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)

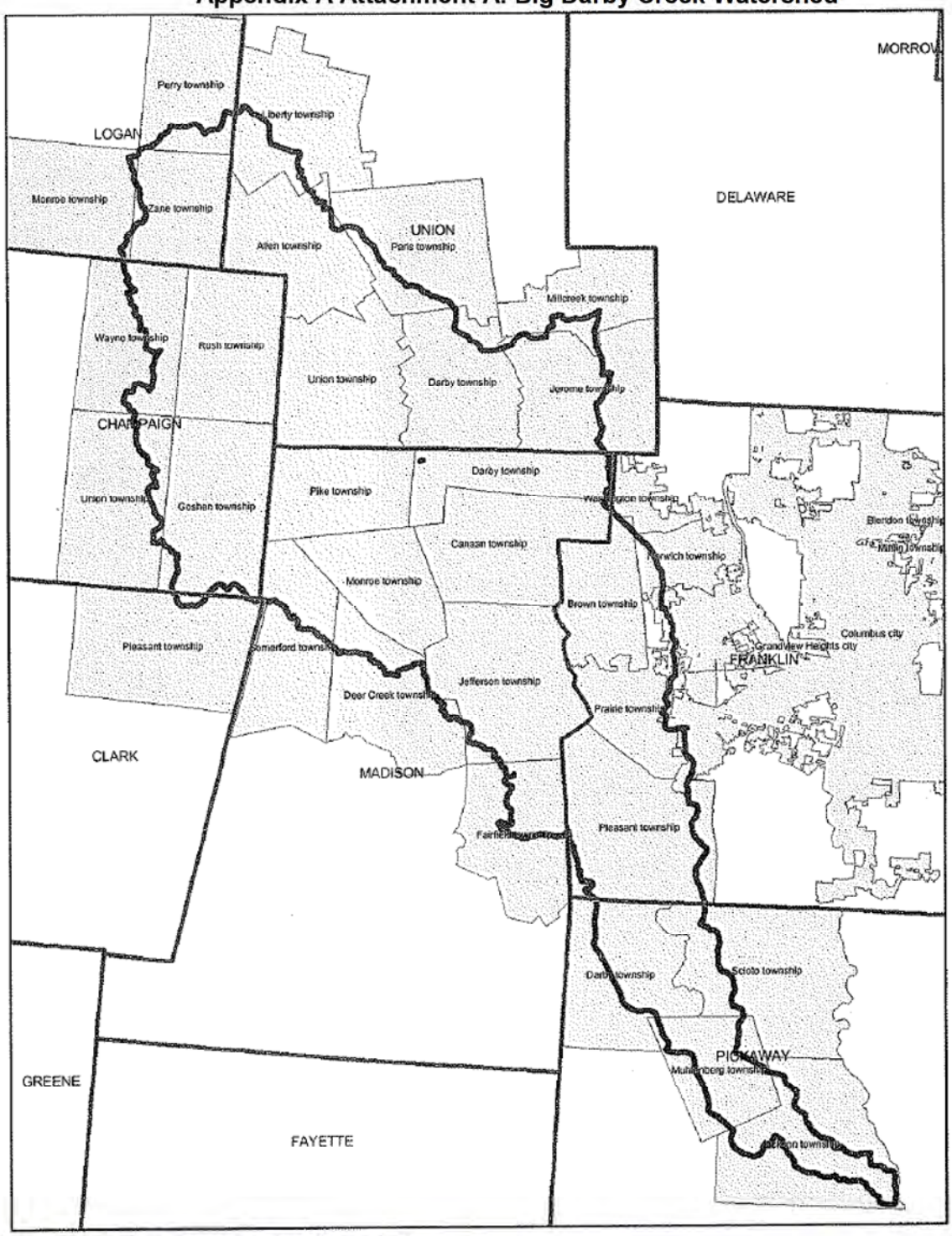
Where,
$V_{retention}$ = volume of runoff retained onsite using an approved infiltration practice
$A_{HSG\text{-}x}$ = area of each hydrologic soil group within the disturbed area

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
B.2 TMDL Conditions
B.3 Riparian Setback Requirements
B.4 Riparian Setback Mitigation

Attachment B-A: Area of Applicability for the Olentangy Watershed (Map)

Attachment B-B: Stream Assessment and Restoration

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.

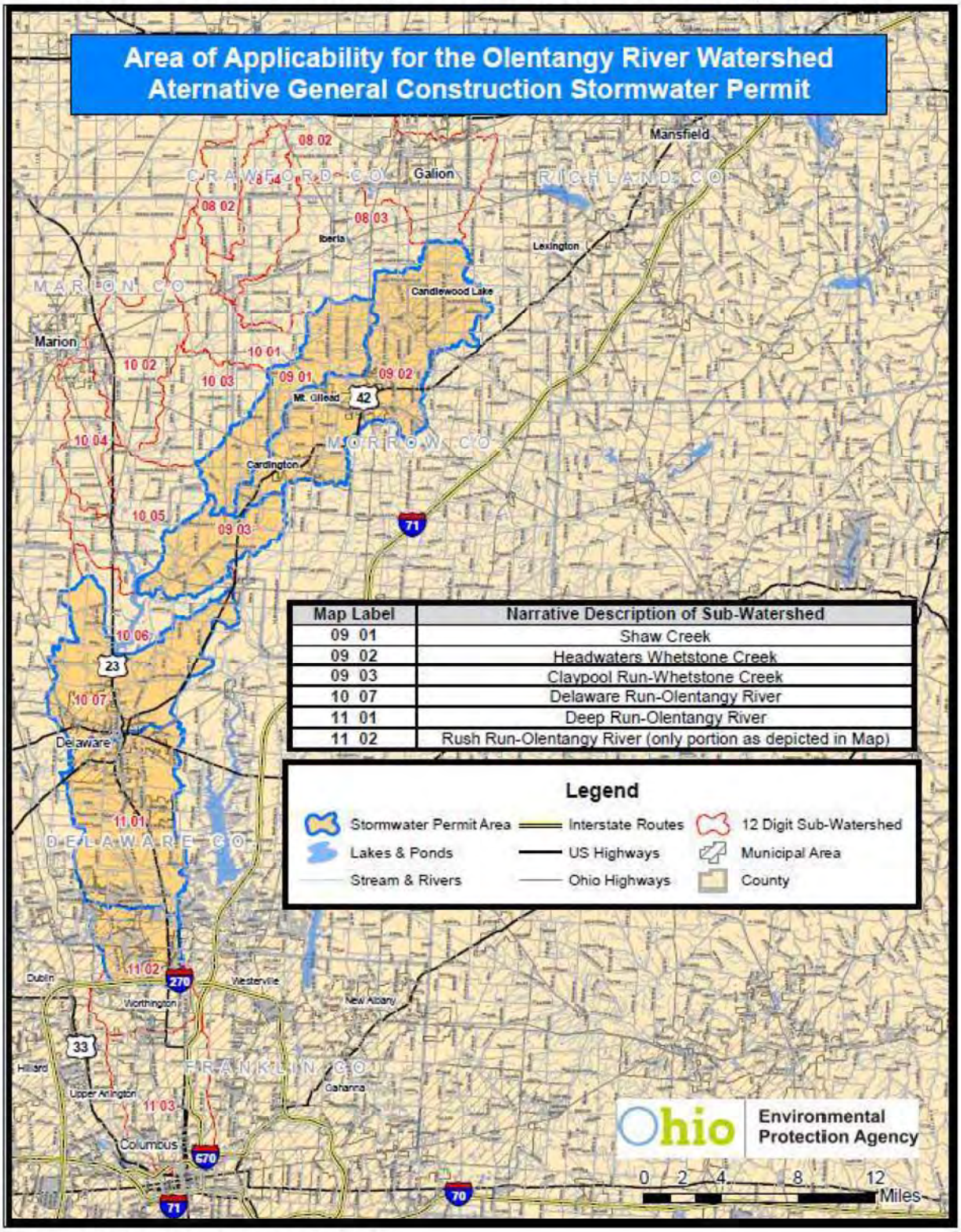
The mitigation required for intrusion into the riparian setback of an **intermittent stream** shall be four (4) times the total area disturbed within the riparian setback of the site being developed shall be mitigated; or two (2) times the total area disturbed within the riparian setback shall be mitigated 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)

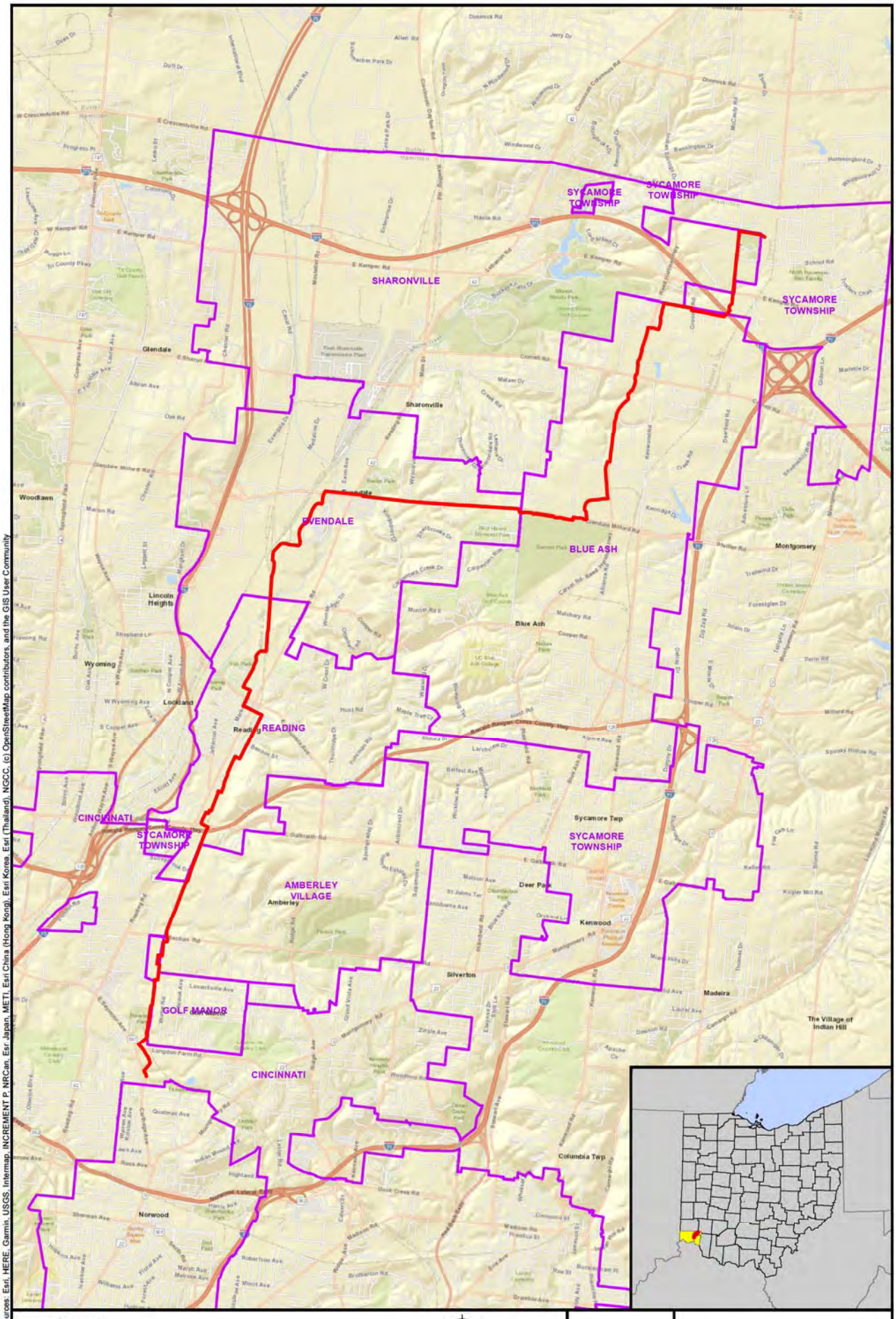
DURATION t_c (minutes)	WATER QUALITY INTENSITY [i_{wq}] (inches/hour)
5	2.37
6	2.26
7	2.15
8	2.04
9	1.94
10	1.85
11	1.76
12	1.68
13	1.62
14	1.56
15	1.51
16	1.46
17	1.41
18	1.37
19	1.33
20	1.29
21	1.26
22	1.22
23	1.19
24	1.16
25	1.13
26	1.10
27	1.07
28	1.05
29	1.03
30	1.01
31	0.99
32	0.97

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

PROJECT FIGURES


SYCAMORE TOWNSHIP
SYCAMORE TOWNSHIP
SHARONVILLE
SYCAMORE TOWNSHIP
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Sharonville
Woodlawn
EVENDALE
BLUE ASH
Montgomery
Lincoln Heights
Blue Ash
Wyoming
Lockland
READING
CINCINNATI
SYCAMORE TOWNSHIP
Sycamore Twp
SYCAMORE TOWNSHIP
AMBERLEY VILLAGE
Amberley
Deer Park
Kenwood
Silverton
Madeira
The Village of Indian Hill
GOLF MANOR
CINCINNATI
Columbia Twp
Norwood
Alignment
Municipal Boundary
NORTH
4,000 2,000 0 4,000
Scale in Feet
BURNS McDONNELL
Figure 1
Vicinity Map
C350
Source: Esri, and Burns & McDonnell Engineering Company, Inc.
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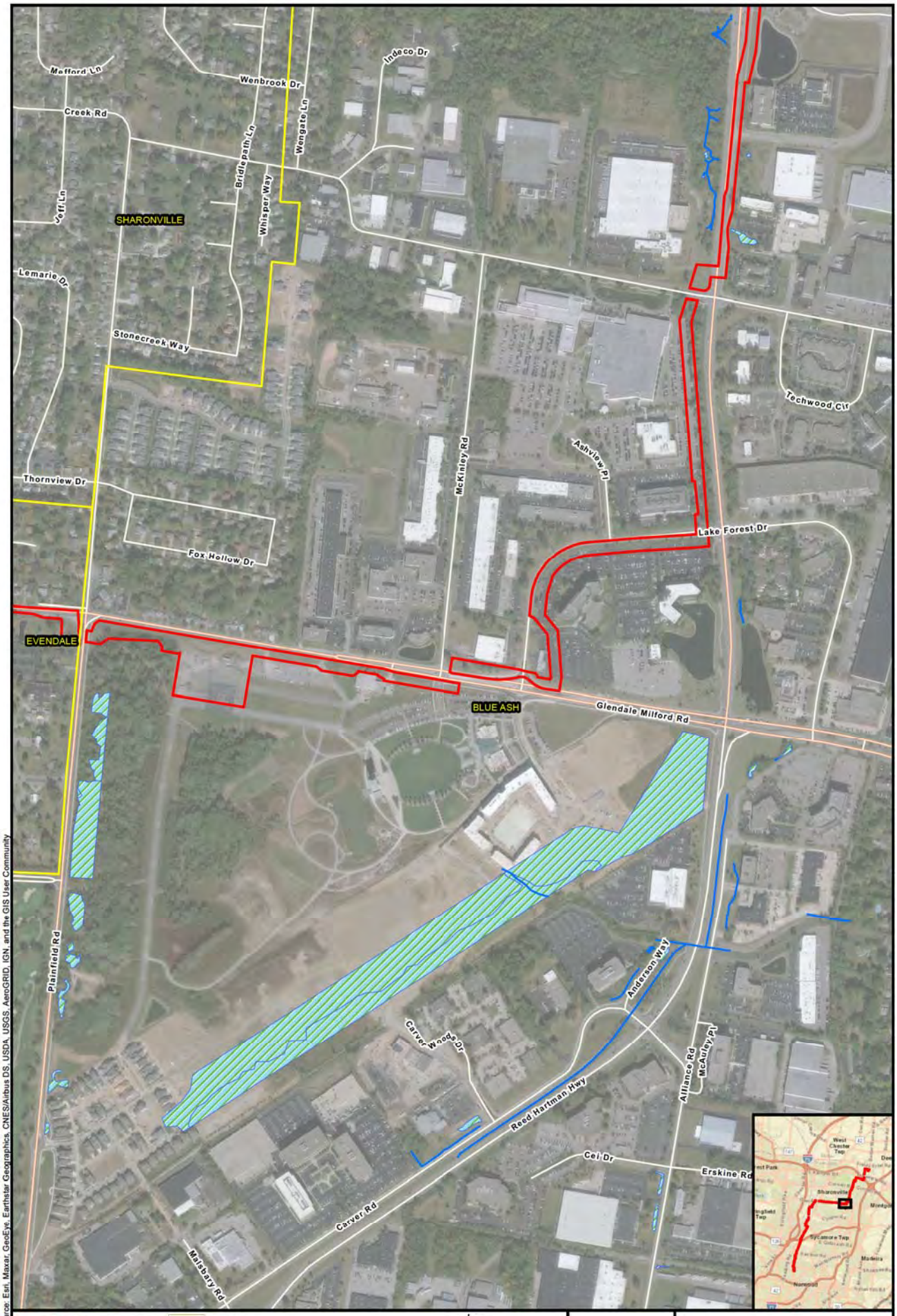

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Construction Footprint
City Limits
Stream
Wetland
Floodplain
Floodway

NORTH

550 275 0 550

Scale in Feet

BURNS McDONNELL

Figure 2
Site Map
C350
Page 1 of 5

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

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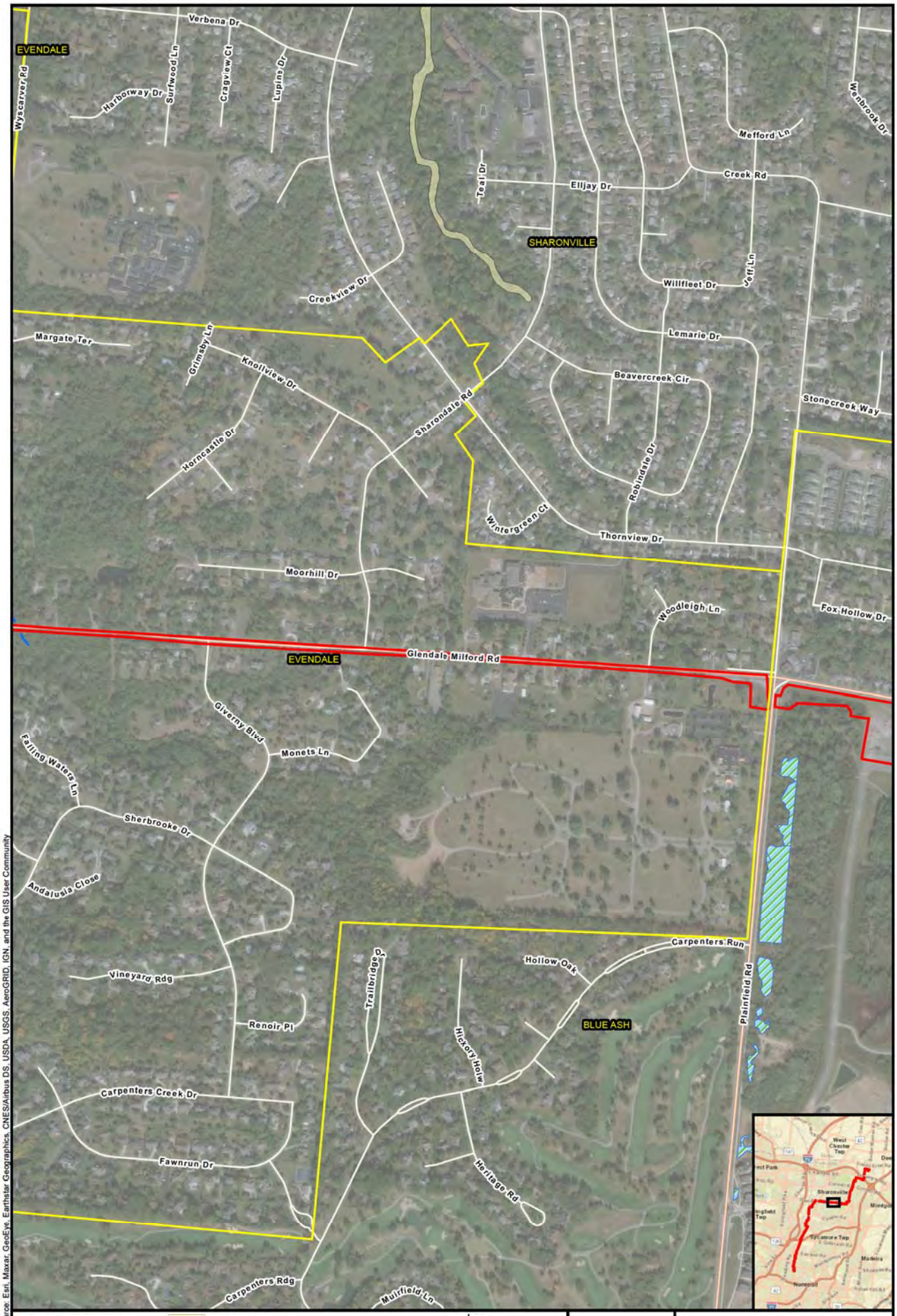
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Verbena Dr
Wyscarver Rd
Harborway Dr
Surfwood Ln
Cragview Ct
Lupine Dr
Teal Dr
Ellijay Dr
Mefford Ln
Creek Rd
Wenbrook Dr
SHARONVILLE
Creekview Dr
Willfleet Dr
Yeiff Ln
Margate Ter
Grimsby Ln
Knollview Dr
Lemarie Dr
Beavercreek Cir
Stonecreek Way
Sharondale Rd
Hornecastle Dr
Robindale Dr
Wintergreen Ct
Thornview Dr
Moorhill Dr
Woodleigh Ln
Fox Hollow Dr
EVENDALE
Glendale Milford Rd
Giverny Blvd
Monets Ln
Falling Waters Ln
Sherbrooke Dr
Andalusia Close
Carpenters Run
Hollow Oak
Trailbridge Dr
Vineyard Rdg
Renoir Pl
BLUE ASH
Plainfield Rd
Hickory Holw
Carpenters Creek Dr
Fawnrun Dr
Heritage Rd
Carpenters Rdg
Muirfield Ln
Construction Footprint
City Limits
Stream
Wetland
Floodplain
Floodway
NORTH
550 275 0 550
Scale in Feet
BURNS McDONNELL
Figure 2
Site Map
C350
Page 2 of 5
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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: 9/18/2020

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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

~~Construction~~ Footprint
City Limits
Stream
Wetland
Floodplain
Floodway

NORTH

550 275 0 550

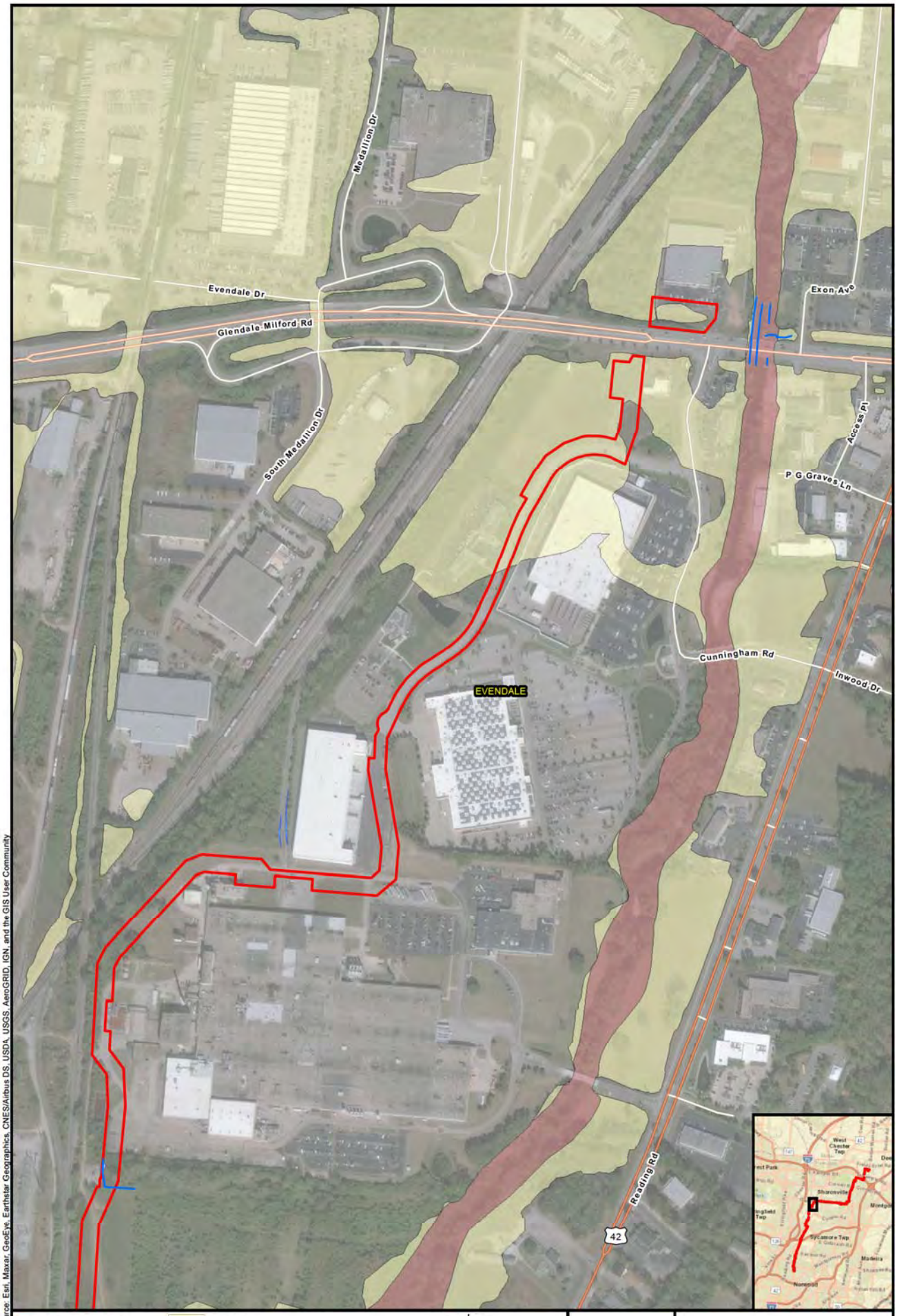
Scale in Feet

BURNS McDONNELL

Figure 2
Site Map
C350
Page 3 of 5

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

Issued: 9/18/2020



Construction Footprint
City Limits
Stream
Wetland
Floodplain
Floodway

NORTH

375 187.5 0 375

Scale in Feet

BURNS McDONNELL

Figure 2
Site Map
C350
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Source: Esri, FEMA, and Burns & McDonnell Engineering Company, Inc.

