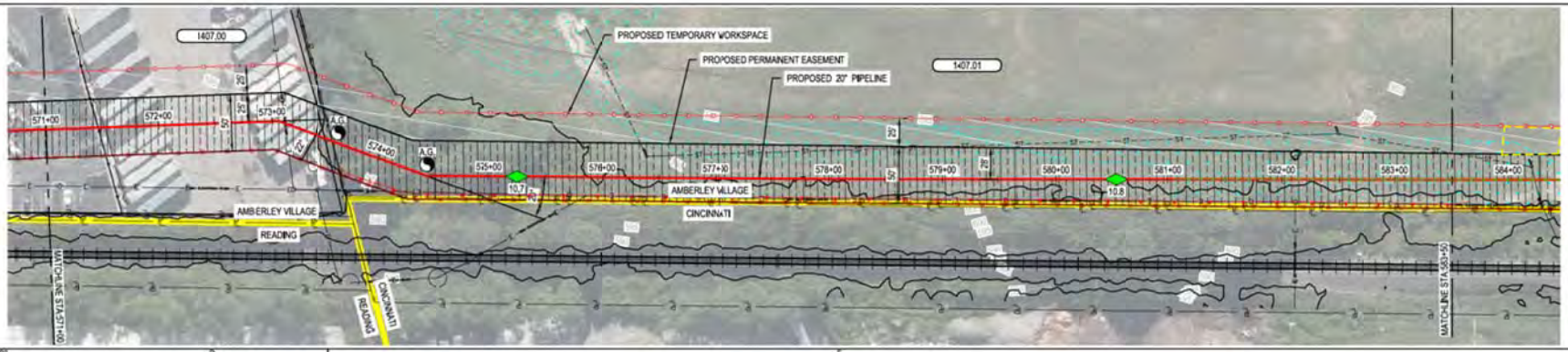
SHEET(S)	53 OF 84
DWG SCALE	AS NOTED
DWG DATE	01/13/2020
SUPERSEDED	
DRAWING NUMBER	PNG -C-350-0001231
REVISION	B

C:\HAMILTON COUNTY\C350

RIGHT-OF-WAY			
	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-350-0001303

STATIONING

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

PIPE DATA (SLOPE STATIONING)

PROFILE

VERTICAL SCALE: 1" = 10'

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

BURNS & MCDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA: 01557

PROFESSIONAL ENGINEER / STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	09/23/2020	ISSUED FOR PERMITTING	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	180115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS		
DATE	METHOD	
-	-	REGIONAL ENGINEER
DATE	METHOD	MGR. TECH REC & STD
-	-	PRINCIPAL ENGINEER

DUKE ENERGY | Piedmont Natural Gas

C350 PIPELINE
ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH

HAMILTON COUNTY, OH

REF. DWG(S): SEE REFERENCE BAND

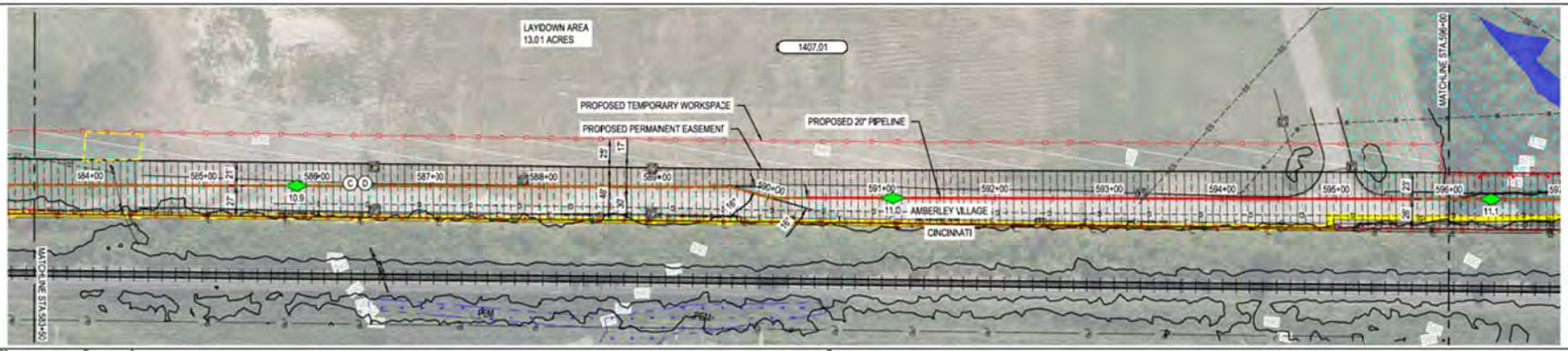
SHEET(S)	54 OF 64	DWG SCALE	AS NOTED
DWG DATE	01/13/2020	SUPERSEDED	

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



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

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

BURNS & MCDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA: 01557

PROFESSIONAL ENGINEER / STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	09/23/2020	ISSUED FOR PERMITTING	AKT	CNS	AMP

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	180115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	CNS

APPROVALS		
	DATE	INITIALS
REGIONAL ENGINEER	-	-
MGR. TECH REC & STD	-	-
PRINCIPAL ENGINEER	-	-

C350 PIPELINE
ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH

HAMILTON COUNTY, OH

REF. DWG(S): SEE REFERENCE BAND

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

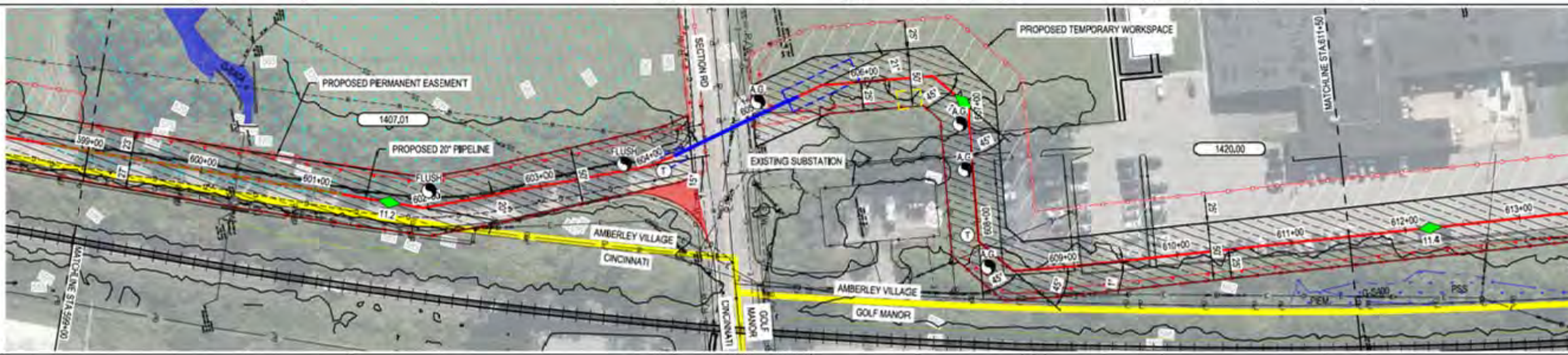
C:\HAMILTON COUNTY\C350

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-004-0001264	

STATIONING

- STA: 599+86 1° SAG BEND (V)
- STA: 600+81 2° SAG BEND (V)
- STA: 601+96 20° BEND (H-LT)
- STA: 603+51 6° OVERBEND (V)
- STA: 603+99 BEND 15° (H-LT) 4° SAG BEND (V)
- STA: 605+82 FITTING 21° (H-RT) 10° SAG BEND (V)
- STA: 606+17 10° OVERBEND (V)
- STA: 606+59 45° FTG (H-RT)
- STA: 606+99 FTG 45° (H-RT) 1° OVERBEND (V)
- STA: 608+17 FTG 45° (H-LT) 1° SAG BEND (V)
- STA: 608+57 FTG 45° (H-LT) 1° SAG BEND (V)
- STA: 609+09 1° BEND (H-LT)
- STA: 610+11 1° OVERBEND (V)

PLAN



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

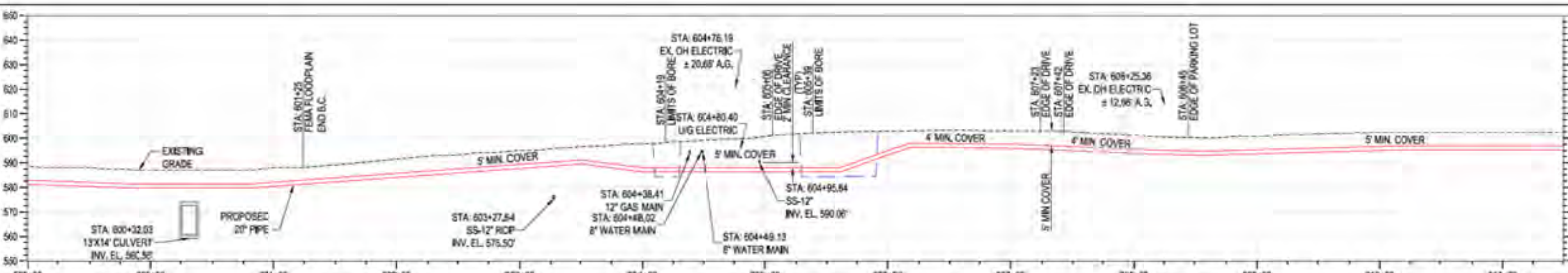
CONSTRUCTION NOTE:

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.

