

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:

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

(Equation 3, Appendix A)

Where,

$V_{\text{retention}}$ = volume of runoff retained onsite using an approved infiltration practice

$A_{\text{HSG-x}}$ = 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 ($V_{\text{retention}}$) 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:

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

where:

DA = drainage area (mi²)

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.

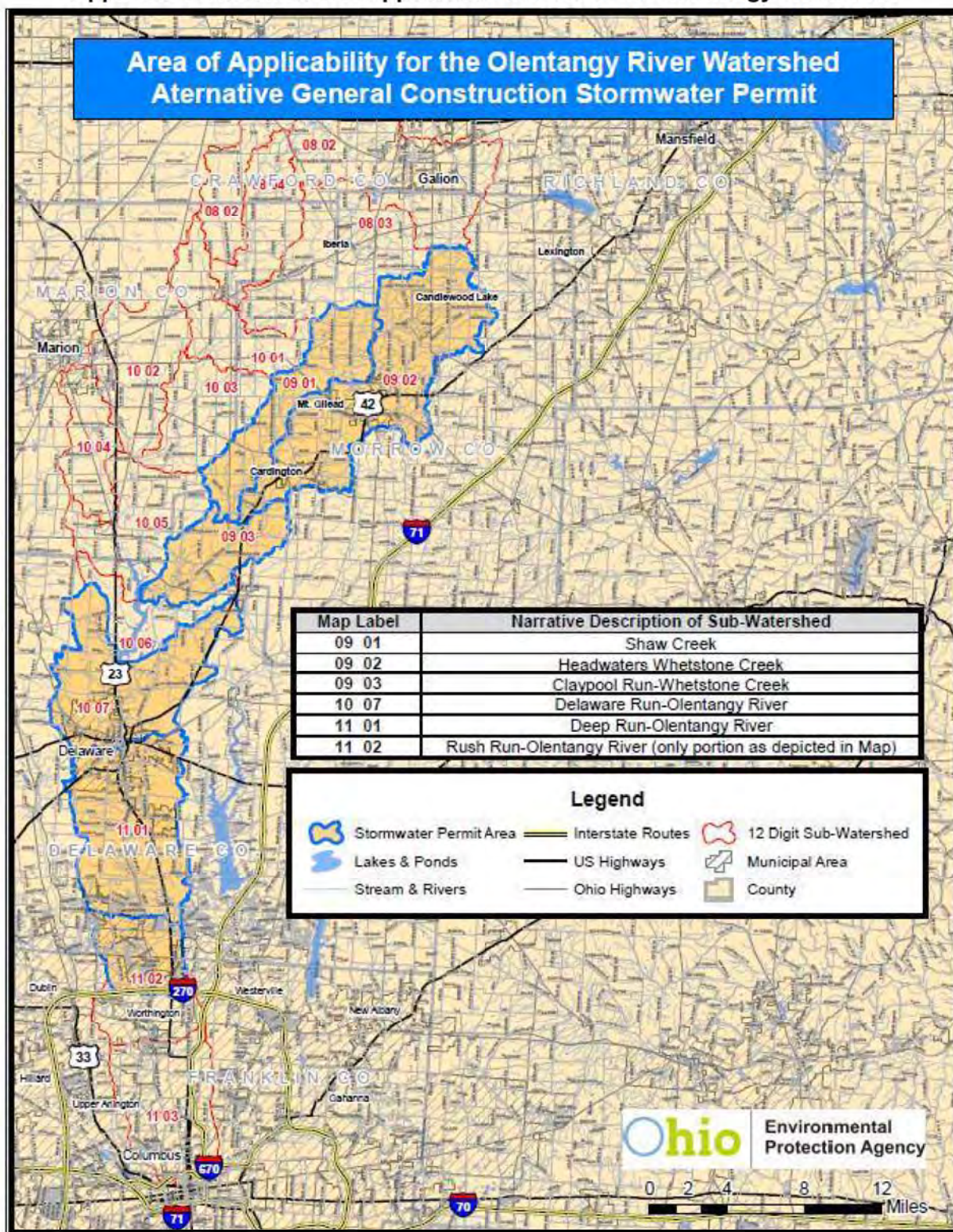
The mitigation required for intrusion into the riparian setback of an **intermittent stream** shall be four (4) times the total area disturbed within the riparian setback of the site being developed shall be mitigated; or two (2) times the total area disturbed within the riparian setback shall be mitigated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

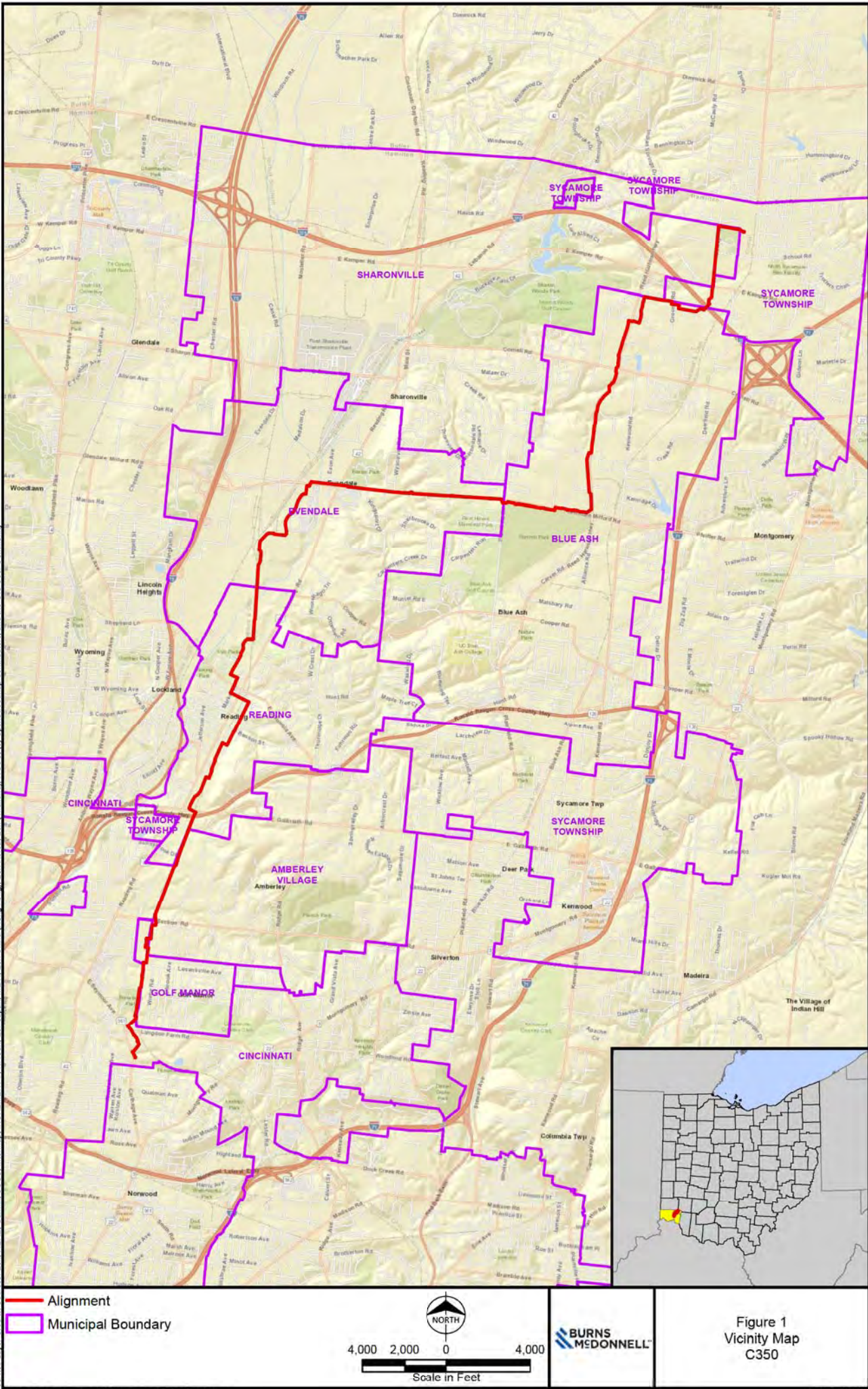
DURATION t_c (minutes)	WATER QUALITY INTENSITY [i_{wq}] (inches/hour)	DURATION t_c (minutes)	WATER QUALITY INTENSITY [i_{wq}] (inches/hour)
5	2.37	33	0.95
6	2.26	34	0.93
7	2.15	35	0.92
8	2.04	36	0.90
9	1.94	37	0.88
10	1.85	38	0.86
11	1.76	39	0.85
12	1.68	40	0.83
13	1.62	41	0.82
14	1.56	42	0.80
15	1.51	43	0.78
16	1.46	44	0.77
17	1.41	45	0.76
18	1.37	46	0.75
19	1.33	47	0.74
20	1.29	48	0.73
21	1.26	49	0.72
22	1.22	50	0.71
23	1.19	51	0.69
24	1.16	52	0.68
25	1.13	53	0.67
26	1.10	54	0.66
27	1.07	55	0.66
28	1.05	56	0.65
29	1.03	57	0.64
30	1.01	58	0.64
31	0.99	59	0.63
32	0.97	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

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



BURNS
MCDONNELL

Figure 1
Vicinity Map
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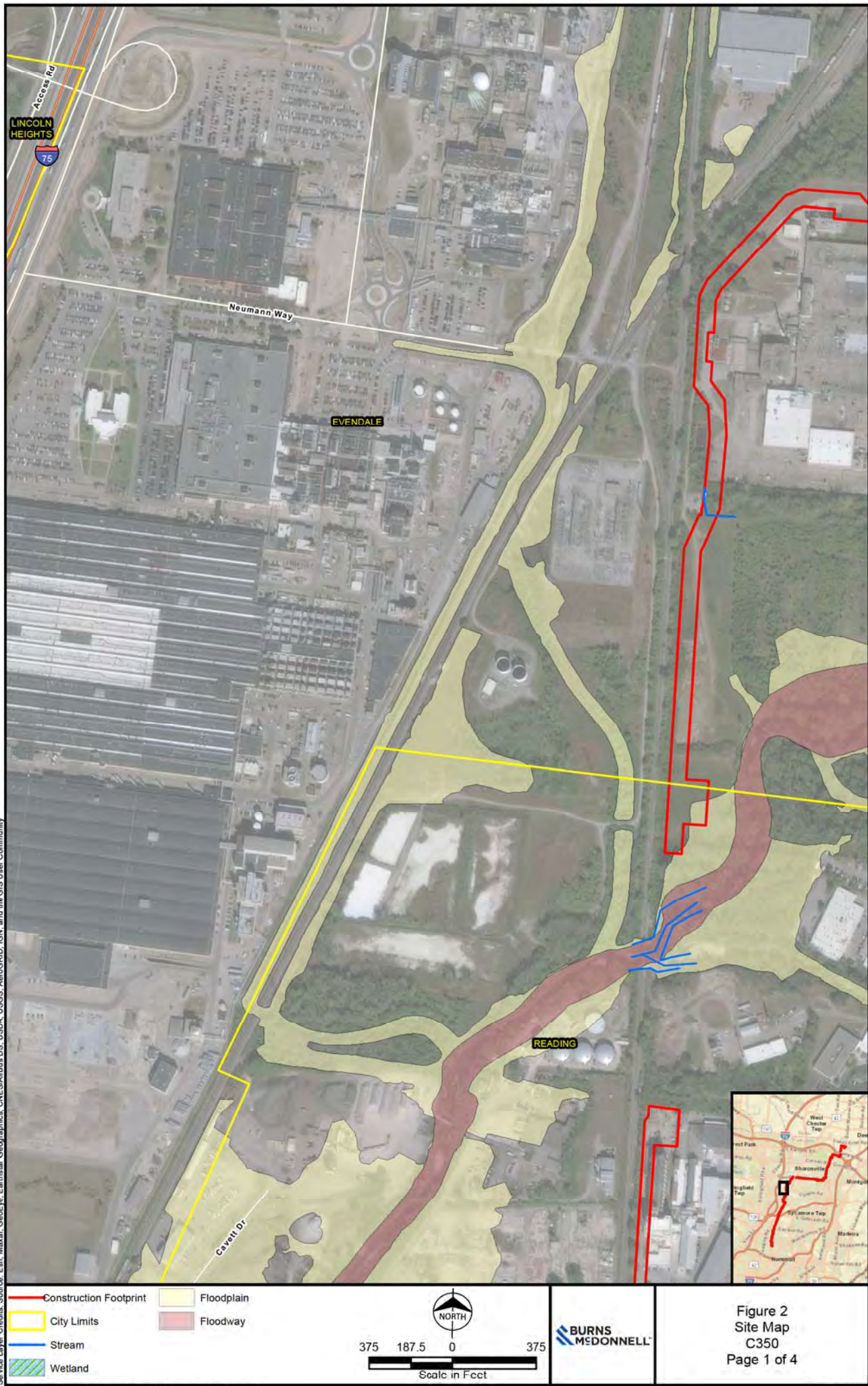


Figure 2
 Site Map
 C350
 Page 1 of 4

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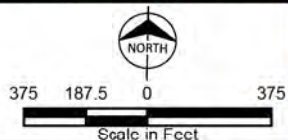
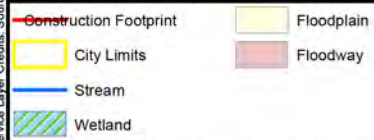
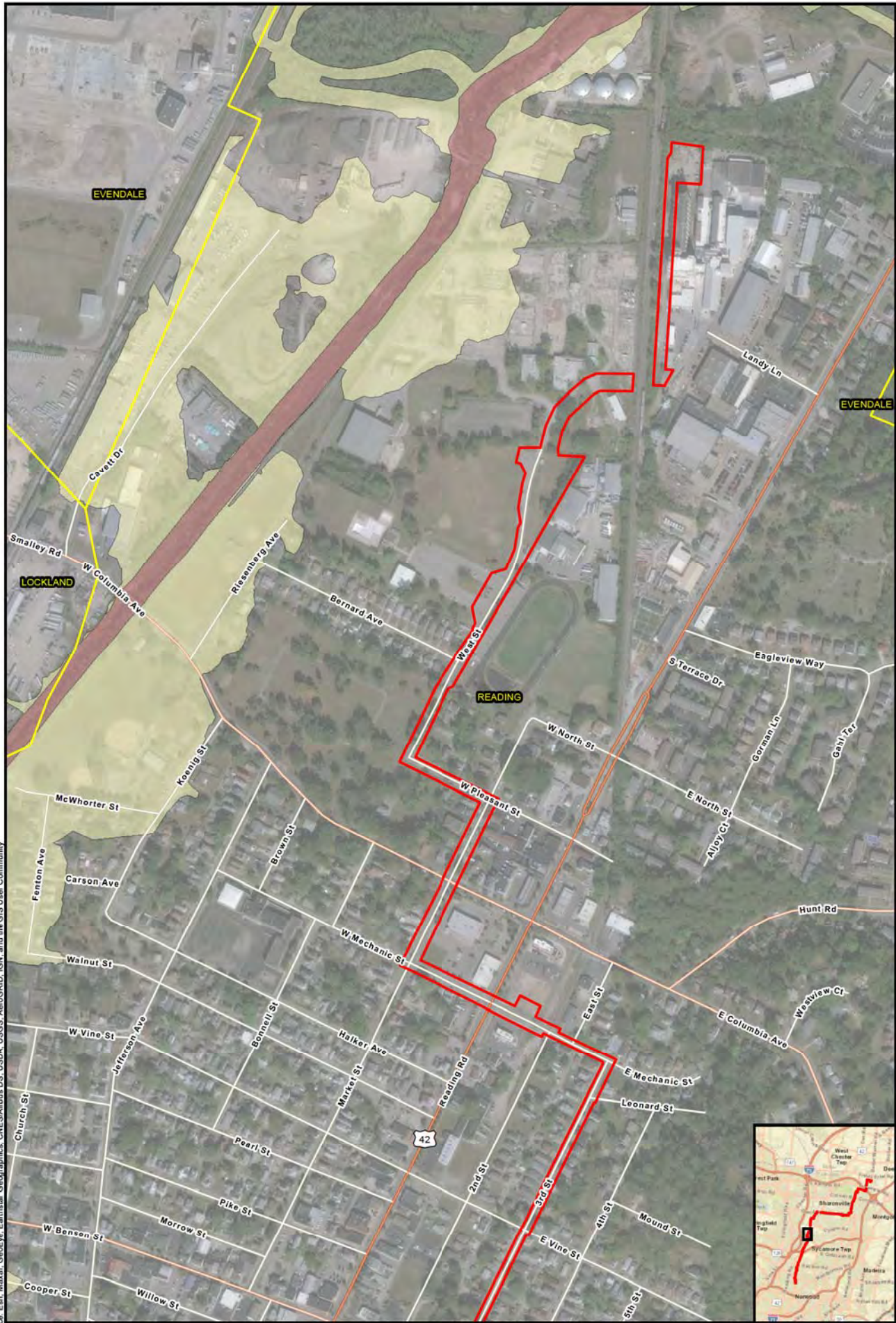
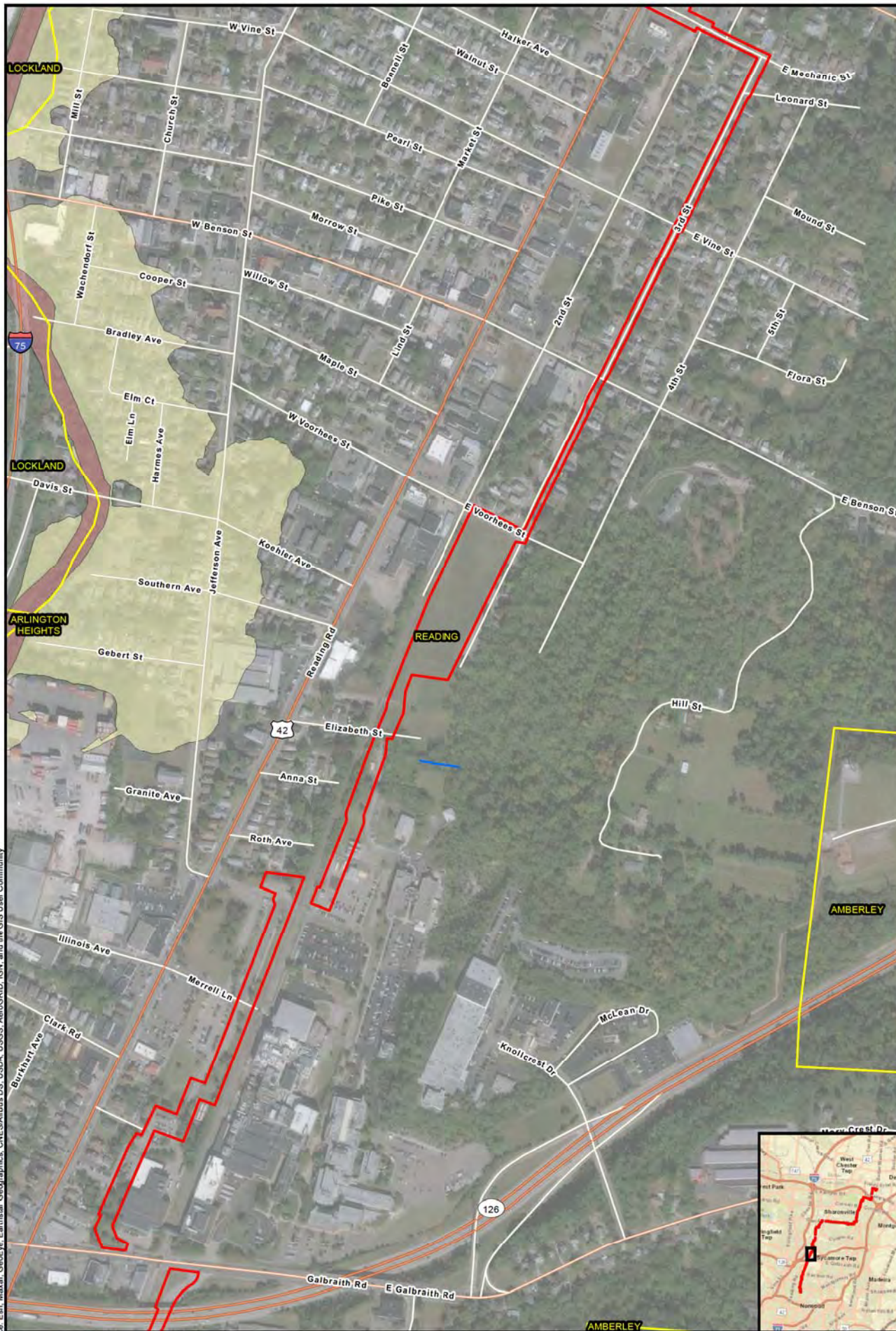


Figure 2
 Site Map
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- Construction Footprint
- City Limits
- Floodplain
- Floodway
- Stream
- Wetland

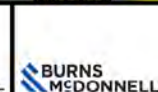
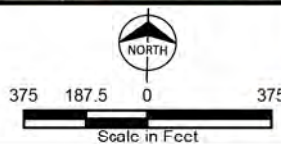


Figure 2
 Site Map
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 Page 3 of 4

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- Construction Footprint
- City Limits
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- Floodplain
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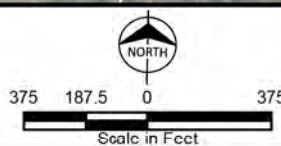


Figure 2
 Site Map
 C350
 Page 4 of 4

Map Unit Symbol & Name
 CdD- Casco loam, 15 to 25 % slopes
 Pn- Patton silty clay loam, 0 to 2 % slopes*
 St- Stonelick fine sandy loam, 0 to 2 % slopes, frequently flooded*
 Ur- Urban land
 UrUXC- Urban land-Udortheims complex, 0 to 12 % slopes
 UrUXF- Urban land-Udortheims complex, smoothed, 0 to 50 % slopes
 UwAXC- Urban land-Alic Udarens complex, loamy substratum over outwash, 0 to 12 % slopes
 W- Water

LINCOLN HEIGHTS

EVENDALE

CdD

Pn

UrUXC

W

W

W

St

UrUXC

READING

St

Ur

Ur

UwAXC

- Construction Footprint
- City Limits
- SSURGO Soils Map Unit

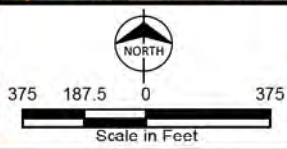
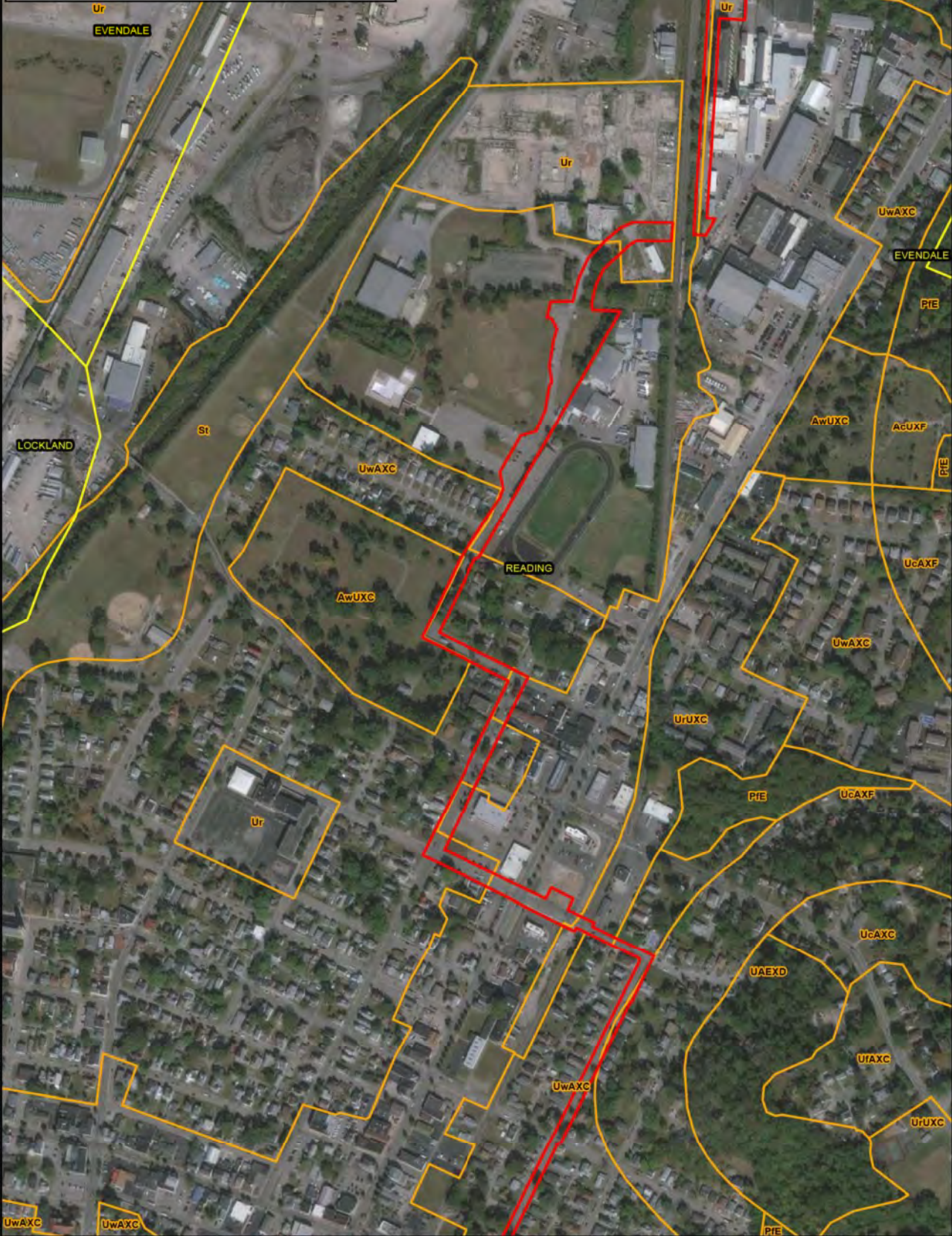


Figure 3
 Soils Map
 C350
 Page 1 of 4

Map Unit Symbol & Name	
AcUXF-	Alfif Udarents-Urban land complex, clayey substratum over bedrock, 25 to 60 % slopes
AwUXC-	Alfif Udarents-Urban land complex, loamy substratum over outwash, 0 to 12 % slopes
PTE-	Pate silty clay loam, 25 to 35 % slopes
St-	Stonelick fine sandy loam, 0 to 2 % slopes, frequently flooded*
UAEXD-	Urban land-Alfif Udarents-Eden complex, 12 to 25 % slopes
UcAXC-	Urban land-Alfif Udarents complex, clayey substratum over bedrock, 0 to 12 % slopes
UcAXF-	Urban land-Alfif Udarents complex, clayey substratum over bedrock, 25 to 60 % slopes
UfAXC-	Urban land-Alfif Udarents complex, fragipan substratum over till, 0 to 12 % slopes
Ur-	Urban land
UrUXC-	Urban land-Udorthents complex, 0 to 12 % slopes
UwAXC-	Urban land-Alfif Udarents complex, loamy substratum over outwash, 0 to 12 % slopes
W-	Water



