

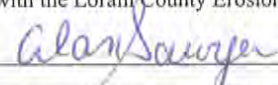
**CASE No. 14-1717-GA-BLN
LON
AVON LAKE GAS ADDITION PROJECT
PROPOSED NATURAL GAS PIPELINE**

ATTACHMENT K

EROSION AND SEDIMENT CONTROL PLAN

**EROSION AND SEDIMENT CONTROL PLAN REVIEW APPLICATION FORM
LORAIN SOIL AND WATER CONSERVATION DISTRICT**

ALL NECESSARY INFORMATION MUST BE PROVIDED ON THIS FORM. THE REVIEW AND
INSPECTION FEE SHALL BE SUBMITTED WITH THE DEVELOPMENT PLAN. PLANS SHALL NOT
BE APPROVED UNTIL THE FEE HAS BEEN PAID.

1. Owner Information					
Name	NRG Ohio Pipeline Company LLC		Phone	609-524-4677	
Address	211 Carnegie Center		Fax/Email	alan.sawyer@nrg.com	
City	Princeton	State	NJ	Zip	08540
2. Agent/Engineer/Contractor/Builder Information					
Name	ERM		Phone	847-258-8912	
Contact Person	Doni Murphy		Phone	847-258-8912	
Address	1701 Golf Road, Suite 1-1700		Fax/Email	doni.murphy@erm.com	
City	Rolling Meadows	State	IL	Zip	60008
3. Site Information					
Site Name	Avon Lake Gas Addition Project			Township	Eaton, LaGrange and Carlisle
Address	See attached maps			Project Type	Natural Gas Pipeline
NPDES Permit #	Pursuing	Wetland Permit #	Pursuing	Sublot #	
Receiving Watershed	04110001				
4. Soil Disturbing Activity Information					
Total Project Area (acres)	235 acres		Proposed Start Date	July 2015	
Total Contributing Drainage Area (acres)			Estimated Completion Date	April 2016	
Pre-Construction Site Conditions	Existing utility corridor/agricultural fields/residential or commercial development				
5. Payment Information Make Checks Payable to Lorain County Commissioners					
Date of Check		Check #		Amount \$	1,300.00
6. Certification					
I certify under penalty of law that this document and all attachments were prepared under my direction or supervision and are to the best of my knowledge and belief, true, accurate, and complete.					
NRG Ohio Pipeline Company LLC					
Printed Name	By Alan Sawyer, Vice President			Affiliation	NRG Ohio Pipeline Company LLC
I authorize the Lorain County Commissioners or its appointed agents to enter this property for the purposes of plan review, site inspection or compliance with the Lorain County Erosion & Sediment Control Rules for the duration of the project.					
Signature				Date	18 Dec 2014
7. Approval					
Approved as submitted	Y	N	By		
Date					
Disapproved – Please Correct the following items:					



Avon Lake Gas Addition Project

Lorain County, Ohio

Erosion and Sediment Control Plan

Prepared by
Environmental Resources Management
Hanover Engineering Associates

Prepared for
NRG Ohio Pipeline Company LLC

December 19, 2014

Signatory Requirement
(to be completed in advance of construction)

NRG Ohio Pipeline Company LLC

Avon Lake Gas Addition Project
Lorain County, Ohio

Erosion and Sediment Control Plan

Planned Construction Start Date: _____
Planned Construction Completion Date: _____

Construction Supervisor: _____
Phone: _____

Project Manager (signature): _____
Construction Contractor (signature): _____
Environmental Inspector (signature): _____

Prepared by
Environmental Resources Management
Hanover Engineering Associates

Prepared for
NRG Ohio Pipeline Company LLC

(Signature)

(Title)

(Date)

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APPENDICES

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Appendix B	Affected Wetlands and Waterways
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Appendix D	Typical Construction Diagrams

1.0 PROJECT OVERVIEW

Introduction

This Erosion and Sediment Control Plan (“ESCP or Plan”) has been prepared for NRG Ohio Pipeline Company LLC for construction activities associated with the Avon Lake Gas Addition Project (the “Project”) in Lorain County, Ohio. The purpose of this ESCP is to describe the planned methods, location and maintenance of erosion and sediment control to be implemented during construction of the Project, and methods of restoration following construction. The ESCP also documents planned best management practices (“BMPs”) that will be implemented during construction of the Project to minimize adverse environmental impacts associated with storm water runoff and sedimentation by preventing sedimentation into aquatic features and the tracking of sediment and debris onto public roads. This Plan has been prepared pursuant to the Ohio Department of Natural Resources’ pipeline construction standards, in conjunction with the most stringent of the collective requirements of the Ohio Environmental Protection Agency, Ohio Department of Natural Resources Division of Soil and Water Conservation, Lorain County Soil and Water Conservation District, City of Avon Lake, City of Avon, City of Elyria and the City of North Ridgeville.

Project Description

The Avon Lake Power Plant is a 734 MW coal-fired generating facility located in Avon Lake, Ohio (“Power Plant”).¹ The Power Plant is owned by NRG Power Midwest LP (“NRG Midwest”), which is an indirect subsidiary of NRG Energy, Inc. (“NRG”). The Power Plant was slated for retirement by the facility’s prior owner as a result of significant expenditures required to meet increasingly stringent environmental requirements. NRG Midwest has decided to move ahead with a gas addition project, which will keep the facility in operation on natural gas beyond its planned deactivation date (the “Avon Lake Gas Addition Project”). To add natural gas as a fuel supply for the Power Plant, the proposed natural gas pipeline must be designed, permitted and constructed. The Avon Lake Gas Addition Project will bring environmental, economic, employment and electric supply reliability benefits to the region as well as the State. The expected operation date for the pipeline is April 2016. The construction of the proposed pipeline is anticipated to begin as early as summer 2015. If NRG Ohio Pipeline receives the necessary permits and approvals to begin tree cutting in March of 2015, NRG Ohio Pipeline will do so.

The proposed 24-inch diameter high-grade steel pipeline will extend south from the Power Plant, which is located along the Lake Erie shoreline in the City of Avon Lake, to a proposed supply tap location southwest of the Village of Grafton (approximately 20 miles). The proposed pipeline will require siting approval from the Ohio Power Siting Board (“OPSB”), as well as permits and approvals from other local, State and federal authorities.

¹ The Power Plant also has one oil-fueled unit.

Approximately 3,922 feet of the proposed pipeline will be aboveground. The pipeline will require a permanent right-of-way (“ROW”) typically 50-feet in width for operation and maintenance and a temporary ROW of 100-feet for construction. Both the permanent and temporary ROWs have been reduced in some areas to reduce the potential for environmental impacts. Additional temporary workspace areas outside of the temporary construction ROW will be needed for short durations during construction. Existing public and private roads will be utilized for access to most of the construction ROW; however, approximately 2.2-miles (or 11,806-feet) of new 25-foot-wide temporary access roads are anticipated. Finally, the required regulating station will occupy up to approximately one acre.

Route Selection

The evaluation or consideration of route alternatives was generally aimed at reducing proximity to existing buildings and other above and below-ground infrastructure or features, while also balancing trade-offs associated with other routing considerations (socioeconomic, ecological, engineering, construction and cost related). Various routing objectives served as the underlying basis of the identification and consideration of alternatives, namely including the following:

- Reducing the potential for impact to wetlands, waterways and other surface and ground waters, to the extent feasible—including minimizing the number of waterway crossings to the extent feasible;
- Minimizing the extent of tree removal required, to the extent feasible;
- Reducing the extent of construction in areas of steep slopes, to the extent feasible; and
- Locating and designing the pipeline such that the use of existing access can be maximized and construction eased, to the extent feasible, with steadfast attention to public safety.

A comprehensive routing study was conducted to identify a preferred alternative. Multiple potential route corridors or alternatives, or iterations thereof, were identified and comparatively evaluated. Route alternatives were removed from consideration where they would result in a greater potential for adverse impacts.

Route adjustments requested by landowners have been incorporated to the extent feasible, reasonable or appropriate. For example, route adjustments requested by landowners have been incorporated when those requested adjustments would not otherwise significantly and adversely compromise or conflict with any routing objectives, or to the extent that any adjacent landowners were not involuntarily and adversely impacted. The proposed location of the Project, as depicted on the maps provided in Appendix A, reflects the results of NRG Ohio Pipeline Company LLC’s robust and comprehensive consideration of alternatives, as well as its willingness to work cooperatively with affected landowners.

General Description of Construction Activities and the Area to be Disturbed

Construction activities will occur within a newly acquired right-of-way though the majority of the area to be disturbed is either developed already (e.g. parking lot) or hosts existing crops or other herbaceous vegetation. Project construction activities (e.g. clearing/grubbing, grading, trench excavation, spoil storage, backfilling and restoration) will disturb soils within a corridor ranging from 50 to 100-feet in width, encompassing both the permanent and temporary ROWs. Both the permanent and temporary ROWs have been reduced in some areas to reduce the potential for environmental impacts. All work will be performed within the limit of disturbance described herein, and as depicted on the maps provided in Appendix A. Sediment controls must be installed within seven days of first clearing/grubbing or prior to any ground disturbing activity, whichever is first. Adherence to the erosion and sediment controls identified within this Plan will minimize the potential for soil erosion and sedimentation during construction and site restoration.

Typically, the trench will be excavated to allow three to five feet of cover over the new pipeline after installation and backfilling. The backfill material that will be returned to the trench will consist of the same material removed from the trench, to the extent practicable. Excess soil will be spread onsite, except in wetlands and waterways. Following the installation of the pipeline, all disturbed areas will be returned to their pre-construction slope and contour, to the extent feasible, stabilized and seeded. All vegetated areas that undergo Project-related soil disturbance will be seeded and re-vegetated to provide a permanent herbaceous cover to stabilize soils and prevent erosion. Other temporary erosion and sediment controls will be maintained until disturbed areas are stabilized.

Segmented construction is expected to ensure the Project is completed on schedule. Soil disturbing activities are anticipated to begin as early as June 2015 and be completed by April 2016. Some of the work will be performed during periods of frozen ground, to the extent feasible, to minimize impact to wetlands and other sensitive areas. A detailed sequence of construction activities can be found on page 83 of Appendix A.

The collective area of anticipated ground disturbance associated with the Project, including all permanent and temporary ROWs, temporary workspace areas, newly constructed temporary access roads, footprint of the regulating station, and BMP installation encompasses approximately 233 acres. Maps provided in Appendix A provide further detail as to the area or limit of disturbance associated with the Project.

New Impervious Areas and Runoff Coefficients

There will be no new impervious surfaces created as a result of the construction of the Project. As previously identified, the area to be disturbed is either developed already (e.g. parking lot) or hosts existing crops or other herbaceous vegetation. All areas disturbed by the Project will be restored to their

pre-construction material, condition or contours to the maximum extent feasible, unless they are restored to meadow condition.

Accordingly, post-construction runoff will remain essentially the same as pre-construction runoff. Therefore, the calculation of runoff coefficients for pre-construction vs. post-construction conditions is not warranted or applicable.

Delineation of Drainage Watersheds

Delineation of drainage watersheds traversed is not warranted or applicable for this Project because the temporary storm water control measures that will be implemented during construction are adaptable to any size watershed based on field conditions and professional judgment. No permanent storm water management systems will be developed for the Project. No permanent filling or relocation of wetlands or waters is planned, and no permanent bridges or culverts will be installed. Furthermore, there will be no permanent change to existing grade, ground surface material or waterway drainage or wetland contours, as all areas disturbed by the Project will be restored to their pre-construction condition, to the extent feasible, or restored to meadow condition.

Site Conditions

Soils

Based on review of U.S. Department of Agricultural National Resource Conservation Service soils data and the Lorain County Soil Survey, the following general soil series occur along the Project, as listed in Table 1.

Table 1. Soils along the Project

Soil Series	Description
Mahoning	Very deep somewhat poorly drained soils formed in low-lime till on till plains of Wisconsin age. The till is derived primarily from shale and siltstone, with minor amounts of limestone and crystalline erratics. Slope is primarily 0 to 6 percent, but ranges to 15 percent.
Udorthents	Moderately well drained to excessively drained soils that have been disturbed by filling, and areas that are disturbed or covered by development. Slopes range from 0 to 10 percent but are dominantly 0 to 5 percent.
Orrville	Very deep, somewhat poorly drained soils formed in loamy alluvium and are on flood plain steps on flood plains. They formed in alluvium from upland areas of low-lime drift, and from areas of sandstone, siltstone, shale, and limestone. They are in or bordering areas of Wisconsinan or Illinoian glaciation. Slope ranges from 0 to 3 percent.
Miner	Very deep, very poorly drained soils formed in low-lime glacial till principally derived from acid shale on lake plains which have been modified by lake action, and in shallow depressions and narrow drainages on till plains. They formed in till principally derived from acid shale. The slope gradient ranges from 0 to 2 percent.
Lorain	Very deep, very poorly drained soils that formed in Wisconsin age fine-textured glaciolacustrine sediments. These soils formed in Wisconsin age glaciolacustrine sediments in depressions on lake plains, terraces, and till plains. Slope ranges from 0 to 2 percent.
Fitchville	Very deep, somewhat poorly drained soils formed in stratified Wisconsinan age glaciolacustrine sediments that are derived mainly from materials high in sandstone and shale and are on summits and shoulders on lake plains and are on treads on terraces. Slope ranges from 0 to 12 percent.
Mermill	Very deep, very poorly drained soils on lake plains, and less commonly on till plains of late Wisconsinan age. They have a plane or concave surface with a slope gradient of 0 to 2 percent.
Oshtemo	Very deep, well drained soils formed in stratified loamy and sandy deposits on outwash plains, valley trains, moraines, and beach ridges. These soils formed in stratified loamy and sandy deposits that have a high content of quartz and contain variable amounts of material derived from igneous and metamorphic rocks, sandstone, limestone, and dolomite. Slope ranges from 0 to 55 percent.
Holly	Very deep, very poorly and poorly drained soils formed on broad flat areas and in slight depressions on flood plains receiving alluvium from upland areas of low-lime drift and noncalcareous sandstone and shale. Slope ranges from 0 through 3 percent.
Chili	Very deep, well drained soils on outwash plains, terraces, kames, and beach ridges. The soils formed in Wisconsinan age stratified outwash derived largely from noncalcareous sandstone and shale that contains a high amount of quartz gravel. Commonly, the outwash is mantled with silt. The slope gradient typically is 0 to 18 percent, but the range is up to 70 percent.
Haskins	Very deep, somewhat poorly drained soils that are moderately deep or deep to dense till on lake plains and on till plains of late Wisconsinan age. They formed in

Soil Series	Description
	loamy water-sorted or glaciolacustrine material and in the underlying till. These soils are on lake plains and till plains. Slope ranges from 0 to 6 percent.
Lobdell	Very deep, moderately well drained soils that formed in recent loamy alluvium. These soils are on nearly level flood plains receiving loamy alluvium from upland areas of sandstone, shale, and low lime glacial drift. Slope ranges from 0 to 3 percent.
Mentor	Very deep, well drained soils formed in silty lacustrine material. These soils are on threads and risers on terraces, dissected lake plains, and silty outwash plains. These soils are formed in stratified glaciolacustrine or terrace deposits derived from materials high in sandstone and shale. Slope ranges from 0 to 70 percent.
Luray	Very deep, very poorly drained soils formed in silty lacustrine material or slack water sediments. These soils are on slight depressions or on level areas on lake plains, terraces, outwash plains, and in small local areas on till plains. Slope ranges from 0 to 2 percent.
Sebring	Very deep, poorly drained soils formed in stratified Wisconsinan age glaciolacustrine sediments and are on broad flats and depressions on lake plains and slackwater terraces. Slope ranges from 0 to 2 percent.
Trumbull	Deep, poorly drained soils formed in low-lime glacial till. These soils are on level to gently sloping and depressional portions of till plains. Slopes are dominantly less than 4 percent but range to 6 percent.
Rawson	Very deep, moderately well drained soils that formed in loamy sediments and till on till plains, outwash plains and lake plains of Wisconsinan age. They are moderately deep or deep to dense till. Slope ranges from 0 to 12 percent.
Bogart	Very deep, moderately well drained soils that formed in Wisconsinan age stratified outwash deposits and are on convex slopes in areas of low relief on stream terraces, beach ridges, and outwash plains. Slopes range from 0 to 12 percent.
Tioga	Very deep, well drained soils formed in alluvium on higher positions in flood plains. These soils formed in recent alluvium, mainly from areas of sandstone, siltstone, and shale. Slope ranges from 0 to 3 percent.
Ellsworth	Very deep, moderately well drained soils formed in low-lime till on plains of Wisconsin age typically with a calcium carbonate equivalent of between 5 and 15 percent. The till is derived from shale and sandstone, with minor amounts of limestone and crystalline rocks. Slope ranges from 0 to 70 percent.
Allis	Moderately deep, poorly drained soils on bedrock controlled uplands. They are less frequently located on lake plains. They are on till plains and, less frequently, lake plains. The soils are formed in a thin mantle of glacial till dominated by, and underlain by, acid shale which, in some places is interbedded with siltstone and sandstone. Slope is 0 to 2 percent.
Jimtown	Very deep, somewhat poorly drained soils formed in Wisconsinan Age stratified outwash deposits on stream terraces, outwash terraces, outwash plains, and beach ridges. Slope ranges from 0 to 6 percent.

Land Use

Current land use along the Project area generally consists of industrial, mixed developed, undeveloped and varying densities of residential uses. Where the Project generally extends through the City of Avon Lake, the predominant land use crossed by the Project is industrial use. Where the Project generally extends through the City of Avon, the predominant land use is undeveloped with adjacent industrial, recreational, and residential uses from north to south through the City. Where the Project generally extends through the City of Elyria, the predominant land use is institutional (Lorain County Community College). Where the Project generally extends through the City of North Ridgeville, the predominant land use is undeveloped/wooded with adjacent residential and commercial uses. Proposed residential uses are known to occur in some areas along the Project. Some agricultural uses do occur along the Project, near its southern end, in the undeveloped portions of Eaton, Carlisle and LaGrange Townships. Because this Project mostly crosses lands already developed and parallels existing previously disturbed rights-of-way, there has already been prior ground disturbance and maintenance in the area of the Project. Once the Project is built, the permanent ROW will be maintained as an operational ROW. The ROW will be reseeded, though trees will not be allowed to regrow within the operational ROW.

Wetlands and Waters

Wetlands and streams will be crossed by the Project. There are three predominant types of wetlands that occur along the Project; palustrine forested ("PFO"), palustrine scrub-shrub ("PSS") and palustrine emergent ("PEM"). Construction of the Project will require the removal of trees in 41 acres of PFO wetlands. Forested wetlands along the Project are depressional in nature and located adjacent to agricultural areas that have been actively farmed and ditched. Seven acres of PSS wetlands will be affected by the Project and like the forested wetlands along the Project, these wetlands are also depressional in nature and typically located adjacent to agricultural areas that have been actively farmed and ditched. The Project will affect 11 acres of PEM wetlands, which are similar in nature to the PSS wetlands but located in wet meadows and areas that have endured past clear cutting and farming activities.

Vegetation along intermittent and perennial streams that will be crossed by the Project typically includes a mixture of forested, scrub-shrub and emergent vegetation. Typical substrate types include leaf pack/woody debris, clay or hardpan, muck, gravel, silt and sand. Maps provided in Appendix A depict the location and type of each wetland, in addition to streams, that are within 200-feet of the Project. A copy of the wetland delineation report prepared for the Project and submitted to both the U.S. Army Corps of Engineers and the Ohio Environmental Protection Agency ("OEPA") is included in Appendix D.

Receiving Waters

Surface waters along the Project that are potential receiving waters are identified in Appendix B. Thermal impacts, flow rate, runoff volume and runoff pollution will be minimized by restoring the entire limits of ground disturbance to pre-construction conditions, to the extent feasible, or converting to

meadow in good condition. The thick, vegetative cover will help minimize storm water impacts. Additionally, the permanent ROW will be restored to pre-construction grade, which will promote sheet flow where it currently occurs, across a vegetated area acting as a filter strip.

2.0 CONSTRUCTION ACTIVITIES

This section describes the environmental construction techniques that will be performed to install the pipeline. As previously identified, BMPs will be implemented throughout construction to minimize soil erosion and the transport of sediments from the construction area, and to protect surface waters and wetlands located in and adjacent to the Project area. Detail drawings of specific BMPs are included in Appendix A.

Sequence of Construction Activities

The following provides an overview of the typical activities performed during pipeline construction. Wherever practical, construction activities will occur simultaneously and some steps may not occur in the exact order in which they are listed below.

- Survey and stake proposed pipeline and limits of disturbance.
- Install rock entrances at ingress/egress points to the ROW.
- Flag/field mark wetland areas.
- Install perimeter and other sediment barriers, as required by this Plan.
- Begin clearing of the ROW.
- Grade the workspace if necessary.
- Install geotextile fabric, matting or plating, as required by this Plan.
- Install erosion control blankets on steep slopes.
- Implement BMPs for trench dewatering.
- Install temporary stream crossings (install sedimentation controls as necessary for retaining temporary spoil piles) and restore/stabilize stream banks.
- Excavate the pipeline trench.
- String new pipe along the ROW.
- Weld new pipe sections together.
- Lower pipeline into trench.
- Install clay trench plugs or anti-seep collars.
- Backfill trench.
- Restore grade to preconstruction contours.
- Apply lime and fertilizer as needed. Seed and mulch all disturbed upland areas, and only use the specified wetland seed mix, if required, in wetlands.
- Monitor adequacy of erosion control practices.
- After permanent stabilization is achieved, remove temporary erosion and sediment controls.

Timing of Certain Construction Activities

The special timing considerations that apply to construction activities and implementation of BMPs are described below.

Sediment controls such as siltsoxx will be installed before initial ground disturbance, or immediately following ground disturbance if the nature of the disturbance (e.g., grading) would affect the stability of preinstalled sediment controls. Disturbed areas must be stabilized (i.e., using vegetative or structural soil cover to control erosion, such as temporary or permanent seed and mulch) during construction as specified in Tables 2 and 3 below.

Table 2. Temporary Stabilization Requirements

Area Requiring Temporary Stabilization	Timeframe to Apply Erosion Controls
Disturbed areas within 50-feet of jurisdictional wetlands and waters and before final grade	Within two days of the most recent disturbance if the area will remain idle for >14 days
For all disturbed areas that will be idle for >21 days but <1 year, and not within 50-feet of a stream	Within two days of the most recent disturbance in the area
Disturbed areas that will be idle over the winter	Prior to November 1

Table 3. Permanent Stabilization Requirements

Area Requiring Permanent Stabilization	Timeframe to Apply Erosion Controls
Any areas that will lie dormant for one year or more	Within two days of the most recent disturbance
Any areas within 50-feet of a stream and at final grade	Within two days of reaching final grade
Any other areas at final grade	Within two days of reaching final grade within that area

Timing of Waterway Crossings

In-stream work will be scheduled to avoid high stream flow conditions, such as immediately following heavy periods of rain, to achieve a dry or low flow condition. The total length of excavated trench open at the stream crossing at any one time will not be greater than the total length of pipeline that can be placed in the trench and backfilled in one working day. Equipment associated with isolation crossing methods (i.e., sand bag dams, flume pipe, pumps, etc.), should they be employed, should not be left in the stream overnight. Every effort will be made to cross streams 10-feet in (bottom) width or less, including the trench backfilling, in one working day. Stream banks and the areas 50-feet from the top of each stream bank will be stabilized within 72 hours from the beginning of the stream crossing.

3.0 EROSION PREVENTION AND SEDIMENT CONTROL MEASURES

Construction activities will occur within a newly acquired right-of-way, though the area to be disturbed hosts existing vegetation. Project construction activities (e.g. clearing/grubbing, grading, trench excavation, spoil storage, backfilling and restoration) will disturb soils within a corridor ranging from 50 to 100-feet in width, encompassing both the permanent and temporary ROWs. Both the permanent and temporary ROWs have been reduced in some areas to reduce the potential for environmental impacts. All work will be performed within the limit of disturbance described herein, and as depicted on the maps provided in Appendix A. Sediment controls must be installed within seven days of first clearing/grubbing or prior to any ground disturbing activity, whichever is first. Adherence to the erosion and sediment controls identified within this Plan will minimize the potential for soil erosion and sedimentation during construction and site restoration.

In general, the measures in this ESCP are designed to minimize erosion and sedimentation by:

- Limiting construction activities to only approved areas identified in this Plan;
- Minimizing the extent and duration of exposed bare soil conditions;
- Stabilizing exposed bare soils;
- Installing and maintaining erosion and sediment control measures in appropriate locations;
- Protecting slopes;
- Establishing perimeter controls and sediment barriers;
- Utilizing specialized construction and restoration techniques for wetland and waterway crossings;
- Retaining sediment on-site;
- Implementing spill prevention and control measures;
- Establishing vegetation as soon as possible following construction activities;
- Continually inspecting the area of ground disturbance and ensuring all implemented BMPs are maintained and effective until final stabilization is achieved.

Temporary Sediment Barriers

Temporary sediment barriers, such as siltsoxx, shall be placed to intercept runoff from the construction area to prevent sediment from entering surface waters and off-ROW areas.

General Right-of-Way Area

Perimeter sediment control (i.e. siltsoxx) will be placed down-gradient of pipeline construction activities and staging areas, where effective and required to protect adjacent undisturbed wetlands and other surface water resources and road surfaces from sedimentation. Installation will be in accordance with the details depicted or described in Appendix A. Sediment will be removed when accumulations reach

1/2 the above ground height of the barrier. Perimeter sediment control barriers that have been undermined or topped will be immediately repaired.

Hillside Pipeline Construction

For pipeline construction parallel to the gradient of a hill (uphill/downhill), where the slope is greater than 1%, suitable sediment barriers may be installed across the ROW to divert runoff to well vegetated areas if runoff has the potential to adversely affect adjacent surface waters and road surfaces. For pipeline construction perpendicular to the gradient of a hill (sidehill areas), where the slope is greater than 1%, a perimeter sediment control barrier shall be installed to protect adjacent surface waters and road surfaces. Both ends of the barrier will be extended at least eight feet up slope at 45 degrees to the main barrier alignment. Installation will be in accordance with the details depicted or described in Appendix A.

Soil Stockpiles

A perimeter sediment control barrier will be installed adjacent to soils stockpiles to prevent sedimentation into streams and wetlands. Maps or drawings illustrating the locations of proposed BMPs are provided in Appendix A. Stockpiles will be placed at existing level grade with both ends of the barrier extending at least eight feet up slope at 45 degrees to the main barrier alignment. Sediment will be removed when accumulations reach 1/2 the aboveground height of the barrier.

Spoil piles from trench excavation will be placed outside of streams and stabilized in a way that will limit the extent of sedimentation entering any stream bed. Spoil piles located in wetlands may be temporarily side-cast into wetlands. However, side-cast material will be managed with appropriate BMPs (stacking spoils on geotextile fabric, timber matting or steel plating and installation of siltsoxx along the perimeter of the spoil pile area) to prevent sedimentation into wetlands and waters.

Road Crossings

The types and locations of control measures needed at roadway crossings will depend upon the slope of the land and the type of roadway drainage systems present at that location. Upslope runoff will be diverted around the work area, as appropriate. For this Project, upslope diversion is not anticipated since the terrain at the road crossings is flat. Sediment barriers will be located downslope of trench or boring pit storage piles. Such storage piles will not be located in any roadway swale or ditch. Runoff from existing roadway culverts, storm sewers, swales, and ditches will be safely conveyed over any open trench.

When entering any construction area from paved roads, all sediment tracked onto the road will be cleaned as soon as practical. If excessive tracking occurs or equipment will access an area for extended periods of time, a stabilized construction entrance constructed of stone will be installed. Installation of stone entrances will be in accordance with the details depicted or described in Appendix A.

Trench Dewatering

Excessive water that accumulates in the trench will be pumped from the trench and filtered prior to discharging onto the ground along the ROW. Filter bags, designed to trap particles larger than 150 microns, will be used to remove sediment from the water. The filter bags will be located on a relatively flat (< 5% slope), well-vegetated area. If the dewatering location is within 50 feet of a stream or wetland, a suitable barrier will be installed to prevent sedimentation into the stream or wetlands. The pump discharge hose will be inserted into the bags in the manner specified by the manufacturer and securely clamped. When the bag is filled to 1/2 its total capacity, it will be replaced with a new bag and

properly disposed. If a well-vegetated area is not available, a geotextile underlayment will be placed under the discharge area. Installation of filter bags will be in accordance with the details depicted or described in Appendix A.

Permanent Sediment Barriers

Trench Plugs

Clay trench plugs or anti-seep collars are required for trenching in wetlands, regardless of trench slope. These requirements supplement the general construction practice of placement of plugs in trenches on steep slopes. Trench plugs will also be installed if it is determined that flooding at the low point elevation of a pipeline will adversely affect an adjacent property. Installation of trench plugs will be in accordance with the details depicted or described in Appendix A.

Wetland and Waterway Crossings

Proposed stream-crossing techniques have been selected in accordance with applicable permit requirements, the technical feasibility of the method at each site and the ability of the technique to minimize the potential for sediment release to downstream habitats. Contingency methods will be used if the preferred technique is assessed to be not practical or too high a risk at the time of construction as determined by stream flows and other on-site conditions.

Typically, minor streams, ≤ 10 -feet wide at normal flow depth, will be crossed using “open cut” method. Intermediate streams, > 10 -feet and ≤ 100 -feet wide, and major streams, > 100 -feet in width, will be crossed using the wet trench method or by horizontal directional drilling.

Hazardous materials, chemicals, fuels, and lubricating oils will not be stored, and concrete coating activities will not be conducted, within 100 feet of any waterway or wetland. Refueling of construction equipment will be conducted at least 100 feet away from waterways and wetlands.

Additional erosion and sediment control will be implemented near wetlands and waterways in the form of erosion control matting. Matting will be placed along the edges of wetlands and waterways within the construction ROW. Where construction equipment and vehicular traffic must cross wetlands, temporary timber matting or other suitable methods will be utilized to prevent sedimentation into wetlands.

The requirements of applicable federal (i.e. U.S. Army Corps of Engineers) and State (e.g. Ohio Environmental Protection Agency) regulatory approvals associated with jurisdictional wetlands and waters will otherwise be adhered to at wetland and waterway crossings. Typical drawings depicting wetland crossing methods, stream crossing methods, temporary equipment bridges and stream crossing BMPs are provided in Appendix A.

Stream Crossings

Prior to any construction activities within the stream channel, perimeter sediment control barriers will be installed on both sides of the stream banks. Spoil piles from the tie-in and trench excavations will be placed behind the barriers to protect the stream or waterway from sediment buildup. Assembly areas, temporary equipment and non-hazardous material storage areas will be located a minimum of 50 feet back from the top of the stream bank.

Perimeter sediment control barriers shall be installed parallel to the stream bank with both ends extending at least eight feet upslope at 45 degrees to the main barrier alignment. Sediment shall be removed when accumulations reach ½ the above ground height of the device. Any section of the sediment barrier that has been undermined, topped or damaged will be immediately repaired. The barriers shall remain in place until final stabilization of the area.

Open Cut Method

Open cutting is the standard method for pipe installation in dry watercourses well removed from fish bearing reaches. The pipeline trench is excavated in the bed and banks of the flowing or dry watercourse channel and is backfilled after the pipe is lowered in. The bed and banks of the channel are re-contoured to their original condition and stabilized with seed and mulch. Erosion control matting and/or rip-rap may also be used to further stabilize the watercourse.

After installation of the perimeter sediment control barrier, excavation activities may commence. The trench will be excavated to the minimum width necessary to accommodate installation of the pipe. The trench will be monitored to ensure proper depth and width. In most instances, streambed substrate should be separated from the subsoil and backfilled last to minimize impact. Excavated material that will be subsequently used as backfill shall be immediately removed from the stream crossing and placed behind the sediment barriers on the stream bank. The pipeline will then be lowered into the trench and backfilled. Trench plugs will be installed at the top of the stream bank as depicted on the maps or drawings provided in Appendix A. The stream bank will then be stabilized with seed and mulch. Erosion control matting and/or rip-rap may also be applied to further stabilize the stream banks.

Isolation Method

The isolation method is one in which a trench is excavated in the bed and banks of a water body while the surface water in the water body flows uninterrupted and isolated from the excavation area. Isolation techniques include, but are not limited to, fluming, pumped by-pass, and in-channel diversion.

After placement of the perimeter sediment control barrier, installation of the flume or pumped by-pass will commence. The structures for stream isolation methods will be installed and functioning prior to any trench excavation within the stream channel. Sand-filled bags may be stacked at least 12 inches above the level of the stream to create a dam. The trench will be excavated to the minimum width necessary to accommodate installation of the pipe. The trench will be monitored to ensure proper depth and width. Excavated material that will be subsequently used as backfill will be immediately removed from the stream crossing and placed behind the sediment barriers on the stream bank. The pipeline will then be lowered into the ditch and backfilled. (Pipe will be welded and bent prior to placement in the trench.) Trench plugs will be installed at the top of the stream bank as provided in Appendix A. The stream banks will be restored to original contour and stabilized with either riprap or erosion control matting. The sand bag dams will be removed following complete restoration of the stream channel and banks.

Horizontal Directional Drill Method

Horizontal directional drilling has been identified as the preferred crossing method for some waterways, particularly larger waterways that will be crossed by the Project. After placement of the perimeter sediment barrier, the launching and receiving holes on both sides of the waterway will be excavated. These excavations will be at least ten feet or more from the stream bank.

Wetland Crossings

Prior to construction, wetlands will be identified and flagged within the ROW. Extra work and staging areas will be located at least 50 feet from the edge of the wetland, where possible. The width of the disturbance will be limited to the minimum necessary for the actual crossing. Movement of vehicles and equipment across the wetland will be minimized. Where equipment and vehicles must traverse saturated wetlands, the use of pads, mats or other suitable methods will be used to minimize disturbance.

During trench excavation, the top six to 12 inches of topsoil (with the vegetative root mass) will be carefully removed from over the trenchline and stockpiled separately from the trench subsoil (unless standing water or saturated soils make this impracticable to effectively segregate). Topsoil piles should be differentiated from subsoil piles with flagging, ribbons or other effective devices. The pipeline will be installed and trench plugs will be placed as identified in this Plan, to prevent the trench from draining the wetland or changing its hydrology. The trench will be backfilled with subsoil first and topsoil on top, and the preconstruction contours will be restored. Excess material, if any, will be removed from the wetland upon completion. Unless required by local agencies, seeding, mulching and fertilization will not be done in wetlands. Restoration of the previously salvaged topsoil will allow the wetland vegetation indigenous to the wetland to re-vegetate naturally. Disturbed slopes adjacent to the wetland will be stabilized immediately upon pipeline installation.

4.0 POST-CONSTRUCTION EROSION CONTROL PRACTICES

Permanent or temporary soil stabilization shall be applied to disturbed areas within two (2) days after final grade has been reached at any location along the Project. Seeding will take place once construction has been completed and the soil has been returned to its pre-construction grade. Recommended seed mixtures and seed rates are found in Appendix A (see page 84). Any removed topsoil in wetlands will be returned to where it was removed and the natural seed allowed to re-establish. If landowner specific requests for restoration measures or seed mixes are received, they will be evaluated on a case by case basis and only implemented if such request(s) adheres to all applicable regulatory requirements. When seasonal conditions prohibit the application of temporary or permanent seeding, dormant seeding (applying seed at 1.5 times the permanent seeding rate) or non-vegetative soil stabilization practices such as mulching or matting will be used.

All disturbed areas will be seeded with plant species that have a high germination capacity. Seeding will be performed with broadcast seeding equipment followed by mulch covering in accordance with the application rates provided in Appendix A. Similarly, lime and fertilizer will be applied at the amounts identified in Appendix A. Final stabilization must be achieved where grass growth has achieved, at a minimum, an 85% even perennial coverage in all disturbed areas. At the end of construction/restoration activities, final site inspection to identify any remaining items to be completed to ensure long-term soil stability will be completed.

5.0 ADDITIONAL POLLUTION CONTROL MEASURES

NRG Ohio Pipeline Company LLC will implement a Spill Prevention, Control and Countermeasure Plan ("SPCC Plan") for the Project (see Appendix A; pages 83-88). The SPCC Plan describes planning, prevention and control measures to minimize impacts resulting from spills of fuels, petroleum products or other regulated substances as a result of pipeline construction. Mixing, pumping, transferring or other handling of construction chemicals or compounds such as fertilizer, lime, any concrete drying compounds, and all other potentially hazardous materials shall be performed in an area away from any water source or ditch. Equipment fueling and maintenance shall be performed away from surface waters, in areas designated specifically for this purpose. The designated areas shall be equipped for recycling oil and catching spills.

If substances such as oil, diesel fuel, hydraulic fluid, antifreeze, etc., are spilled, leaked or released onto the soil, the soil should be dug up and disposed of at a licensed sanitary landfill or other approved petroleum contaminated soil remediation facility (not a construction /demolition debris landfill). In the event that there are areas of contaminated soils encountered during construction, additional measures may be required. The soils shall be dug up and disposed of at a licensed facility (not a construction/demolition debris landfill). Depending on the extent of contamination, additional treatment and/or collection and disposal may be required. All storm water discharge associated with any contaminated soils must be permitted.

Spills on pavement shall be absorbed with appropriate absorbent materials and disposed of with the trash at a licensed sanitary landfill. Hazardous or industrial wastes such as most solvents, gasoline, oil-based paints and any cement curing compounds require special handling. Spills shall be reported to the Ohio Environmental Protection Agency ("OEPA") at (1-800-282-9378). Spills of 25-gallons or more of petroleum products shall be reported to the OEPA, the local fire department and the Local Emergency Planning Committee within 30 minutes of discovery of the release. All spills which result in contact with any State jurisdictional waters must be reported to the OEPA.

Waste disposal containers shall be provided for the proper collection of all waste materials including construction debris, sanitary garbage, petroleum products, and any hazardous materials to be used on-site. Containers shall be covered and not leaking. All waste material shall be disposed of at facilities approved for that material. Construction wastes will be disposed of in a timely manner. Dumpsters will be emptied on an as-needed basis. No construction wastes or unused materials will be buried, dumped or discharged at or near the area of construction.

Open burning is not allowed within restricted areas such as within municipal corporation limits.

No materials containing rubber, grease, asphalt, or petroleum products (such as tires, auto parts, plastic, or plastic coated wire) may be burned (see OAC 3745-19) at any location.

Dust control is required to prevent nuisance conditions. Dust controls must be used in accordance with the manufacturer's specifications and not be applied in a manner, which would result in a discharge to waters of the state. Isolation distances from bridges, catch basins, and other drainages must be observed. Application (excluding water) may not occur when precipitation is imminent as noted in the short term forecast. Used oil may not be used as dust control.

External washing of wheels, trucks or other construction equipment will be confined to designated washing locations. Wash water from these areas must be directed to a designated sediment trap, settling pool or a sump pump. Sediments deposited on roadways will be removed and returned to the construction site on a daily basis. Discharges such as vehicle and or equipment washing are considered process wastewaters. All process wastewaters must be collected and properly disposed at an approved disposal facility. In the event of an unintended discharge of process wastewaters to any jurisdictional surface waters, it must be isolated for collection and proper disposal and corrective actions taken to eliminate the source of waste water.

Portable sanitary facilities will be kept on-site during construction. These facilities will be emptied on an as-needed basis and will be left empty if a break in construction occurs. A licensed sanitary waste sub-contractor will be used for managing the sanitary facilities.

6.0 MAINTENANCE AND INSPECTION

NRG Ohio Pipeline Company LLC will ensure inspection and maintenance on erosion prevention and sediment control measures occurs on a weekly basis and after each rainfall event greater than 0.5-inches. All necessary repairs must be made immediately to ensure effective and efficient operation. A copy of the inspection form is found in Appendix C.

Maintenance

All protective measures identified in this ESCP must be maintained in effective operating condition. If, through inspection or other means, it is determined that BMPs are not operating effectively, then maintenance shall be performed as necessary to maintain the continued effectiveness of stormwater controls, within three (3) days. Erosion and sediment controls that have been intentionally disabled, run-over, removed or otherwise rendered ineffective must be replaced or corrected immediately upon discovery. If periodic inspections or other information indicate a control has been used incorrectly, is performing inadequately or is damaged, then it must be replaced or modified within ten days following the discovery.

Inspection

The disturbed area will be regularly inspected during construction, as will areas of temporary and permanent stabilization. Personnel conducting these inspections must be familiar with the construction area and knowledgeable of this ESCP. Sediment and erosion control measures identified in this ESCP will be inspected to ensure that they are operating correctly. Inspection of the entire area of disturbance must be conducted at least once every seven (7) days during active construction and within 24 hours after a rainfall event greater than 0.5-inches. Following an inspection which occurs within 24 hours after a rainfall event greater than 0.5-inches, the next inspection must be conducted within seven (7) days.

This ESCP will be modified based on the results of the inspections, as necessary, to ensure adequate erosion and sediment control. Any revisions to the Plan will be completed within seven (7) days following each inspection, and provided to the appropriate administering parties in accordance with State and local requirements. If existing BMPs are modified or if additional BMPs are necessary, an implementation schedule will be provided at the time that the Plan is revised. Inspection and maintenance forms are provided in Appendix C.

7.0 TRAINING

Since the training of staff and subcontractors can act as an effective BMP, a construction personnel training program is recommended to educate personnel responsible for implementing any component of the ESCP, or personnel otherwise responsible for storm water pollution prevention in accordance with the ESCP.

8.0 HYDROSTATIC DISCHARGE

After installation, most pipelines require testing using hydrostatic pressure to ensure integrity of the welds and seams. The subsequent test water is typically discharged onsite or into a sanitary sewer. If discharge into any jurisdictional surface waters is anticipated, NRG Ohio Pipeline Company LLC will obtain the required regulatory approvals for such discharge.

BMPs must be implemented during the hydrostatic discharge test. Every effort will be made to discharge onto a large, well vegetated, non-sloping upland area. The water will be regulated at the discharge point to prevent excessive flow and scouring. Test water is typically obtained from a municipal water source and no chemicals or additives are to be used in the test water. If the discharge conditions require releasing water near any jurisdictional surface water or if high levels of iron or total suspended solids are anticipated, BMPs such as slowing the velocity of the release and/or using treated filters to remove suspended solids and metals may be considered.

9.0 ENVIRONMENTAL APPROVALS

NRG Ohio Pipeline Company LLC will obtain all permits and approvals required to construct the Project. Table 4 lists the major federal and state environmental permits required for the Project and the status of each permit or approval.

Table 4. Required Permits and Approvals

Agency	Permit or Approval Required	Status
Federal		
U.S. Army Corps of Engineers	Section 404 Clean Water Act Authorization	Being submitted in December 2014
U.S. Fish and Wildlife Service	Threatened and Endangered Species Consultation	Pending
State		
Ohio Environmental Protection Agency	General Construction Permit, Notice of Intent/Storm Water Pollution Prevention Plan	To be submitted in advance of construction
	Hydrostatic Test Water General Permit	To be submitted in advance of testing
	Section 401 Water Quality Certification	Submitted
Ohio Department of Natural Resources	State Protected Species Consultation	Pending
Ohio Historic Preservation Office	Historic Preservation Consultation	Pending
Ohio Power Siting Board	Letter of Notification	Being submitted in December 2014

Appendix A

Project Erosion and Sediment Control Plans

AVON LAKE GAS ADDITION PROJECT

E&SC PLAN

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA & NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

PLANS PREPARED BY:

Hanover
Engineering Associates Inc
3355 ROUTE 611, SUITE 1
BARTONSVILLE, PA 18321-7822
PHONE: 570.688.9550
FAX: 570.688.9768

PROJECT OWNER/APPLICANT:

NRG OHIO PIPELINE COMPANY LLC
211 CARNEGIE CENTER
PRINCETON, NEW JERSEY 08540
CONTACT: NATHAN J. ROZIC
PHONE: 724.597.8630
FAX: 724.554.6208
EMAIL: Nathan.Rozic@nrg.com

"CALL BEFORE YOU DIG"

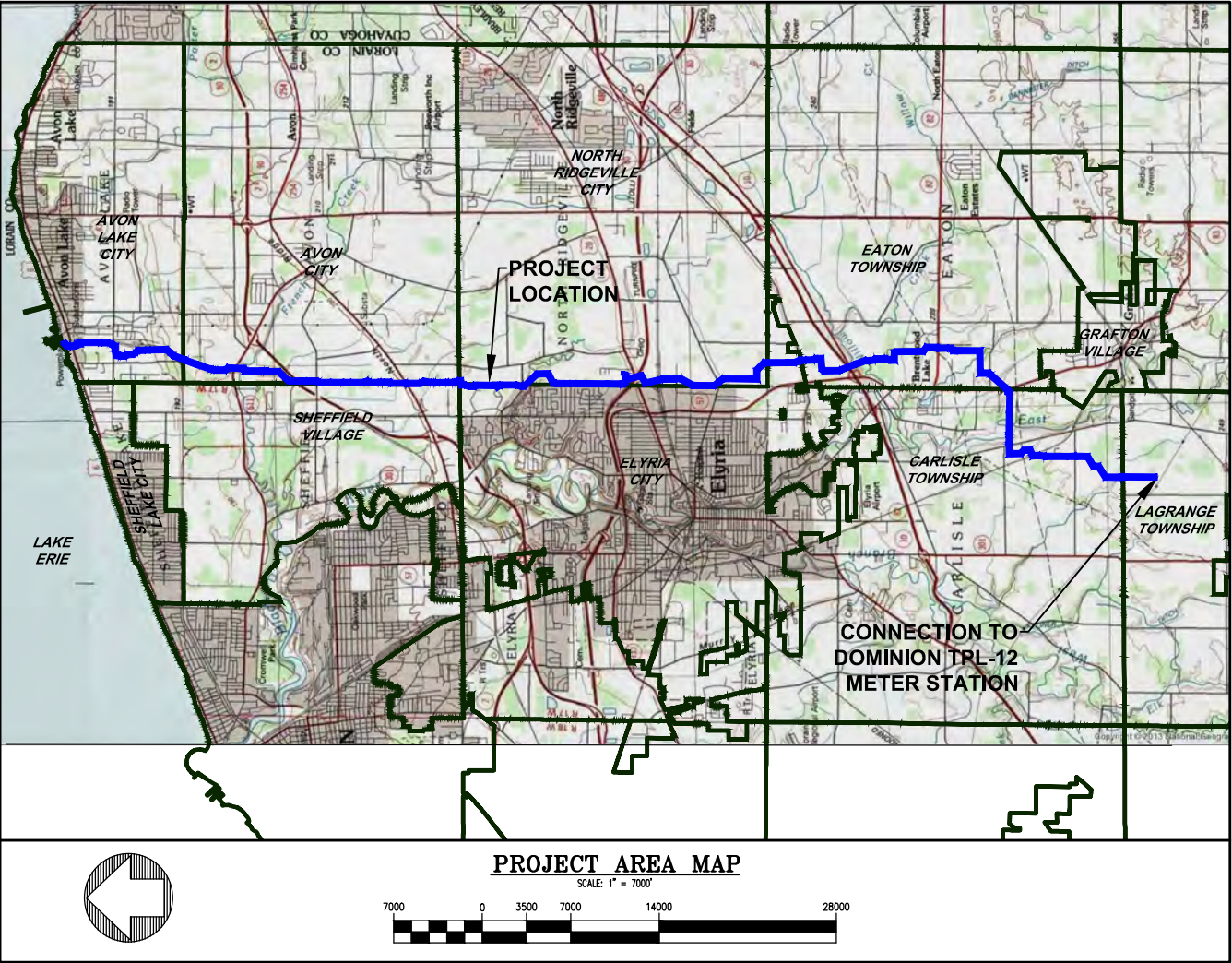
BY LAW, EVERYONE MUST CONTACT THE OHIO UTILITIES PROTECTION SERVICE,
8-1-1 OR 1-800-362-2764, AT LEAST 48 HOURS BUT NO MORE THAN 10
WORKING DAYS (EXCLUDING WEEKENDS AND LEGAL HOLIDAYS) BEFORE
BEGINNING ANY DIGGING PROJECT.



1. Serial Number XXXXXXXXXX - XXXX to XXXX (nearest intersection)

	HORZ. LENGTH	SLOPE LENGTH
MAIN LINE R.O.W.	103,505 L.F.	103,724 L.F.

LIMIT OF CONSTRUCTION AND LIMIT OF
DISTURBANCE - 235 AC.



SHEET INDEX

SHEET 1	OF	88	COVER SHEET
SHEETS 2-3	OF	88	CONTOUR INDEX MAP
SHEETS 4-5	OF	88	AERIAL INDEX MAP
SHEETS 6-44	OF	88	E&SPC LAYOUT PLANS
SHEETS 45-82	OF	88	E&SPC SITE DETAILS
SHEETS 83-88	OF	88	E&SPC TYPICAL DETAILS

RECEIVING WATERS

LAKE ERIE
UNNAMED TRIBUTARY TO LAKE ERIE
BLACK RIVER
UNNAMED TRIBUTARY TO BLACK RIVER
UNNAMED TRIBUTARY TO EAST BRANCH OF BLACK RIVER
FRENCH CREEK
UNNAMED TRIBUTARY TO FRENCH CREEK
JUNGBLUTH DITCH
WILLOW CREEK
JACKSON DITCH
ALEXANDER DITCH
DENT DITCH

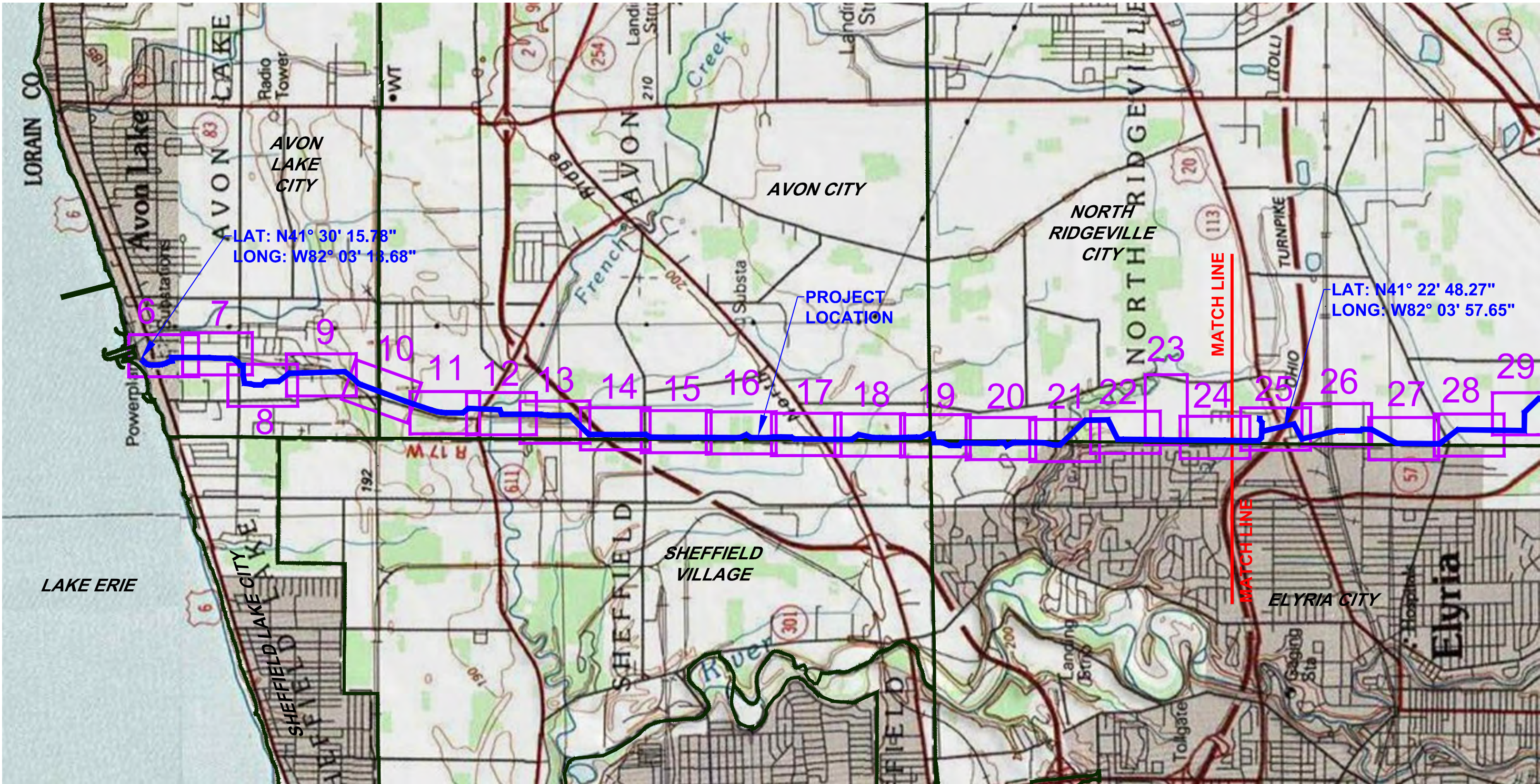
COVER SHEET

NO.			REVISIONS	DATE	AVON LAKE GAS ADDITION PROJECT			
					CARLISLE, EATON & LAGRANGE TOWNSHIPS AVON, AVON LAKE, ELYRIA & NORTH RIDGEVILLE CITIES LORAIN COUNTY OHIO			
					Hanover Engineering Associates Inc			
					3355 Route 611, Suite 1 Bartonsville, PA 18321-7822 570.688.9550 Fax 570.688.9768			
					DRAWN BY: AEJ CHECKED BY: SJC DATE: 12.15.14 SCALE: 1"=7000'			
					PROJECT NO. NRG-1007 SHEET NO. 1 OF 88			

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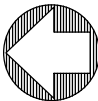
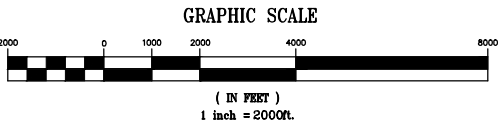
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 CENTERLINE OF AVON LAKE GAS ADDITION PIPELINE R.O.W.



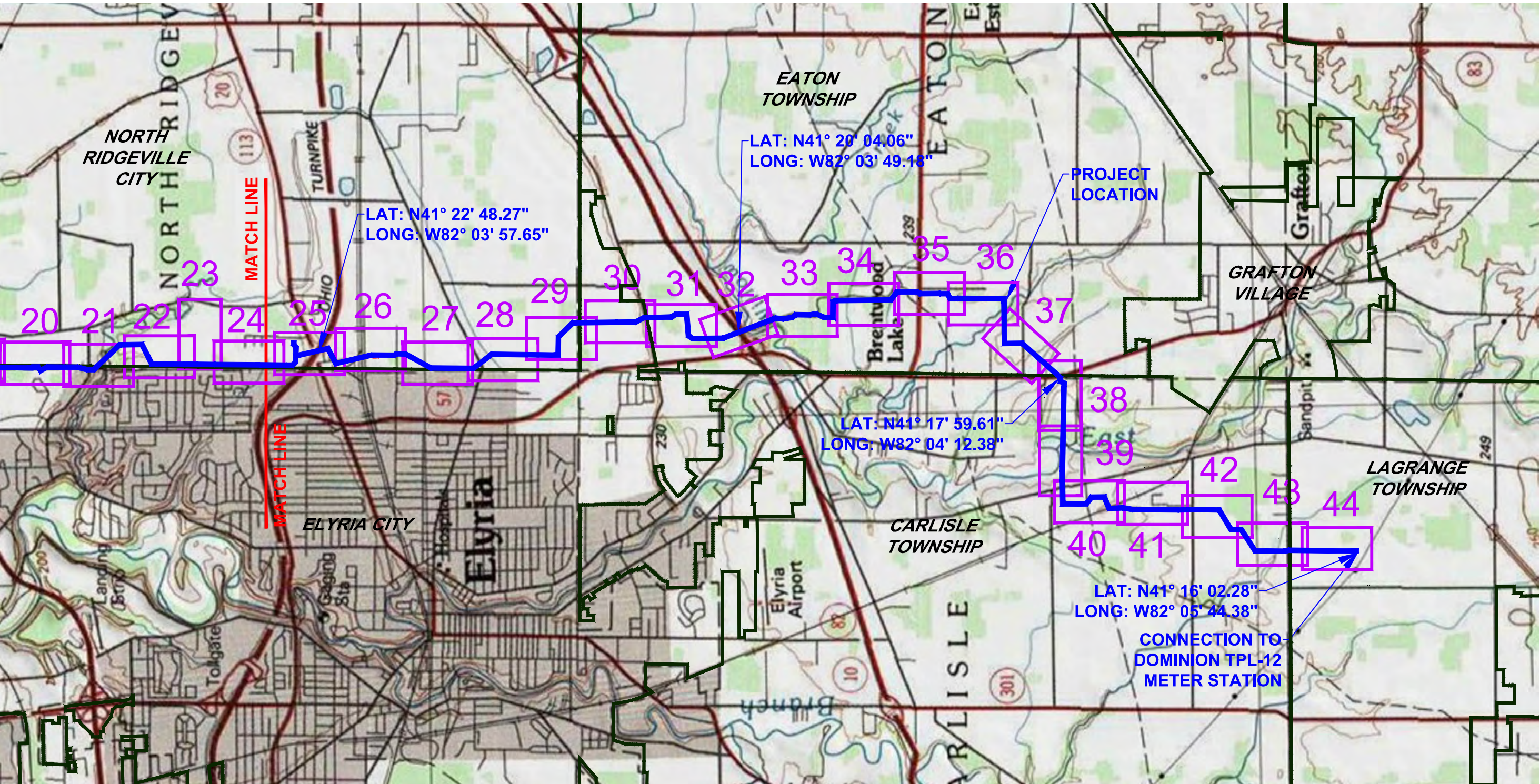
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CONTOUR INDEX MAP

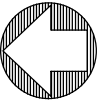
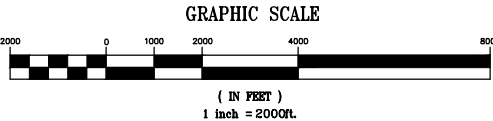
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					CHECKED BY: SJC	NRG-1007	
					DATE: 12.15.14		SHEET NO.
					SCALE: 1"=2000'		2 OF 88
				Hanover Engineering Associates Inc	3355 Route 611, Suite 1 Bartonsville, PA 18321-7822 570.688.9550 Fax 570.688.9768		

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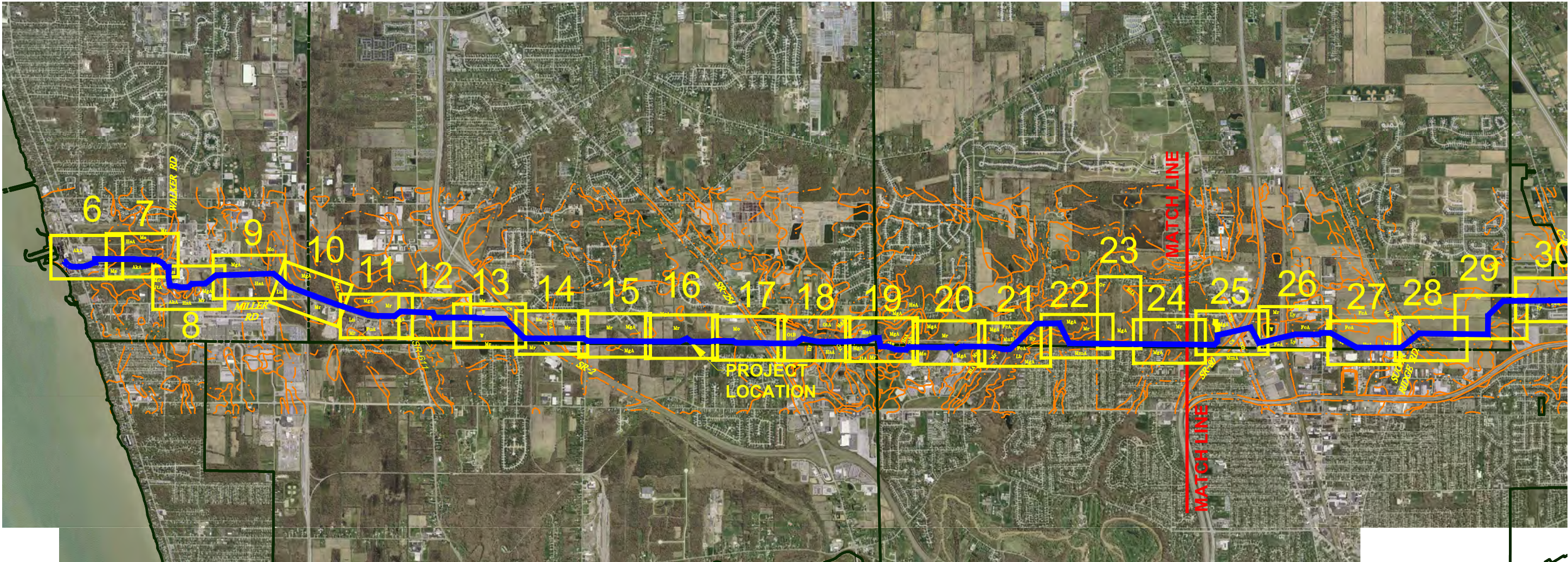


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NO.	REVISIONS	DATE

CONTOUR INDEX MAP			
AVON LAKE GAS ADDITION PROJECT			
CARLISLE, EATON & LAGRANGE TOWNSHIPS AVON, AVON LAKE, ELYRIA & NORTH RIDGEVILLE CITIES LORAIN COUNTY OHIO		DRAWN BY: AEJ	PROJECT NO. NRG-1007
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Hanover Engineering Associates Inc		DATE: 12.15.14	3355 Route 611, Suite 1 Bartonsville, PA 18321-7822 570.688.9550 Fax 570.688.9768
		SCALE: 1"=2000'	

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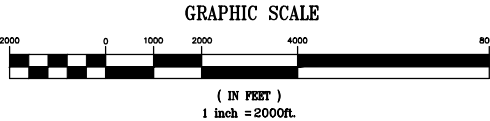


Soil Chart

SYMBOL	SOIL TYPE	SYMBOL	SOIL TYPE	SYMBOL	SOIL TYPE
AkA	ALLIS LOAM, 0 TO 2 PERCENT SLOPES	HsA	HASKINS LOAM, 0 TO 2 PERCENT SLOPES	Mr	MINER SILTY CLAY LOAM
BtA	BOGART LOAM, 0 TO 2 PERCENT SLOPES	Hy	HOLLY SILT LOAM	Ms	MINER SILTY CLAY LOAM, SHALE SUBSTRATUM
CIA	CHILI LOAM, 0 TO 2 PERCENT SLOPES	JtA	JM TOWN LOAM, 0 TO 2 PERCENT SLOPES	Or	ORVILLE SILT LOAM
CIB	CHILI LOAM, 2 TO 6 PERCENT SLOPES	Lb	LOBDELL SILT LOAM	OtA	OSHTIMO SANDY LOAM, 0 TO 2 PERCENT SLOPES
CID2	CHILI LOAM, 6 TO 18 PERCENT SLOPES, MODERATELY ERODED	Ln	LORAIN SILTY CLAY LOAM	OtB	OSHTIMO SANDY LOAM, 2 TO 6 PERCENT SLOPES
DkB	DEKALB VERY CHANNERY LOAM, 1 TO 6 PERCENT SLOPES	Ly	LURAY SILTY CLAY LOAM	OtC	OSHTIMO SANDY LOAM, 6 TO 12 PERCENT SLOPES
EIB2	ELLSWORTH SILT LOAM, 2 TO 6 PERCENT SLOPES, MODERATELY ERODED	MgA	MAHONING SILT LOAM, 0 TO 2 PERCENT SLOPES	RdA	RAWSON LOAM, 0 TO 2 PERCENT SLOPES
EIC2	ELLSWORTH SILT LOAM, 6 TO 12 PERCENT SLOPES, MODERATELY ERODED	MgB	MAHONING SILT LOAM, 2 TO 6 PERCENT SLOPES	RdB	RAWSON LOAM, 2 TO 6 PERCENT SLOPES
EID2	ELLSWORTH SILT LOAM, 12 TO 18 PERCENT SLOPES, MODERATELY ERODED	MgB2	MAHONING SILT LOAM, 2 TO 6 PERCENT SLOPES, MODERATELY ERODED	Sb	SEBRING SILT LOAM
FcA	FITCHVILLE SILT LOAM, 0 TO 2 PERCENT SLOPES	MkA	MAHONING-TIRO SILT LOAMS, 0 TO 2 PERCENT SLOPES	Tg	TIOGA FINE SANDY LOAM
FdA	FITCHVILLE SILT LOAM, LOW TERRACE, 0 TO 2 PERCENT SLOPES	MmA	MAHONING-URBAN LAND COMPLEX, NEARLY LEVEL	TrA	TRUMBULL SILTY CLAY LOAM, 0 TO 2 PERCENT SLOPES
FeA	FITCHVILLE-URBAN LAND COMPLEX, NEARLY LEVEL	MnB	MENTOR SILT LOAM, 2 TO 6 PERCENT SLOPES		
FuA	FULTON SILT LOAM, 0 TO 2 PERCENT SLOPES	Mo	MERMILL LOAM		

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- - - SOIL BOUNDARY

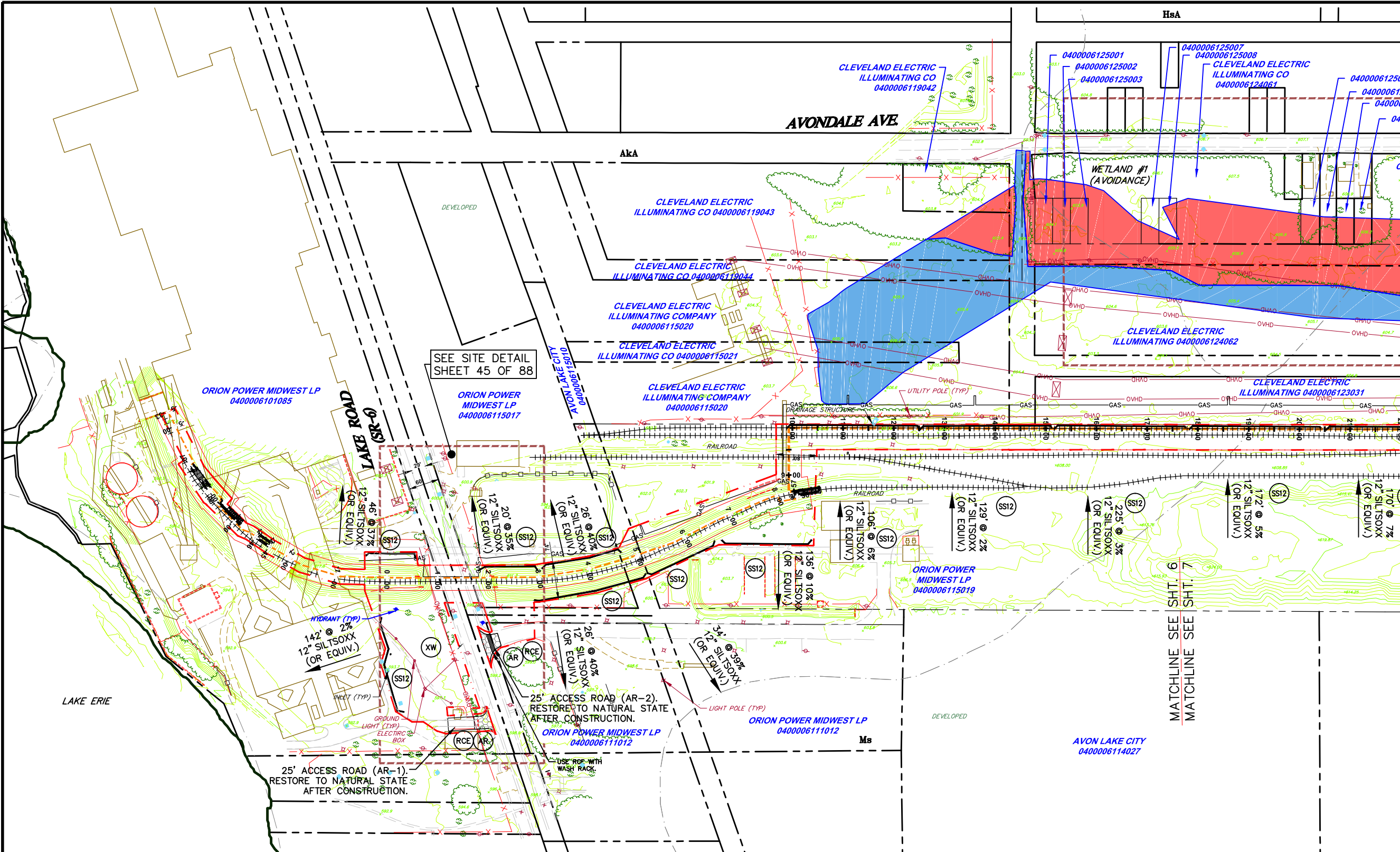


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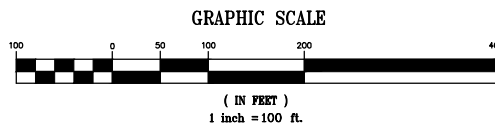
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					CHECKED BY: SJC	SHEET NO. 4 OF 88	
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						3355 Route 611, Suite 1 Bartonsville, PA 18321-7822 570.688.9550 Fax 570.688.9768	
				Hanover Engineering Associates Inc			



NOTES:

1. FLOW LENGTH SHOULD BE VERIFIED PRIOR TO CONSTRUCTION. IF FLOW LENGTH EXCEEDS SILT SOILS LIMITS, SILT SOILS OF APPROPRIATE SIZE SHALL BE USED.
2. SHALLOW EXCAVATIONS SHOULD NOT CREATE ANY ISSUES FOR GEOLOGICAL FORMATIONS.
3. THE ENTIRE PROJECT AREA WILL BE RESTORED TO EXISTING CONDITIONS OR MEADOW CONDITIONS, UNLESS IT IS CURRENTLY USED AS AN AGRICULTURAL USE. THE THICK, VEGETATIVE COVER WILL HELP MINIMIZE THERMAL IMPACTS. THE PIPELINE R.O.W. WILL BE RESTORED TO ORIGINAL GRADE, WHICH WILL PROMOTE SHEET FLOW WHERE IT CURRENTLY OCCURS, ACROSS A VEGETATED AREA, ACTING AS A FILTER STRIP.
4. SILT SOIL OR CONSTRUCTION FENCE SHALL BE INSTALLED ON BOTH SIDES OF WORKSPACE

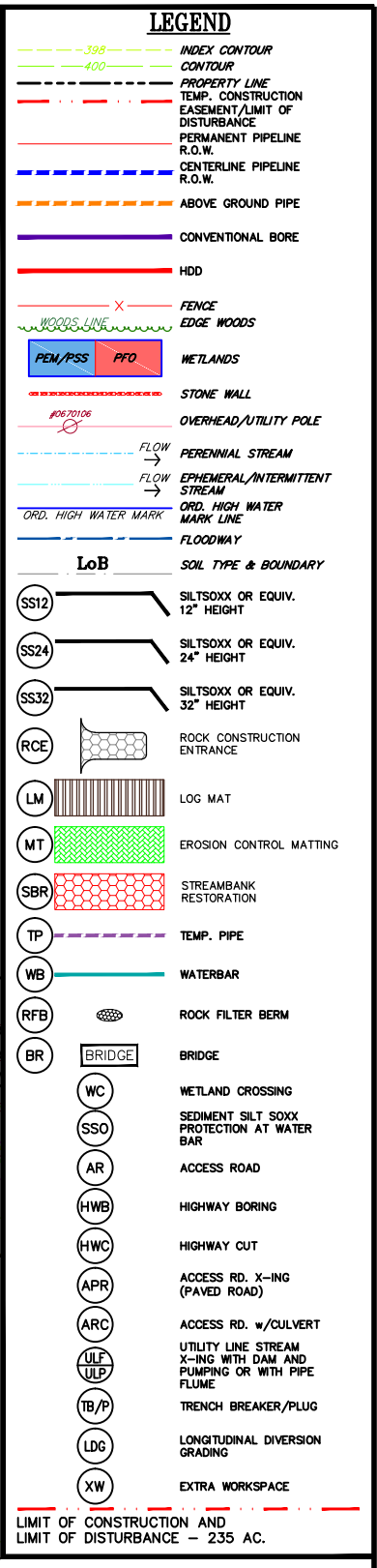
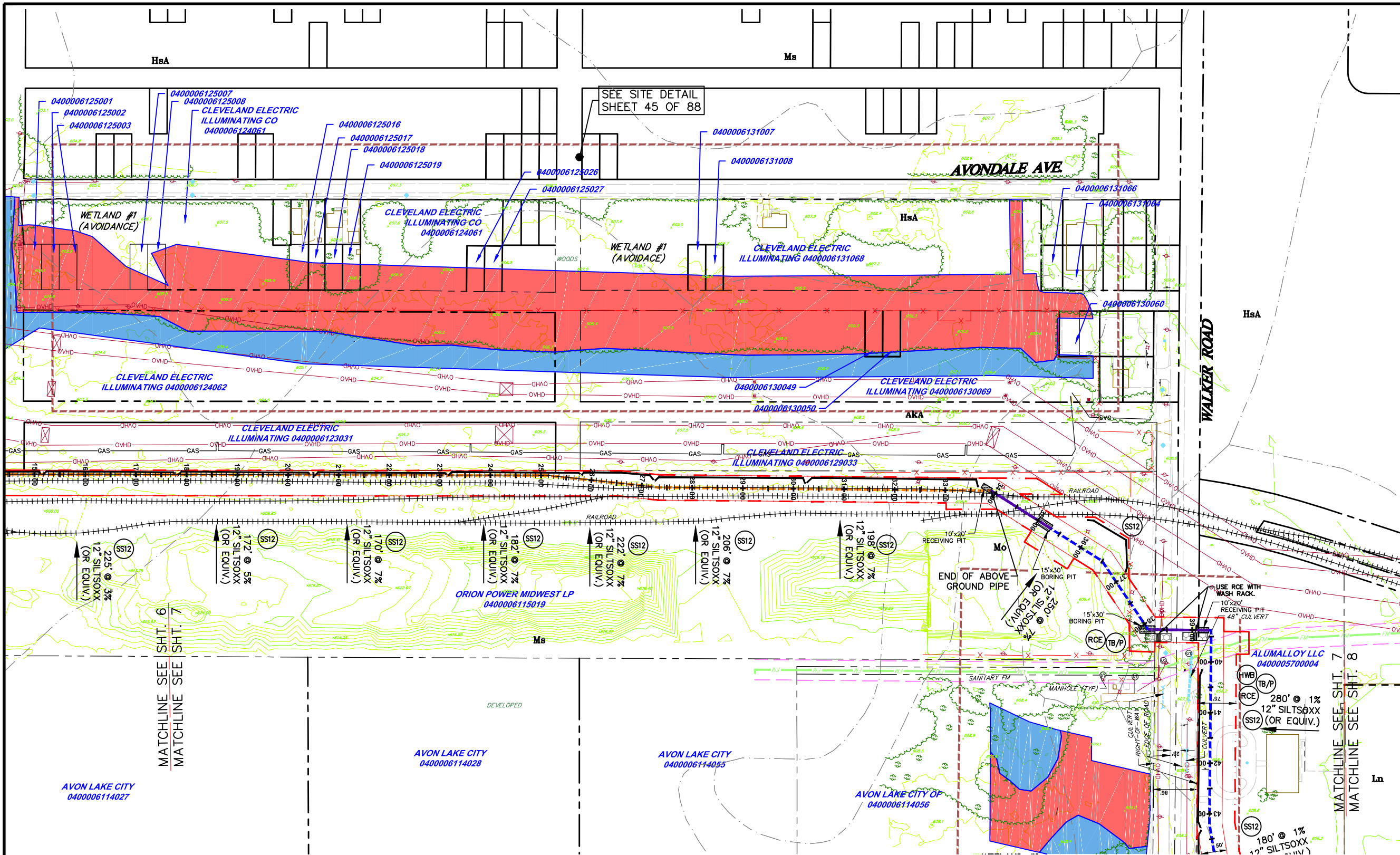
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SEAL	NO.	REVISIONS	DATE	AVON LAKE GAS ADDITION PROJECT			
				CARLISLE, EATON & LAGRANGE TOWNSHIPS AVON, AVON LAKE, ELYRIA & NORTH RIDGEVILLE CITIES LORAIN COUNTY OHIO	DRAWN BY: AEJ	PROJECT NO.	
					CHECKED BY: SJC	NRG-1007	
					DATE: 12.15.14	SHEET NO.	
					SCALE: 1"=100'	6 OF 88	
				Hanover Engineering Associates Inc	3355 Route 611, Suite 1 Bartonsville, PA 18321-7822 570.688.9550 Fax 570.688.9768		

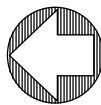
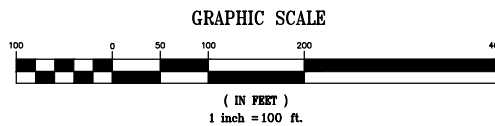
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SEAL

E&SPC LAYOUT PLAN

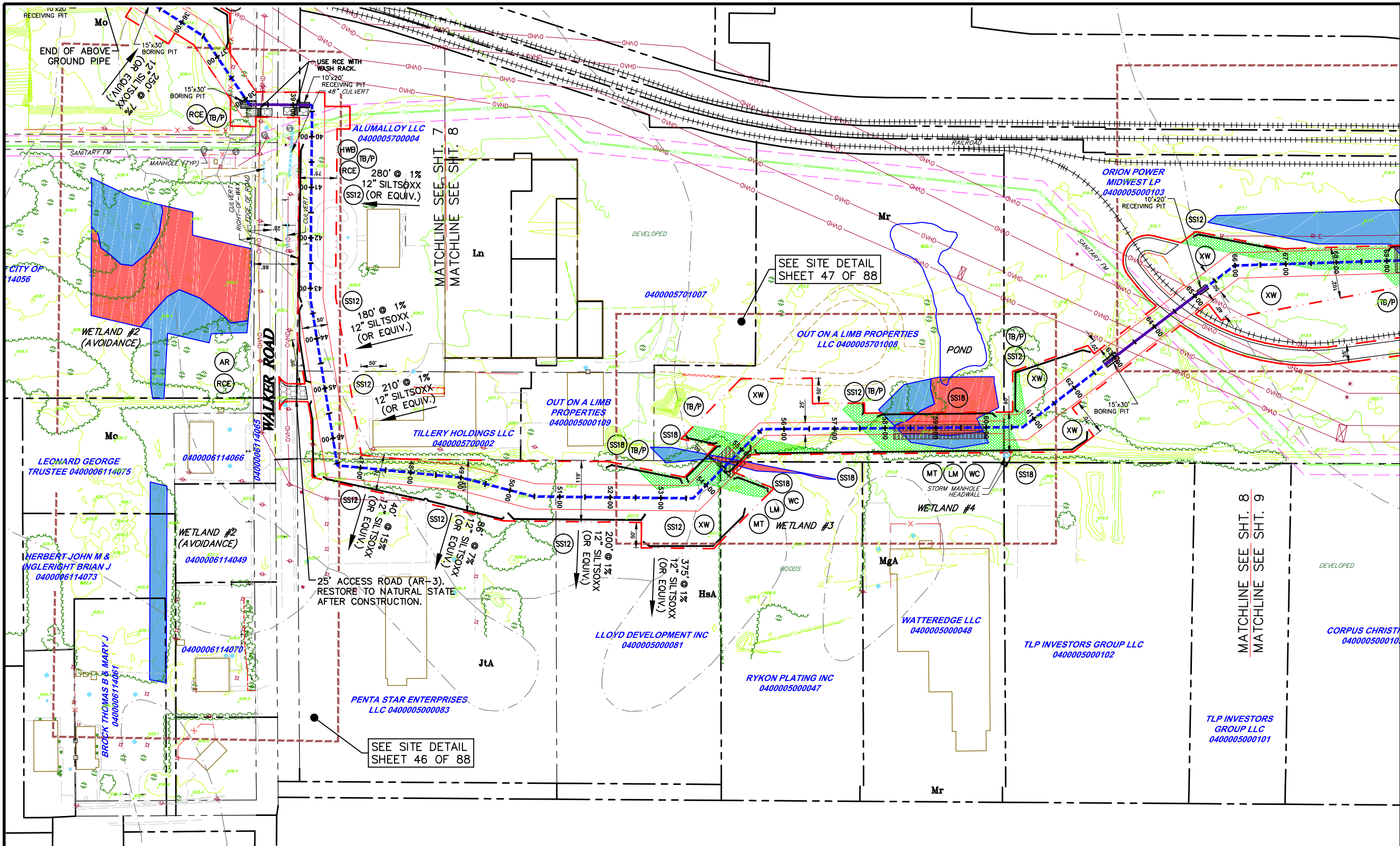
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

Hanover
Engineering Associates Inc

DRAWN BY: AEJ	PROJECT NO. NRG-1007
CHECKED BY: SJC	SHEET NO. 7 OF 88
DATE: 12.15.14	
SCALE: 1"=100'	
3355 Route 611, Suite 1 Bartonsville, PA 18321-7822 570.688.9550 Fax 570.688.9768	

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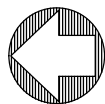
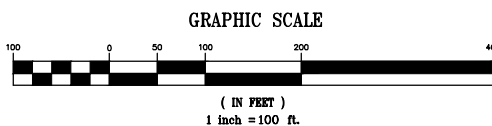
LEGEND

- INDEX CONTOUR
- CONTOUR
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- CENTERLINE PIPELINE R.O.W.
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- EXTRA WORKSPACE
- LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE - 235 AC.

