Legal Department

American Electric Power
1 Riverside Plaza
Columbus, OH 43215-2373
AEP.com

August 16, 2023

Ms. Tanowa Troupe, Secretary
Ohio Power Siting Board
180 East Broad Street
Columbus, Ohio 43215-3793

Hector Garcia
Senior Counsel –
Regulatory Services
(614) 716-3410 (P)
hgarcia1@aep.com

RE: Proof of Compliance with Condition
Case No. 21-0199-EL-BTX
Groves Road-Shannon 138 kV Transmission Line Project

Dear Ms. Troupe:

In satisfaction of Conditions (6) and (17) of the Staff Report for this Project, AEP Ohio Transmission Company, Inc. submits this notice and attachment to provide updated information for the Storm Water Pollution Prevention Plan, which includes a map of sensitive areas and was previously docketed for the above-referenced Project in March 2023.

If you have any questions regarding this information, please do not hesitate to contact me.

Respectfully submitted,

/s/ *Hector Garcia*
Hector Garcia (0084517), Counsel of Record
Counsel for AEP Ohio Transmission Company, Inc.

cc: John Jones, Counsel OPSB Staff
Jon Pawley, OPSB Staff

ASTOR - SHANNON 138 KV TRANSMISSION LINE PROJECT

FRANKLIN COUNTY, OHIO

LAT/LONG: 39.9462, -82.8350

WORK ORDER # 4298744502

STORM WATER POLLUTION PREVENTION PLAN (SWP3)

Prepared for:

AEP Ohio Transmission Company, Inc.
8500 Smith's Mill Road
New Albany, OH 43054

Prepared by:

Environmental Solutions & Innovations, Inc
4525 Este Avenue
Cincinnati, OH 45232

Site Contact: Nathaniel Thomas
Phone: (614) 753-5870
E-mail: njthomas@aep.com

Revision 4, August 2023

Project Start Date: March 2023
Project End Date: November 2023

ASTOR TO SHANNON 138 KV TRANSMISSION LINE PROJECT

CERTIFICATION

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

Name: _____

Title: _____

Signature: _____

Date: _____

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APPENDIX 2 – ODNR Rainwater and Land Development Manual Details

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APPENDIX 4 – Duty to Inform Contractors and Subcontractors Signature Form

I. Site Description

A. Description of Construction Activity

Ohio Transmission Company, Inc. (AEP) is proposing to conduct construction activities for the Astor-Shannon 138kV Transmission Line (Project) located in Truro and Madison Township, City of Columbus, Franklin County, Ohio. The Project consists of upgrading approximately 5.31 miles of existing 138kV transmission line traversing residential developments within new and existing right-of-way (ROW). Construction activities will include grading and timber mat placement, the installation of new steel monopoles. Approximately 2.09 miles of temporary access roads will also be established to facilitate construction activities.

The total Project area is estimated at 68.82 acres, and the maximum area of disturbed soil is approximately 14.25 acres.

B. Disturbed Area

Total Area of the Site – 68.82 acres

Total Disturbed Area – 14.25 acres

Table 1: Disturbed Area

County	Township/Village/City	Disturbance Acreage
Franklin (MS4)	City of Columbus (MS4) Truro & Madison Township	14.25

C. Impervious Area

Table 2: Impervious Area

	Impervious Acreage	% Imperviousness
Existing	0.00	0.00%
New	0.00	0.00%
Total	0.00	0.00%

[The proposed project will result in 111 additional/new structures to be installed. However, the structures are not located in a concentrated location and are dispersed throughout the project area. As a result, the single point of new impervious area at each pole location is well below 2 acres, and no receiving streams will be impacted by the impervious area created by the structure installations. Therefore, no post-construction best management practices (BMPs) are warranted for this project.

D. Storm Water Calculations

Because this is a linear Project with temporary access roads and work pads, there will be no post-construction increase in runoff.

E. Existing Soil Data

The United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey was used to determine soil types within the Project area. A copy of the web-based soil map is included in Appendix 1. Soils in the Project area are shown in Table 3.

Table 3: Soil Types

Map Unit Symbol	Map Unit Description	Drainage Class	Hydric Soil?
BeA	Bennington silt loam, 0 to 2 percent slopes	Somewhat poorly drained	No[1]
BeB	Bennington silt loam, 2 to 6 percent slopes	Somewhat poorly drained	No[1]
BfB	Bennington-Urban land complex, 0 to 6 percent slopes	Somewhat poorly drained	No[1]
CeB	Celina silt loam, 2 to 6 percent slopes	Moderately well drained	No[1]
CeC2	Celina silt loam, 6 to 12 percent slopes, eroded	Moderately well drained	No[1]
CrA	Crosby silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes	Somewhat poorly drained	No[1]
CrB	Crosby silt loam, Southern Ohio Till Plain, 2 to 6 percent slopes	Somewhat poorly drained	No[1]
Ee	Eel silt loam, 0 to 2 percent slopes, occasionally flooded	Moderately well drained	No[1]
Gn	Genesee silt loam, 0 to 2 percent slopes, occasionally flooded	Well drained	No[1]
KeC2	Kendallville silt loam, 6 to 12 percent slopes, eroded	Well drained	No
Ko	Kokomo silty clay loam, 0 to 2 percent slopes	Very poorly drained	Yes
MkB	Miamian silt loam, 2 to 6 percent slopes	Well drained	No[1]
MlC2	Miamian silty clay loam, 6 to 12 percent slopes, eroded	Well drained	No[1]
OcB	Ockley silt loam, Southern Ohio Till Plain, 2 to 6 percent slopes	Well drained	No
Pn	Pewamo low carbonate till-Urban land complex, 0 to 2 percent slopes	Very poorly drained	Yes
SlA	Sleeth silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes	Somewhat poorly drained	No[1]
ThB	Thackery silt loam, 2 to 6 percent slopes	Moderately well drained	No[1]
Ut	Udorthents- Urban land complex, gently rolling	n/a	n/a
Wt	Westland silty clay loam, Southern Ohio Till Plain, 0 to 2 percent slopes	Poorly drained	Yes

[1] Contains hydric inclusions.

F. Prior Land Uses

[The Project corridor contains the Astor-Shannon 138kV Transmission Line right-of-way (ROW) which consists of residential communities, agricultural lands, and areas of undeveloped woody vegetation

G. On-site Streams and Receiving Streams and Surface Waters

1. On-Site Waterbodies

Table 4: Delineated Streams

Stream ID	Stream Name	Flow Regime	Ohio EPA 401 Permitting Eligibility	Stream Stability
Stream AS-7	Blacklick Creek	Perennial	Eligible	Stable
Stream AS-6	Blacklick Creek	Perennial	Eligible	Stable
Stream AS-5	Blacklick Creek	Perennial	Eligible	Stable
Stream AS-3	Blacklick Creek	Intermittent	Eligible	Moderately Stable
Stream AS-2	Blacklick Creek	Intermittent	Eligible	Moderately Stable
Stream AS-1	Blacklick Creek	Intermittent	Eligible	Moderately Stable
Stream AS-8	Blacklick Creek	Perennial	Eligible	Stable

Table 5: Delineated Wetlands and Ponds

Wetland ID	Cowardin Classification	ORAM Category
Wetland AS-1	PEM	1
Wetland AS-4	PEM	1
Wetland AS-2	PEM	1
Wetland AS-3	PEM	1
Wetland SS-1	PSS	1
Wetland A-2	PSS	1
Pond AS-1	n/a	n/a

2. Receiving Waters

The Project is located in the Town of Brice-Blacklick Creek Watershed (HUC-12: 050600011504) and Mason Run – Big Walnut Creek Watershed (HUC-12: 050600011505) which ultimately drains to the Blacklick River. The receiving streams for the Project include Blacklick Creek. The site is located in the City of Columbus.

H. Implementation Schedule

A construction log will be kept at the Project site to record major dates of grading and stabilization. The general order of construction is provided in Table 6 below and will begin in March 2023 and is estimated to end in November 2023.

Table 6: Implementation Schedule

Task	Date
Identify environmental avoidance areas in the field [i.e. wetlands, 50' stream buffers, other environmental commitments]	May 2023
Mobilize construction equipment	March 2023
Forestry clearing/grubbing to begin	March 2023
Install [erosion controls/BMPs] filter sock, timber matting, and temporary construction entrances, as needed	March 2023
Excavate foundations for new poles, install new poles	July 2023
Install temporary seed and mulch, as needed, during Project activities	August 2023
Grade pole locations to pre-existing conditions	September 2023
Install permanent seed and mulch	October 2023
Remove matting and temporary BMPs	October 2023
Repair/restore all remaining disturbed areas	November 2023
Seed and mulch all remaining disturbed areas	November 2023
Construction demobilization	November 2023
Inspection with AEP and SWP3 contractor	November 2023

I. Subdivided Development Drawing

Not applicable.

J. Dedicated Asphalt and Concrete Plant Discharges

Not applicable.

K. Log of Grading and Stabilization Activities

A log for documenting grading and stabilization activities and amendments to the SWP3 is included in Appendix 3.

L. Site Map

A vicinity of the Project area is included in Appendix 1, along with the Soil Erosion Sediment and Sediment Control Plan and details. The Soil Erosion and Sediment Control Plan shows the Project boundaries and contours, the limits of construction, and the locations of the erosion and sediment control features.

M. Permit Requirements

The permit requirements can be reviewed in the Ohio EPA General Permit No. OHC000006 which is available at https://epa.ohio.gov/static/Portals/35/permits/OHC000006.pdf.

II. Storm Water Pollution Prevention Plan

The SWP3 was developed to meet the objectives in Part II. Non-numeric Effluent Limitations and Part III. Storm Water Pollution Prevention Plan (SWP3) of Ohio EPA General Permit No. OHC000006.

A. SWP3 Availability

This Plan, a copy of the Notice of Intent (NOI), and the Ohio EPA authorization shall be made available on-site immediately upon request of the director or an authorized representative and MS4 operators or authorized representative during working hours. Per Ohio EPA, an electronic copy is an acceptable format for on-site availability and review.

B. Amendments

The SWP3 is a living document that will be updated as needed. The SWP3 shall be amended whenever there is a change in design, construction, operation or maintenance, or if the SWP3 proves to be ineffective in controlling pollutants in storm water discharges associated with construction activity. A log for documenting amendments is included in Appendix 3.

AEP Environmental Services shall be notified prior to any significant modifications to the SWP3, such as changes to the access roads, disturbance acreage, culvert installations, etc., to ensure the Project remains in compliance with Ohio EPA General Permit No. OHC000006.

C. Duty to Inform Contractors

All contractors and subcontractors who will be involved in implementation of the SWP3 shall review and understand the conditions and responsibilities of the SWP3 and document their acknowledgement by signing the form included in Appendix 4.

D. Controls

Timing: Temporary erosion and sediment control measures shall be installed prior to earth-disturbing activity. Temporary control measures will not be removed until final site stabilization, in the form of permanent gravel cover or perennial vegetative cover with a density of at least 70%, is achieved.

The locations of the control methods are shown on the Soil Erosion and Sediment Control Plans in Appendix 2. Maintenance and inspections requirements for these controls can be found in Section II.D.6 of this SWP3. The control measures for this Project include the following:

1. Preservation Methods

   Existing natural conditions shall be preserved as much as feasible. Such practices may include: preserving existing vegetation, vegetative buffer strips, and existing soil profile and topsoil; minimizing soil compaction; minimizing disturbance of steep slopes; phasing of construction operations to minimize the amount of disturbed land at any one time; and protective clearing or grubbing practices. For all construction activity adjacent to surface waters of the state, a 50-foot undisturbed natural buffer will be maintained as measured from the ordinary high water mark (OHWM).

2. Erosion, Sediment, and Runoff Controls

   a. *Stabilization and Seeding*

      Disturbed areas will be stabilized as specified in tables 7 and 8 below per the Soil Erosion and Sediment Control Plan and BMP detail sheets in Appendix 2. Mulch shall be applied to all exposed soil that has been seeded in an effort to facilitate seed germination and development.

Table 7: Permanent Stabilization

Area Requiring Permanent Stabilization	Time Frame to Apply Erosion Controls
Any areas that will lie dormant for one year or more.	Within seven calendar days of the most recent disturbance.
Any areas within 50 feet of a surface water of the state and at final grade.	Within two calendar days of reaching final grade.
Other areas at final grade.	Within seven calendar days of reaching final grade within that area.

Table 8: Temporary Stabilization

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

   b. *Sediment Barriers and Diversions*

      Filter sock will be installed to encompass the entire site at all appropriate locations to filter sediment from site runoff. Orange barrier fencing will be used as needed and to protect wetland areas and 50-foot natural stream buffers. After Project completion, the posts, fencing, and ties shall be removed from the Project site and transported to an appropriate off-site disposal facility.

c. *Wetland and Stream Crossings*

Stream and wetland crossings shall be avoided where possible by accessing pole locations from either side of the surface waters. Temporary wetland crossings for this Project are limited to Wetlands as shown on the Plans in Appendix 2 and shall consist of geotextile fabric and prefabricated wood matting lined with filter sock and orange barrier fence. Timber mat or span bridge stream crossings are limited to streams shown on the Plans in Appendix 2 and shall not be placed below the OHWM. Timber matting/span bridges shall span the stream(s) from bank to bank. No fording of the stream is permitted.

After construction is completed, the wood mats and geotextile fabric shall be removed and the area seeded with a wetland seed mix (see enclosed seed mix in Appendix 2).

d. *Temporary Construction Entrances*

Construction entrances consisting of a stabilized pad of aggregate will be installed where construction vehicles leave active construction areas and enter public roadways to reduce the amount of sediment tracked offsite. Temporary construction entrance locations and details are provided in Appendix 2.

e. *Erosion Control Blanket*

Temporary rolled erosion control products should be used on areas where erosion potential is high or a failure to establish vegetation is difficult or costly such as slopes greater than 3:1, constructed channels or stream banks. Areas of concentrated flow, especially where flows exceed 3.5 feet per second or problem areas with highly erosive soils. Additionally, erosion control blanket should be used where mulch is difficult to hold in place due to wind or water.

3. Surface Water Protection

No direct discharge to surface waters is proposed for this Project. Surface waters will be protected through the erosion and sediment controls outlined in the sections above.

4. Other Controls

a. *Non-sediment Pollutant Controls*

Waste disposal containers shall be provided for proper collection of all waste material including sanitary garbage, petroleum products and any materials to be used onsite (excluding inert waste/materials such as construction debris that would not be expected to contribute pollution to storm water). Containers shall be covered and not leaking. No construction waste materials shall be buried on-site. All waste materials shall be disposed of in the manner specified by local or state regulations or by the manufacturer. No solid or liquid wastes will be discharged in storm water runoff.

b. *Off-site Traffic and Dust Control*

Any paved roads adjacent to the site entrance shall be swept to remove any excess mud, dirt, or rock tracked from the site, as necessary. Dump trucks hauling materials to or from the site shall be covered with a tarpaulin. Dust control shall be observed both on and off the site for the duration of the Project. Dust and sedimentation will be minimized by limiting earth-moving activities, site traffic, and soil and vegetation disturbances throughout the site. Chemical stabilizers and adhesives will not be used unless written permission is received from AEP Environmental Representative. Dust control details can be found in Appendix 2.

c. *Concrete Washouts*

Concrete washouts will be located in upland areas outside of wetlands or flood zones. Under no circumstances will concrete trucks wash out into a drainage channel, storm sewer or surface water.

d. *Wash Water*

Water from vehicle washing, wheel washing, and other wash waters will be treated appropriately prior to discharge to minimize pollutants. Spills and leaks will be prevented and responded to as necessary.

e. *Compliance with Other Requirements*

This SWP3 is consistent with state and/or local waste disposal, sanitary sewer or septic system regulations including provisions prohibiting waste disposal by open burning. Spill response, disposal of suspect contaminated soils and clean-up activities are initiated by calling the AEP Regional Environmental Coordinator (REC).

f. *Trench and Groundwater Control and Dewatering*

Trench dewatering and groundwater control is not likely since this is an overhead line and any necessary trenching will be relatively shallow and short in duration. Dewatering may be needed if surface or subsurface water creates conditions where pole or foundation placement is being prevented or hindered and removing the water has the potential to contribute sediment to surface waters. If dewatering is needed, water shall be pumped directly into a dewatering device such as a tube or bag that has been sized according to the flow rate of the dewatering pump and the predominant sediment size (woven for sand, non-woven for silt and clay). Upon construction completion, accumulated sediment shall be removed from the dewatering device and either placed in an upland part of the site where it shall then be seeded and mulched or shall be removed to an appropriate off-site disposal facility.

g. *Contaminated Sediment*

Contaminated soils are not expected to be encountered on this Project. However, if they should exist within the limits of construction, they will be disposed of properly per direction of the AEP Regional Environmental Coordinator (REC).

5. Post-Construction Storm Water Management Requirements

There will be no increase in impervious surfaces as a result of the rebuild work on the 138kV transmission line. Therefore, there will be no change from pre- to post-construction runoff, and post-construction storm water management is not required per Part III.G.2.e of Ohio EPA General Permit No. OHC000006.

6. Maintenance and Inspections Requirements

*All temporary and permanent control practices shall be maintained and repaired as needed to ensure continued performance of their intended function. All erosion and sediment control measures shall be inspected:

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

An inspection report shall be made after each inspection. The SWP3 Inspection Form is included in Appendix 3.

*The Contractor shall select at least two qualified individuals responsible for inspections, maintenance, and repair activities, and filling out the SWP3 Inspection Form and SWP3 Amendments, Grading, and Stabilization Log in Appendix 3. Personnel selected for these responsibilities shall be knowledgeable and experienced in all inspection and maintenance practices necessary for keeping the erosion and sediment controls in good working order.

*If an inspection reveals that a control is in need of repair or maintenance, with the exception of a sediment settling pond, it shall be repaired or maintained within three calendar days of the inspection. Sediment ponds will be repaired or maintained within 10 calendar days of the inspection. If an inspection reveals that a control fails to perform its intended function and that another, more appropriate control is required, the SWP3 shall be amended and the new control shall be installed within 10 calendar days of the inspection. If an inspection reveals a control has been installed inappropriately or incorrectly, the control will be replaced or modified for site conditions.

*When controls are modified, the erosion control drawings associated with the SWP3 will be updated to reflect the modifications, and the changes will be reflected using the SWP3 Amendments, Grading, and Stabilization Log in Appendix 3.

- Filter sock shall be inspected for depth of sediment, tears, and to ensure the anchor posts are firmly in the ground. Filter sock shall also be inspected to ensure they are maintained in the appropriate positions per the plans in Appendix 2. Built up sediment shall be removed from the filter sock when it has reached one-third the height of the sock.
- Orange barrier fence shall be inspected to ensure the fence is erect and functioning as intended per the plans in Appendix 2.
- Temporary and permanent seeding shall be inspected for bare spots, washouts, and healthy growth. If seed does not germinate in an area on which it was placed, the area will either be re-seeded or an alternate erosion control method will be employed.
- Locations where vehicles and equipment enter or exit the site shall be inspected for evidence of off-site tracking of sediment. Sediment being tracked onto off-site roadways shall be cleaned up promptly.
- Excess concrete should be removed when the washout system reaches 50 percent of the design capacity. Use of the system should be discontinued until appropriate measures can be initiated to clean out the structure. Prefabricated systems should also utilize this criterion unless the manufacturer has alternative specifications.

*The permittee shall maintain the SWP3 Inspection Forms for three years following the submittal of a notice of termination (NOT) form. The Inspection Forms shall be signed in accordance with Part V.G of Ohio EPA General Permit OHC000006.

III. Approved State or Local Plans

The erosion and sediment control plans were prepared in accordance with Ohio EPA Permit No. OHC000006.

IV. Exceptions

There are no exceptions to the erosion and sediment control practices contained in the Ohio EPA General Permit No. OHC000006.

APPENDIX 1

Project Location Map, Soil Erosion and Sediment Control Plan, USDA Soils Map, Watershed (HUC-12) Map

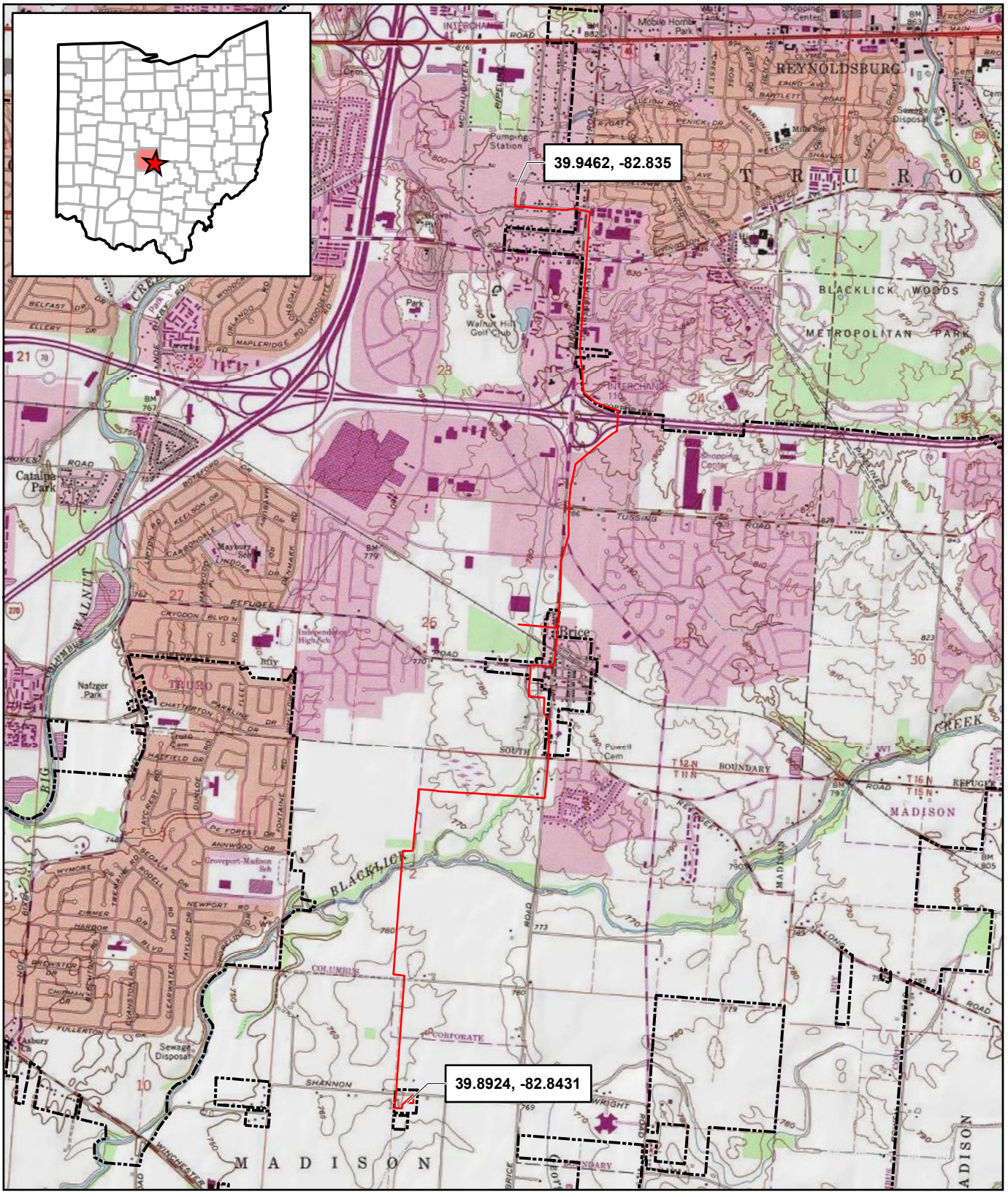

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Figure 1. Location of the Astor-Shannon 138 kV Transmission Line project in Franklin County, Ohio.

Project No. 1769.01

0 2,500 5,000 Feet

Base Map: USGS Topographic Map

ESI ENVIRONMENTAL SOLUTIONS & INNOVATIONS, INC.

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ASTOR TO SHANNON 138KV TRANSMISSION LINE PROJECT

STORMWATER POLLUTION PREVENTION PLAN

TRURO AND MADISON TOWNSHIP, CITY OF COLUMBUS, FRANKLIN COUNTY, OHIO

PREPARED FOR

AEP OHIO TRANSMISSION COMPANY, INC
8500 SMITH'S MILL ROAD
NEW ALBANY, OH 43054

SHEET INDEX	
SHEET	**TITLE**
COV	COVER SHEET
GN-01	GENERAL NOTES
KM-01	KEY MAP
SWP-01	EROSION & SEDIMENTATION POLLUTION CONTROL PLAN
SWP-02	EROSION & SEDIMENTATION POLLUTION CONTROL PLAN
SWP-03	EROSION & SEDIMENTATION POLLUTION CONTROL PLAN
SWP-04	EROSION & SEDIMENTATION POLLUTION CONTROL PLAN
SWP-05	EROSION & SEDIMENTATION POLLUTION CONTROL PLAN
SWP-06	EROSION & SEDIMENTATION POLLUTION CONTROL PLAN
SWP-07	EROSION & SEDIMENTATION POLLUTION CONTROL PLAN
SWP-08	EROSION & SEDIMENTATION POLLUTION CONTROL PLAN
SWP-09	EROSION & SEDIMENTATION POLLUTION CONTROL PLAN
SWP-10	EROSION & SEDIMENTATION POLLUTION CONTROL PLAN
SWP-11	EROSION & SEDIMENTATION POLLUTION CONTROL PLAN
SWP-12	EROSION & SEDIMENTATION POLLUTION CONTROL PLAN
SWP-13	EROSION & SEDIMENTATION POLLUTION CONTROL PLAN
SWP-14	EROSION & SEDIMENTATION POLLUTION CONTROL PLAN
SWP-15	EROSION & SEDIMENTATION POLLUTION CONTROL PLAN
SWP-16	EROSION & SEDIMENTATION POLLUTION CONTROL PLAN
SWP-17	EROSION & SEDIMENTATION POLLUTION CONTROL PLAN
SWP-18	EROSION & SEDIMENTATION POLLUTION CONTROL PLAN
SWP-19	EROSION & SEDIMENTATION POLLUTION CONTROL PLAN
SWP-20	EROSION & SEDIMENTATION POLLUTION CONTROL PLAN
SWP-21	EROSION & SEDIMENTATION POLLUTION CONTROL PLAN
SWP-22	EROSION & SEDIMENTATION POLLUTION CONTROL PLAN
SWP-23	EROSION & SEDIMENTATION POLLUTION CONTROL PLAN
SWP-24	EROSION & SEDIMENTATION POLLUTION CONTROL PLAN

NOTES:

1. **DUE TO THE LINEAR NATURE OF THE PROPOSED TEMPORARY PROJECT, IN CONJUNCTION WITH THE LACK OF PROPOSED IMPERVIOUS AREA AND NO CHANGE IN COVER TYPE, PERMANENT STORMWATER POST CONSTRUCTION BMP'S ARE NOT REQUIRED. ALL DISTURBANCE PROPOSED WILL BE MINIMAL IN NATURE, WITH THE USE OF TIMBER MATS FOR ALL CONSTRUCTION. ACTUAL EARTH DISTURBANCE WITHIN THE AREAS OF PROPOSED STRUCTURES WILL BE MINIMIZED TO THE MAXIMUM EXTENT PRACTICABLE AND ALL AREAS WITHIN THE PROPOSED PROJECT AREA WILL BE RESTORED TO EXISTING GRADE AND CONDITION WITHIN 30 DAYS OF PROJECT COMPLETION. THIS INCLUDES, BUT IS NOT LIMITED TO THE USE OF DISKING OR SCARIFYING, SOIL REMEDIATION AND AMENDMENT AND APPROPRIATE APPLICATION OF NATIVE SEED MIXTURES TO RESTORE THE AREA TO THE ORIGINALLY EXISTING PERVIOUS LANDSCAPE.**
2. **THE USE OF PORTABLE CONCRETE WASHOUT UNITS IS APPROVED (AND ENCOURAGED) FOR ALL CONSTRUCTION AREAS IN THE CITY OF COLUMBUS. THE EXACT LOCATION OF THE CONCRETE WASHOUT(S) MAY BE FIELD LOCATED BY THE ON SITE PROJECT ENGINEER/CONTACT.**
3. **ALL PROPOSED STRUCTURES ON THIS PLAN ARE TRANSMISSION LINE POLES. PROPOSED ALTERATIONS TO THE TRANSMISSION LINE POLES WILL NOT RESULT IN ANY INCREASE IN THE BASE FLOOD ELEVATION AND WILL NOT REDUCE THE FLOOD CARRYING CAPACITY OF BLACKLICK CREEK.**
4. **TEMPORARY CUT/FILL WILL BE USED TO INSTALL TEMPORARY TIMBER MATTING ON EXISTING GRADE DURING THE DURATION OF THE PROJECT. TIMBER MATTING WILL BE REMOVED AT THE CONCLUSION OF THE PROJECT, AND THE EXISTING GRADE WILL BE RESTORED. NO PERMANENT FILL WILL BE ADDED IN THE FLOODWAY OR THE 100-YEAR FLOODPLAIN AS PART OF THIS PROJECT.**
5. **ALL DRAINAGE AREAS TO EACH INLET AND UNDER 1.0 ACRES PER OHIO EPA REQUIREMENTS. SEE SHEETS SBV-01 THROUGH SBV-24 FOR TABULATIONS OF DRAINAGE AREAS TO EACH INLET AND PROTECTION CONTROL DEVICE WITHIN THE PROJECT EXTENTS.**
6. **NO CONSTRUCTION ACTIVITIES ALLOWED WITHIN SURFACE WATERS. SHOULD THEY BE ENCOUNTERED IN WORK AREAS, CONTACT AEP ENVIRONMENTAL TO ENSURE THEY ARE AVOIDED.**

FLOODPLAIN INFORMATION ASTOR - SHANNON 138kV PROJECT:

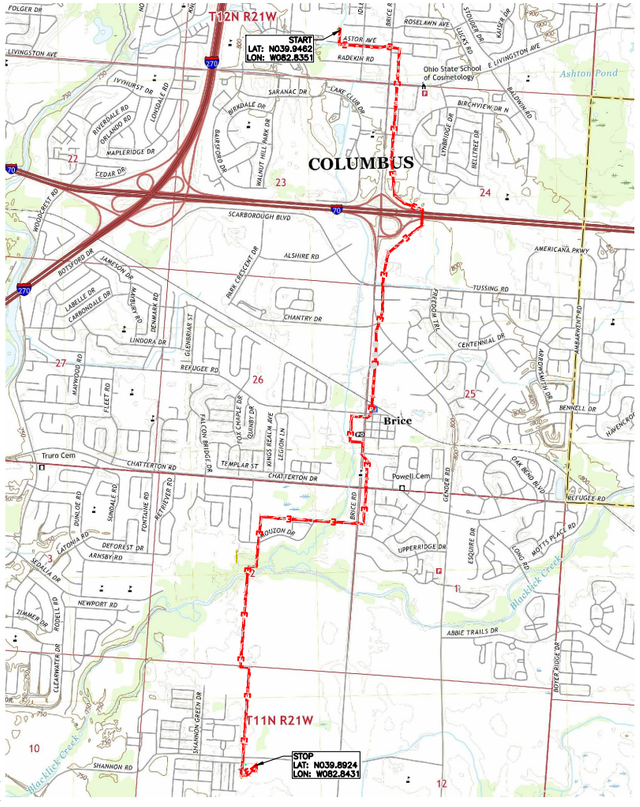
FIRM PANEL:

Franklin County, Ohio and Incorporated Areas, Panel 354 of 465-Map 39049C0354K (effective 6/17/2008) Zone A, AE, X
Franklin County, Ohio and Incorporated Areas, Panel 361 of 465-Map 39049C0361K (effective 6/17/2008) Zone A, AE, X
Franklin County, Ohio and Incorporated Areas, Panel 362 of 465-Map 39049C0362K (effective 6/17/2008) Zone AE, X
Franklin County, Ohio and Incorporated Areas, Panel 363 of 465-Map 39049C0363K (effective 6/17/2008) Zone AE, X
Franklin County, Ohio and Incorporated Areas, Panel 364 of 465-Map 39049C0364K (effective 6/17/2008) Zone A, AE, X

FLOOD ZONE: AE and X

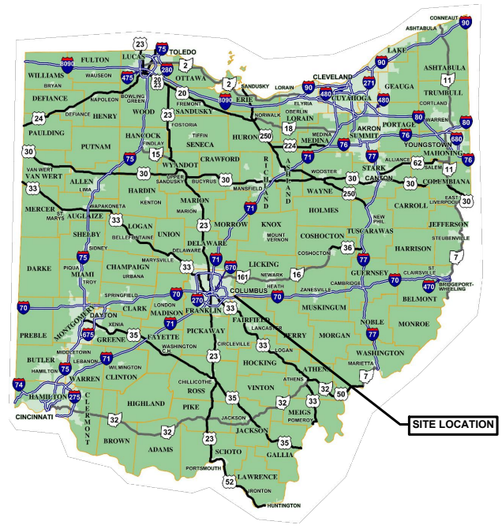
APPROXIMATE BASE FLOOD ELEVATION (BFE) FOR POWELL DITCH = 775 FT
APPROXIMATE BASE FLOOD ELEVATION (BFE) FOR BLACKLICK CREEK = 762 FT

LIMITS OF DISTURBANCE: 620,692 S.F.; 14.25 ACRES



LOCATION MAP
1" = 4,000'

SITE DATA TABLE		
Total Site Area	68.82	Acres
Total Disturbed Area	14.25	Acres
Pre-Development Impervious	0	Acres
Post-Development Impervious	0	Acres



VICINITY MAP
NOT TO SCALE

OGPUPS
Ohio Oil & Gas Producers Underground Protection Service
800-925-0988

OHIO Utilities Protection SERVICE
Call Before You Dig

CALL 8-1-1 OR 1-800-362-2764

STATE OF OHIO
SHAUN W. KLINE
E-84364
REGISTERED PROFESSIONAL ENGINEER

NO.	REVISION	DATE	BY
4	UPDATED ACCESS ROADS	08/04/2023	LJS
3	UPDATED ACCESS ROADS	07/25/2023	LJS
2	UPDATED ACCESS ROADS	03/20/2023	LJS
1	UPDATED ACCESS ROADS	03/16/2023	LJS

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COVER SHEET

ASTOR TO SHANNON 138KV TRANSMISSION LINE
STORMWATER POLLUTION PREVENTION PLAN
TRURO AND MADISON TOWNSHIP FRANKLIN COUNTY OHIO

DRAWN BY/CHK. BY:	LJS/SLA
PROJECT MANAGER:	SWK
DATE:	DECEMBER 2022
SCALE:	AS SHOWN
SHEET NUMBER:	COV
PROJECT NUMBER:	1769.01

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GENERAL NOTES:

1. THE CITY OF COLUMBUS CONSTRUCTION AND MATERIALS SPECIFICATIONS (CMSC), 2018 EDITION, REVISION (01/01/2021), INCLUDING ALL REVISIONS AND SUPPLEMENTS THERETO, SHALL GOVERN ALL CONSTRUCTION ITEMS THAT ARE A PART OF THIS PLAN UNLESS NOTED OTHERWISE. .
2. THE CONTRACTOR SHALL NOTIFY THE FOLLOWING DIVISIONS AT LEAST 24–HOURS IN ADVANCE OF ANTICIPATED START OF CONSTRUCTION:
   - 2.1. DIVISION OF SEWERAGE AND DRAINAGE (614) 645–7102
   - 2.2. DIVISION OF DESIGN AND CONSTRUCTION (CONSTRUCTION SECTION) (614) 645–0433
3. THE CONTRACTOR IS RESPONSIBLE FOR THE INVESTIGATION, LOCATION, SUPPORT, PROTECTION, AND RESTORATION OF ALL EXISTING UTILITIES AND APPURTENANCES WHETHER SHOWN ON THESE PLANS OR NOT. THE CONTRACTOR SHALL EXPOSE ALL UTILITIES OR STRUCTURE PRIOR TO CONSTRUCTION TO VERIFY THE VERTICAL AND HORIZONTAL EFFECT ON THE PROPOSED CONSTRUCTION. THE CONTRACTOR SHALL CALL, TOLL FREE, THE OHIO UTILITIES PROTECTION SERVICE (1–800–362–2764) 48–HOURS PRIOR TO CONSTRUCTION AND SHALL NOTIFY ALL UTILITY COMPANIES AT LEAST 48–HOURS PRIOR TO WORK IN THE VICINITY OF THEIR UNDERGROUND LINES.
4. CONSTRUCTION OF THIS PROJECT MAY NOT BEGIN UNTIL THE EASEMENTS INDICATED HAVE BEEN RECORDED BY THE CITY.
5. THE DEVELOPER/OWNER SHALL, PRIOR TO ANY CONSTRUCTION OPERATION, DEPOSIT WITH THE CITY. THE TOTAL ESTIMATED COSTS FOR INSPECTION AND WHERE REQUIRED A RE–PAVING GUARANTEE.
6. ANY MODIFICATION TO THE WORK AS SHOWN ON THESE DRAWINGS MUST HAVE PRIOR WRITTEN APPROVAL BY THE ADMINISTRATOR, DIVISION OF SEWAGE AND DRAINAGE.
7. IT IS THE RESPONSIBILITY OF THE SITE OWNER TO NOTIFY THE CITY OF COLUMBUS TWO WORKING DAYS PRIOR TO COMMENCEMENT OF INITIAL SITE LANS DISTURBANCE ON ANY SITE OF ONE OR MORE ACRES. THIS INCLUDES SITE CLEARING, GRUBBING AND ANY EARTH MOVING. PRIMARY EROSION AND SEDIMENT CONTROL PRACTICES ARE MANDATED BY REGULATION TO BE IN PLACE FROM THE BEGINNING OF THE CONSTRUCTION ACTIVITY. PLEASE CONTACT THE RESPONSIBLE AEP ENVIRONMENTAL SPECIALIST (MARIAN ASANTE–GRABLE 614–933–2523 or NATE THOMAS 614–753–5870). DETAILS OF THIS REQUIREMENT MAY BE FOUND IN THE REGULATION FOR CONTROL OF STORMWATER POLLUTION FROM LAND DISTURBANCE. FAILURE TO COMPLY MAY RESULT IN ENFORCEMENT ACTION.
8. THE AMOUNT OF FILL WITHIN DESIGNATED FEMA FLOODPLAIN AREAS ONSITE IS 2138 C.Y. THE AMOUNT OF FILL COMPENSATED WITHIN DESIGNATED FEMA FLOODPLAIN AREAS ONSITE IS 2138 C.Y.
9. THIS PLAN MUST BE POSTED ON–SITE. A COPY OF THE SWPPP PLAN AND THE APPROVED EPA STORMWATER PERMIT (WITH THE SITE–SPECIFIC NOI NUMBER) SHALL BE KEPT ON–SITE AT ALL TIMES.
10. ALL EROSION AND SEDIMENT CONTROL PRACTICES ARE SUBJECT TO FIELD MODIFICATION AT THE DISCRETION OF THE CITY OF COLUMBUS AND/OR THE OHIO EPA.
11. DIRECT DISCHARGE OF SEDIMENT LADEN WATER TO THE CITY'S SEWER SYSTEM OR A RECEIVING STREAM IS A VIOLATION OF THE OHIO EPA AND CITY OF COLUMBUS REGULATIONS. THE CONTRACTOR WILL BE HELD LIABLE FOR THE VIOLATION AND SUBSEQUENT FINES.
12. ANY EXISTING STORM INLETS IMPACTED BY THE NEW CONSTRUCTION ACTIVITY WILL NEED THE APPROPRIATE INLET PROTECTION FOR SEDIMENT CONTROL.
13. STREET CLEANING (ON AN AS–NEEDED BASIS) IS REQUIRED THROUGH THE DURATION OF THIS CONSTRUCTION PROJECT. THIS INCLUDES SWEEPING, POWER CLEANING AND (IF NECESSARY) MANUAL REMOVAL OF DIRT OR MUD IN THE STREET.
14. THE USE OF STRAW WATTLES HAD PROVEN TO BE A VERSATILE AND EFFECTIVE ESC BMP, ESPECIALLY IN RESIDENTIAL SETTINGS. STRAW WATTLES MAY BE SUBSTITUTED FOR SILT FENCE. ADDITIONALLY, THE USE OF COMPOST FILTER SOCKS AND COMPOST BLANKETS ARE GAINING WIDER ACCEPTANCE NATIONWIDE. THEY ARE NOW APPROVED FOR USE ON ALL COLUMBUS SWPPP PLANS AND CONSTRUCTION SITE.
15. STRAW WATTLES OR COMPOST ROLLS SHALL BE A MINIMUM OF 12 INCHES IN DIAMETER (OEPA).
16. UPPER BANK ABOVE NORMAL WATER ELEVATION SHOULD BE STABILIZED QUICKLY WITH STRAW BLANKETS, JUTE MATTING OR SIMILAR GEO–TEXTILE.
17. THE USE OF PORTABLE CONCRETE WASHOUT UNITS IS APPROVED (AND ENCOURAGED) FOR ALL CONSTRUCTION AREAS IN THE CITY OF COLUMBUS. THE EXACT LOCATION OF THE CONCRETE WASHOUT(S) MAY BE FIELD LOCATED BY THE ON–SITE PROJECT ENGINEER/CONTACT. APPLIES TO ALL SWPPP PLAN REVIEW PAGES.
18. THE USE OF PORTABLE CONCRETE WASHOUT UNITS IS APPROVED (AND ENCOURAGED) FOR ALL CONSTRUCTION AREAS IN THE CITY OF COLUMBUS. THE EXACT LOCATION OF THE CONCRETE WASHOUT(S) MAY BE FIELD LOCATED BY THE ON SITE PROJECT ENGINEER/CONTACT.
19. BASED ON THE RESULTS OF THE HYDROLOGIC AND HYDRAULIC ANALYSIS, THERE WILL NO RISE IN THE BFE FOR THE PROPOSED CONSTRUCTION ACTIVITIES. A COPY OF THE H&H STUDY IS AVAILABLE UPON REQUEST.