PIPE DATA (SLOPE STATIONING)

PROFILE



MATERIAL	519 (1)	120 (2)	(11)	(11) (11)	(11) 611 (1) (11)
CONST. METHOD	OPEN TRENCH	BORE		OPEN TRENCH	
CLASS / MAOP	CLASS 4 / MAOP 500 PSIG				

BURNS & MCDONNELL ENGINEERING COMPANY, INC. STATE LICENSE # COA. 01557

PROFESSIONAL ENGINEER STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
A	06/17/2020	ISSUED FOR 90% REVIEW	AKT	CNS	AMP
B	07/24/2020	ISSUED FOR BID	AKT	JMP	CNS

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

APPROVALS: REGIONAL ENGINEER; MGR. TECH REC & STD; PRINCIPAL ENGINEER

DUKE ENERGY. Piedmont Natural Gas

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C350 PIPELINE
ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH

HAMILTON COUNTY, OH

REF. DWG(S): SEE REFERENCE BAND

SHEET(S): 56 OF 84 | DWG SCALE: AS NOTED

DWG DATE: 01/13/2020 | SUPERSEDED: —

DRAWING NUMBER: PNG -C-350-0001234 | REVISION: B

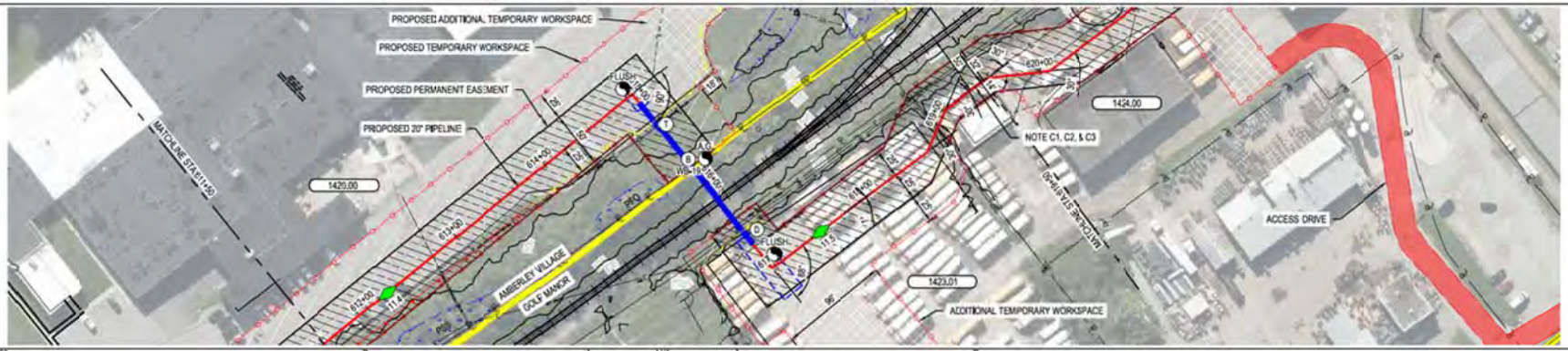
C:\HAMILTON COUNTY\C350

RIGHT-OF-WAY	1420.00	S,O,R,T,A, ROW	1423.01	1424.00
OWNERSHIP				
JURISDICTION	AMBERLEY VILLAGE	GOLF MANOR	GOLF MANOR	GOLF MANOR
ACREAGE	1.2432 ACRES		0.2659 ACRES	0.3524 ACRES
EASEMENTS	50' EASEMENT		50' EASEMENT	VARIES
REF. DWG. NO.	PNG-B-350-0001014 PNG-C-350-0001265			

STATIONING

STA: 613+37 1° OVERBEND (V)
STA: 614+23 6° OVERBEND (V)
STA: 615+00 FTG 90° (H-RT) 7° SAG BEND (V)
STA: 616+97 FTG 88° (H-LT) 4° SAG BEND (V)
STA: 617+73 BEND 1° (H-RT) 6° OVERBEND (V)
STA: 618+68 FTG 30° (H-LT) 2° SAG BEND (V)
STA: 619+08 30° FTG (H-RT)

PLAN

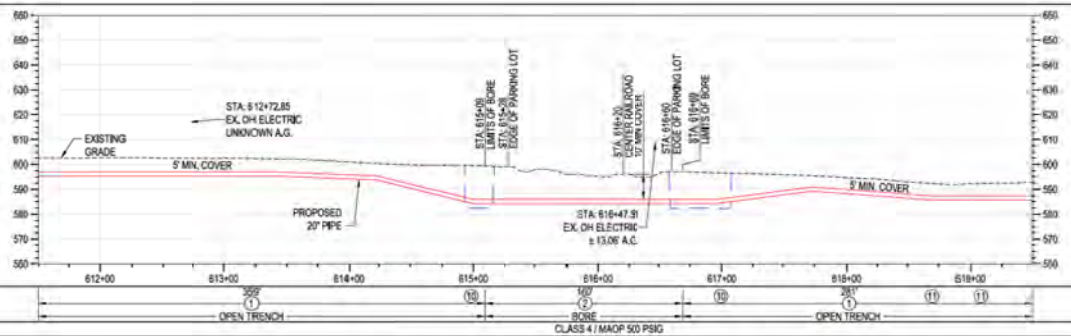


RESTORE

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)

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	309' (1)	(10)	107' (2)	(10)	281' (1)	(11)	(11)
CONST. METHOD	OPEN TRENCH		BORE		OPEN TRENCH		
CLASS / MAOP	CLASS 4 / MAOP 500 PSIG						

BURNS & MCDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA: 01557

PROFESSIONAL ENGINEER / STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
A	05/17/2020	ISSUED FOR 90% REVIEW	AKT	CNS	AMP
B	07/24/2020	ISSUED FOR BID	AKT	JMP	CNS

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

APPROVALS

	DATE	INITIALS
REGIONAL ENGINEER	-	-
MGR. TECH REC & STD	-	-
PRINCIPAL ENGINEER	-	-

DUKE ENERGY | Piedmont Natural Gas

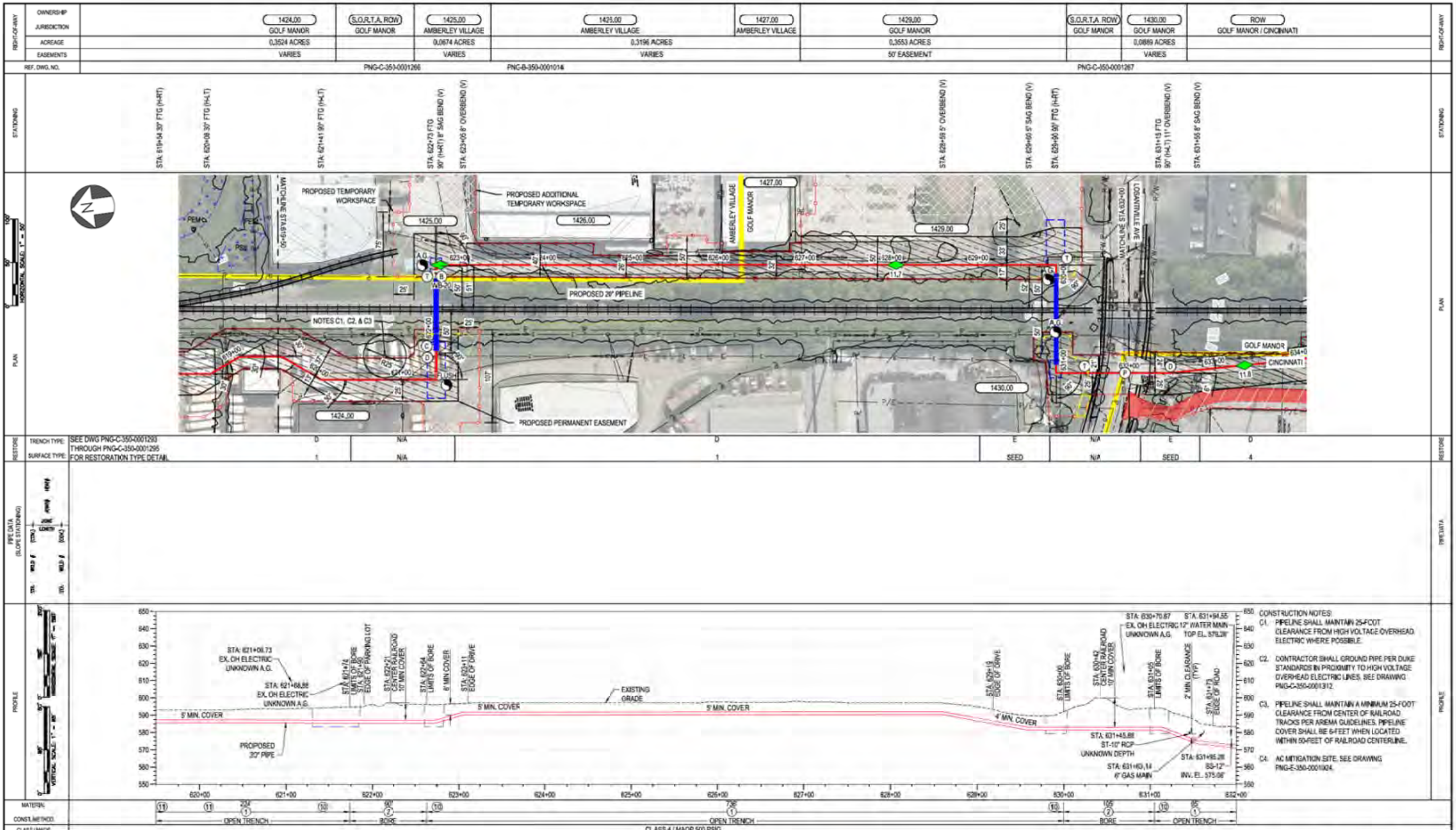
C350 PIPELINE
ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH

HAMILTON COUNTY, OH

REF. DWG(S): SEE REFERENCE BAND

SHEET(S): 57 OF 84	DWG SCALE: AS NOTED
DWG DATE: 01/13/2020	SUPERSEDED
DRAWING NUMBER: PNG -C-350-0001235	REVISION: B

C:\HAMILTON (C3)\PNG-C350



BURNS & MCDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA. 01557

PROFESSIONAL ENGINEER STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
A	06/17/2020	ISSUED FOR 90% REVIEW	AKT	CNS	AMP
B	07/24/2020	ISSUED FOR BID	AKT	JMP	CNS

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

APPROVALS: REGIONAL ENGINEER; MGR. TECH REC & STD; PRINCIPAL ENGINEER

DUKE ENERGY | Piedmont Natural Gas

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C350 PIPELINE
ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH

HAMILTON COUNTY, OH

REF. DWG(S): SEE REFERENCE BAND

SHEET(S) 58 OF 84 | DWG SCALE AS NOTED
DWG DATE 01/13/2020 | SUPERSEDED

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

INSTALLATION:

1. AASHTO #1 (1.5-3.5 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

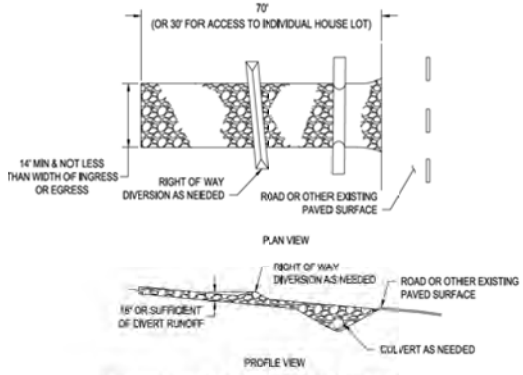
4. IF NEEDED, A PIPE OR CULVERT SHALL BE CONSTRUCTED UNDER THE ENTRANCE TO PREVENT SURFACE WATER FROM FLOWING ACROSS THE ENTRANCE OUT ONTO PAVED SURFACES.
5. IF NEEDED, A WATER BAR SHALL BE CONSTRUCTED TO PREVENT SURFACE WATER FROM FLOWING ALONG THE LENGTH OF THE ENTRANCE UT ONTO PAVED SURFACE.