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SEAL

E&SPC LAYOUT PLAN

AVON LAKE GAS ADDITION PROJECT

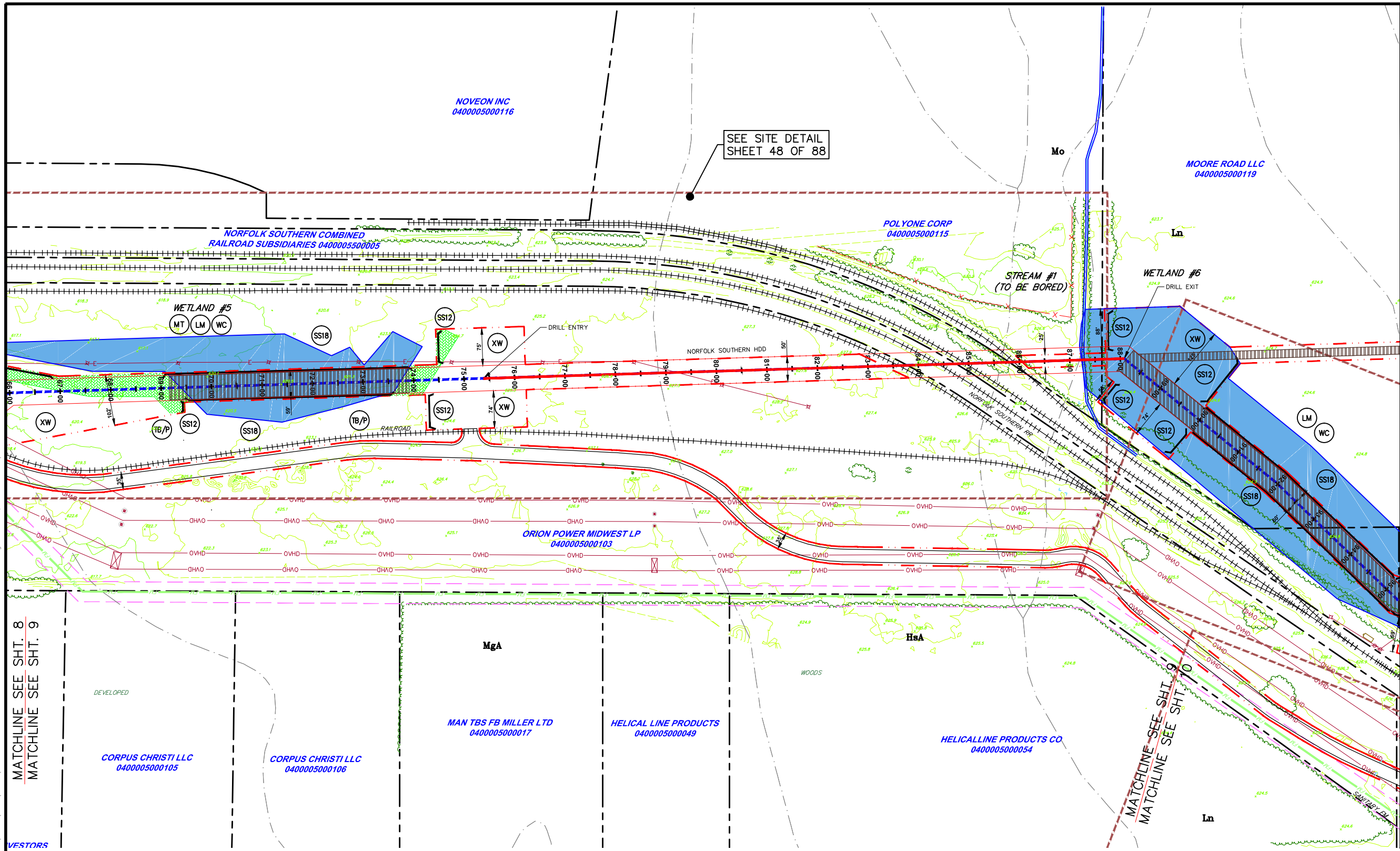
CARLISLE, EATON & LAGRANGE TOWNSHIPS
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LORAIN COUNTY
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Hanover
Engineering Associates Inc

PROJECT NO.
NRG-1007
SHEET NO.
8 OF 88

3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

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LEGEND

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CONTOUR

PROPERTY LINE

TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE

PERMANENT PIPELINE R.O.W.

CENTERLINE PIPELINE R.O.W.

ABOVE GROUND PIPE

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FENCE

EDGE WOODS

WETLANDS

STONE WALL

OVERHEAD/UTILITY POLE

PERENNIAL STREAM

EPHEMERAL/INTERMITTENT STREAM

ORD. HIGH WATER MARK

FLOODWAY

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SILT SOCKS OR EQUIV. 24" HEIGHT

SILT SOCKS OR EQUIV. 32" HEIGHT

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LOG MAT

EROSION CONTROL MATTING

STREAMBANK RESTORATION

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WATERBAR

ROCK FILTER BERM

BRIDGE

WETLAND CROSSING

SEDIMENT SILT SOCK PROTECTION AT WATER BAR

ACCESS ROAD

HIGHWAY BORING

HIGHWAY CUT

ACCESS RD. X-ING (PAVED ROAD)

ACCESS RD. w/CULVERT

UTILITY LINE STREAM X-ING WITH DAM AND PUMPING OR WITH PIPE FLUME

TRENCH BREAKER/PLUG

LONGITUDINAL DIVERSION GRADING

EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE - 235 AC.

SS12

SS24

SS32

RCE

LM

MT

SBR

TP

WB

RFB

BR

WC

SSO

AR

HWB

HWC

APR

ARC

ULP

ULP

TB/P

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SEAL

E&SPC LAYOUT PLAN

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY:
AEJ

CHECKED BY:
SJC

DATE:
12.15.14

SCALE:
1"=100'

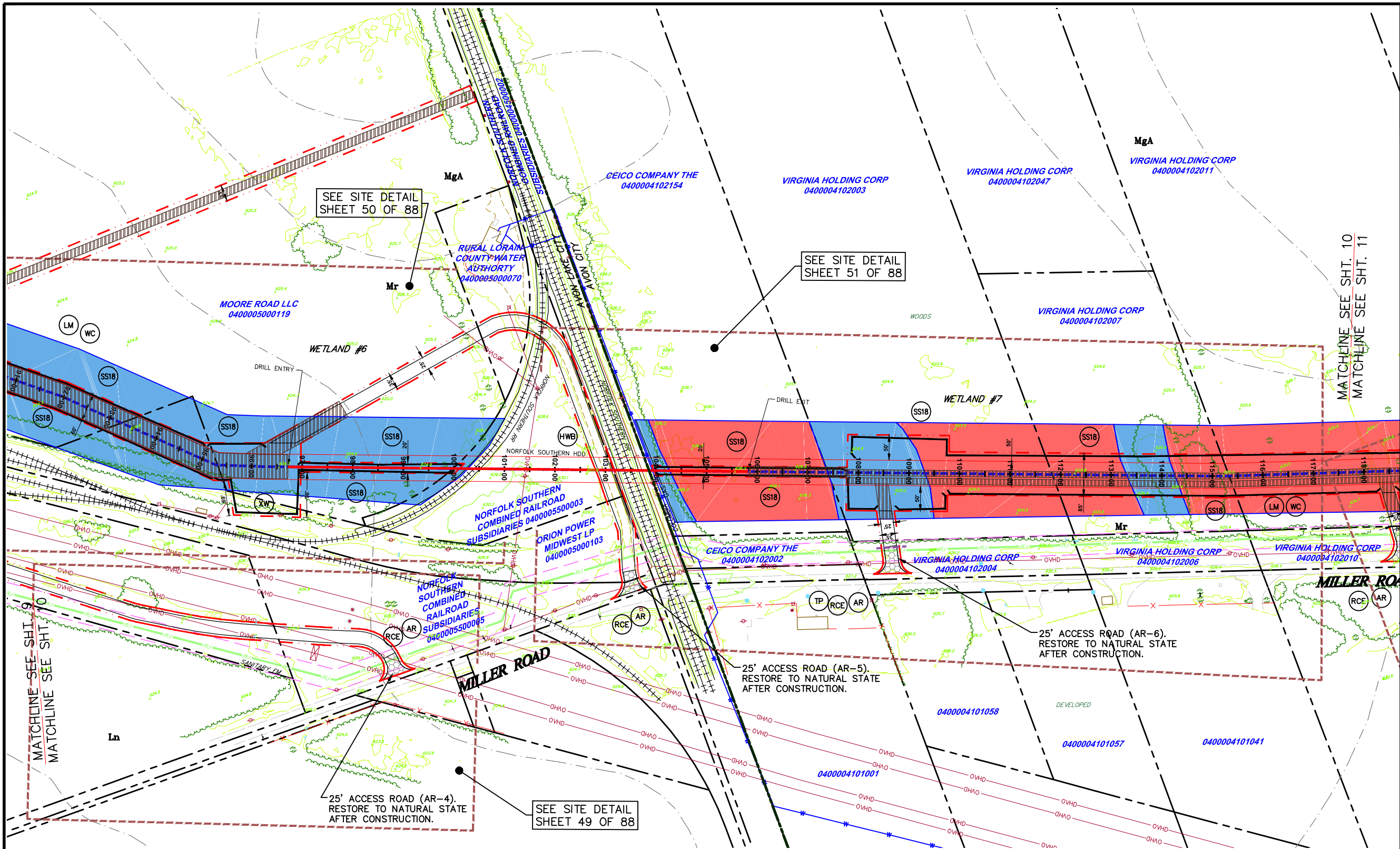
PROJECT NO.
NRG-1007

SHEET NO.
9 OF 88

Hanover
Engineering Associates Inc

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Bartonsville, PA 18321-7822
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Fax 570.688.9768

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LEGEND

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FENCE

EDGE WOODS

WETLANDS

STONE WALL

OVERHEAD/UTILITY POLE

PERENNIAL STREAM

EPHEMERAL/INTERMITTENT STREAM

ORD. HIGH WATER MARK LINE

FLOODWAY

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WATERBAR

ROCK FILTER BERM

BRIDGE

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LONGITUDINAL DIVERSION GRADING

EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE - 235 AC.

PEM/PSS

PFO

WETLANDS

STONE WALL

OVERHEAD/UTILITY POLE

PERENNIAL STREAM

EPHEMERAL/INTERMITTENT STREAM

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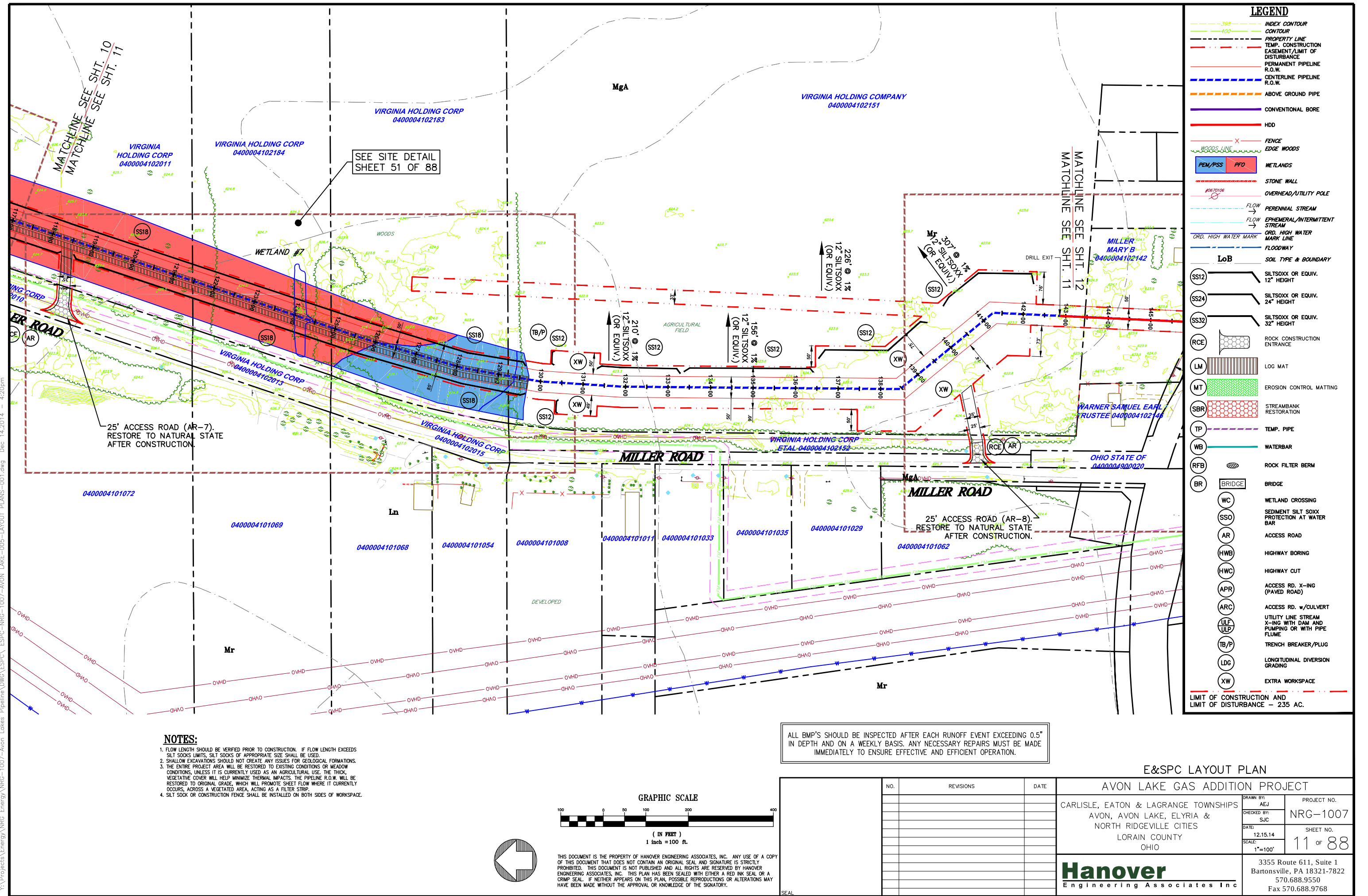
AVON LAKE GAS ADDITION PROJECT

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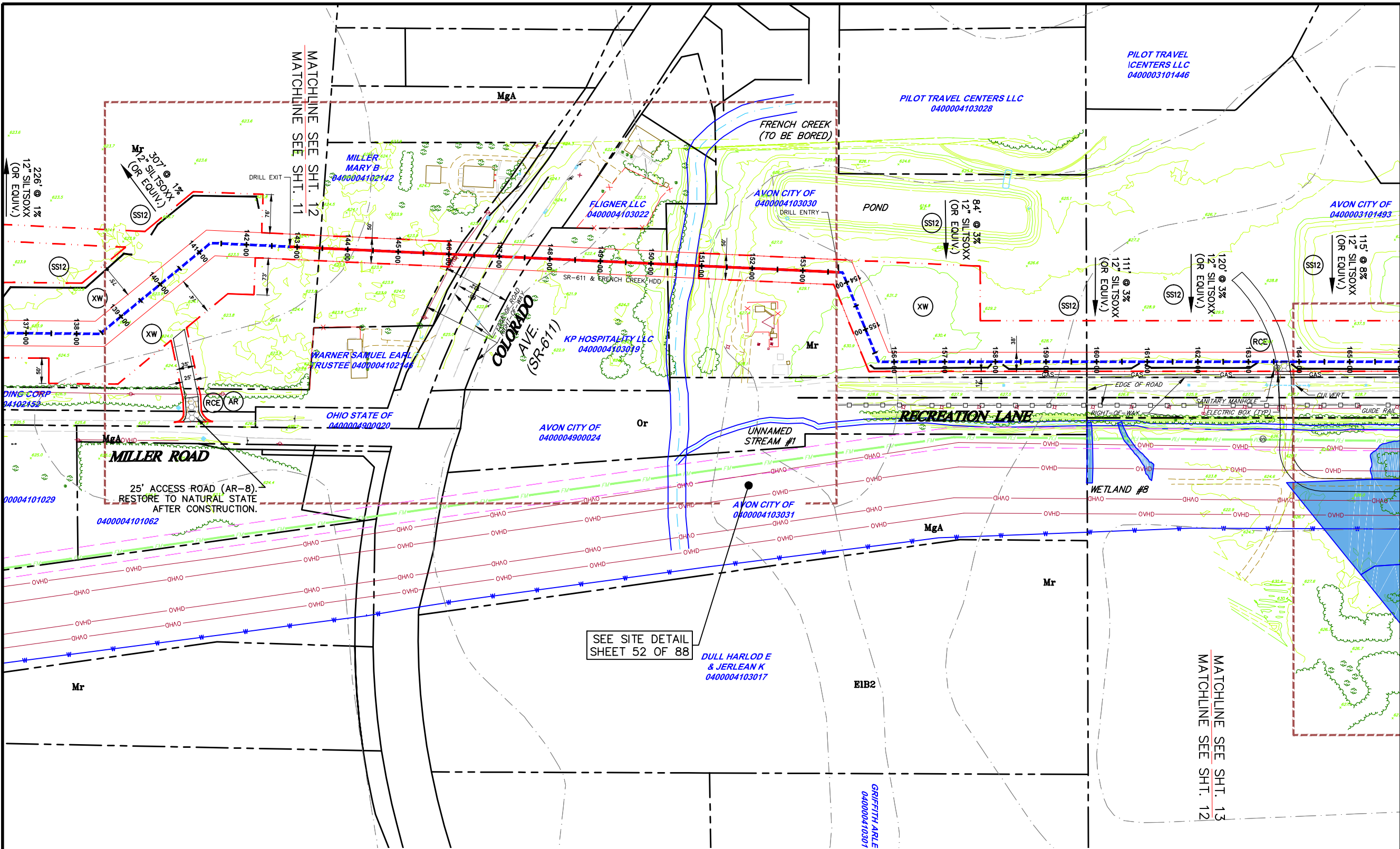
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LEGEND

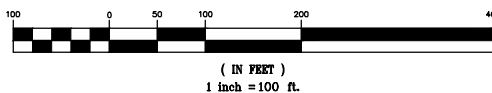
- INDEX CONTOUR (395, 400)
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- CENTERLINE PIPELINE R.O.W.
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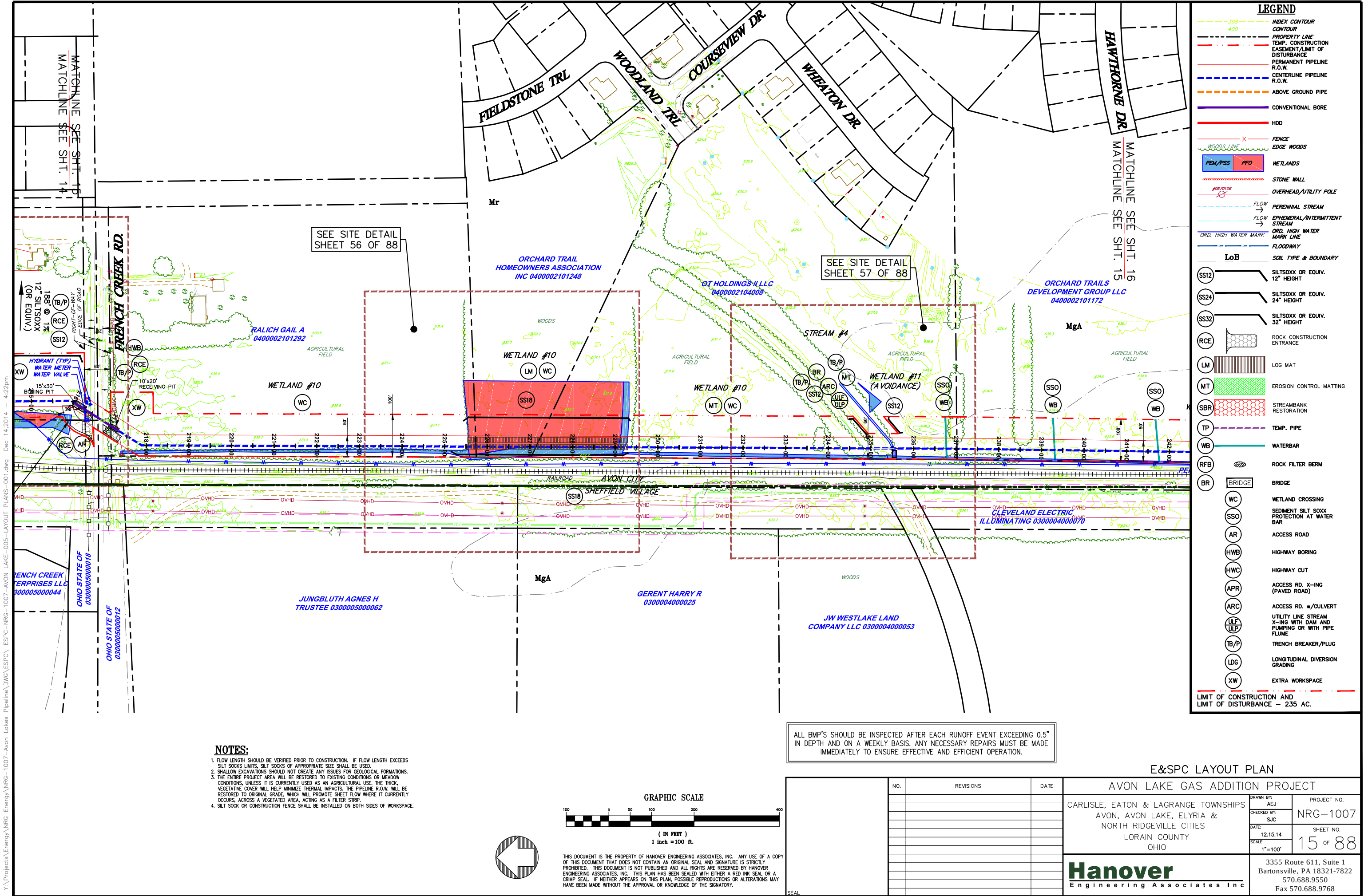


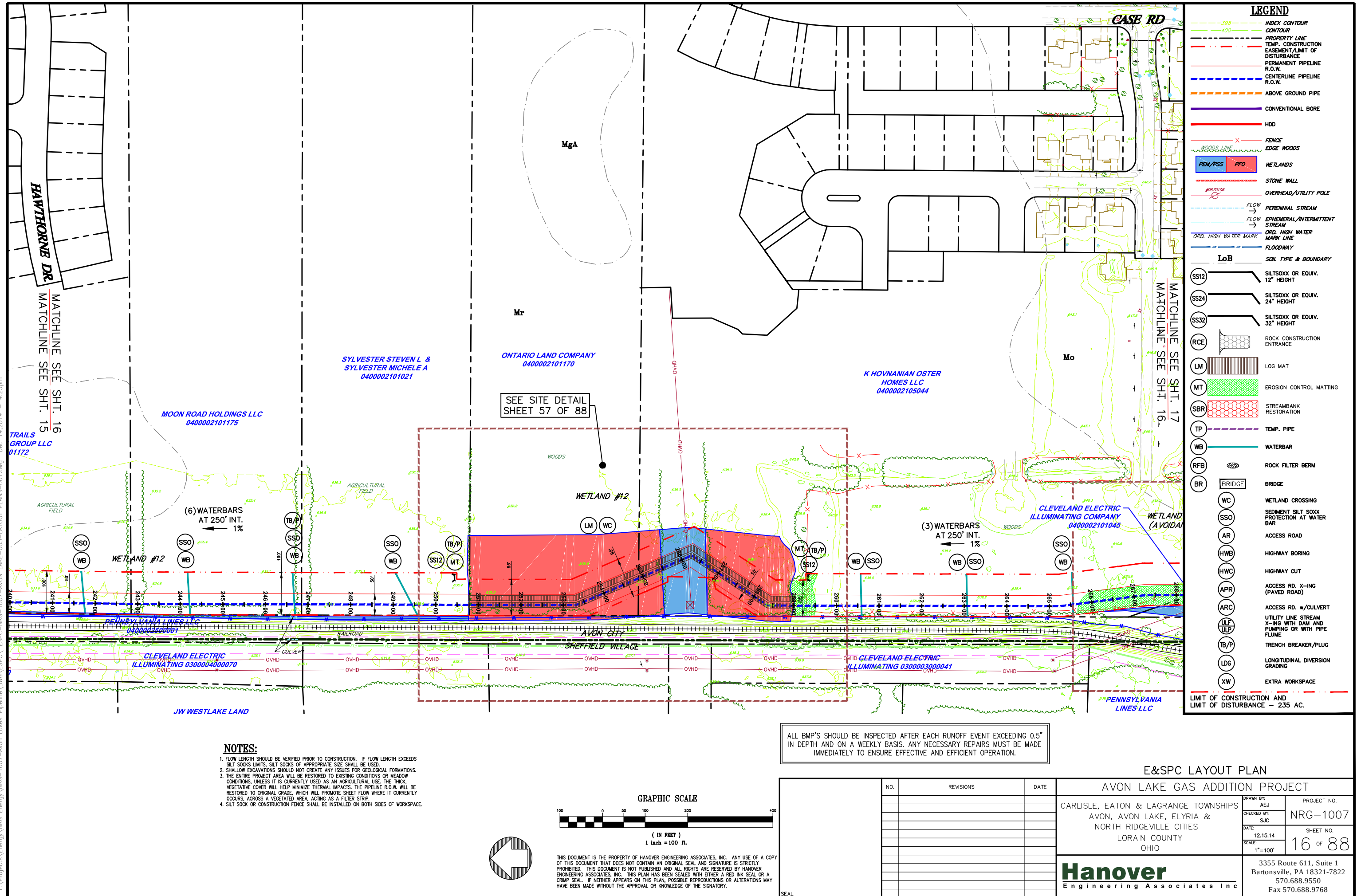
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E&SPC LAYOUT PLAN

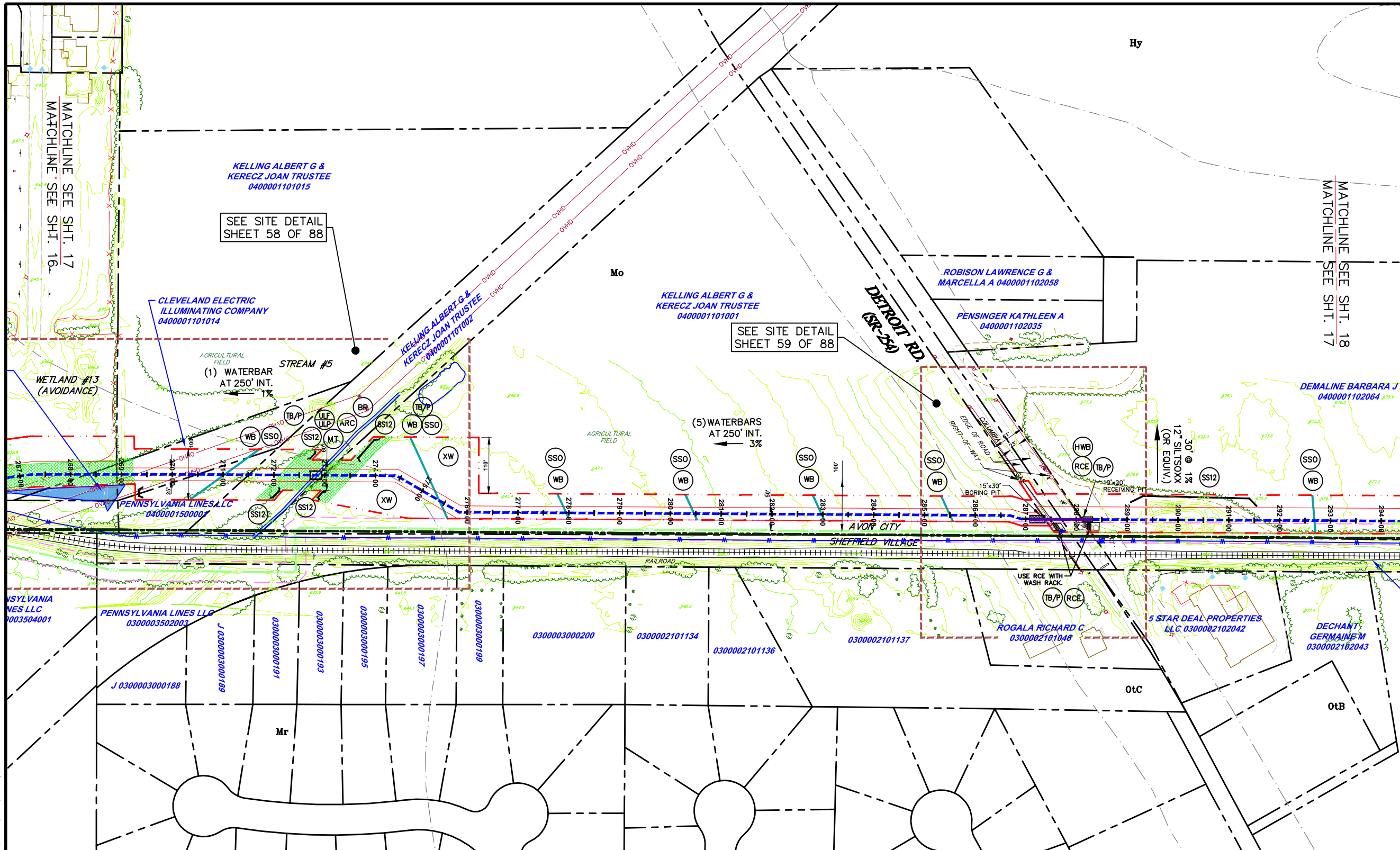
AVON LAKE GAS ADDITION PROJECT			
CARLISLE, EATON & LAGRANGE TOWNSHIPS AVON, AVON LAKE, ELYRIA & NORTH RIDGEVILLE CITIES LORAIN COUNTY OHIO		PROJECT NO. NRG-1007	SHEET NO. 12 OF 88
Hanover Engineering Associates Inc		3355 Route 611, Suite 1 Bartonsville, PA 18321-7822 570.688.9550 Fax 570.688.9768	







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CONVENTIONAL BORE

HDD

FENCE

EDGE WOODS

WETLANDS

STONE WALL

OVERHEAD/UTILITY POLE

PERENNIAL STREAM

EPHEMERAL/INTERMITTENT STREAM

ORD. HIGH WATER MARK LINE

FLOODWAY

SOIL TYPE & BOUNDARY

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SILT SOCKS OR EQUIV. 24" HEIGHT

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ROCK CONSTRUCTION ENTRANCE

LOG MAT

EROSION CONTROL MATTING

STREAMBANK RESTORATION

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ROCK FILTER BERM

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TRENCH BREAKER/PLUG

LONGITUDINAL DIVERSION GRADING

EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE - 235 AC.

SS12

SS24

SS32

RCE

LM

MT

SBR

TP

WB

RFB

BR

WC

SSO

AR

HWB

HWC

APR

ARC

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TB/P

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XW

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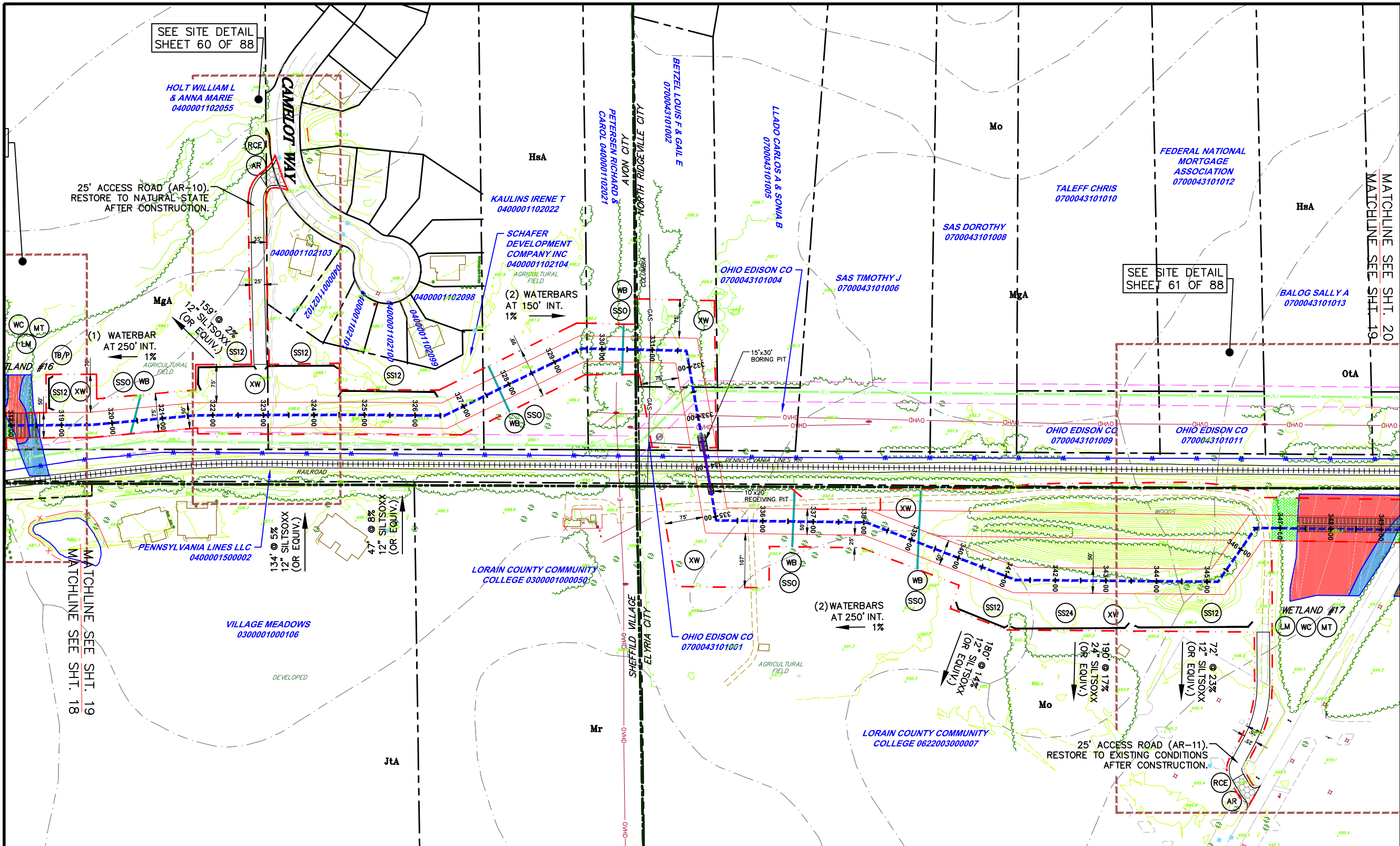
SEAL

E&SPC LAYOUT PLAN

NO.			REVISIONS			DATE			AVON LAKE GAS ADDITION PROJECT		
									CARLISLE, EATON & LAGRANGE TOWNSHIPS AVON, AVON LAKE, ELYRIA & NORTH RIDGEVILLE CITIES LORAIN COUNTY OHIO		
									DRAWN BY: AEJ CHECKED BY: SJC DATE: 12.15.14 SCALE: 1"=100'		
									PROJECT NO. NRG-1007 SHEET NO. 17 OF 88		
									3355 Route 611, Suite 1 Bartonsville, PA 18321-7822 570.688.9550 Fax 570.688.9768		

Hanover
Engineering Associates Inc

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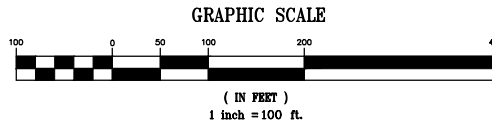


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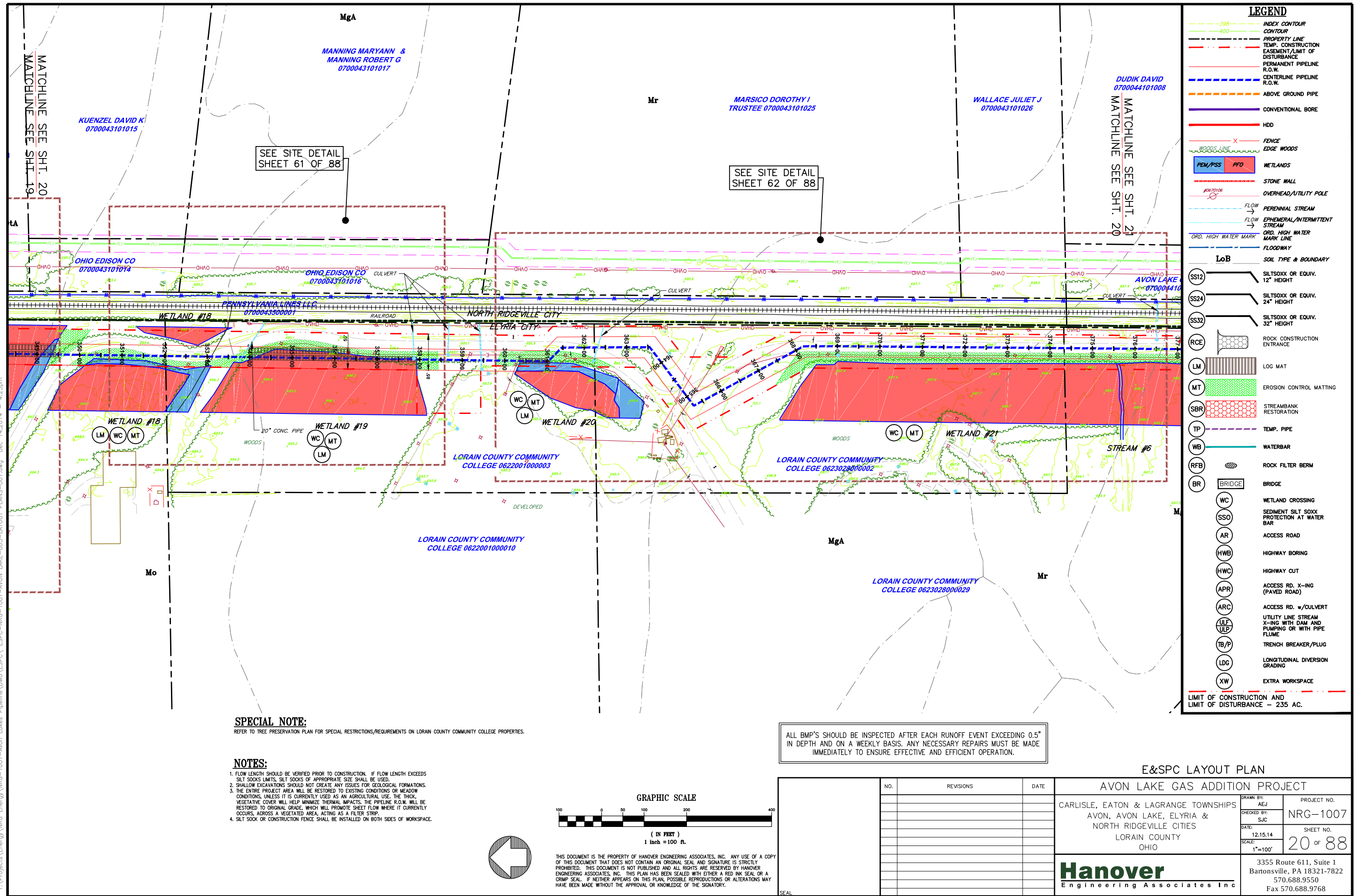
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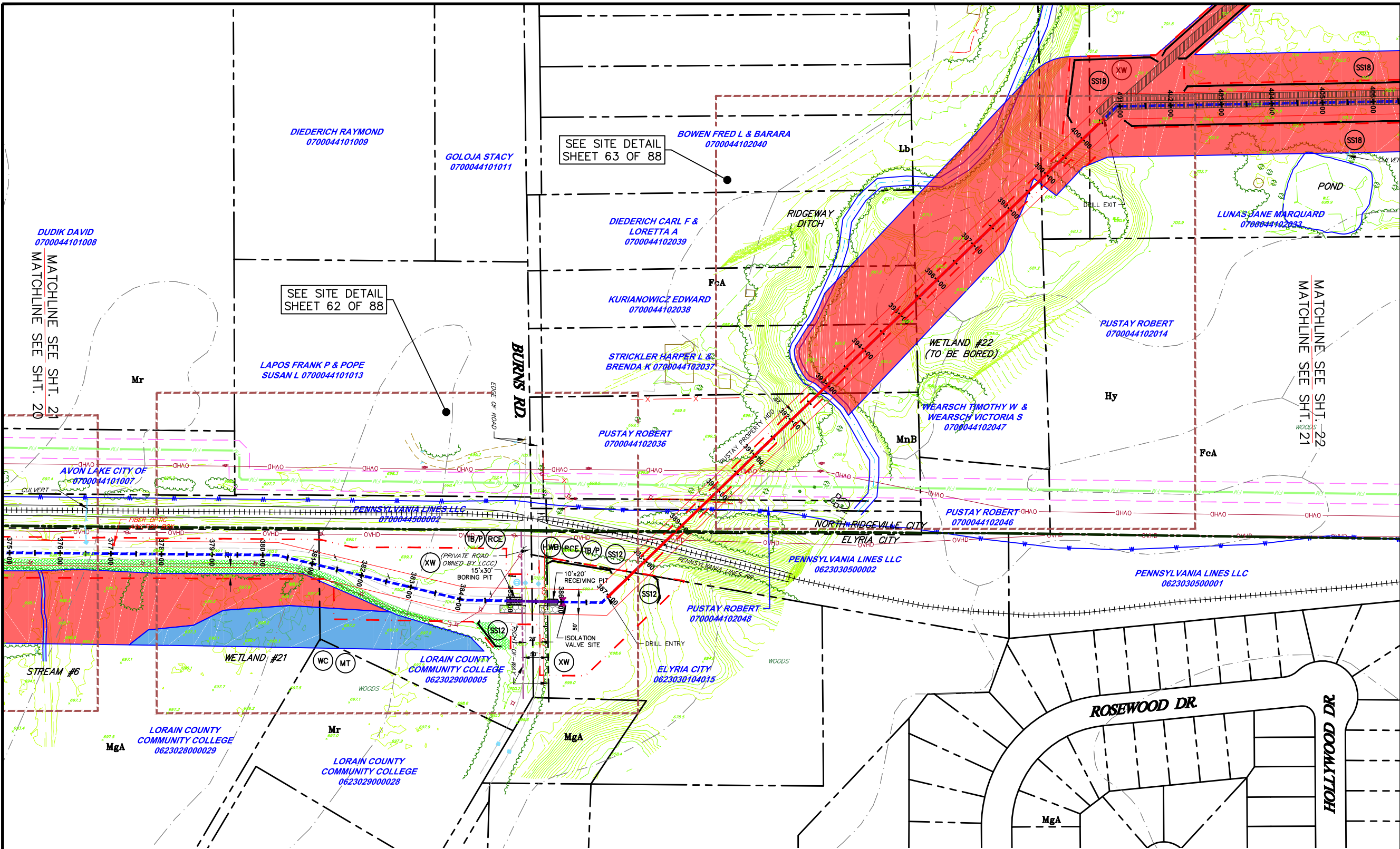
SFAI	NO.	REVISIONS	DATE	AVON LAKE GAS ADDITION PROJECT			
				CARLISLE, EATON & LAGRANGE TOWNSHIPS AVON, AVON LAKE, ELYRIA & NORTH RIDGEVILLE CITIES LORAIN COUNTY OHIO	DRAWN BY: AEJ	PROJECT NO.	
					CHECKED BY: SJC	NRG-1007	
					DATE: 12.15.14	SHEET NO.	
					SCALE: 1"=100'	19 of 88	
				Hanover Engineering Associates Inc	3355 Route 611, Suite 1 Bartonsville, PA 18321-7822 570.688.9550 Fax 570.688.9768		

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PEN/SS

PFO

SS12

SS24

SS32

RCE

LM

MT

SBR

TP

WB

RFB

BR

WC

SSO

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E&SPC LAYOUT PLAN

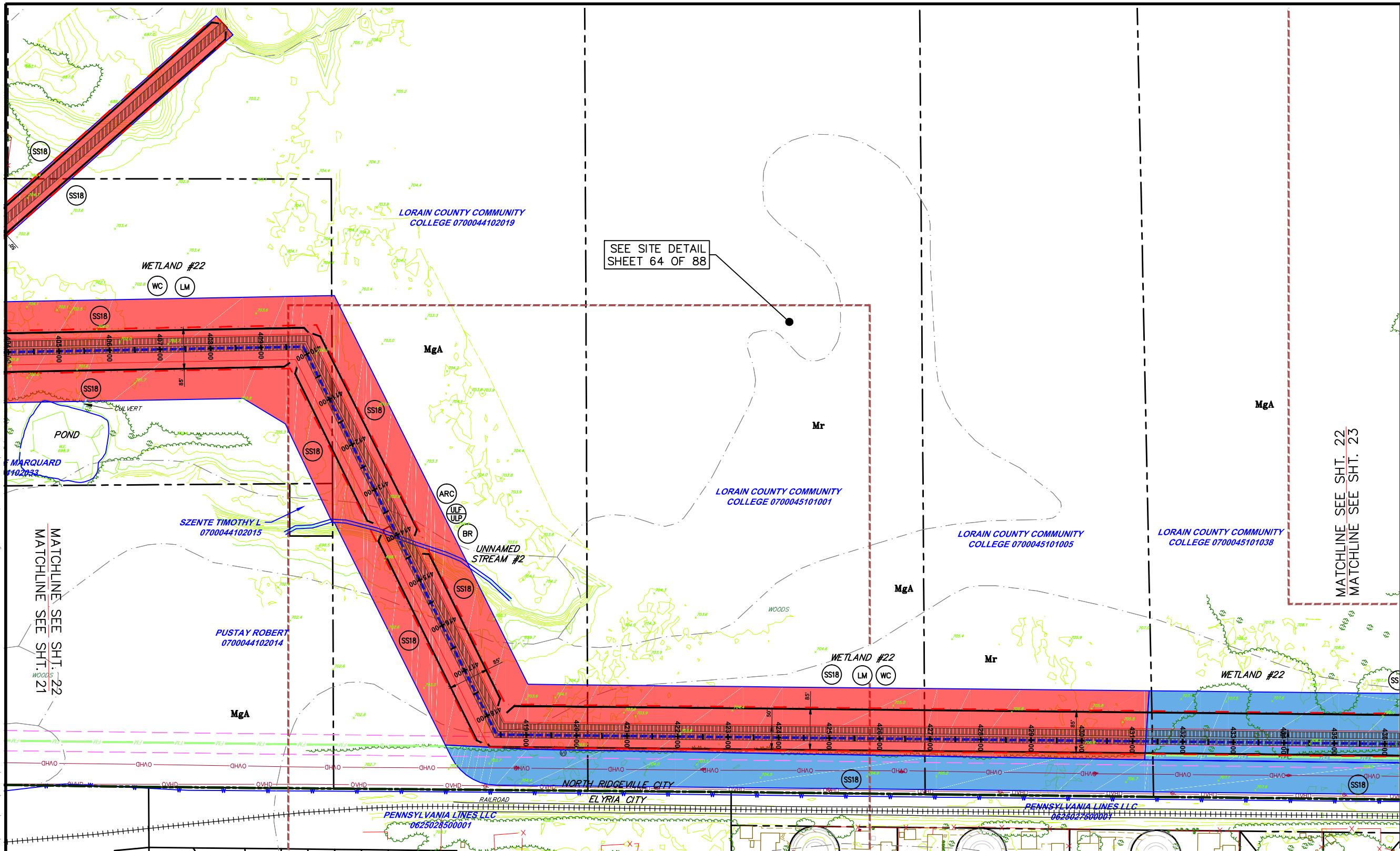
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

Hanover
Engineering Associates Inc

DRAWN BY: AEJ
CHECKED BY: SIC
DATE: 12.15.14
SCALE: 1"=100'
PROJECT NO.: NRG-1007
SHEET NO.: 21 OF 88
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

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LEGEND

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EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE - 235 AC.

SS18

SS12

SS24

SS32

RCE

LM

MT

SBR

TP

WB

RFB

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AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY:
AEJ

CHECKED BY:
SJC

DATE:
12.15.14

SCALE:
1"=100'

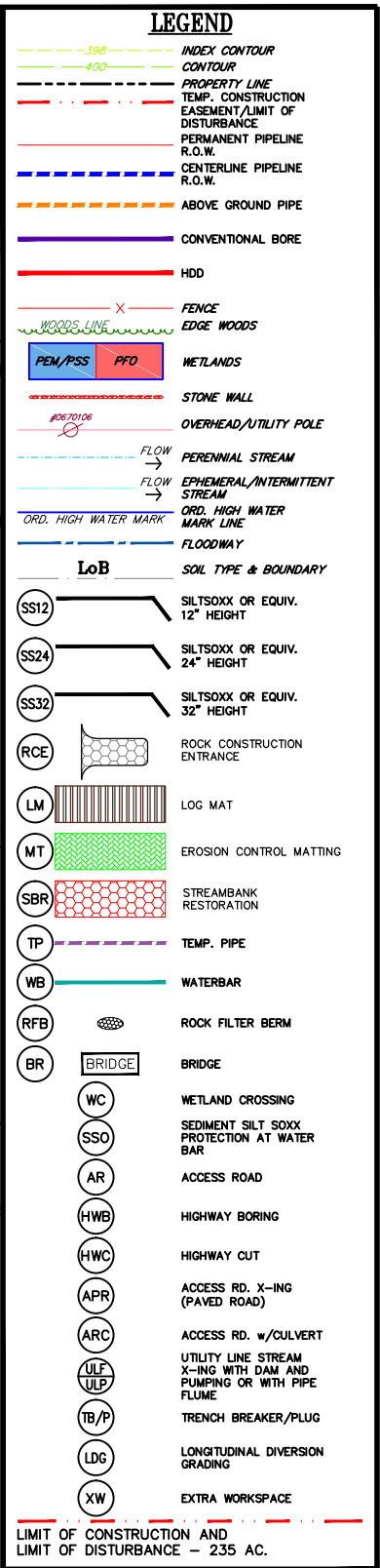
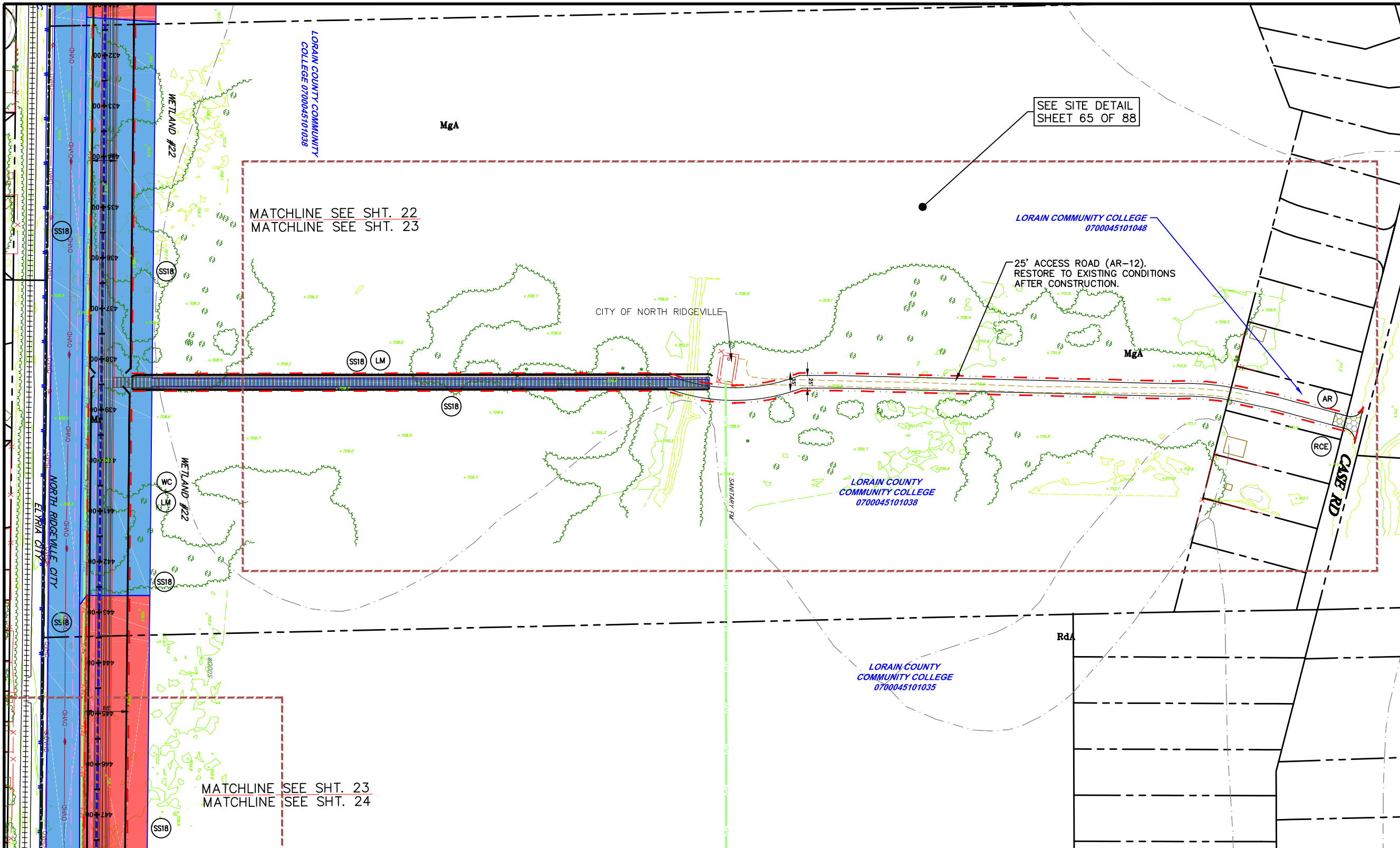
PROJECT NO.
NRG-1007

SHEET NO.
22 OF 88

Hanover
Engineering Associates Inc

3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
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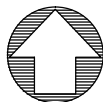
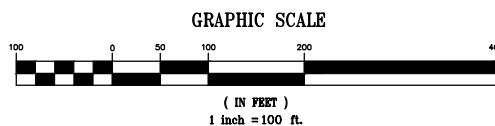
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SEAL

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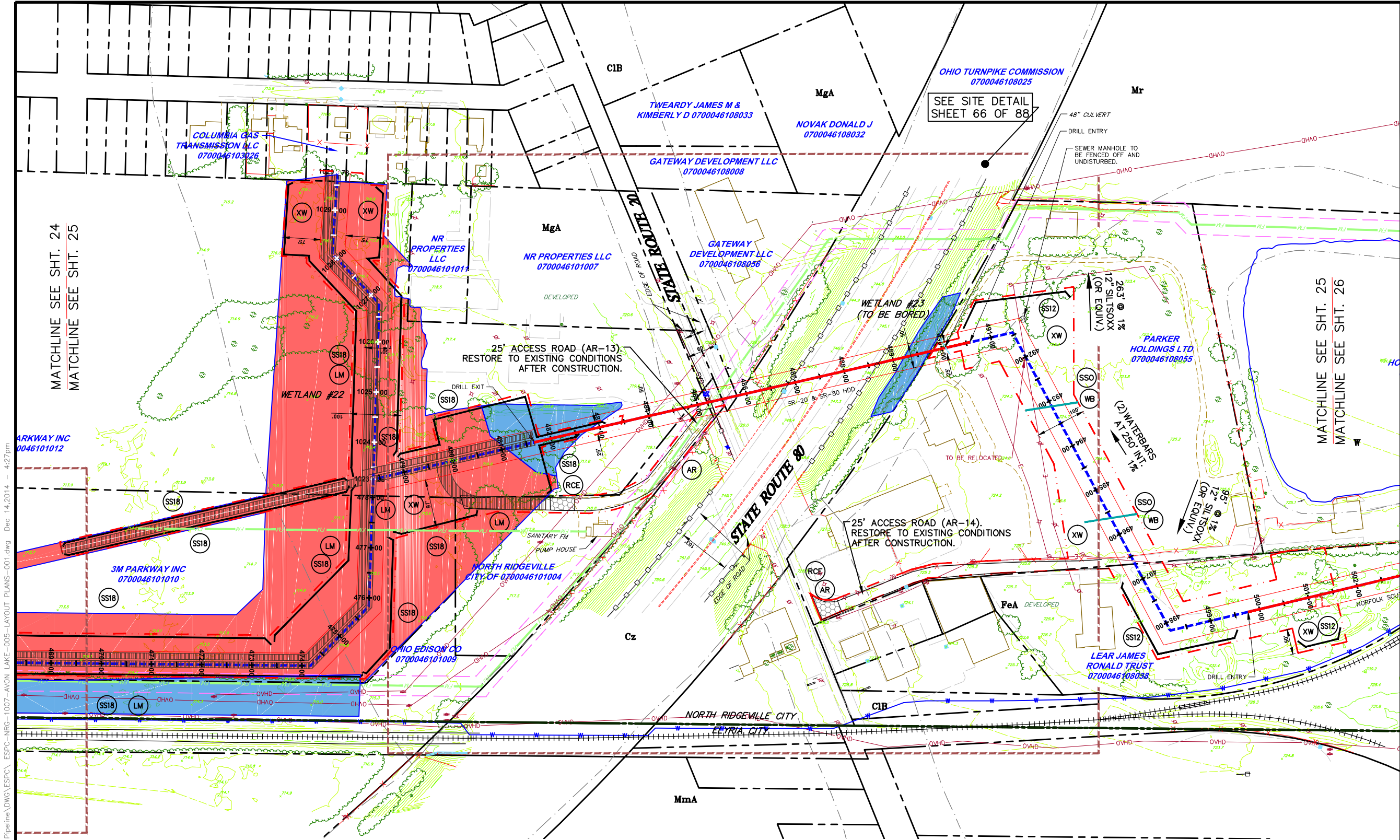
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LORAIN COUNTY
OHIO

Hanover
Engineering Associates Inc

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: 1\"/>

PROJECT NO. NRG-1007
SHEET NO. 23 OF 88
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768



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SS12

SS24

SS32

RCE

LM

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E&SPC LAYOUT PLAN

AVON LAKE GAS ADDITION PROJECT

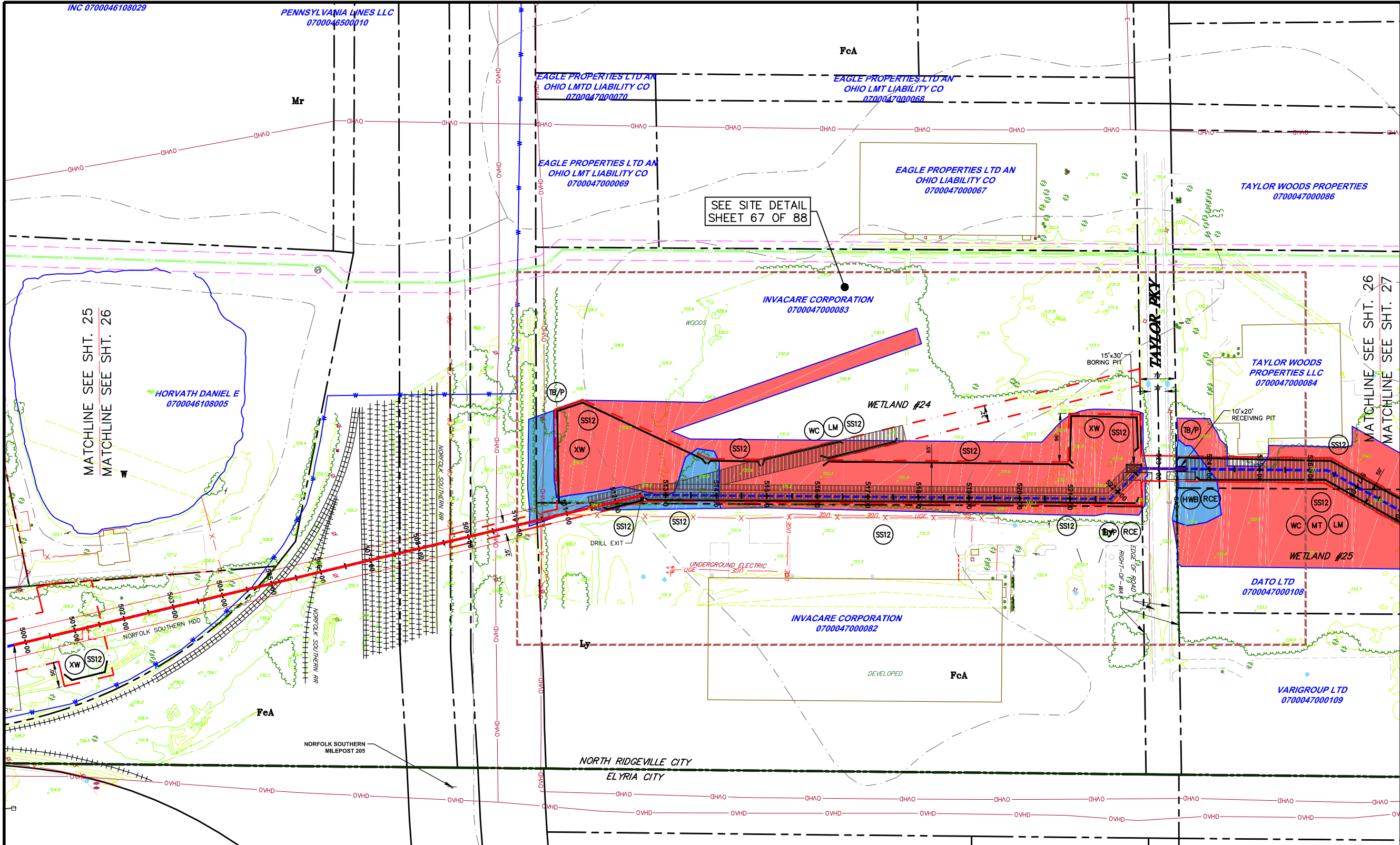
CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

Hanover
Engineering Associates Inc

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: 1"=100'
PROJECT NO.: NRG-1007
SHEET NO.: 25 OF 88

3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

Y:\Projects\Energy\NRG Energy\NRG-1007-Avon Lakes Pipeline\DWG\ESPC\ESPC-NRG-1007-Avon Lake-005-LAYOUT PLANS-001.dwg Dec 14, 2014 -- 4:28pm



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HDD

FENCE

EDGE WOODS

WETLANDS

STONE WALL

OVERHEAD/UTILITY POLE

PERENNIAL STREAM

EPHEMERAL/INTERMITTENT STREAM

ORD. HIGH WATER MARK LINE

FLOODWAY

SOIL TYPE & BOUNDARY

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SILT SOCK OR EQUIV. 32" HEIGHT

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LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE - 235 AC.

PEM/PSS

PFD

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AVON LAKE GAS ADDITION PROJECT

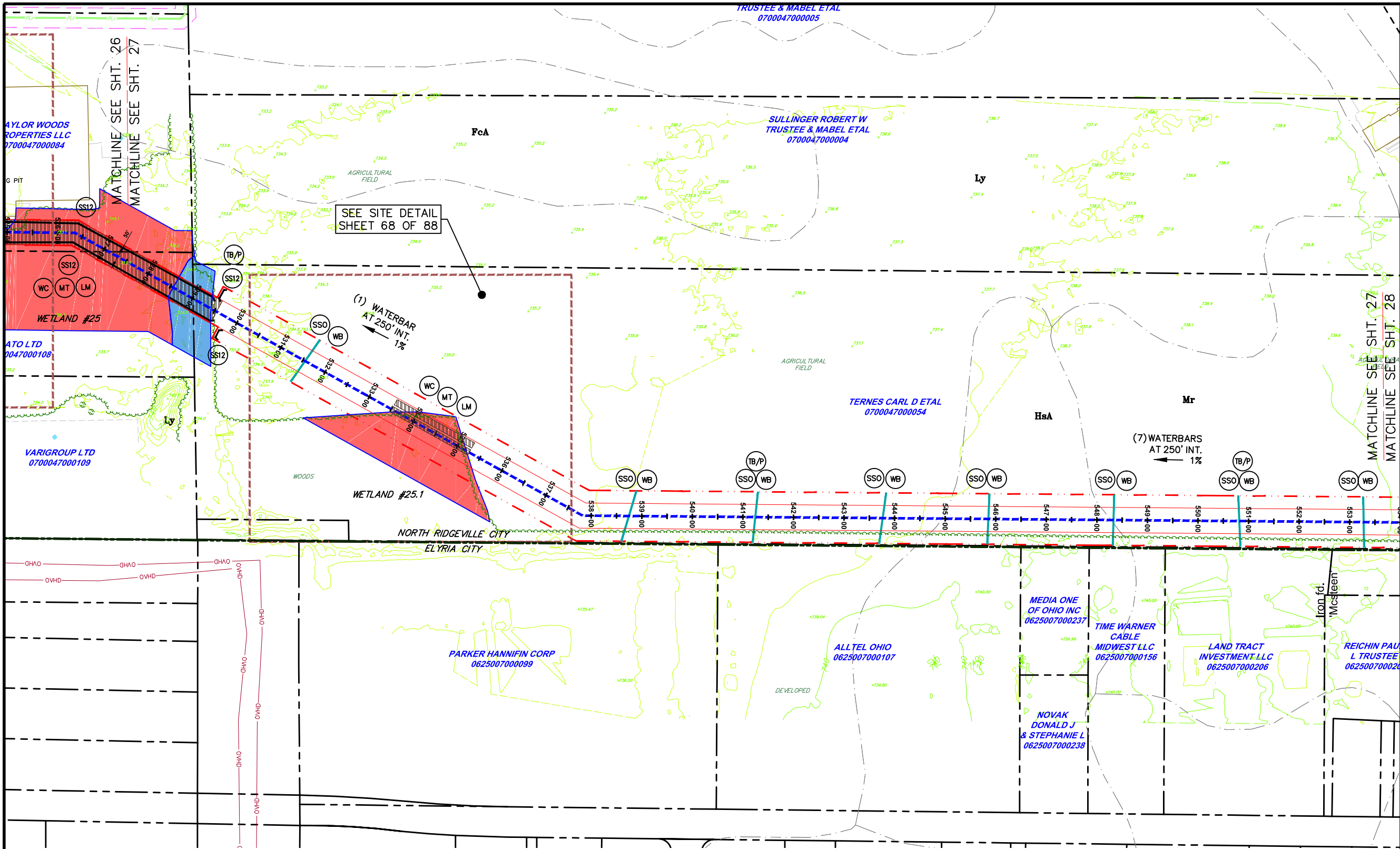
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OHIO

Hanover
Engineering Associates Inc

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: 1"=100'
PROJECT NO. NRG-1007
SHEET NO. 26 OF 88

3355 Route 611, Suite 1
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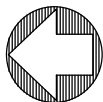
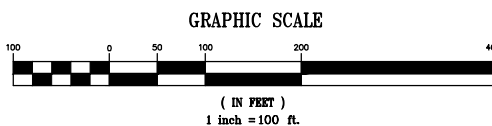
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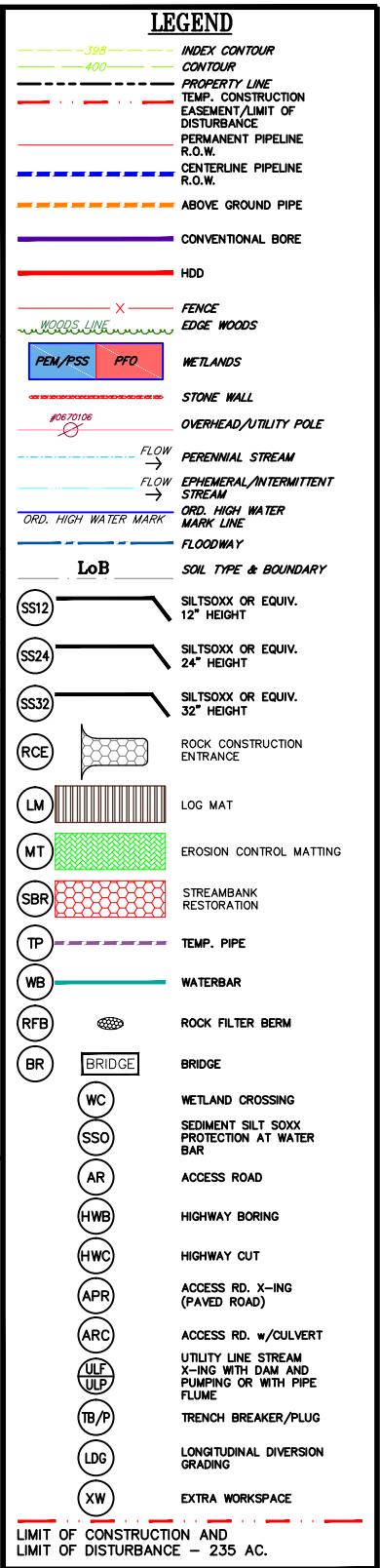
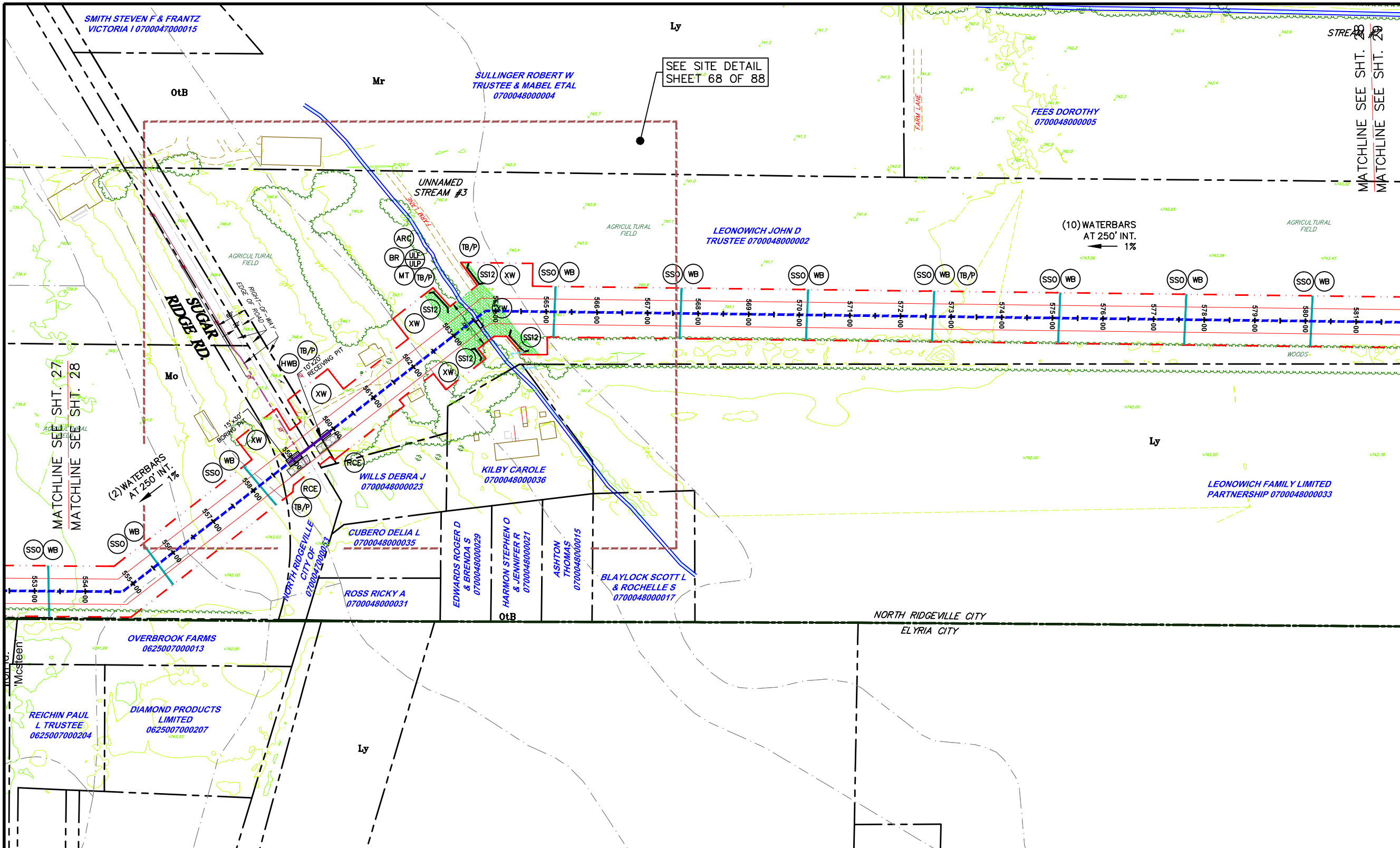
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

Hanover
Engineering Associates Inc

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: 1"=100'
PROJECT NO. NRG-1007
SHEET NO. 27 OF 88
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
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Fax 570.688.9768

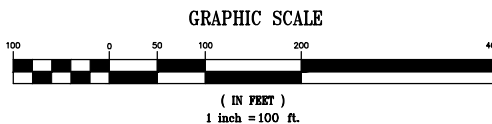
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SEAL

E&SPC LAYOUT PLAN

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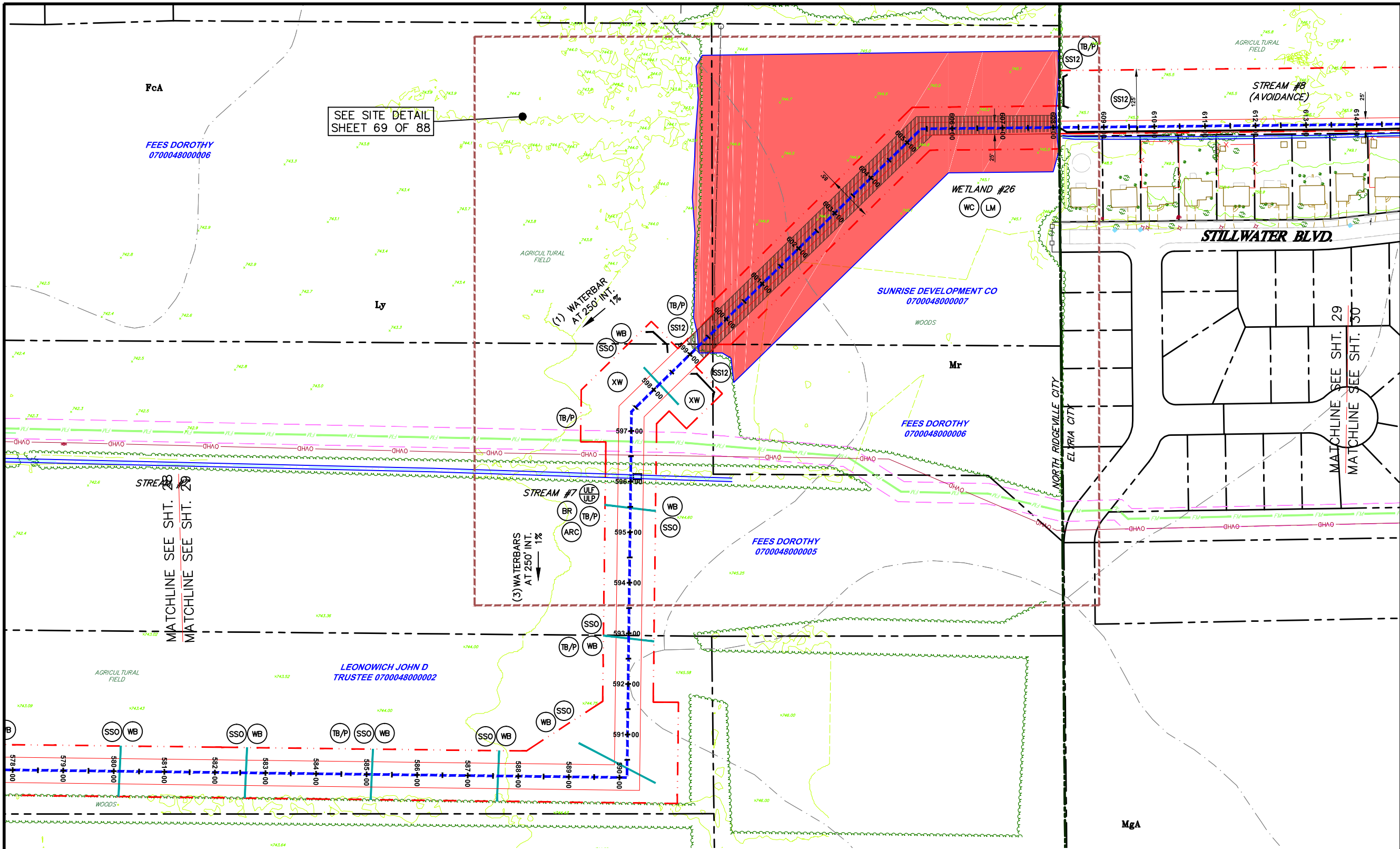
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LORAIN COUNTY
OHIO

Hanover
Engineering Associates Inc

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: 1"=100'
PROJECT NO. NRG-1007
SHEET NO. 28 OF 88

3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
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Fax 570.688.9768

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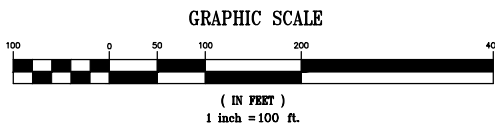


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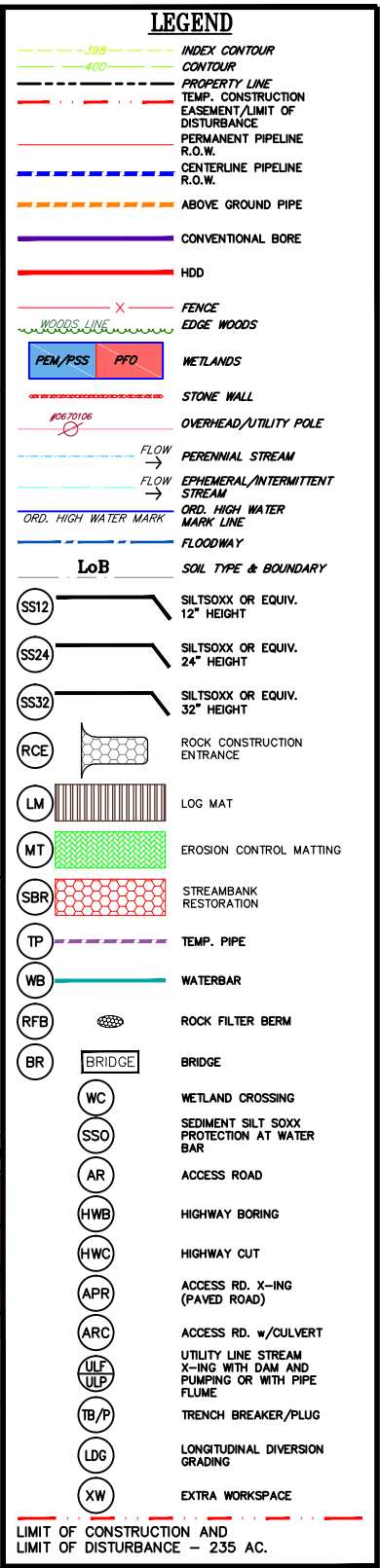
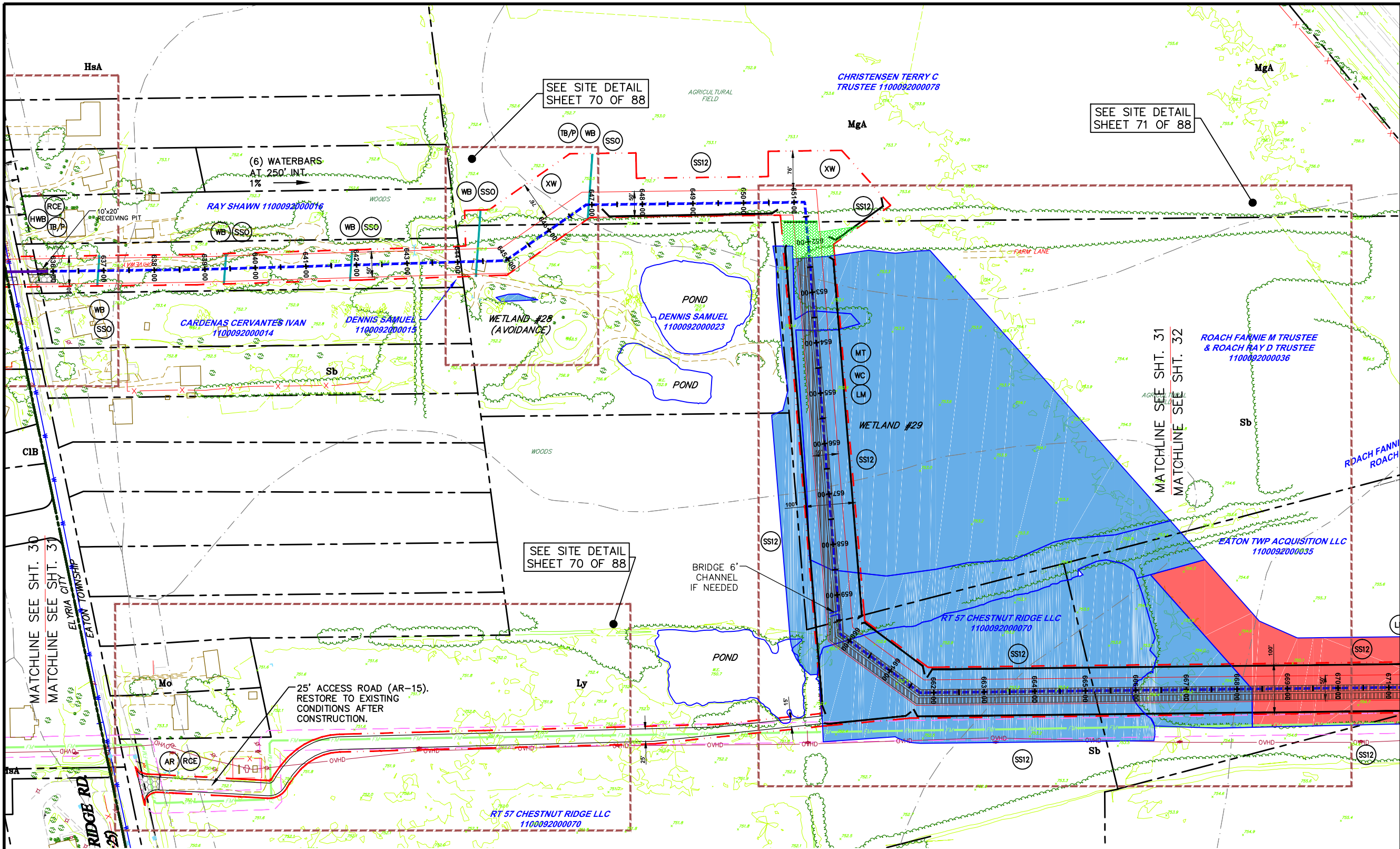
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
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LORAIN COUNTY
OHIO

Hanover
Engineering Associates Inc

DRAWN BY: AEJ	PROJECT NO. NRG-1007
CHECKED BY: SJC	SHEET NO. 29 OF 88
DATE: 12.15.14	
SCALE: 1"=100'	
3355 Route 611, Suite 1 Bartonsville, PA 18321-7822 570.688.9550 Fax 570.688.9768	

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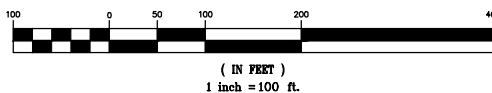


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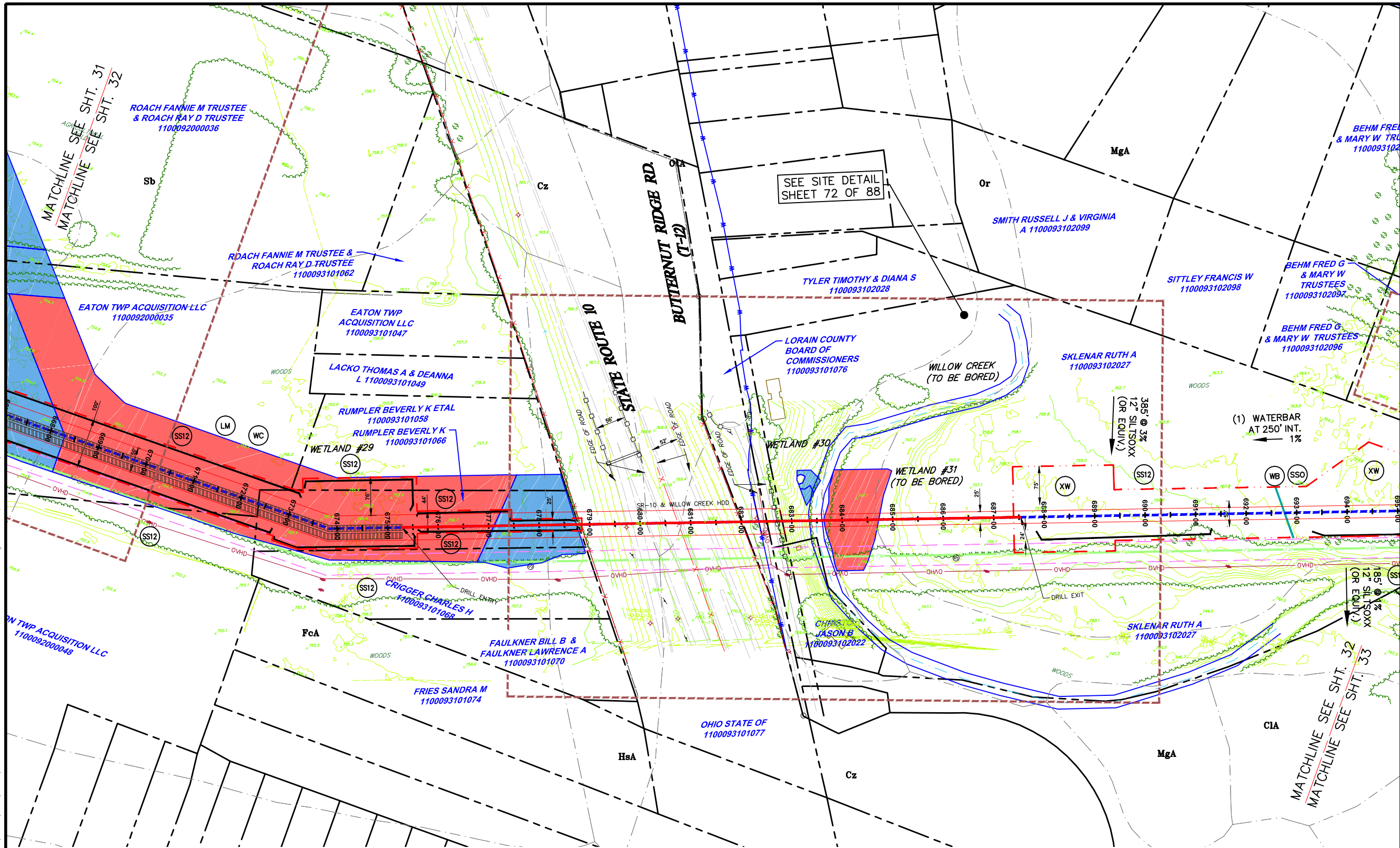
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OHIO

Hanover
Engineering Associates Inc

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: 1"=100'
PROJECT NO.: NRG-1007
SHEET NO.: 31 OF 88
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
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SS24

SS32

RCE

LM

MT

SBR

TP

WB

RFB

BR

WC

SSO

AR

HWB

HWC

APR

ARC

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ULP

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LORAIN COUNTY
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DATE:
12.15.14

SCALE:
1"=100'

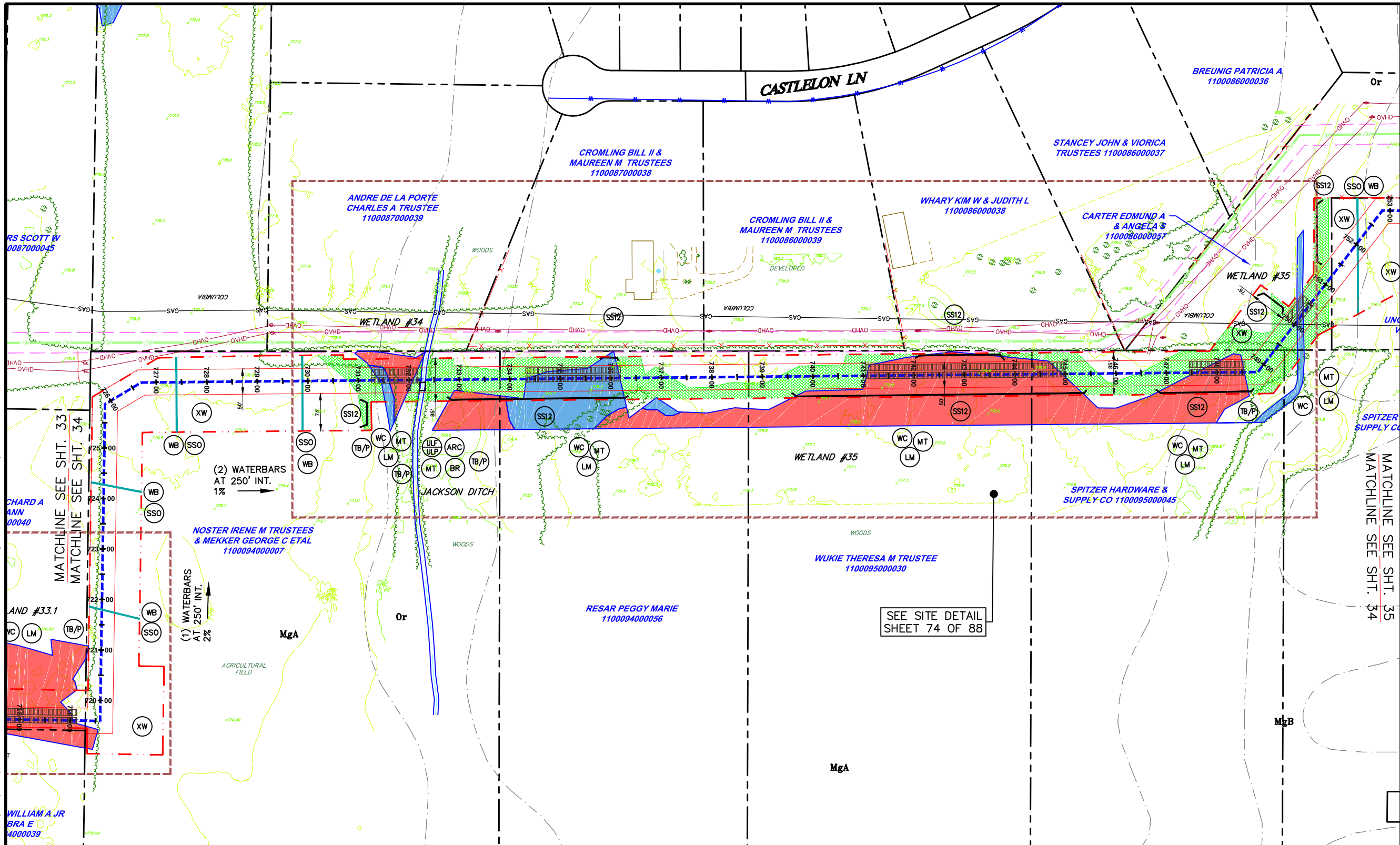
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NRG-1007

SHEET NO.
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Engineering Associates Inc

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LEGEND

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CENTERLINE PIPELINE R.O.W.