PAVEMENT CUTTING, SAWING AND EXCAVATION OPERATIONS:

PAVEMENT CUTTING, SAWING AND EXCAVATION OPERATIONS NOTE:

ALL PUBLIC AGENCIES AND PRIVATE CONTRACTORS PERFORMING PAVEMENT–CUTTING OPERATIONS ON CITY OF COLUMBUS STREETS AND ROADWAYS SHALL PROTECT THE ENVIRONMENT FROM DISCHARGES CREATED BY THEIR PAVEMENT CUTTING OPERATIONS. NOTE THAT COLUMBUS CITY CODE 1145 PROHIBITS NON–STORMWATER DISCHARGE INTO THE CITY OF COLUMBUS SEWER SYSTEM, CURB INLETS AND ANY PART OF ITS MS4 (MUNICIPAL SEPARATE STORM SEWER SYSTEM).

THE REQUIREMENT INCLUDES BUT IS NOT LIMITED TO WET OR DRY SAW–CUTTING, JACK HAMMERING, EXCAVATION EQUIPMENT USE, ETC. THE PUBLIC AGENCY AND/OR PRIVATE CONTRACTOR WORK CREWS SHALL RECOVER AND DISPOSE OF DETRITUS, POLLUTED WATERS, OR OTHER SUCH DISCHARGES RESULTING FROM THEIR PAVEMENT CUTTING OPERATIONS AND PROTECT ALL STORM SEWER INLETS FROM RECEIVING ANY DISCHARGES FROM THE CONSTRUCTION OPERATIONS. THE AGENCY OR CONTRACTOR RESPONSIBLE FOR EACH PAVEMENT CUTTING ACTIVITY SHALL BE SOLELY LIABLE FOR NOTICE OF VIOLATIONS (NOV/S) AND FINES ISSUED BY CITY OF COLUMBUS AND/OR STATE OF OHIO AUTHORITIES.

EQUIPMENT, MATERIALS AND METHODS SHALL BE PROVIDED BY THE RESPONSIBLE PUBLIC AGENCY AND/OR PRIVATE CONTRACTOR TO WORK CREWS PERFORMING THE PAVEMENT CUTTING ACTIVITY AND MADE AVAILABLE TO WORK CREWS FOR USE IN CLEANING UP DISCHARGES RESULTING FROM SUCH CUTTING ACTIVITIES AND PREVENTING RUNOFF. ALL WORK CREWS SHALL BE TRAINED TO EXERCISE AND EMPLOY EQUIPMENT, MATERIALS, AND ENVIRONMENTAL PROTECTIVE MEASURES TO PREVENT POLLUTED DISCHARGES FROM ENTERING THE CITY OF COLUMBUS STORM SEWER SYSTEM AND WATERS OF THE STATE OF OHIO.

THE PUBLIC AGENCY AND/OR PRIVATE CONTRACTOR IS SOLELY RESPONSIBLE FOR ENSURING THAT THE INLET PROTECTION IS ADEQUATE. THE MOST STRINGENT PROJECT PLANS, NOTES AND/OR DRAWINGS INCLUDING STORMWATER POLLUTION PREVENTION PLAN (SWP3) OR SPILL PREVENTION/REMEDIATION PLAN SHALL APPLY TO ALL PAVEMENT CUTTING, SAWING OR EXCAVATION OPERATIONS.

NOTE TO SPECIFICATION WRITERS: IF SWP3 OR SPILL PREVENTION/REMEDIATION PLANS ARE INCLUDED IN CONTRACT DOCUMENTS, THEY SHOULD BE CITED IN THE LAST PARAGRAPH ABOVE BY VOLUME, PAGE OR SHEET NUMBERS; SO DIRECTING THE READER TO SUCH PLAN.

EROSION CONTROL:

EROSION AND SEDIMENT CONTROL MEASURES ARE REQUIRED AS A PART OF THIS PROJECT. EROSION AND SEDIMENT CONTROL MEASURES SPECIFIC TO THIS SITE MAY BE FOUND IN THIS PLAN. LAND–DISTURBING ACTIVITIES MUST COMPLY WITH ALL PROVISIONS OF THE DIVISION OF SEWERAGE AND DRAINAGE EROSION AND SEDIMENT CONTROL REGULATION. ALL LAND–DISTURBING ACTIVITIES SHALL BE SUBJECT TO INSPECTION AND SITE INVESTIGATION BY THE CITY OF COLUMBUS AND/OR THE OHIO EPA.

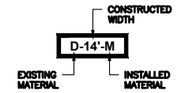
ALL EROSION SEDIMENTATION CONTROL PRACTICES ARE SUBJECT TO FIELD MODIFICATIONS AT THE DISCRETION OF THE CITY OF COLUMBUS, PROJECT ENGINEER AND/OR THE OHIO EPA.

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE CITY OF COLUMBUS TWO WORKING DAYS PRIOR TO COMMENCEMENT OF INITIAL SITE LAND DISTURBANCE ON ANY SITE OF ONE (1) OR MORE ACRES. THIS INCLUDES SITE CLEARING, GRUBBING AND ANY EARTH MOVING. PRIMARY EROSION AND SEDIMENT CONTROL PRACTICES ARE MANDATED BY REGULATION TO BE IN PLACE FROM THE BEGINNING OF THE CONSTRUCTION ACTIVITY. PLEASE CONTACT THE RESPONSIBLE AEP ENVIRONMENTAL SPECIALIST (MARIAN ASANTE–GRABLE 614–933–2523 or NATE THOMAS 614–753–5870). DETAILS OF THIS REQUIREMENT MAY BE FOUND IN THE EROSION AND SEDIMENT POLLUTION CONTROL REGULATION (ADOPTED JUNE 1, 1994). FAILURE TO COMPLY MAY RESULT IN ENFORCEMENT ACTION AS DETAILED IN THE COLUMBUS CITY CODES SECTION 1145.80.

THE NPDES PERMIT HOLDER SHALL PROVIDE QUALIFIED PERSONNEL TO CONDUCT SITE INSPECTIONS ENSURING PROPER FUNCTIONALITY OF THE EROSION AND SEDIMENTATION CONTROLS. ALL EROSION AND SEDIMENTATION CONTROLS ARE TO BE INSPECTED ONCE EVERY SEVEN (7) CALENDAR DAYS AND WITHIN 24 HOURS OF ½" STORM EVENT OR GREATER THAT OCCURS OVER A 24 HOUR PERIOD. RECORDS OF THE SITE INSPECTIONS SHALL BE KEPT BY THE CONTRACTOR AND MADE AVAILABLE TO JURISDICTIONAL AGENCIES IF REQUIRED. THIS PLAN MUST BE POSTED ON SITE. A COPY OF THE SWPPP PLAN AND THE APPROVED EPA STORMWATER PERMIT (WITH THE SITE–SPECIFIC NOI NUMBER) SHALL BE KEPT ON SITE AT ALL TIMES.

TYPE OF ACCESS ROAD (AR)	EXISTING ROADWAY MATERIAL	ROADWAY MATERIAL TO BE INSTALLED	LEGEND
PROPOSED TEMPORARY ACCESS ROAD	DIRT	TIMBER MAT	
PROPOSED EXISTING HARD SURFACE	PAVEMENT	PAVEMENT	

ACCESS ROAD LABELING



© DENOTES A CHANGE IN ACCESS ROAD CATEGORY.

M=TIMBER MAT
G=GRAVEL
D=DIRT
V=VEGETATION

1. ALL ACCESS ROADS ARE DEPICTED AS SHOWN IN THIS LEGEND.
2. THE CONSTRUCTED WITH OF EACH ACCESS ROAD IS STE SPECIFIC AND INDICATED IN THE MAP SHEET LABEL CORRESPONDING TO EACH ACCESS ROAD. FOR EXAMPLE, V–16'–G, WHERE V=THE EXISTING ROADWAY MATERIAL (VEGETATION), 16'=THE CONSTRUCTED WIDTH OF THE ACCESS ROAD, AND G=THE ROADWAY MATERIAL TO BE INSTALLED (GRAVEL). SEE ACCESS ROAD LABELING TO THE RIGHT.
3. STRUCTURE WORK PADS WILL BE REQUIRED AS SHOWN ON PLAN SHEETS. COVER MATERIAL FOR THE PADS WILL BE THE SAME AS REQUIRED FOR THE ACCESS ROADS IN EACH LOCATION, UNLESS OTHERWISE INDICATED ON THE MAPPING.
4. IN AREAS OF ACCESS ROAD TURNS GREATER THAN 90 DEGREES, A WIDER ROADWAY MIGHT BE NEEDED AT THAT POINT (APPROXIMATELY 60'–70' IN WIDTH).
5. STANDARD DEPTH OF COVER MATERIAL AS REQUESTED BY TCR SUPERVISOR: 6" OF ODOT #2 AND 4" OF ODOT #304 FOR EXISTING GRAVEL ACCESS ROADS. THE TCR SUPERVISOR'S REQUEST IS INCLUDED IN THE E&SC BMP DETAIL TABLES.

ACCESS ROAD LEGEND

Custom Soil Resource Report
Soil Map

Map Scale: 1:34,900 if printed on A portrait (8.5" x 11") sheet.
Meters: 0 500 1000 2000 3000
Feet: 0 1500 3000 6000 9000
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BeA	Bennington silt loam, 0 to 2 percent slopes	0.3	2.0%
BeB	Bennington silt loam, 2 to 6 percent slopes	0.2	1.6%
BfB	Bennington-Urban land complex, 0 to 6 percent slopes	1.6	11.4%
CeB	Celina silt loam, 2 to 6 percent slopes	0.3	2.0%
CeC2	Celina silt loam, 6 to 12 percent slopes, eroded	0.3	2.0%
CrA	Crosby silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes	1.0	7.5%
CrB	Crosby silt loam, Southern Ohio Till Plain, 2 to 6 percent slopes	3.9	28.1%
Ee	Eel silt loam, 0 to 2 percent slopes, occasionally flooded	0.3	2.1%
Gn	Genesee silt loam, 0 to 2 percent slopes, occasionally flooded	0.0	0.3%
KeC2	Kendallville silt loam, 6 to 12 percent slopes, eroded	0.3	2.4%
Ko	Kokomo silty clay loam, 0 to 2 percent slopes	1.3	9.0%
MkB	Miamian silt loam, 2 to 6 percent slopes	0.6	4.4%
MIC2	Miamian silty clay loam, 6 to 12 percent slopes, eroded	0.0	0.1%
OcB	Ockley silt loam, Southern Ohio Till Plain, 2 to 6 percent slopes	0.1	0.6%
Pn	Pewamo low carbonate till-Urban land complex, 0 to 2 percent slopes	0.4	2.7%
StA	Sleeth silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes	0.9	6.6%
ThB	Thackery silt loam, 2 to 6 percent slopes	0.1	0.7%
Ut	Udorthents-Urban land complex, gently rolling	0.2	1.2%
Wt	Westland silty clay loam, Southern Ohio Till Plain, 0 to 2 percent slopes	2.1	15.2%

Soil Identification	Soil Limitations: Corrosived to Steel	Shrink/Swell	Easily Erodable	Flooding	Depth to Saturated	Hydric	Low Strength Landslide	Frost Action	Slope
BeA	X				X		X	X	
BeB	X				X		X	X	
BfB	X				X		X	X	
CeB	X				X		X	X	
CeC2	X	X			X		X	X	X
CrA	X				X		X	X	
CrB	X				X		X	X	
Ee	X			X	X		X	X	
Gn				X	X		X	X	
KeC2		X						X	X
Ko	X	X		X	X	X	X	X	
MkB	X	X			X		X	X	
MIC2	X	X					X	X	X
OcB		X					X	X	
Pn	X			X	X	X	X	X	
StA	X				X		X	X	
ThB	X	X			X			X	
Ut									
Wt	X			X	X	X		X	

SOIL INFORMATION

NO.	REVISION	DATE	BY
4	UPDATED ACCESS ROADS	08/04/2023	LJS
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GENERAL NOTES

ASTOR TO SHANNON 138KV TRANSMISSION LINE
STORMWATER POLLUTION PREVENTION PLAN
TRURO AND MADISON TOWNSHIP FRANKLIN COUNTY OHIO

DRAWN BY/CHK. BY:	LJS/SLA
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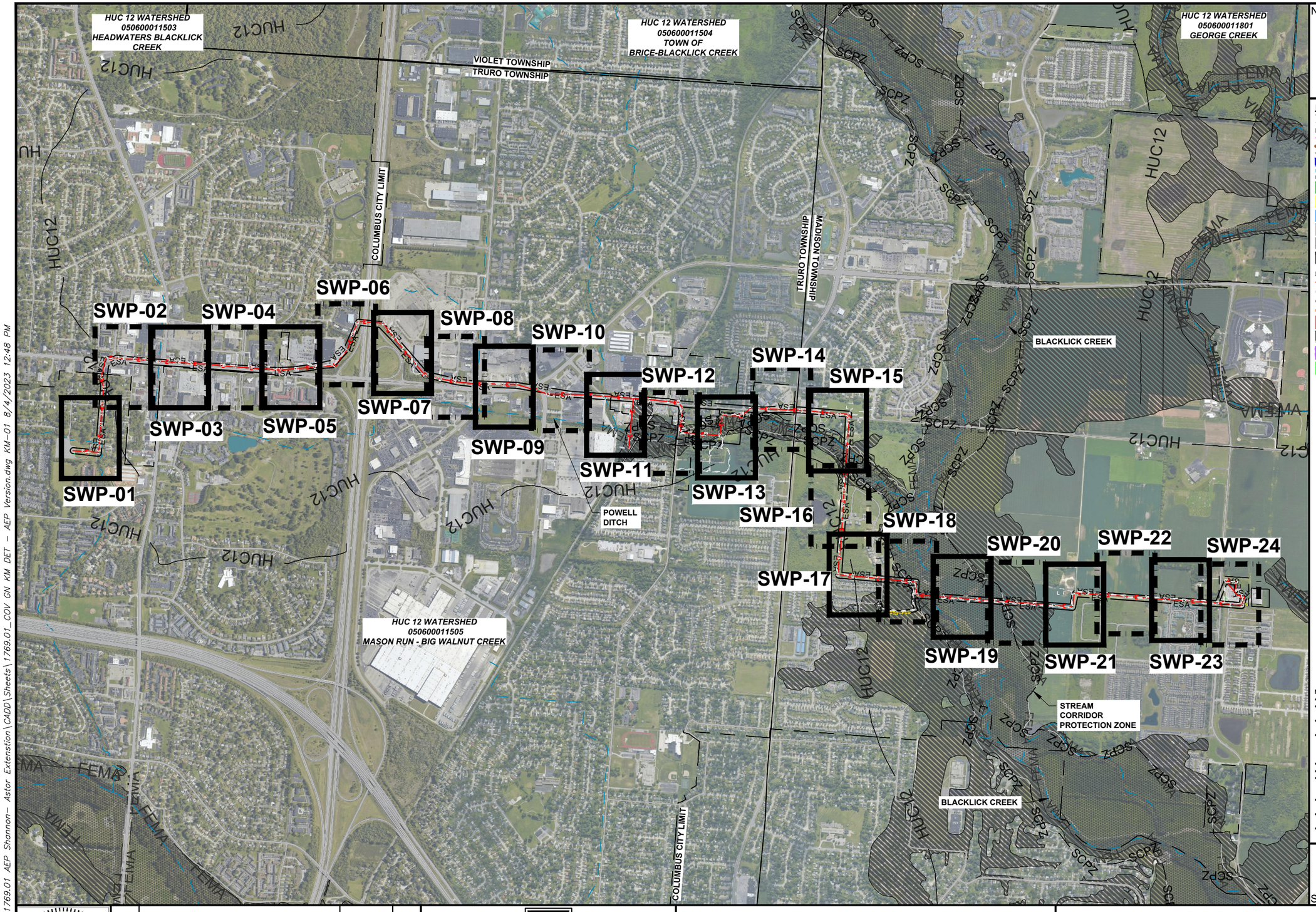

NORTH:

LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- COLUMBUS CITY BOUNDARY
- PROPOSED RIGHT-OF-WAY (60')
- EXISTING SOIL BOUNDARY LINES/LABEL
- ENVIRONMENTAL SURVEY AREA
- EXISTING DELINEATED STREAMS
- EXISTING NHD STREAMS
- EXISTING STREAM CORRIDOR PROTECTION ZONE
- EXISTING DELINEATED PEM WETLAND
- EXISTING DELINEATED PSS WETLAND
- EXISTING DELINEATED POND
- EXISTING ROADWAY
- FEMA 100-YEAR FLOODPLAIN ZONE AE
- FEMA REGULATORY FLOODWAY ZONE AE
- HUC WATERSHED BOUNDARIES
- PROPOSED ASTOR-SHANNON 138kV TRANSMISSION LINE
- PROPOSED LIMIT OF DISTURBANCE
- 12" COMPOST FILTER SOCK
- ORANGE BARRIER FENCE
- PROPOSED EXISTING HARD SURFACE ACCESS
- PROPOSED DIRT/TIMBERMAT ACCESS ROAD
- PROPOSED TEMPORARY 50' X 50' TIMBERMAT WORK PAD
- PROPOSED TEMPORARY 100' X 100' PULL PADS
- PROPOSED TEMPORARY CONSTRUCTION ENTRANCE
- DUMPSTER
- CONCRETE WASHOUT
- FUELING AREA
- SANITARY FACILITY
- PROPOSED TRANSMISSION LINE POLE STRUCTURE
- PROPOSED INLET PROTECTION

NOTE:

- All temporary workspaces will be timber matted.
- Sanitary facility, dumpster, and fueling locations are approximate and may change throughout project construction.
- All 100-year floodplain lines, floodway lines, and stream corridor protection zones are included on this plan.
- During the project, ensure that the paved surface of public streets in the vicinity of the construction entrance is swept on a regular basis, as needed and as required by the city, to remove gravel and dirt pulled onto the paved surface.
- BMPs shall not be installed within streams, wetlands, or ponds.
- install inlet protection within 50 feet of project limits.
- Due to temporary disturbance of a linear site, water quality impacts, including thermal impacts will be transient in nature and short lived, and returned to a pre-construction state once work has been completed.
- The exact locations of the concrete washout(s) may be field located by the on-site project engineer/contact.
- All erosion and sediment control practices are subject to field modification at the discretion of the City of Columbus and/or the Ohio EPA.
- Upper bank above normal water elevation should be stabilized quickly with straw blankets, jute matting, or similar geotextile.

1,600' 0 1,600'

SCALE: SCALE IN FEET

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KEY MAP

ASTOR TO SHANNON 138KV TRANSMISSION LINE

STORMWATER POLLUTION PREVENTION PLAN

TRURO AND MADISON TOWNSHIP FRANKLIN COUNTY OHIO

DRAWN BY/CHK. BY:	LJS/SLA
PROJECT MANAGER:	SWK
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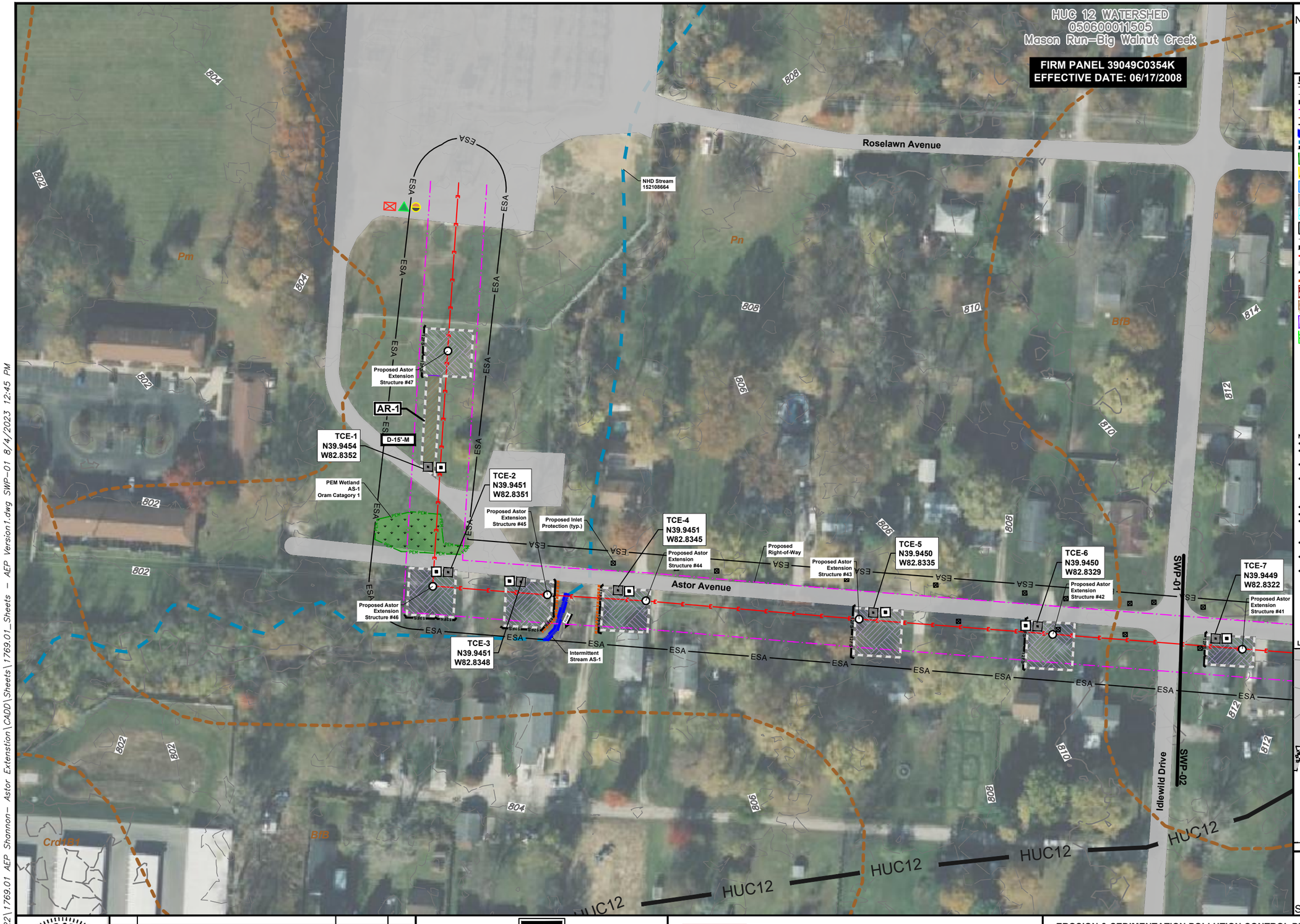

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- CONCRETE WASHOUT
- FUELING AREA
- SANITARY FACILITY
- PROPOSED STRUCTURE
- PROPOSED INLET PROTECTION

NOTE:

- **All temporary workspaces will be timber matted.**
- **Sanitary facility, dumpster, and fueling locations are approximate and may change throughout project construction.**
- **All 100-year floodplain lines, floodway lines, and stream corridor protection zones are included on this plan.**
- **During the project, ensure that the paved surface of public streets in the vicinity of the construction entrance is swept on a regular basis, as needed and as required by the city, to remove gravel and dirt pulled onto the paved surface.**
- **BMPs shall not be installed within streams, wetlands, or ponds.**
- **install inlet protection within 50 feet of project limits.**
- **Due to temporary disturbance of a linear site, water quality impacts, including thermal impacts will be transient in nature and short lived, and returned to a pre-construction state once work has been completed.**
- **The exact locations of the concrete washout(s) may be field located by the on-site project engineer/contact.**
- **All erosion and sediment control practices are subject to field modification at the discretion of the City of Columbus and/or the Ohio EPA.**
- **Upper bank above normal water elevation should be stabilized quickly with straw blankets, jute matting, or similar geotextile.**

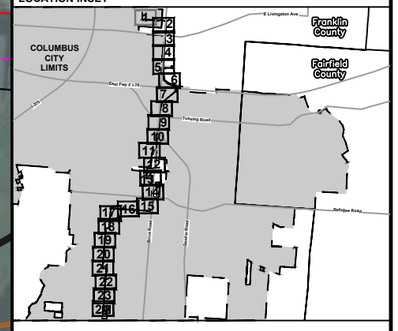
ACCESS ROAD LABELING

CONSTRUCTED WIDTH — D-15'-M — EXISTING MATERIAL / INSTALLED MATERIAL

M=TIMBER MAT
G=GRAVEL
D=DIRT
V=VEGETATION
P=PAVEMENT

© DENOTES A CHANGE IN ACCESS ROAD CATEGORY

LOCATION INSET



100' 0 100'

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NEW ALBANY, OHIO 43054

EROSION & SEDIMENTATION POLLUTION CONTROL PLAN

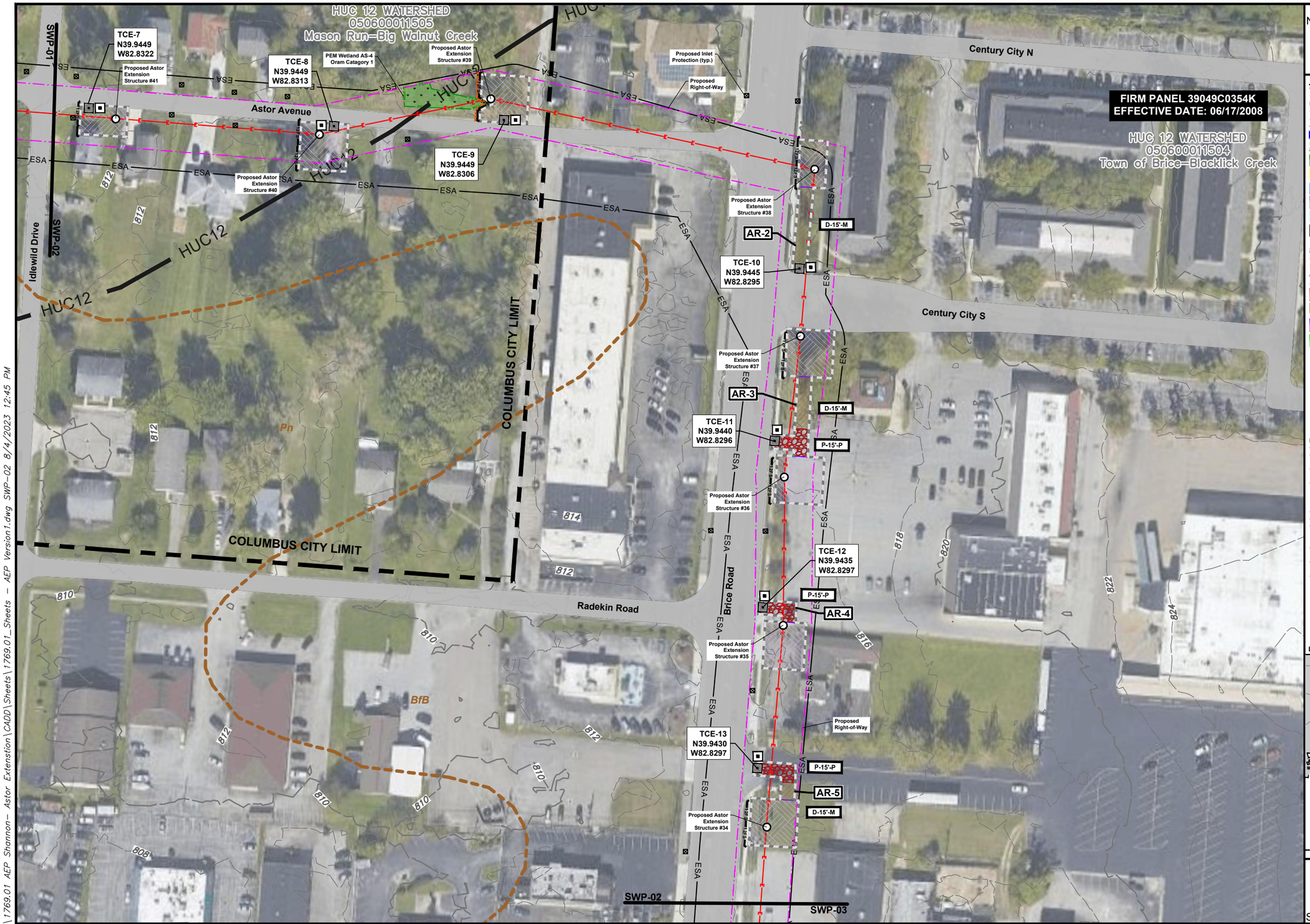
ASTOR TO SHANNON 138KV TRANSMISSION LINE

STORMWATER POLLUTION PREVENTION PLAN

TRURO AND MADISON TOWNSHIP **FRANKLIN COUNTY** **OHIO**

DRAWN BY	LJS/SLA
PROJECT MANAGER:	SWK
DATE:	DECEMBER 2022
SCALE:	AS SHOWN
SHEET NUMBER:	SWP-01
PROJECT NUMBER:	1769.01

R:\Projects\2022\1769.01 AEP Shannon– Astor Extension\CADD\Sheets\1769.01_Sheets – AEP Version1.dwg SWP–01 8/4/2023 12:45 PM



NORTH:

LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- COLUMBUS CITY BOUNDARY
- PROPOSED RIGHT-OF-WAY (60')
- EXISTING SOIL BOUNDARY LINES/LABEL
- ENVIRONMENTAL SURVEY AREA
- EXISTING DELINEATED STREAMS
- EXISTING NHD STREAMS
- EXISTING STREAM CORRIDOR PROTECTION ZONE
- EXISTING DELINEATED PEM WETLAND
- EXISTING DELINEATED PSS WETLAND
- EXISTING DELINEATED POND
- EXISTING ROADWAY
- FEMA 100-YEAR FLOODPLAIN ZONE AE
- FEMA FLOODWAY ZONE AE
- EXISTING TRANSMISSION LINE
- HUC WATERSHED BOUNDARIES
- PROPOSED ASTOR-SHANNON 138kV TRANSMISSION LINE
- PROPOSED LIMIT OF DISTURBANCE
- 12" COMPOST FILTER SOCK
- ORANGE BARRIER FENCE
- PROPOSED EXISTING HARD SURFACE ACCESS
- PROPOSED DIRT/TIMBERMAT ACCESS ROAD
- PROPOSED TEMPORARY 50' X 50' TIMBERMAT WORK PAD
- PROPOSED TEMPORARY 100' X 100' PULL PADS
- PROPOSED TEMPORARY CONSTRUCTION ENTRANCE
- DUMPSTER
- CONCRETE WASHOUT
- FUELING AREA
- SANITARY FACILITY
- PROPOSED STRUCTURE
- PROPOSED INLET PROTECTION

NOTE:

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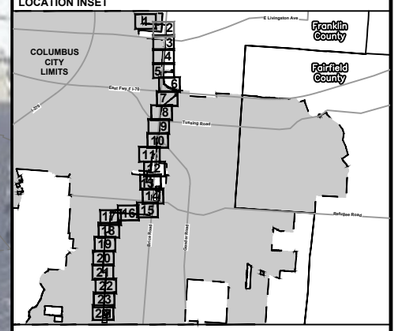
ACCESS ROAD LABELING

CONSTRUCTED WIDTH — **D-15'-M** — EXISTING MATERIAL / INSTALLED MATERIAL

M=TIMBER MAT
G=GRAVEL
D=DIRT
V=VEGETATION
P=PAVEMENT

© DENOTES A CHANGE IN ACCESS ROAD CATEGORY.