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.

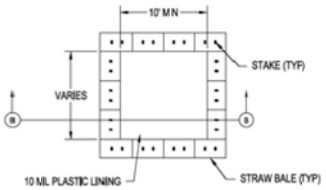


STABILIZING CONSTRUCTION ENTRANCE

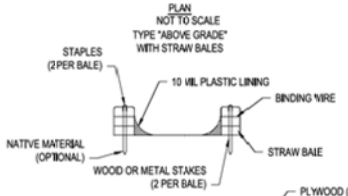
SCALE: N.T.S.

NOTES:

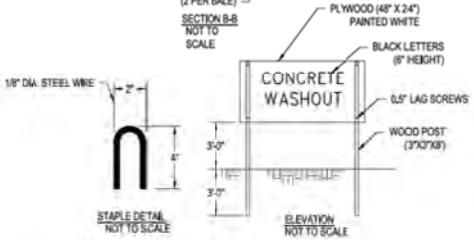
1. CONCRETE WASHOUT WATER SHALL NOT BE ALLOWED TO FLOW TO STREAMS, DITCHES, STORM DRAINS, OR ANY OTHER WASHOUT CONVEYANCE.
2. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED ADJACENT TO THE TEMPORARY CONCRETE WASHOUT FACILITY.
3. WASHOUT PIT MUST BE INSPECTED FREQUENTLY TO ENSURE LINER IS INTACT.
4. ONCE 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.



PLAN
NOT TO SCALE

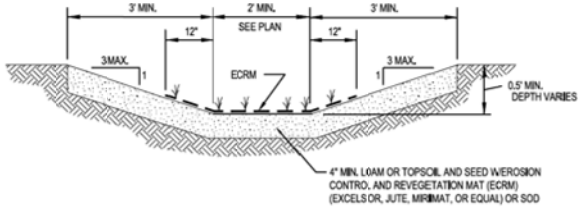


SECTION B-B
NOT TO SCALE



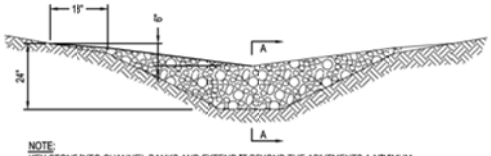
CONCRETE WASHOUT AREAS

SCALE: N.T.S.



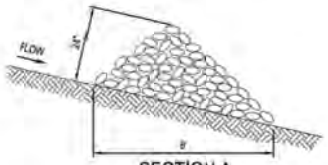
SWALE CROSS SECTION

SCALE: N.T.S.

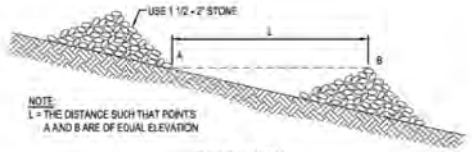


NOTE:
KEY STONE INTO CHANNEL BANKS AND EXTEND IT BEYOND THE ABUTMENTS A MINIMUM OF 18" TO PREVENT FLOW AROUND THE DAM.

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.

BURNS & MCDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA: 01567

PROFESSIONAL ENGINEER STAMP

NO	DATE	REVISION(S) DESCRIPTION	BY	CHK	APVD
A	06/17/2020	IS-SUED FOR 90% REVIEW	AKT	CNS	AMP
B	07/24/2020	IS-SUED FOR BID	AKT	JMP	CNS

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

APPROVALS		
DATE	SIGNATURE	
-	-	REGIONAL ENGINEER
DATE	SIGNATURE	
-	-	MGR. TECH REG & STD
DATE	SIGNATURE	
-	-	PRINCIPAL ENGINEER

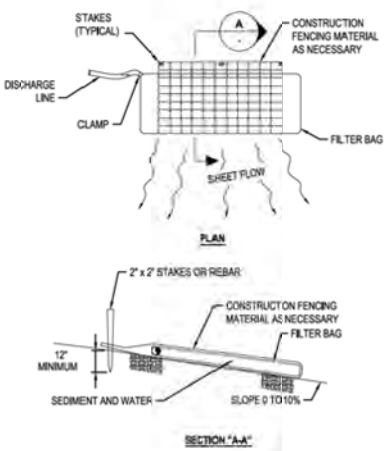
C350 PROJECT
ENVIRONMENTAL NOTES & DETAILS 1
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

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

SHEET(S)	1 OF 4
DWG SCALE	NONE
DWG DATE	08-05-2018
SUPERSEDED	—
DRAWING NUMBER	PNG -C-350-0001283
REVISION	B

C:\HAMILTON COUNTY\C350\

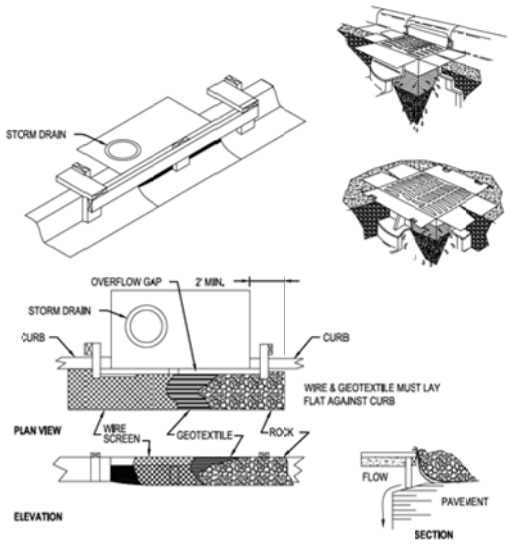


NOTES:

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 CATCHBASIN 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.

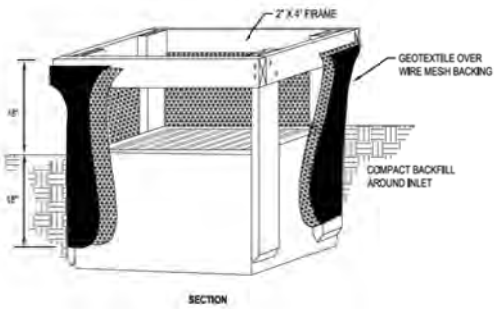
INSPECTION:

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.



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 (IE, 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.

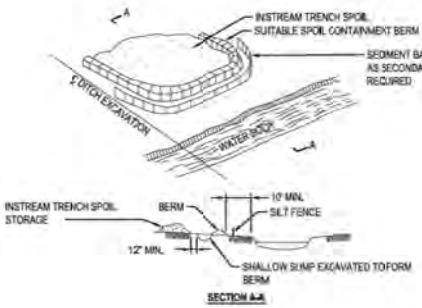
ALTERNATIVE MANUFACTURED YARD DRAIN/INLET PROTECTION PRODUCTS ARE AVAILABLE AND CAN BE USED, SUBJECT TO PRIOR APPROVED BY THE COMMUNITY ENGINEER.

DROP INLET PROTECTION

SCALE:N.T.S.

CURB 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.

BURNS & MCDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA: 01567

PROFESSIONAL ENGINEER STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
A	06/17/2020	IS-SUED FOR 90% REVIEW	AKT	CNS	AMP
B	07/24/2020	IS-SUED FOR BID	AKT	JMP	CNS

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1860115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	JMP

APPROVALS		
DATE	SIGNATURE	
-	-	REGIONAL ENGINEER
DATE	SIGNATURE	MGR. TECH REC & STD
-	-	
DATE	SIGNATURE	PRINCIPAL ENGINEER
-	-	

DUKE ENERGY. Piedmont Natural Gas

C350 PROJECT
ENVIRONMENTAL NOTES & DETAILS 2
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

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

SHEET(S)	2 OF 4	DWG SCALE	NONE
DWG DATE	09-05-2018	SUPERSEDED	—

DRAWING NUMBER: PNG -C-350-0001284

REVISION: B

CHAMILTON COUNTY,OHIO

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.

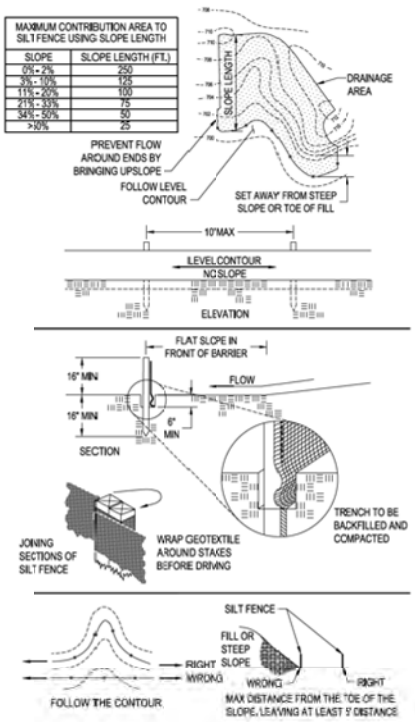
MAINTENANCE:

1. REMOVE ACCUMULATED SEDIMENT WHEN IT REACHES 1/3 RD 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:

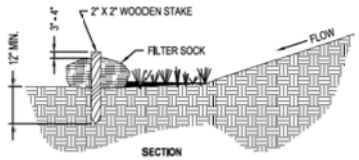
1. PULL OUT ALL SILT FENCE MATERIAL AND STAKES AND PROPERLY DISPOSE OF OFF-SITE.
2. RE-GRADE AREA WHERE SEDIMENT HAS ACCUMULATED AS NECESSARY AND ESTABLISH VEGETATION IN ANY RESULTING DISTURBED AREAS.

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:

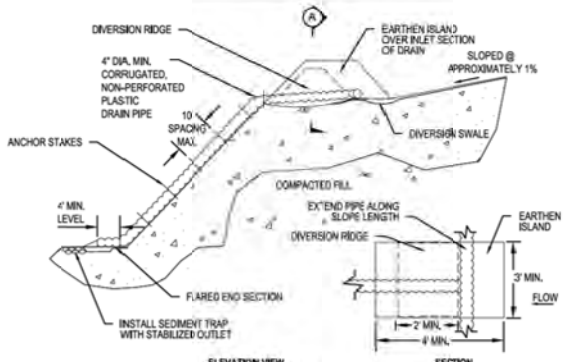
1. FILTER SOCKS WILL BE PLACED ON A LEVEL LINE ACROSS SLOPES, GENERALLY PARALLEL TO THE BASE OF THE SLOPE OR OTHER AFFECTED AREA, ON SLOPES APPROACHING 2:1, ADDITIONAL SOCKS SHALL BE PROVIDED AT THE TOP AND AS NEEDED MID-SLOPE.
2. FILTER SOCKS INTENDED TO BE LEFT AS A PERMANENT FILTER OR PART OF THE 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.