ABOVE GROUND PIPE

CONVENTIONAL BORE

HDD

FENCE

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LONGITUDINAL DIVERSION GRADING

EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE - 235 AC.

PEN/PSS

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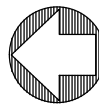
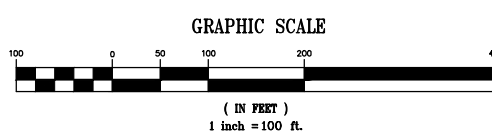
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SEAL

E&SPC LAYOUT PLAN

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY:
AEJ

CHECKED BY:
SJC

DATE:
12.15.14

SCALE:
1"=100'

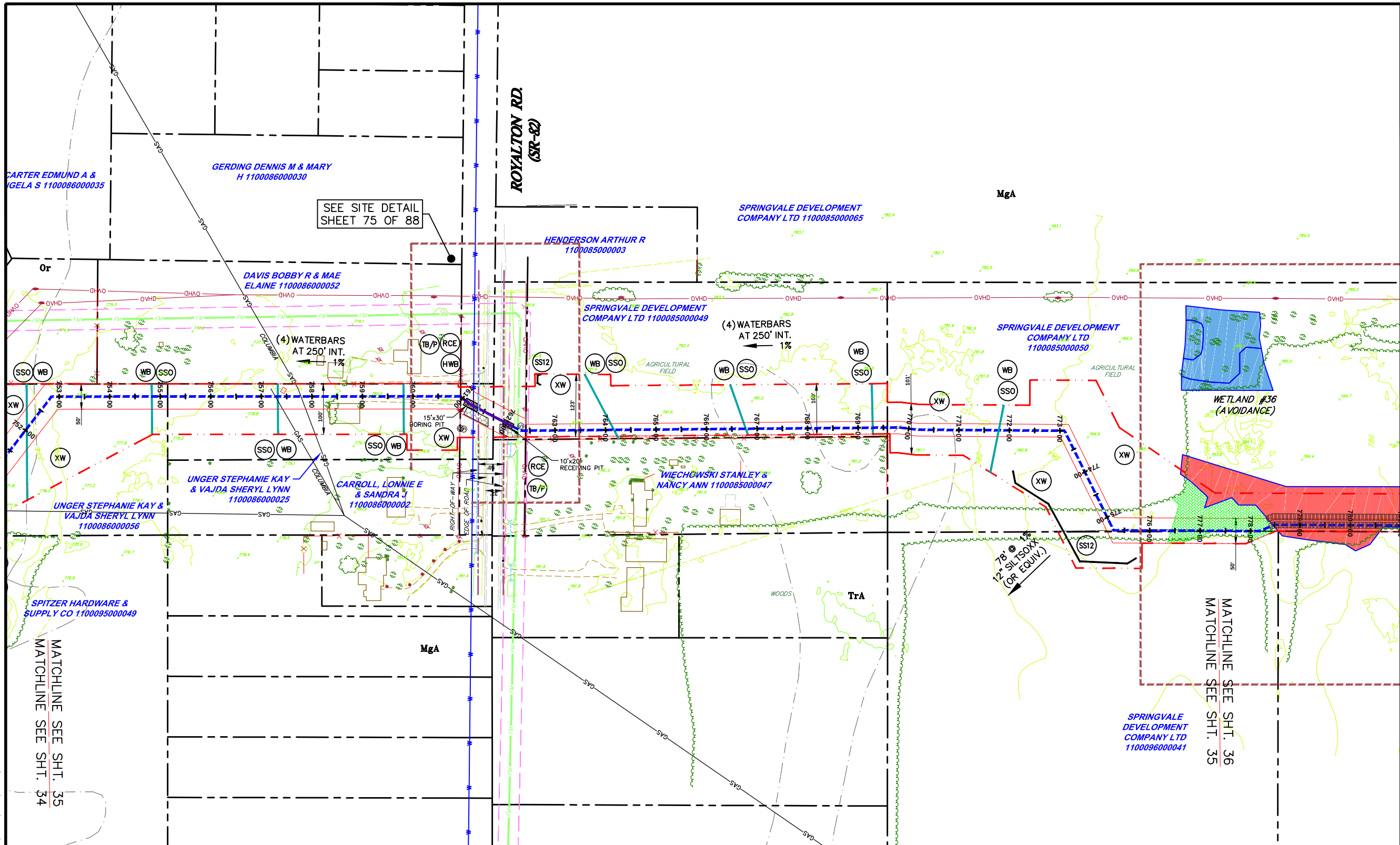
PROJECT NO.
NRG-1007

SHEET NO.
34 OF 88

Hanover
Engineering Associates Inc

3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

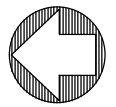
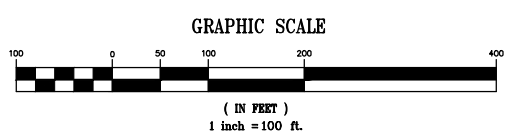
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E&SPC LAYOUT PLAN

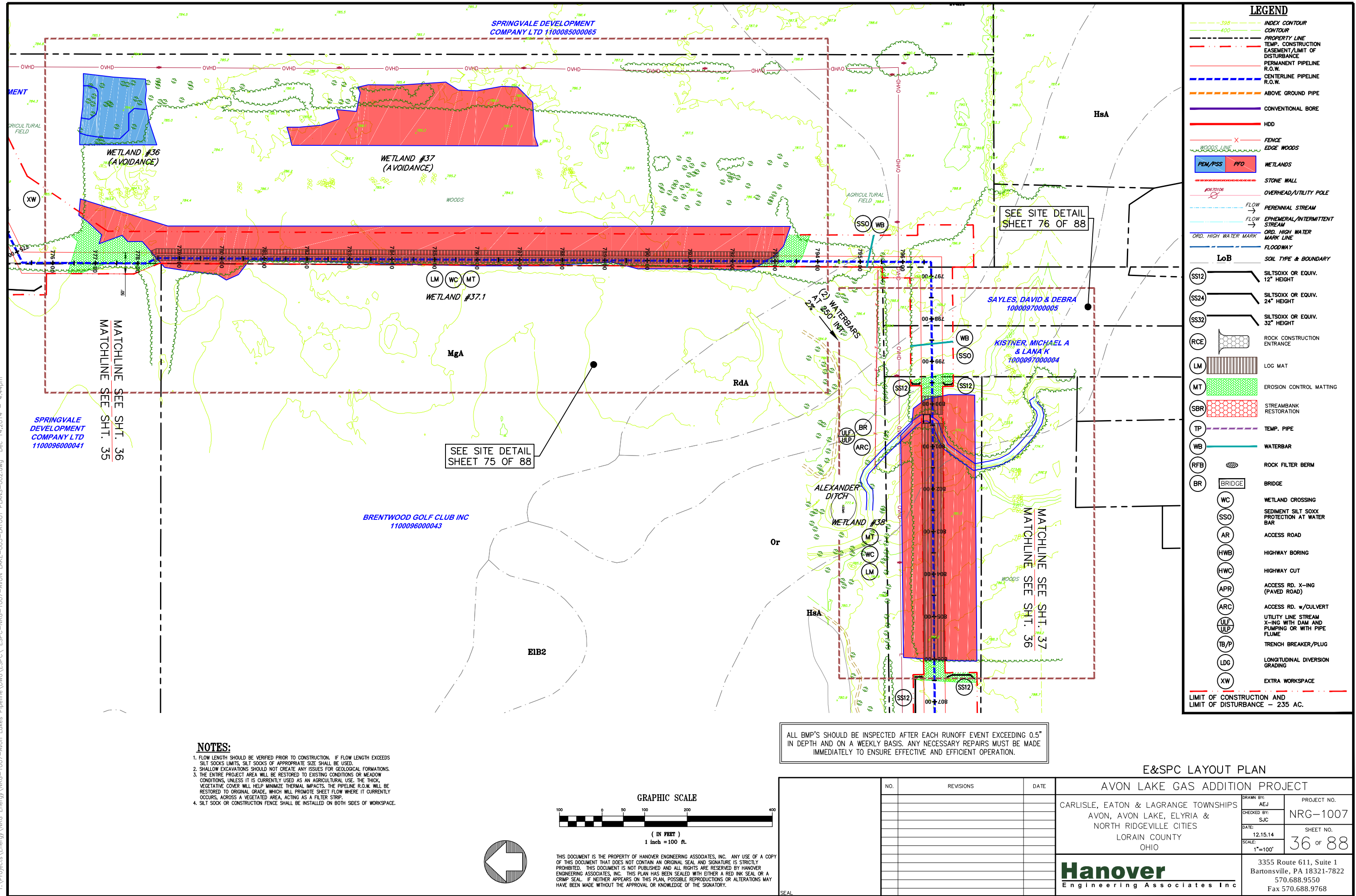
AVON LAKE GAS ADDITION PROJECT

NO.	REVISIONS	DATE

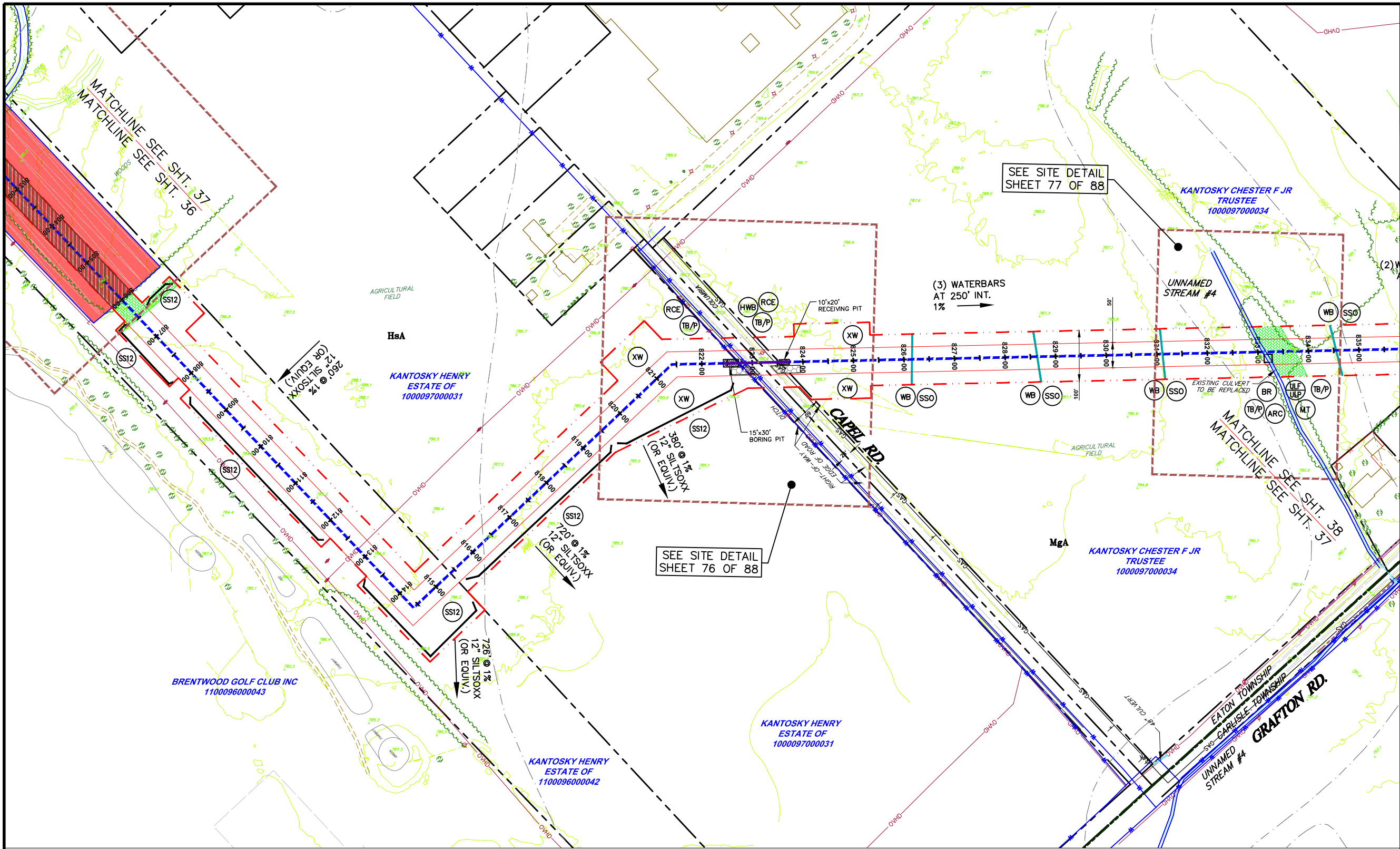
DRAWN BY: AEJ		PROJECT NO. NRG-1007
CHECKED BY: SJC		SHEET NO. 35 OF 88
DATE: 12.15.14		3355 Route 611, Suite 1 Bartonsville, PA 18321-7822 570.688.9550 Fax 570.688.9768
SCALE: 1"=100'		

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
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LORAIN COUNTY
OHIO

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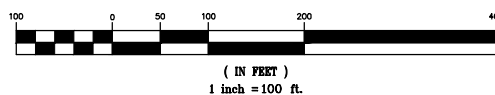
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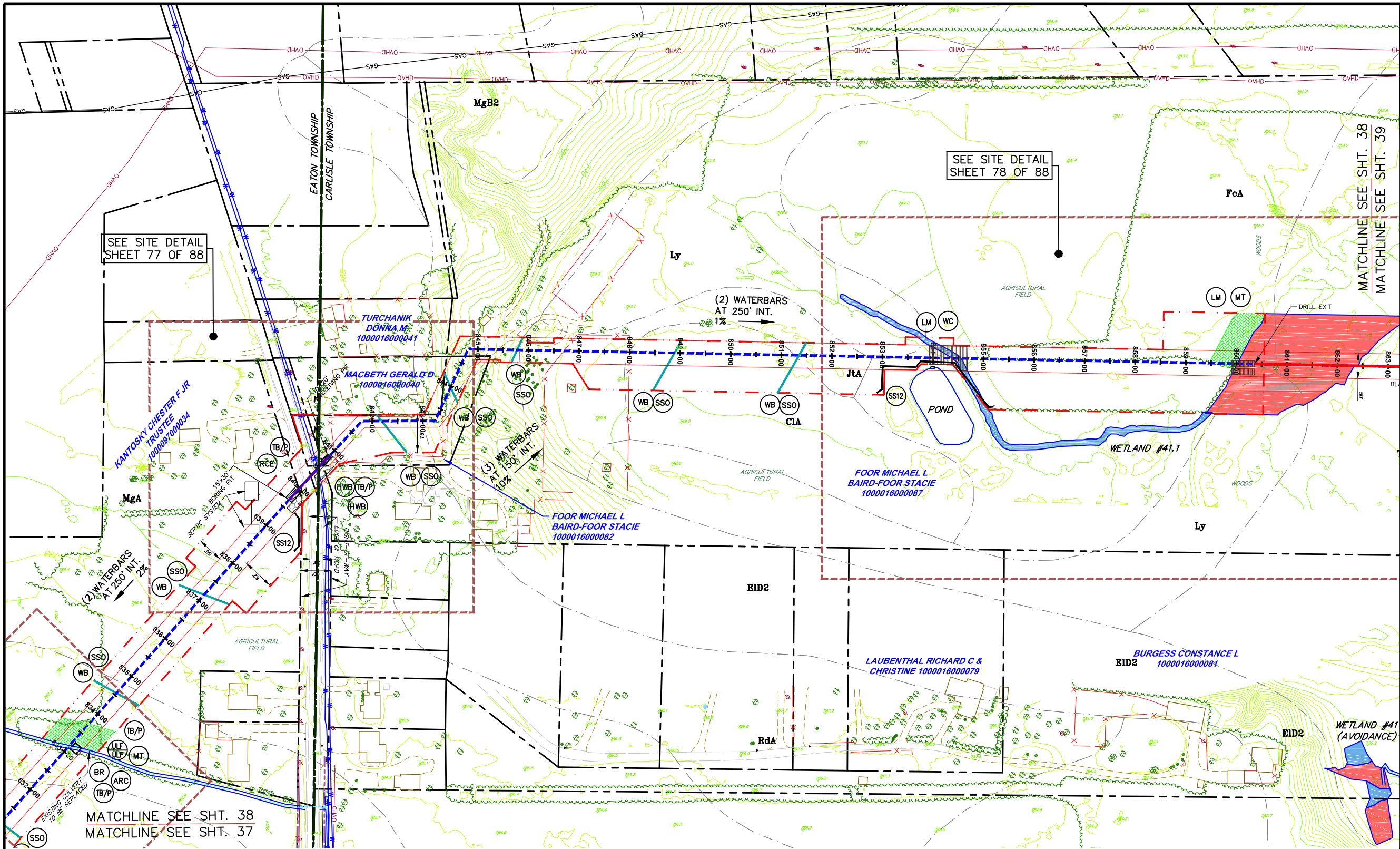
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
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LORAIN COUNTY
OHIO

Hanover
Engineering Associates Inc

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: 1"=100'
PROJECT NO.: NRG-1007
SHEET NO.: 37 OF 88
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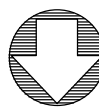
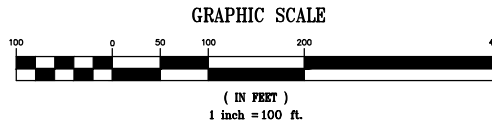


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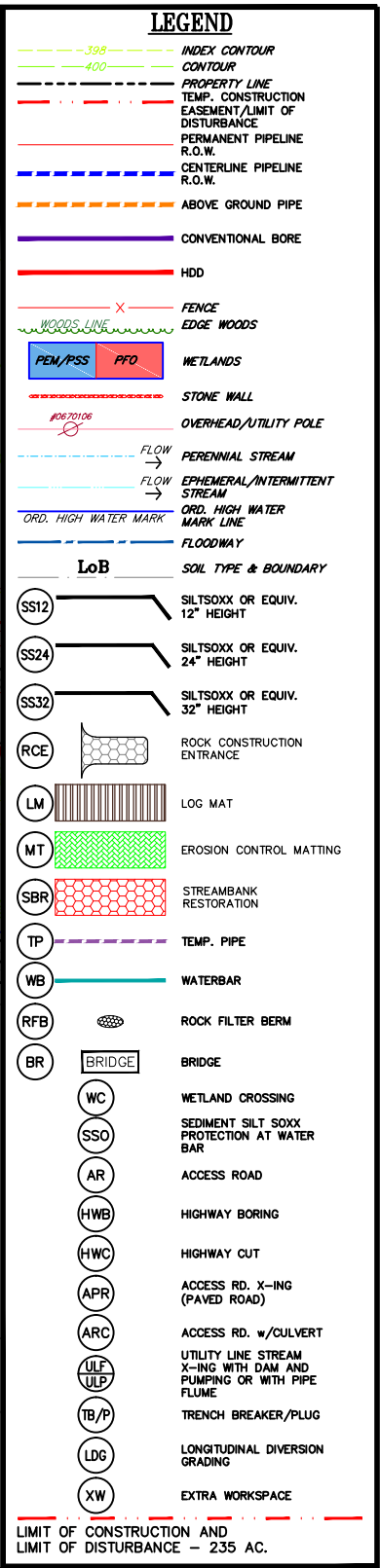
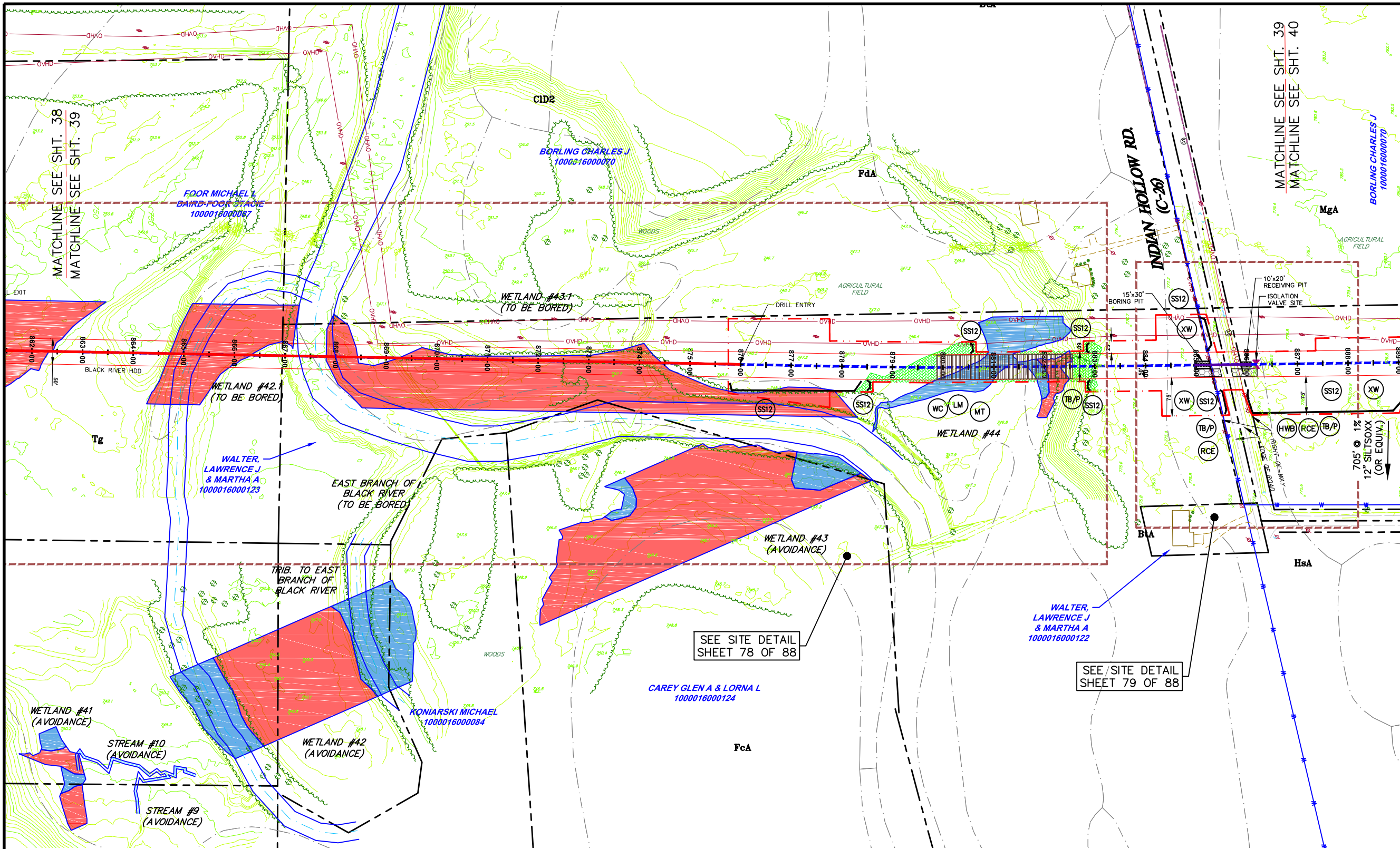
SEAL

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NO.			REVISIONS	DATE	AVON LAKE GAS ADDITION PROJECT		
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					PROJECT NO. NRG-1007 SHEET NO. 38 OF 88		
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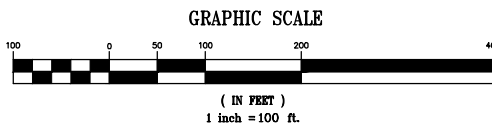
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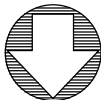
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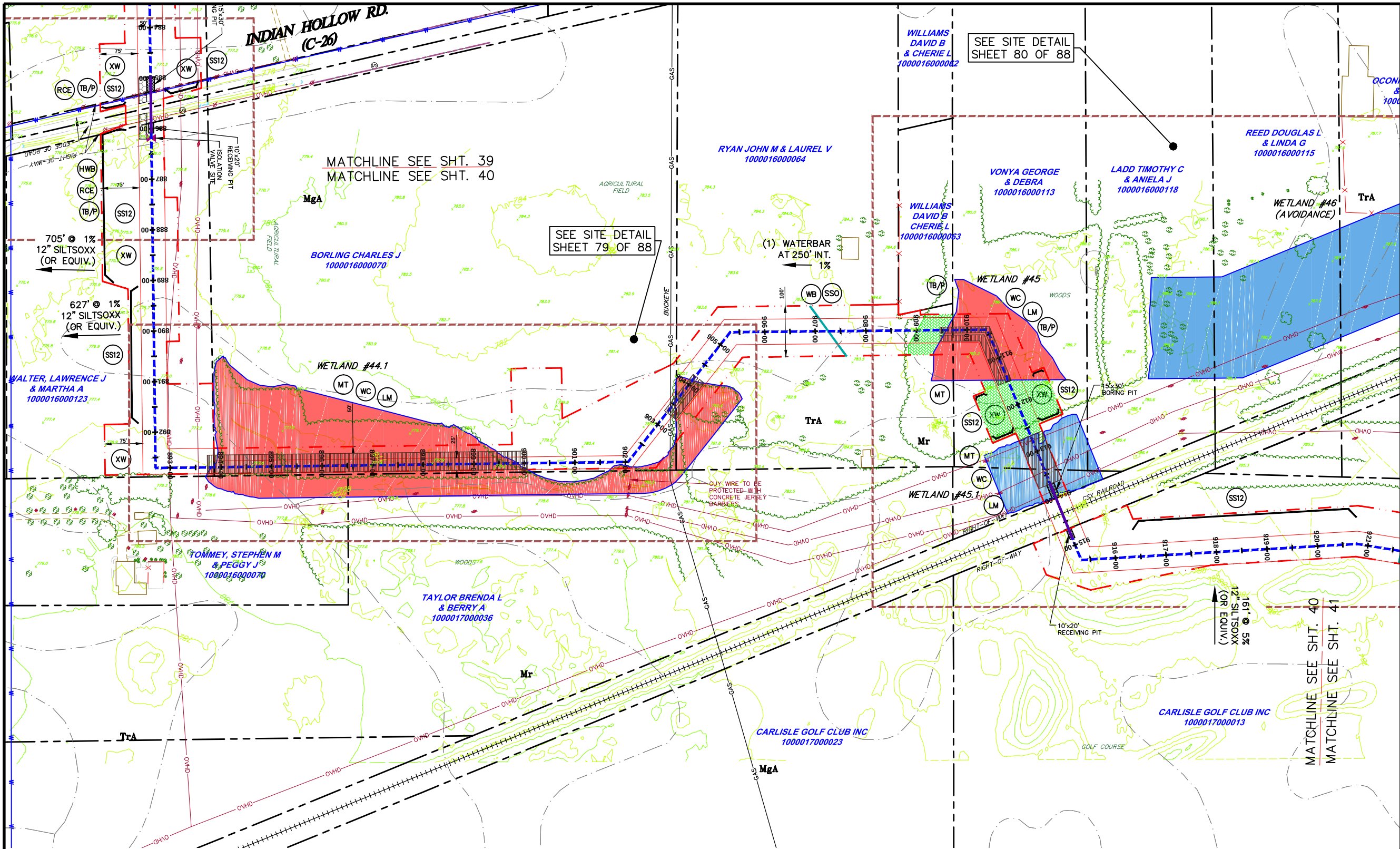
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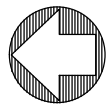
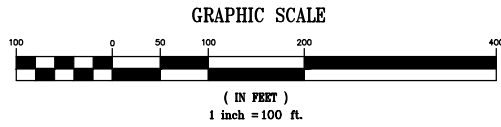


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SEAL

E&SPC LAYOUT PLAN

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

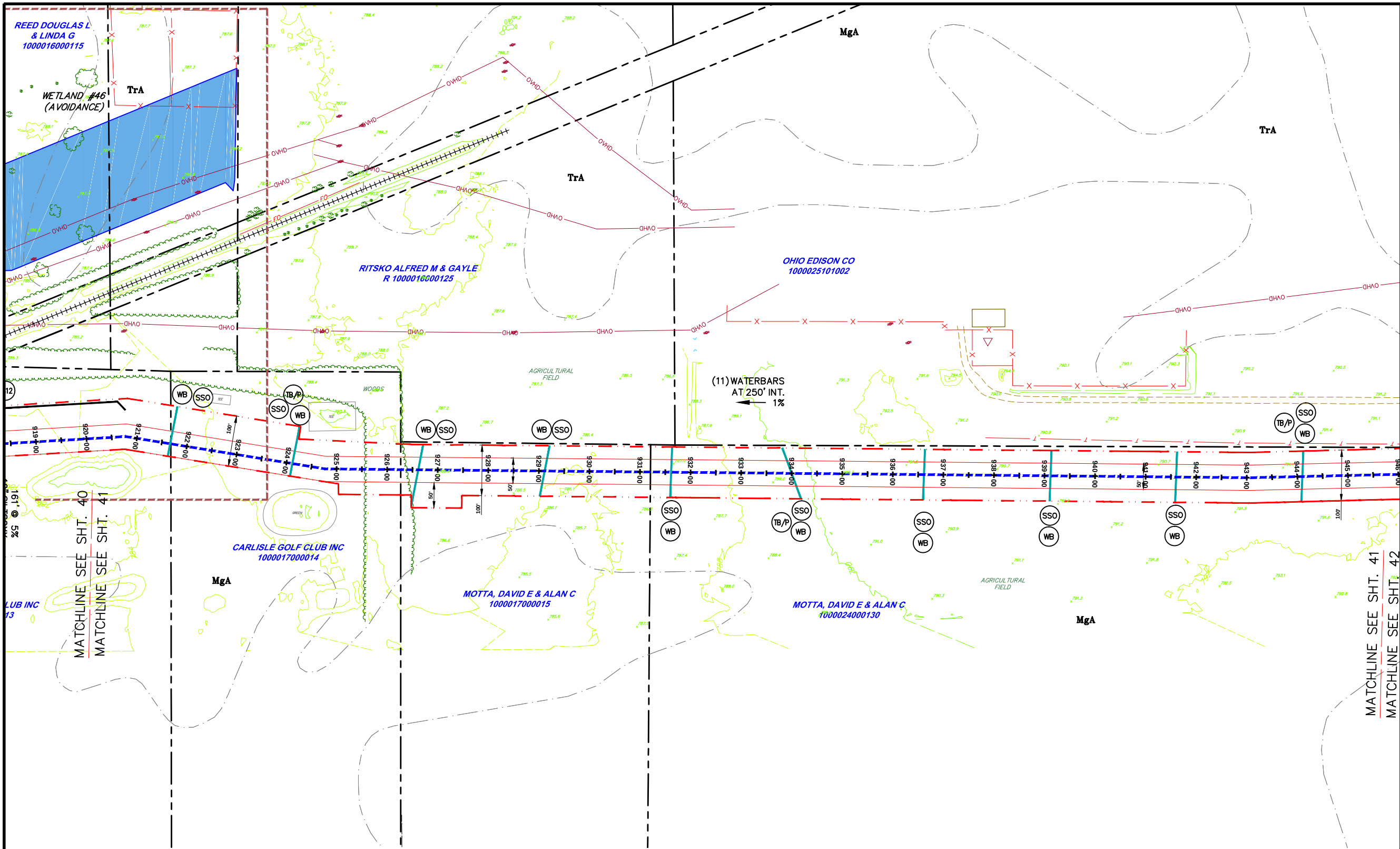
Hanover
Engineering Associates Inc

PROJECT NO.
NRG-1007

SHEET NO.
40 OF 88

3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

Y:\Projects\Energy\NRG Energy\NRG-1007-Avon Lakes Pipeline\DWG\ESPC\ESPC-NRG-1007-Avon Lake-005-LAYOUT PLANS-002.dwg Dec 14, 2014 - 4:47pm

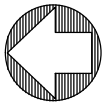
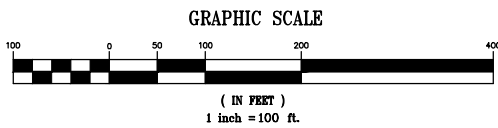


LEGEND

- INDEX CONTOUR
- CONTOUR
- PROPERTY LINE
- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
- PERMANENT PIPELINE R.O.W.
- CENTERLINE PIPELINE R.O.W.
- ABOVE GROUND PIPE
- CONVENTIONAL BORE
- HDD
- FENCE
- EDGE WOODS
- WETLANDS
- STONE WALL
- OVERHEAD/UTILITY POLE
- PERENNIAL STREAM
- EPHEMERAL/INTERMITTENT STREAM
- ORD. HIGH WATER MARK LINE
- FLOODWAY
- SOIL TYPE & BOUNDARY
- SILT SOCK OR EQUIV. 12" HEIGHT
- SILT SOCK OR EQUIV. 24" HEIGHT
- SILT SOCK OR EQUIV. 32" HEIGHT
- ROCK CONSTRUCTION ENTRANCE
- LOG MAT
- EROSION CONTROL MATTING
- STREAMBANK RESTORATION
- TEMP. PIPE
- WATERBAR
- ROCK FILTER BERM
- BRIDGE
- WETLAND CROSSING
- SEDIMENT SILT SOCK PROTECTION AT WATER BAR
- ACCESS ROAD
- HIGHWAY BORING
- HIGHWAY CUT
- ACCESS RD. X-ING (PAVED ROAD)
- ACCESS RD. w/CULVERT
- UTILITY LINE STREAM X-ING WITH DAM AND PUMPING OR WITH PIPE FLUME
- TRENCH BREAKER/PLUG
- LONGITUDINAL DIVERSION GRADING
- EXTRA WORKSPACE
- LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE - 235 AC.

- NOTES:**
1. FLOW LENGTH SHOULD BE VERIFIED PRIOR TO CONSTRUCTION. IF FLOW LENGTH EXCEEDS SILT SOCKS LIMITS, SILT SOCKS OF APPROPRIATE SIZE SHALL BE USED.
 2. SHALLOW EXCAVATIONS SHOULD NOT CREATE ANY ISSUES FOR GEOLOGICAL FORMATIONS.
 3. THE ENTIRE PROJECT AREA WILL BE RESTORED TO EXISTING CONDITIONS OR MEADOW CONDITIONS, UNLESS IT IS CURRENTLY USED AS AN AGRICULTURAL USE. THE THICK VEGETATIVE COVER WILL HELP MINIMIZE THERMAL IMPACTS. THE PIPELINE R.O.W. WILL BE RESTORED TO ORIGINAL GRADE, WHICH WILL PROMOTE SHEET FLOW WHERE IT CURRENTLY OCCURS, ACROSS A VEGETATED AREA, ACTING AS A FILTER STRIP.
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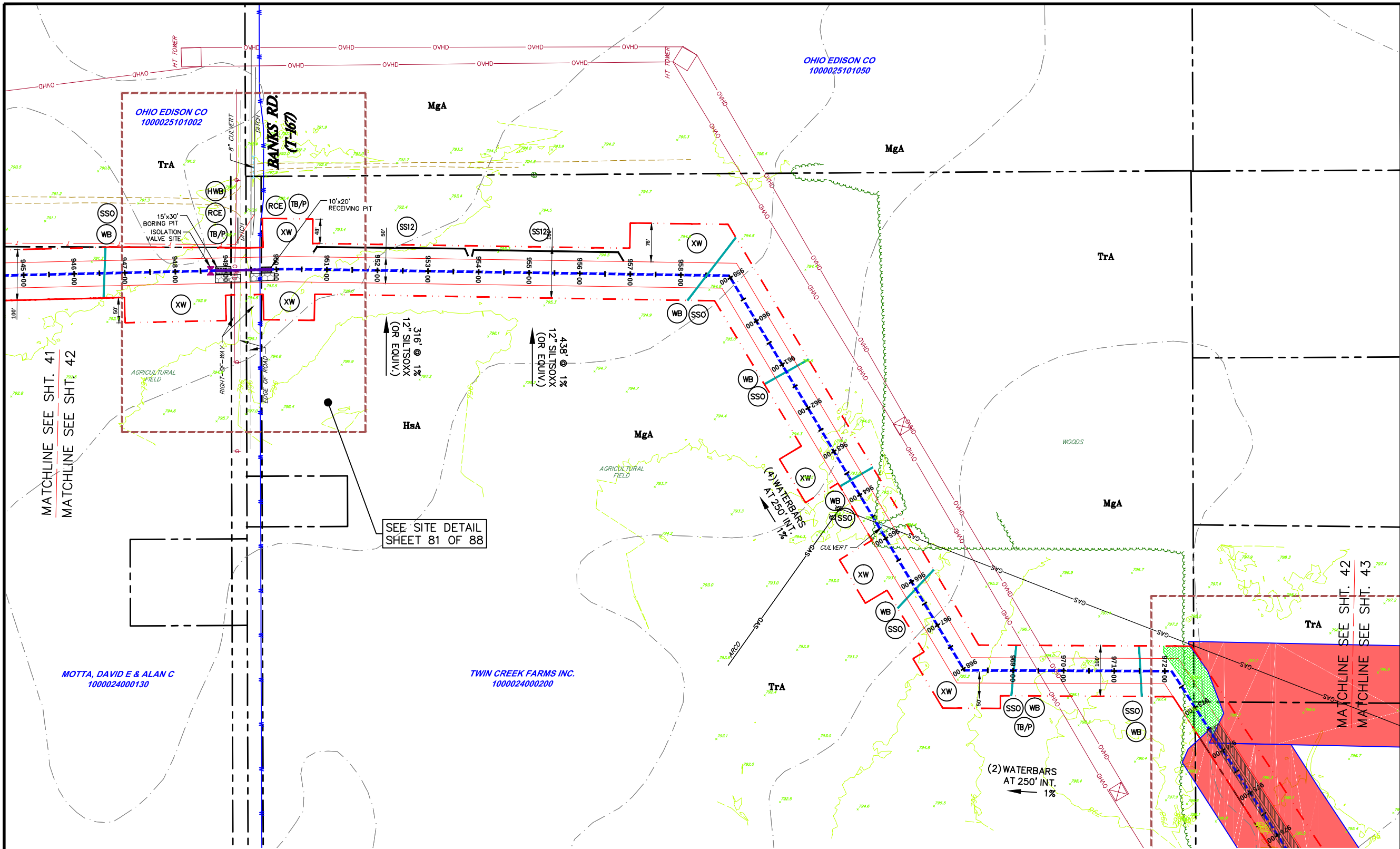


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SEAL

E&SPC LAYOUT PLAN

SEAL	NO.	REVISIONS	DATE	AVON LAKE GAS ADDITION PROJECT			
				CARLISLE, EATON & LAGRANGE TOWNSHIPS AVON, AVON LAKE, ELYRIA & NORTH RIDGEVILLE CITIES LORAIN COUNTY OHIO	DRAWN BY: AEJ	PROJECT NO.	
					CHECKED BY: SJC	NRG-1007	
					DATE: 12.15.14	SHEET NO.	
					SCALE: 1"=100'	41 OF 88	
				Hanover Engineering Associates Inc	3355 Route 611, Suite 1 Bartonsville, PA 18321-7822 570.688.9550 Fax 570.688.9768		



LEGEND

INDEX CONTOUR

CONTOUR

PROPERTY LINE

TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE

PERMANENT PIPELINE R.O.W.

CENTERLINE PIPELINE R.O.W.

ABOVE GROUND PIPE

CONVENTIONAL BORE

HDD

FENCE

EDGE WOODS

PEN/PSS

PFO

WETLANDS

STONE WALL

OVERHEAD/UTILITY POLE

PERENNIAL STREAM

EPHEMERAL/INTERMITTENT STREAM

ORD. HIGH WATER MARK

FLOODWAY

SOIL TYPE & BOUNDARY

SILT SOCK OR EQUIV. 12" HEIGHT

SILT SOCK OR EQUIV. 24" HEIGHT

SILT SOCK OR EQUIV. 32" HEIGHT

ROCK CONSTRUCTION ENTRANCE

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EROSION CONTROL MATTING

STREAMBANK RESTORATION

TEMP. PIPE

WATERBAR

ROCK FILTER BERM

BRIDGE

WETLAND CROSSING

SEDIMENT SILT SOCK PROTECTION AT WATER BAR

ACCESS ROAD

HIGHWAY BORING

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ACCESS RD. w/CULVERT

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TRENCH BREAKER/PLUG

LONGITUDINAL DIVERSION GRADING

EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE - 235 AC.

SS12

SS24

SS32

RCE

LM

MT

SBR

TP

WB

RFB

BR

WC

SSO

AR

HWB

HWC

APR

ARC

ULP

ULP

TB/P

LDG

XW

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GRAPHIC SCALE

(IN FEET)
1 inch = 100 ft.

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SEAL

E&SPC LAYOUT PLAN

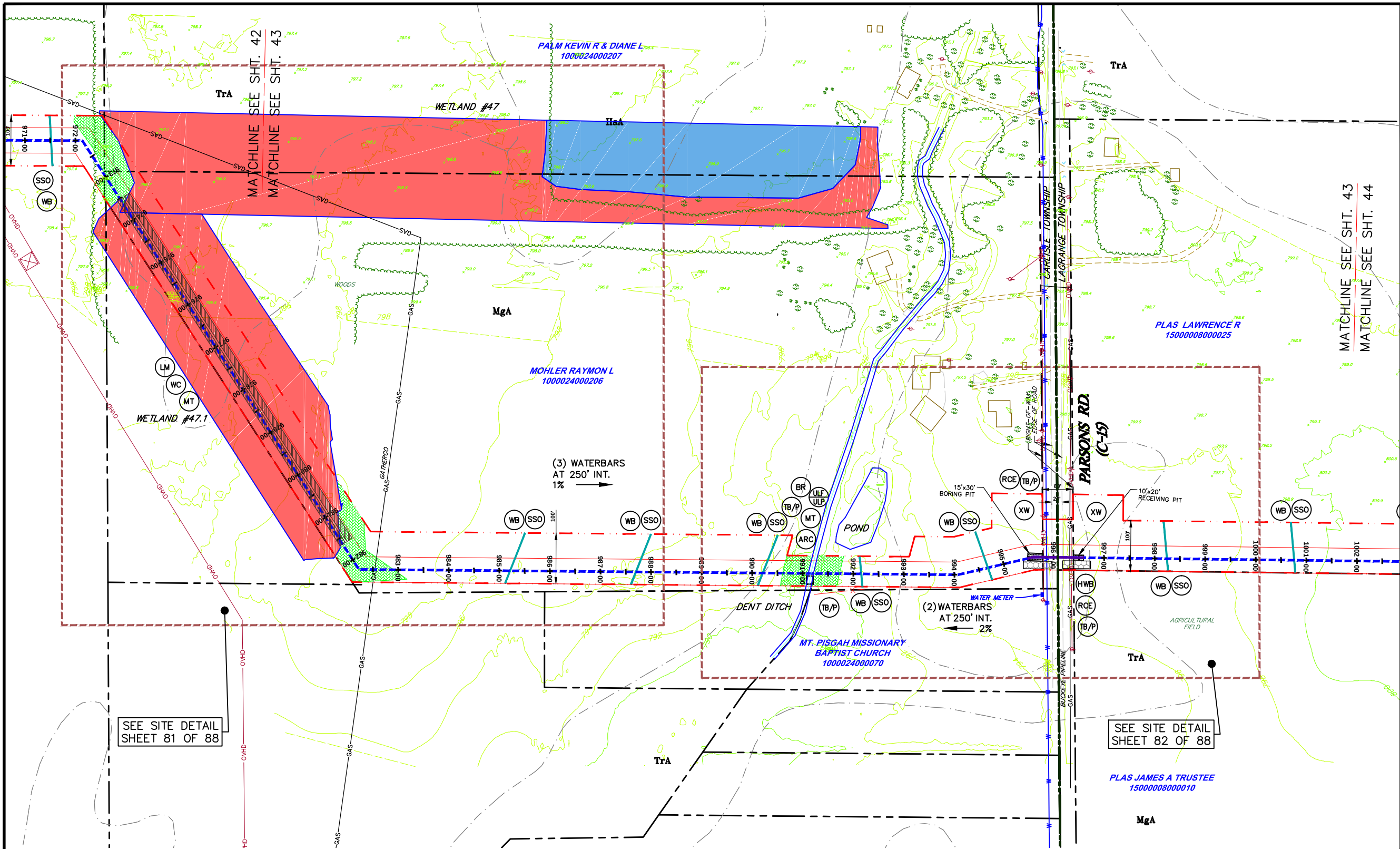
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

Hanover
Engineering Associates Inc

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: 1"=100'
PROJECT NO. NRG-1007
SHEET NO. 42 OF 88

3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768



LEGEND

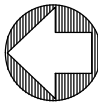
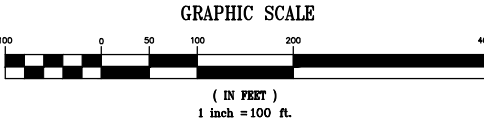
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- LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE - 235 AC.

SEE SITE DETAIL SHEET 81 OF 88

SEE SITE DETAIL SHEET 82 OF 88

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SEAL

E&SPC LAYOUT PLAN

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

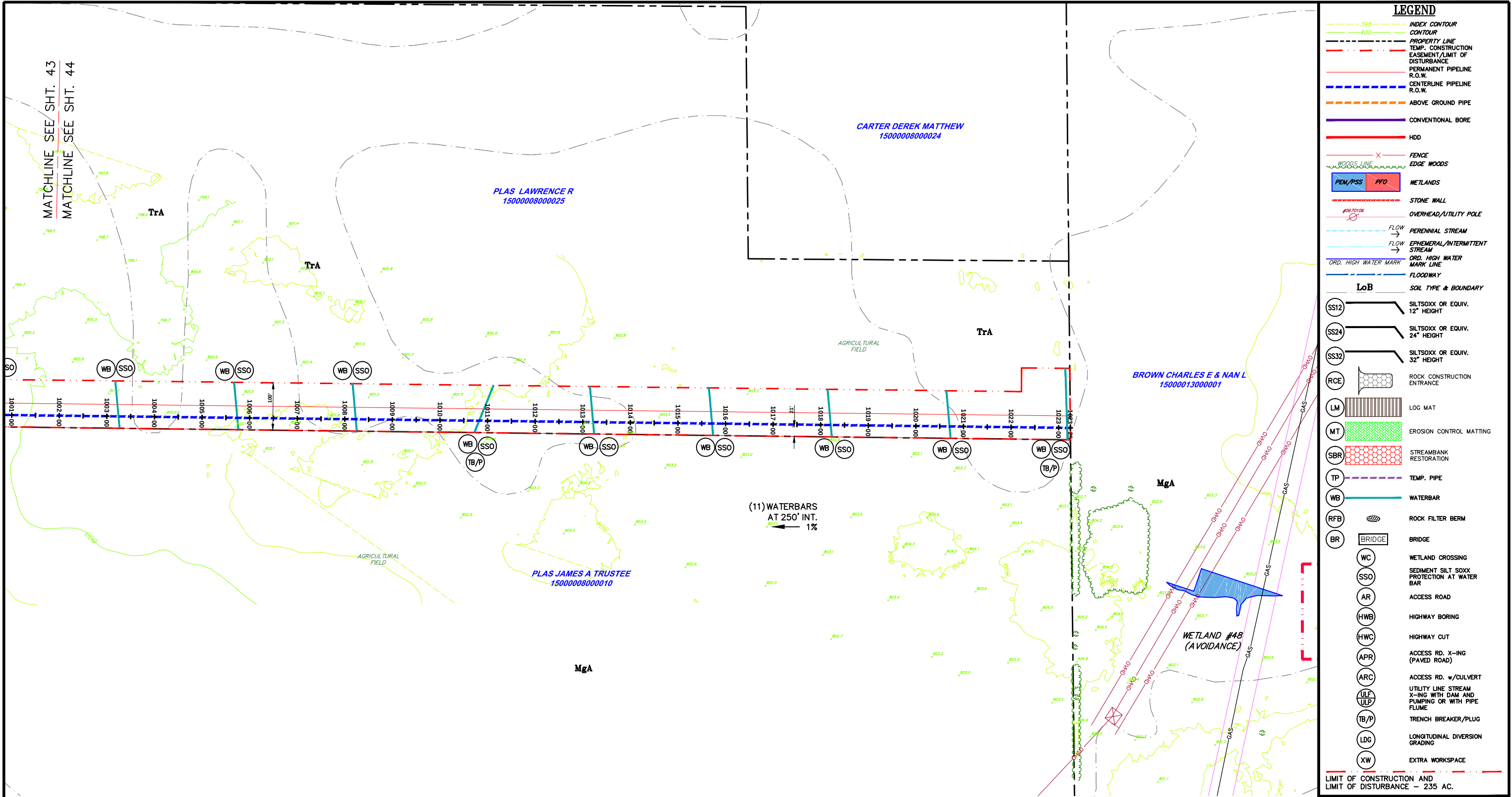
DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: 1"=100'

PROJECT NO. NRG-1007
SHEET NO. 43 OF 88

3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

Hanover
Engineering Associates Inc

Y:\Projects\Energy\NRG Energy\NRG-1007-Avon Lakes Pipeline\DWG\ESPC\ESPC-NRG-1007-Avon LAKE-005-LAYOUT PLANS-002.dwg Dec 14, 2014 4:49pm

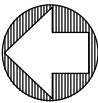
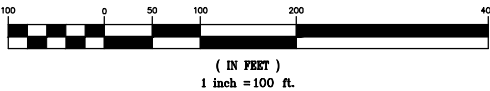


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GRAPHIC SCALE



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SEAL

E&SPC LAYOUT PLAN

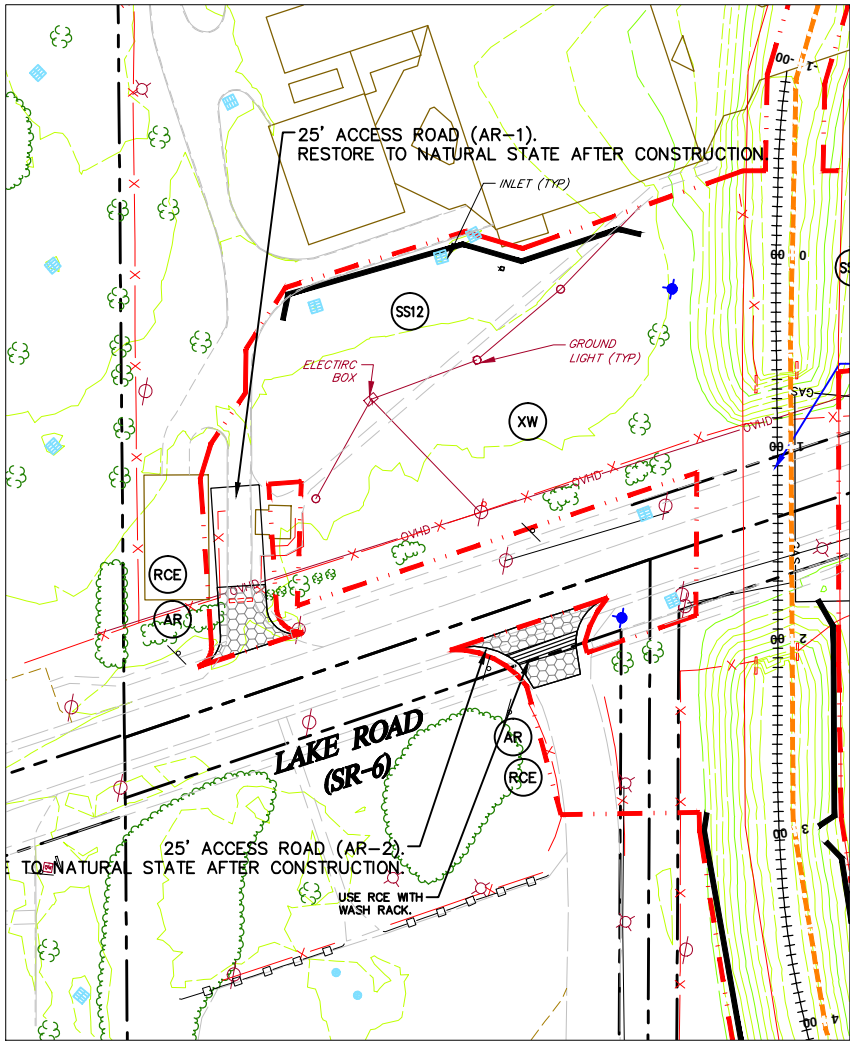
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

Hanover
Engineering Associates Inc

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: 1"=100'
PROJECT NO. NRG-1007
SHEET NO. 44 OF 88

3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768



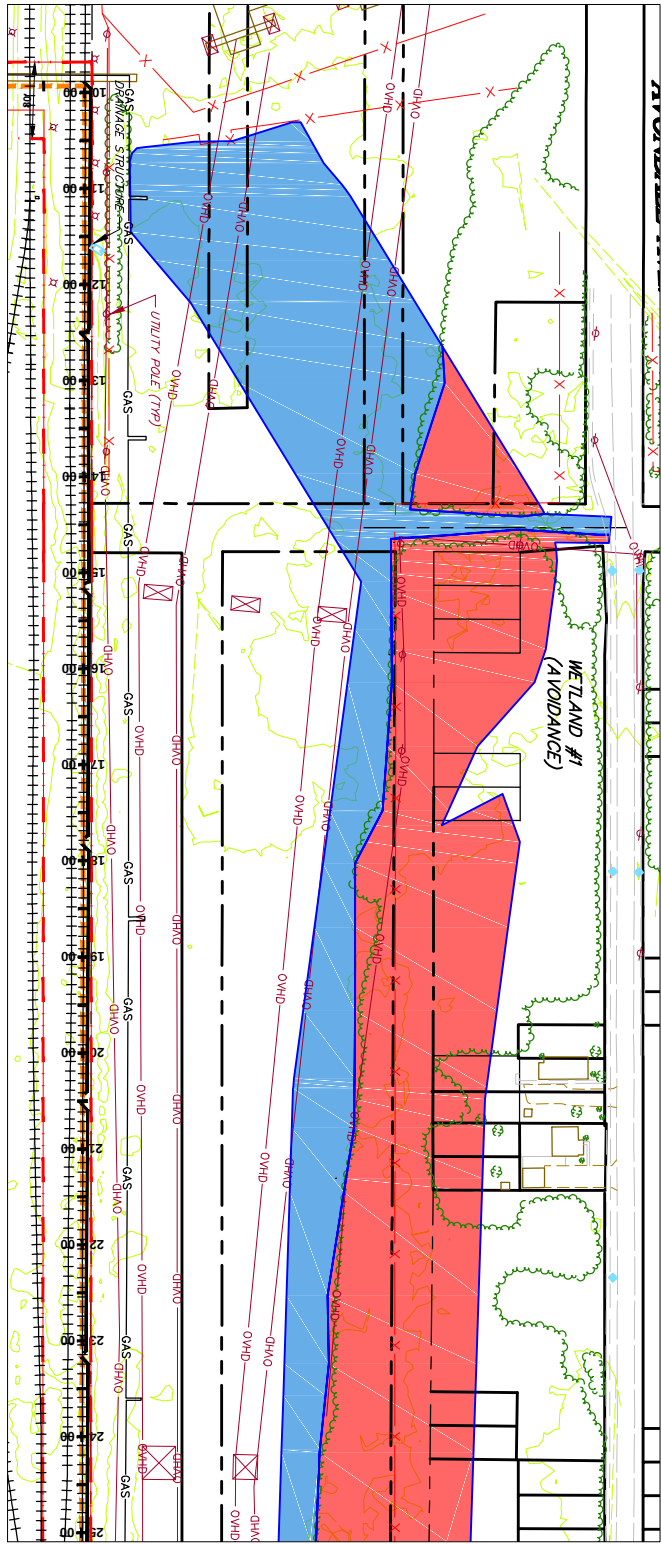
**ACCESS ROAD (AR-1) TO LAKE ROAD (SR-6),
ACCESS ROAD (AR-2) TO LAKE ROAD (SR-6),
& LAKE ROAD (SR-6)**
SCALE: 1" = 50'

NOTES:

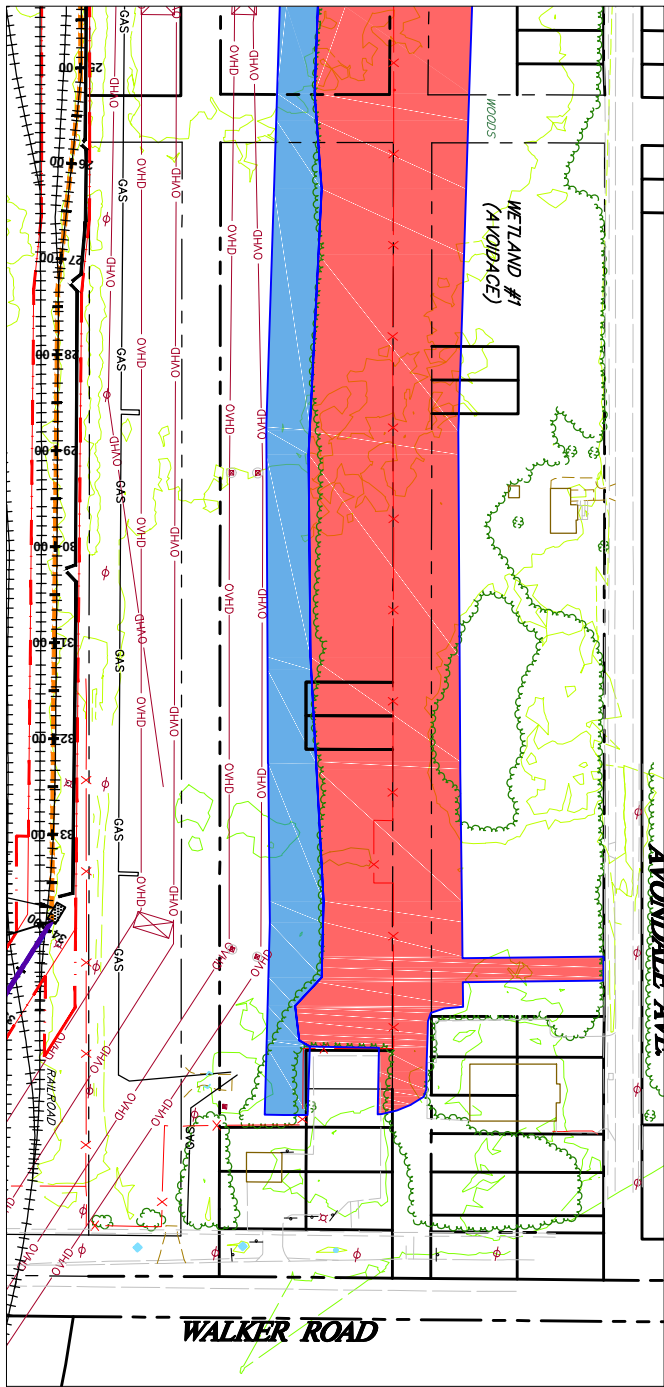
1. REFER TO DETAIL SHEET 5 FOR "RCE" DETAIL.
2. REFER TO DETAIL SHEET 5 FOR "AR" DETAIL.
3. REFER TO DETAIL SHEET 3 FOR "HWC" OR "HMB" DETAIL. PLACE TRENCH BREAKERS ON EITHER SIDE OF THE EXISTING ROAD.
4. SEE ODOT PERMITS FOR STATE REQUIREMENTS.
5. REFER TO DETAIL SHEET 3 FOR "TB" DETAIL.
6. REFER TO DETAIL SHEET 6 FOR INLET PROTECTION DETAIL.

GENERAL NOTES:

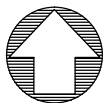
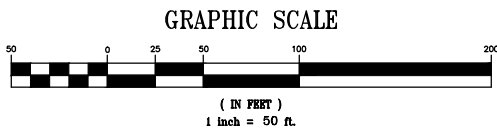
1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.



WETLAND #1 (AVOIDANCE)
SCALE: 1" = 100'



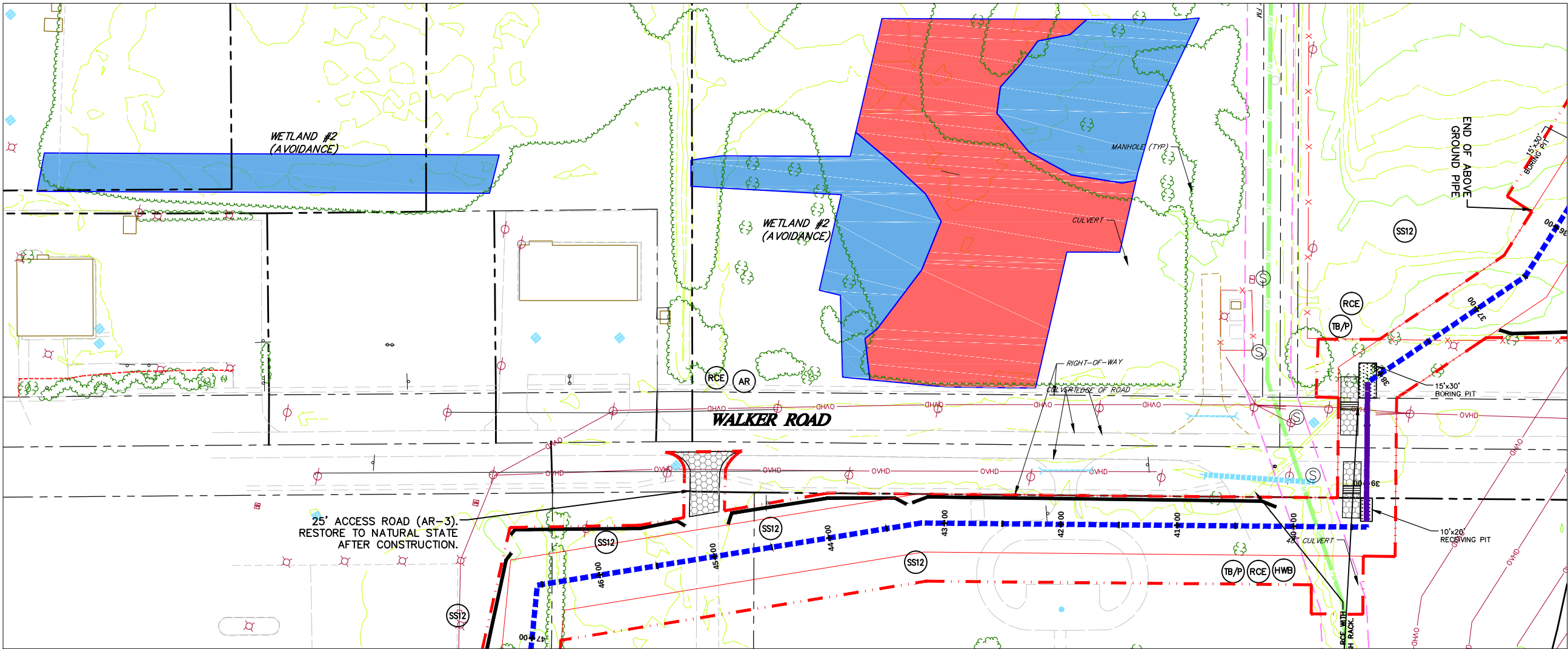
LEGEND	
	INDEX CONTOUR
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LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE - 235 AC.	



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SEAL	NO.	REVISIONS	DATE	AVON LAKE GAS ADDITION PROJECT			
				CARLISLE, EATON & LAGRANGE TOWNSHIPS AVON, AVON LAKE, ELYRIA & NORTH RIDGEVILLE CITIES LORAIN COUNTY OHIO	DRAWN BY: AEJ	PROJECT NO. NRG-1007	
					CHECKED BY: SJC	SHEET NO. 45 OF 88	
					DATE: 12.15.14		
					SCALE: AS NOTED		
					Hanover Engineering Associates Inc		3355 Route 611, Suite 1 Bartonsville, PA 18321-7822 570.688.9550 Fax 570.688.9768

Y:\Projects\Energy\NRG Energy\NRG-1007-Avon Lakes Pipeline\DWG\ESPC\ ESPC-NRG-1007-Avon Lake-006-SITE DETAILS-1.dwg Dec 14, 2014 - 5:38pm



WETLAND #2(AVOIDANCE), WALKER ROAD, & ACCESS ROAD (AR-3) TO WALKER ROAD

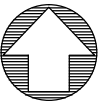
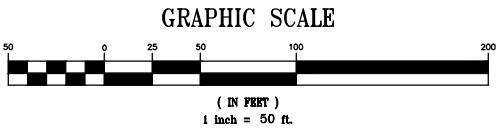
SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
3. REFER TO DETAIL SHEET 5 FOR "RCE" DETAIL.
4. REFER TO DETAIL SHEET 5 FOR "AR" DETAIL.
5. REFER TO DETAIL SHEET 3 FOR "HWB" DETAIL. PLACE TRENCH BREAKERS ON EITHER SIDE OF THE EXISTING ROAD.
6. REFER TO DETAIL SHEET 3 FOR "TB" DETAIL.
7. REFER TO DETAIL SHEET 6 FOR INLET PROTECTION DETAIL.

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- ROCK FILTER BERM
- BRIDGE
- WETLAND CROSSING
- SEDIMENT SILT SOXX PROTECTION AT WATER BAR
- ACCESS ROAD
- HIGHWAY BORING
- HIGHWAY CUT
- ACCESS RD. X-ING (PAVED ROAD)
- ACCESS RD. w/CULVERT
- UTILITY LINE STREAM X-ING WITH DAM AND PUMPING OR WITH PIPE FLUME
- TRENCH BREAKER/PLUG
- LONGITUDINAL DIVERSION GRADING
- EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND
LIMIT OF DISTURBANCE - 235 AC.

E&SPC SITE DETAIL

AVON LAKE GAS ADDITION PROJECT

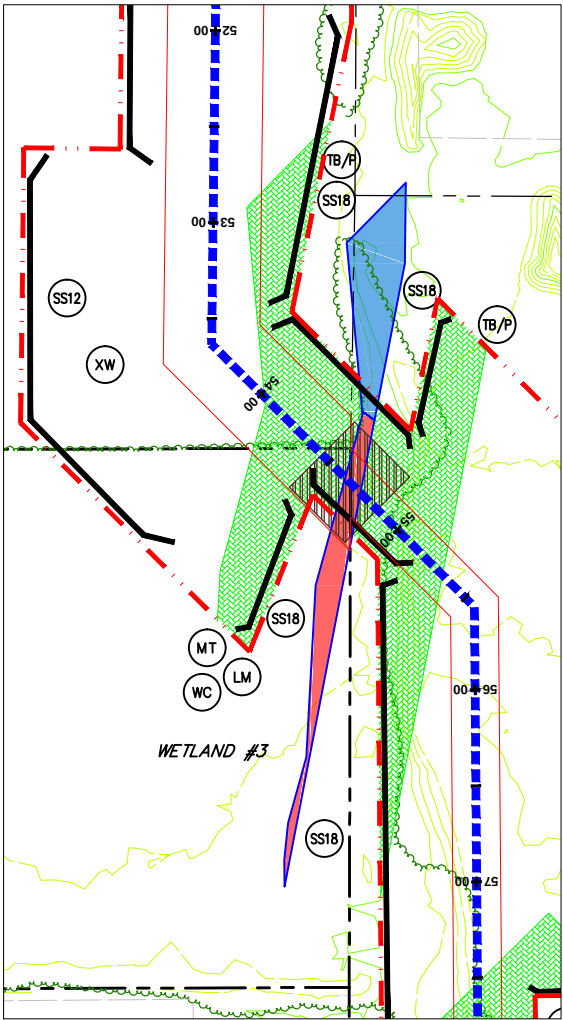
CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

Hanover
Engineering Associates Inc

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO. NRG-1007
SHEET NO. 46 OF 88

3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

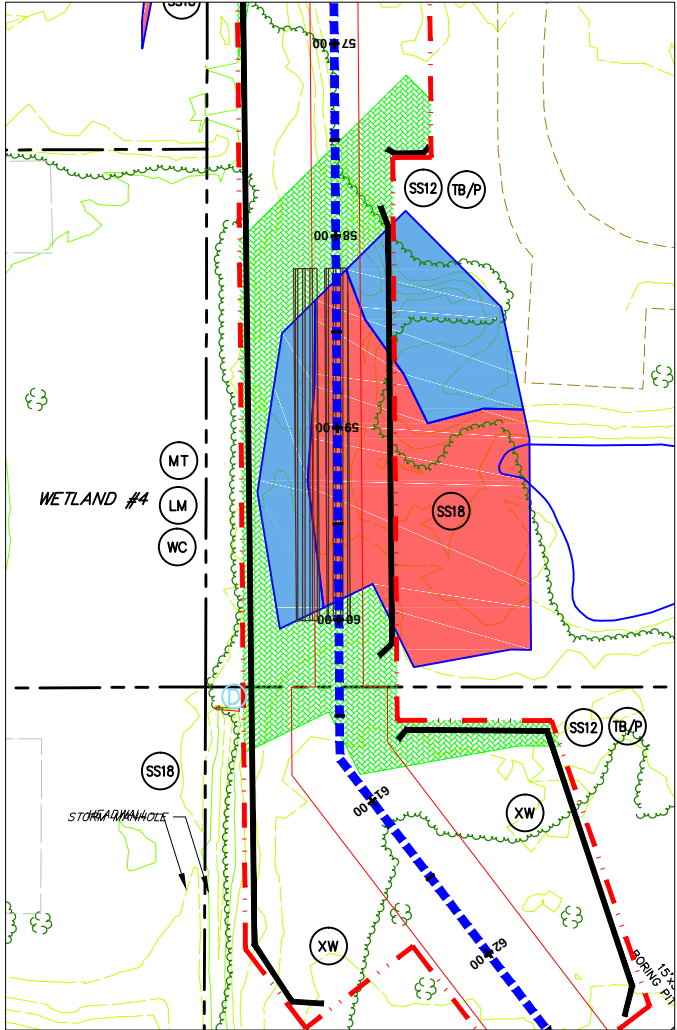
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WETLAND #3
SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
4. THE CONTRACTOR SHALL PLACE LOG MATS TO CROSS THE WETLAND AREA. ALL APPLICABLE WETLAND AREA WITHIN THE LIMITS OF CONSTRUCTION/DISTURBANCE SHALL BE COVERED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES AND/OR REPAIRS REQUIRED AS A RESULT OF DAMAGE TO WETLANDS AND WATERCOURSES AT NO COST TO THE FACILITY OWNER.
5. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
 - a) WETLAND #3 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
6. REFER TO DETAIL SHEET 3 FOR "TB" DETAIL.