LOCATION INSET



100' 0 100'

SCALE: SCALE IN FEET

NO.	REVISION	DATE	BY
4	UPDATED ACCESS ROADS	08/03/2023	LJS
3	UPDATED ACCESS ROADS	07/25/2023	LJS
2	UPDATED ACCESS ROADS	03/20/2023	LJS
1	UPDATED ACCESS ROADS	03/16/2023	LJS

STATE OF OHIO — SHAUN W KLINE — E-84364 — REGISTERED PROFESSIONAL ENGINEER

ESI
Environmental Solutions & Innovations, Inc.
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ASTOR TO SHANNON 138KV TRANSMISSION LINE

STORMWATER POLLUTION PREVENTION PLAN

TRURO AND MADISON TOWNSHIP **FRANKLIN COUNTY** **OHIO**

DRAWN BY	LJS/SLA
PROJECT MANAGER:	SWK
DATE:	DECEMBER 2022
SCALE:	AS SHOWN
SHEET NUMBER:	**SWP-02**
PROJECT NUMBER:	1769.01

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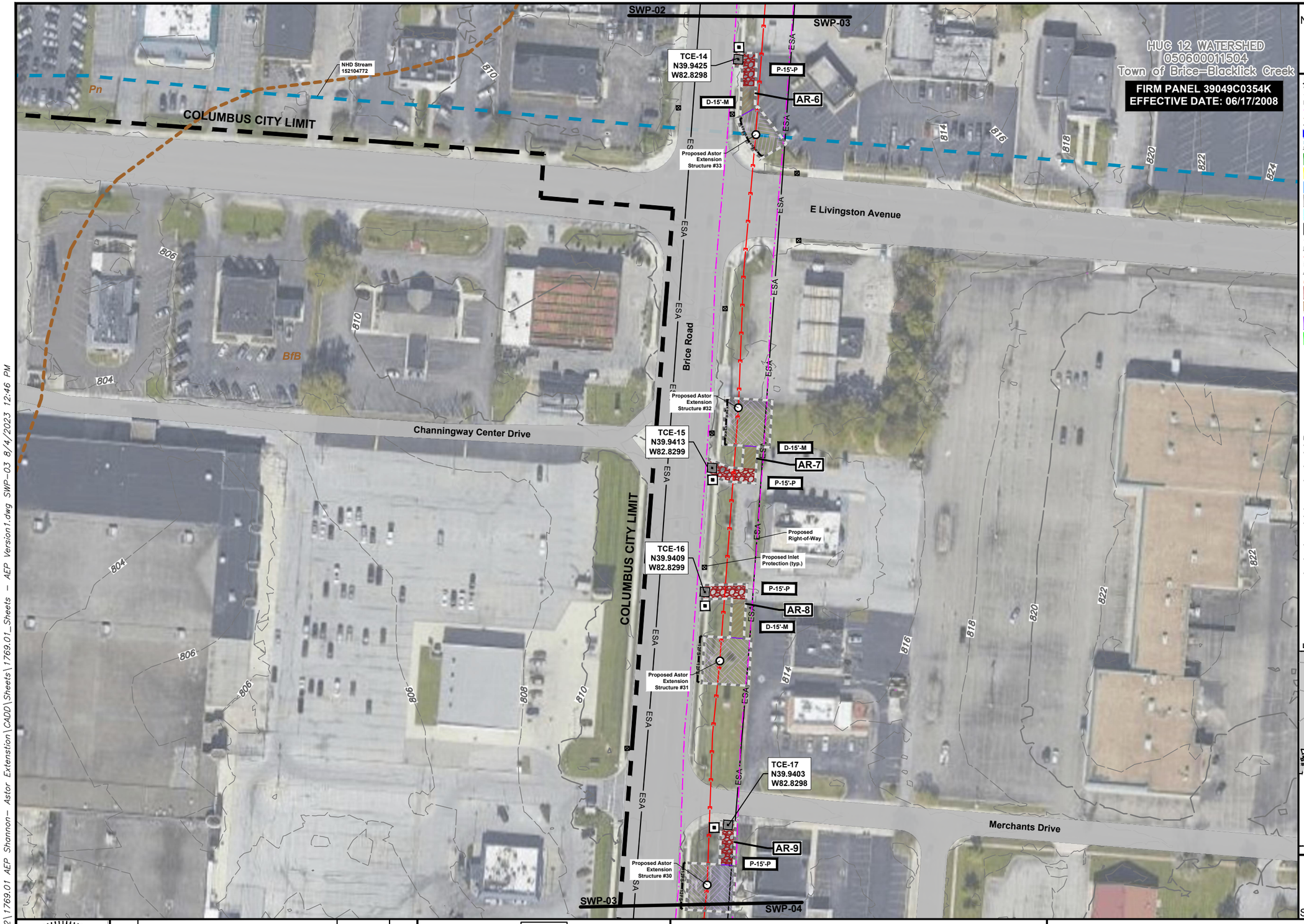

HUC 12 WATERSHED
050600011504
Town of Brice–Blackick Creek

FIRM PANEL 39049C0354K
EFFECTIVE DATE: 06/17/2008

NORTH:

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- EXISTING SOIL BOUNDARY LINES/LABEL
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- EXISTING NHD STREAMS
- EXISTING STREAM CORRIDOR PROTECTION ZONE
- EXISTING DELINEATED PEM WETLAND
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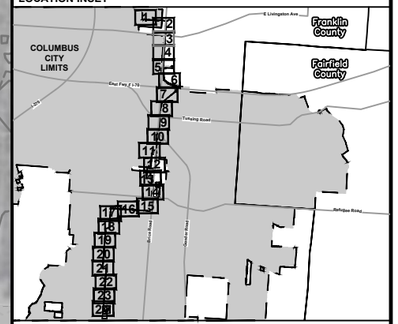

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SCALE: SCALE IN FEET

NO.	REVISION	DATE	BY
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ASTOR TO SHANNON 138KV TRANSMISSION LINE

STORMWATER POLLUTION PREVENTION PLAN

TRURO AND MADISON TOWNSHIP **FRANKLIN COUNTY** **OHIO**

DRAWN BY	LJS/SLA
PROJECT MANAGER:	SWK
DATE:	DECEMBER 2022
SCALE:	AS SHOWN
SHEET NUMBER:	**SWP-03**
PROJECT NUMBER:	1769.01

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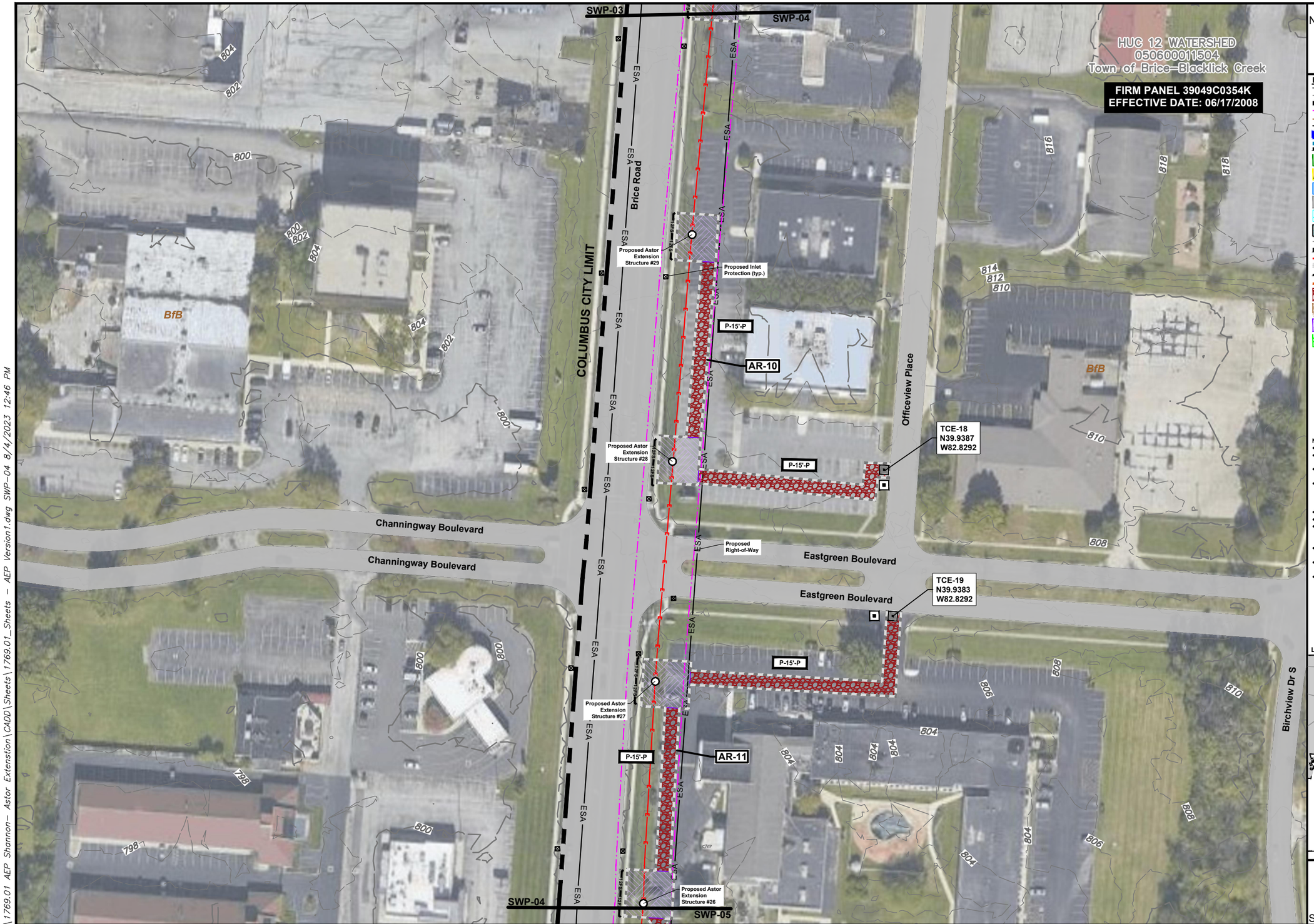

NORTH:

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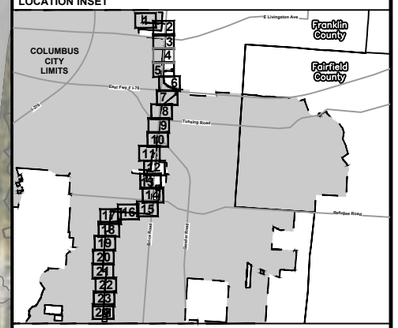
LOCATION INSET



100' 0 100'

SCALE: SCALE IN FEET

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STATE OF OHIO
SHAUN W. KLINE
E-84364
REGISTERED PROFESSIONAL ENGINEER

NO.	REVISION	DATE	BY
4	UPDATED ACCESS ROADS	08/03/2023	LJS
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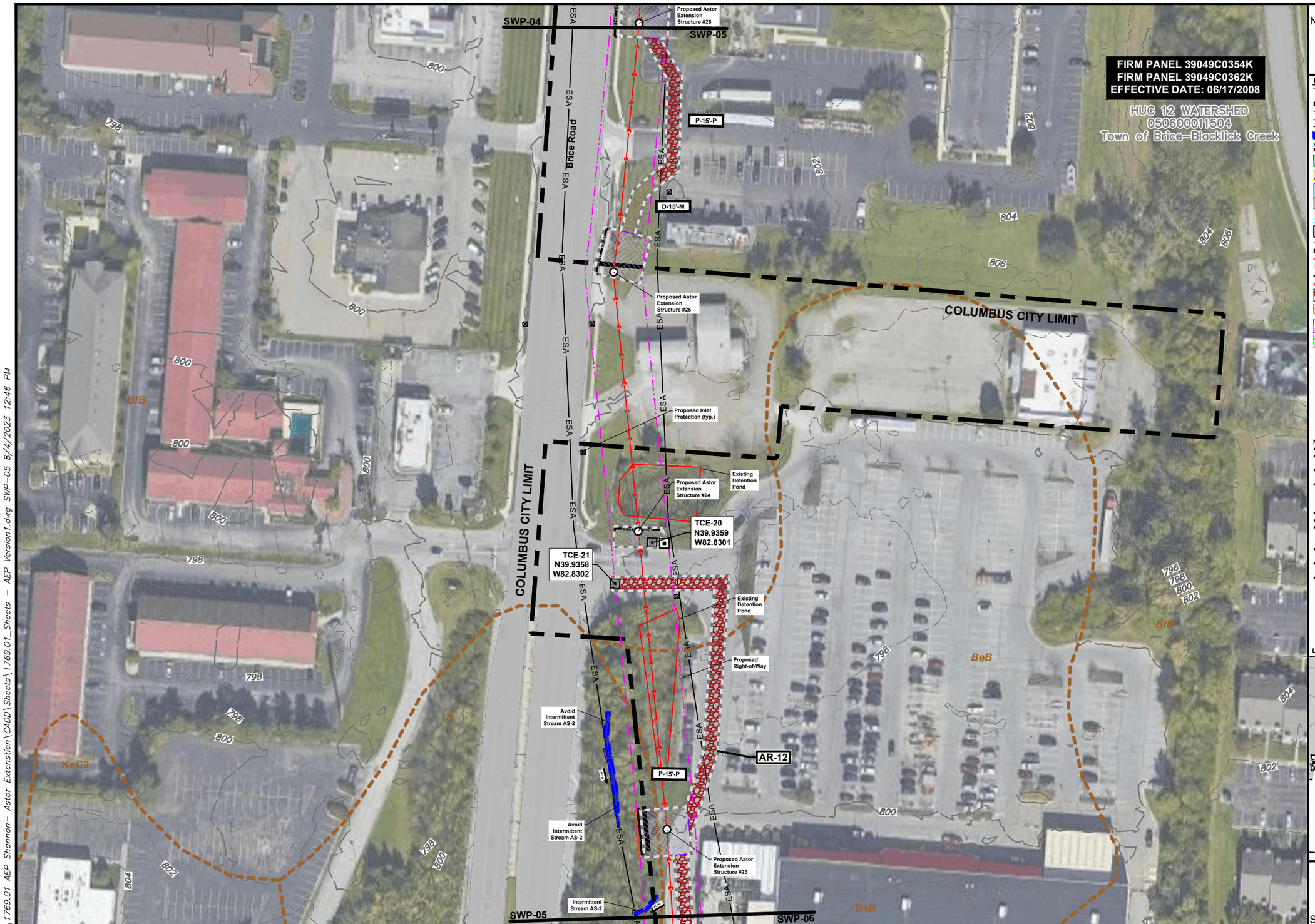
STORMWATER POLLUTION PREVENTION PLAN

TRURO AND MADISON TOWNSHIP FRANKLIN COUNTY OHIO

DRAWN BY	LJS/SLA
PROJECT MANAGER:	SWK
DATE:	DECEMBER 2022
SCALE:	AS SHOWN
SHEET NUMBER:	**SWP-04**
PROJECT NUMBER:	1769.01



NORTH:

LEGEND

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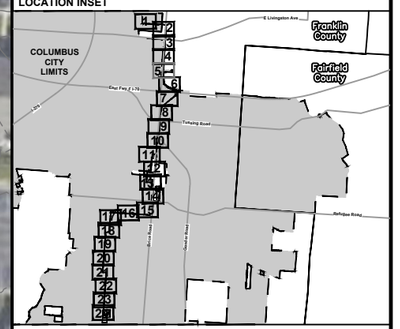

100' 0 100'

SCALE: SCALE IN FEET

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STATE OF OHIO — SHAUN W KLINE — E-84364 — REGISTERED PROFESSIONAL ENGINEER

NO.	REVISION	DATE	BY
4	UPDATED ACCESS ROADS	08/03/2023	LJS
3	UPDATED ACCESS ROADS	07/25/2023	LJS
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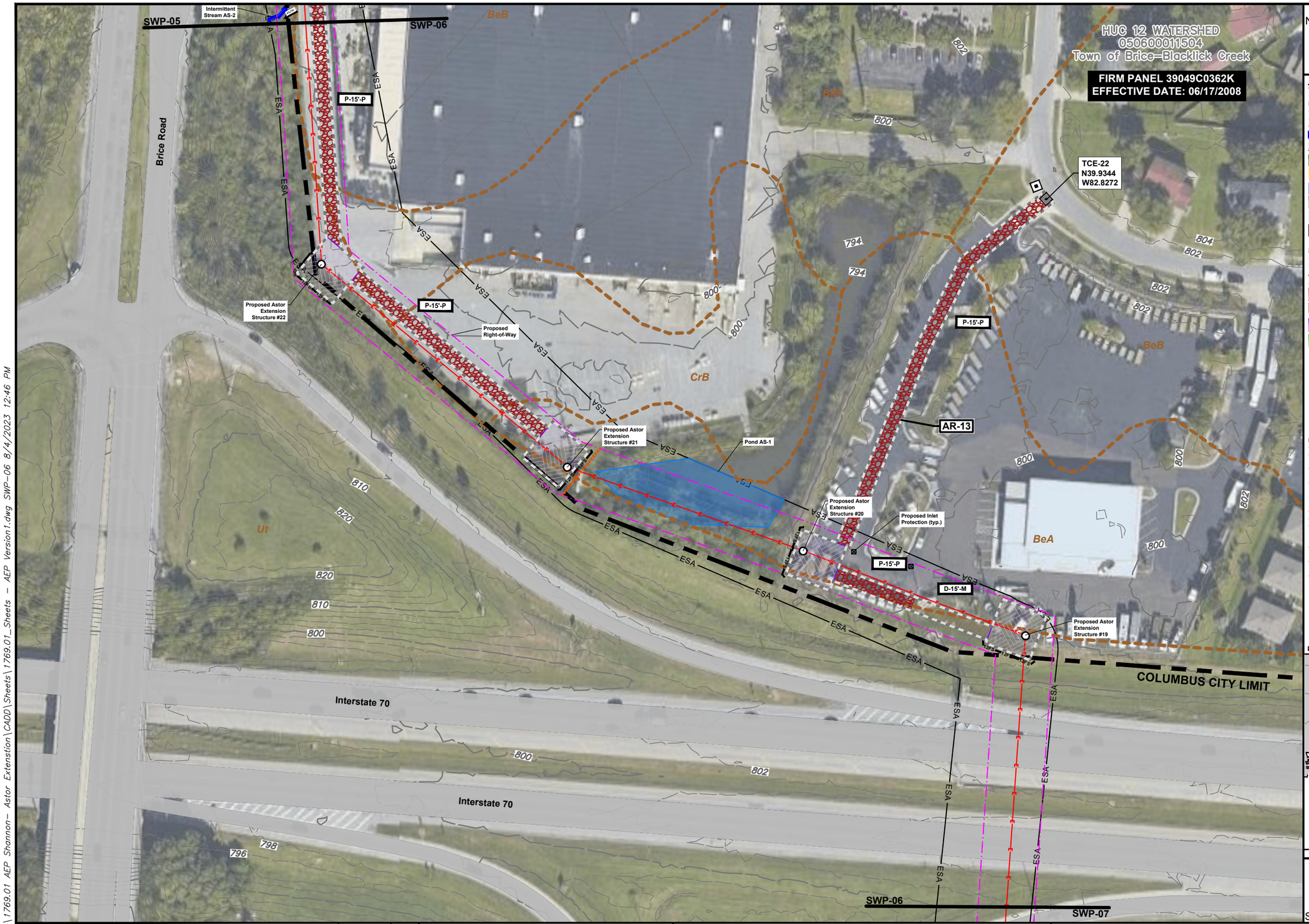
STORMWATER POLLUTION PREVENTION PLAN

TRURO AND MADISON TOWNSHIP **FRANKLIN COUNTY** **OHIO**

DRAWN BY	LJS/SLA
PROJECT MANAGER:	SWK
DATE:	DECEMBER 2022
SCALE:	AS SHOWN
SHEET NUMBER:	**SWP-05**
PROJECT NUMBER:	1769.01



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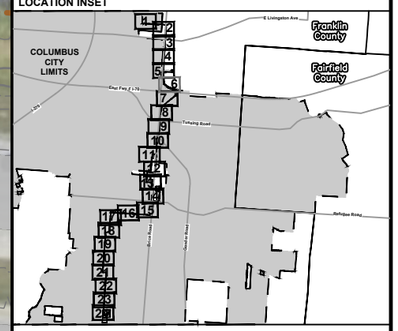

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TRURO AND MADISON TOWNSHIP FRANKLIN COUNTY OHIO

DRAWN BY	LJS/SLA
PROJECT MANAGER:	SWK
DATE:	DECEMBER 2022
SCALE:	AS SHOWN
SHEET NUMBER:	**SWP-06**
PROJECT NUMBER:	1769.01

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HUC 12 WATERSHED
050600011504
Town of Brice–Blacklick Creek

FIRM PANEL 39049C0362K
EFFECTIVE DATE: 06/17/2008

NORTH:

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- HUC WATERSHED BOUNDARIES
- PROPOSED ASTOR-SHANNON 138kV TRANSMISSION LINE
- PROPOSED LIMIT OF DISTURBANCE
- 12" COMPOST FILTER SOCK
- ORANGE BARRIER FENCE
- PROPOSED EXISTING HARD SURFACE ACCESS
- PROPOSED DIRT/TIMBERMAT ACCESS ROAD
- PROPOSED TEMPORARY 50' X 50' TIMBERMAT WORK PAD
- PROPOSED TEMPORARY 100' X 100' PULL PADS
- PROPOSED TEMPORARY CONSTRUCTION ENTRANCE
- DUMPSTER
- CONCRETE WASHOUT
- FUELING AREA
- SANITARY FACILITY
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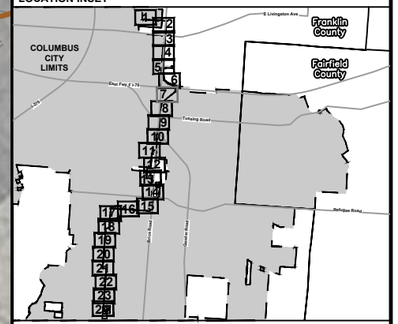
ACCESS ROAD LABELING

D-15'-M
(CONSTRUCTED WIDTH; EXISTING MATERIAL; INSTALLED MATERIAL)

M=TIMBER MAT
G=GRAVEL
D=DIRT
V=VEGETATION
P=PAVEMENT

© DENOTES A CHANGE IN ACCESS ROAD CATEGORY.

LOCATION INSET



100' 0 100'

SCALE: SCALE IN FEET

NO.	REVISION	DATE	BY
4	UPDATED ACCESS ROADS	08/03/2023	LJS
3	UPDATED ACCESS ROADS	07/25/2023	LJS
2	UPDATED ACCESS ROADS	03/20/2023	LJS
1	UPDATED ACCESS ROADS	03/16/2023	LJS

STATE OF OHIO
SHAUN W KLINE
E-84364
REGISTERED PROFESSIONAL ENGINEER

ESI
Environmental Solutions & Innovations, Inc.
1158 Dutilh Road
Mars, PA 16046-9448
Ravenna, OH • Indianapolis, IN • Orlando, FL • Springfield, MO
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AEP OHIO TRANSMISSION COMPANY, INC

8500 SMITH'S MILL ROAD
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EROSION & SEDIMENTATION POLLUTION CONTROL PLAN

ASTOR TO SHANNON 138KV TRANSMISSION LINE

STORMWATER POLLUTION PREVENTION PLAN

TRURO AND MADISON TOWNSHIP **FRANKLIN COUNTY** **OHIO**

DRAWN BY	LJS/SLA
PROJECT MANAGER:	SWK
DATE:	DECEMBER 2022
SCALE:	AS SHOWN
SHEET NUMBER:	**SWP-07**
PROJECT NUMBER:	1769.01

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HUC 12 WATERSHED
050600011504
Town of Brice-Blacklick Creek

FIRM PANEL 39049C0362K
EFFECTIVE DATE: 06/17/2008

SWP-07 | SWP-08 | SWP-09

D-15'-M

P-15'-P

AR-14 | AR-15 | AR-16

TCE-24
N39.9285
W82.8303

TCE-23
N39.9285
W82.8293

TCE-25
N39.9275
W82.8306

Proposed Astor Extension Structure #12

Proposed Astor Extension Structure #11

Proposed Astor Extension Structure #10

Proposed Right-of-Way

NHD Stream
152108662

NHD Stream
152107219

Perennial Stream AS-5

Brice Road

Scarborough Boulevard

Tussing Road

ESA

Ut | Ko | CeC2 | KeC2 | CrB

NORTH:

LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- COLUMBUS CITY BOUNDARY
- PROPOSED RIGHT-OF-WAY (60')
- EXISTING SOIL BOUNDARY LINES/LABEL
- ENVIRONMENTAL SURVEY AREA
- EXISTING DELINEATED STREAMS
- EXISTING NHD STREAMS
- EXISTING STREAM CORRIDOR PROTECTION ZONE
- EXISTING DELINEATED PEM WETLAND
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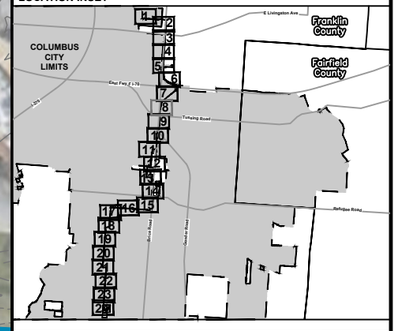
© DENOTES A CHANGE IN ACCESS ROAD CATEGORY

LOCATION INSET



100' 0 100'

SCALE: SCALE IN FEET

STATE OF OHIO
SHAUN W. KLINE
E-84364
REGISTERED PROFESSIONAL ENGINEER

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EROSION & SEDIMENTATION POLLUTION CONTROL PLAN

ASTOR TO SHANNON 138KV TRANSMISSION LINE

STORMWATER POLLUTION PREVENTION PLAN

TRURO AND MADISON TOWNSHIP FRANKLIN COUNTY OHIO

DRAWN BY	LJS/SLA
PROJECT MANAGER:	SWK
DATE:	DECEMBER 2022
SCALE:	AS SHOWN
SHEET NUMBER:	SWP-08
PROJECT NUMBER:	1769.01

R:\Projects\2022\1769.01 AEP Shannon- Astor Extension\CADD\Sheets\1769.01_Sheets - AEP Version1.dwg SWP-08 8/4/2023 12:47 PM

FIRM PANEL 39049C0362K
EFFECTIVE DATE: 06/17/2008

HUC 12 WATERSHED
050600011504
Town of Brice–Blacklick Creek

NHD Stream 152107219
NHD Stream 152108663
Perennial Stream AS-5

SWP-08
SWP-09
SWP-10

Tussing Road
Brice Road

TCE-25
N39.9275
W82.8306

TCE-26
N39.9263
W82.8310

TCE-27
N39.9256
W82.8311

TCE-28
N39.9250
W82.8312

Proposed Astor Extension Structure #9
Proposed Astor Extension Structure #8
Proposed Astor Extension Structure #7

P-15'-P
AR-17

Proposed Right-of-Way
Proposed Inlet Protection (typ.)

ESA

Ko
CrB
MkB
CrA

NORTH:

LEGEND

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- EXISTING INTERMEDIATE CONTOUR
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- PROPOSED RIGHT-OF-WAY (60')
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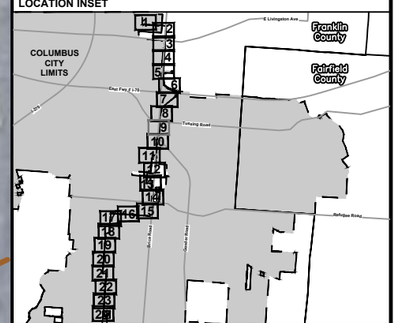

100' 0 100'
SCALE: SCALE IN FEET

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STATE OF OHIO
SHAUN W. KLINE
E-84364
REGISTERED PROFESSIONAL ENGINEER

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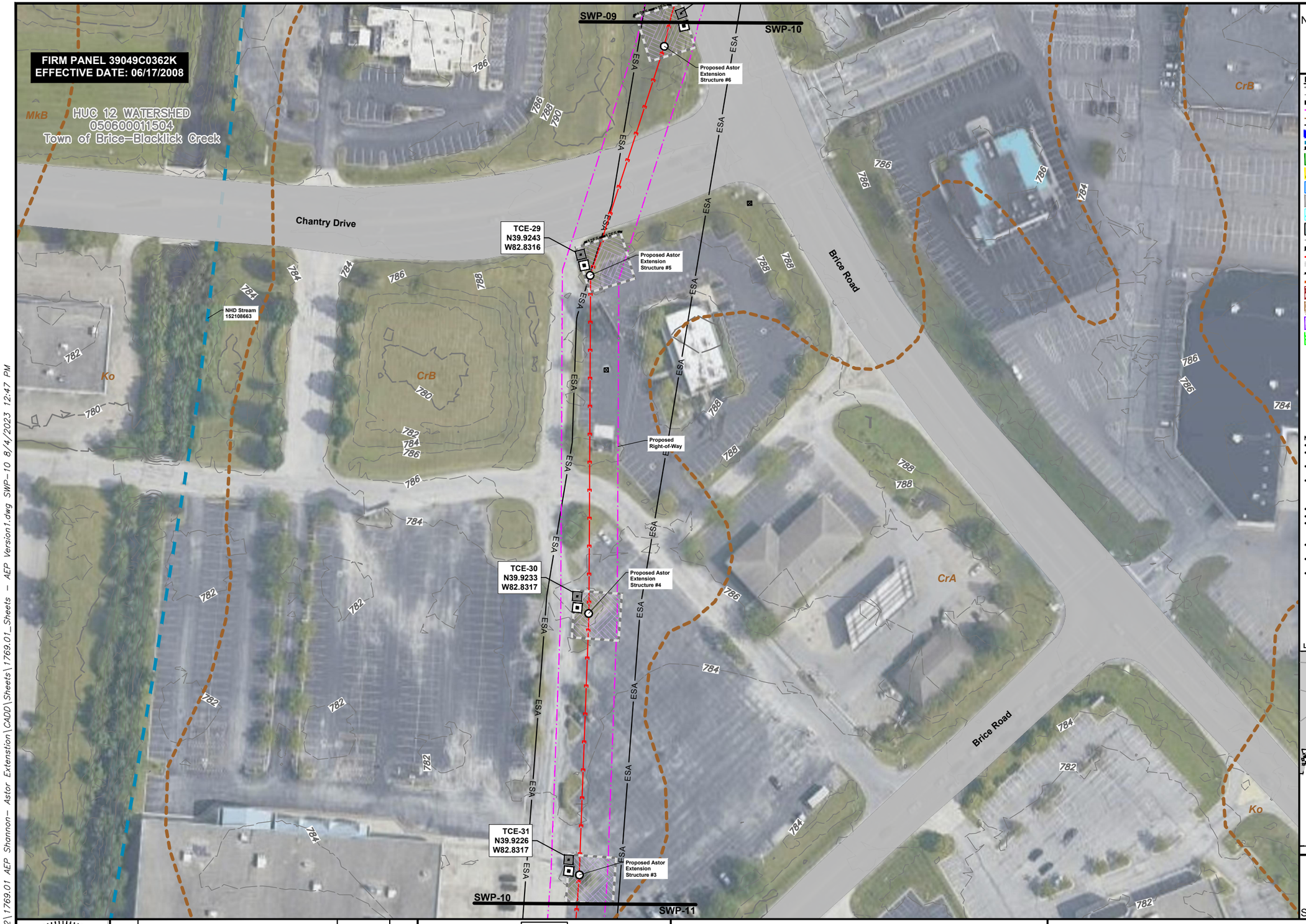
ASTOR TO SHANNON 138KV TRANSMISSION LINE

STORMWATER POLLUTION PREVENTION PLAN

TRURO AND MADISON TOWNSHIP FRANKLIN COUNTY OHIO

DRAWN BY	LJS/SLA
PROJECT MANAGER:	SWK
DATE:	DECEMBER 2022
SCALE:	AS SHOWN
SHEET NUMBER:	SWP-09
PROJECT NUMBER:	1769.01



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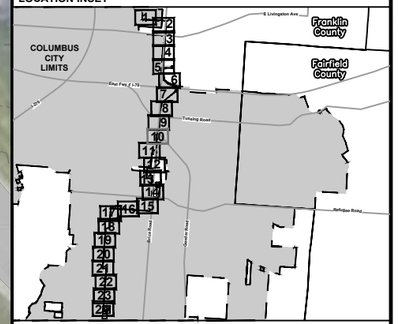
LOCATION INSET



100' 0 100'

SCALE: SCALE IN FEET

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1	UPDATED ACCESS ROADS	03/16/2023	LJS

STATE OF OHIO — SHAUN W KLINE — E-84364 — REGISTERED PROFESSIONAL ENGINEER

ESI
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Mars, PA 16046-9448
Ravenna, OH • Indianapolis, IN • Orlando, FL • Springfield, MO
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EROSION & SEDIMENTATION POLLUTION CONTROL PLAN

ASTOR TO SHANNON 138KV TRANSMISSION LINE

STORMWATER POLLUTION PREVENTION PLAN

TRURO AND MADISON TOWNSHIP **FRANKLIN COUNTY** **OHIO**

DRAWN BY	LJS/SLA
PROJECT MANAGER:	SWK
DATE:	DECEMBER 2022
SCALE:	AS SHOWN
SHEET NUMBER:	**SWP-10**
PROJECT NUMBER:	1769.01

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HUC 12 WATERSHED
050600011504
Town of Brice–Blacklick Creek

FIRM PANEL 39049C0362K
EFFECTIVE DATE: 06/17/2008

ACTIVITIES WITHIN THE STREAM CORRIDOR PROTECTION ZONE INCLUDE HAND CLEARING OF VEGETATION, EXCAVATION FOR PROVIDING COMPENSATORY FLOODPLAIN VOLUME, TEMPORARY AND PERMANENT FILL, AND REVEGETATION WITH PLANTINGS OF NATIVE SPECIES. ORANGE BARRIER FENCE WILL BE PLACED AROUND BOUNDARY AND SHOULD NOT BE PLACED IN THE STREAM.

SWP-10
SWP-11
SWP-12
ESA
Brice Road
TCE-32
N39.9218
W82.8318
Proposed Astor Extension Structure #2
P-15'-P
TCE-33
N39.9216
W82.8318
Proposed Right-of-Way
COLUMBUS CITY LIMIT
NHD Stream 152108663
NHD Stream 152104773
NHD Stream 152108661
AR-18
AR-19
TCE-34
N39.9209
W82.8320
TCE-35
N39.9209
W82.8318
Proposed Astor Extension Structure #1
TCE-36
N39.9203
W82.8319
Proposed Structure #62
D-15'-M
Proposed Structure #59
Proposed Structure #60
Proposed Structure #61
Adjust Pad Size To Accommodate Site Constraints
Stream Corridor Protection Zone
SCPZ
FEMA
FEMA FLOOD ZONE AE Floodway
FEMA FLOOD ZONE AE 100–year Floodplain
MkB
CrB
Ko
MIC2
780
782
784
786
778
776
774

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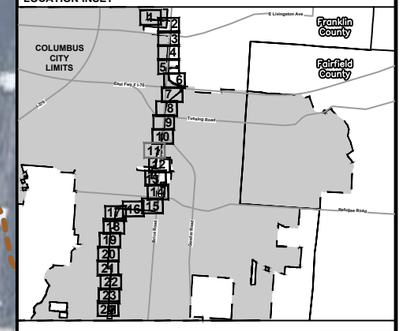

100' 0 100'
SCALE: SCALE IN FEET

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STATE OF OHIO
SHAUN W KLINE
E-84364
REGISTERED PROFESSIONAL ENGINEER

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ASTOR TO SHANNON 138KV TRANSMISSION LINE

STORMWATER POLLUTION PREVENTION PLAN

TRURO AND MADISON TOWNSHIP **FRANKLIN COUNTY** **OHIO**

DRAWN BY	LJS/SLA
PROJECT MANAGER:	SWK
DATE:	DECEMBER 2022
SCALE:	AS SHOWN
SHEET NUMBER:	SWP-11
PROJECT NUMBER:	1769.01

HUC 12 WATERSHED
050600011504
Town of Brice-Blacklick Creek

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FIRM PANEL 39049C0362K
EFFECTIVE DATE: 06/17/2008

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- EXISTING DELINEATED STREAMS
- EXISTING NHD STREAMS
- EXISTING STREAM CORRIDOR PROTECTION ZONE
- EXISTING DELINEATED PEM WETLAND
- EXISTING DELINEATED PSS WETLAND
- EXISTING DELINEATED POND
- EXISTING ROADWAY
- FEMA 100-YEAR FLOODPLAIN ZONE AE
- FEMA FLOODWAY ZONE AE
- EXISTING TRANSMISSION LINE
- HUC WATERSHED BOUNDARIES
- PROPOSED ASTOR-SHANNON 138kV TRANSMISSION LINE
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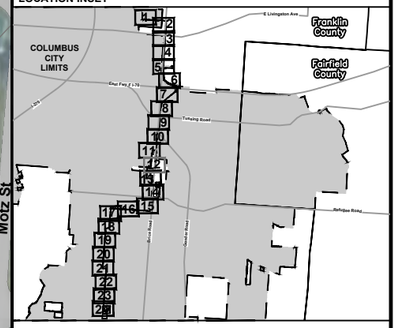
ACCESS ROAD LABELING

CONSTRUCTED WIDTH
D-15'-M
EXISTING MATERIAL / INSTALLED MATERIAL

M=TIMBER MAT
G=GRAVEL
D=DIRT
V=VEGETATION
P=PAVEMENT

© DENOTES A CHANGE IN ACCESS ROAD CATEGORY

LOCATION INSET



100' 0 100'
SCALE: SCALE IN FEET

NO.	REVISION	DATE	BY
4	UPDATED ACCESS ROADS	08/03/2023	LJS
3	UPDATED ACCESS ROADS	07/25/2023	LJS
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STATE OF OHIO
SHAUN W. KLINE
E-84364
REGISTERED PROFESSIONAL ENGINEER

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Environmental Solutions & Innovations, Inc.
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EROSION & SEDIMENTATION POLLUTION CONTROL PLAN

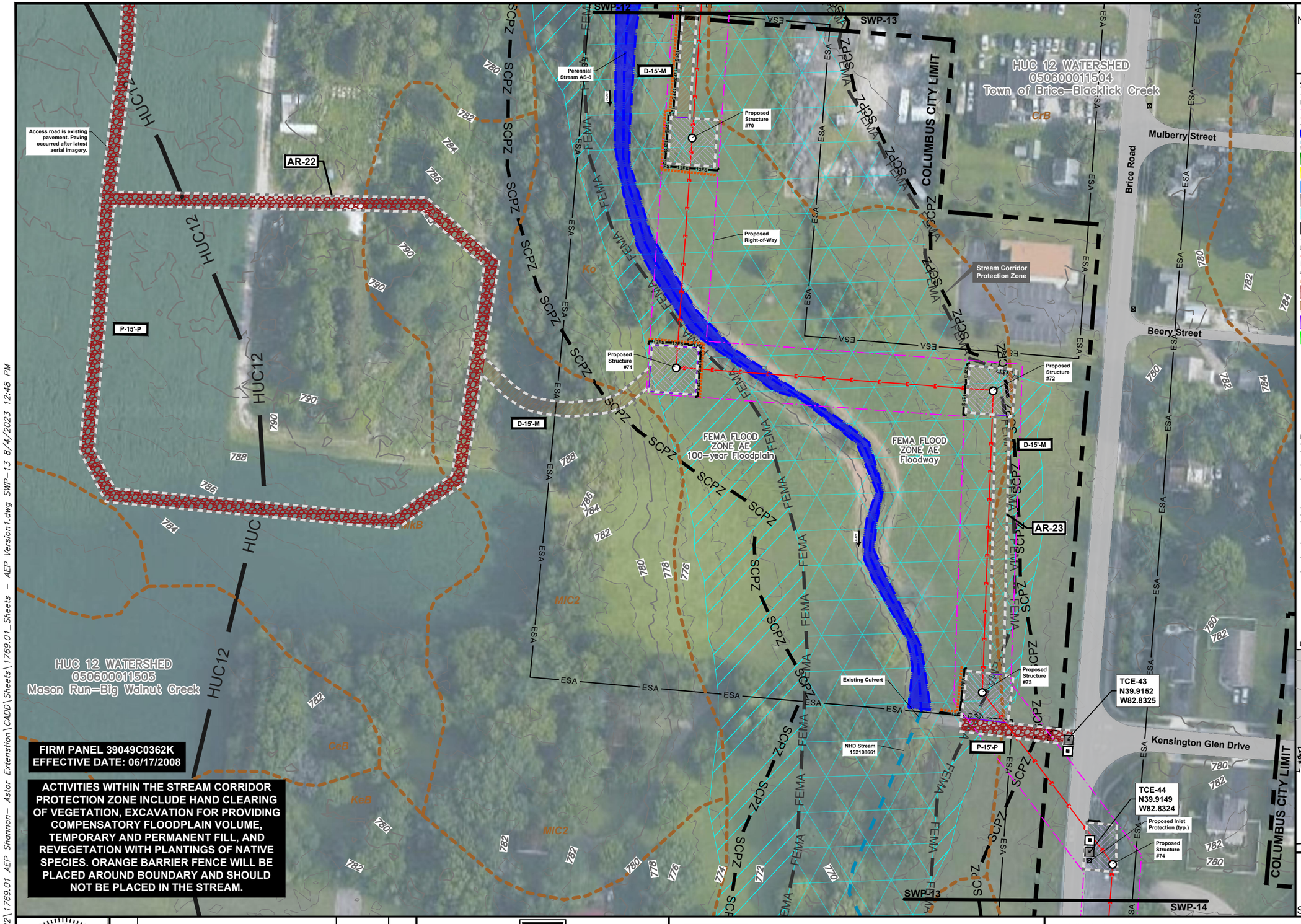
ASTOR TO SHANNON 138KV TRANSMISSION LINE

STORMWATER POLLUTION PREVENTION PLAN

TRURO AND MADISON TOWNSHIP **FRANKLIN COUNTY** **OHIO**

DRAWN BY	LJS/SLA
PROJECT MANAGER:	SWK
DATE:	DECEMBER 2022
SCALE:	AS SHOWN
SHEET NUMBER:	SWP-12
PROJECT NUMBER:	1769.01

R:\Projects\2022\1769.01 AEP Shannon- Astor Extension\CADD\Sheets\1769.01_Sheets - AEP Version1.dwg SWP-12 8/4/2023 12:48 PM



FIRM PANEL 39049C0362K
EFFECTIVE DATE: 06/17/2008

ACTIVITIES WITHIN THE STREAM CORRIDOR PROTECTION ZONE INCLUDE HAND CLEARING OF VEGETATION, EXCAVATION FOR PROVIDING COMPENSATORY FLOODPLAIN VOLUME, TEMPORARY AND PERMANENT FILL, AND REVEGETATION WITH PLANTINGS OF NATIVE SPECIES. ORANGE BARRIER FENCE WILL BE PLACED AROUND BOUNDARY AND SHOULD NOT BE PLACED IN THE STREAM.