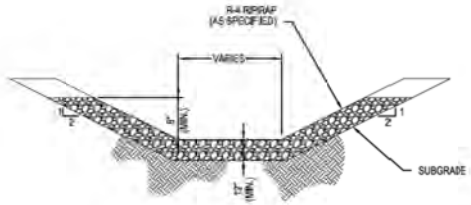


NOTES:

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.

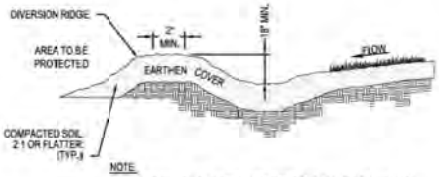
TEMPORARY SLOPE DRAIN

SCALE: N.T.S.



RIPRAPPED CHANNEL

SCALE: N.T.S.

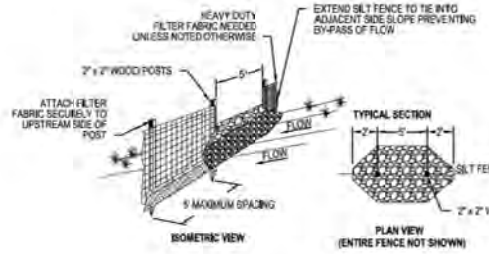


NOTE:

1. SWALE SHALL BE CONSTRUCTED WITH POSITIVE SLOPE ≤ 1% AND OUTLET TO A STABLE VEGETATED AREA OR SEDIMENT TRAP OR BASIN.

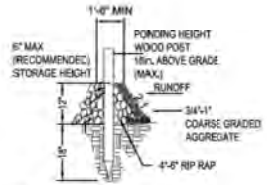
DIVERSION SWALE

N.T.S.



SILT FENCE ROCK OUTLET

SCALE: 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.

BURNS & MCDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA, 01567

PROFESSIONAL ENGINEER STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
A	06/17/2020	IS-SUED FOR 90% REVIEW	AKT	CNS	AMP
B	07/24/2020	IS-SUED FOR BID	AKT	JMP	CNS

DESCRIPTION		APPROVALS	
AREA CODE	-	-	REGIONAL ENGINEER
ACCOUNT NUMBER	Q3680		
PROJECT NUMBER	1860115	-	MGR. TECH REC & STD
DRAWING BY	AKT		
STATION ID	C350	-	PRINCIPAL ENGINEER
CHECKER INITIALS	JMP		

DUKE ENERGY. Piedmont Natural Gas

C350 PROJECT
ENVIRONMENTAL NOTES & DETAILS 3
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

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

SHEET(S)	3 OF 4	DWG SCALE	NONE
DWG DATE	09/05/2018	SUPERSEDED	—

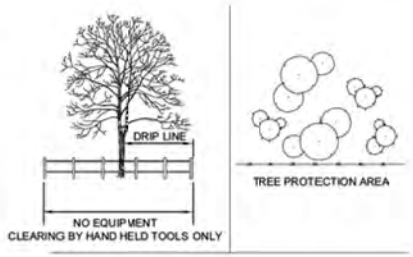
DRAWING NUMBER: PNG -C-350-0001285

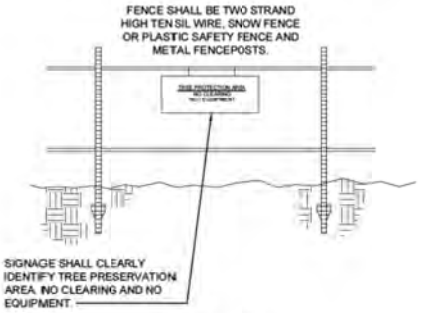
REVISION: B

CHAMELTON COUNTY, OHIO

PRESERVATION OF NATURAL VEGETATION

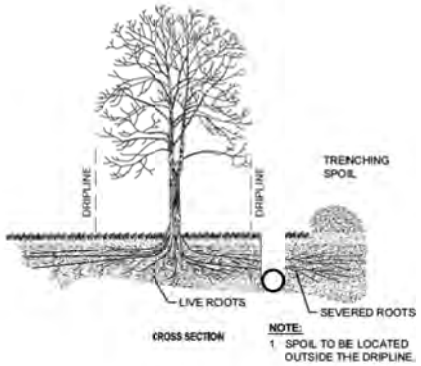
1. AREAS WHERE NATURAL VEGETATION IS TO BE PRESERVED, INCLUDING TREES, SHALL BE FENCED PRIOR TO BEGINNING CLEARING OPERATIONS.
2. ACCEPTABLE FENCE MATERIALS INCLUDE PLASTIC FENCE OR SNOW FENCE ANCHORED TO METAL FENCE POSTS.
3. SIGNAGE SHALL CLEARLY IDENTIFY THE PROTECTION AREA AND STATE THAT NO CLEARING 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.





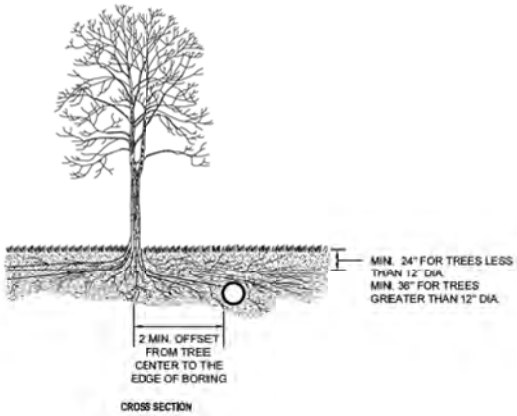
TREE PRESERVATION AREA

SCALE: N.T.S.



TREE PRESERVATION AREA BEFORE TRENCHING

SCALE: N.T.S.



TREE PRESERVATION AREA DURING BORING

SCALE: N.T.S.

BURNS & MCDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA: 01557

PROFESSIONAL ENGINEER STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APVD
A	06/17/2020	IS-SUED FOR 90% REVIEW	AKT	CNS	AMP
B	07/24/2020	IS-SUED FOR BID	AKT	JMP	CNS

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3580
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	JMP

APPROVALS	DATE	INITIALS	
	-	-	REGIONAL ENGINEER
	-	-	MGR. TECH REC & STD
	-	-	PRINCIPAL ENGINEER

DUKE ENERGY. Piedmont Natural Gas

C350 PROJECT
ENVIRONMENTAL NOTES & DETAILS 4
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

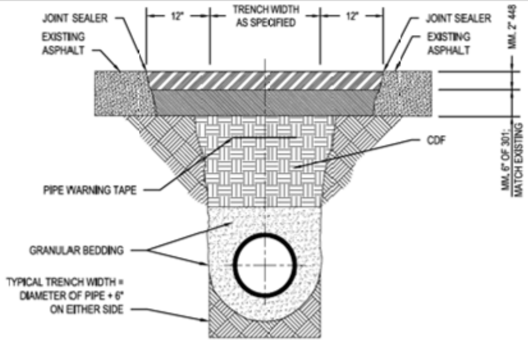
REF. DWG(S): PNG-G-350-0001009

SHEET(S)	4 OF 4	DWG SCALE	NONE
DWG DATE	09-05-2018	SUPERSEDED	—

DRAWING NUMBER: PNG -C-350-0001286

REVISION: B

C:\HAMILTON COUNTY\C350

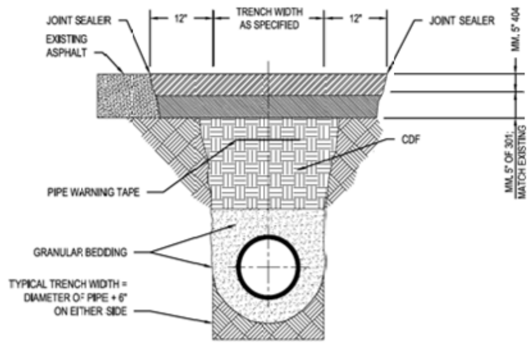


NOTES:

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.

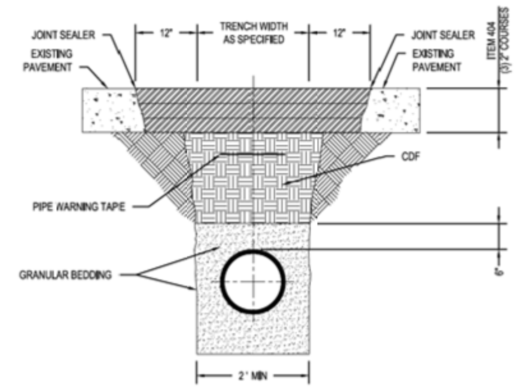


NOTES:

1. 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.

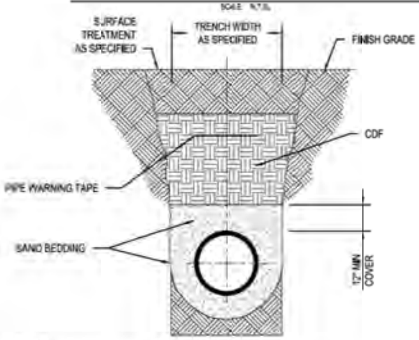


NOTES:

1. 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.

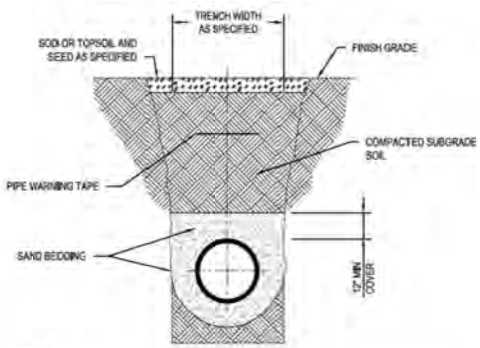


NOTES:

1. 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.

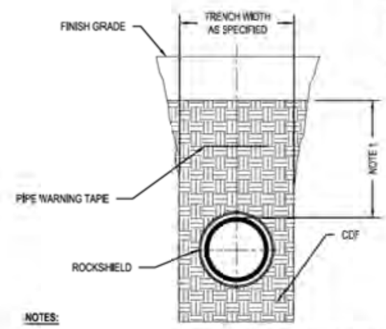


NOTES:

1. 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. 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.