Construction Footprint

City Limits

SSURGO Soils Map Unit

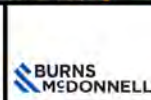
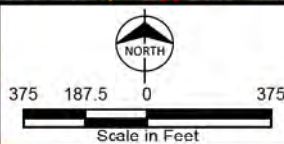
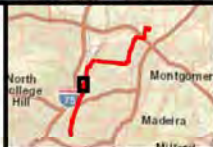
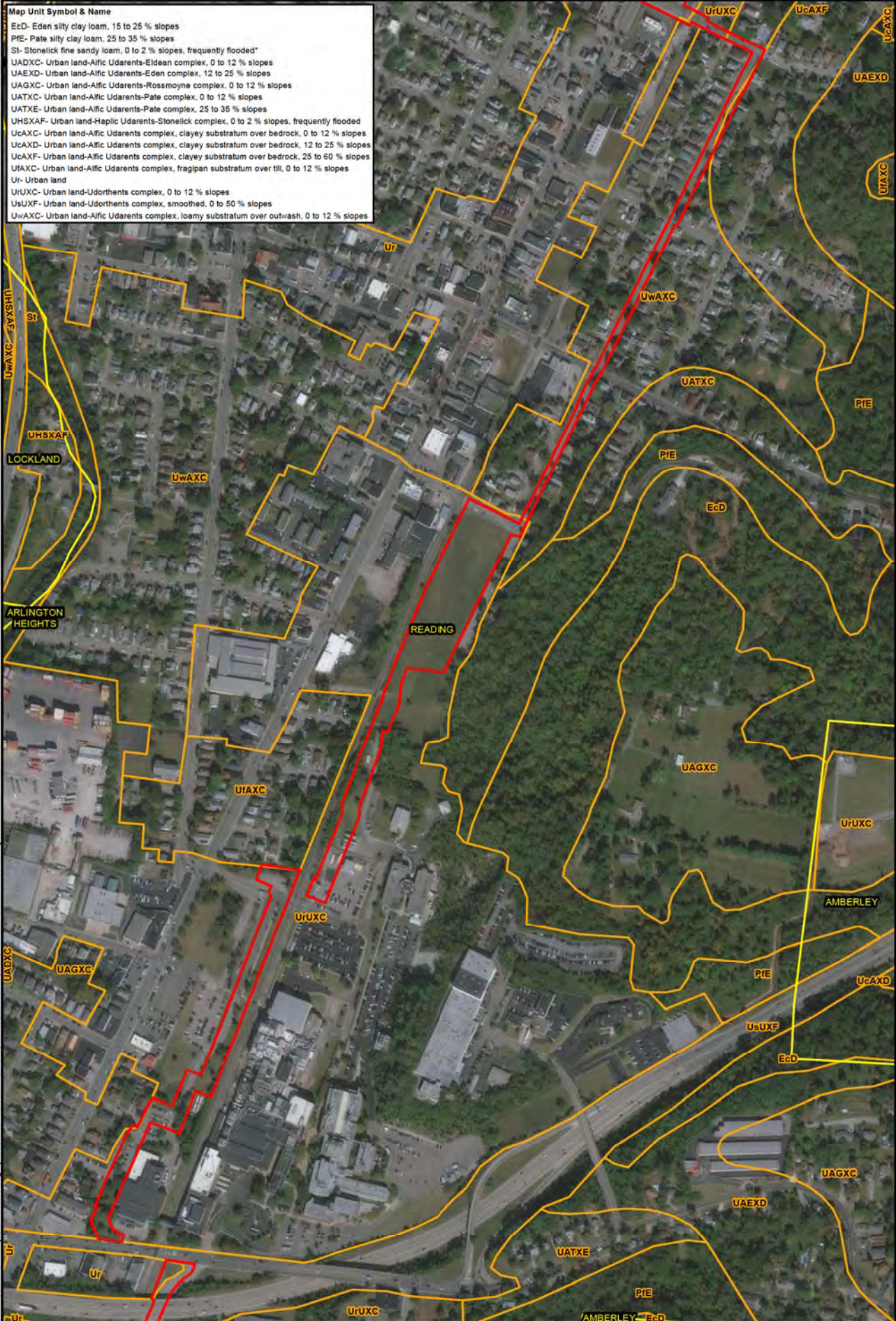


Figure 3
Soils Map
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Page 2 of 4

Map Unit Symbol & Name	
EcD- Eden silty clay loam, 15 to 25 % slopes	
PtE- Pate silty clay loam, 25 to 35 % slopes	
St- Stonelick fine sandy loam, 0 to 2 % slopes, frequently flooded*	
UADXC- Urban land-Alic Udarents-Edlean complex, 0 to 12 % slopes	
UAXC- Urban land-Alic Udarents-Edlean complex, 12 to 25 % slopes	
UAGXC- Urban land-Alic Udarents-Rossmoyne complex, 0 to 12 % slopes	
UATXC- Urban land-Alic Udarents-Pate complex, 0 to 12 % slopes	
UATXE- Urban land-Alic Udarents-Pate complex, 25 to 35 % slopes	
UHSXAF- Urban land-Haplic Udarents-Stonelick complex, 0 to 2 % slopes, frequently flooded	
UcAXD- Urban land-Alic Udarents complex, clayey substratum over bedrock, 0 to 12 % slopes	
UcAXF- Urban land-Alic Udarents complex, clayey substratum over bedrock, 12 to 25 % slopes	
UcAXG- Urban land-Alic Udarents complex, clayey substratum over bedrock, 25 to 60 % slopes	
UfAXC- Urban land-Alic Udarents complex, fragipan substratum over till, 0 to 12 % slopes	
Ur- Urban land	
UrUXC- Urban land-Udorthents complex, 0 to 12 % slopes	
UsUXF- Urban land-Udorthents complex, smoothed, 0 to 50 % slopes	
UwAXC- Urban land-Alic Udarents complex, loamy substratum over outwash, 0 to 12 % slopes	



- Construction Footprint
- City Limits
- SSURGO Soils Map Unit

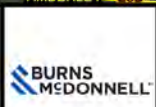
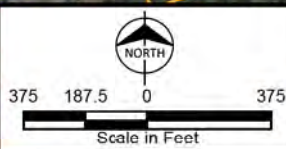
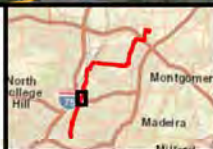
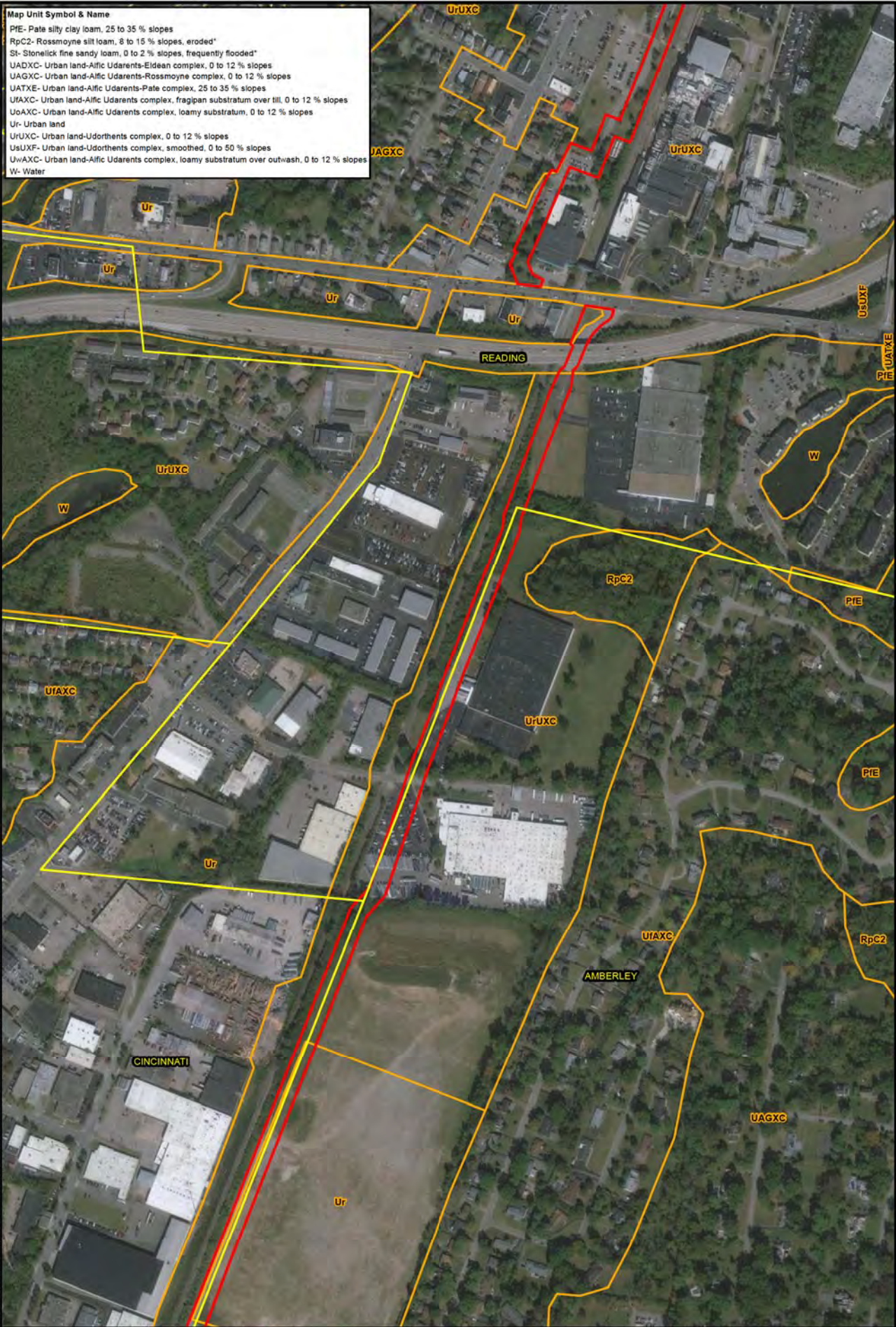


Figure 3
Soils Map
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Page 3 of 4

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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

Map Unit Symbol & Name

PtE- Pate silty clay loam, 25 to 35 % slopes
 RpC2- Rossmyre silt loam, 8 to 15 % slopes, eroded*
 St- Stonelick fine sandy loam, 0 to 2 % slopes, frequently flooded*
 UADXC- Urban land-Alic Udarents-Eldean complex, 0 to 12 % slopes
 UAGXC- Urban land-Alic Udarents-Rossmyre complex, 0 to 12 % slopes
 UATXE- Urban land-Alic Udarents-Pate complex, 25 to 35 % slopes
 UfAXC- Urban land-Alic Udarents complex, fragipan substratum over till, 0 to 12 % slopes
 UoAXC- Urban land-Alic Udarents complex, loamy substratum, 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
 UwAXC- Urban land-Alic Udarents complex, loamy substratum over outwash, 0 to 12 % slopes
 W- Water



Construction Footprint

City Limits

SSURGO Soils Map Unit

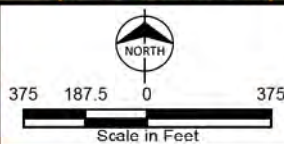


Figure 3
 Soils Map
 C350
 Page 4 of 4

ESC PLANS AND BMP DETAILS FOR PIPELINE CONSTRUCTION



C350 20" PIPELINE
SCALE 1:250

PAGE	DRAWING NUMBER	COVER DESCRIPTION	REV.
1	PNG-C-350-000108	COVER PAGE	B
2	PNG-C-350-000110	SIGN OFF SHEET	B
3	PNG-C-350-000111	GENERAL NOTES SHEET 1	B
4	PNG-C-350-000112	GENERAL NOTES SHEET 2	B
5	PNG-C-350-000113	LEGEND, SYMBOLS, & ABBREVIATIONS	B
6	PNG-D-350-000101	MLV-01 (C350-0001) PWD	B
7	PNG-D-350-000102	MLV-02 (C350-0005) PWD	B
8	PNG-D-350-000103	PIPELINE BILL OF MATERIAL	B
9	PNG-C-350-000113	PIPELINE ROUTE OVERVIEW MAP	B
10	PNG-C-350-000114	ACCESS ROUTES 1	B
11	PNG-C-350-000115	ACCESS ROUTES 2	B
12	PNG-C-350-000116	ACCESS ROUTES 3	B
13	PNG-C-350-000117	ACCESS ROUTES 4	B
14	PNG-C-350-000118	ACCESS ROUTES 5	B
15	PNG-C-350-000119	ACCESS ROUTES 6	B
16	PNG-C-350-000120	ACCESS ROUTES 7	B
17	PNG-C-350-000121	ACCESS ROUTES 8	B
18	PNG-C-350-000122	ACCESS ROUTES 9	B
19	PNG-C-350-000123	ACCESS ROUTES 10	B
20	PNG-C-350-000124	ACCESS ROUTES 11	B
21	PNG-C-350-000125	ACCESS ROUTES 12	B
22	PNG-C-350-000126	ALIGNMENT PLAN AND PROFILE SHT 1	B
23	PNG-C-350-000127	ALIGNMENT PLAN AND PROFILE SHT 2	B
24	PNG-C-350-000128	ALIGNMENT PLAN AND PROFILE SHT 3	B
25	PNG-C-350-000129	ALIGNMENT PLAN AND PROFILE SHT 4	B
26	PNG-C-350-000130	ALIGNMENT PLAN AND PROFILE SHT 5	B
27	PNG-C-350-000131	ALIGNMENT PLAN AND PROFILE SHT 6	B
28	PNG-C-350-000132	ALIGNMENT PLAN AND PROFILE SHT 7	B
29	PNG-C-350-000133	ALIGNMENT PLAN AND PROFILE SHT 8	B
30	PNG-C-350-000134	ALIGNMENT PLAN AND PROFILE SHT 9	B
31	PNG-C-350-000135	ALIGNMENT PLAN AND PROFILE SHT 10	B
32	PNG-C-350-000136	ALIGNMENT PLAN AND PROFILE SHT 11	B
33	PNG-C-350-000137	ALIGNMENT PLAN AND PROFILE SHT 12	B
34	PNG-C-350-000138	ALIGNMENT PLAN AND PROFILE SHT 13	B
35	PNG-C-350-000139	ALIGNMENT PLAN AND PROFILE SHT 14	B
36	PNG-C-350-000140	ALIGNMENT PLAN AND PROFILE SHT 15	B
37	PNG-C-350-000141	ALIGNMENT PLAN AND PROFILE SHT 16	B
38	PNG-C-350-000142	ALIGNMENT PLAN AND PROFILE SHT 17	B
39	PNG-C-350-000143	ALIGNMENT PLAN AND PROFILE SHT 18	B
40	PNG-C-350-000144	ALIGNMENT PLAN AND PROFILE SHT 19	B
41	PNG-C-350-000145	ALIGNMENT PLAN AND PROFILE SHT 20	B
42	PNG-C-350-000146	ALIGNMENT PLAN AND PROFILE SHT 21	B
43	PNG-C-350-000147	ALIGNMENT PLAN AND PROFILE SHT 22	B
44	PNG-C-350-000148	ALIGNMENT PLAN AND PROFILE SHT 23	B
45	PNG-C-350-000149	ALIGNMENT PLAN AND PROFILE SHT 24	B
46	PNG-C-350-000150	ALIGNMENT PLAN AND PROFILE SHT 25	B
47	PNG-C-350-000151	ALIGNMENT PLAN AND PROFILE SHT 26	B
48	PNG-C-350-000152	ALIGNMENT PLAN AND PROFILE SHT 27	B
49	PNG-C-350-000153	ALIGNMENT PLAN AND PROFILE SHT 28	B
50	PNG-C-350-000154	ALIGNMENT PLAN AND PROFILE SHT 29	B
51	PNG-C-350-000155	ALIGNMENT PLAN AND PROFILE SHT 30	B
52	PNG-C-350-000156	ALIGNMENT PLAN AND PROFILE SHT 31	B
53	PNG-C-350-000157	ALIGNMENT PLAN AND PROFILE SHT 32	B
54	PNG-C-350-000158	ALIGNMENT PLAN AND PROFILE SHT 33	B
55	PNG-C-350-000159	ALIGNMENT PLAN AND PROFILE SHT 34	B
56	PNG-C-350-000160	ALIGNMENT PLAN AND PROFILE SHT 35	B
57	PNG-C-350-000161	ALIGNMENT PLAN AND PROFILE SHT 36	B
58	PNG-C-350-000162	ALIGNMENT PLAN AND PROFILE SHT 37	B
59	PNG-C-350-000163	ALIGNMENT PLAN AND PROFILE SHT 38	B

60	PNG-C-350-000127	ALIGNMENT PLAN AND PROFILE SHT 39	B
61	PNG-C-350-000128	ALIGNMENT PLAN AND PROFILE SHT 40	B
62	PNG-C-350-000129	ALIGNMENT PLAN AND PROFILE SHT 41	B
63	PNG-C-350-000130	ALIGNMENT PLAN AND PROFILE SHT 42	B
64	PNG-C-350-000131	ALIGNMENT PLAN AND PROFILE SHT 43	B
65	PNG-C-350-000132	ALIGNMENT PLAN AND PROFILE SHT 44	B
66	PNG-C-350-000133	ALIGNMENT PLAN AND PROFILE SHT 45	B
67	PNG-C-350-000134	ALIGNMENT PLAN AND PROFILE SHT 46	B
68	PNG-C-350-000135	ALIGNMENT PLAN AND PROFILE SHT 47	B
69	PNG-C-350-000136	ALIGNMENT PLAN AND PROFILE SHT 48	B
70	PNG-C-350-000137	ALIGNMENT PLAN AND PROFILE SHT 49	B
71	PNG-C-350-000138	ALIGNMENT PLAN AND PROFILE SHT 50	B
72	PNG-C-350-000139	ALIGNMENT PLAN AND PROFILE SHT 51	B
73	PNG-C-350-000140	ALIGNMENT PLAN AND PROFILE SHT 52	B
74	PNG-C-350-000141	ALIGNMENT PLAN AND PROFILE SHT 53	B
75	PNG-C-350-000142	ALIGNMENT PLAN AND PROFILE SHT 54	B
76	PNG-C-350-000143	ALIGNMENT PLAN AND PROFILE SHT 55	B
77	PNG-C-350-000144	ALIGNMENT PLAN AND PROFILE SHT 56	B
78	PNG-C-350-000145	ALIGNMENT PLAN AND PROFILE SHT 57	B
79	PNG-C-350-000146	ALIGNMENT PLAN AND PROFILE SHT 58	B
80	PNG-C-350-000147	ALIGNMENT PLAN AND PROFILE SHT 59	B
81	PNG-C-350-000148	ALIGNMENT PLAN AND PROFILE SHT 60	B
82	PNG-C-350-000149	ALIGNMENT PLAN AND PROFILE SHT 61	B
83	PNG-C-350-000150	ALIGNMENT PLAN AND PROFILE SHT 62	B
84	PNG-C-350-000151	ALIGNMENT PLAN AND PROFILE SHT 63	B
85	PNG-C-350-000152	ALIGNMENT PLAN AND PROFILE SHT 64	B
86	PNG-C-350-000153	CROSSING DETAILS 1	B
87	PNG-C-350-000154	CROSSING DETAILS 2	B
88	PNG-C-350-000155	CROSSING DETAILS 3	B
89	PNG-C-350-000156	CROSSING DETAILS 4	B
90	PNG-C-350-000157	CROSSING DETAILS 5	B
91	PNG-C-350-000158	CROSSING DETAILS 6	B
92	PNG-C-350-000159	CROSSING DETAILS 7	B
93	PNG-C-350-000160	CROSSING DETAILS 8	B
94	PNG-C-350-000161	CROSSING DETAILS 9	B
95	PNG-C-350-000162	CROSSING DETAILS 10	B
96	PNG-C-350-000163	CROSSING DETAILS 11	B
97	PNG-C-350-000164	CROSSING DETAILS 12	B
98	PNG-C-350-000165	CROSSING DETAILS 13	B
99	PNG-C-350-000166	CROSSING DETAILS 14	B
100	PNG-C-350-000167	CROSSING DETAILS 15	B
101	PNG-C-350-000168	CROSSING DETAILS 16	B
102	PNG-C-350-000169	CROSSING DETAILS 17	B
103	PNG-C-350-000170	CROSSING DETAILS 18	B
104	PNG-C-350-000171	CROSSING DETAILS 19	B
105	PNG-C-350-000172	CROSSING DETAILS 20	B
106	PNG-C-350-000173	CROSSING DETAILS 21	B
107	PNG-C-350-000174	CROSSING DETAILS 22	B
108	PNG-C-350-000175	CROSSING DETAILS 23	B
109	PNG-C-350-000176	CROSSING DETAILS 24	B
110	PNG-C-350-000177	CROSSING DETAILS 25	B
111	PNG-C-350-000178	CROSSING DETAILS 26	B
112	PNG-C-350-000179	CROSSING DETAILS 27	B
113	PNG-C-350-000180	CROSSING DETAILS 28	B
114	PNG-C-350-000181	CROSSING DETAILS 29	B
115	PNG-C-350-000182	CROSSING DETAILS 30	B
116	PNG-C-350-000183	CROSSING DETAILS 31	B
117	PNG-C-350-000184	CROSSING DETAILS 32	B
118	PNG-C-350-000185	CROSSING DETAILS 33	B
119	PNG-C-350-000186	CROSSING DETAILS 34	B
120	PNG-C-350-000187	CROSSING DETAILS 35	B

121	PNG-C-350-000128A	ENVIRONMENTAL NOTES & DETAILS 2	B
122	PNG-C-350-000128B	ENVIRONMENTAL NOTES & DETAILS 3	B
123	PNG-C-350-000128C	ENVIRONMENTAL NOTES & DETAILS 4	B
124	PNG-C-350-000129	RESTORATION DETAILS 1	B
125	PNG-C-350-000129A	RESTORATION DETAILS 2	B
126	PNG-C-350-000129B	RESTORATION DETAILS 3	B
127	PNG-C-350-000130	CONSTRUCTION DETAILS 1	B
128	PNG-C-350-000130A	CONSTRUCTION DETAILS 2	B
129	PNG-C-350-000130B	CONSTRUCTION DETAILS 3	B
130	PNG-C-350-000130C	CONSTRUCTION DETAILS 4	B
131	PNG-C-350-000131	CONSTRUCTION DETAILS 5	B
132	PNG-C-350-000132	CONSTRUCTION DETAILS 6	B
133	PNG-C-350-000133	CONSTRUCTION DETAILS 7	B
134	PNG-C-350-000134	CONSTRUCTION DETAILS 8	B
135	PNG-C-350-000135	CONSTRUCTION DETAILS 9	B
136	PNG-C-350-000136	CONSTRUCTION DETAILS 10	B
137	PNG-C-350-000137	CONSTRUCTION DETAILS 11	B
138	PNG-C-350-000138	CONSTRUCTION DETAILS 12	B
139	PNG-C-350-000139	CONSTRUCTION DETAILS 13	B
140	PNG-C-350-000140	CONSTRUCTION DETAILS 14	B
141	PNG-C-350-000141	CONSTRUCTION DETAILS 15	B
142	PNG-C-350-000142	CONSTRUCTION DETAILS 16	B
143	PNG-C-350-000143	CONSTRUCTION DETAILS 17	B
144	PNG-C-350-000144	CONSTRUCTION DETAILS 18	B
145	PNG-C-350-000145	CONSTRUCTION DETAILS 19	B
146	PNG-C-350-000146	CONSTRUCTION DETAILS 20	B
147	PNG-C-350-000147	CONSTRUCTION DETAILS 21	B
148	PNG-C-350-000148	CONSTRUCTION DETAILS 22	B
149	PNG-C-350-000149	CONSTRUCTION DETAILS 23	B
150	PNG-C-350-000150	CONSTRUCTION DETAILS 24	B
151	PNG-C-350-000151	CONSTRUCTION DETAILS 25	B
152	PNG-C-350-000152	CONSTRUCTION DETAILS 26	B
153	PNG-C-350-000153	CONSTRUCTION DETAILS 27	B
154	PNG-C-350-000154	CONSTRUCTION DETAILS 28	B
155	PNG-C-350-000155	CONSTRUCTION DETAILS 29	B
156	PNG-C-350-000156	CONSTRUCTION DETAILS 30	B
157	PNG-C-350-000157	CONSTRUCTION DETAILS 31	B
158	PNG-C-350-000158	CONSTRUCTION DETAILS 32	B
159	PNG-C-350-000159	CONSTRUCTION DETAILS 33	B
160	PNG-C-350-000160	CONSTRUCTION DETAILS 34	B
161	PNG-C-350-000161	CONSTRUCTION DETAILS 35	B
162	PNG-C-350-000162	CONSTRUCTION DETAILS 36	B
163	PNG-C-350-000163	CONSTRUCTION DETAILS 37	B
164	PNG-C-350-000164	CONSTRUCTION DETAILS 38	B
165	PNG-C-350-000165	CONSTRUCTION DETAILS 39	B
166	PNG-C-350-000166	CONSTRUCTION DETAILS 40	B
167	PNG-C-350-000167	CONSTRUCTION DETAILS 41	B

FOR BID - NOT
FOR CONSTRUCTION

SHEET 1 OF 5	DWG SCALE	AS NOTED
DWG DATE 08/04/2020	SUPERSEDED	
DRAWING NUMBER		
PNG - G-350-0001009		
HAMILTON COUNTY, OHIO		

C350 PROJECT
COVER SHEET
HAMILTON COUNTY, OHIO



DATE	BY	CHK	APP	DESCRIPTION
08/17/2020	AKT	CNS	AKT	REVISION DESCRIPTION
07/24/2020	AKT	CNS	AKT	PROJECT NUMBER 180115
				DRAWING BY AKT
				STATION ID C350
				CHECKER INITIALS JMP

18/07/2020	AKT	CNS	AKT	REVISION DESCRIPTION
07/24/2020	AKT	CNS	AKT	PROJECT NUMBER 180115
				DRAWING BY AKT
				STATION ID C350
				CHECKER INITIALS JMP

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

PROFESSIONAL ENGINEER'S STAMP

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: YES NO
REVIEWED BY: DATE:
VALUES THAT HAVE BEEN ABANDONED AND REMOVED:
CONSTRUCTION ENGINEERING: CONDITION OF COATING WHEN DELIVERED TO JOB:
APPR. BY: DATE:
COATING TYPE: GOOD FAIR POOR
INSPECTION: INSULATION CHECKED:
VISUAL: JEP:
TYPE PATCH MATERIAL:
SUPERVISOR BLOCK: SUPERVISOR OR CONTRACTOR: DATE PLACED IN SERVICE:
DATE STARTED: DATE COMPLETED:
PERMIT NO.:
TRACEABILITY OF PLASTIC MAN AND SERVICES TESTED UPON COMPLETION:
COMPLETION CONTRACTOR:
VERIFICATION INSPECTOR:
HYDROSTATIC TEST WATER DISCHARGE REQUIREMENTS:
HYDROSTATIC PRESSURE TEST:
ALL LINES OPERATING ABOVE 40 PSIG REQUIRE STRENGTH TESTING BEFORE PLACING INTO SERVICE. PRESSURE CHARTS AND FORMS MUST BE FORWARDED TO GAS ENGINEERING. TEST PER PROCEDURE GD10-1003-1.
REQUIRED TEST PRESSURE RANGE: MIN 750 PSIG TO MAX 850 PSIG MEDIUM WATER.
HOURS: 8 DATE:
SIGNATURE:
HYDROSTATIC TEST PROJECT CONTACTS:
CONSTRUCTION MANAGER: MATT WEBER (C) 513-310-8881
CONTRACTOR CONSTRUCTION MANAGEMENT SUPERVISOR: JAMIE OLBERDING (C) 513-544-9892
PROJECT MANAGER: JAMIE OLBERDING (C) 513-544-9892
CORROSION ENGINEER: MICKEY HARGROVE (C) 615-472-2962
CONSTRUCTION & MAINTENANCE (C&M) MANAGER: JAMIE OLBERDING (C) 513-544-9892
WELD PROCEDURE(S) REQUIRED:
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 AND THAT THE MATERIAL WAS INSTALLED AS DESIGNED UNLESS NOTED ON MATERIAL LIST.
MAOP ENGINEER SIGNATURE: DATE:
PIPE INSTALLED ON JOB:
PIPE SIZE: 20"
PIPE WALL THK: 0.438"
PIPE GRADE: X60
SYMS PER MAOP: 19.0%
WELDING SPEC: 100%
% XRAY: 100%
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.
CONFORMING TO THE OFFICE OF PIPELINE SAFETY'S REGULATIONS (SECTIONS 1001-1004), THE PIPELINE IS REQUIRED TO BE MAINTAINED AS A PART OF THE PIPELINE'S PERMANENT RECORD.
TO MEET THIS REQUIREMENT, THE INSPECTOR SHALL IDENTIFY EACH FIELD OF THIS PIPELINE BY NUMBERING AND LOCATING THE WELD ON THE CONSTRUCTION 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"
PIPE WALL THK: 0.438"
PIPE GRADE: X60
SYMS PER MAOP: 19.0%
WELDING SPEC: 100%
% XRAY: 100%
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.
TO BE FILLED OUT BY INSPECTOR:
PIPE SIZE: 20"
PIPE WALL THK: 0.438"
PIPE GRADE: X60
SYMS PER MAOP: 19.0%
WELDING SPEC: 100%
% XRAY: 100%
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 PRESENTED BELOW:
SEE CONSTRUCTION BID FOR FULL PERMIT LIST.
PERMIT(S) REQUIRED:
PROJECT CONTACTS:
CONSTRUCTION: MATT WEBER (W) 513-287-2888 (C) 513-310-8881
ENGINEERING: JAMIE OLBERDING (W) 513-287-3021 (C) 513-544-9892
SPONSOR: NICK WEL (W) 513-287-2088 (C) 512-808-7862
HYDROSTATIC TEST PROJECT CONTACTS:
CONSTRUCTION MANAGER: MATT WEBER (C) 513-310-8881
CONTRACTOR CONSTRUCTION MANAGEMENT SUPERVISOR: JAMIE OLBERDING (C) 513-544-9892
PROJECT MANAGER: JAMIE OLBERDING (C) 513-544-9892
CORROSION ENGINEER: MICKEY HARGROVE (C) 615-472-2962
CONSTRUCTION & MAINTENANCE (C&M) MANAGER: JAMIE OLBERDING (C) 513-544-9892
WELD PROCEDURE(S) REQUIRED:
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 AND THAT THE MATERIAL WAS INSTALLED AS DESIGNED UNLESS NOTED ON MATERIAL LIST.
MAOP ENGINEER SIGNATURE: DATE:
PIPE INSTALLED ON JOB:
PIPE SIZE: 20"
PIPE WALL THK: 0.438"
PIPE GRADE: X60
SYMS PER MAOP: 19.0%
WELDING SPEC: 100%
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TOTAL NO. OF WELDS MADE:
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TOTAL NO. OF WELDS REPLACED:
NOTE: TOTAL OF REPAIRED PLUS REPLACED WELDS SHOULD EQUAL AMOUNT OF REJECTED WELDS.
CONFORMING TO THE OFFICE OF PIPELINE SAFETY'S REGULATIONS (SECTIONS 1001-1004), THE PIPELINE IS REQUIRED TO BE MAINTAINED AS A PART OF THE PIPELINE'S PERMANENT RECORD.
TO MEET THIS REQUIREMENT, THE INSPECTOR SHALL IDENTIFY EACH FIELD OF THIS PIPELINE BY NUMBERING AND LOCATING THE WELD ON THE CONSTRUCTION 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"
PIPE WALL THK: 0.438"
PIPE GRADE: X60
SYMS PER MAOP: 19.0%
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TOTAL NO. OF WELDS MADE:
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TOTAL NO. OF WELDS REPAIRED:
TOTAL NO. OF WELDS REPLACED:
NOTE: TOTAL OF REPAIRED PLUS REPLACED WELDS SHOULD EQUAL AMOUNT OF REJECTED WELDS.
TO BE FILLED OUT BY INSPECTOR:
PIPE SIZE: 20"
PIPE WALL THK: 0.438"
PIPE GRADE: X60
SYMS PER MAOP: 19.0%
WELDING SPEC: 100%
% XRAY: 100%
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.
COUNTY OF: ITEM NO.: SHEET NO.:
C350 PROJECT SIGN OFF SHEET HAMILTON COUNTY, OHIO
Piedmont Natural Gas
DUKE ENERGY
C350 PROJECT SIGN OFF SHEET HAMILTON COUNTY, OHIO
Piedmont Natural Gas
DUKE ENERGY
C350 PROJECT SIGN OFF SHEET HAMILTON COUNTY, OHIO
Piedmont Natural Gas
DUKE ENERGY