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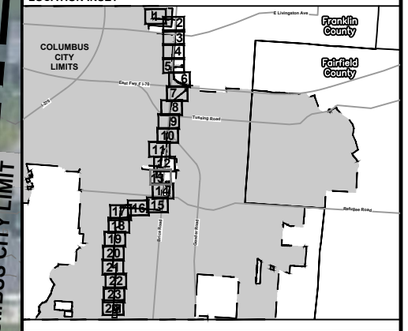
LOCATION INSET



100' 0 100'

SCALE: SCALE IN FEET

NO.	REVISION	DATE	BY
4	UPDATED ACCESS ROADS	08/03/2023	LJS
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STATE OF OHIO — SHAUN W. KLINE — E-84364 — REGISTERED PROFESSIONAL ENGINEER

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EROSION & SEDIMENTATION POLLUTION CONTROL PLAN

ASTOR TO SHANNON 138KV TRANSMISSION LINE

STORMWATER POLLUTION PREVENTION PLAN

TRURO AND MADISON TOWNSHIP **FRANKLIN COUNTY** **OHIO**

DRAWN BY	LJS/SLA
PROJECT MANAGER:	SWK
DATE:	DECEMBER 2022
SCALE:	AS SHOWN
SHEET NUMBER:	SWP-13
PROJECT NUMBER:	1769.01

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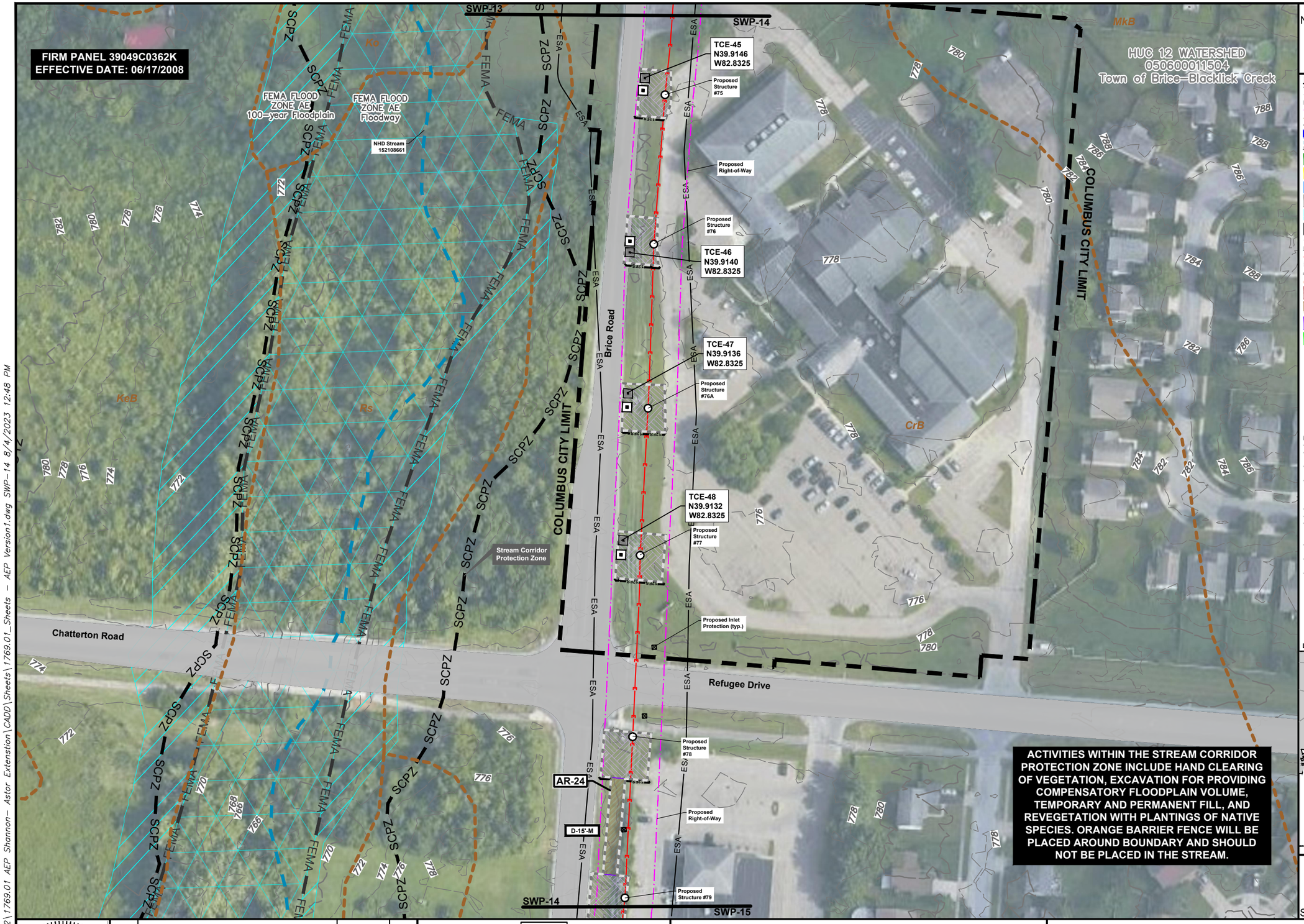

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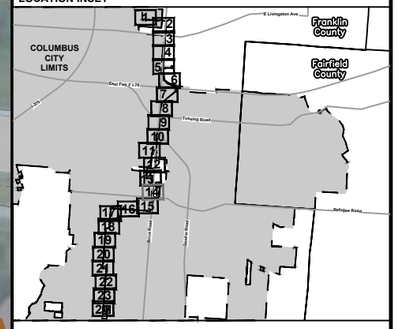
LOCATION INSET



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DRAWN BY	LJS/SLA
PROJECT MANAGER:	SWK
DATE:	DECEMBER 2022
SCALE:	AS SHOWN
SHEET NUMBER:	**SWP-14**
PROJECT NUMBER:	1769.01

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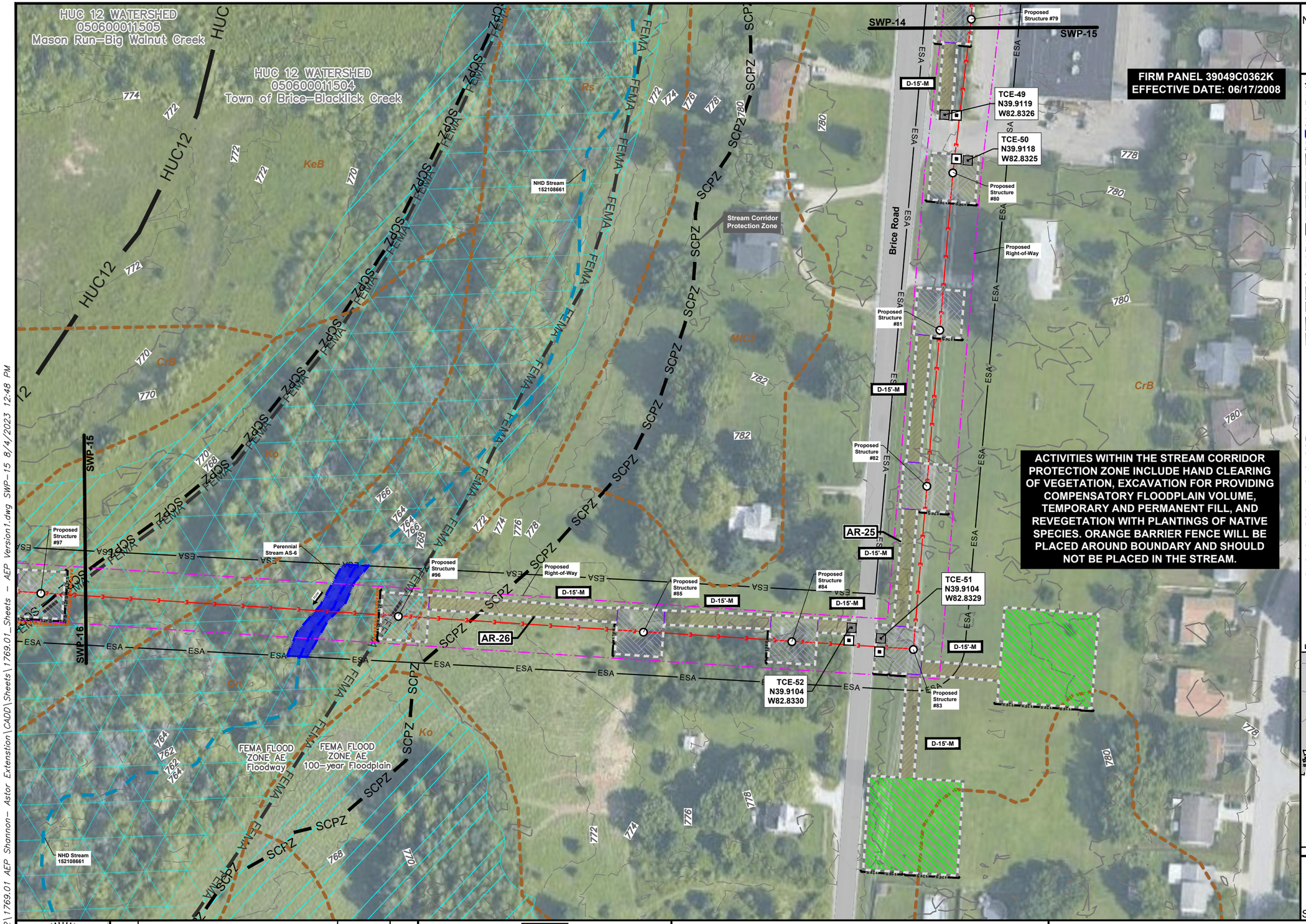

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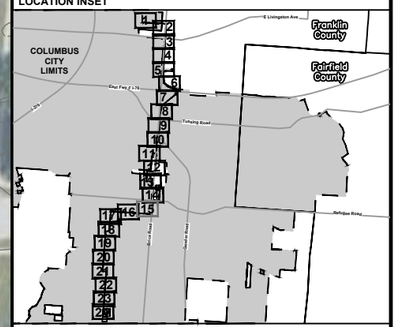

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SCALE: SCALE IN FEET

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1	UPDATED ACCESS ROADS	03/16/2023	LJS

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STORMWATER POLLUTION PREVENTION PLAN

TRURO AND MADISON TOWNSHIP **FRANKLIN COUNTY** **OHIO**

DRAWN BY	LJS/SLA
PROJECT MANAGER:	SWK
DATE:	DECEMBER 2022
SCALE:	AS SHOWN
SHEET NUMBER:	SWP-15
PROJECT NUMBER:	1769.01

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FIRM PANEL 39049C0362K
EFFECTIVE DATE: 06/17/2008

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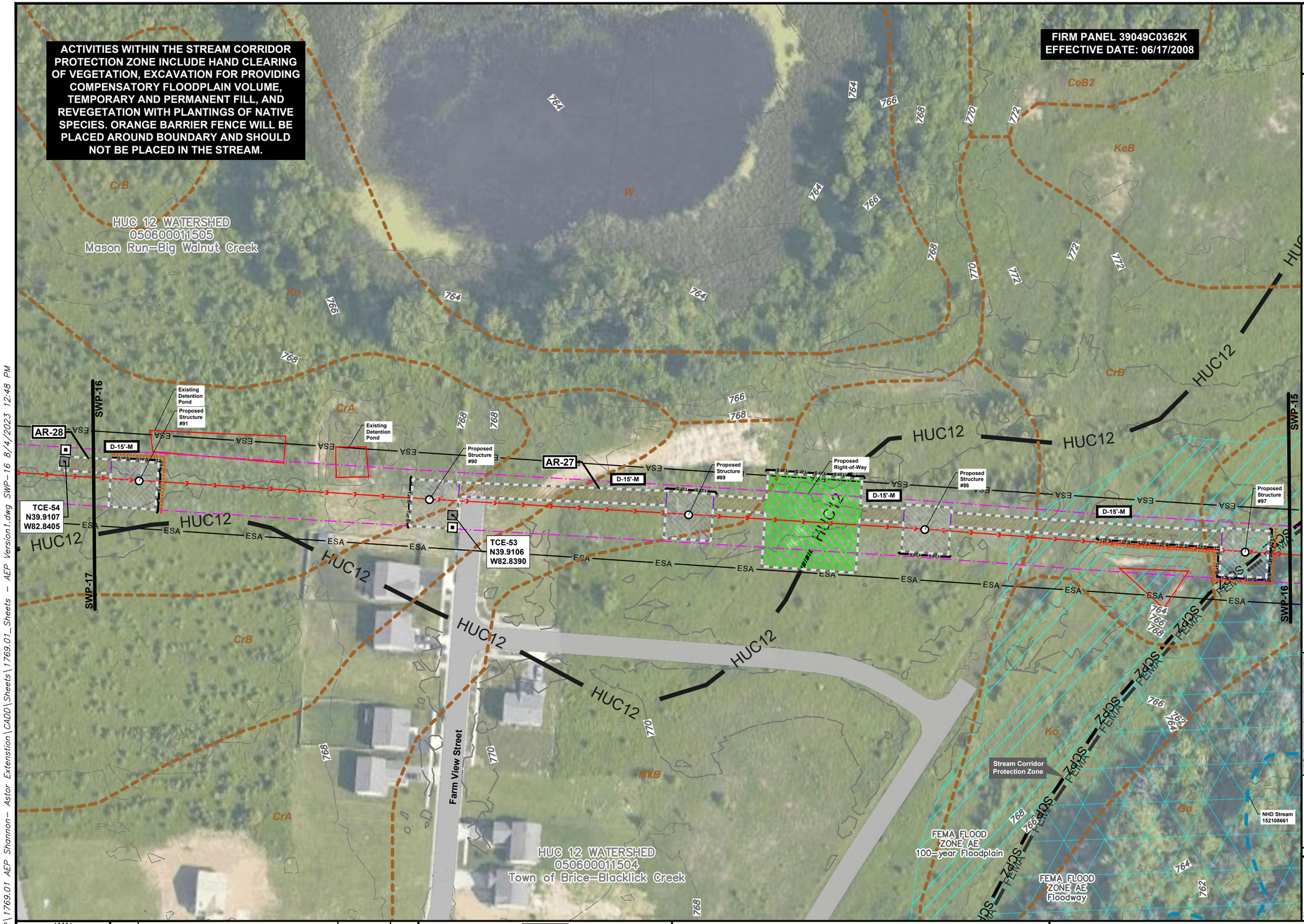

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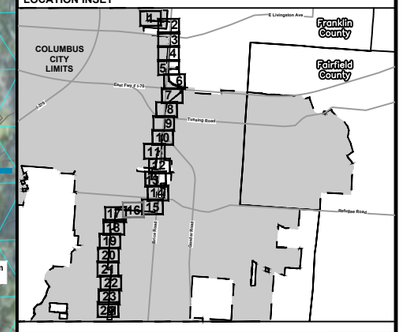

100' 0 100'

SCALE: **SCALE IN FEET**

NO.	REVISION	DATE	BY
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DRAWN BY	LJS/SLA
PROJECT MANAGER:	SWK
DATE:	DECEMBER 2022
SCALE:	AS SHOWN
SHEET NUMBER:	**SWP-16**
PROJECT NUMBER:	1769.01

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ACTIVITIES WITHIN THE STREAM CORRIDOR PROTECTION ZONE INCLUDE HAND CLEARING OF VEGETATION, EXCAVATION FOR PROVIDING COMPENSATORY FLOODPLAIN VOLUME, TEMPORARY AND PERMANENT FILL, AND REVEGETATION WITH PLANTINGS OF NATIVE SPECIES. ORANGE BARRIER FENCE WILL BE PLACED AROUND BOUNDARY AND SHOULD NOT BE PLACED IN THE STREAM.

FIRM PANEL 39049C0361K
FIRM PANEL 39049C0362K
EFFECTIVE DATE: 06/17/2008

HUC 12 WATERSHED
050600011505
Mason Run–Big Walnut Creek

HUC 12 WATERSHED
050600011504
Town of Brice–Blacklick Creek

AR-30 | P-15'-P | D-15'-M | TCE-56 N39.9108 W82.8418 | Proposed Structure #93
AR-29 | D-15'-M | TCE-55 N39.9107 W82.8408 | Proposed Structure #92
AR-28 | D-15'-M | TCE-54 N39.9107 W82.8405 | Proposed Structure #91 | Existing Detention Pond
AR-31 | Proposed Structure #94 | Proposed Right-of-Way | Existing Detention Pond | Proposed Structure #95
SWP-16 | SWP-17 | SWP-18
TCE-57 N39.9088 W82.8425 | D-15'-M | Proposed Right-of-Way
TCE-58 N39.9087 W82.8426 | Proposed Structure #96
TCE-60A N39.9089 W82.8441

Payday Lane | Kady Lane | Yozuri Drive | Mouzon Drive

FEMA FLOOD ZONE AE 100–year Floodplain

Stream Corridor Protection Zone

NORTH:

LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- COLUMBUS CITY BOUNDARY
- PROPOSED RIGHT-OF-WAY (60')
- EXISTING SOIL BOUNDARY LINES/LABEL
- ENVIRONMENTAL SURVEY AREA
- EXISTING DELINEATED STREAMS
- EXISTING NHD STREAMS
- EXISTING STREAM CORRIDOR PROTECTION ZONE
- EXISTING DELINEATED PEM WETLAND
- EXISTING DELINEATED PSS WETLAND
- EXISTING DELINEATED POND
- EXISTING ROADWAY
- FEMA 100-YEAR FLOODPLAIN ZONE AE
- FEMA FLOODWAY ZONE AE
- EXISTING TRANSMISSION LINE
- HUC WATERSHED BOUNDARIES
- PROPOSED ASTOR-SHANNON 138kV TRANSMISSION LINE
- PROPOSED LIMIT OF DISTURBANCE
- 12" COMPOST FILTER SOCK
- ORANGE BARRIER FENCE
- PROPOSED EXISTING HARD SURFACE ACCESS
- PROPOSED DIRT/TIMBERMAT ACCESS ROAD
- PROPOSED TEMPORARY 50' X 50' TIMBERMAT WORK PAD
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M=TIMBER MAT
G=GRAVEL
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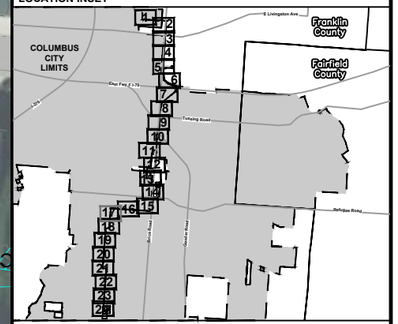
V=VEGETATION
P=PAVEMENT

© DENOTES A CHANGE IN ACCESS ROAD CATEGORY.

LOCATION INSET



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SCALE: SCALE IN FEET

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STATE OF OHIO — SHAUN W KLINE E-84364 — REGISTERED PROFESSIONAL ENGINEER

NO.	REVISION	DATE	BY
4	UPDATED ACCESS ROADS	08/03/2023	LJS
3	UPDATED ACCESS ROADS	07/25/2023	LJS
2	UPDATED ACCESS ROADS	03/20/2023	LJS
1	UPDATED ACCESS ROADS	03/16/2023	LJS

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NEW ALBANY, OHIO 43054

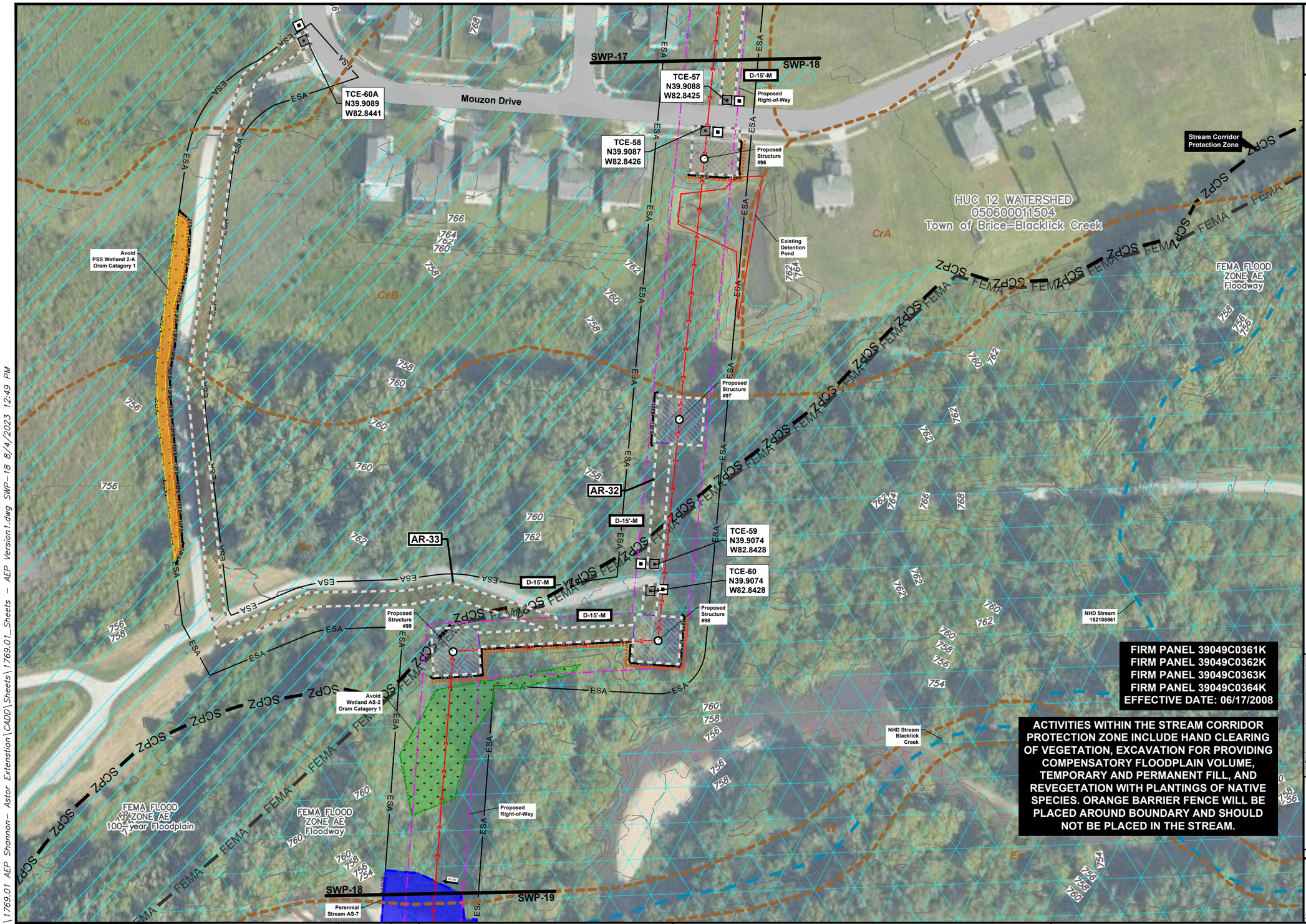
EROSION & SEDIMENTATION POLLUTION CONTROL PLAN

ASTOR TO SHANNON 138KV TRANSMISSION LINE

STORMWATER POLLUTION PREVENTION PLAN

TRURO AND MADISON TOWNSHIP FRANKLIN COUNTY OHIO

DRAWN BY	LJS/SLA
PROJECT MANAGER:	SWK
DATE:	DECEMBER 2022
SCALE:	AS SHOWN
SHEET NUMBER:	**SWP-17**
PROJECT NUMBER:	1769.01



NORTH:

LEGEND

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- EXISTING SOIL BOUNDARY LINES/LABEL
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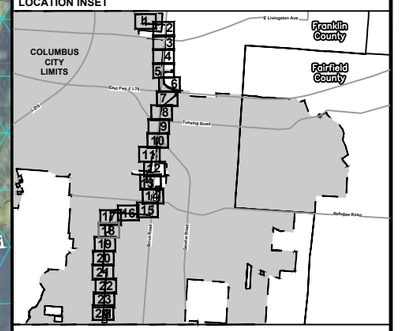
FIRM PANEL 39049C0361K
FIRM PANEL 39049C0362K
FIRM PANEL 39049C0363K
FIRM PANEL 39049C0364K
EFFECTIVE DATE: 06/17/2008

ACTIVITIES WITHIN THE STREAM CORRIDOR PROTECTION ZONE INCLUDE HAND CLEARING OF VEGETATION, EXCAVATION FOR PROVIDING COMPENSATORY FLOODPLAIN VOLUME, TEMPORARY AND PERMANENT FILL, AND REVEGETATION WITH PLANTINGS OF NATIVE SPECIES. ORANGE BARRIER FENCE WILL BE PLACED AROUND BOUNDARY AND SHOULD NOT BE PLACED IN THE STREAM.

LOCATION INSET



100' 0 100'

SCALE: SCALE IN FEET

STATE OF OHIO
SHAUN W KLINE
E-84364
REGISTERED PROFESSIONAL ENGINEER

NO.	REVISION	DATE	BY
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STORMWATER POLLUTION PREVENTION PLAN

TRURO AND MADISON TOWNSHIP FRANKLIN COUNTY OHIO

DRAWN BY	LJS/SLA
PROJECT MANAGER:	SWK
DATE:	DECEMBER 2022
SCALE:	AS SHOWN
SHEET NUMBER:	**SWP-18**
PROJECT NUMBER:	1769.01

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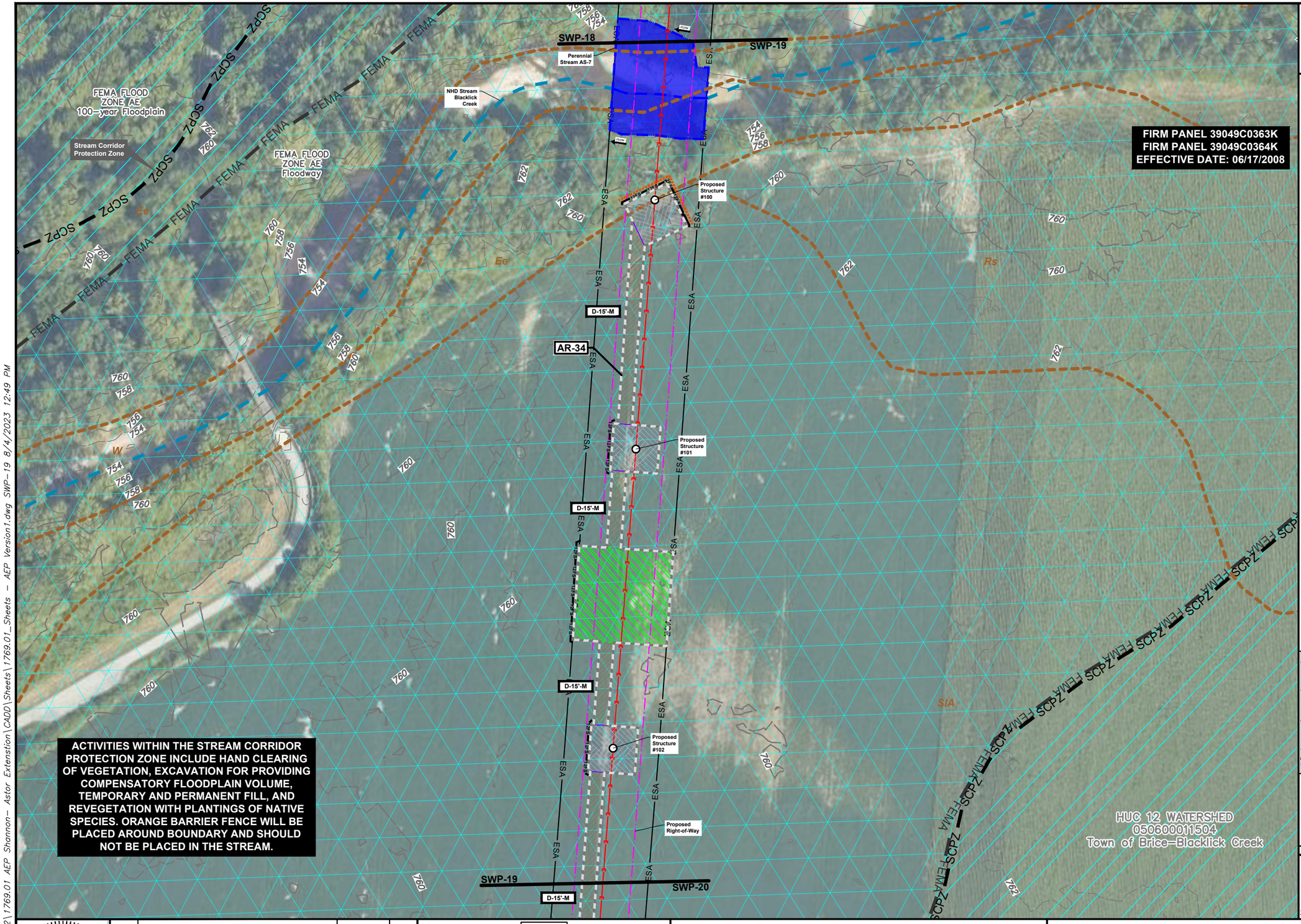

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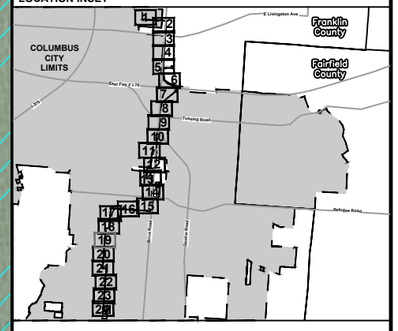

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SCALE: SCALE IN FEET

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STATE OF OHIO — SHAUN W KLINE — E-84364 — REGISTERED PROFESSIONAL ENGINEER

NO.	REVISION	DATE	BY
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ASTOR TO SHANNON 138KV TRANSMISSION LINE

STORMWATER POLLUTION PREVENTION PLAN

TRURO AND MADISON TOWNSHIP **FRANKLIN COUNTY** **OHIO**

DRAWN BY	LJS/SLA
PROJECT MANAGER:	SWK
DATE:	DECEMBER 2022
SCALE:	AS SHOWN
SHEET NUMBER:	**SWP-19**
PROJECT NUMBER:	1769.01

FIRM PANEL 39049C0363K
FIRM PANEL 39049C0364K
EFFECTIVE DATE: 06/17/2008

SWP-19 | SWP-20 | SWP-21

D-15'-M

AR-35

Proposed Structure #103

Proposed Structure #104

Proposed Structure #105

Proposed Right-of-Way

Stream Corridor Protection Zone

FEMA FLOOD ZONE AE Floodway

FEMA FLOOD ZONE AE 100-year Floodplain

SCPZ FEMA

ESA

SIA

OcB

Wt

HUC 12 WATERSHED
050600011504
Town of Brice-Blacklick Creek

ACTIVITIES WITHIN THE STREAM CORRIDOR PROTECTION ZONE INCLUDE HAND CLEARING OF VEGETATION, EXCAVATION FOR PROVIDING COMPENSATORY FLOODPLAIN VOLUME, TEMPORARY AND PERMANENT FILL, AND REVEGETATION WITH PLANTINGS OF NATIVE SPECIES. ORANGE BARRIER FENCE WILL BE PLACED AROUND BOUNDARY AND SHOULD NOT BE PLACED IN THE STREAM.