BURNS & MCDONNELL ENGINEERING COMPANY, INC. STATE LICENSE # COA. 01557

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

NO.	DATE	REVISIONS / DESCRIPTION	BY	CHK	APPD
A	06/17/2020	ISSUED FOR 90% REVIEW	AKT	CNS	AMP
B	07/24/2020	ISSUED FOR BID	AKT	JMP	CNS

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	Q3880
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	JMP

APPROVALS: REGIONAL ENGINEER; MGR. TECH REC & STD; PRINCIPAL ENGINEER

DUKE ENERGY. Piedmont Natural Gas

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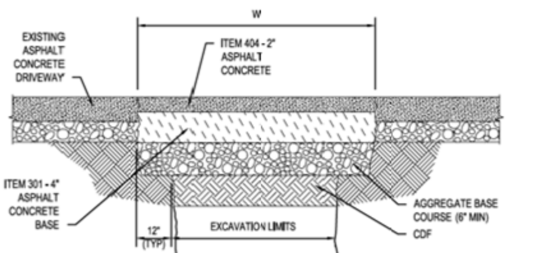
C350 PROJECT RESTORATION DETAILS 1 HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

SHEET(S)	1 OF 3	DWG SCALE	NONE
DWG DATE	02/04/2020	SUPERSEDED	—

DRAWING NUMBER: PNG -C-350-0001293 REVISION: B

PROFESSIONAL ENGINEER STAMP

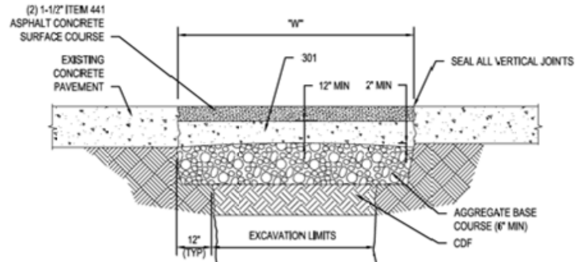


NOTES:

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.

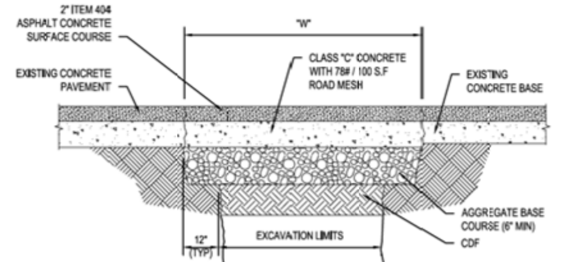


NOTES:

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.

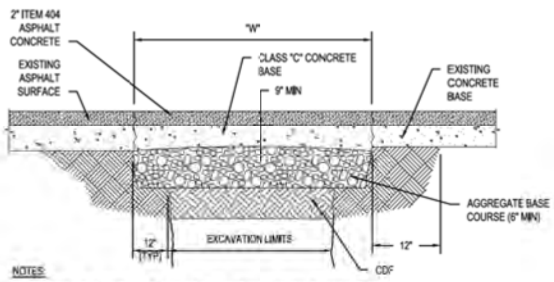


NOTES:

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.

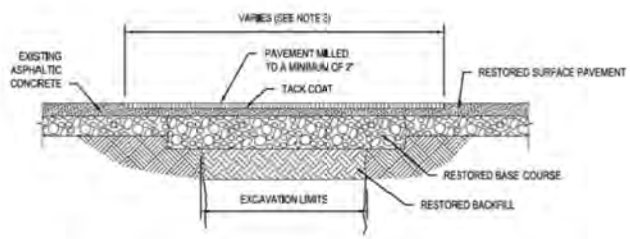


NOTES:

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.

BURNS & MCDONNELL ENGINEERING COMPANY, INC. STATE LICENSE # COA, 01557

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

NO.	DATE	REVISION(S) / DESCRIPTION	BY	CHK	APPD
A	06/17/2020	ISSUED FOR 90% REVIEW	AKT	CNS	AMP
B	07/24/2020	ISSUED FOR BID	AKT	JMP	CNS

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	Q3880
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	JMP

APPROVALS: REGIONAL ENGINEER; MGR. TECH REC & STD; PRINCIPAL ENGINEER

DUKE ENERGY | Piedmont Natural Gas

C350 PROJECT
RESTORATION DETAILS 2
HAMILTON COUNTY, OHIO
HAMILTON COUNTY, OHIO

SHEET(S)	2 OF 3	DWG SCALE	NONE
DWG DATE	02/04/2020	SUPERSEDED	—

DRAWING NUMBER: PNG -C-350-0001294 REVISION: B

C:\HAMILTON COUNTY\C350

PROFESSIONAL ENGINEER STAMP

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:

TYPE 1 MIX – CUT AND EMBANKMENT FILL AREAS (NON-WET)/CHANNELS

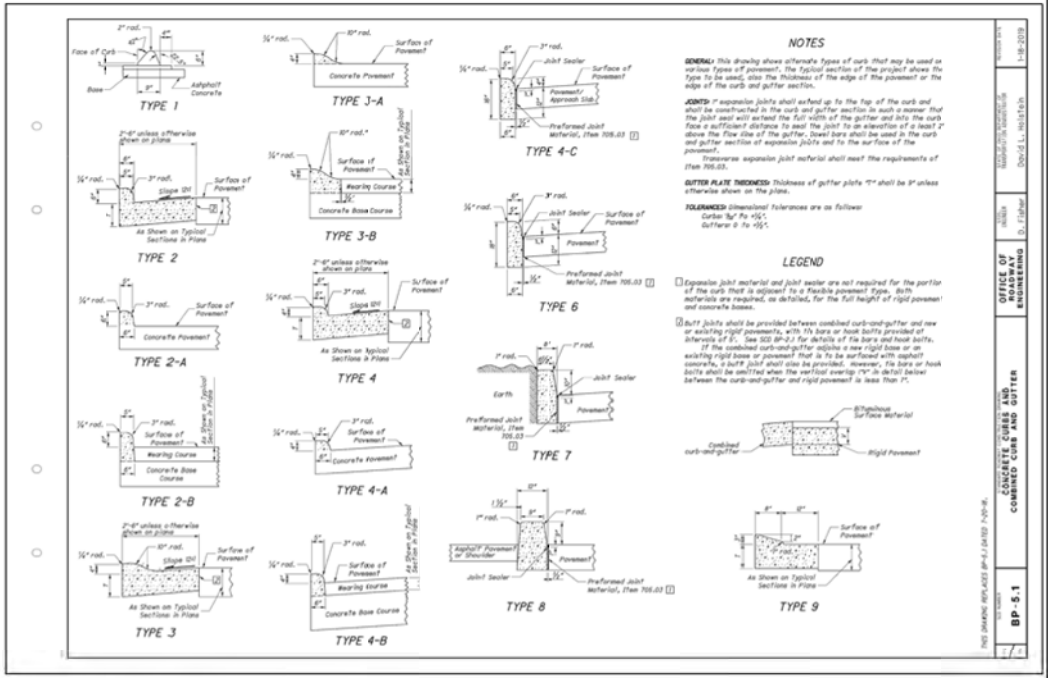
BOTANICAL NAME	COMMON NAME	RATE OF PURE LIVE SEED (PLS) PER ACRE:
FESTUCA ARUNDINACEA	TALL FESCUE	40-50 LBS

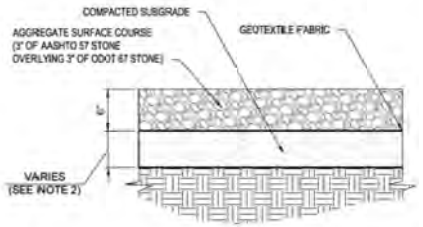
NOTES:

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: NOT TO SCALE





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.

BURNS & MCDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA: 01557

PROFESSIONAL ENGINEER STAMP

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A	06/17/2020	ISSUED FOR 90% REVIEW	AKT	CNS	JMP
B	07/24/2020	ISSUED FOR BID	AKT	JMP	CNS

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1860115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	JMP

APPROVALS		
DATE	DESIGN ENGINEER	REGIONAL ENGINEER
-	-	
DATE	DESIGN ENGINEER	MGR. TECH REC. & STD
-	-	
DATE	DESIGN ENGINEER	PRINCIPAL ENGINEER
-	-	

C350 PROJECT
RESTORATION DETAILS 3
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

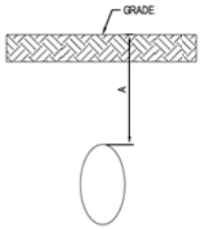
REF. DWG(S): PNG-G-350-0001009

SHEET(S)	3 OF 3	DWG SCALE	NONE
DWG DATE	02/04/2020	SUPERSEDED	—

DRAWING NUMBER	REVISION
PNG -C-350-0001295	B

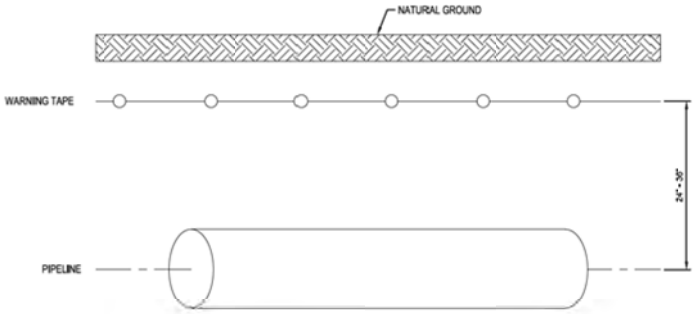
C:\HAMILTON COUNTY\C350

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.

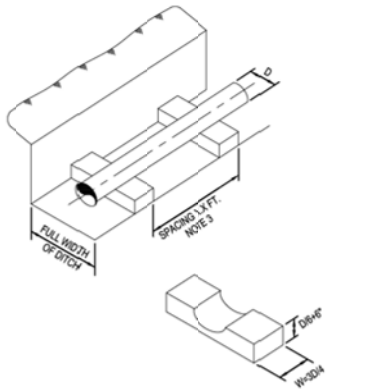


NOTES:

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.

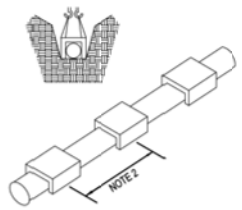


NOTES:

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.

BURNS & MCDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA: 01567

PROFESSIONAL ENGINEER STAMP

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DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3580
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	JMP

APPROVALS		
DATE -	INITIALS -	REGIONAL ENGINEER
DATE -	INITIALS -	MGR. TECH REG & STD
DATE 07/20/2020	INITIALS CNS	PRINCIPAL ENGINEER

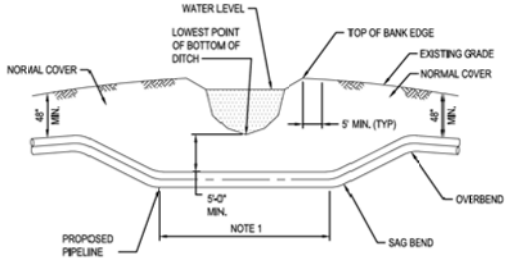
C350 PROJECT
CONSTRUCTION DETAILS 1
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

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

SHEET(S)	1 OF 10
DWG SCALE	NONE
DWG DATE	09-06-2018
SUPERSEDED	—
DRAWING NUMBER	PNG -C-350-0001303
REVISION	B

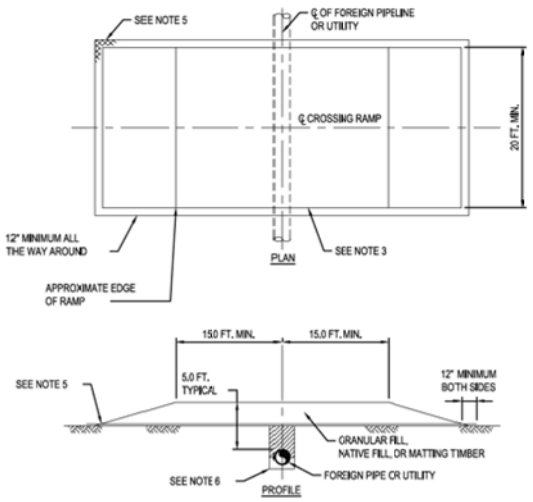
C:\HAMILTON COUNTY\C350



NOTE:
1. PIPELINE WEIGHTS OR ANCHORS TO BE INSTALLED PER PLANS OR AS DIRECTED BY COMPANY.

