

CHERRY LAKE DAM REHABILITATION / BANNING PROJECT NO. 22067

PLANS PREPARED FOR:
INDIANA DEPARTMENT OF ADMINISTRATION
402 W. WASHINGTON ST., ROOM W467, IGCS
INDIANAPOLIS, INDIANA 46204
PHONE: 317-232-4160
FAX: 317-233-4613
CONTACT: MICHAEL CHAPMAN

VICINITY MAP

NO SCALE

LOCATION MAP
NO SCALE

<u>COMMUNICATIONS</u> AT&T 240 N. Meridian St., Room 1791 Indianapolis, IN, 46204 317-265-3050	<u>ELECTRIC</u> South Central Indiana R.E.M.C. 300 Morton Ave. Martinsville, IN 46151 765-352-4751 Howard McCormick	<u>FIBER OPTIC</u> South Central Indiana R.E.M.C. 300 Morton Ave. Martinsville, IN 46151 765-352-4771 or 765-352-4744 Joby Jordan or Doug Hornberger
<u>WATER & STORM SEWER</u> City of Martinsville 390 S. Mulberry St. Martinsville, IN 46151 765-342-2707	<u>SANITARY SEWER</u> City of Martinsville 995 Rodgers Rd. Martinsville, IN 46151 765-342-2342 Phil McLary	<u>FIRE DEPARTMENT</u> Martinsville Fire Department 160 W. Morgan St. Martinsville, IN 46151 765-342-2343
<u>SCHOOL DISTRICT</u> Monroe County Community School Corp. 315 E. North Dr. Bloomington, IN 47401 812-330-7813		

SCALE: 1" = 50'

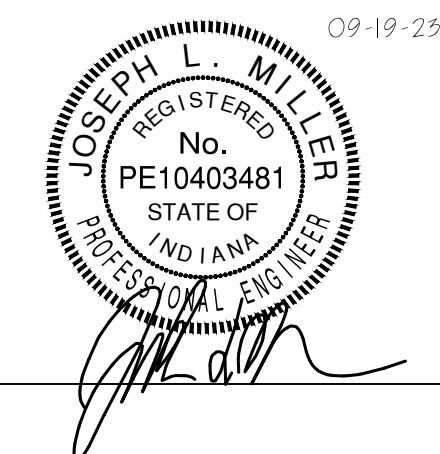
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PROJECT MANAGER: _____ DATE: _____

THESE PLANS ARE NOT TO BE CONSIDERED FINAL OR TO BE UTILIZED FOR CONSTRUCTION UNLESS SIGNED AND DATED BY THE APPROPRIATE BANNING ENGINEERING PROJECT MANAGER.

THESE PLANS ARE NOT INTENDED TO BE REPRESENTED AS A RETRACEMENT OR ORIGINAL BOUNDARY SURVEY, A ROUTE SURVEY, OR A SURVEYOR LOCATION REPORT.

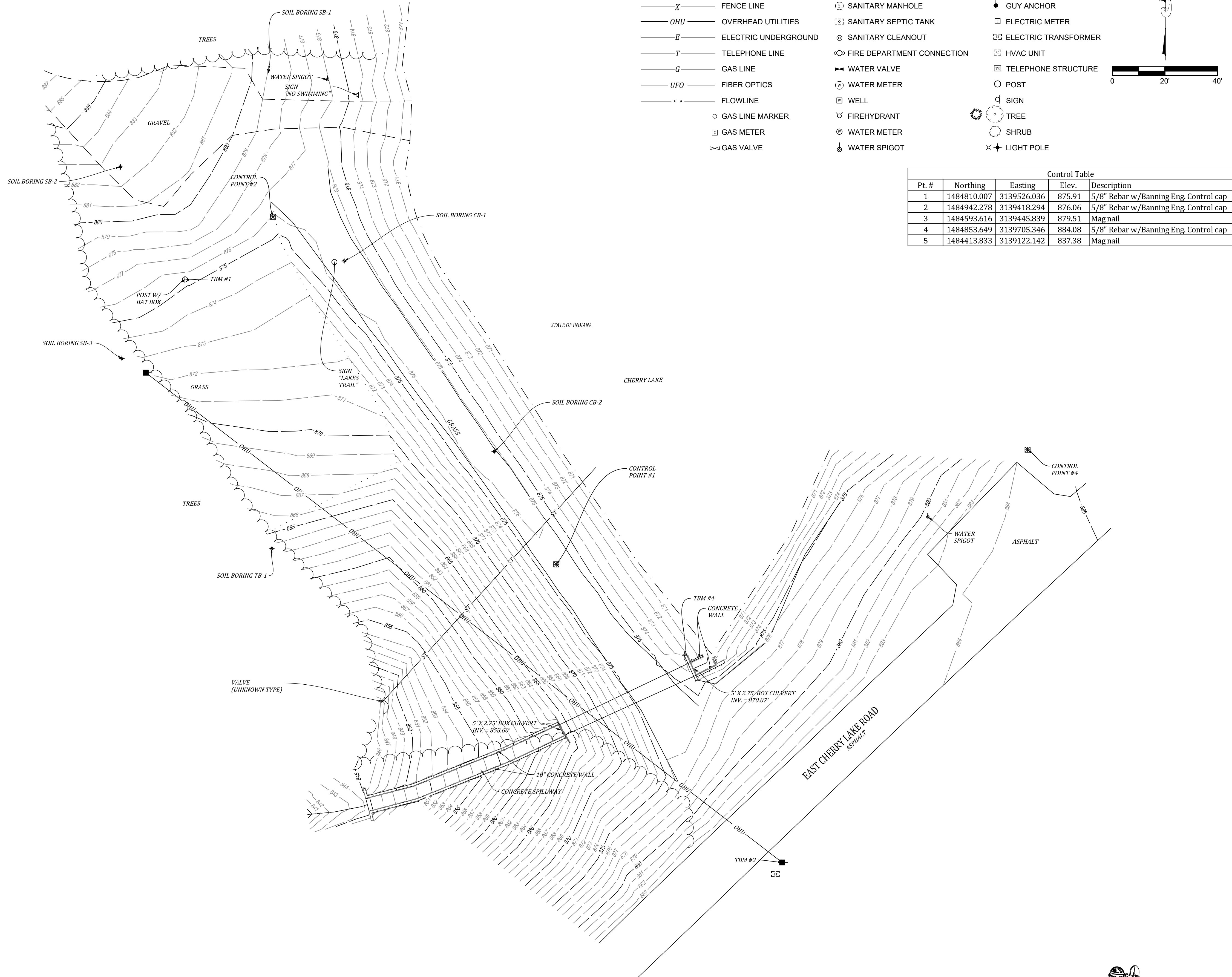
CERTIFIED BY: 



Date:	09-19-23
Project No:	22067
Sheet No:	

C100





Project Benchmark
The vertical datum for this site was based upon North American Vertical Datum of 1988 (NAVD 88) and established by an OPUS solution on Control Point #4. Differential leveling from Control Point #4 was utilized to establish the elevations of the remaining control points for this survey.

Site Benchmarks
TBM #1 - Bench tie set, 1' above ground, in north face of bat box pole located on the west side of the Cherry Lake dam.
Elev. = 876.71' (NAVD 88)

TBM #2 - Bench tie set, 1' above ground, in power pole #171-37-2 located on the south side of East Cherry Lake Road at the centerline of the Cherry Lake dam extended east.
Elev. = 883.20' (NAVD 88)

TBM #3 - Benchtie set in north face of wood guardrail located on the south side of East Cherry Lake Road, +/- 120' south of shelter house.
Elev. = 838.36" (NAVD 88)

TBM #4 - Cut square on east end of the Cherry Lake concrete outlet structure.
Elev. = 874.30' (NAVD 88)

Notes:
Per 865 IAC 1-12-12 this drawing is not intended to be represented as a retracement
or original boundary survey, a route survey, or a Surveyor Location Report.

The horizontal data shown on this exhibit is based upon standard radial survey techniques and by global positioning equipment, utilizing the VRS Network, a real-time kinematic (RTK) correction service over the internet. The coordinate values shown are in Indiana State Plane West Zone on the 1983 North American Datum.