WETLAND #4
SCALE: 1" = 50'

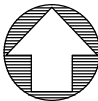
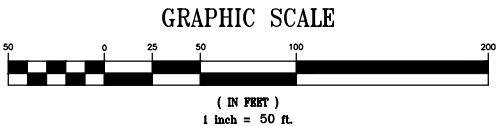
NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
4. THE CONTRACTOR SHALL PLACE LOG MATS TO CROSS THE WETLAND AREA. ALL APPLICABLE WETLAND AREA WITHIN THE LIMITS OF CONSTRUCTION/DISTURBANCE SHALL BE COVERED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES AND/OR REPAIRS REQUIRED AS A RESULT OF DAMAGE TO WETLANDS AND WATERCOURSES AT NO COST TO THE FACILITY OWNER.
5. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
 - a) WETLAND #4 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
6. REFER TO DETAIL SHEET 3 FOR "TB" DETAIL.

LEGEND	
	INDEX CONTOUR
	CONTOUR
	PROPERTY LINE
	TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
	PERMANENT PIPELINE R.O.W.
	CENTERLINE PIPELINE R.O.W.
	ABOVE GROUND PIPE
	CONVENTIONAL BORE
	HDD
	FENCE
	EDGE WOODS
	WETLANDS
	STONE WALL
	OVERHEAD/UTILITY POLE
	FLOW
	PERENNIAL STREAM
	EPHEMERAL/INTERMITTENT STREAM
	ORD. HIGH WATER MARK
	FLOODWAY
	SOIL TYPE & BOUNDARY
	SILT/SOXX OR EQUIV. 12" HEIGHT
	SILT/SOXX OR EQUIV. 24" HEIGHT
	SILT/SOXX OR EQUIV. 32" HEIGHT
	ROCK CONSTRUCTION ENTRANCE
	LOG MAT
	EROSION CONTROL MATTING
	STREAMBANK RESTORATION
	TEMP. PIPE
	WATERBAR
	ROCK FILTER BERM
	BRIDGE
	WETLAND CROSSING
	SEDIMENT SILT SOXX PROTECTION AT WATER BAR
	ACCESS ROAD
	HIGHWAY BORING
	HIGHWAY CUT
	ACCESS RD. X-ING (PAVED ROAD)
	ACCESS RD. w/CULVERT
	UTILITY LINE STREAM X-ING WITH DAM AND PUMPING OR WITH PIPE FLUME
	TRENCH BREAKER/PLUG
	LONGITUDINAL DIVERSION GRADING
	EXTRA WORKSPACE
	LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE - 235 AC.

GENERAL NOTES:

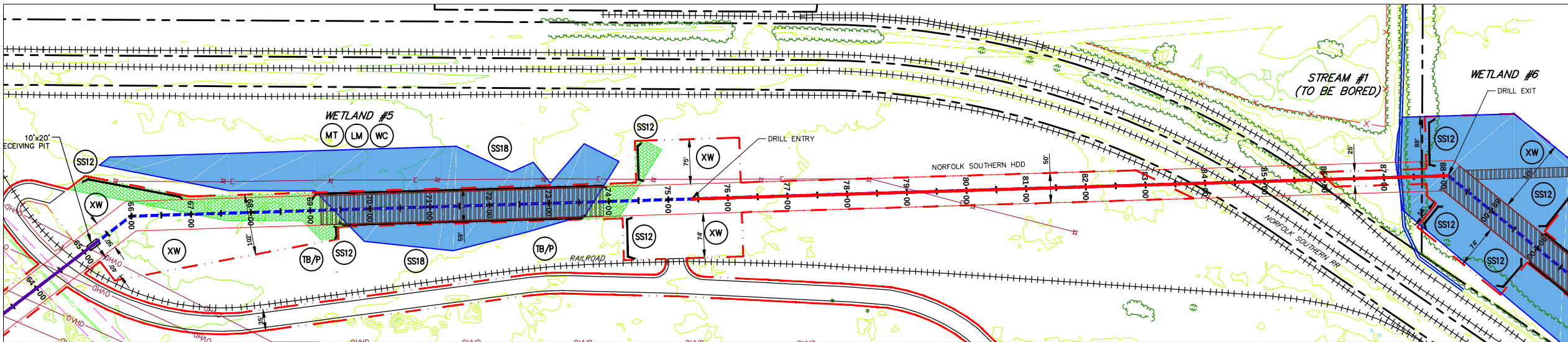
1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.



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E&SPC SITE DETAIL			
AVON LAKE GAS ADDITION PROJECT			
SEAL	NO.	REVISIONS	DATE
CARLISLE, EATON & LAGRANGE TOWNSHIPS AVON, AVON LAKE, ELYRIA & NORTH RIDGEVILLE CITIES LORAIN COUNTY OHIO		DRAWN BY: AEJ CHECKED BY: SJC DATE: 12.15.14 SCALE: AS NOTED	PROJECT NO. NRG-1007 SHEET NO. 47 OF 88
Hanover Engineering Associates Inc		3355 Route 611, Suite 1 Bartonsville, PA 18321-7822 570.688.9550 Fax 570.688.9768	

Y:\Projects\Energy\NRG Energy\NRG-1007-Avon Lake Pipeline\DWG\ESPC\ESPC-NRG-1007-Avon Lake-006-SITE DETAILS-1.dwg Dec 14,2014 - 5:41pm

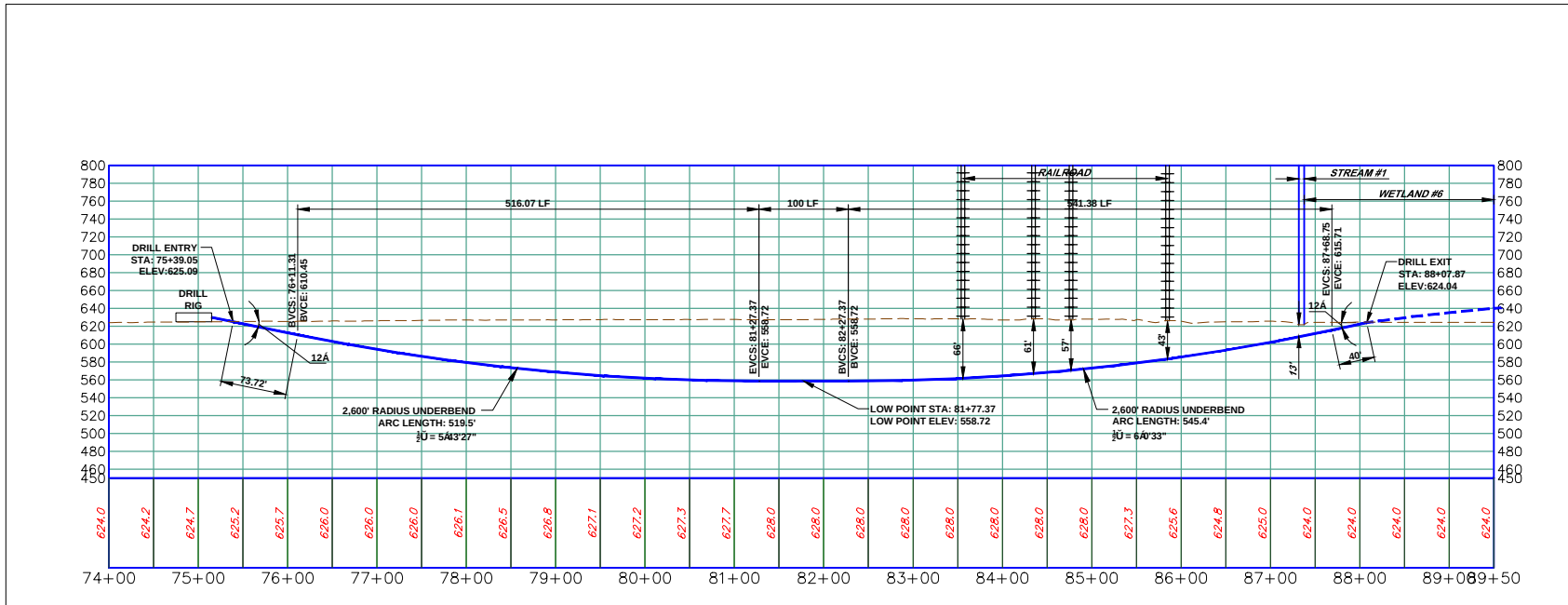


WETLAND #5 & STREAM #1 (TO BE BORED)

SCALE: 1" = 100'

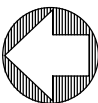
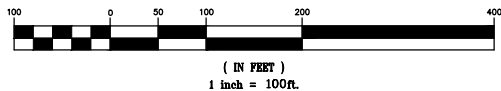
NOTES:

- REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
- REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
- PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
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- REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
a) WETLAND #5 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
- REFER TO DETAIL SHEET 3 FOR "TB" DETAIL.



NORFOLK SOUTHERN HDD

GRAPHIC SCALE



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SEAL

LEGEND

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- LONGITUDINAL DIVERSION GRADING
- EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND
LIMIT OF DISTURBANCE - 235 AC.

E&SPC SITE DETAIL

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

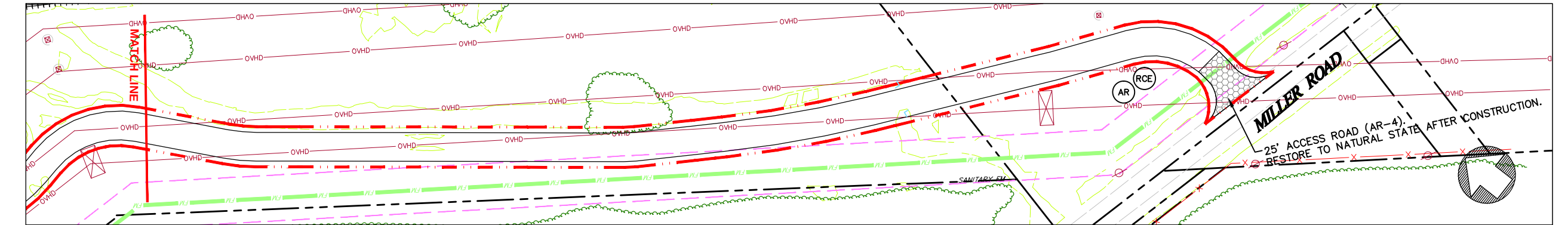
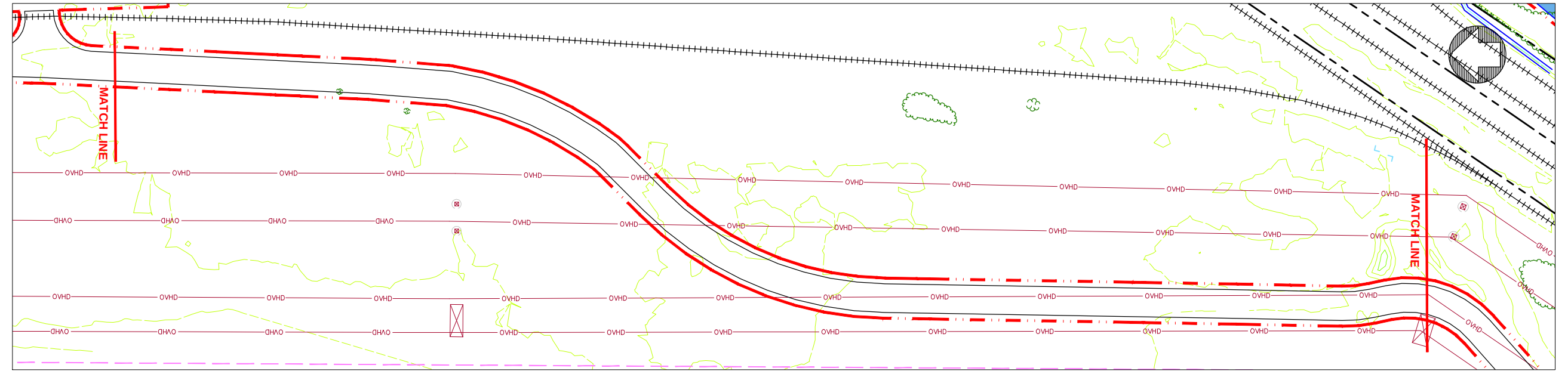
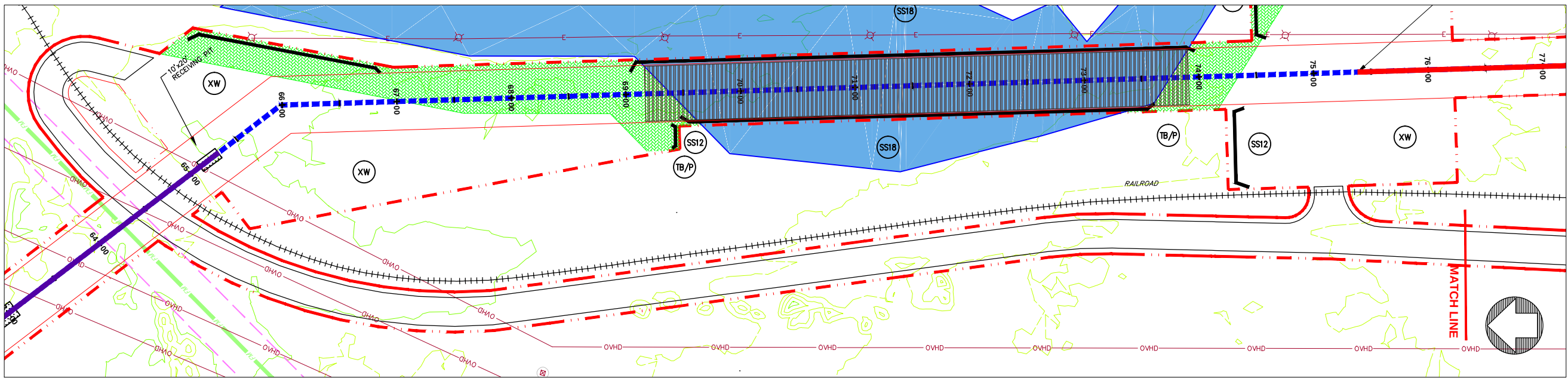
Hanover
Engineering Associates Inc

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO. NRG-1007
SHEET NO. 48 OF 88
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

GENERAL NOTES:

- SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
- STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

Y:\Projects\Energy\NRG Energy\NRG-1007-Avon Lakes Pipeline\DWG\ESPC\ ESPC-NRG-1007-AVON LAKE-006-SITE DETAILS-1.dwg Dec 14, 2014 - 5:43pm



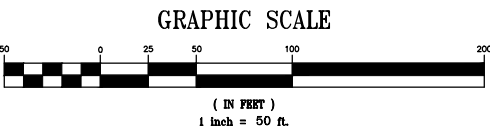
LEGEND

- INDEX CONTOUR
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- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
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- TRENCH BREAKER/PLUG
- LONGITUDINAL DIVERSION GRADING
- EXTRA WORKSPACE
- LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE - 235 AC.

ACCESS ROAD (AR-6) TO MILLER ROAD
SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 5 FOR "RCE" OR "BRC" DETAIL.
2. REFER TO DETAIL SHEET 5 FOR "AR" DETAIL.
3. REFER TO DETAIL SHEET 3 FOR "TB" DETAIL.



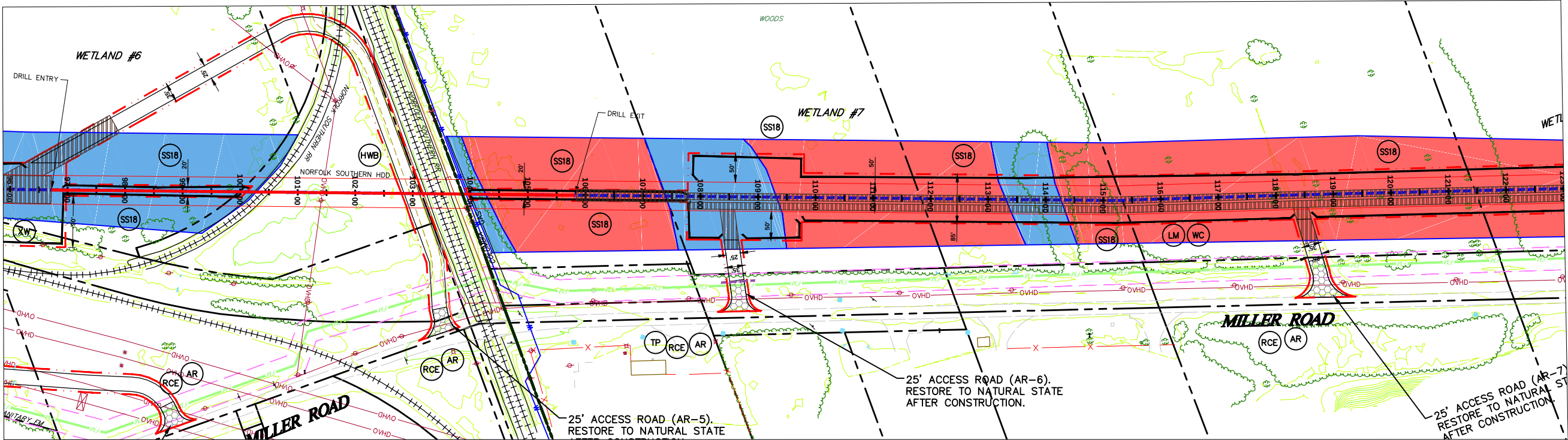
GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
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SEAL	NO.	REVISIONS	DATE	AVON LAKE GAS ADDITION PROJECT			
				CARLISLE, EATON & LAGRANGE TOWNSHIPS AVON, AVON LAKE, ELYRIA & NORTH RIDGEVILLE CITIES LORAIN COUNTY OHIO	DRAWN BY: AEJ	PROJECT NO. NRG-1007	
					CHECKED BY: SJC	SHEET NO. 49 OF 88	
					DATE: 12.15.14		
					SCALE: AS NOTED		

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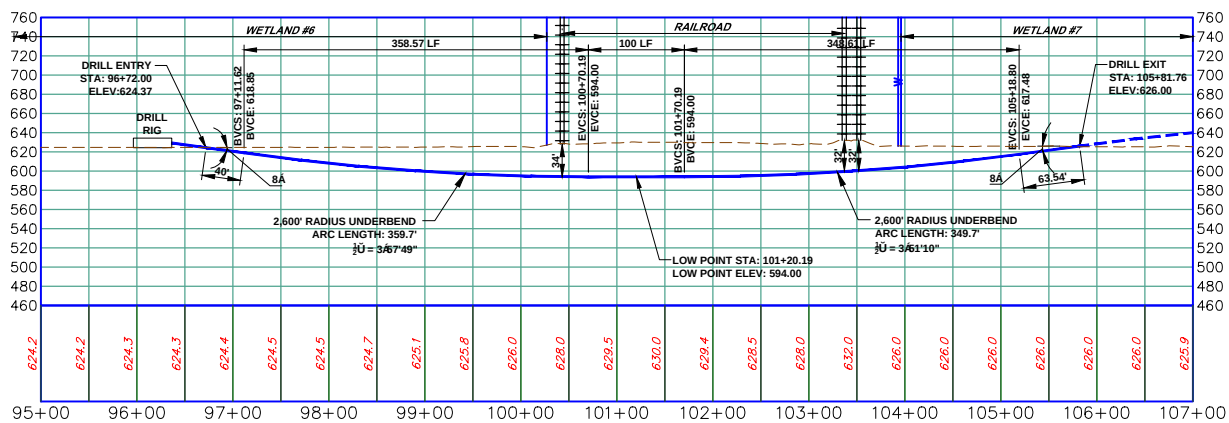


**ACCESS ROAD (AR-5) TO MILLER ROAD, ACCESS ROAD (AR-6) TO MILLER ROAD,
ACCESS ROAD (AR-7) TO MILLER ROAD, & WETLAND #7**

NOTES:

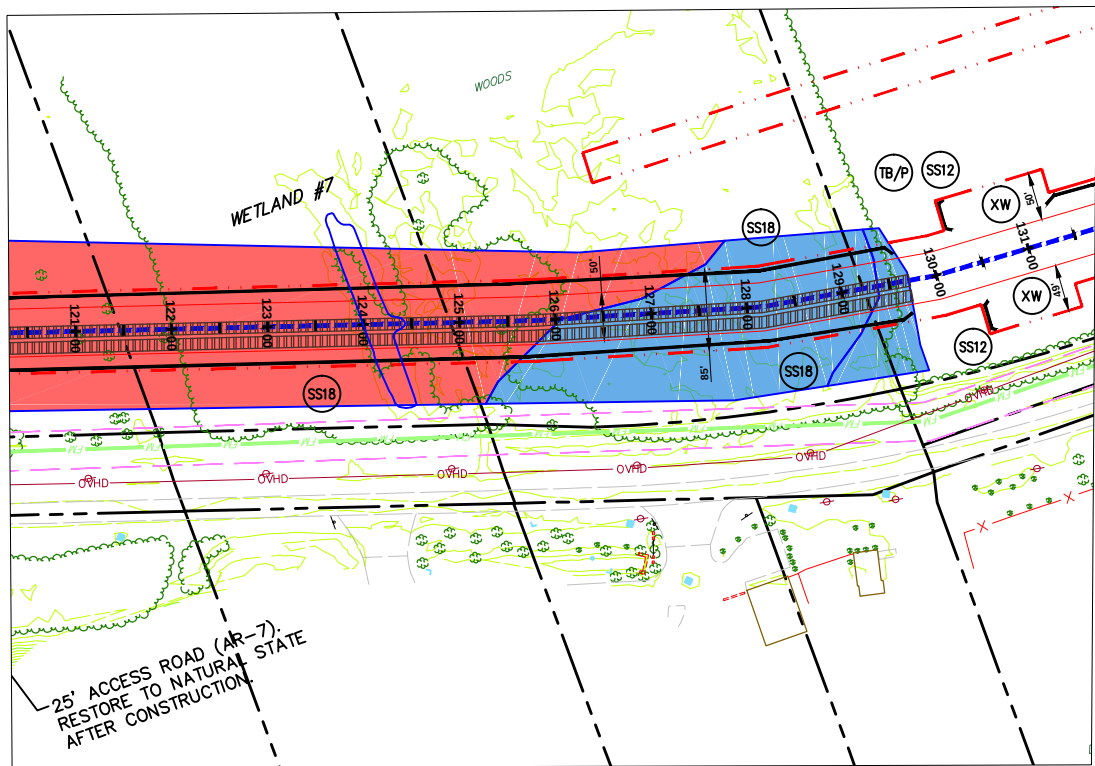
1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WB" DETAIL.
3. REFER TO DETAIL SHEET 3 FOR "SSO" DETAIL.
4. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
5. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
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7. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
a) WETLAND #6 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
8. REFER TO DETAIL SHEET 5 FOR "RCE" DETAIL.
9. REFER TO DETAIL SHEET 5 FOR "AR" DETAIL.
10. REFER TO DETAIL SHEET 3 FOR "TB" DETAIL.

SCALE: 1" = 100'



NORFOLK SOUTHERN HDD

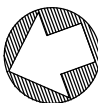
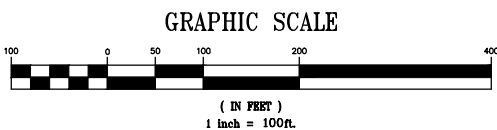
SCALE: 1" = 100'



LEGEND	
	INDEX CONTOUR
	CONTOUR
	PROPERTY LINE
	TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
	PERMANENT PIPELINE R.O.W.
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	ABOVE GROUND PIPE
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	HDD
	FENCE
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	STONE WALL
	OVERHEAD/UTILITY POLE
	PERENNIAL STREAM
	EPHEMERAL/INTERMITTENT STREAM
	ORD. HIGH WATER MARK
	FLOODWAY
	SOIL TYPE & BOUNDARY
	SILTS/SOX OR EQUIV. 12' HEIGHT
	SILTS/SOX OR EQUIV. 24' HEIGHT
	SILTS/SOX OR EQUIV. 32' HEIGHT
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	TRENCH BREAKER/PLUG
	LONGITUDINAL DIVERSION GRADING
	EXTRA WORKSPACE
	LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE - 235 AC.

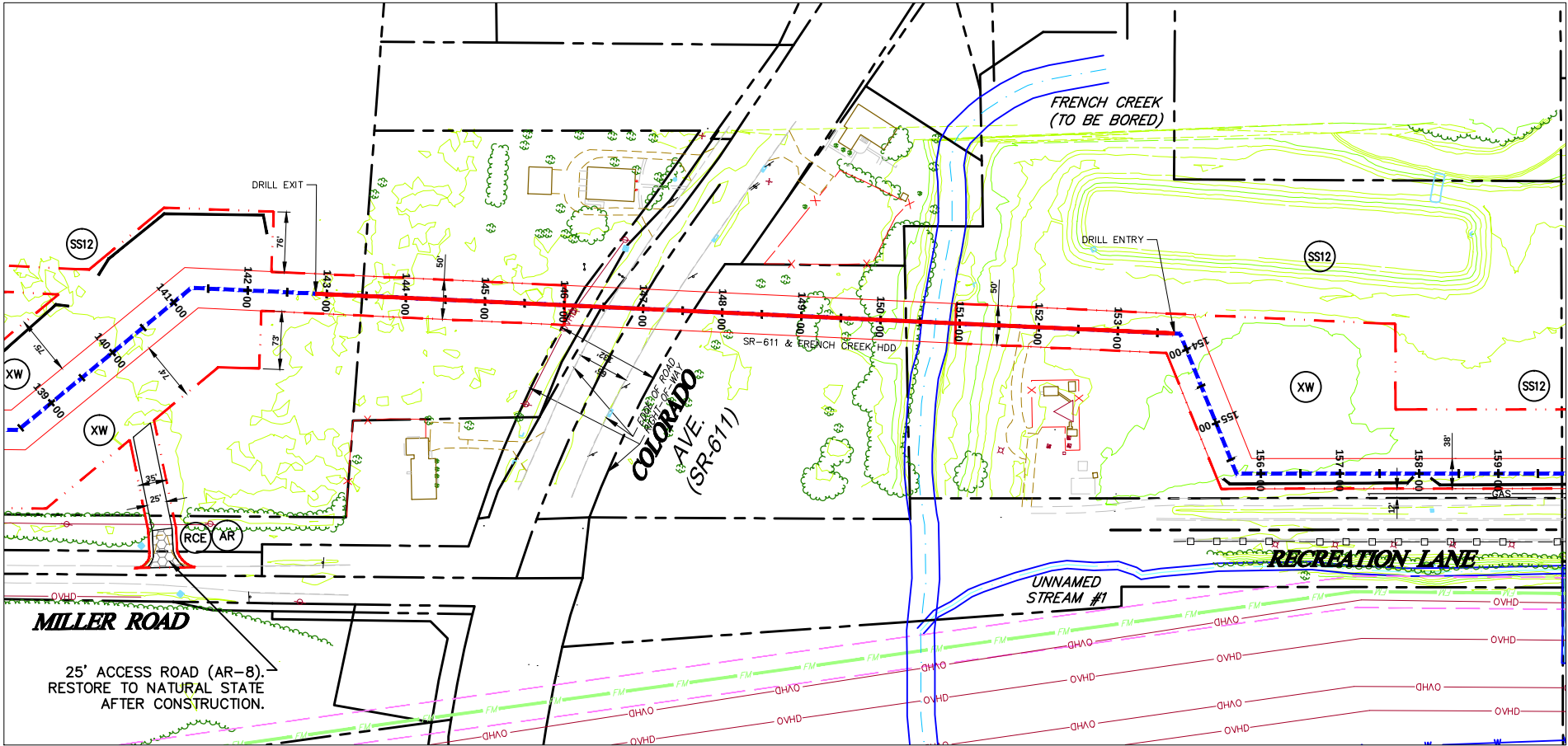
GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.



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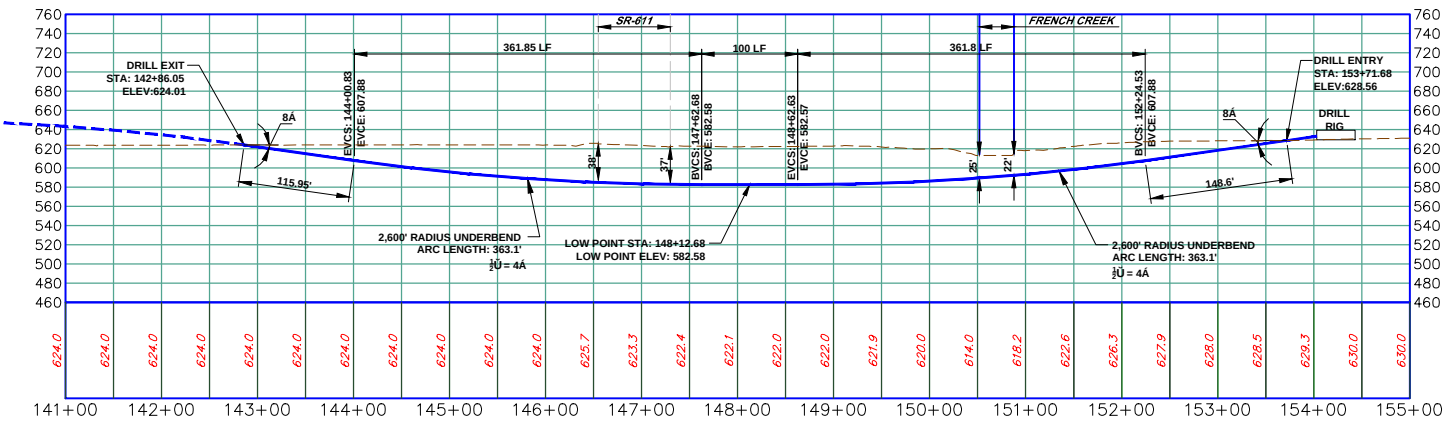
SEAL	NO.	REVISIONS	DATE	AVON LAKE GAS ADDITION PROJECT			
				CARLISLE, EATON & LAGRANGE TOWNSHIPS AVON, AVON LAKE, ELYRIA & NORTH RIDGEVILLE CITIES LORAIN COUNTY OHIO	DRAWN BY: AEJ	PROJECT NO.	
					CHECKED BY: SJC	NRG-1007	
					DATE: 12.15.14	SHEET NO.	
					SCALE: AS NOTED	51 OF 88	
				Hanover Engineering Associates Inc 3355 Route 611, Suite 1 Bartonsville, PA 18321-7822 570.688.9550 Fax 570.688.9768			



COLORADO AVE. (SR-611) & FRENCH CREEK (TO BE BORED)

SCALE: 1" = 100'

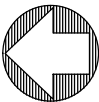
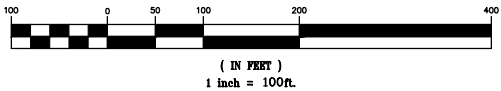
1. REFER TO DETAIL SHEET 5 FOR "RCE" DETAIL.
2. REFER TO DETAIL SHEET 5 FOR "AR" DETAIL.
6. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.



FRENCH CREEK HDD

(ON 22x34 SHEET)
HORIZONTAL & VERTICAL

GRAPHIC SCALE



GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

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- LONGITUDINAL DIVERSION GRADING
- EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND
LIMIT OF DISTURBANCE - 235 AC.

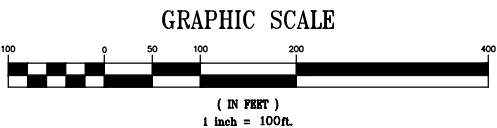
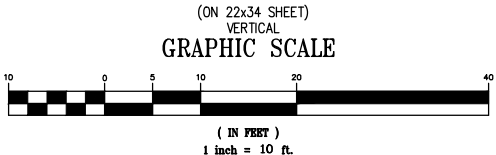
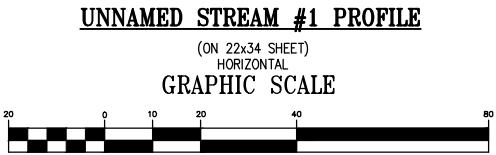
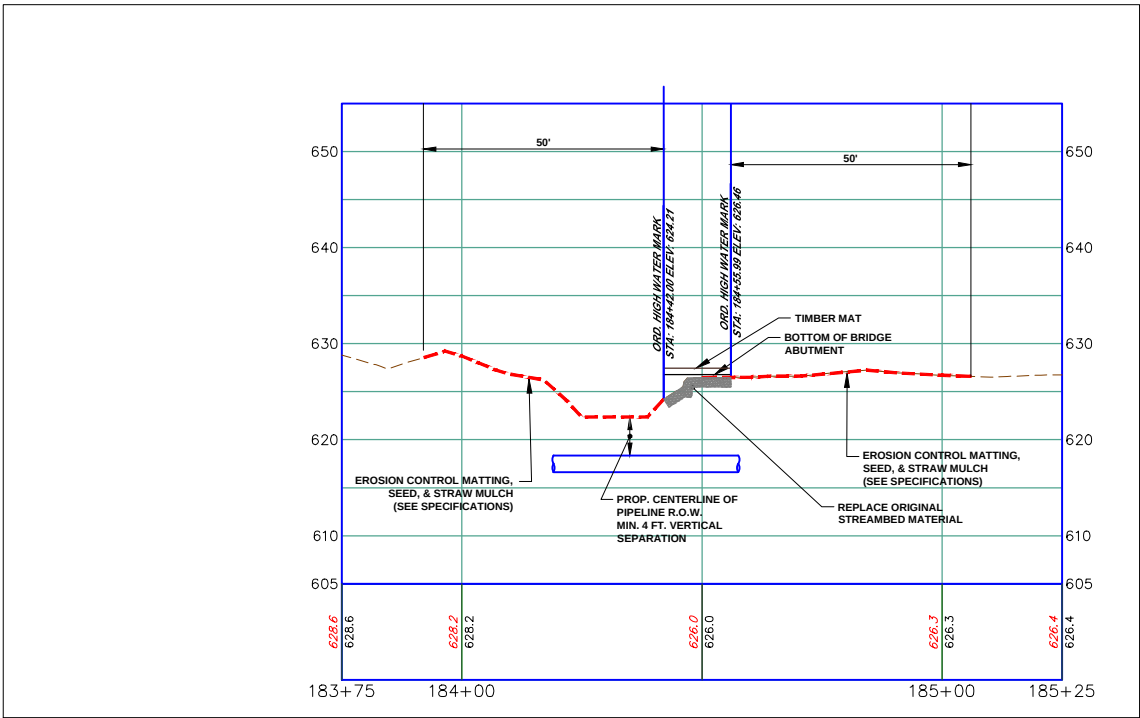
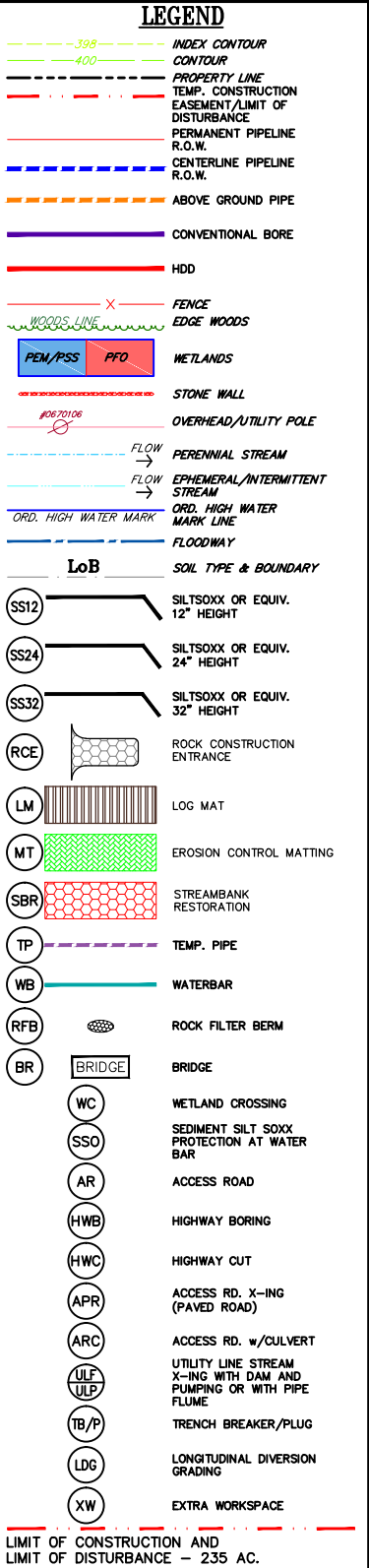
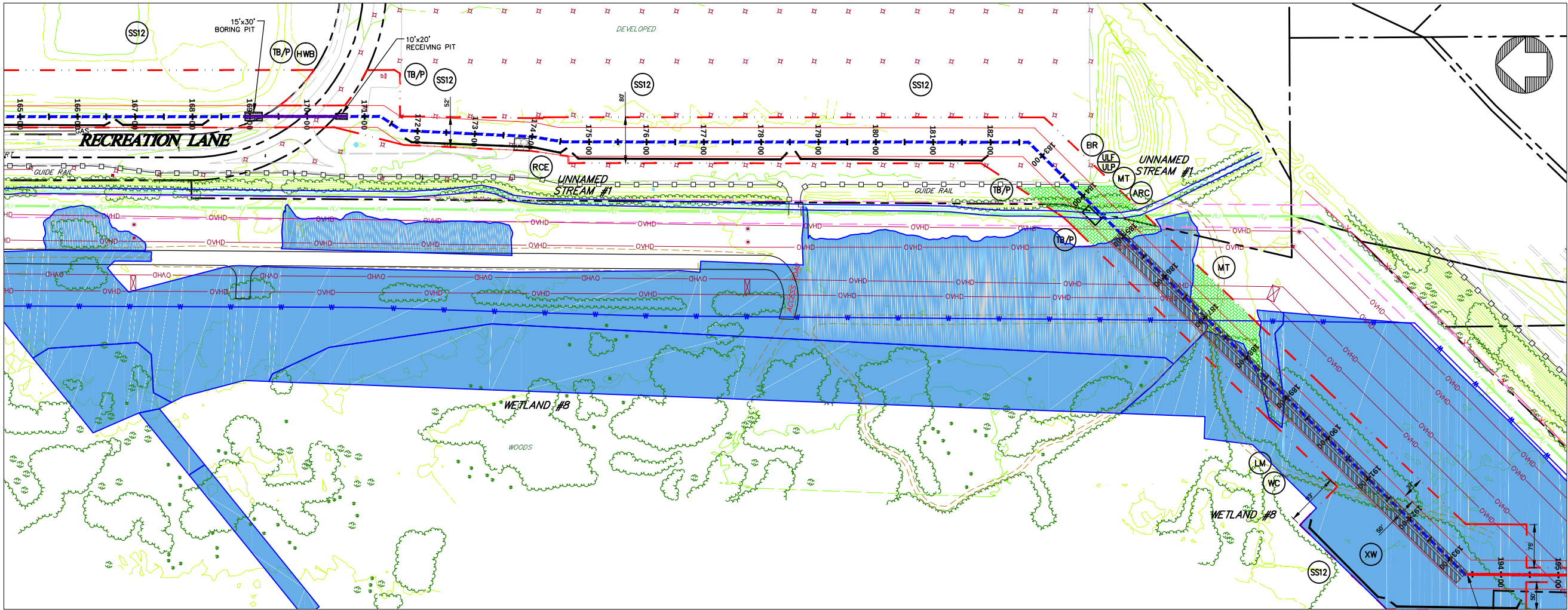
E&SPC SITE DETAIL

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

Hanover
Engineering Associates Inc

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO. NRG-1007
SHEET NO. 52 OF 88
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768



RECREATION LANE, WETLAND #8 & UNNAMED STREAM #1

SCALE: 1" = 100'

NOTES:

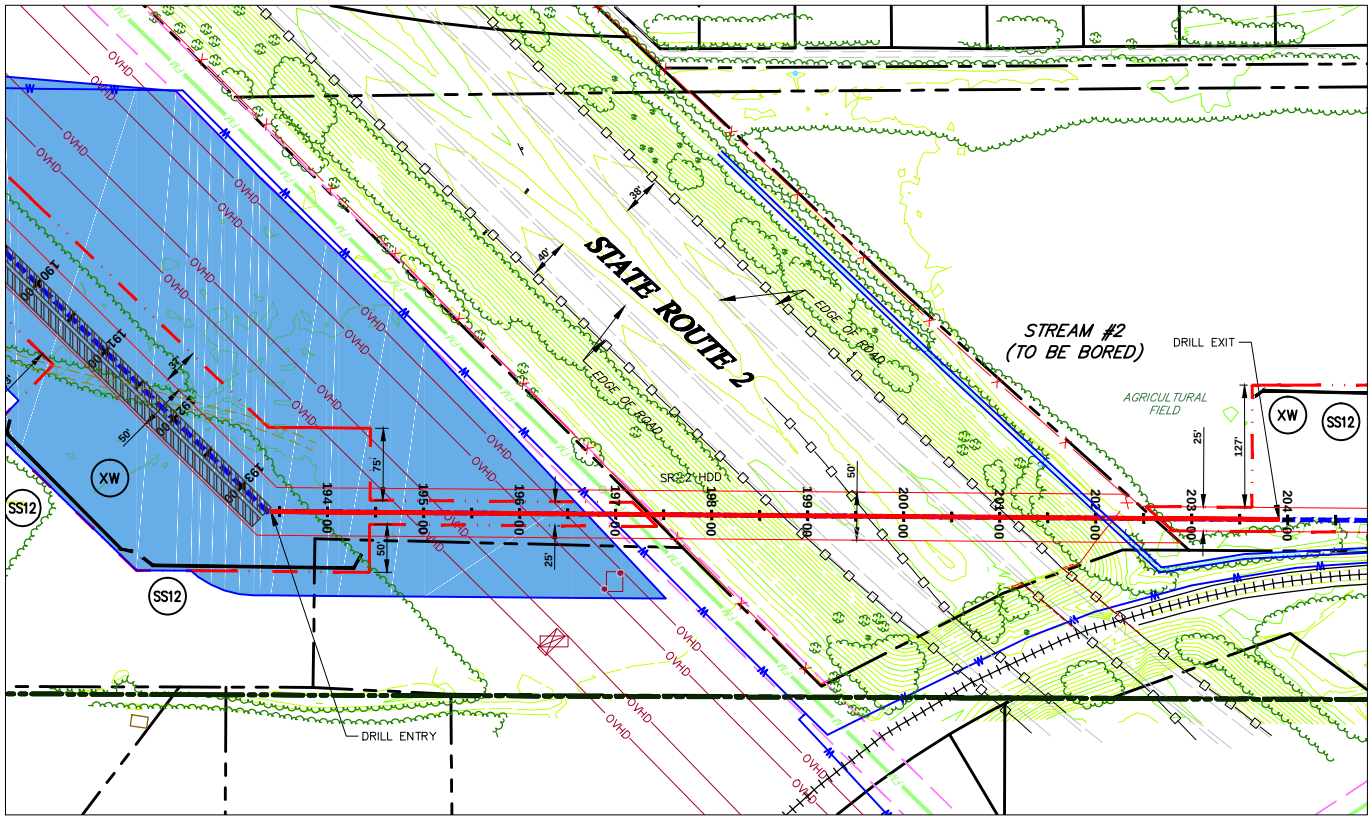
1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WB" DETAIL.
3. REFER TO DETAIL SHEET 3 FOR "SSO" DETAIL.
4. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
5. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
6. THE CONTRACTOR SHALL PLACE LOG MATS TO CROSS THE WETLAND AREA. ALL APPLICABLE WETLAND AREA WITHIN THE LIMITS OF CONSTRUCTION/DISTURBANCE SHALL BE COVERED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES AND/OR REPAIRS REQUIRED AS A RESULT OF DAMAGE TO WETLANDS AND WATERCOURSES AT NO COST TO THE FACILITY OWNER.
7. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
 - a) WETLAND #8 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
 - b) UNNAMED STREAM #1 USE BLANKET TYPE S75 OR APPROVED EQUAL STAPLE PATTERN "C".
8. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.
9. REFER TO DETAIL SHEET 6 FOR INLET PROTECTION DETAIL.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

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SEAL	NO.	REVISIONS	DATE	AVON LAKE GAS ADDITION PROJECT			
				CARLISLE, EATON & LAGRANGE TOWNSHIPS AVON, AVON LAKE, ELYRIA & NORTH RIDGEVILLE CITIES LORAIN COUNTY OHIO	DRAWN BY: AEJ	PROJECT NO.	
					CHECKED BY: SJC	NRG-1007	
					DATE: 12.15.14	SHEET NO.	
					SCALE: AS NOTED	53 OF 88	
					Hanover Engineering Associates Inc 3355 Route 611, Suite 1 Bartonsville, PA 18321-7822 570.688.9550 Fax 570.688.9768		

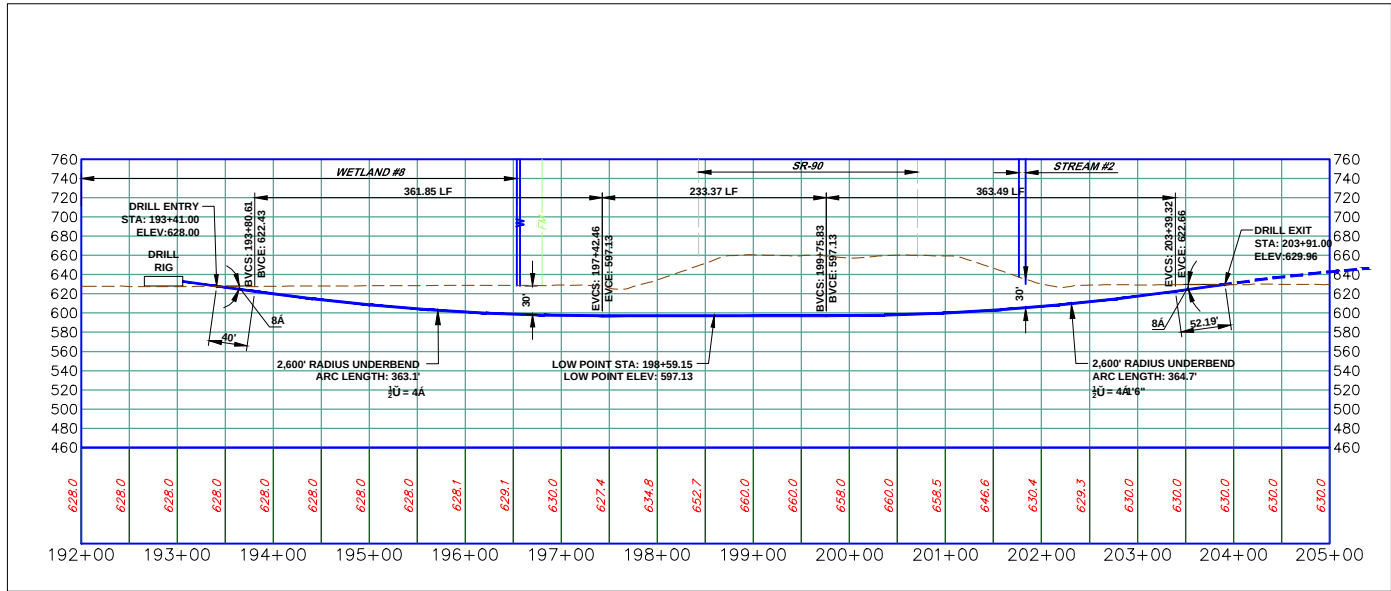


STATE ROUTE 2 & STREAM #2 (TO BE BORED)

SCALE: 1" = 100'

NOTES:

1. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
2. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.



STATE ROUTE 2 HDD

SCALE: 1" = 100'

LEGEND	
	INDEX CONTOUR
	CONTOUR
	PROPERTY LINE
	TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
	PERMANENT PIPELINE
	CENTERLINE PIPELINE
	ABOVE GROUND PIPE
	CONVENTIONAL BORE
	HDD
	FENCE
	EDGE WOODS
	WETLANDS
	STONE WALL
	OVERHEAD/UTILITY POLE
	FLOW
	PERENNIAL STREAM
	EPHEMERAL/INTERMITTENT STREAM
	ORD. HIGH WATER MARK
	FLOODWAY
	LoB
	SILT/SOX OR EQUIV. 12" HEIGHT
	SILT/SOX OR EQUIV. 24" HEIGHT
	SILT/SOX OR EQUIV. 32" HEIGHT
	ROCK CONSTRUCTION ENTRANCE
	LOG MAT
	EROSION CONTROL MATTING
	STREAMBANK RESTORATION
	TEMP. PIPE
	WATERBAR
	ROCK FILTER BERM
	BRIDGE
	WETLAND CROSSING
	SEDIMENT SILT SOX PROTECTION AT WATER BAR
	ACCESS ROAD
	HIGHWAY BORING
	HIGHWAY CUT
	ACCESS RD. X-ING (PAVED ROAD)
	ACCESS RD. w/CULVERT
	UTILITY LINE STREAM X-ING WITH DAM AND PUMPING OR WITH PIPE FLUME
	TRENCH BREAKER/PLUG
	LONGITUDINAL DIVERSION GRADING
	EXTRA WORKSPACE
	LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE - 235 AC.

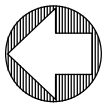
GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

GRAPHIC SCALE



(IN FEET)
1 inch = 100ft.



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SEAL

E&SPC SITE DETAIL

AVON LAKE GAS ADDITION PROJECT

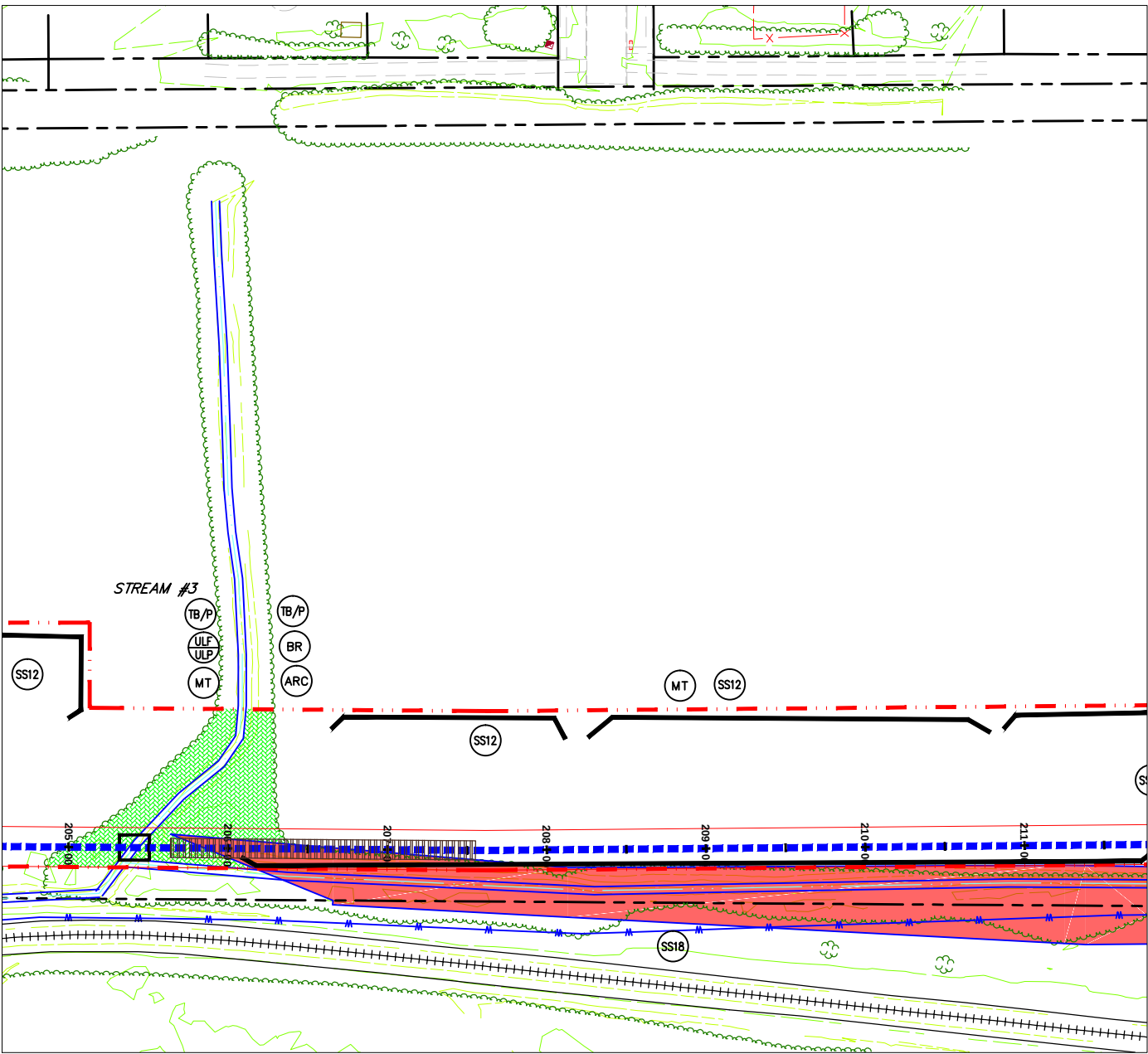
CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

Hanover
Engineering Associates Inc

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO. NRG-1007
SHEET NO. 54 OF 88

3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

Y:\Projects\Energy\NRG Energy\NRG-Avon Lakes Pipeline\DWG\ESPC\ ESPC-NRG-1007-AVON LAKE-006-SITE DETAILS-1.dwg Dec 14,2014 - 5:57pm



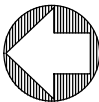
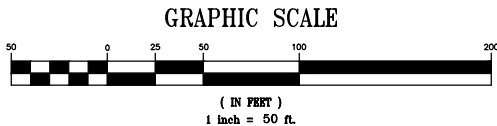
STREAM #3 & WETLAND #9
SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
3. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
 - a) WETLAND #9 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
 - b) STREAM #3 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "B".
4. REFER TO DETAIL SHEET 4 FOR "ULF" OR "ULP" DETAIL. UTILIZE FOR STREAM CROSSINGS.
5. ALTHOUGH A BRIDGE IS SHOWN, A TEMPORARY CULVERT CROSSING MAY BE INSTALLED. REFER TO DETAIL SHEET 1 FOR "BR" DETAIL AND FOR THE SPECIFIED SIZE AND NUMBER OF CULVERTS.
6. REFER TO DETAIL SHEET 4 FOR "ARC" DETAIL.
7. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

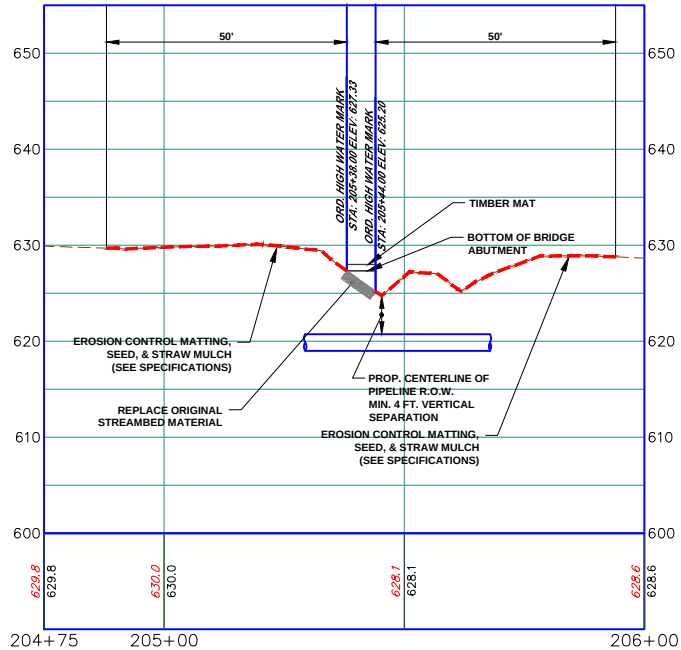
GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.



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SEAL



STREAM #3 PROFILE

(ON 22x34 SHEET)

HORIZONTAL
GRAPHIC SCALE



(IN FEET)
1 inch = 20 ft.

(ON 22x34 SHEET)

VERTICAL
GRAPHIC SCALE



(IN FEET)
1 inch = 10 ft.

LEGEND

- INDEX CONTOUR
- CONTOUR
- PROPERTY LINE
- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
- PERMANENT PIPELINE R.O.W.
- CENTERLINE PIPELINE R.O.W.
- ABOVE GROUND PIPE
- CONVENTIONAL BORE
- HDD
- FENCE
- EDGE WOODS
- WETLANDS
- STONE WALL
- OVERHEAD/UTILITY POLE
- PERENNIAL STREAM
- EPHEMERAL/INTERMITTENT STREAM
- ORD. HIGH WATER MARK
- FLOODWAY
- SOIL TYPE & BOUNDARY
- SILT/COARSE OR EQUIV. 12" HEIGHT
- SILT/COARSE OR EQUIV. 24" HEIGHT
- SILT/COARSE OR EQUIV. 32" HEIGHT
- ROCK CONSTRUCTION ENTRANCE
- LOG MAT
- EROSION CONTROL MATTING
- STREAMBANK RESTORATION
- TEMP. PIPE
- WATERBAR
- ROCK FILTER BERM
- BRIDGE
- WETLAND CROSSING
- SEDIMENT SILT SOXX PROTECTION AT WATER BAR
- ACCESS ROAD
- HIGHWAY BORING
- HIGHWAY CUT
- ACCESS RD. X-ING (PAVED ROAD)
- ACCESS RD. w/CULVERT
- UTILITY LINE STREAM X-ING WITH DAM AND PUMPING OR WITH PIPE FLUME
- TRENCH BREAKER/PLUG
- LONGITUDINAL DIVERSION GRADING
- EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND
LIMIT OF DISTURBANCE - 235 AC.

E&SPC SITE DETAIL

AVON LAKE GAS ADDITION PROJECT

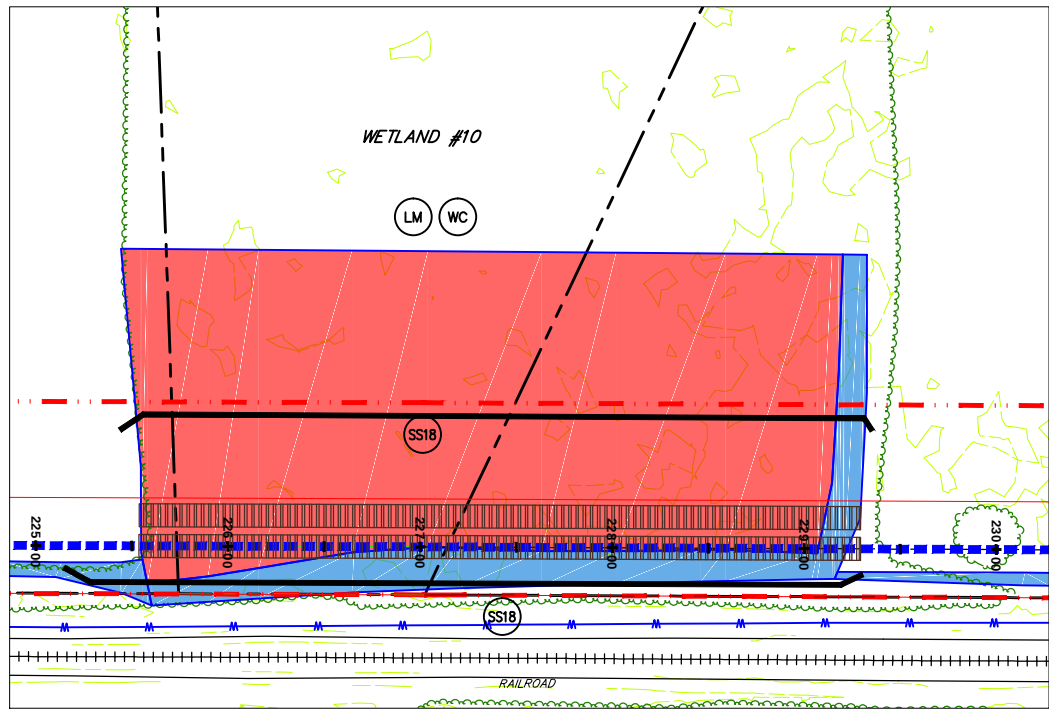
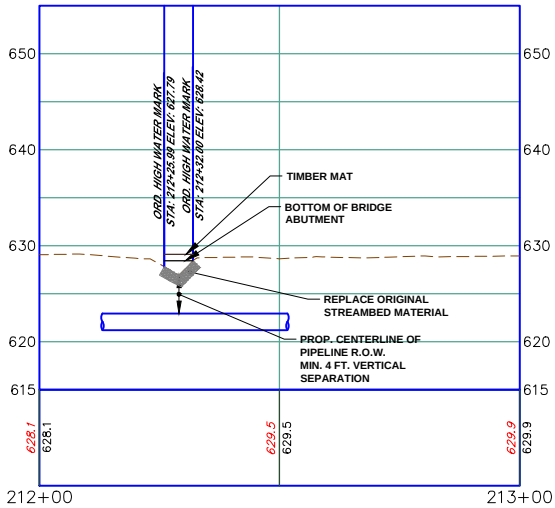
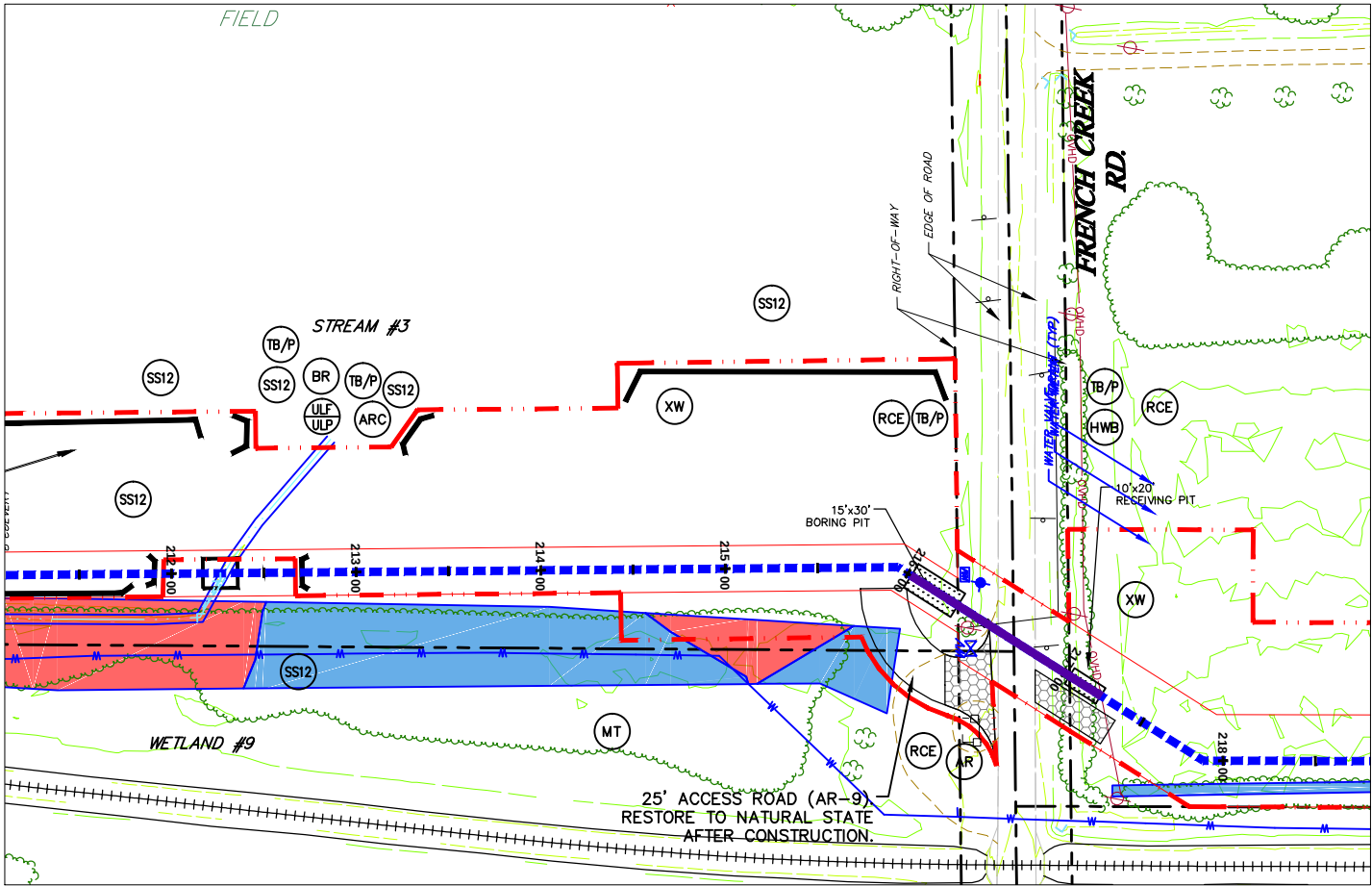
CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

Hanover
Engineering Associates Inc

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO. NRG-1007
SHEET NO. 55 OF 88

3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

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STREAM #3, WETLAND #9, ACCESS ROAD (AR-9) TO FRENCH CREEK RD., FRENCH CREEK RD. & WETLAND #10

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
3. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
 - a) WETLAND #9 & WETLAND #10 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
 - b) STREAM #3 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "B".
4. REFER TO DETAIL SHEET 4 FOR "ULP" OR "ULP" DETAIL. UTILIZE FOR STREAM CROSSINGS.
5. ALTHOUGH A BRIDGE IS SHOWN, A TEMPORARY CULVERT CROSSING MAY BE INSTALLED. REFER TO DETAIL SHEET 1 FOR "BR" DETAIL AND FOR THE SPECIFIED SIZE AND NUMBER OF CULVERTS.
6. REFER TO DETAIL SHEET 4 FOR "ARC" DETAIL.
7. REFER TO DETAIL SHEET 5 FOR "RCE" OR DETAIL.
8. REFER TO DETAIL SHEET 3 FOR OR "HWB" DETAIL. PLACE TRENCH BREAKERS ON EITHER SIDE OF THE EXISTING ROAD.
9. REFER TO DETAIL SHEET 3 FOR "STONE/DIRT TWP ROAD CROSSING DETAIL" OR "PAVED TWP ROAD CROSSING" FOR TRENCH BACKFILL AND ROAD SURFACE RESTORATION.
10. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
11. REFER TO DETAIL SHEET 3 FOR "TB" DETAIL.
12. REFER TO DETAIL SHEET 6 FOR INLET PROTECTION DETAIL.

STREAM #3 PROFILE

(ON 22x34 SHEET)
HORIZONTAL

GRAPHIC SCALE



(IN FEET)
1 inch = 20 ft.

(ON 22x34 SHEET)
VERTICAL

GRAPHIC SCALE



(IN FEET)
1 inch = 10 ft.

GRAPHIC SCALE



(IN FEET)
1 inch = 50 ft.

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LEGEND

- INDEX CONTOUR
- CONTOUR
- PROPERTY LINE
- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
- PERMANENT PIPELINE R.O.W.
- CENTERLINE PIPELINE R.O.W.
- ABOVE GROUND PIPE
- CONVENTIONAL BORE
- HDD
- FENCE
- EDGE WOODS
- WETLANDS
- STONE WALL
- OVERHEAD/UTILITY POLE
- PERENNIAL STREAM
- EPHEMERAL/INTERMITTENT STREAM
- ORD. HIGH WATER MARK
- FLOODWAY
- SOIL TYPE & BOUNDARY
- SILT/SSOX OR EQUIV. 12" HEIGHT
- SILT/SSOX OR EQUIV. 24" HEIGHT
- SILT/SSOX OR EQUIV. 32" HEIGHT
- ROCK CONSTRUCTION ENTRANCE
- LOG MAT
- EROSION CONTROL MATTING
- STREAMBANK RESTORATION
- TEMP. PIPE
- WATERBAR
- ROCK FILTER BERM
- BRIDGE
- WETLAND CROSSING
- SEDIMENT SILT SOXX PROTECTION AT WATER BAR
- ACCESS ROAD
- HIGHWAY BORING
- HIGHWAY CUT
- ACCESS RD. X-ING (PAVED ROAD)
- ACCESS RD. w/CULVERT
- UTILITY LINE STREAM X-ING WITH DAM AND PUMPING OR WITH PIPE FLUME
- TRENCH BREAKER/PLUG
- LONGITUDINAL DIVERSION GRADING
- EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND
LIMIT OF DISTURBANCE - 235 AC.

E&SPC SITE DETAIL

AVON LAKE GAS ADDITION PROJECT

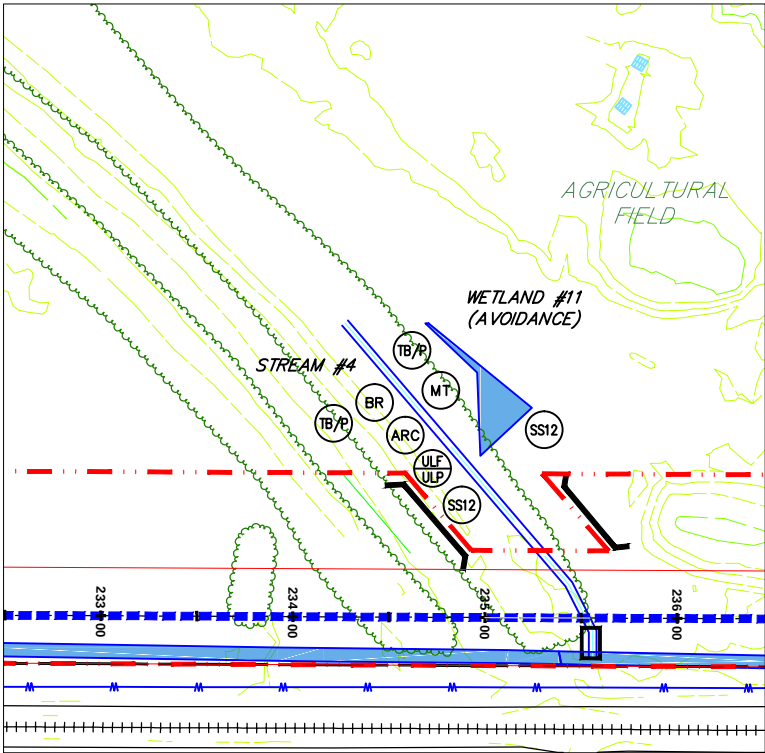
CARLISLE, EATON & LAGRANGE TOWNSHIPS
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LORAIN COUNTY
OHIO

Hanover
Engineering Associates Inc

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO. NRG-1007
SHEET NO. 56 OF 88

3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

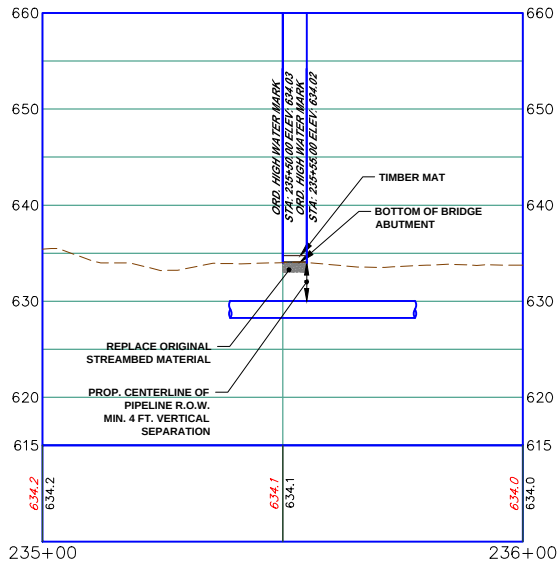
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**STREAM #4, WETLAND #11 (AVOIDANCE),
& WETLAND #12**
SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
3. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
 - a) WETLAND #12 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
 - b) STREAM #4 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "B".
4. REFER TO DETAIL SHEET 4 FOR "ULP" OR "ULP" DETAIL. UTILIZE FOR STREAM CROSSINGS.
5. ALTHOUGH A BRIDGE IS SHOWN, A TEMPORARY CULVERT CROSSING MAY BE INSTALLED. REFER TO DETAIL SHEET 1 FOR "BR" DETAIL AND FOR THE SPECIFIED SIZE AND NUMBER OF CULVERTS.
6. REFER TO DETAIL SHEET 4 FOR "ARC" DETAIL.
7. REFER TO DETAIL SHEET 5 FOR "RCE" OR DETAIL.
8. REFER TO DETAIL SHEET 3 FOR "TB" DETAIL.



STREAM #4 PROFILE

(ON 22x34 SHEET)

HORIZONTAL

GRAPHIC SCALE



(IN FEET)

1 inch = 20 ft.

(ON 22x34 SHEET)

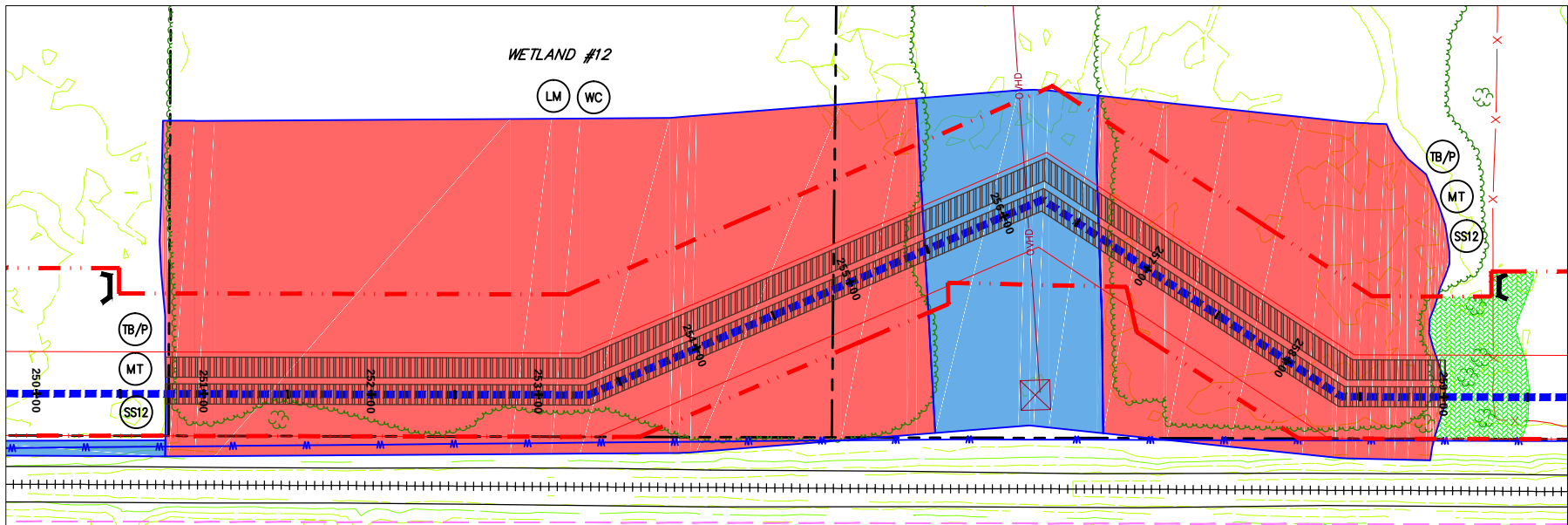
VERTICAL

GRAPHIC SCALE



(IN FEET)

1 inch = 10 ft.

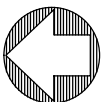


GRAPHIC SCALE



(IN FEET)

1 inch = 50 ft.



GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

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SEAL

LEGEND

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- CENTERLINE PIPELINE R.O.W.
- ABOVE GROUND PIPE
- CONVENTIONAL BORE
- HDD
- FENCE
- EDGE WOODS
- WETLANDS
- STONE WALL
- OVERHEAD/UTILITY POLE
- PERENNIAL STREAM
- EPHEMERAL/INTERMITTENT STREAM
- ORD. HIGH WATER MARK
- FLOODWAY
- SOIL TYPE & BOUNDARY
- SS12 SILT/SOXX OR EQUIV. 12" HEIGHT
- SS24 SILT/SOXX OR EQUIV. 24" HEIGHT
- SS32 SILT/SOXX OR EQUIV. 32" HEIGHT
- RCE ROCK CONSTRUCTION ENTRANCE
- LM LOG MAT
- MT EROSION CONTROL MATTING
- SBR STREAMBANK RESTORATION
- TP TEMP. PIPE
- WB WATERBAR
- RFB ROCK FILTER BERM
- BR BRIDGE
- WC WETLAND CROSSING
- SSO SEDIMENT SILT SOXX PROTECTION AT WATER BAR
- AR ACCESS ROAD
- HWB HIGHWAY BORING
- HWC HIGHWAY CUT
- APR ACCESS RD. X-ING (PAVED ROAD)
- ARC ACCESS RD. w/CULVERT
- ULP UTILITY LINE STREAM X-ING WITH DAM AND PUMPING OR WITH PIPE FLUME
- TB/P TRENCH BREAKER/PLUG
- LDG LONGITUDINAL DIVERSION GRADING
- XW EXTRA WORKSPACE
- LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE - 235 AC.