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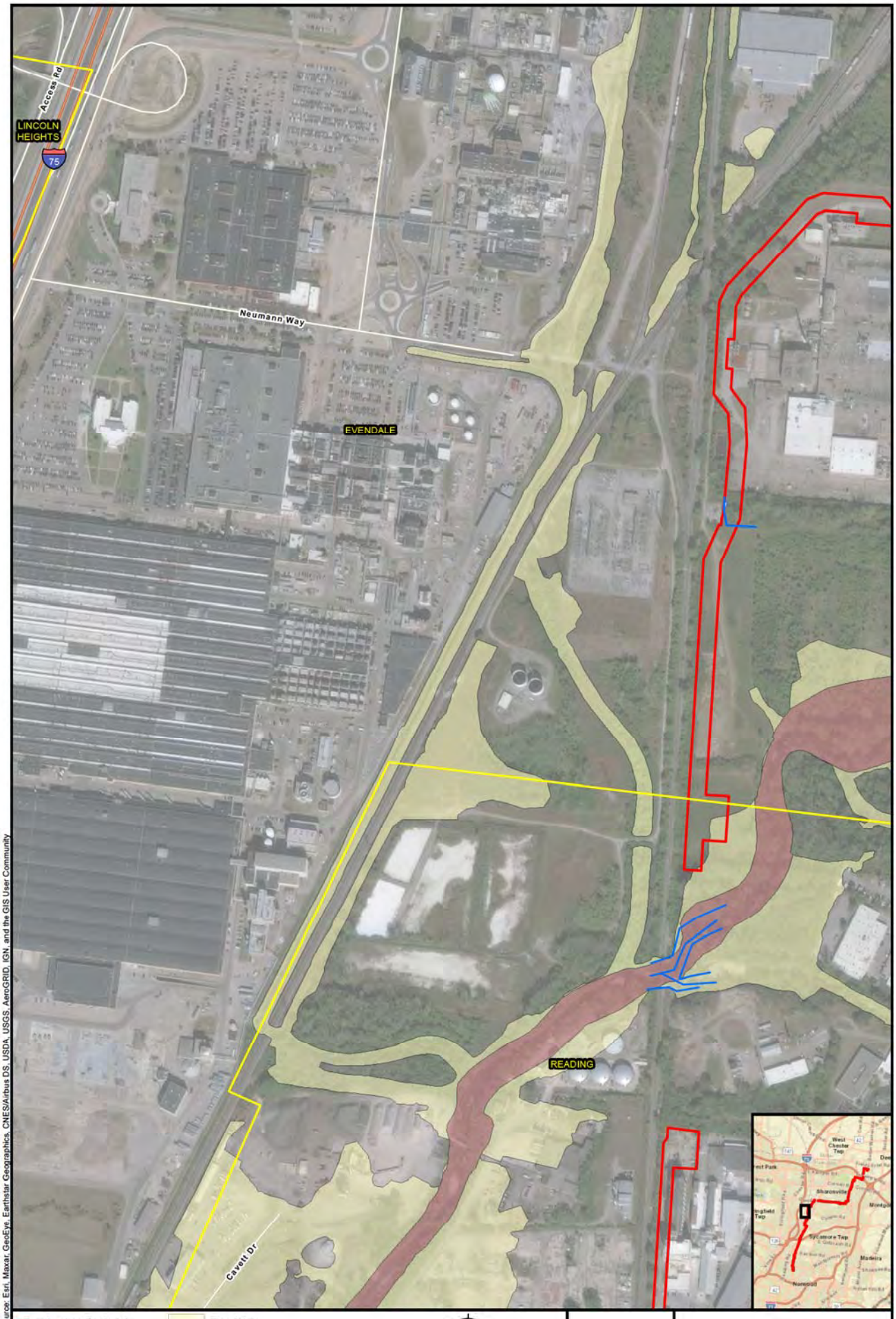

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BURNS McDONNELL

Figure 2
Site Map
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Source: Esri, FEMA, and Burns & McDonnell Engineering Company, Inc.

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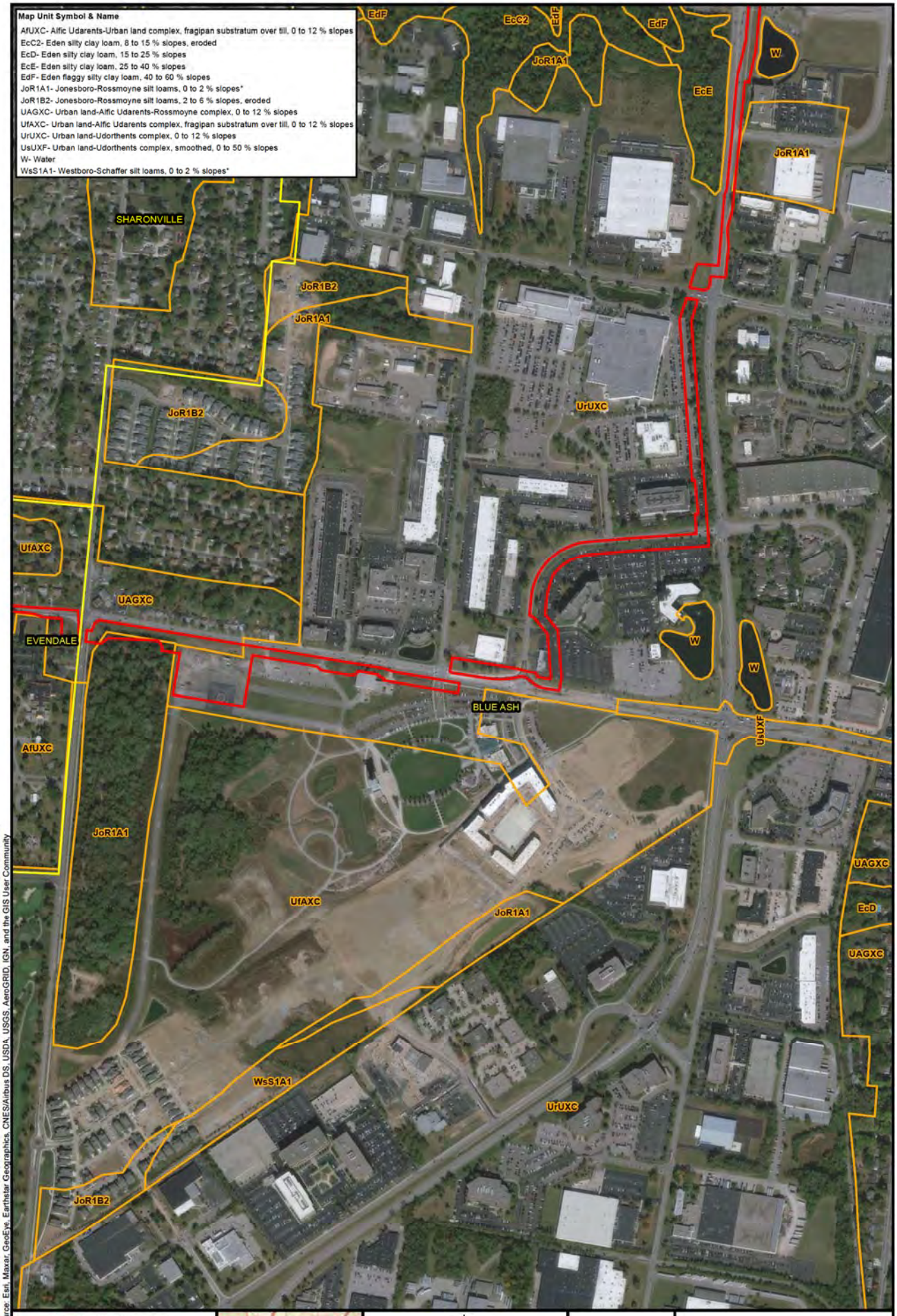
Map Unit Symbol & Name
AfUXC- Aiffic Udarents-Urban land complex, fragipan substratum over till, 0 to 12 % slopes
EcC2- Eden silty clay loam, 8 to 15 % slopes, eroded
EcD- Eden silty clay loam, 15 to 25 % slopes
EcE- Eden silty clay loam, 25 to 40 % slopes
EdF- Eden flaggy silty clay loam, 40 to 60 % slopes
JoR1A1- Jonesboro-Rossmoyne silt loams, 0 to 2 % slopes*
JoR1B2- Jonesboro-Rossmoyne silt loams, 2 to 6 % slopes, eroded
UAGXC- Urban land-Alfic Udarents-Rossmoyne complex, 0 to 12 % slopes
UfAXC- Urban land-Alfic Udarents complex, fragipan substratum over till, 0 to 12 % slopes
UrUXC- Urban land-Udorthents complex, 0 to 12 % slopes
UsUXF- Urban land-Udorthents complex, smoothed, 0 to 50 % slopes
W- Water
WsS1A1- Westboro-Schaffer silt loams, 0 to 2 % slopes*
SHARONVILLE
EVENDALE
BLUE ASH
EdF
EcC2
EcE
JoR1A1
JoR1B2
UrUXC
UfAXC
UAGXC
AfUXC
UsUXF
EcD
WsS1A1
W
Construction Footprint
City Limits
SSURGO Soils Map Unit
North College Hill
Montgomery
Madeira
NORTH
550 275 0 550
Scale in Feet
BURNS McDONNELL
Figure 3
Soils Map
C350
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Source: Esri, SSURGO Soils Database, and Burns & McDonnell Engineering Company, Inc.
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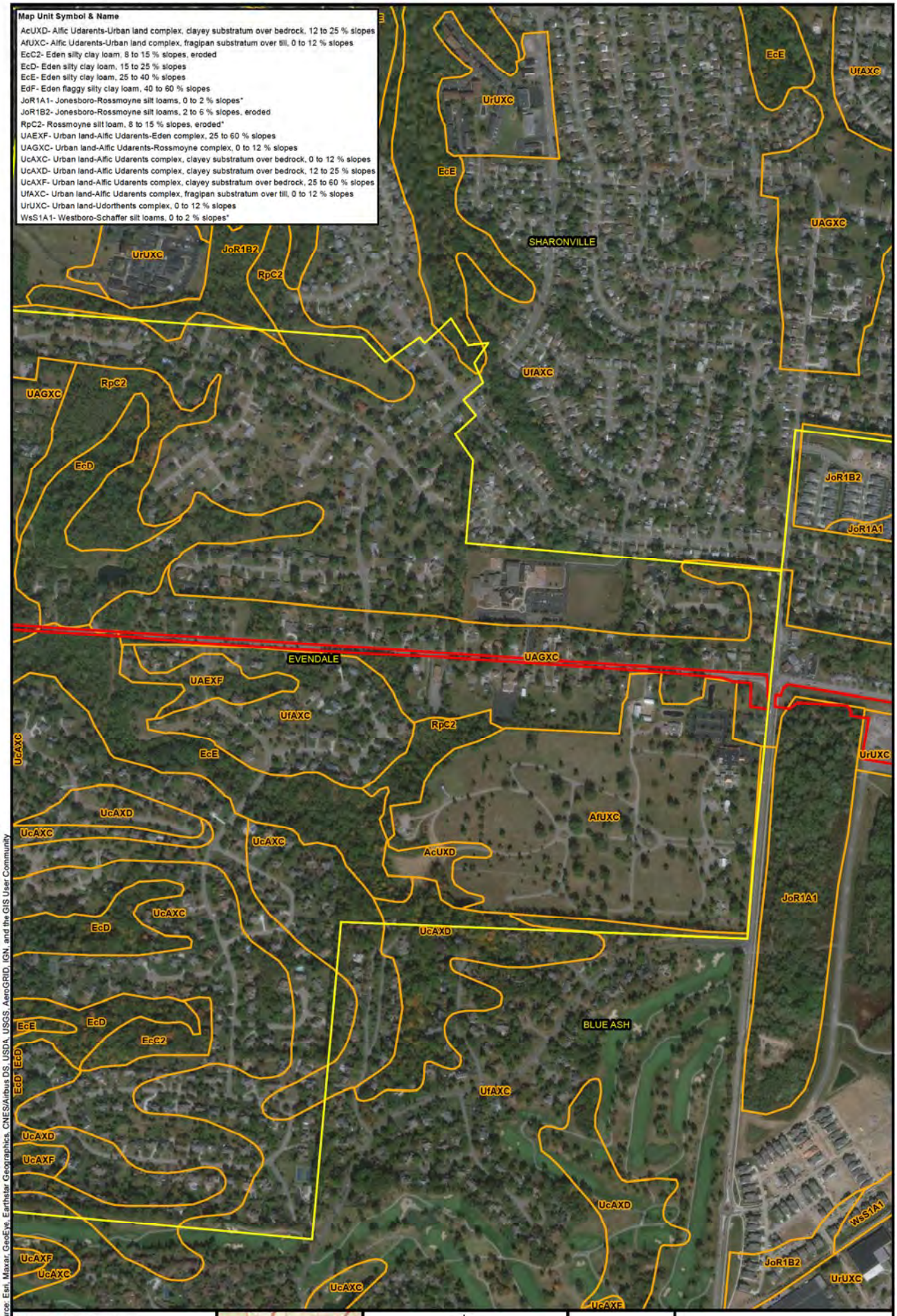
Map Unit Symbol & Name
AcUXD- Alfic Udarents-Urban land complex, clayey substratum over bedrock, 12 to 25 % slopes
AfUXC- Alfic Udarents-Urban land complex, fragipan substratum over till, 0 to 12 % slopes
EcC2- Eden silty clay loam, 8 to 15 % slopes, eroded
EcD- Eden silty clay loam, 15 to 25 % slopes
EcE- Eden silty clay loam, 25 to 40 % slopes
EdF- Eden flaggy silty clay loam, 40 to 60 % slopes
JoR1A1- Jonesboro-Rossmoyne silt loams, 0 to 2 % slopes*
JoR1B2- Jonesboro-Rossmoyne silt loams, 2 to 6 % slopes, eroded
RpC2- Rossmoyne silt loam, 8 to 15 % slopes, eroded*
UAEXF- Urban land-Alfic Udarents-Eden complex, 25 to 60 % slopes
UAGXC- Urban land-Alfic Udarents-Rossmoyne complex, 0 to 12 % slopes
UcAXC- Urban land-Alfic Udarents complex, clayey substratum over bedrock, 0 to 12 % slopes
UcAXD- Urban land-Alfic Udarents complex, clayey substratum over bedrock, 12 to 25 % slopes
UcAXF- Urban land-Alfic Udarents complex, clayey substratum over bedrock, 25 to 60 % slopes
UfAXC- Urban land-Alfic Udarents complex, fragipan substratum over till, 0 to 12 % slopes
UrUXC- Urban land-Udorthents complex, 0 to 12 % slopes
WsS1A1- Westboro-Schaffer silt loams, 0 to 2 % slopes*
SHARONVILLE
EVENDALE
BLUE ASH
UrUXC
EcE
UfAXC
UAGXC
JoR1B2
RpC2
EcD
JoR1A1
UAEXF
UcAXC
UcAXD
AcUXD
AfUXC
EcC2
UcAXF
WsS1A1
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Montgomery
Madeira
Milford
NORTH
550 275 0 550
Scale in Feet
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Map Unit Symbol & Name
CnB2- Cincinnati silt loam, 3 to 8 % slopes, eroded*
EcC2- Eden silty clay loam, 8 to 15 % slopes, eroded
EcD- Eden silty clay loam, 15 to 25 % slopes
EcE- Eden silty clay loam, 25 to 40 % slopes
EdF- Eden flaggy silty clay loam, 40 to 60 % slopes
Gn- Genesee loam, occasionally flooded*
HoA- Henshaw silt loam, 0 to 2 % slopes*
JoR1B2- Jonesboro-Rossmoyne silt loams, 2 to 6 % slopes, eroded
McB- Martinsville silt loam, 2 to 6 % slopes
PfE- Pate silty clay loam, 25 to 35 % slopes
Pn- Patton silty clay loam, 0 to 2 % slopes*
RpC2- Rossmoyne silt loam, 8 to 15 % slopes, eroded*
UAEXD- Urban land-Alfic Udarents-Eden complex, 12 to 25 % slopes
UAEXF- Urban land-Alfic Udarents-Eden complex, 25 to 60 % slopes
UAGXC- Urban land-Alfic Udarents-Rossmoyne complex, 0 to 12 % slopes
UARXC- Urban land-Alfic Udarents-Martinsville complex, 0 to 12 % slopes
UcAXC- Urban land-Alfic Udarents complex, clayey substratum over bedrock, 0 to 12 % slopes
UcAXD- Urban land-Alfic Udarents complex, clayey substratum over bedrock, 12 to 25 % slopes
UcAXF- Urban land-Alfic Udarents complex, clayey substratum over bedrock, 25 to 60 % 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
UuBXAB- Urban land-Udarents complex, wet substratum, 0 to 6 % slopes
HoA
UuBXAB
UrUXC
EcE
JoR1B2
UfAXC
Ur
UfAXC
SHARONVILLE
EdF
UAGXC
UrUXC
Pn
JoR1B2
UfAXC
UAGXC
RpC2
EcD
EcD
Pn
Gn
UrUXC
UfAXC
UfAXC
EVENDALE
UAGXC
UAEXD
EcE
UfAXC
UAEXF
UfAXC
Pn
UcAXC
UAEXD
Ur
UfAXC
UcAXD
UfAXC
EcD
UcAXF
Gn
UcAXD
UcAXC
EcD
EcD
EcC2
UcAXD
PfE
UcAXD
EcE
UfAXC
CnB2
EcD
McB
EcC2
UcAXF
UfAXC
UcAXC
UcAXD
BLUE ASH
UfAXC
UARXC
UcAXC
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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, SSURGO Soils Database, and Burns & McDonnell Engineering Company, Inc.
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Map Unit Symbol & Name
CdD- Casco loam, 15 to 25 % slopes
EcD- Eden silty clay loam, 15 to 25 % slopes
Gn- Genesee loam, occasionally flooded*
McB- Martinsville silt loam, 2 to 6 % slopes
Pn- Patton silty clay loam, 0 to 2 % slopes*
UAEXD- Urban land-Alfic Udarents-Eden complex, 12 to 25 % slopes
UARXC- Urban land-Alfic Udarents-Martinsville complex, 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
Pn
Gn
Gn
Pn
UsUXF
UrUXC
Pn
UAEXD
EVENDALE
Ur
EcD
Gn
CdD
Pn
McB
EcD
McB
Construction Footprint
City Limits
SSURGO Soils Map Unit
North College Hill
Montgomery
Madeira
Milford
NORTH
375 187.5 0 375
Scale in Feet
BURNS McDONNELL
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Construction Footprint
City Limits
SSURGO Soils Map Unit

NORTH
375 187.5 0 375
Scale in Feet

BURNS McDONNELL

Figure 3
Soils Map
C350
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APPENDIX C – EROSION AND SEDIMENT CONTROL PLANS AND BMP DETAILS

ESC PLANS AND BMP DETAILS FOR PIPELINE CONSTRUCTION

C350 20" PIPELINE

SCALE: 1:2500

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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
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15	PNG-C-350-0001169	ACCESS ROUTES 6	B
16	PNG-C-350-0001170	ACCESS ROUTES 7	B
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27	PNG-C-350-0001184	ALIGNMENT PLAN AND PROFILE SHT 6	B
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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
33	PNG-C-350-0001190	ALIGNMENT PLAN AND PROFILE SHT 12	B
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35	PNG-C-350-0001192	ALIGNMENT PLAN AND PROFILE SHT 14	B
36	PNG-C-350-0001193	ALIGNMENT PLAN AND PROFILE SHT 15	B
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
40	PNG-C-350-0001197	ALIGNMENT PLAN AND PROFILE SHT 19	B
41	PNG-C-350-0001198	ALIGNMENT PLAN AND PROFILE SHT 20	B
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43	PNG-C-350-0001200	ALIGNMENT PLAN AND PROFILE SHT 22	B
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45	PNG-C-350-0001202	ALIGNMENT PLAN AND PROFILE SHT 24	B
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95	PNG-C-350-0001258	CROSSING DETAILS 10	B
96	PNG-C-350-0001259	CROSSING DETAILS 11	B
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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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
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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	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		
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☐

INSPECTION: INSULATION CHECKED

VISUAL☐ JEEP☐ NO. CHECKED _____

TYPE PATCH MATERIAL _____

TEST CONN. PER STD. 7.7.1

NO. PROPOSED _____

NO. INSTALLED _____

NO. TESTED OK _____
(P/S 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	NICK WEIL
(W) 513-287-3021	(W) 513-287-2088
(C) 513-544-9692	(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							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) 615-872-2392

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

REGIONAL ENGINEER:
MGR. TECH REC & STD
PRINCIPAL ENGINEER

C350 PROJECT SIGN OFF SHEET HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

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

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 XP-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 "ESTED 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 SPECIFICATONS, 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

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DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	Q3680
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
GENERAL NOTES SHEET 1
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

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

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

G:\HAMILTON-COUNTY\C350

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 SHARE 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 ASTN 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 10 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 3RUM 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 ARCUND 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 WIT 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.

C350 PROJECT
GENERAL NOTES SHEET 2
HAMILTON COUNTY, OHIO
HAMILTON COUNTY, OHIO

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
SBD	SOLID STATE DECOUPLER
STA	STATION
TOP	TOP OF PIPE
TWS	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
- COMM — EX. COMMUNICATION LINE
- OH — EX. OVERHEAD LINE
- E — EX. ELECTRIC LINE
- F — FENCE
- G — EX. GAS LINE
- R/W — RIGHT-OF-WAY
- RAILROAD
- SS — EX. SANITARY SEWER
- ST — EX. STORM WATER LINE
- W — EX. WATER LINE
- PL — PROPERTY LINE
- SILT FENCE
- FILTER SOCK
- CONSTRUCTION BOUNDARY
- EX. MAJOR CONTOUR
- EX. MINOR CONTOUR
- 500 — PROPOSED MAJOR CONTOUR
- 501 — PROPOSED MINOR CONTOUR
- JURISDICTIONAL LINE
- BUOYANCY CONTROL
- 123+00 — PROPOSED GAS LINE
- 123+00 — HORIZONTAL DIRECTIONAL DRILL
- 123+00 — AUGER BORE
- EXCAVATION PIT

- (P) POTHOLE LOCATION
- (B) BORING LOCATION
- FLUSH — FLUSH PIPELINE MARKER
- A.G. — ABOVE GRADE PIPELINE MARKER
- 0.0 — MILE MARKER
- INLET PROTECTION
- (J) J-HOOK
- NO INWATER WORK FROMAPRIL 15TH THROUGH JUNE 30TH ON PERENNIAL STREAMS
- ROCK DITCH CHECK
- SCE — CONSTRUCTION ENTRANCE
- (T) TEST STATION (SEE EQUIPMENT SCHEDULES ON PNG-E-350-0001021)
- (D) SOLID STATE DECOUPLER (SEE EQUIPMENT SCHEDULES ON PNG-E-350-0001024)
- (C) COUPON TEST STATION (SEE EQUIPMENT SCHEDULES ON PNG-E-350-0001024)
- (M) 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	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	DATE	INITIALS
REGIONAL ENGINEER:	-	-
MGR. TECH REC & STD	-	-
PRINCIPAL ENGINEER	-	-

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

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

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

G:\HAMILTON COUNTY\C350

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.

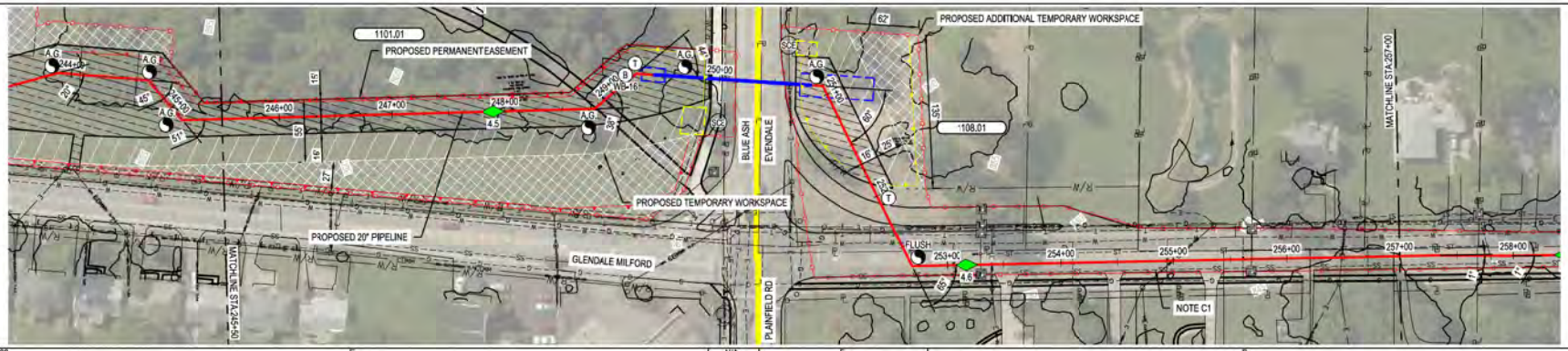
C350 POWERCRETE SUMMARY				C350 POWERCRETE SUMMARY			
Length	**Start Station**	**End Station**	**Crossing Type**	**Length**	**Start Station**	**End Station**	**Crossing Type**
100	21+45	22+45	BORE	200	381+95	383+95	BORE
1471	41+82	56+53	HDD	1406	416+72	430+78	HDD
360	60+75	64+35	BORE	134	440+34	441+68	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	1101.01		ROW	1108.01	ROW	
JURISDICTION	BLUE ASH		BLUE ASH/EVENDALE	EVENDALE	EVENDALE	
ACREAGE	2.8528 ACRES			0.1128 ACRES		
EASEMENTS	50' EASEMENT			VARIES		
REF. DWG. NO.	PNG-B-350-0001014 PNG-C-350-0001256					

STATIONING

PLAN



RESTORE						
TRENCH TYPE:	SEE DWG PNG-C-350-0001293 THROUGH PNG-C-350-0001295 FOR RESTORATION TYPE DETAIL	E	N/A	E	D	
SURFACE TYPE:		SEED	N/A	SEED	2	

PIPE DATA (SLOPE STATIONING)

PROFILE

NOTE:
1. MAINTAIN 1 LANE FOR ALL EMERGENCY VEHICLES AT ALL TIMES.
2. RESIDENTIAL DRIVEWAY ACCESS MUST BE MAINTAINED FOR LOCAL RESIDENTS.