TYPICAL OPEN CUT STREAM CROSSING

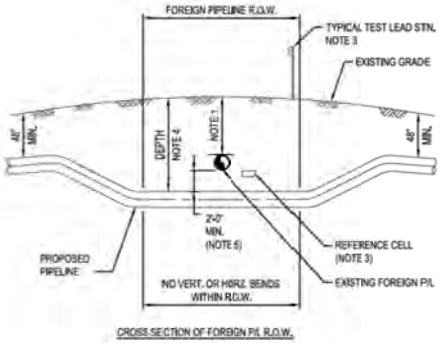
SCALE: N.T.S.



TEMPORARY RAMP CROSSING

SCALE: N.T.S.

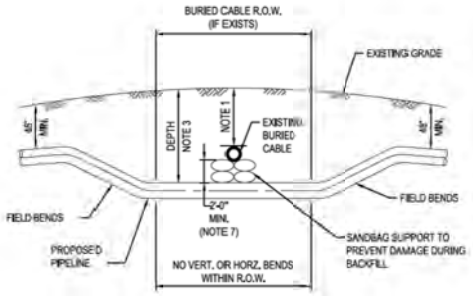
NOTES:
1. CONTRACTOR TO NOTIFY EXISTING PIPELINE/UTILITY COMPANY PRIOR TO INSTALLATION OF CROSSING RAMP.
2. LENGTH OF RAMP TO VARY IN ACCORDANCE WITH CROSSING ANGLE MINIMUM CROSSING ANGLE TO BE 45 DEGREES.
3. VEHICLES OR EQUIPMENT USING CROSSINGS SHALL PROCEED SLOWLY AND WITH CAUTION TO MINIMIZE IMPACT 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.

BURNS & MCDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA: 01567

PROFESSIONAL ENGINEER STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
A	06/17/2020	ISSUED FOR 90% REVIEW	AKT	CNS	AMP
B	07/24/2020	ISSUED FOR BID	AKT	JMP	CNS

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3580
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	JMF

APPROVALS		
DATE	SIGNED	
-	-	REGIONAL ENGINEER
DATE	SIGNED	
-	-	MGR. TECH REG & STD
DATE	SIGNED	
-	-	PRINCIPAL ENGINEER

C350 PROJECT CONSTRUCTION DETAILS 2 HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

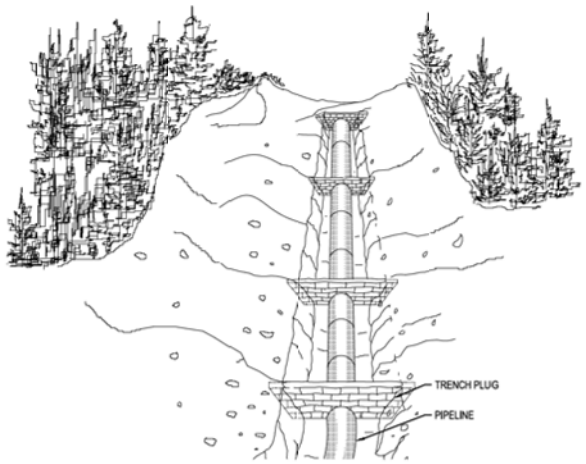
REF. DWG(S): PNG-G-350-0001001

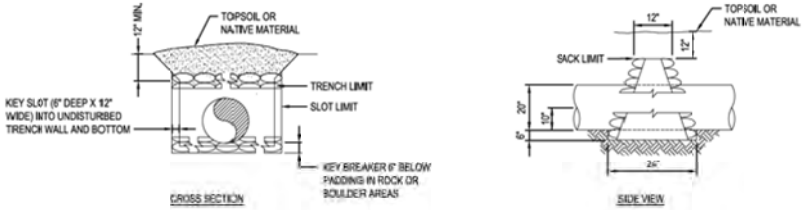
SHEET(S)	2 OF 10	DWG SCALE	NONE
DWG DATE	09-05-2018	SUPERSEDED	—

DRAWING NUMBER: PNG -C-350-0001304

REVISION: B

CHARLTON COUNTY CSD



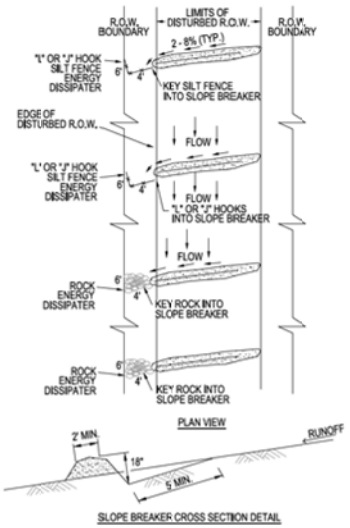


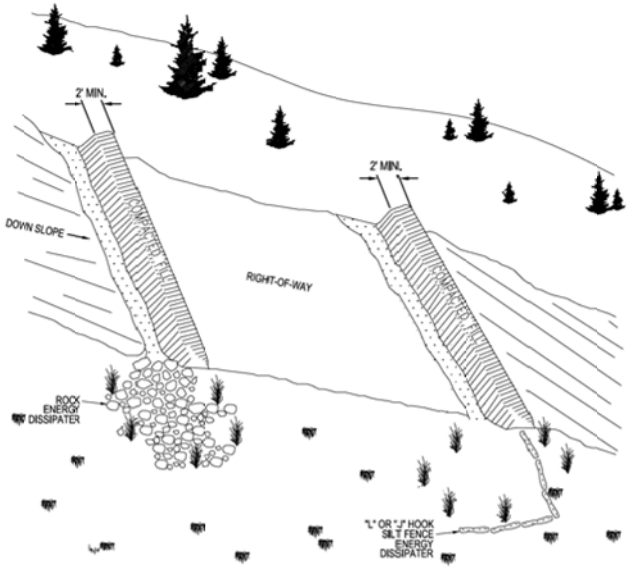
NOTES:

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 "OP OF THE SLOPE BREAKER), THE TROUGH 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.

BURNS & MCDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA: 01567

PROFESSIONAL ENGINEER STAMP

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B	07/24/2020	IS-SUED FOR BID	AKT	JMP	CNS

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3580
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	JMP

APPROVALS		
DATE	INITIALS	
-	-	REGIONAL ENGINEER
DATE	INITIALS	MGR. TECH REC & STD
DATE	INITIALS	PRINCIPAL ENGINEER
-	-	

DUKE ENERGY. Piedmont Natural Gas

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	09-06-2018	SUPERSEDED	—

DRAWING NUMBER: PNG -C-350-0001305

REVISION: B

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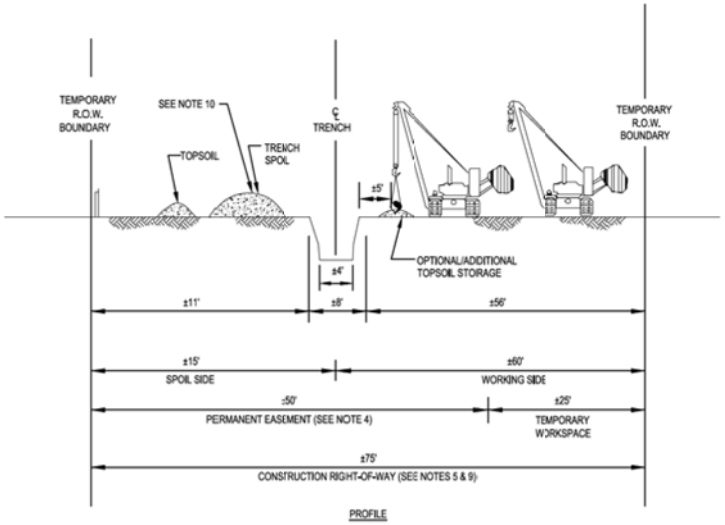
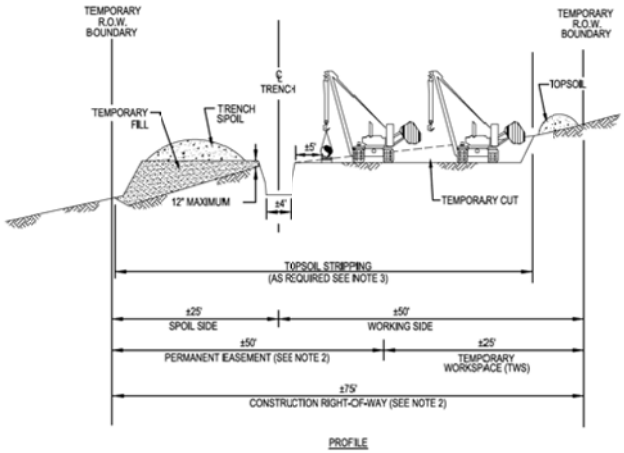


NOTES:

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.



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.