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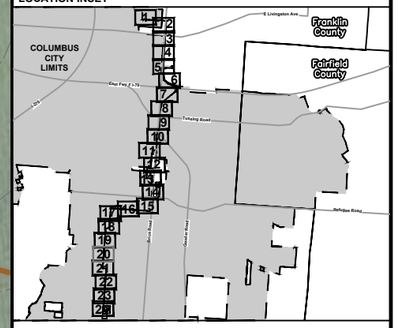

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SHAUN W KLINE
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REGISTERED PROFESSIONAL ENGINEER

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ASTOR TO SHANNON 138KV TRANSMISSION LINE

STORMWATER POLLUTION PREVENTION PLAN

TRURO AND MADISON TOWNSHIP FRANKLIN COUNTY OHIO

DRAWN BY	LJS/SLA
PROJECT MANAGER:	SWK
DATE:	DECEMBER 2022
SCALE:	AS SHOWN
SHEET NUMBER:	**SWP-20**
PROJECT NUMBER:	1769.01

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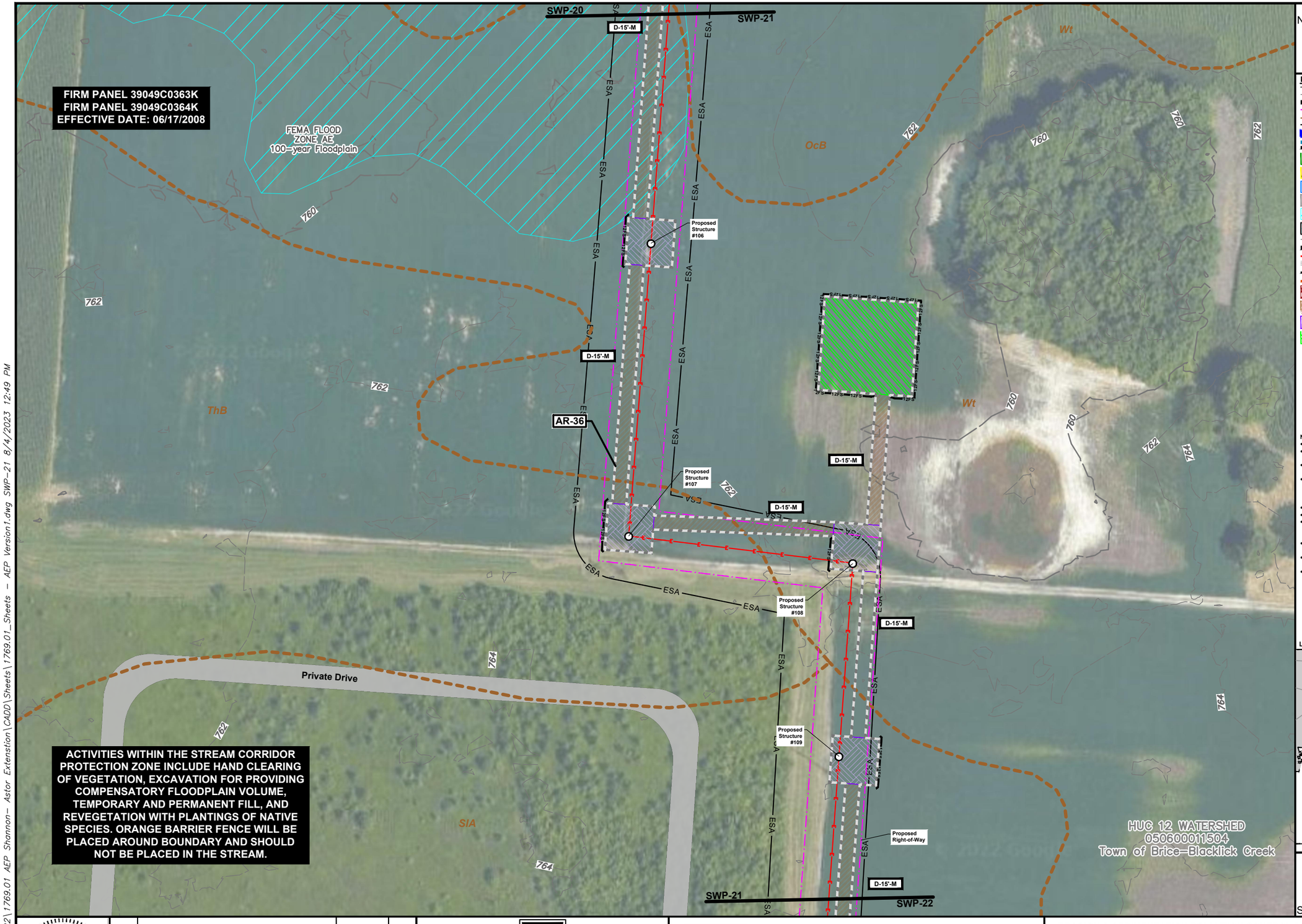

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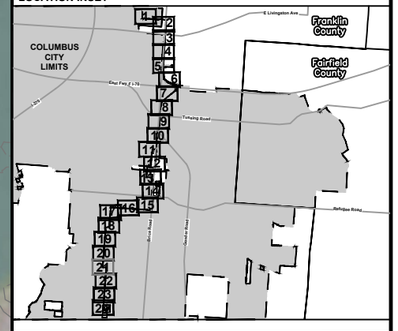

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SCALE: SCALE IN FEET

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SHAUN W. KLINE
E-84364
REGISTERED PROFESSIONAL ENGINEER

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DRAWN BY	LJS/SLA
PROJECT MANAGER:	SWK
DATE:	DECEMBER 2022
SCALE:	AS SHOWN
SHEET NUMBER:	SWP-21
PROJECT NUMBER:	1769.01

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- EXISTING NHD STREAMS
- EXISTING STREAM CORRIDOR PROTECTION ZONE
- EXISTING DELINEATED PEM WETLAND
- EXISTING DELINEATED PSS WETLAND
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- FEMA 100-YEAR FLOODPLAIN ZONE AE
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D-15'-M (CONSTRUCTED WIDTH / EXISTING MATERIAL / INSTALLED MATERIAL)

M=TIMBER MAT
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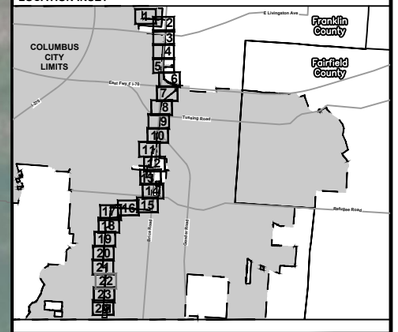
P=PAVEMENT

© DENOTES A CHANGE IN ACCESS ROAD CATEGORY

LOCATION INSET



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STATE OF OHIO — SHAUN W. KLINE — E-84364 — REGISTERED PROFESSIONAL ENGINEER

NO.	REVISION	DATE	BY
4	UPDATED ACCESS ROADS	08/03/2023	LJS
3	UPDATED ACCESS ROADS	07/25/2023	LJS
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EROSION & SEDIMENTATION POLLUTION CONTROL PLAN

ASTOR TO SHANNON 138KV TRANSMISSION LINE

STORMWATER POLLUTION PREVENTION PLAN

TRURO AND MADISON TOWNSHIP **FRANKLIN COUNTY** **OHIO**

DRAWN BY	LJS/SLA
PROJECT MANAGER:	SWK
DATE:	DECEMBER 2022
SCALE:	AS SHOWN
SHEET NUMBER:	**SWP-22**
PROJECT NUMBER:	1769.01

NORTH:

LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- COLUMBUS CITY BOUNDARY
- PROPOSED RIGHT-OF-WAY (60')
- EXISTING SOIL BOUNDARY LINES/LABEL
- ENVIRONMENTAL SURVEY AREA
- EXISTING DELINEATED STREAMS
- EXISTING NHD STREAMS
- EXISTING STREAM CORRIDOR PROTECTION ZONE
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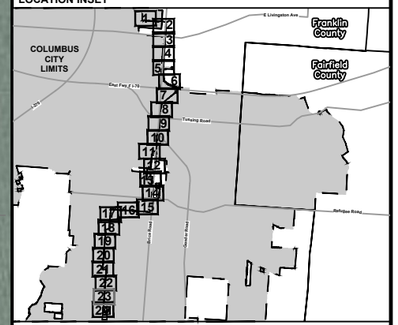

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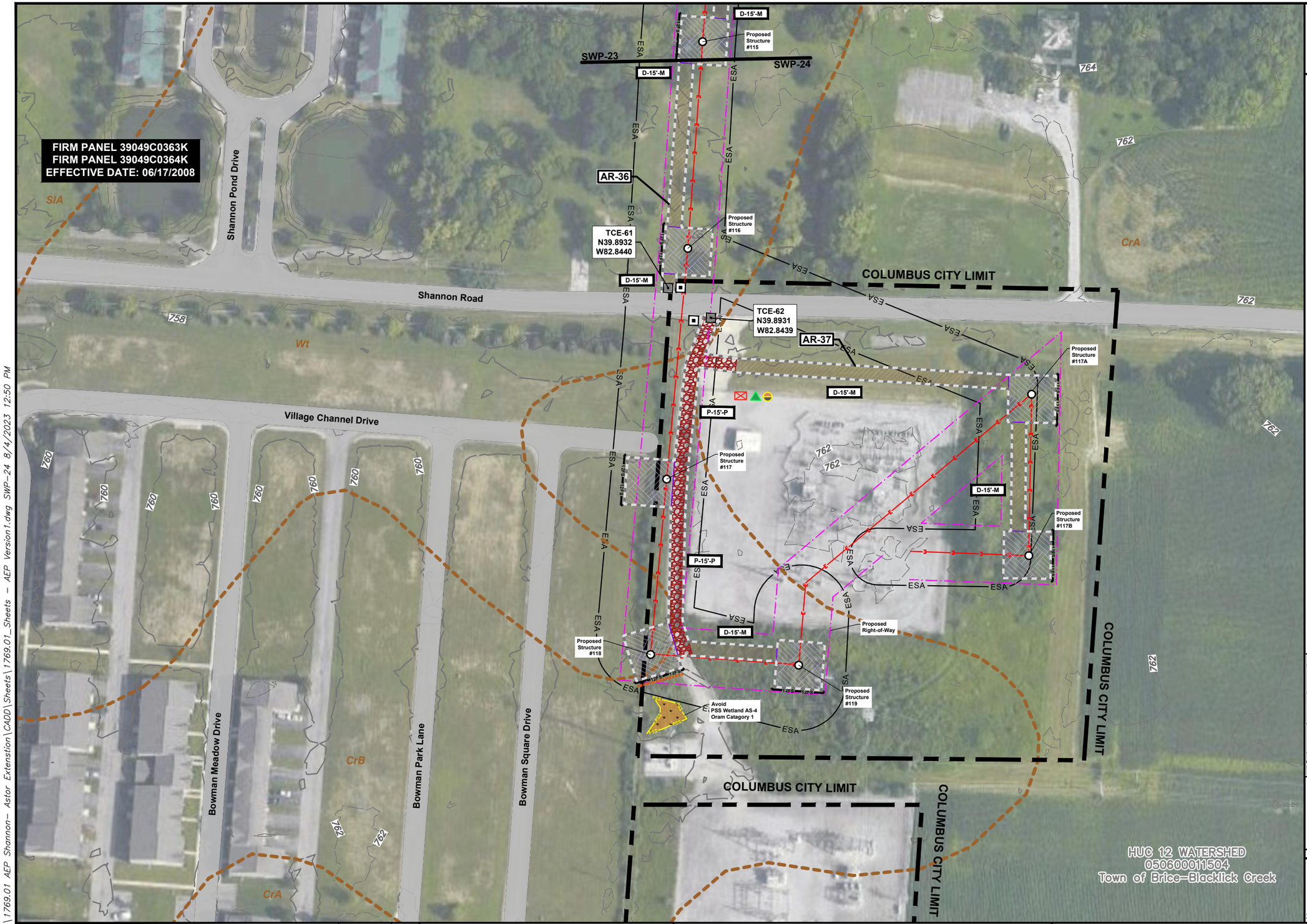

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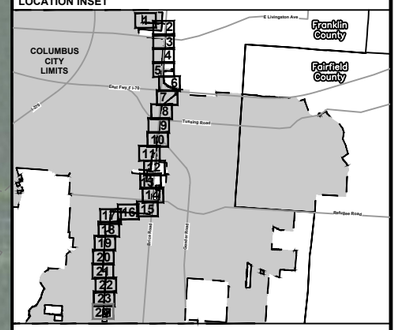

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SCALE: SCALE IN FEET

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STATE OF OHIO — SHAUN W KLINE — E-84364 — REGISTERED PROFESSIONAL ENGINEER

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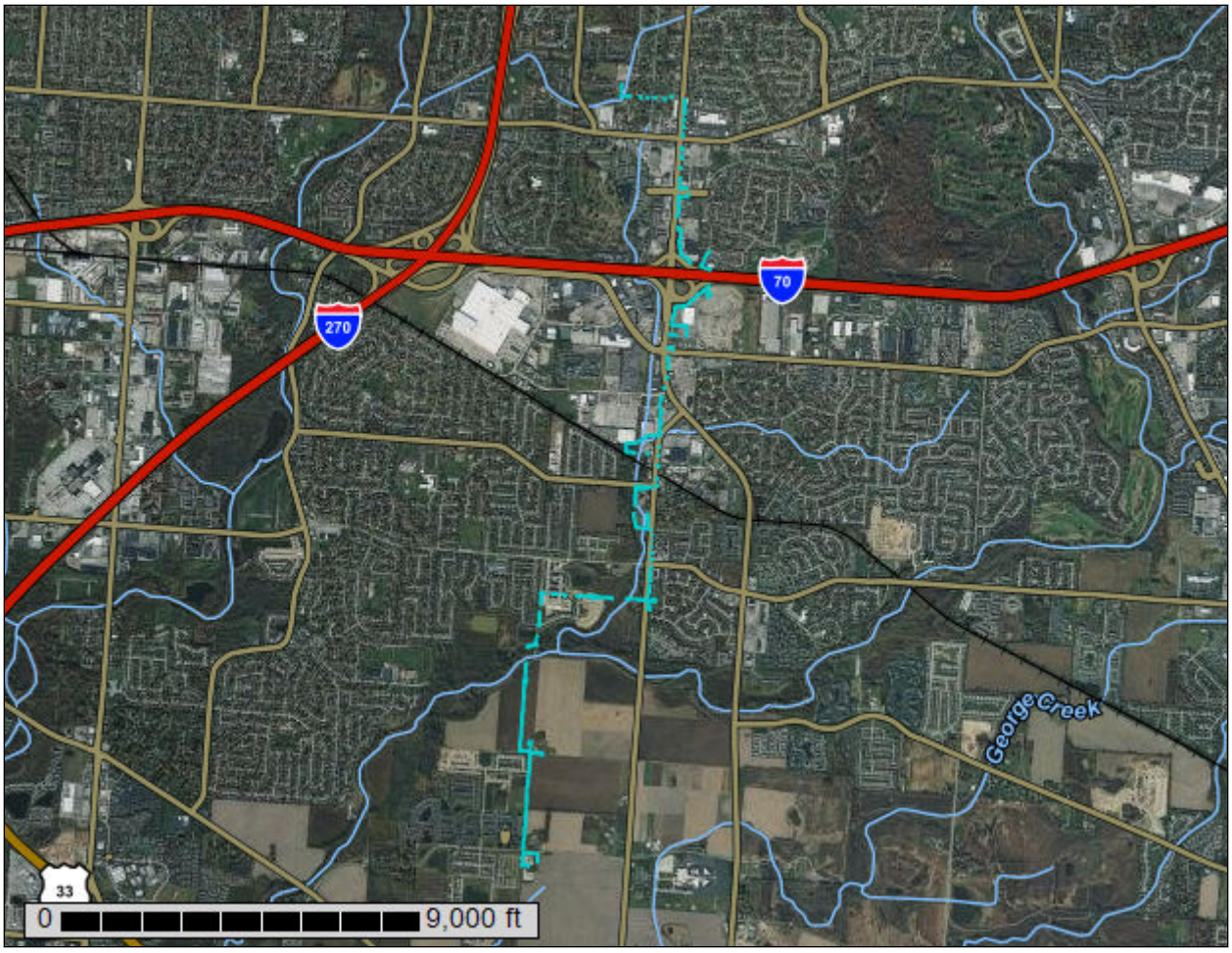
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Franklin County, Ohio



December 15, 2022

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

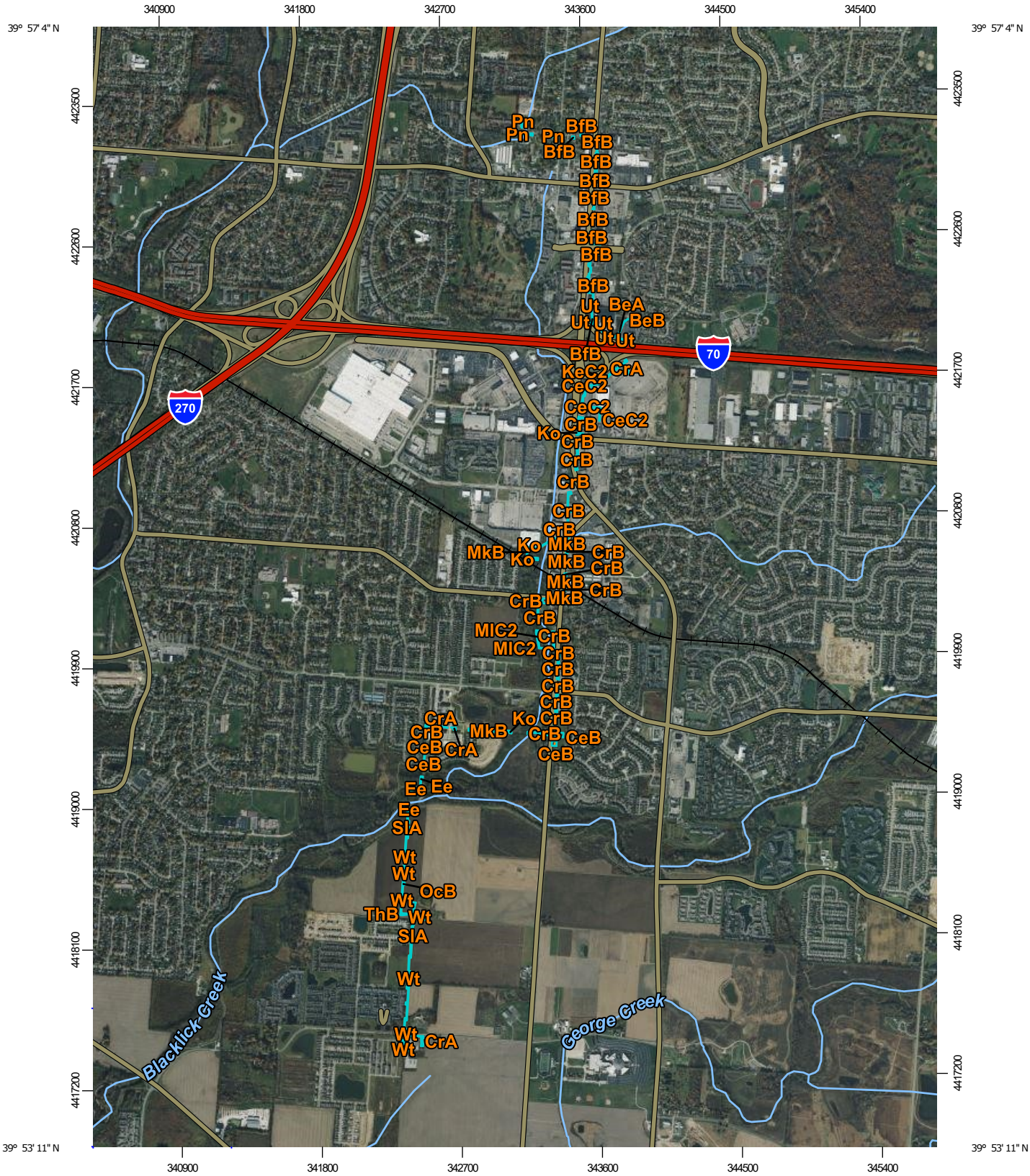
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:34,900 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0, 500, 1000, 2000, 3000

Feet: 0, 1500, 3000, 6000, 9000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Franklin County, Ohio
Survey Area Data: Version 21, Sep 8, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 8, 2020—Nov 7, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BeA	Bennington silt loam, 0 to 2 percent slopes	0.3	2.0%
BeB	Bennington silt loam, 2 to 6 percent slopes	0.2	1.6%
BfB	Bennington-Urban land complex, 0 to 6 percent slopes	1.6	11.4%
CeB	Celina silt loam, 2 to 6 percent slopes	0.3	2.0%
CeC2	Celina silt loam, 6 to 12 percent slopes, eroded	0.3	2.0%
CrA	Crosby silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes	1.0	7.5%
CrB	Crosby silt loam, Southern Ohio Till Plain, 2 to 6 percent slopes	3.9	28.1%
Ee	Eel silt loam, 0 to 2 percent slopes, occasionally flooded	0.3	2.1%
Gn	Genesee silt loam, 0 to 2 percent slopes, occasionally flooded	0.0	0.3%
KeC2	Kendallville silt loam, 6 to 12 percent slopes, eroded	0.3	2.4%
Ko	Kokomo silty clay loam, 0 to 2 percent slopes	1.3	9.0%
MkB	Miamian silt loam, 2 to 6 percent slopes	0.6	4.4%
MlC2	Miamian silty clay loam, 6 to 12 percent slopes, eroded	0.0	0.1%
OcB	Ockley silt loam, Southern Ohio Till Plain, 2 to 6 percent slopes	0.1	0.6%
Pn	Pewamo low carbonate till-Urban land complex, 0 to 2 percent slopes	0.4	2.7%
SlA	Sleeth silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes	0.9	6.6%
ThB	Thackery silt loam, 2 to 6 percent slopes	0.1	0.7%
Ut	Udorthents-Urban land complex, gently rolling	0.2	1.2%
Wt	Westland silty clay loam, Southern Ohio Till Plain, 0 to 2 percent slopes	2.1	15.2%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Totals for Area of Interest		**13.9**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Franklin County, Ohio

BeA—Bennington silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2t6m9
Elevation: 800 to 1,000 feet
Mean annual precipitation: 34 to 42 inches
Mean annual air temperature: 48 to 54 degrees F
Frost-free period: 145 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Bennington and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bennington

Setting

Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope, backslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, concave
Across-slope shape: Linear
Parent material: Wisconsin loamy till derived from sandstone and shale

Typical profile

Ap - 0 to 10 inches: silt loam
Bt - 10 to 29 inches: silty clay loam
BCt - 29 to 42 inches: silty clay loam
C - 42 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 22 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XE502OH - Wet Till Ridge
Hydric soil rating: No

Minor Components

Cardington

Percent of map unit: 7 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Ecological site: F111XE503OH - Till Ridge
Hydric soil rating: No

Condit

Percent of map unit: 5 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear, concave
Across-slope shape: Concave
Ecological site: F111XE501OH - Till Depression
Hydric soil rating: Yes

Pewamo, low carbonate till

Percent of map unit: 3 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear, concave
Across-slope shape: Concave
Hydric soil rating: Yes

BeB—Bennington silt loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2t6mb
Elevation: 800 to 1,120 feet
Mean annual precipitation: 34 to 42 inches
Mean annual air temperature: 48 to 54 degrees F
Frost-free period: 145 to 175 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Bennington and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bennington

Setting

Landform: End moraines, ground moraines

Landform position (two-dimensional): Footslope, backslope, summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Concave, linear
Across-slope shape: Linear
Parent material: Wisconsin loamy till derived from sandstone and shale

Typical profile

Ap - 0 to 9 inches: silt loam
Bt - 9 to 29 inches: silty clay loam
BCt - 29 to 40 inches: silty clay loam
C - 40 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 22 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F111XE502OH - Wet Till Ridge
Hydric soil rating: No

Minor Components

Cardington

Percent of map unit: 9 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Ecological site: F111XE503OH - Till Ridge
Hydric soil rating: No

Pewamo, low carbonate till

Percent of map unit: 3 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear, concave
Across-slope shape: Concave
Hydric soil rating: Yes

Condit

Percent of map unit: 3 percent
Landform: Depressions, drainageways

Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F111XE501OH - Till Depression
Hydric soil rating: Yes

BfB—Bennington-Urban land complex, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2t6ml
Elevation: 800 to 1,120 feet
Mean annual precipitation: 34 to 42 inches
Mean annual air temperature: 48 to 54 degrees F
Frost-free period: 145 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Bennington and similar soils: 50 percent
Urban land: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bennington

Setting

Landform: End moraines, ground moraines
Landform position (two-dimensional): Footslope, backslope, summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Concave, linear
Across-slope shape: Linear
Parent material: Wisconsin loamy till derived from sandstone and shale

Typical profile

A - 0 to 9 inches: silt loam
Bt - 9 to 29 inches: silty clay loam
BCt - 29 to 40 inches: silty clay loam
C - 40 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 22 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.0 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F111XE502OH - Wet Till Ridge
Hydric soil rating: No

Description of Urban Land

Setting
Landform: Till plains

Minor Components

Aeric epiaquents, till substratum
Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Typic endoaquents, till substratum
Percent of map unit: 6 percent
Landform: Moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

CeB—Celina silt loam, 2 to 6 percent slopes

Map Unit Setting
National map unit symbol: 2rwj9
Elevation: 820 to 1,180 feet
Mean annual precipitation: 37 to 46 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 145 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Celina and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Celina

Setting

Landform: Till plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loess derived from quartzite over loamy till derived from limestone and dolomite

Typical profile

Ap - 0 to 9 inches: silt loam
2Bt - 9 to 38 inches: clay loam
2Cd - 38 to 79 inches: loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 24 to 40 inches to densic material
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.01 to 0.06 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F111XA009IN - Till Ridge
Hydric soil rating: No

Minor Components

Brookston

Percent of map unit: 5 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XA007IN - Till Depression Flatwood
Hydric soil rating: Yes

Kokomo

Percent of map unit: 5 percent
Landform: Depressions on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave

Ecological site: F111XA007IN - Till Depression Flatwood
Hydric soil rating: Yes

Crosby

Percent of map unit: 5 percent
Landform: Till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XA008IN - Wet Till Ridge
Hydric soil rating: No

CeC2—Celina silt loam, 6 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 5mpp
Elevation: 860 to 1,100 feet
Mean annual precipitation: 33 to 45 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 151 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Celina and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Celina

Setting

Landform: Till plains, moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 25 inches: silty clay loam
H3 - 25 to 70 inches: loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 18 to 36 inches

Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XA009IN - Till Ridge
Forage suitability group: Unnamed (G111AYA-6OH)
Other vegetative classification: Unnamed (G111AYA-6OH)
Hydric soil rating: No

Minor Components

Crosby

Percent of map unit: 10 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XA008IN - Wet Till Ridge

Kokomo

Percent of map unit: 5 percent
Landform: Drainageways
Ecological site: F111XA007IN - Till Depression Flatwood
Hydric soil rating: Yes

Lewisburg

Percent of map unit: 5 percent
Landform: Till plains
Ecological site: F111XA009IN - Till Ridge

CrA—Crosby silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2thy7
Elevation: 520 to 1,550 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 48 to 54 degrees F
Frost-free period: 145 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Crosby and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Crosby

Setting

Landform: Recessionial moraines, ground moraines, water-lain moraines
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Interfluve, rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Silty material or loess over loamy till

Typical profile

Ap - 0 to 8 inches: silt loam
BE - 8 to 11 inches: silt loam
Bt1 - 11 to 14 inches: silt loam
2Bt2 - 14 to 28 inches: silty clay loam
2BCt - 28 to 36 inches: loam
2Cd - 36 to 79 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 24 to 40 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 50 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XA008IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Kokomo, drained

Percent of map unit: 5 percent
Landform: Swales, water-lain moraines, depressions
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XA007IN - Till Depression Flatwood
Hydric soil rating: Yes

Celina, eroded

Percent of map unit: 4 percent
Landform: Recessionial moraines, ground moraines, water-lain moraines
Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Side slope, head slope, nose slope, crest, rise
Down-slope shape: Linear, convex
Across-slope shape: Convex, linear
Ecological site: F111XA009IN - Till Ridge
Hydric soil rating: No

Miamian, eroded

Percent of map unit: 1 percent
Landform: Recessionial moraines, ground moraines, water-lain moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest, nose slope, head slope, side slope, rise
Down-slope shape: Linear, convex
Across-slope shape: Convex, linear
Ecological site: F111XA009IN - Till Ridge
Hydric soil rating: No

CrB—Crosby silt loam, Southern Ohio Till Plain, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2thy8
Elevation: 520 to 1,550 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 48 to 54 degrees F
Frost-free period: 145 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Crosby and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Crosby

Setting

Landform: Recessionial moraines, ground moraines, water-lain moraines
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Interfluve, rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Silty material or loess over loamy till

Typical profile

Ap - 0 to 8 inches: silt loam
BE - 8 to 11 inches: silt loam
Bt1 - 11 to 14 inches: silt loam
2Bt2 - 14 to 28 inches: silty clay loam
2BCt - 28 to 36 inches: loam
2Cd - 36 to 79 inches: loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 24 to 40 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 50 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F111XA008IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Kokomo, drained

Percent of map unit: 5 percent
Landform: Swales, water-lain moraines, depressions
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XA007IN - Till Depression Flatwood
Hydric soil rating: Yes

Celina, eroded

Percent of map unit: 3 percent
Landform: Recessionial moraines, ground moraines, water-lain moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest, nose slope, head slope, side slope, rise
Down-slope shape: Linear, convex
Across-slope shape: Convex, linear
Ecological site: F111XA009IN - Till Ridge
Hydric soil rating: No

Lewisburg

Percent of map unit: 1 percent
Landform: Recessionial moraines, ground moraines, water-lain moraines
Landform position (two-dimensional): Footslope, backslope, summit
Landform position (three-dimensional): Interfluve, rise
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F111XA009IN - Till Ridge
Hydric soil rating: No

Miamian, eroded

Percent of map unit: 1 percent

Landform: Recessionial moraines, ground moraines, water-lain moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest, nose slope, head slope, side slope, rise
Down-slope shape: Linear, convex
Across-slope shape: Convex, linear
Ecological site: F111XA009IN - Till Ridge
Hydric soil rating: No

Ee—Eel silt loam, 0 to 2 percent slopes, occasionally flooded

Map Unit Setting

National map unit symbol: 2ygzp
Elevation: 440 to 1,280 feet
Mean annual precipitation: 37 to 46 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 145 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Eel, occasionally flooded, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Eel, Occasionally Flooded

Setting

Landform: Flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

Ap - 0 to 9 inches: silt loam
Bw1 - 9 to 15 inches: silt loam
Bw2 - 15 to 53 inches: silt loam
Cg - 53 to 72 inches: stratified sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 15 to 24 inches
Frequency of flooding: NoneOccasional
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: A/D
Ecological site: F111XB204IN - Dry Alluvium Forest, F111XA005IN - Dry Alluvium
Hydric soil rating: No

Minor Components

Genesee, occasionally flooded

Percent of map unit: 10 percent
Landform: Flood-plain steps, natural levees
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F111XA005IN - Dry Alluvium
Hydric soil rating: No

Shoals, occasionally flooded

Percent of map unit: 6 percent
Landform: Flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XA004IN - Wet Alluvium
Hydric soil rating: No

Sloan, occasionally ponded

Percent of map unit: 4 percent
Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XA004IN - Wet Alluvium
Hydric soil rating: Yes

Gn—Genesee silt loam, 0 to 2 percent slopes, occasionally flooded

Map Unit Setting

National map unit symbol: 2t68m
Elevation: 340 to 1,000 feet
Mean annual precipitation: 37 to 46 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 145 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Genesee and similar soils: 85 percent

Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Genesee

Setting

Landform: Natural levees on flood-plain steps
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

Ap - 0 to 8 inches: silt loam
Bw - 8 to 32 inches: loam
C - 32 to 79 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 30 to 33 inches
Frequency of flooding: NoneOccasional
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F111XA005IN - Dry Alluvium, F114XA204IN - Alluvium Forest
Hydric soil rating: No

Minor Components

Sloan

Percent of map unit: 6 percent
Landform: Meander scars on flood-plain steps, backswamps on flood-plain steps
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Riser, tread
Down-slope shape: Linear, concave
Across-slope shape: Linear
Ecological site: F111XA004IN - Wet Alluvium
Hydric soil rating: Yes

Eel

Percent of map unit: 3 percent
Landform: Flood-plain steps
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear

Across-slope shape: Linear
Ecological site: F111XA005IN - Dry Alluvium
Hydric soil rating: No

Shoals

Percent of map unit: 2 percent
Landform: Flood plains
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XA004IN - Wet Alluvium
Hydric soil rating: No

Stonelick

Percent of map unit: 2 percent
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XA005IN - Dry Alluvium
Other vegetative classification: Trees/Timber (Woody Vegetation)
Hydric soil rating: No

Ross

Percent of map unit: 2 percent
Landform: Flood-plain steps
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XA005IN - Dry Alluvium
Hydric soil rating: No

KeC2—Kendallville silt loam, 6 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 5mqd
Elevation: 700 to 1,210 feet
Mean annual precipitation: 30 to 45 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 151 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Kendallville and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kendallville

Setting

Landform: Eskers, kames, moraines, outwash terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Nose slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy outwash over loamy till

Typical profile

H1 - 0 to 14 inches: silt loam
H2 - 14 to 38 inches: clay loam
H3 - 38 to 70 inches: clay loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XA009IN - Till Ridge
Hydric soil rating: No

Minor Components

Crosby

Percent of map unit: 5 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XA008IN - Wet Till Ridge

Bennington

Percent of map unit: 5 percent
Landform: Rises on end moraines, rises on ground moraines, flats on end moraines, flats on ground moraines
Landform position (two-dimensional): Summit, shoulder
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XA008IN - Wet Till Ridge

Ko—Kokomo silty clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2rwj8
Elevation: 820 to 1,140 feet
Mean annual precipitation: 37 to 46 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 145 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Kokomo and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kokomo

Setting

Landform: Depressions on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loamy glaciofluvial deposits derived from sedimentary rock over loamy till derived from limestone and dolomite

Typical profile

Ap - 0 to 11 inches: silty clay loam
Btg - 11 to 41 inches: clay loam
Bt - 41 to 64 inches: clay loam
2C - 64 to 79 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D

Ecological site: F111XA007IN - Till Depression Flatwood
Hydric soil rating: Yes

Minor Components

Crosby
Percent of map unit: 5 percent
Landform: Till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XA008IN - Wet Till Ridge
Hydric soil rating: No

Celina
Percent of map unit: 5 percent
Landform: Till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: F111XA009IN - Till Ridge
Hydric soil rating: No

MkB—Miamian silt loam, 2 to 6 percent slopes

Map Unit Setting
National map unit symbol: 2rwj6
Elevation: 500 to 1,530 feet
Mean annual precipitation: 37 to 46 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 145 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Miamian and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Miamian

Setting
Landform: Till plains
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loess derived from quartzite over loamy till derived from limestone and dolomite

Typical profile

Ap - 0 to 10 inches: silt loam
Bt1 - 10 to 14 inches: silty clay loam
2Bt2 - 14 to 36 inches: clay
2Cd - 36 to 79 inches: loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 25 to 40 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XA009IN - Till Ridge
Hydric soil rating: No

Minor Components

Celina

Percent of map unit: 5 percent
Landform: Till plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XA009IN - Till Ridge
Hydric soil rating: No

Brookston

Percent of map unit: 5 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XA007IN - Till Depression Flatwood
Hydric soil rating: Yes

Crosby

Percent of map unit: 5 percent
Landform: Till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear

Ecological site: F111XA008IN - Wet Till Ridge
Hydric soil rating: No

MIC2—Miamian silty clay loam, 6 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 5mqm
Elevation: 700 to 1,530 feet
Mean annual precipitation: 35 to 45 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 151 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Miamian and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Miamian

Setting

Landform: Till plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Nose slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 9 inches: silty clay loam
H2 - 9 to 36 inches: clay loam
H3 - 36 to 70 inches: loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XA009IN - Till Ridge

Forage suitability group: Unnamed (G111BYA-1OH)
Other vegetative classification: Unnamed (G111BYA-1OH)
Hydric soil rating: No

Minor Components

Crosby
Percent of map unit: 5 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XA008IN - Wet Till Ridge

Kokomo
Percent of map unit: 5 percent
Landform: Drainageways
Ecological site: F111XA007IN - Till Depression Flatwood
Hydric soil rating: Yes

OcB—Ockley silt loam, Southern Ohio Till Plain, 2 to 6 percent slopes

Map Unit Setting
National map unit symbol: 2t4ln
Elevation: 400 to 1,300 feet
Mean annual precipitation: 37 to 46 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 155 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Ockley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ockley

Setting
Landform: Outwash terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess over loamy outwash over sandy and gravelly outwash

Typical profile
Ap - 0 to 10 inches: silt loam
2Bt1 - 10 to 41 inches: clay loam
2Bt2 - 41 to 66 inches: gravelly clay loam
3C - 66 to 79 inches: gravelly loamy coarse sand

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 40 to 70 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 50 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F111XA015IN - Dry Outwash Upland, F111XD018IN - Dry Outwash Upland
Hydric soil rating: No

Minor Components

Eldean

Percent of map unit: 5 percent
Landform: Outwash terraces
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XA015IN - Dry Outwash Upland
Hydric soil rating: No

Fox

Percent of map unit: 5 percent
Landform: Outwash plains, terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F111XA015IN - Dry Outwash Upland
Hydric soil rating: No

Sleeth

Percent of map unit: 5 percent
Landform: Stream terraces, outwash terraces
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XA014IN - Outwash Upland
Hydric soil rating: No

Pn—Pewamo low carbonate till-Urban land complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2t6m7
Elevation: 800 to 1,000 feet
Mean annual precipitation: 34 to 42 inches
Mean annual air temperature: 48 to 54 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Pewamo, low carbonate till, and similar soils: 50 percent
Urban land: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pewamo, Low Carbonate Till

Setting

Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear, concave
Across-slope shape: Concave
Parent material: Till derived from limestone, sandstone, and shale

Typical profile

Ap - 0 to 12 inches: silty clay loam
Btg1 - 12 to 34 inches: silty clay loam
Btg2 - 34 to 47 inches: silty clay loam
BCg - 47 to 57 inches: silty clay loam
Cg - 57 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 22 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XE501OH - Till Depression
Hydric soil rating: Yes

Description of Urban Land

Setting
Landform: Till plains

Minor Components

Typic endoaquents, till substratum
Percent of map unit: 9 percent
Hydric soil rating: Yes

Bennington
Percent of map unit: 6 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Footslope, backslope, summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F111XE502OH - Wet Till Ridge
Hydric soil rating: No

SlA—Sleeth silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: 2w3qp
Elevation: 500 to 1,280 feet
Mean annual precipitation: 37 to 46 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 145 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition
Sleeth and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sleeth

Setting
Landform: Stream terraces, outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Other silty material/ loess over loamy outwash over stratified sandy and gravelly outwash

Typical profile

Ap - 0 to 9 inches: silt loam
E - 9 to 14 inches: silt loam
2Bt1 - 14 to 38 inches: clay loam
2Btg2 - 38 to 50 inches: gravelly clay loam
3Cg - 50 to 60 inches: stratified gravelly coarse sand to gravelly sand to sand to gravelly loamy coarse sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 38 to 60 inches to strongly contrasting textural stratification
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XA014IN - Outwash Upland
Hydric soil rating: No

Minor Components

Westland

Percent of map unit: 5 percent
Landform: Depressions on outwash terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: R111XA016IN - Outwash Mollisol
Hydric soil rating: Yes

Thackery

Percent of map unit: 5 percent
Landform: Outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XA014IN - Outwash Upland
Hydric soil rating: No

Ockley

Percent of map unit: 5 percent
Landform: Outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Ecological site: F111XA015IN - Dry Outwash Upland
Hydric soil rating: No

ThB—Thackery silt loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 5mrd
Elevation: 600 to 1,200 feet
Mean annual precipitation: 32 to 45 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 150 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Thackery and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Thackery

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-loamy outwash over fine-loamy outwash

Typical profile

H1 - 0 to 10 inches: silt loam
H2 - 10 to 21 inches: loam
H3 - 21 to 49 inches: clay loam
H4 - 49 to 54 inches: gravelly sandy loam
H5 - 54 to 70 inches: gravelly sand

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C

Ecological site: F111XA014IN - Outwash Upland
Hydric soil rating: No

Minor Components

Sleeth
Percent of map unit: 5 percent
Landform: Outwash plains, stream terraces, outwash terraces
Ecological site: F111XA014IN - Outwash Upland

Westland
Percent of map unit: 5 percent
Landform: Drainageways
Ecological site: R111XA016IN - Outwash Mollisol
Hydric soil rating: Yes

Ut—Udorthents-Urban land complex, gently rolling

Map Unit Setting
National map unit symbol: 5mrj
Elevation: 670 to 950 feet
Mean annual precipitation: 35 to 45 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 160 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition
Udorthents and similar soils: 50 percent
Urban land: 40 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Properties and qualities
Slope: 2 to 12 percent
Depth to restrictive feature: More than 80 inches
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Minor Components

Slopes of 12 to 55 percent
Percent of map unit: 5 percent

Areas similar to adjacent soils
Percent of map unit: 5 percent

Wt—Westland silty clay loam, Southern Ohio Till Plain, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2t4m2
Elevation: 400 to 1,030 feet
Mean annual precipitation: 37 to 46 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 155 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Westland and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Westland

Setting

Landform: Depressions on stream terraces, swales on stream terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Loess over loamy outwash over sandy and gravelly outwash

Typical profile

Ap - 0 to 10 inches: silty clay loam
Bt1 - 10 to 21 inches: silty clay loam
2Bt2 - 21 to 37 inches: clay loam
2BCg - 37 to 47 inches: loam
3C - 47 to 79 inches: stratified coarse sand to extremely gravelly coarse sand to gravelly loamy coarse sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 40 to 60 inches to strongly contrasting textural stratification
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: R111XA016IN - Outwash Mollisol
Hydric soil rating: Yes

Minor Components

Algiers

Percent of map unit: 5 percent
Landform: Terraces, flood plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Talf, dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XA004IN - Wet Alluvium
Hydric soil rating: No

Sleeth

Percent of map unit: 5 percent
Landform: Stream terraces, outwash terraces
Landform position (two-dimensional): Shoulder, backslope, footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XA014IN - Outwash Upland
Hydric soil rating: No

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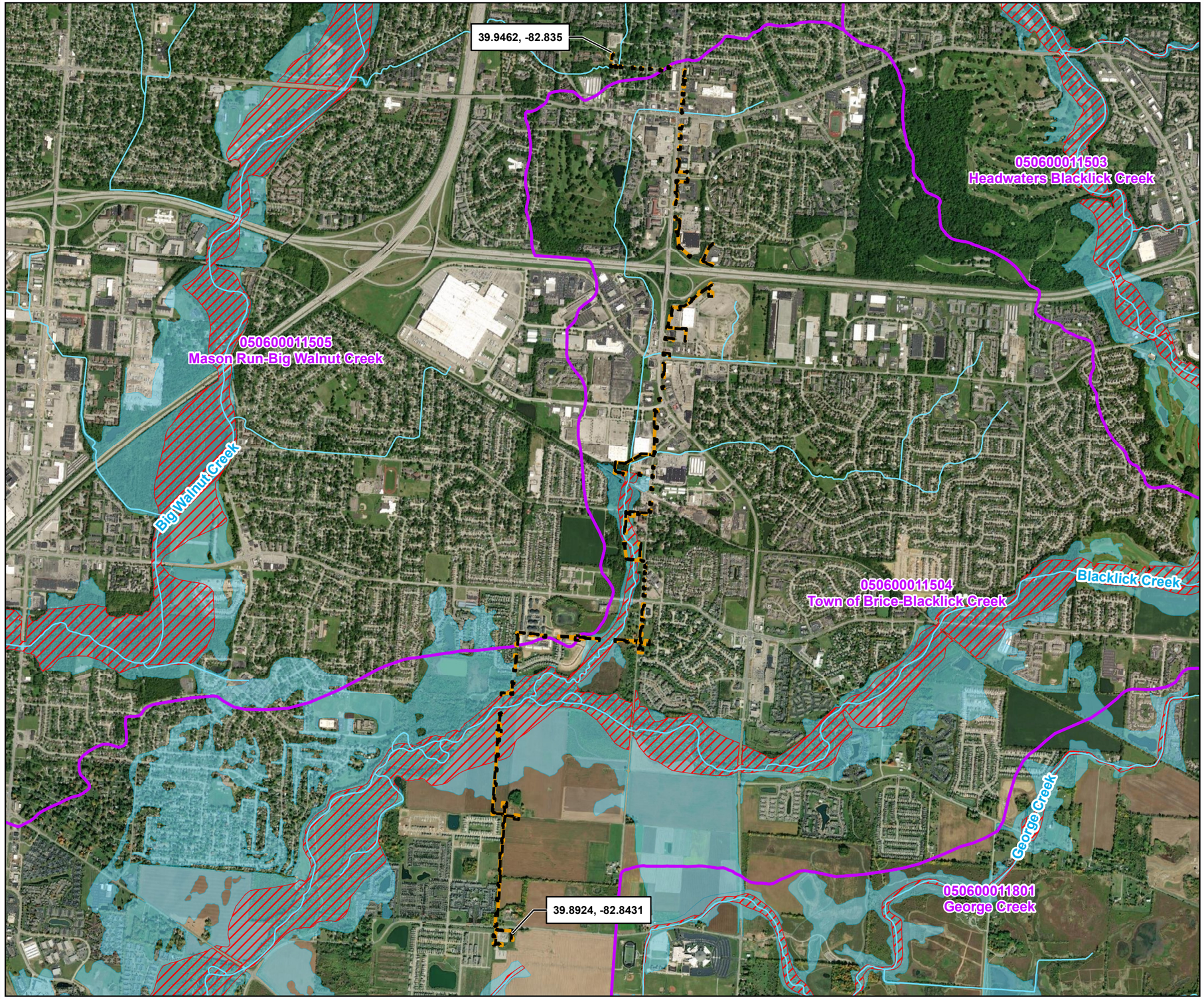
Watershed (HUC12) Map for AEP's Astor-Shannon 138kV Transmission Line Project in Franklin County, Ohio



- Limits of Disturbance (LOD)
- National Hydrography Dataset (NHD) Stream
- HUC 12 Watershed Boundary

FEMA Flood Zone

- AE
- Floodway

N
W E
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Project No. 1769.01

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APPENDIX 2

ODNR Rainwater and Land Development Manual Details

BMP Detail Sheets

Temporary Seeding

Permanent Seeding

Mulching

Construction Entrance

Timbermat

Filter Sock

Dust Control

Erosion Control Blanket

Inlet Protection

Concrete Washout

TEMPORARY SEEDING

DESCRIPTION

TEMPORARY SEEDINGS ESTABLISH TEMPORARY COVER ON DISTURBED AREAS BY PLANTING APPROPRIATE RAPIDLY GROWING ANNUAL GRASSES OR SMALL GRAINS. TEMPORARY SEEDING PROVIDES EROSION CONTROL ON AREAS IN BETWEEN CONSTRUCTION OPERATIONS. GRASSES, WHICH ARE QUICK GROWING, ARE SEEDED AND USUALLY MULCHED TO PROVIDE PROMPT, TEMPORARY SOIL STABILIZATION. IT EFFECTIVELY MINIMIZES THE AREA OF A CONSTRUCTION SITE PRONE TO EROSION AND SHOULD BE USED EVERYWHERE THE SEQUENCE OF CONSTRUCTION OPERATIONS ALLOWS VEGETATION TO BE ESTABLISHED.