E&SPC SITE DETAIL

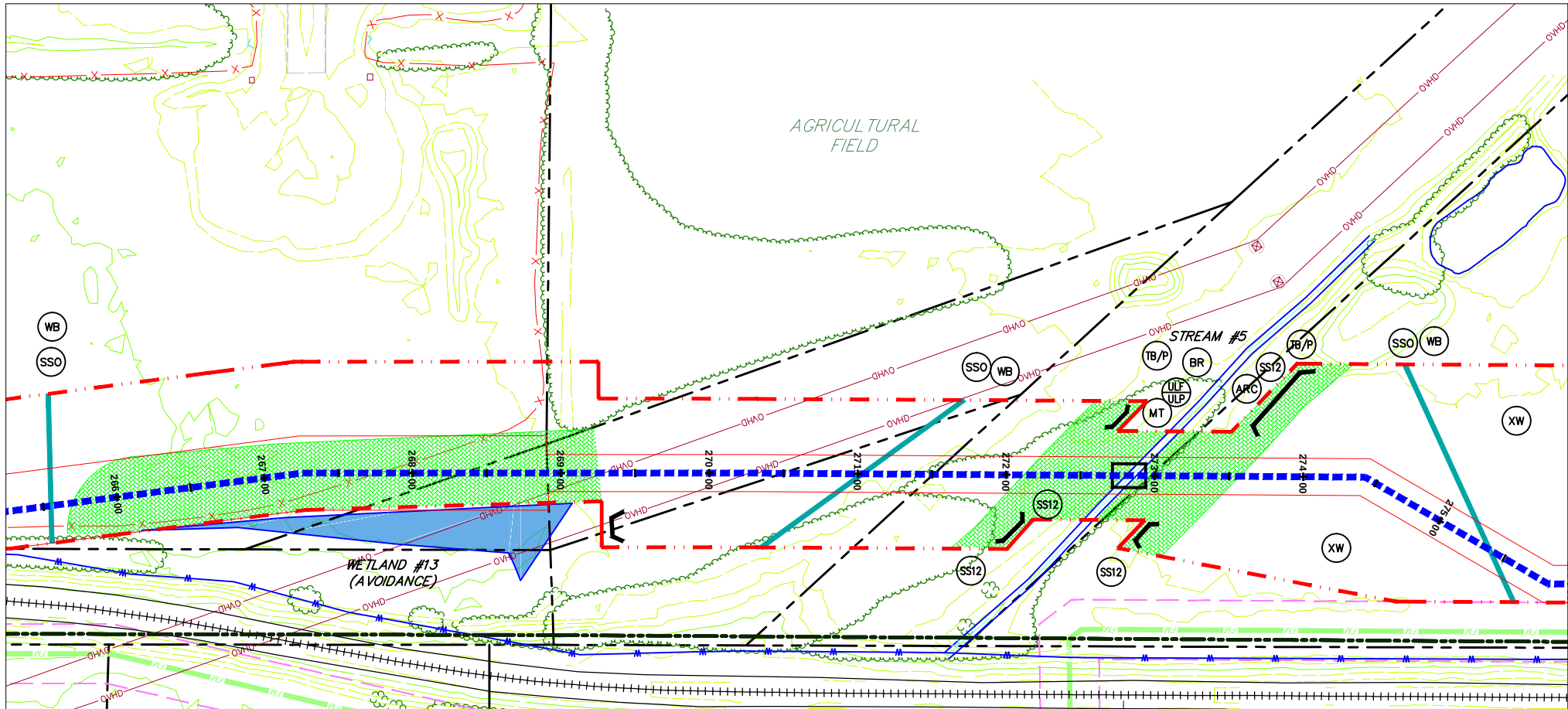
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
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SCALE: AS NOTED
PROJECT NO. NRG-1007
SHEET NO. 57 OF 88

3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768



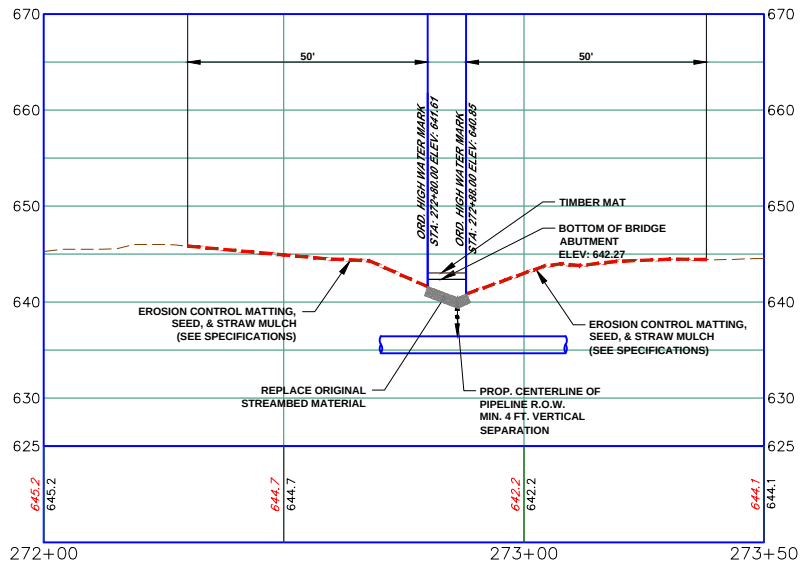
WETLAND #13 (AVOIDANCE)& STREAM #5

SCALE: 1" = 100'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
4. THE CONTRACTOR SHALL PLACE LOG MATS TO CROSS THE WETLAND AREA. ALL APPLICABLE WETLAND AREA WITHIN THE LIMITS OF CONSTRUCTION/DISTURBANCE SHALL BE COVERED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES AND/OR REPAIRS REQUIRED AS A RESULT OF DAMAGE TO WETLANDS AND WATERCOURSES AT NO COST TO THE FACILITY OWNER.
5. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
a) WETLAND #13 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
b) STREAM #5 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "B".
6. REFER TO DETAIL SHEET 4 FOR "ULP" OR "ULP" DETAIL UTILIZE FOR STREAM CROSSINGS.
7. ALTHOUGH A BRIDGE IS SHOWN, A TEMPORARY CULVERT CROSSING MAY BE INSTALLED. REFER TO DETAIL SHEET 1 FOR "BR" DETAIL AND FOR THE SPECIFIED SIZE AND NUMBER OF CULVERTS.
8. REFER TO DETAIL SHEET 4 FOR "ARC" DETAIL.
9. REFER TO DETAIL SHEET 5 FOR "RCE" DETAIL.
10. REFER TO DETAIL SHEET 5 FOR "AR" DETAIL.
11. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

LEGEND	
	INDEX CONTOUR
	CONTOUR
	PROPERTY LINE
	TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
	PERMANENT PIPELINE R.O.W.
	CENTERLINE PIPELINE R.O.W.
	ABOVE GROUND PIPE
	CONVENTIONAL BORE
	HDD
	FENCE
	EDGE WOODS
	WETLANDS
	STONE WALL
	OVERHEAD/UTILITY POLE
	FLOW
	PERENNIAL STREAM
	EPHEMERAL/INTERMITTENT STREAM
	ORD. HIGH WATER MARK LINE
	FLOODWAY
	SOIL TYPE & BOUNDARY
	SILT/CLAY OR EQUIV. 12" HEIGHT
	SILT/CLAY OR EQUIV. 24" HEIGHT
	SILT/CLAY OR EQUIV. 32" HEIGHT
	ROCK CONSTRUCTION ENTRANCE
	LOG MAT
	EROSION CONTROL MATTING
	STREAMBANK RESTORATION
	TEMP. PIPE
	WATERBAR
	ROCK FILTER BERM
	BRIDGE
	WETLAND CROSSING
	SEDIMENT SILT SOXX PROTECTION AT WATER BAR
	ACCESS ROAD
	HIGHWAY BORING
	HIGHWAY CUT
	ACCESS RD. X-ING (PAVED ROAD)
	ACCESS RD. w/CULVERT
	UTILITY LINE STREAM X-ING WITH DAM AND PUMPING OR WITH PIPE FLUME
	TRENCH BREAKER/PLUG
	LONGITUDINAL DIVERSION GRADING
	EXTRA WORKSPACE
	LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE - 235 AC.



STREAM #5 PROFILE

(ON 22x34 SHEET)

HORIZONTAL

GRAPHIC SCALE



(IN FEET)

1 inch = 20 ft.

(ON 22x34 SHEET)

VERTICAL

GRAPHIC SCALE



(IN FEET)

1 inch = 10 ft.

GRAPHIC SCALE



(IN FEET)

1 inch = 50 ft.

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GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

E&SPC SITE DETAIL

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

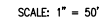
Hanover
Engineering Associates Inc

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO.: NRG-1007
SHEET NO.: 58 OF 88

3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

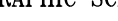
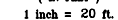
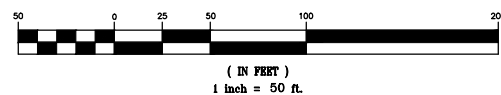


1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WB" DETAIL.
3. REFER TO DETAIL SHEET 3 FOR "SSO" DETAIL.
4. REFER TO DETAIL SHEET 5 FOR "ROE" OR DETAIL.
5. REFER TO DETAIL SHEET 3 FOR OR "HMB" DETAIL. PLACE TRENCH BREAKERS ON EITHER SIDE OF THE EXISTING ROAD.
6. DETAIL SHEET 3 FOR "STONE/DIRT TWP ROAD CROSSING DETAIL" OR "PAVED TWP ROAD CROSSING" FOR TRENCH BACKFILL AND ROAD SURFACE RESTORATION.
7. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.
8. REFER TO DETAIL SHEET 6 FOR INLET PROTECTION DETAIL.

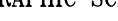


1. REFER TO DETAIL SHEET 3 FOR "T/B/P" DETAIL.
ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WB" DETAIL.
3. REFER TO DETAIL SHEET 3 FOR "SSO" DETAIL.
4. REFER TO DETAIL SHEET 3 FOR "W" DETAIL.
5. PLACE A WARNING BARRIER/SIGNAL AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
6. THE CONTRACTOR SHALL PLACE LOG MATS TO CROSS THE WETLAND AREA. ALL APPLICABLE WETLAND AREAS WITHIN THE LIMITS OF CONSTRUCTION/DISTURBANCE SHALL BE COVERED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES AND/OR REPAIRS TO THE WETLAND AS A RESULT OF DAMAGE TO WETLANDS AND WATERCOURSES: AT NO COST TO THE FACILITY OWNER.
7. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
 - a) WETLAND #14 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "CR"
 - b) JUNCTION DITCH #14 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "B"
8. REFER TO DETAIL SHEET 4 FOR "ULP" OR "ULP" DETAIL. UTILIZE FOR STREAM CROSSINGS.
9. ALTHOUGH A BRIDGE IS SHOW, A TEMPORARY CULVERT CROSSING MAY BE INSTALLED. REFER TO DETAIL SHEET 1 FOR "BR" DETAIL AND FOR THE SPECIFIED SIZE AND NUMBER OF CULVERTS.
10. REFER TO DETAIL SHEET 4 FOR "C/R" DETAIL.
11. REFER TO DETAIL SHEET 2 FOR STREAMBANK RESTORATION SPECIFICATIONS.
12. REFER TO DETAIL SHEET 4 FOR "FB" DETAIL.
13. REFER TO DETAIL SHEET 6 FOR INLET PROTECTION DETAIL.

	INDEX CONTOUR
	CONTOUR
	PROPERTY LINE
	TEMP. CONSTRUCTION
	EASEMENT/LIMIT OF
	DISTURBANCE
	PERMANENT PIPELINE
	R.O.W.
	CENTERLINE PIPELINE
	R.O.W.
	ABOVE GROUND PIPE
	CONVENTIONAL BORE
	HDD
	FENCE
	EDGE WOODS
	WETLANDS
	STONE WALL
	OVERHEAD/UTILITY POLE
	PERENNIAL STREAM
	EPHEMERAL/INTERMITTENT
	STREAM
	ORD. HIGH WATER
	MARK LINE
	FLOODWAY
	LoB
	SOIL TYPE & BOUNDARY
	SILT/SOXX OR EQUIV.
	12" HEIGHT
	SILT/SOXX OR EQUIV.
	24" HEIGHT
	SILT/SOXX OR EQUIV.
	32" HEIGHT
	ROCK CONSTRUCTION
	ENTRANCE
	LOG MAT
	EROSION CONTROL MATTING
	STREAMBANK
	RESTORATION
	TEMP. PIPE
	WATERBAR
	ROCK FILTER BERM
	BRIDGE
	WETLAND CROSSING
	SEDIMENT SILT SOXX
	PROTECTION AT WATER
	BAR
	ACCESS ROAD
	HIGHWAY BORING
	HIGHWAY CUT
	ACCESS RD. X-ING
	(PAVED ROAD)
	ACCESS RD. w/CULVERT
	UTILITY LINE STREAM
	X-ING WITH DAM AND
	PUMPING OR WITH PIPE
	FLUME
	TRENCH BREAKER/PLUG
	LONGITUDINAL DIVERSION
	GRADING
	EXTRA WORKSPACE



(ON 22x34 SHEET)



10 2

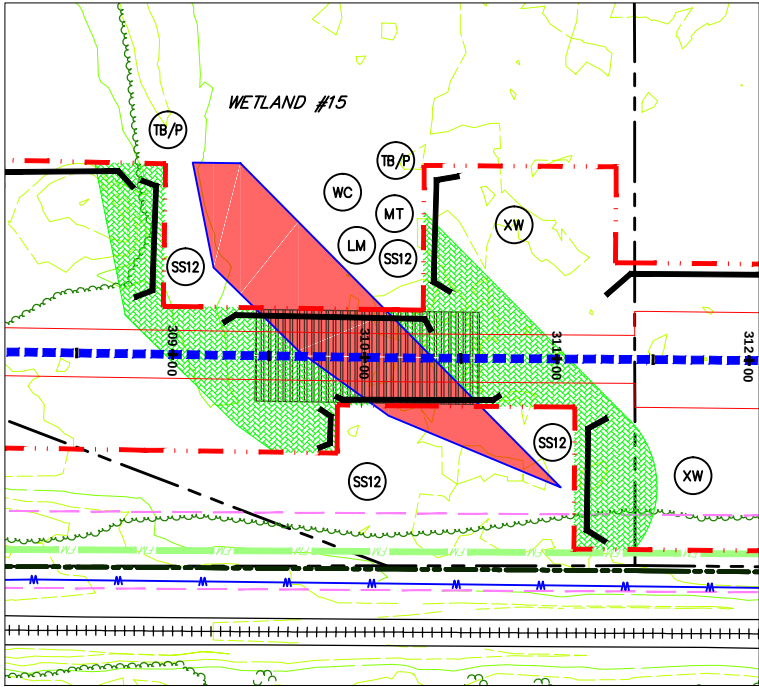


1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

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SEAL	NO.	REVISIONS	DATE	AVON LAKE GAS ADDITION PROJECT			
				CARLISLE, EATON & LAGRANGE TOWNSHIPS AVON, AVON LAKE, ELYRIA & NORTH RIDGEVILLE CITIES LORAIN COUNTY OHIO			
					DRAWN BY: AEJ	PROJECT NO. NRG-1007	
					CHECKED BY: SJC	SHEET NO. 59 OF 88	
					DATE: 12.15.14		
					SCALE: AS NOTED		
				3355 Route 611, Suite 1 Bantonsville, PA 18321-7822 570.688.9550 Fax 570.688.9768			

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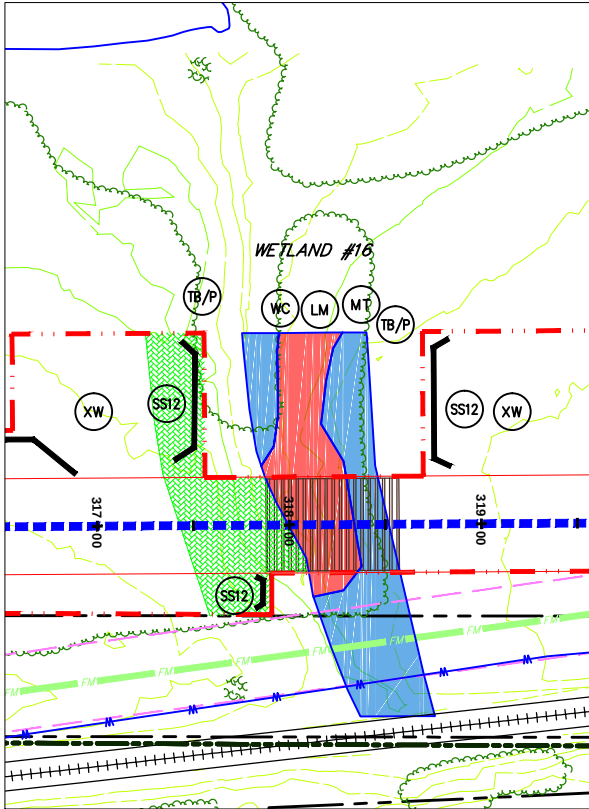


WETLAND #15

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
4. THE CONTRACTOR SHALL PLACE LOG MATS TO CROSS THE WETLAND AREA. ALL APPLICABLE WETLAND AREA WITHIN THE LIMITS OF CONSTRUCTION/DISTURBANCE SHALL BE COVERED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES AND/OR REPAIRS REQUIRED AS A RESULT OF DAMAGE TO WETLANDS AND WATERCOURSES AT NO COST TO THE FACILITY OWNER.
5. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
a) WETLAND #15 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
6. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

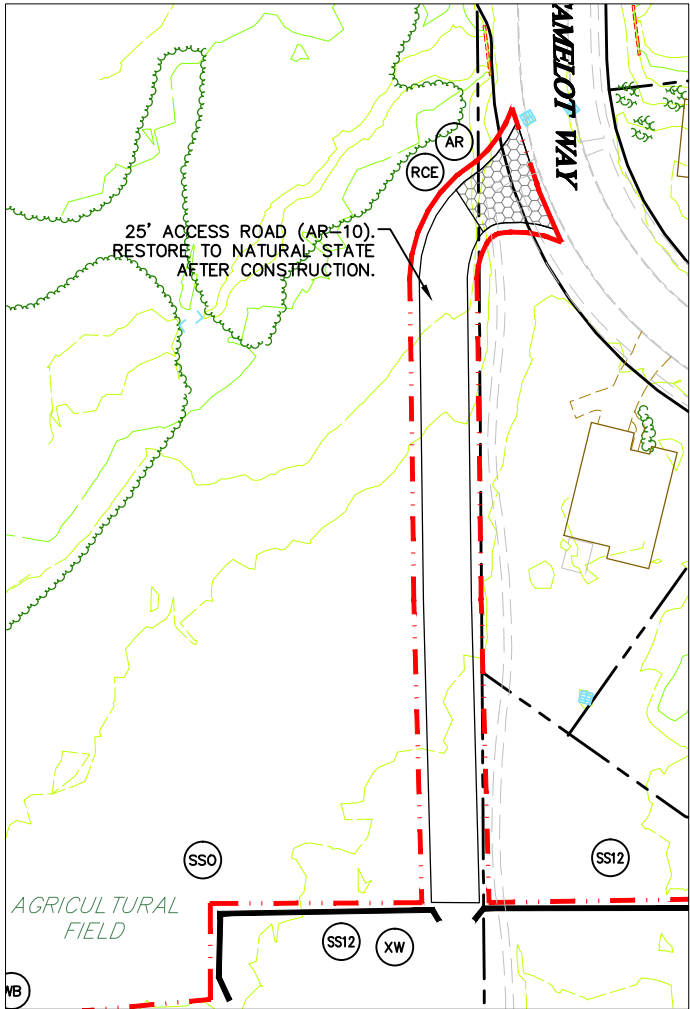


WETLAND #16

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
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5. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
a) WETLAND #16 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
6. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.



ACCESS ROAD (AR-10) TO CAMELOT WAY

SCALE: 1" = 50'

NOTES:

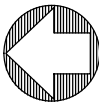
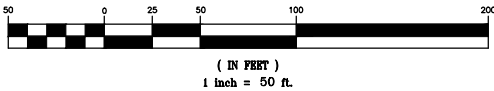
1. REFER TO DETAIL SHEET 5 FOR "RCE" OR DETAIL.
2. REFER TO DETAIL SHEET 5 FOR "AR" DETAIL.
3. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

LEGEND	
	INDEX CONTOUR
	CONTOUR
	PROPERTY LINE
	TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
	PERMANENT PIPELINE R.O.W.
	CENTERLINE PIPELINE R.O.W.
	ABOVE GROUND PIPE
	CONVENTIONAL BORE
	HDD
	FENCE
	EDGE WOODS
	WETLANDS
	STONE WALL
	OVERHEAD/UTILITY POLE
	FLOW
	PERENNIAL STREAM
	EPHEMERAL/INTERMITTENT STREAM
	ORD. HIGH WATER MARK
	FLOODWAY
	SOIL TYPE & BOUNDARY
	SILT/CLAY OR EQUIV. 12" HEIGHT
	SILT/CLAY OR EQUIV. 24" HEIGHT
	SILT/CLAY OR EQUIV. 32" HEIGHT
	ROCK CONSTRUCTION ENTRANCE
	LOG MAT
	EROSION CONTROL MATTING
	STREAMBANK RESTORATION
	TEMP. PIPE
	WATERBAR
	ROCK FILTER BERM
	BRIDGE
	WETLAND CROSSING
	SEDIMENT SILT SOXX PROTECTION AT WATER BAR
	ACCESS ROAD
	HIGHWAY BORING
	HIGHWAY CUT
	ACCESS RD. X-ING (PAVED ROAD)
	ACCESS RD. w/CULVERT
	UTILITY LINE STREAM X-ING WITH DAM AND PUMPING OR WITH PIPE FLUME
	TRENCH BREAKER/PLUG
	LONGITUDINAL DIVERSION GRADING
	EXTRA WORKSPACE
	LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE - 235 AC.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

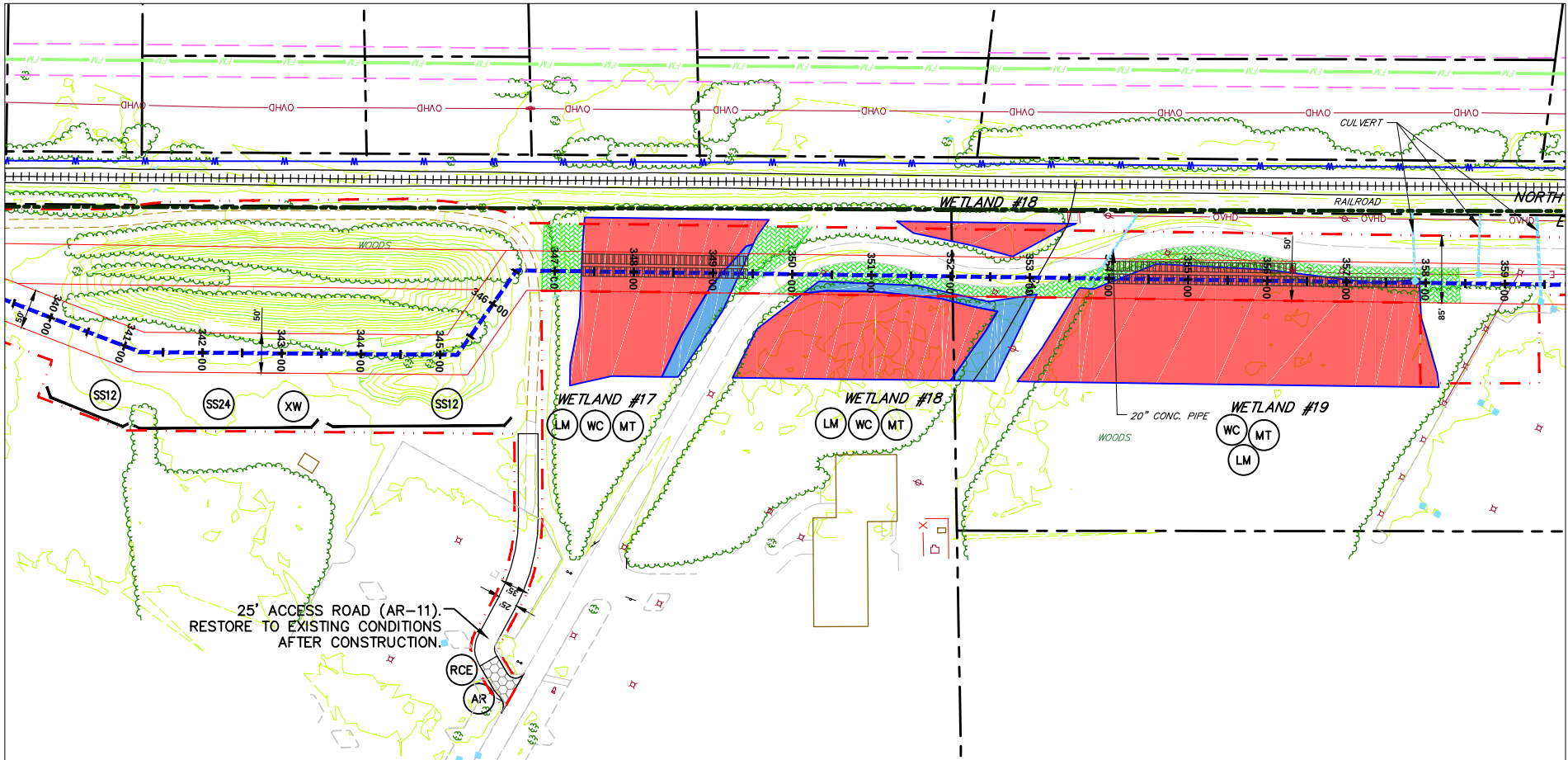
GRAPHIC SCALE



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SEAL	NO.	REVISIONS	DATE	AVON LAKE GAS ADDITION PROJECT			
				CARLISLE, EATON & LAGRANGE TOWNSHIPS AVON, AVON LAKE, ELYRIA & NORTH RIDGEVILLE CITIES LORAIN COUNTY OHIO	DRAWN BY: AEJ	PROJECT NO. NRG-1007	
					CHECKED BY: SJC		
					DATE: 12.15.14	SHEET NO. 60 OF 88	
					SCALE: AS NOTED		
				Hanover Engineering Associates Inc	3355 Route 611, Suite 1 Bartonsville, PA 18321-7822 570.688.9550 Fax 570.688.9768		

Y:\Projects\Energy\NRG Energy\NRG-1007-Avon Lakes Pipeline\DWG\ESPC\ ESPC-NRG-1007-Avon LAKE-006-SITE DETAILS-1.dwg Dec 14,2014 - 6:12pm



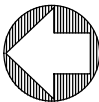
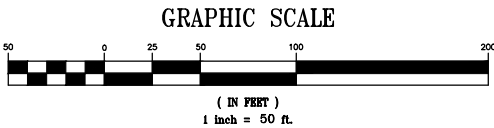
ACCESS ROAD (AR-11),
WETLAND #17,
WETLAND #18,
& WETLAND #19
SCALE: 1" = 100'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
4. THE CONTRACTOR SHALL PLACE LOG MATS TO CROSS THE WETLAND AREA. ALL APPLICABLE WETLAND AREA WITHIN THE LIMITS OF CONSTRUCTION/DISTURBANCE SHALL BE COVERED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES AND/OR REPAIRS REQUIRED AS A RESULT OF DAMAGE TO WETLANDS AND WATERCOURSES AT NO COST TO THE FACILITY OWNER.
5. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
a) WETLAND #17, #18 & #19 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
6. REFER TO DETAIL SHEET 5 FOR "RCE" DETAIL.
7. REFER TO DETAIL SHEET 5 FOR "AR" DETAIL.
8. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.
9. REFER TO DETAIL SHEET 6 FOR INLET PROTECTION DETAIL.

GENERAL NOTES:

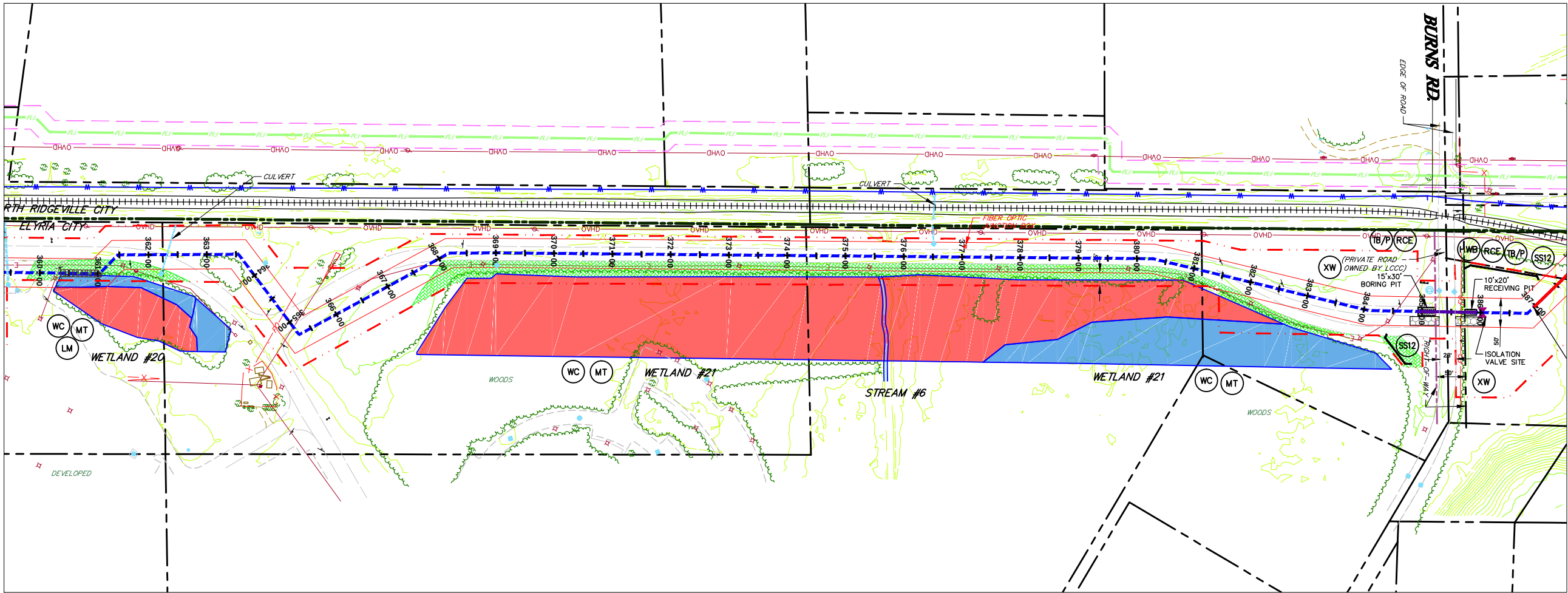
1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.



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E&SPC SITE DETAIL			
AVON LAKE GAS ADDITION PROJECT			
SEAL	NO.	REVISIONS	DATE
CARLISLE, EATON & LAGRANGE TOWNSHIPS AVON, AVON LAKE, ELYRIA & NORTH RIDGEVILLE CITIES LORAIN COUNTY OHIO		DRAWN BY: AEJ	PROJECT NO. NRG-1007
		CHECKED BY: SJC	SHEET NO. 61 OF 88
		DATE: 12.15.14	
		SCALE: AS NOTED	
Hanover Engineering Associates Inc		3355 Route 611, Suite 1 Bartonsville, PA 18321-7822 570.688.9550 Fax 570.688.9768	

Y:\Projects\Energy\NRG Energy\NRG-1007-Avon Lakes Pipeline\DWG\ESPC\ ESPC-NRG-1007-Avon Lake-006-SITE DETAILS-1.dwg Dec 14,2014 - 6:13pm



WETLAND #20, WETLAND #21, STREAM #6, & BURNS RD.

SCALE: 1" = 100'

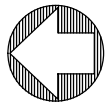
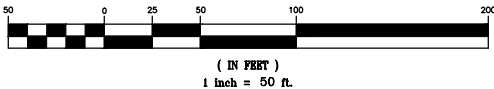
NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
4. THE CONTRACTOR SHALL PLACE LOG MATS TO CROSS THE WETLAND AREA. ALL APPLICABLE WETLAND AREA WITHIN THE LIMITS OF CONSTRUCTION/DISTURBANCE SHALL BE COVERED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES AND/OR REPAIRS REQUIRED AS A RESULT OF DAMAGE TO WETLANDS AND WATERCOURSES AT NO COST TO THE FACILITY OWNER.
5. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
 - a) WETLAND #20 & #21 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
6. REFER TO DETAIL SHEET 5 FOR "RCE" DETAIL.
7. REFER TO DETAIL SHEET 3 FOR "HMB" DETAIL. PLACE TRENCH BREAKERS ON EITHER SIDE OF THE EXISTING ROAD.
8. REFER TO DETAIL SHEET 3 FOR "PAVED TWP ROAD CROSSING" FOR TRENCH BACKFILL AND ROAD SURFACE RESTORATION.
9. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.
10. REFER TO DETAIL SHEET 6 FOR INLET PROTECTION DETAIL.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

GRAPHIC SCALE



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LEGEND

- INDEX CONTOUR
- CONTOUR
- PROPERTY LINE
- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
- PERMANENT PIPELINE R.O.W.
- CENTERLINE PIPELINE R.O.W.
- ABOVE GROUND PIPE
- CONVENTIONAL BORE
- HDD
- FENCE
- EDGE WOODS
- WETLANDS
- STONE WALL
- OVERHEAD/UTILITY POLE
- PERENNIAL STREAM
- EPHEMERAL/INTERMITTENT STREAM
- ORD. HIGH WATER MARK LINE
- FLOODWAY
- SOIL TYPE & BOUNDARY
- SILT/SOXX OR EQUIV. 12" HEIGHT
- SILT/SOXX OR EQUIV. 24" HEIGHT
- SILT/SOXX OR EQUIV. 32" HEIGHT
- ROCK CONSTRUCTION ENTRANCE
- LOG MAT
- EROSION CONTROL MATTING
- STREAMBANK RESTORATION
- TEMP. PIPE
- WATERBAR
- ROCK FILTER BERM
- BRIDGE
- WETLAND CROSSING
- SEDIMENT SILT SOXX PROTECTION AT WATER BAR
- ACCESS ROAD
- HIGHWAY BORING
- HIGHWAY CUT
- ACCESS RD. X-ING (PAVED ROAD)
- ACCESS RD. w/CULVERT
- UTILITY LINE STREAM X-ING WITH DAM AND PUMPING OR WITH PIPE FLUME
- TRENCH BREAKER/PLUG
- LONGITUDINAL DIVERSION GRADING
- EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND
LIMIT OF DISTURBANCE - 235 AC.

E&SPC SITE DETAIL

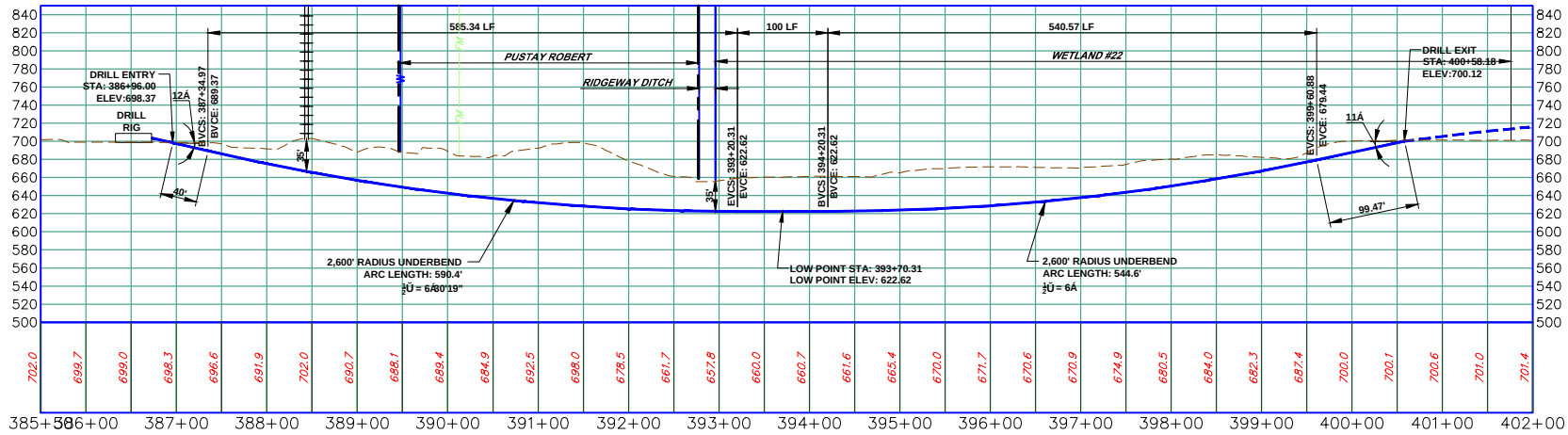
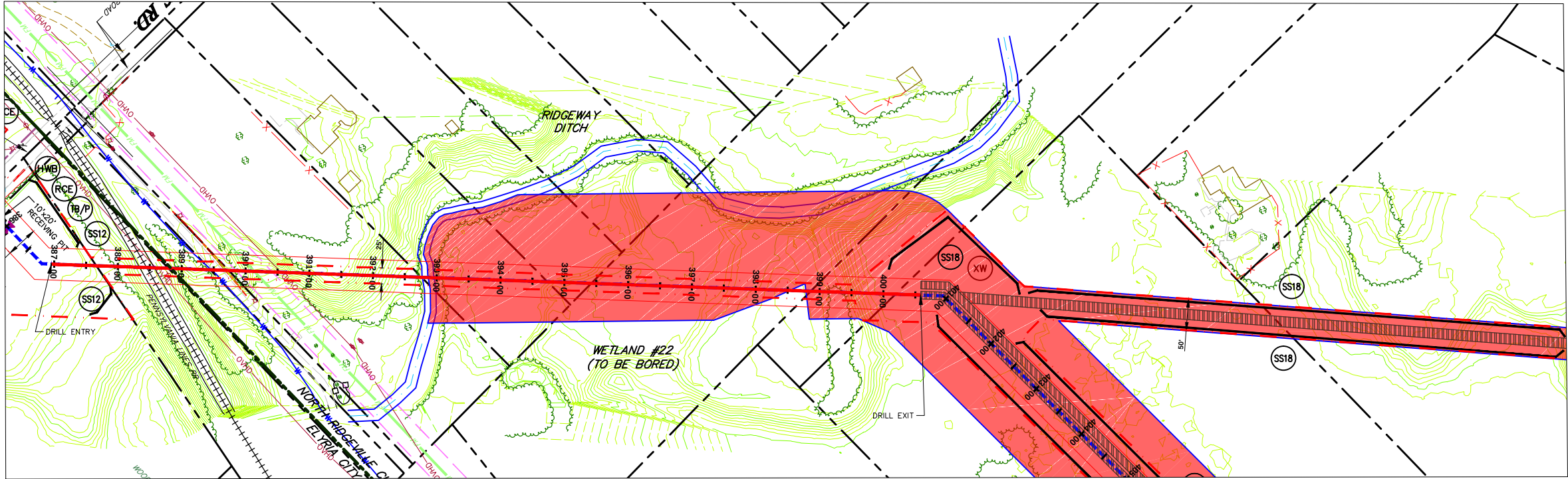
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

Hanover
Engineering Associates Inc

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO. NRG-1007
SHEET NO. 62 OF 88

3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

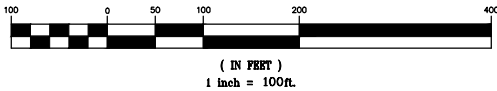


PUSTAY PROPERTY HDD

HDD PROFILE

(ON 22x34 SHEET)
HORIZONTAL & VERTICAL

GRAPHIC SCALE



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SEAL

RIDGEWAY DITCH & WETLAND #22

SCALE: 1" = 100'

NOTES:

1. RIDGEWAY DITCH AND WETLAND #22 TO BE BORED.
2. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
4. REFER TO DETAIL SHEET 3 FOR "TB" DETAIL.

LEGEND

- INDEX CONTOUR
- CONTOUR
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- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
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- CENTERLINE PIPELINE R.O.W.
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- CONVENTIONAL BORE
- HDD
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- STONE WALL
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- EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND
LIMIT OF DISTURBANCE - 235 AC.

E&SPC SITE DETAIL

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
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LORAIN COUNTY
OHIO

Hanover
Engineering Associates Inc

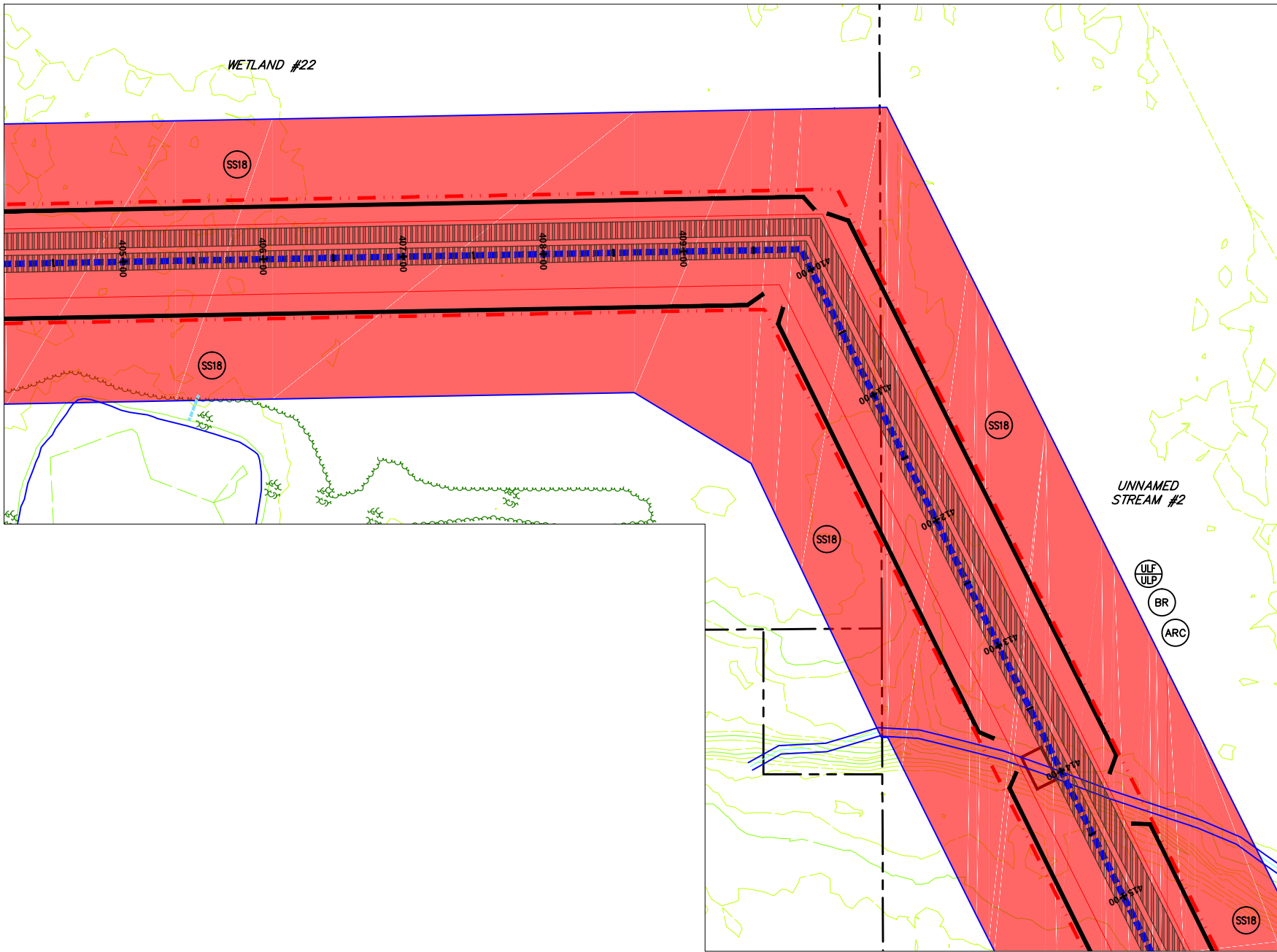
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PROJECT NO. NRG-1007
SHEET NO. 63 OF 88

3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

Y:\Projects\Energy\NRG Energy\NRG-1007-Avon Lakes Pipeline\DWG\ESPC\ ESPC-NRG-1007-Avon LAKE-006-SITE DETAILS-2.dwg Dec 14,2014 -- 4:55pm



WETLAND #23 & UNNAMED STREAM #2

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
4. THE CONTRACTOR SHALL PLACE LOG MATS TO CROSS THE WETLAND AREA. ALL APPLICABLE WETLAND AREA WITHIN THE LIMITS OF CONSTRUCTION/DISTURBANCE SHALL BE COVERED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES AND/OR REPAIRS REQUIRED AS A RESULT OF DAMAGE TO WETLANDS AND WATERCOURSES AT NO COST TO THE FACILITY OWNER.
5. REFER TO DETAIL SHEET 4 FOR "ULF" OR "ULP" DETAIL. UTILIZE FOR STREAM CROSSINGS.
6. ALTHOUGH A BRIDGE IS SHOWN, A TEMPORARY CULVERT CROSSING MAY BE INSTALLED. REFER TO DETAIL SHEET 1 FOR "BR" DETAIL AND FOR THE SPECIFIED SIZE AND NUMBER OF CULVERTS.
7. REFER TO DETAIL SHEET 4 FOR "ARC" DETAIL.
8. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

UNNAMED STREAM #2 PROFILE

(ON 22x34 SHEET)

GRAPHIC SCALE



(ON 22x34 SHEET)

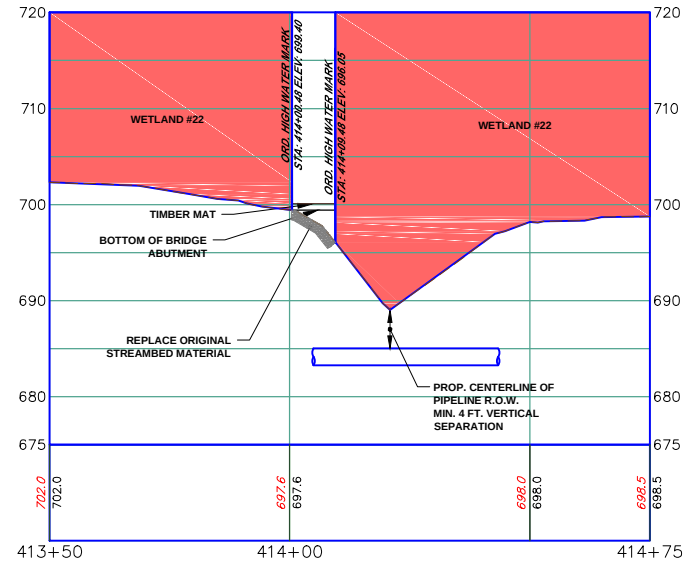
GRAPHIC SCALE



GRAPHIC SCALE



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UNNAMED STREAM #2 PROFILE

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- LONGITUDINAL DIVERSION GRADING
- EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND
LIMIT OF DISTURBANCE - 235 AC.

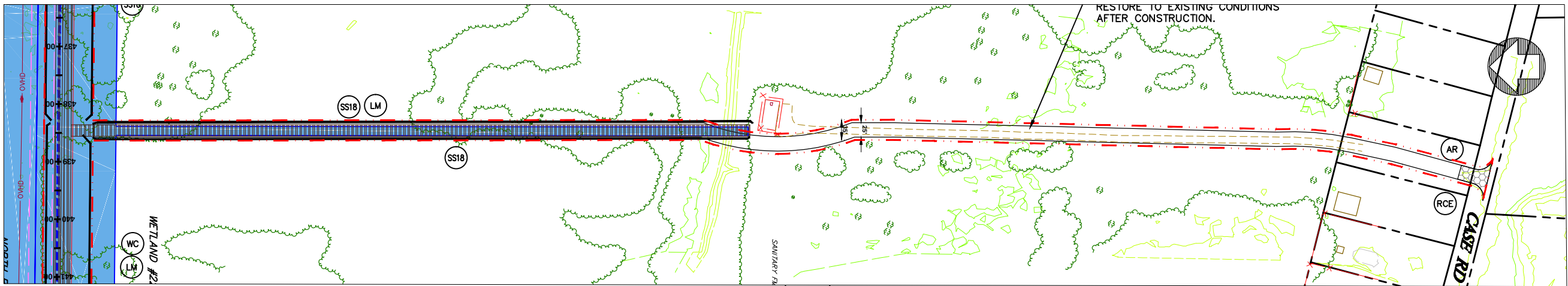
E&SPC SITE DETAIL

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
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LORAIN COUNTY
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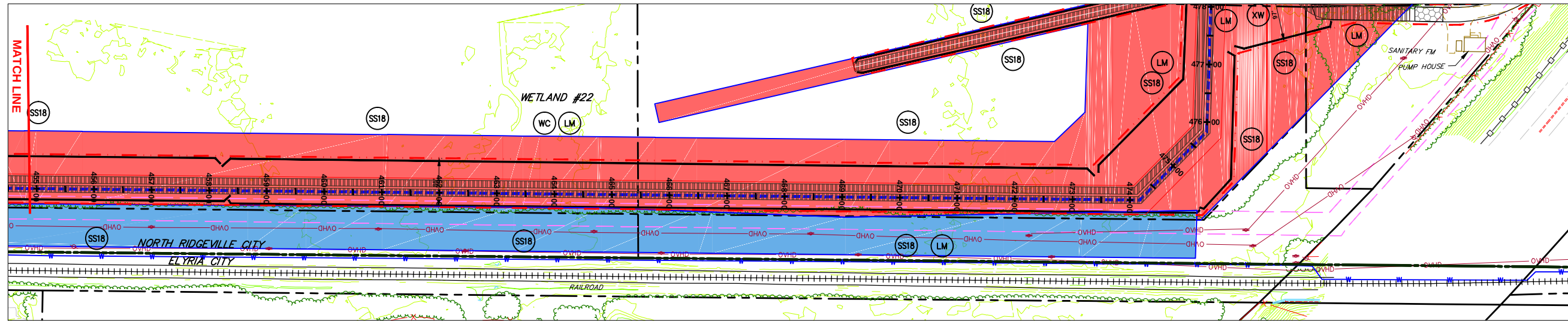
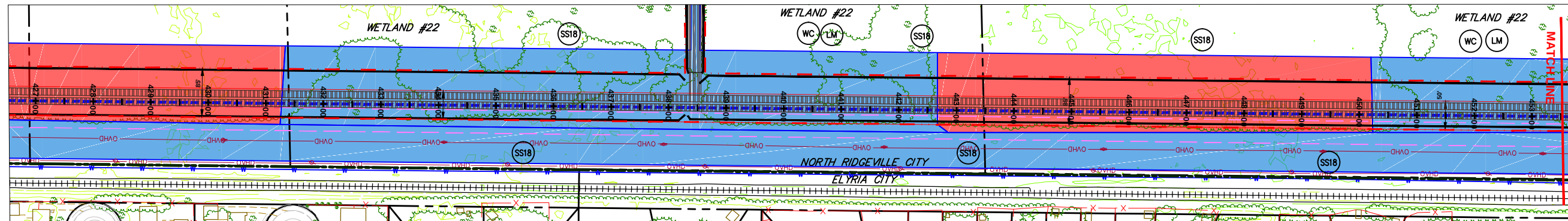


ACCESS ROAD (AR-12) TO CASE RD

NOTES:

1. REFER TO DETAIL SHEET 5 FOR "RCE" OR DETAIL.
2. REFER TO DETAIL SHEET 5 FOR "AR" DETAIL.

SCALE: 1" = 100'



WETLAND #22

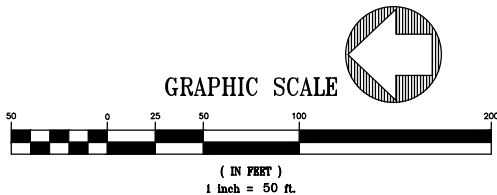
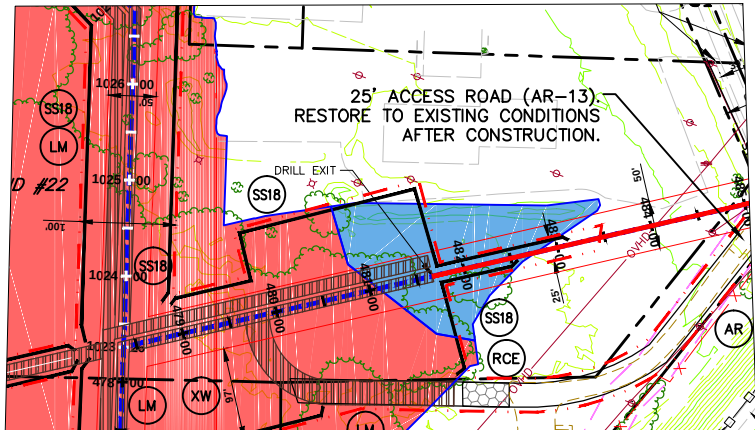
SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "IB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
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5. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.



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- TRENCH BREAKER/PLUG
- LONGITUDINAL DIVERSION GRADING
- EXTRA WORKSPACE
- LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE - 235 AC.

E&SPC SITE DETAIL

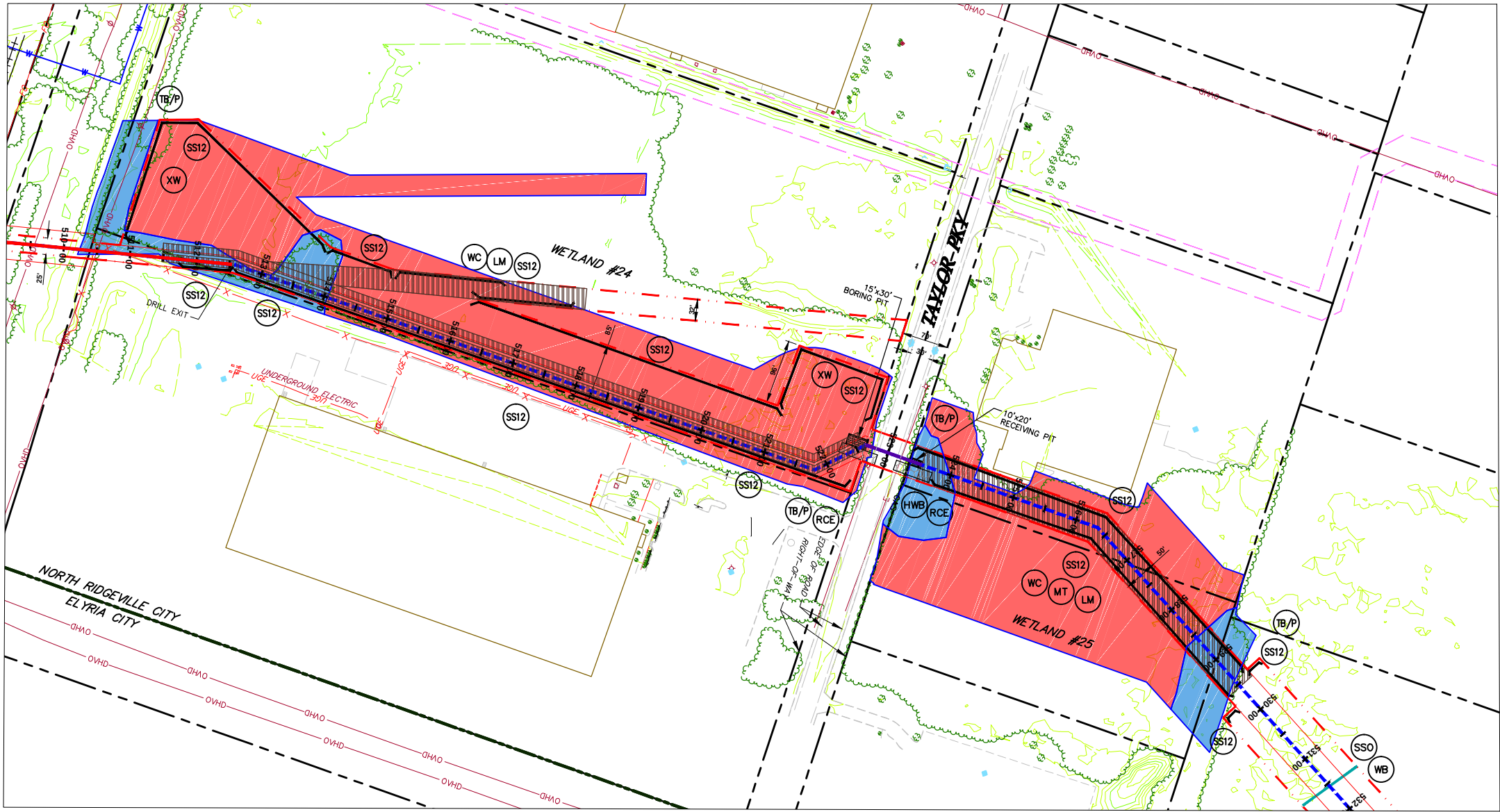
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

Hanover
Engineering Associates Inc

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO.: NRG-1007
SHEET NO.: 65 OF 88
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

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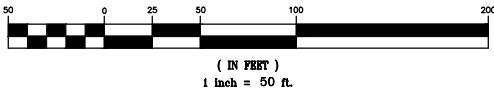
WETLAND #24, TAYLOR PARKWAY, & WETLAND #25

SCALE: 1" = 100'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
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5. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
a) WETLAND #25 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
6. REFER TO DETAIL SHEET 5 FOR "RCE" OR DETAIL.
7. REFER TO DETAIL SHEET 3 FOR "HWB" DETAIL. PLACE TRENCH BREAKERS ON EITHER SIDE OF THE EXISTING ROAD.
8. REFER TO DETAIL SHEET 3 FOR "TB" DETAIL.
9. REFER TO DETAIL SHEET 6 FOR INLET PROTECTION DETAIL.

GRAPHIC SCALE



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LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE - 235 AC.

E&SPC SITE DETAIL

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CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
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LORAIN COUNTY
OHIO

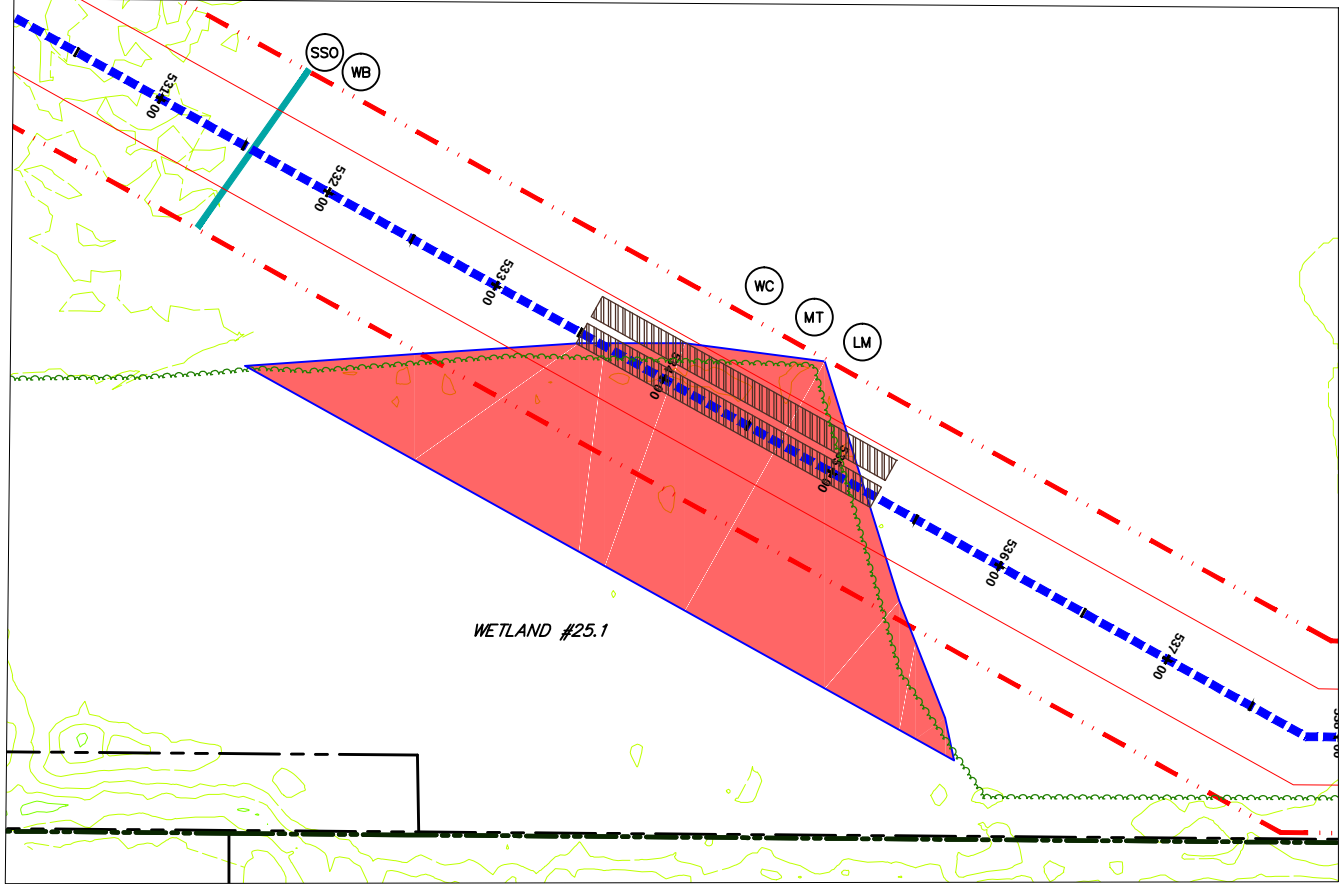
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GENERAL NOTES:

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2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

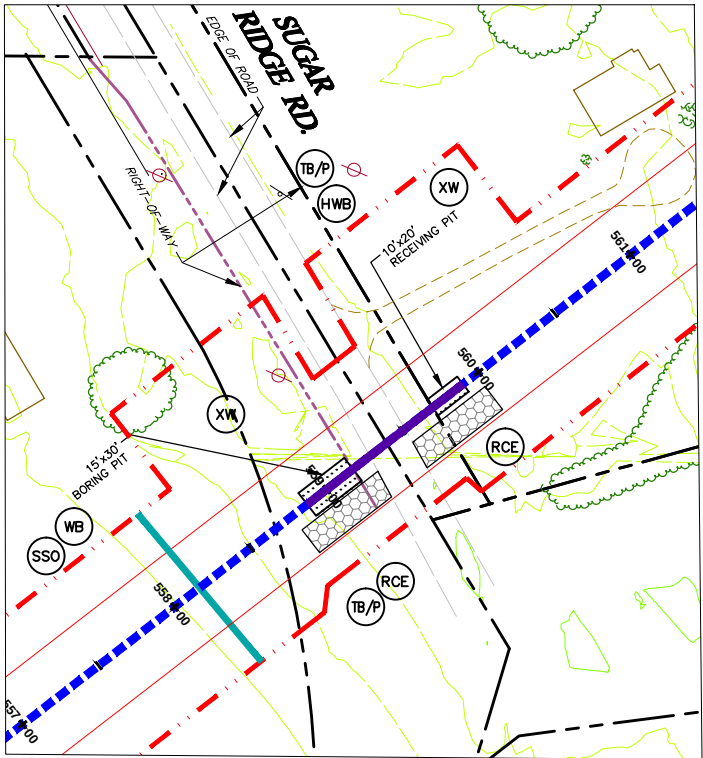


WETLAND #25.1

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
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5. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

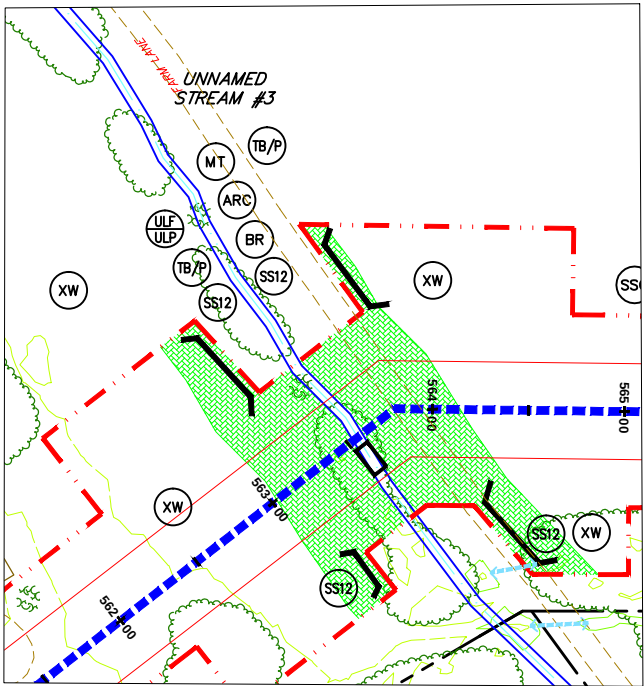
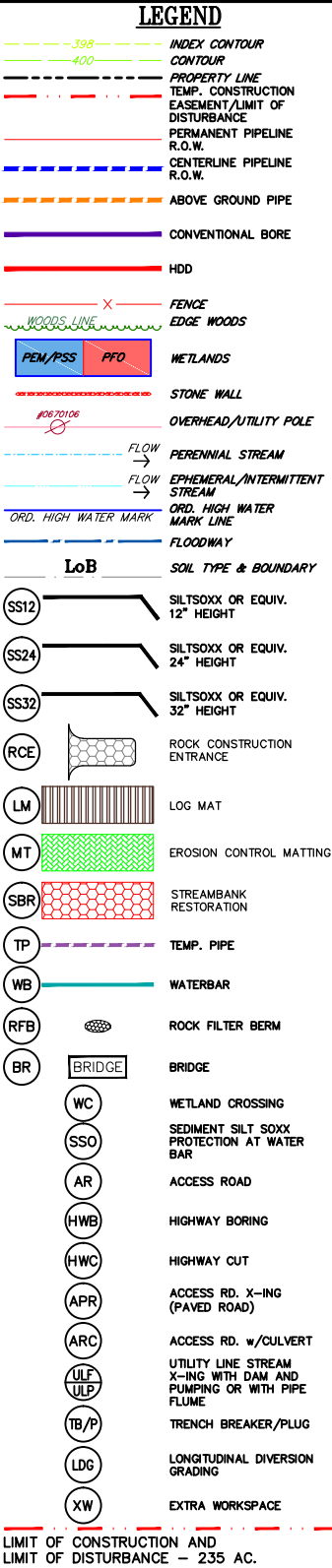


SUGAR RIDGE ROAD

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 5 FOR "RCE" OR DETAIL.
2. REFER TO DETAIL SHEET 3 FOR OR "HWB" DETAIL. PLACE TRENCH BREAKERS ON EITHER SIDE OF THE EXISTING ROAD.
3. REFER TO DETAIL SHEET 3 FOR "STONE/DIRT TWP ROAD CROSSING DETAIL" OR "PAVED TWP ROAD CROSSING" FOR TRENCH BACKFILL AND ROAD SURFACE RESTORATION.
4. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.



UNNAMED STREAM #3

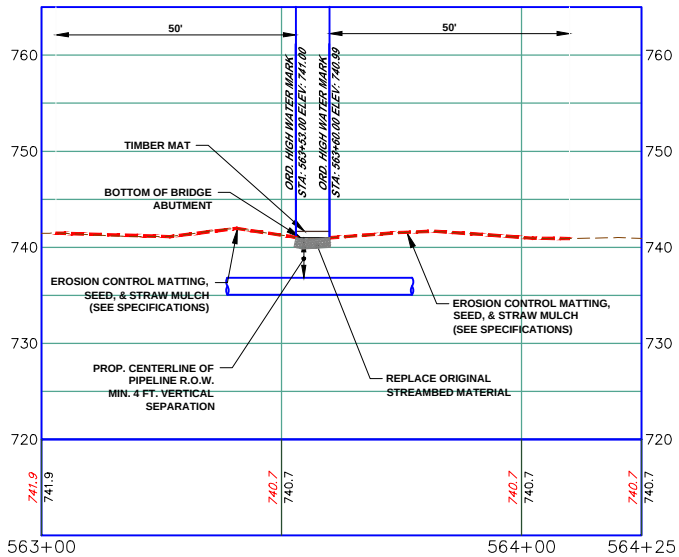
SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL.
3. STREAM #2 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "B".
4. ALTHOUGH A BRIDGE IS SHOWN, A TEMPORARY CULVERT CROSSING MAY BE INSTALLED. REFER TO DETAIL SHEET 1 FOR "BR" DETAIL AND FOR THE SPECIFIED SIZE AND NUMBER OF CULVERTS.
5. REFER TO DETAIL SHEET 4 FOR "ARC" DETAIL.
6. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.



UNNAMED STREAM #3 PROFILE

(ON 22x34 SHEET)

HORIZONTAL

GRAPHIC SCALE



(IN FEET)

1 inch = 20 ft.

(ON 22x34 SHEET)

VERTICAL

GRAPHIC SCALE



(IN FEET)

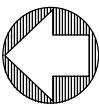
1 inch = 10 ft.

GRAPHIC SCALE



(IN FEET)

1 inch = 50 ft.



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SEAL

E&SPC SITE DETAIL

AVON LAKE GAS ADDITION PROJECT

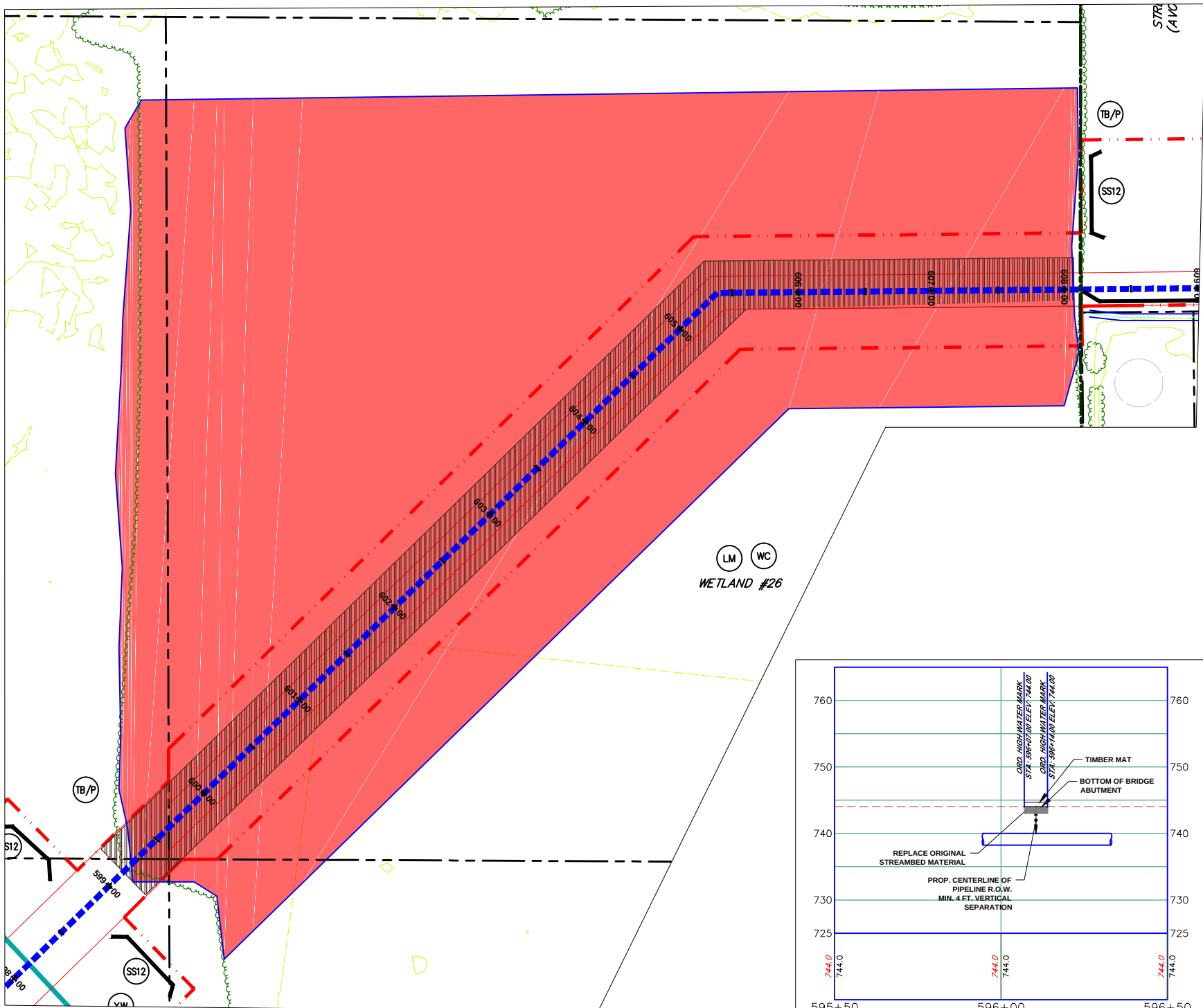
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CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO.: NRG-1007
SHEET NO.: 68 OF 88

3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

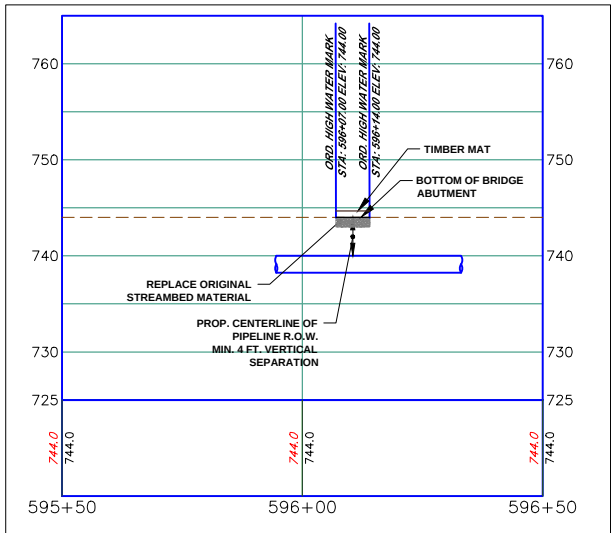
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WETLAND #26
SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
4. THE CONTRACTOR SHALL PLACE LOG MATS TO CROSS THE WETLAND AREA. ALL APPLICABLE WETLAND AREA WITHIN THE LIMITS OF CONSTRUCTION/DISTURBANCE SHALL BE COVERED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES AND/OR REPAIRS REQUIRED AS A RESULT OF DAMAGE TO WETLANDS AND WATERCOURSES AT NO COST TO THE FACILITY OWNER.
5. REFER TO DETAIL SHEET 3 FOR "TB" DETAIL.



STREAM #7 PROFILE

(ON 22x34 SHEET)

GRAPHIC SCALE



(IN FEET)

1 inch = 20 ft.

(ON 22x34 SHEET)

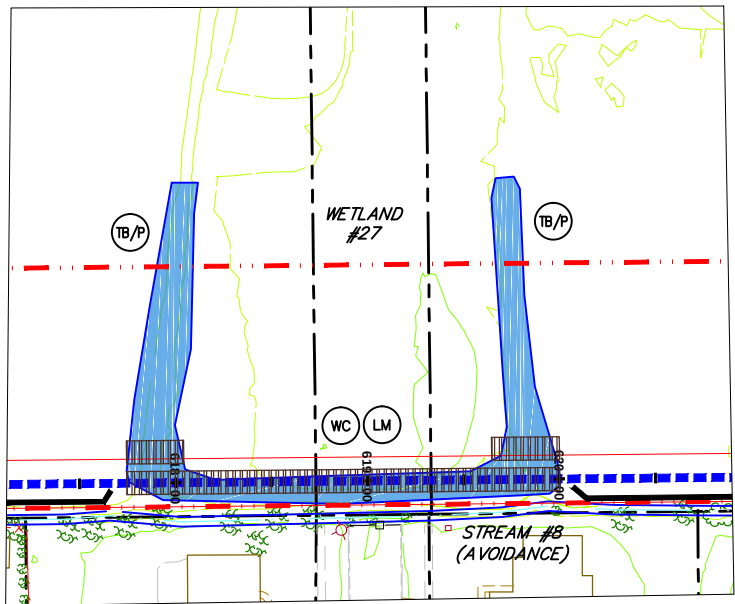
GRAPHIC SCALE



(IN FEET)

1 inch = 10 ft.

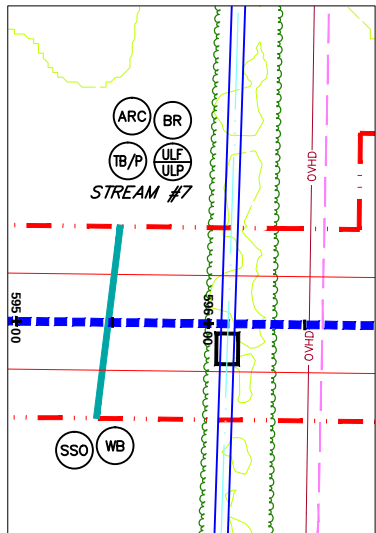
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WETLAND #27 & STREAM #8 (AVOIDANCE)

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
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5. REFER TO DETAIL SHEET 3 FOR "TB" DETAIL.



STREAM #7

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WB" DETAIL.
3. REFER TO DETAIL SHEET 3 FOR "SSO" DETAIL.
4. REFER TO DETAIL SHEET 4 FOR "ULF" OR "ULP" DETAIL. UTILIZE FOR STREAM CROSSINGS.
5. ALTHOUGH A BRIDGE IS SHOWN, A TEMPORARY CULVERT CROSSING MAY BE INSTALLED. REFER TO DETAIL SHEET 1 FOR "BR" DETAIL AND FOR THE SPECIFIED SIZE AND NUMBER OF CULVERTS.
6. REFER TO DETAIL SHEET 4 FOR "ARC" DETAIL.
7. REFER TO DETAIL SHEET 3 FOR "TB" DETAIL.

LEGEND	
	INDEX CONTOUR
	CONTOUR
	PROPERTY LINE
	TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
	PERMANENT PIPELINE
	CENTERLINE PIPELINE
	ABOVE GROUND PIPE
	CONVENTIONAL BORE
	HDD
	FENCE
	EDGE WOODS
	WETLANDS
	STONE WALL
	OVERHEAD/UTILITY POLE
	FLOW
	PERENNIAL STREAM
	EPHEMERAL/INTERMITTENT STREAM
	ORD. HIGH WATER MARK LINE
	FLOODWAY
	SOIL TYPE & BOUNDARY
	SILT/CLAY OR EQUIV. 12" HEIGHT
	SILT/CLAY OR EQUIV. 24" HEIGHT
	SILT/CLAY OR EQUIV. 32" HEIGHT
	ROCK CONSTRUCTION ENTRANCE
	LOG MAT
	EROSION CONTROL MATTING
	STREAMBANK RESTORATION
	TEMP. PIPE
	WATERBAR
	ROCK FILTER BERM
	BRIDGE
	WETLAND CROSSING
	SEDIMENT SILT SOXX PROTECTION AT WATER BAR
	ACCESS ROAD
	HIGHWAY BORING
	HIGHWAY CUT
	ACCESS RD. X-ING (PAVED ROAD)
	ACCESS RD. w/CULVERT
	UTILITY LINE STREAM X-ING WITH DAM AND PUMPING OR WITH PIPE FLUME
	TRENCH BREAKER/PLUG
	LONGITUDINAL DIVERSION GRADING
	EXTRA WORKSPACE
	LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE - 235 AC.