CONSTRUCTION NOTE:
C1. SANITARY SEWER LATERALS NOT SHOWN ON PLANS. PIPELINE ELEVATION MAY NEED TO BE ADJUSTED TO MAINTAIN A MINIMUM 1-FOOT (2-FOOT PREFERRED) CLEARANCE.
C2. TRENCH BACKFILL TYPE F SHALL BE USED WHEN ALIGNMENT PASSES OVERTOP SANITARY SEWER LATERALS

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

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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	–	–

DUKE ENERGY | Piedmont Natural Gas

C350 PIPELINE
ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH

HAMILTON COUNTY, OH

REF. DWG(S): SEE REFERENCE BAND

SHEET(S)	24 OF 64	DWG SCALE	AS NOTED
DWG DATE	01/13/2020	SUPERSEDED	

DRAWING NUMBER: PNG -C-350-0001202 | REVISION: 0

©HAMILTON COUNTY C350

RIGHT-OF-WAY

OWNERSHIP	ROW
JURISDICTION	EVENDALE
ACREAGE	
EASEMENTS	
REF. DWG. NO.	

STATIONING

STA: 261+87.1° BEND (H-RT)
STA: 262+51 BEND 1° (H-LT) 1° OVERBEND (V)
STA: 263+13.6° OVERBEND (V)
STA: 263+68.8° SAG BEND (V)
STA: 265+35.2° OVERBEND (V)
STA: 266+93.2° SAG BEND (V)
STA: 268+92.2° OVERBEND (V)
STA: 272+99.1° BEND (H-LT)

PLAN

RESTORE

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

D
2

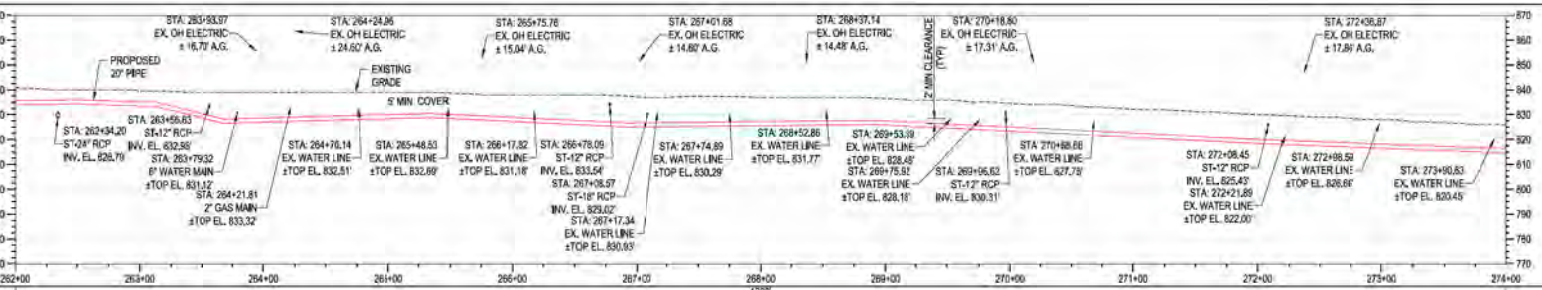
PIPE DATA (SLOPE STATIONING)

STA.	WELD #	JOINT LENGTH	JOINT	WELD #	STA.

NOTE:
1. MAINTAIN 1 LANE FOR ALL EMERGENCY VEHICLES AT ALL TIMES.
2. RESIDENTIAL DRIVEWAY ACCESS MUST BE MAINTAINED FOR LOCAL RESIDENTS.

CONSTRUCTION NOTE:
C1. SANITARY SEWER LATERALS NOT SHOWN ON PLANS, PIPELINE ELEVATION MAY NEED TO BE ADJUSTED TO MAINTAIN A MINIMUM 1-FOOT (24-FOOT PREFERRED) CLEARANCE.
C2. TRENCH BACKFILL TYPE F SHALL BE USED WHEN ALIGNMENT PASSES OVERTOP SANITARY SEWER LATERALS.

PROFILE



MATERIAL:	1200'
CONST. METHOD	(1) 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)	25 OF 64
DWG SCALE	AS NOTED
DWG DATE	01/13/2020
SUPERSEDED	
DRAWING NUMBER	PNG -C-350-0001203
REVISION	B

C:\HAMILTON COUNTY\C350

RIGHT-OF-WAY

OWNERSHIP: ROW
JURISDICTION: EVENDALE
ACREAGE:
EASEMENTS:
REF. DWG. NO.:

STATIONING

STA: 274+10.1° BEND (HI-LT) | STA: 275+49.2° OVERBEND (V) | STA: 276+98.3° SAG BEND (V) | STA: 277+98.3° OVERBEND (V) | STA: 279+98.2° SAG BEND (V) | STA: 279+87.14° BEND (HI-LT) | STA: 280+28 BEND 14° (HI-RT 1° SAG BEND (V) | STA: 281+72.4° OVERBEND (V) | STA: 282+36.4° SAG BEND (V) | STA: 282+76.1° SAG BEND (V) | STA: 283+32.4° OVERBEND (V) | STA: 286+17.4° SAG BEND (V) | STA: 286+93.8° OVERBEND (V)

PLAN

RESTORE

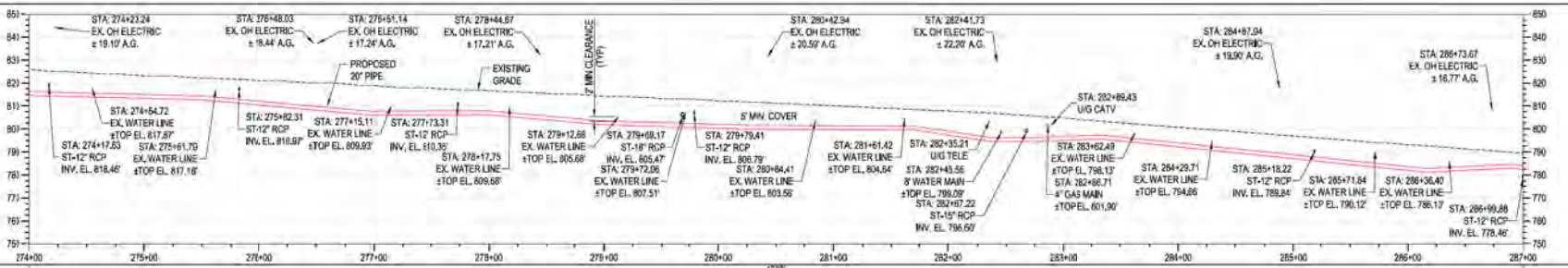
TRENCH TYPE: SEE DWG PNG-C-350-0001293 THROUGH PNG-C-350-0001295
SURFACE TYPE: FOR RESTORATION TYPE DETAIL

NOTE
1. MAINTAIN 1 LANE FOR ALL EMERGENCY VEHICLES AT ALL TIMES.
2. RESIDENTIAL DRIVEWAY ACCESS MUST BE MAINTAINED FOR LOCAL RESIDENTS.

CONSTRUCTION NOTE:
C1. SANITARY SEWER LATERALS NOT SHOWN ON PLANS, PIPELINE ELEVATION MAY NEED TO BE ADJUSTED TO MAINTAIN A MINIMUM 1-FOOT (24-FOOT PREFERRED) CLEARANCE.
C2. TRENCH BACKFILL TYPE F SHALL BE USED WHEN ALIGNMENT PASSES OVERTOP SANITARY SEWER LATERALS.

PIPE DATA (SLOPE STATIONING)

PROFILE



MATERIAL: 1300
CONST. METHOD: (1) 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: –
ACCOUNT NUMBER	Q3680		REGIONAL ENGINEER
PROJECT NUMBER	1880115	DATE: –	INITIALS: –
DRAWING BY	AKT		MGR. TECH REC & STD
STATION ID	C350	DATE: –	INITIALS: –
CHECKER INITIALS	JMP		PRINCIPAL ENGINEER

DUKE ENERGY. | Piedmont Natural Gas

C350 PIPELINE
ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH

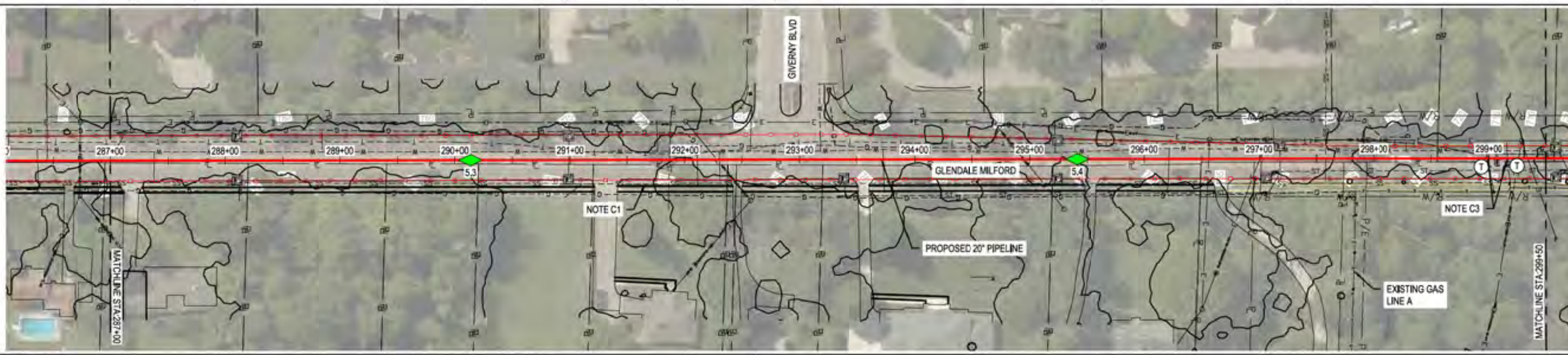
HAMILTON COUNTY, OH

SHEET(S): 26 OF 64 | DWG SCALE: AS NOTED
DWG DATE: 01/13/2020 | SUPERSEDED
DRAWING NUMBER: PNG -C-350-0001204 | REVISION: B
C:\HAMILTON COUNTY\C350

OWNERSHIP	ROW
JURISDICTION	EVENDALE
ACREAGE	
EASEMENTS	
REF. DWG. NO.	

STATIONING: STA. 287+31 5° SAG BEND (V); STA. 287+87 1° SAG BEND (V); STA. 289+52 3° OVERBEND (V); STA. 290+37 1° SAG BEND (V); STA. 291+09 2° SAG BEND (V); STA. 291+75 11° OVERBEND (V); STA. 292+08 11° SAG BEND (V); STA. 292+93 4° OVERBEND (V); STA. 295+74 1° OVERBEND (V); STA. 297+38 1° SAG BEND (V)

PLAN



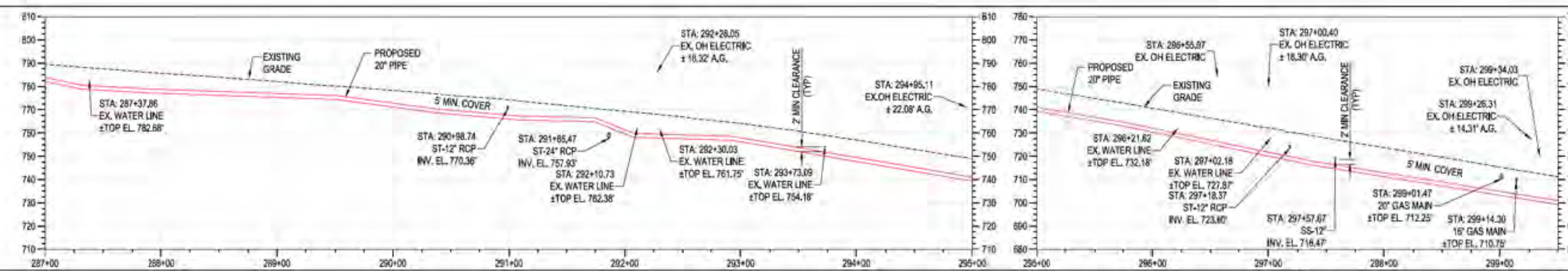
RESTORE
TRENCH TYPE: SEE DWG PNG-C-350-0001293 THROUGH PNG-C-350-0001295 FOR RESTORATION TYPE DETAIL — D
SURFACE TYPE: 2

PIPE DATA (SLOPE STATIONING)

NOTE:
1. MAINTAIN 1 LANE FOR ALL EMERGENCY VEHICLES AT ALL TIMES.
2. RESIDENTIAL DRIVEWAY ACCESS MUST BE MAINTAINED FOR LOCAL RESIDENTS.

CONSTRUCTION NOTE:
C1. SANITARY SEWER LATERALS NOT SHOWN ON PLANS. PIPELINE ELEVATION MAY NEED TO BE ADJUSTED TO MAINTAIN A MINIMUM 1-FOOT (2-FOOT PREFERRED) CLEARANCE.
C2. TRENCH BACKFILL TYPE F SHALL BE USED WHEN ALIGNMENT PASSES OVERTOP SANITARY SEWER LATERALS.
C3. FIBER WRAP TO BE INSTALLED AT BOTH DUKE GAS LINE CROSSINGS.

PROFILE



MATERIAL:
CONST. METHOD: 800 (1) OPEN TRENCH; 450 (1) OPEN TRENCH
CLASS / MAOP: CLASS 4 / MAOP 500 PSIG

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

PROFESSIONAL ENG/ARCH 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: REGIONAL ENGINEER; MOR TECH REC & STD; PRINCIPAL ENGINEER

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

REF. DWG(S): SEE REFERENCE BAND

SHEET(S) 27 OF 64 | DWG SCALE AS NOTED
DWG DATE 01/13/2020 | SUPERSEDED

DRAWING NUMBER: PNG -C-350-0001205 | REVISION: B

C/HAMILTON COUNTY/C350

RIGHT-OF-WAY

OWNERSHIP	ROW
JURISDICTION	EVENDALE
ACREAGE	
EASEMENTS	
REF. DWG. NO.	

STATIONING

STA: 301+64.4° SAG BEND (V) · STA: 302+43.3° OVERBEND (V) · STA: 303+68.3° SAG BEND (V) · STA: 305+04.14° SAG FTG (V) · STA: 305+25.13° OVERBEND FTG · STA: 306+02 BEND 14° (H-MT) 6° OVERBEND (V) · STA: 306+32 BEND 14° (H-LT) 6° SAG BEND (V) · STA: 307+74.5° OVERBEND (V) · STA: 308+34.4° SAG BEND (V) · STA: 308+63 BEND 3° (H-RT) 3° SAG BEND (V) · STA: 309+42.6° OVERBEND (V)

PLAN

HORIZONTAL SCALE: 1" = 50'

RESTORE

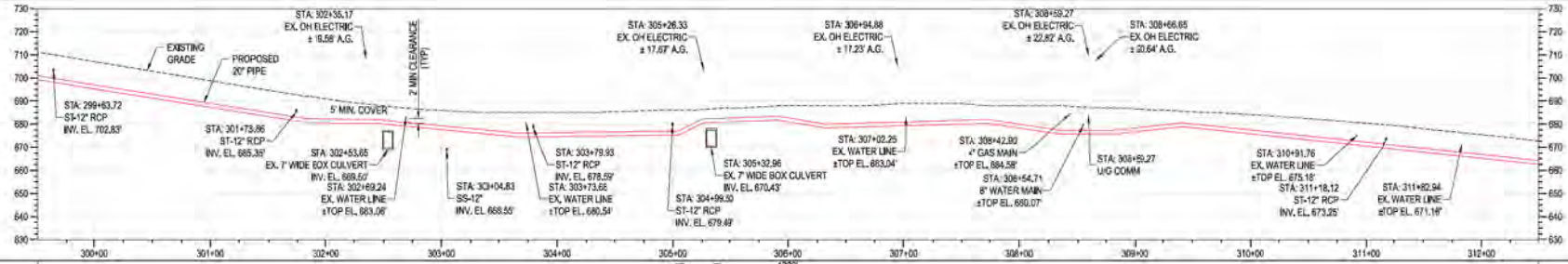
TRENCH TYPE:	SEE DWG PNG-C-350-0001293 THROUGH PNG-C-350-0001295
SURFACE TYPE:	FOR RESTORATION TYPE DETAIL

NOTE:
1. MAINTAIN 1 LANE FOR ALL EMERGENCY VEHICLES AT ALL TIMES.
2. RESIDENTIAL DRIVEWAY ACCESS MUST BE MAINTAINED FOR LOCAL RESIDENTS.

CONSTRUCTION NOTE:
C1. SANITARY SEWER LATERALS NOT SHOWN ON PLANS, PIPELINE ELEVATION MAY NEED TO BE ADJUSTED TO MAINTAIN A MINIMUM 1-FOOT (2-FOOT PREFERRED) CLEARANCE.
C2. TRENCH BACKFILL TYPE F SHALL BE USED WHEN ALIGNMENT PASSES OVERTOP SANITARY SEWER LATERALS.

PIPE DATA (SLOPE STATIONING)

PROFILE



HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 10'

MATERIAL:	(11) (11) 1300' (1)
CONST. METHOD:	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		APPROVALS	
AREA CODE	–	DATE –	INITIALS –
ACCOUNT NUMBER	Q3680		REGIONAL ENGINEER
PROJECT NUMBER	1880115	DATE –	INITIALS –
DRAWING BY	AKT		MGR. TECH REC & STD
STATION ID	C350	DATE –	INITIALS –
CHECKER INITIALS	JMP		PRINCIPAL ENGINEER

C350 PIPELINE
ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH

HAMILTON COUNTY, OH

REF. DWG(S) SEE REFERENCE BAND

SHEET(S)	28 OF 64
DWG SCALE	AS NOTED
DWG DATE	01/13/2020
SUPERSEDED	
DRAWING NUMBER	PNG -C-350-0001206
REVISION	B

C:\HAMILTON COUNTY\C350

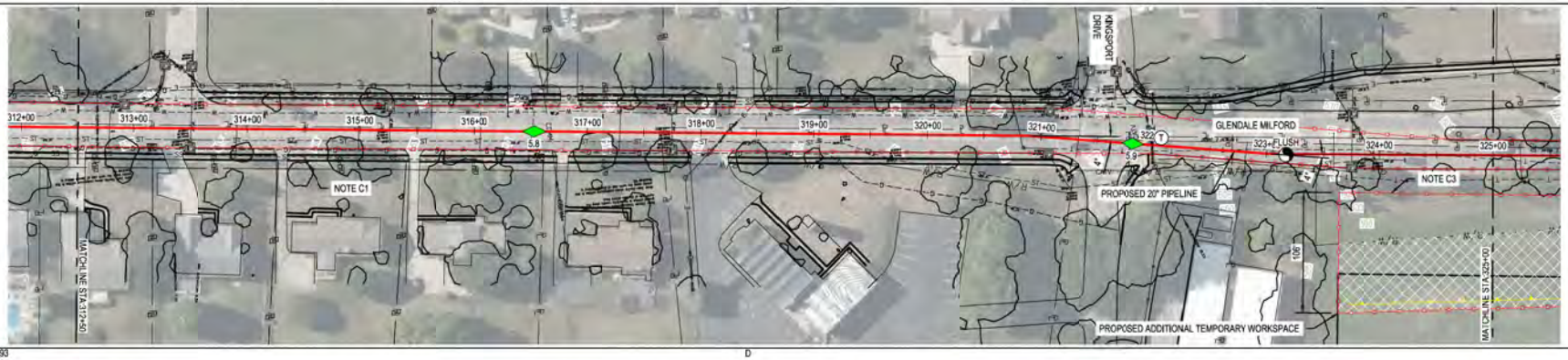
RIGHT-OF-WAY

OWNERSHIP	ROW
JURISDICTION	EVENDALE
ACREAGE	
EASEMENTS	
REF. DWG. NO.	

STATIONING

STA: 313+62.5° SAG BEND (V)
STA: 314+02.10° OVERBEND (V)
STA: 314+63.5° SAG BEND (V)
STA: 315+94.5° SAG BEND (V)
STA: 316+58.8° OVERBEND (V)
STA: 317+14.3° SAG BEND (V)
STA: 318+91.1° SAG BEND (V)
STA: 320+89 BEND 4° (H-RT) 1° OVERBEND (V)
STA: 323+04 BEND 4° (H-LT) 1° OVERBEND (V)
STA: 324+14.2° SAG BEND (V)

PLAN



RESTORE

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

D
2

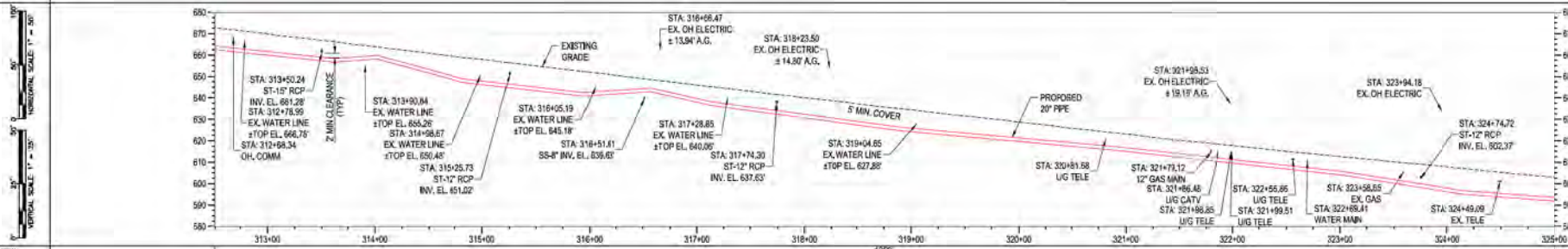
PIPE DATA (SLOPE STATIONING)

STA.	WT.	GRADE	LENGTH	GRADE	STA.

NOTE:
1. MAINTAIN 1 LANE FOR ALL EMERGENCY VEHICLES AT ALL TIMES.
2. RESIDENTIAL DRIVEWAY ACCESS MUST BE MAINTAINED FOR LOCAL RESIDENTS.

CONSTRUCTION NOTE:
C1. SANITARY SEWER LATERALS NOT SHOWN ON PLANS. PIPELINE ELEVATION MAY NEED TO BE ADJUSTED TO MAINTAIN A MINIMUM 1-FOOT (2-FOOT PREFERRED) CLEARANCE.
C2. TRENCH BACKFILL TYPE F SHALL BE USED WHEN ALIGNMENT PASSES OVERTOP SANITARY SEWER LATERALS.
C3. CONTRACTOR SHALL NOT DISTURB TREES OR SLOPE.

PROFILE



MATERIAL:	
CONST. METHOD:	1250 (1) 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		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

REF. DWG(S) SEE REFERENCE BAND

SHEET(S)	29 OF 64
DWG SCALE	AS NOTED
DWG DATE	01/13/2020
SUPERSEDED	
DRAWING NUMBER	PNG -C-350-0001207
REVISION	B

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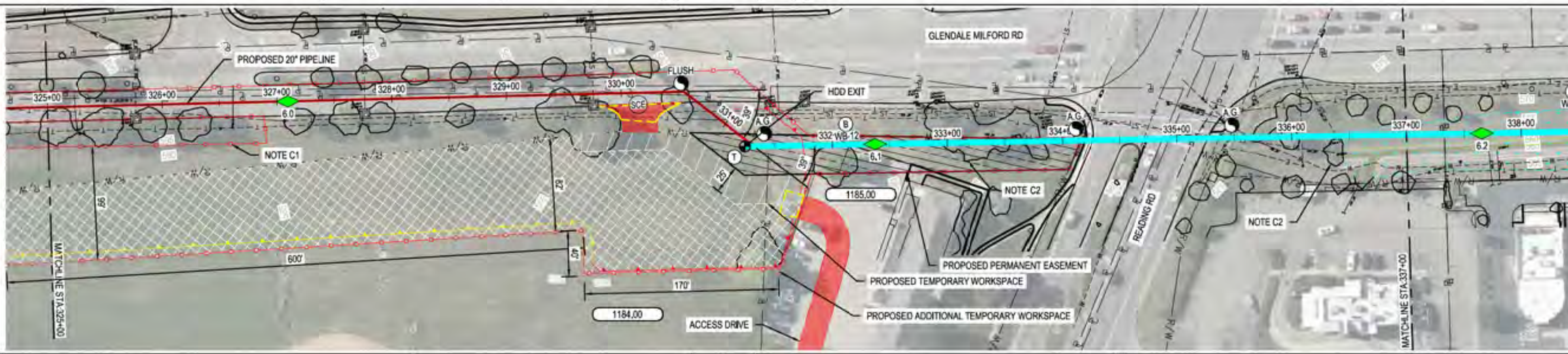
C350 PIPELINE
ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH

RIGHT-OF-WAY				
OWNERSHIP / JURISDICTION	ROW EVENDALE	1184.00 EVENDALE	1185.00 EVENDALE	ROW EVENDALE
ACREAGE		0.2266 ACRES		
EASEMENTS		VARIES		
REF. DWG. NO.		PNG-B-350-0001013		PNG-C-350-0001273

STATIONING:
STA. 327+51 1° OVERBEND (V)
STA. 329+09 1° SAG BEND (V)
STA. 330+54 FTG 39° (H-RT) 1° SAG BEND (V)
STA. 331+32 39° FTG (H-LT)
STA. 331+67 FTG 9° OVERBEND (V)

PLAN

HORIZONTAL SCALE: 1" = 50'



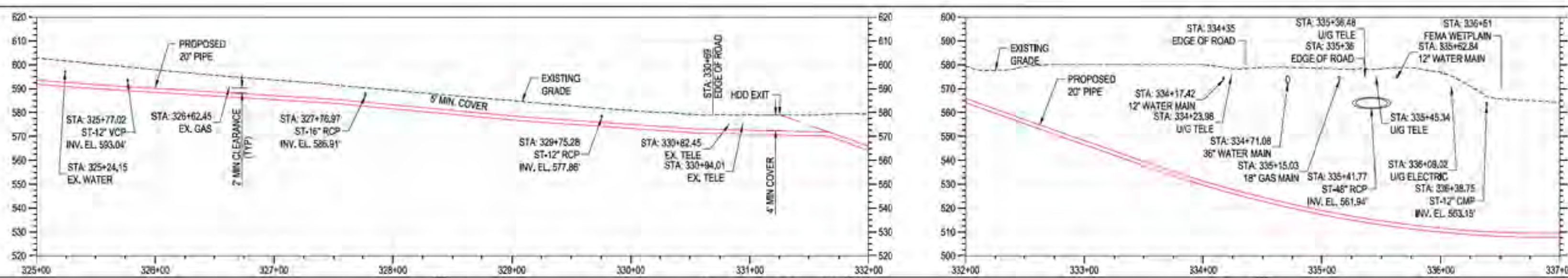
RESTORE			
TRENCH TYPE:	SEE DWG PNG-C-350-0001293 THROUGH PNG-C-350-0001295 FOR RESTORATION TYPE DETAIL	D	E	N/A
SURFACE TYPE:		2	SEED	N/A

PIPE DATA (SLOPE STATIONING)

CONSTRUCTION NOTE:
C1. CONTRACTOR SHALL NOT DISTURB TREES OR SLOPE.
C2. CONTRACTOR SHALL NOT CLEAR LANDSCAPING TREES IN HDD, UNLESS INSTRUCTED OTHERWISE BY DUKE ENVIRONMENTAL INSPECTOR.