BURNS & MCDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA: 01567

PROFESSIONAL ENGINEER STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
A	06/17/2020	IS-SUED FOR 90% REVIEW	AKT	CNS	AMP
B	07/24/2020	IS-SUED FOR BID	AKT	JMP	CNS

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3580
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	JMP

APPROVALS		
DATE	INITIALS	
-	-	REGIONAL ENGINEER
DATE	INITIALS	MGR. TECH REC & STD
DATE	INITIALS	PRINCIPAL ENGINEER

C350 PROJECT
CONSTRUCTION DETAILS 4
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

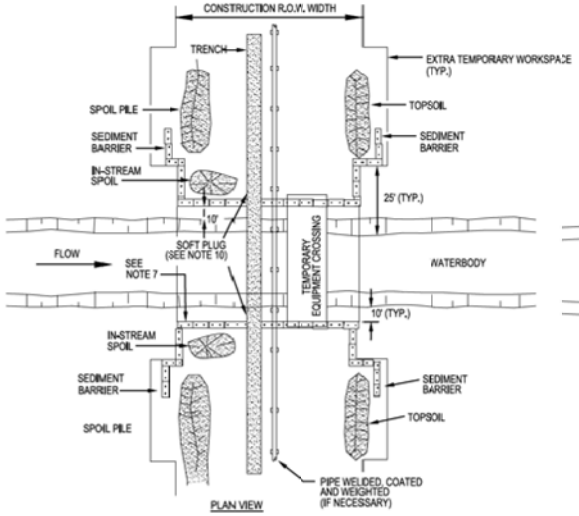
REF. DWG(S): PNG-G-350-0001609

SHEET(S): 4 OF 10 | DWG SCALE: NONE

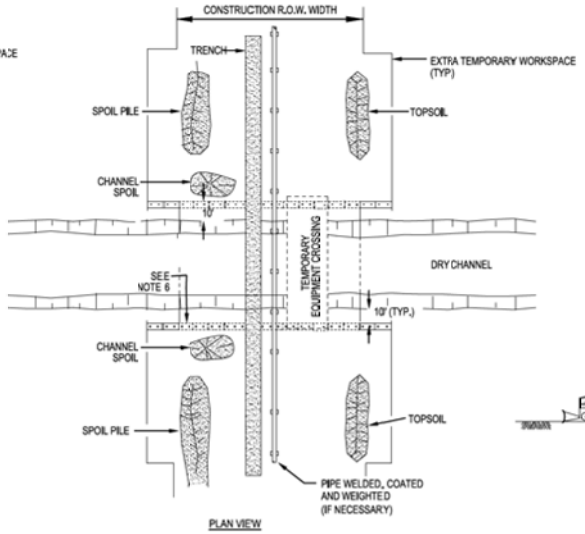
DWG DATE: 09/05/2018 | SUPERSEDED: —

DRAWING NUMBER: PNG -C-350-0001306 | REVISION: B

CHANGE TON COUNTY C350



PLAN VIEW



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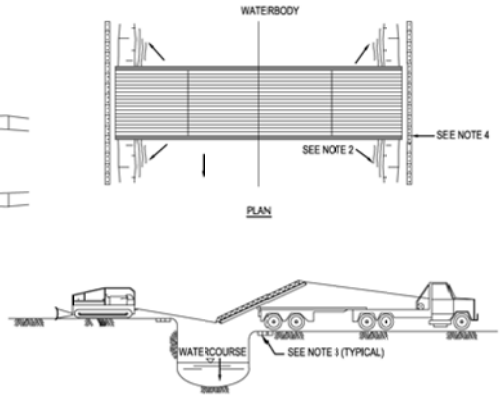
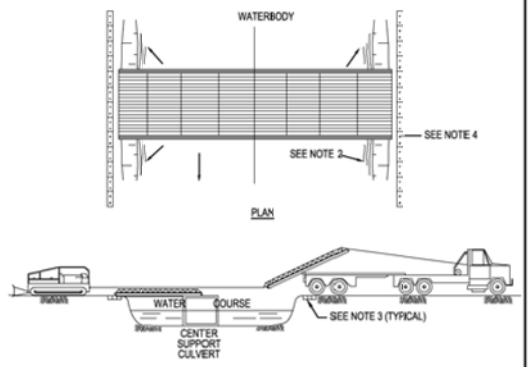


PLAN

PROFILE



PLAN

PROFILE

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 REMOVE 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 JP 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.

BURNS & MCDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA: 01567

PROFESSIONAL ENGINEER STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
A	06/17/2020	IS-SUED FOR 90% REVIEW	AKT	CNS	AMP
B	07/24/2020	IS-SUED FOR BID	AKT	JMP	CNS

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3580
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	JMP

APPROVALS		
DATE	SIGNATURE	
-	-	REGIONAL ENGINEER
DATE	SIGNATURE	
-	-	MGR. TECH REG & STD
DATE	SIGNATURE	
07/20/2020	CNS	PRINCIPAL ENGINEER

C350 PROJECT
CONSTRUCTION DETAILS 5
HAMILTON COUNTY, OHIO

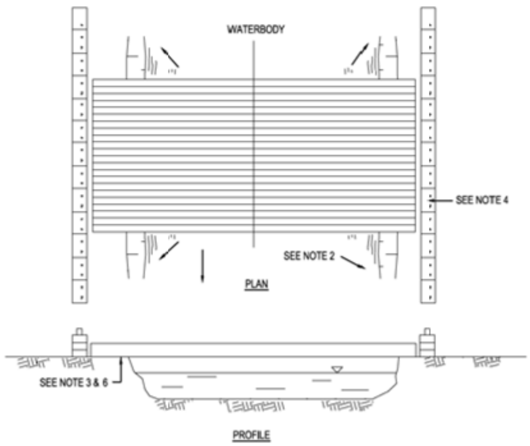
HAMILTON COUNTY, OHIO

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

SHEET(S)	DWG SCALE
S CF 10	NONE
DWG DATE: 06-05-2018	SUPERSEDED

DRAWING NUMBER	REVISION
PNG -C-350-0001307	B

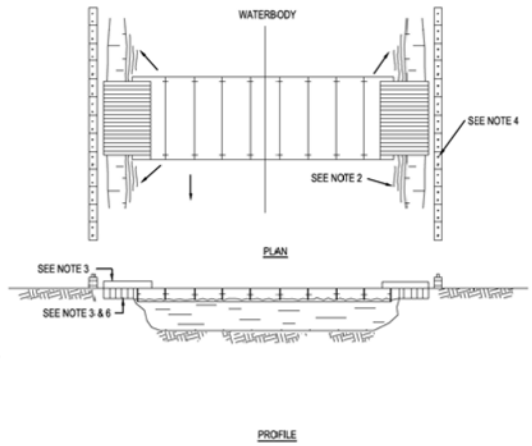
C:\HAMILTON COUNTY\PC350\



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

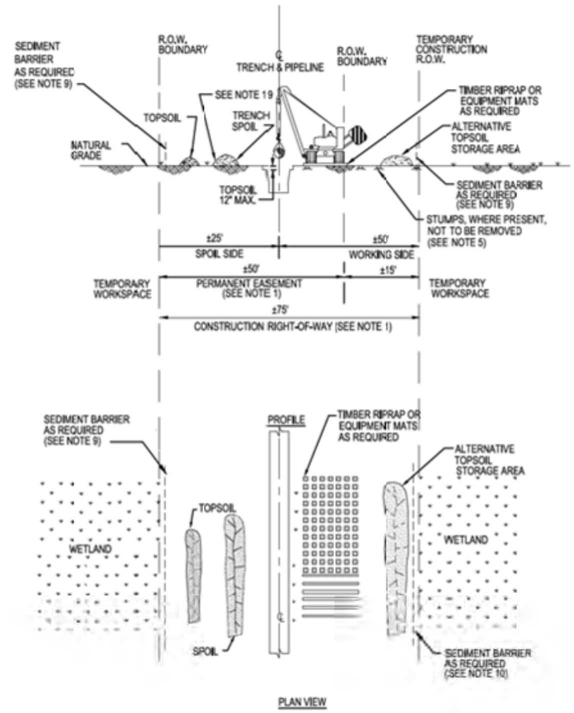
SCALE: N.T.S.



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 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 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.



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.

BURNS & MCDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA. 01567

PROFESSIONAL ENGINEER STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
A	06/17/2020	ISSUED FOR 90% REVIEW	AKT	CNS	AMP
B	07/24/2020	ISSUED FOR BID	AKT	JMP	CNS

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

APPROVALS: REGIONAL ENGINEER; MGR. TECH REC & STD; PRINCIPAL ENGINEER

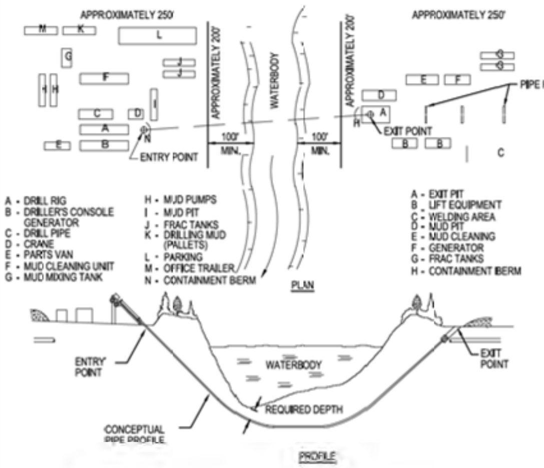
DUKE ENERGY. Piedmont Natural Gas

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: B

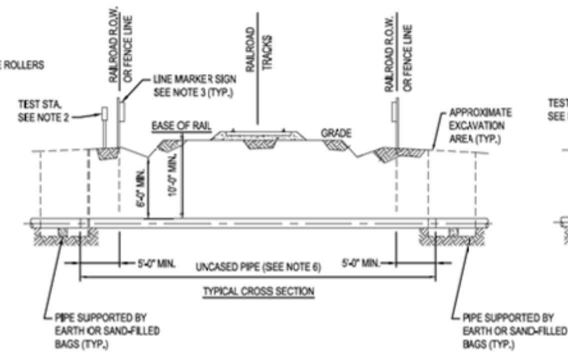


NOTES:

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.

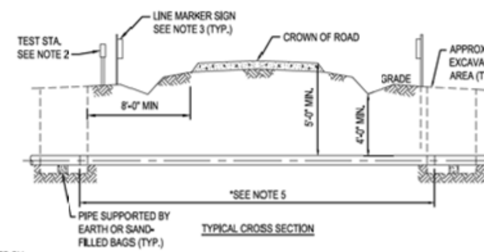


NOTES:

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.

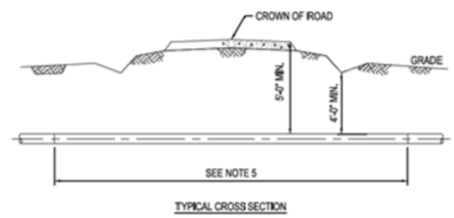


NOTES:

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° 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' 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).
3. INSTALL PIPELINE MARKER & TEST STATIONS ON ROW LINE NEXT TO FENCE IF POSSIBLE.
4. CROSSING SHALL BE INSTALLED BY OPEN CUTTING.
5. PIPE WALL THICKNESS AND GRADE SHALL BE AS SPECIFIED ON ALIGNMENT DRAWINGS.
6. CROSSING TO BE AS NEAR TO 90° TO THE CENTERLINE OF ROADWAY AS PRACTICAL.
7. 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.