SPECIFICATIONS FOR TEMPORARY SEEDING

SEE THE TEMPORARY AND PERMANENT AEP SEED MIX TABLES AFTER THE PERMANENT SEEDING DETAIL SHEETS FOR TEMPORARY SEED SPECIES AND APPLICATION RATES.

1. STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES SUCH AS DIVERSIONS AND SEDIMENT TRAPS SHALL BE INSTALLED AND STABILIZED WITH TEMPORARY SEEDING PRIOR TO GRADING THE REST OF THE CONSTRUCTION SITE.
2. TEMPORARY SEED SHALL BE APPLIED BETWEEN CONSTRUCTION OPERATIONS ON SOIL THAT WILL NOT BE GRADED OR REWORKED FOR 14 DAYS OR GREATER. THESE IDLE AREAS SHALL BE SEEDED WITHIN 7 DAYS AFTER GRADING.
3. THE SEEDBED SHOULD BE PULVERIZED AND LOOSE TO ENSURE THE SUCCESS OF ESTABLISHING VEGETATION. TEMPORARY SEEDING SHOULD NOT BE POSTPONED IF IDEAL SEEDBED PREPARATION IS NOT POSSIBLE.
4. SOIL AMENDMENTS TEMPORARY VEGETATION SEEDING RATES SHALL ESTABLISH ADEQUATE STANDS OF VEGETATION, WHICH MAY REQUIRE THE USE OF SOIL AMENDMENTS. BASE RATES FOR LIME AND FERTILIZER SHALL BE USED.
5. SEEDING METHOD SEED SHALL BE APPLIED UNIFORMLY WITH A CYCLONE SPREADER, DRILL, CULTIPACKER SEEDER, OR HYDROSEEDER. WHEN FEASIBLE, SEED THAT HAS BEEN BROADCAST SHALL BE COVERED BY RAKING OR DRAGGING AND THEN LIGHTLY TAMPED INTO PLACE USING A ROLLER OR CULTIPACKER. IF HYDROSEEDING IS USED, THE SEED AND FERTILIZER WILL BE MIXED ON-SITE AND THE SEEDING SHALL BE DONE IMMEDIATELY AND WITHOUT INTERRUPTION.

MULCHING TEMPORARY SEEDING:

1. APPLICATIONS OF TEMPORARY SEEDING SHALL INCLUDE MULCH, WHICH SHALL BE APPLIED DURING OR IMMEDIATELY AFTER SEEDING. SEEDINGS MADE DURING OPTIMUM SEEDING DATES ON FAVORABLE, VERY FLAT SOIL CONDITIONS MAY NOT NEED MULCH TO ACHIEVE ADEQUATE STABILIZATION.
2. MATERIALS:
   - 2.1. STRAW IF STRAW IS USED, IT SHALL BE UNROTTED SMALL-GRAIN STRAW APPLIED AT A RATE OF 2 TONS PER ACRE OR 90 LBS./1,000 SQ. FT. (2-3 BALES)
   - 2.2. HYDROSEEDERS IF WOOD CELLULOSE FIBER IS USED, IT SHALL BE USED AT 2000 LBS./AC. OR 46 LB./1,000-SQ.-FT.
   - 2.3. OTHER OTHER ACCEPTABLE MULCHES INCLUDE MULCH MATTINGS APPLIED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS OR WOOD CHIPS APPLIED AT 6 TON/AC.

3. STRAW MULCH SHALL BE ANCHORED IMMEDIATELY TO MINIMIZE LOSS BY WIND OR WATER. ANCHORING METHODS:
   - 3.1. MECHANICAL A DISK, CRIMPER, OR SIMILAR TYPE TOOL SHALL BE SET STRAIGHT TO PUNCH OR ANCHOR THE MULCH MATERIAL INTO THE SOIL. STRAW MECHANICALLY ANCHORED SHALL NOT BE FINELY CHOPPED BUT LEFT TO A LENGTH OF APPROXIMATELY 6 INCHES.
   - 3.2. MULCH NETTING NETTING SHALL BE USED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS. NETTING MAY BE NECESSARY TO HOLD MULCH IN PLACE IN AREAS OF CONCENTRATED RUNOFF AND ON CRITICAL SLOPES.
   - 3.3. SYNTHETIC BINDERS SYNTHETIC BINDERS SUCH AS ACRYLIC DLR (AGRI-TAC), DCA-70, PETROSET, TERRA TRACK OR EQUIVALENT MAY BE USED AT RATES RECOMMENDED BY THE MANUFACTURER.
   - 3.4. WOOD-CELLULOSE FIBER WOOD-CELLULOSE FIBER BINDER SHALL BE APPLIED AT A NET DRY WT. OF 750 LB./AC. THE WOOD-CELLULOSE FIBER SHALL BE MIXED WITH WATER AND THE MIXTURE SHALL CONTAIN A MAXIMUM OF 50 LB./100 GAL.

7.10 Permanent Seeding

Description

Perennial vegetation is established on areas that will not be re-disturbed for periods longer than 12 months. Permanent seeding includes site preparation, seedbed preparation, planting seed, mulching, irrigation and maintenance.

Permanent vegetation is used to stabilize soil, reduce erosion, prevent sediment pollution, reduce runoff by promoting infiltration, and provide stormwater quality benefits offered by dense grass cover.

Conditions Where Practice Applies

Permanent seeding should be applied to:

- Any disturbed areas or portions of construction sites at final grade. Permanent seeding should not be delayed on any one portion of the site at final grade while construction on another portion of the site is being completed. Permanent seeding shall be completed in phases, if necessary.
- Areas subject to grading activities but will remain dormant for a year or more.

Planning Considerations

Vegetation controls erosion by reducing the velocity and the volume of overland flow and protects bare soil surface from raindrop impact. A healthy, dense turf promotes infiltration and reduces the amount of runoff. The establishment of quality vegetation requires selection of the right plant materials for the site, adequate soil amendments, careful seedbed preparation, and maintenance.

Soil Compaction— Storm water quality and the amount of runoff both vary significantly with soil compaction. Non-compacted soils improve stormwater infiltration by promoting:

- dense vegetative growth;
- high soil infiltration & lower runoff rates;
- pollutant filtration, deposition & absorption; and
- beneficial biologic activity in the soil.

Construction activity creates highly compacted soils that restrict water infiltration and root growth. The best time for improving soil condition is during the establishment of permanent vegetation. It is highly recommended that subsoilers, plows, or other implements are specified as part of final seedbed preparation. Use discretion in slip-prone areas.

Minimum Soil Conditions— Vegetation cannot be expected to stabilize soil that is unstable due to its texture, structure, water movement or excessively steep slope. The following minimum soil conditions are needed for the establishment and maintenance of a long-lived vegetative cover. If these conditions cannot be met, see the standards and specifications for Topsoiling.

- Soils must include enough fine-grained material to hold at least a moderate amount of available moisture.
- The soil must be free from material that is toxic or otherwise harmful to plant growth.

Design Criteria

See specifications for permanent seeding below.

Maintenance

1. Expect emergence within 4 to 28 days after seeding, with legumes typically following grasses. Check permanent seedlings within 4 to 6 weeks after planting. Look for:
   - Vigorous seedlings;
   - Uniform ground surface coverage with at least 30% growth density;
   - Uniformity with legumes and grasses well intermixed;
   - Green, not yellow, leaves. Perennials should remain green throughout the summer, at least at the plant bases.

2. Permanent seeding shall not be considered established for at least 1 full year from the time of planting. Inspect the seeding for soil erosion or plant loss during this first year. Repair bare and sparse areas. Fill gullies. Re-fertilize, re-seed, and re-mulch if required. Consider no-till planting. A minimum of 70% growth density, based on a visual inspection, must exist for an adequate permanent vegetative planting.

- If stand is inadequate or plant cover is patchy, identify the cause of failure and take corrective action: choice of plant materials, lime and fertilizer quantities, poor seedbed preparation, or weather. If vegetation fails to grow, have the soil tested to determine whether pH is in the correct range or nutrient deficiency is a problem.
- Depending on stand conditions, repair with complete seedbed preparation, then over-seed or re-seed.
- If it is the wrong time of year to plant desired species, over-seed with small grain cover crop to thicken the stand until timing is right to plant perennials or use temporary seeding. See Temporary Seeding standard.

Modified
Specifications
for

Permanent Seeding

Site Preparation

1. Subsoiler, plow, or other implement shall be used to reduce soil compaction and allow maximum infiltration. (Maximizing infiltration will help control both runoff rate and water quality.) Subsoiling should be done when the soil moisture is low enough to allow the soil to crack or fracture. Subsoiling shall not be done on slip-prone areas where soil preparation should be limited to what is necessary for establishing vegetation.
2. The site shall be graded as needed to permit the use of conventional equipment for seedbed preparation and seeding.
3. Topsoil shall be applied where needed to establish vegetation.

Seedbed Preparation

1. Lime—Agricultural ground limestone shall be applied to acid soil as recommended by a soil test. In lieu of a soil test, lime shall be applied at the rate of 100 pounds per 1,000-sq. ft. or 2 tons per acre.
2. Fertilizer—Fertilizer shall be applied as recommended by a soil test. In place of a soil test, fertilizer shall be applied at a rate of 25 pounds per 1,000-sq. ft. or 1000 pounds per acre of a 10-10-10 or 12-12-12 analyses.
3. The lime and fertilizer shall be worked into the soil with a disk harrow, spring-tooth harrow, or other suitable field implement to a depth of 3 inches. On sloping land, the soil shall be worked on the contour.

Seeding Dates and Soil Conditions

Seeding should be done March 1 to May 31 or August 1 to September 30. If seeding occurs outside of the above-specified dates, additional mulch and irrigation may be required to ensure a minimum of 80% germination. Tillage for seedbed preparation should be done when the soil is dry enough to crumble and not form ribbons when compressed by hand. For winter seeding, see the following section on dormant seeding.

Dormant Seedings

1. Seedings should not be made from October 1 through November 20. During this period, the seeds are likely to germinate but probably will not be able to survive the winter.
2. The following methods may be used for “Dormant Seeding”:

- From October 1 through November 20, prepare the seedbed, add the required amounts of lime and fertilizer, then mulch and anchor. After November 20, and before March 15, broadcast the selected seed mixture. Increase the seeding rates by 50% for this type of seeding.
- From November 20 through March 15, when soil conditions permit, prepare the seedbed, lime and fertilize, apply the selected seed mixture, mulch and anchor. Increase the seeding rates by 50% for this type of seeding.
- Apply seed uniformly with a cyclone seeder, drill, cultipacker seeder, or hydro-seeder (slurry may include seed and fertilizer) on a firm, moist seedbed.
- Where feasible, except when a cultipacker type seeder is used, the seedbed should be firmed following seeding operations with a cultipacker, roller, or light drag. On sloping land, seeding operations should be on the contour where feasible.

Mulching

1. Mulch material shall be applied immediately after seeding. Dormant seeding shall be mulched. 100% of the ground surface shall be covered with an approved material.
2. Materials

- Straw—If straw is used it shall be unrotted small-grain straw applied at the rate of 2 tons per acre or 90 pounds (two to three bales) per 1,000-sq. ft. The mulch shall be spread uniformly by hand or mechanically applied so the soil surface is covered. For uniform distribution of hand-spread mulch, divide area into approximately 1,000-sq.-ft. sections and spread two 45-lb. bales of straw in each section.
- Hydroseeders—If wood cellulose fiber is used, it shall be applied at 2,000 lb./ac. or 46 lb./1,000 sq. ft.
- Other—Other acceptable mulches include rolled erosion control mattings or blankets applied according to manufacturer’s recommendations or wood chips applied at 6 tons per acre.

3. Straw and Mulch Anchoring Methods

Straw mulch shall be anchored immediately to minimize loss by wind or water.

- Mechanical—A disk, crimper, or similar type tool shall be set straight to punch or anchor the mulch material into the soil. Straw mechanically anchored shall not be finely chopped but, generally, be left longer than 6 inches.
- Mulch Netting—Netting shall be used according to the manufacturer's recommendations. Netting may be necessary to hold mulch in place in areas of concentrated runoff and on critical slopes.
- Asphalt Emulsion—Asphalt shall be applied as recommended by the manufacture or at the rate of 160 gallons per acre.
- Synthetic Binders—Synthetic binders such as Acrylic DLR (Agri-Tac), DCA-70, Petroset, Terra Tack or equivalent may be used at rates specified by the manufacturer.
- Wood Cellulose Fiber—Wood cellulose fiber shall be applied at a net dry weight of 750 pounds per acre. The wood cellulose fiber shall be mixed with water with the mixture containing a maximum of 50 pounds cellulose per 100 gallons of water.

Irrigation

Permanent seeding shall include irrigation to establish vegetation during dry weather or on adverse site conditions, which require adequate moisture for seed germination and plant growth.

Irrigation rates shall be monitored to prevent erosion and damage to seeded areas from excessive runoff.

TEMPORARY AND PERMANENT AEP SEED MIXES

Slope Stability & Natural Corridors Seed Mix

Temporary Matrix		
oz/ac	Grasses	
512	*Avena sativa*	Seed Oats
160	*Lolium multiflorum*	Annual Ryegrass
Permanent Matrix		
oz/acre	Grasses	
16	*Andropogon gerardii*	Big Bluestem
16	*Bouteloua curtipendula*	Side-Oats Grama
48	*Elymus canadensis*	Canada Wild Rye
48	*Elymus virginicus*	Virginia Wild Rye
32	*Schizachyrium scoparium*	Little Bluestem
16	*Sorghastrum nutans*	Indian Grass
oz/acre	Forbs	
1	*Monarda fistulosa*	Bergamot
2	*Coreopsis lanceolata*	Lanceleaf coreopis
4	*Rudbecka hirta*	Black-eyed Susan
2	*Solidago nemoralis*	Grey Goldenrod
2	*Solidago speciosa*	Showy Goldenrod

Lawn Mix – Sun to partial shade

lbs/acre	Grasses	
20	*Lolium multiflorum*	Annual Ryegrass
100	*Poa pratensis*	Kentucky Bluegrass
100	*Lolium perenne*	Perennial Ryegrass

Lawn Mix –Shade

lbs/acre	Grasses	
20	*Lolium multiflorum*	Annual Ryegrass
100	*Poa pratensis*	Kentucky Bluegrass
100	*Festuca rubra*	Creeping Red Fescue

Swale and Retention Area Seed Mix

Temporary Matrix		
oz/ac	Grasses	
512	*Avena sativa*	Seed Oats
160	*Lolium multiflorum*	Annual Ryegrass
Permanent Matrix		
oz/acre	Grasses	
8	*Carex frankii*	Frank's Sedge
2	*Eleocharis obtusa*	BluntSpike Rush
8	*Carex vulpinoidea*	Fox Sedge
32	*Panicum virgatum*	Switchgrass
2	*Scirpus acutus*	Hard Stem Rush
oz/acre	Forbs	
2	Asclepias incarnata	Swamp milkweed
2	Aster novae-angliae	New England Aster
2	Eupatorium perfoliatum	Boneset
1	Helenium autumnale	Autumn Sneezeweed
2	Monarda fistulosa	Bergamot
2	Ratibida pinnata	Yellow Coneflower
2	Rudbeckia subtomentosa	Sweet Black-Eyed Susan

Farm Lane Area Seed Mix

Temporary Matrix		
oz/ac	Grasses	
512	*Avena sativa*	Seed Oats
160	*Lolium multiflorum*	Annual Ryegrass
Permanent Matrix		
oz/acre		
64	*Trifolium pratense*	Red Clover
32	*Trifolium repens*	White Clover

7.9 Mulching

Description

A protective layer of mulch, usually of straw, applied to bare soil is used to abate erosion by shielding it from raindrop impact. Mulch also helps establish vegetation by conserving moisture and creating favorable conditions for seeds to germinate.

Conditions Where Practice Applies

Mulch should be used liberally throughout construction to limit the areas that are bare and susceptible to erosion. Mulch can be used in conjunction with seeding to establish vegetation or by itself to provide erosion control when the season does not allow grass to grow. Mulch and other vegetative practices must be applied on all disturbed portions of construction-sites that will not be re-disturbed for more than 21 days.

Design Criteria

See specifications for Mulching.

Maintenance

Additional mulching is necessary to cover exposed soil conditions when observed during routine maintenance inspections.

Common Problems / Concerns

The application of synthetic binders must be conducted in such a manner as to not be introduced into watercourses.

Weather considerations must be addressed to ensure the application of synthetic binders are not washed away and introduced into watercourses.

The use of a mulch cover is not recommended for areas, which will exhibit higher velocities than 3.5 feet/second. An erosion control matting is recommended for areas which will exhibit higher velocities.

Areas which have been mulched should be inspected and maintained if necessary every 7 days or within 24 hours of a rain event greater than or equal to 0.5 inches to ensure adequate protection.

Specifications
for

Mulching

1. Mulch and other appropriate vegetative practices shall be applied to disturbed areas within 7 days of grading if the area is to remain dormant (undisturbed) for more than 21 days or on areas and portions of the site which can be brought to final grade.
2. Mulch shall consist of one of the following:

- Straw - Straw shall be unrotted small grain straw applied at the rate of 2 tons/ac. or 90 lb./1,000 sq. ft. (two to three bales). The straw mulch shall be spread uniformly by hand or mechanically so the soil surface is covered. For uniform distribution of hand-spread mulch, divide area into approximately 1,000 sq.ft. sections and place two 45-lb. bales of straw in each section.
- Hydroseeders - Wood cellulose fiber should be used at 2,000 lb./ac. or 46 lb./1,000 sq. ft.
- Other - Acceptable mulches include mulch mattings and rolled erosion control products applied according to manufacturer's recommendations or wood mulch/chips applied at 10-20 tons/ac.

3. Mulch Anchoring - Mulch shall be anchored immediately to minimize loss by wind or runoff. The following are acceptable methods for anchoring mulch.

- Mechanical - Use a disk, crimper, or similar type tool set straight to punch or anchor the mulch material into the soil. Straw mechanically anchored shall not be finely chopped but be left generally longer than 6 inches.
- Mulch Nettings - Use according to the manufacturer's recommendations, following all placement and anchoring requirements. Use in areas of water concentration and steep slopes to hold mulch in place.
- Synthetic Binders - For straw mulch, synthetic binders such as Acrylic DLR (Agri-Tac), DCA-70, Petroset, Terra Tack or equal may be used at rates recommended by the manufacturer. All applications of Sythetic Binders must be conducted in such a manner where there is no contact with waters of the state.
- Wood Cellulose Fiber - Wood cellulose fiber may be used for anchoring straw. The fiber binder shall be applied at a net dry weight of 750 lb./acre. The wood cellulose fiber shall be mixed with water and the mixture shall contain a maximum of 50 lb./100 gal. of wood cellulose fiber.

7.4 Construction Entrance

Description

A construction entrance is a stabilized pad of stone underlain with a geotextile and is used to reduce the amount of mud tracked off-site with construction traffic. Located at points of ingress/egress, the practice is used to reduce the amount of mud tracked off-site with construction traffic.

Conditions Where Practice Applies

A construction entrance is applicable where:

- Construction traffic leaves active construction areas and enters public roadways or areas unchecked by effective sediment controls;
- Areas where frequent vehicle and equipment access is expected and likely to contribute sediment to runoff, such as at the entrance to individual building lots.

Planning Considerations

Construction entrances address areas that contribute significant amounts of mud to runoff by providing a stable area for traffic. Although they allow some mud to be removed from construction vehicle tires before they enter a public roads, they should not be the only practice relied upon to manage off-site tracking. Since most mud is flung from tires as they reach higher speeds, restricting traffic to stabilized construction roads, entrances and away from muddy areas is necessary.

If a construction entrance is not sufficient to remove the majority of mud from wheels or there is an especially sensitive traffic situation on adjacent roads, wheel wash areas may be necessary. This requires an extended width pad to avoid conflicts with traffic, a supply of wash water and sufficient drainage to assure runoff is captured in a sediment pond or trap.

Proper installation of a construction entrance requires a geotextile and proper drainage to insure construction site runoff does not leave the site. The use of geotextile under the stone helps to prevent potholes from developing and will save the amount of stone needed during the life of the practice. Proper drainage may include culverts to direct water under the roadway or water bars to direct muddy water off the roadway toward sediment traps or ponds.

Design Criteria

The area of the entrance must be cleared of all vegetation, roots, and other objectionable material. Geotextile will then be placed the full width and length of the entrance.

Stone shall be placed to a depth of at least 6 inches. Roads subject to heavy duty loads should be increased to a minimum of 10 inches. Surface water shall be conveyed under the entrance, through culverts, or diverted via a water bars or mountable berms (minimum 5:1 slopes) so as to convey sediment laden runoff to sediment control practices or to allow clean water to pass by the entrance.

The stabilized construction entrance shall meet the specifications that follow.

Maintenance

The entrance shall be maintained in a condition that will prevent tracking or flow of mud onto public rights-of-way. This may require periodic top dressing with additional stone or the washing and reworking of existing stone as conditions demand and repair and/or cleanout of any structures used to trap sediment. All materials spilled, dropped, washed, or tracked from vehicles onto roadways or into storm drains must be removed immediately. The use of water trucks to remove materials dropped, washed, or tracked onto roadways will not be permitted under any circumstances.

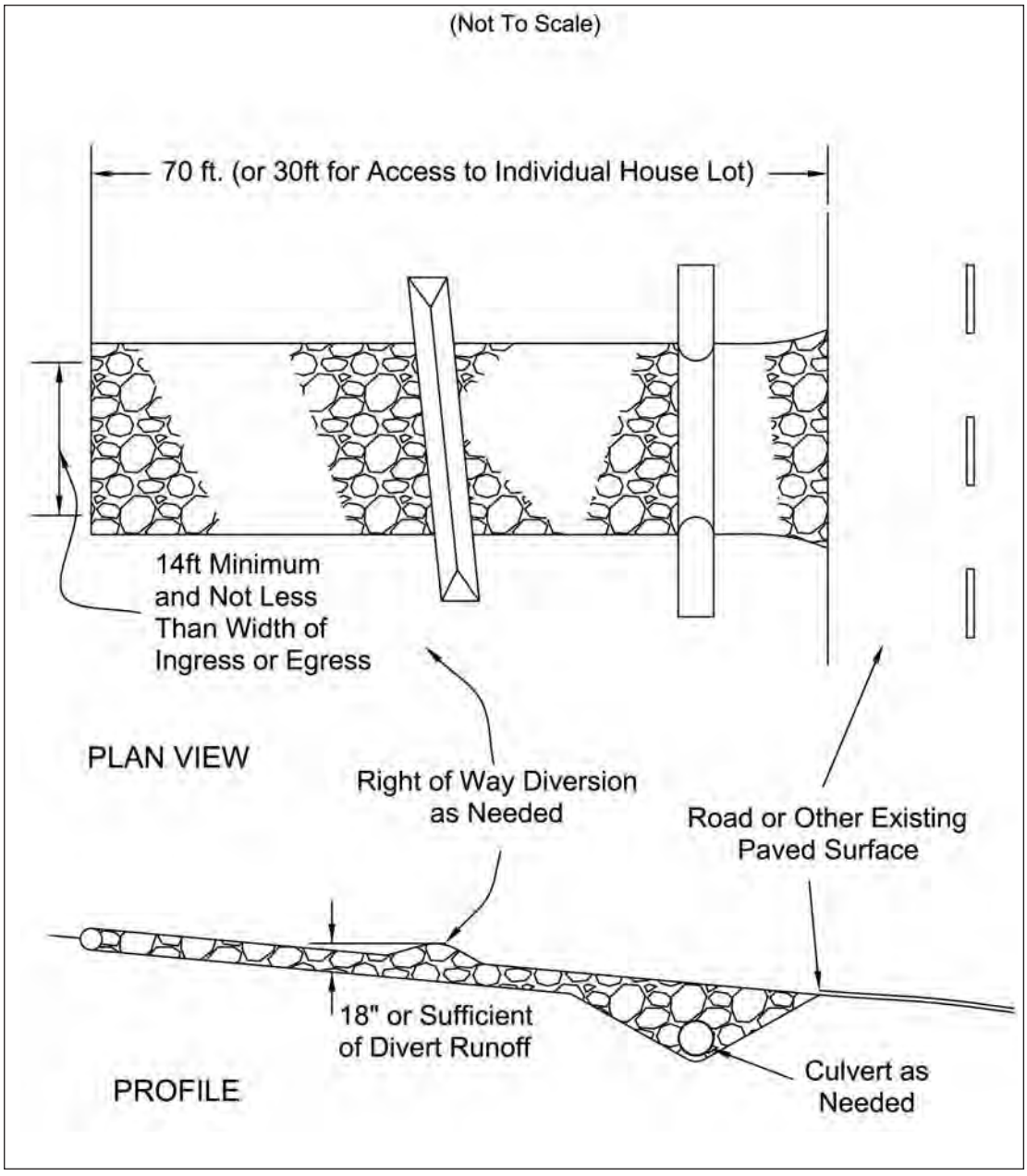
Common Problems / Concerns

Mud is allowed to accumulate and is tracked on to public right-of-ways. The entrance and associated construction roads may need dressing with additional stone.

Soft depression areas develop in entrance area. Stone may not have been underlain with geotextile or insufficient stone base has been provided.

Specifications
for

Construction Entrance



Specifications
for

Construction Entrance

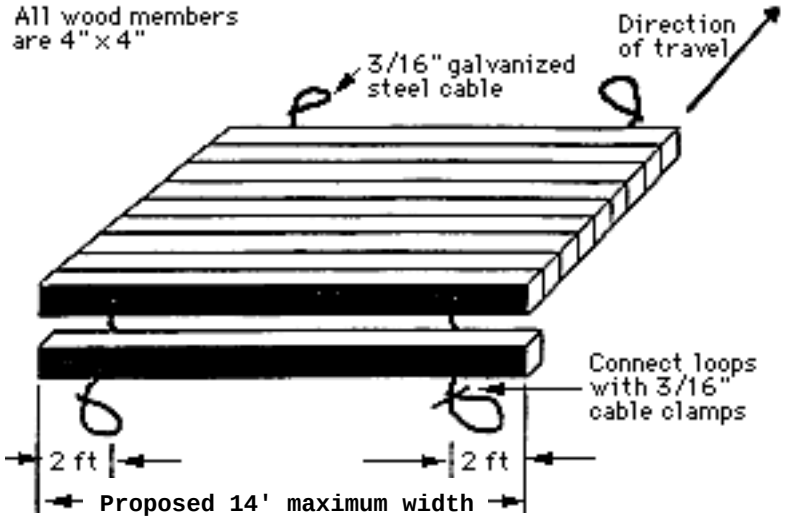
1. Stone Size—ODOT # 2 (1.5-2.5 inch) stone shall be used, or recycled concrete equivalent.
2. Length—The Construction entrance shall be as long as required to stabilize high traffic areas but not less than 70 ft. (exception: apply 30 ft. minimum to single residence lots).
3. Thickness -The stone layer shall be at least 6 inches thick for light duty entrances or at least 10 inches for heavy duty use.
4. Width -The entrance shall be at least 14 feet wide, but not less than the full width at points where ingress or egress occurs.
5. Geotextile -A geotextile shall be laid over the entire area prior to placing stone. It shall be composed of strong rot-proof polymeric fibers and meet the following specifications:

Figure 7.4.1

Geotextile Specification for Construction Entrance	
Minimum Tensile Strength	200 lbs.
Minimum Puncture Strength	80 psi.
Minimum Tear Strength	50 lbs.
Minimum Burst Strength	320 psi.
Minimum Elongation	20%
Equivalent Opening Size	EOS < 0.6 mm.
Permittivity	1×10-3 cm/sec.

6. Timing—The construction entrance shall be installed as soon as is practicable before major grading activities.
7. Culvert -A pipe or culvert shall be constructed under the entrance if needed to prevent surface water from flowing across the entrance or to prevent runoff from being directed out onto paved surfaces.
8. Water Bar -A water bar shall be constructed as part of the construction entrance if needed to prevent surface runoff from flowing the length of the construction entrance and out onto paved surfaces.
9. Maintenance -Top dressing of additional stone shall be applied as conditions demand. Mud spilled, dropped, washed or tracked onto public roads, or any surface where runoff is not checked by sediment controls, shall be removed immediately. Removal shall be accomplished by scraping or sweeping.
10. Construction entrances shall not be relied upon to remove mud from vehicles and prevent off-site tracking. Vehicles that enter and leave the construction-site shall be restricted from muddy areas.
11. Removal—the entrance shall remain in place until the disturbed area is stabilized or replaced with a permanent roadway or entrance.

MODIFIED FIGURE 3.7
Typical Wood Mat



University of Minnesota FS 07009

Source: PaDEP, E&S Pollution Control Manual, March 2012

TIMBER MAT

NOT TO SCALE

6.6 Filter Sock

Description

Filter socks are sediment-trapping devices using compost inserted into a flexible, permeable tube with a pneumatic blower device or equivalent. Filter socks trap sediment by filtering water passing through the berm and allowing water to pond, creating a settling of solids.

Conditions where practice applies

Filter socks are appropriate for limited drainage areas, requiring sediment control where runoff is in the form of sheet flow or in areas that silt fence is normally considered acceptable. The use of filter socks is applicable to slopes up to 2:1 (H:V), around inlets, and in other disturbed areas of construction sites requiring sediment control. Filter socks also may be useful in areas, where migration of aquatic life such as turtles, salamanders and other aquatic life would be impeded by the use of silt fence.

Planning Considerations

Filter socks are sediment barriers, capturing sediment by ponding and filtering water through the device during rain events. They may be a preferred alternative where equipment may drive near or over sediment barriers, as they are not as prone to complete failure as silt fence if this occurs during construction. Driving over filter socks is not recommended; but if it should occur, the filter sock should be inspected immediately, repaired and moved back into place as soon as possible.

Design Criteria

Typically, filter socks can handle the same water flow or slightly more than silt fence. For most applications, standard silt fence is replaced with 12" diameter filter socks. However, proper installation is especially important for them to work effectively.

Materials – Compost/mulch used for filter socks shall be weed free and derived from a well-decomposed source of organic matter. The compost shall be produced using an aerobic composting process meeting CFR 503 regulations, including time and temperature data indicating effective weed seed, pathogen and insect larvae kill. The compost shall be free of any refuse, contaminants or other materials toxic to plant growth. Non-composted products are not acceptable.

Materials should meet the following requirements: pH between 5.0-8.0; 100% passing a 2" sieve and a minimum of 70% greater than the 3/8" sieve; moisture content is less than 60%; material shall be relatively free (<1% by dry weight) of inert or foreign man made materials.

Level Contour – Place filter socks on the level contour of the land so that flows are dissipated into uniform sheet flow. Flow coming to filter socks must not be concentrated and the filter sock should lie perpendicular to flows.

Flat Slopes – When possible, place filter socks at a 5' or greater distance away from the toe of the slopes in order for the water coming from the slopes to maximize space available for sediment deposit (see the illustration). When this is not possible due to construction limitations, additional filter socks may be required upslope of the initial filter sock (see the chart below for appropriate slope lengths and spacing).

Flow Around Ends – In order to prevent water flowing around the ends of filter socks, the ends of the filter socks must be constructed pointing upslope so the ends are at a higher elevation.

Vegetation – For permanent areas, seeding filter socks is recommended to establish vegetation directly in the sock and immediately in front and back of the sock at a distance of 5 feet. Vegetating on and around the filter socks will assist in slowing down water for filtration creating a more effective longer-term sediment control.

Drainage Area: Generally filter socks are limited to ¼ to ½ acre drainage area per 100 foot of the sediment barrier. Specific guidance is given in the chart below.

Table 6.6.1 Maximum Slope Length Above Filter Sock and Recommended Diameter

Slope	Ratio (H:V)	8"	12"	18"	24"
0% - 2%	10% - 20%	125	250	300	350
10% - 20%	50:1 - 10:1	100	125	200	250
2% - 10%	10:1 - 5:1	75	100	150	200
20% - 33%	5:1 - 2:1		50	75	100
>50%	>2:1		25	50	75

Note: For larger drainage areas, see standards for temporary diversions, sediment traps and sediment basins.

Dispersing flow – Sheet flow and runoff should not exceed berm height or capacity in most storm events. If overflow of the berm is a possibility, a larger filter sock should be installed or an alternative sediment control should be used.

Maintenance – Filter socks should be regularly inspected to make sure they hold their shape, are ponding, and allowing adequate flow through. If ponding becomes excessive, filter socks should be replaced. Used filter socks may be cut and the compost dispersed and seeded to prevent captured sediment from being resuspended.