PROFILE

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



MATERIAL	667' (1)	(11)	(11)	(11) 33' (2)	500' (2)
CONST. METHOD	OPEN TRENCH			HDD	HDD
CLASS / MAOP	CLASS 4 / MAOP 500 PSIG				

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

PROFESSIONAL ENG/ARCH 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

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HAMILTON COUNTY, OH

REF. DWG(S): SEE REFERENCE BAND

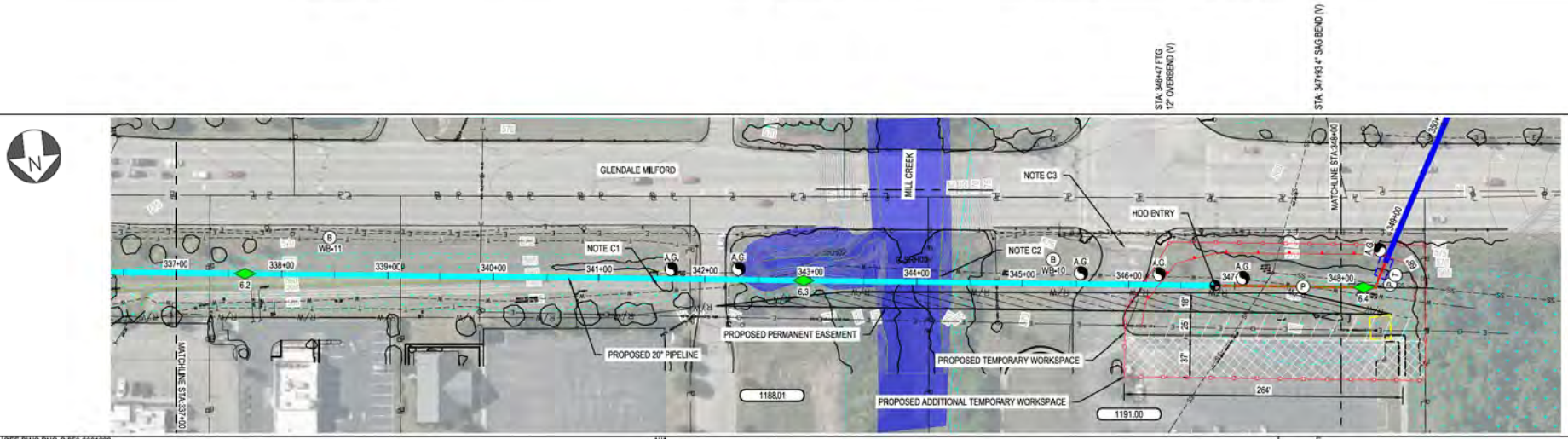
SHEET(S) 30 OF 64	DWG SCALE AS NOTED
DWG DATE 01/13/2020	SUPERSEDED —
DRAWING NUMBER: PNG -C-350-0001208	REVISION: B

C:\HAMILTON COUNTY\C350

RIGHT-OF-WAY				
OWNERSHIP	ROW EVENDALE	1188.01 EVENDALE	1191.00 EVENDALE	
ACREAGE				
EASEMENTS				
REF. DWG. NO.	PNG-B-350-0001013	PNG-C-350-0001273	PNG-B-350-0001013	PNG-C-350-0001303

STATIONING

PLAN



RESTORE

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

PIPE DATA (SLOPE STATIONING)

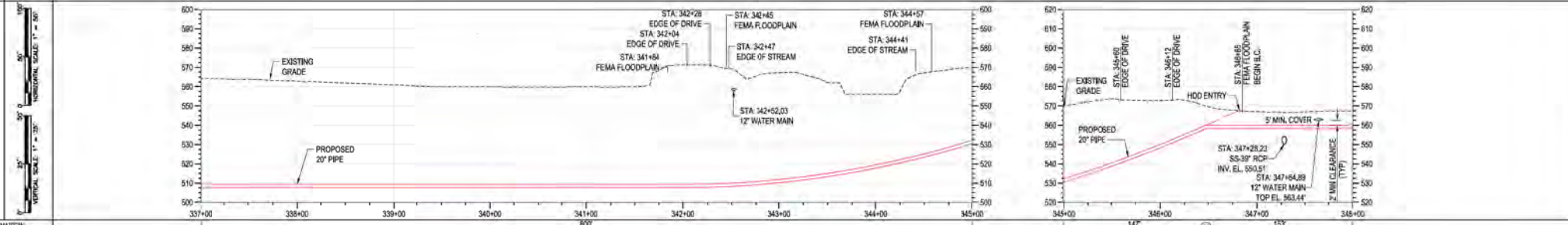
CONSTRUCTION NOTE:

C1. CONTRACTOR SHALL NOT CLEAR LANDSCAPING TREES IN HDD UNLESS INSTRUCTED OTHERWISE BY DUKE ENVIRONMENTAL INSPECTOR.

C2. CONTRACTOR SHALL HAND CLEAR MINIMUM 15' CENTERED OVER PIPELINE IN HDD UNLESS INSTRUCTED OTHERWISE BY DUKE ENVIRONMENTAL INSPECTOR.

C3. CONTRACTOR SHALL MAINTAIN COMMERCIAL ACCESS FOR BUSINESS AT ALL TIMES.

PROFILE



MATERIAL			
CONST. METHOD	800' (2) HDD	147' (2) HDD	153' (1) 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		APPROVALS	
AREA CODE	–	DATE – INITIALS –	REGIONAL ENGINEER
PROJECT NUMBER	1880115		MGR. TECH REC & STD
DRAWING BY	AKT	DATE – INITIALS –	
STATION ID	C350		PRINCIPAL ENGINEER
CHECKER INITIALS	JMP	DATE – INITIALS –	

DUKE ENERGY | Piedmont Natural Gas

C350 PIPELINE
ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH

HAMILTON COUNTY, OH

REF. DWG(S) SEE REFERENCE BAND

SHEET(S) 31 OF 64	DWG SCALE AS NOTED
DWG DATE 01/13/2020	SUPERSEDED

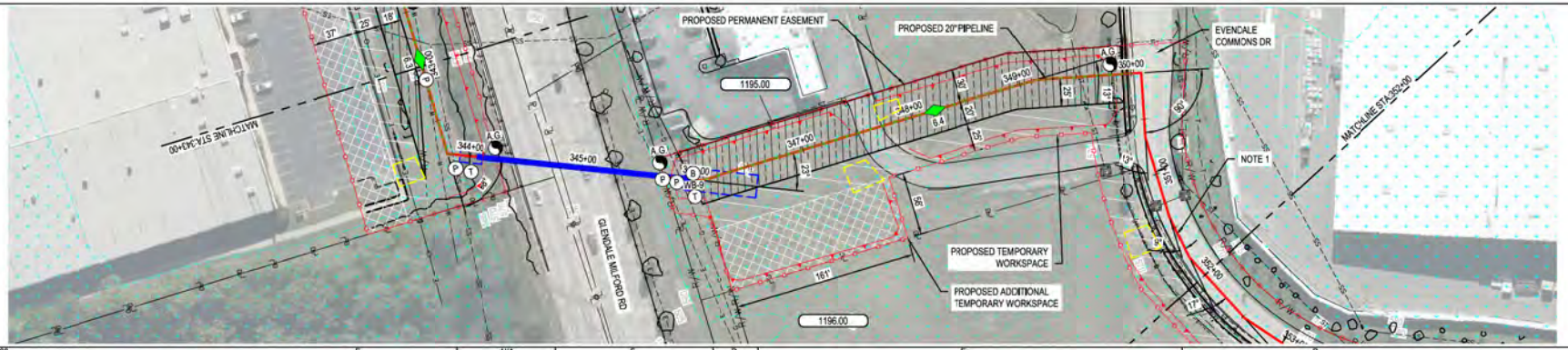
DRAWING NUMBER: PNG -C-350-0001209 | REVISION: B

C:\HAMILTON COUNTY\C350

RIGHT-OF-WAY					
OWNERSHIP / JURISDICTION	ROW EVENDALE	1195.00 EVENDALE	1196.00 EVENDALE	ROW EVENDALE	
ACREAGE		0.4533 ACRES			
EASEMENTS		50' EASEMENT			
REF. DWG. NO.	PNG-C-350-0001257	PNG-B-350-0001012	PNG-C-350-0001303		

STATIONING

PLAN



RESTORE								
TRENCH TYPE: SEE DWG PNG-C-350-0001293 THROUGH PNG-C-350-0001295	E	N/A	E	D	E	D		
SURFACE TYPE: FOR RESTORATION TYPE DETAIL	SEED	N/A	SEED	1	SEED	2		

PIPE DATA (SLOPE STATIONING)

STA.	WALL	GRADE	LENGTH	GRADE	WALL	STA.
			VERT.			

NOTE:
1. ROUTE SHALL BE FIELD ADJUSTED AS NECESSARY FOR TRENCH TO STAY IN ONE LANE AS MUCH AS PRACTICAL. CONTRACTOR SHALL MAINTAIN ONE LANE OPEN AT ALL TIMES.

PROFILE

HORIZONTAL SCALE: 1" = 50'
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	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): 32 OF 64 | DWG SCALE: AS NOTED

DWG DATE: 01/13/2020 | SUPERSEDED

DRAWING NUMBER: PNG -C-350-0001210 | REVISION: 0

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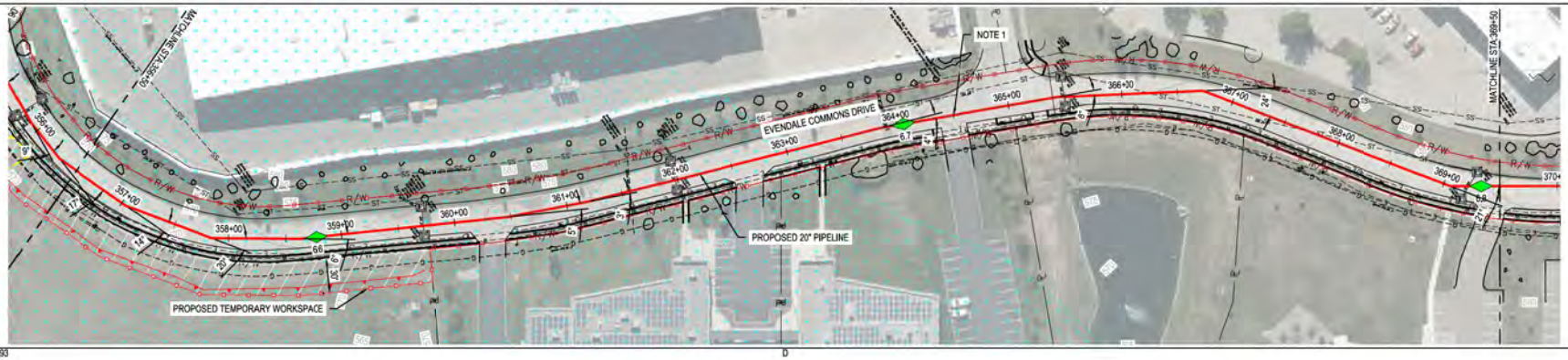
RIGHT-OF-WAY

OWNERSHIP	ROW
JURISDICTION	EVENDALE
ACREAGE	
EASEMENTS	
REF. DWG. NO.	

STATIONING

STA. 357+04 14° BEND (H-LT) | STA. 357+65 20° BEND (H-LT) | STA. 359+63 6° BEND (H-LT) | STA. 360+48 5° BEND (H-LT) | STA. 361+18 3° BEND (H-LT) | STA. 363+44 10° OVERBEND (V) | STA. 363+65 BEND 4° (H-RT) 9° SAG BEND (V) | STA. 364+25 10° SAG BEND (V) | STA. 364+64 10° OVERBEND (V) | STA. 365+42 8° BEND (H-RT) | STA. 366+01 2° SAG BEND (V) | STA. 366+72 24° BEND (H-RT) | STA. 369+05 BEND 21° (H-LT) 11° OVERBEND (V)

PLAN



RESTORE

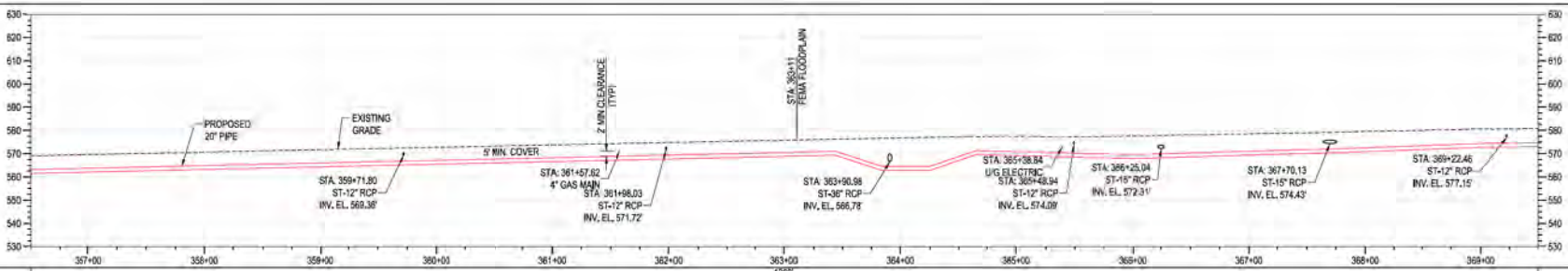
TRENCH TYPE: SEE DWG PNG-C-350-0001293 THROUGH PNG-C-350-0001295
SURFACE TYPE: FOR RESTORATION TYPE DETAIL

PIPE DATA (SLOPE STATIONING)

STA.	WELD #	LENGTH	JOINT	WELD #	STA.

NOTE:
1. USE FLOWABLE FILL AROUND PIPE BENEATH 12", 15", & 36" PIPE TO PREVENT FLOW OF WATER ALONG PIPELINE. SEE BACKFILL TYPE F DETAIL ON DWG PNG-C-350-0001293.
2. ROUTE SHALL BE FIELD ADJUSTED AS NECESSARY FOR TRENCH TO STAY IN ONE LANE AS MUCH AS PRACTICAL. CONTRACTOR SHALL MAINTAIN ONE LANE OPEN AT ALL TIMES.

PROFILE



MATERIAL:	1300'
CONST. METHOD:	(1) 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		APPROVALS	
AREA CODE	–	DATE: –	INITIALS: –
ACCOUNT NUMBER	Q3680		REGIONAL ENGINEER
PROJECT NUMBER	1880115	DATE: –	INITIALS: –
DRAWING BY	AKT		MGR. TECH REC & STD
STATION ID	C350	DATE: –	INITIALS: –
CHECKER INITIALS	JMP		PRINCIPAL ENGINEER

REF. DWG(S): SEE REFERENCE BAND

C350 PIPELINE
ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH

HAMILTON COUNTY, OH

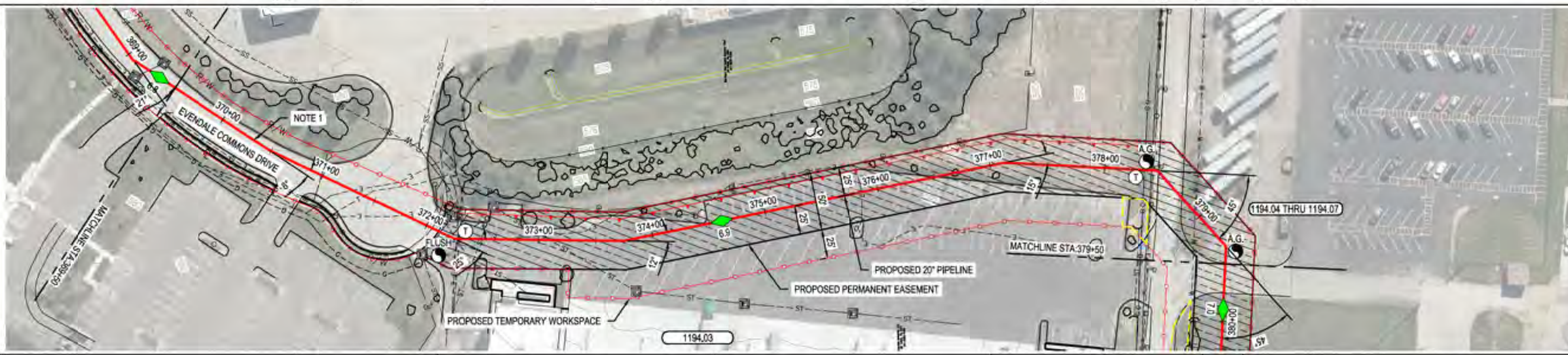
SHEET(S) 33 OF 64 | DWG SCALE: AS NOTED
DWG DATE: 01/13/2020 | SUPERSEDED
DRAWING NUMBER: PNG -C-350-0001211 | REVISION: B
C:\HAMILTON COUNTY\C350

RIGHT-OF-WAY				
OWNERSHIP / JURISDICTION	ROW EVENDALE	1194.03 EVENDALE	1194.04 THRU 1194.07 EVENDALE
ACREAGE		0.7337 ACRES	4.1081 ACRES
EASEMENTS		50' EASEMENT	50' EASEMENT
REF. DWG. NO.			

STATIONING

- STA. 370+48 BEND 8° (H-LT) 1° OVERBEND (V)
- STA. 371+12 1° SAG BEND (V)
- STA. 372+27 25° BEND (H-LT)
- STA. 373+19 5° SAG BEND (V)
- STA. 373+75 BEND 12° (H-LT) 5° OVERBEND (V)
- STA. 376+01 3° SAG BEND (V)
- STA. 377+13 END 15° (H-RT) 10° OVERBEND (V)
- STA. 378+16 7° SAG BEND (V)
- STA. 378+46 45° FTG (H-RT)
- STA. 379+01 2° SAG BEND (V)
- STA. 379+35 FTG 45° (H-RT) 2° OVERBEND (V)

PLAN

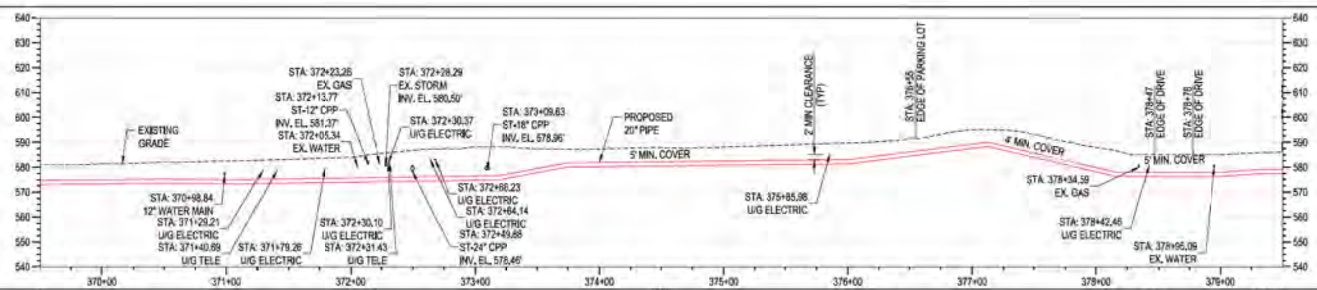


RESTORE						
TRENCH TYPE:	SEE DWG PNG-C-350-0001293 THROUGH PNG-C-350-0001295 FOR RESTORATION TYPE DETAIL	D	D	E	D	E
SURFACE TYPE:		2	1	SEED	1	SEED

PIPE DATA (SLOPE STATIONING)

NOTE:
1. ROUTE SHALL BE FIELD ADJUSTED AS NECESSARY FOR TRENCH TO STAY IN ONE LANE AS MUCH AS PRACTICAL. CONTRACTOR SHALL MAINTAIN ONE LANE OPEN AT ALL TIMES.

PROFILE



MATERIAL	1000' (1)	(11)	(11)
CONST. METHOD	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	DATE	INITIALS
REGIONAL ENGINEER	-	-
MGR. TECH REC & STD	-	-
PRINCIPAL ENGINEER	-	-

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ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH

HAMILTON COUNTY, OH

REF. DWG(S)	SEE REFERENCE BAND		
SHEET(S)	34 OF 64	DWG SCALE	AS NOTED
DWG DATE	01/13/2020	SUPERSEDED	—
DRAWING NUMBER	PNG -C-350-0001212	REVISION	B

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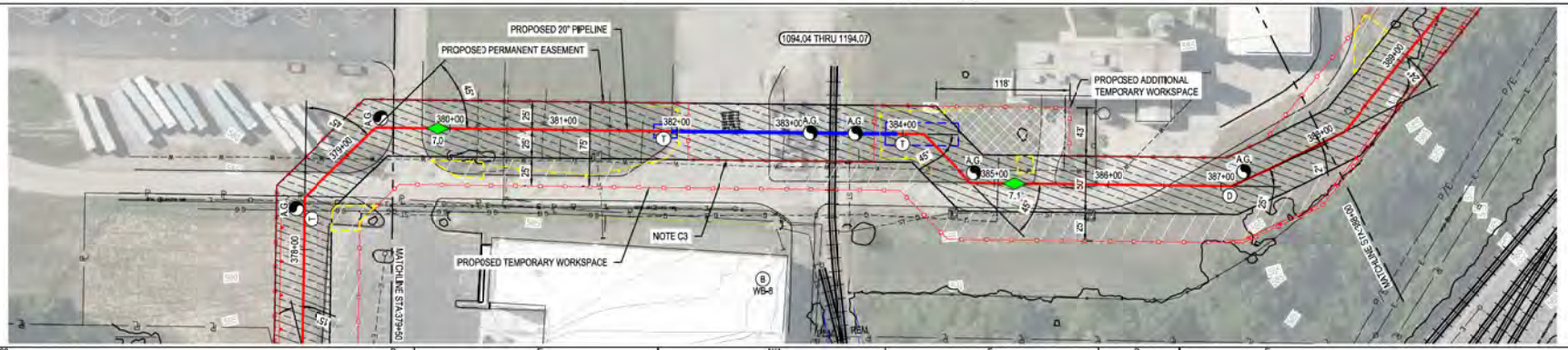
RIGHT-OF-WAY		
	OWNERSHIP	1094.04 THRU 1194.07
	JURISDICTION	EVENDALE
	ACREAGE	4.1081 ACRES
	EASEMENTS	50' EASEMENT
	REF. DWG. NO.	PNG-B-350-0001012 PNG-C-350-0001258

STATIONING

STA: 381+33 10° OVERBEND (V)
STA: 381+75 10° SAG BEND (V)
STA: 384+19 FTG 45° (H-RT) 6° SAG BEND (V)
STA: 384+79 FTG 45° (H-LT) 5° OVERBEND (V)
STA: 387+09 25° BEND (H-LT)
STA: 387+49 2° BEND (H-LT)

PLAN



RESTORE

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

PIPE DATA (SLOPE STATIONING)

STA.	WELD #	WT	GRADE	JOINT LENGTH	GRADE	WT	WELD #	STA.
379+50								388+15

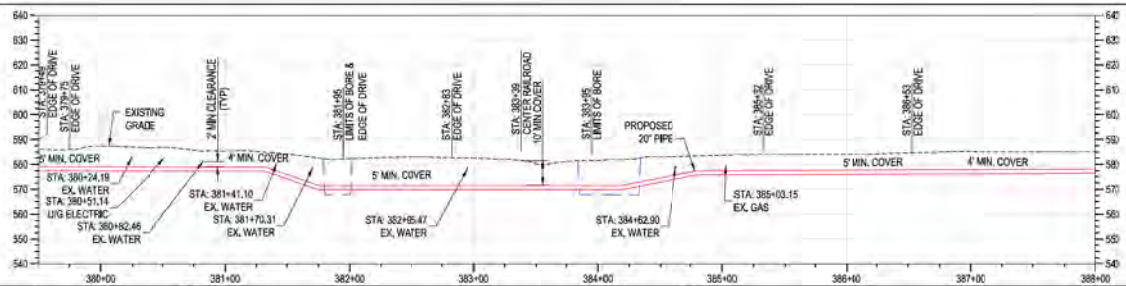
CONSTRUCTION NOTE:

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

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

C3. CONTRACTOR SHALL MAINTAIN ONE LANE OPEN TO ACCESS LOADING DOCK AT ALL TIMES.