E&SPC SITE DETAIL

AVON LAKE GAS ADDITION PROJECT

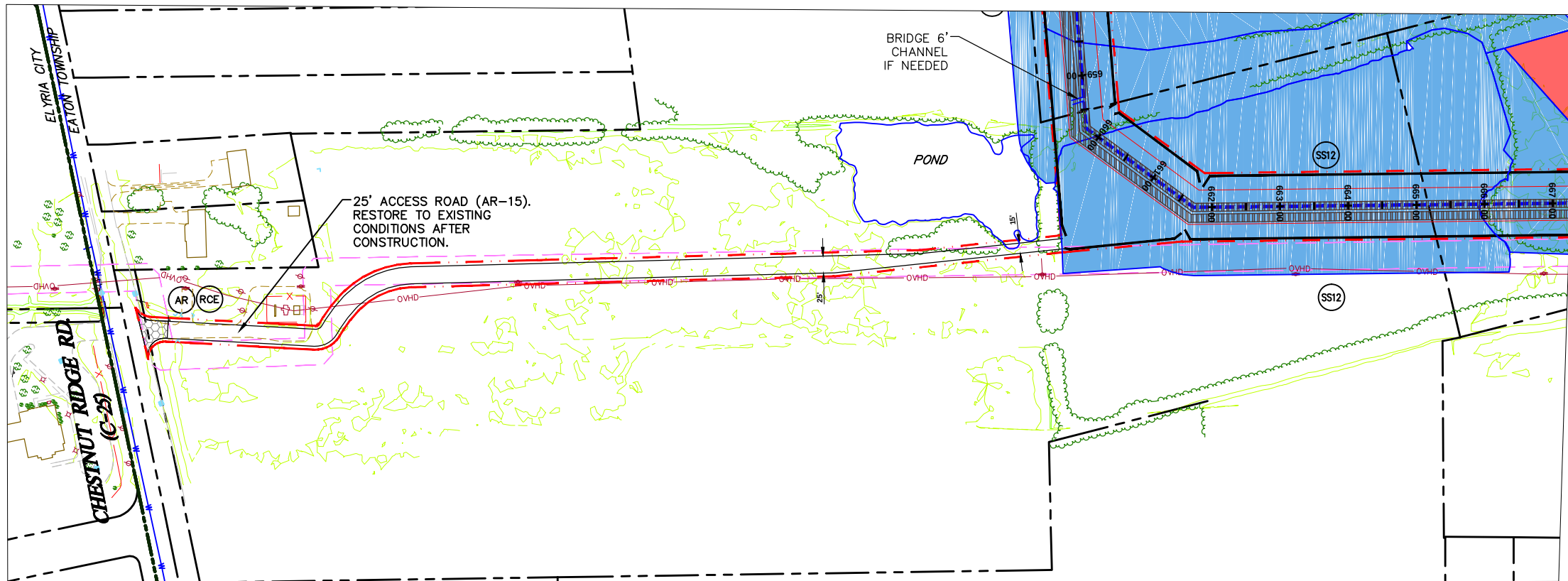
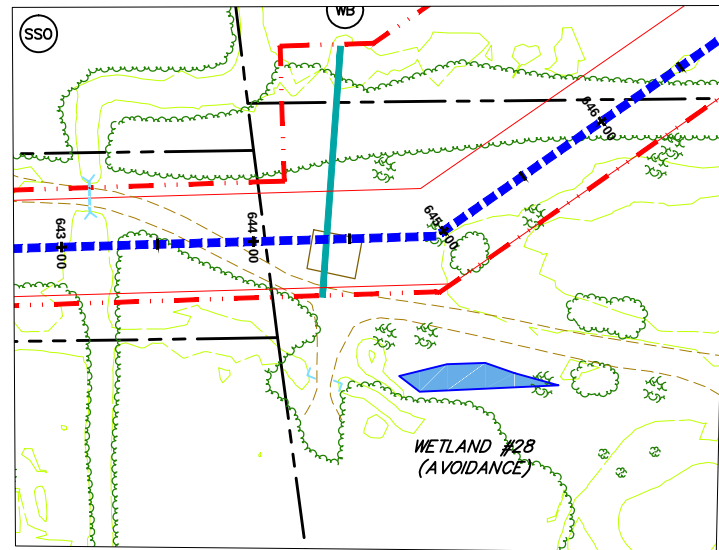
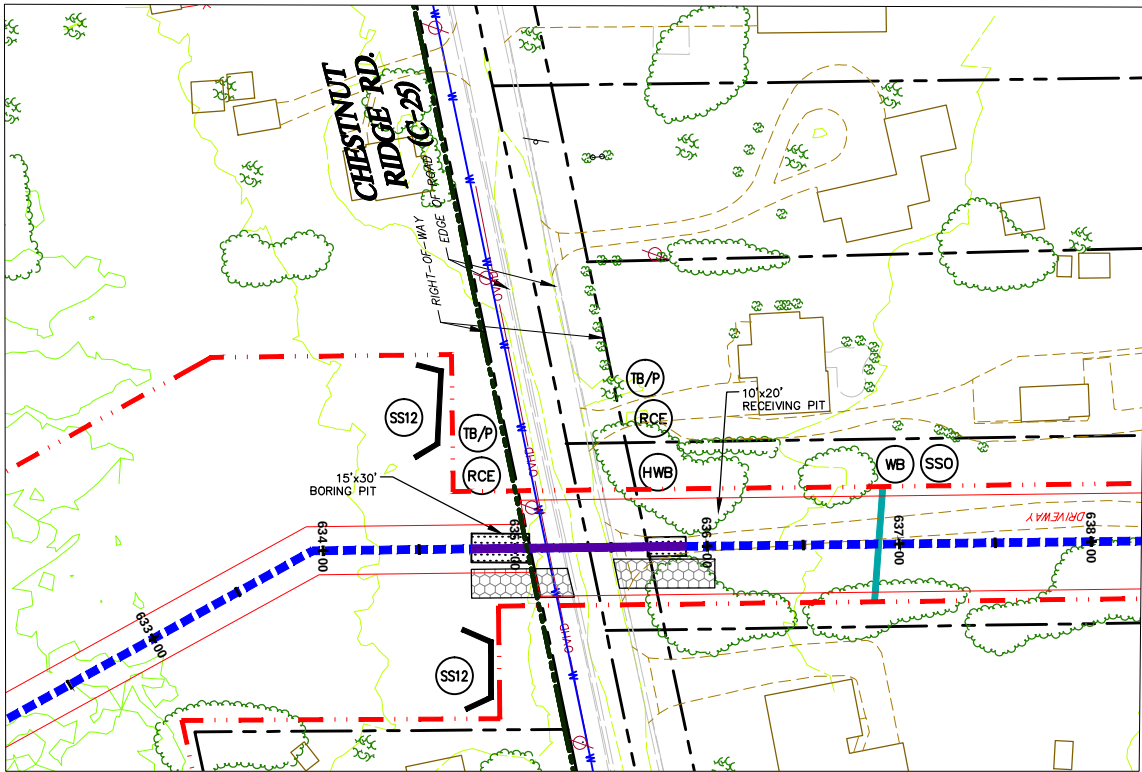
CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

Hanover
Engineering Associates Inc

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO. NRG-1007
SHEET NO. 69 OF 88

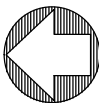
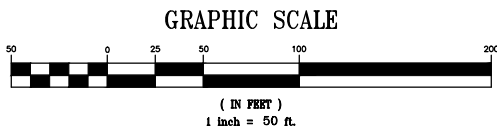
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GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.



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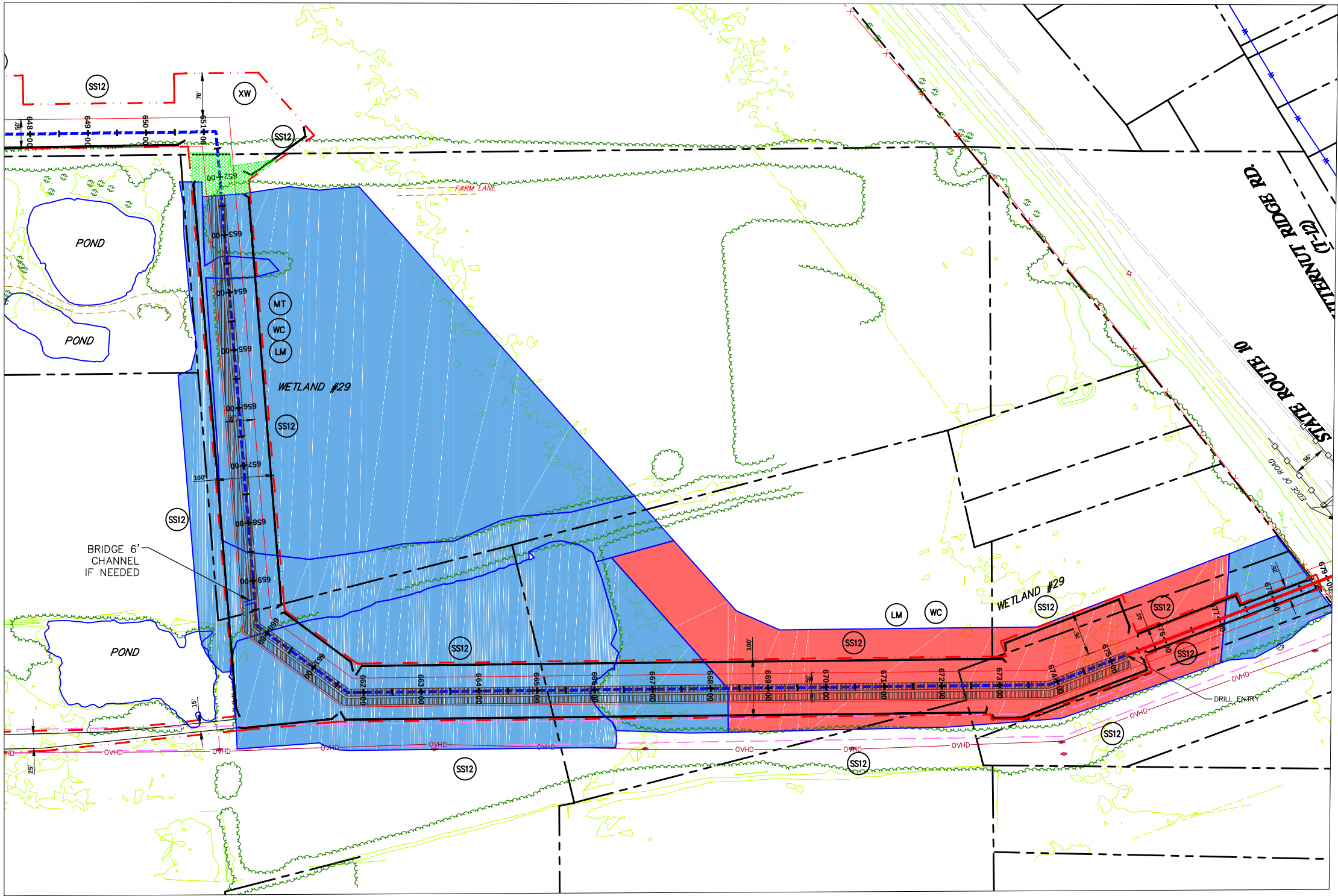
LEGEND

- INDEX CONTOUR
- CONTOUR
- PROPERTY LINE
- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
- PERMANENT PIPELINE R.O.W.
- CENTERLINE PIPELINE R.O.W.
- ABOVE GROUND PIPE
- CONVENTIONAL BORE
- HDD
- FENCE
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- WETLANDS
- STONE WALL
- OVERHEAD/UTILITY POLE
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- EPHEMERAL/INTERMITTENT STREAM
- ORD. HIGH WATER MARK
- FLOODWAY
- SOIL TYPE & BOUNDARY
- SILT/COX OR EQUIV. 12" HEIGHT
- SILT/COX OR EQUIV. 24" HEIGHT
- SILT/COX OR EQUIV. 32" HEIGHT
- ROCK CONSTRUCTION ENTRANCE
- LOG MAT
- EROSION CONTROL MATTING
- STREAMBANK RESTORATION
- TEMP. PIPE
- WATERBAR
- ROCK FILTER BERM
- BRIDGE
- WETLAND CROSSING
- SEDIMENT SILT COX PROTECTION AT WATER BAR
- ACCESS ROAD
- HIGHWAY BORING
- HIGHWAY CUT
- ACCESS RD. X-ING (PAVED ROAD)
- ACCESS RD. w/CULVERT
- UTILITY LINE STREAM X-ING WITH DAM AND PUMPING OR WITH PIPE FLUME
- TRENCH BREAKER/PLUG
- LONGITUDINAL DIVERSION GRADING
- EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND
LIMIT OF DISTURBANCE - 235 AC.

E&SPC SITE DETAIL

SEAL	NO.	REVISIONS	DATE	AVON LAKE GAS ADDITION PROJECT			
				CARLISLE, EATON & LAGRANGE TOWNSHIPS AVON, AVON LAKE, ELYRIA & NORTH RIDGEVILLE CITIES LORAIN COUNTY OHIO	DRAWN BY: AEJ	PROJECT NO.	
					CHECKED BY: SJC	NRG-1007	
					DATE: 12.15.14	SHEET NO.	
					SCALE: AS NOTED	70 OF 88	
				Hanover Engineering Associates Inc	3355 Route 611, Suite 1 Bartonsville, PA 18321-7822 570.688.9550 Fax 570.688.9768		



WETLAND #29
SCALE: 1" = 100'

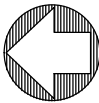
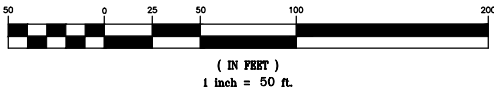
NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WB" DETAIL.
3. REFER TO DETAIL SHEET 3 FOR "SSO" DETAIL.
4. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
5. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
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7. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL.
8. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

GRAPHIC SCALE



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LEGEND

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- TRENCH BREAKER/PLUG
- LONGITUDINAL DIVERSION GRADING
- EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND
LIMIT OF DISTURBANCE - 235 AC.

E&SPC SITE DETAIL

AVON LAKE GAS ADDITION PROJECT

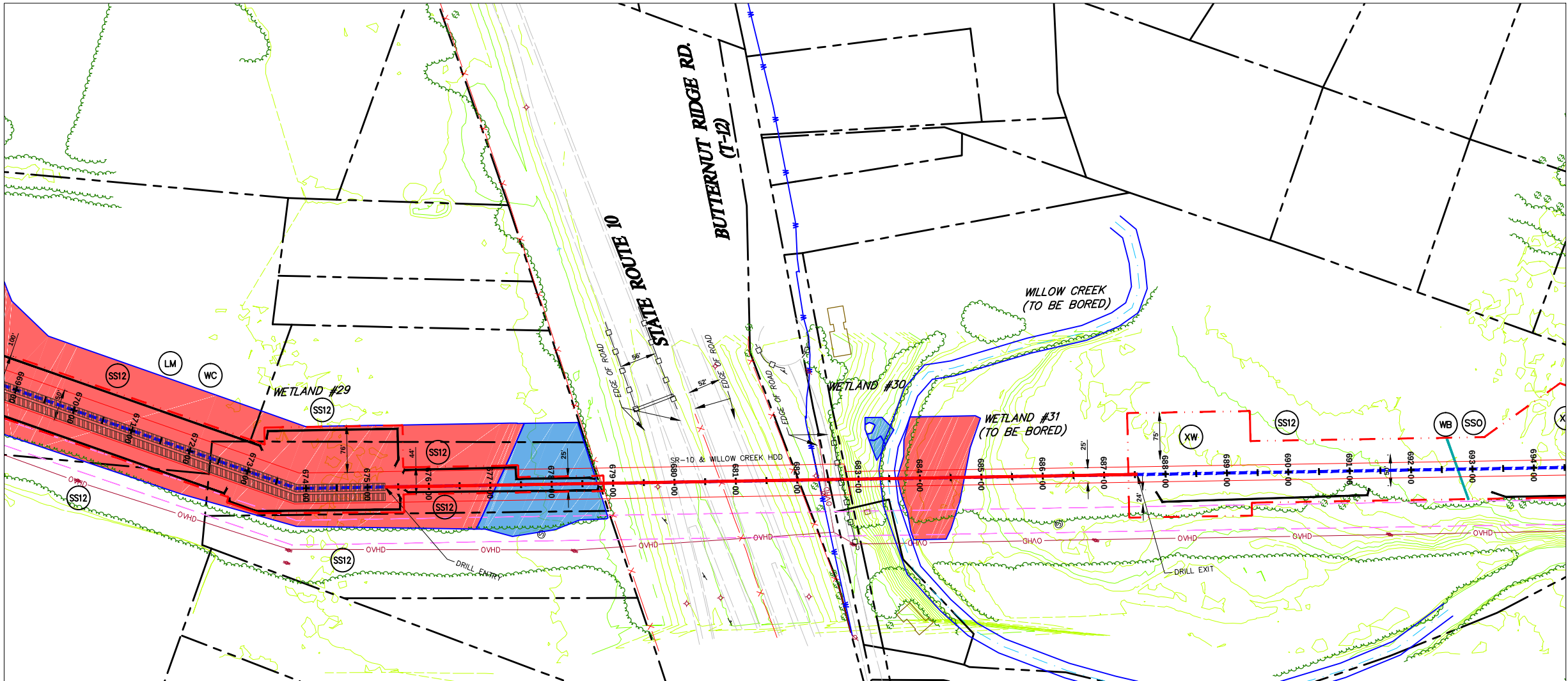
CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

Hanover
Engineering Associates Inc

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO. NRG-1007
SHEET NO. 71 OF 88

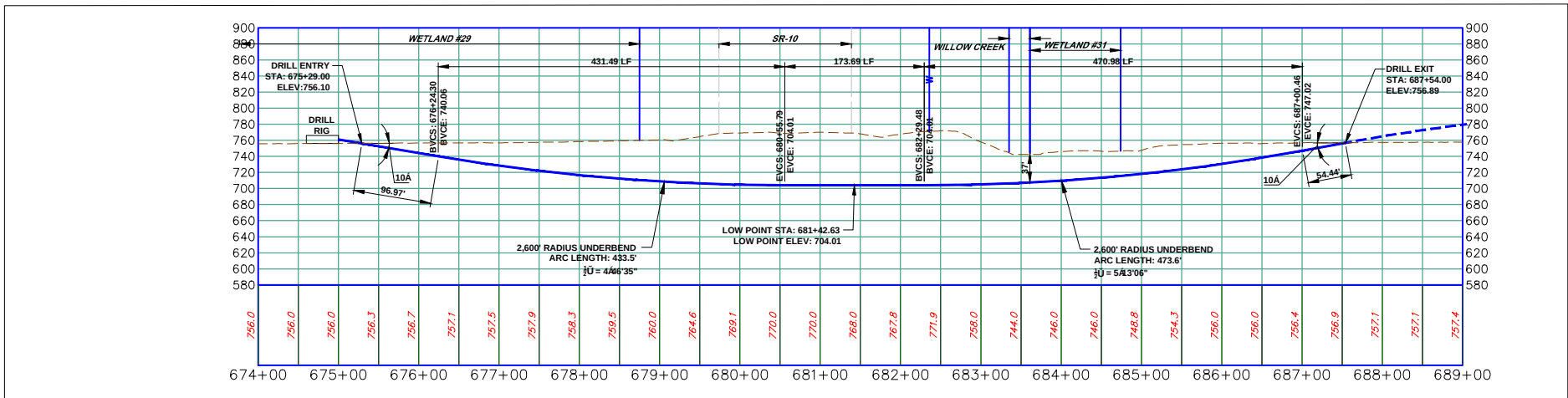
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

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STATE ROUTE 10, BUTTERNUT RIDGE RD (T-12), WETLAND #30,
WILLOW CREEK & WETLAND #31

SCALE: 1" = 100'



HDD PROFILE

(ON 22x34 SHEET)
HORIZONTAL & VERTICAL

GRAPHIC SCALE



(IN FEET)
1 inch = 100ft.



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SEAL

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- EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND
LIMIT OF DISTURBANCE - 235 AC.

E&SPC SITE DETAIL

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

Hanover
Engineering Associates Inc

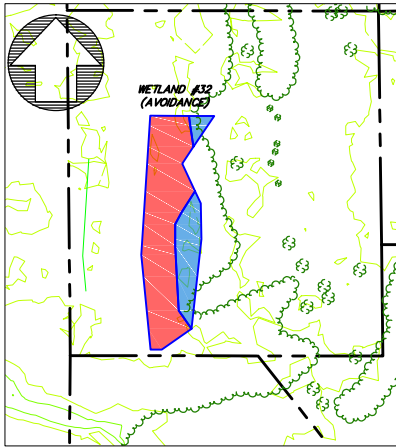
DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO. NRG-1007
SHEET NO. 72 of 88

3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

GENERAL NOTES:

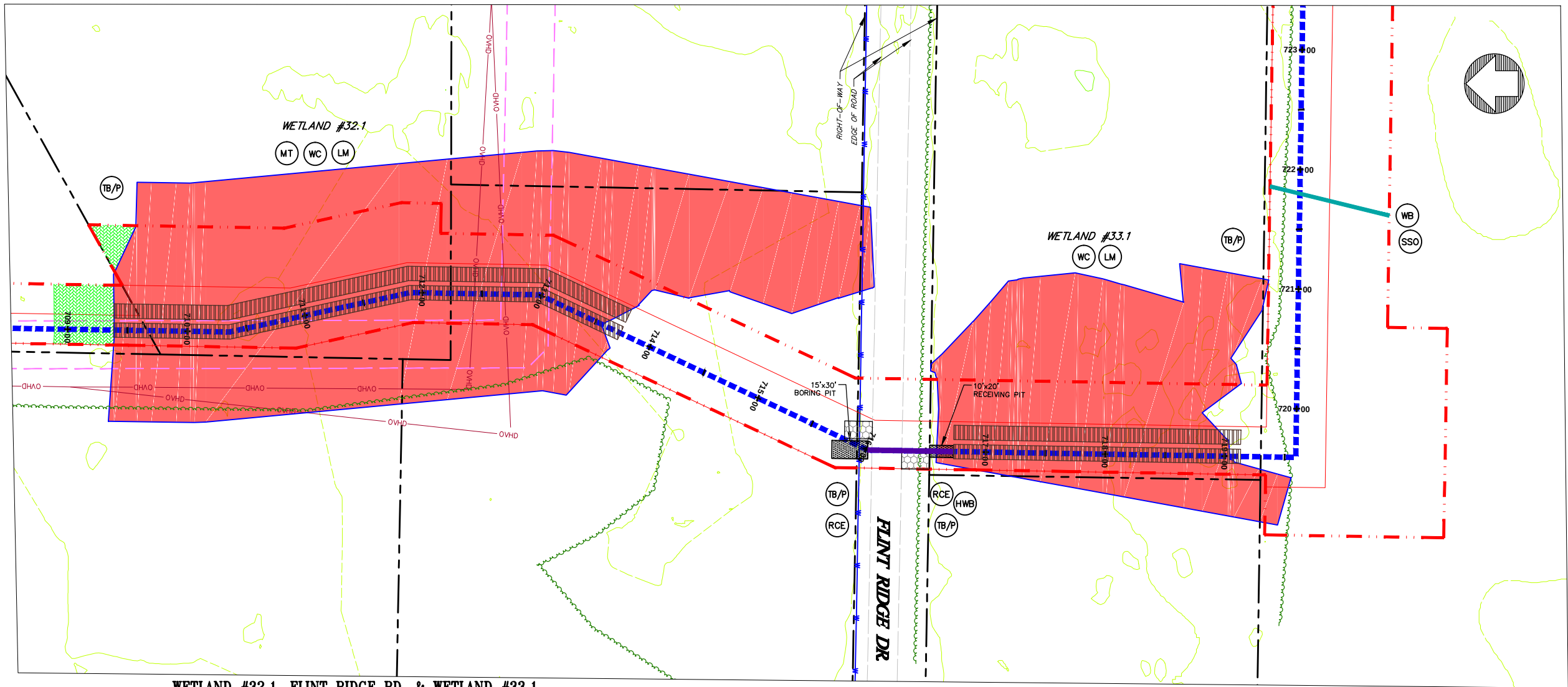
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- STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

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WETLAND #32 (AVOIDANCE)

SCALE: 1" = 50'



WETLAND #32.1, FLINT RIDGE RD. & WETLAND #33.1

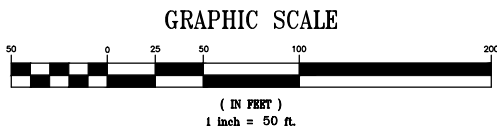
SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
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5. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
 - a) WETLAND #32.1 & #33.1 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
6. REFER TO DETAIL SHEET 5 FOR "RCE" OR DETAIL.
7. REFER TO DETAIL SHEET 3 FOR OR "HWB" DETAIL. PLACE TRENCH BREAKERS ON EITHER SIDE OF THE EXISTING ROAD.
8. REFER TO DETAIL SHEET 3 FOR "WB" DETAIL.
9. REFER TO DETAIL SHEET 3 FOR "SSO" DETAIL.
10. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.



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- EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE - 235 AC.

E&SPC SITE DETAIL

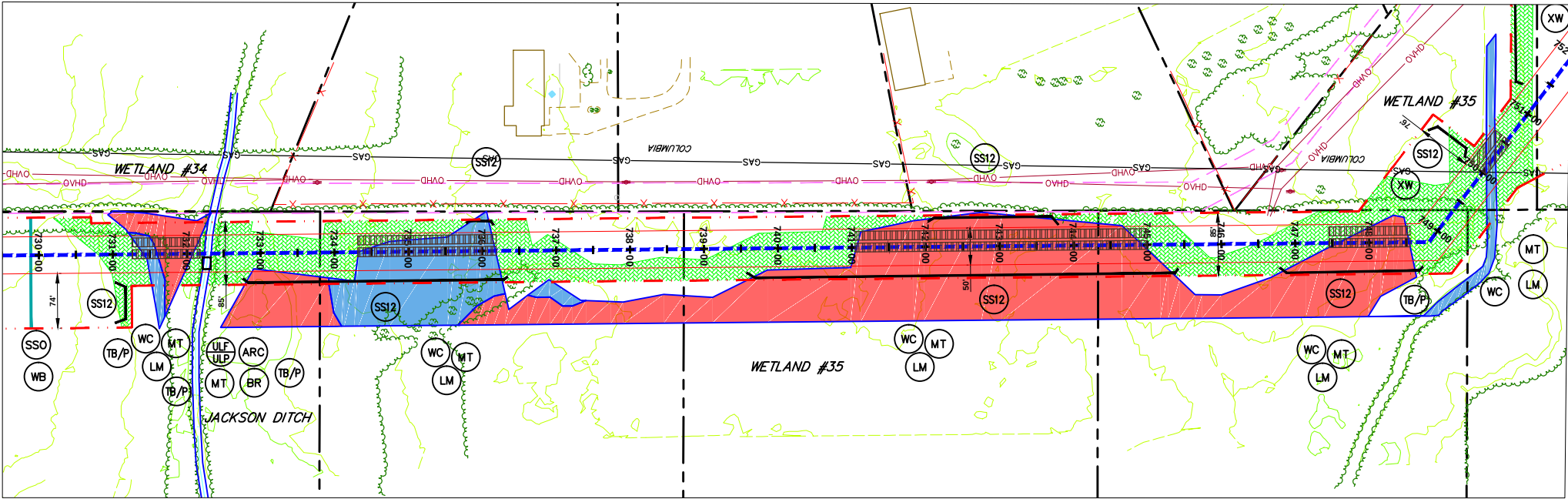
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

Hanover
Engineering Associates Inc

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO. NRG-1007
SHEET NO. 73 OF 88

3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

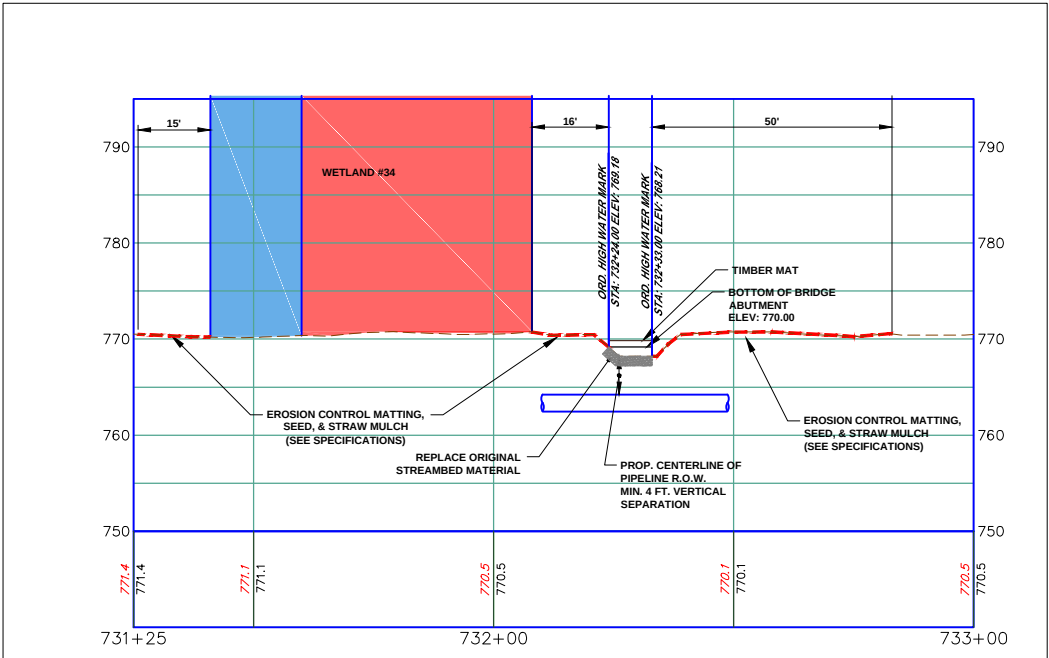


WETLAND #34, JACKSON DITCH.
& WETLAND #35
SCALE: 1" = 100'

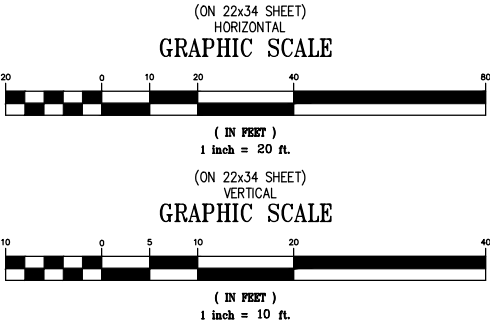
- NOTES:
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 3. REFER TO DETAIL SHEET 3 FOR "SSO" DETAIL.
 4. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
 5. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
 6. THE CONTRACTOR SHALL PLACE LOG MATS TO CROSS THE WETLAND AREA. ALL APPLICABLE WETLAND AREA WITHIN THE LIMITS OF CONSTRUCTION/DISTURBANCE SHALL BE COVERED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES AND/OR REPAIRS REQUIRED AS A RESULT OF DAMAGE TO WETLANDS AND WATERCOURSES AT NO COST TO THE FACILITY OWNER.
 7. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
 - a) WETLAND #34 & #35 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
 - b) JACKSON DITCH USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "B".
 8. REFER TO DETAIL SHEET 4 FOR "ULF" OR "ULP" DETAIL. UTILIZE FOR STREAM CROSSINGS.
 9. ALTHOUGH A BRIDGE IS SHOWN, A TEMPORARY CULVERT CROSSING MAY BE INSTALLED. REFER TO DETAIL SHEET 1 FOR "BR" DETAIL AND FOR THE SPECIFIED SIZE AND NUMBER OF CULVERTS.
 10. REFER TO DETAIL SHEET 4 FOR "ARC" DETAIL.
 11. REFER TO DETAIL SHEET 3 FOR "TB" DETAIL.

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- ORD. HIGH WATER MARK
- FLOODWAY
- SOIL TYPE & BOUNDARY
- SILT/SSX OR EQUIV. 12" HEIGHT
- SILT/SSX OR EQUIV. 24" HEIGHT
- SILT/SSX OR EQUIV. 32" HEIGHT
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- TRENCH BREAKER/PLUG
- LONGITUDINAL DIVERSION GRADING
- EXTRA WORKSPACE
- LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE - 235 AC.



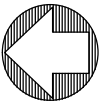
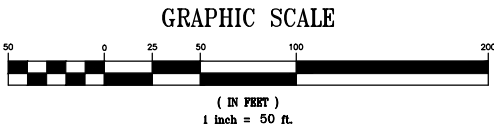
JACKSON DITCH PROFILE



JACKSON DITCH

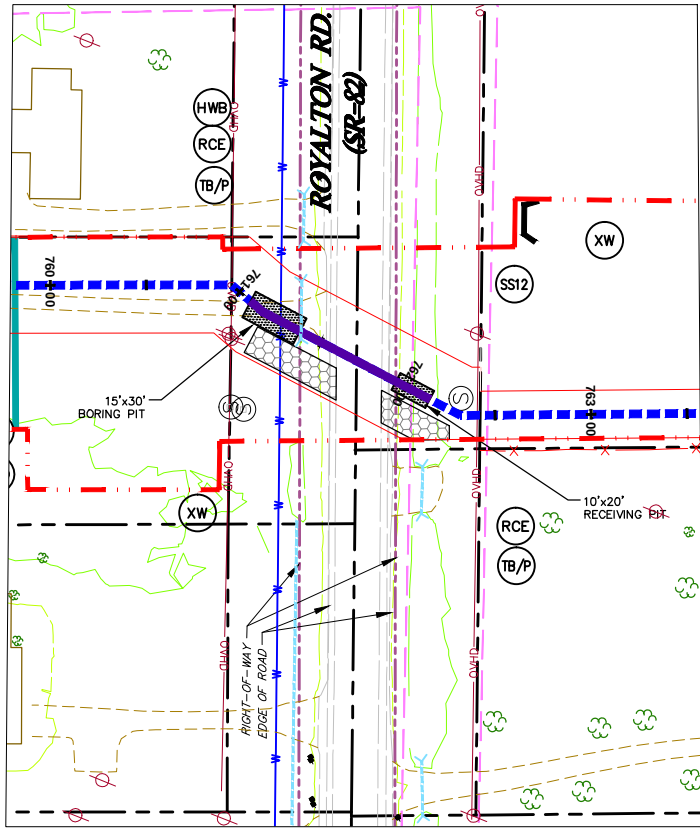
GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.



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SEAL	NO.	REVISIONS	DATE	AVON LAKE GAS ADDITION PROJECT			
				CARLISLE, EATON & LAGRANGE TOWNSHIPS AVON, AVON LAKE, ELYRIA & NORTH RIDGEVILLE CITIES LORAIN COUNTY OHIO	DRAWN BY: AEJ	PROJECT NO.	
					CHECKED BY: SJC	NRG-1007	
					DATE: 12.15.14	SHEET NO.	
					SCALE: AS NOTED	74 OF 88	
				Hanover Engineering Associates Inc	3355 Route 611, Suite 1 Bartonsville, PA 18321-7822 570.688.9550 Fax 570.688.9768		

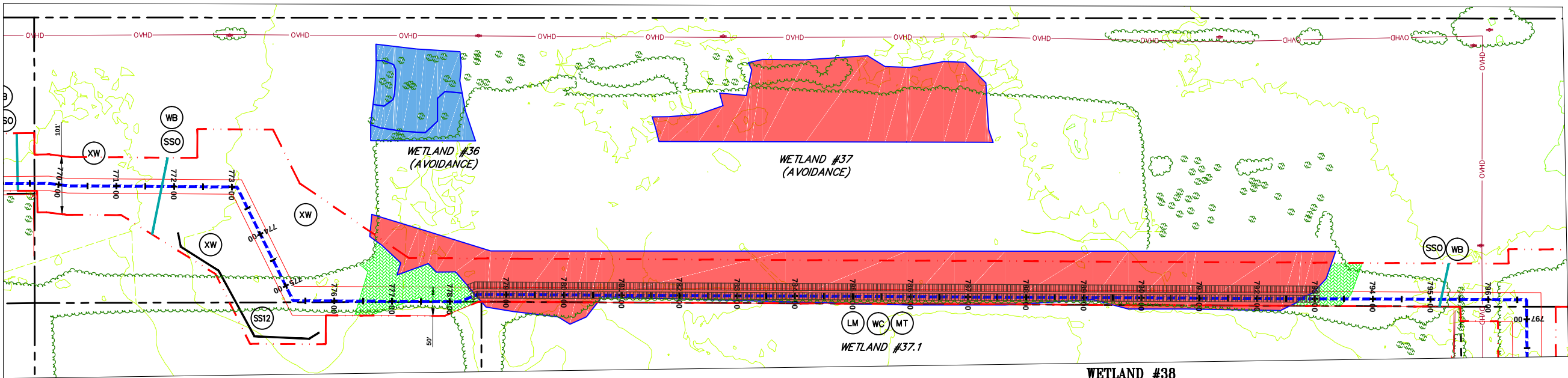


ROYALTON RD (SR-82)

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 5 FOR "RCE" DETAIL.
3. REFER TO DETAIL SHEET 5 FOR "AR" DETAIL.
4. REFER TO DETAIL SHEET 3 FOR "HWB" DETAIL. PLACE TRENCH BREAKERS ON EITHER SIDE OF THE EXISTING ROAD.
5. REFER TO DETAIL SHEET 3 FOR "STONE/DIRT TWP ROAD CROSSING DETAIL" OR "PAVED TWP ROAD CROSSING" FOR TRENCH BACKFILL AND ROAD SURFACE RESTORATION.
6. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.
7. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.



WETLAND #36 (AVOIDANCE), WETLAND #27 (AVOIDANCE) & WETLAND #37.1

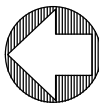
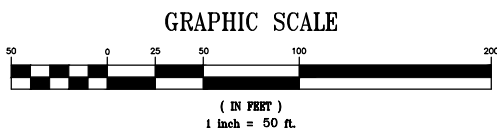
SCALE: 1" = 100'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
5. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
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7. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
 - a) WETLAND #37.1 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
8. REFER TO DETAIL SHEET 3 FOR "WB" DETAIL.
9. REFER TO DETAIL SHEET 3 FOR "SSO" DETAIL.
10. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.



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SEAL

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- CENTERLINE PIPELINE R.O.W.
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- TRENCH BREAKER/PLUG
- LONGITUDINAL DIVERSION GRADING
- EXTRA WORKSPACE
- LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE - 235 AC.

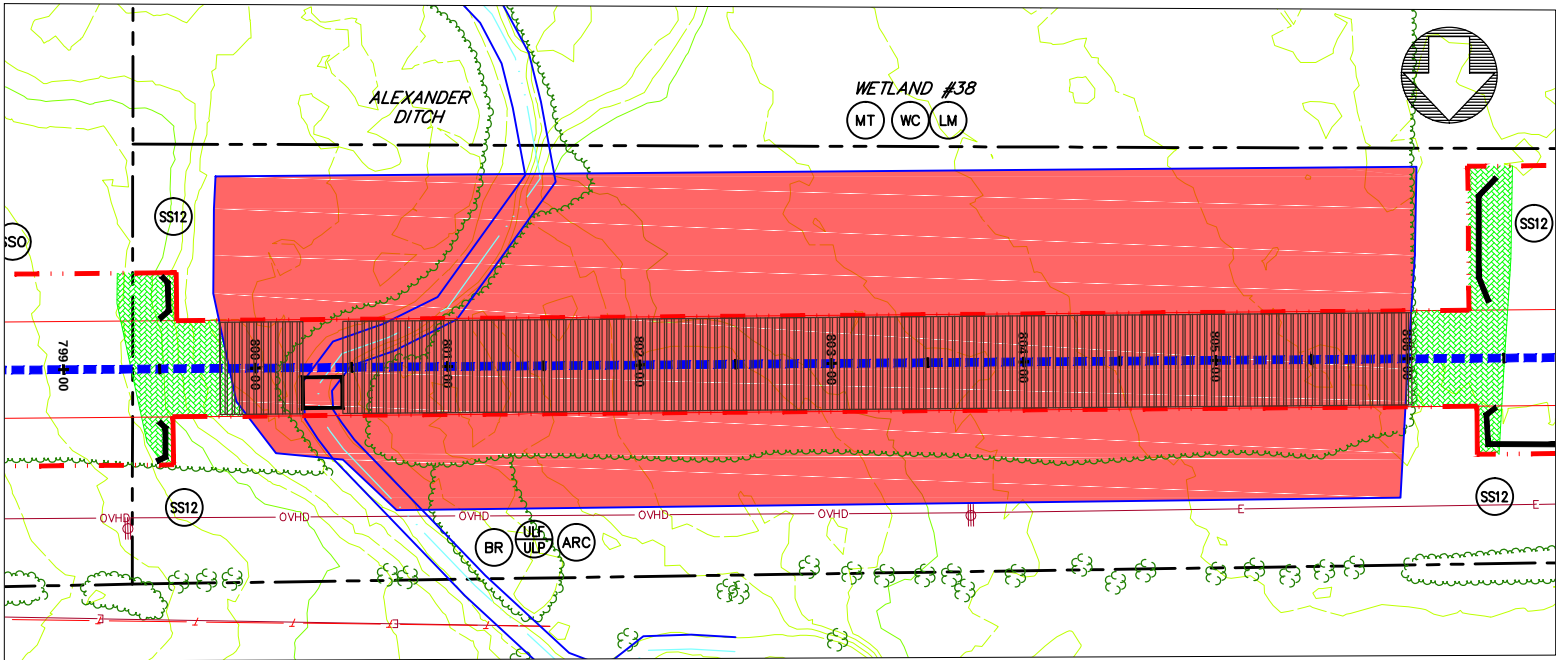
E&SPC SITE DETAIL

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

Hanover
Engineering Associates Inc

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO.: NRG-1007
SHEET NO.: 75 OF 88
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

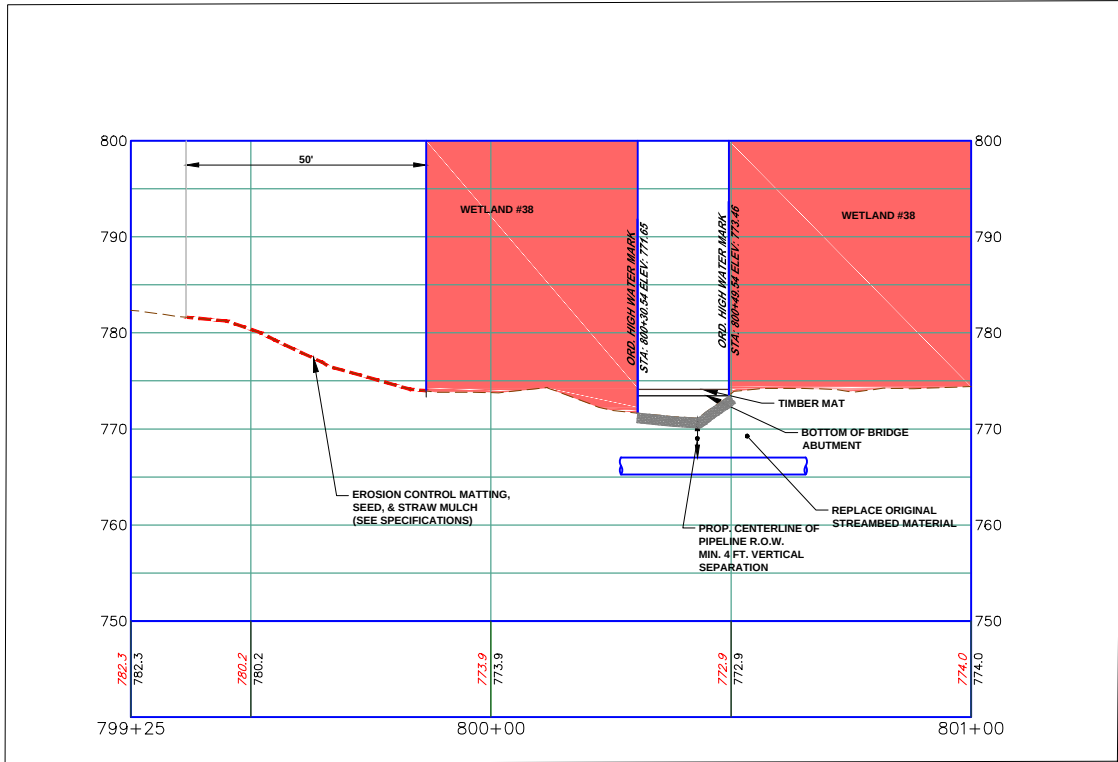


WETLAND #38 & ALEXANDER DITCH

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
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5. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
 - a) WETLAND #38 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
 - b) ALEXANDER DITCH USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "B".
6. REFER TO DETAIL SHEET 4 FOR "ULP" OR "ULP" DETAIL. UTILIZE FOR STREAM CROSSINGS.
7. ALTHOUGH A BRIDGE IS SHOWN, A TEMPORARY CULVERT CROSSING MAY BE INSTALLED. REFER TO DETAIL SHEET 1 FOR "BR" DETAIL AND FOR THE SPECIFIED SIZE AND NUMBER OF CULVERTS.
8. REFER TO DETAIL SHEET 4 FOR "ARC" DETAIL.
9. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.



ALEXANDER DITCH PROFILE

(ON 22x34 SHEET)
HORIZONTAL
GRAPHIC SCALE



(IN FEET)
1 inch = 20 ft.

(ON 22x34 SHEET)
VERTICAL
GRAPHIC SCALE



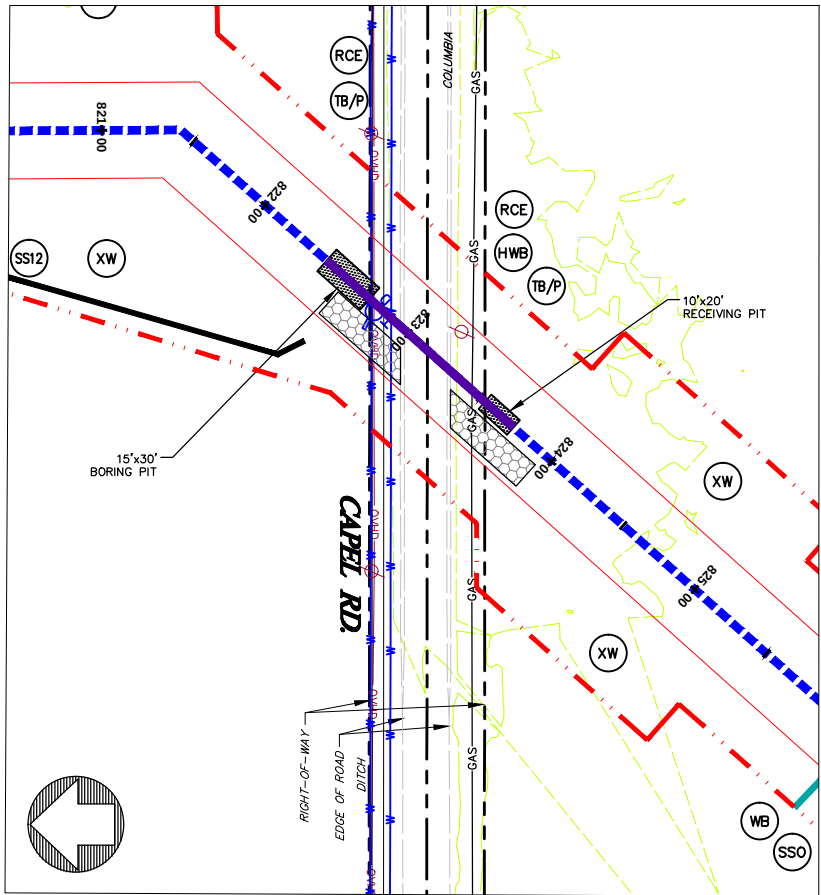
(IN FEET)
1 inch = 10 ft.

GRAPHIC SCALE



(IN FEET)
1 inch = 50 ft.

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CAPEL RD

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 5 FOR "RCE" DETAIL.
3. REFER TO DETAIL SHEET 3 FOR "HWB" DETAIL. PLACE TRENCH BREAKERS ON EITHER SIDE OF THE EXISTING ROAD.
4. REFER TO DETAIL SHEET 3 FOR "STONE/DIRT TWP ROAD CROSSING DETAIL" OR "PAVED TWP ROAD CROSSING" FOR TRENCH BACKFILL AND ROAD SURFACE RESTORATION.
5. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

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	CONVENTIONAL BORE
	HDD
	FENCE
	EDGE WOODS
	WETLANDS
	STONE WALL
	OVERHEAD/UTILITY POLE
	FLOW
	PERENNIAL STREAM
	EPHEMERAL/INTERMITTENT STREAM
	ORD. HIGH WATER MARK
	FLOODWAY
	SOIL TYPE & BOUNDARY
	SILT/SSX OR EQUIV. 12" HEIGHT
	SILT/SSX OR EQUIV. 24" HEIGHT
	SILT/SSX OR EQUIV. 32" HEIGHT
	ROCK CONSTRUCTION ENTRANCE
	LOG MAT
	EROSION CONTROL MATTING
	STREAMBANK RESTORATION
	TEMP. PIPE
	WATERBAR
	ROCK FILTER BERM
	BRIDGE
	WETLAND CROSSING
	SEDIMENT SILT SOXX PROTECTION AT WATER BAR
	ACCESS ROAD
	HIGHWAY BORING
	HIGHWAY CUT
	ACCESS RD. X-ING (PAVED ROAD)
	ACCESS RD. w/CULVERT
	UTILITY LINE STREAM X-ING WITH DAM AND PUMPING OR WITH PIPE FLUME
	TRENCH BREAKER/PLUG
	LONGITUDINAL DIVERSION GRADING
	EXTRA WORKSPACE
	LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE - 235 AC.

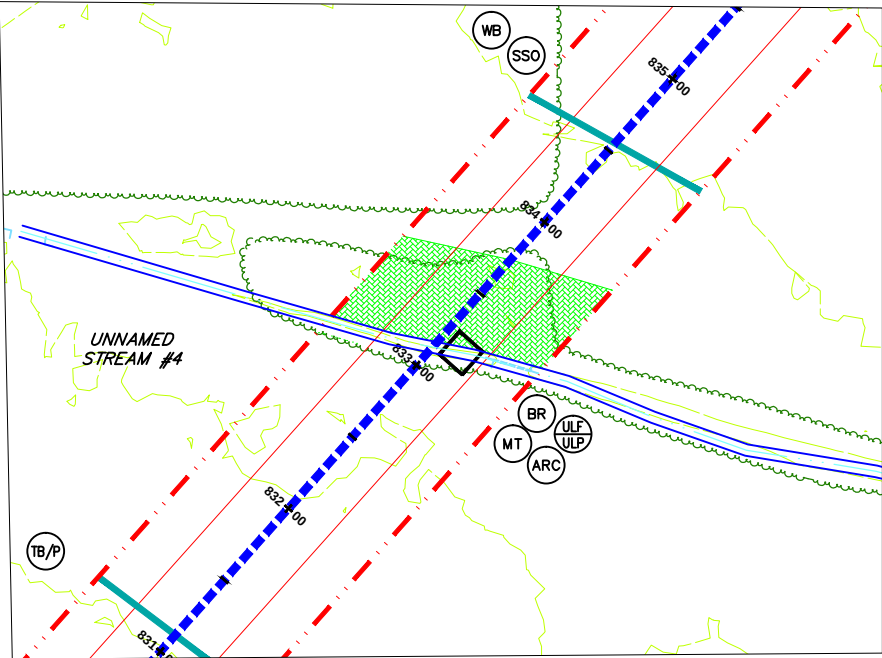
E&SPC SITE DETAIL

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

Hanover
Engineering Associates Inc

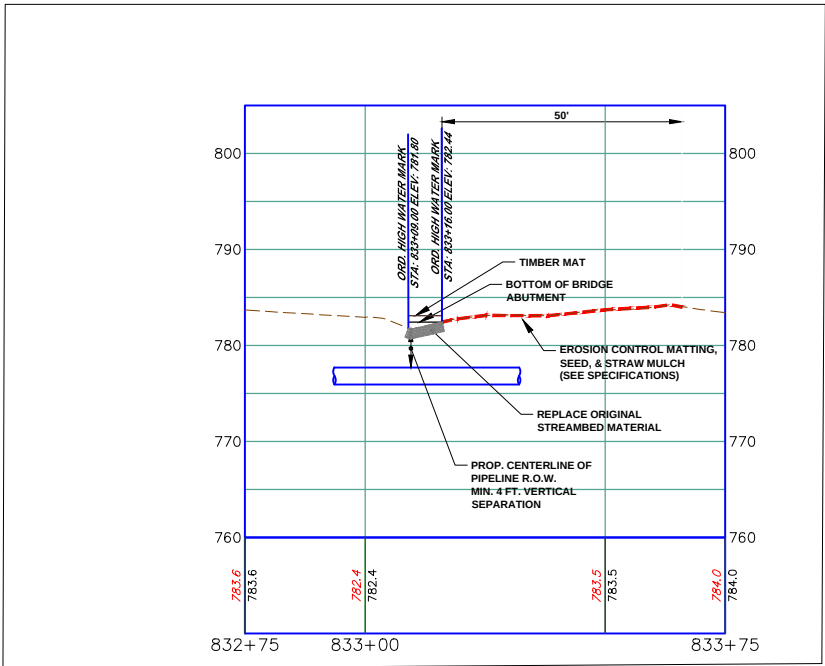
DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO. NRG-1007
SHEET NO. 76 OF 88
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768



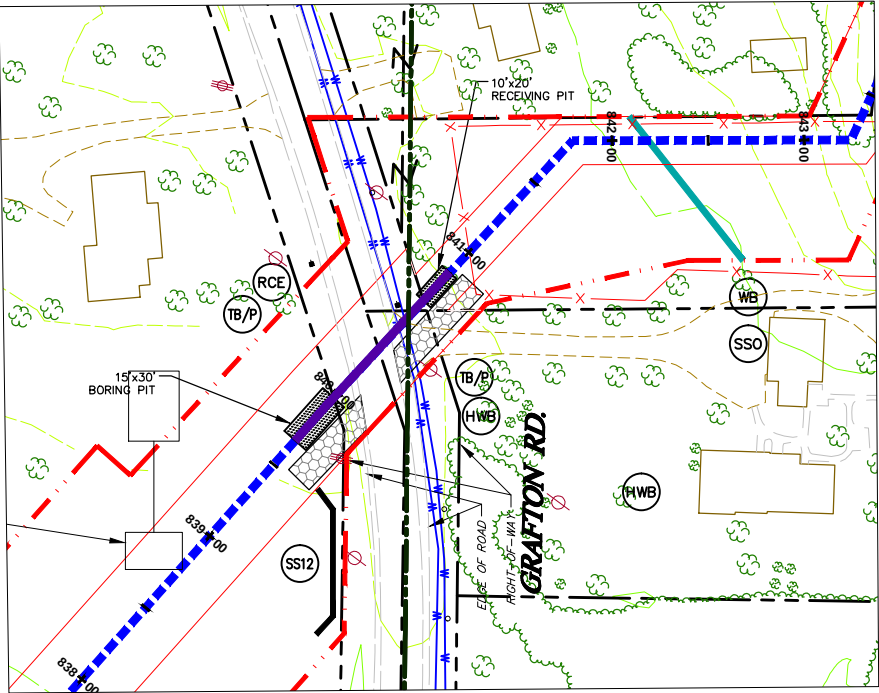
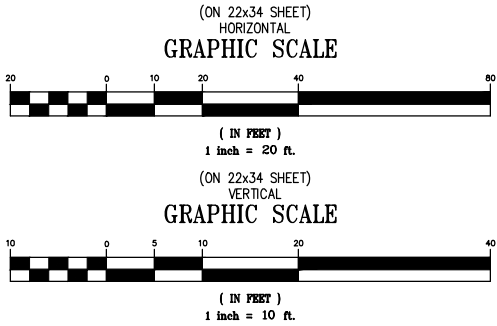
UNNAMED STREAM #4
SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
 - a) UNNAMED STREAM #4 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "B".
3. REFER TO DETAIL SHEET 4 FOR "ULP" OR "ULP" DETAIL. UTILIZE FOR STREAM CROSSINGS.
4. ALTHOUGH A BRIDGE IS SHOWN, A TEMPORARY CULVERT CROSSING MAY BE INSTALLED. REFER TO DETAIL SHEET 1 FOR "BR" DETAIL AND FOR THE SPECIFIED SIZE AND NUMBER OF CULVERTS.
5. REFER TO DETAIL SHEET 3 FOR "TB" DETAIL.



UNNAMED STREAM #4 PROFILE



GRAFTON RD.

SCALE: 1" = 50'

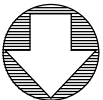
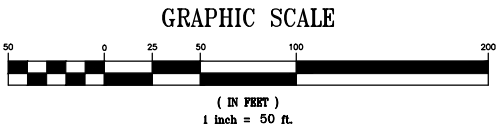
NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "HWB" DETAIL. PLACE TRENCH BREAKERS ON EITHER SIDE OF THE EXISTING ROAD.
3. REFER TO DETAIL SHEET 3 FOR "STONE/DIRT TWP ROAD CROSSING DETAIL" OR "PAVED TWP ROAD CROSSING" FOR TRENCH BACKFILL AND ROAD SURFACE RESTORATION.
4. REFER TO DETAIL SHEET 3 FOR "TB" DETAIL.

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	EPHEMERAL/INTERMITTENT STREAM
	ORD. HIGH WATER MARK LINE
	FLOODWAY
	SOIL TYPE & BOUNDARY
	SILT/CLAY OR EQUIV. 12" HEIGHT
	SILT/CLAY OR EQUIV. 24" HEIGHT
	SILT/CLAY OR EQUIV. 32" HEIGHT
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	BRIDGE
	WETLAND CROSSING
	SEDIMENT SILT SOXX PROTECTION AT WATER BAR
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	HIGHWAY CUT
	ACCESS RD. X-ING (PAVED ROAD)
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	UTILITY LINE STREAM X-ING WITH DAM AND PUMPING OR WITH PIPE FLUME
	TRENCH BREAKER/PLUG
	LONGITUDINAL DIVERSION GRADING
	EXTRA WORKSPACE
	LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE - 235 AC.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.



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SEAL

E&SPC SITE DETAIL

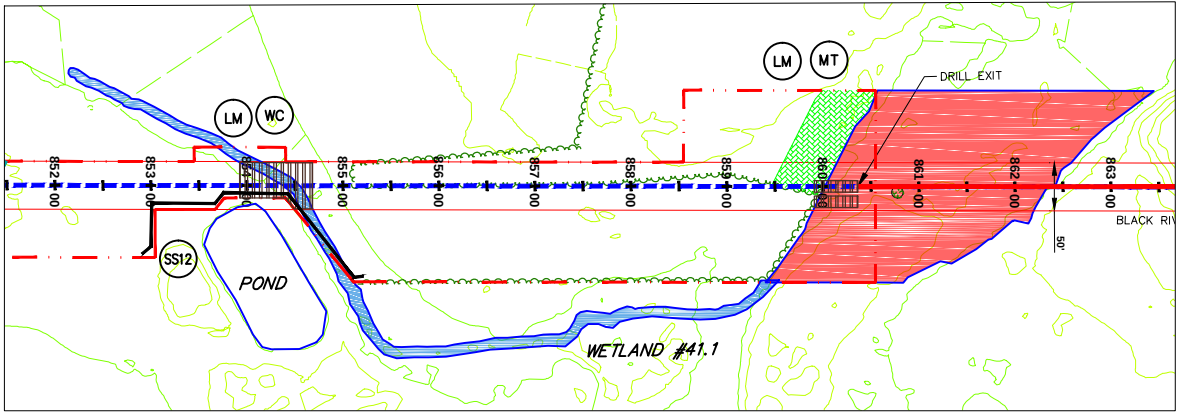
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
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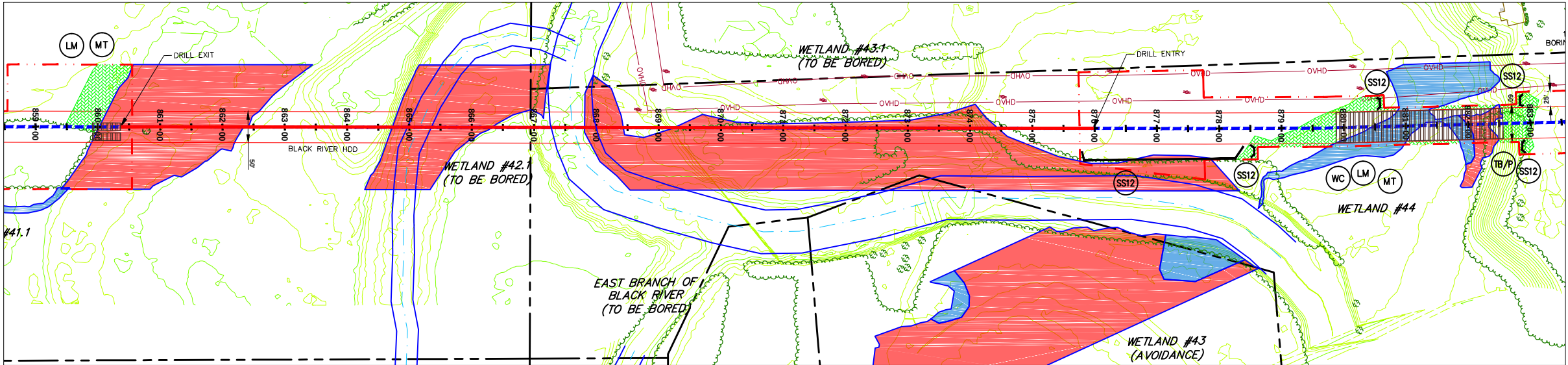
DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
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PROJECT NO. NRG-1007
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Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768



WETLAND #41.1

SCALE: 1" = 100'

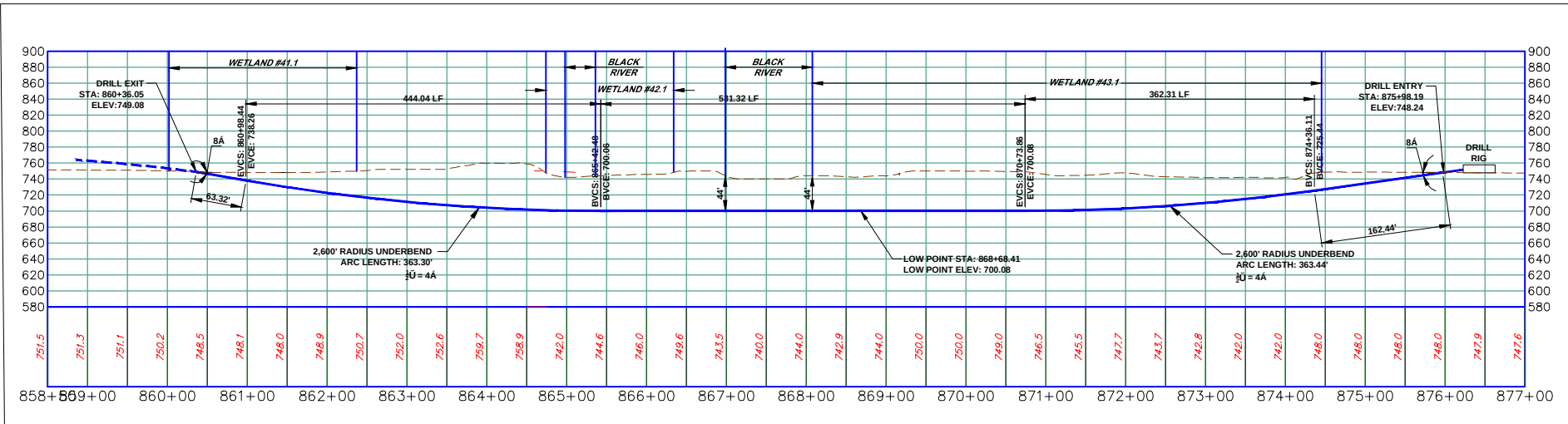


WETLAND #42.1, BLACK RIVER, WETLAND #43 (AVOIDANCE),
WETLAND #43.1 & WETLAND #44

SCALE: 1" = 100'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
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5. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
a) WETLAND #44 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
6. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

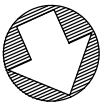


BLACK RIVER HDD

(ON 22x34 SHEET)
HORIZONTAL & VERTICAL
GRAPHIC SCALE



(IN FEET)
1 inch = 100ft.



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	ROCK FILTER BERM
	BRIDGE
	WETLAND CROSSING
	SEDIMENT SILT/SOXX PROTECTION AT WATER BAR
	ACCESS ROAD
	HIGHWAY BORING
	HIGHWAY CUT
	ACCESS RD. X-ING (PAVED ROAD)
	ACCESS RD. w/CULVERT
	UTILITY LINE STREAM X-ING WITH DAM AND PUMPING OR WITH PIPE FLUME
	TRENCH BREAKER/PLUG
	LONGITUDINAL DIVERSION GRADING
	EXTRA WORKSPACE
LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE - 235 AC.	

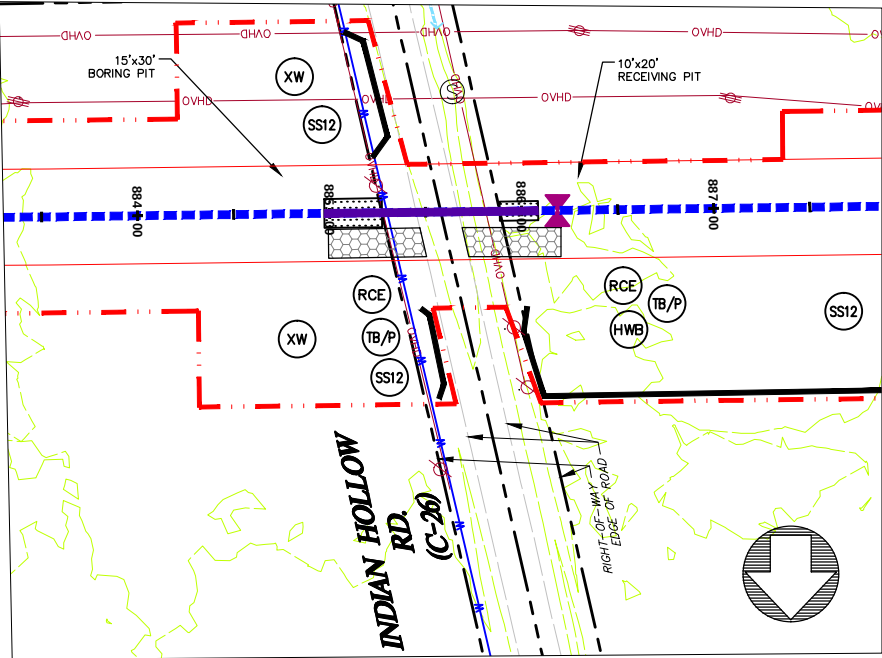
GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

E&SPC SITE DETAIL

AVON LAKE GAS ADDITION PROJECT	
CARLISLE, EATON & LAGRANGE TOWNSHIPS AVON, AVON LAKE, ELYRIA & NORTH RIDGEVILLE CITIES LORAIN COUNTY OHIO	PROJECT NO. NRG-1007 SHEET NO. 78 OF 88
Hanover Engineering Associates Inc	3355 Route 611, Suite 1 Bartonsville, PA 18321-7822 570.688.9550 Fax 570.688.9768

Y:\Projects\Energy\NRG Energy\NRG-1007-Avon Lakes Pipeline\DWG\ESPC\ ESPC-NRG-1007-Avon LAKE-006-SITE DETAILS-2.dwg Dec 14,2014 -- 5:28pm

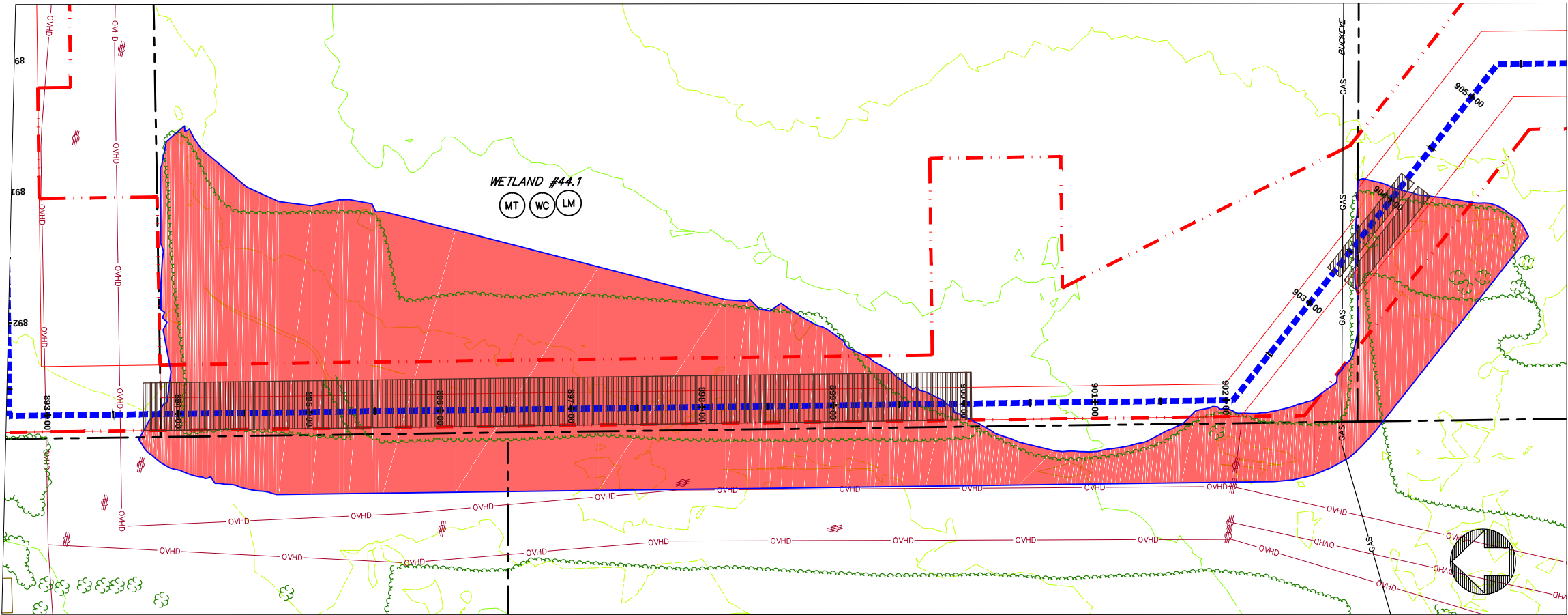


INDIAN HOLLOW ROAD

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 5 FOR "RCE" OR "BRCE" DETAIL.
3. REFER TO DETAIL SHEET 3 FOR "HWB" DETAIL. PLACE TRENCH BREAKERS ON EITHER SIDE OF THE EXISTING ROAD.
4. REFER TO DETAIL SHEET 3 FOR "STONE/DIRT TWP ROAD CROSSING DETAIL" OR "PAVED TWP ROAD CROSSING" FOR TRENCH BACKFILL AND ROAD SURFACE RESTORATION.
5. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.



WETLAND #44.1

SCALE: 1" = 50'

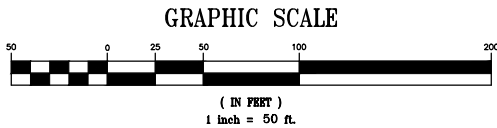
NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
4. THE CONTRACTOR SHALL PLACE LOG MATS TO CROSS THE WETLAND AREA. ALL APPLICABLE WETLAND AREA WITHIN THE LIMITS OF CONSTRUCTION/DISTURBANCE SHALL BE COVERED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES AND/OR REPAIRS REQUIRED AS A RESULT OF DAMAGE TO WETLANDS AND WATERCOURSES AT NO COST TO THE FACILITY OWNER.
5. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

LEGEND	
	INDEX CONTOUR
	CONTOUR
	PROPERTY LINE
	TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
	PERMANENT PIPELINE R.O.W.
	CENTERLINE PIPELINE R.O.W.
	ABOVE GROUND PIPE
	CONVENTIONAL BORE
	HDD
	FENCE
	EDGE WOODS
	WETLANDS
	STONE WALL
	OVERHEAD/UTILITY POLE
	FLOW
	PERENNIAL STREAM
	EPHEMERAL/INTERMITTENT STREAM
	ORD. HIGH WATER MARK
	FLOODWAY
	LoB
	SILT/COXX OR EQUIV. 12" HEIGHT
	SILT/COXX OR EQUIV. 24" HEIGHT
	SILT/COXX OR EQUIV. 32" HEIGHT
	ROCK CONSTRUCTION ENTRANCE
	LOG MAT
	EROSION CONTROL MATTING
	STREAMBANK RESTORATION
	TEMP. PIPE
	WATERBAR
	ROCK FILTER BERM
	BRIDGE
	WETLAND CROSSING
	SEDIMENT SILT/COXX PROTECTION AT WATER BAR
	ACCESS ROAD
	HIGHWAY BORING
	HIGHWAY CUT
	ACCESS RD. X-ING (PAVED ROAD)
	ACCESS RD. w/CULVERT
	UTILITY LINE STREAM X-ING WITH DAM AND PUMPING OR WITH PIPE FLUME
	TRENCH BREAKER/PLUG
	LONGITUDINAL DIVERSION GRADING
	EXTRA WORKSPACE
	LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE - 235 AC.

GENERAL NOTES:

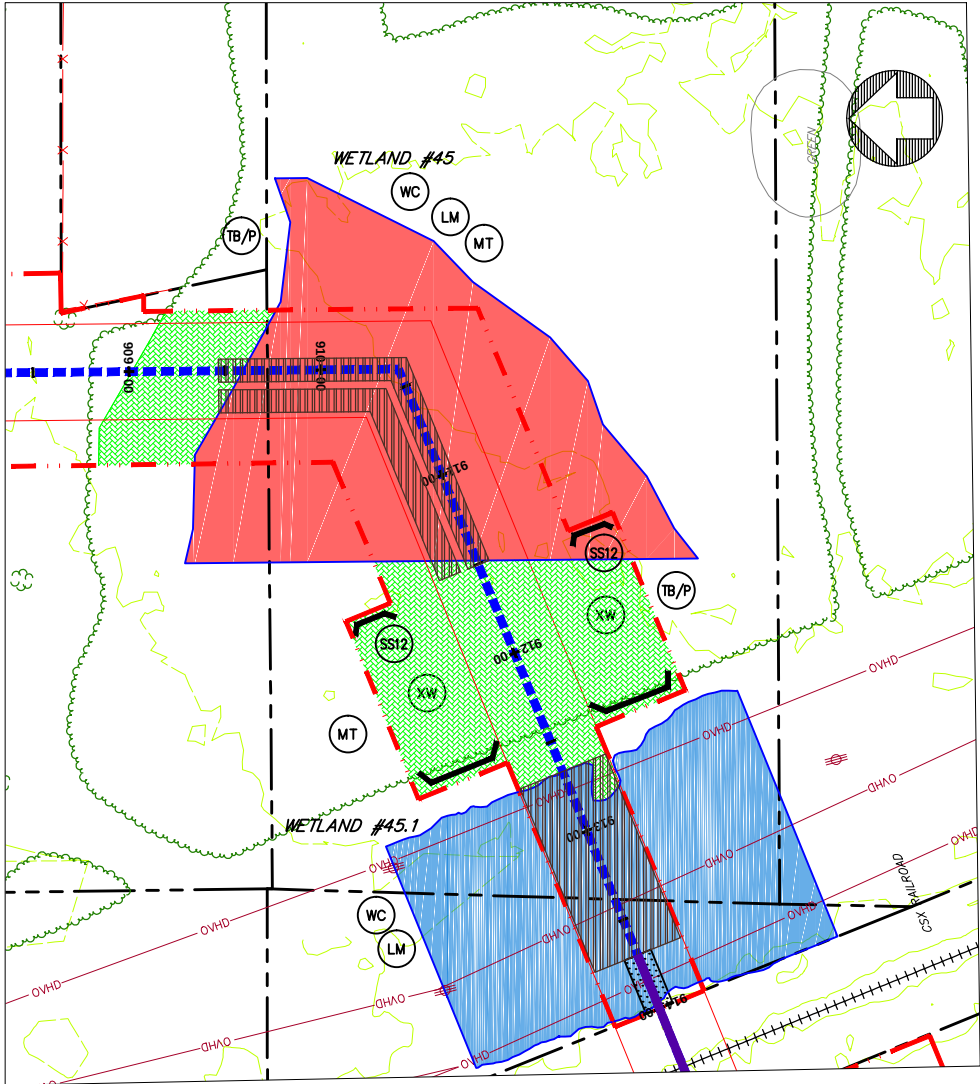
1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.



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E&SPC SITE DETAIL			
AVON LAKE GAS ADDITION PROJECT			
SEAL	NO.	REVISIONS	DATE
CARLISLE, EATON & LAGRANGE TOWNSHIPS AVON, AVON LAKE, ELYRIA & NORTH RIDGEVILLE CITIES LORAIN COUNTY OHIO		DRAWN BY: AEJ CHECKED BY: SJC DATE: 12.15.14 SCALE: AS NOTED	
PROJECT NO. NRG-1007		SHEET NO. 79 OF 88	
Hanover Engineering Associates Inc		3355 Route 611, Suite 1 Bartonsville, PA 18321-7822 570.688.9550 Fax 570.688.9768	

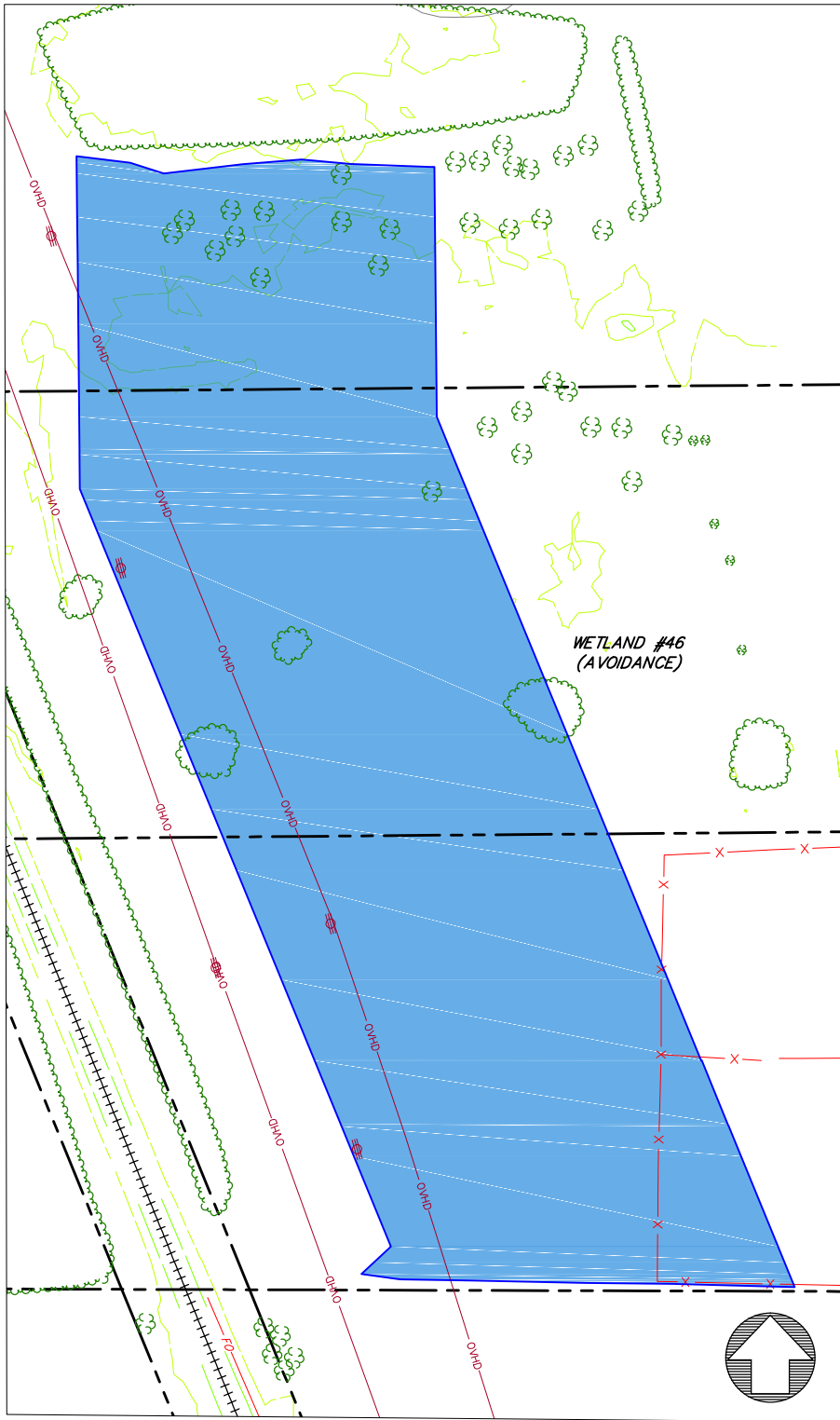
Y:\Projects\Energy\NRG Energy\NRG-1007-Avon Lakes Pipeline\DWG\ESPC\ESPC-NRG-1007-Avon LAKE-006-SITE DETAILS-2.dwg Dec 14,2014 -- 5:30pm



WETLAND #45 & WETLAND #45.1
SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
4. THE CONTRACTOR SHALL PLACE LOG MATS TO CROSS THE WETLAND AREA. ALL APPLICABLE WETLAND AREA WITHIN THE LIMITS OF CONSTRUCTION/DISTURBANCE SHALL BE COVERED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES AND/OR REPAIRS REQUIRED AS A RESULT OF DAMAGE TO WETLANDS AND WATERCOURSES AT NO COST TO THE FACILITY OWNER.
5. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
a) WETLAND #45 & #45.1 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
6. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

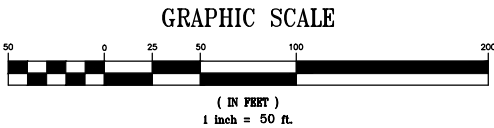


WETLAND #46 (AVOIDANCE)
SCALE: 1" = 50'

LEGEND	
	INDEX CONTOUR
	CONTOUR
	PROPERTY LINE
	TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
	PERMANENT PIPELINE R.O.W.
	CENTERLINE PIPELINE R.O.W.
	ABOVE GROUND PIPE
	CONVENTIONAL BORE
	HDD
	FENCE
	EDGE WOODS
	WETLANDS
	STONE WALL
	OVERHEAD/UTILITY POLE
	FLOW
	PERENNIAL STREAM
	EPHEMERAL/INTERMITTENT STREAM
	ORD. HIGH WATER MARK LINE
	FLOODWAY
LoB SOIL TYPE & BOUNDARY	
	SILT/CLAY OR EQUIV. 12" HEIGHT
	SILT/CLAY OR EQUIV. 24" HEIGHT
	SILT/CLAY OR EQUIV. 32" HEIGHT
	ROCK CONSTRUCTION ENTRANCE
	LOG MAT
	EROSION CONTROL MATTING
	STREAMBANK RESTORATION
	TEMP. PIPE
	WATERBAR
	ROCK FILTER BERM
	BRIDGE
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	SEDIMENT SILT SOXX PROTECTION AT WATER BAR
	ACCESS ROAD
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	ACCESS RD. X-ING (PAVED ROAD)
	ACCESS RD. w/CULVERT
	UTILITY LINE STREAM X-ING WITH DAM AND PUMPING OR WITH PIPE FLUME
	TRENCH BREAKER/PLUG
	LONGITUDINAL DIVERSION GRADING
	EXTRA WORKSPACE
LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE - 235 AC.	