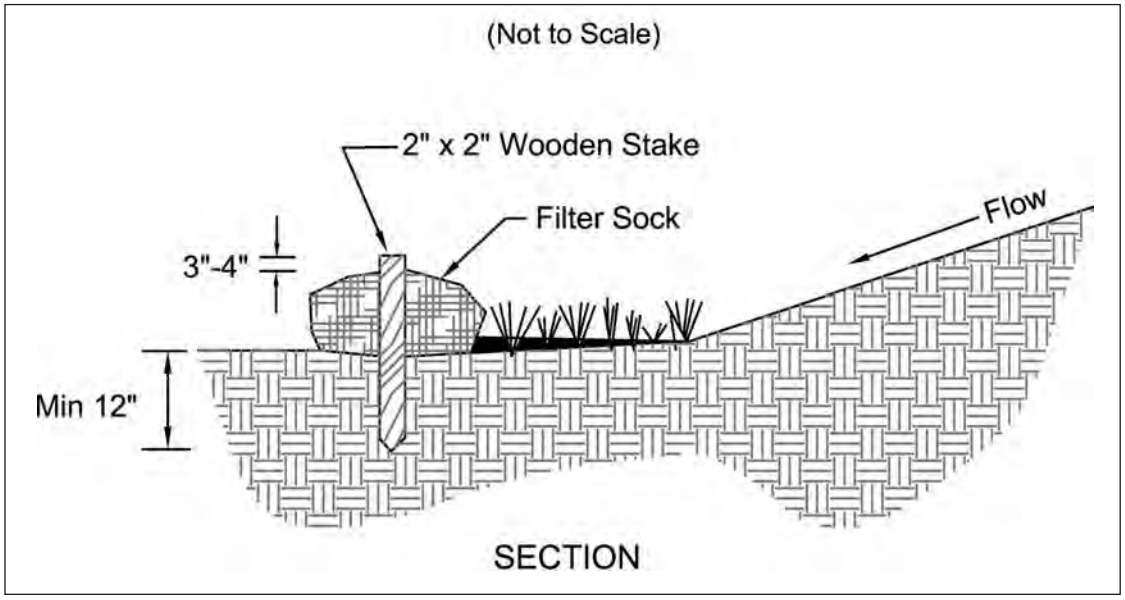
Removal – When construction is completed on site, the filter socks may be cut and dispersed with a loader, rake, bulldozer or other device to be incorporated into the soil or left on top of the soil for final seeding. The mesh netting material will be disposed of in normal trash container or removed by the contractor.

References

Standard Specification for Compost for Erosion/Sediment Control (Filter Berms) AASHTO Designation: MP-9 http://www.iaasla.org/NEWS/FILES/AASHTO-Filterberm6.doc

Specifications
for

Filter Sock



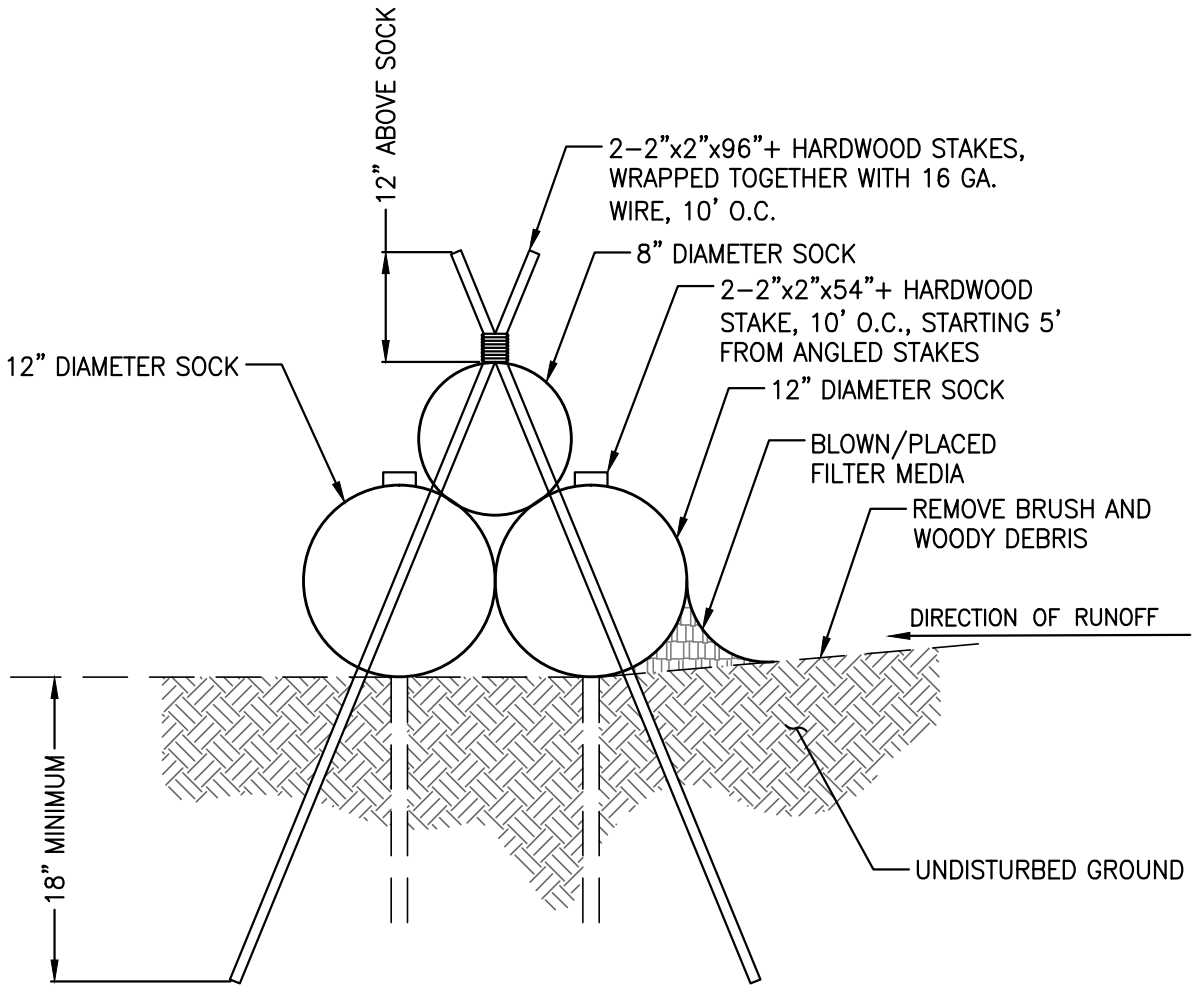
1. Materials – Compost used for filter socks shall be weed, pathogen and insect free and free of any refuse, contaminants or other materials toxic to plant growth. They shall be derived from a well-decomposed source of organic matter and consist of a particles ranging from 3/8" to 2".
2. Filter Socks shall be 3 or 5 mil continuous, tubular, HDPE 3/8" knitted mesh netting material, filled with compost passing the above specifications for compost products.

INSTALLATION:

3. 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.
4. 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.
5. Filter Socks are not to be used in concentrated flow situations or in runoff channels.

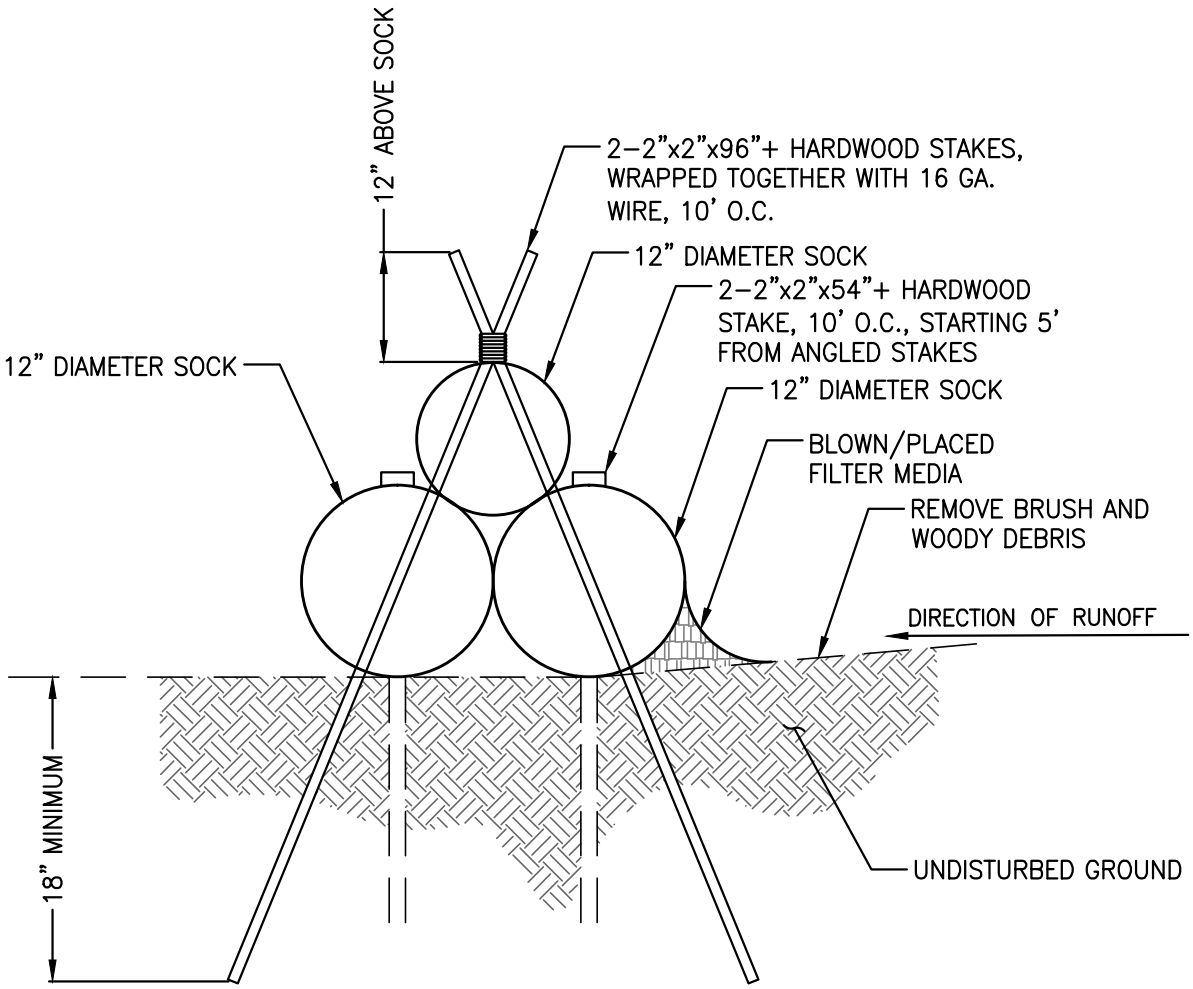
MAINTENANCE:

6. Routinely inspect filter socks after each significant rain, maintaining filter socks in a functional condition at all times.
7. Remove sediments collected at the base of the filter socks when they reach 1/3 of the exposed height of the practice.
8. Where the filter sock deteriorates or fails, it will be repaired or replaced with a more effective alternative.
9. Removal – Filter socks will be dispersed on site when no longer required in such as way as to facilitate and not obstruct seedings.



18" EQUIVALENT TRIPLE STACKED FILTER SOCK DETAIL

N.T.S.



24" EQUIVALENT TRIPLE STACKED FILTER SOCK DETAIL

N.T.S.

7.5 Dust Control

Description

Dust control involves preventing or reducing dust from exposed soils or other sources during land disturbing, demolition and construction activities to reduce the presence of airborne substances which may present health hazards, traffic safety problems or harm animal or plant life.

Conditions Where Practice Applies

In areas subject to surface and air movement of dust where on-site and off-site damage is likely to occur if preventive measures are not taken.

Planning Considerations

Construction activities inevitably result in the exposure and disturbance of soil. Fugitive dust results from both construction activities and as a result of wind erosion over the exposed earth surfaces. Large quantities of dust are typically generated in heavy construction activities, such as road construction and subdivision, commercial or industrial development, which involve disturbing significant areas of the soil surface. Research of construction sites has established an average dust emission rate of 1.2 tons/acre/month for active construction. Earth-moving activities comprise the major source of construction dust emissions, but traffic and general disturbance of the soil also generate significant dust emissions.

Planning for dust control involves limiting the amount of soil disturbance at any one time as a key objective. Therefore, phased clearing and grading operations (minimize disturbance-phasing) and the utilization of other stabilization practices can significantly reduce dust emissions. Undisturbed vegetative buffers (minimum 50-foot widths) left between graded areas and protected areas can also be very helpful in dust control by providing windbreaks and non-erosive areas.

Design Criteria

A number of measures can be utilized to limit dust either during or between construction stages or once construction is complete. Generally the same methods that are used to limit erosion by limiting exposure of soils to rainfall can be used to limit dust including: stabilizing exposed soils with mulch, vegetation or permanent cover. Additional methods particular to dust control include managing vehicles and construction traffic, road treatment and treatment of exposed soil with chemical stabilizers.

Vegetative Cover – The most effective way to prevent dust from exposed soil is to provide a dense cover of vegetation. In areas subject to little or no construction traffic, vegetative stabilization reduces dust drastically. Timely temporary and permanent seedings must be utilized to accomplish this. See TEMPORARY SEEDING & PERMANENT SEEDING.

Mulch - When properly applied, mulch offers a fast, effective means of controlling dust. Mulching is not recommended for areas within heavy traffic pathways. Binders or tackifiers should be used to tack organic mulches. See MULCHING.

Rough Graded Soils – Leaving the soil in a temporary state of rough grade, where clods rather than flattened soils predominate the surface can reduce the amount of dust generated from areas during periods of higher winds. This must be balanced by the need to reach a stage where the soil can be stabilized and may be only be necessary when high winds are predicted.

Watering - This is the most commonly used dust control practice. The site is sprinkled with water until the surface is wet before and during grading and is repeated as needed. It offers fast protection for haul roads and other heavy traffic routes. Watering should be done at a rate that prevents dust but does not cause soil erosion. Wetting agents are also available to increase the effectiveness of watering and must follow manufacturers instructions.

Chemical Stabilizers/Wetting Agents – Many products of this type are available and are usually most effective on typical mineral soils but may not be on predominantly organic soils such as muck. Users are advised to pay attention to the limitations and instructions regarding each product. The following table lists various adhesives and provides corresponding information on mixing and application:

Table 7.5.1 Adhesives for Dust Control

Adhesive	Water Dilution (Adhesive: Water)	Nozzle Type	Application Rate Gallon/Acre
Latex Emulsion	12.5:1	Fine	235
Resin in Water	4:1	Fine	300
Acrylic Emulsion (No-traffic)	7:1	Coarse	450
Acrylic Emulsion (Traffic)	3.5:1	Coarse	350

Stone - Stone can be used to stabilize roads or other areas during construction using crushed stone or coarse gravel. Research has shown the addition of bentonite to limestone roads (not igneous gravel) has shown benefits in reducing dust.

Windbreaks and Barriers – Where dust is a known problem, existing windbreak vegetation should be preserved. Maintaining existing rows of trees or constructing a wind fence, sediment fence, or similar barrier can help to control air currents and blowing soil. Place barriers perpendicular to prevailing air currents at intervals of about 15 times the barrier height.

Calcium Chloride - This chemical may be applied by mechanical spreader as loose, dry granules or flakes at a rate that keeps the surface moist but not so high as to cause water pollution or plant damage. Liquid application of a 35% calcium chloride solution is common. Note: application rates should be strictly in accordance with suppliers' specified rates.

Street Cleaning - Paved areas that have accumulated sediment from construction sites should be cleaned daily, or as needed, utilizing a street sweeper or bucket -type loader or scraper.

Operation and Maintenance

Most dust control measures, such as applications of water or road treatments will require monitoring and repeat applications as needed to accomplish good control.

Common Problems / Concerns

Vegetation is removed from large areas of the construction site and left barren for long periods of time.

Continuous, scheduled monitoring of the construction site conditions is not made.

Specifications
for

Dust Control

1. Vegetative Cover and/mulch – Apply temporary or permanent seeding and mulch to areas that will remain idle for over 21 days. Saving existing trees and large shrubs will also reduce soil and air movement across disturbed areas. See Temporary Seeding; Permanent Seeding; Mulching Practices; and Tree and Natural Area Protection practices.
2. Watering – Spray site with water until the surface is wet before and during grading and repeat as needed, especially on haul roads and other heavy traffic routes. Watering shall be done at a rate that prevents dust but does not cause soil erosion. Wetting agents shall be utilized according to manufacturers instructions.
3. Spray-On Adhesives – Apply adhesive according to the following table or manufacturers' instructions.

Table 7.5.1 Adhesives for Dust Control

Adhesive	Water Dilution (Adhesive: Water)	Nozzle Type	Application Rate Gal./Ac.
Latex Emulsion	12.5:1	Fine	235
Resin in Water Acrylic Emulsion (No-traffic)	4:1	Fine	300
Acrylic Emulsion (No-traffic)	7:1	Coarse	450
Acrylic Emulsion (Traffic)	3.5:1	Coarse	350

4. Stone – Graded roadways and other suitable areas will be stabilized using crushed stone or coarse gravel as soon as practicable after reaching an interim or final grade. Crushed stone or coarse gravel can be used as a permanent cover to provide control of soil emissions.
5. Barriers – Existing windbreak vegetation shall be marked and preserved. Snow fencing or other suitable barrier may be placed perpendicular to prevailing air currents at intervals of about 15 times the barrier height to control air currents and blowing soil.
6. Calcium Chloride - This chemical may be applied by mechanical spreader as loose, dry granules or flakes at a rate that keeps the surface moist but not so high as to cause water pollution or plant damage. Application rates should be strictly in accordance with suppliers' specified rates.
7. Operation and Maintenance - When Temporary Dust Control measures are used; repetitive treatment should be applied as needed to accomplish
control.

   Street Cleaning - Paved areas that have accumulated sediment from construction should be cleaned daily, or as needed, utilizing a street sweeper or bucket -type endloader or scraper.

7.12 Temporary Rolled Erosion Control Products (Erosion Control Matting)

Description

A Temporary Rolled Erosion Control Product (TRECP) is a degradable manufactured material used to stabilize easily eroded areas while vegetation becomes established. Temporary Rolled Erosion Control Products are degradable products composed of biologically, photo chemically or otherwise degradable materials. Temporary RECPs consist of erosion control netting, open weave textiles, and erosion control blankets and mattings. These products reduce soil erosion and assist vegetative growth by providing temporary cover from the erosive action of rainfall and runoff while providing soil-seed contact.

Condition where practice applies:

Temporary rolled erosion control products (matting or blankets) should be used on:

- Areas where erosion potential is high or a failure to establish vegetation is costly such as slopes greater than 3:1, constructed channels or stream banks
- Areas where establishing vegetation is difficult such as southern exposures or areas prone to drying
- Areas of concentrated flow, especially where flows exceeds 3.5 feet per second (e.g near culverts)
- Problem areas with highly erosive soils
- Areas where mulch is difficult to hold in place due to wind or water

Planning Considerations:

Temporary RECPs can be applied to critical or problem areas to enhance the erosion control as vegetation is being established. Although these materials add cost, they insure more immediate stability following construction reducing grading repairs and a faster greening of projects. Permanent non-degradable rolled erosion control products (turf reinforcement mats) are beyond the scope of this practice, but may be useful where design discharges or runoff exert velocities and shear stresses exceeding the ability of mature vegetation to withstand.

Temporary RECPs provide stable and rapid greening for areas conveying stormwater runoff. Care must be taken to choose the type of RECP, which is most appropriate for the specific needs of a project. Designers must take into account the vegetated and unvegetated velocities and sheer stresses in channel applications. With the abundance of soil stabilization products available, it is impossible to cover all the advantages, disadvantages and specifications of all manufactured RECPs. Therefore, as with many erosion control-type products, there is no substitute for a thorough understanding of the manufacturer's instructions and recommendations and a site visit by a product's designer or plan reviewer to verify appropriateness.

Temporary RECPs should be used to help establish vegetation on previously disturbed slopes - especially slopes of 3:1 or greater. The materials that compose the RECP will deteriorate over time. If used in permanent conveyance channels, designers should consider the system's resistance to erosion as it relates to the type of vegetation planted and the existing soil characteristics. As much as possible during establishment of vegetation, soil stabilization blankets should not be subjected to concentrated flows moving at greater than 3.5 feet/second.

Design Criteria

Choose a product that will provide the appropriate time period of protection. Allowable velocity range during vegetation establishment should be 3.5 feet per second or less.

Erosion Control Blankets - shall consist of photodegradable plastic netting or biodegradable natural fiber netting that covers and is entwined in a natural organic or man-made mulching material. The mulching material shall consist of wood fibers, wood excelsior, straw, coconut fiber, or man-made fibers, or a combination of the same. The blanket shall be of consistent thickness with the mulching material/fibers evenly distributed over its entire length. Mulching material/fibers must interlock or entwine to form a dense layer, which not only resists raindrop impact, but also will allow vegetation to penetrate the blanket. The mulching material degradation rate must be consistent with the designers desired slope protection time. Temporary Rolled Erosion Control Products (or erosion control blankets) shall meet the specifications that follow.

Table 7.12.1

Material	Maximum Length Of Protection
Straw	10-12 Months
Straw/Coconut	24 Months
Coconut	36 Months
Excelsior	36 Months

Erosion Control Netting - shall consist of a woven natural fiber or extruded geosynthetic mesh used as a component in the manufacture of RECPs, or separately as a temporary RECP to anchor loose fiber mulches.

Open Weave Textile - shall consist of processed natural or polymer yarns woven into a matrix, used to provide erosion control and facilitate vegetation establishment.

Maintenance:

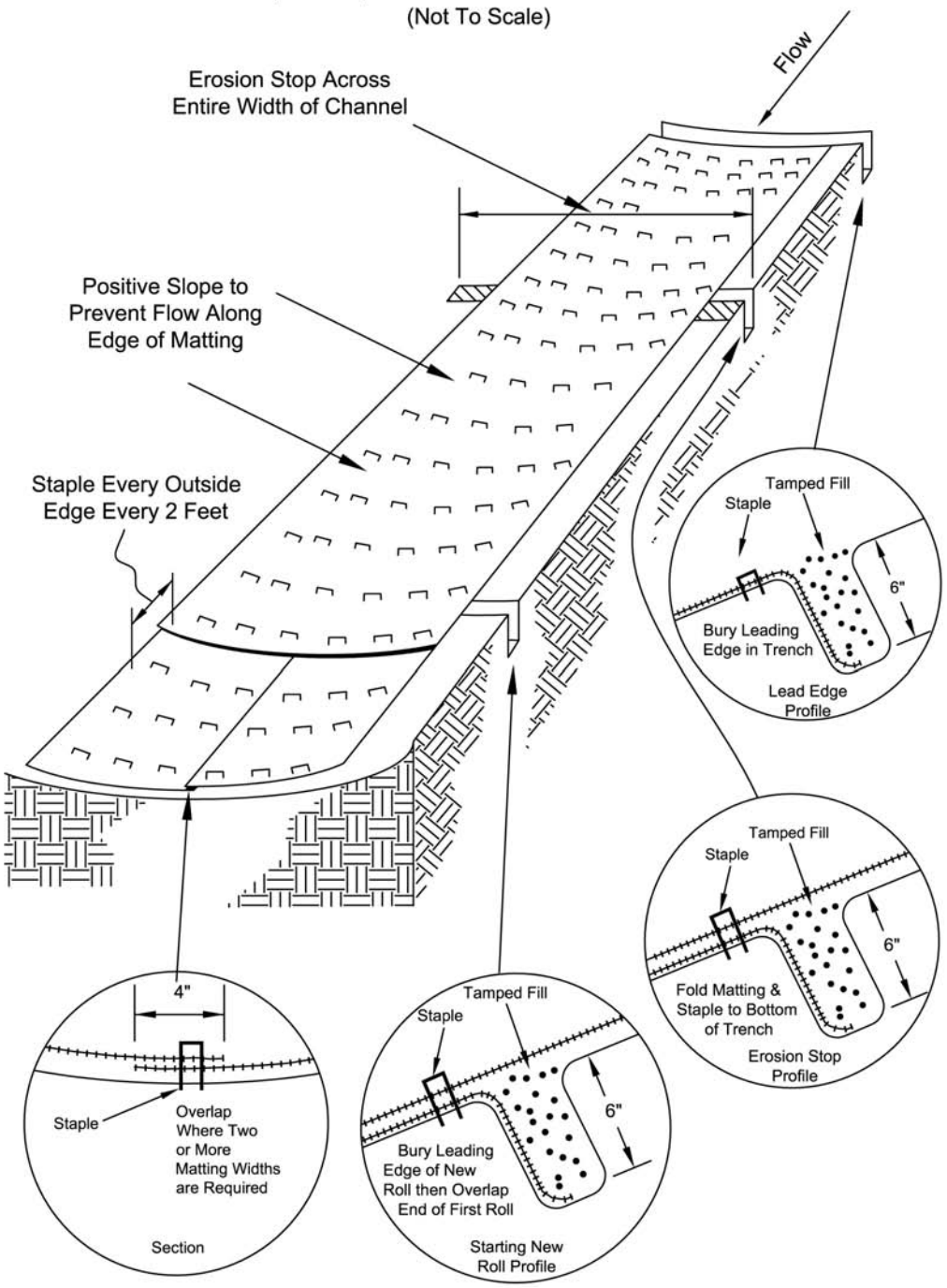
All RECPs should be inspected regularly after installation, especially after storms to check for erosion or undermining of the product. Make needed repairs immediately, addressing rills or gullies that have developed prior to replacing the RECP. In the case erosion repairs, assure that subsequent runoff across the area is dispersed or adequately spread.

Common Problems/Concerns:

- Manufacturer's selection and installation recommendations not followed. Results in failure of the RECP.
- Poor contact between soil and the RECP. Results in erosion below the RECP and lower seed germination rates, causing failure.
- Proper stapling guidelines not followed. Results in movement or displacement of RECP.
- Erosion check slots are not used. Results in erosion under the RECP, causing failure.
- Unstable slopes that result in RECP or slope failure. Determine cause of slope failure, correct, and reinstall RECP
- In channels, the width of RECP used is not sufficient, this causes water to flow along the sides of RECP causing erosion. Install RECP up side slopes of ditch line as well as the bottom.

Specifications
for

Temporary Rolled Erosion Control Product



Specifications
for

Temporary Rolled Erosion Control Product

1. Channel/Slope Soil Preparation Grade and compact area of installation, preparing seedbed by loosening 2”-3” of topsoil above final grade. Incorporate amendments such as lime and fertilizer into soil. Remove all rocks, clods, vegetation or other debris so that installed RECP will have direct contact with the soil surface.
2. Channel/Slope Seeding Apply seed to soil surface prior to installation. All check slots, anchor trenches, and other disturbed areas must be reseeded. Refer to the Permanent Seeding specification for seeding recommendations.

Slope Installation

3. Excavate top and bottom trenches (12”x6”). Intermittent erosion check slots (6”x6”) may be required based on slope length. Excavate top anchor trench 2’ x 3’ over crest of the slope.
4. If intermittent erosion check slots are required, install RECP in 6”x6” slot at a maximum of 30’ centers or the mid point of the slope. RECP should be stapled into trench on 12” centers.
5. Install RECP in top anchor trench, anchor on 12” spacings, backfill and compact soil.
6. Unroll RECP down slope with adjacent rolls overlapped a minimum of 3”. Anchor the seam every 18”. Lay the RECP loose to maintain direct soil contact, do not pull taught.
7. Overlap roll ends a minimum of 12” with upslope RECP on top for a shingle effect. Begin all new rolls in an erosion check slot if required, double anchor across roll every 12”.
8. Install RECP in bottom anchor trench (12”x6”), anchor every 12”. Place all other staples throughout slope at 1 to 2.5 per square yard dependant on slope. Refer to manufacturer’s anchor guide.

Channel Installation

9. Excavate initial anchor trench (12”x6”) across the lower end of the project area.
10. Excavate intermittent check slots (6”x6”) across the channel at 30’ intervals along the channel.
11. Excavate longitudinal channel anchor slots (4”x4”) along both sides of the channel to bury the edges. Whenever possible extend the RECP 2’-3’ above the crest of channel side slopes.
12. Install RECP in initial anchor trench (downstream) anchor every 12”, backfill and compact soil.
13. Roll out RECP beginning in the center of the channel toward the intermittent check slot. Do not pull taught. Unroll adjacent rolls upstream with a 3” minimum overlap (anchor every 18”) and up each channel side slope.
14. At top of channel side slopes install RECP in the longitudinal anchor slots, anchor every 18”.
15. Install RECP in intermittent check slots. Lay into trench and secure with anchors every 12”, backfill with soil and compact.
16. Overlap roll ends a minimum of 12” with upstream RECP on top for a shingling effect. Begin all new rolls in an intermittent check slot, double anchored every 12”.
17. Install upstream end in a terminal anchor trench (12”x6”); anchor every 12”, backfill and compact.
18. Complete anchoring throughout channel at 2.5 per square yard using suitable ground anchoring devices (U shaped wire staples, metal geotextile pins, plastic stakes, and triangular wooden stakes). Anchors should be of sufficient length to resist pullout. Longer anchors may be required in loose sandy or gravelly soils.

6.4 Storm Drain Inlet Protection

Description

Storm drain inlet protection devices remove sediment from storm water before it enters storm sewers and downstream areas. Inlet protection devices are sediment barriers that may be constructed of washed gravel or crushed stone, geotextile fabrics and other materials that are supported around or across storm drain inlets.

Inlet protection is installed to capture some sediment and reduce the maintenance of storm sewers and other underground piping systems prior to the site being stabilized. Due to their poorer effectiveness, inlet protection is considered a secondary sediment control to be used in conjunction with other more effective controls.

Condition Where Practice Applies

Storm drain inlet protection is applicable anywhere construction site runoff may enter closed conveyance systems through storm sewer inlets. Generally inlet protection is limited to areas draining less than 1 acre.

This practice is generally not recommended as a primary means of sediment control. Storm drain inlet protection has limited capacity to control silts and clays, and is most effective in capturing larger sand-sized particles. It should only be a primary means if it is not possible to divert the storm drainage to a sediment trap or sediment basin, or if it is to be used only for a short period of time during the construction process.

Planning Considerations

Inlet protection in effect blocks storm drain inlets. Therefore consider the effect of ponding muddy water on streets and nearby areas and plan accordingly. Although ponding is beneficial in the sediment removal process, this may pose hazardous conditions for street travel. Additional ponding capacity with related increase in effectiveness can be provided for some drop inlets by excavating around the inlet.

Utilizing inlet protection on long sloping streets may cause runoff to bypass inlets on the slope and cause extra water to accumulate in low areas. In order for the inlet protection to work ponding must be maintained at the practice.

The recommended geotextiles are suitable for retaining/trapping large particle size materials, such as sand while maintaining some flow. Only specialized geotextile materials are suitable for retaining clay, silt and other fine soils. These materials, however, are subject to clogging.

Apply storm drain inlet protection as soon as the surface inlet is capable of receiving storm water. Geotextiles utilized in inlet protection are manufactured to control the rate of storm water flow, to retain certain sizes of soil particles. The controlled flow and ponding assists in sediment deposition. Geotextile fabrics come in a variety of materials with permeability, strength and durability ratings. In all cases, follow the manufacturer's recommendations for the specific product application, as well as installation and maintenance requirements.

All inlet protection practices require frequent maintenance and cleaning to maintain sufficient flow rates and to prevent accumulation of mud on streets and other areas.

The following types of storm drain inlet protection are listed according to type of flows and situations where they will perform best. Note that straw bales are not suitable as storm drain inlet protection, since they are often cease to allow flow through once saturated and often leak where bales join. Different types of storm drain inlet protection available are as follows:

A. Excavated Drop Inlet Sediment Trap. Where the storm sewer can be left below the final grade, a depression in the ground adjacent to the inlet can be an effective way of reducing sediment going to the storm sewer. Runoff is directed to the depression and a sediment barrier is maintained between the depression and the storm sewer.

B. Geotextile Inlet Protection. This method consists of placing filter fence around the perimeter of the drop inlet and backfilling. Apply this method where the inlet drains overload flow or sheet flow from gentle slopes and sheet or overland flow.

C. Geotextile-Stone Protection. These are used both on drop inlets and in street curbs and gutters where the ponding of water will not cause damage or inconvience. This filter is simply constructed of geotextile materials over the inlet, with stone on top. Note: this practices does not have an opening for overflow and should not be placed where clogging and subsequent flooding would cause safety concerns or property damage.

D. Geotextile-Stone Curb Inlet Protection. This method is used only on curb and gutter inlets and utilizes wire mesh, geotextile and stone over a wood frame. This practice should be used to prevent larger volumes of water from ponding in the street. If the overflow provided is insufficient, it may be modified according to this specification to accommodate greater flows.

E. Block and Gravel Drop Inlet Protection. This practice utilizes a wall of cement blocks overlain with wire mesh and gravel around the perimeter to slow runoff before entering a storm drain. It is not recommended anywhere vehicle traffic will be operating.

F. Manufactured Inlet Protection Devices. Any manufactured products utilized for inlet protection must be constructed of materials equally durable and effective as those provided in this practice. They must be able to be secured such that construction site runoff is intercepted, ponded and filtered prior to entering the storm drain except during extreme flows. Devices must allow the removal of captured material without falling into the catch basin.

Maintenance

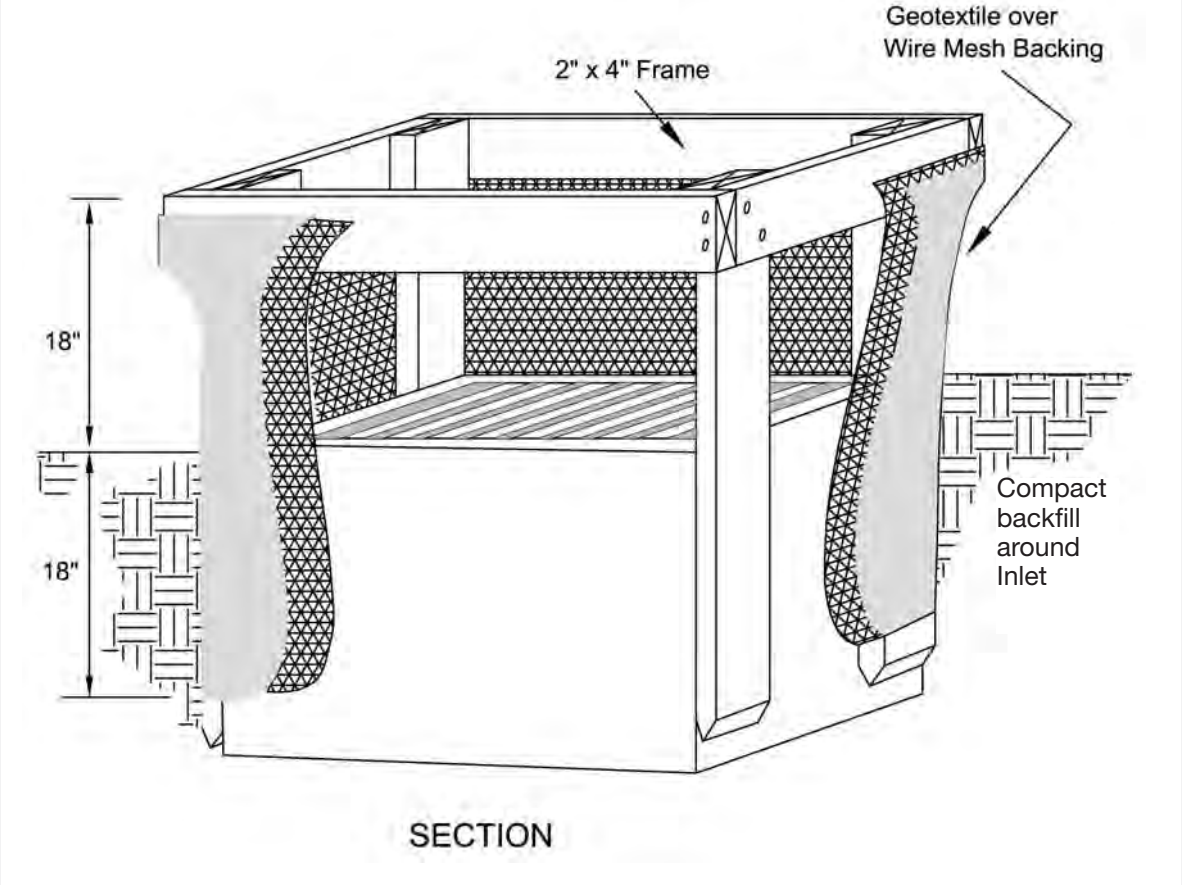
Effective storm drain inlet protection collects sediment and therefore must be cleaned regularly to prevent clogging and subsequent flooding conditions, piping, or overtopping of the control structures. Sediment barriers that sag, fall over, or are not properly secured, must be promptly repaired or replaced.

Inlet protection shall be inspected weekly and after each rainfall event. Areas where there is active traffic shall be inspected daily. Repairs shall be made as needed to assure the practice is performing as intended. Sediment shall be removed when accumulation is one-half the height of the trap. Sediment shall not be washed into the inlet. Sediment shall be removed and placed in a location where it is stable and not subject to erosion.

Once the contributing drainage area has been properly stabilized, all filter material and collected sediment shall be removed and properly disposed.