PROFILE



MATERIAL					
CONST. METHOD	245' (1) OPEN TRENCH		290' (2) BORE	(11)	405' (1) 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	07/24/2002	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:	-	-

C350 PIPELINE
ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH

HAMILTON COUNTY, OH

REF. DWG(S) SEE REFERENCE BAND

SHEET(S) 35 OF 64 | DWG SCALE AS NOTED
DWG DATE 01/13/2020 | SUPERSEDED

DRAWING NUMBER: PNG -C-350-0001213 | REVISION: B

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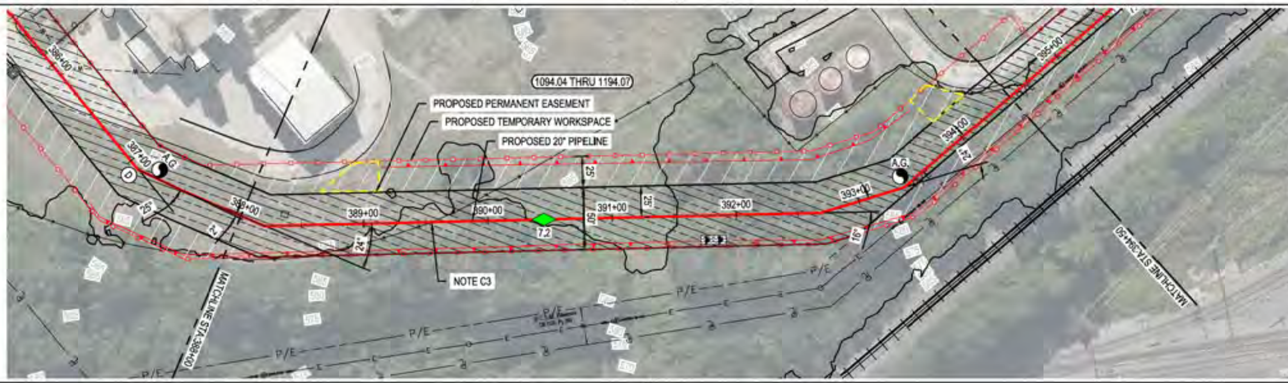
RIGHT-OF-WAY	
OWNERSHIP / JURISDICTION	(1094.04 THRU 1194.07) EVENDALE
ACREAGE	4.1081 ACRES
EASEMENTS	VARIES
REF. DWG. NO.	

STATIONING

STA: 388+21 24° BEND (H-LT)
STA: 389+94 1° SAG BEND (V)
STA: 391+20 14° OVERBEND (V)
STA: 391+59 13° SAG BEND (V)
STA: 392+00 7° SAG BEND (V)
STA: 392+69 BEND 16° (H-LT) 7° OVERBEND (V)
STA: 393+39 24° BEND (H-LT)

PLAN

HORIZONTAL SCALE: 1" = 50'



RESTORE

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

E

SEED

PIPE DATA (SLOPE STATIONING)

CONSTRUCTION NOTE:

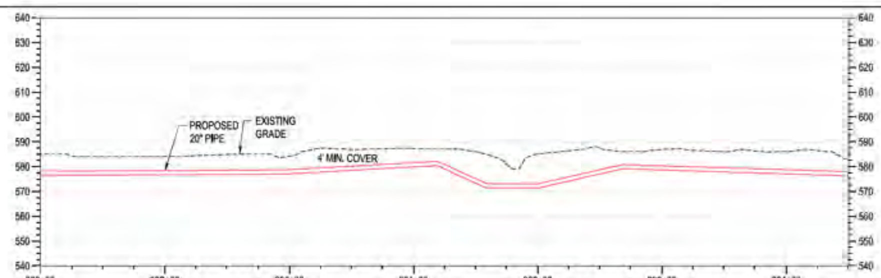
C1. CONTRACTOR SHALL GROUND PIPE PER DUKE STANDARDS IN PROXIMITY TO HIGH VOLTAGE OVERHEAD ELECTRIC LINES. SEE DRAWING PNG-C-350-0001312.

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

C3. CONTRACTOR SHALL TEMPORARILY REMOVE FENCE DURING CONSTRUCTION AND REINSTALL AS DIRECTED BY COMPANY.

PROFILE

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



MATERIAL: 650 (1)

CONST. METHOD: OPEN TRENCH

CLASS / MAOP: CLASS 4 / MAOP 500 PSIG

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

REF. DWG(S): SEE REFERENCE BAND

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 PIPELINE
ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH

HAMILTON COUNTY, OH

SHEET(S) 38 OF 64 | DWG SCALE AS NOTED
DWG DATE 01/13/2020 | SUPERSEDED

DRAWING NUMBER: PNG -C-350-0001214 | REVISION: B

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PROFESSIONAL ENGINEER STAMP

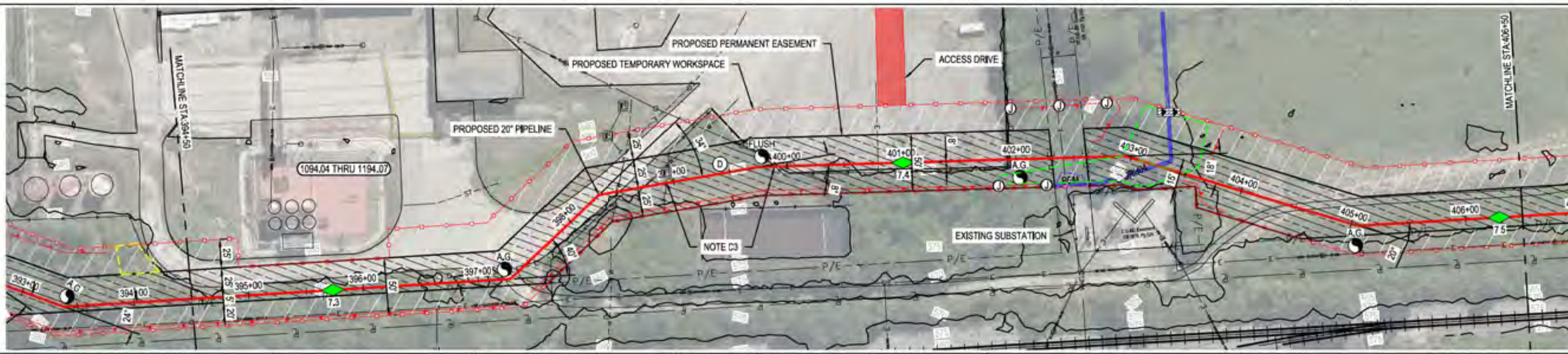
RIGHT-OF-WAY				
OWNERSHIP				
JURISDICTION	(1094.04 THRU 1194.07) EVENDALE	CG&E	(1094.04 THRU 1194.07) EVENDALE
ACREAGE	4.1081 ACRES	-	4.1081 ACRES
EASEMENTS	VARIES	30' EASEMENT	VARIES
REF. DWG. NO.		PNG-C-350-0001303	

STATIONING

STA: 394+56 1° SAG BEND (V)
STA: 395+82 1° OVERBEND (V)
STA: 397+28 40° FTG (H-LT)
STA: 398+34 FTG 34° (H-RT) 2° OVERBEND (V)
STA: 399+08 3° SAG BEND (V)
STA: 399+76 BEND 8° (H-RT) 1° OVERBEND (V)
STA: 401+75 9° OVERBEND (V)
STA: 402+26 5° SAG BEND (V)
STA: 402+94 BEND 18° (H-RT) 4° SAG BEND (V)
STA: 405+06 20° BEND (H-LT)

PLAN

HORIZONTAL SCALE: 1" = 50'



RESTORE

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

PIPE DATA (SLOPE STATIONING)

CONSTRUCTION NOTES

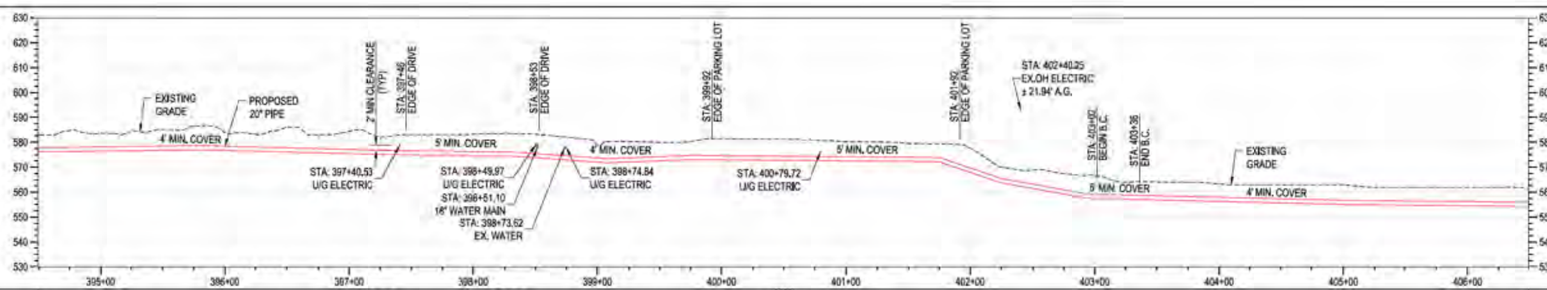
C1. CONTRACTOR SHALL GROUND PIPE PER DUKE STANDARDS IN PROXIMITY TO HIGH VOLTAGE OVERHEAD ELECTRIC LINES. SEE DRAWING PNG-C-350-0001312.

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

C3. CONTRACTOR SHALL TEMPORARILY REMOVE FENCE DURING CONSTRUCTION AND REINSTALL AS DIRECTED BY COMPANY.

PROFILE

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



MATERIAL	(11) (11)
CONST. METHOD	1200' (1) OPEN TRENCH
CLASS / MAOP	CLASS 4 / MAOP 500 PSIG

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

PROFESSIONAL ENG/ARCH 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			
DATE -	INITIALS -	REGIONAL ENGINEER	
DATE -	INITIALS -	MGR. TECH REC & STD	
DATE -	INITIALS -	PRINCIPAL ENGINEER	

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ALIGNMENT PLAN & PROFILE
HAMILTON COUNTY, OH

HAMILTON COUNTY, OH

REF. DWG(S) SEE REFERENCE BAND

SHEET(S) 37 OF 64	DWG SCALE AS NOTED
DWG DATE 01/13/2020	SUPERSEDED —
DRAWING NUMBER PNG -C-350-0001215	REVISION B

C/HAMILTON COUNTY/C350

RIGHT-OF-WAY				
	OWNERSHIP	1094.04 THRU 1194.07	1209.00	1210.00
	JURISDICTION	EVENDALE	EVENDALE	READING
	ACREAGE	4.1081 ACRES	1.0963 ACRES	
	EASEMENTS	VARIES	50' EASEMENT	
	REF. DWG. NO.	PNG-B-350-0001010	PNG-C-350-0001274	

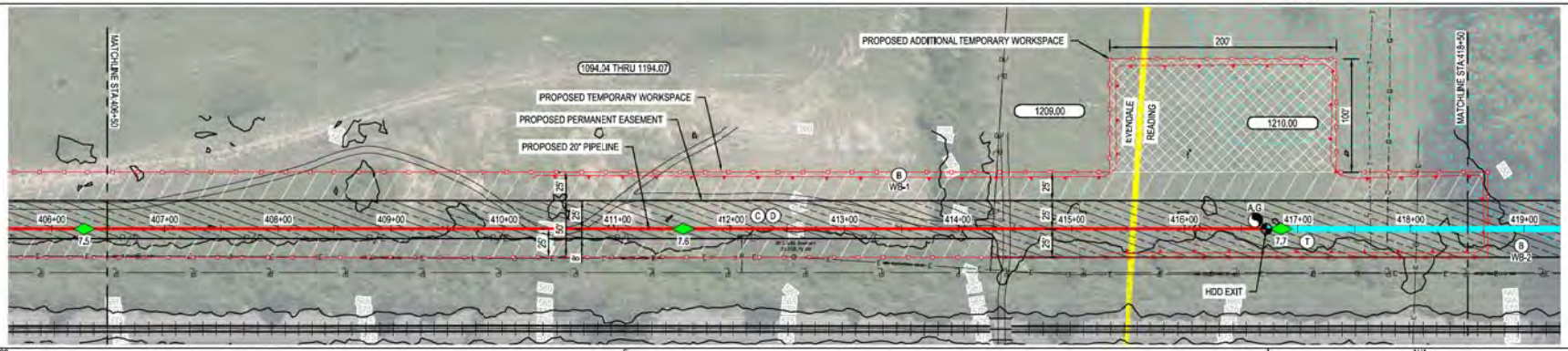
STATIONING

STA: 411+58.1° SAG BEND (V)

STA: 414+59.1° OVERBEND (V)

STA: 417+01 FTG 9° OVERBEND (V)

PLAN



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

PIPE DATA (SLOPE STATIONING)

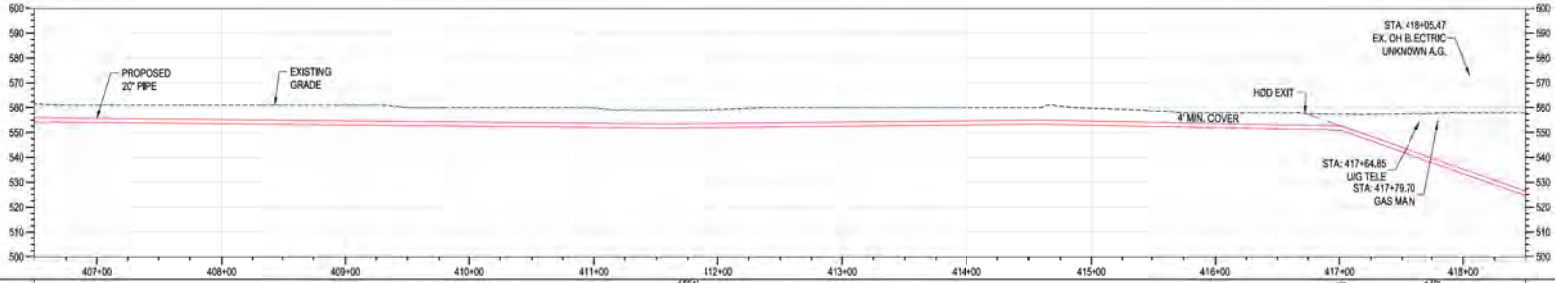
CONSTRUCTION NOTE:

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

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

C3. CONTRACTOR SHALL HAND CLEAR MINIMUM 18' CENTERED OVER PIPELINE IN HDD, UNLESS INSTRUCTED OTHERWISE BY DUKE ENVIRONMENTAL INSPECTOR.

PROFILE



MATERIAL		1051' (1)	149' (2)
CONST. METHOD		OPEN TRENCH	HDD
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	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	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)	38 OF 64
DWG SCALE	AS NOTED
DWG DATE	01/13/2020
SUPERSEDED	
DRAWING NUMBER	PNG -C-350-0001216
REVISION	B

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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

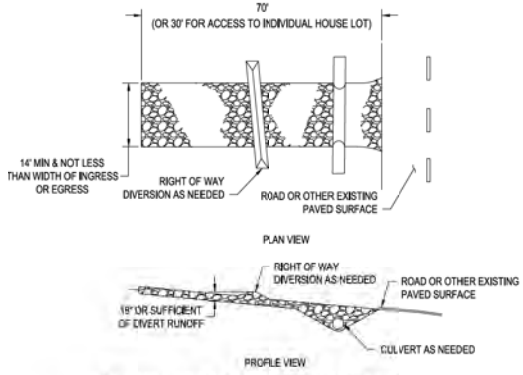
4. IF NEEDED, A PIPE OR CULVERT SHALL BE CONSTRUCTED UNDER THE ENTRANCE TO PREVENT SURFACE WATER FROM FLOWING ACROSS THE ENTRANCE OUT ONTO PAVED SURFACES.
5. IF NEEDED, A WATER BAR SHALL BE CONSTRUCTED TO PREVENT SURFACE WATER FROM FLOWING ALONG THE LENGTH OF THE ENTRANCE UT ONTO PAVED SURFACE.

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.

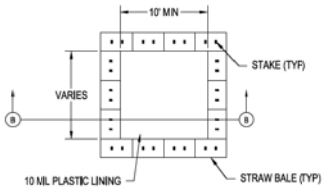


STABILIZING CONSTRUCTION ENTRANCE

SCALE: N.T.S.

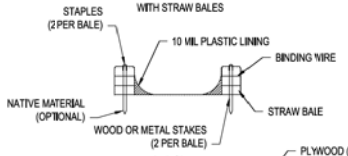
NOTES:

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.

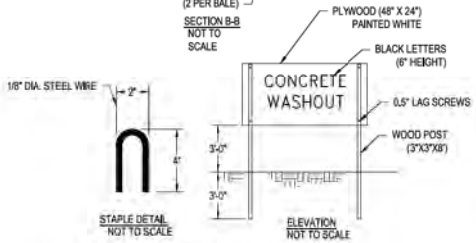


PLAN
NOT TO SCALE

TYPE "ABOVE GRADE" WITH STRAW BALES

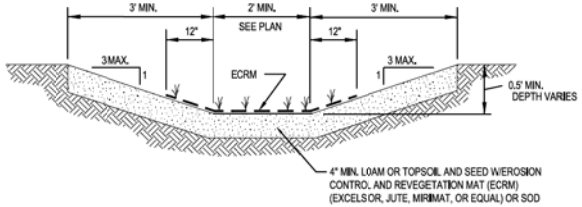


SECTION B-B
NOT TO SCALE



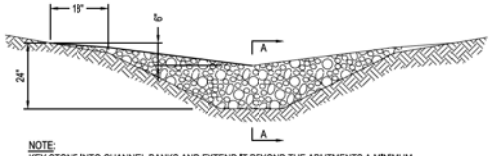
CONCRETE WASHOUT AREAS

SCALE: N.T.S.



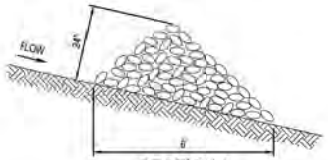
SWALE CROSS SECTION

SCALE: N.T.S.

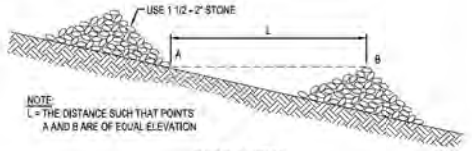


NOTE:
KEY STONE INTO CHANNEL BANKS AND EXTEND IT BEYOND THE ABUTMENTS A MINIMUM OF 18" TO PREVENT FLOW AROUND THE DAM.

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

DUKE ENERGY. Piedmont Natural Gas

C350 PROJECT
ENVIRONMENTAL NOTES & DETAILS 1
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

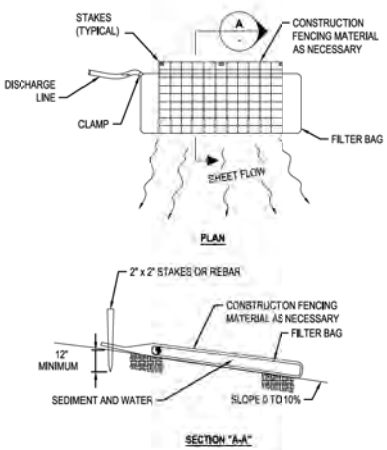
REF. DWG(S): PNG-G-350-0001009

SHEET(S)	1 OF 4	DWG SCALE	NONE
DWG DATE	06-05-2018	SUPERSEDED	—

DRAWING NUMBER: PNG -C-350-0001283

REVISION: B

C:\HAMILTON COUNTY\C350

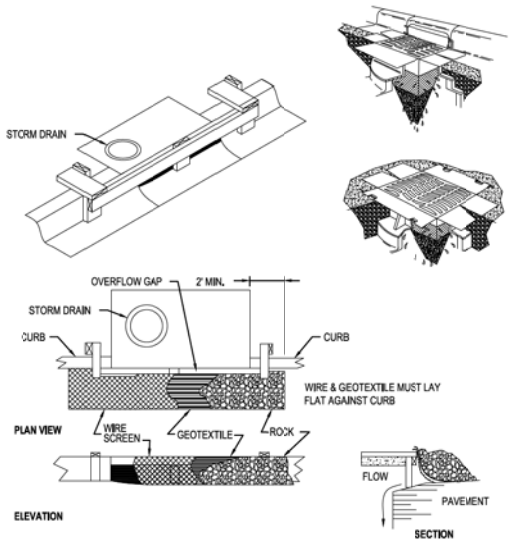


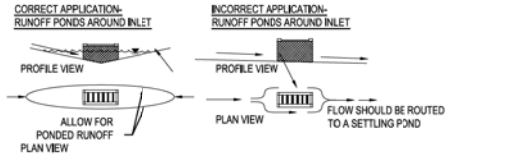
NOTES:

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.





INLET PROTECTION FOR CURB DRAINS & YARD DRAINS SITUATED ON A SLOPE:

INSTALLATION:

1. REMOVE THE GRATE FROM THE CATCH BASIN.
2. INSERT THE FILTRATION SACK INTO OPENING OF CATCH BASIN. SOME PRODUCTS REQUIRE THE FILTRATION SACK BE SLIPPED OVER THE CATCH BASIN GRATE FIRST.
3. REINSERT GRATE INTO CATCH BASIN WHILE ENSURING ALL NECESSARY SUPPORT STRAPS TO PROVIDE SUPPORT AND ENSURE THE FILTRATION SACK DOES NOT FALL INTO CATCH BASIN AS IT FILLS WITH SEDIMENT.

MAINTENANCE:

1. THE FILTRATION SACK MUST BE EMPTIED WHEN IT IS 1/3RD FULL OF SEDIMENT AND DEBRIS. SACKS ARE TYPICAL MANUFACTURED WITH LIFTING STRAPS AND DUMPING STRAPS.
2. TO EMPTY THE SACK, REMOVE THE GRADE, LIFT THE SACK OUT OF THE CATCH BASIN VIA THE LIFTING STRAPS AND HAUL IT TO AN APPROPRIATE AREA. TURN IT INSIDE OUT WITH THE DUMPING STRAPS PROVIDED.
3. THE FILTRATION SACK MUST BE REPLACED IF IT IS TORN, OTHERWISE THE SAME SACK CAN BE USED MULTIPLE TIMES.
4. THE CONTRACTOR IS REQUIRED TO HAVE STAGED REDUNDANT CONTROLS ONSITE IN THE EVENT REPLACEMENTS ARE NEEDED.

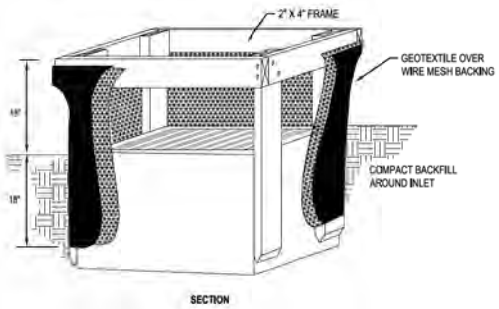
INSPECTION:

1. INLET PROTECTION MEASURES MUST BE INSPECTED AT LEAST 12-HOURS PRIOR TO RAIN EVENTS, IN ADDITION TO THE WEEKLY AND POST-RAIN EVENT INSPECTIONS. NON-FUNCTIONAL DEVICES MUST BE REPLACED.

REMOVAL:

1. PULL OUT ALL INLET PROTECTION MATERIAL AND PROPERLY DISPOSE OF OFF-SITE.
2. RE-GRADE AREA WHERE ACCUMULATED SEDIMENT HAS BEEN PLACED AS NECESSARY AND ESTABLISH VEGETATION ON ANY RESULTING DISTURBED AREAS.

THE FOLLOWING DIAGRAMS PROVIDE A GENERAL IDEA OF HOW TO INSTALL AND MAINTAIN A VARIETY OF MANUFACTURED STORM DRAIN INLET PROTECTION PRACTICES. BE SURE TO IMPLEMENT FILTRATION SACKS THAT ARE APPROPRIATE FOR EITHER CURB INLETS OR FOR YARD DRAIN INLETS. MANUFACTURER'S SPECIFICATIONS FOR THE PRODUCT OF CHOICE SHOULD BE FOLLOWED.



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.

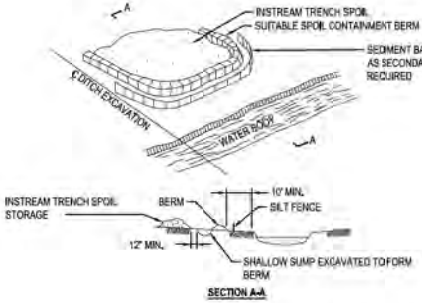
ALTERNATIVE MANUFACTURED YARD DRAIN/INLET PROTECTION PRODUCTS ARE AVAILABLE AND CAN BE USED, SUBJECT TO PRIOR APPROVED BY THE COMMUNITY ENGINEER.

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	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	180115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	JMP

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

C350 PROJECT
ENVIRONMENTAL NOTES & DETAILS 2
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

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

SHEET(S)	2 OF 4	DWG SCALE	NONE
DWG DATE	06-05-2018	SUPERSEDED	—

DRAWING NUMBER: PNG -C-350-0001284

REVISION: B

C:\HAMILTON COUNTY\C350\

INSTALLATION:

1. CONSTRUCT PRIOR TO UPSLOPE LAND DISTURBANCE.
2. PLACE CONTINUOUS LENGTHS OF SILT FENCE ALONG A CONSISTENT CONTOUR SO AS TO PREVENT THE CONCENTRATION OF RUNOFF AT LOW POINTS IN THE FENCE.
3. TO PREVENT FLOW AROUND ENDS, EXTEND EACH OF A CONTINUOUS LENGTH OF SILT FENCE UPSLOPE (90° TO THE CONTOUR) SO THE ENDS ARE AT A HIGHER ELEVATION OR 20-FEET IN HORIZONTAL DISTANCE, WHICHEVER IS ACHIEVED FIRST.
4. AT A MINIMUM, THE BOTTOM 8-INCHES OF THE SILT FENCE MATERIAL MUST BE PLACED IN A TRENCH (MINIMUM 6-INCH DEPTH) THAT IS CUT WITH A TRENCHER, CABLE LAYING MACHINE, OR OTHER SUITABLE DEVICE. THE TRENCH SHALL NOT BE CONSTRUCTED WITH THE TILT BLADE OF A BULLDOZER.
5. THE TRENCH MUST BE BACKFILLED WITH SOIL AND PROPERLY COMPACTED, WHEN AGGRESSIVELY PULLED UPWARD BETWEEN TWO CONSECUTIVE STAKES, THE MATERIAL SHOULD NOT PULL OUT OF THE GROUND.
6. STAKES (MIN. 32-INCH LENGTH, 2"X2" HARDWOOD OF GOOD QUALITY) MUST BE PALCED ON THE DOWNSLOPE SIDE OF THE SILT FENCE MATERIAL.
7. SILT FENCE MATERIAL MUST BE PULLED TIGHT BETWEEN CONSECUTIVE STAKES TO ENSURE THE FENCE DOES NOT SAG.
8. WHEN IT IS NECESSARY TO JOIN TWO SEPARATE LENGTHS OF SILT FENCE TO FORM A CONTINUOUS RUN, THE END OF TWO SEPARATE LENGTHS MUST BE JOINED TOGETHER BY FIRST OVERLAPPING THEM AND THEN TWISTING THEM TOGETHER AT LEAST 180° PRIOR TO DRIVING THE STAKES INTO THE GROUND.
9. GRADES IN EXCESS OF 10% REQUIRE SILT FENCE TO BE "J-HOOKED" AS DESCRIBED IN THE SWPPP DOCUMENT.