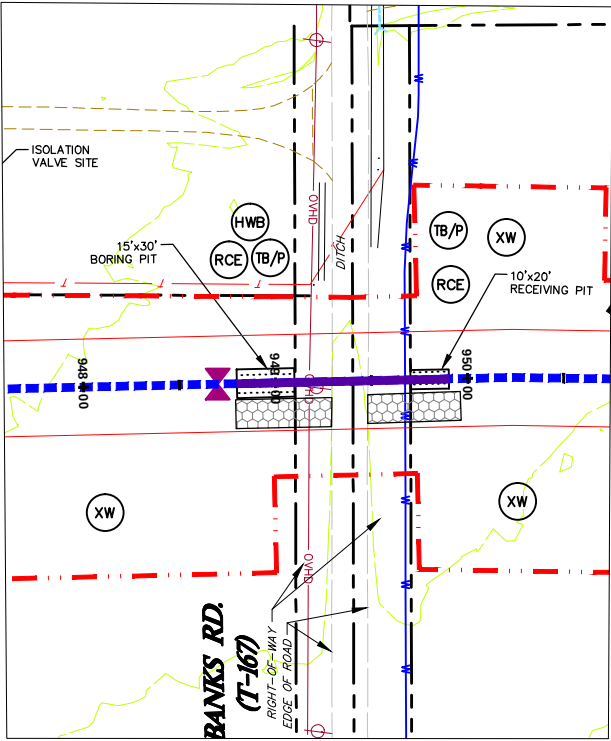
GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.



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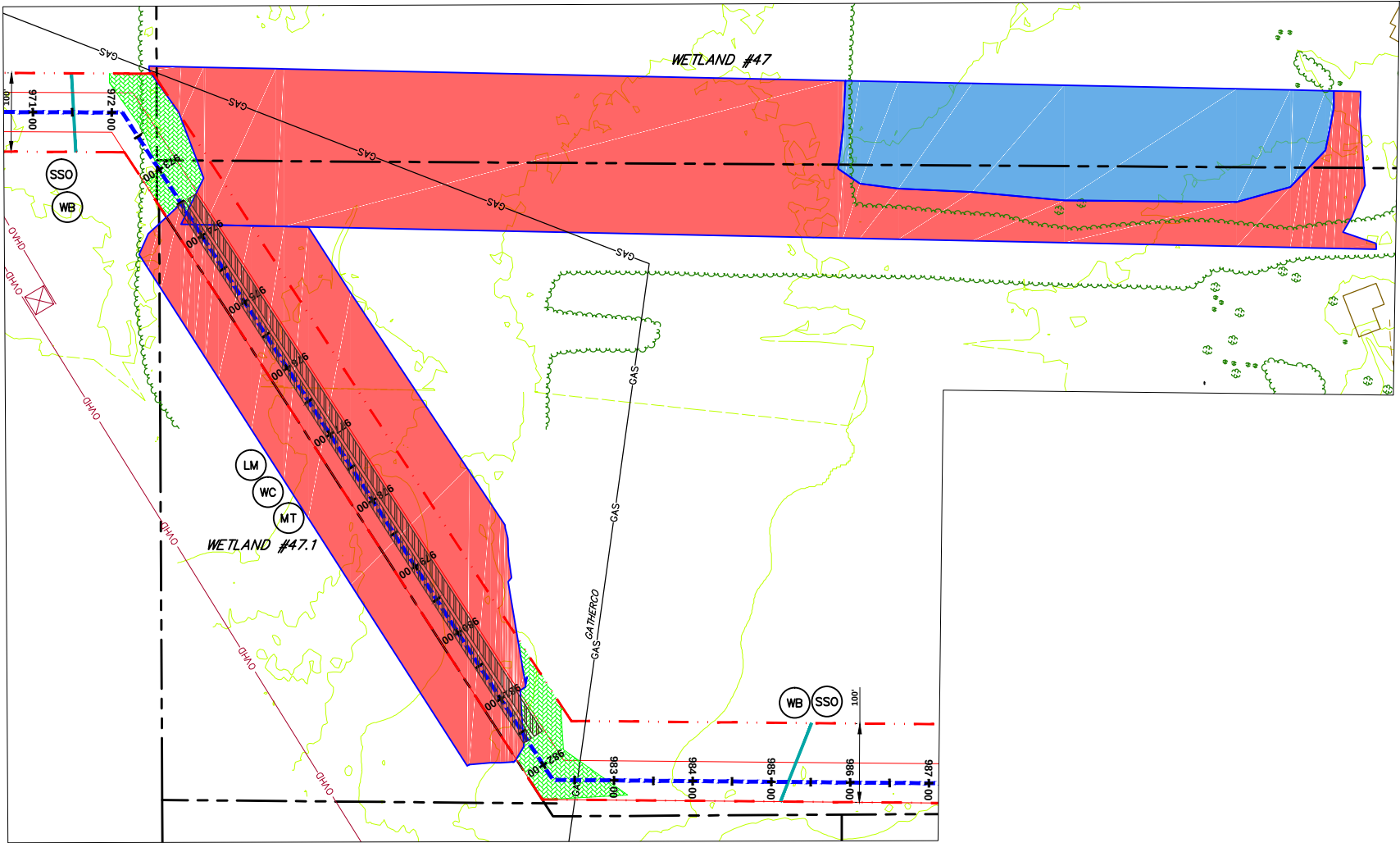
SEAL	NO.	REVISIONS	DATE	AVON LAKE GAS ADDITION PROJECT			
				CARLISLE, EATON & LAGRANGE TOWNSHIPS AVON, AVON LAKE, ELYRIA & NORTH RIDGEVILLE CITIES LORAIN COUNTY OHIO	DRAWN BY: AEJ	PROJECT NO.	
					CHECKED BY: SJC	NRG-1007	
					DATE: 12.15.14	SHEET NO.	
					SCALE: AS NOTED	80 OF 88	
				Hanover Engineering Associates Inc	3355 Route 611, Suite 1 Bartonsville, PA 18321-7822 570.688.9550 Fax 570.688.9768		



BANKS ROAD
SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 5 FOR "RCE" OR "BRCE" DETAIL.
3. REFER TO DETAIL SHEET 3 FOR "HWC" DETAIL. PLACE TRENCH BREAKERS ON EITHER SIDE OF THE EXISTING ROAD.
4. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

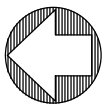
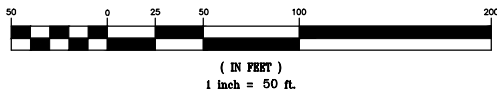


WETLAND #47 & WETLAND #47.1
SCALE: 1" = 100'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WB" DETAIL.
3. REFER TO DETAIL SHEET 3 FOR "SSO" DETAIL.
4. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
5. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
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7. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
 - a) WETLAND #47 & 47.1 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
8. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

GRAPHIC SCALE



GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

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SEAL

LEGEND

- INDEX CONTOUR
- CONTOUR
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- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
- PERMANENT PIPELINE R.O.W.
- CENTERLINE PIPELINE R.O.W.
- ABOVE GROUND PIPE
- CONVENTIONAL BORE
- HDD
- FENCE
- EDGE WOODS
- WETLANDS
- STONE WALL
- OVERHEAD/UTILITY POLE
- PERENNIAL STREAM
- EPHEMERAL/INTERMITTENT STREAM
- ORD. HIGH WATER MARK
- FLOODWAY
- SOIL TYPE & BOUNDARY
- SILT/SSX OR EQUIV. 12" HEIGHT
- SILT/SSX OR EQUIV. 24" HEIGHT
- SILT/SSX OR EQUIV. 32" HEIGHT
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- LOG MAT
- EROSION CONTROL MATTING
- STREAMBANK RESTORATION
- TEMP. PIPE
- WATERBAR
- ROCK FILTER BERM
- BRIDGE
- WETLAND CROSSING
- SEDIMENT SILT SOXX PROTECTION AT WATER BAR
- ACCESS ROAD
- HIGHWAY BORING
- HIGHWAY CUT
- ACCESS RD. X-ING (PAVED ROAD)
- ACCESS RD. w/CULVERT
- UTILITY LINE STREAM X-ING WITH DAM AND PUMPING OR WITH PIPE FLUME
- TRENCH BREAKER/PLUG
- LONGITUDINAL DIVERSION GRADING
- EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND
LIMIT OF DISTURBANCE - 235 AC.

E&SPC SITE DETAIL

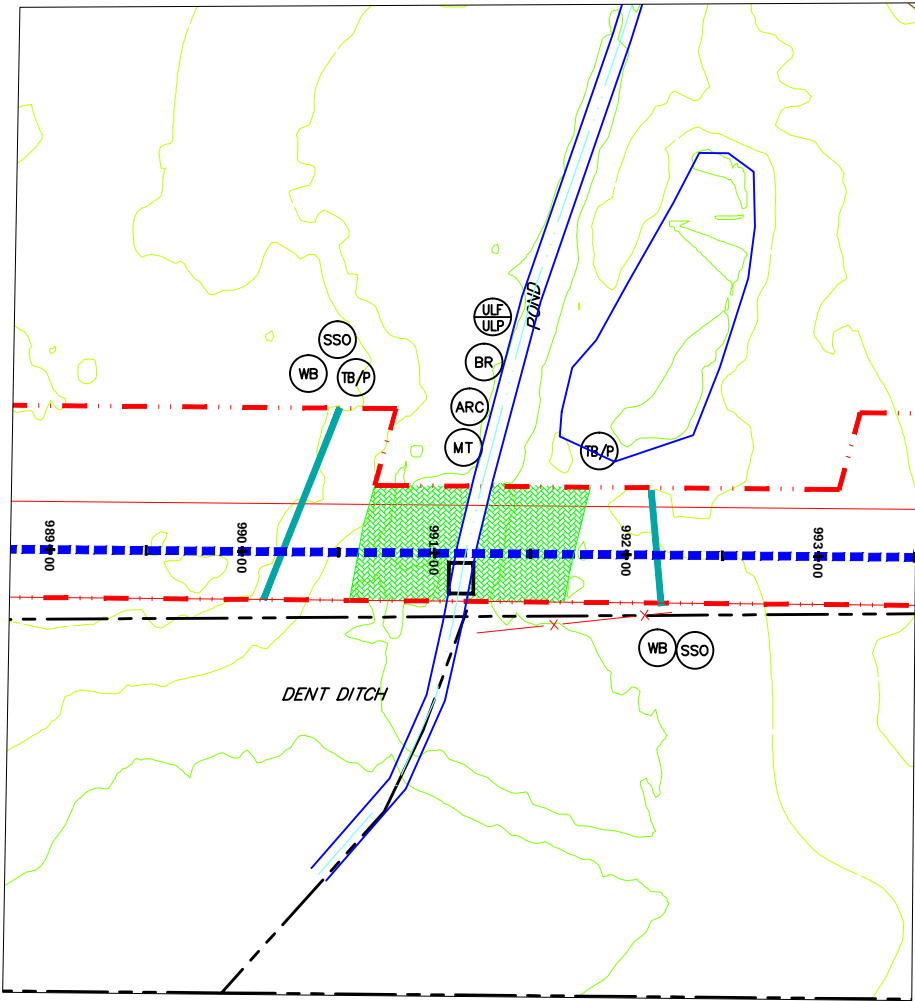
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

Hanover
Engineering Associates Inc

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO. NRG-1007
SHEET NO. 81 OF 88

3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

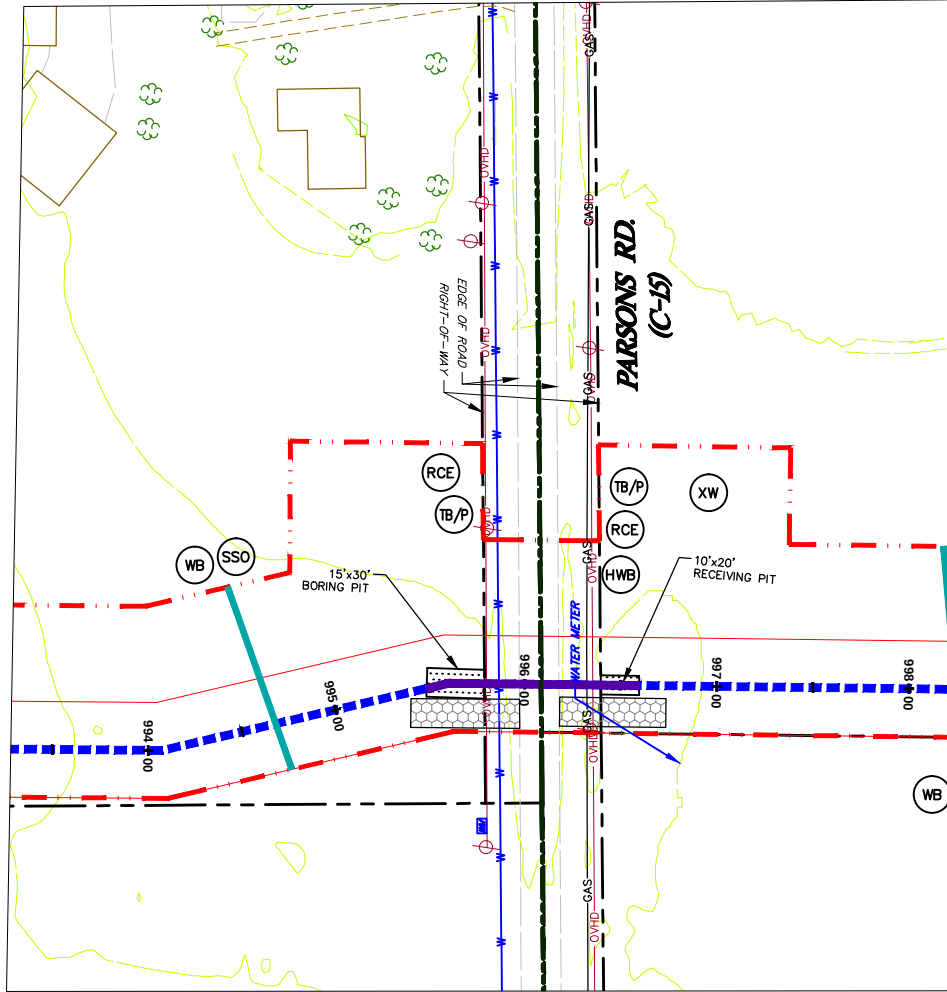


DENT DITCH

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WB" DETAIL.
3. REFER TO DETAIL SHEET 3 FOR "SSO" DETAIL.
4. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
a) DENT DITCH USE BLANKET TYPE S75 OR APPROVED EQUAL STAPLE PATTERN "B".
5. REFER TO DETAIL SHEET 4 FOR "ULP" OR "ULP" DETAIL. UTILIZE FOR STREAM CROSSINGS.
6. ALTHOUGH A BRIDGE IS SHOWN, A TEMPORARY CULVERT CROSSING MAY BE INSTALLED. REFER TO DETAIL SHEET 1 FOR "BR" DETAIL AND FOR THE SPECIFIED SIZE AND NUMBER OF CULVERTS.
7. REFER TO DETAIL SHEET 4 FOR "ARC" DETAIL.
8. REFER TO DETAIL SHEET 3 FOR "TB" DETAIL.

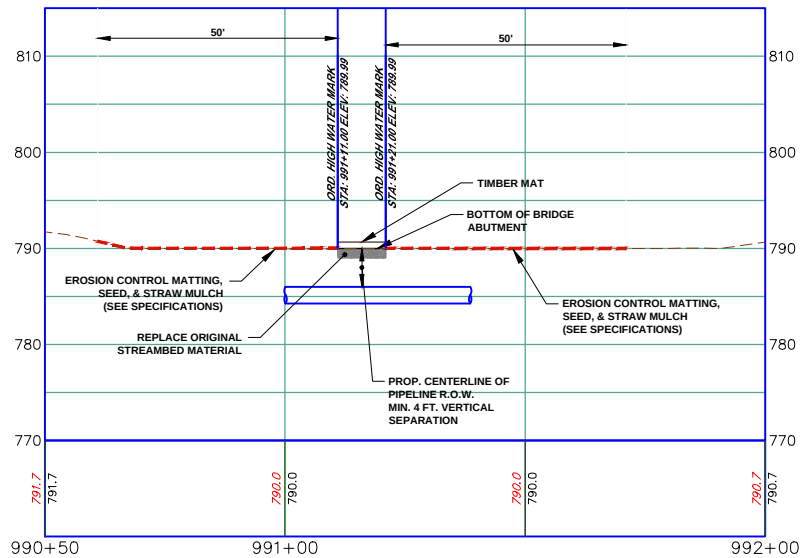


PARSONS RD.

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 5 FOR "RCE" DETAIL.
3. REFER TO DETAIL SHEET 3 FOR "HWC" DETAIL. PLACE TRENCH BREAKERS ON EITHER SIDE OF THE EXISTING ROAD.
4. REFER TO DETAIL SHEET 3 FOR "STONE/DIRT TWP ROAD CROSSING DETAIL" OR "PAVED TWP ROAD CROSSING" FOR TRENCH BACKFILL AND ROAD SURFACE RESTORATION.
5. REFER TO DETAIL SHEET 3 FOR "TB" DETAIL.



DENT DITCH PROFILE

(ON 22x34 SHEET)

HORIZONTAL

GRAPHIC SCALE



(IN FEET)

1 inch = 20 ft.

(ON 22x34 SHEET)

VERTICAL

GRAPHIC SCALE



(IN FEET)

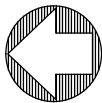
1 inch = 10 ft.

GRAPHIC SCALE



(IN FEET)

1 inch = 50 ft.



GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

LEGEND

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- CONTOUR
- PROPERTY LINE
- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
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- LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE - 235 AC.

E&SPC SITE DETAIL

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

Hanover
Engineering Associates Inc

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO. NRG-1007
SHEET NO. 82 OF 88

3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

SEAL

Instructions For Staging Of Earthmoving Activities:

CONSTRUCTION MUST BE IN ACCORDANCE WITH THE FOLLOWING SCHEDULE. THIS SCHEDULE IS DESIGNED TO MINIMIZE SOIL EROSION AND SEDIMENTATION. THE CONTRACTOR MAY DEVIATE SLIGHTLY FROM THE STAGING OF PERMANENT SITE IMPROVEMENTS, BUT NO DEVIATION FROM THE RELATIVE ORDER OF EROSION AND SEDIMENTATION CONTROL MEASURES WILL BE ALLOWED.

FACILITIES TO CONTROL THE TRANSPORT OF SOIL MATERIAL FROM THE CONSTRUCTION AREA SHALL BE INSTALLED PRIOR TO ANY EARTH DISTURBANCE OR PAVEMENT REMOVAL.

NOTE: THE STAGING OF EARTHMOVING ACTIVITIES FOR THIS PROJECT IS A GENERAL DESCRIPTION OF THE WORK REQUIRED. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH COMPANY STANDARDS, THE OHIO DEPARTMENT OF ENVIRONMENTAL PROTECTION REGULATIONS, AND ALL OTHER APPLICABLE FEDERAL, STATE OR LOCAL REQUIREMENTS.

ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE FOLLOWING SEQUENCE. CONSTRUCTION MAY START AT MULTIPLE POINTS. THE CONTRACTOR SHALL PLACE ALL BMPs FOR THAT SECTION OR AREA PRIOR TO THE START OF CONSTRUCTION.

AT LEAST SEVEN (7) DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, THE COMPANY SHALL INVITE ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES, ALL APPROPRIATE MUNICIPAL, STATE & FEDERAL OFFICIALS, THE LOCAL COUNTY CONSERVATION DISTRICT, AND THE EROSION AND SEDIMENTATION CONTROL PLAN PREPARER TO AN ON-SITE PRECONSTRUCTION MEETING. THE MAIN LINE CONTRACTOR SHALL HAVE PRESENT THE SUPERVISORY PERSON RESPONSIBLE FOR THE GENERAL CONSTRUCTION AND SUPERVISORY PERSON RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF BMPs FOR THE PROJECT. THE COMPANY SHALL HAVE PRESENT AT LEAST ONE COMPANY PERSON WHO HAS ENFORCEMENT AUTHORITY TO ASSURE THAT THE CONTRACTOR COMPLIES WITH THE DESIGNED BMPs. THE COMPANY SHOULD ALSO HAVE AT LEAST ONE OF THE COMPANY'S INSPECTION PERSONNEL (WITH STOP WORK AUTHORITY) WHO WILL BE ON SITE TO ASSURE THAT THE CONTRACTOR COMPLIES WITH THE DESIGNED BMPs AND IS QUALIFIED TO DIRECT THE INSTALLATION OF ADDITIONAL BMPs AS NECESSARY, BEFORE IMPLEMENTING ANY REVISIONS TO THE APPROVED EROSION AND SEDIMENT CONTROL PLAN OR REVISIONS TO OTHER PLANS WHICH MAY AFFECT THE EFFECTIVENESS OF THE APPROVED E & S CONTROL PLAN, THE OPERATOR MUST RECEIVE APPROVAL OF THE REVISIONS FROM THE COUNTY CONSERVATION DISTRICT.

AT LEAST THREE (3) DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES SHALL NOTIFY THE ONE CALL SYSTEM INCORPORATED AT 1-800-362-2764 FOR BURIED UTILITIES LOCATION.

BEFORE IMPLEMENTING ANY REVISIONS TO THE APPROVED EROSION AND SEDIMENTATION CONTROL PLAN OR REVISIONS TO OTHER PLANS WHICH MAY AFFECT THE EFFECTIVENESS OF THE APPROVED E&S PLAN, THE OPERATOR MUST RECEIVE APPROVAL OF THE REVISIONS FROM THE APPROPRIATE CONSERVATION DISTRICT.

THE CONTRACTOR SHALL REMOVE FROM THE SITE, RECYCLE, OR DISPOSE OF ALL BUILDING MATERIALS AND WASTES IN ACCORDANCE WITH OHIO EPA'S SOLID WASTE MANAGEMENT REGULATIONS AT OAC CHAPTER 3745. THE CONTRACTOR SHALL NOT ILLEGALLY BURY, DUMP, OR DISCHARGE ANY BUILDING MATERIAL OR WASTES AT THE SITE. BEFORE DISPOSING OF SOIL OR RECEIVING BORROW FOR THE SITE, THE CONTRACTOR MUST ASSURE THAT EACH SOIL OR BORROW AREA HAS AN EROSION AND SEDIMENTATION CONTROL PLAN APPROVED BY OHIO EPA, AND WHICH IS BEING IMPLEMENTED AND MAINTAINED ACCORDING TO THEIR REGULATIONS.

THE APPROVED EROSION AND SEDIMENTATION CONTROL PLAN INCLUDING THE SOIL EROSION CONTROL DRAWINGS AND NARRATIVE SHALL BE AVAILABLE ON SITE AT ALL TIMES DURING EARTH DISTURBANCE.

SEQUENCE OF BMP INSTALLATION AND REMOVAL DURING PIPELINE CONSTRUCTION

1. STAKE/FLAG DISTURBED RIGHT-OF-WAY EXTENTS, CLEARLY IDENTIFYING WETLAND AND STREAM EDGES AND BUFFERS. INSTALL SIGNS OR OTHER MEANS TO IDENTIFY IMPORTANT PROJECT ATTRIBUTES SUCH AS APPROVED ACCESS ROADS, NO REFUELING ZONES, WETLAND/STREAM BOUNDS, ETC.
2. SCHEDULE A PRECONSTRUCTION CONFERENCE AS DESCRIBED ABOVE AND PROVIDE AT LEAST THREE (3) WORKING DAYS, SEVENTY-TWO (72) HOURS NOTICE TO THE OHIO EPA PRIOR TO COMMENCEMENT OF SITE GRADING WORK.
NOTE: IT IS INTENDED THAT THE PIPELINE PROJECT WILL BEGIN AT ONE END AND PROGRESS IN AN ORDERLY FASHION TO THE OTHER END. IT IS ALSO INTENDED THAT DISTURBED SOILS WILL BE RESTORED TO THEIR VEGETATED STATE AS SOON AS IS PRACTICAL WITH PERMANENT BMPs PROPERLY INSTALLED AND MAINTAINED. DUE TO THE NATURE OF THE TERRAIN AND OTHER FACTORS, DEVIATION FROM THE SEQUENTIAL PROGRESS OF THE PROJECT FROM ONE END TO THE OTHER WILL BE ALLOWED WITH PERMISSION FROM THE COMPANY, BUT THE SEQUENCE OF BMP INSTALLATION RELATED TO SOIL DISTURBANCE, ESPECIALLY STREAM AND WETLAND CROSSINGS, IS AN ABSOLUTE.
3. PRIOR TO ACCESSING THE RIGHT-OF-WAY FROM A PUBLIC ROAD, INSTALL THE REQUIRED BMPs PER THE SPECIFIC DETAIL DESIGN. THE PRIORITY IS TYPICALLY TO FIRST BE SILT FENCE, FILTER SOXX, STRAW BALS, ETC., THEN CULVERTS IF REQUIRED, FOLLOWED BY ROCK PADS AND THEN ALL OTHER BMPs AS DESIGNED.
4. FOR RIGHT-OF-WAY IN UPLAND AREAS, THE RIGHT-OF-WAY IS FIRST TO MOWED/BRUSH HOGGED/HYDRO-AXED; TREES CUT; BRUSH, LIMBS, AND TREES UNDER 6 INCHES CHIPPED, WITH CHIPS BROADCAST OFF RIGHT-OF-WAY (PROVIDED ON SAME PROPERTY COVERED BY F.O.W. OPTION) AND LOGS STACKED IN DESIGNATED AREAS.
5. AS STREAMS OR WETLANDS ARE ENCOUNTERED DURING CLEARING, INSTALL TEMPORARY OR PERMANENT BMPs PER DETAILED DESIGN. TEMPORARY BMPs ARE TO INCLUDE SILT FENCE OR EQUIVALENT ACROSS ENTIRE RIGHT-OF-WAY ON BOTH SIDES UNTIL PERMANENT BMPs ARE INSTALLED. CLEARING EQUIPMENT IS NOT TO CROSS ANY STREAM OR WETLAND EXCEPT ON TIMBER MATS.
6. IN ACTIVE AGRICULTURAL AREAS, CROPS ARE TO BE BRUSH HOGGED IF NECESSARY AND THE TOPSOIL STRIPPED PRIOR TO ANY VEHICULAR TRAVEL ON THE RIGHT-OF-WAY. ALL TOPSOIL THAT IS STRIPPED IS TO BE PLACED ON ONE SIDE OF THE RIGHT-OF-WAY IN THE DESIGNATED AREA ON TOP OF UNDISTURBED TOPSOIL. FOR RIGHT-OF-WAY WHICH SPECIFIC BMPs SUCH AS UPOLE DIVERSION DITCHES, SILT FENCE, ETC. IS DESIGNED, THOSE BMPs ARE TO BE INSTALLED PRIOR TO STRIPPING.
7. PRIOR TO GRADING OR OTHER EARTH DISTURBANCE ON THE RIGHT-OF-WAY, PERMANENT DOWN SLOPE BMPs ARE TO BE INSTALLED. SPECIFICALLY, AS GRADING APPROACHES STREAM OR WETLAND CROSSINGS, NO EARTH DISTURBANCE IS TO OCCUR WITHIN 50 FEET OF THE STREAM OR WETLAND WITH DESIGNED BMPs INSTALLED AT THAT PARTICULAR CROSSING.
8. AT THE END OF EACH WORK DAY WHERE THE RIGHT-OF-WAY HAS BEEN GRADED INCLUDING ANY STRIPPING, STUMPING, LEVELING, TWO-TONE ON SIDE SLOPES, ETC., BMPs ARE TO BE INSTALLED. IN NO CASE IS THE CONTRACTOR TO LEAVE THE JOB SITE AT THE END OF THE WORK DAY WITHOUT TEMPORARY OR PERMANENT BMPs (SPECIFICALLY WATER BARS) BEING INSTALLED. THE CONTRACTOR IS NOT REQUIRED TO MAINTAIN WATER BARS DURING THE WORK DAY UNLESS THE ENVIRONMENTAL INSPECTOR DETERMINES THAT THERE IS A RISK OF A RAIN EVENT THAT WARRANTS THEIR INSTALLATION/MAINTENANCE.
9. AS CROSSINGS ARE CONSTRUCTED, THE DETAIL DESIGN IS TO BE FOLLOWED PAYING PARTICULAR ATTENTION TO THE SPECIFIC NOTES SECTION OF THE DRAWING.
10. ONCE ALL REQUIRED BMPs ARE IN PLACE ON THE DISTURBED RIGHT-OF-WAY, DITCHING, STRINGING, BENDING OPERATIONS, WELDING, ETC. CAN BEGIN. ONCE THE PIPE IS LOWERED INTO THE TRENCH, TRENCH BREAKERS ARE TO BE INSTALLED PER THE STANDARD SPACING SPECIFICATION. NOTE THAT THE DETAILED CROSSING DESIGNS REQUIRE SPECIFIC LOCATIONS OF TRENCH BREAKERS.
11. IT IS DESIGNED THAT THE AMOUNT AND DURATION OF OPEN TRENCH BE MINIMIZED DURING THE PROJECT. IN GENERAL, NO TRENCH SHALL BE OPEN AT ONE TIME FOR MORE THAN 30 DAYS EXCEPT FOR TIE IN LOCATIONS WITHOUT THE APPROVAL OF THE COMPANY.
12. ALL AREAS OF OPEN TRENCH MUST HAVE INSTALLED TRENCH BREAKERS/TRENCH PLUGS AS LISTED IN TRENCH BREAKERS/TRENCH PLUGS DETAIL ON DETAIL SHEET 3.
13. IF TOPSOIL PILES ARE EXPOSED FOR GREATER THAN 2 DAYS, THEY SHALL BE SEEDED IN ACCORDANCE WITH DETAILS PROVIDED HEREIN. WHERE CESSATION OF EARTH DISTURBANCE ACTIVITY WILL EXCEED TWO (2) DAYS, THE SITE SHALL IMMEDIATELY SEEDED, MULCHED OR OTHERWISE PROTECTED FROM ACCELERATED EROSION AND SEDIMENTATION.
14. PRIOR TO ANY PERMANENT SEEDING, LIME, AND FERTILIZING APPLICATION, A SOIL TEST SHALL BE PERFORMED TO DETERMINE THE PH FACTOR.
15. LIME, FERTILIZE, SEED, AND MULCH THE DISTURBED AREAS PER THE COMPANY SPECIFICATIONS. IN AREAS OF STEEP SLOPES OR OBVIOUS AREAS WHERE POTENTIAL EROSION MAY OCCUR, AND EROSION CONTROL MAT OR FLEXIBLE GROWTH MEDIUM (FGM) SHALL BE USED. FGM SHALL BE APPLIED PER THE MANUFACTURER'S SPECIFICATIONS.
16. ONCE A SECTION OF THE PIPELINE HAS BEEN STABILIZED, NO CONSTRUCTION TRAFFIC SHALL OCCUR TO REMOVE ANY BMPs UNTIL THE SECTION HAS ACHIEVED 85% PERENNIAL VEGETATIVE COVER. AN AREA SHALL BE CONSIDERED TO HAVE ACHIEVED FINAL STABILIZATION WHEN IT HAS A MINIMUM UNIFORM 80% PERENNIAL VEGETATIVE COVER OR OTHER PERMANENT NONVEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED SURFACE EROSION AND SUBSURFACE CHARACTERISTICS SUFFICIENT TO RESIST SLIDING OR OTHER MOVEMENTS.

PERMANENT STABILIZATION - ALTERNATE FINAL RESTORATION NOTE

- A. LIMITING EXPOSED AREAS - "EARTH DISTURBANCE ACTIVITIES SHALL BE PLANNED AND CONDUCTED TO MINIMIZE THE EXTENT AND DURATION OF THE DISTURBANCE."

THE LENGTH OF TIME FOR CONSTRUCTING ACCESS ROADS, UTILITY LINE TRENCHING, TRENCH BACK-FILLING, FINAL GRADING, AND CLEANUP SHOULD BE KEPT TO A MINIMUM. GOOD PLANNING AND SCHEDULING OF THE VARIOUS UTILITY CONSTRUCTION ITEMS, TOGETHER WITH TIMELY AVAILABILITY OF MATERIALS, ADEQUATE EQUIPMENT, AND ADEQUATE MANPOWER, WILL HELP REDUCE THE TIME OF EXPOSURE OF DISTURBED LAND.

LARGE DIAMETER STEEL PIPELINES WITH WELDED JOINTS WHERE THE PIPE JOINTS ARE WELDED WHILE THE PIPE IS OUT OF THE TRENCH USUALLY REQUIRE A FAIRLY LONG LENGTH OF OPEN PIPELINE TRENCH. THE TOTAL TIME FROM TRENCH EXCAVATION TO PLACEMENT OF BACKFILL FOR THIS TYPE OF PIPELINE CONSTRUCTION SHOULD GENERALLY BE LIMITED TO NO MORE THAN THIRTY (30) CALENDAR DAYS AT ANY GIVEN POINT ALONG THE PIPELINE. THIS MEANS THAT, FOR EXAMPLE, THAT FROM THE TIME THAT TRENCH EXCAVATION ACTIVITIES COMMENCE AT STATION 1+00 UNTIL THE TRENCH IS BACKFILLED AT STATION 1+00, NO MORE THAN THIRTY (30) CALENDAR DAYS SHOULD EXPIRE. AT ANY GIVEN PLACE ALONG THE PIPELINE TRENCH WHERE THE TIME TO EXCAVATE AND BACKFILL THE TRENCH WILL EXCEED THIRTY (30) CALENDAR DAYS, OR THE TIME SPECIFIED IN THE PERMIT, THE CONTRACTOR SHALL CONTACT THE COMPANY TO DETERMINE IF THE ADDITIONAL TIME CAN BE APPROVED UNDER A MINOR MODIFICATION. WHERE EARTH DISTURBANCE ACTIVITY IS NOT COMPLETED IN AN AREA WHERE THE TRENCH HAS BEEN BACKFILLED, BMPs SHOULD BE MAINTAINED AND TEMPORARY STABILIZATION PROVIDED AS REQUIRED ACCORDING TO §102.22(B). WHERE DISTURBANCE ACTIVITIES HAVE BEEN COMPLETED, PERMANENT STABILIZATION SHALL BE PROVIDED AS REQUIRED UNDER §102.22(A).

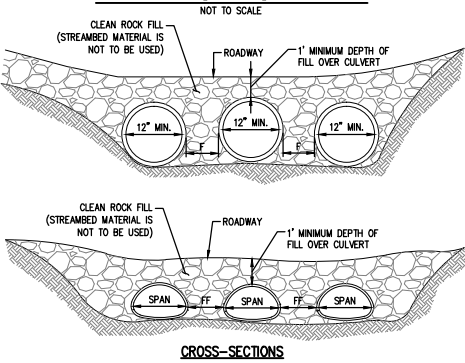
NO SOIL IS TO BE HAULED OFF SITE WITHOUT A SEPARATE EROSION AND SEDIMENTATION CONTROL PLAN REVIEWED FOR ADEQUACY BY THE OHIO EPA OR THE LOCAL COUNTY CONSERVATION DISTRICT AS APPROPRIATE.

INSPECTION - ALL BMPs SHOULD BE INSPECTED AFTER EACH MEASURABLE RAINFALL RUNOFF EVENT AND ON A WEEKLY BASIS. ANY NECESSARY REPAIRS MUST BE MADE IMMEDIATELY TO ENSURE EFFECTIVE AND EFFICIENT OPERATION.

General Notes:

1. BMPs SHOWN MAY NEED TO BE FIELD ADJUSTED TO FIT ACTUAL CONDITIONS. IN SOME CASES, THE NEXT LARGER BMP MAY BE NEEDED DUE TO UNFORESEEN CONDITIONS. ADDITIONAL BMPs MAY BE REQUIRED OTHER THAN THOSE SHOWN. THE CONTRACTOR SHALL TAKE WHATEVER MEASURES NECESSARY TO PREVENT SILT FROM LEAVING THE SITE.
2. ALL PIPES/BRIDGES ARE FOR CONSTRUCTION ONLY AND THE SITE OF SAID PIPES/BRIDGES SHALL BE RESTORED TO ORIGINAL TOPOGRAPHY AND STABILIZED WITHIN FIVE (5) DAYS AFTER TERMINATION OF ITS INTENDED USE OR AT THE END OF THE ONE (1) YEAR PERIOD, WHICHEVER OCCURS FIRST.

Temporary Stream Crossing With Multiple Pipes Detail



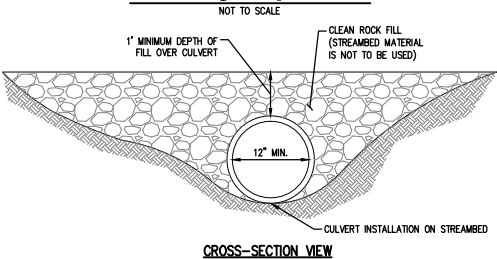
NOTES:

1. MULTIPLE PIPES AND MULTIPLE SPAN BRIDGES AND CULVERTS WHICH MAY TEND TO COLLECT DEBRIS, CONTRIBUTE TO THE FORMATION OF ICE JAMS AND INCREASE HEAD LOSSES SHALL BE AVOIDED TO THE MAXIMUM EXTENT PRACTICABLE. CROSSINGS OF LESS THAN 15 FEET SHALL BE BY ONE SPAN, EXCEPT WHERE CONDITIONS MAKE IT IMPRACTICAL TO AFFECT THE CROSSING WITHOUT MULTIPLE SPANS.
2. PROVIDE 50' STABILIZED ACCESS TO CROSSING ON BOTH SIDES OF STREAM CHANNEL. PIPES SHALL EXTEND BEYOND THE TOE OF THE ROADWAY.
3. RUNOFF FROM THE ROADWAY SHALL BE DIVERTED OFF THE ROADWAY AND INTO A SEDIMENT REMOVAL BMP BEFORE IT REACHES THE ROCK APPROACH TO THE CROSSING.

MAINTENANCE:

1. TEMPORARY STREAM CROSSINGS SHALL BE INSPECTED ON A DAILY BASIS.
2. DAMAGED CROSSINGS SHALL BE REPAIRED WITHIN 24 HOURS OF THE INSPECTION AND BEFORE ANY SUBSEQUENT USE.
3. SEDIMENT DEPOSITS ON THE CROSSING OR ITS APPROACHES SHALL BE REMOVED WITHIN 24 HOURS OF THE INSPECTION.
4. AS SOON AS THE TEMPORARY CROSSING IS NO LONGER NEEDED, IT SHALL BE REMOVED. ALL MATERIALS SHALL BE DISPOSED OF PROPERLY AND DISTURBED AREAS STABILIZED.

Temporary Stream Crossing With Single Pipe Detail



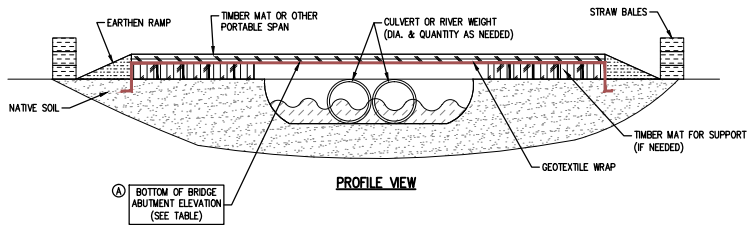
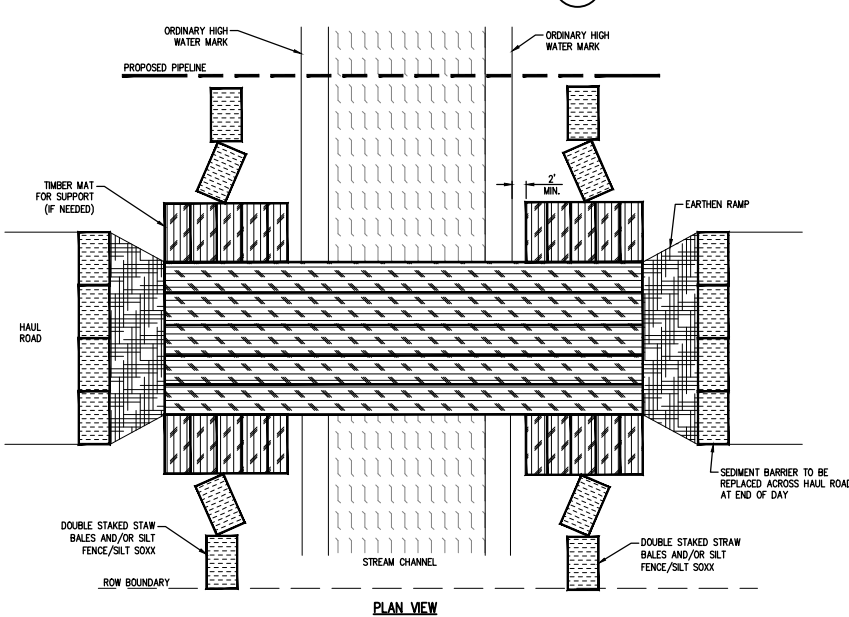
NOTES:

1. PROVIDE 50' STABILIZED ACCESS TO CROSSING ON BOTH SIDES OF STREAM CHANNEL.
2. PIPES SHALL EXTEND BEYOND THE TOE OF THE ROADWAY.
3. RUNOFF FROM THE ROADWAY SHALL BE DIVERTED OFF THE ROADWAY AND INTO A SEDIMENT REMOVAL BMP BEFORE IT REACHES THE ROCK APPROACH TO THE CROSSING.

MAINTENANCE:

1. TEMPORARY STREAM CROSSINGS SHALL BE INSPECTED ON A DAILY BASIS.
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3. SEDIMENT DEPOSITS ON THE CROSSING OR ITS APPROACHES SHALL BE REMOVED WITHIN 24 HOURS OF THE INSPECTION.
4. AS SOON AS THE TEMPORARY CROSSING IS NO LONGER NEEDED, IT SHALL BE REMOVED. ALL MATERIALS SHALL BE DISPOSED OF PROPERLY AND DISTURBED AREAS STABILIZED.

Timber Mat Bridge Detail



NOTES:

1. STRAW BALES TO BE PLACED ACROSS BRIDGE ENTRANCE EVERY NIGHT.
2. THE CONTRACTOR HAS THE OPTION TO INSTALL PIPES OR BRIDGE TO CROSS STREAM. IF USING BRIDGE, CULVERTS MAY BE USED TO STABILIZE BRIDGE. THE QUANTITY AND DIAMETER OF CULVERTS SHALL BE AS NEEDED TO STABILIZE THE BRIDGE AND TO MEET THE MINIMUM BRIDGE ELEVATION SHOWN IN TABLE BELOW. IF USING PIPES, THE DIAMETER AND QUANTITY OF PIPES SHALL BE AS SHOWN IN TABLE BELOW.
3. CONTRACTOR HAS THE OPTION TO CHOOSE BETWEEN PUMPING OR FLUMING STREAM FLOW FOR TRENCH CROSSING.

E&SPC TYPICAL DETAIL SHEET 1

GENERAL NOTES:	
1. ALL BMPs SHALL BE INSPECTED AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ANY NECESSARY REPAIRS MUST BE MADE IMMEDIATELY TO ENSURE EFFECTIVE AND EFFICIENT OPERATION.	
2. BMPs SHOWN MAY NEED TO BE FIELD ADJUSTED TO FIT ACTUAL CONDITIONS.	
3. IN SOME CASES, THE NEXT LARGER BMP MAY BE NEEDED DUE TO UNFORESEEN CONDITIONS.	
4. ADDITIONAL BMPs MAY BE REQUIRED OTHER THAN THOSE SHOWN.	
5. THE CONTRACTOR SHALL TAKE WHATEVER MEASURES NECESSARY TO PREVENT SEDIMENT FROM LEAVING THE SITE.	

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SEAL

SEAL	NO.	REVISIONS	DATE	AVON LAKE GAS ADDITION PROJECT			
				CARLISLE, EATON & LAGRANGE TOWNSHIPS AVON, AVON LAKE, ELYRIA & NORTH RIDGEVILLE CITIES LORAIN COUNTY OHIO	DRAWN BY: AEJ	PROJECT NO. NRG-1007	
					CHECKED BY: SJC		
					DATE: 12.15.14	SHEET NO. 83 OF 88	
					SCALE:		
					AS NOTED		
				Hanover Engineering Associates Inc 3355 Route 611, Suite 1 Bartonsville, PA 18321-7822 570.688.9550 Fax 570.688.9768			

Revegetation Best Management Practices:

AFTER EARTH DISTURBANCE ACTIVITY IS COMPLETED, THE DISTURBED AREA MUST BE REVEGETATED. THE VEGETATIVE COVER MUST BE A UNIFORM 85% PERENNIAL VEGETATIVE COVER, WITH A DENSITY CAPABLE OF RESISTING ACCELERATED EROSION AND SEDIMENTATION. ANOTHER OPTION IS TO USE AN ACCEPTABLE BMP WHICH PERMANENTLY MINIMIZES ACCELERATED EROSION AND SEDIMENTATION. 1. SEED MIXTURES - STANDARD SEED MIXTURES THAT HAVE BEEN SHOWN TO BE EFFECTIVE IN STABILIZING AREAS IN OHIO ARE RECOMMENDED. THIS INFORMATION IS SUMMARIZED IN TABLES 13 THROUGH 16. ALTHOUGH THESE RECOMMENDED MIXTURES WILL BE SUITABLE FOR MOST SITES, THEY MAY NOT BE DESIRABLE FOR ALL SITUATIONS THAT MAY BE ENCOUNTERED IN SUCH INSTANCES, THE COMPANY SHOULD BE CONTACTED FOR ADDITIONAL GUIDANCE. THE WEBSITE [WWW.PLANT-MATERIALS.NRC.USDA.GOV](http://www.plant-materials.nrc.usda.gov) IS ANOTHER EXCELLENT SOURCE OF INFORMATION. A SEED MIX SHOULD CONTAIN MORE THAN ONE VARIETY OF SEED AND INCLUDE THE APPLICATION RATE (E.G. LB./ACRE), AND GERMINATION SEASON. B. IF THE AREA TO BE VEGETATED IS A STEEP SLOPE (> 3:1), A STEEP SLOPE MIXTURE SHOULD BE USED. OTHER LIMITATIONS, SUCH AS DROUGHTY OR SATURATED CONDITIONS, ACID SOILS, AND SHADED AREAS SHOULD ALSO BE ADDRESSED BY THE PROPOSED SEEDING PLAN (SEE TABLES 13 THROUGH 16). C. WHEREVER TALL FESCUE IS PROPOSED, AN ENDOPHYTIC FREE VARIETY (E.G. JOHNSTONE, BARCEL, OR FESTORINA) SHOULD BE USED. D. SEED MIXTURES SHOULD INCLUDE A LEGUME. WHEN USED IN AREAS DIFFICULT TO VEGETATE, LEGUME SEED LOTS SHOULD CONTAIN A CERTAIN AMOUNT OF HARD SEED (SEE TABLE 13 FOR RECOMMENDED SPECIFICATIONS). LEGUME SEED MUST BE INOCULATED IN ORDER TO FORM NODULES ON THE ROOTS WHICH FIX ATMOSPHERIC NITROGEN. USE ONLY SEED WHICH HAS BEEN FRESHLY AND PROPERLY INOCULATED. E. WARM SEASON GRASSES MAY HAVE SOME LIMITATIONS FOR USE IN EROSION CONTROL AND MUST BE CONSIDERED WHEN SELECTING A SEED MIXTURE, THEY GROW MUCH MORE SLOWLY DURING THE SPRING AND FALL MONTHS. THEY TEND TO FORM BUNCHES, RATHER THAN SOO. THEREFORE, THE COVERAGE MAY NOT BE AS UNIFORM AS DESIRED.

TABLE 13 PLANT TOLERANCES OF SOIL LIMITATION FACTORS

SPECIES	GROWTH HABIT	TOLERATES				MINIMUM SEED SPECIFICATIONS (3)					
		NET SOIL	DRY SITE	LOW FERTILITY	(2) ACID SOIL (pH 5-5.5)	PURITY (%)	READY GERM (%)	HARD SEED (%)	TOTAL GERM (%)	SEEDS/b (1,000s)	
		WARM-SEASON GRASSES									
DEERTONGUE	BUNCH	YES	NO	YES	YES	95	75		75	250	
WEeping LOVEGRASS	BUNCH	NO	YES	YES	YES	97	75		75	1,500	
SWITCHGRASS (4)	BUNCH	YES	NO	YES	YES			(60 PLS)		390	
BIG BLUESTEM	BUNCH	NO	YES	YES	YES			(60 PLS)		150	
COOL-SEASON GRASSES											
TALL FESCUE	BUNCH	YES	NO	YES	NO	95	80		80	227	
REDTOP	SOD	YES	YES	YES	YES	92	80		80	5,000	
PINE FESCUES	SOD	NO	NO	YES	NO	95	80		80	400	
PERENNIAL RYEGRASS	BUNCH	YES	NO	NO	NO	95	85		85	227	
ANNUAL RYEGRASS	BUNCH	YES	NO	YES	NO	95	85		85	227	
KENTUCKY BLUEGRASS	SOD	NO	NO	NO	NO	85	75		75	2,200	
REICHENBACHGRASS	SOD	YES	YES	YES	NO	95	70		70	520	
ORCHARDGRASS	BUNCH	YES	YES	YES	YES	95	80		80	650	
TIMOTHY	BUNCH	YES	NO	YES	YES	95	80		80	1,230	
SMOOTH BROMEGRASS	SOD	NO	YES	YES	NO	95	80		80	136	
LEGUMES (5)											
CROWNVELTCH	SOD	NO	YES	YES	NO	98	40	30	65	120	
BIRDSFOOT TREFOIL (6)	BUNCH	YES	NO	YES	YES	98	60	20	80	400	
FLATPEA	SOD	NO	NO	YES	YES	98	55	20	75	10	
BERCEJA LESPEDEZA	BUNCH	NO	YES	YES	YES	98	60	20	80	335	
CEREALS											
WINTER WHEAT	BUNCH	NO	NO	NO	NO	98	85		85	15	
WINTER RYE	BUNCH	NO	NO	NO	YES	98	85		85	18	
SPRING OATS	BUNCH	NO	NO	NO	NO	98	85		85	13	
SUNDOGGRASS	BUNCH	NO	YES	NO	NO	98	85		85	55	
JAPANESE MILLET	BUNCH	YES	NO	YES	YES	98	80		80	155	

- ① GROWTH HABIT REFERS TO THE ABILITY OF THE SPECIES TO EITHER FORM A DENSE SOD BY VEGETATIVE MEANS (STOLONS, RHIZOMES, OR ROOTS) OR REMAIN IN A BUNCH OR SINGLE PLANT FORM. IF SEEDS HEAVILY ENOUGH, EVEN BUNCH FORMERS CAN PRODUCE A VERY DENSE STAND. THIS IS SOMETIMES CALLED A SOD, BUT NOT IN THE SENSE OF A SOD FORMED BY VEGETATION MEANS.
- ② ONCE ESTABLISHED, PLANTS MAY GROW AT A SOMEWHAT LOWER PH, BUT COVER GENERALLY IS ONLY ADEQUATE AT PH 6.0 OR ABOVE.
- ③ MINIMUM SEED LOTS ARE TRULY MINIMUM, AND SEED LOTS TO BE USED FOR REVEGETATION PURPOSES SHOULD EQUAL OR EXCEED THESE STANDARDS. THUS, DEERTONGUE GRASS SHOULD GERMINATE 75% OR BETTER. CROWNVELTCH SHOULD HAVE AT LEAST 50% GERMINABLE SEED AND 30% HARD SEED. COMMONLY, SEED LOTS ARE AVAILABLE THAT EQUAL OR EXCEED MINIMUM SPECIFICATIONS. REMEMBER THAT DISTURBED SITES ARE ADVERSE FOR PLANT ESTABLISHMENT. READY GERMINATION REFERS TO SEED THAT GERMINATES DURING THE PERIOD OF THE GERMINATION TEST AND THAT WOULD BE EXPECTED, IF CONDITIONS ARE FAVORABLE, TO GERMINATE RAPIDLY WHEN PLANTED. THE OPPOSITE OF READY GERMINATION IS DORMANT SEED, OF WHICH HARD SEED IS ONE TYPE.
- ④ SWITCHGRASS SEED IS SOLD ONLY ON THE BASIS OF PURE LIVE SEED (PLS).
- ⑤ NEED SPECIFIC LEGUME INOCULANT, INOCULANT SUITABLE FOR GARDEN PEAS AND SWEETPEAS USUALLY IS SATISFACTORY FOR FLATPEA.
- ⑥ BIRDSFOOT TREFOIL IS ADAPTED OVER THE ENTIRE STATE, EXCEPT IN THE EXTREME SOUTHWEST WHERE CROWN AND ROOT ROT MAY INJURE STANDS.

TABLE 14. RECOMMENDED PERMANENT SEED MIXTURES
COOL AND WARM SEASON GRASSES

MIXTURE NUMBER	SEASON	SPECIES	SEEDING RATE lb./ac.
1	COOL	TALL FESCUE*OR FINE FESCUE, PLUS	79
		REEDTOP OR PERENNIAL RYEGRASS, PLUS	46
		BIRDSFOOT TREFOIL	8
		BIRDSFOOT TREFOIL, PLUS	8
2	COOL	TALL FESCUE	26
		ORCHARDGRASS, OR	26
		SMOOTH BROMEGRASS, PLUS	33
		BIRDSFOOT TREFOIL	8
3	COOL	FLATPEA, PLUS	27
		TALL FESCUE, OR	26
		PERENNIAL RYEGRASS	25
		DEERTONGUE, PLUS	21
4	WARM	BIRDSFOOT TREFOIL	8
		SWITCHGRASS, OR	15
		BIG BLUESTEM, PLUS	15
		BIRDSFOOT TREFOIL	8

* USE ONLY ENDOPHYTIC FREE VARIETIES SUCH AS JOHNSTONE, BARCEL OR FESTORINA.

TEMPORARY SEEDING SPECIFICATIONS			
SEEDING DATES	SPECIES	LB. PER 1,000 SQ. FT.	PER-ACRE
MARCH 1-TO-AUGUST 15	OATS	3	4 BUSHELS
	TALL FESCUE	1	40 LB
	ANNUAL RYEGRASS	1	40 LB
	PERENNIAL RYEGRASS	1	40 LB
	TALL FESCUE	1	40 LB
AUGUST 1-TO-NOVEMBER 1	RYE	3	2 BUSHELS
	TALL FESCUE	1	40 LB
	ANNUAL RYEGRASS	1	40 LB
	WHEAT	3	2 BUSHELS
	TALL FESCUE	1	40 LB
NOVEMBER 1-TO-SPRING	RYE	3	2 BUSHELS
	TALL FESCUE	1	40 LB
	ANNUAL RYEGRASS	1	40 LB
	PERENNIAL RYEGRASS	1	40 LB
	TALL FESCUE	1	40 LB
NOTE: OTHER APPROVED SEED SPECIES MAY BE SUBSTITUTED.			

TABLE 16. RECOMMENDED SEED MIXTURES FOR STABILIZING DISTURBED AREAS

STE CONDITION	SEED MIXTURE (SELECT ONE MIXTURE)
CUT SLOPES AND FILLS (NOT MOWED)	2,4, OR 6
WELL-DRAINED VARIABLE DRAINAGE	2
CUT SLOPES AND FILLS (MOWED)	1
CUT SLOPES AND FILLS (GRAZED/HAY)	1,2, OR 3
GULLIES AND ERODED AREAS	2 OR 6
EROSION CONTROL BMP'S	
CHANNELS, DRAINAGE DITCHES, TRAP EMBANKMENTS, ETC.	1 OR 2
FOR HAY OR SILAGE	2 OR 3
RIGHT-OF-WAY	
WELL-DRAINED VARIABLE DRAINAGE	4 OR 6
WELL-DRAINED AREAS FOR GRAZING/HAY	2
STRIP MINED AREAS	2 OR 3
SPOILS, WASTE AREAS, FLY ASH, SLAG, ETC. (LIME TO SOIL TEST)	2,4, OR 5
FOR GRAZING/HAY	2,3, OR 6

2. SOIL AMENDMENTS: A SOIL TEST IS RECOMMENDED TO DETERMINE THE TYPE AND RATE OF APPLICATION OF SOIL AMENDMENTS. ESPECIALLY WHEN THE COUNTY SOIL SURVEY INDICATES THE PRESENCE OF SOILS WITH LOW FERTILITY OR A PH RANGING BELOW 5.5 IT IS ALSO RECOMMENDED WHERE DIFFICULTIES HAVE BEEN ENCOUNTERED IN ESTABLISHING A GOOD COVER (E.G. ABANDONED MINED LANDS). THE COSTS OF SOIL TESTING ARE MINIMAL AND CAN RESULT IN HUGE SAVINGS IN SOIL AMENDMENTS AND THE COSTS OF RE-SEEDING. IN THE ABSENCE OF A SOIL TEST:

A. THE LIMING RATE SHOULD BE AT LEAST 4 TO 5 TONS/ACRE. FOR TEMPORARY SEEDING, A LIMING RATE OF 2 TONS/ACRE IS ACCEPTABLE. NO MORE THAN 4 TONS/ACRE SHOULD BE ADDED TO AGRICULTURAL LAND.

B. FERTILIZER SHOULD BE APPLIED AT THE RATE OFF 100LB N, 200 LB. OF P2O5, AND 200 LB. OF K2O PER ACRE (E.G. 1000 LB./ACRE OF 10-20-20 FERTILIZER). FOR TEMPORARY SEEDING, A RATE OF 50 LB. N, 50 LB. P2O5, 50 LB. K2O PER ACRE (E.G. 500 LB. OF 10-10-10 FERTILIZER) IS ACCEPTABLE.

3. MULCHING-MULCH ABSORBS RAINFALL IMPACT, INCREASES THE RATE OF INFILTRATION, REDUCES SOIL MOISTURE LOSS DUE TO EVAPORATION, MODERATES SOIL TEMPERATURES, PROVIDES A SUITABLE ENVIRONMENT FOR GERMINATION, AND PROTECTS THE SEEDING FROM INTENSE SUNLIGHT. ALL SEEDED AREAS SHOULD BE MULCHED UNLESS THE SEED MIXTURE IS DRILLED AND INCLUDES A NURSE CROP (SEE TABLE 4-17). MULCHING MAY ALSO BE USED AS A TEMPORARY STABILIZATION OF DISTURBED AREAS IN NON-GERMINATING SEASONS.

A. THE MINIMUM APPLICATION RATE FOR HAY OR STRAW MULCH SHOULD BE 3 TONS/ACRE. ON STEEP SLOPES THE HAY OR STRAW SHOULD BE CRIMPED, TACKED, NETTED, OR OTHERWISE ANCHORED.

B. WOOD CELLULOSE IS NOT RECOMMENDED FOR STEEP SLOPE (> 1:3 H:V) APPLICATIONS. WHERE USED, THE MINIMUM RATE OF APPLICATION SHOULD BE 2000 LB./ACRE.

C. EROSION CONTROL BLANKETING SHOULD BE CONSIDERED FOR STEEP SLOPE (> 1:3 H:V) SITUATIONS AND IN CRITICAL AREAS (E.G. STREAM CROSSINGS, ADJACENT WETLANDS, ETC.).

TABLE 17. MULCH APPLICATION RATES

MULCH APPLICATION RATE (MIN.)				NOTES
TYPE	PER ACRE	PER 1,000 sq.ft.	PER 1,000 sq.yd.	
STRAW	2 TONS	90 lb.	810 lb.	OTHER WHEAT OR OAT STRAW/FREE OF WEEDS, NOT CHOPPED OR FINELY BROKEN
HAY	2 TONS	90 lb.	810 lb.	TIMOTHY, MIXED CLOVER AND TIMOTHY OR OTHER NATIVE FORAGE GRASSES
WOOD CELLULOSE	2,000 lb.	46 lb.	414 lb.	DO NOT USE ALONE IN WINTER DURING HOT AND DRY WEATHER, OR ON STEEP SLOPES(>3:1)
WOOD CHIPS	6 TONS			MAY PREVENT GERMINATION OF GRASSES AND LEGUMES

NOTE:

AFTER SOIL PH ANALYSIS IS PERFORMED, A SUITABLE MIX SHALL BE DETERMINED FROM THE TABLES.

Upland Seed Mix Option:

SHOWY NORTHEAST NATIVE, WILDLIFER MIX: ERNMX-153
ERNST CONSERVATION SEED
9006 MERGER PINE
MEADVILLE, PA 16335-9299
TELEPHONE: 800-873-3321 / 814-336-2404
FAX: 814-336-5191
EMAIL: ernst@ernstseed.com
APPLICATION RATE: 15 lbs/acre (BULK) THOROUGHLY MIXED WITH ANNUAL RYEGRASS (LOJUM MULTIFLORUM) AT 10 lbs/acre.
NOTE: STRAW MULCH LIGHTLY AND COVER WITH JUTE MAT, INSTALLED PER MANUFACTURER'S SPECS.

PERCENT BY NO. OF SEEDS (NOT WEIGHT)	SCIENTIFIC NAME	COMMON NAME
15%	ANDROPOGON SOPORARIUS	LITTLE BLUESTEM
10%	BOUTELOUA CURTIPENDULA	SIDE OATS GRAMA
10%	ELYNUS VILLOSIUS	SILKY WILD RYE
10%	SORGHASTRUM NITANS	INDIAN GRASS
5%	CHAMACOSTRIS FASCIOLATA	PARTRIDGE PEA
5%	HELIOPSIS HELIANTHODES	OX EYE SUNFLOWER
5%	ANDROPOGON GERARDII, NAGARA	NAGARA BIG BLUESTEM
5%	PENSTEMON DIDYOTIS	TALL WHITE BEARD TONGUE
5%	RUBROEGOA HIRTA	BLACK EYED SUSAN
5%	SENNA HEBCARPA	WILD SENNA
5%	ASTER PRENANTHODES/NOVBELGI	ZIGZAG ASTER/NEW YORK ASTER
4%	HYPERICUM PYRAMIDATUM	MILK
2.5%	ADZIA AFRICA	GREAT ST. JOHN'S WORT
2%	ASOLEPIAS SYRIACA	GOLDEN ALEXANDERS
2%	ASOLEPIAS TUBEROSA	COMMON MILKWEED
1.5%	TRACHEANTHUS THROGENSES	BUTTERFLY MILKWEED
1.5%	ASTER NOVAEANGULAE	OHIO SPIDERWORT
1.5%	LUPINUS PERENNIS	NEW ENGLAND ASTER
1.5%	MONARDA FISTULIOSA	WILD BLUE LUPINE
1%	BAPTISMA AUSTRALIS	WILD BERGAMOT
1%	LESPEDEZA CAPITATA	BLUE FALSE INDIGO
1%		ROUNDHEAD LESPEDEZA

Wetland Seed Method :

1. WETLAND AREAS SHALL BE TOPSOILED WITH THE NATURAL TOPSOIL. AN ANNUAL RYE MIX SHALL BE PLANTED IN THE INTERIM UNTIL THE NATURAL PLANTS INUNDATE THE DISTURBED AREAS.
2. NO LIME OR FERTILIZER SHALL BE USED IN WETLAND AREAS.

Streambank & Wetland Seed Mix Option:

RETENTION BASIN FLOOR SEEDING FOR WILDLIFE & PLANT DIVERSITY MIX - ERNMX-127 APPLIED AT A SEEDING RATE OF 15 BULK LBS PER ACRE OR 1 1/2-1 LBS PER 1,000 FT2, SEWN ALONG WITH 10 LBS/ACRE OF CEREAL OATS (Avena sativa) OR GRAIN (CEREAL) RYE (SECALE CEREAL) AVAILABLE FROM:
ERNST CONSERVATION SEEDS
9006 MERGER PINE
MEADVILLE, PA 16335
PHONE: (800) 873-3321 (814) 336-2404
FAX: (814) 336-5191
EMAIL: sales@ernstseed.com info@ernstseed.com

General Construction Notes:

EROSION CONTROL BLANKET FOR STEEP SLOPES

STEEP SLOPES THAT ARE DISTRIBUTED FOR UTILITY LINE CONSTRUCTION SUCH AS ROADWAY/RAILROAD CUT OR EMBANKMENT SLOPES GREATER THAN OR EQUAL TO 3 HORIZONTAL TO 1 VERTICAL SHOULD BE PROTECTED AGAINST EROSION WITH EROSION CONTROL BLANKETS OR MATS SUITABLE FOR THE ESTABLISHMENT OF VEGETATION. THE EROSION CONTROL BLANKETS SHOULD BE INSTALLED IMMEDIATELY AFTER THE SOIL AMENDMENTS AND THE SEED ARE APPLIED. EROSION CONTROL BLANKETS SHOULD ALSO BE INSTALLED ON OTHER STEEP RIGHT-OF-WAY SLOPES WHERE EROSION WILL BE A PROBLEM UNTIL VEGETATION IS ESTABLISHED.

THE INSTALLATION PROCEDURE SHOULD COMPLY WITH THE MANUFACTURER'S RECOMMENDATIONS, INCLUDING SLOPE PREPARATION, ORIENTATION, TRENCHING, OVERLAP AND SPACING OF STAPLES.

STABILIZATION DURING NON-GROWING SEASONS

ALL UTILITY LINE CONSTRUCTION SHOULD BE PLANNED FOR COMPLETION WITHIN THE RECOMMENDED DATES FOR THE APPLICATION OF PERMANENT SEEDING AND ESTABLISHMENT OF PERMANENT VEGETATIVE COVER. HOWEVER, WHEN EMERGENCY UTILITY LINE CONSTRUCTION MUST BE DONE AND IS COMPLETED DURING A NON-GROWING SEASON (WINTER, ETC.), INTERIM STABILIZATION BMP'S MUST BE IMPLEMENTED AND ADEQUATELY MAINTAINED. THE APPLICATION OF STRAW MULCH AT THE RATE OF TWO TONS PER ACRE IS RECOMMENDED. THE BMP'S SHOULD BE CHECKED WEEKLY (UNLESS SNOW COVERED) TO IDENTIFY AREAS THAT BECOME BARE.

THESE BARE AREAS SHOULD BE COVERED WITH A PROPERLY INSTALLED EROSION CONTROL BLANKET. ALL TEMPORARY EROSION AND SEDIMENT POLLUTION CONTROLS MUST BE MAINTAINED UNTIL PERENNIAL VEGETATION IS ESTABLISHED.

A PRE-WINTER STABILIZATION MEETING NEEDS TO BE HELD IF THE PROJECT IS TO REMAIN OPEN THROUGH WINTER. PLANNING SHOULD BE SUCH THAT THE SITE IS ABLE TO BE SEEDD DURING THE GROWING SEASON. IF SEEDING IS NOT POSSIBLE, THEN THE SITE WILL HAVE TO BE MULCHED AND POSSIBLY DORMANT SEEDD.

PERMANENT STABILIZATION

PERMANENT CONTROL BMP'S SUCH AS SLOPE BREAKERS/INTERCEPTOR DIKES/WATER BARS, ETC. SHOULD BE IN PLACE PRIOR TO APPLICATION OF SOIL AMENDMENTS, SEED AND MULCH. THE OBJECTIVE SHOULD BE TO OBTAIN PERENNIAL VEGETATIVE COVER THAT IS RESISTANT TO EROSION. THE ACCEPTABLE STANDARD FOR VEGETATIVE STABILIZATION IS A UNIFORM 85% COVER.

RESPONSIBILITY FOR E&S CONTROL FACILITIES:

DURING IMPROVEMENTS CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTION, STABILIZATION & MAINTENANCE OF ALL SITE EROSION & SEDIMENTATION CONTROL FACILITIES. AFTER CONTRACTOR INVOLVEMENT CEASES, RESPONSIBILITY SHALL REVERT TO THE PROJECT OWNER.

SEDIMENT RE-DISTRIBUTION

WASHING OF FILTER STONE AND RE-DISTRIBUTION OF WET SEDIMENT FROM BASINS, TRAPS OR OTHER FACILITIES SHALL ONLY BE PERMITTED UPRIILL OF AN EFFECTIVE SEDIMENT FILTER FACILITY. SILT LAZEN RUNOFF SHALL NOT BE ALLOWED TO FLOW DIRECTLY TO UNPROTECTED CATCH BASINS, PONDS, ADJACENT PROPERTIES, ROADS OR WETLANDS.

OFF-SITE BORROW OR DISPOSAL AREAS

IT IS INTENDED THAT ANY BORROW OR DISPOSAL AREAS FOR THIS SITE SHALL BE ACQUIRED FROM OR DISPOSED OF ON THIS SITE. THE CONTRACTOR SHALL UTILIZE THIS APPROVAL PLAN.

ASSURANCE OF DESIGN PERFORMANCE

THE SPECIFICATIONS AND REQUIREMENTS OF THE PROJECT PLANS, NARRATIVE AND SPECIFICATION ARE THE MINIMUM ACCEPTABLE CONSTRUCTION CRITERIA FOR THIS PROJECT.

DURING SITE DEVELOPMENT CONSTRUCTION, ALL TEMPORARY EROSION AND SEDIMENTATION CONTROL FACILITIES MUST BE CHECKED BY THE CONTRACTOR AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ANY DAMAGE TO THE FACILITIES MUST BE REPAIRED IMMEDIATELY. ANY LOST SOIL MATERIAL SHALL BE RECOVERED, IF POSSIBLE. WASHED OUT LAWN OR SLOPE AREAS MUST HAVE TOPSOIL REPLACED AND THEN MUST BE RE-SEEDD AND MULCHED.

IF, FOR ANY REASON, THE DESIGNED FACILITIES OR MEASURES DO NOT PROVIDE THE NECESSARY PROTECTION, THE CONTRACTOR SHALL ADJUST THE EROSION CONTROL MEASURES AND SEDIMENT CONTROL MEASURES TO ACHIEVE A COMPLETE NON-ERODED STABILIZED SITE CONDITION.

REFUELING AREAS

ALL ABOVE-GROUND GAS OR LIQUID STORAGE TANKS SHALL BE ANCHORED TO PREVENT FLATATION OR LATERAL MOVEMENT RESULTING FROM HYDRODYNAMIC AND HYDROSTATIC LOADS IF THEY ARE LOCATED WITHIN 1,000 FT OF A FLOODWAY, 100-YEAR FLOODPLAIN, OR A 500-YEAR FLOODPLAIN.

ALL FUEL TANKS AND DRUMS SHALL BE STORED IN A MARKED STORAGE AREA. A DIKE SHALL BE CONSTRUCTED AROUND THIS STORAGE AREA ACCORDING TO ALL LOCAL, STATE, AND FEDERAL REGULATIONS.

WASTE DISPOSAL

AREAS DESIGNATED FOR STORAGE DISPOSAL OF SOLID, SANITARY AND TOXIC WASTES (DUMPSTER AREAS, CEMENT TRUCK WASHOUT, VEHICLE FUELING) SHALL BE CLEARLY IDENTIFIED.

COVERED CONTAINERS SHALL BE AVAILABLE FOR DISPOSAL OF DEBRIS TRASH AND HAZARDOUS WASTES.

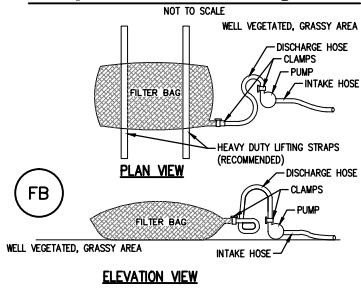
DUST CONTROL

FLUSTE DUST RESULTING FROM CONSTRUCTION ACTIVITIES SHALL BE MINIMIZED TO THE MAXIMUM EXTENT PRACTICAL BY IMPLEMENTING APPROPRIATE CONTROL MEASURES. THESE MEASURES INCLUDE THE APPLICATION OF MULCH, WATER, STONE, OR APPROVED CHEMICAL AGENTS ON ACCESS ROADS, EXPOSED SOILS, STOCKPILED SOILS, OR UNPAVED PUBLIC ROADS WHEN DRY AND WINDY CONDITIONS EXIST. A WATERING VEHICLE SHALL BE AVAILABLE FOR THE DURATION OF PROJECT ACTIVITIES, INCLUDING THROUGHOUT RESTORATION.

Standard Erosion And Sedimentation Control Plan Notes:

- VEHICLES AND EQUIPMENT MAY NEITHER ENTER DIRECTLY TO NOR EXIT DIRECTLY FROM ANYWHERE EXCEPT AT THE PROPOSED ROCK CONSTRUCTION ENTRANCES.
- STOCKPILE HEIGHTS MUST NOT EXCEED 35 FEET. STOCKPILE SLOPES MUST BE 2:1 OR FLATTER.
- THE OPERATOR SHALL ASSURE THAT THE APPROVED EROSION AND SEDIMENT CONTROL PLAN IS PROPERLY AND COMPLETELY IMPLEMENTED.
- FAILURE TO CORRECTLY INSTALL SEDIMENT CONTROL FACILITIES OR FAILURE TO PREVENT SEDIMENT LAZEN RUNOFF FROM LEAVING THE CONSTRUCTION SITE OR FAILURE TO TAKE CORRECTIVE ACTIONS TO IMMEDIATELY RESOLVE FAILURES OF SEDIMENT CONTROL FACILITIES MAY RESULT IN ADMINISTRATIVE, CIVIL AND/OR CRIMINAL PENALTIES BEING INSTITUTED.
- UNTIL THE SITE ACHIEVES FINAL STABILIZATION, THE OPERATOR SHALL ASSURE THAT THE BEST MANAGEMENT PRACTICES ARE IMPLEMENTED, OPERATED, AND MAINTAINED PROPERLY AND COMPLETELY. MAINTENANCE SHALL INCLUDE INSPECTIONS OF ALL BEST MANAGEMENT PRACTICE FACILITIES. THE OPERATOR WILL MAINTAIN AND MAKE AVAILABLE TO THE DEPARTMENT AND APPLICABLE CONSERVATION DISTRICT, WRITTEN INSPECTION LOGS OF ALL THOSE INSPECTIONS. ALL MAINTENANCE WORK, INCLUDING CLEANING, REPAIR, REPLACEMENT, TRENCHING, AND RESTABILIZATION SHALL BE PERFORMED IMMEDIATELY.
- IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE OPERATOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES TO ELIMINATE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION.
- ALL PUMPING OF SEDIMENT LAZEN WATER SHALL BE THROUGH A SEDIMENT CONTROL BMP, SUCH AS A PUMPED WATER FILTER BAG DISCHARGING OVER NON-DISTURBED AREAS.
<

Pumped Water Filter Bag Detail



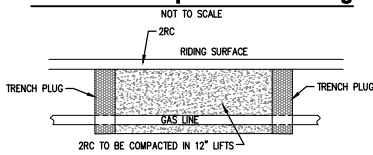
NOTES:

- LOW VOLUME FILTER BAGS SHALL BE MADE FROM NON-WOVEN GEOTEXTILE MATERIAL SEWN WITH HIGH STRENGTH, DOUBLE STITCHED "J" TYPE SEAMS. THEY SHALL BE CAPABLE OF TRAPPING PARTICLES LARGER THAN 150 MICRONS. HIGH VOLUME FILTER BAGS SHALL BE MADE FROM WOVEN GEOTEXTILES THAT MEET THE FOLLOWING STANDARDS:

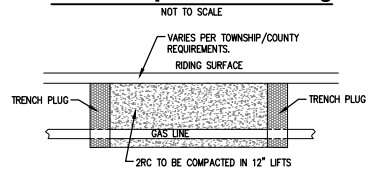
PROPERTY	TEST METHOD	MINIMUM STANDARD
AVG. WIDE WIDTH STRENGTH	ASTM D-4884	60 LB/IN
GRAB TENSILE	ASTM D-4632	205 LB
PUNCTURE	ASTM D-4833	110 LB
MULLEN BURST	ASTM D-3786	350 PSI
UV RESISTANCE	ASTM D-4355	85%
AOS % RETAINED	ASTM D-4751	80 SIEVE

- A SUITABLE MEANS OF ACCESSING THE BAG WITH MACHINERY REQUIRED FOR DISPOSAL PURPOSES SHALL BE PROVIDED. FILTER BAGS SHALL BE REPLACED WHEN THEY BECOME 1/2 FULL OF SEDIMENT. SPARE BAGS SHALL BE KEPT AVAILABLE FOR REPLACEMENT OF THOSE THAT HAVE FAILED OR ARE FILLED. BAGS SHALL BE PLACED ON STRAPS TO FACILITATE REMOVAL UNLESS BAGS COME WITH LIFTING STRAPS ALREADY ATTACHED.
- BAGS SHALL BE LOCATED IN WELL-VEGETATED (GRASSY) AREA, AND DISCHARGE ONTO STABLE, EROSION RESISTANT AREAS. WHERE THIS IS NOT POSSIBLE, A GEOTEXTILE UNDERLAYMENT AND FLOW PATH SHALL BE PROVIDED. BAGS MAY BE PLACED ON FILTER STONE TO INCREASE DISCHARGE CAPACITY. BAGS SHALL NOT BE PLACED ON SLOPES GREATER THAN 5% FOR SLOPES EXCEEDING 5% CLEAN ROCK OR OTHER NON-ERODIBLE AND NON-POLLUTING MATERIAL MAY BE PLACED UNDER THE BAG TO REDUCE SLOPE STEEPNESS.
- NO DOWNSLOPE SEDIMENT BARRIER IS REQUIRED FOR MOST INSTALLATIONS.
- THE PUMP DISCHARGE HOSE SHALL BE INSERTED INTO THE BAGS IN THE MANNER SPECIFIED BY THE MANUFACTURER AND SECURELY CLAMPED. A PIECE OF PVC PIPE IS RECOMMENDED FOR THIS PURPOSE.
- THE PUMPING RATE SHALL BE NO GREATER THAN 750 GPM OR 1/2 THE MAXIMUM SPECIFIED BY THE MANUFACTURER, WHICHEVER IS LESS. PUMP INTAKES SHALL BE FLOATING AND SCREENED.
- FILTER BAGS SHALL BE INSPECTED DAILY. IF ANY PROBLEM IS DETECTED, PUMPING SHALL CEASE IMMEDIATELY AND NOT RESUME UNTIL THE PROBLEM IS CORRECTED.

Stone/Dirt Twp. Road Crossing

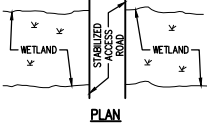


Paved Twp. Road Crossing



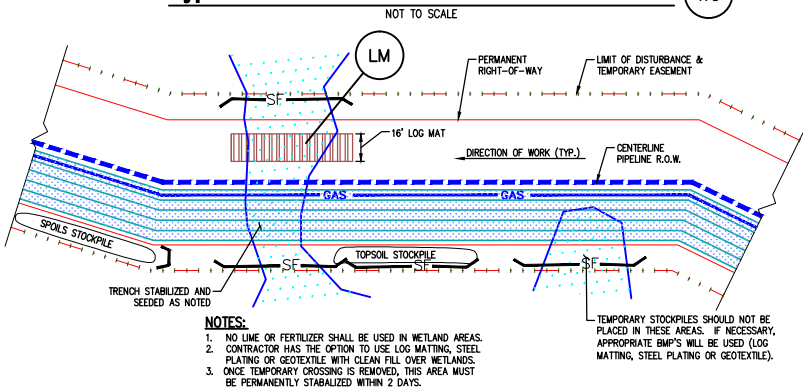
Access Road Wetland And Crossing

REMOVAL OF TREES, TREE STUMPS, BRUSH AND VEGETATION SHOULD BE KEPT TO A MINIMUM IN THE WETLAND. GRADING SHOULD BE LIMITED TO THE AREA DIRECTLY OVER THE TRENCH TO THE EXTENT POSSIBLE. WHERE CLEARING OF TREES AND VEGETATION IS REQUIRED FOR THE EQUIPMENT ACCESS AREAS, THE TREE AND VEGETATION ROOT MASS IS TO REMAIN UNDISTURBED. VEGETATION MAY BE CUT AT/NEAR THE GROUND LINE AND SHOULD BE REMOVED FROM THE WETLAND. TREES SHOULD BE CUT ABOVE THE GROUND LINE AND SHOULD BE REMOVED FROM THE WETLAND. TREES SHOULD BE CUT ABOVE THE GROUND LINE WITH THE STUMPS LEFT IN PLACE, EXCEPT WHERE REMOVAL IS REQUIRED FOR SAFETY REASONS.