GENERAL NOTES:

1. INSTALLER SHALL FURNISH ALL MATERIALS NOT PROVIDED BY THE COMPANY (INLESS OTHERWISE NOTED ON DRAWINGS OR SPECIFICATIONS), INCLUDING EQUIPMENT, TRANSPORTATION, SERVICES, AND PERFORM ALL NECESSARY WORK SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN/ATTACHED.
 2. IT SHALL BE THE RESPONSIBILITY OF THE INSTALLER TO VERIFY ALL DIMENSIONS AND LOCATIONS OF ALL EXISTING UTILITIES PRIOR TO ANY CONSTRUCTION. THE ATTENTION OF THE PROJECT MANAGER IN WRITING A WRAP 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 CONTRACTOR LIMITS. DISCRESSION SHALL BE PER PROJECT REPRESENTATIVE.
 4. PROPOSED ELEVATIONS AND DIMENSIONS INDICATE TOP OF JOINT, UNLESS OTHERWISE NOTED. UNLESS OTHERWISE NOTED, ALL EXISTING UTILITIES ARE ASSUMED TO BE 18" DEEP. CONTRACTOR IS RESPONSIBLE FOR VERIFYING DEPTH AND LOCATION OF ALL FACILITIES PRIOR TO COMMENCED WORK.
 5. ALL BELOW GROUND WELDS SHALL BE COMPLETED WITH DENS0 700 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 DUCES' PRESSURE TESTING STANDARD. PER PERTINENT DESIGN AND CONSTRUCTION STANDARDS, ALL WELDS SHALL BE PRESSURE TESTED TO 1.5 TIMES THE DESIGN WORKING PRESSURE. CLEANING RIGS IS REQUIRED, AND DIRT TO A DEPTH OF 24" PER PERTINENT DESIGN AND CONSTRUCTION STANDARDS.
 8. ALL DISTANCES SHOWN ARE GRID DISTANCES BASED ON OHIO STATE PLANE COORDINATE SOUTH ZONE (4202) AND NAD 83.
 9. ABOVE GROUND FEATURES AND CONTOURS PROVIDED BY X-84S, LLC FROM
10. DRAWINGS AND ALL PERMITS AT THE JOB SITE, ANY MODIFICATIONS OR ALTERATIONS TO THE PLANS OR SPECIFICATIONS SHALL BE APPROVED BY THE PROJECT MANAGER.
 11. THE INSTALLER IS RESPONSIBLE FOR PROTECTION OF EXISTING WORK IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS AND SPECIFICATIONS. INSTALLER IS RESPONSIBLE FOR THE CONSTRUCTION METHODS AND TECHNIQUES, SEQUENCES, TIME OF PERFORMANCE, AND ALL SAFETY PRECAUTIONS.
 12. MINIMUM DEPTH OF BURIAL SHALL BE PER PERTINENT DESIGN AND CONSTRUCTION STANDARDS.
 13. ALL PIPE LINES BEING CROSSED ARE TO BE PROTECTED WITH A MINIMUM OF (8) 4 FEET X 18 FEET WOODEN MATS.
 14. CONTRACTOR TO PROTECT SIDEWALKS AND BIKE PATHS FROM VEHICLE TRAFFIC DURING THE INSTALLATION OF ANY EXISTING OR NEW UTILITIES. EXISTING OR NEW UTILITIES SHALL BE PROTECTED BY A MINIMUM OF 18" OF SAND OR OTHER UNCOMPRESSED OR DAMAGED DUE TO THE PERMITTED WORK SHALL BE REPLACED IN AND UP TO THE LIMITS AS DETERMINED AND DIRECTED BY THE CITY REPRESENTATIVE IN THE EVENT DAMAGE WAS DONE.
 15. PER PERTINENT DESIGN AND CONSTRUCTION STANDARDS, FOR OPEN DITCH EXCAVATION, A MINIMUM OF TWO FEET OF SEPARATION SHALL BE MAINTAINED BETWEEN ALL EXISTING AND NEW UTILITIES. EXISTING UTILITIES SHALL BE PROTECTED BY STRUCTURES AND PRELIMS THAT ARE INSTALLED IN UNIDIRECTIONAL DRILLING METHODS IS AT THE DISCRETION OF ENGINEERING.
 16. DURING BACKFILLING, A 8" MIN GROWN SHALL BE PLACED ON ALL DISTURBED AREAS. COMPACTION REQUIREMENTS SHALL BE PER PERTINENT DESIGN AND CONSTRUCTION STANDARDS.
 17. BOLTS FOR FLANGES TO BE TORQUED PER PERTINENT DESIGN AND CONSTRUCTION STANDARDS.
 18. MAINLINE GIRTH WELDS SHALL BE 100% X-RAYED PER PERTINENT WELDING CODE. ALL WELDS SHALL BE 100% VISUALLY INSPECTED PER PERTINENT WELDING PROCEDURES.

11. BELOW GROUND SURVEY PROVIDED BY G.J. BERDING SURVEYING FROM MILFORD, OH

45150. SURVEY SUBS INCLUDE R/L 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. INSTANTLY, INSTALLER IS RESPONSIBLE FOR HAVING SUCH FACILITIES LOCATED AND IS RESPONSIBLE FOR MAINTENANCE AND PRESERVATION OF THESE FACILITIES.**
2. **FOR PERMIT DESIGN AND PRESERVATION 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 WORK INTERRUPTED BY OTHER UTILITIES.**
3. **INSTALLER WILL BE REQUIRED TO PROTECT ALL EXISTING FIELD AND DESIGN LOCATIONS TO BE MAINTAINED BY THE OWNER. INSTALLER SHALL NOTIFY THE PROJECT MANAGER IN WRITING (PAPER 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 DUE TO COMPLETION OF THE PROJECT AND ARE CONSIDERED MAINTAINANCE 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 PERMIT 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 DUE ENERGY PROJECT WORKING LIMITS.**
7. **ALL EXCESS EXCAVATION, CONSTRUCTION DEMOLITION DEBRIS AND UNSUITABLE MATERIALS AND EXCESS CONFINED AESTHETIC SHALL BE REMOVED FROM THE SITE AND PROPERLY DISPOSED.**
8. **STANDARD SPECIFICATIONS REFERENCED ON THIS SHEET AND CONSTRUCTION STANDARDS ARE CONSIDERED AS PART OF THE CONTRACT DOCUMENTS. MODERATE ITEMS ON 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 ONE OF THE OWNER'S PROJECT REPRESENTATIVE. FINAL ACCEPTANCE AND APPROVAL IS IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.**
10. **DURING CONSTRUCTION, ALL EXCESS MATERIAL THAT IS SPECIFICALLY EXCLUDED FROM THE WORK, SUCH AS EXCESS STRUCTURES, JOINTS, ETC., THAT THE NATURAL FLOW LINE OF WATER IS OBSTRUCTED, SHALL BE REMOVED AT THE END OF EACH WORK DAY.**
11. **ALL FIELD TIE ENCOUNTERED DURING CONSTRUCTION SHALL BE EXTENDED TO TIE INTO AN EXISTING WORKING LINE. A RECORD OF ALL FIELD TIE FOR DIGITE SHALL BE SUBMITTED TO THE PROJECT MANAGER IMMEDIATELY. ALL FIELD TIE FOR DIGITE SHALL BE SUBMITTED TO THE PROJECT MANAGER IMMEDIATELY. ALL FIELD TIE FOR DIGITE SHALL BE SUBMITTED TO THE PROJECT MANAGER IMMEDIATELY.**

SURVEY INVESTIGATION NOTES:

- 1. BEARINGS AND COORDINATES ARE RELATIVE TO NORTH OHIO STATE PLANE, SOUTH ZONE (NAD83). US FOOT. VERTICAL DATUM IS NAVD83.**
- GEOTECHNICAL DATA:**
- 1. THE GEOTECHNICAL INFORMATION PROVIDED ON THE DRAWING IS A GENERAL SUMMARY OF THE GEOTECHNICAL REPORT IN THE CONTRACT DOCUMENTS FOR MORE DETAILED INFORMATION, CONSULT THE FOLLOWING DOCUMENTS:**
- GEOTECHNICAL ENGINEERING REPORT C350 CENTRAL CORRIDOR PIPELINE EVALUATION, BEARING, OHIO, TERRACON PROJECT NUMBER N17535A, REVISED JULY 1, 2020, TERRACON PROJECT NUMBER N17535A.
 - LETTER REBARKING GEOTECHNICAL SERVICES ALXIN CONSTRUCTION SITE EVALUATION, BEARING, OHIO, TERRACON PROJECT NUMBER N17535A, ADDRESSED TO MR. JAMES OLSBERG DATED MAY 22, 2020.
 - LETTER REBARKING GEOTECHNICAL SERVICES ANA REAL ESTATE SITE EVALUATION, BLUE ASH, OHIO, TERRACON PROJECT NUMBER N17535A, ADDRESSED TO MR. JAMES OLSBERG DATED JUNE 22, 2020.

CATHODIC PROTECTION & ANODE MITIGATION NOTES:

- CONTRACTOR SHALL PROVIDE AND INSTALL ALL NON-STOCK CP C MATERIALS AND ALL NECESSARY PHASED WIRING TO MEET THE REQUIREMENTS OF THESE CONTRACT SPECIFICATIONS, ELECTRICAL CODES, STATE AND LOCAL ORDINANCES, STANDARDS, AND LOCAL ELECTRICAL DISTRIBUTION COMPANY REQUIREMENTS. CONTRACTOR SHALL ALSO INSTALL ALL OWNER PROVIDED CP C MATERIALS AND EQUIPMENT PARTS AS WELL AS BE NOT LIMITED TO: WIRING AND MOUNTING MATERIALS, METER SOCKET, DISCONNECT EQUIPMENT ENCLOSURES, TRANSIENT VOLTAGE SURGE SUPPRESSORS, AC MAIN BUS TERMINATION, CIRCUIT BREAKERS, AND OTHER ELECTRICAL EQUIPMENT REQUIRED. ACTUAL LENGTH OF WIRING IS DEPENDENT ON DISTANCE FROM INSTALLATION.

DESIGN NOTES:

- DESIGN WACP: 300 PSIG
- 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.
- MINIMUM ROPING RADII FOR 20" PIPE: 100' BASED ON 3-JOINT RADII.
- UNLESS NOTED OTHERWISE MINIMUM DESIGN CLEARANCE BETWEEN PIPELINE AND FOREIGN STRUCTURES IS 24". FIELD ADJUSTMENT MAY BE REQUIRED TO LESS THAN DESIGNED CLEARANCE, BUT IN NO CIRCUMSTANCES WILL CLEARANCE BE LESS THAN 1' (17').
- CONTRACTOR SHALL ADOPT TO DUKE OHO 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 "TIME ENERGY COST 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 5PM 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 CNGO PROJECT TRAFFIC MANAGEMENT PLAN"

RESTORATION:

1. RESTORATION SHALL BE CONTROLLED BY APPLICABLE PERMITS AND AS DIRECTED BY THE STATE OF CALIFORNIA'S REGIONAL WATER QUALITY CONTROL BOARD.
2. RESTORATION SHALL BE CONTROLLED BY APPLICABLE PERMITS AND AS DIRECTED BY THE STATE OF CALIFORNIA'S REGIONAL WATER QUALITY CONTROL BOARD.
3. RESTORATION SHALL BE CONTROLLED BY APPLICABLE PERMITS AND AS DIRECTED BY THE STATE OF CALIFORNIA'S REGIONAL WATER QUALITY CONTROL BOARD.
4. RESTORATION SHALL BE CONTROLLED BY APPLICABLE PERMITS AND AS DIRECTED BY THE STATE OF CALIFORNIA'S REGIONAL WATER QUALITY CONTROL BOARD.

[illegible]

BY	CHK	DATE	DESCRIPTION
AKT	CNS	AMP	AREA CODE
AKT	CNS	AMP	ACCOUNT NUMBER
AKT	JMP	CNS	PROJECT NUMBER
			DRAWING BY
			STATION ID
			CHECKED BY
			DATE

REF. DWG(S): PNG-G-350-001009	SHEET(S) 3 OF 5	DWG SCALE	AS NOTED
DWG DATE 09-05-2018		SUPERSEDED	
DRAWING NUMBER		REVISION	
PNG - G-350-0001011		B	
NAME: TONGYINTV300			

C350 PROJECT
GENERAL NOTES SHEET 1
HAMILTON COUNTY, OHIO



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HAMILTON COUNTY, OHIO

GENERAL RESTRICTIONS

- STAY IN ROW/SEPARATORS OR WITHIN PREDETERMINED WORKSPACE AREAS.
- ONLY USE DESIGNATED POINTS OF ACCESS AS APPROVED BY DUKE.
- 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.
- ANY DOT CROSSING NOTIFICATIONS TO BE MADE AS INDICATED BY THE PERMIT OR STATE DOT PERMIT.
- INSTALLER IS RESPONSIBLE FOR KNOWING LOCATION OF ALL ENVIRONMENTALLY SENSITIVE AREA RESTRICTIONS PERTAINING TO THIS PROJECT.

ABBREVIATIONS

APPROX.	DESCRIPTION
B.C.	BUOYANCY CONTROL
C.L.	CENTERLINE
C.F.	CONTROLLED DENSITY FILL
C.S.M.	CONTROLLED LOW STRENGTH MATERIAL
C.M.P.	CORRUGATED METAL PIPE
COM.	COMMUNICATIONS
C.P.	CATHODIC PROTECTION
D.I.	DROP INLET
D.A.	DUCTILE IRON PIPE
E.	EASTING
E.A.	EACH
E.L.	ELEVATION
EX.	EXISTING
R.C.	FOREIGN LINE CROSSING
R.M.	FORCE MAIN
FT.	FEET
F.T.G.	FITTING
H/HORZ.	HORIZONTAL
H.D.	HORIZONTAL, DIRECTIONAL DRILL
H.L.T.	HORIZONTAL, LEFT TURN
H.R.T.	HORIZONTAL, RIGHT TURN
I.N.V.	INVERT
J.B.	JACK AND AUGER BORE
L.	LENGTH
L.A.T.	LATITUDE
L.F.	LINEAR FEET
L.O.	LONGITUDE
MAX.	MAXIMUM
MIN.	MINIMUM
M.H.	MANHOLE
N.	NORTHING
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
O.D.	OUTSIDE DIAMETER
P.C.	PORTLAND CEMENT CONCRETE
P.V.	POST INDICATOR VALVE
P.L.	PROPERTY LINE
P.S.	POUNDS PER SQUARE INCH
P.C.	POLY VINYL CHLORIDE
R.	RADIUS
R.O.	ROAD
R.W./ROW	RIGHT-OF-WAY
R.C.P.	REINFORCED CONCRETE PIPE
S.D.	STORM DRAIN
S.S.	SANITARY SEWER
S.S.D.	SOLID STATE DECOILER
STA.	STATION
T.O.P.	TOP OF PIPE
T.W.	TEMPORARY WORKSPACE
T.C.E.	TEMPORARY CONSTRUCTION EASEMENT
T.Y.	TYPICAL
USE	UNDERGROUND ELECTRIC
NOT	UNDERGROUND TELEPHONE COMMUNICATIONS
V.I.VERT.	VERTICAL
W.	WIDTH
W.T.	WALL THICKNESS
Y.A.N.G.	CROSSING

LEGEND

PROPOSED TEMPORARY WORKSPACE	POT HOLE LOCATION
PROPOSED PERMANENT EASEMENT	SPRING LOCATION
ADDITIONAL TEMPORARY WORKSPACE	FLUSH PIPELINE MARKER
CONSTRUCTION MATTING	ADDITIONAL GRADE PIPELINE MARKER
TRACKING CONTROL	WILE MARKER
UPSIDE RUINION CONTROL	WILET PROTECTION
SLOPE BREAKER	JACK
DELIMITED WETLAND	NO WATER WORK FROM APRIL 15TH THROUGH JUNE 30TH ON PERENNIAL STREAMS
FEMA 100 YEAR FLOOD AREA	ROCK DITCH CHECK
ACCESS PATH	CONSTRUCTION ENTRANCE
STREAM	TEST STATION (SEE EQUIPMENT SCHEDULES ON PNG-G-350-0001021)
DITCH	SOLID STATE DECOILER (SEE EQUIPMENT SCHEDULES ON PNG-G-350-0001024)
TREE LINE	COURTIN TEST STATION (SEE EQUIPMENT SCHEDULES ON PNG-G-350-0001024)
EX. OVERHEAD LINE	MONOLITHIC INSULATOR JUNCTION BOX (SEE EQUIPMENT SCHEDULES ON PNG-G-350-0001021)
EX. ELECTRIC LINE	
FENCE	
EX. GAS LINE	
RIGHT-OF-WAY	
RAILROAD	
EX. SANITARY SEWER	
EX. STORM WATER LINE	
EX. WATER LINE	
PROPERTY LINE	
SILT FENCE	
FLYER GUY	
CONSTRUCTION BOUNDARY	
EX. MAJOR CONTOUR	
EX. MINOR CONTOUR	
PROPOSED MAJOR CONTOUR	
PROPOSED MINOR CONTOUR	
JURISDICTIONAL LINE	
BUOYANCY CONTROL	
PROPOSED GAS LINE	
HORIZONTAL DIRECTIONAL DRILL	
RUGER BURE	
EXCAVATION (T)	

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

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BILL OF MATERIAL

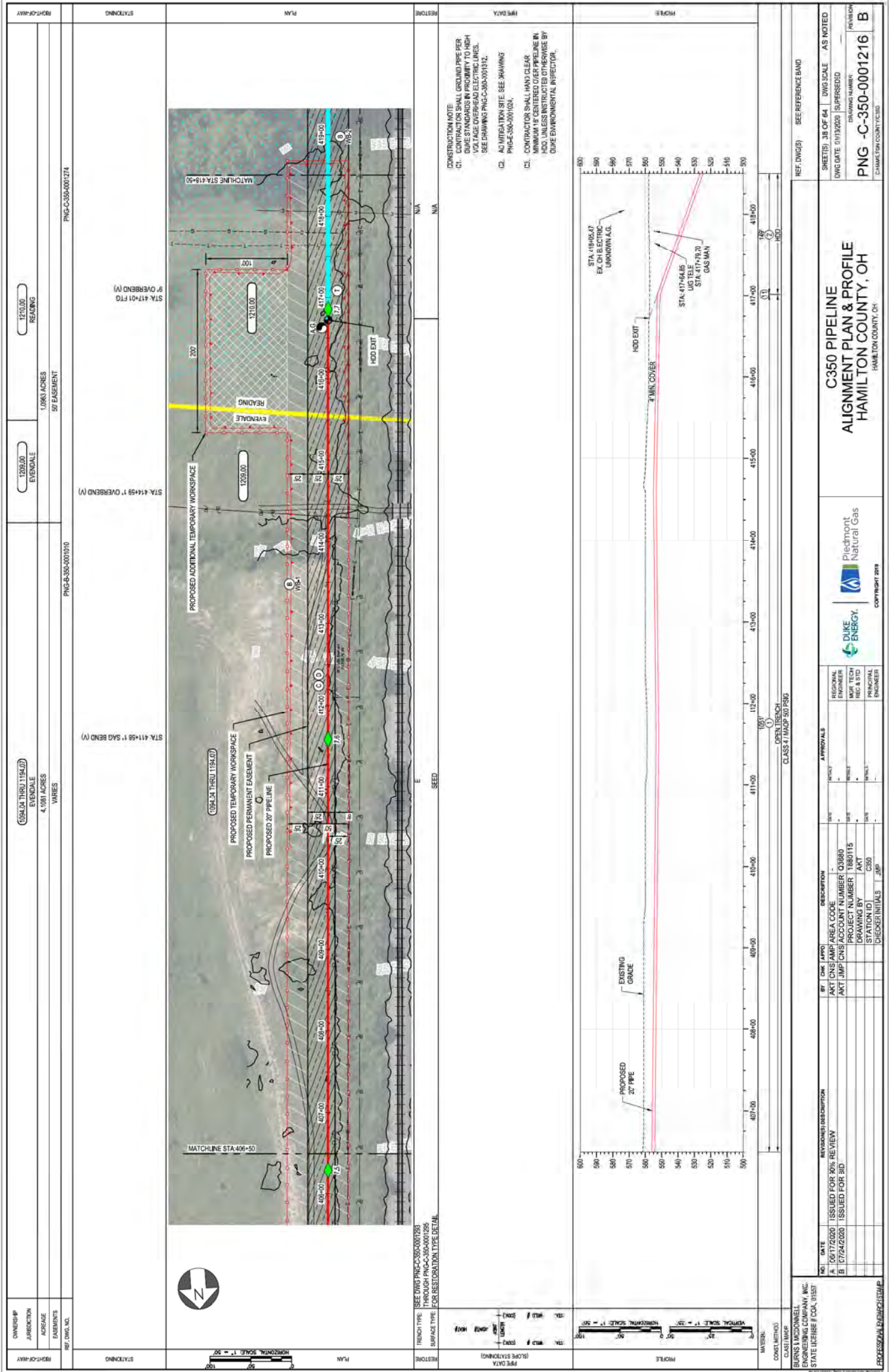
GROUP	MARK	QTY (FT OR EA)	SIZE	LINE	ITEM NUMBER	DESCRIPTION	AS BUILT QTY
PIPE	1	60,000	20"	C350 / CENTRAL CORRIDOR	1597626	PIPE, 20", DBL RANDOM LG, BEVELED ENDS, ELECTRIC RESISTANCE WELD, 0.438" WALL THK, STL, API 5L, PSL-2, GR X80, NO JOINTERS, W/ FUSION BONDED EPOXY COATING (16-18 MILS)	
	2	7,120	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 X80, NO JOINTERS, W/ FUSION BONDED EPOXY (16-18 MILS)/POWDER COATING (40 MILS MINIMUM)	
	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	
SEGMENTABLE ELBOWS	-	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	Length	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.									

BURNS & MCDONNELL ENGINEERING COMPANY, INC. STATE LICENSE # COL 01557		REVISIONS A 07/17/2020 ISSUED FOR 0% REVIEW B 07/24/2020 ISSUED FOR BID		APPROVALS BY: [Signature] DATE: [Date] AXT: [Signature] DATE: [Date] AXT: [Signature] DATE: [Date]		PROJECT INFORMATION PROJECT NUMBER: 180715 DRAWING BY: [Signature] STATION ID: C350 CHECKER INITIALS: [Signature]		CLIENT INFORMATION DUNE ENERGY PLDmont Natural Gas CONTRACT # 2018		PROJECT TITLE C350 PROJECT PIPELINE BILL OF MATERIAL HAMILTON COUNTY, OHIO		REFERENCE REF: DWG(S) PNG-C-350-0001337		SHEET(S) 1 OF 1 DWG DATE 08-05-2018 DRAWING NUMBER PNG -C-350-0001337 REVISION B	
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OWNER: AP	JURISDICTION: OHIO	DATE: 06/17/2020	ISSUED FOR 30% REVIEW	BY: CHS (APR)	DESCRIPTION: ACT CHS MAP AREA CODE	NO.:	DATE:	REVISION DESCRIPTION	ENGINEERING COMPANY, INC.
JURISDICTION: OHIO	DATE: 06/17/2020	ISSUED FOR 30% REVIEW	BY: CHS (APR)	DESCRIPTION: ACT CHS MAP AREA CODE	NO.:	DATE:	REVISION DESCRIPTION	ENGINEERING COMPANY, INC.	STATE LICENSE # 0001216
JURISDICTION: OHIO	DATE: 06/17/2020	ISSUED FOR 30% REVIEW	BY: CHS (APR)	DESCRIPTION: ACT CHS MAP AREA CODE	NO.:	DATE:	REVISION DESCRIPTION	ENGINEERING COMPANY, INC.	STATE LICENSE # 0001216
JURISDICTION: OHIO	DATE: 06/17/2020	ISSUED FOR 30% REVIEW	BY: CHS (APR)	DESCRIPTION: ACT CHS MAP AREA CODE	NO.:	DATE:	REVISION DESCRIPTION	ENGINEERING COMPANY, INC.	STATE LICENSE # 0001216
JURISDICTION: OHIO	DATE: 06/17/2020	ISSUED FOR 30% REVIEW	BY: CHS (APR)	DESCRIPTION: ACT CHS MAP AREA CODE	NO.:	DATE:	REVISION DESCRIPTION	ENGINEERING COMPANY, INC.	STATE LICENSE # 0001216

OWNER: P
JUNCTION
ADJACENT
EASEMENTS
RIGHT-OF-WAY

1221.00
READING

0.9526 ACRES
VARIES

1221.01
READING

STATIONING

PLAN

RESTORE

PROFILE

CONSTRUCTION NOTES:
C1. PIPELINE SHALL MAINTAIN A MINIMUM 25'-0" CLEARANCE FROM CENTER OF RAILROAD TRACKS AND A MINIMUM 10'-0" CLEARANCE FROM ANY OTHER OBSTACLE.
C2. PIPELINE SHALL BE INSTALLED AT LEAST 16 FEET FROM BUILDINGS UNLESS APPROVED BY DUKES ENERGY.
C3. CONTRACTOR SHALL GROUND WIRE PER DUKES STANDARDS IN PROXIMITY TO HIGH VOLTAGE OVERHEAD ELECTRIC LINES. SEE DRAWING PNG-C-350-0001212.