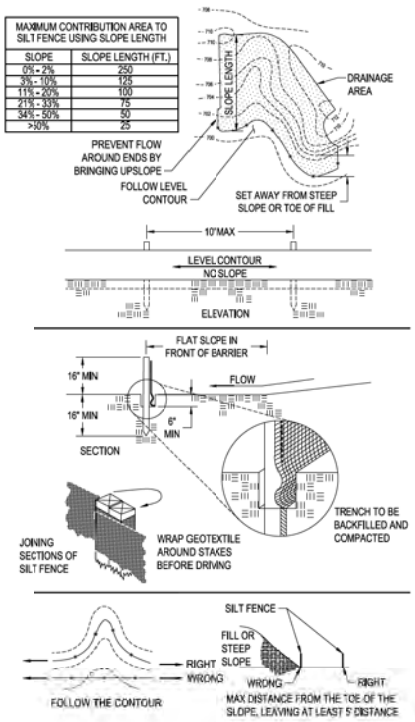
MAINTENANCE:

1. REMOVE ACCUMULATED SEDIMENT WHEN IT REACHES 1/3RD THE HEIGHT OF THE SILT FENCE. THE REMOVED SEDIMENT MUST BE STABILIZED AND SHOULD NOT BE PLACED WHERE IT COULD EVENTUALLY BE CONVEYED BACK TO THE SILT FENCE VIA SURFACE RUNOFF.
2. REPLACE AND PROPERLY DISPOSE OF DAMAGED SILT FENCE MATERIAL.
3. AREAS WHERE SURFACE FLOW HAS CUT UNDER THE SILT FENCE MATERIAL WITHIN THE TRENCH SHALL BE RE-COMPACTED WITH APPROPRIATE MATERIAL (I.E. HIGH CLAY CONTENT).

REMOVAL:

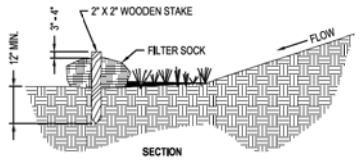
1. PULL OUT ALL SILT FENCE MATERIAL AND STAKES AND PROPERLY DISPOSE OF OFF-SITE.
2. RE-GRADE AREA WHERE SEDIMENT HAS ACCUMULATED AS NECESSARY AND ESTABLISH VEGETATION IN ANY RESULTING DISTURBED AREAS.

MAXIMUM CONTRIBUTION AREA TO SILT FENCE USING SLOPE LENGTH	
SLOPE	SLOPE LENGTH (FT.)
0% - 2%	250
3% - 10%	125
11% - 20%	100
21% - 33%	75
34% - 50%	50
>50%	25



SILT FENCE

SCALE: N.T.S.



NOTES:

1. ALL FILTER SOCK MUST BE 12-INCH COMPOST FILTER SOCK OR THE ENGINEERED EQUIVALENT.
2. MATERIALS - COMPOST USED FOR FILTER SOCKS SHALL BE WEED, PATHOGEN AND INSECT FREE AND FREE OF ANY REFUSE, CONTAMINANTS OR OTHER MATERIALS TOXIC TO PLANT GROWTH. THEY SHALL BE DERIVED FROM A WELL-DECOMPOSED SOURCE OF ORGANIC MATTER AND CONSIST OF A PARTICLES RANGING FROM 3/8" TO 2".
3. FILTER SOCKS SHALL BE 3 OR 5 MIL CONTINUOUS, TUBULAR, HDPE 3/8" KNITTED MESH NETTING MATERIAL, FILLED WITH COMPOST PASSING THE ABOVE SPECIFICATIONS FOR COMPOST PRODUCTS.

INSTALLATION:

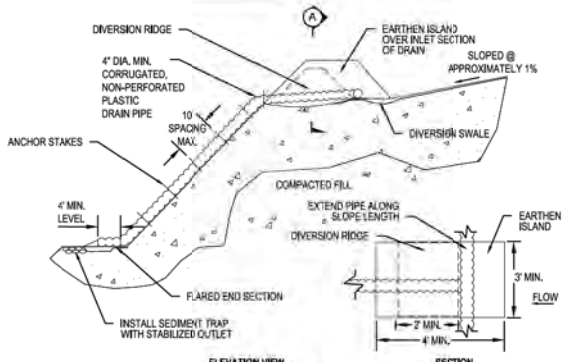
1. FILTER SOCKS WILL BE PLACED ON A LEVEL LINE ACROSS SLOPES, GENERALLY PARALLEL TO THE BASE OF THE SLOPE OR OTHER AFFECTED AREA, ON SLOPES APPROACHING 2:1, ADDITIONAL SOCKS SHALL BE PROVIDED AT THE TOP AND AS NEEDED MID-SLOPE.
2. FILTER SOCKS INTENDED TO BE LEFT AS A PERMANENT FILTER OR PART OF THE NATURAL LANDSCAPE, SHALL BE SEEDED AT THE TIME OF INSTALLATION FOR ESTABLISHMENT OF PERMANENT VEGETATION.
3. FILTER SOCKS ARE NOT TO BE USED IN CONCENTRATED FLOW SITUATIONS OR IN RUNOFF CHANNELS.

MAINTENANCE:

1. ROUTINELY INSPECT FILTER SOCKS AFTER EACH SIGNIFICANT RAIN, MAINTAINING FILTER SOCKS IN A FUNCTIONAL CONDITION AT ALL TIMES.
2. REMOVE SEDIMENTS COLLECTED AT THE BASE OF THE FILTER SOCKS WHEN THEY REACH 1/3 OF THE EXPOSED HEIGHT OF THE PRACTICE.
3. WHERE THE FILTER SOCK DETERIORATES OR FAILS, IT WILL BE REPAIRED OR REPLACED WITH A MORE EFFECTIVE ALTERNATIVE.
4. REMOVAL - FILTER SOCKS WILL BE DISPERSED ON SITE WHEN NO LONGER REQUIRED IN SUCH AS WAY AS TO FACILITATE AND NOT OBSTRUCT SEEDINGS.

FILTER SOCK

SCALE: N.T.S.

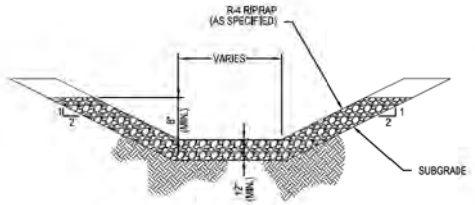


NOTES:

1. THE SLOPE DRAIN SHALL BE CONSTRUCTED/LENGTHENED WITH THE CONSTRUCTION OF THE FILL SLOPE. AS A RESULT, INLET ELEVATIONS WILL VARY ACCORDING TO GRADE ELEVATIONS AT THE TIME OF CONSTRUCTION.
2. INSPECT SLOPE DRAIN AND SUPPORTING DIVERSIONS AFTER EVERY RAINFALL EVENT AND MAKE NECESSARY REPAIRS FOR PROPER OPERATION OF THE SYSTEM.
3. UPON PROJECT COMPLETION, REMOVE THE SLOPE DRAIN AND PROPERLY STABILIZE ALL DISTURBED AREAS.

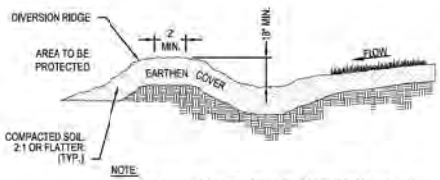
TEMPORARY SLOPE DRAIN

SCALE: N.T.S.



RIPRAPPED CHANNEL

SCALE: N.T.S.

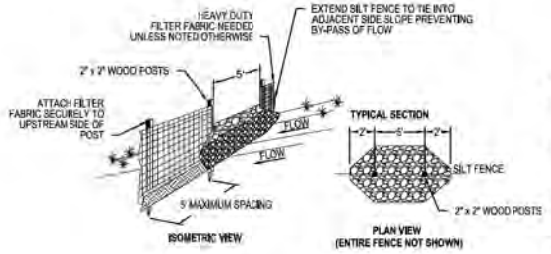


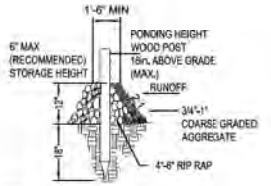
NOTE:

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

DIVERSION SWALE

N.T.S.





NOTES:

1. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.
2. INSPECT AND REPAIR AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN IT REACHES ONE-HALF HEIGHT OF FENCE OR FABRIC STARTS TO BULGE.
3. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE SEDIMENT OFF-SITE AND CAN BE PERMANENTLY STABILIZED.
4. TURN END OF SILT FENCE UP SLOPE TO PREVENT BYPASS FLOW AND ALLOW FOR PONDING.
5. SEE TYPICAL SILT FENCE DETAIL FOR ADDITIONAL INFORMATION.

SILT FENCE ROCK OUTLET

SCALE: N.T.S.

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

C350 PROJECT
ENVIRONMENTAL NOTES & DETAILS 3
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

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

SHEET(S)	3 OF 4	DWG SCALE	NONE
DWG DATE	06-05-2018	SUPERSEDED	—

DRAWING NUMBER: PNG -C-350-0001285
REVISION: B

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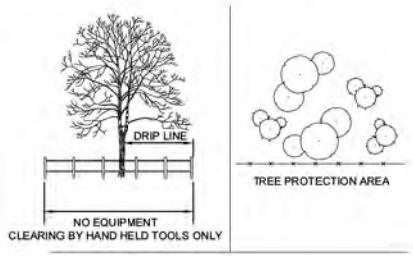
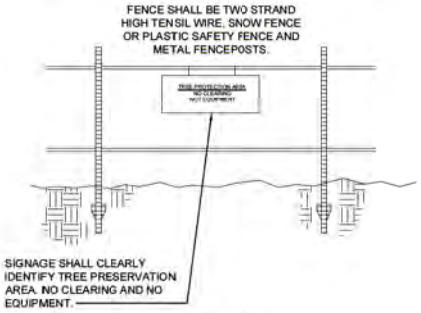
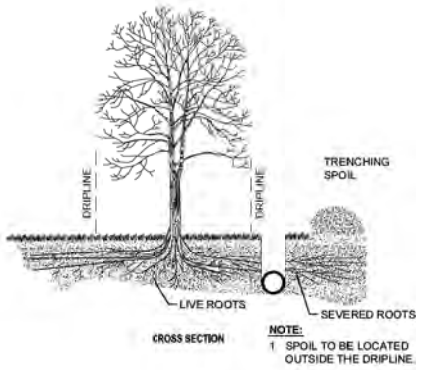
PRESERVATION OF NATURAL VEGETATION

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.

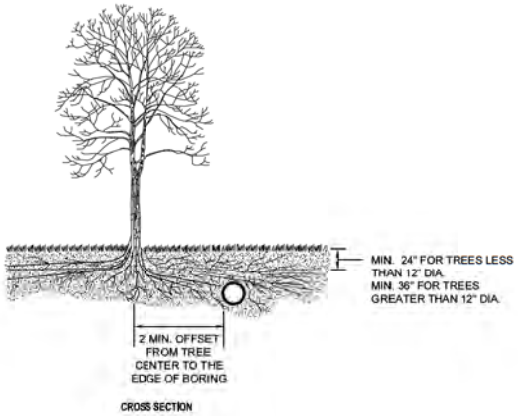




TREE PRESERVATION AREA
SCALE: N.T.S.



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

DUKE ENERGY. Piedmont Natural Gas

C350 PROJECT
ENVIRONMENTAL NOTES & DETAILS 4
HAMILTON COUNTY, OHIO

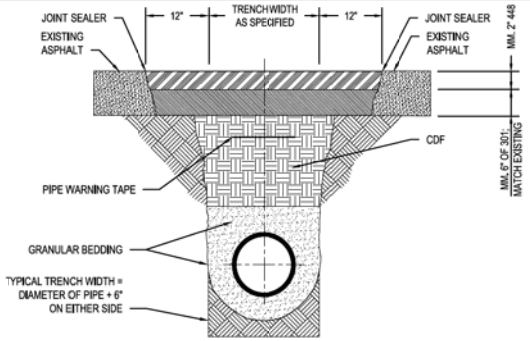
HAMILTON COUNTY, OHIO

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

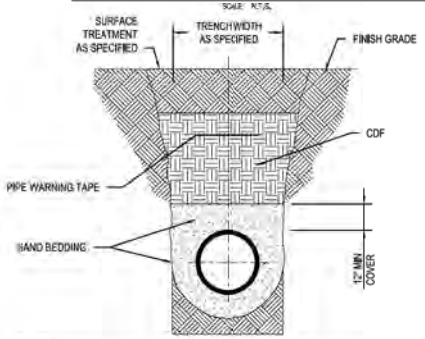


NOTES:

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.

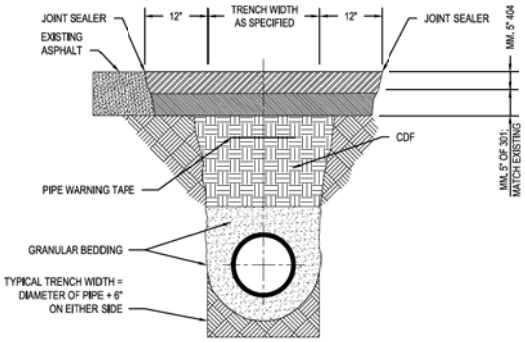


NOTES:

1. PIPE BEDDING SHALL BE CLEAN, GRADED SAND COMPACTED TO PROVIDE EVEN SUPPORT FOR PIPE. APPROVED MATERIALS INCLUDE M10 "STONE DUST" OR SIMILAR. BEDDING MATERIAL SHALL FULLY ENCIRCLE PIPE. CONTROLLED DENSITY FILL (CDF) SHALL BE INSTALLED IN SUCH A MANNER THAT MINIMIZES VOIDS AND DOES NOT DISTURB BEDDING OR PIPE.
2. PIPE WARNING TAPE SHALL BE INSTALLED APPROXIMATELY 24"-36" ABOVE PIPELINE, OR AS OTHERWISE RECOMMENDED BY MANUFACTURER. MATERIALS SHALL BE SIGNALTAPE® OR APPROVED EQUIVALENT AND SHALL BE NON-TRACEABLE VARIETY.

TYPICAL UTILITY TRENCH D

SCALE: N.T.S.

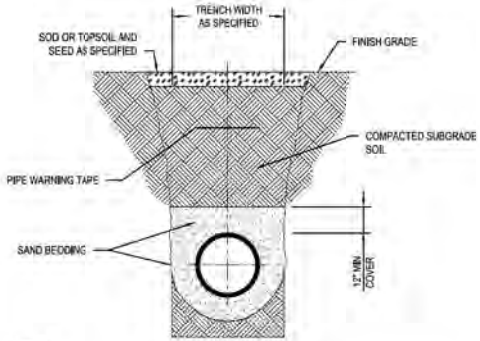


NOTES:

1. APPLY GRANULAR BEDDING AROUND PIPE AND BACKFILL TRENCH WITH FLASH FILL TO BOTTOM OF EXISTING ASPHALT.
2. MINIMUM 5"OF 301 ASPHALT OR MATCH EXISTING ASPHALT CROSS SECTION. APPLY MINIMUM 5" OF ITEM 404 ASPHALT SURFACE COURSE.
3. APPLY ASPHALT IN SUCH A WAY THAT WHEN IT IS FULLY COMPACTED, THE EDGES ARE FLUSH, AND THE CENTER IS 1/4" HIGH, FOR FUTURE COMPACTION.
4. SEAL ALL EDGES OF THE TRENCH WITH ITEM 702.17 JOINT SEALER.
5. PIPE WARNNG TAPE SHALL BE INSTALLED APPROXIMATELY 24"-36" ABOVE PIPELINE, OR AS OTHERWISE RECOMMENDED BY MANUFACTURER. MATERIALS SHALL BE SIGNALTAPE® OR APPROVED EQUIVALENT AND SHALL BE NON-TRACEABLE VARIETY.

TYPICAL UTILITY TRENCH AND SURFACE RESTORATION B: SHARONVILLE

SCALE: N.T.S.

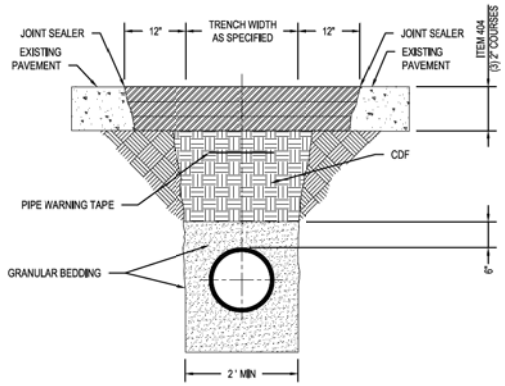


NOTES:

1. PIPE BEDDING SHALL BE CLEAN, GRADED SAND COMPACTED TO PROVIDE EVEN SUPPORT FOR PIPE. APPROVED MATERIALS INCLUDE M10 "STONE DUST" OR SIMILAR. BEDDING MATERIAL SHALL FULLY ENCIRCLE PIPE.
2. PIPE WARNING TAPE SHALL BE INSTALLED APPROXIMATELY 24"-36" ABOVE PIPELINE, OR AS OTHERWISE RECOMMENDED BY MANUFACTURER. MATERIALS SHALL BE SIGNALTAPE® OR APPROVED EQUIVALENT AND SHALL BE NON-TRACEABLE VARIETY.

TYPICAL UTILITY TRENCH E

SCALE: N.T.S.

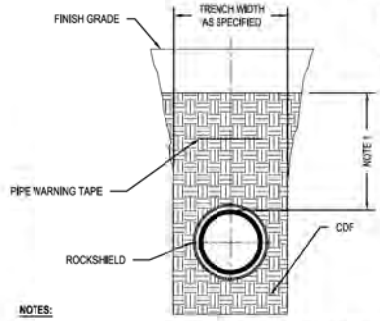


NOTES:

1. ALL RESTORATION IN CITY OF READING RIGHT OF WAY SHALL BE MILLED AND PAVED FROM CURB TO CURB. SEE PNG-C-350-0001294 FOR MILL AND PAVE DETAIL.
2. ALL CONCRETE TO BE CLASS C-4000 P.S.I.
3. SAW CUT EXISTING PAVEMENT FULL DEPTH ALL EDGES.
4. REPLACE PAVEMENT WITH (3) 2" LAYER OF 404.
5. BACKFILL SHALL BE CONTROL DENSITY FLOWABLE MATERIAL.
6. SEAL ALL PAVEMENT EDGES.
7. INSPECTOR MUST BE PRESENT DURING CONSTRUCTION.
8. COVER TRENCH WITH STEEL PLATE AS NEEDED.
9. STREET TO BE SWEPT CLEAN AT CONCLUSION OF CONSTRUCTION.
10. PIPE WARNING TAPE SHALL BE INSTALLED APPROXIMATELY 24"-36" ABOVE PIPELINE, OR AS OTHERWISE RECOMMENDED BY MANUFACTURER. MATERIALS SHALL BE SIGNALTAPE® OR APPROVED EQUIVALENT AND SHALL BE NON-TRACEABLE VARIETY.

TYPICAL UTILITY TRENCH AND SURFACE RESTORATION C: CITY OF READING

SCALE: N.T.S.



NOTES:

1. CDF BACKFILL SHALL EXTEND TO BOTTOM OF PIPE IF CROSSING EXISTING PIPE OR A MINIMUM OF 12 INCHES.
2. CDF SHALL BE PER HAMILTON COUNTY SPECIFICATION. CLSM SHALL BE EXCAVATABLE AND HAVE A COMPRESSIVE STRENGTH NO LESS THAN 100 PSI.

TYPICAL UTILITY TRENCH F

SCALE: N.T.S.

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

PROFESSIONAL ENGINEER STAMP

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	1880116
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	JMP

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

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

C350 PROJECT
RESTORATION DETAILS 1
HAMILTON COUNTY, OHIO

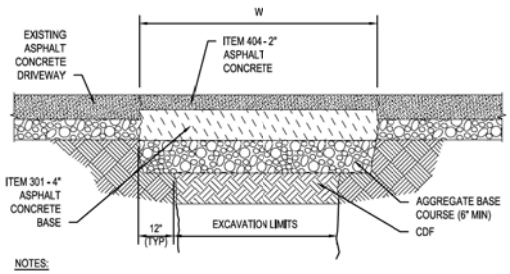
HAMILTON COUNTY, OHIO

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

DRAWING NUMBER: PNG -C-350-0001293

REVISION: B

C:\HAMILTON COUNTY\C350

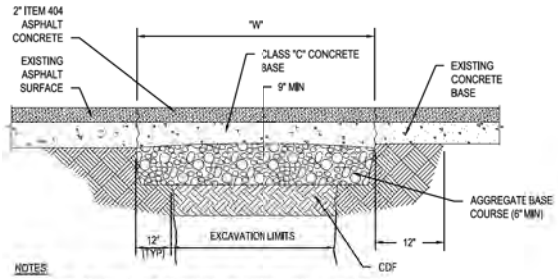


NOTES:

1. SEE MILL AND PAVE DETAIL ON THIS DRAWING. WIDTH SHALL BE 12'.
2. WHERE ASPHALT CONCRETE PAVEMENT IS REQUIRED, THE EDGES ARE TO BE CUT WITH A SAW IN A NEAT STRAIGHT LINE. ALL EDGES ARE TO BE SWEPT AND TACKED; AND ALL JOINTS, AFTER THE SURFACE HAS BEEN PLACED, ARE TO BE SEALED WITH AC-20 IN A MANNER TO AVOID TRACKING.

SURFACE TYPE 1 RESTORATION STANDARD: HAMILTON COUNTY ASPHALT CONC. DRIVEWAY

SCALE: N.T.S.

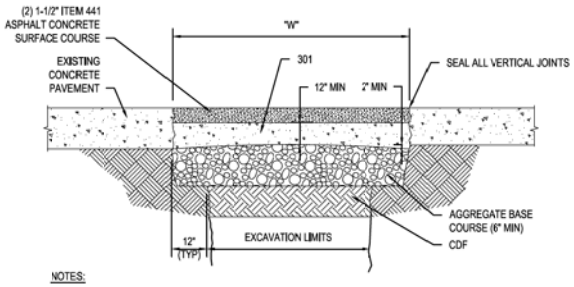


NOTES:

1. 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.

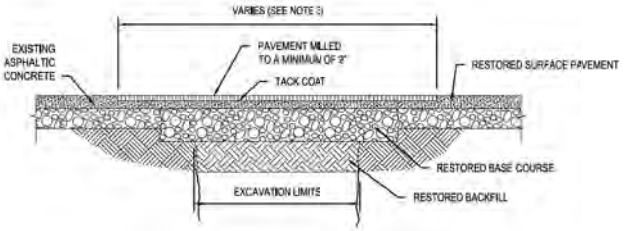


NOTES:

1. 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.

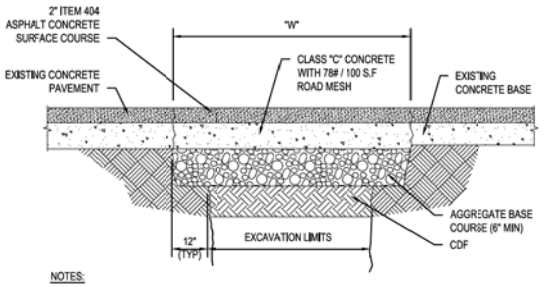


NOTES:

1. 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.



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.

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

PROFESSIONAL ENGINEER STAMP

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	1880116
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
RESTORATION DETAILS 2
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

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

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

DRAWING NUMBER: PNG -C-350-0001294

REVISION: B

C:\HAMILTON COUNTY\C350

PERMANENT STABILIZATION

AREAS REQUIRING PERMANENT STABILIZATION	TIME FRAME TO APPLY EROSION CONTROLS:
ANY AREAS THAT WILL LIE DORMANT FOR ONE (1) YEAR OR MORE	WITHIN SEVEN (7) DAYS OF THE MOST RECENT DISTURBANCE
ANY DISTURBED ARE WITHIN FIFTY (50) FEET OF A STREAM AND AT FINAL GRADE.	WITHIN TWO (2) DAYS OF REACHING FINAL GRADE.
ANY OTHER AREAS AT FINAL GRADE	WITHIN SEVEN (7) DAYS OF REACHING FINAL GRADE WITHIN THAT AREA
NOTE: WHERE VEGETATIVE STABILIZATION TECHNIQUES MAY CAUSE STRUCTURAL INSTABILITY OR ARE OTHERWISE UNOBTAINABLE, ALTERNATIVE STABILIZATION TECHNIQUES MUST BE EMPLOYED, THESE TECHNIQUES MAY INCLUDE MULCHING OR EROSION MATTING.	