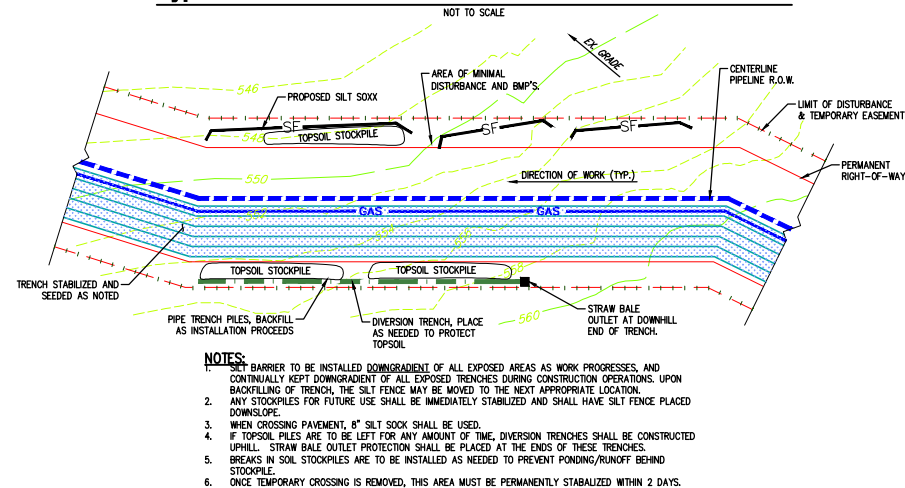


THE MOVEMENT OF VEHICLES AND/OR EQUIPMENT ACROSS WETLANDS, SHOULD BE KEPT TO AN ABSOLUTE MINIMUM. THE ACCESS ROAD WIDTH SHOULD BE KEPT TO A MINIMUM AND BE STABILIZED AS SPECIFIED IN THE EROSION AND SEDIMENTATION CONTROL PLAN. THE ACCESS ROAD MAY BE STABILIZED BY PLACING GRAVEL, OR CRUSHED AGGREGATE UPON GEOTEXTILE FABRIC, OR BY PLACING TIMBER RIP RAP OR PREFABRICATED SWAMP MATS. THE TIMBER RIP RAP OR PREFABRICATED SWAMP MATS SHOULD NOT BE MORE THAN 2 LAYERS THICK. A PROPERLY DESIGNED PLANK ROAD MAY ALSO BE UTILIZED. DIRT, ROCK, STUMPS OR BRUSH SHALL NOT BE USED TO STABILIZE THE WETLAND. ALL MATERIAL USED TO STABILIZE THE ACCESS ROAD MUST BE REMOVED FROM THE WETLAND WHEN UTILITY CONSTRUCTION IS COMPLETED.

Typical Trench E&S Controls For Wetland Areas



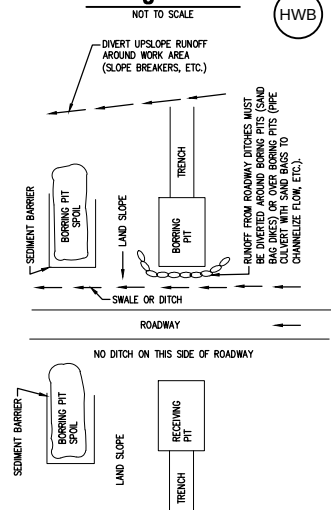
Typical Trench E&S Controls For Areas Outside Of Wetlands



- NOTES:
- SILT BARRIER TO BE INSTALLED DOWNGRADIENT OF ALL EXPOSED AREAS AS WORK PROGRESSES, AND CONTINUALLY KEPT DOWNGRADIENT OF ALL EXPOSED TRENCHES DURING CONSTRUCTION OPERATIONS. UPON BACKFILLING OF TRENCH, THE SILT FENCE MAY BE MOVED TO THE NEXT APPROPRIATE LOCATION.
 - ANY STOCKPILES FOR FUTURE USE SHALL BE IMMEDIATELY STABILIZED AND SHALL HAVE SILT FENCE PLACED DOWNSLOPE.
 - WHEN CROSSING PAVEMENT, 8\"/>

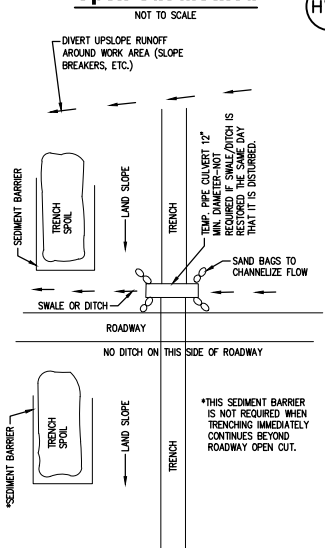
Utility Line Highway/Roadway Crossing

Boring Method

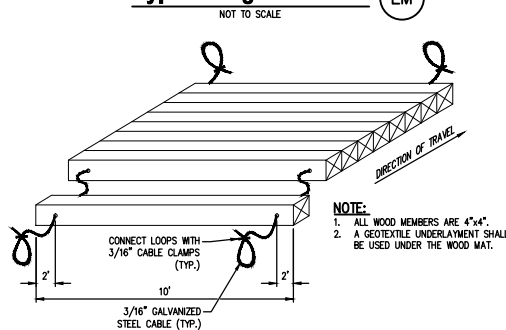


Utility Line Highway/Roadway Crossing

Open Cut Method

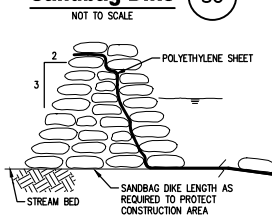


Typical Log Mat Detail

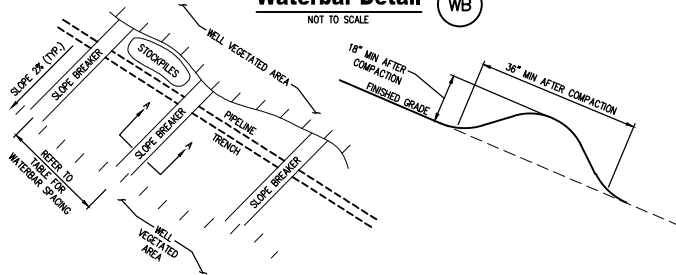


- NOTE:
- ALL WOOD MEMBERS ARE 4\"/>

Sandbag Dike



Waterbar Detail

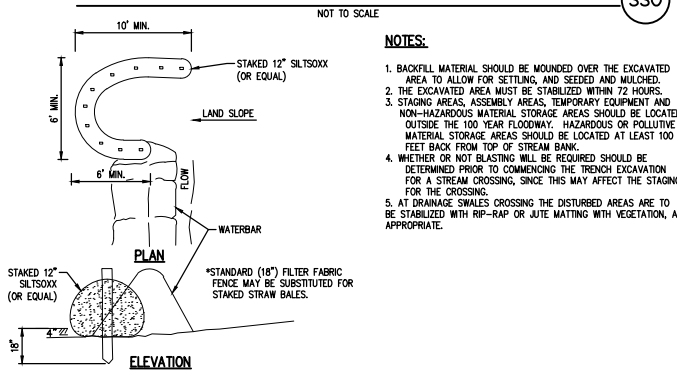


Required Spacing For Temporary Waterbars

PERCENT SLOPE	SPACING (FT.)
< 5	250
5 - 15	150
15 - 30	100
> 30	50

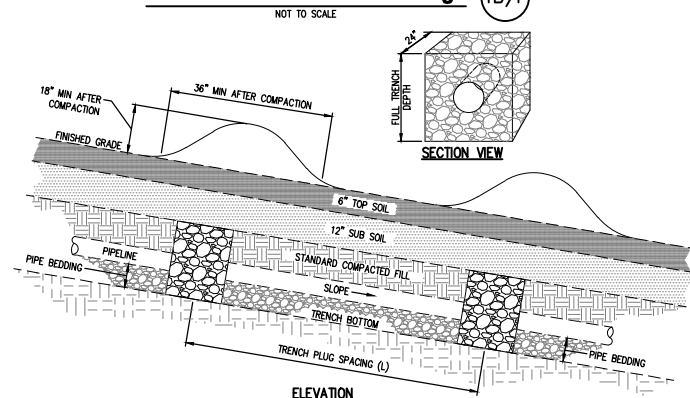
* PERMANENT WATERBARS ARE REQUIRED AT ALL STREAM, RIVER, AND OTHER WATER BODY CROSSINGS AS WELL AS UPSLOPE FROM ROADWAY AND RAILROAD CUT SLOPES. OTHERWISE NOT REQUIRED.

Sediment Filter-Sock Protection At Waterbar Outlet



- NOTES:
- BACKFILL MATERIAL SHOULD BE MOUND OVER THE EXCAVATED AREA TO ALLOW FOR SETTLING AND SEEDING AND MULCHED.
 - THE EXCAVATED AREA MUST BE STABILIZED WITHIN 72 HOURS.
 - STAGING AREAS, ASSEMBLY AREAS, TEMPORARY EQUIPMENT AND NON-HAZARDOUS MATERIAL STORAGE AREAS SHOULD BE LOCATED OUTSIDE THE 100 YEAR FLOODWAY. HAZARDOUS OR POLLUTIVE MATERIAL STORAGE AREAS SHOULD BE LOCATED AT LEAST 100 FEET BACK FROM TOP OF STREAM BANK.
 - WHETHER OR NOT BLASTING WILL BE REQUIRED SHOULD BE DETERMINED PRIOR TO COMMENCING THE TRENCH EXCAVATION FOR A STREAM CROSSING, SINCE THIS MAY AFFECT THE STAGING FOR THE CROSSING.
 - AT DRAINAGE SWALES CROSSING THE DISTURBED AREAS ARE TO BE STABILIZED WITH RIP-RAP OR JUTE MATTING WITH VEGETATION, AS APPROPRIATE.

Trench Breakers/Trench Plugs



Required Spacing And Materials For Trench Breakers/Trench Plugs

TRENCH SLOPE	SPACING (L) IN FEET	PLUG MATERIAL
0-5%	1000	CLAY, BENTONITE, OR CONCRETE FILLED SACKS
5-15%	500	CLAY, BENTONITE, OR CONCRETE FILLED SACKS
15-25%	300	CLAY, BENTONITE, OR CONCRETE FILLED SACKS
25-35%	200	CLAY, BENTONITE, OR CONCRETE FILLED SACKS
35-100%	100	CLAY, BENTONITE, OR CONCRETE FILLED SACKS
OVER 100%	50	CLAY, BENTONITE, OR CONCRETE FILLED SACKS

- NOTES:
- IMPERVIOUS TRENCH PLUGS ARE REQUIRED FOR ALL STREAM, RIVER, WETLAND, OR OTHER BODY CROSSING REGARDLESS OF TRENCH SLOPE.
 - TO ENSURE PROPER TOPSOIL CONSERVATION, TOPSOIL SHOULD NOT BE USED IN EARTH FILLED SACKS.
 - PLACE AT ALL VERTICAL ANGLE POINTS (TOP AND BOTTOM OF SLOPE).
 - TRENCH BREAKERS/TRENCH PLUGS SHOULD BE INSTALLED IN ALL UTILITY LINE TRENCHES PER TABLE ABOVE.
- TABLE ABOVE INDICATES THE REQUIRED SPACING AND MATERIALS FOR THE TRENCH BREAKERS/TRENCH PLUGS.

- GENERAL NOTES:
- ALL BMP'S SHALL BE INSPECTED AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ANY NECESSARY REPAIRS MUST BE MADE IMMEDIATELY TO ENSURE EFFECTIVE AND EFFICIENT OPERATION.
 - BMP'S SHOWN MAY NEED TO BE FIELD ADJUSTED TO FIT ACTUAL CONDITIONS.
 - IN SOME CASES, THE NEXT LARGER BMP MAY BE NEEDED DUE TO UNFORESEEN CONDITIONS.
 - ADDITIONAL BMP'S MAY BE REQUIRED OTHER THAN THOSE SHOWN.
 - THE CONTRACTOR SHALL TAKE WHATEVER MEASURES NECESSARY TO PREVENT SEDIMENT FROM LEAVING THE SITE.

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SEAL

E&SPC TYPICAL DETAIL SHEET 3

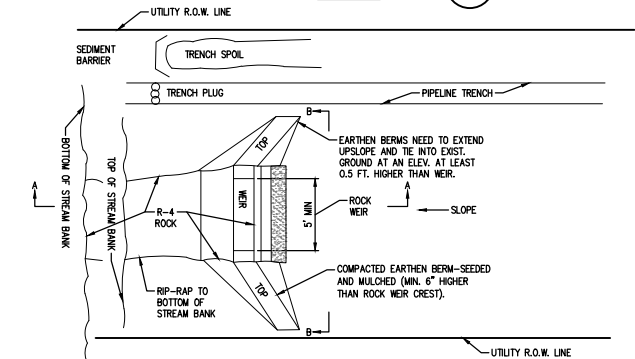
AVON LAKE GAS ADDITION PROJECT			
CARLISLE, EATON & LAGRANGE TOWNSHIPS AVON, AVON LAKE, ELYRIA & NORTH RIDGEVILLE CITIES LORAIN COUNTY OHIO	DRAWN BY: AEJ		PROJECT NO.
	CHECKED BY: SJC		NRG-1007
	DATE: 12.15.14		SHEET NO.
	SCALE: AS NOTED		85 OF 88
Hanover Engineering Associates Inc		3355 Route 611, Suite 1 Bartonsville, PA 18321-7822 570.688.9550 Fax 570.688.9768	

Rock Filter Berm

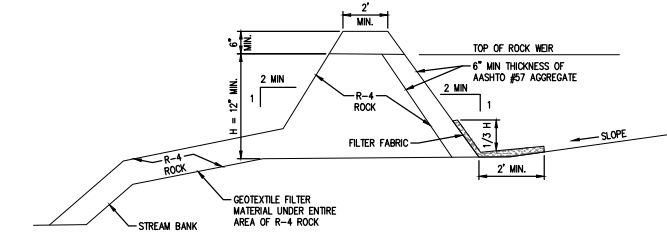
NOT TO SCALE

PLAN VIEW

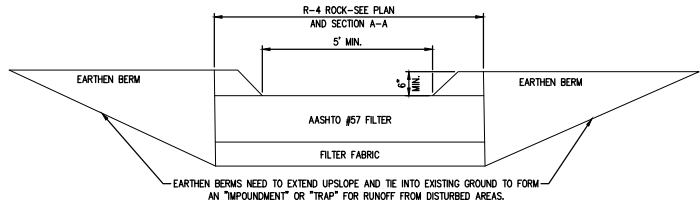
RFB



SECTION A-A ROCK FILTER BERM



SECTION B-B ROCK FILTER BERM

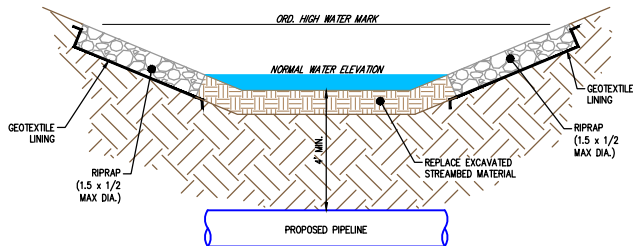


NOTES:

1. THE "ROCK FILTER BERM" SHOULD ONLY BE USED AT THE BOTTOM OF VERY STEEP UTILITY LINE SLOPES THAT DISCHARGE DIRECTLY TO A STREAM OR RIVER AND WHERE THERE IS NOT SUFFICIENT AREA TO INSTALL CONVENTIONAL SEDIMENT POLLUTION CONTROLS (SEDIMENT TRAPS, ETC.).
2. GEOTEXTILE FILTER MATERIAL SHOULD BE PLACED UNDER THE ENTIRE AREA OF THE R-4 ROCK. R-4 ROCK SHOULD BE PLACED IN THE FLOW PATH FROM THE ROCK FILTER TO THE BOTTOM OF THE STREAM BANK. IF THE STREAM BANK IS TOO STEEP TO PROPERLY PLACE THE R-4 ROCK, THEN THE GEOTEXTILE MATERIAL ALONE SHOULD EXTEND DOWN OVER THE STREAM BANK AND BE SECURED TO PREVENT ITS MOVEMENT OR DISPLACEMENT.
3. THE EARTHEN BERMS NEED TO EXTEND UPSLOPE AND TIE INTO EXISTING GROUND AT AN ELEVATION AT LEAST 0.5 FEET HIGHER THAN THE ROCK WEIR CREST. THE OBJECTIVE IS TO COLLECT RUNOFF FROM DISTURBED AREAS AND MAKE THAT RUNOFF FLOW THROUGH THE FILTER MEDIA.
4. IF AN ACCESS ROAD PARALLEL TO THE TRENCH IS NEEDED, THE AFFECTED EARTHEN BERM SHOULD BE DESIGNED AND INSTALLED SO THAT TRAFFIC CAN SAFELY PASS OVER IT. ALSO, THE BEM SHOULD BE "REINFORCED" TO PREVENT "BREAKDOWN" FROM HEAVY VEHICLES.
5. ALL OF THE AREAS THAT ARE DISTURBED TO INSTALL THE ROCK FILTER BERM SHOULD BE SEEDED AND MULCHED.
6. SEDIMENT SHOULD BE REMOVED FROM THE FILTER WHEN IT REACHES HALF OF THE HEIGHT OF THE FILTER FABRIC ON THE UPSLOPE SIDE OF THE FILTER. THE REMOVED SEDIMENT SHOULD BE DISPOSED OF AT A LOCATION THAT PREVENTS SEDIMENT FROM DISCHARGING TO A STREAM.

Utility Trench Crossing

NOT TO SCALE



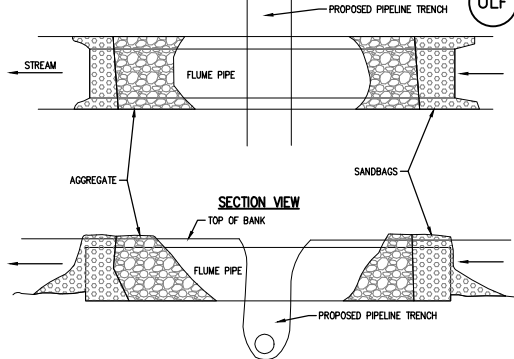
* ONLY REQUIRED IF EROSION CONDITIONS PREVAIL.

Utility Line Stream Crossing With Pipe Flume

NOT TO SCALE

PLAN VIEW

ULF

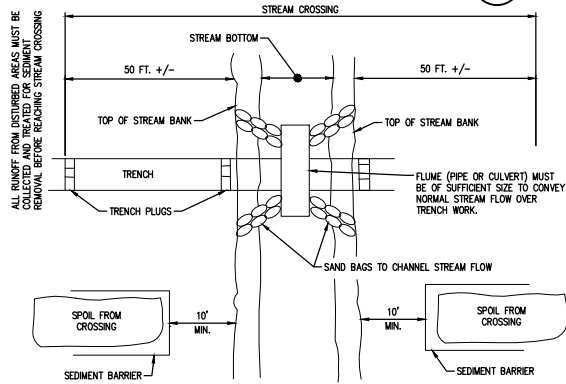


Utility Line Stream Crossing With Pipe Flume

NOT TO SCALE

PLAN VIEW

ULF



NOTES:

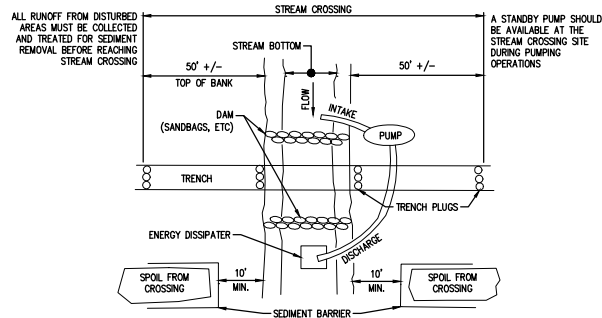
1. TRENCH EXCAVATION FOR UTILITY LINE CROSSINGS SHOULD BE UNDERTAKEN FROM THE TOP OF BANKS WHENEVER POSSIBLE. THE CROSSING SHOULD BE PERPENDICULAR TO THE LENGTH OF THE STREAM TO MINIMIZE THE DISTURBED AREA IN THE STREAM.
2. ALL EXCAVATED CHANNEL MATERIALS THAT WILL BE SUBSEQUENTLY USED AS BACKFILL WILL BE PLACED IN A TEMPORARY STOCKPILE LOCATED OUTSIDE OF THE CHANNEL. THESE STORAGE AREAS MUST BE ENFORCED WITH A BARRIER OR SEDIMENT REMOVAL STRUCTURE TO PREVENT SEDIMENT LADEN RUNOFF FROM RE-ENTERING THE CHANNEL. ALL EXCAVATED MATERIALS THAT WILL NOT BE USED ON THE SITE CANNOT BE STORED IN THE FLOODPLAIN AND MUST BE HAULED TO A DISPOSAL SITE LOCATED OUTSIDE OF THE FLOODPLAIN.
3. DISTURBED AREAS SHOULD BE STABILIZED WHEN THE CROSSING IS COMPLETED.
4. ALL WORK, INCLUDING STABILIZATION, SHOULD BE PLANNED FOR PERIODS OF LOW STREAM FLOWS. THE SCHEDULE SHOULD ALLOW SUFFICIENT TIME TO ALLOW FOR THE ESTABLISHMENT OF AN EROSION RESISTANT VEGETATIVE COVER ON DISTURBED AREAS BEFORE THE START OF THE DORMANT SEASON UNLESS OTHER MEANS TO STABILIZE AGAINST EROSION ARE USED.
5. TEMPORARY ACCESS ROADS, CROSSINGS WHERE REPEATED TRAFFIC IS PLANNED, AND ANY OTHER FORM OF TEMPORARY FILL OR BALLAST LOCATED WITHIN THE CHANNEL, WILL BE CONSTRUCTED WITH CLEAN ROCK FILL.

Utility Line Stream Crossing With Dam And Pumping

NOT TO SCALE

PLAN VIEW

ULP



A STANDBY PUMP SHOULD BE AVAILABLE AT THE STREAM CROSSING SITE DURING PUMPING OPERATIONS

GENERAL NOTES:

1. ALL BMPs SHALL BE INSPECTED AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ANY NECESSARY REPAIRS MUST BE MADE IMMEDIATELY TO ENSURE EFFECTIVE AND EFFICIENT OPERATION.
2. BMPs SHOWN MAY NEED TO BE FIELD ADJUSTED TO FIT ACTUAL CONDITIONS.
3. IN SOME CASES, THE NEXT LARGER BMP MAY BE NEEDED DUE TO UNFORESEEN CONDITIONS.
4. ADDITIONAL BMPs MAY BE REQUIRED OTHER THAN THOSE SHOWN.
5. THE CONTRACTOR SHALL TAKE WHATEVER MEASURES NECESSARY TO PREVENT SEDIMENT FROM LEAVING THE SITE.

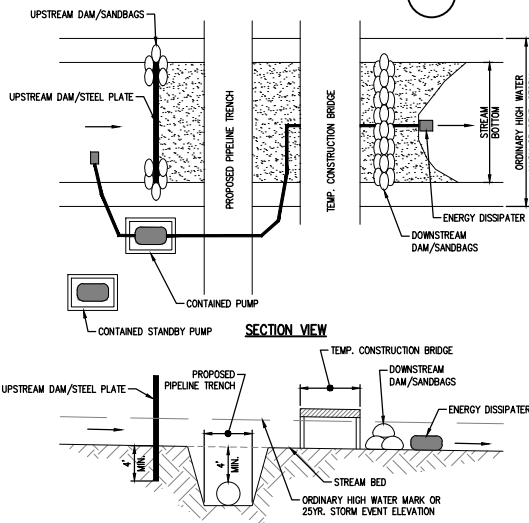
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Utility Line Stream Crossing With Steel Plate

NOT TO SCALE

PLAN VIEW

ULP



Utility Line Crossing General Notes:

THESE COMMENTS APPLY TO BOTH "UTILITY LINE STREAM CROSSING WITH PIPE FLUME" AND "UTILITY LINE STREAM CROSSING WITH DAM AND PUMPING".

UTILITY LINE STREAM CROSSING ARE CONSIDERED TO BEGIN (OR END) 50 FEET BACK FROM THE TOP OF THE STREAM BANK ON BOTH SIDES OF THE STREAM. PIPELINES WITH THE PIPE JOINTS ASSEMBLED/MADE IN THE TRENCH SHOULD MAINTAIN A 50 FOOT BUFFER ON BOTH SIDES OF THE STREAM UNTIL THE STREAM CROSSING COMMENCES. LARGE DIAMETER STEEL PIPELINES WITH WELDED JOINTS WHERE THE PIPE JOINTS ARE WELDED WHILE THE PIPELINE IS OUT OF THE TRENCH SHOULD MAINTAIN A 25 FOOT BUFFER ON BOTH SIDES OF THE STREAM UNTIL THE STREAM CROSSING COMMENCES.

A UTILITY LINE STREAM CROSSING OF A STREAM 10 FEET IN (BOTTOM) WIDTH OR LESS SHOULD BE COMPLETED WITHIN 24 HOURS (FROM START TO FINISH) INCLUDING THE TRENCH BACKFILLING.

FACILITIES FOR REMOVING SEDIMENT FROM PUMPED WATER SHOULD BE AVAILABLE AT THE UTILITY LINE STREAM CROSSING SITE BEFORE TRENCHING COMMENCES AND MAINTAINED UNTIL TRENCH BACKFILLING IS COMPLETED.

ASSEMBLY AREAS, TEMPORARY EQUIPMENT AND NON-HAZARDOUS MATERIAL STORAGE AREAS SHOULD BE LOCATED AT LEAST 50 FEET BACK FROM THE TOP OF THE STREAM BANK.

HAZARDOUS OR POLLUTIVE MATERIAL STORAGE AREAS SHOULD BE LOCATED AT LEAST 100 FEET BACK FROM THE TOP OF THE STREAM BANK.

ALL EXCESS EXCAVATED MATERIAL SHALL BE IMMEDIATELY REMOVED FROM STREAM CROSSING.

UTILITY LINE CROSSING OF A STREAM CHANNEL WITH A BOTTOM WIDTH OF 10 FEET OR LESS SHALL BE COMPLETED WITHIN 24 HOURS FROM START TO FINISH. CROSSINGS WITH A BOTTOM WIDTH OF 10 FEET TO 100 FEET SHALL BE COMPLETED WITHIN 48 HOURS FROM START TO FINISH. COMPLETION INCLUDES THE STABILIZATION OF STREAM BANKS AND THE STABILIZATION OF THE AREA 50 FEET BACK FROM THE TOP OF EACH STREAM BANK.

UTILITY LINE WETLAND CROSSING

STAGING AREAS OR WORK AREAS REQUIRED TO MAKE THE WETLAND CROSSING SHOULD BE LOCATED IN AN UPLAND AT LEAST 50 FEET FROM THE WETLAND EDGE AND INDICATED ON THE SITE DRAWINGS. STREAM/RIVER CROSSINGS MUST BE CAREFULLY PLANNED AND CONSTRUCTED WHERE WETLANDS ARE ADJACENT TO THE STREAM/RIVER CROSSING. WHERE TRENCH SPOIL FROM THE STREAM/RIVER CROSSING MUST BE TEMPORARILY PLACED/STORED ON AN ADJACENT WETLAND, SUFFICIENT RIGHT-OF-WAY SHOULD BE FURNISHED FOR THE TRENCH SPOIL AND THE STREAM/RIVER CROSSING WORK AND PRECAUTIONS SHOULD BE TAKEN TO PREVENT THE TRENCH SPOIL FROM INTERMIXING WITH THE WETLANDS SOILS. IT MAY BE NECESSARY TO PLACE A LAYER OF GEOTEXTILE MATERIAL OR OTHER COVER ON THE WETLAND TO TEMPORARILY STORE THE STREAM CROSSING TRENCH SPOIL.

WHEN GRADING AND TRENCH EXCAVATION OCCUR WITHIN THE WETLAND, THE WETLAND TOPSOIL (WITH THE VEGETATION ROOT MASS) SHALL BE CAREFULLY REMOVED AND STOCKPILED SEPARATELY FROM THE SUBSOIL. THE FOREGOING WILL NOT BE REQUIRED WHERE THERE IS STANDING WATER OR THE TOPSOIL IS SATURATED TO THE POINT THAT IT CANNOT BE SEGREGATED. SHORTLY AFTER THE PIPELINE IS INSTALLED AND THE TRENCH BACKFILLED, THE TOPSOIL SHOULD BE RESTORED TO THE GRADED AREAS.

SEDIMENT POLLUTION CONTROLS SHOULD BE PROVIDED AS NECESSARY TO PREVENT SEDIMENT DISCHARGES FROM DISTURBED AREAS INTO WETLANDS AND OFF THE RIGHT-OF-WAY FROM WETLAND CONSTRUCTION. WATER PUMPED OR REMOVED FROM TRENCHES SHALL NOT BE DISCHARGED INTO WETLANDS WITHOUT PROPER SEDIMENT REMOVAL TREATMENT.

BMPs (TRENCH PLUGS, ETC.) SHOULD BE IMPLEMENTED TO PREVENT THE TRENCH FROM PERMANENTLY DRAINING THE WETLAND OR CHANGING THE SITE HYDROLOGY. THE STOCKPILED WETLAND TOPSOIL SHOULD BE RETURNED TO ITS ORIGINAL HORIZON. ALL TEMPORARY RIGHT-OF-WAY STABILIZATION FOR THE ACCESS ROAD SHOULD BE REMOVED.

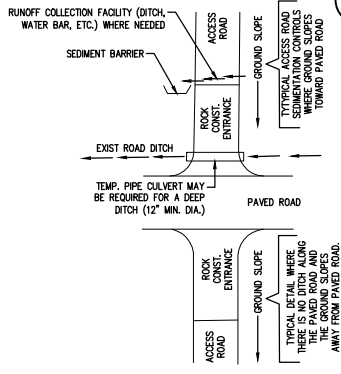
ORIGINAL CONTOURS AND CROSS DRAINAGES SHOULD BE RESTORED. ALL EXCESS SPOIL MUST BE REMOVED FROM THE WETLAND AND PROPERLY DISPOSED OF.

IN GENERAL, ANNUAL RYEGRASS AT THE RATE OF 40 POUNDS PER ACRE SHOULD BE APPLIED TO ALL DISTURBED AREAS WHERE STANDING WATER IS NOT PREVALENT. STRAW MULCH, WITHOUT BINDING AGENTS, SHOULD BE APPLIED AT THE RATE OF 3 TONS PER ACRE ON AREAS SEEDED WITH ANNUAL RYEGRASS. FUELS OR HAZARDOUS MATERIALS SHOULD NOT BE STORED WITHIN 100 FEET OF A WETLAND. APPLICATION OF CONCRETE COATING OF PIPES SHOULD NOT BE PERFORMED WITHIN 100 FEET OF A WETLAND.

Access Road Crossing Of Paved Road

NOT TO SCALE

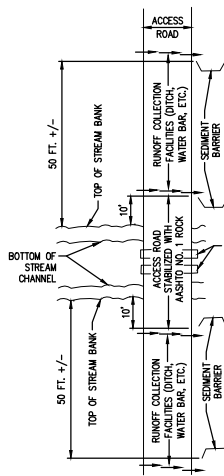
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Access Road Stream Crossing With Pipe Culverts

NOT TO SCALE

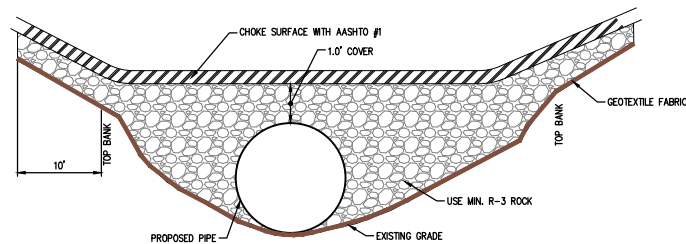
ARC



NOTE: SEE "ACCESS ROAD CROSS SECTION" DETAIL FOR PLACEMENT OF PIPE IN STREAM BED.

Access Road Cross Section

NOT TO SCALE



E&SPC TYPICAL DETAIL SHEET 4

SFAI	NO.	REVISIONS	DATE	AVON LAKE GAS ADDITION PROJECT			
				CARLISLE, EATON & LAGRANGE TOWNSHIPS AVON, AVON LAKE, ELYRIA & NORTH RIDGEVILLE CITIES LORAIN COUNTY OHIO		DRAWN BY: AEJ	PROJECT NO.
						CHECKED BY: SJC	NRG-1007
						DATE: 12.15.14	SHEET NO.
						SCALE: AS NOTED	86 OF 88
				Hanover Engineering Associates Inc		3355 Route 611, Suite 1 Bartonsville, PA 18321-7822 570.688.9550 Fax 570.688.9768	

- Typical Soil Stockpile** 
- NOT TO SCALE

Diagram illustrating the application of temporary seed mix and mulch on a slope. The diagram shows a cross-section of a slope with a maximum height of 35' MAX. The slope is divided into two sections: a lower section with a 2:1 slope and an upper section with a 1:1 slope. The temporary seed mix and mulch is applied to the upper section. The existing ground has a maximum slope of 8%.

Labels in the diagram include:

- 35' MAX.
- 2:1
- 1:1
- TEMPORARY SEED MIX AND MULCH ON ALL SURFACES
- EXISTING GROUND MAX. SLOPE = 8%

Filter fabric fence on low side and around both ends of stockpile, with stone filter at low point(s). Maintain as specified on details.

1. STOCKPILE TOPSOIL OR EXCAVATED SOIL MATERIAL AT LOCATIONS SHOWN FOR EACH PHASE OF CONSTRUCTION.
2. HEIGHT AND SIDES SLOPES SHALL NOT EXCEED MAXIMUM VALUES SHOWN ON DETAIL.
3. INSTALL FILTER FENCE PRIOR TO STOCKPILING OF MATERIAL. REPLACE ANY FENCE REMOVED FOR VEHICULAR ACCESS AFTER EACH WORK DAY.
4. APPLY A TEMPORARY SEED MIX AND MULCH WHEN PILE WILL REMAIN FOR 30 DAYS OR MORE.
5. TOPSOIL PILES AND TRENCH SOIL STOCKPILES SHOULD BE SEPARATED BY A MINIMUM OF 2 FEET TO AVOID CONTAMINATION OF TOPSOIL.

NOT TO SCALE

STRAW BALES - INSTALLED CONTINUOUSLY AGAINST DOWNSLOPE SIDE OF FILTER FABRIC FENCE

SUPPORT STAKES* (2 PER BALE)

SUPPORT STAKES* (Ø 8" MAX. SPACING)

FABRIC FENCE

BALE BINDING

COMPACTED BACKFILL

TOE ANCHOR TRENCH

FLOW

EXISTING GROUND

30"

18"

6"

12"

NOTES:

- ### Access Road For Pipe Installation

NOT TO SCALE

ACCESS ROADS SHALL ONLY BE PLACED AT LOCATION AS SHOWN
AND BACKFILLED, THESE ROADS SHALL BE REMOVED AND
AL STATE.
REMOVE STONE AND GEOTEXTILE AND SCARIFY THE AREA UNDER
ITE, LIME, SEED AND MULCH PER THE PERMANENT SEEDING
SPECS.
PROTECTION MAT SHALL BE APPLIED.

-
- 20 FT. WITH-IN STATE R.O.W.
- WIDTH VARIES
- EXISTING FARM LANE
- PLACE LAYER OF GEOTEXTILE
- C.A.B. DEPTH VARIES DUE TO DEPTH OF TOPSOIL

1. ALL BMP'S SHALL BE INSPECTED AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ANY NECESSARY REPAIRS MUST BE MADE IMMEDIATELY TO ENSURE EFFECTIVE AND EFFICIENT OPERATION.
2. BMP'S SHOWN MAY NEED TO BE FIELD ADJUSTED TO FIT ACTUAL CONDITIONS.
3. IN SOME CASES, THE NEXT LARGER BMP MAY BE NEEDED DUE TO UNFORESEEN CONDITIONS.
4. ADDITIONAL BMP'S MAY BE REQUIRED OTHER THAN THOSE SHOWN.
5. THE CONTRACTOR SHALL TAKE WHATEVER MEASURES NECESSARY TO PREVENT SEDIMENT FROM LEAVING THE SITE.

Diagram illustrating the cross-section view of the proposed road. The road width is 50' R.O.W. (Right of Way). The road surface is shown with a 2% min. backslope. The topsoil stockpile is indicated by a dashed line. The road is labeled "TEMP. CONSTRUCTION AREA (WIDTH VARIES)".

PLAN VIEW

70' (MIN.)

TEMPORARY CULVERT (IF NEEDED) MIN. 15' DIA.

15' OR TOTAL WIDTH OF ACCESS

15' OR TOTAL WIDTH OF ACCESS

#1 ROCK OVER-ROCK, TYPE 2B

C = 8 IN.

SECTION A-A

RADIUS=35'

AREAS TO RECEIVE RADIUS TO FIT SITE CONDITIONS(MIN.-10 FT.)

ROADSIDE DITCH FLOWS TO BE MAINTAINED. USE APPROPRIATE SIZED CULVERTS AS NECESSARY.

GEOTEXTILE W/ GRAB TEN AND MULLEN

The diagram consists of two parts. The top part is a perspective view of a rectangular wash rack. It is filled with a blue stippled pattern representing #1 rock. A dashed line with an arrow indicates the flow of water from the left towards the right end of the rack. The right end of the rack is shown with a series of parallel lines, representing the grate. The bottom part is a cross-sectional view of the wash rack. It shows a layer of blue stippled material (the rock) on top of a solid grey base. The base is labeled 'REINFORCED CONCRETE OR WELDED STEEL PIPE'. The top surface of the rock layer is labeled 'WASH RACK'. The right side of the rock layer is labeled 'DRAIN SPACE'. A dimension line above the cross-section indicates a length of '5' - 7'.

WASH RACK

AASHTO #1 ROCK (6" THICK)
EXTENDING 25' MIN. ON BOTH
APPROACHES TO WASH RACK

5' - 7'

REINFORCED CONCRETE
OR WELDED STEEL PIPE

DRAIN SPACE

NOT TO SCALE
INSTALL PER MANUFACTURERS' SPECIFICATIONS

COMPOST FILTER SOCK
PLACED OVER MEDIA
AREA

2"x2" WOODEN STAKES
PLACED 10 FT ON
CENTER

UNDISTURBED AREA

12' MIN.

SECTION

DISTURBED AREA

102'
101'
100'

UNDISTURBED AREA

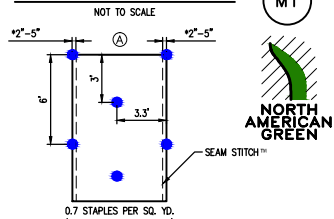
2"x2" WOODEN
PLACED 10 FT
CENTER

PLAN VIEW

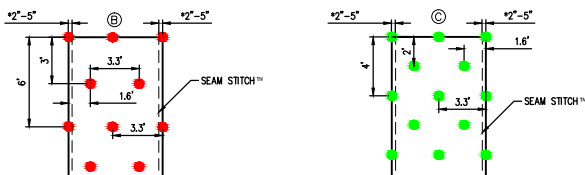
- NOTES:**
1. SOCK FABRIC SHALL MEET STANDARDS OF CHAPTER 6 OF THE RAINWATER & LAND DEVELOPMENT MANUAL FOR OHIO. COMPOST FILT SOCK SHALL MEET THE STANDARDS OF CHAPTER 6 OF THE RAINWATER & LAND DEVELOPMENT MANUAL FOR OHIO.
 2. COMPOST FILTER SOCK SHALL BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE BARRIER SHALL BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN BARRIER ALIGNMENT. MAXIMUM SOLE LENGTH AND MAXIMUM SOLE WIDTH SHALL NOT EXCEED THAT SPECIFIED FOR THE SIZE OF THE SOCK AND THE SLOPE OF ITS TERRITORY AREA.
 3. TRAFFIC SHALL NOT BE PERMITTED TO CROSS COMPOST FILTER SOCKS.
 4. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES 1/2" ABOVE GROUND HEIGHT OF THE BARRIER AND DISPOSED IN THE MANNER DESCRIBED ELSEWHERE IN THE PLAN.
 5. COMPOST FILTER SOCKS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED SOCKS SHALL BE REPLACED ACCORDING TO MANUFACTURER'S RECOMMENDATION WITHIN 24 HOURS OF INSPECTION.
 6. BIODEGRADABLE COMPOST FILTER SOCKS SHALL BE REPLACED AFTER 6 MONTHS; PHOTODEGRADABLE SOCKS AFTER 1 YEAR. POLYPROPYLENE SOCKS SHALL BE REPLACED ACCORDING TO MANUFACTURER.
 7. UPON REMOVAL OF THE SOCKS, THE UNDERLYING SOIL SHALL BE REVEALED. THE SOCK MAY BE LEFT IN PLACE AND VEGETATED OR REMOVED. IN THE LATTER CASE, THE MESH SHALL BE CUT OPEN AND THE MESH SPREAD AS A SOIL SUPPLEMENT.
 8. THE SURFACE SHOULD BE PREPARED PRIOR TO INSTALLATION OF SILT SOCKS TO CREATE A DIRECT CONTACT BETWEEN THE BOTTOM OF THE SILT SOCKS AND THE EARTH ON WHICH THEY ARE PLACED.

Staple Pattern Guide

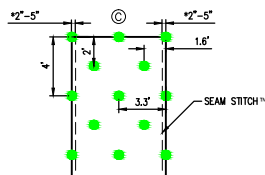
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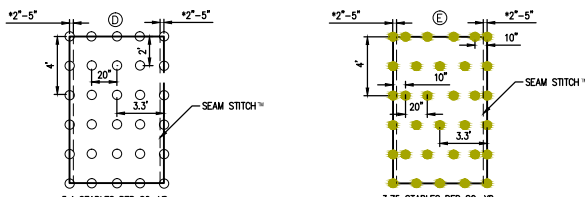
FOR BLANKETS WITH THE OPTIONAL NORTH AMERICAN GREEN DOT SYSTEM™ PLACE STAPLES/STAKES THROUGH EACH OF THE BLUE COLORED DOTS.



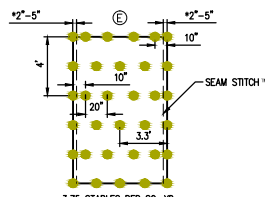
FOR BLANKETS WITH THE OPTIONAL NORTH AMERICAN GREEN DOT SYSTEM™ PLACE STAPLES/STAKES THROUGH EACH OF THE RED COLORED DOTS.



FOR BLANKETS WITH THE OPTIONAL NORTH AMERICAN GREEN DOT SYSTEM™ PLACE STAPLES/STAKES THROUGH EACH OF THE GREEN COLORED DOTS.



FOR BLANKETS WITH THE OPTIONAL NORTH AMERICAN GREEN DOT SYSTEM™ PLACE STAPLES/STAKES THROUGH EACH OF THE WHITE COLORED DOTS.

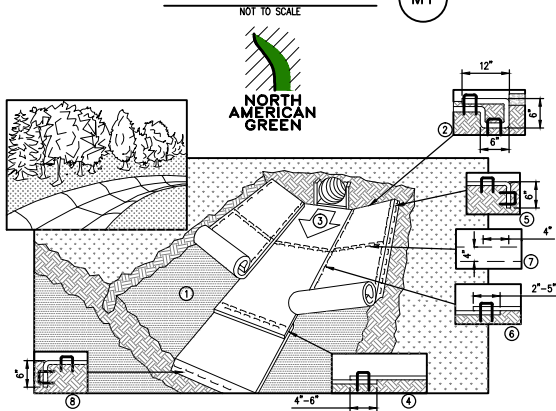


FOR BLANKETS WITH THE OPTIONAL NORTH AMERICAN GREEN DOT SYSTEM™ PLACE STAPLES/STAKES THROUGH EACH OF THE YELLOW COLORED DOTS.

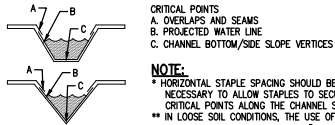
*LOCATION OF SEAM STITCH™ WILL VARY DEPENDING ON NORTH AMERICAN GREEN PRODUCT TYPE.
14649 HIGHWAY 41 NORTH, EVANSVILLE, INDIANA 47725
USA 1-800-772-2040 CANADA 1-800-448-2040
www.nogreen.com

Channel Installation

MT



1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-0-SEED DO NOT SEED PREPARED AREA. CELL-0-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE BLANKET IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL CENTER BLANKET IN DIRECTION OF WATER FLOW IN BOTTOM OF CHANNEL. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING OPTIONAL DOT SYSTEM™, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. PLACE CONSECUTIVE BLANKETS END OVER END (SHINGLE STYLE) WITH A 4"-6" OVERLAP. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER TO SECURE BLANKETS.
5. FULL LENGTH EDGE OF BLANKETS AT TOP OF SIDE SLOPES MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
6. ADJACENT BLANKETS MUST BE OVERLAPPED APPROXIMATELY 2'-5" (DEPENDING ON BLANKET TYPE) AND STAPLED. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH™ ON THE BLANKET BEING OVERLAPPED.
7. IN HIGH FLOW CHANNEL APPLICATIONS, A STAPLE CHECK SLOT IS RECOMMENDED AT 30 TO 40 FOOT INTERVALS. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER OVER ENTIRE WIDTH OF THE CHANNEL.
8. THE TERMINAL END OF THE BLANKETS MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.

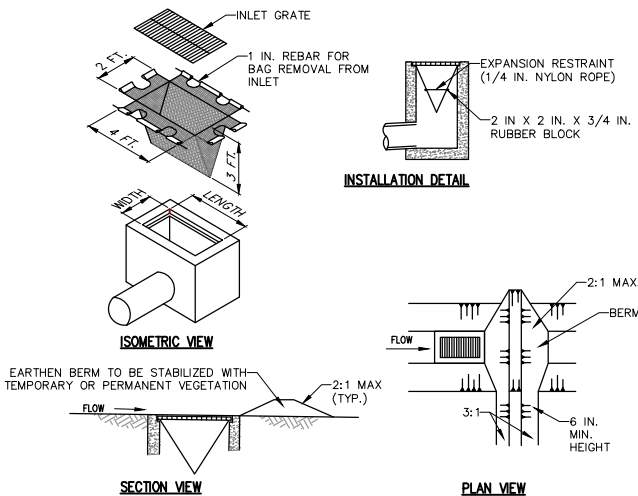


CRITICAL POINTS
A. OVERLAPS AND SEAMS
B. PROTECTED WATER LINE
C. CHANNEL BOTTOM/SIDE SLOPE VERTICES
NOTE:
* HORIZONTAL STAPLE SPACING SHOULD BE ALTERED IF NECESSARY TO ALLOW STAPLES TO SECURE THE CRITICAL POINTS ALONG THE CHANNEL SURFACE.
** IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY ANCHOR THE BLANKETS.

14649 HIGHWAY 41 NORTH, EVANSVILLE, INDIANA 47725
USA 1-800-772-2040 CANADA 1-800-448-2040
www.nogreen.com

FILTER BAG INLET PROTECTION - TYPE M INLET

NOT TO SCALE



NOTES:

MAXIMUM DRAINAGE AREA = 1/2 ACRE.

INLET PROTECTION SHALL NOT BE REQUIRED FOR INLET TRIBUTARY TO SEDIMENT BASIN OR TRAP. BERMS SHALL BE REQUIRED FOR ALL INSTALLATIONS.

ROLLED EARTHEN BERM IN ROADWAY SHALL BE MAINTAINED UNTIL ROADWAY IS STONED. ROAD SUBBASE BERM ON ROADWAY SHALL BE MAINTAINED UNTIL ROADWAY IS PAVED. EARTHEN BERM IN CHANNEL SHALL BE MAINTAINED UNTIL PERMANENT STABILIZATION IS COMPLETED OR REMAIN PERMANENTLY.

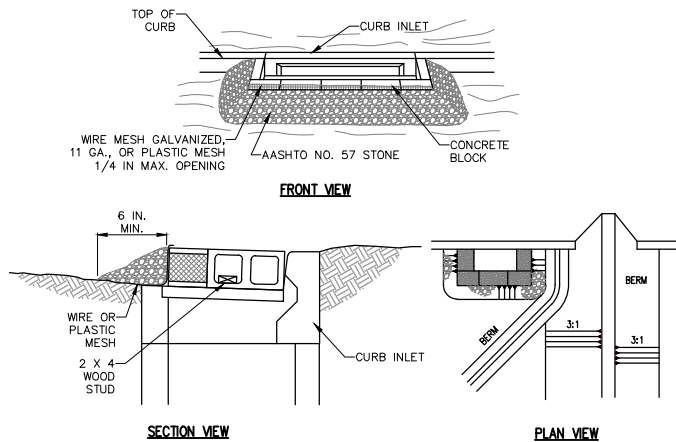
AT A MINIMUM, THE FABRIC SHALL HAVE A MINIMUM GRAB TENSILE STRENGTH OF 120 LBS., A MINIMUM BURST STRENGTH OF 200 PSI, AND A MINIMUM TRAPEZOIDAL TEAR STRENGTH OF 50 LBS. FILTER BAGS SHALL BE CAPABLE OF TRAPPING ALL PARTICLES NOT PASSING A NO. 40 SIEVE.

INLET FILTER BAGS SHALL BE INSPECTED ON A WEEKLY BASIS AND AFTER EACH RUNOFF EVENT. BAGS SHALL BE EMPTIED AND RINSED OR REPLACED WHEN HALF FULL OR WHEN FLOW CAPACITY HAS BEEN REDUCED SO AS TO CAUSE FLOODING OR BYPASSING OF THE INLET. DAMAGED OR CLOGGED BAGS SHALL BE REPLACED. A SUPPLY SHALL BE MAINTAINED ON SITE FOR REPLACEMENT OF BAGS. ALL NEEDED REPAIRS SHALL BE INITIATED IMMEDIATELY AFTER THE INSPECTION. DISPOSE ACCUMULATED SEDIMENT AS WELL AS ALL USED BAGS ACCORDING TO THE PLAN NOTES.

DO NOT USE ON MAJOR PAVED ROADWAYS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS.

STONE AND CONCRETE BLOCK INLET PROTECTION - TYPE C INLET

NOT TO SCALE



NOTES:

MAXIMUM DRAINAGE AREA = 1 ACRE.

INLET PROTECTION SHALL NOT BE REQUIRED FOR INLET TRIBUTARY TO SEDIMENT BASIN OR TRAP. BERMS SHALL BE REQUIRED FOR ALL INSTALLATIONS.

ROLLED EARTHEN BERM SHALL BE PROVIDED AND MAINTAINED IMMEDIATELY DOWN GRADIENT OF THE PROTECTED INLET UNTIL ROADWAY IS STONED. ROAD SUBBASE BERM SHALL BE MAINTAINED UNTIL ROADWAY IS PAVED. SIX INCH MINIMUM HEIGHT ASPHALT BERM SHALL BE MAINTAINED UNTIL ROADWAY SURFACE RECEIVES FINAL COAT.

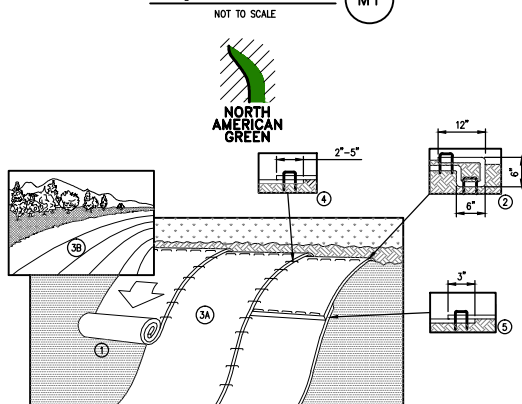
SEDIMENT SHALL BE REMOVED WHEN IT REACHES HALF THE HEIGHT OF THE STONE. DAMAGED OR CLOGGED INSTALLATIONS SHALL BE REPAIRED OR REPLACED IMMEDIATELY.

FOR SYSTEMS DISCHARGING TO HO OR EV SURFACE WATER, A 6 INCH THICK COMPOST LAYER SHALL BE SECURELY ANCHORED ON OUTSIDE AND OVER TOP OF STONE.

DO NOT USE ON MAJOR PAVED ROADWAYS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS.

Slope Installation

MT



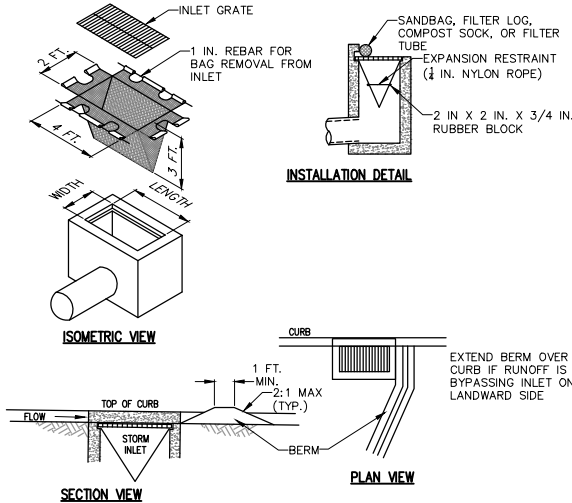
1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-0-SEED DO NOT SEED PREPARED AREA. CELL-0-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL THE BLANKETS (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING OPTIONAL DOT SYSTEM™, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2'-5" OVERLAP DEPENDING ON BLANKET TYPE. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH™ ON THE PREVIOUSLY INSTALLED BLANKET.
5. CONSECUTIVE BLANKETS SPICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE BLANKET WIDTH.

NOTE:
* IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE BLANKETS.

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FILTER BAG INLET PROTECTION - TYPE C INLET

NOT TO SCALE



NOTES:

MAXIMUM DRAINAGE AREA = 1/2 ACRE.

INLET PROTECTION SHALL NOT BE REQUIRED FOR INLET TRIBUTARY TO SEDIMENT BASIN OR TRAP. BERMS SHALL BE REQUIRED FOR ALL INSTALLATIONS.

ROLLED EARTHEN BERM SHALL BE MAINTAINED UNTIL ROADWAY IS STONED. ROAD SUBBASE BERM SHALL BE MAINTAINED UNTIL ROADWAY IS PAVED. SIX INCH MINIMUM HEIGHT ASPHALT BERM SHALL BE MAINTAINED UNTIL ROADWAY SURFACE RECEIVES FINAL COAT. AT A MINIMUM, THE FABRIC SHALL HAVE A MINIMUM GRAB TENSILE STRENGTH OF 120 LBS., A MINIMUM BURST STRENGTH OF 200 PSI, AND A MINIMUM TRAPEZOIDAL TEAR STRENGTH OF 50 LBS. FILTER BAGS SHALL BE CAPABLE OF TRAPPING ALL PARTICLES NOT PASSING A NO. 40 SIEVE.

INLET FILTER BAGS SHALL BE INSPECTED ON A WEEKLY BASIS AND AFTER EACH RUNOFF EVENT. BAGS SHALL BE EMPTIED AND RINSED OR REPLACED WHEN HALF FULL OR WHEN FLOW CAPACITY HAS BEEN REDUCED SO AS TO CAUSE FLOODING OR BYPASSING OF THE INLET. DAMAGED OR CLOGGED BAGS SHALL BE REPLACED. A SUPPLY SHALL BE MAINTAINED ON SITE FOR REPLACEMENT OF BAGS. ALL NEEDED REPAIRS SHALL BE INITIATED IMMEDIATELY AFTER THE INSPECTION. DISPOSE OF ACCUMULATED SEDIMENT AS WELL AS ALL USED BAGS ACCORDING TO THE PLAN NOTES.

DO NOT USE ON MAJOR PAVED ROADWAYS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS.

GENERAL NOTES:

1. ALL BMP'S SHALL BE INSPECTED AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ANY NECESSARY REPAIRS MUST BE MADE IMMEDIATELY TO ENSURE EFFECTIVE AND EFFICIENT OPERATION.
2. BMP'S SHOWN MAY NEED TO BE FIELD ADJUSTED TO FIT ACTUAL CONDITIONS.
3. IN SOME CASES, THE NEXT LARGER BMP MAY BE NEEDED DUE TO UNFORESEEN CONDITIONS.
4. ADDITIONAL BMP'S MAY BE REQUIRED OTHER THAN THOSE SHOWN.
5. THE CONTRACTOR SHALL TAKE WHATEVER MEASURES NECESSARY TO PREVENT SEDIMENT FROM LEAVING THE SITE.

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Rock Gradation Chart

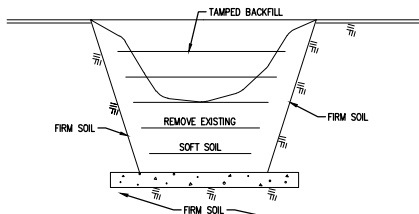
AASHTO NUMBER	NSA NUMBER	PA NUMBER	6 1/2"	4"	3 1/2"	2 1/2"	2"	1 1/2"	1"	3/4"	1/2"	3/8"	#4	#8	#16	#30	#100	#200
FS-3			100												0			
1		4		100	90-100	25-60		0-15		0-5								
3		3A				100	90-100	35-70	0-15									
467	FS-2						100			35-70	0-5	10-30						
5		2A								52-100	20-55	36-70	24-50	18-38	10-30		0	
57		2B								25-60	0-10	0-5						
67		2NS								0-15		0-10	0-5					
7		1NS								90-100	0-15	0-10	0-5					
8										100	90-100	40-70	0-15	0-5				
10		1B								100	85-100	10-30	0-10	0-5				
FS-1		1								100	75-100	10-30	0-10				10-30	
										100	75-100					50	0	

Table 4-9 ROCK GRADATION, FILTER BLANKET REQUIREMENTS.

NSA NO.	GRADED ROCK SIZE (IN.)			FILTER BLANKET REQUIREMENTS		Vmax (FT/SEC)
	MAX	D	MIN.	SIZE NSA NO.	PLACEMENT THICKNESS	
R-1	1.5	0.75	NO. 8	FS-1	N/A	2.5
R-2	3	1.5	1	FS-1	N/A	4.5
R-3	6	3	2	FS-1	3	6.5
R-4	12	6	3	FS-2	4	9.0
R-5	18	9	5	FS-2	6	11.5
R-6	24	12	7	FS-3	8	13.0
R-7	30	15	12	FS-3	10	14.5

Sinkhole In Soil

NOT TO SCALE

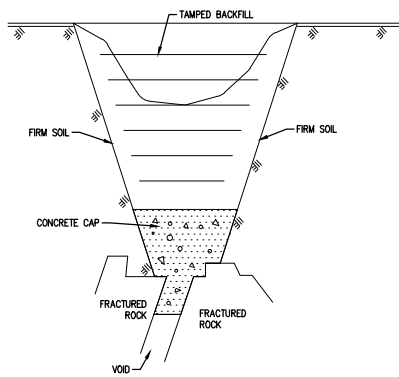


NOTES:

1. EXCAVATE DOWN TO ROCK TO SINKHOLE THROAT OR TO A DEPTH OF 15 FEET BELOW GRADE, WHICHEVER OCCURS FIRST.
2. IF ROCK IS ENCOUNTERED WITHIN 10 FEET, STOP EXCAVATION. THE LIMIT OF EXCAVATION SHALL BE DETERMINED BY THE ENGINEER. GENERALLY, A ZONE OF SOFT, IN-FILL MATERIAL WILL BE FOUND WHICH COVERS MOST OF THE BOTTOM OF THE EXCAVATION. COVER THIS AREA WITH FOUR(4) FEET OF CONCRETE EXTENDING AT LEAST 1 FOOT INTO FIRM SOIL. IF THE SOFT ZONE IS LARGE(±3FT.), REINFORCING STEEL SHOULD BE INCLUDED WITHIN THE CONCRETE CAP WITH 1" DIAMETER REBAR AT 24" ON CENTER EACH WAY. THE LIMIT OF CONCRETE SHOULD BE DETERMINED BY THE ENGINEER.
3. AFTER CONCRETE HAS SET OVERNIGHT, BACKFILL HOLE WITH RELATIVELY IMPERMEABLE CLAY SOIL. COMPACT SOIL IN 6" LIFTS WITH A POWER TAMPER OR RAMMER. THE TOP THREE(3) FEET SHALL BE BACKFILLED WITH 20C CRUSHED AGGREGATE.
4. BACKFILL HOLE ABOVE EXISTING GRADE TO DIVERT SURFACE WATER.
5. WHEN SINKHOLE IS UNDER A PROPOSED UTILITY, CONCRETE IS TO BE SET 6" BELOW THE UTILITY TO ALLOW FOR A STONE BEDDING.

Sinkhole In Rock

NOT TO SCALE



NOTES:

1. SHOULD THE EXCAVATION BECOME 20' OR DEEPER, A GEOTECHNICAL ENGINEER SHOULD BE CONSULTED AS TO THE CORRECT PROCEDURE TO BE CARRIED OUT.
2. EXCAVATE DOWN TO BEDROCK OR TO THE SINKHOLE THROAT.
3. EXPOSE THE ROCK SURFACE BY WASHING THE AREA WITH A SMALL HOSE WATER SPRAY AND INSTALL HIGHSLUMP CEMENT INTO VOIDS AND CREVICES UNTIL VOIDS ARE FILLED AND A CAP COVERS THE AREA. THE LIMIT OF EXCAVATION AND CONCRETE SHALL BE DETERMINED BY THE ENGINEER.
4. AFTER CONCRETE HAS SET OVERNIGHT, BACKFILL HOLE WITH RELATIVELY IMPERMEABLE CLAY SOIL. COMPACT SOIL IN 6" LIFTS WITH A POWER TAMPER OR RAMMER. THE TOP THREE(3) FEET SHALL BE BACKFILLED WITH 20C CRUSHED AGGREGATE.
5. BACKFILL HOLE ABOVE EXISTING GRADE TO DIVERT SURFACE WATER.
6. WHEN SINKHOLE IS UNDER A PROPOSED UTILITY, CONCRETE IS TO BE SET 6" BELOW THE UTILITY TO ALLOW FOR A STONE BEDDING.

E&SPC TYPICAL DETAIL SHEET 6

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO. NRG-1007
SHEET NO. 88 OF 88

Hanover
Engineering Associates Inc

3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

Appendix B

Affected Wetlands and Waterways

**Avon Lake Gas Addition Project
NRG Ohio Pipeline Company LLC
Attachment B: Wetlands and Streams Crossed by the Project**

Wetlands Affected by the Project

Wetland ID	Corwardin Class	ORAM Category	Temporary Impacts (Acres) ¹	Mile Post
3	PFO/PSS	2	0.0	1.1
4	PFO/PSS	2	0.3	1.2
5	PEM	1	0.6	1.4
6	PEM	1	2.6	1.8
7	PEM	2	4.8	2.1
8	PEM	2	2.8	3.6
9	PFO/PSS	2	0.1	4.0
10	PEM/PFO/PSS	2	1.0	4.2
12	PEM/PFO	2	1.8	4.8
13	PEM	2	0	5.1
14	PFO/PSS	1	0.3	5.8
15	PFO	2	0.1	6.0
16	PFO/PSS	2	0.1	6.1
17	PFO/PSS	2	0.4	6.7
18	PFO/PSS	2	0.1	6.7
19	PFO	2	0.3	6.8
20	PSS	2	0.0	6.9
21	PFO/PSS	2	0.5	7.1
22	PEM/PFO/PSS	2	21.5	7.5
24	PFO/PSS	2	3.6	9.8
25	PFO/PSS	2	0.7	10.0
25.1	PFO	2	0.4	10.2
26	PFO	2	1.7	11.4
27	PEM	1	0.2	11.8
29	PEM/PFO/PSS	2	6.1	12.5
32.1	PFO	1	0.9	13.5
33.1	PFO	1	0.4	13.7
34	PEM/PFO	2	0.1	14.0
35	PEM/PFO/PSS	2	1.3	14.0
37.1	PFO	2	2.5	14.8
38	PFO	2	0.7	15.3
41.1	PFO/PSS	2	0.3	16.4
43.1	PFO	2	0.1	16.7

Wetland ID	Corwardin Class	ORAM Category	Temporary Impacts (Acres) ¹	Mile Post
44	PEM/PFO	2	0.2	16.8
44.1	PFO	2	0.8	17.0
45	PFO	2	0.4	17.3
45.1	PEM	1	0.1	17.4
47	PFO	2	0.1	18.5
47.1	PFO	2	1.4	18.5
		Total	59.4	

¹All impacts will be temporary and all grades will be returned to pre-construction contours

Streams Affected by the Project

Mile Post	Waterbody Name	Waterbody Type	Crossing Type
1.8	Stream 1	Intermittent	HDD
3.0	French Creek	Perennial	HDD
3.6	Unnamed Stream	Intermittent	Open Cut
3.7	Stream 2	Intermittent	HDD
4.1	Stream 3	Intermittent	Open Cut
4.6	Stream 4	Intermittent	Open Cut
5.3	Stream 5	Intermittent	Open Cut
5.9	Jungbluth Ditch	Perennial	Open Cut
7.5	Ridgeway Ditch	Perennial	HDD
7.9	Unnamed Stream	Intermittent	Open Cut
10.8	Unnamed Stream	Intermittent	Open Cut
11.4	Stream 7	Intermittent	Open Cut
13.0	Willow Creek	Intermittent	HDD
14.0	Jackson Ditch	Intermittent	Open Cut
15.3	Alexander Ditch	Intermittent	Open Cut
15.9	Unnamed Stream	Intermittent	Open Cut
16.5	East Branch of Black River	Perennial	HDD
18.9	Dent Ditch	Intermittent	Open Cut

Appendix C

Inspection Form

Power to be freeSM

Construction Storm Water Inspection and Maintenance Form

Type of Inspection: ☒ 7 Day ☐ 24-hour for >0.5-inch precipitation

Milepost/Station Location: _____ to _____

Date: _____

Inspector: _____

Time: _____

Date of Precipitation Event (if applicable): _____

Amount of Rainfall (if applicable): _____inches

Inspect Construction areas for appropriate sediment control barriers

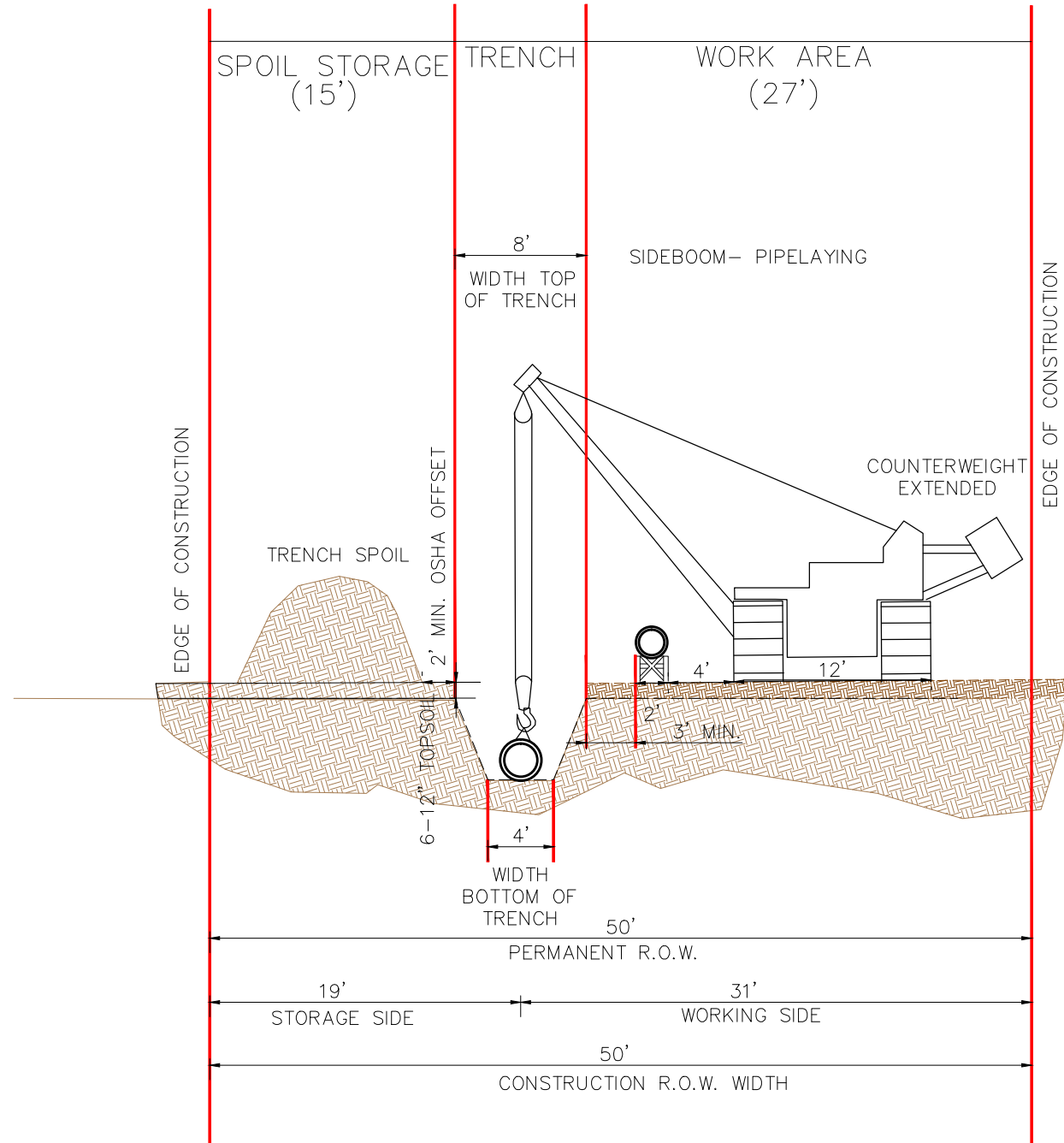
Identify locations where sediment barriers must be maintained or replaced, or where additional sediment barriers are necessary.

[illegible]

Appendix D

Typical Construction Diagrams

CROSS SECTION
NOT TO SCALE



**MAINLINE CONSTRUCTION
NON-PARALLEL CONSTRUCTION
WITH TOPSOIL SEGREGATION
50' RIGHT-OF-WAY**



Know what's **below.**
Call before you dig.

SUMMARY

NO.	SUMMARY OF MATERIALS – DESCRIPTION (IN HORIZONTAL DISTANCE)	QTY.	REFERENCE DRAWINGS	REV.	REVISIONS	DATE	DRAWN	CHKD.	APPD.

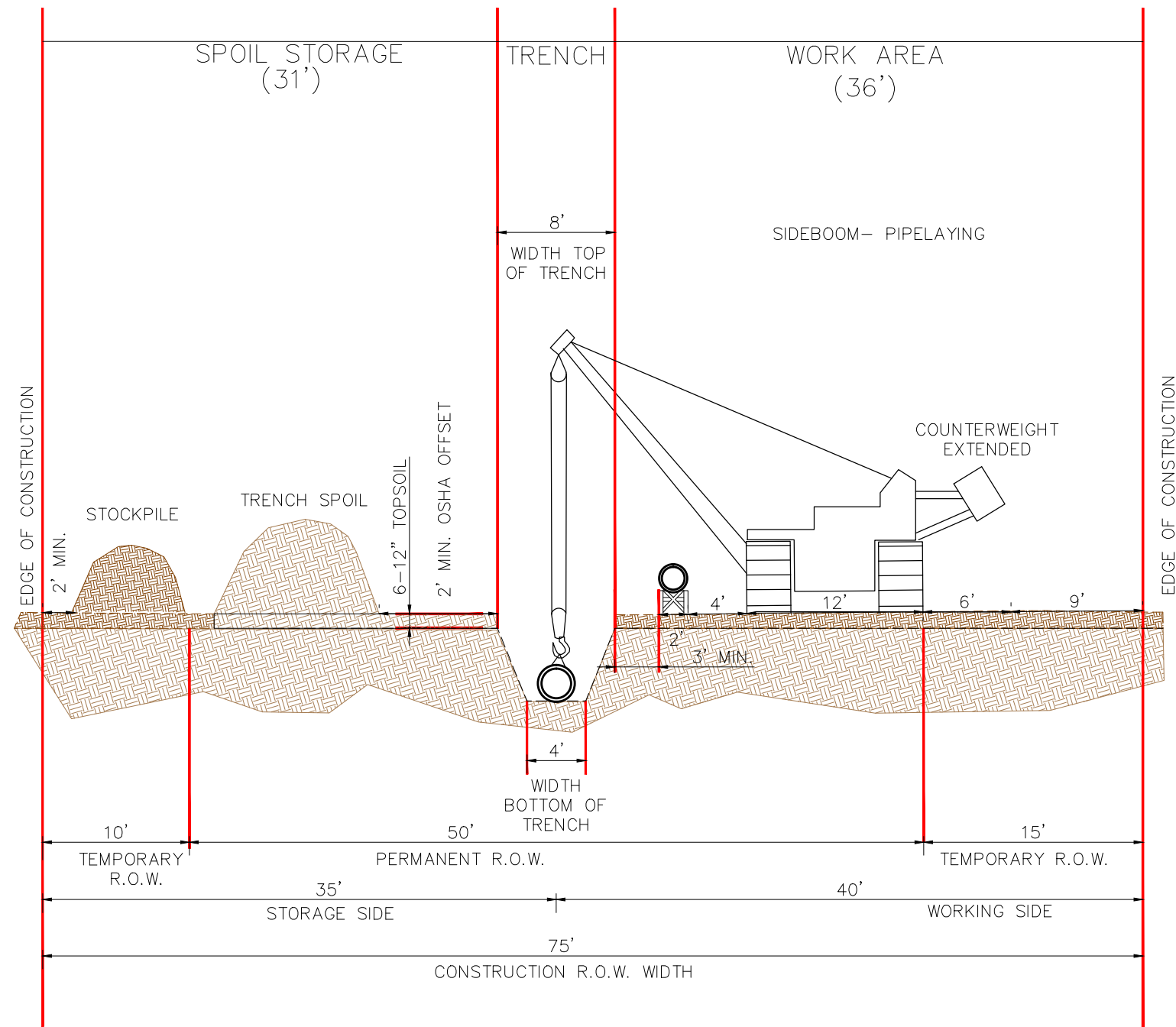
NOT FOR
CONSTRUCTION

DRAWING APPROVAL		
	SIGNATURE	DATE
DRAWN BY	JAG	9.15.14
CHECKED BY	SJC	
IN HOUSE APPD.		
CLIENT APPD.		
PROJECT NUMBER		
NRG-1003		

CLIENT	
NRG OHIO PIPELINE COMPANY LLC	
PROJECT TITLE	
AVON LAKE NATURAL GAS PIPELINE PROJECT PROPOSED 24" GAS PIPELINE	

Hanover		
Engineering Associates Inc		
DWG. TITLE		
MAINLINE NON-PARA CONST. WITH TOP SOIL SEGREGATION R.O.W.		
CHAUTAUQUA COUNTY	NEW YORK	
SCALE	SHEET NO.	REV.
AS NOTED	1 OF 1	0

CROSS SECTION
NOT TO SCALE



**MAINLINE CONSTRUCTION
NON-PARALLEL CONSTRUCTION
WITH TOPSOIL SEGREGATION
75' RIGHT-OF-WAY**



Know what's below.
Call before you dig.

SUMMARY

NO.	SUMMARY OF MATERIALS - DESCRIPTION (IN HORIZONTAL DISTANCE)	QTY.	REFERENCE DRAWINGS	REV.	REVISIONS	DATE	DRAWN	CHKD.	APPD.

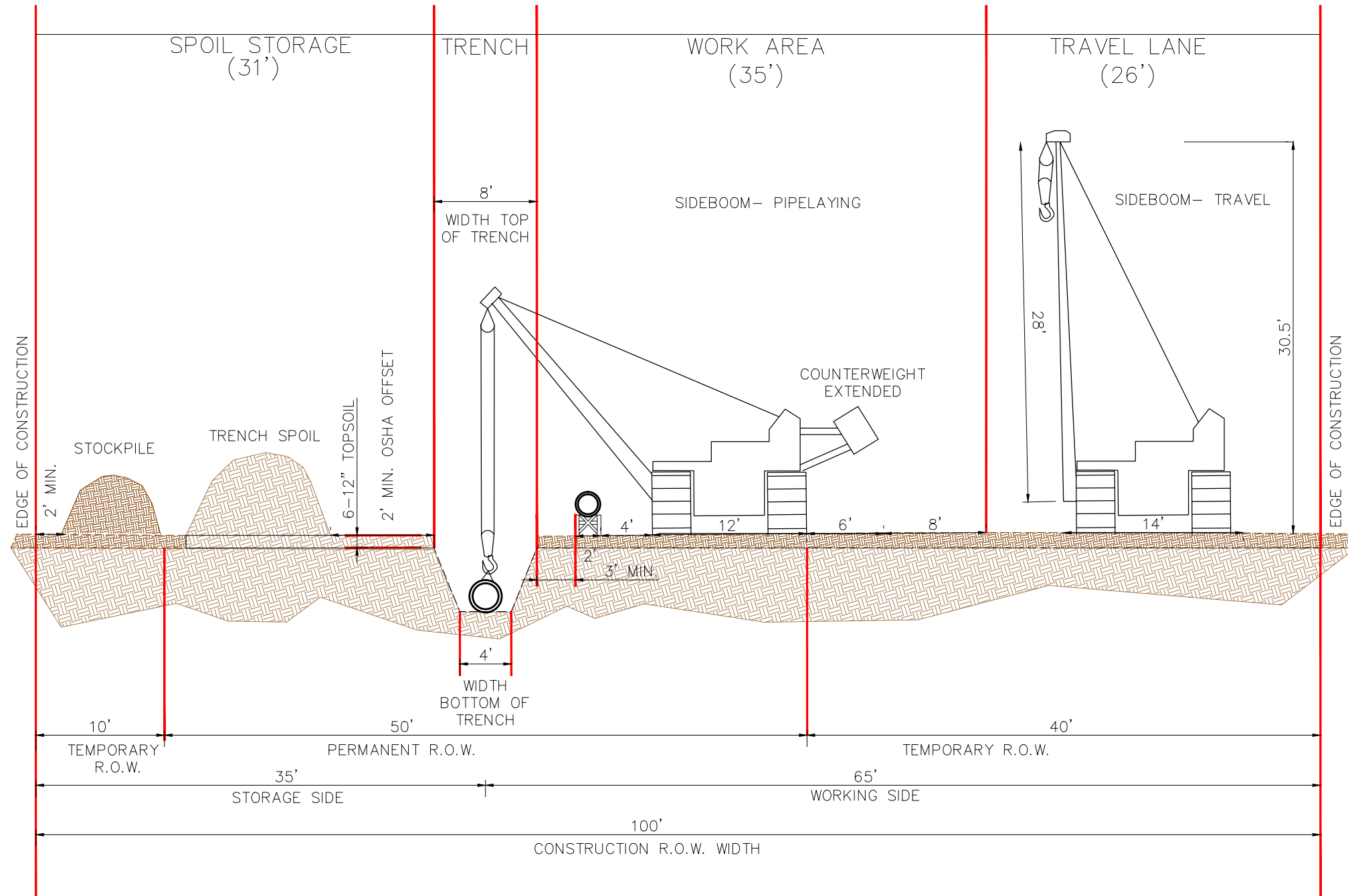
NOT FOR
CONSTRUCTION

DRAWING APPROVAL		
	SIGNATURE	DATE
DRAWN BY	JAG	9.15.14
CHECKED BY	SJC	
IN HOUSE APPD.		
CLIENT APPD.		
PROJECT NUMBER		
NRG-1003		

CLIENT		NRG OHIO PIPELINE COMPANY LLC	
PROJECT TITLE		AVON LAKE NATURAL GAS PIPELINE PROJECT	
PROPOSED 24" GAS PIPELINE			

Hanover		Engineering Associates Inc	
DWG. TITLE		MAINLINE NON-PARA CONST. WITH TOP SOIL SEGREGATION R.O.W.	
CHAUTAUQUA COUNTY		NEW YORK	
SCALE	SHEET NO.	1 OF 1	REV. 0

CROSS SECTION
NOT TO SCALE



**MAINLINE CONSTRUCTION
NON-PARALLEL CONSTRUCTION
WITH TOPSOIL SEGREGATION
100' RIGHT-OF-WAY**



Know what's **below.**
Call before you dig.

SUMMARY

NO.	SUMMARY OF MATERIALS — DESCRIPTION (IN HORIZONTAL DISTANCE)	QTY.	REFERENCE DRAWINGS	REV.	REVISIONS	DATE	DRAWN	CHKD.	APPD.

NOT FOR
CONSTRUCTION

DRAWING APPROVAL		
	SIGNATURE	DATE
DRAWN BY	JAG	9.15.14
CHECKED BY	SJC	
IN HOUSE APPD.		
CLIENT APPD.		
PROJECT NUMBER	NRG-1003	

CLIENT	
NRG OHIO PIPELINE COMPANY LLC	
PROJECT TITLE	
AVON LAKE NATURAL GAS PIPELINE PROJECT	
PROPOSED 24" GAS PIPELINE	

Hanover Engineering Associates Inc		
DWG. TITLE	MAINLINE NON-PARA CONST. WITH TOP SOIL SEGREGATION R.O.W.	
CHAUTAUQUA COUNTY	NEW YORK	
SCALE	SHEET NO. 1 OF 1	REV. 0