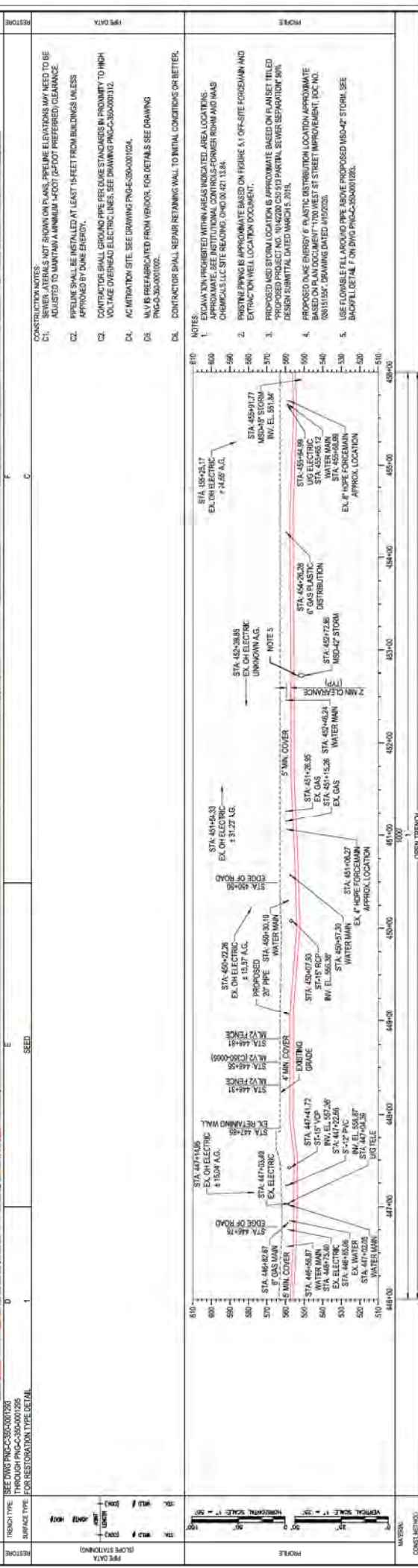
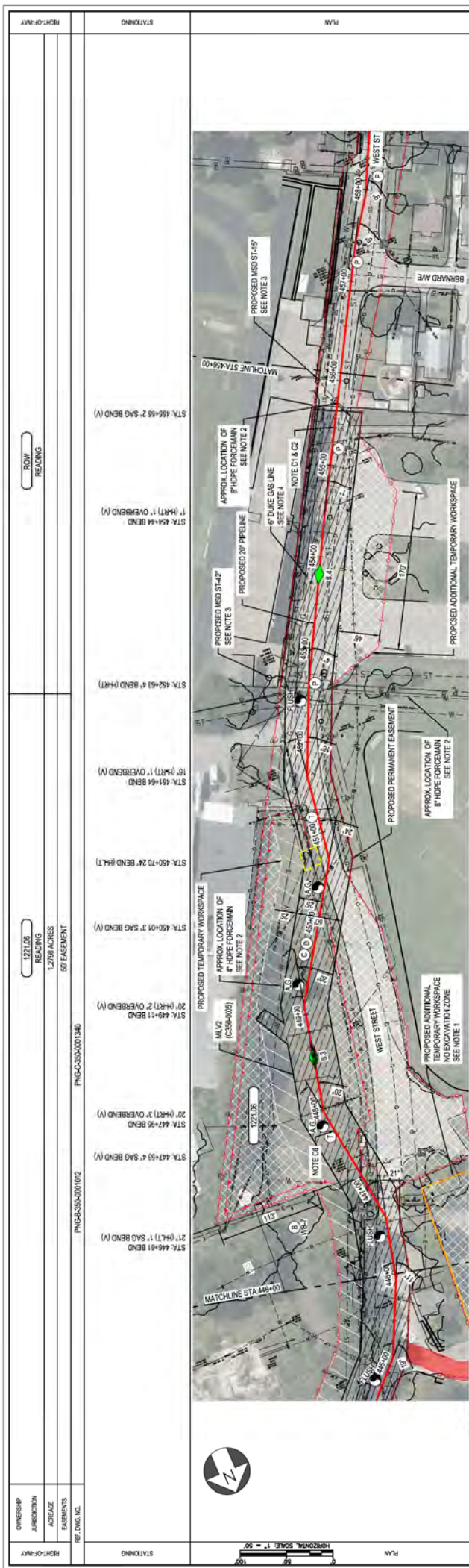
NOTES:
1. PIPELINE SHALL BE PLACED IN ACCORDANCE WITH TERRAZON RECOMMENDATIONS DOCUMENTED IN THE LETTER TO MR. JAMES OBERGUNG TITLED "GEOTECHNICAL SERVICES K.L. NEW CONSTRUCTION SITE EVALUATION READING, OHIO TERRAZON PROJECT NO. 1115-2019-0001".
2. RECOMMENDATIONS INCLUDE:
- EASTERN WALL OF PIPELINE INSTALLATION TRENCH SHALL BE LOCATED OUTSIDE OF A 24" IV PROJECTION DOWN AND AWAY FROM BEARING LEVEL OF THE WALL.
- IF REQUIRED DISTANCE CANNOT BE IMPLEMENTED, THEN 11" IV PROJECTION CAN BE USED ALONG WITH PROTECTIVE MEASURES SUCH AS SHIELDING.
3. AWNING TO BE REMOVED PRIOR TO CONSTRUCTION.

CONSTRUCTION NOTES:
C1. PIPELINE SHALL MAINTAIN A MINIMUM 25'-0" CLEARANCE FROM CENTER OF RAILROAD TRACKS AND A MINIMUM 10'-0" CLEARANCE FROM ANY OTHER OBSTACLE.
C2. PIPELINE SHALL BE INSTALLED AT LEAST 16 FEET FROM BUILDINGS UNLESS APPROVED BY DUKES ENERGY.
C3. CONTRACTOR SHALL GROUND WIRE PER DUKES STANDARDS IN PROXIMITY TO HIGH VOLTAGE OVERHEAD ELECTRIC LINES. SEE DRAWING PNG-C-350-0001212.

DATE: 06/17/2020
REVISION: 1
ISSUED FOR 80% REVIEW
DATE: 07/24/2020
REVISION: 2
ISSUED FOR BID

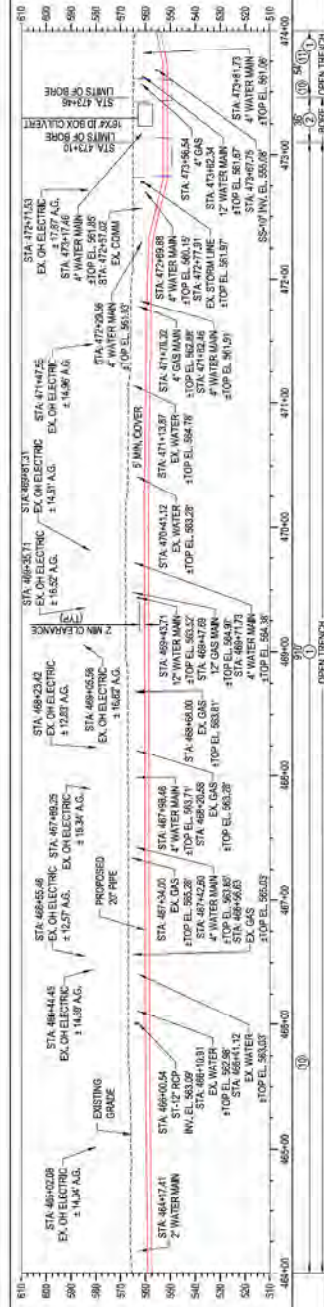
PROJECT: C350 PIPELINE ALIGNMENT PLAN & PROFILE
LOCATION: HAMILTON COUNTY, OH
DRAWING NUMBER: PNG - C-350-0001218
SHEET: 40 OF 64
DATE: 01/15/2020
SUPERSEDED: 01/15/2020
DRAWING NUMBER: PNG - C-350-0001218
SHEET: 40 OF 64
DATE: 01/15/2020
SUPERSEDED: 01/15/2020

[illegible]



CLASS MAP		CLASS 41 (UACIP 500.7590)		REF. DWG(S)		SEE REFERENCE BAND	
BURNS & MCDONNELL ENGINEERING COMPANY, INC. STATE LICENSE # COA, 11557		REVISION B DESCRIPTION		APPROVALS		C350 PIPELINE ALIGNMENT PLAN & PROFILE HAMILTON COUNTY, OH	
NO.	DATE	BY	CHK	APPD	DESCRIPTION	DATE	REVISION
1	06/17/2020	ART	CNS	JMP	AREA CODE	06/17/2020	1
2	07/26/2020	ART	CNS	JMP	ACCOUNT NUMBER	03/30/20	2
3	07/26/2020	ART	CNS	JMP	DRAWING NUMBER	030715	3
4		ART	CNS	JMP	STATION ID	C350	4
5		ART	CNS	JMP	CHECKER INITIALS	JMP	5
PROFESSIONAL ENGINEER'S STAMP		DUNE ENERGY		Piedmont Natural Gas		COPYRIGHT 2019	
SHEET(S) 42 OF 64		DWG SCALE		AS NOTED		REF. DWG(S)	
DWG DATE 01/13/2020		SUPERSEDED				PENG - C-350-0001220	
						HAMILTON COUNTY, OH	
						HAMILTON COUNTY, OH	

[illegible]

[illegible]

OVERSIGHT
JURISDICTION
ADVISANCE
EASIMENTS

REF. SHE. NO.

RIGHT-OF-WAY

STATIONING

PLAN

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PREP DATA

PROFILE

CONSTRUCTION NOTES

SEE DWG PNG-C-350-0001224

THROUGH PNG-C-350-0001225

FOR RESTORATION TYPE DETAIL

RESTORE

PREP DATA

PROFILE

CONSTRUCTION NOTES

SEE DWG PNG-C-350-0001224

THROUGH PNG-C-350-0001225

FOR RESTORATION TYPE DETAIL

RESTORE

PREP DATA

PROFILE

CONSTRUCTION NOTES

SEE DWG PNG-C-350-0001224

THROUGH PNG-C-350-0001225

FOR RESTORATION TYPE DETAIL

RESTORE

PREP DATA

PROFILE

CONSTRUCTION NOTES

SEE DWG PNG-C-350-0001224

THROUGH PNG-C-350-0001225

FOR RESTORATION TYPE DETAIL

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PROFILE

CONSTRUCTION NOTES

SEE DWG PNG-C-350-0001224

THROUGH PNG-C-350-0001225

FOR RESTORATION TYPE DETAIL

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CONSTRUCTION NOTES

SEE DWG PNG-C-350-0001224

THROUGH PNG-C-350-0001225

FOR RESTORATION TYPE DETAIL

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CONSTRUCTION NOTES

SEE DWG PNG-C-350-0001224

THROUGH PNG-C-350-0001225

FOR RESTORATION TYPE DETAIL

RESTORE

PREP DATA

PROFILE

ROW
READING

STATIONING

PLAN

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PROFILE

CONSTRUCTION NOTES

SEE DWG PNG-C-350-0001224

THROUGH PNG-C-350-0001225

FOR RESTORATION TYPE DETAIL

RESTORE

PREP DATA

PROFILE

CONSTRUCTION NOTES

SEE DWG PNG-C-350-0001224

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FOR RESTORATION TYPE DETAIL

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CONSTRUCTION NOTES

SEE DWG PNG-C-350-0001224

THROUGH PNG-C-350-0001225

FOR RESTORATION TYPE DETAIL

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CONSTRUCTION NOTES

SEE DWG PNG-C-350-0001224

THROUGH PNG-C-350-0001225

FOR RESTORATION TYPE DETAIL

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CONSTRUCTION NOTES

SEE DWG PNG-C-350-0001224

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THROUGH PNG-C-350-0001225

FOR RESTORATION TYPE DETAIL

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PREP DATA

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CONSTRUCTION NOTES

SEE DWG PNG-C-350-0001224

OVERSIGHT
JURISDICTION
ADVISANCE
EASIMENTS

REF. SHE. NO.

RIGHT-OF-WAY

STATIONING

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RESTORE

PREP DATA

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CONSTRUCTION NOTES

SEE DWG PNG-C-350-0001224

THROUGH PNG-C-350-0001225

FOR RESTORATION TYPE DETAIL

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CONSTRUCTION NOTES

SEE DWG PNG-C-350-0001224

THROUGH PNG-C-350-0001225

FOR RESTORATION TYPE DETAIL

RESTORE

PREP DATA

PROFILE

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

PIEDMONT
Natural Gas

DUNE ENERGY

APPENDIX

REV	DATE	DESCRIPTION
A	07/17/2020	ISSUED FOR 60% REVIEW
B	07/24/2020	ISSUED FOR BID

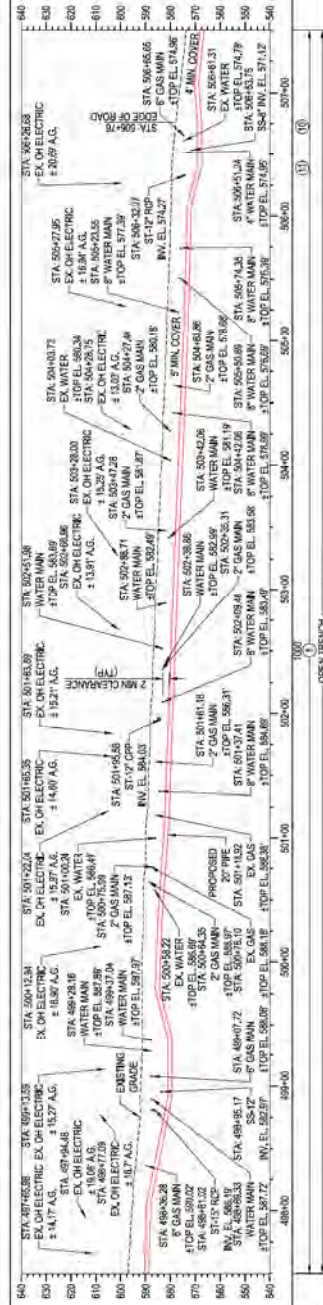
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AKT	PRO	AKT	PROJECT NUMBER: 1580115
AKT	DRAW	AKT	DRAWING BY
AKT	STATION	AKT	STATION ID
AKT	CHECK	AKT	CHECKER INITIALS

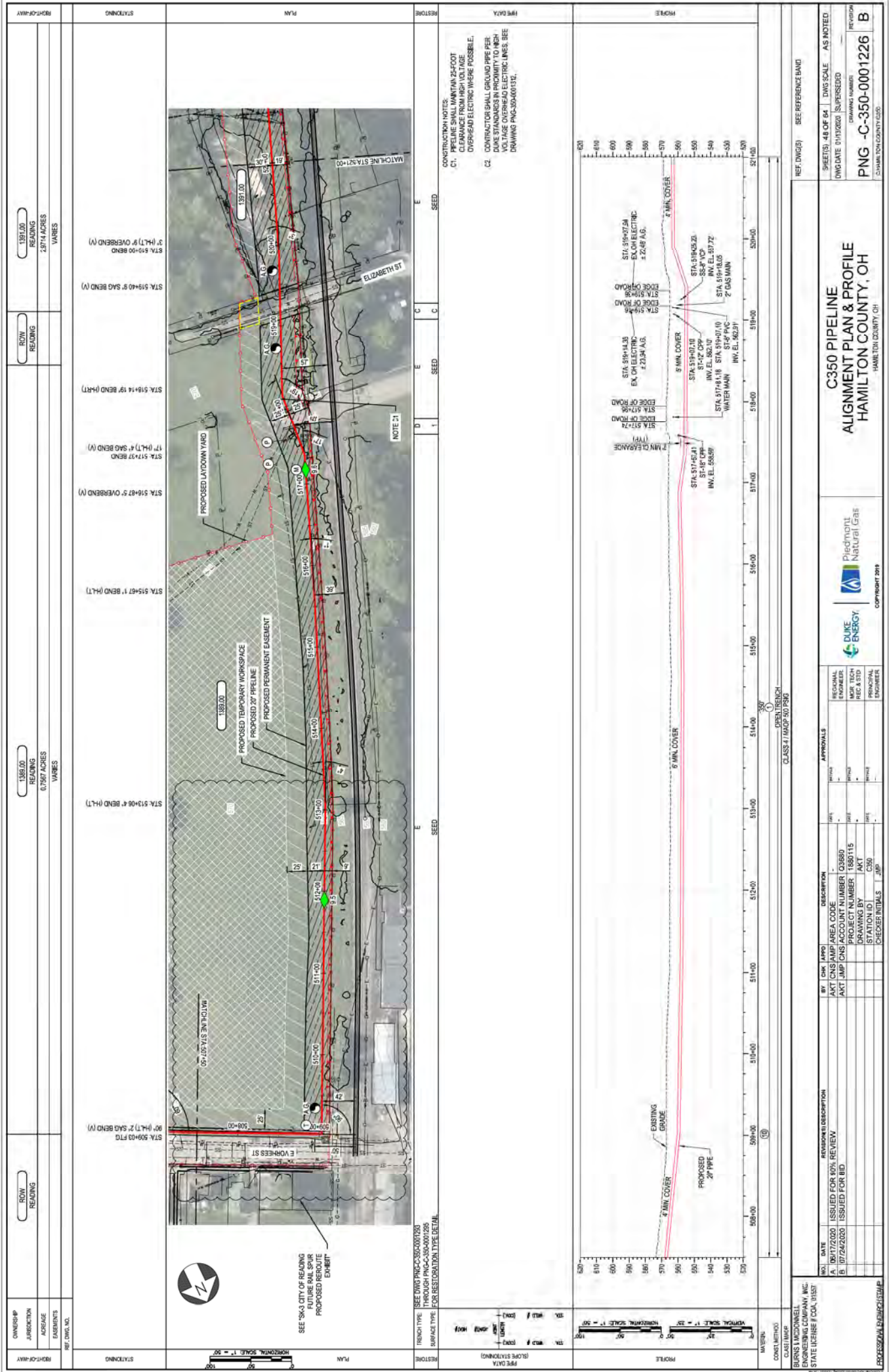
PROFESSIONAL ENGINEER

BURNS & MCDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE #001224

SEE REFERENCE BAND

SHEET 46 OF 64 DWS SCALE AS NOTED
DWG DATE 01/13/2020 (SUPERSEDED)
DRAWING NUMBER: PNG-C-350-0001224
HAMILTON COUNTY, OH

[illegible]



OWNER/APP	JURISDICTION	ROW READING	ROW READING	ROW READING
		1385.00	1381.00	1381.00
		0.757 ACRES	2.974 ACRES	VARIES
		VARIES	VARIES	VARIES

STATIONING	STATIONING	STATIONING	STATIONING	STATIONING
STA. 508+00.00	STA. 513+06.4' BEND (H/LT)	STA. 516+37.5' OVERBEND (M)	STA. 517+37.0' BEND (M)	STA. 519+14.1' BEND (H/LT)
STA. 519+40.9' SAG BEND (M)	STA. 519+40.9' SAG BEND (M)	STA. 519+40.9' SAG BEND (M)	STA. 519+40.9' SAG BEND (M)	STA. 519+40.9' SAG BEND (M)

PLAN	PLAN	PLAN	PLAN	PLAN
SEE 'S&S' CITY OF READING FUTURE RAIL SPUR PROPOSED EASEMENT	PROPOSED 20' PIPELINE	PROPOSED PERMANENT EASEMENT	PROPOSED TEMPORARY WORKSPACE	PROPOSED LAYOUT YARD
NOTE: SEE 'S&S' CITY OF READING FUTURE RAIL SPUR PROPOSED EASEMENT	NOTE: SEE 'S&S' CITY OF READING FUTURE RAIL SPUR PROPOSED EASEMENT	NOTE: SEE 'S&S' CITY OF READING FUTURE RAIL SPUR PROPOSED EASEMENT	NOTE: SEE 'S&S' CITY OF READING FUTURE RAIL SPUR PROPOSED EASEMENT	NOTE: SEE 'S&S' CITY OF READING FUTURE RAIL SPUR PROPOSED EASEMENT

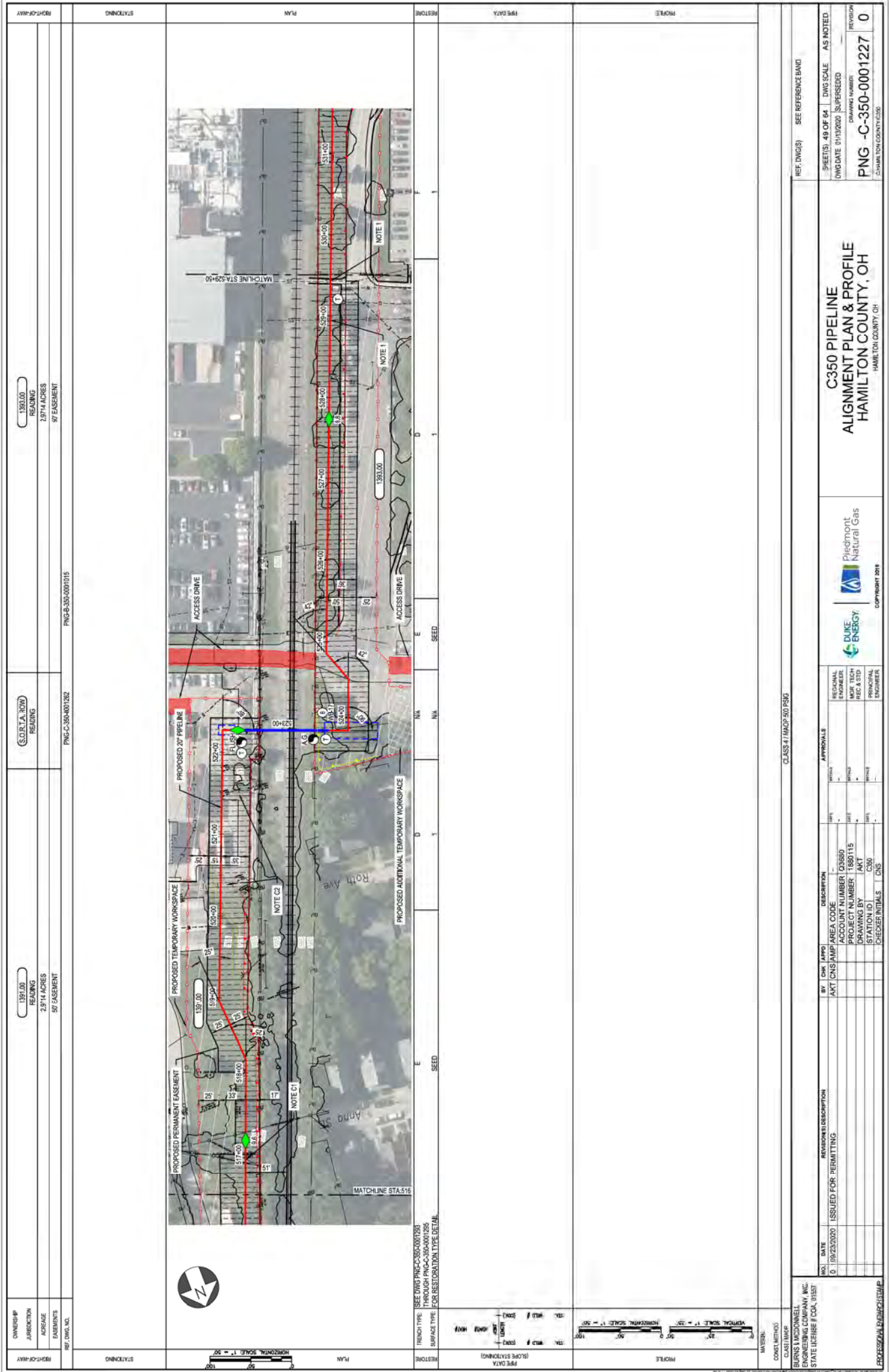
RESTORE	RESTORE	RESTORE	RESTORE	RESTORE
SEE DWG PNC-C-350-0001235 THROUGH PNC-C-350-0001235 FOR RESTORATION TYPE DETAIL	SEE DWG PNC-C-350-0001235 THROUGH PNC-C-350-0001235 FOR RESTORATION TYPE DETAIL	SEE DWG PNC-C-350-0001235 THROUGH PNC-C-350-0001235 FOR RESTORATION TYPE DETAIL	SEE DWG PNC-C-350-0001235 THROUGH PNC-C-350-0001235 FOR RESTORATION TYPE DETAIL	SEE DWG PNC-C-350-0001235 THROUGH PNC-C-350-0001235 FOR RESTORATION TYPE DETAIL

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

APPROVALS	APPROVALS	APPROVALS	APPROVALS	APPROVALS
DATE	DATE	DATE	DATE	DATE
07/24/2020	07/24/2020	07/24/2020	07/24/2020	07/24/2020
ISSUED FOR 40% REVIEW	ISSUED FOR 40% REVIEW	ISSUED FOR 40% REVIEW	ISSUED FOR 40% REVIEW	ISSUED FOR 40% REVIEW
ISSUED FOR BID	ISSUED FOR BID	ISSUED FOR BID	ISSUED FOR BID	ISSUED FOR BID

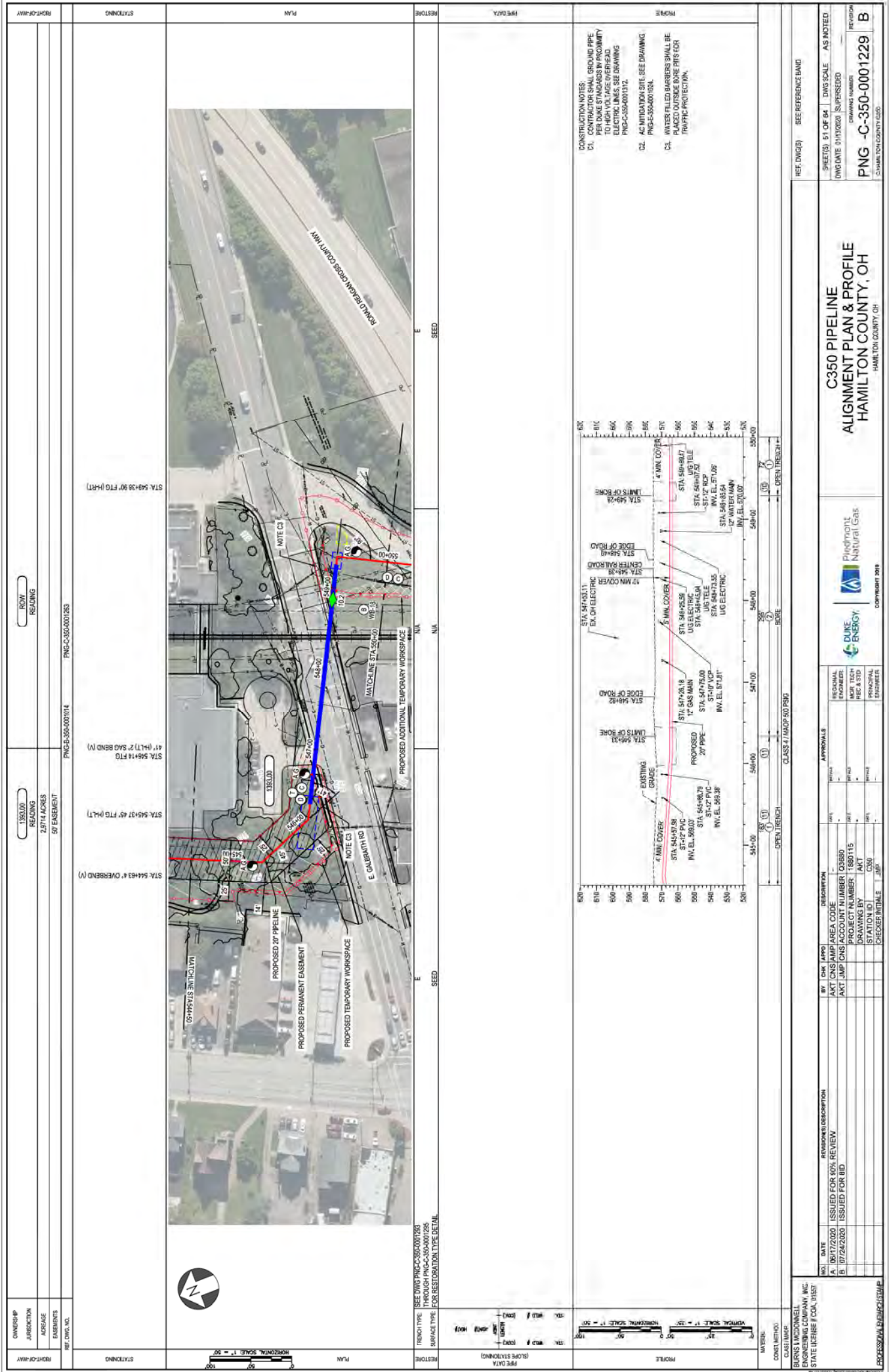
PROJECT INFORMATION	PROJECT INFORMATION	PROJECT INFORMATION	PROJECT INFORMATION	PROJECT INFORMATION
PROJECT NAME	PROJECT NAME	PROJECT NAME	PROJECT NAME	PROJECT NAME
C350 PIPELINE	C350 PIPELINE	C350 PIPELINE	C350 PIPELINE	C350 PIPELINE
ALIGNMENT PLAN & PROFILE	ALIGNMENT PLAN & PROFILE	ALIGNMENT PLAN & PROFILE	ALIGNMENT PLAN & PROFILE	ALIGNMENT PLAN & PROFILE