All bearings, distances and coordinates are referenced to the Indiana State Plane West Zone (NAD 83) Coordinate System. The Combined Scale Factor for this project is 1.000000. Distances shown hereon are GRID distances.

The topographic information shown hereon was obtained in the field during February 2023. The topographic data was gathered using a robotic total station and data collector applying standard radial surveying techniques and by global positioning equipment, utilizing the VRS Network, a real-time kinematic (RTK) correction service over the internet.

Elevations on hard surfaces or structures are accurate to within 0.05 feet, elevations on natural surfaces are accurate to within 0.15 feet. The contours shown hereon were plotted based upon interpolation of spot elevations and other topographic information and are accurate to within one half of the contour interval.

This survey reflects above ground indications of utilities and information available from utility companies. The surveyor makes no guarantee that the underground utilities shown comprise all such utilities in the area, either in service or abandoned. The surveyor further does not warrant that the underground utilities shown are in the exact location indicated, although they are located as accurately as possible from the information available. The surveyor has not physically located the underground utilities.

Underground utilities shown per Indiana 811 ticket numbers 2301173214 and 2301173365.

EXISTING TOPOGRAPHY PLAN

CHERRY LAKE DAM REHABILITATION

INDIANA DEPARTMENT OF ADMINISTRATION

BENTON NORTH TOWNSHIP: MARTINSVILLE INDIANA

09-19-
JOSEPH L. MILLER
REGISTERED
No.
PE10403481
STATE OF
INDIANA
PROFESSIONAL ENGINEER

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853 COLUMBIA ROAD, SUITE #101
PLAINFIELD, IN 46168

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Project No: 22067

Sheet No

C101



GENERAL NOTES

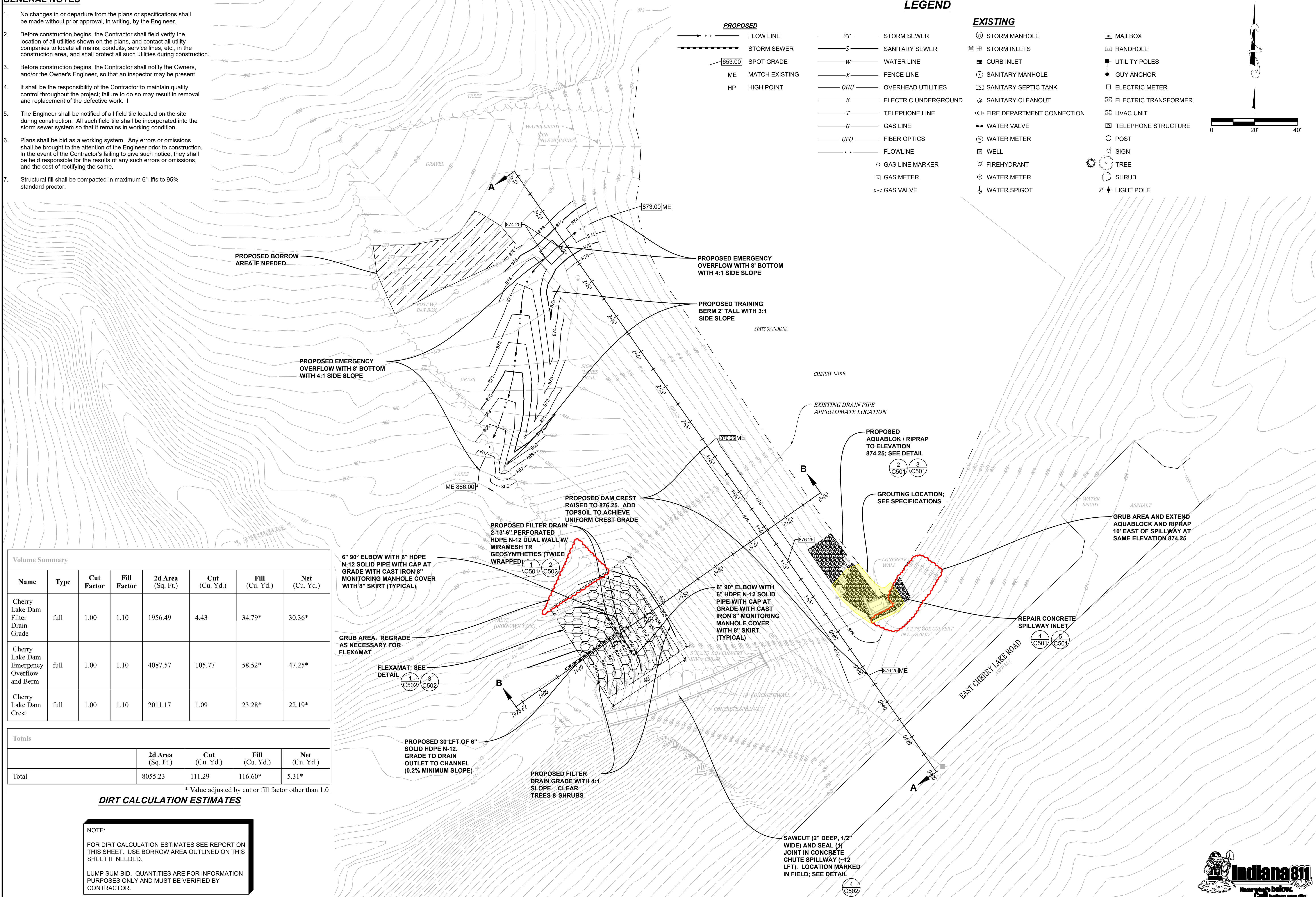
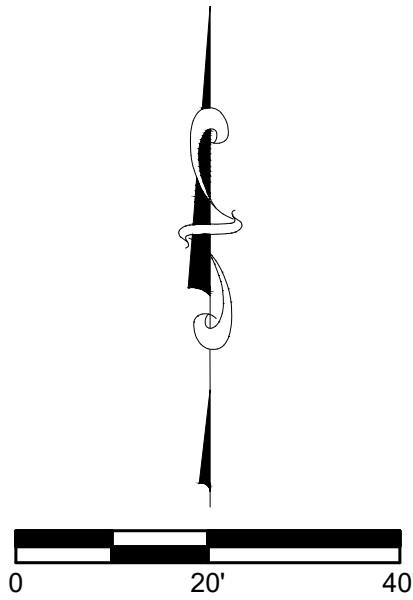
- No changes in or departure from the plans or specifications shall be made without prior approval, in writing, by the Engineer.
- Before construction begins, the Contractor shall field verify the location of all utilities shown on the plans, and contact all utility companies to locate all mains, conduits, service lines, etc., in the construction area, and shall protect all such utilities during construction.
- Before construction begins, the Contractor shall notify the Owners, and/or the Owner's Engineer, so that an inspector may be present.
- It shall be the responsibility of the Contractor to maintain quality control throughout the project; failure to do so may result in removal and replacement of the defective work. I
- The Engineer shall be notified of all field tile located on the site during construction. All such field tile shall be incorporated into the storm sewer system so that it remains in working condition.
- Plans shall be bid as a working system. Any errors or omissions shall be brought to the attention of the Engineer prior to construction. In the event of the Contractor's failing to give such notice, they shall be held responsible for the results of any such errors or omissions, and the cost of rectifying the same.
- Structural fill shall be compacted in maximum 6" lifts to 95% standard proctor.