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STATE LICENSE # COA. 01567

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B	07/24/2020	ISSUED FOR BID	AKT	JMP	CNS

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

APPROVALS: REGIONAL ENGINEER; MGR. TECH REC & STD; PRINCIPAL ENGINEER

DUKE ENERGY | Piedmont Natural Gas

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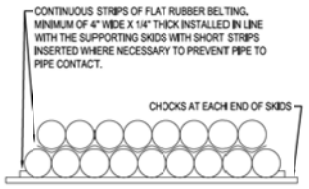
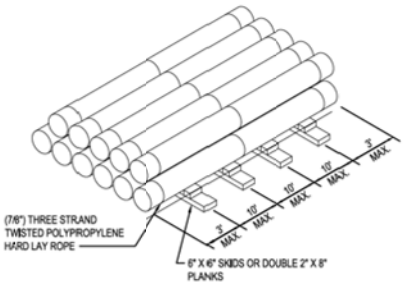
REF. DWG(S): PNG-G-350-0001009

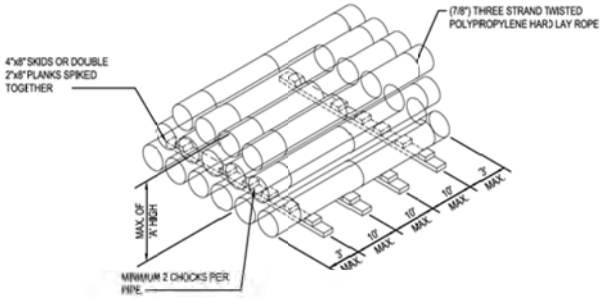
C350 PROJECT
CONSTRUCTION DETAILS 7
HAMILTON COUNTY, OHIO
HAMILTON COUNTY, OHIO

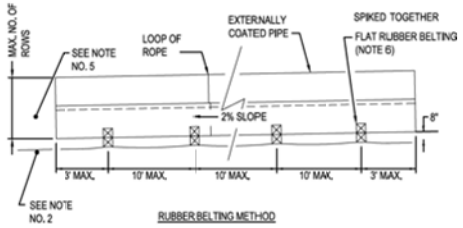
SHEET(S) 7 OF 10 | DWG SCALE NONE
DWG DATE 09-05-2018 | SUPERSEDED —
DRAWING NUMBER: PNG -C-350-0001309 | REVISION: B

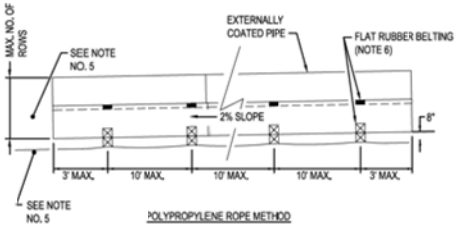
SIZE	'A' (NO. OF ROWS)	CIRCUMFERENCE OF FINISHED LOOPS	SIZE	'A' (NO. OF ROWS)	CIRCUMFERENCE OF FINISHED LOOPS	
4"	12	16'	18"	5	60"	* PIPE GREATER THAN 20" WILL BE 4 ROWS.
6"	10	24'	20"	4 *	66"	
8"	8	30'	24"	4	72"	
10"	6	37'	32"	4	80"	
12"	6	43'	36"	4	92"	
16"	5	54'	42"	4	98"	











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'	24'	24'

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 6.0 FEET FROM THE PIPE ENDS AND A MAXIMUM OF 6.0 FEET FROM GIRTH WELDS. THE INTERVALS BETWEEN RINGS SHOULD BE BETWEEN 10.0 FEET AND 25.0 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: NOT TO SCALE

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' FROM THE PIPE ENDS AND A MAXIMUM OF 6' FROM GIRTH WELDS. THE INTERVAL BETWEEN RINGS SHOULD BE BETWEEN 10' AND 25' 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: NOT TO SCALE

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STATE LICENSE # COA: 01567

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B	07/24/2020	IS-SUED FOR BID	AKT	JMP	CNS

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3580
PROJECT NUMBER	1880115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	JMP

APPROVALS		
DATE	REVIEW	REGIONAL ENGINEER
-	-	
DATE	TITLE	MGR. TECH REC & STD
-	-	
DATE	REVIEW	PRINCIPAL ENGINEER
-	-	

DUKE ENERGY. Piedmont Natural Gas

C350 PROJECT CONSTRUCTION DETAILS 8 HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

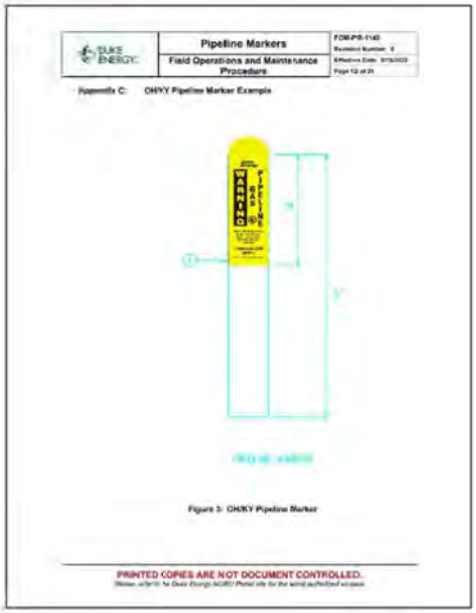
REF. DWG(S): PNG-G-350-0001009

SHEET(S)	8 OF 10	DWG SCALE	NONE
DWG DATE	09-05-2018	SUPERSEDED	—

DRAWING NUMBER: PNG -C-350-0001310

REVISION: B

C:\HAMILTON COUNTY\C350

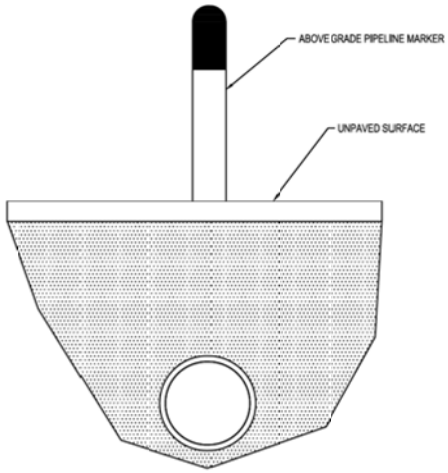


Pipeline Markers
Field Operations and Maintenance Procedures
FDM-PR-1140

Appendix C: OH/KY Pipeline Marker Example

Figure 3: OH/KY Pipeline Marker

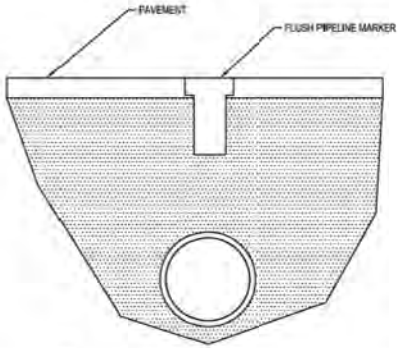
PRINTED COPIES ARE NOT DOCUMENT CONTROLLED.



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 FDM-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

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

APPROVALS		
DATE	INITIALS	
-	-	REGIONAL ENGINEER
DATE	INITIALS	MGR. TECH REC & STD
-	-	
DATE	INITIALS	PRINCIPAL ENGINEER
-	-	

DUKE ENERGY. Piedmont Natural Gas

C350 PROJECT
CONSTRUCTION DETAILS 9
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

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

SHEET(S): 9 OF 10 | DWG SCALE: NONE
DWG DATE: 09-05-2018 | SUPERSEDED: —

DRAWING NUMBER: PNG -C-350-0001311 | REVISION: B

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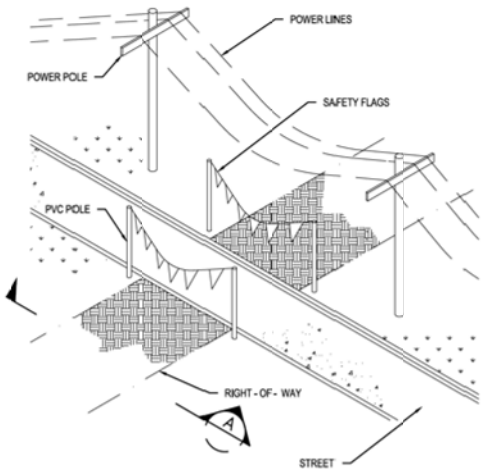
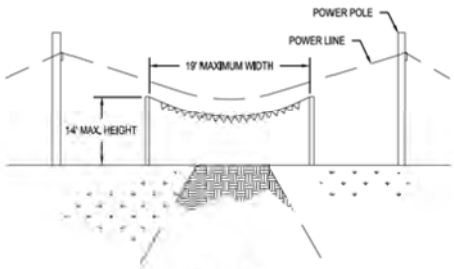




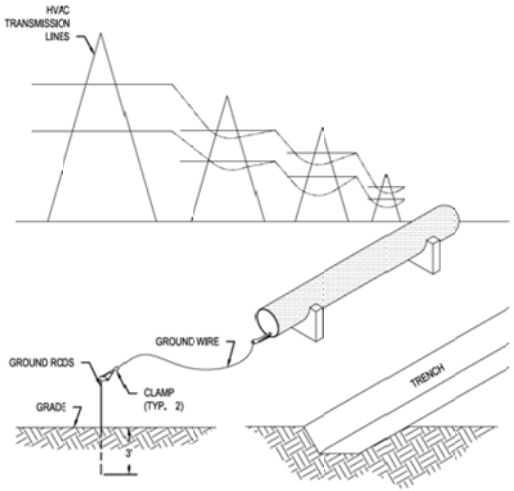
SECTION A-A

SCALE: N.T.S.

NOTE:
1. FLAG HEIGHT AND WIDTH MAY BE ADJUSTED BASED ON SITE CONDITIONS OR AS DIRECTED BY COMPANY REPRESENTATIVE.

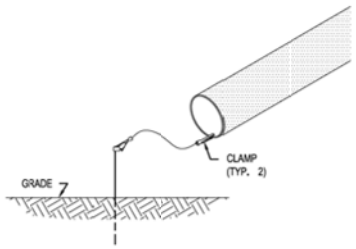
OVERHEAD ELECTRICAL WARNING FLAGS

SCALE: N.T.S.



SAFETY GROUNDING

SCALE: N.T.S.



CLIP CONNECTION

SCALE: N.T.S.

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DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	JMP

APPROVALS		
DATE	INITIALS	
-	-	REGIONAL ENGINEER
DATE	INITIALS	MGR. TECH REC & STD
DATE	INITIALS	PRINCIPAL ENGINEER

DUKE ENERGY. Piedmont Natural Gas

C350 PROJECT
CONSTRUCTION DETAILS 10
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

REF. DWG(S): PNG-G-350-0001001

SHEET(S): 10 OF 10 | DWG SCALE: NONE

DWG DATE: 09-05-2018 | SUPERSEDED: —

DRAWING NUMBER: PNG -C-350-0001312 | REVISION: B

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.

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