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



OWNER: @4500	JURISDICTION: @4500	1391.00	READING	1391.00	READING	1391.00	READING	
ADJACENT: @4500	EASEMENTS: @4500	2.9714 ACRES	57' EASEMENT	2.9714 ACRES	57' EASEMENT	2.9714 ACRES	57' EASEMENT	
REF. DWG. NO.	REF. DWG. NO.	PNG-C-350-0001282	PNG-C-350-0001282	PNG-C-350-0001282	PNG-C-350-0001282	PNG-C-350-0001282	PNG-C-350-0001282	
STATIONING	STATIONING							
PLAN	PLAN							
RESTORE	RESTORE							
PIPE DATA	PIPE DATA							
PROFILE	PROFILE							
MATERIAL	MATERIAL							
CLASS/MAF	CLASS/MAF							
ENGINEERING COMPANY, INC.	ENGINEERING COMPANY, INC.							
STATE LICENSE #	STATE LICENSE #							
PROFESSIONAL ENGINEER	PROFESSIONAL ENGINEER							
DATE	DATE	01/23/2020	ISSUED FOR PERMITTING	01/23/2020	ISSUED FOR PERMITTING	01/23/2020	ISSUED FOR PERMITTING	
REVISIONS	REVISIONS							
BY	DATE	AKT	CNS	AKT	CNS	AKT	CNS	
DESCRIPTION	DESCRIPTION							
ACCOUNT NUMBER	ACCOUNT NUMBER	03880	PROJECT NUMBER	1880115	DRAWING BY	AKT	STATION ID	C350
CHECKER INITIALS	CNS							
APPROVALS	APPROVALS							
REVISION	REVISION							
ENGINEER	ENGINEER							
MAP TECH	MAP TECH							
REC & STD	REC & STD							
PRINCIPAL	PRINCIPAL							
ENGINEER	ENGINEER							
COPYRIGHT 2019	COPYRIGHT 2019							
DUKE ENERGY	DUKE ENERGY							
Piedmont Natural Gas	Piedmont Natural Gas							
C350 PIPELINE	C350 PIPELINE							
ALIGNMENT PLAN & PROFILE	ALIGNMENT PLAN & PROFILE							
HAMILTON COUNTY, OH	HAMILTON COUNTY, OH							
SHEETS: 49 OF 64	SHEETS: 49 OF 64							
DWG DATE: 01/13/2020	DWG DATE: 01/13/2020							
DRAWING NUMBER	DRAWING NUMBER							
REVISED	REVISED							
PNG -C-350-0001227	PNG -C-350-0001227							
0	0							

[illegible]



OWNER'S #	JURISDICTION	READING	ROW
1350.00	2.5714 ACRES	50' EASEMENT	
REF. DWG. NO.	PNG-C-350-0001229	PNG-C-350-0001014	

STATIONING	STATIONING	STATIONING
STA. 544+83.4' OVERBEND (N)	STA. 545+31' 45' FTG (H&T)	STA. 546+18' FTG
	41' (H&T) 2' S&D BEND (N)	
		STA. 548+38' 90' FTG (H&T)

PLAN	PLAN	PLAN
SEE DNG PNG-C-350-0001229 THROUGH PNG-C-350-0001229 FOR RESTORATION TYPE DETAIL		

RESTORE	RESTORE	RESTORE
SEE DNG PNG-C-350-0001229 THROUGH PNG-C-350-0001229 FOR RESTORATION TYPE DETAIL		

PIPE DATA	PIPE DATA	PIPE DATA
SEE DNG PNG-C-350-0001229 THROUGH PNG-C-350-0001229 FOR RESTORATION TYPE DETAIL		

PROFILE	PROFILE	PROFILE
SEE DNG PNG-C-350-0001229 THROUGH PNG-C-350-0001229 FOR RESTORATION TYPE DETAIL		

CONSTRUCTION NOTES	CONSTRUCTION NOTES	CONSTRUCTION NOTES
CONTRACTOR SHALL GROUND PIPE PER DUKES STANDARDS BY PROXIMITY TO HIGH VOLTAGE OVERHEAD ELECTRIC LINES. SEE DRAWING PNG-C-350-0001229.	CONTRACTOR SHALL GROUND PIPE PER DUKES STANDARDS BY PROXIMITY TO HIGH VOLTAGE OVERHEAD ELECTRIC LINES. SEE DRAWING PNG-C-350-0001229.	CONTRACTOR SHALL GROUND PIPE PER DUKES STANDARDS BY PROXIMITY TO HIGH VOLTAGE OVERHEAD ELECTRIC LINES. SEE DRAWING PNG-C-350-0001229.

PROJECT NAME	C350 PIPELINE
PROJECT NUMBER	1350.00
DRAWING NUMBER	PNG-C-350-0001229
DRAWING DATE	01/13/2020
DRAWING SCALE	AS NOTED
DRAWING SHEETS	51 OF 64
DRAWING SHEET	51 OF 64
DRAWING SHEET	51 OF 64

PROJECT NAME	C350 PIPELINE
PROJECT NUMBER	1350.00
DRAWING NUMBER	PNG-C-350-0001229
DRAWING DATE	01/13/2020
DRAWING SCALE	AS NOTED
DRAWING SHEETS	51 OF 64
DRAWING SHEET	51 OF 64
DRAWING SHEET	51 OF 64

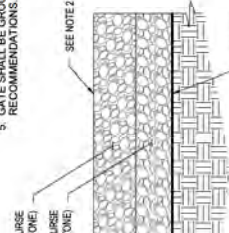
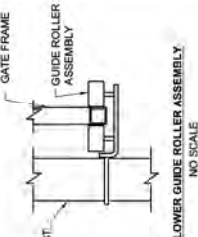
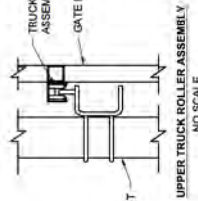
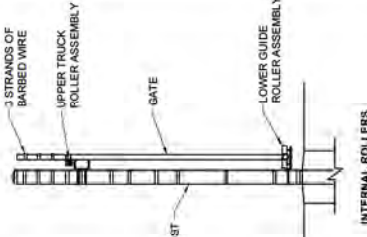
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PROJECT NUMBER	1350.00
DRAWING NUMBER	PNG-C-350-0001229
DRAWING DATE	01/13/2020
DRAWING SCALE	AS NOTED
DRAWING SHEETS	51 OF 64
DRAWING SHEET	51 OF 64
DRAWING SHEET	51 OF 64

PROJECT NAME	C350 PIPELINE
PROJECT NUMBER	1350.00
DRAWING NUMBER	PNG-C-350-0001229
DRAWING DATE	01/13/2020
DRAWING SCALE	AS NOTED
DRAWING SHEETS	51 OF 64
DRAWING SHEET	51 OF 64
DRAWING SHEET	51 OF 64

PROJECT NAME	C350 PIPELINE
PROJECT NUMBER	1350.00
DRAWING NUMBER	PNG-C-350-0001229
DRAWING DATE	01/13/2020
DRAWING SCALE	AS NOTED
DRAWING SHEETS	51 OF 64
DRAWING SHEET	51 OF 64
DRAWING SHEET	51 OF 64

PROJECT NAME	C350 PIPELINE
PROJECT NUMBER	1350.00
DRAWING NUMBER	PNG-C-350-0001229
DRAWING DATE	01/13/2020
DRAWING SCALE	AS NOTED
DRAWING SHEETS	51 OF 64
DRAWING SHEET	51 OF 64
DRAWING SHEET	51 OF 64

PROJECT NAME	C350 PIPELINE
PROJECT NUMBER	1350.00
DRAWING NUMBER	PNG-C-350-0001229
DRAWING DATE	01/13/2020
DRAWING SCALE	AS NOTED
DRAWING SHEETS	51 OF 64
DRAWING SHEET	51 OF 64
DRAWING SHEET	51 OF 64



SURFACE COURSE MATERIAL NOTES:

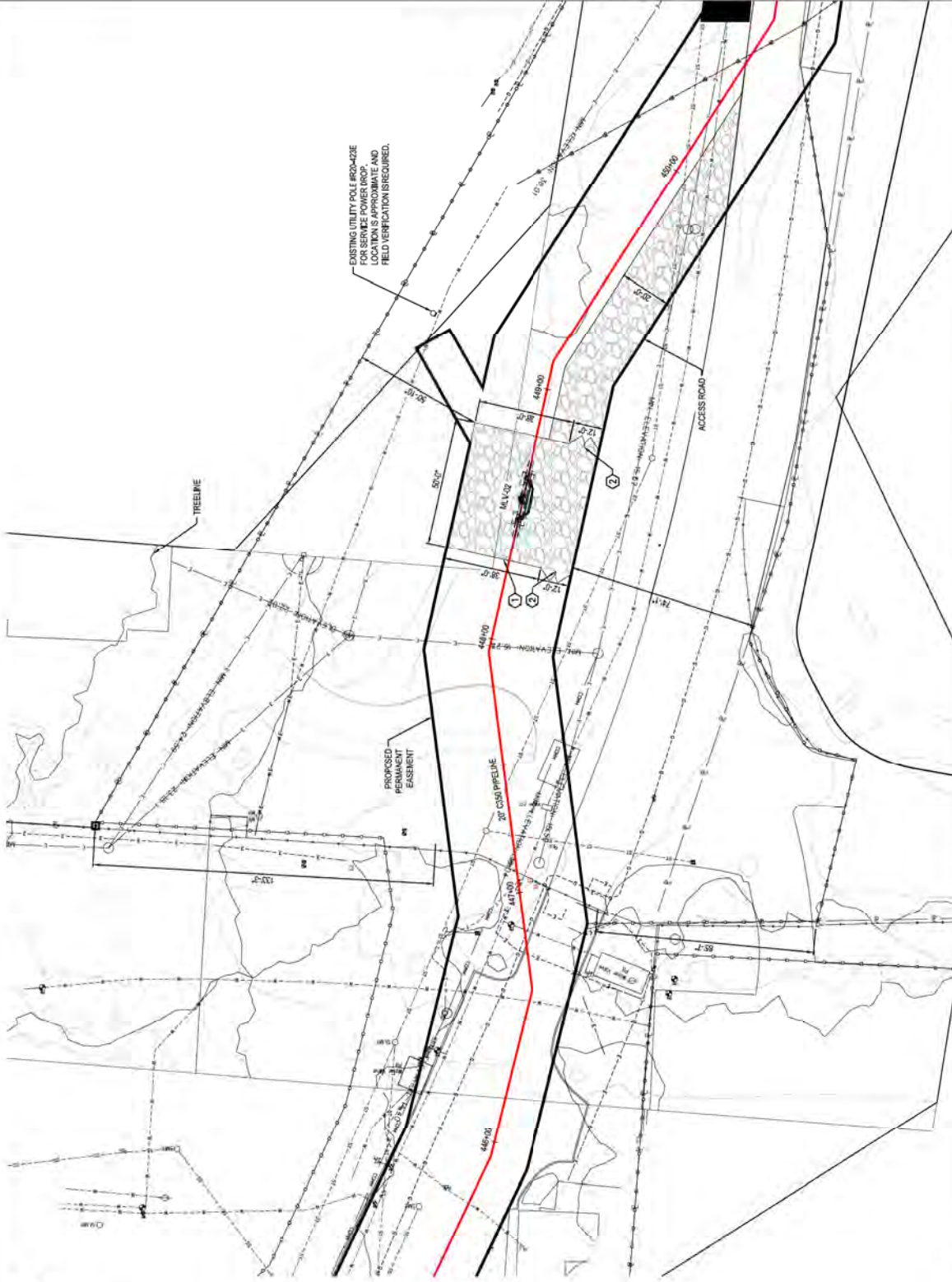
1. GEOGRID SHALL BE TENSAR FG30 OR ENGINEER APPROVED EQUAL
2. ACCESS ROAD SURFACE COURSE DETAIL APPLIES TO MLV 2 ONLY. SEE DRAWING C-350-0001342 FOR MLV 1 ACCESS PATH DETAILS.



ACCESS ROAD SURFACE COURSE

TELEPHONE: 800-368-6868
FAX: 800-368-6869
WWW: WWW.MCDONNELL-CONTRACTING.COM

[illegible]



- NOTES:**
1. THE EXISTING SITE UTILITIES AND FEATURES SHOWN ARE BASED ON THE SURVEY DATA AND FIELD SURVEY PERFORMED BY BERDING SURVEYING IN FEBRUARY 2020.
 2. ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE NOTED.
 3. SEE DRAWINGS PNG-C-350-0001000 THRU 0001013 FOR LEGEND, ABBREVIATIONS, AND GENERAL NOTES.

KEY NOTES:

- 1 10' CHAIN-LINK BARBED WIRE FENCE WITH VINYL SCREENING
- 2 12' DOUBLE SWING GATE

LEGEND:



PROPOSED GRAVEL SURFACE COURSE
C-350-0001340

BERDING SURVEYING, INC.
STATE LICENSE #00000000000000000000000000000000

NO. DATE
A 08/17/2020 ISSUED FOR 90% REVIEW
B 07/24/2020 ISSUED FOR 80

BY (CHK) (APP)
JTG CWS/AREA CODE
JTG CWS/ACCOUNT NUMBER
PROJECT NUMBER 1880115
DRAWING BY HEC
STATION ID C350
CHECKER INITIALS DWS

APPROVALS

DATE	BY	ROLE
N/A	N/A	REGISTERED ENGINEER
N/A	N/A	REGISTERED PROFESSIONAL ENGINEER
N/A	N/A	REGISTERED PROFESSIONAL ENGINEER
07/23/2020	CON	REGISTERED PROFESSIONAL ENGINEER



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**C350 PROJECT
MLV-02 SITE PLAN
HAMILTON COUNTY, OHIO**
HAMILTON COUNTY, OH

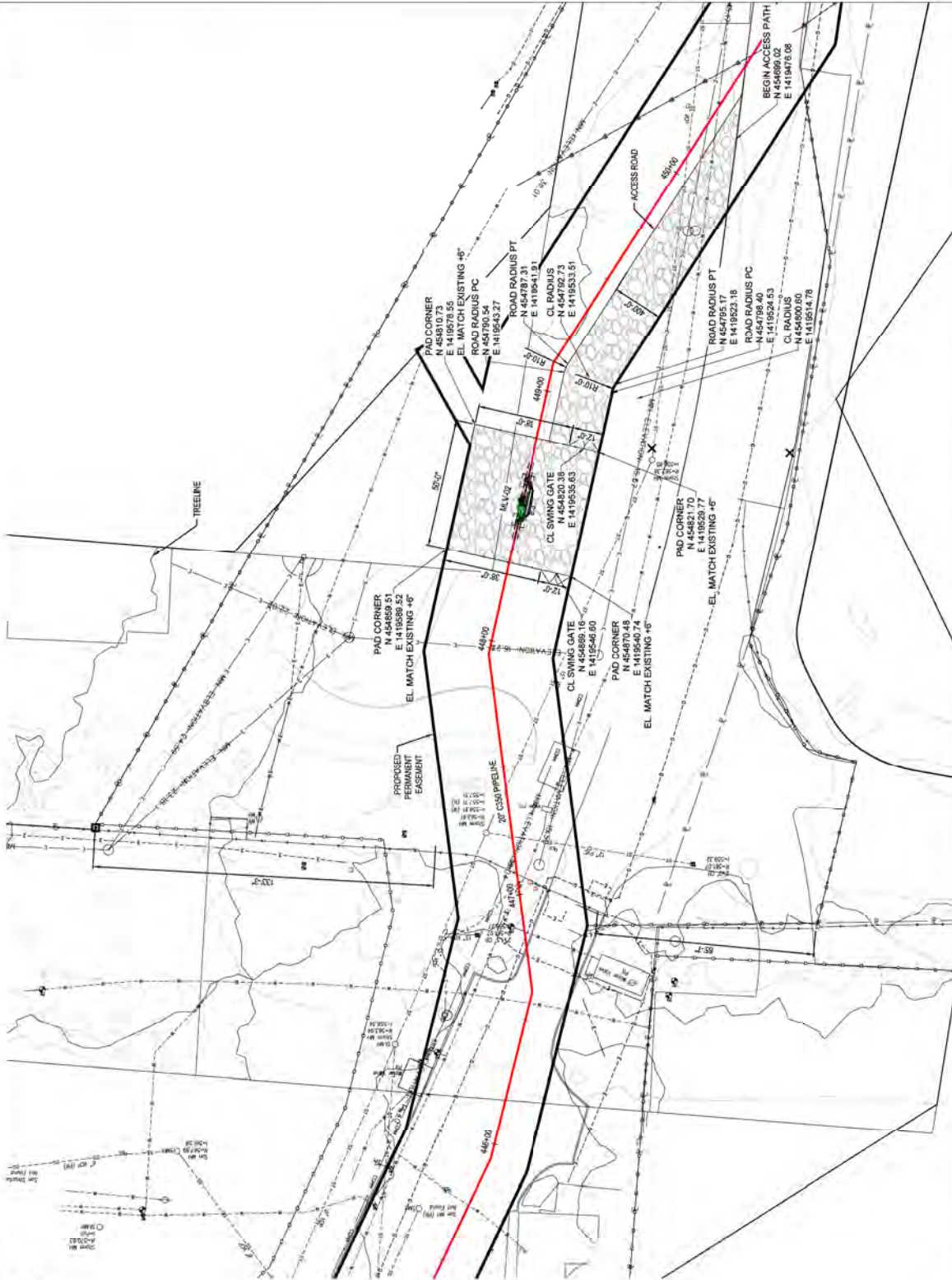
REF DWG(S) C-350-0001000
C-350-0001341
SHEETS 5 OF 7
DWG SCALE 1"=40'
DWG DATE 08-21-2018
SUPERSEDED
DRAWING NUMBER
PNG C-350-0001340
B
HAMILTON COUNTY, OH

- NOTES:**
1. THE EXISTING SITE UTILITIES AND FEATURES SHOWN ARE BASED ON THE RECORD DRAWING SURVEY PERFORMED BY BERDING SURVEYING IN FEBRUARY 2020.
 2. ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE NOTED.
 3. SEE DRAWINGS PNG-C-350-0001000 THRU 0001013 FOR LEGEND, ABBREVIATIONS, AND GENERAL NOTES.
 4. COORDINATES SHOWN ARE IN OHIO STATE PLANE SOUTH, ZONE 1402. NAD83 AND NAVD83 HORIZONTAL AND VERTICAL DATA, RESPECTIVELY.
 5. CALLOUTS WITH NO ELEVATION DESIGNATED SHALL MATCH EXISTING GRADE.
 6. ALL ELEVATIONS INDICATED ARE TO FINISHED GRADE (TOP OF STRIP AND GRUB ALL EXISTING TOPSOIL AND VEGETATION PRIOR TO GRADING. REPLACE WITH APPROVED FILL MATERIAL PER THE GEOTECHNICAL REPORT.
 7. ROCK SURFACING.

LEGEND:



PROPOSED GRAVEL SURFACE COURSE
ROAD RADIUS PT.



REF DWG(S) C-350-0001000
C-350-0001000
SHEET(S) 8 OF 7
DWG SCALE 1"=40'
DWG DATE 08-21-2018
SUPERSEDED
DRAWING NUMBER
PNG C-350-0001341
HAMILTON COUNTY, OH

C350 PROJECT MLV-02 GRADING PLAN HAMILTON COUNTY, OHIO



DESIGNED BY
JTG CWS
CHECKED BY
JTG CWS
DATE
07/24/2020
PROJECT NUMBER
1880115
DRAWING BY
HEC
STATION ID
C350
CHECKER INITIALS
DNS

APPROVALS
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JTG CWS
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JTG CWS
DATE
07/24/2020
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STATION ID
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DATE
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DNS

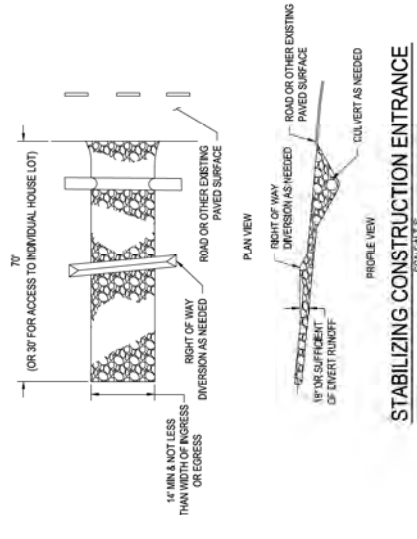
DESIGNED BY
JTG CWS
CHECKED BY
JTG CWS
DATE
07/24/2020
PROJECT NUMBER
1880115
DRAWING BY
HEC
STATION ID
C350
CHECKER INITIALS
DNS

INSTALLATION:

1. ANSIPD #1 (1.5 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 (NOT MINIMUM ON A SINGLE RESIDENTIAL LOT; 14 FT MINIMUM LENGTH).
3. A GEOTEXTILE SHALL BE PLACED OVER THE ENTIRE AREA UNDER THE ENTRANCE TO PREVENT SURFACE WATER FROM FLOWING UNDER THE ENTRANCE. THE GEOTEXTILE SHALL BE A STRONG NOT-PROOF POLYMERIC FIBER AND MEET THE FOLLOWING SPECIFICATIONS:

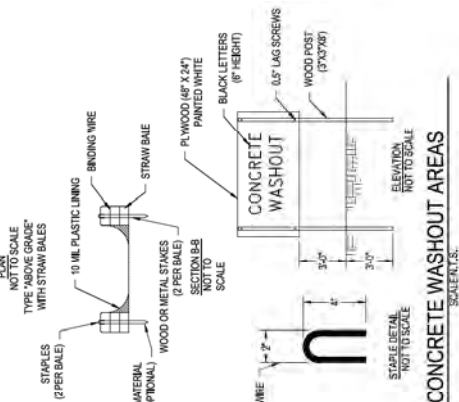
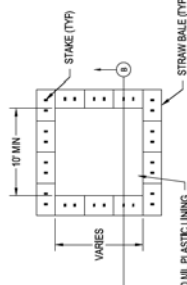
MINIMUM TENSILE STRENGTH	200 LB
MINIMUM TENSILE STRENGTH	300 LB
MINIMUM TENSILE STRENGTH	500 LB
MINIMUM TENSILE STRENGTH	750 LB
MINIMUM TENSILE STRENGTH	1000 LB
MINIMUM TENSILE STRENGTH	1500 LB
MINIMUM TENSILE STRENGTH	2000 LB
MINIMUM TENSILE STRENGTH	2500 LB
MINIMUM TENSILE STRENGTH	3000 LB
MINIMUM TENSILE STRENGTH	3500 LB
MINIMUM TENSILE STRENGTH	4000 LB
MINIMUM TENSILE STRENGTH	4500 LB
MINIMUM TENSILE STRENGTH	5000 LB
MINIMUM TENSILE STRENGTH	5500 LB
MINIMUM TENSILE STRENGTH	6000 LB
MINIMUM TENSILE STRENGTH	6500 LB
MINIMUM TENSILE STRENGTH	7000 LB
MINIMUM TENSILE STRENGTH	7500 LB
MINIMUM TENSILE STRENGTH	8000 LB
MINIMUM TENSILE STRENGTH	8500 LB
MINIMUM TENSILE STRENGTH	9000 LB
MINIMUM TENSILE STRENGTH	9500 LB
MINIMUM TENSILE STRENGTH	10000 LB

4. IF NEEDED, A WATER BAR SHALL BE CONSTRUCTED TO PREVENT SURFACE WATER FROM FLOWING UNDER THE ENTRANCE. THE WATER BAR SHALL BE 18" MIN. HIGH AND 18" MIN. WIDE. THE LENGTH OF THE ENTRANCE UT ONTO PAVED SURFACE.
5. IF NEEDED, A WATER BAR SHALL BE CONSTRUCTED TO PREVENT SURFACE WATER FROM FLOWING UNDER THE ENTRANCE. THE WATER BAR SHALL BE 18" MIN. HIGH AND 18" MIN. WIDE. THE LENGTH OF THE ENTRANCE UT ONTO PAVED SURFACE.



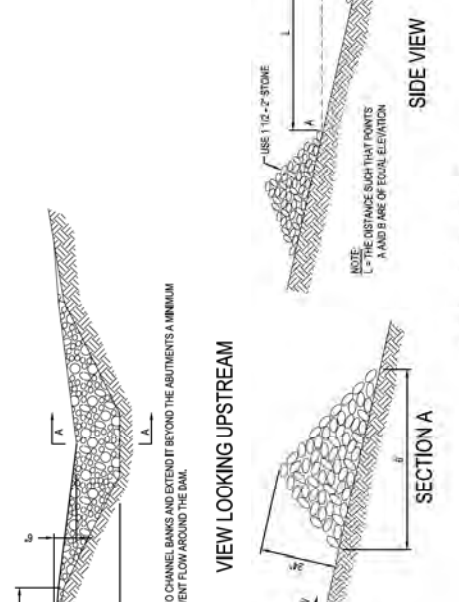
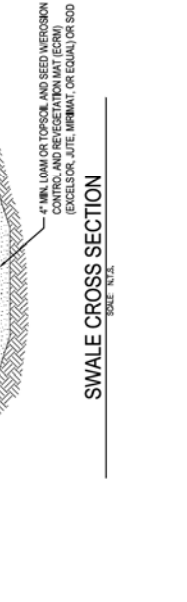
MAINTENANCE:

1. TOP DRESS WITH ADDITIONAL STONE AS SITE CONDITIONS DEMAND.
2. REMOVE AND REWORK INTO PUBLIC STREETS IMMEDIATELY VIA SHOVELING OR SWEEPING.
3. ENSURE THE ENDS OF A TEMPORARY CULVERT PIPE (IF USED) ARE PROPERLY SEaled AND THAT THE PIPE IS FREE OF DEBRIS THROUGHOUT.
4. ONCE 75% OF ORIGINAL PIT VOLUME IS FILLED OR LINER IS EXPOSED, THE ENTRANCE SHALL BE REPAIRED IMMEDIATELY. DISPOSED OF ONCE HARDENED, LINER SHALL BE REPLACED IF TORN.

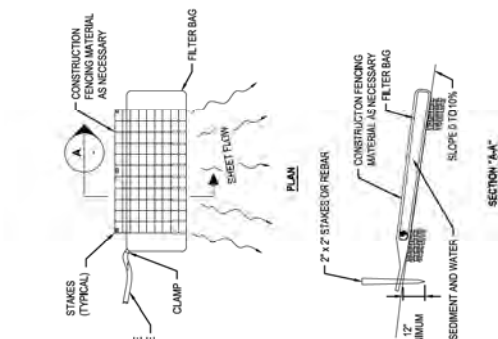


NOTES:

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 EXPOSED, THE ENTRANCE SHALL BE REPAIRED IMMEDIATELY. DISPOSED OF ONCE HARDENED, LINER SHALL BE REPLACED IF TORN.



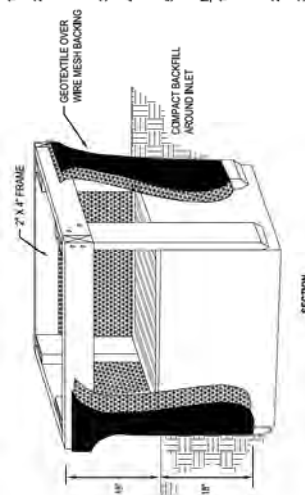
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B	10/24/2020	ISSUED FOR BID	AKT	CNS	JMP	AKT CNS ACCOUNT NUMBER 1807115	REGIONAL MANAGER
		DRAWING BY	AKT			AKT CNS ACCOUNT NUMBER 1807115	REGIONAL MANAGER
		STATION ID	AKT			AKT CNS ACCOUNT NUMBER 1807115	REGIONAL MANAGER
		CHECKER/INITIALS	JMP			AKT CNS ACCOUNT NUMBER 1807115	REGIONAL MANAGER



**TYPICAL GEOTEXTILE
FILTER BAG FOR DEWATERING**
SCALE 1/8" = 1'-0"

- NOTES:**
1. INSTALL A DRAINING GEOTEXTILE FILTER BAG AS DIRECTED BY THE COMPANY'S INSPECTOR TO PREVENT THE FLOW OF HEAVILY SILT-LADEN WATER INTO WATERSHEDS 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 BAGS SHALL BE 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. BACKFILL WITH SEDIMENT AND OTHER 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.