LEGEND

- PROPOSED**
- FLOW LINE
 - — — STORM SEWER
 - 653.00 — SPOT GRADE
 - ME MATCH EXISTING
 - HP HIGH POINT
- ST STORM SEWER
S SANITARY SEWER
W WATER LINE
X FENCE LINE
OHU OVERHEAD UTILITIES
E ELECTRIC UNDERGROUND
T TELEPHONE LINE
G GAS LINE
UFO FIBER OPTICS
—••— FLOWLINE
○ GAS LINE MARKER
□ GAS METER
X GAS VALVE

EXISTING

- ⊙ STORM MANHOLE
- ⊕ STORM INLETS
- ⊕ CURB INLET
- ① SANITARY MANHOLE
- ② SANITARY SEPTIC TANK
- ⊙ SANITARY CLEANOUT
- ⊙ FIRE DEPARTMENT CONNECTION
- ▶ WATER VALVE
- ⊕ WATER METER
- ⊕ WELL
- ⊕ FIREHYDRANT
- ⊙ WATER METER
- ⊕ WATER SPIGOT
- ⊕ MAILBOX
- ⊕ HANDHOLE
- UTILITY POLES
- GUY ANCHOR
- ⊕ ELECTRIC METER
- ⊕ ELECTRIC TRANSFORMER
- ⊕ HVAC UNIT
- ⊕ TELEPHONE STRUCTURE
- POST
- ⊕ SIGN
- ⊕ TREE
- ⊕ SHRUB
- ⊕ LIGHT POLE



Volume Summary

Name	Type	Cut Factor	Fill Factor	2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)
Cherry Lake Dam Filter Drain Grade	full	1.00	1.10	1956.49	4.43	34.79*	30.36*
Cherry Lake Dam Emergency Overflow and Berm	full	1.00	1.10	4087.57	105.77	58.52*	47.25*
Cherry Lake Dam Crest	full	1.00	1.10	2011.17	1.09	23.28*	22.19*

Totals				2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)
Total				8055.23	111.29	116.60*	5.31*

* Value adjusted by cut or fill factor other than 1.0

DIRT CALCULATION ESTIMATES

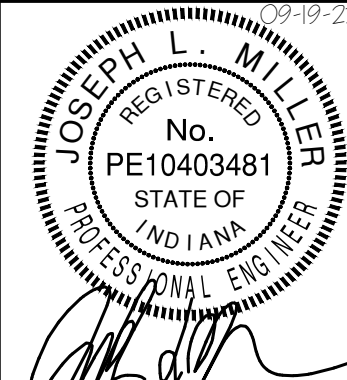
NOTE:

FOR DIRT CALCULATION ESTIMATES SEE REPORT ON THIS SHEET. USE BORROW AREA OUTLINED ON THIS SHEET IF NEEDED.

LUMP SUM BID. QUANTITIES ARE FOR INFORMATION PURPOSES ONLY AND MUST BE VERIFIED BY CONTRACTOR.

OVERALL PLAN

CHERRY LAKE DAM REHABILITATION
INDIANA DEPARTMENT OF ADMINISTRATION
BENTON NORTH TOWNSHIP, MARTINSVILLE, INDIANA



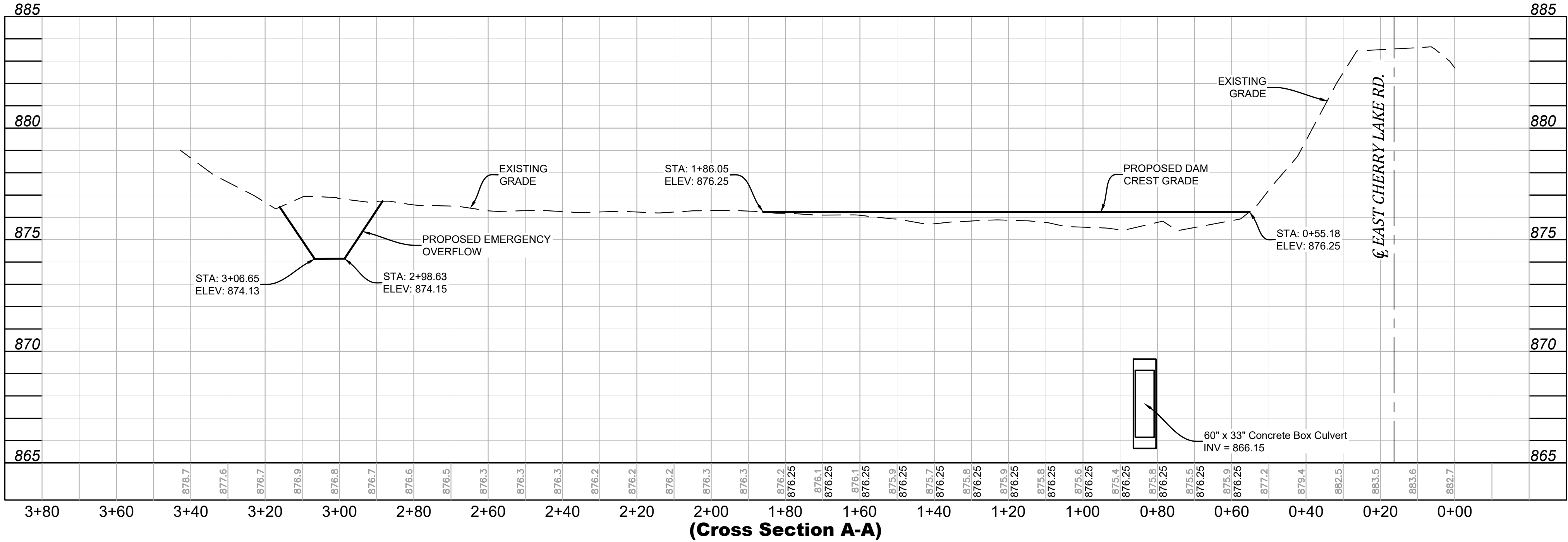
Project No: 22067

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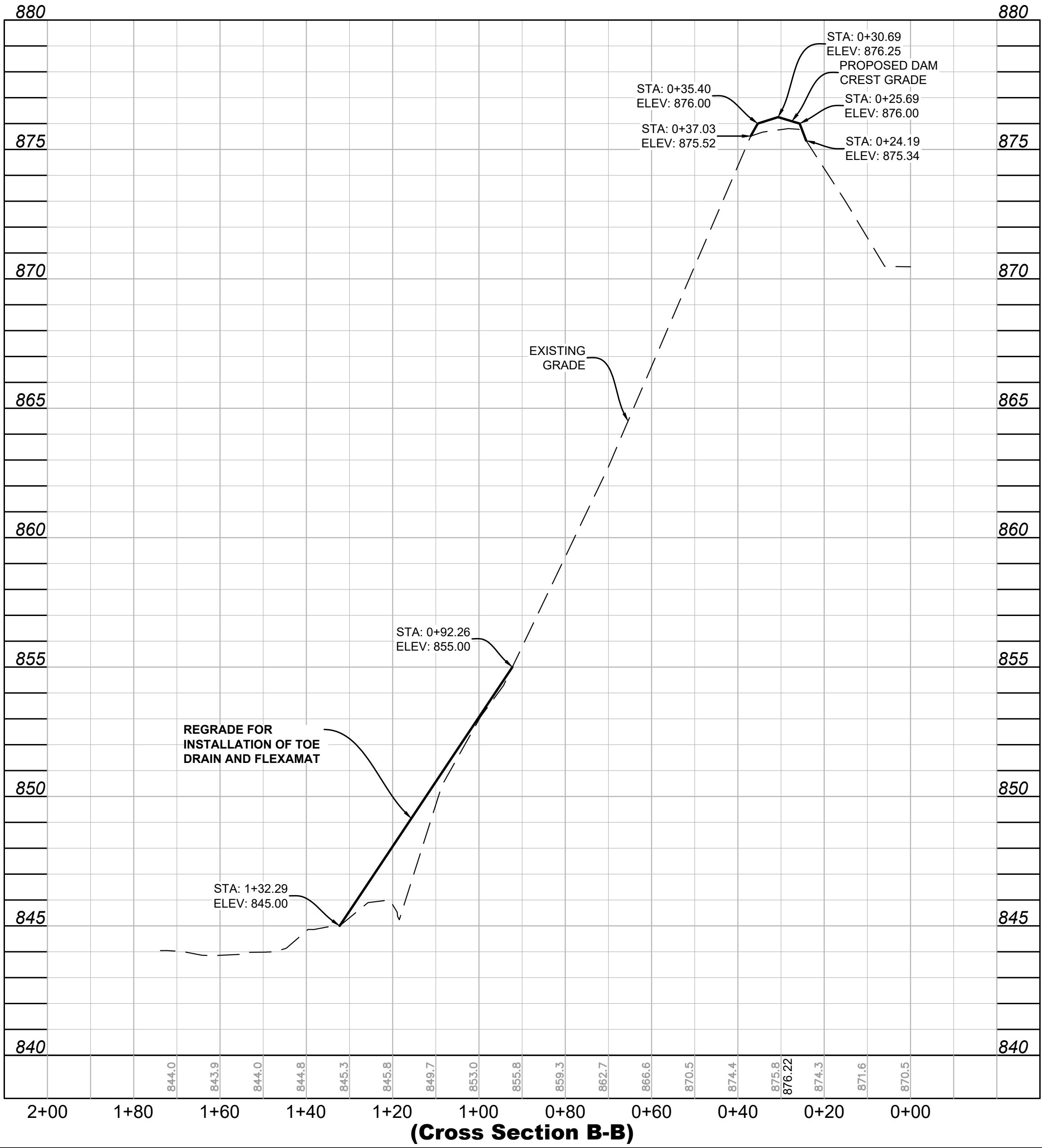
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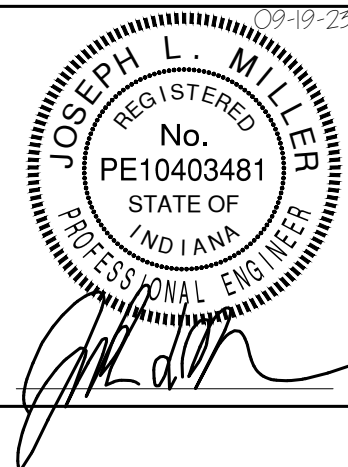