TEMPORARY STABILIZATION

AREAS REQUIRING TEMPORARY STABILIZATION	TIME FRAME TO APPLY EROSION CONTROLS:
ANY DISTURBED AREA WITHIN FIFTY (50) FEET OF A STREAM AND NOT AT FINAL GRADE.	WITHIN TWO (2) DAYS OF THE MOST RECENT DISTURBANCE IF THAT AREA WILL REMAIN IDLE FOR MORE THAN FOURTEEN (14) DAYS.
FOR ALL CONSTRUCTION ACTIVITIES, ANY DISTURBED AREA, INCLUDING SOIL STOCKPILES THAT WILL BE DORMANT FOR MORE THAN FOURTEEN (14) DAYS BUT LESS THAN ONE YEAR, AND NOT WITHIN FIFTY (50) FEET OF A STREAM.	WITHIN SEVEN (7) DAYS OF THE MOST RECENT DISTURBANCE WITHIN THE AREA.
DISTURBED AREA THAT WILL BE IDLE OVER WINTER.	PRIOR TO THE ONSET OF WINTER WEATHER/NOVEMBER 1ST.
NOTE: WHERE VEGETATIVE STABILIZATION TECHNIQUES MAY CAUSE STRUCTURAL INSTABILITY OR ARE OTHERWISE UNOBTAINABLE, ALTERNATIVE STABILIZATION TECHNIQUES MUST BE EMPLOYED, THESE TECHNIQUES MAY INCLUDE MULCHING OR EROSION MATTING.	

SEEDING SCHEDULE:

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

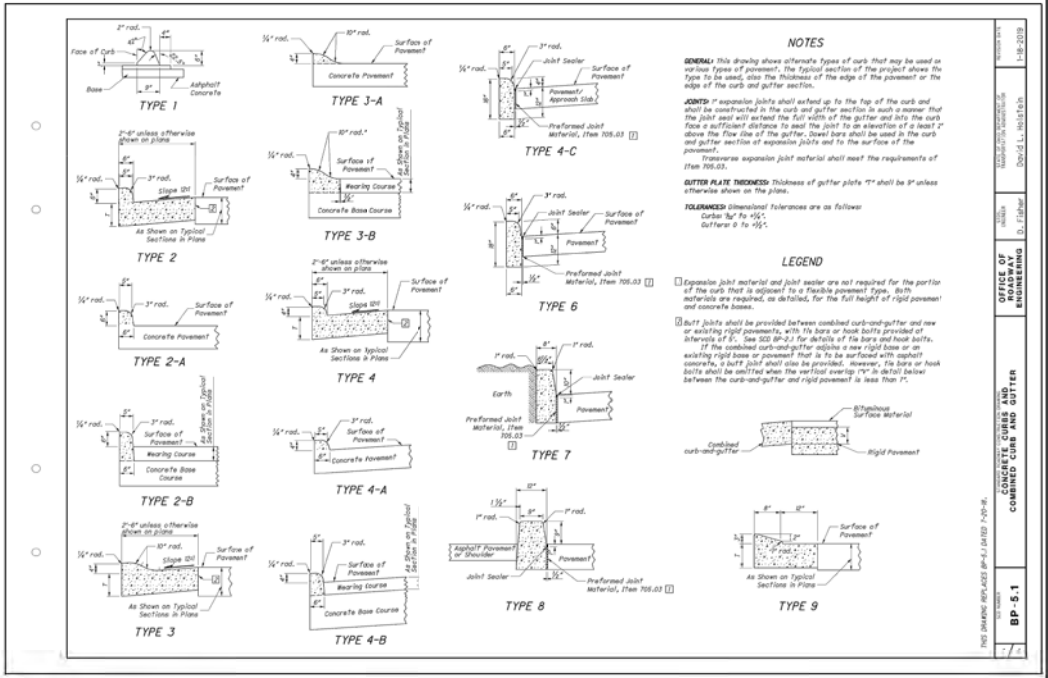
BOTANICAL NAME	COMMON NAME	RATE OF PURE LIVE SEED (PLS) PER ACRE:
FESTUCA ARUNDINACEA	TALL FESCUE	40-50 LBS

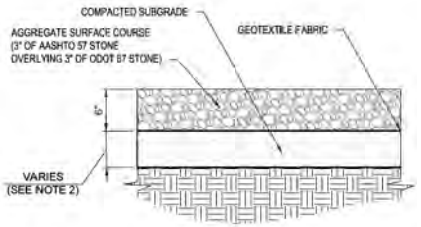
NOTES:

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: N.T.S.





MLV GRAVEL SURFACING

SURFACE COURSE MATERIAL NOTES:

1. NON-WOVEN GEOTEXTILE SHALL BE MIRAFI 140N OR ENGINEER-APPROVED EQUAL.
2. CONTRACTOR SHALL REMOVE TOPSOIL AND ROOT MASSES FROM MLV AREA, THEN REPLACE WITH ACCEPTABLE FILL MATERIAL PER THE GEOTECHNICAL REPORT. COMPACT SUBGRADE AND FILL MATERIAL TO AT LEAST 95% MAXIMUM DRY DENSITY PER ASTM D698.

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

PROFESSIONAL ENGINEER STAMP

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	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 PROJECT RESTORATION DETAILS 3 HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

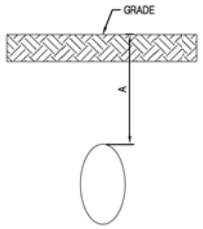
REF. DWG(S): PNG-G-350-0001009

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

DRAWING NUMBER: PNG -C-350-0001295 | REVISION: B

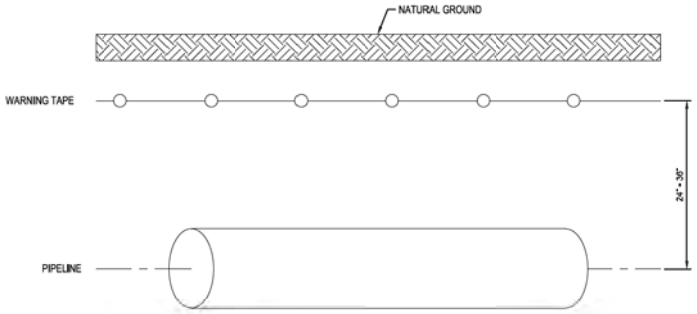
C:\HAMILTON COUNTY\C350

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.

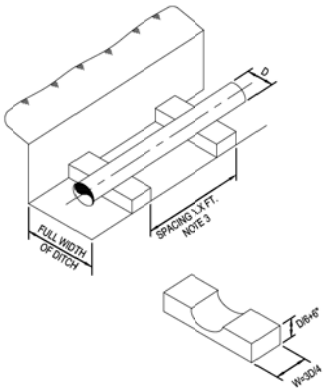


NOTES:

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.

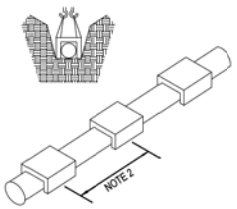


NOTES:

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

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	1860115
DRAWING BY	AKT
STATION ID	C350
CHECKER INITIALS	JMP

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

DUKE ENERGY. Piedmont Natural Gas

C350 PROJECT
CONSTRUCTION DETAILS 1
HAMILTON COUNTY, OHIO

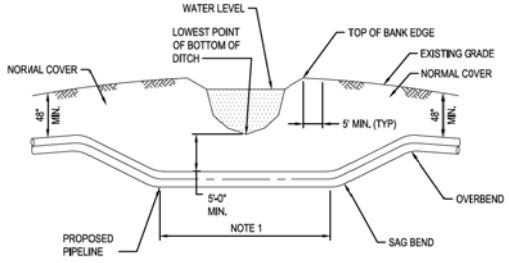
HAMILTON COUNTY, OHIO

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

SHEET(S) 1 OF 10	DWG SCALE NONE
DWG DATE 09-05-2018	SUPERSEDED —

DRAWING NUMBER: PNG -C-350-0001303 | REVISION: B

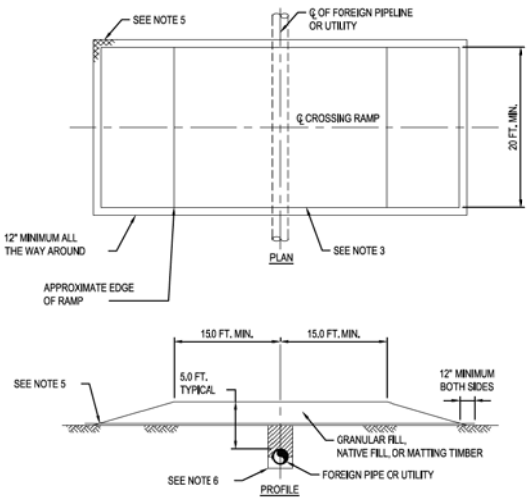
C:\HAMILTON COUNTY\C350



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

TYPICAL OPEN CUT STREAM CROSSING

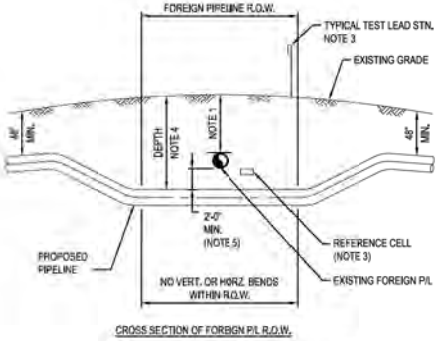
SCALE: N.T.S.



TEMPORARY RAMP CROSSING

SCALE: N.T.S.

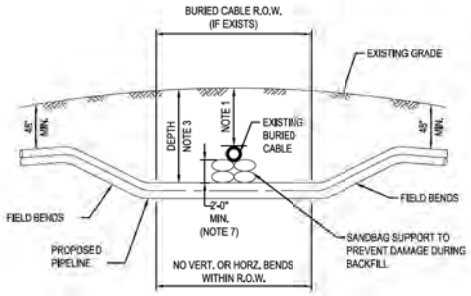
NOTES:
1. CONTRACTOR TO NOTIFY EXISTING PIPELINE/UTILITY COMPANY PRIOR TO INSTALLATION OF CROSSING RAMP.
2. LENGTH OF RAMP TO VARY IN ACCORDANCE WITH CROSSING ANGLE MINIMUM CROSSING ANGLE TO BE 45 DEGREES.
3. VEHICLES OF EQUIPMENT USING CROSSINGS SHALL PROCEED SLOWLY AND WITH CAUTION TO MINIMIZE IMPACT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

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B	07/24/2020	ISSUED FOR BID	AKT	JMP	CNS

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	180011.5
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 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	06-05-2018	SUPERSEDED	—

DRAWING NUMBER	REVISION
PNG -C-350-0001304	B

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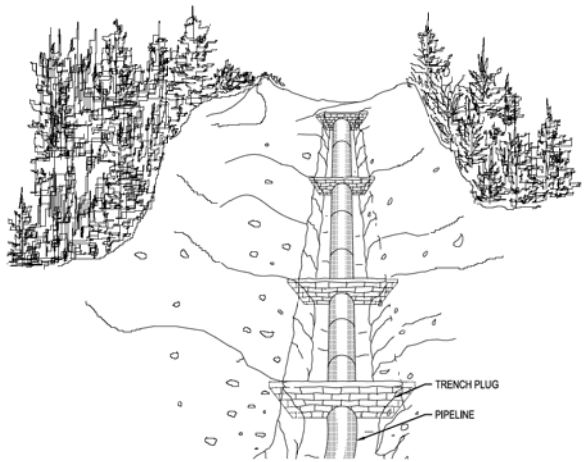
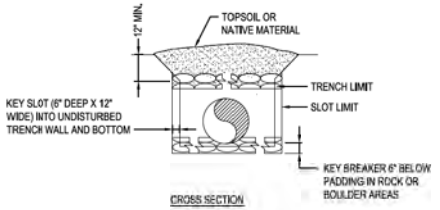
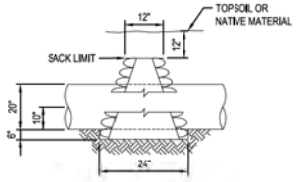




CROSS SECTION



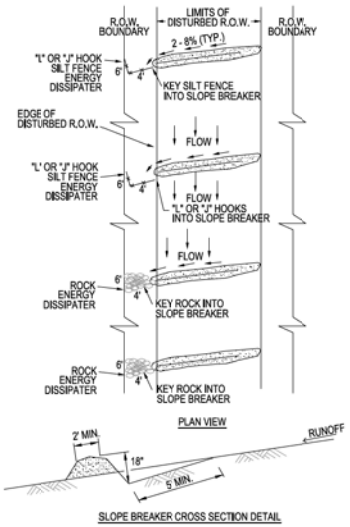
SIDE VIEW

NOTES:

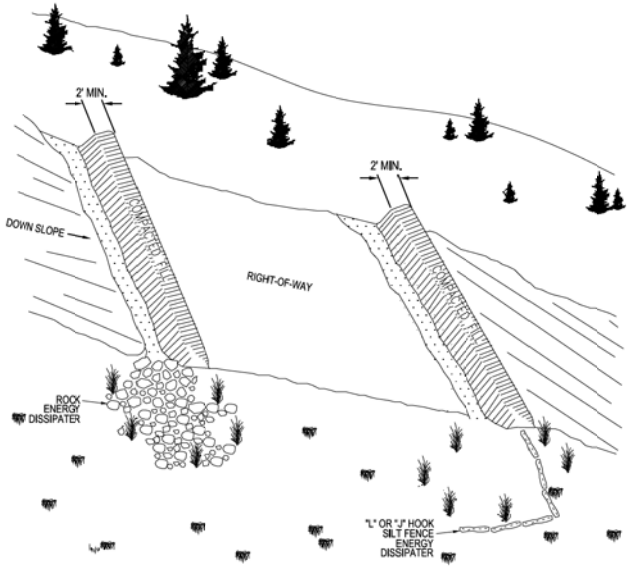
1. TRENCH PLUGS SHALL BE INSTALLED:
   - ON SLOPES ALONG THE TRENCH LINE WHERE THE NATURAL DRAINAGE PATTERN, PROFILE, AND TYPE OF BACKFILL MATERIAL MAY RESULT IN LOSS OF BACKFILL MATERIAL OR ALTERATION OF THE NATURAL PATTERN;
   - AT THE BASE OF SLOPES ADJACENT TO WATERBODIES AND WETLANDS;
   - WHERE 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.



SLOPE BREAKER CROSS SECTION DETAIL



NOTES:

1. SLOPE BREAKERS SHALL BE CONSTRUCTED OF COMPACTED NATIVE SOIL AND INSTALLED AT LOCATIONS AS REQUIRED BY DUKE CONSTRUCTION STANDARDS OR AS DIRECTED BY THE COMPANY'S REPRESENTATIVE.
2. SLOPE BREAKERS SHALL BE ORIENTED AS SHOWN OR OTHER PATTERN AS DIRECTED BY THE COMPANY'S REPRESENTATIVE TO DIRECT THE WATER OFF THE RIGHT-OF-WAY.
3. SLOPE BREAKERS SHALL BE CONSTRUCTED AT 2-8% GRADIENT ACROSS THE SLOPE.
4. THE SLOPE BREAKERS SHALL BE 18" DEEP (AS MEASURED FROM THE TROUGH TO THE TOP OF THE SLOPE BREAKER), THE THROUGH WILL BE A MINIMUM OF 5' WIDE ACROSS THE WIDTH OF THE RIGHT-OF-WAY.
5. THE OUTLET OF THE SLOPE BREAKER MUST FREELY DISCHARGE ALL RUNOFF OFF THE DISTURBED RIGHT-OF-WAY INTO AN ENERGY DISSIPATER.
6. WHERE SLOPE BREAKERS EXTEND BEYOND THE EDGE OF THE CONSTRUCTION RIGHT-OF-WAY TO DIRECT RUNOFF INTO STABLE, WELL VEGETATED AREAS, THESE LOCATIONS MUST BE APPROVED BY THE COMPANY'S REPRESENTATIVE.

FLOW ENERGY DISSIPATER NOTES:

1. THE OUTLET SHALL CONTAIN AN ENERGY DISSIPATER IF THE COMPANY'S INSPECTOR DETERMINES EXISTING VEGETATION IS NOT SUFFICIENTLY STABLE TO PREVENT EROSION. THE ENERGY DISSIPATER SHALL BE CONSTRUCTED AS FOLLOWS:
   - OUTFALL END OF DISSIPATER SHOULD BE LOWER THAN SLOPE BREAKER END.
   - SILT FENCE OR ROCK DISSIPATERS SHOULD BE KEYED INTO THE END OF THE SLOPE BREAKER.
   - PROVIDE ENOUGH AREA INSIDE "L" TO CAPTURE AND HOLD SEDIMENT.

TYPICAL SLOPE BREAKER

SCALE: N.T.S.

BURNS & MCDONNELL ENGINEERING COMPANY, INC.
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		
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 09-05-2018 | SUPERSEDED —

DRAWING NUMBER: PNG -C-350-0001305 | REVISION: B

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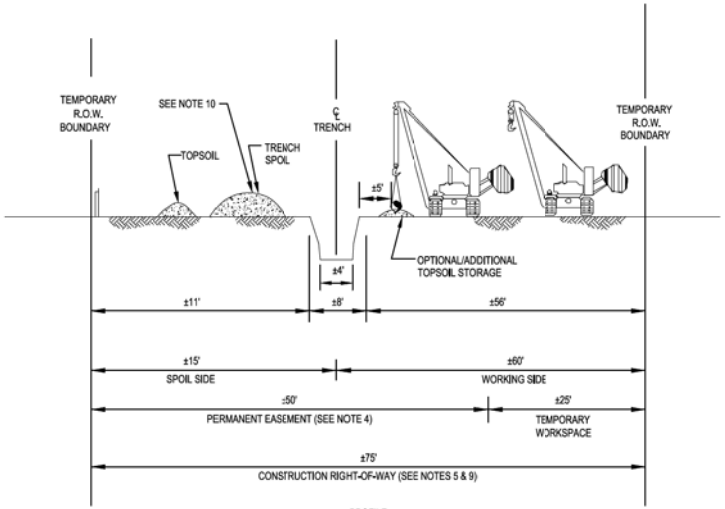


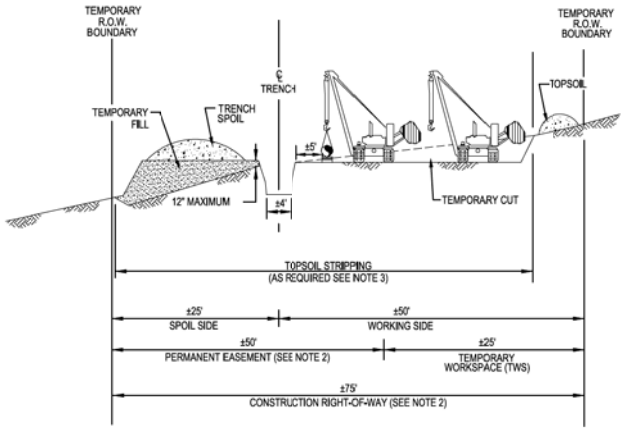
PROFILE

NOTES:

1. UTILIZE THE "TRENCH ONLY" TOPSOIL SALVAGE METHOD AT LOCATIONS SUCH AS RIPARIAN AREAS OR UNMANAGED WOODLAND, WHERE IDENTIFIED ON THE CONSTRUCTION DRAWINGS OR AS DIRECTED BY THE COMPANY'S REPRESENTATIVE.
2. THE TRENCH ONLY METHOD IS NOT TO BE USED ON AGRICULTURAL LAND EXCEPT AS DIRECTED BY THE COMPANY INSPECTOR (PER LANDOWNER REQUEST).
3. FOR TRENCH ONLY STRIPPING, THE STRIPPED AREA SHALL BE WIDE ENOUGH TO ACCOMMODATE TRENCHING EQUIPMENT.
4. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 80 FEET WIDE CONSISTING OF 50 FEET OF PERMANENT EASEMENT AND 25 FEET OF TEMPORARY WORKSPACE. EXTRA TEMPORARY WORK SPACE WILL BE NECESSARY AT MAJOR ROAD, RAIL AND RIVER CROSSINGS AND OTHER SPECIAL CIRCUMSTANCES, AS REQUIRED. CERTAIN SITUATIONS MAY REQUIRE A NARROWER WIDTH.
5. STOCKPILE TOPSOIL AS SHOWN OR IN ANY CONFIGURATION APPROVED BY THE COMPANY'S INSPECTOR. KEEP TOPSOIL CLEAN OF ALL CONSTRUCTION DEBRIS.
6. LEAVE GAPS IN TOPSOIL AND SPOIL PILES AT OBVIOUS DRAINAGES. DO NOT PUSH TOPSOIL INTO CREEKS OR WETLANDS, DO NOT USE TOPSOIL FOR PADDING.
7. AVOID SCALPING VEGETATED GROUND SURFACE WHEN BACKFILLING SPOIL AND TOPSOIL PILES.
8. SAME LAYOUT APPLIES WHERE CONSTRUCTION R.O.W. DOES NOT ABUT EXISTING R.O.W.
9. TEMPORARILY SUSPEND TOPSOIL HANDLING OPERATIONS DURING INORDINATELY WINDY CONDITIONS UNTIL MITIGATIVE MEASURES TO MINIMIZE WIND EROSION CAN BE IMPLEMENTED.
10. TOPSOIL AND TRENCH SPOIL RELATIVE POSITIONS CAN, AS DIRECTED BY THE COMPANY'S INSPECTOR, BE REVERSED.

TYPICAL 75' WORKSPACE TOPSOIL SEPARATION

SCALE: N.T.S.



PROFILE

NOTES:

1. SIDE HILL CONSTRUCTION CUT AND FILL SHALL BE ALLOWED WHENEVER, IN THE OPINION OF THE CONTRACTOR, STEEP SIDE HILL CONSTRUCTION IS WARRANTED FOR PERSONNEL AND/OR EQUIPMENT SAFETY CONSIDERATIONS.
2. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 75 FEET WIDE CONSISTING OF 50 FEET OF PERMANENT EASEMENT AND 25 FEET OF TEMPORARY WORKSPACE. EXTRA TEMPORARY WORK SPACE WILL BE NECESSARY AT MAJOR ROAD, RAIL AND RIVER CROSSINGS AND OTHER SPECIAL CIRCUMSTANCES, AS REQUIRED. CERTAIN SITUATIONS MAY REQUIRE A NARROWER WIDTH.
3. THIS DRAWING REFLECTS "TRENCH, SPOIL, AND WORKING SIDE" TOPSOIL STRIPPING PROCEDURE AS NEEDED FOR HILLSIDE 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

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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		
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-350-0001009

SHEET(S)	4 OF 10	DWG SCALE	NONE
DWG DATE	06-05-2018	SUPERSEDED	—

DRAWING NUMBER: PNG -C-350-0001306

REVISION: B

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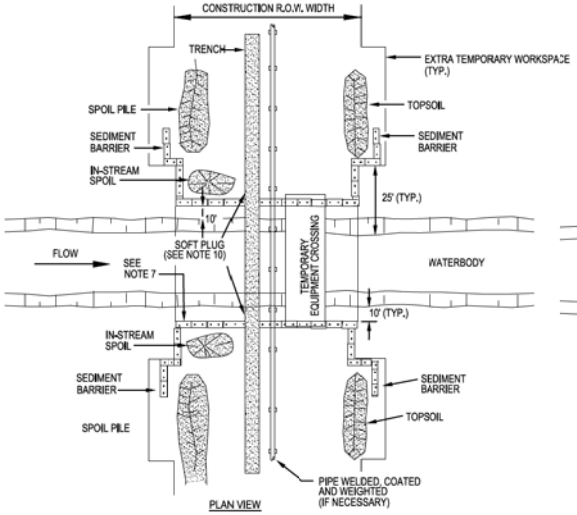
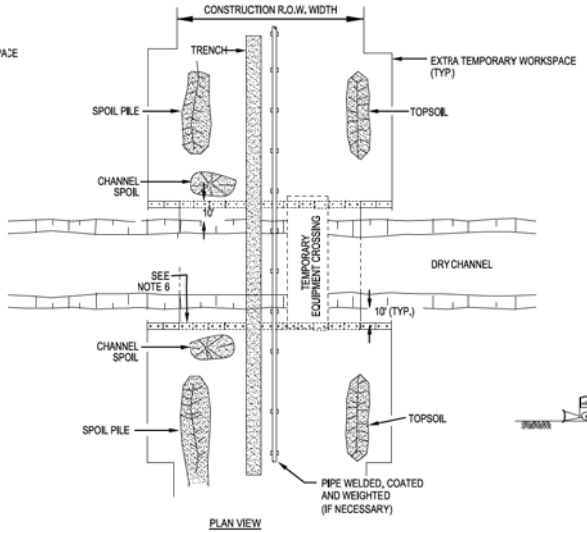
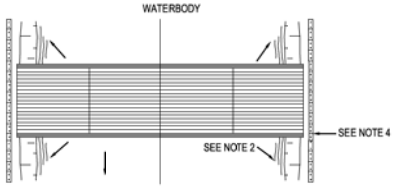


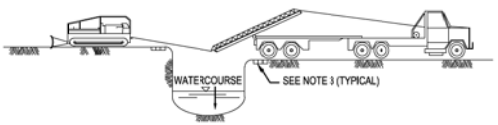
PLAN VIEW



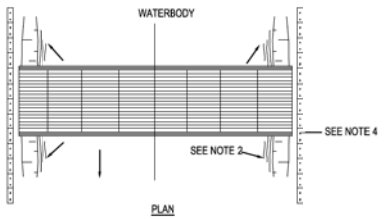
PLAN VIEW



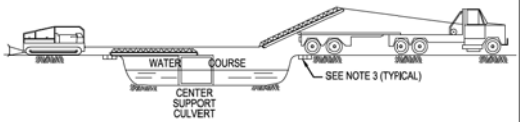
PLAN



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 UP TO BOTH SIDES OF THE CROSSING; STRING, WELD, COAT AND WEIGHT (IF NECESSARY) USING THE MAINLINE CREW WITH THE PIPE SKIDDED OVER THE CROSSING.
3. NO REFUELING OF MOBILE EQUIPMENT WITHIN 100 FEET OF DRY CHANNEL. REFUEL STATIONARY EQUIPMENT AS PER THE SPCC PLAN.
4. INSTALLATION OF TEMPORARY EQUIPMENT CROSSING IS REQUIRED AT ALL STREAM CROSSINGS. EQUIPMENT CROSSING MUST BE BUILT IN ACCORDANCE WITH THE TYPICAL PORTABLE WATERBODY BRIDGE DETAIL.
5. IN AGRICULTURAL LAND, STRIP TOPSOIL FROM SPOIL STORAGE AREA. STOCKPILE TOPSOIL AND SPOIL SEPARATELY. TOPSOIL AND SPOIL WILL NOT BE STOCKPILED IN THE CROSSING CHANNEL AND WILL BE PLACED A MINIMUM OF 10 FEET FROM CROSSING BANKS WITHIN THE CONSTRUCTION R.O.W.
6. CONSTRUCT SEDIMENT BARRIERS ACROSS THE ENTIRE CONSTRUCTION R.O.W. FOLLOWING CLEARING AND GRADING AND MAINTAIN UNTIL CONSTRUCTION OF THE CROSSING. EROSION CONTROL MEASURES SHALL BE REINSTALLED IMMEDIATELY FOLLOWING BACKFILLING OF TRENCH AND STABILIZATION OF BANKS. BARRIERS MAY BE TEMPORARILY REMOVED TO ALLOW CONSTRUCTION ACTIVITIES BUT MUST BE REPLACED BY THE END OF EACH WORK DAY.
7. IN-STREAM SPOIL TO BE STORED OUT OF THE STREAM CHANNEL A MINIMUM OF 10 FEET FROM HIGH BANK AND WITHIN THE CONSTRUCTION R.O.W. UNLESS DEPICTED OTHERWISE IN SITE SPECIFIC CROSSING PLANS.
8. BACKFILL WITH NATIVE MATERIAL.
9. RESTORE CROSSING CHANNEL TO APPROXIMATE PRE-CONSTRUCTION PROFILE AND SUBSTRATE.
10. RESTORE CROSSING BANKS TO APPROXIMATE ORIGINAL CONDITION AND STABILIZE, AS REQUIRED.
11. ALL DIMENSIONS INDICATED SHALL BE DETERMINED BY ACTUAL CONSTRUCTION CONDITIONS.