- 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 OF 12" AND SECURE WITH 2"x4" LUMBER. THE FRAME SHALL BE AT AN ELEVATION THAT DOES NOT CAUSE PONDING 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 4" LAYERS UNTIL THE ELEVATION OF THE TOP OF THE GATE IS REACHED.



DROP INLET PROTECTION
SCALE 1/8" = 1'-0"

- 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-CONFINED 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-GRASS AREA SEDIMENT HAS ACCUMULATED AS NECESSARY AND ESTABLISH VEGETATION ON ANY RESULTING DISTURBED AREAS.
- ALTERNATIVE MANUFACTURED DRAINAGE PROTECTION PRODUCTS ARE AVAILABLE AND CAN BE USED, SUBJECT TO PRIOR APPROVAL BY THE COMPANY ENGINEER.

NO.	DATE	REVISION/DESCRIPTION	BY	CHK.	APP'D.	DESCRIPTION	DATE	APPROVALS
1	08/17/2020	ISSUED FOR BIDDING	AKT	CHS	AMP	AREA CODE	03699	REGIONAL SUPERVISOR
2	07/24/2020	ISSUED FOR BID	AKT	CHS	AMP	AREA CODE	180715	REGIONAL SUPERVISOR
		DRAWING BY	AKT					PRINCIPAL ENGINEER
		STATION ID	CHS					PRINCIPAL ENGINEER
		CHECKER INITIALS	AMP					PRINCIPAL ENGINEER

BURNS & MCGONNELL
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STATE LICENSE # 004, 01567

PROFESSIONAL ENGINEER'S SEAL



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**C350 PROJECT
ENVIRONMENTAL NOTES & DETAILS 2
HAMILTON COUNTY, OHIO**

HAMILTON COUNTY, OHIO

REF: DWG(S): PNG-C-350-0001284

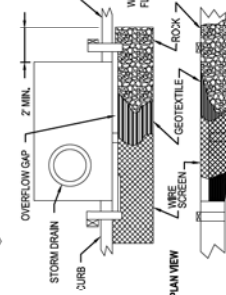
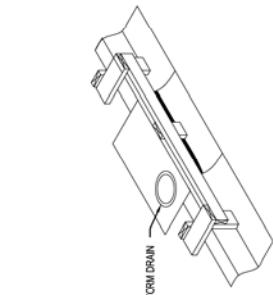
SHEETS: 2 OF 4

DWG(S) DATE: 04-25-2018 (SUPERSEDED)

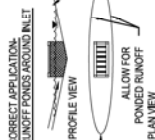
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PROJECT: C350-0001284

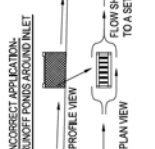
REVISION: B



ELEVATION



ELEVATION



ELEVATION

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 SECURED OVER THE CATCH BASIN GRATE WITH LIFTING STRAPS AND DUMPING STRAPS.
 3. PROVIDE SUPPORT AND ENSURE THE FILTRATION SACK DOES NOT FALL INTO CATCH BASIN AS IT FILLS WITH SEDIMENT.

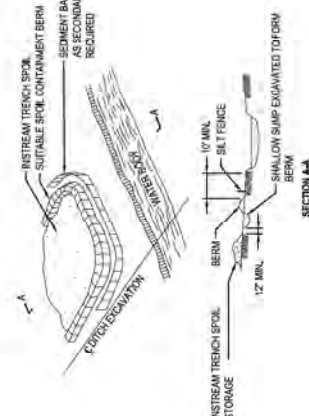
- MAINTENANCE:**
1. FILTRATION SACK MUST BE EMPTIED WHEN IT IS 1/2 FULL OF SEDIMENT AND DEBRIS.
 2. TO EMPTY THE SACK, REMOVE THE GRADE, LIFT THE SACK OUT OF THE CATCH BASIN VIA THE LIFTING STRAPS AND HAIL IT TO AN APPROPRIATE AREA, TURN IT INSIDE OUT WITH THE DUMPING STRAPS PROVIDED.
 3. THE FILTRATION SACK MUST BE REPLACED IF IT IS TORN. OTHERWISE THE SAME SACK CAN BE REPLACED IF IT IS TORN.
 4. THE CONTRACTOR IS REQUIRED TO HAVE STAGED REDUNDANT CONTROLS ON-SITE IN THE EVENT REPLACEMENTS ARE NEEDED.

- INSPECTION:**
1. INLET PROTECTION MEASURES MUST BE INSPECTED AT LEAST 24 HOURS PRIOR TO RAIN EVENTS. INSPECTION MUST BE CONDUCTED PRIOR TO RAIN EVENTS. NON-FUNCTIONAL DEVICES MUST BE REPLACED.

- REMOVAL:**
1. PULL OUT ALL INLET PROTECTION MATERIAL AND PROPERLY DISPOSE OF OFF-SITE.
 2. RE-GRASS AREA SEDIMENT HAS ACCUMULATED AS NECESSARY AND ESTABLISH VEGETATION IN 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 YARD DRAIN INLETS. MANUFACTURER'S SPECIFICATIONS FOR THE PRODUCT OF CHOICE SHOULD BE FOLLOWED.

CURB INLET PROTECTION
SCALE 1/8" = 1'-0"



NOTES:

1. SOIL CONTAMINANT BERMAS ARE TO BE USED WHERE INSTREAM TRENCH SOIL COULD REENTER THE WATERCOURSE DIRECTLY OR INDIRECTLY AND WITH SMALL AREAS UTILIZATION OF SEDIMENT BARRIERS IS REQUIRED.
2. MATERIAL USED FOR THE CONTAMINANT BERM SHOULD BE A MINIMUM OF 10" FT. FROM THE WATERS EDGE. IT SHOULD BE TYPED TO A TIGHT WHICH REMAINS STABLE DURING THE CONSTRUCTION PERIOD.
3. CARE SHOULD BE TAKEN THAT THE SOIL FILE DOES NOT OVERTOP THE CONTAMINANT BERM.
4. THE CONTAMINANT 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 SOIL MAY BE REQUIRED IF QUANTITIES ARE EXCESSIVE.
7. CARE AND ATTENTION MUST BE TAKEN TO ENSURE SOIL CONTAMINANT BERMAS ARE MAINTAINED.
8. FULL CONSIDERATION FOR OVERALL STABILITY IS REQUIRED WHEN SELECTING A SOIL CONTAMINANT LOCATION.

**TYPICAL TEMPORARY SOIL CONTAMINANT
BERM FOR WATERBODY TRENCH SPOILS**
SCALE 1/8" = 1'-0"

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 UP SLOPE TO A MINIMUM OF 10 FEET BEYOND THE END OF THE FENCE. WHEN ELEVATION OR SLOPE IS HORIZONTAL, DISTANCE, WHENEVER IS ACHIEVED FIRST.
4. AT A MINIMUM, THE BOTTOM RANCHES 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 SILT FENCE OF A OTHER SUITABLE DEVICE. THE TRENCH SHALL NOT BE CONSTRUCTED WITH THE SILT FENCE OF A OTHER SUITABLE DEVICE.
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. 3-INCH LENGTH, 2X2" HARDWOOD OF GOOD QUALITY MUST BE PALCED ON THE DOWNSLOPE SIDE OF THE SILT FENCE MATERIAL.
7. STAKES MUST BE PALCED RIGHT 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 18" PRIOR TO DRIVING THE STAKES INTO THE GROUND.
9. ON SLOPES OF EXCESS OF 10% REQUIRE SILT FENCE TO BE "HOOKED" AS DESCRIBED IN THE SHEPP DOCUMENT.

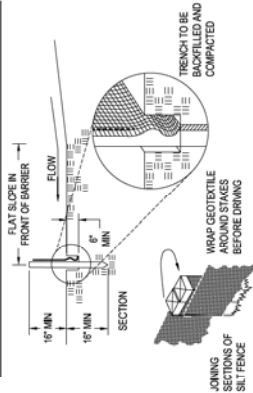
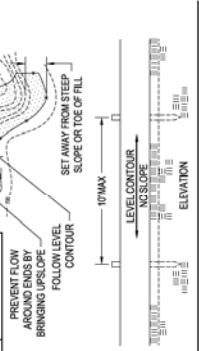
MAINTENANCE:

1. REMOVE ACCUMULATED SEDIMENT WHEN IT REACHES 1/3RD THE HEIGHT OF THE SILT FENCE. THE SEDIMENT SHOULD BE REMOVED BY HAND OR WITH A SHOVEL. WHERE IT COULD BE REMOVED BY HAND, IT SHOULD BE COMPOSTED OR USED AS FILL.
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:

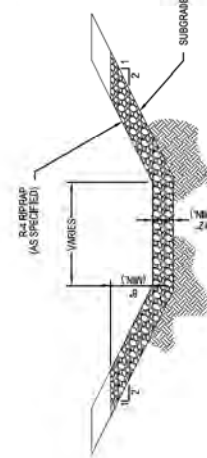
1. PULL OUT ALL SILT FENCE MATERIAL AND STAKES AND PROPERLY DISPOSE OF OFF-SITE.
2. RE-GRASS AREA WHERE SEDIMENT HAS ACCUMULATED AS NECESSARY AND ESTABLISH VEGETATION IN ANY RESULTING DISTURBED AREAS.

MINIMUM CONTRIBUTION AREA TO SILT FENCE USING SLOPE LENGTH	SLOPE	SLOPE LENGTH (FT.)
25% - 25%	25%	250
25% - 33%	33%	175
33% - 40%	40%	125
40% - 50%	50%	75
50% - 60%	60%	50
60% - 75%	75%	25



SILT FENCE

SCALE: N.T.S.

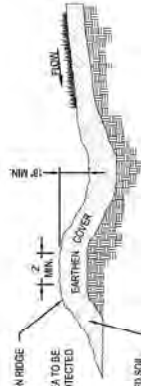


RIPRAPPED CHANNEL

SCALE: N.T.S.

DIVERSION SWALE

N.T.S.



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



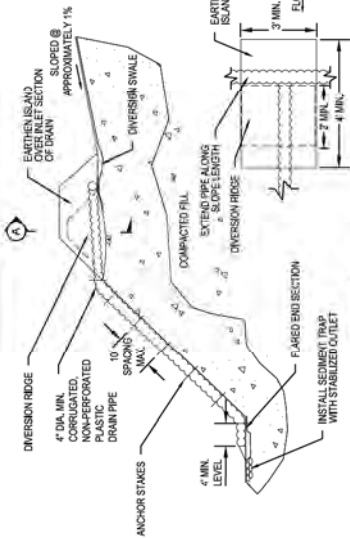
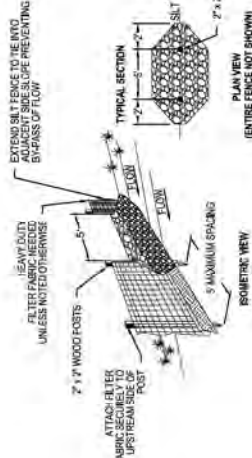
1. ALL FILTER SOCKS MUST BE 12-INCH COMPOST FILTER SOCK OR THE ENGINEERED EQUIVALENT.
2. MATERIALS - COMPOST USED FOR FILTER SOCKS SHALL BE WEED, PATHOGEN AND INSECT FREE AND FREE OF ANY REFUSE, CONTAMINANTS OR OTHER MATERIALS TOXIC TO PLANT GROWTH. THEY SHALL BE DERIVED FROM A WELL-COMPOSTED SOURCE 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, HOPE 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.

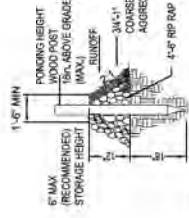


NOTES:

1. THE SLOPE DRAIN SHALL BE CONSTRUCTED LENGTHWISER WITH THE CONSTRUCTION OF THE SLOPE AS NEARLY AS POSSIBLE. ELEVATIONS WILL VARY ACCORDING TO GROUND ELEVATIONS AT THE TIME OF CONSTRUCTION.
2. INSPECT SLOPE DRAIN AND SUPPORTING OVERSLOWS 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.



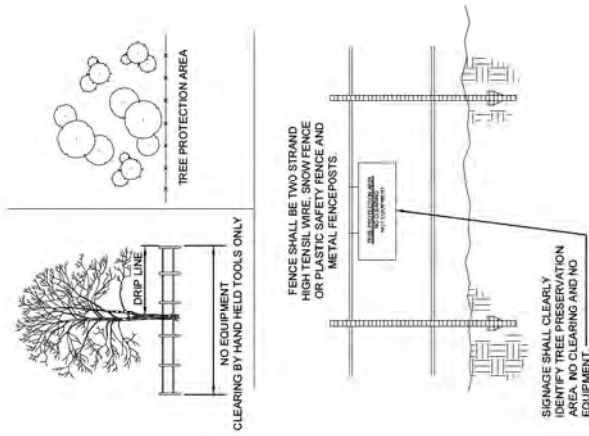
NOTES:

1. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE FLOWING EFFICIENCY.
2. INSPECT AND REPAIR AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN IT REACHES ONE-HALF HEIGHT OF FENCE OR FLOW 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 FLOWING.
5. SEE TYPICAL SILT FENCE DETAIL FOR ADDITIONAL INFORMATION.

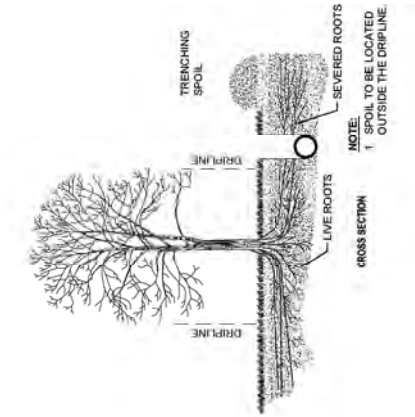
SILT FENCE ROCK OUTLET

SCALE: N.T.S.

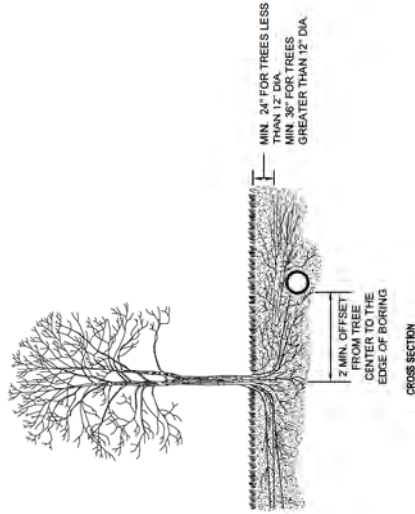
- PRESERVATION OF NATURAL VEGETATION**
1. AREAS WHERE NATURAL VEGETATION IS TO BE PRESERVED, INCLUDING TREES, SHALL BE FENCED PRIOR TO BEGINNING CLEARING OPERATIONS.
 2. ACCEPTABLE FENCE MATERIALS INCLUDE PLASTIC FENCE OR SNOW FENCE ANCHORED TO METAL FENCE POSTS.
 3. SIGNAGE SHALL CLEARLY IDENTIFY THE PROTECTION AREA AND STATE THAT NO CLEARING OR EQUIPMENT IS ALLOWED WITHIN IT.
 4. FENCE SHALL REMAIN AROUND PROTECTION AREAS UNTIL AFTER FINAL GRADING HAS BEEN COMPLETED.
 5. FENCE SHALL BE PLACED AS SHOWN ON PLANS AND BEYOND THE DRIP LINE OR CANOPY OF TREES TO BE PROTECTED.
 6. IF ANY CLEARING IS DONE AROUND SPECIMEN TREES IT SHALL BE DONE BY CUTTING AT GROUND LEVEL WITH HAND TOOLS AND SHALL NOT BE GRUBBED OR PULLED OUT.



CROSS SECTION
TREE PRESERVATION AREA



CROSS SECTION
TREE PRESERVATION AREA BEFORE TRENCHING

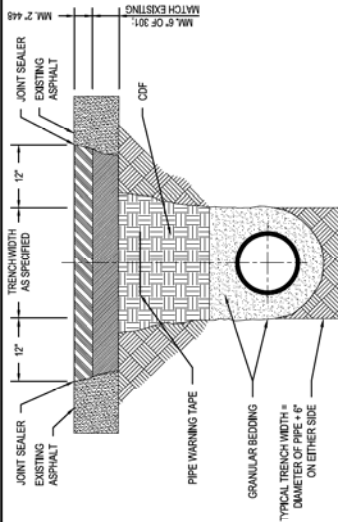


CROSS SECTION
TREE PRESERVATION AREA DURING BORING

NO.	DATE	REVISION/DESCRIPTION	BY	CHK.	APP'D	DESCRIPTION	APPROVALS
A	10/01/2020	ISSUED FOR BIDDING REVIEW	JAKT	CNS	JMP	JAKT CNS ACCOUNT NUMBER 03669	REGIONAL SUPERVISOR
B	07/24/2020	ISSUED FOR BID	JAKT	CNS	JMP	JAKT CNS ACCOUNT NUMBER 1880715	REGIONAL SUPERVISOR
						DRAWING BY JAKT	REGIONAL SUPERVISOR
						STATION ID C350	REGIONAL SUPERVISOR
						CHECKER INITIALS JMP	REGIONAL SUPERVISOR

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C350 PROJECT
ENVIRONMENTAL NOTES & DETAILS 4
HAMILTON COUNTY, OHIO
HAMILTON COUNTY, OHIO

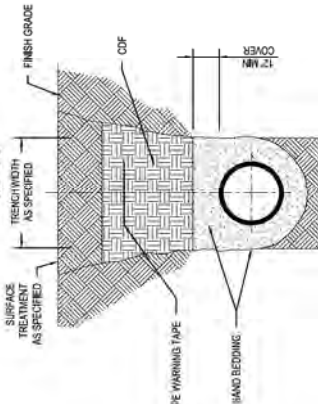


NOTES:

1. ALL RESTORATION IN BLUE ASH RIGHT OF WAY SHALL BE MILLED AND PAVED TO A WIDTH OF 12'.
2. SEE PNC C-350-0001294 FOR MILL AND PAVE DETAIL.
3. APPLY GRANULAR BEDDING AROUND PIPE AND BACKFILL TRENCH WITH A CONTROLLED DENSITY FILL (CDF) TO BOTTOM OF EXISTING ASPHALT.
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" ABOVE PIPELINE, OR AS OTHERWISE RECOMMENDED BY MANUFACTURER. MATERIALS SHALL BE SIGNAL TAPE OR APPROVED EQUIVALENT AND SHALL BE NON-TRACEABLE VARIETY.

TYPICAL UTILITY TRENCH AND SURFACE RESTORATION A: CITY OF BLUE ASH

SCALE: N.T.S.

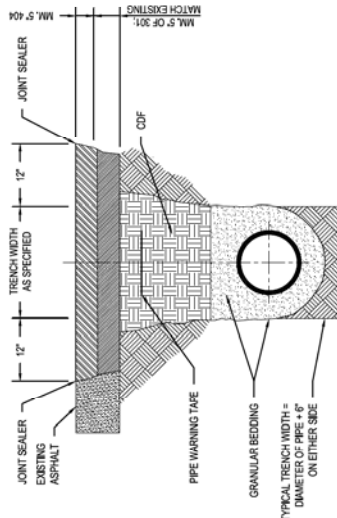


NOTES:

1. PIPE BEDDING SHALL BE CLEAN, GRADED SAND COMPACTED TO PROVIDE EVEN SUPPORT FOR PIPE. APPROVED MATERIALS INCLUDE M-10 STONE DUST OR SIMILAR BEDDING MATERIAL SHALL BE INSTALLED IN SUCH A MANNER THAT MINOR VIBES AND DOES NOT DISTURB BEDDING OR PIPE.
2. PIPE WARNING TAPE SHALL BE INSTALLED APPROXIMATELY 24" ABOVE PIPELINE, OR AS OTHERWISE RECOMMENDED BY MANUFACTURER. MATERIALS SHALL BE SIGNAL TAPE OR APPROVED EQUIVALENT AND SHALL BE NON-TRACEABLE VARIETY.

TYPICAL UTILITY TRENCH D

SCALE: N.T.S.

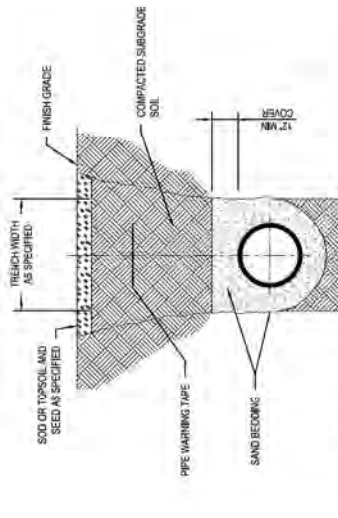


NOTES:

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" HIGH, FOR FUTURE COMPACTION.
4. SEAL ALL EDGES OF THE TRENCH WITH ITEM 702.17 JOINT SEALER.
5. PIPE WARNING TAPE SHALL BE INSTALLED APPROXIMATELY 24" ABOVE PIPELINE, OR AS OTHERWISE RECOMMENDED BY MANUFACTURER. MATERIALS SHALL BE SIGNAL TAPE OR APPROVED EQUIVALENT AND SHALL BE NON-TRACEABLE VARIETY.

TYPICAL UTILITY TRENCH AND SURFACE RESTORATION B: SHARONVILLE

SCALE: N.T.S.

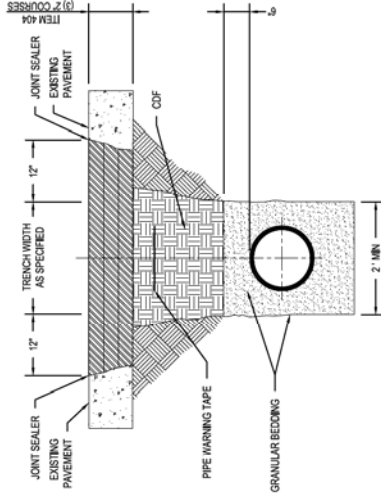


NOTES:

1. PIPE BEDDING SHALL BE CLEAN, GRADED SAND COMPACTED TO PROVIDE EVEN SUPPORT FOR PIPE. APPROVED MATERIALS INCLUDE M-10 STONE DUST OR SIMILAR BEDDING MATERIAL SHALL BE INSTALLED IN SUCH A MANNER THAT MINOR VIBES AND DOES NOT DISTURB BEDDING OR PIPE.
2. PIPE WARNING TAPE SHALL BE INSTALLED APPROXIMATELY 24" ABOVE PIPELINE, OR AS OTHERWISE RECOMMENDED BY MANUFACTURER. MATERIALS SHALL BE SIGNAL TAPE OR APPROVED EQUIVALENT AND SHALL BE NON-TRACEABLE VARIETY.

TYPICAL UTILITY TRENCH E

SCALE: N.T.S.

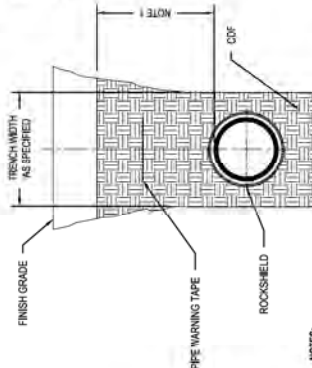


NOTES:

1. ALL RESTORATION IN CITY OF READING RIGHT OF WAY SHALL BE MILLED AND PAVED FROM CURB TO CURB. SEE PNC-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 (8) 2" LAYER OF 404.
5. BACKFILL SHALL BE CONTROL DENSITY FLOWABLE MATERIAL.
6. SEAL ALL PAVEMENT EXPOSED.
7. INSPECTOR MUST BE PRESENT DURING CONSTRUCTION.
8. COVER TRENCH WITH STEEL PLATE AS NEEDED.
9. STREET TO BE SWEEP CLEAN AT CONCLUSION OF CONSTRUCTION.
10. PIPE WARNING TAPE SHALL BE INSTALLED APPROXIMATELY 24" ABOVE PIPELINE, OR AS OTHERWISE RECOMMENDED BY MANUFACTURER. MATERIALS SHALL BE SIGNAL TAPE OR APPROVED EQUIVALENT AND SHALL BE NON-TRACEABLE VARIETY.

TYPICAL UTILITY TRENCH AND SURFACE RESTORATION C: CITY OF READING

SCALE: N.T.S.

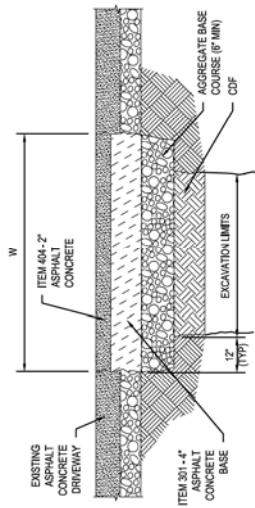


NOTES:

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. CDF SHALL BE EXCAVATABLE AND HAVE A COMPRESSIVE STRENGTH NO LESS THAN 100 PSI.

TYPICAL UTILITY TRENCH F

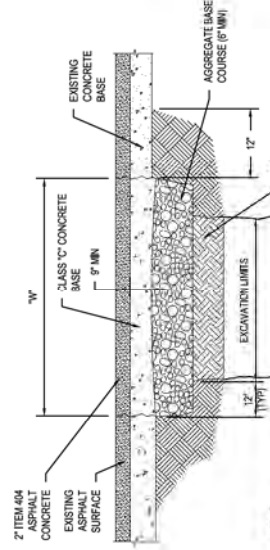
SCALE: N.T.S.



- NOTES:
- SEE MILL AND PAVE DETAIL ON THIS DRAWING. WIDTH SHALL BE 12".
 - 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 SWEEP 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

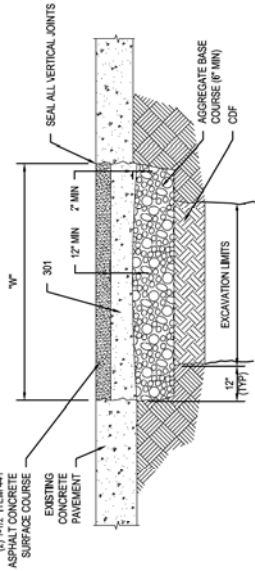
SCALE: N.T.S.



- NOTES:
- SEE MILL AND PAVE DETAIL ON THIS DRAWING. WIDTH SHALL BE THAT OF THE AFFECTED LANE(S).
 - THICKNESS OF ALL REPLACEMENT COURSES SHALL BE EQUAL TO EXISTING BUT SHALL NOT BE LESS THAN INDICATED.
 - 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.
 - SAWCUTS THAT EXTEND OUTSIDE THE AREA OF REMOVAL AND REPLACEMENT SHALL BE FILLED WITH AN EPOXY-BASED GROUT APPROVED BY THE ENGINEER.
 - 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.
 - LONGITUDINAL FULL DEPTH SAWCUTS SHALL BE AT EXISTING LONGITUDINAL JOINTS.
 - ADDITIONAL SAWCUTS MAY BE REQUIRED WITH THE AREA OF THE PATCH TO FACILITATE REMOVAL OF THE CONCRETE OR TO ALLEVIATE BONDING OF THE FULL DEPTH SAW CUT AT THE PATCH EDGE.
 - SEAL ALL EDGES OF RESTORATION WITH ITEM 16021+1 JOINT SEALER.

SURFACE TYPE 4 RESTORATION STANDARD: CINCINNATI, GOLF MANOR, AMBERLEY VILLAGE

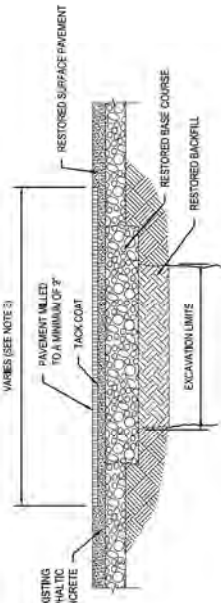
SCALE: N.T.S.



- NOTES:
- 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.
 - EXCAVATION MUST BE REPLACED IN THE LIKE KIND OR BETTER.
 - IF PAVEMENT IS ASPHALT, REPLACE WITH NOT LESS THAN 12" - 301+ WITH NO LIFT TO EXCEED 5" - 441+ AND TO BE SEALED WITH AC-20 IN A MANNER TO AVOID TRACKING. THE ABOVE IN ACCORDANCE WITH THE OHIO DEPARTMENT OF TRANSPORTATION SPECIFICATIONS.
 - IF PAVEMENT IS CONCRETE, REPLACE WITH NOT LESS THAN 10" OF CONCRETE PLUS 8" CONCRETE UNDERCUT AND KEYED IN ACCORDANCE WITH ITEM #452 OF THE OHIO DEPARTMENT OF TRANSPORTATION SPECIFICATIONS, OR LATEST SPECIFICATIONS ADOPTED BY THE SAME.
 - THE SERVICE DEPARTMENT SUPERINTENDENT MUST BE NOTIFIED A DAY IN ADVANCE OF RESTORATION WORK (584-4338).
 - PERMANENT RESTORATION MADE WITHIN 3 DAYS AFTER STREET IS OPENED.