PROFILE VIEW SCALE:
1"=5' VERT.
1"=20' HOR.



CROSS SECTIONS

CHERRY LAKE DAM REHABILITATION
INDIANA DEPARTMENT OF ADMINISTRATION
BENTON NORTH TOWNSHIP, MARTINSVILLE, INDIANA



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Project No: 22067
Sheet No:

C103

1. Only those areas within the designated construction limits are to be disturbed during construction.
2. Contractor to provide temporary surface stabilization of any area scheduled or likely to remain inactive for a period of 15 days or more.
3. Contractor to provide temporary signage near the entrance of the project identifying the responsible parties and other information about the project.
4. Contractor shall implement design concepts and storm water quality measures, which are shown on this plan, to reduce post construction pollutants discharging from the site.
5. All erosion control measures shall meet the Phase 2 IDEM Rule 327 IAC 15-5 requirements.
6. Refer to the "Indiana Storm Water Quality Manual", "The Urban Development Planning Guide", and Manufactures Recommendations for Installation for all required measures.
7. Inspection and repair of erosion control measures shall be done weekly and after each $\frac{1}{2}$ " rainfall event.
8. Contractor to provide a 1 year warranty on all seeding to ensure adequate and established cover. Refer to contract documents.

1. Contractor shall prepare a self-monitoring plan and procedure, including documentation of weekly self monitoring operations. These documents must be kept on file and made available upon request.
2. Start construction log. This log will document the performance of each pollution prevention measure. A thorough site inspection should be completed weekly, and within 24 hours of every ½ train event.
3. Existing access drive to be used as construction entrance. Install construction staging area on site as delineated on this sheet.
4. Establish concrete washout as delineated on this sheet.
5. Install erosion control as delineated on this sheet.
6. Begin earth work for dam rehabilitation. Strip topsoil and vegetation from work area. This area is to be filled when project complete.
7. Install new emergency overflow channel and berm, raise dam crest, install filter drain and grade, install Aquablok and Riprap, and repair concrete wall.
8. Finish grade site and replace topsoil as appropriate.
9. Install erosion control blankets with permanent seeding, and other erosion control measures as delineated on this sheet.
10. Re-grade, repair existing access drive to existing or better when construction is completed
11. Temporarily seed and mulch all areas scheduled or likely to remain inactive for 15 days or more.
12. After construction is completed, vegetation established and permission received from Indiana Department of Administration representative, remove temporary erosion control measures.

CONSTRUCTION ENTRANCE MAINTENANCE

- *Inspect entrance daily and after each 1/2" rainfall event or heavy use.
- *Immediately remove mud and sediment tracked or washed onto public roads by brushing or sweeping. Flushing should only be used if the water is conveyed into a sediment trap or basin
- *Repair any broken on public road pavement immediately.
- *Repair existing drive (if needed) to existing or better when construction is completed.

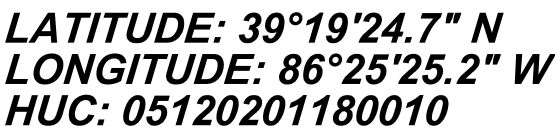
BEDFORD SERIES
BdB Bedford silt loam (2-6% slopes)
Bedford Series – The Bedford series consists of moderately well drained soils formed in loess and the underlying yellow material over a paleosol from clayey residuum. They are on hills underlain with limestone bedrock. They are very deep soils that are moderately deep to a fragipan. Permeability is moderate above the fragipan and very slow in the fragipan. Slopes range from 0 to 12 percent.

BROWNSTOWN SERIES
BkF Brownstown-Gilwood silt loams(25-75% slopes)
Brownstown Series – The Brownstown series consists of moderately deep, well drained soils that formed in residuum from siltstone on hills and knobs. Slopes range from 15 to 75 percent.

CRIDER SERIES
CrC Crider silt loam (6-12% slopes)
Crider Series – The Crider series consists of very deep, well drained, moderately permeable soils on uplands. They formed in a loess mantle and the underlying residuum from limestone. Slopes range from 0 to 30 percent.

MAINTENANCE GUIDELINES

1. Dumpster to be lined w/ 10mil Plastic.
2. No overfilling, leave at least 12" of freeboard.
3. Liquids are to be disposed as wastewater.
4. If liquids to be hauled away in dumpster, it must be equipped with a water tight lid to prevent spilling during transport.
5. Inspect daily if concrete work occurs daily. Inspect weekly if concrete work does not occur each day.



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<div style="display: flex; align-items: center; margin-bottom: 10px;"> <div style="border: 1px solid black; border-radius: 50%; padding: 5px; margin-right: 10px;">CB</div> <div style="width: 60px; height: 60px; background-color: #cccccc; background-image: radial-gradient(circle, black 1px, transparent 1px); background-size: 20px 20px;"></div> </div>	<p>FLEXAMAT WITH CURLEX II UNDERLAYMENT BIODEGRADABLE ADD PERMANENT SEEDING SEE DETAIL ON SHEET C500 & C502</p>
<div style="display: flex; align-items: center; margin-bottom: 10px;"> <div style="border: 1px solid black; border-radius: 50%; padding: 5px; margin-right: 10px;">PS</div> <div style="width: 60px; height: 60px; background-color: #cccccc; background-image: radial-gradient(circle, black 1px, transparent 1px); background-size: 20px 20px;"></div> </div>	<p>PERMANENT SEEDING & MULCHING SEE DETAIL ON SHEET C500</p>
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<div style="display: flex; align-items: center; margin-bottom: 10px;"> <div style="border: 1px solid black; border-radius: 50%; padding: 5px; margin-right: 10px;">RR</div> <div style="width: 60px; height: 60px; background-color: #cccccc; background-image: radial-gradient(circle, black 1px, transparent 1px); background-size: 20px 20px;"></div> </div>	<p>RIP-RAP SEE DETAIL ON SHEET C501</p>
<div style="display: flex; align-items: center; margin-bottom: 10px;"> <div style="width: 20px; height: 20px; background-color: black; margin-right: 10px;"></div> <div style="flex-grow: 1; border-bottom: 2px solid black; position: relative; margin-bottom: 10px;"> <div style="position: absolute; left: 0; top: -5px; width: 10px; height: 10px; background-color: black; border-radius: 50%;"></div> </div> </div>	<p>CONSTRUCTION LIMITS</p>
<div style="display: flex; align-items: center; margin-bottom: 10px;"> <div style="border: 1px solid black; border-radius: 50%; padding: 5px; margin-right: 10px;">SF</div> <div style="width: 20px; height: 20px; background-color: black; margin-right: 10px;"></div> </div>	<p>SOCK; 8" SITE PERIMETER FILTER/MULCH (INSTALL PER MANUFACTURERS GUIDELINES)</p>

INDIANA DEPARTMENT OF ADMINISTRATION
BENTON NORTH TOWNSHIP; MARTINSVILLE, INDIANA



No:

C400



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Construction Plan - General Plan Components (Section A)

A1 - Index of the location of required plan elements in the construction plan:

The plan index should include a list of the required items in the CSGP and where they occur in the plan. Plan preparers often have their plan index mirror items in the IDEM standard plan review checklist. An MS4 may have different requirements and plan expectations based on their local ordinance.