Specifications
for

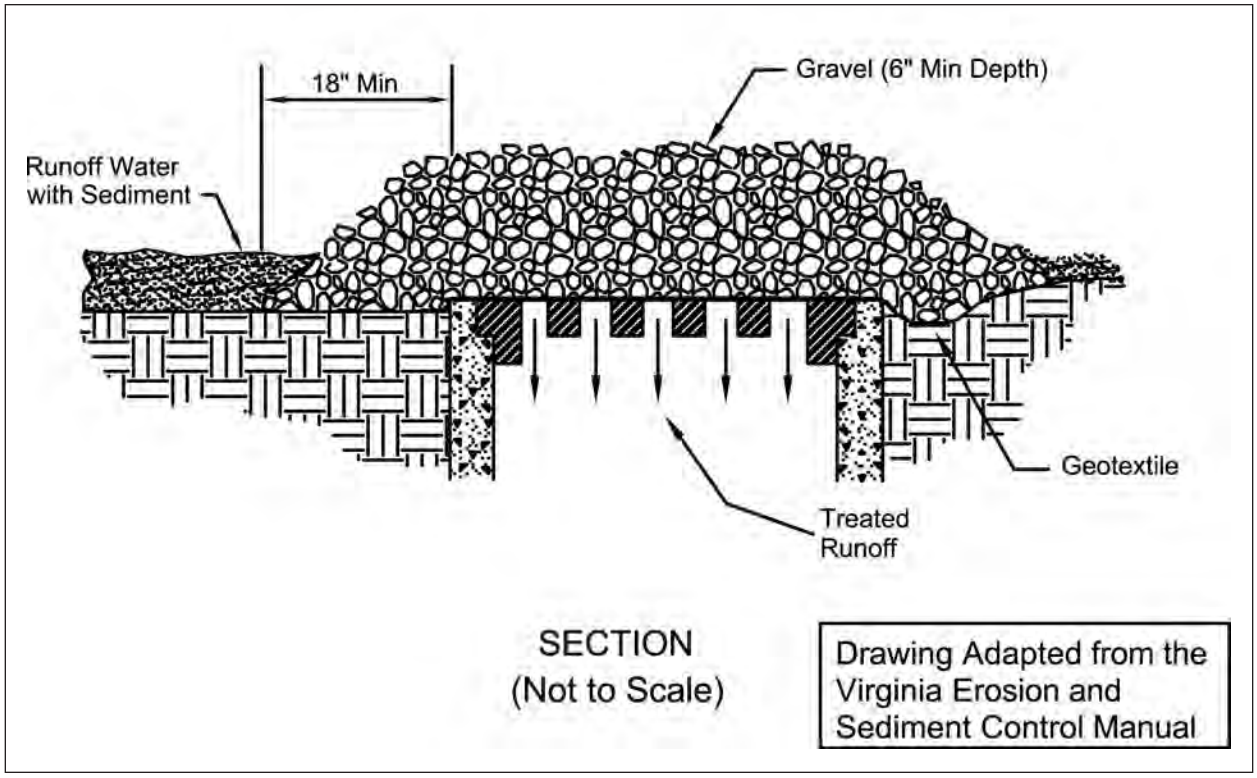
Geotextile Inlet Protection



1. Inlet protection shall be constructed either before upslope land disturbance begins or before the inlet becomes functional.
2. The earth around the inlet shall be excavated completely to a depth at least 18 inches.
3. The wooden frame shall be constructed of 2-inch by 4-inch construction grade lumber. The 2-inch by 4-inch posts shall be driven one (1) ft. into the ground at four corners of the inlet and the top portion of 2-inch by 4-inch frame assembled using the overlap joint shown. The top of the frame shall be at least 6 inches below adjacent roads if ponded water will pose a safety hazard to traffic.
4. Wire mesh shall be of sufficient strength to support fabric with water fully impounded against it. It shall be stretched tightly around the frame and fastened securely to the frame.
5. Geotextile material shall have an equivalent opening size of 20-40 sieve and be resistant to sunlight. It shall be stretched tightly around the frame and fastened securely. It shall extend from the top of the frame to 18 inches below the inlet notch elevation. The geotextile shall overlap across one side of the inlet so the ends of the cloth are not fastened to the same post.
6. Backfill shall be placed around the inlet in compacted 6-inch layers until the earth is even with notch elevation on ends and top elevation on sides.
7. A compacted earth dike or check dam shall be constructed in the ditch line below the inlet if the inlet is not in a depression. The top of the dike shall be at least 6 inches higher than the top of the frame.

Specifications
for

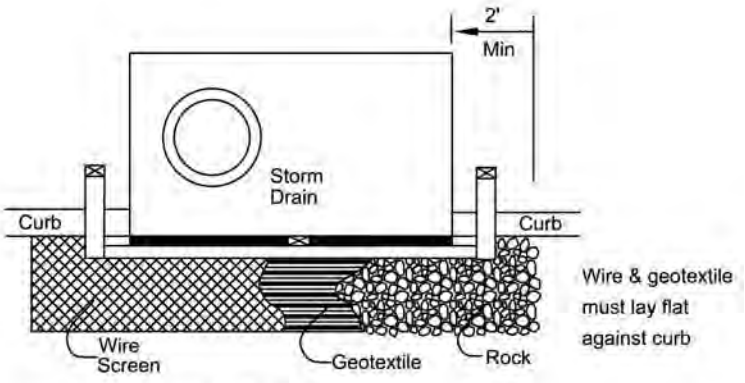
Geotextile-Stone Inlet Protection



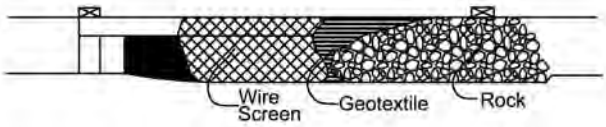
1. Inlet protecion shall be constructed either before upslope land disturbance begins or before the inlet becomes functional.
2. Geotextile and/or wire material shall be placed over the top of the storm sewer and approximately six (6) inches of 2-inch or smaller clean aggregate placed on top. Extra support for geotextile is provided by placing hardware cloth or wire mesh across the inlet cover. The wire should be no larger than ½" mesh and should extend an extra 12 inches across the top and sides of the inlet cover.
3. Maintenance must be performed regularly, especially after storm events. When clogging of the stone or geotextile occurs, the material must be removed and replaced.

Specifications
for

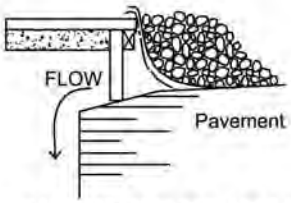
Geotextile - Stone Inlet Protection for Curb Inlets



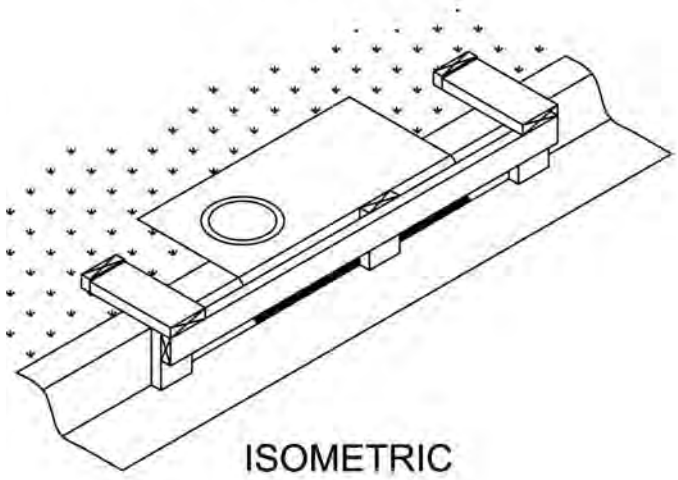
PLAN VIEW



ELEVATION



CROSS SECTION



ISOMETRIC

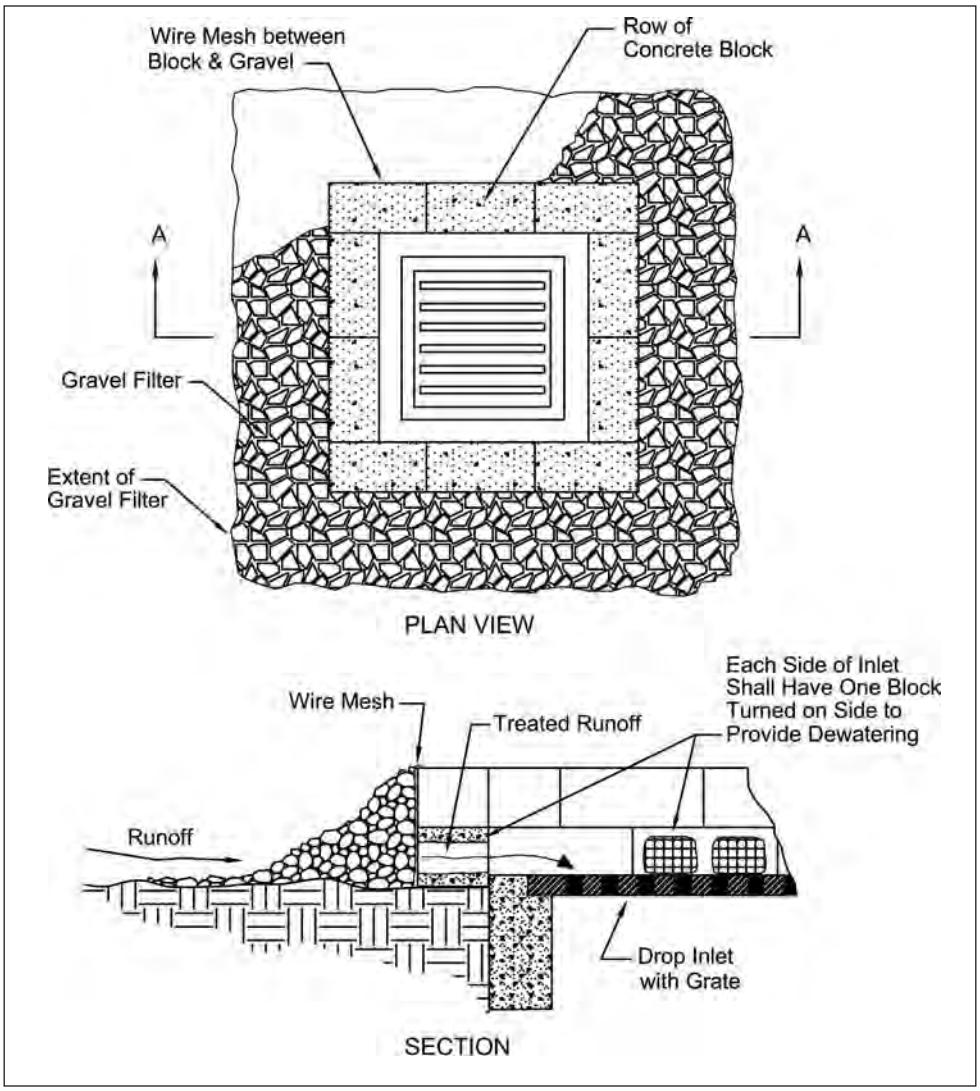
Specifications
for

Geotextile-Stone Inlet Protection for Curb Inlets

1. Inlet protection shall be constructed either before upslope land disturbance begins or before the inlet becomes functional.
2. Construct a wooden frame of 2-by-4-in. construction-grade lumber. The end spacers shall be a minimum of 1 ft. beyond both ends of the throat opening. The anchors shall be nailed to 2-by-4-in. stakes driven on the opposite side of the curb.
3. The wire mesh shall be of sufficient strength to support fabric and stone. It shall be a continuous piece with a minimum width of 30 in. and 4 ft. longer than the throat length of the inlet, 2 ft. on each side.
4. Geotextile cloth shall have an equivalent opening size (EOS) of 20-40 sieve and be resistant to sunlight. It shall be at least the same size as the wire mesh.
5. The wire mesh and geotextile cloth shall be formed to the concrete gutter and against the face of the curb on both sides of the inlet and securely fastened to the 2-by-4-in. frame.
6. Two-inch stone shall be placed over the wire mesh and geotextile in such a manner as to prevent water from entering the inlet under or around the geotextile cloth.
7. This type of protection must be inspected frequently and the stone and/or geotextile replaced when clogged with sediment.

Specifications
for

Block and Gravel Drop Inlet Filter



1. Place 4-inch by 8-inch by 12-inch concrete blocks lengthwise on their sides in a single row around the perimeter of the inlet, with the ends of adjacent blocks abutting. The height of the barrier can be varied, depending upon the design needs, by stacking combinations of the same size blocks. The barrier of blocks should be at least 12-inches high but no greater than 24-inches high.
2. Wire mesh should be placed over the outside vertical face (webbing) of the concrete blocks to prevent stone from being washed through the block cores. Hardware cloth or comparable wire mesh with ½-inch openings should be used.
3. Two-inch stone should be piled against the wire to the top of the block barrier, as shown below.
4. If the stone filter becomes clogged with sediment so that it no longer adequately performs its function, pull stone away from the blocks, clean and/or replace.

Concrete Washout

Concrete washout *areas are designated locations within a construction site that are either a prefabricated unit or a designed measure that is constructed to contain concrete washout. Concrete washout systems are typically used to contain washout water when chutes and hoppers are rinsed following delivery.*

Purpose

Concrete washout systems are implemented to reduce the discharge of pollutants that are associated with concrete washout waste through consolidation of solids and retention of liquids. Uncured concrete and associated liquids are highly alkaline which may leach into the soil and contaminate ground water or discharge to a waterbody or wetland which can elevate the pH and be harmful to aquatic life. Performing concrete washout in designated areas and into specifically designed systems reduces the impact concrete washout will have on the environment.

Specifications

Site Management

- Complete construction/installation of the system and have washout locations operational prior to concrete delivery.
- Do not wash out concrete trucks or equipment into storm drains, wetlands, streams, rivers, creeks, ditches, or streets.
- Never wash out into a storm sewer drainage system. These systems are typically connected to a natural conveyance system.
- Where necessary, provide stable ingress and egress (see **Temporary Construction Ingress/Egress Pad** on page 17).
- It is recommended that washout systems be restricted to washing concrete from mixer and pump trucks and not used to dispose of excess concrete or

residual loads due to potential to exceed the design capacity of the washout system. Small amounts of excess or residual concrete (not washout water) may be disposed of in areas that will not result in flow to an area that is to be protected.

- Install systems at strategic locations that are convenient and in close proximity to work areas and in sufficient number to accommodate the demand for disposal.
- Install signage identifying the location of concrete washout systems.

Location

- Locate concrete washout systems at least 50 feet from any creeks, wetlands, ditches, karst features, or storm drains/manmade conveyance systems.
- To the extent practical, locate concrete washout systems in relatively flat areas that have established vegetative cover and do not receive runoff from adjacent land areas.
- Locate in areas that provide easy access for concrete trucks and other construction equipment.
- Locate away from other construction traffic to reduce the potential for damage to the system.

General Design Considerations

- The structure or system shall be designed to contain the anticipated washout water associated with construction activities.
- The system shall be designed, to the extent practical, to eliminate runoff from entering the washout system.
- Runoff from a rainstorm or snowmelt should not carry wastes away from the washout location.
- Washout will not impact future land uses (i.e., open spaces, landscaped areas, home sites, parks).
- Washout systems/containment measures may also be utilized on smaller individual building sites. The design and size of the system can be adjusted to accommodate the expected capacity.

Prefabricated Washout Systems/Containers

- Self-contained sturdy containment systems that are delivered to a site and located at strategic locations for concrete disposal.

- These systems are manufactured to resist damage from construction equipment and protect against leaks or spills.
- Manufacturer or supplier provides the containers. The project site manager maintains the system or the supplier provides complete service that includes maintenance and disposal.
- Units are often available with or without ramps. Units with ramps lend themselves to accommodate pump trucks.
- Maintain according to the manufacturer's recommendations.

Designed and Installed Units

These units are designed and installed on site. They tend to be less reliable than prefabricated systems and are often prone to failure. Concrete washout systems can be constructed above or below grade. It is not uncommon to have a system that is partly below grade with an additional containment structure above grade.

- Washout systems shall utilize a pit or bermed area designed and maintained at a capacity to contain all liquid and concrete waste generated by washout operations.
- The volume of the system must also be designed to contain runoff that drains to the system and rainfall that enters the system for a two-year frequency, 24-hour storm event.

■ Below Grade System

- ♦ A washout system installed below grade should be a minimum of ten feet wide by ten feet long, but sized to contain all liquid and waste that is expected to be generated between scheduled cleanout periods. The size of the pit may be limited by the size of polyethylene available. The polyethylene lining should be of adequate size to extend over the entire excavation.
- ♦ Include a minimum 12-inch freeboard to reasonably ensure that the structure will not overtop during a rain event.
- ♦ Line the pit with ten millimeter polyethylene lining to control seepage.
- ♦ The bottom of excavated pit should be above the seasonal high water table.

■ Above Grade System

- ♦ A system designed and built above grade should be a minimum of ten feet wide by ten feet long, but sized to contain all liquid and waste that is expected to be generated between scheduled cleanout periods. The size of the containment system may be limited by the size of

polyethylene available. The polyethylene lining should be of adequate size to extend over the berm or containment system.

- The system design may utilize an earthen berm, straw bales, sandbags, or other acceptable barriers that will maintain its shape and integrity and support the polyethylene lining.
- Include a minimum four-inch freeboard as part of the design.

Washout Procedures

- Do not leave excess mud in the chutes or hopper after the pour. Every effort should be made to empty the chutes and hopper at the pour. The less material left in the chutes and hopper, the quicker and easier the cleanout. Small amounts of excess concrete (not washout water) may be disposed of in areas that will not result in flow to an area that is to be protected.
- At the washout location, scrape as much material from the chutes as possible before washing them. Use non-water cleaning methods to minimize the chance for waste to flow off site.
- Remove as much mud as possible when washing out.
- Stop washing out in an area if you observe water running off the designated area or if the containment system is leaking or overflowing and ineffective.
- Do not back flush equipment at the project site. Back flushing should be restricted to the plant as it generates large volumes of waste that more than likely will exceed the capacity of most washout systems. If an emergency arises, back flush should only be performed with the permission of an on-site manager for the project.
- Do not use additives with wash water. Do not use solvents or acids that may be used at the target plant.

Materials

- Minimum of ten millimeter polyethylene sheeting that is free of holes, tears, and other defects. The sheeting selected should be of an appropriate size to fit the washout system without seams or overlap of the lining **(designed and installed systems)**.
- Signage.
- Orange safety fencing or equivalent.
- Straw bales, sandbags (bags should be ultraviolet-stabilized geotextile fabric), soil material, or other appropriate materials that can be used to construct a containment system **(above grade systems)**.

- Metal pins or staples at a minimum of six inches in length, sandbags, or alternative fastener to secure polyethylene lining to the containment system.
- Non-collapsing and non-water holding cover for use during rain events (optional).

Installation

Prefabricated Washout Systems/Containers

- Install and locate according to the manufacturer's recommendations.

Designed and Installed Systems

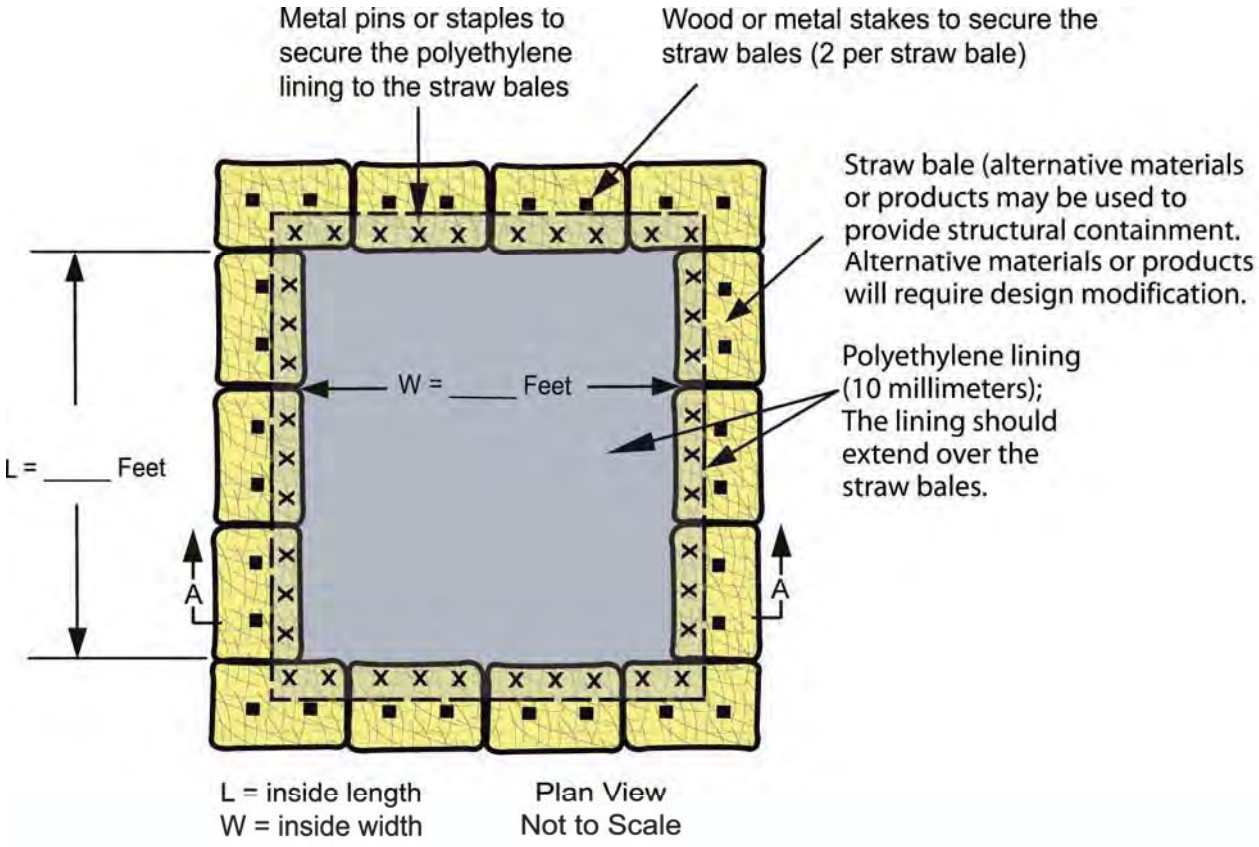
- Utilize and follow the design in the storm water pollution prevention plan to install the system.
- Dependent upon the type of system, either excavate the pit or install the containment system.
- A base shall be constructed and prepared that is free of rocks and other debris that may cause tears or punctures in the polyethylene lining.
- Install the polyethylene lining. For excavated systems, the lining should extend over the entire excavation. The lining for bermed systems should be installed over the pooling area with enough material to extend the lining over the berm or containment system. The lining should be secured with pins, staples, or other fasteners.
- Place flags, safety fencing, or equivalent to provide a barrier to construction equipment and other traffic.
- Place a non-collapsing, non-water holding cover over the washout facility prior to a predicted rainfall event to prevent accumulation of water and possible overflow of the system (optional).
- Install signage that identifies concrete washout areas.
- Post signs directing contractors and suppliers to designated locations.
- Where necessary, provide stable ingress and egress (see **Temporary Construction Ingress/Egress Pad** on page 17) or alternative approach pad for concrete washout systems.

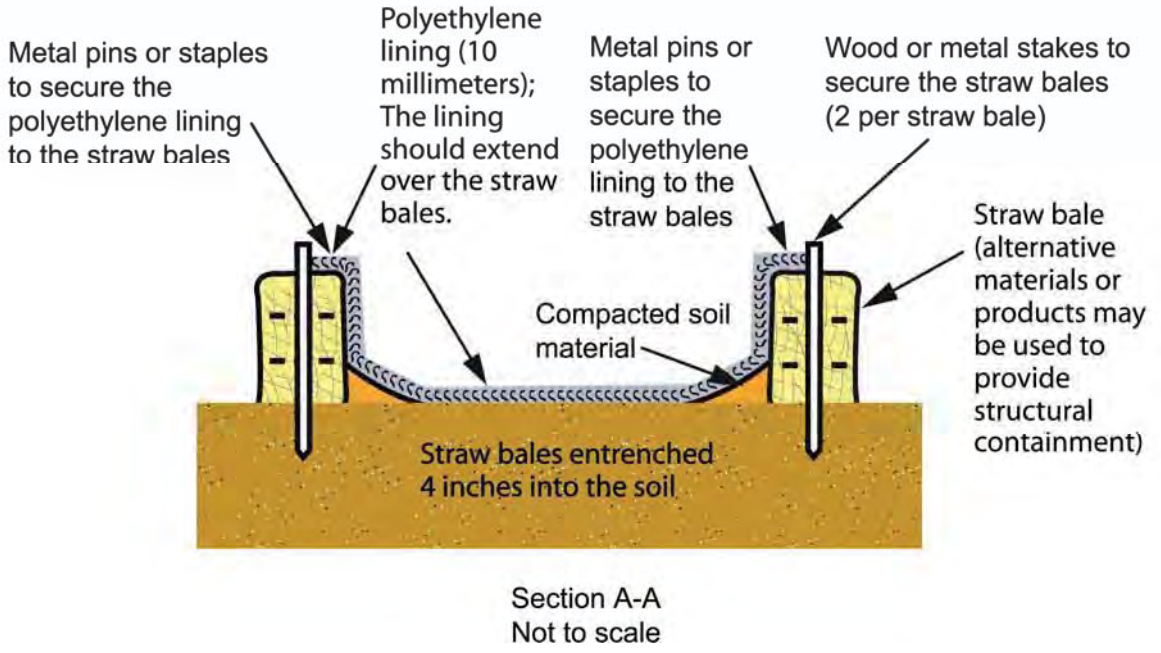
Maintenance

- Inspect daily and after each storm event.
- Inspect the integrity of the overall structure including, where applicable, the containment system.
- Inspect the system for leaks, spills, and tracking of soil by equipment.
- Inspect the polyethylene lining for failure, including tears and punctures.
- Once concrete wastes harden, remove and dispose of the material.
- Excess concrete should be removed when the washout system reaches 50 percent of the design capacity. Use of the system should be discontinued until appropriate measures can be initiated to clean the structure. Prefabricated systems should also utilize this criterion, unless the manufacturer has alternate specifications.
- Upon removal of the solids, inspect the structure. Repair the structure as needed or construct a new system.
- Dispose of all concrete in a legal manner. Reuse the material on site, recycle, or haul the material to an approved construction/demolition landfill site. Recycling of material is encouraged. The waste material can be used for multiple applications including but not limited to roadbeds and building. The availability for recycling should be checked locally.
- The plastic liner should be replaced after every cleaning; the removal of material will usually damage the lining.
- The concrete washout system should be repaired or enlarged as necessary to maintain capacity for concrete waste.
- Concrete washout systems are designed to promote evaporation. However, if the liquids do not evaporate and the system is near capacity it may be necessary to vacuum or remove the liquids and dispose of them in an acceptable method. Disposal may be allowed at the local sanitary sewer authority provided their National Pollutant Discharge Elimination System permits allow for acceptance of this material. Another option would be to utilize a secondary containment system or basin for further dewatering.
- Prefabricated units are often pumped and the company supplying the unit provides this service.
- Inspect construction activities on a regular basis to ensure suppliers, contractors, and others are utilizing designated washout areas. If concrete waste is being disposed of improperly, identify the violators and take appropriate action.

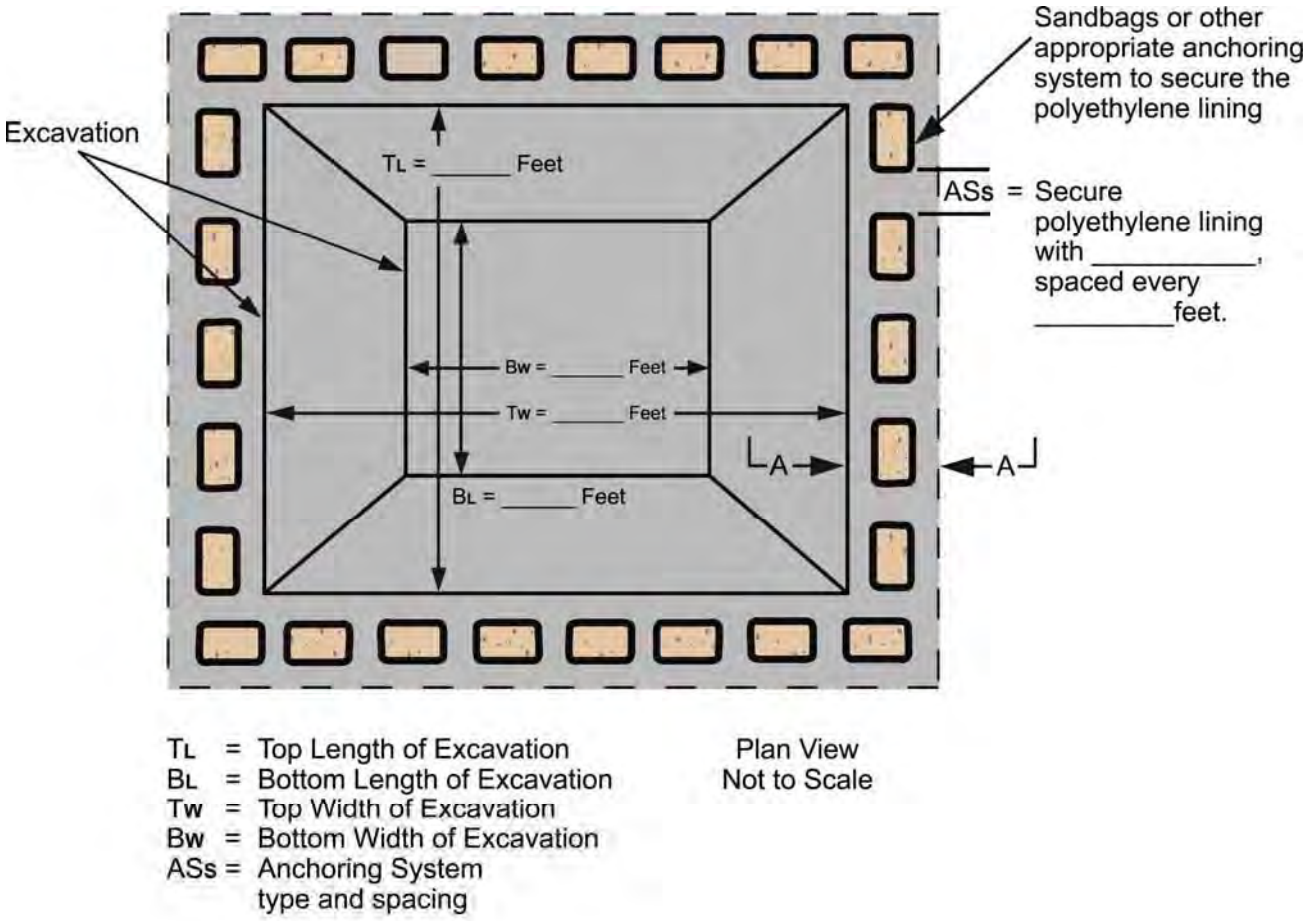
- When concrete washout systems are no longer required, the concrete washout systems shall be closed. Dispose of all hardened concrete and other materials used to construct the system.
- Holes, depressions and other land disturbances associated with the system should be backfilled, graded, and stabilized.

Concrete Washout (Above Grade System) Worksheet



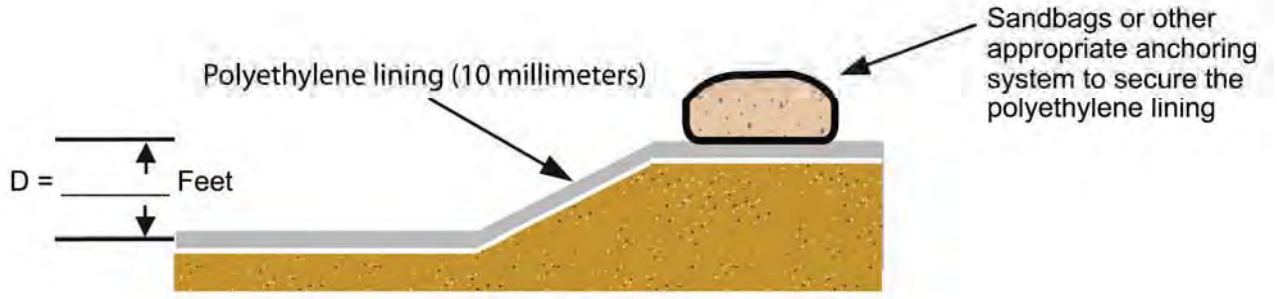


Concrete Washout (Below Grade System) Worksheet



TL = Top Length of Excavation
BL = Bottom Length of Excavation
Tw = Top Width of Excavation
Bw = Bottom Width of Excavation
ASs = Anchoring System type and spacing

Plan View
Not to Scale



Section A-A
Not to Scale

APPENDIX 3

SWP3 Inspection Forms and SWP3 Amendments, Grading, and Stabilization Log

AEP OHIO TRANSMISSION COMPANY, INC.
ASTOR-SHANNON 138 KV TRANSMISSION LINE PROJECT

STORM WATER POLLUTION PREVENTION PLAN (SWP3) INSPECTION FORM

Date: _____ Inspector's Name/Title: _____

Inspector's Company: _____

Inspector Qualified in accordance with Part VII.BB of Permit: ☐ Yes ☐ No (Document Qualifications in Appendix 3 of SWP3)

Inspection Type: ☐ Weekly (once every seven calendar days)

☐ Storm Event (0.5 inch or greater) Date: _____ Amount: _____ Duration: _____

Rain Event(s) Since Last Inspection:

Date: _____ Amount: _____ Duration: _____	Date: _____ Amount: _____ Duration: _____
Date: _____ Amount: _____ Duration: _____	Date: _____ Amount: _____ Duration: _____

Did any discharges occur during these events? ☐ No ☐ Yes, Location: _____

Current Weather: ☐ Clear ☐ Cloudy ☐ Fog ☐ Rain ☐ Snow ☐ Sleet ☐ High Winds ☐ Other: _____ Temp: _____

Current Discharges: ☐ No ☐ Yes, Location: _____

Evidence of Sediment/Pollutants Leaving the Site? ☐ No ☐ Yes, Location: _____

Has Seeding Taken Place? ☐ No ☐ Yes, Location/Seed tag photo included: _____

Erosion and Sediment Control Features / BMPs Inspected:

☐ **Silt Fence / Filter Sock (Mark which one applies)**

Location(s) (Structure # (STR#)): _____

Properly anchored/installed: ☐ Yes ☐ No Repairs Needed: ☐ Yes ☐ No

Sediment Removal Required (Sediment one-half height for fence & one-third height for sock): ☐ Yes ☐ No

Action Required/Taken/Location(s): _____

_____

☐ **Orange Barrier Fence**

Location(s) (Wetland / Access Road / STR#): _____

Properly anchored/installed: ☐ Yes ☐ No Repairs Needed: ☐ Yes ☐ No

Action Required/Taken/Location(s): _____

_____

☐ **Construction Entrance**

Location(s) (Reference intersection of road and nearest STR#): _____

Entrance Stabilized: ☐ Yes ☐ No Evidence of mud tracked on roadway: ☐ Yes ☐ No

Action Required/Taken/Location(s): _____

_____

☐ **Material Storage Areas (Including waste containers, fuel areas)**

Material Storage Areas located on site and shown on the SWP3: ☐ Yes ☐ No

Materials properly contained and labeled: ☐ Yes ☐ No Evidence of spills or releases: ☐ Yes ☐ No

Action Required/Taken/Location(s): _____

_____

☐ **Concrete Washouts**

Location(s) (Access Road / STR#): _____

Properly installed and located at least 50 feet from wetlands/streams/ditches/storm drains: ☐ Yes ☐ No

Replacement needed (concrete reaches 50 percent of the system): ☐ Yes ☐ No

Action Required/Taken/Location(s): _____

_____

Comments / Additional Control Measures Recommended: _____

_____

_____

If BMP modifications are made, you must update the SWP3 drawings and document changes on the SWP3 amendment log.

Inspector's Signature: _____ Date: _____

AEP OHIO TRANSMISSION COMPANY, INC.
ASTOR-SHANNON 138 KV TRANSMISSION LINE PROJECT

STORM WATER POLLUTION PREVENTION PLAN
AMENDMENTS, GRADING, AND STABILIZATION LOG

Date: _____ Inspector's Name/Title: _____

Location and Description of Grading and Stabilization Activities

_____

_____

_____

_____

Amendments to SWP3:

_____

_____

_____

Date: _____ Inspector's Name/Title: _____

Location and Description of Grading and Stabilization Activities

_____

_____

_____

_____

Amendments to SWP3:

_____

_____

_____

Date: _____ Inspector's Name/Title: _____

Location and Description of Grading and Stabilization Activities

_____

_____

_____

_____

Amendments to SWP3:

_____

_____

_____

AEP OHIO TRANSMISSION COMPANY, INC.
ASTOR-SHANNON 138 KV TRANSMISSION LINE PROJECT

SUMMARY SWP3 INSPECTION RECORDS – FOR TCRs

I have completed a review of the SWP3 inspections completed on the project for the period of _____ to _____.

The following major observations were made relating to the implementation of the SWP3 and review of the inspection log.

Inspector Qualifications:

☐ The inspections were performed by "qualified inspection personnel" knowledgeable in the principles of erosion and sediment control and skilled in assessing the effectiveness of control measures.

☐ The inspections were NOT performed by "qualified inspection personnel" knowledgeable in the principles of erosion and sediment control and skilled in assessing the effectiveness of control measures.

☐ Corrective Measures were taken on _____ to provide "qualified inspection personnel" at the site.

Permit Compliance Observations:

☐ The project was in compliance with the SWP3 and permit during the review period.

☐ The project was NOT in compliance with the SWP3 and permit during the review period as noted below:

☐ Non-compliance issues included:

_____
_____
_____
_____
_____
_____
_____
_____

☐ Corrective Measures were taken on _____ to correct the above non-compliance issues.

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

Name: _____

Title: _____

Signature: _____

Date: _____

APPENDIX 4

Duty to Inform Contractors and Subcontractors Signature Form

AEP OHIO TRANSMISSION COMPANY, INC.
ASTOR-SHANNON 138 KV TRANSMISSION LINE PROJECT

DUTY TO INFORM CONTRACTORS AND SUBCONTRACTORS SIGNATURE FORM

By signing below, I acknowledge that I have been informed of the terms and conditions of the Ohio Environmental Protection Agency's General NPDES Permit for Storm Water Associated with Construction Activity, and have reviewed and understand the conditions and responsibilities of the Storm Water Pollution Prevention Plan for the AEP Ohio Transmission Company, Inc. Astor-Shannon 138 kV Transmission Line Project. I understand that Inspectors shall meet the qualifications outlined in Part VII.BB. of Ohio EPA Permit No.: OHC000006.

Printed Name	Company	Signature	Date

Summary: Correspondence Proof of Compliance with Conditions 6 & 17. electronically filed by Hector Garcia-Santana on behalf of AEP Ohio Transmission Company, Inc..