SURFACE TYPE 2 RESTORATION STANDARD: VILLAGE OF EVENDALE

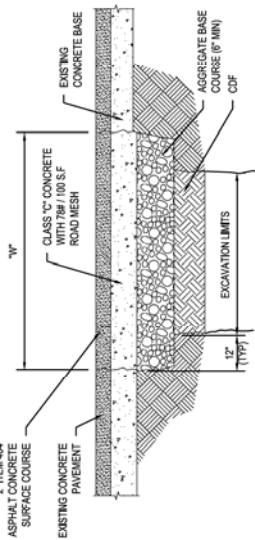
SCALE: N.T.S.



- NOTES:
- THICKNESS OF ALL REPLACEMENT COURSES SHALL NOT BE LESS THAN THAT OF EXISTING COURSE.
 - OVERLAY MATERIAL USED TO REPLACE MILLED SURFACE SHALL MATCH MATERIAL USED DURING RESTORATION.
 - MILLING WIDTHS VARY BASED ON LOCATION/MUNICIPALITY. SEE THE SELECTED RESTORATION TYPE FOR SPECIFIED WIDTHS.

MILL AND PAVE

SCALE: N.T.S.



- NOTES:
- 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 SWEEP AND TACKED, AND ALL JOINTS, AFTER THE SURFACE HAS BEEN PLACED, ARE TO BE SEALED WITH AC-20 IN A MANNER TO AVOID TRACKING.
 - 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.

REF. DWG(S): PNG-C-350-0001009 SHEET(S) 2 OF 3 DWG SCALE NONE DATE 02/04/2020 SUPERSEDED DRAWING NUMBER PNG -C-350-0001294 CHAIRMAN COUNTY CDS		C350 PROJECT RESTORATION DETAILS 2 HAMILTON COUNTY, OHIO HAMILTON COUNTY, OHIO		REF. DWG(S): PNG-C-350-0001009 SHEET(S) 2 OF 3 DWG SCALE NONE DATE 02/04/2020 SUPERSEDED DRAWING NUMBER PNG -C-350-0001294 CHAIRMAN COUNTY CDS	
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AREAS REQUIRING PERMANENT STABILIZATION	TIME FRAME TO APPLY EROSION CONTROLS:
ANY AREAS THAT ARE DORMANT FOR ONE (1) YEAR OR MORE	WITHIN SEVEN (7) DAYS OF THE MOST RECENT DISTURBANCE
ANY DISTURBED AREAS 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 INCONGRUOUS WITH THE PROJECT, EROSION CONTROL TECHNIQUES MUST BE EMPLOYED. THESE TECHNIQUES MAY INCLUDE MULCHING OR EROSION MATTING.	

AREAS REQUIRING TEMPORARY STABILIZATION ANY DISTURBED AREA SHALL BE PROTECTED BY A STRIP OF GRASS AND NOT IN FINAL GRADE.	TIME FRAME TO APPLY EROSION CONTROLS: DISTURBANCE SHALL REMAIN FOR NO MORE THAN SEVENTEEN (17) DAYS. WITHIN SEVEN (7) DAYS OF THE MOST RECENT DISTURBANCE WITHIN THE AREA.
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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 MIK - CUT AND EMBANKMENT FILL AREAS (NON-WET) CHANNELS		
BOTANICAL NAME	COMMON NAME	RATE OF PURE LIVE SEED (P.L.S.) PER ACRE:
FESTUCA ARUNDINACEA	TALL FESCUE	40-60 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 40 POUNDS OF PURE LIME SEED (PALS) PER ACRE IF LEFT UNDISTURBED FOR OVER 20 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 SPECIFICATION.
5. ESTABLISHMENT SHALL BE IN ACCORDANCE WITH THE FOLLOWING TABLES.

MAC N/A.

[illegible]

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MILY GRAVEL SURFACING

SHIRAZI COURSE MATERIAL NOTES

1. NON-WOVEN GEOTEXTILE SHALL BE MINST 140W 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.

SHEET: DWG(S): PNG-G-350-000(000)
 SHEET(S) 3 OF 3 DWG SCALE NONE
 DWG DATE 02/04/2020 SUPERSEDED —
 DRAWING NUMBER
 PNG -C-350-000(1295) B
 REVISIONS
 C-HAMILTON COUNTY/CY200

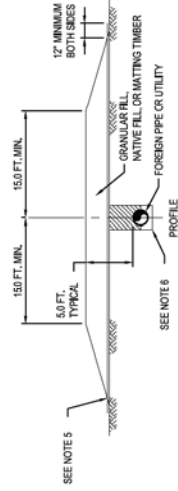
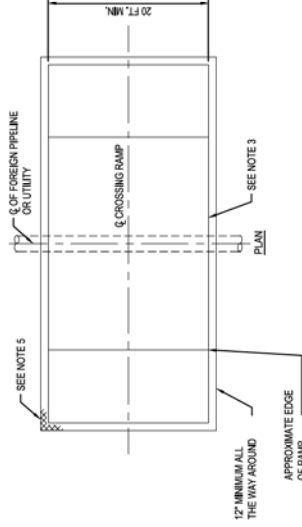
**C350 PROJECT
RESTORATION DETAILS 3
HAMILTON COUNTY, OHIO
HAMILTON COUNTY, OHIO**

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NOTES:

1. CONTRACTOR TO NOTIFY EXISTING PIPELINE/UTILITY COMPANY PRIOR TO INSTALLATION OF CROSSING RAMP.
2. LENGTH OF RAMP TO VARY IN ACCORDANCE WITH CROSSING ANGLE MINIMUM CROSSING ANGLE TO BE 45 DEGREES.
3. VEHICLES OR EQUIPMENT USING CROSSINGS SHALL PROCEED SLOWLY AND WITH CAUTION TO MINIMIZE IMPACT LOADING AND REDUCTION ON DEPTH OF COVER OVER PIPE/UTILITY.
4. ON COMPLETION OF CONSTRUCTION, CONTRACTOR TO REMOVE COMPLETE RAMP AND RESTORE AREA TO THE SATISFACTION OF THE EXISTING PIPELINE/UTILITY COMPANY AND THE COMPANY'S INSPECTOR.
5. GEOTEXTILE FABRIC AND GEOTEXTILE GRID WHERE REQUIRED SHALL BE INSTALLED TO PROTECT NATIVE TOP SOIL AS DIRECTED BY COMPANY'S INSPECTOR WHEN IMPORTED GRANULAR FILL OR NATIVE SUBSOIL FILL MATERIAL IS UTILIZED. IMPORTED GRANULAR FILL MATERIAL OR NATIVE SUBSOIL FILL MATERIAL TO BE REMOVED AND DISPOSED OF AS DIRECTED BY COMPANY'S REPRESENTATIVE.
6. IN ROCK TERRAIN THE CONTRACTOR SHALL UNDER THE EXISTING PIPELINE COMPANY'S SUPERVISION, EXPOSE THE TOP HALF OF THE PIPE AND BACKFILL WITH COMPACTED SAND OR APPROVED SOIL.



TEMPORARY RAMP CROSSING

SCALE: N.T.S.

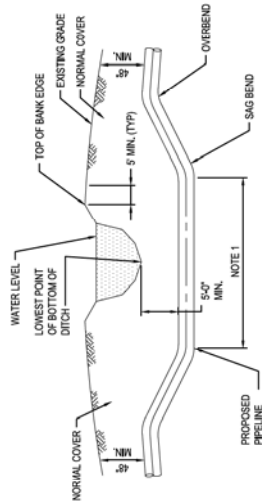
NOTES:

1. BURIED CABLE LOCATIONS & PIPE DEPTHS TO BE DETERMINED BY ELECTRONIC MEANS IN ADVANCE OF CONSTRUCTION. LOCATIONS TO BE DETERMINED BY CAREFULLY EXPOSING 6\"/>
2. OWNER OF BURIED CABLE(S) SHALL BE NOTIFIED 48 HOURS IN ADVANCE OF EXCAVATION OF CROSSING.
3. DEPTH OF PRELIME INCLUDING 2-4\"/>
4. PROPOSED PIPELINE MAY ONLY CROSS ABOVE BURIED CABLE(S) WHERE APPROVED IN WRITING BY BURIED CABLE OWNER.
5. CONTRACTORS 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.



CROSS SECTION OF BURIED CABLE R.O.W.

SCALE: N.T.S.



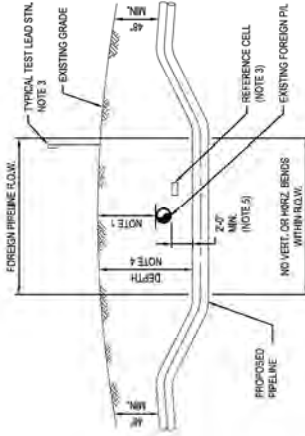
- NOTE:
1. PIPELINE WEIGHTS OR ANCHORS TO BE INSTALLED PER PLANS OR AS DIRECTED BY COMPANY.

TYPICAL OPEN CUT STREAM CROSSING

SCALE: N.T.S.

NOTES:

1. FOREIGN PIPELINE LOCATIONS & DEPTHS TO BE DETERMINED BY ELECTRONIC MEANS IN ADVANCE OF CONSTRUCTION. LOCATIONS TO BE DETERMINED BY CAREFULLY EXPOSING 6\"/>
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 REASILY ACCESSIBLE. INSTALL PERMANENT REFERENCE CELL AND EXTEND CELL LEAD TO TEST LEAD STATION.
4. DEPTH OF PRELIME INCLUDING 2-4\"/>
5. PROPOSED PIPELINE MAY ONLY CROSS ABOVE THE FOREIGN PIPELINE(S) WHERE REQUESTED BY OR APPROVED BY FOREIGN OWNER IN WRITING.

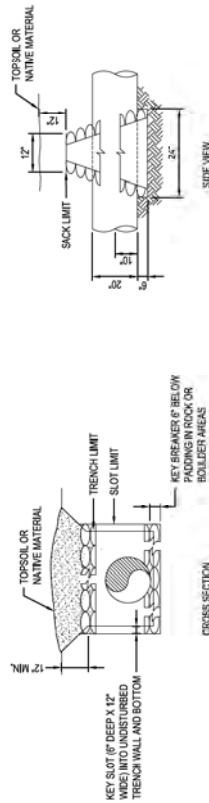
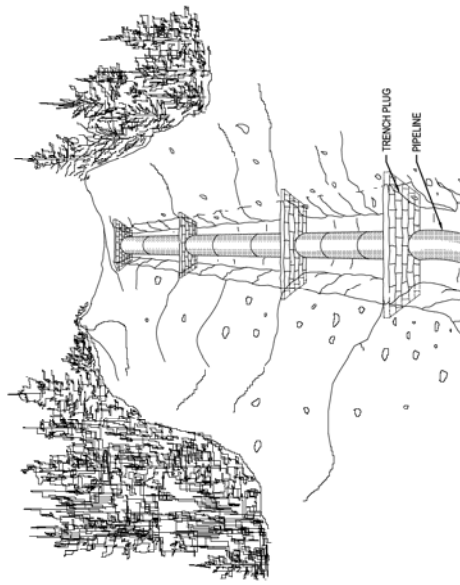


CROSS SECTION OF FOREIGN P.L. R.O.W.

CROSSING FOREIGN PIPELINE

SCALE: N.T.S.

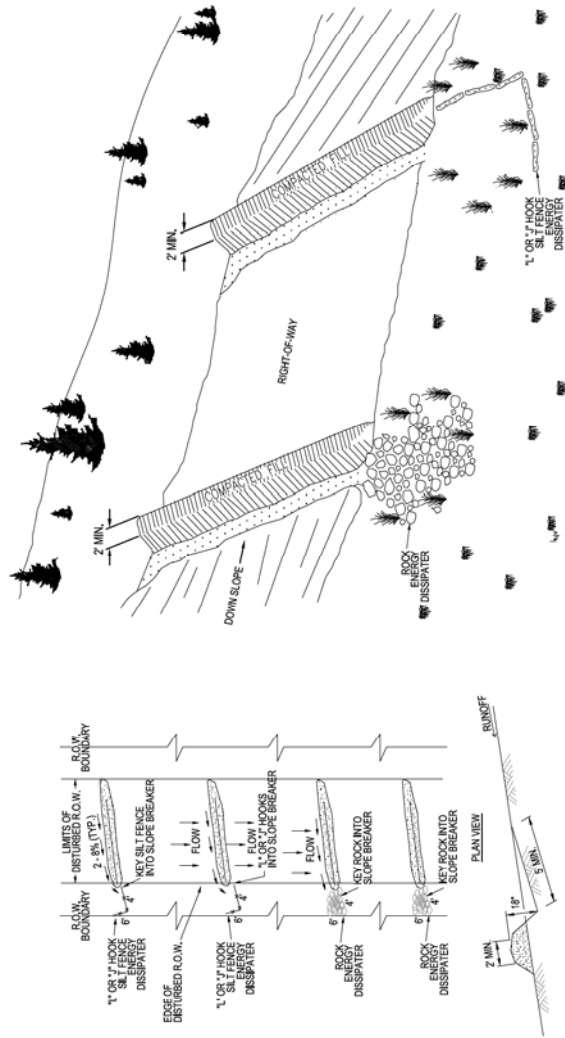
NO.	DATE	DESCRIPTION	BY	CHK.	APP'D.	DESCRIPTION	APPROVALS
A	08/17/2020	ISSUED FOR REVIEW	JAKT	CHS	JAMP	03669	REGIONAL ENGINEER
B	07/24/2020	ISSUED FOR BID	JAKT	CHS	JAMP	138715	REGIONAL ENGINEER
							PRINCIPAL ENGINEER



- 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.
 - WHERE THERE ARE TRENCHES IN THE VICINITY OF SLOPES AND WETLANDS.
 - WHERE NEEDED TO AVOID DRAINAGE DETAILING.
 - 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 DRAIN CONSTRUCTION STANDARDS AND AS DIRECTED:
 - BY COMPANY'S INSPECTOR. SACK BREAKERS SHALL UTILIZE OPEN WEAVE HEMP OR LITE SACKS FILLED WITH MINIMUM OF 3/8" OF SUBSOL SAND OR A NATURAL OF 1 PART CEMENT TO 6 PARTS SAND OR SUBSOL AS DETERMINED BY COMPANY'S INSPECTOR.
 - POLYURETHANE FOAM BREAKERS MAY BE USED IN-BELOW SACK BREAKERS, WHEN APPROVED BY COMPANY'S REPRESENTATIVE.
 3. PLUG SPACING AND CONFIGURATION MAY BE CHANGED AS DIRECTED BY COMPANY. DEPTH OF DITCH MAY VARY WITH SITE CONDITIONS.
 4. ALL MATERIALS SHALL BE SUPPLIED BY CONTRACTOR.

TYPICAL TRENCH PLUG

SCALE: N.T.S.



- NOTES:**
1. SLOPE BREAKERS SHALL BE CONSTRUCTED OF COMPACTED NATIVE SOIL AND INSTALLED AT LOCATIONS AS REQUIRED BY DUKE CONSTRUCTION STANDARDS OR AS DIRECTED BY THE COMPANY'S REPRESENTATIVE.
 2. SLOPE BREAKERS SHALL BE ORIENTED AS SHOWN OR OTHER PATTERN AS DIRECTED BY THE COMPANY'S REPRESENTATIVE TO DIRECT THE WATER OFF THE RIGHT-OF-WAY.
 3. SLOPE BREAKERS SHALL BE CONSTRUCTED AT 2% GRAZIENT ACROSS THE SLOPE.
 4. THE SLOPE BREAKERS SHALL BE 1' 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.
 - SLOPE DISSIPATER SHOULD BE KEYED INTO THE END OF THE SLOPE BREAKER.
 - PROVIDE ENOUGH AREA INSIDE 1' TO CAPTURE AND HOLD SEDIMENT.

TYPICAL SLOPE BREAKER

SCALE: N.T.S.

NO.	DATE	REVISION/DESCRIPTION	BY	CHK.	APP.	DESCRIPTION	APPROVALS
A	08/17/2020	ISSUED FOR WAY REVIEW	AKT	CHS	AMP	AREA CODE	REGIONAL
B	07/24/2020	ISSUED FOR BID	AKT	CHS	AMP	ACCOUNT NUMBER	DESIGNER
			AKT	CHS	AMP	NUMBER	REVIEWER
			AKT	CHS	AMP	STATION	MECHANICAL
			AKT	CHS	AMP	STATION	PRINCIPAL
			AKT	CHS	AMP	STATION	ENGINEER



C350 PROJECT
CONSTRUCTION DETAILS 3
HAMILTON COUNTY, OHIO

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

SHEET(S): 3 OF 10 | DWG SCALE: NONE

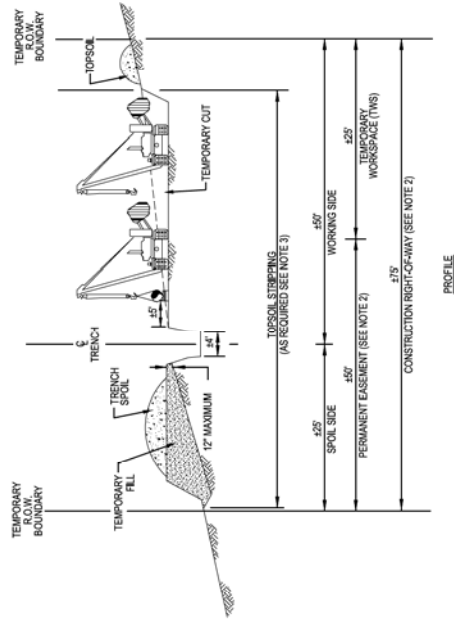
DWG DATE: 04-25-2018 | SUPERSEDED: NONE

DATE: 04-25-2018 | SUPERSEDED: NONE

PROJECT: PNG - C-350-0001005

REVISION: B

EXAMINER: COUNTY: OHIO



1. UTILIZE THE "T" TOSPOIL, SALVAGE METHOD AT LOCATIONS SUCH AS REPAIR AREAS OR UNMANNAGED WOODLAND, WHEN 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 RIGIDITY WALL, TYPICALLY BE 80 FEET WIDE CONSISTING OF 40 FEET OF PERMANENT EASEMENT AND 40 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 TOSPOIL AS SHOWN OR IN ANY CONFIGURATION APPROVED BY THE COMPANY'S INSPECTOR. KEEP TOSPOIL CLEAN OF ALL CONSTRUCTION DEBRIS.
6. LEAVE GRAPS IN TOSPOIL, AND SPOT APPLIES AT CIRCULAR DRAINAGES. DO NOT PUSH TOSPOIL INTO DRENCH OR SWELANDS, DO NOT USE TOSPOIL FOR PADDING.
7. AVOID SCALPING VEGETATED GROUND SURFACE WHEN BACKFILLING SPOIL AND TOSPOIL PILES.
8. SAME LAYOUT APPLIES WHERE CONSTRUCTION S.O.W. DOES NOT ABUT EXISTING R.O.W.
9. TEMPORARILY SUSPEND TOSPOIL HANDLING OPERATIONS DURING INCLEMENT WEATHER WINDY OR WITH UNFAVORABLE MEASURES TO MINIMIZE WIND EROSION CAN BE IMPLEMENTED.
10. TOSPOIL AND TRENCH SPOIL RELATIVE POSITIONS CAN, AS DIRECTED BY THE COMPANY'S INSPECTOR, BE REVERSED.

TYPICAL SIDE HILL CONSTRUCTION

5.175

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C350 PROJECT
CONSTRUCTION DETAILS 4
HAMILTON COUNTY, OHIO
HAMILTON COUNTY, OHIO

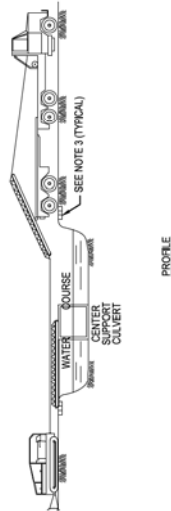
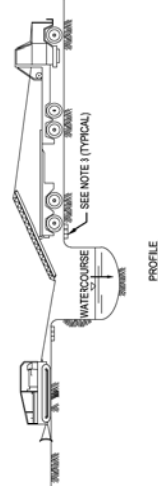
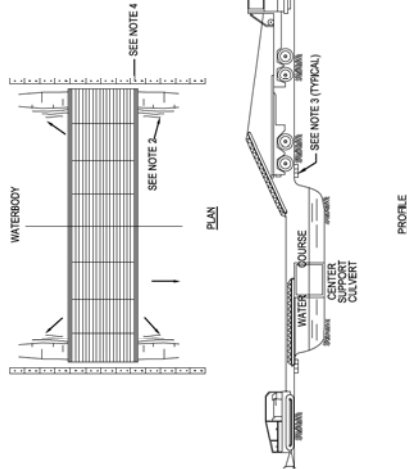
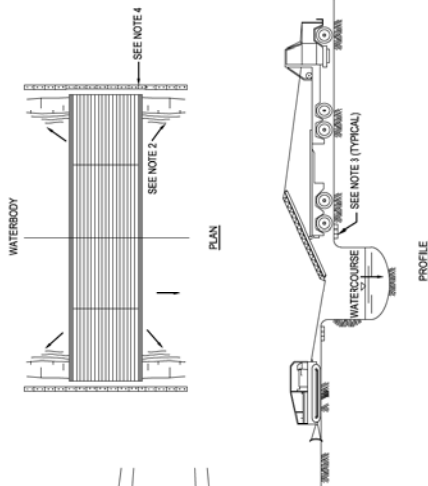
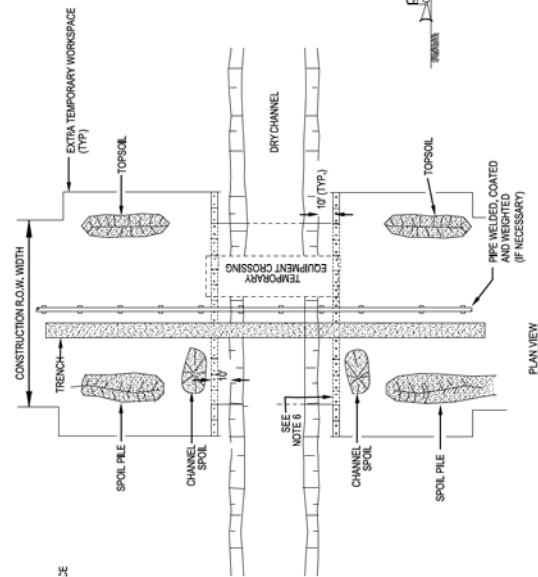
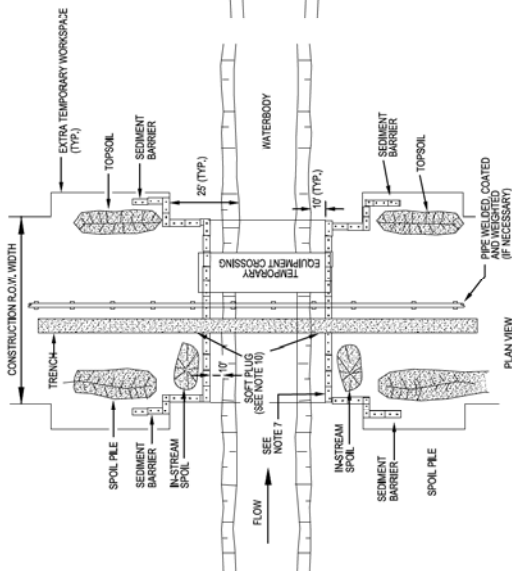
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SHEET(S)	4 OF 10	DWG SCALE	NONE
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UNQ DATE 1/15/2018	SUPERSEDED
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DWG	C 3 E0 0001306		REV
		DRAWING NUMBER	

PNG -C-350-0001306



1. METHOD APPLIES TO WATERBODIES THAT ARE NOT STAT-DESIGNATED FISHERIES WHERE FLUME CROSSINGS ARE NOT REQUIRED.
11. IF TOPOGRAPHY PERMITS TEMPORARY EQUIPMENT BRIDGE INSTALLATION, THE CONTRACTOR SHALL TRENCH, STAKE, WELD, COAT, WEDGE, IF NECESSARY, LOWER IN AND BACKFILL UTILIZING THE MAIN LINE CREW TRAVELING OVER THE BRIDGE.
12. IF TOPOGRAPHY DOES NOT PERMIT EQUIPMENT BRIDGE, CONTRACTORS SHALL TRENCH UP TO BOTH SIDES OF CROSSING, STAKE, WELD, COAT, AND WEDGE, IF NECESSARY, USING THE MAINLINE CREW IN STREAM EXCAVATION, LOWER IN AND BACKFILL, WALL UTILIZES A CLAM OR HOES WORKING FROM THE BANKS.
13. SCHEDULE CROSSING DURING LOW FLOW PERIOD IF POSSIBLE, NO IN-STREAM WORK BETWEEN 15 AND 30 JUNE 31.
14. COMPLETE ALL IN-STREAM ACTIVITIES WITHIN 24 HOURS OF FEASIBLE.
15. COMPLETE ALL LOGGABLE EQUIPMENT WITHIN 100 YD OF WATERBODY, REEFEL STATIONARY EQUIPMENT AS PER THE SPEC PLAN.
16. 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.
17. IN AGRICULTURAL LAND STRIP TRENCH FROM SPOIL STORAGE AREA.
18. CONSTRUCTION ALLOW TO PRESENT SILT, LAKE WATER AND SPOIL FROM FLOWING BACK INTO WATERBODY.
19. BARRIERS MAY BE TEMPORARILY REMOVE TO ALLOW CONSTRUCTION ACTIVITIES BUT MUST BE REPLACED BY THE END OF EACH WORK DAY.
20. IN-STREAM SPOIL TO BE STORED OUT OF THE STREAM CHANNEL (MINIMUM OF 10' FEET FROM THE WATERS EDGE AND WITHIN THE CONSTRUCTION PLAIN, UNLESS SPECIFIED OTHERWISE IN A SITE SPECIFIC CROSSING PLAN).
21. TRENCH DEPTH SHALL BE 18" TO 24" WITH A MINIMUM OF 24" FILL WITHIN 24" OF THE WATERS EDGE.
22. THE TEMPORARY EQUIPMENT CROSSING SHALL BE BUILT TO ALLOW EQUIPMENT TO ENTER THE PRACTICAL INSTALL CUT PLUS 1/2" AT THE EDGE OF THE STREAM BANKS UNTIL JUST PRIOR TO PIPE INSTALLATION TO CONTROL WATER FLOW & TRENCH SLOUGHING.
23. MAINTAIN STREAM FLOW THROUGHOUT CROSSING CONSTRUCTION.
24. BACKFILL WITH NATIVE MATERIAL.
25. RESTORE WATERBODY CHANNEL TO APPROXIMATE PRE-CONSTRUCTION PROFILE AND SUBSTRATE.
26. ALL DIMENSIONS INDICATED SHALL BE DETERMINED BY ACTUAL CONSTRUCTION CONDITIONS.
27. NO FORD CROSSINGS ARE PERMITTED.