A2 - A vicinity map depicting the project site location in relationship to recognizable local landmarks, towns, and major roads:

See Plan Set: Title Sheet, C100

A3 - Narrative of the nature and purpose of the project:

This project consist of constructing a new emergency overflow channel and berm, raising part of dam crest, install a new filter drain and grading around filter drain, and installing Aquablok and rip rap for State of Indiana. The project is located in Benton North Township, Monroe County.

A4 - Latitude and longitude to the nearest fifteen (15) seconds:

Latitude: 39°19'24.70" N

Longitude: 85°25'25.17" W

A5 - Legal description of the project site:

See Plan Set: Title Sheet, C100

A6 - 11 X 17-inch plat showing building lot numbers/boundaries and road layout/names:

N/A

A7 - Boundaries of the one hundred (100) year floodplains, floodway fringes, and floodways

See Plan Set: This site is located in Flood Zone X (Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile, and areas protected by levees from 1% annual chance flood) per Firm Map 18105C00750 Dated December 17, 2010. See this Sheet

A8 - Land use of all adjacent properties:

See Plan Set: Existing Topography Plan, C101

North: Wooded

South: Wooded

East: Wooded

A9 - Identification of a U.S. EPA approved or established TMDL

None

A10 - Name(s) of the receiving water(s):

Little Indian Creek

A11 - Identification of discharges to a water on the current 303(d) list of impaired waters and the pollutant(s) for which it is impaired:

Impairments: None

A12 - Soils map of the predominate soil types:

See Plan Set: Erosion Control Plan, C400

A13 - Identification and location of all known wetlands, lakes, and water courses on or adjacent to the project site (construction plan, existing site layout):

See Plan Set: Existing Topography Plan, C101

A14 - Identification of any other state or federal water quality permits or authorizations that are required for construction activities:

401 Water Quality Certification (IDEM): None

Section 404 Permit (USACE): None

Construction in a Floodway (DNR): None

A15 - Identification and delineation of existing cover, including natural buffers:

See Plan Set: Existing Topography Plan, C101

A16 - Existing site topography at an interval appropriate to indicate drainage patterns:

See Plan Set: Existing Topography Plan, C101

A17 - Location(s) where run-off enters the project site:

See Plan Set: Existing Topography Plan, C101

A18 - Location(s) where run-off discharges from the project site prior to land disturbance:

See Plan Set: Existing Topography Plan, C101

A19 - Location of all existing structures on the project site:

See Plan Set: Existing Topography Plan, C101

A20 - Existing permanent retention or detention facilities, including manmade wetlands, designed for the purpose of stormwater management:

See Plan Set: Existing Topography Plan, C101

A21 - Locations where stormwater may be directly discharged into ground water, such as abandoned wells, sinkholes, or karst features:

None known

A22 - Size of the project area expressed in acres:

00.97 Acres +/-

A23 - Total expected land disturbance expressed in acres:

00.97 Acres +/-

A24 - Proposed final topography:

See Plan Set: Overall Plan, C102

A25 - Locations and approximate boundaries of all disturbed areas:

Construction Limits, Erosion Control Plan, C400

A26 - Locations, size, and dimensions of all stormwater drainage system such as culverts, stormwater sewer, and conveyance channels:

See Plan Set: Overall Plan, C102

A27 - Locations of specific points where stormwater and non-stormwater discharges will leave the project site:

See Plan Set: Overall Plan, C102

A28 - Location of all proposed site improvements, including roads, utilities, lot delineation and identification, proposed structures, and common areas:

See Plan Set: Sheet, Sheet Number

A29 - Location of all on-site and off-site soil stockpiles and borrow areas:

See Plan Set: Erosion Control Plan, C400

A30 - Construction support activities that are expected to be part of the project:

Construction support activities include construction entrance (existing drive), construction staging area (existing parking lot), and concrete washout.

A31 - Location of any in-stream activities that are planned for the project including, but not limited to, stream crossings and pump arounds:

See Plan Set: None

Stormwater Pollution Prevention - Construction Component (Section B)

B1 - Description of the potential pollutant generating sources and pollutants, including all potential non-stormwater discharges:

Silt and sediment from exposed soils, leaves, mulch, vehicular sources such as leaking fuel or oil, brake fluid, brake dust, antifreeze, trash, debris, biological agents found in trash, fertilizers, herbicides, pesticides, lime dust and concrete washout.

B2 - Stable construction entrance locations and specifications:

For Location, See Plan Set: Erosion Control Plan, C400

For Detail, See Plan Set: Erosion Control Details, C500

B3 - Specifications for temporary and permanent stabilization:

Temporary seeding is required for any area left for 7 days or longer within this project, such as soil stockpiles. Temporary seeding is also required in areas that will be disturbed in future projects. This seeding will be placed after finish grading and topsoil replacement.

Permanent seeding will be applied in areas under the solar panels after replacement of topsoil as described in the construction sequencing.

For Locations See Plan Set: Erosion Control Plan, C400

For Detail See Plan Set: Erosion Control Details & Miscellaneous Details, C500 - C502

B4 - Sediment control measures for concentrated flow areas:

Erosion control Blankets, and Rip Rap will be installed to reduce and collect sediment from concentrated flow.

For Locations See Plan Set: Erosion Control Plan, C400

For details See Plan Set: Erosion Control Details & Miscellaneous Details, C500 - C502

B5 - Sediment control measures for sheet flow areas:

Mulch sock will be installed along portion of the project to collect sediment runoff.

For Locations See Plan Set: Erosion Control Plan, C400

For details See Plan Set: Erosion Control Details, C500

B6 - Run-off control measures:

Almost all of the erosion control measures used at this site can be viewed as runoff control measures, with the possible exception of the construction entrances and the concrete washout area, in that they either reduce the velocity, such as socks, or reduce the energy of the runoff, such as rip rap. Even erosion control blankets could be said to be a runoff control measure in that they certainly reduce the erosiveness of the runoff.

For Locations See Plan Set: Erosion Control Plans, C400

For details See Plan Set: Erosion Control Details & Miscellaneous Details, C500 - C502

B7 - Stormwater outlet protection location and specifications:

An erosion control blanket will be install at the emergency overflow channel as outlet protection.

For Locations See Plan Set: Erosion Control Plan, C400

For details See Plan Set: Erosion Control Details, C500

B8 - Grade stabilization structure locations and specifications:

None Required.

B9 - Dewatering applications and management methods:

Description and Purpose

Dewatering operations are practices that manage the discharge of pollutants when non-stormwater and accumulated precipitation must be removed from a work location so that construction work may be accomplished.

Suitable Applications

These practices are implemented for discharges of non-stormwater from construction sites. Non-stormwaters include, but are not limited to, groundwater, water from cofferdams, water diversions, and waters used during construction activities that must be removed from a work area. Practices identified in this section are also appropriate for implementation when managing the removal of accumulated precipitation (stormwater) from depressed areas at a construction site.

Limitations

Site conditions will dictate design and use of dewatering operations. The controls discussed in this best management practice (BMP) address sediment only. The controls detailed in this BMP only allow for minimal settling time for sediment particles. Use only when site conditions restrict the use of the other control methods. Dewatering operations will require, and must comply with, applicable local permits.