TYPICAL NON-FLOWING WATERBODY CROSSING OPEN CUT TRENCHING

SCALE: N.T.S.

NOTES:

1. THIS TYPE OF BRIDGE IS GENERALLY USED ON NARROW, DEEP CROSSINGS.
2. BRIDGE IS ANCHORED AND/OR TIED OFF TO ANCHOR BLOCKS FOR STABILITY.
3. UTILIZE APPROACH FILLS OF CLEAN GRANULAR MATERIAL, SWAMP MATS, SKIDS OR OTHER SUITABLE MATERIALS TO AVOID CUTTING THE BANKS WHEREVER FEASIBLE. ENSURE ADEQUATE FREEBOARD, AS REQUIRED, ENSURE THAT FILL MATERIAL USED DOES NOT SPILL INTO WATERCOURSE.
4. CONSTRUCT SEDIMENT BARRIERS ACROSS THE ENTIRE CONSTRUCTION R.O.W. TO PREVENT SILT LADEN WATER AND SPOIL FROM FLOWING BACK INTO WATERSODY. 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	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
07/20/2020	CNS	PRINCIPAL ENGINEER

DUKE ENERGY. Piedmont Natural Gas

C350 PROJECT
CONSTRUCTION DETAILS 5
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

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

SHEET(S)	5 OF 10	DWG SCALE	NONE
DWG DATE	06-05-2018	SUPERSEDED	

DRAWING NUMBER	REVISION
PNG -C-350-0001307	B

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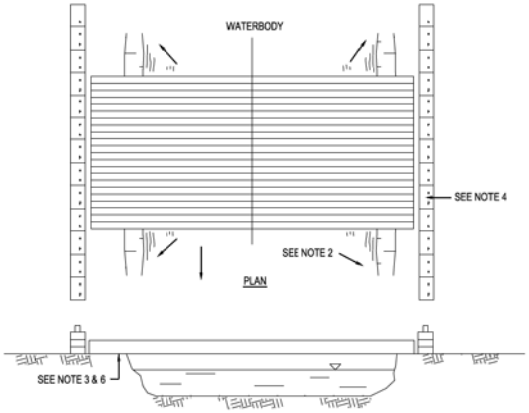
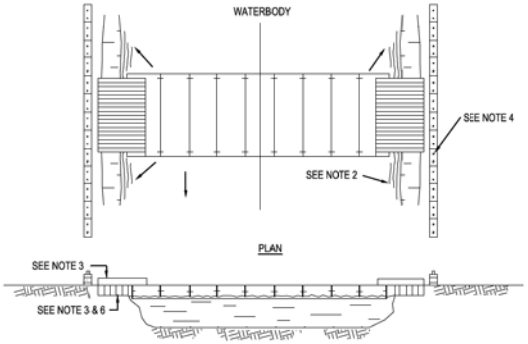


1. THIS TYPE OF BRIDGE IS GENERALLY USED ON NARROW CROSSINGS, LESS THAN 20 FEET WIDE WITH APPROPRIATE BANK CONFIGURATION. MULTIPLE MATS MAY BE LAYERED FOR HEAVIER EQUIPMENT CROSSINGS.
2. BRIDGE IS ANCHORED AND/OR TIED OFF TO ANCHOR BLOCKS FOR STABILITY. BRIDGE SHOULD BE TEMPORARILY REMOVED IF HIGH WATER 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

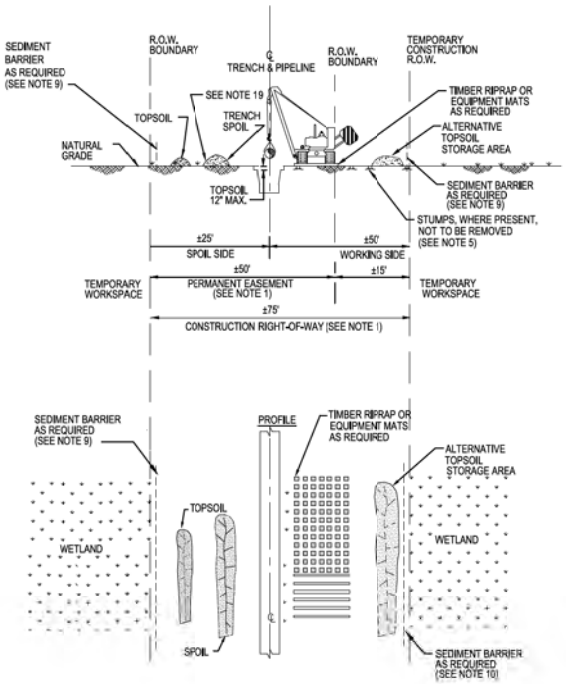
SCALE: N.T.S.



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.



PLAN VIEW

1. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 75 FEET WIDE CONSISTING OF 50 FEET OF PERMANENT EASEMENT AND UP TO 25 FEET OF TEMPORARY WORKSPACE.
2. THE SAME LAYOUT APPLIES WHETHER CONSTRUCTION R.O.W. DOES OR DOES NOT ABUT A FOREIGN R.O.W.
3. LOCATE ANY EXTRA TEMPORARY WORK SPACE AREAS AT LEAST 25 FEET FROM EDGE OF WETLAND AND WITHIN THE APPLICABLE FULL WIDTH CONSTRUCTION R.O.W.
4. CLEARING OF VEGETATION AND TREES IS PROHIBITED BETWEEN TEMPORARY EXTRA WORK SPACE AND THE EDGE OF THE WETLAND
5. CUT VEGETATION AND TREES OFF AT GROUND LEVEL, LEAVING EXISTING ROOT SYSTEMS IN PLACE WHEREVER PRACTICABLE, AND REMOVE CUTTINGS FROM THE WETLAND FOR DISPOSAL.
6. LIMIT CONSTRUCTION EQUIPMENT TO ONE PASS THROUGH WETLANDS TO THE EXTENT PRACTICABLE.
7. NO REFUELING OF EQUIPMENT WITHIN 100 FEET OF WETLAND EXCEPT IN ACCORDANCE WITH THE SPCC PLAN.
8. IF SATURATED AT TIME OF CONSTRUCTION, REDUCE SOIL COMPACTION BY UTILIZING WIDE-TRACK OR BALLOON TIRE CONSTRUCTION EQUIPMENT OR NORMAL EQUIPMENT OPERATED ON TIMBER RIPRAP OR EQUIPMENT MATS.
9. AVOID ADJACENT WETLANDS. INSTALL SEDIMENT BARRIERS IMMEDIATELY AFTER INITIAL GROUND DISTURBANCE AND AT THE EDGE OF THE CONSTRUCTION R.O.W. ALONG THE WETLAND AS DIRECTED BY THE COMPANY'S INSPECTOR.
10. THIS DRAWING REFLECTS "TRENCH ONLY" TOPSOIL STRIPPING PROCEDURE FOR AREAS WHERE STANDING WATER OR SATURATED SOIL ARE NOT PRESENT.
11. SALVAGE UP TO 12" OF TOPSOIL OVER TRENCH AT LOCATIONS IDENTIFIED ON THE CONSTRUCTION DRAWINGS OR AS DIRECTED BY THE COMPANY'S INSPECTOR. MAINTAIN SEPARATION BETWEEN TOPSOIL AND TRENCH SPOIL.
12. LEAVE GAPS IN TOPSOIL AND SPOIL PILES AT OBVIOUS DRAINAGES. DO NOT USE TOPSOIL FOR PADDING. AVOID SCALPING VEGETATED GROUND SURFACE WHEN BACKFILLING SPOIL PILE.
13. IN UNSATURATED CONDITIONS, SPOIL MAY BE USED TO STABILIZE THE WORKING SIDE.
14. IF SATURATED AT TIME OF CONSTRUCTION, LEAVE HARD PLUGS AT THE EDGE OF WETLAND UNTIL JUST PRIOR TO TRENCHING.
15. TRENCH THROUGH WETLANDS.
16. LOWER-IN PIPE, INSTALL TRENCH BREAKERS AT WETLAND EDGES AS DIRECTED BY THE COMPANY'S INSPECTOR TO PREVENT DRAINAGE. BACKFILL UPON COMPLETION OF CONSTRUCTION.
17. REMOVE ALL TIMBER, RIPRAP OR EQUIPMENT MATS FROM WETLANDS UPON COMPLETION OF CONSTRUCTION.
18. RESTORE GRADE TO NEAR PRE-CONSTRUCTION TOPOGRAPHY AND REPLACE TOPSOIL, WHERE SALVAGED, WITHOUT A CROWN OVER THE TRENCH.
19. IF STANDING WATER IS NOT PRESENT, SEED AS SPECIFIED.
20. TOPSOIL AND TRENCH SPOIL RELATIVE POSITIONS CAN, AS DIRECTED BY THE COMPANY'S INSPECTOR, BE REVERSED.

TYPICAL WETLAND CROSSING

SCALE: N.T.S.

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

DUKE ENERGY. Piedmont Natural Gas

C350 PROJECT
CONSTRUCTION DETAILS 6
HAMILTON COUNTY, OHIO

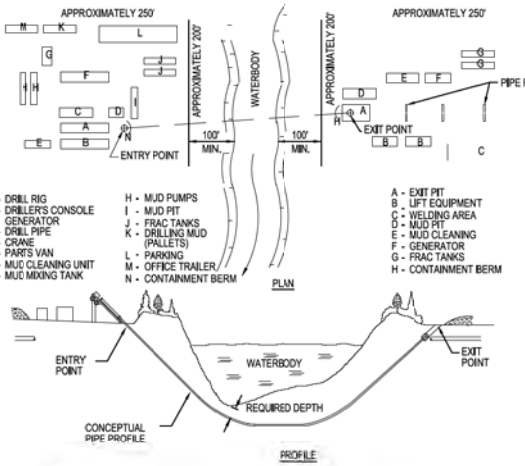
HAMILTON COUNTY, OHIO

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

SHEET(S) 6 OF 10	DWG SCALE NONE
DWG DATE 06-05-2018	SUPERSEDED —

DRAWING NUMBER: PNG -C-350-0001308 | REVISION: B

C:\HAMILTON COUNTY\C350

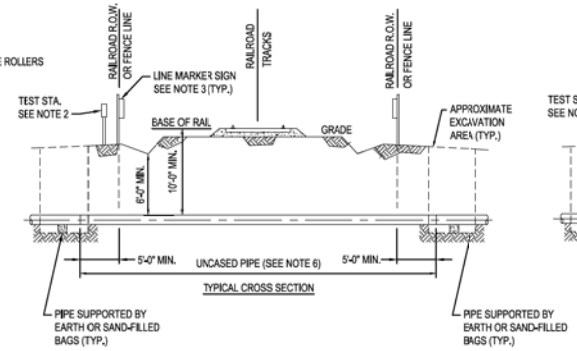


NOTES:

1. SET UP DRILLING EQUIPMENT A MINIMUM OF 100 FEET FROM THE EDGE OF THE WATERCOURSE. DO NOT CLEAR OR GRADE WITHIN THE 100 FOOT ZONE.
2. ENSURE THAT ONLY BENTONITE BASED DRILLING MUD IS USED. DO NOT ALLOW THE USE OF ANY ADDITIVES TO THE DRILLING MUD WITHOUT THE APPROVAL OF COMPANY'S INSPECTOR.
3. INSTALL SUITABLE DRILLING MUD TANKS OR SUMPS TO PREVENT CONTAMINATION OF WATERCOURSE.
4. INSTALL BERMS DOWNSLOPE FROM THE DRILL ENTRY AND ANTICIPATED EXIT POINTS TO CONTAIN ANY RELEASE OF DRILLING MUD.
5. DISPOSE OF DRILLING MUD IN ACCORDANCE WITH THE APPROPRIATE REGULATORY AUTHORITY REQUIREMENTS.

CONCEPTUAL CROSSING METHOD FOR HORIZONTAL DIRECTIONAL DRILL

SCALE: N.T.S.

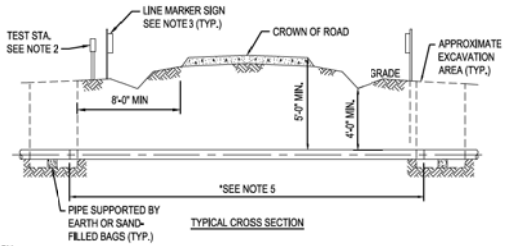


NOTES:

1. WHERE CONFLICTS MAY EXIST, PERMIT SPECIFICATIONS SHALL ALWAYS GOVERN THIS DRAWING.
2. CATHODIC TEST STATION TO BE INSTALLED (IF REQUIRED), SEE TYPICAL DRAWING PNG-E-350-0001013.
3. PIPELINE MARKER TO BE INSTALLED PER TYPICAL DRAWING, PNG-C-350-0001311 (IF REQUIRED).
4. ANY EXCAVATION WITHIN THE LIMITS OF THE R.O.W. SHALL BE REPLACED WITH BACKFILL SPECIFIED BY THE ENGINEER AND COMPACTED IN 6-INCH LAYERS.
5. SAND BAG SUPPORT SHALL BE PLACED ON UNDISTURBED SOIL UNDER THE CARRIER PIPE TO AVOID SAGGING WHEN BACKFILLED.
6. PIPE TO BE IN ACCORDANCE WITH SPECIFIC STATE REQUIREMENTS.
7. THE ANGLE OF INTERSECTION BETWEEN A PIPELINE CROSSING AND THE RAILROAD TO BE CROSSED SHOULD BE AS NEAR TO 90 DEGREES AS PRACTICABLE, IN NO CASE SHOULD IT BE LESS THAN 30 DEGREES.
8. UNCASED GAS PIPELINES, SHALL NOT BE LESS THAN 10 FEET FROM THE BASE OF RAIL TO THE TOP OF THE PIPE AT ITS CLOSEST POINT. AT ALL OTHER LOCATIONS WHERE CROSSING THE RIGHT-OF-WAY, THE MINIMUM GROUND COVER MUST BE 6 FEET.

CONCEPTUAL UNCASED BORED RAILROAD CROSSING

SCALE: N.T.S.

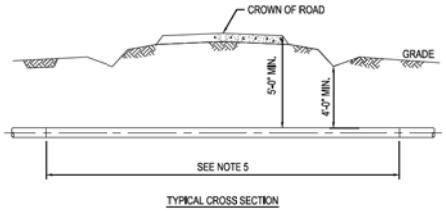


NOTES:

1. CARRIER PIPE IS TO BE COATED WITH APPROVED EXTERNAL PROTECTIVE COATING.
2. CATHODIC TEST STATION TO BE INSTALLED (IF REQUIRED), SEE TYPICAL DRAWING PNG-E-350-0001013.
3. PIPELINE MARKER TO BE INSTALLED PER TYPICAL DRAWING, PNG-C-350-0001311 (IF REQUIRED).
4. INSTALL PIPELINE MARKER & TEST STATIONS ON ROW LINE NEXT TO FENCE IF POSSIBLE.
5. CROSSING SHALL BE INSTALLED BY BORING.
6. PIPE WALL THICKNESS AND GRADE SHALL BE AS SPECIFIED ON ALIGNMENT DRAWINGS.
7. CROSSING TO BE AS NEAR TO 90° 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.

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

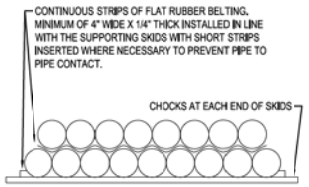
APPROVALS		
DATE	INITIALS	
-	-	REGIONAL ENGINEER
-	-	MGR TECH REC & STD
-	-	PRINCIPAL ENGINEER

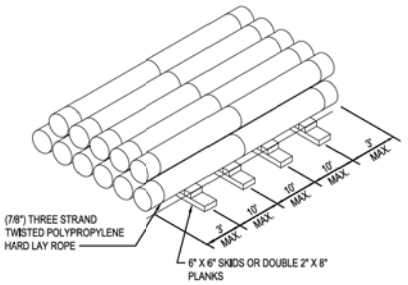
C350 PROJECT
CONSTRUCTION DETAILS 7
HAMILTON COUNTY, OHIO
HAMILTON COUNTY, OHIO

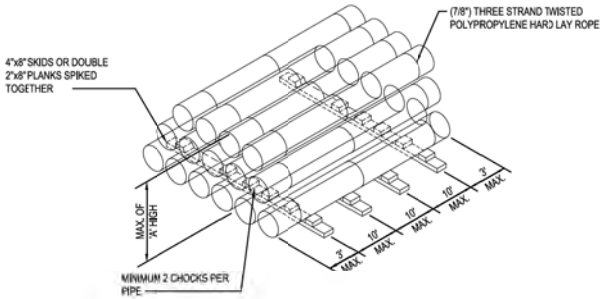
REF. DWG(S): PNG-G-350-0001009

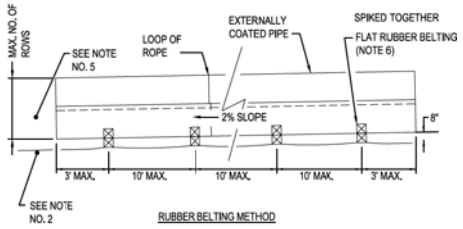
SHEET(S): 7 OF 10 | DWG SCALE: NONE
DWG DATE: 06-05-2018 | SUPERSEDED: —
DRAWING NUMBER: PNG -C-350-0001309 | REVISION: B
C:\HAMILTON COUNTY\C350

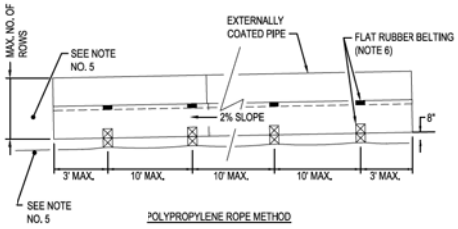
SIZE	'A' (NO. OF ROWS)	CIRCUMFERENCE OF FINISHED LOOPS	SIZE	'A' (NO. OF ROWS)	CIRCUMFERENCE OF FINISHED LOOPS	
4"	12	16'	18"	5	60"	* PIPE GREATER THAN 20" WILL BE 4 ROWS.
6"	10	24"	20"	4 *	66"	
8"	8	30"	24"	4	72"	
10"	6	37"	32"	4	80"	
12"	6	43"	36"	4	92"	
16"	5	54"	42"	4	98"	











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.

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 6" 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 TEMPORARY PIPE STOCKPILE
SCALE: N.T.S.

TYPICAL PERMANENT PIPE STOCKPILE
SCALE: N.T.S.

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

DUKE ENERGY. Piedmont Natural Gas

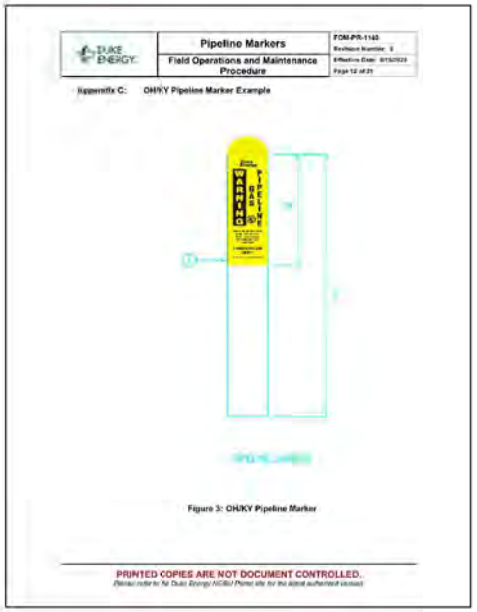
C350 PROJECT
CONSTRUCTION DETAILS 8
HAMILTON COUNTY, OHIO
HAMILTON COUNTY, OHIO

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



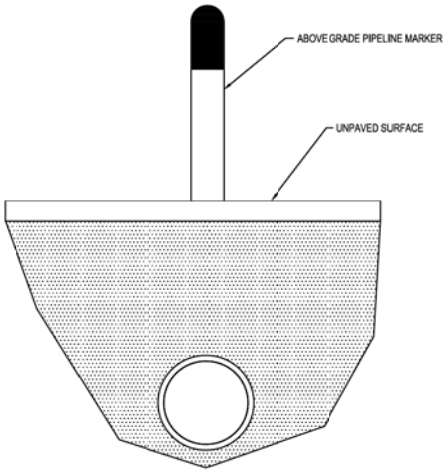
DUKE ENERGY.

Pipeline Markers	FDM-PR-1140
Field Operations and Maintenance Procedure	Revision Number: 3
	Effective Date: 07/15/2020
	Page 12 of 21

Appendix C: OH/KY Pipeline Marker Example

Figure 3: OH/KY Pipeline Marker

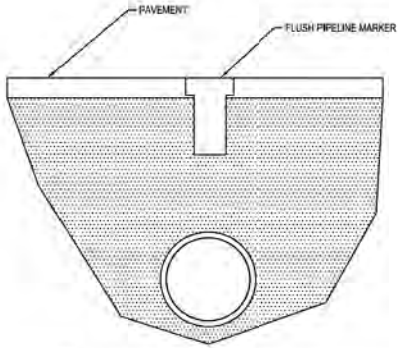
PRINTED COPIES ARE NOT DOCUMENT CONTROLLED.
Please refer to the Duke Energy NCSU Portal site for the latest authorized version.



NOTE:
1. ABOVE GRADE PIPELINE MARKERS TO BE INSTALLED IN GRASS OR UNPAVED AREAS WHEN PIPELINE MARKER IS REQUIRED.
2. PIPELINE MARKERS SHALL BE INSTALLED PER 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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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 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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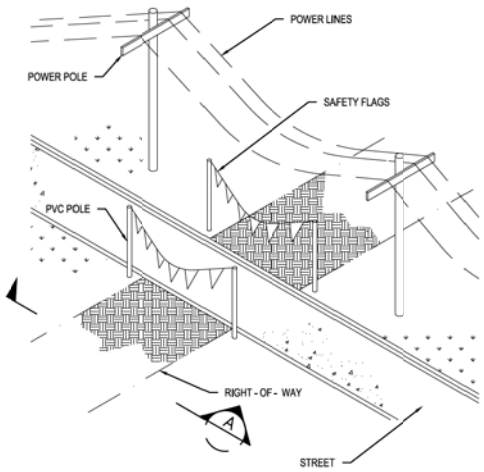
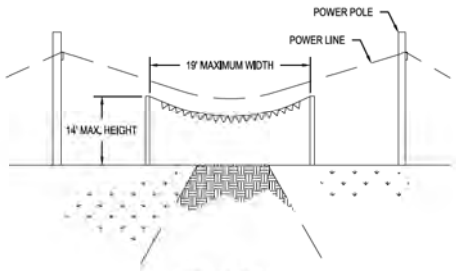




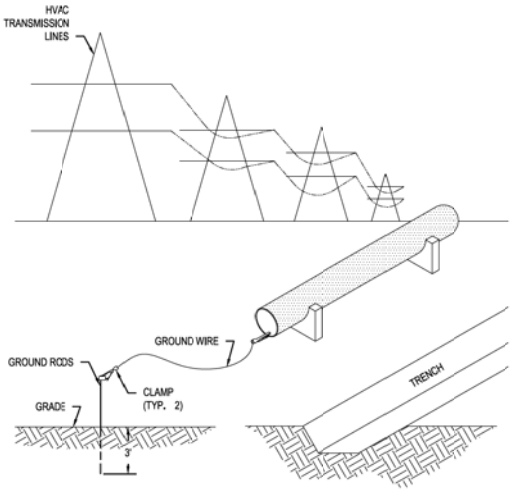
SECTION A-A

SCALE: N.T.S.

NOTE:
1. FLAG HEIGHT AND WIDTH MAY BE ADJUSTED BASED ON SITE CONDITIONS OR AS DIRECTED BY COMPANY REPRESENTATIVE.

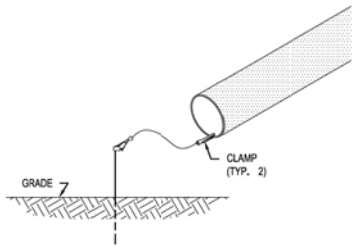
OVERHEAD ELECTRICAL WARNING FLAGS

SCALE: N.T.S.



SAFETY GROUNDING

SCALE: N.T.S.



CLIP CONNECTION

SCALE: N.T.S.

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

DUKE ENERGY. Piedmont Natural Gas

C350 PROJECT
CONSTRUCTION DETAILS 10
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

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

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

DRAWING NUMBER: PNG -C-350-0001312

REVISION: B

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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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