1. METHOD APPLIES TO CROSSINGS WHERE NO FLOWING WATER IS PRESENT AT THE TIME OF CROSSING.
2. CONTRACTION MAY MANUALLY THROUGH THE CROSSING OR TO BOTH SIDES OF THE CROSSING, STRONG WELD, COLD AND REPEAT (IF NECESSARY), USING THE MANUWHE CREW WITH THE PIPE.
3. THE CROSSING SHALL BE INSTALLED WITHIN THE CROSSING AREA, WITH THE CROSSING BEING NO MORE THAN 10 FEET FROM THE CROSSING AREA.
4. NO REINFORCING OF MOBILE EQUIPMENT WITHIN 100 FEET OF DRY CHANNEL, REFUEL, STATIONARY EQUIPMENT AS PER THE SPEC LAM.
5. INSTALLATION OF TEMPORARY SUBMERGED CROSSING IS REQUIRED AT ALL STREAM CROSSINGS.
6. TEMPORARY CROSSING MUST BE BUILT IN ACCORDANCE WITH THE TYPICAL PORTABLE CROSSING DETAIL.
7. IN ADDITIONAL TO LAND, STRIP TOPSOIL, FROM SPILL STORAGE AREA, STOCKPILE TOPSOIL AND SPILL SEPARATELY. LAND AND SPILL WILL NOT BE STOCKPILED IN THE CROSSING CHANNEL AND WILL BE PLACED A MINIMUM OF 10 FEET FROM CROSSING BARS WITHIN THE CONSTRUCTION ROW.
8. MUST NOT EXHIBIT BARRIERS ACROSS THE ENTIRE CONSTRUCTION ROW, FOLLOWING CLEANING AND GRADING, NO MAINTENANCE UNTIL CONSTRUCTION OF THE CROSSING, EROSION CONTROL MEASURES SHALL BE REINSTALLED IMMEDIATELY FOLLOWING BACKFILLING OF FRENCH CHANNEL AND STABILIZATION OF BANKS. BARRIERS MAY BE TEMPORARILY REMOVED TO ALLOW CONSTRUCTION ACTIVITIES BUT MUST BE REPLACED BY THE END OF EACH WORK DAY.
9. HIGH BANK AND WITHIN THE CONSTRUCTION ROW, UNLESS DERIVED OTHERWISE IN SITE SPECIFIC CROSSING PLANS.
10. BACKFILL WITH NATIVE MATERIAL.
11. RESTORE CROSSING CHANNEL TO APPROXIMATE PRE-CROSSING PROFILE AND SUBSTRATE.
12. ALL CROSSING CHANNELS SHALL BE REINSTALLED IMMEDIATELY FOLLOWING CONSTRUCTION.
13. ALL CROSSINGS INSTALLED SHALL BE PERMITTED BY AN ACTUAL CONSTRUCTION CONTRACT.

- NOTES
1. THIS TYPE OF BRIDGE IS GENERALLY USED ON NARROW, DEEP CROSSEINGS.
2. BRIDGE IS APPROXIMATELY 40' TO 50' LONG.
3. BRIDGE IS ANCHORED AT EACH END TO A GRANULAR BLOCK FOR STABILITY.
4. UTILITY MATERIALS ARE USED TO ANCHOR MATERIAL. SWAMP MAT, SMUDS OR OTHER SUITABLE MATERIALS TO ALLOW CUTTING THE BANS WHEN EVER POSSIBLE. ENSURE MATERIALS TO BE REMOVED ENSURE THAT ALL MATERIAL USED DOES NOT SPILL INTO WATER/CROSSING.
5. CONSTRUCT SEDIMENT BARRIERS ACROSS THE ENTIRE CONSTRUCTION ROW. TO PREVENT SILT, ALGAE, WATER AND SPILL FROM FLOWING BACK INTO WATERBODY. BARRIERS MAY BE TEMPORARILY REMOVED TO ALLOW CONSTRUCTION ACTIVITIES BUT MUST BE REPLACED BY REMOVED PORTABLE BARRIERS AS SOON AS POSSIBLE AFTER SEDIMENT SEDING UNLESS OTHERWISE DIRECTED BY COMPANY REPRESENTATIVE. THE STRUCTURE IS TO BE REMOVED IF THERE IS MORE THAN ONE MONTH BETWEEN FINAL GRADING AND SEDING. AND ALTERNATIVE ACCESS TO THE CONSTRUCTION ROW IS AVAILABLE.
6. RESTORE AND STABILIZE BED AND BANS TO APPROPRIATE RECREATION CONDITIONS.

1. THIS TYPE OF BRIDGE IS GENERALLY USED FOR CROSSINGS THAT ARE TOO WIDE FOR A SINGLE BRIDGE SECTION AND/ OR TOO DEEP TO ANCHOR BLOCKS FOR STABILITY.
2. THE MAIN CHALLENGE OF THE GRANULAR FILL BRIDGE IS TO PREVENT SPILLAGE OF WATER INTO THE FILL.
3. AS REQUIRED, INSTALL A TELL MATERIAL, IF USED, DOES NOT SPILL INTO WATERPOND.
4. CONSTRUCT SEMI-IMPERMEABLE BARRIERS ACROSS THE ENTIRE CONSTRUCTION ROW TO PREVENT SURFACE WATER FROM FLOWING BACK INTO WATERPOND. BARRIERS MAY BE CONSTRUCTED BY THE SAME METHOD AS REQUIRED TO ALLOW CONSTRUCTION MATERIALS TO BE DEPOSITED BY THE EXCAVATOR, OR BY A DIFFERENT METHOD.
5. REMOVE PORTABLE BARRIERS AS SOON AS POSSIBLE AFTER PERMANENT BARRIERS ARE IN PLACE. OTHERWISE, DIRECTED BY ONE COMPANY REPRESENTATIVE THE STRUCTURE IS TOBE REMOVED IF THERE IS MORE THAN ONE MONTH BETWEEN FINAL GRADING AND SEEDING, AND AN ALTERNATIVE ACCESS TO THE CONSTRUCTION ROW IS AVAILABLE.
6. RESTORE AND STABILIZE BED AND BANKS TO APPROPRIATE PRE-CONSTRUCTION CONDITIONS.

TYPICAL FLOWING WATERBODY CROSSING OPEN CUT TRENCHED

TYPICAL NON-FLOWING WATERBODY
CROSSING OPEN CUT TRENCHING

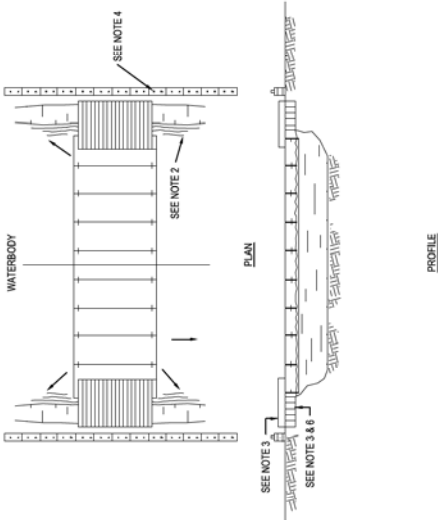
TYPICAL PORTABLE
WATERBODY BRIDGE

TYPICAL PORTABLE WATERBODY
BRIDGE WITH CULVERT SUPPORT

NO.	DRAWING	DATE	REVISIONS DESCRIPTION
A	07/24/2020	ISSUED FOR BIR REVIEW	
B	07/24/2020	ISSUED FOR BID	
C			
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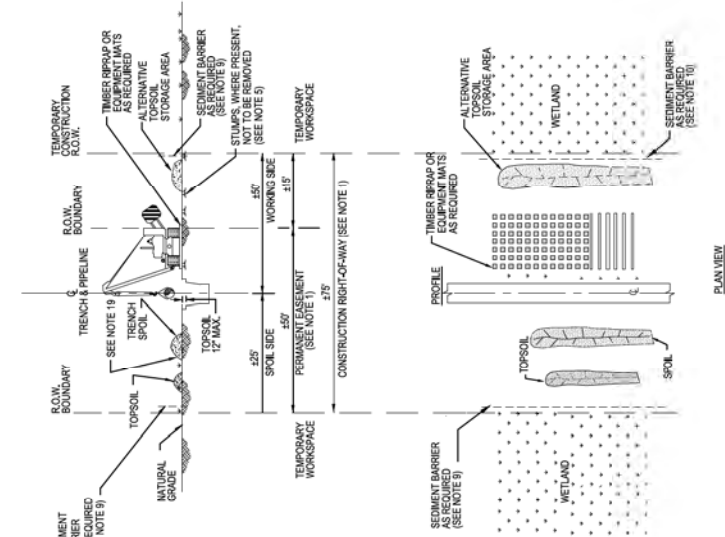
BY	CHK	AMPS	DESCRIPTION	APPROVALS	REVISION
AKT	AMP	AMP	AREA CODE	AKT	1
			PROJECT NUMBER		2
			PROJECT NUMBER		3
			DRAWING BY		4
			STATION ID		5
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REF DWG(S) PNG-6-350-000108	SHEET(S) 5 OF 10	DWG SCALE	NONE
	DWG DATE 1945-2018	SUPERSEDED	
DRAWING NUMBER			REVISION
PNG -C-350-0001307			B
MARLBOROUGH COUNTY, NC			



1. THIS TYPE OF BRIDGE IS GENERALLY USED ON WIDE, DEEP CROSSINGS.
2. BRIDGE IS ANCHORED AND TIED OFF TO ANCHOR BLOCKS FOR STABILITY.
3. UTILIZE APPROXIMATE TELS OF CLEAN GRANULAR MATERIAL, SWAMP MATS, SANDS OR OTHER SUITABLE MATERIALS TO AVOID CUTTING THE BANKS WHEREVER THEY ARE NOT ERODING.
4. FILL MATERIAL, IF USED, MUST NOT SPILL INTO WATERCOURSE.
5. CONTRACT SEDIMENT BARRIERS ACROSS THE ENTIRE CONSTRUCTION ROW, TO PREVENT SILT, ALGAE AND WATER AND SPILL 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. (A FENCE, UNPAILED OR SANDBAGS MAY BE USED INSTEAD OF BARRIERS).
6. REMOVE FLOWING BRIDGES AS SOON AS POSSIBLE AFTER PERMANENT SEEDING UNLESS OTHERWISE DIRECTED BY COMPANY REPRESENTATIVE. THE STRUCTURE MUST BE REMOVED TO PREVENT FLOODING AND TO ALLOW ACCESS TO THE CONSTRUCTION ROW IS AVAILABLE.
7. DISPOSE OF ANY ROCK AS DIRECTED BY COMPANY REPRESENTATIVE.
8. RESTORE AND STABILIZE BED AND BANKS TO APPROXIMATE PRE-CONSTRUCTION CONDITIONS.

TYPICAL FLEXI-FLOAT WATERBODY BRIDGE



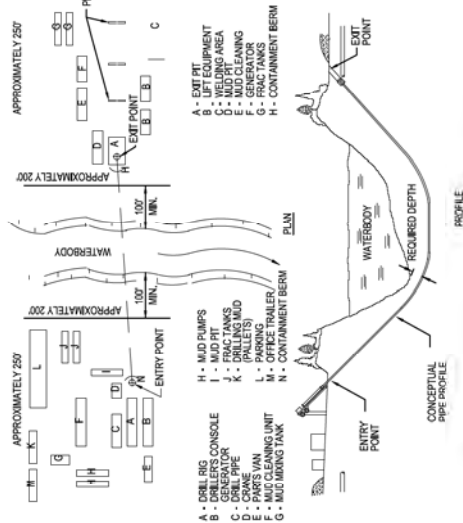
TYPICAL WETLAND CROSSING

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. EXES OR DOES NOT ABUT A FORESTED ROW.
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 FUELING OF EQUIPMENT WITHIN 100 FEET OF WETLAND EXCEPT IN ACCORDANCE WITH THE SPEC PLAN.
8. IF SATURATED AT TIME OF CONSTRUCTION, REDUCE SOIL COMPACTION BY UTILIZING LIGHTER EQUIPMENT OR EQUIPMENT WITH SOFT TREADS OR NORMAL EQUIPMENT OPERATED ON TIMBER RIPRAP OR EQUIPMENT MATS.
9. AVOID ADJACENT WETLANDS. INSTALL SEDIMENT BARRIERS IMMEDIATELY AFTER FINISHING GROUND DISTURBANCE AND AT THE EDGE OF THE FOLLOWING THE WETLAND AND AS DIRECTED BY THE COMPANY'S INSPECTOR.
10. THIS DRAWING REFLECTS "TRENCH ONLY" TOPSOIL STOPPING 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 SPILL.
12. LEAVE GRASS, TOPSOIL AND SPILL PILLS AT OBVIOUS DRAINAGES. DO NOT USE TOPSOIL FOR PADDOCK, AVOID SCALPING VEGETATED GROUND SURFACE WHEN BACKFILLING SPILL PILE.
13. IN SATURATED CONDITIONS, SOIL MAY BE USED TO STABILIZE THE WORKING SURFACE.
14. IF SATURATED AT TIME OF CONSTRUCTION, LEAVE HARD FLUS AT THE EDGE OF WETLAND UNTIL JUST PRIOR TO "REINCHING".
15. TRENCH THROUGH WETLANDS.
16. LOWER AN 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 GRASS TO NEAR PRE-CONSTRUCTION TOPOGRAPHY AND REDUCE TOPSOIL, WHERE SALVAGED WITHOUT A CROWN OVER THE TRENCH.
19. IF STANDING WATER IS NOT PRESENT, SEED AS SPECIFIED.
20. TOPSOIL AND TRENCH SPILL, RELATIVE POSITIONS CAN, AS DIRECTED BY THE COMPANY'S INSPECTOR, BE REVERSED.

[illegible]

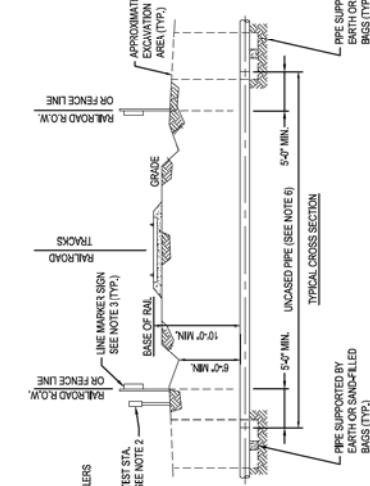
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Piedmont Natural Gas
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C350 PROJECT
CONSTRUCTION DETAILS 6
HAMILTON COUNTY, OHIO
HAMILTON COUNTY, OHIO



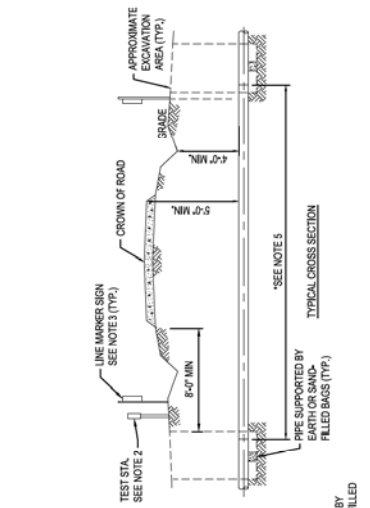
NOTES:

1. SET UP DRILLING EQUIPMENT A MINIMUM OF 100 FEET FROM THE EDGE OF THE WATERBODY. DO NOT CLEAN OR GRADE WITHIN THE 100 FOOT ZONE.
2. ENSURE THAT ONLY BENTONITE BASED DRILLING MUDS 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 DOWNSTREAM 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.



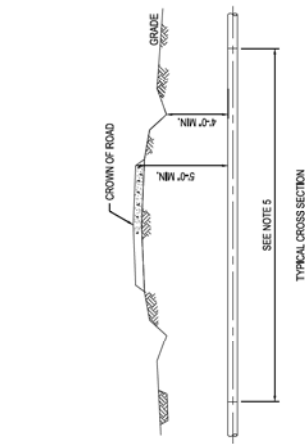
NOTES:

1. WHERE CONFLICTS MAY EXIST, PERMIT SPECIFICATIONS SHALL ALWAYS GOVERN THE DRAWING.
2. CATHODIC TEST STATION TO BE INSTALLED IF REQUIRED. SEE TYPICAL DRAWING PNG-C-350-000101.
3. PIPELINE MARKER TO BE INSTALLED PER TYPICAL DRAWING PNG-C-350-000111 (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 5" 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. UNCAUSED GAS PIPES 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.



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-C-350-000101.
3. PIPELINE MARKER TO BE INSTALLED PER TYPICAL DRAWING PNG-C-350-000111 (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 BAGG 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 BAGG FILL AT THE DISCRETION OF THE COMPANY REPRESENTATIVE.



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-C-350-000101.
3. PIPELINE MARKER TO BE INSTALLED PER TYPICAL DRAWING PNG-C-350-000111 (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 BAGG 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 BAGG FILL AT THE DISCRETION OF THE COMPANY REPRESENTATIVE.

CONCEPTUAL CROSSING METHOD FOR HORIZONTAL DIRECTIONAL DRILL

SCALE: N.T.S.

CONCEPTUAL UNCAUSED BORED RAILROAD CROSSING

SCALE: N.T.S.

CONCEPTUAL UNCAUSED BORED ROAD CROSSING

SCALE: N.T.S.

CONCEPTUAL OPEN CUT ROAD CROSSING

SCALE: N.T.S.

BURNS & MCDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # 004, 01567

PROFESSIONAL ENGINEER'S SEAL

NO.	DATE	REVISION/DESCRIPTION	BY	CHK.	APP'D.	DESCRIPTION	DATE	INITIALS	APPROVALS
A	10/01/2020	ISSUED FOR BIDDING REVIEW	JAKT	CHS	AMP	AREA CODE	05669	05/01	
B	10/24/2020	ISSUED FOR BID	JAKT	CHS	AMP	ACCOUNT NUMBER	1580715	05/01	
						DRAWING BY	JAKT	05/01	
						STATION ID	C350	05/01	
						CHECKER INITIALS	AMP	05/01	



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C350 PROJECT
CONSTRUCTION DETAILS 7
HAMILTON COUNTY, OHIO

HAMILTON COUNTY, OHIO

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

SHEETS: 7 OF 10 DWG SCALE: NONE

DWG DATE: 10/24/2018 (REVISED)

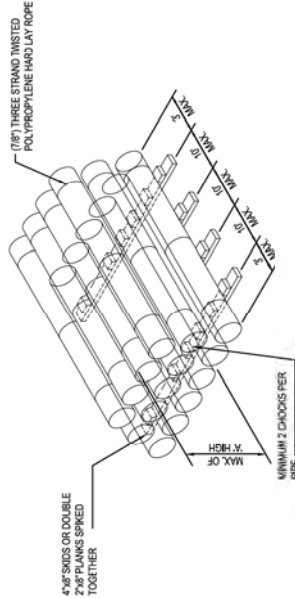
DATE: 10/24/2018 (REVISED)

PROJECT: PNG - C-350-0001309

REVISION: B

SIZE	N° ROWS	CIRCUMFERENCE OF FINISHED LOOPS	N° OF ROWS	SIZE
4"	12	18"	5	60"
6"	10	24"	4	66"
8"	8	30"	4	72"
10"	6	37"	4	80"
12"	6	43"	4	86"
15"	5	54"	4	98"

* PIPE GREATER THAN 20" WILL BE 4 ROWS.



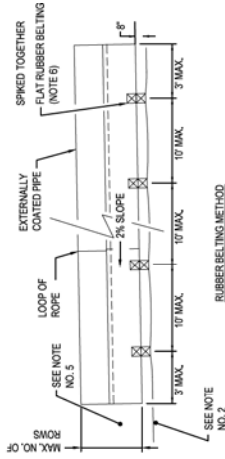
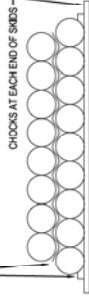
- NOTES:**
1. ALL PIPE THAT BE BARRIS AFTER A CONSTRUCTION PROJECT MUST BE PERMANENTLY STOCKPILED.
 2. THE USE OF ALTERNATE METHODS FOR STOCKPILING PIPE AND/OR THE USE OF ALTERNATE MATERIALS FOR PREVENTING PIPE TO PIPE CONTACT SHALL REQUIRE THE APPROVAL OF THE COMPANY REPRESENTATIVE.
 3. NUMBER OF ROWS TO BE SPECIFIED BY COMPANY.
 4. ALL MATERIALS SHALL BE FURNISHED BY CONTRACTOR.
 5. EARTHEN BARRIS 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 20.0 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 SUPPING THE LOOP OVER THE PIPE.

TYPICAL TEMPORARY PIPE STOCKPILE

SCALE: N.E.L.

CONTINUOUS STRIPS OF FLAT RUBBER BELTING, MINIMUM OF 4" WIDE X 1/4" THICK INSTALLED IN LINE WITH THE SUPPORTING SKIDS WITH SHORT STRIPS INSERTED WHERE NECESSARY TO PREVENT PIPE TO PIPE CONTACT.



CIRCUMFERENCE OF LOOPS		CIRCUMFERENCE OF FINISHED LOOPS	
THE CIRCUMFERENCE OF LOOPS (MINIMUM) SHALL BE IN ACCORDANCE WITH THE FOLLOWING TABLE		THE CIRCUMFERENCE OF FINISHED LOOPS SHALL BE IN ACCORDANCE WITH THE FOLLOWING TABLE	
PIPE O.D.	20"	24"	30"
CIRCUMFERENCE OF FINISHED LOOPS	34"	40"	46"

- 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" 3/4" RIM GRAVEL.
 3. SKIDS TO BE CAREFULLY LEVELED TO MAINTAIN 2% SLOPE. PIPES TO MAINTAIN CLOSE CONTACT THROUGHOUT ENTIRE LENGTH TO PREVENT SPILLING AND ROLLING OF THE STOCKPILE.
 4. MAXIMUM ALLOWED SPACING BETWEEN RINGS TO MAINTAIN CLOSE CONTACT THROUGHOUT ENTIRE LENGTH TO PREVENT SPILLING AND ROLLING OF THE STOCKPILE.
 5. PIPE AT TOP MUST BE STOCKPILED A MINIMUM OF 4 ROWS HIGH. PIPE LARGER THAN 18" TO BE STOCKPILED A MINIMUM OF 3 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 20' 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 SUPPING THE LOOP OVER THE PIPE.

TYPICAL PERMANENT PIPE STOCKPILE

SCALE: N.E.L.

BURNS & MCDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # 004-01567

PROFESSIONAL ENGINEER EXPIRATION DATE

NO.	DATE	REVISION/DESCRIPTION	BY	CHK.	APP'D.	DESCRIPTION	APPROVALS
A	08/17/2020	ISSUED FOR BIDDING REVIEW	AKT	CNS	JMP	DESIGN	REGIONAL ENGINEER
B	07/24/2020	ISSUED FOR BID	AKT	CNS	JMP	DESIGN	REGIONAL ENGINEER
							PRINCIPAL ENGINEER



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

REF: DWG(S) PNG-C-350-000-000

SHEET(S)	8 OF 10	DWG SCALE	NONE
DWG DATE	04-25-2018	SUPERSEDED	—
DRAWING NUMBER	PNG -C-350-0001310		
REVISION	B		

Item 14 C: OHV Pipeline Marker Example

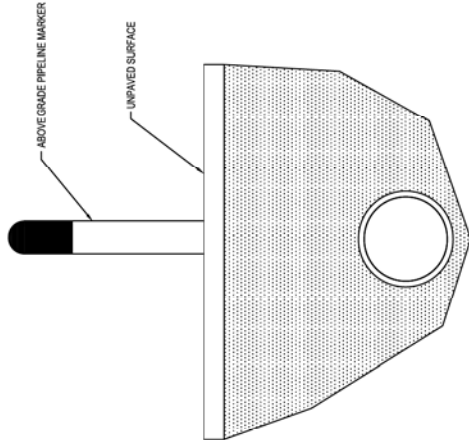


Figure 14 C: OHV Pipeline Marker

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Please refer to the Duke Energy website 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 FORM-140.



ABOVE GRADE PIPELINE MARKER

SCALE: N/A

NOTES:

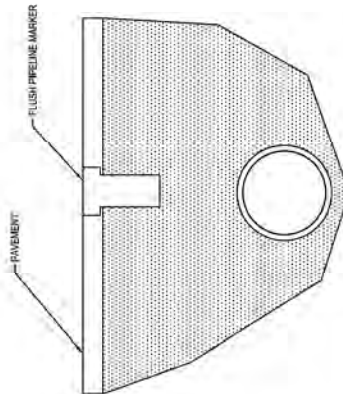
1. PIPELINE MARKERS SHALL BE PLACED AT:
 - IN LINE-OF-SIGHT INTERVALS AND TURNING POINTS
 - ALL RIVER CROSSINGS
 - ALL ROAD CROSSINGS
 - RIVER, STREAM, CREEK, DITCH AND CANAL CROSSINGS
 - UTILITY CROSSINGS (PER DUKE DISCRETION)
 - SWAMPS OR WETLANDS ENTRY AND EXIT
 - ROAD WEDGINGS
 - FACILITIES SUCH AS VALVE SETTINGS, BORDER STATIONS, REGULATOR STATIONS, AND PIPELINE INTERCONNECTS
 - UNDERGROUND VALVES
 - HOV ENTRY AND EXIT POINTS

2. PIPELINE MARKERS SHALL BE PLACED DIRECTLY ON TOP OF 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

CONSTRUCTION BARRIER



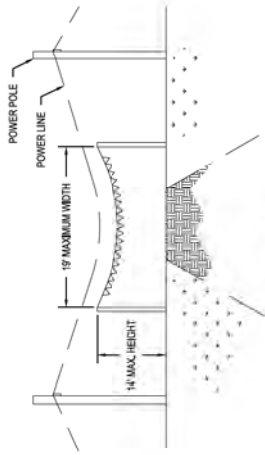
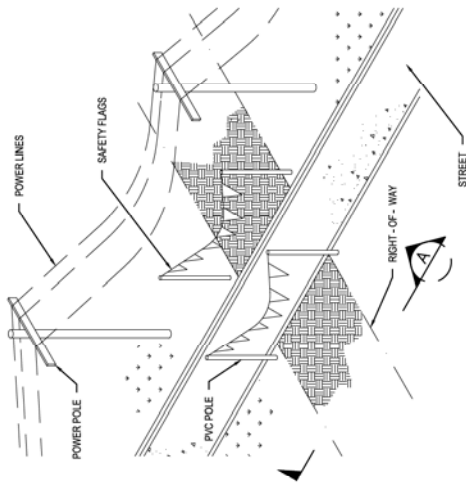
NOTE:

1. FLUSH PIPELINE MARKERS TO BE INSTALLED IN PAVEMENT WHEN PIPELINE MARKER IS REQUIRED.

FLUSH PIPELINE MARKER

SCALE: N/A

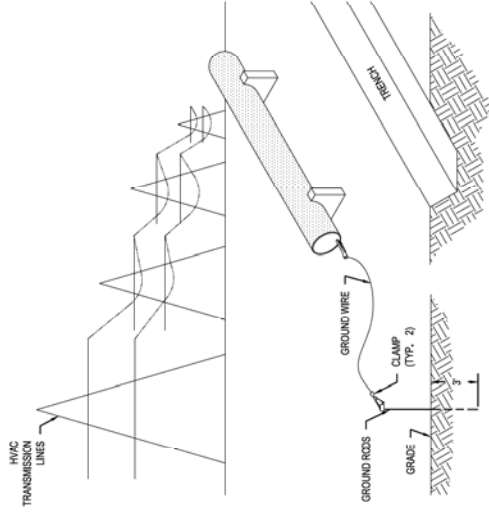
NO.	DATE	REVISION/DESCRIPTION	BY	CHK.	APP.	DESCRIPTION	APPROVALS
A	08/17/2020	ISSUED FOR BAY REVIEW	JAKT	CHS	JMP	AREA CODE	REGIONAL ENGINEER
B	07/24/2021	ISSUED FOR BID	JAKT	CHS	JMP	ACCOUNT NUMBER: 05669	REGIONAL ENGINEER
						DRAWING BY: JAKT	REGIONAL ENGINEER
						STATION ID: C350	REGIONAL ENGINEER
						CHECKER INITIALS: JMP	REGIONAL ENGINEER



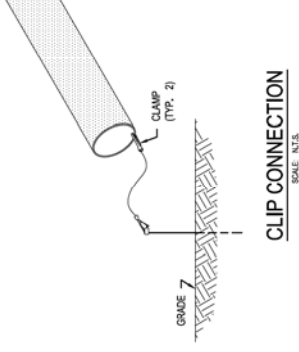
SECTION A-A
SCALE: N.T.S.

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.

BURNS & MCDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # 004, 01567

PROFESSIONAL ENGINEER'S SEAL

NO.	DATE	REVISION/DESCRIPTION	BY	CHK.	APP.	DESCRIPTION
A	08/17/2020	ISSUED FOR 90% REVIEW	AKT	CNS	AMP	AKT CNS AREA CODE
B	07/24/2020	ISSUED FOR BID	AKT	CNS	AMP	AKT CNS ACCOUNT NUMBER C350
						DRAWING NUMBER 180715
						DRAWING BY AKT
						STATION ID C350
						CHECKER INITIALS AMP

APPROVALS	
REGIONAL ENGINEER	DATE
REGIONAL ENGINEER	DATE
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**C350 PROJECT
CONSTRUCTION DETAILS 10
HAMILTON COUNTY, OHIO**
HAMILTON COUNTY, OHIO

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

SHEET(S)	10 OF 10	DWG SCALE	NONE
DWG DATE	04-05-2018	SUPERSEDED	—
DRAWING NUMBER	PNG -C-350-0001312		

REGION
HAMILTON COUNTY, OHIO
B

**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: _____
Environmental Inspector

Printed Name: _____

[illegible]

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: _____

[illegible]

[illegible]

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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