Implementation

Dewatering discharges must not cause erosion at the discharge point. A variety of methods can be used to treat water during dewatering operations. Several below and provide options to achieve sediment removal. The size of the particles present in the sediment and permit or receiving water limitations on sediment are key considerations for selecting sediment treatment option(s), in some cases, the use of multiple devices may be appropriate.

B10 - Measures utilized for work within waterbodies:

None.

For Locations See Plan Set: Erosion Control Plan, C400

For Details, See Plan Set: Erosion Control Details, C500

B11 - Maintenance guidelines for each proposed stormwater quality measure:

Each Measure shall be inspected weekly and after each 1/2" rainfall event. Follow maintenance guidelines for each measure as specified in each relevant construction detail.

See Plan Set: Erosion Control Detail, C500

B12 - Planned construction sequence that describes the implementation of stormwater quality measures in relation to land disturbance:

See Plan Set: Erosion Control Plan, C400

B13 - Provisions for erosion and sediment control on individual residential building lots regulated under the proposed project:

N/A

B14 - Material handling and spill prevention and spill response plan meeting the requirements in 327 IAC 2-6.1-6.15 & ILCS 11-1-1 Material handling and storage procedures associated with construction activity:

MATERIAL HANDLING:

- The proper management and disposal of waste should be practiced on site at all times to reduce pollution of storm water/runoff. Hazardous waste should always be disposed of through a designated hazardous waste management or recycling facility.
- Designate a waste collection area on-site that does not receive a substantial amount of runoff from upland areas and does not drain directly into a water body.

- Keep products in original containers with original labels and material safety data information attached. Make sure products are properly sealed to prevent leaks and spills and stored in a weather proof self contained area away from heat, sparks and flames.
- A program for recycling or disposal of materials associated with or from the project site shall be established by the contractor. All recycling containers shall be clearly labeled.
- All construction activities are to be monitored and maintained by the contractor. As each new subcontractor comes-on-site, the contractor will conduct and document a meeting to ensure awareness of the pollutant prevention program. Guidelines for proper handling, storage and disposal of construction site wastes shall be posted in the storage and use areas, and workers shall be trained in these practices.
- Containers and equipment must be inspected regularly for leaks, corrosion, support or foundation failure, or any other signs of deterioration and must be tested for soundness. Any found to be defective should be repaired or replaced immediately.

SPILL PREVENTION PLAN:

Purpose:

The intention of this Spill Prevention, Control and Countermeasures (SPCC) is to establish the procedures and equipment required to prevent the discharge of oil and hazardous substances in quantities that violate applicable water quality standards, cause a sheen upon or discoloration of the surface of navigable waters or adjoining shorelines, or cause sludge or emulsion to be deposited beneath the surface of the water or adjoining shorelines. The Plan also establishes the activities required to mitigate such discharges (i.e., countermeasures) should they occur.

Definitions:

Pollutant: means pollutant of any kind or in any form, including but not limited to sediment, paint, cleaning agent, concrete washout, pesticides, nutrients, trash, hydraulic fluids, fuel, oil, petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged soil.

Discharge:

Includes but is not limited to, any spilling, leaking, pumping, pouring, emitting, emptying, or dumping.

Navigable Waters:

Means all waters of the United States that are connected with a navigable stream,lake, or sea.

[Note: This definition is usually interpreted to mean any wastewater (even normallydry wash or storm sewer) that eventually drains into a navigable stream.]

Plan Review and Amendments:

This Plan shall be reviewed and/or amended, if necessary, whenever there is a change in the design of the site, construction, operation, or maintenance which materially affects the site's potential for the discharge of regulated material.

Prediction of Potential Spills:

- Nearest Navigable Water: Little Indian Creek
- Drainage System: All storm drainage leaves the site by open channels and closed storm systems to an unnamed tributary of Little Indian Creek.
- Possible Spill Sources (During and post construction): Vehicular sources such as leaking fuel or oil, brake fluid, grease, antifreeze, trash and debris, biological agents found in trash and debris, fertilizers, household items including but not limited to cleaning agents, chemicals, paint, herbicides and pesticides.
- Groundwater Contamination: The facility maintains NO above ground or under ground storage tanks at this site. Therefore, it is felt that there is little or no possibility of post construction groundwater contamination. The facility does have public sanitary sewer and public water.

Alert Procedures for Spills:

- Any personnel observing a spill will immediately instigate the following procedure:
 - Dialing "911" from any telephone.
 - Notify the appropriate emergency personnel.
- The Emergency Coordinator will then take the following actions:
 - Barricade the area allowing no vehicles to enter or leave the spill zone.
 - Notify the Indiana Department of Environmental Management, Office of Emergency Response by calling the appropriate telephone number: 317-233-7745 Toll Free 800-233-7745 Also the National Response Center at 800-424-8802 and provide the following information:
 - Time of observation of the spill
 - Location of the spill
 - Identity of material spilled
 - Probable source of the spill
 - Probable time of the spill
 - Volume of the spill and duration
 - Present and anticipated movement of the spill
 - Weather conditions
 - Personnel at the scene
 - Action initiated by personnel
 - Notify the City of Martinsville Fire Department Phone: 9-1-1
 - Notify the City of Martinsville Police department Phone: 9-1-1
 - Notify waste recovery contractor, maintenance personnel or other contractual personnel as necessary for cleanup.
 - Coordinate and monitor cleanup until the situation has been stabilized and all spills have been eliminated.
 - Cooperate with the IDEM-OER on procedures and reports involved with the event.

Cleanup Parameters:

- The Developer shall be continually kept informed, maintain lists of qualified contractors and available Vac-trucks, tank pumps and other equipment readily accessible for clean-up operations. In addition, a continually updated list of available absorbent materials and clean-up supplies should be kept on site.
- All maintenance personnel will be made aware of techniques for prevention and containment of spills. They will be informed of the requirements and procedures outlined in this plan. They will be kept abreast of current developments or new information on the prevention of spills and / or necessary actions to this plan.
- If spills occur which could endanger human life, this becomes the primary concern. The discharge of the life saving protection function will be carried out by the local police and emergency services.
- Absorbent materials, which are used in cleaning up spilled materials, will be disposed of in a manner subject to the approval of the Indiana Department of Environmental Management. Flushing of spilled material with water will not be permitted unless so authorized by the Indiana Department of Environmental Management.

ADDITIONAL STORMWATER POLLUTION PREVENTION MEASURES VEHICLE & EQUIPMENT MAINTENANCE

Description and Purpose:

Prevent or reduce the contamination of stormwater resulting from vehicle and equipment maintenance by running a "dry clean site". The best option would be to perform maintenance activities at an offsite facility. If this option is not available then work should be performed in designated areas only, while providing cover for materials stored outside, checking for leaks and spills, and containing and cleaning up spills immediately.

Suitable Applications:

These procedures are suitable on all construction projects where an onsite yard area is necessary for storage and maintenance of heavy equipment and vehicles.

Limitations:

Onsite vehicle and equipment maintenance should only be used where it is impractical to send vehicles and equipment offsite for maintenance and repair. Sending vehicles/equipment offsite should be done in conjunction with a stabilized Construction Entrance/Exit. Outdoor vehicle or equipment maintenance is a potentially significant source of stormwater pollution. Activities that can contaminate stormwater include engine repair and service, changing or replacement of fluids, and outdoor equipment storage and parking (engine fluid leaks).

Implementation:

If maintenance must occur onsite, use designated areas, located away from drainage courses. Dedicated maintenance areas should be protected from stormwater runoff and runoff, and should be located at least 50 ft from downstream drainage facilities and watercourses.

Drip pans or absorbent pads should be used during vehicle and equipment maintenance work that involves fluids, unless the maintenance work is performed over an impermeable surface in a dedicated maintenance area.

Place a stockpile of spill cleanup materials where there will be readily accessible.

ADDITIONAL STORMWATER POLLUTION PREVENTION MEASURES (CONTINUED):

All fueling trucks and fueling areas are required to have spill kits and/or use other spill protection devices.

Use absorbent materials on small spills. Remove the absorbent materials promptly and dispose of properly.

Inspect onsite vehicles and equipment daily at startup for leaks, and repair immediately, or remove from site.

Keep vehicles and equipment clean; do not allow excessive build-up of oil and grease.

Segregate and recycle wastes, such as greases, used oil or oil filters, antifreeze, cleaning solutions, automotive batteries, hydraulic and transmission fluids. Provide secondary containment and covers for these materials if stored onsite.

Train employees and subcontractors in proper maintenance and spill cleanup procedures.

Properly dispose of used oils, fluids, lubricants, and spill cleanup materials.

Do not place used oil in a dumpster or pour into a storm drain or watercourse.

Properly dispose of or recycle used batteries.

Do not bury used tires.

Repair leaks of fluids and oil immediately.

Keep ample supplies of spill cleanup materials onsite.

Maintain waste fluid containers in leak proof condition.

VEHICLE AND EQUIPMENT FUELING

Description and Purpose: Vehicle equipment fueling procedures and practices are designed to prevent fuel spills and leaks, and reduce or eliminate contamination of stormwater. This can be accomplished by using offsite facilities, fueling in designated areas only, enclosing or covering stored fuel, implementing spill controls, and training employees and subcontractors in proper fueling procedures.

Limitations: Onsite vehicle and equipment fueling should only be used where it is impractical to send vehicles and equipment offsite for fueling. Sending vehicles and equipment offsite should be done in conjunction with a Stabilized Construction Entrance/Exit.

Implementation: Use offsite fueling stations as much as possible. These businesses are better equipped to handle fuel and spills properly. Performing this work offsite can also be economical by eliminating the need for a separate fueling area at a site.

Discourage "topping off" of fuel tanks.

Absorbent spill cleanup materials and spill kits should be available in fueling areas and on fueling trucks, and should be disposed of properly after use.

Drip pans or absorbent pads should be used during vehicle and equipment fueling, unless the fueling is performed over an impermeable surface in a dedicated fueling area.

Use absorbent materials on small spills. Do not hose down or bury the spill. Remove the absorbent materials promptly and dispose of properly. Avoid mobile fueling of mobile construction equipment around the site; rather, transport the equipment to designated fueling areas.

Train employees and subcontractors in proper fueling and cleanup procedures.

Dedicated fueling areas should be protected from stormwater runoff and runoff should be located at least 50 ft away from downstream drainage facilities and watercourses. Fueling must be performed on level grade areas.

Protect fueling areas with berms and dikes to prevent runoff, runoff, and to contain spills.

Nozzles used in vehicle and equipment fueling should be equipped with an automatic shutoff to control drips. Fueling operations should not be left unattended.

Federal, state, and local requirements should be observed for any stationary above ground storage tanks.

Vehicles and equipment should be inspected each day of use for leaks. Leaks should be repaired immediately or problem vehicles or equipment should be removed from the project site.

Keep ample supplies of spill cleanup materials onsite.

Immediately clean up spills and properly dispose of contaminated soil and cleanup materials.

CONCRETE WASHOUT

The following steps will help reduce stormwater pollution from concrete wastes:

Discuss the concrete management techniques described in this BMP (such as handling of concrete waste and washout) with the ready mix concrete supplier before any deliveries are made.

Incorporate requirements for concrete waste management into material supplies and subcontractor agreements.

Store dry and wet materials under cover, away from drainage areas.

Avoid mixing excess amounts of fresh concrete.

Perform washout of concrete trucks offsite or in designated areas only. Do not wash out concrete trucks into storm drains, open ditches, streets, or streams. Do not allow excess concrete to be dumped onsite, except in designated areas.

For onsite washout:

- Locate washout area at least 50 feet from storm drains, open ditches, or water bodies.
- Do not allow runoff from this area by constructing a temporary pit or bermed area large enough for liquid and solid waste. Liquid that accumulates in a washout area may be high in alkalinity and must be disposed of properly.
- Wash out wastes into the temporary pit where the concrete can set, be broken up, and then disposed properly.
- Avoid creating runoff by draining water to a bermed or level area when washing concrete to remove fine particles and expose the aggregate.
- Do not wash sweepings from exposed aggregate concrete into the street or storm drain. Collect and return sweepings to aggregate base stockpile or dispose in the trash.

SOLID WASTE MANAGEMENT

Description and Purpose: Solid waste management procedures and practices are designed to prevent or reduce the discharge of pollutants to stormwater. The facility maintains NO above ground and all spills have been eliminated.

Suitable Applications: This BMP is suitable for construction sites where the following wastes are generated or stored: Solid waste generated from trees and shrubs removed during land clearing, demolition of existing structures (rubble), and building construction.

Packaging materials including wood, paper, and plastic.

Scrap or surplus building materials including scrap metals, rubber, plastic, glass pieces and masonry products.

Domestic wastes including food containers such as beverage cans, coffee cups, paper bags, plastic wrappers, and cigarettes.

Construction wastes including brick, mortar, timber, steel and metal scraps, pipe and electrical cuttings, nonhazardous equipment parts, styrofoam and other materials from transport and package construction materials

Implementation:

Select designated waste collection areas onsite.

Inform contractors that you will accept only watertight dumpsters for onsite use.

Inspect dumpsters for leaks and repair any dumpster that is not watertight.

Provide an adequate number of containers with lids or covers that can be placed over the container to keep rain out or to prevent loss of wastes when it is windy.

Plan for additional containers and more frequent pickup during the demolition phase of construction.

Collect site trash daily, especially during rainy and windy conditions.

Remove this solid waste promptly since erosion and sediment control devices tend to collect litter.

Make sure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acids, pesticides, additives, curing compounds) are not disposed of in dumpsters designated for construction debris.


Do not dispose out dumpsters on the construction site. Leave dumpster cleaning to the trash hauling contractor.

Arrange for regular waste collection before containers overflow.

Clean up immediately if a container does spill.

Make sure that construction waste is collected, removed, and disposed of only at authorized disposal areas.

Incorporate requirements for solid waste management into builder and subcontractor agreements.



Curlex® NetFree™

100% Biodegradable Erosion Control Blankets

Product Description

American Excelsior Company is constantly researching new ideas to meet the needs of the ever-changing erosion control industry. Our latest innovation is Curlex NetFree™ - The first erosion control blanket (ECB) that does not use any netting material.



The manufacturing of Curlex NetFree begins with choosing the finest Great Lakes aspen. After the material is mechanically shaved, the resulting Curlex excelsior fibers are stitched to form a continuous matrix. Biodegradable thread is used in the process, which makes the entire Curlex NetFree product biodegradable. Curlex NetFree loses the net, but keeps the unique and time proven benefits of the Curlex fiber.

MATERIAL CHARACTERISTICS

Curlex NetFree is manufactured from Great Lakes aspen and is designed to provide protection for grass seed and topsoil from wind and water erosion, while simultaneously promoting ideal growing conditions.

BENEFITS OF CURLEX NETFREE

- No more entrapment of wildlife or pets
- No more netting tangled in mowing equipment
- No more worries about future environmental risks - *Curlex NetFree is 100% biodegradable*
- No more tripping on netting
- No more waiting for netting to decompose


PERFORMANCE CAPABILITIES

SLOPES	3H:1V & flatter
CHANNELS	48 Pa (1 lb/ft ²)

TYPICAL APPLICATIONS

Golf courses, residential projects, environmentally sensitive, commercial development, highway construction, urban drainage, slope stabilization, or other areas that do not want to deal with the potential headaches associated with ECB netting.

American
Excelsior
Company
Earth Science Division
Arlington, Texas (800) 777-SOIL • www.curlex.com



MADE IN
U.S.A.

American
Excelsior
Company®
Earth Science Division

Curlex® NetFree™

100% Biodegradable Erosion Control Blanket

SUGGESTED SPECIFICATIONS

General
Fibers in Curlex NetFree shall be evenly distributed over its entire area and 80% of the fibers shall be six inches or longer with consistent thickness. Biodegradable stitching shall be used to form the continuous matrix of Curlex fibers. The blanket shall be naturally seed free and not contain any foreign weed seed, chemical additives, tackifiers, or paper products that could hinder grass growth, establish unwanted invasive weed species or shorten necessary erosion protection time periods.

Product
Fiber Great Lakes Aspen Excelsior with no weed seeds. Curled, interlocking fibers with barbed edges
Fiber Size 80% of fibers a minimum of 6 in (15.2 cm) long
0.038 in wide x 0.018 in thick (0.97 mm wide x 0.46 mm thick)
Mass per Unit Area* 0.73 lb/yd² (0.40 kg/m²)
Thread Material Biodegradable
Width 8.0 ft (2.4 m)
Length 90.0 ft (27.4 m)
Area 80.0 yd² (66.9 m²)
*Weight is based on a dry fiber weight basis at time of manufacture. Baseline moisture content of Great Lakes Aspen Excelsior is 22%.

Installation
Before installing Curlex NetFree blankets, the seedbed shall be inspected by the Owner's Representative to ensure it has been properly compacted and fine graded to remove any existing rills. It shall be free of obstructions, such as tree roots, projections such as stones, and other foreign objects. The contractor shall proceed when satisfactory conditions are present. After the area has been properly shaped, seeded, fertilized, and compacted, locate the start of the roll, making sure the roll is facing toward the area to be covered, and then roll out the blanket. Blankets shall be rolled out flat, even, and smooth without stretching the material then anchored to the subgrade.

Slopes: Curlex NetFree blankets shall be installed vertically on the slope. If more than one width is required, a minimum two to four inch overlap should be used. Secure the outer most stitch of each adjoining blanket with a common row of staples. Curlex NetFree blankets shall be trenched at the head of the slope if the blanket cannot be extended three feet over the slope crest, or if overland flow is anticipated from upslope areas.

Channels: Curlex NetFree blankets shall be centered to offset a seam in the middle of the waterway. They shall be installed in the same direction as the water flow. Curlex NetFree blankets shall not be installed perpendicular to the direction of flow. The adjoining blankets shall be installed away from the center of channel and overlapped. Curlex NetFree installation shall continue up the side slopes and three feet over the crest to the flat of the final grade. Flanks exposed to runoff, or sheet flow, must be protected by a check slot. Curlex NetFree shall be trenched at the start of the channel and anchored using a staggered staple pattern at end of roll overlaps and end of roll terminations.

Disclaimer: Curlex NetFree is a system for erosion control and revegetation on slopes and channels. American Excelsior (AEC) believes that the information contained herein to be reliable and accurate for use in erosion control and revegetation applications. However, since physical conditions vary from job site to job site and even within a given job site, AEC makes no performance guarantees and assumes no obligation or liability for the reliability or accuracy of information contained herein for the results, safety, or suitability of using Curlex NetFree or for damages occurring in connection with the installation of any erosion control product whether or not made by AEC or its affiliates, except as separately and specifically made in writing. These specifications are subject to change without notice.

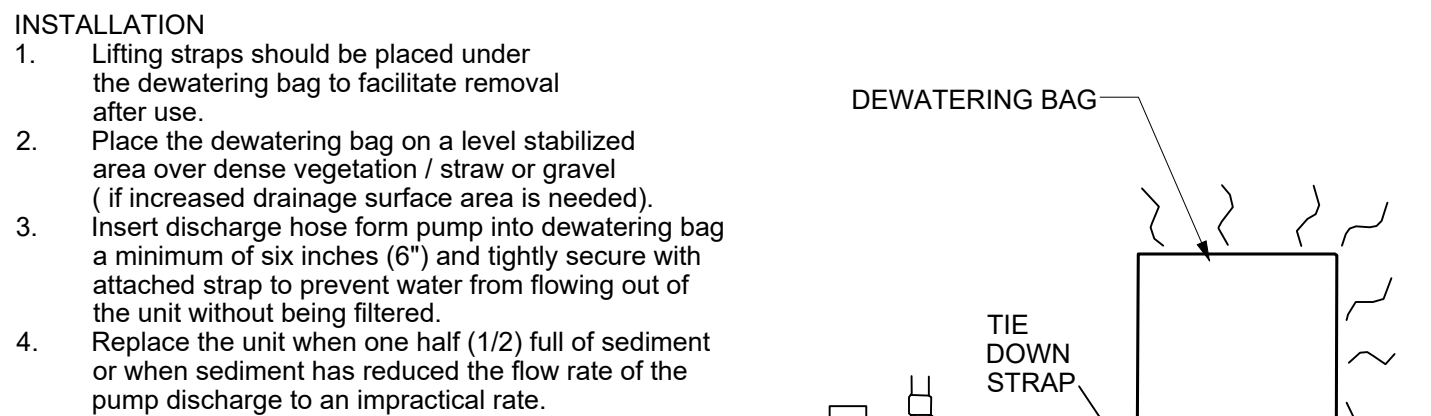
If you would like to receive more information or consult with one of our Customer Care Center Specialists, please call us toll free at (888) 352-6592.

PDF download specifications available in the Technical Support Library at www.curlex.com

Form#289122116E

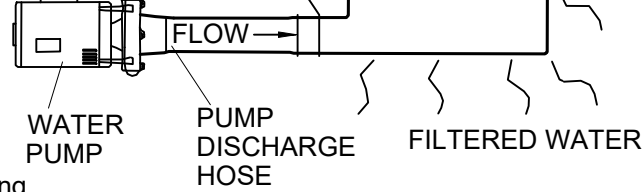
**CURLEX BIODEGRADABLE NETFREE
EROSION CONTROL BLANKET DETAIL**

NO SCALE



DEWATERING FILTER BAG

NO SCALE



NOT USED

NO SCALE



Stabilization Practice	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Permanent Seeding			A ————— *///\\//						————— */\\			
Dormant Seeding	B —————→										B —————→	
Temporary Seeding			C —————→ E —————→				*///\\//		D —————→			
Sodding			F** —————→			*///\\//		—————→				
Mulching	G —————→											

A = Kentucky Bluegrass 40 lbs/acre; or 40 lbs. low or endophyte free tall Fescue; plus 2 tons straw mulch/acre or add Annual Ryegrass 20 lbs/acre.

B = Kentucky Bluegrass 60 lbs/acre; or 40 lbs. low or endophyte free tall Fescue; plus 2 tons straw mulch/acre or add Annual Ryegrass 30 lbs/acre.

C = Spring Oats 100 lbs./acre

D = Wheat or Rye 150 lbs./acre.

E = Annual Ryegrass 40 lbs/acre. (1 lb./1000 sq. ft.)

$$F = \text{Sod}$$

G = Straw Mulch 2 tons/acre.

// Irrigation needed during June, July, and/or September.

** Irrigation needed for 2 to 3 weeks after applying sod.

Lime and fertilize to site specific soils tests or apply fertilizer at a rate of 1000 lbs. per acre or 12-12-12 or equivalent.

All swales shall be seeded with 2 lbs. Adelphi bluegrass and 2 lbs. Perennial Derby rye, or equivalent per 1000 square feet. mulch with one bale of straw per 1000 square feet. Fertilize with 5 lbs. of 20-5-5 per 1000 square feet unless specified otherwise.

SEEDING CHART

NO SCALE



**American
Excelsior
Company®
Earth Science Division**

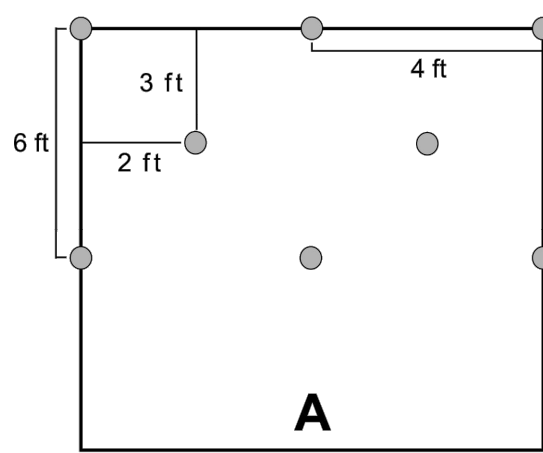
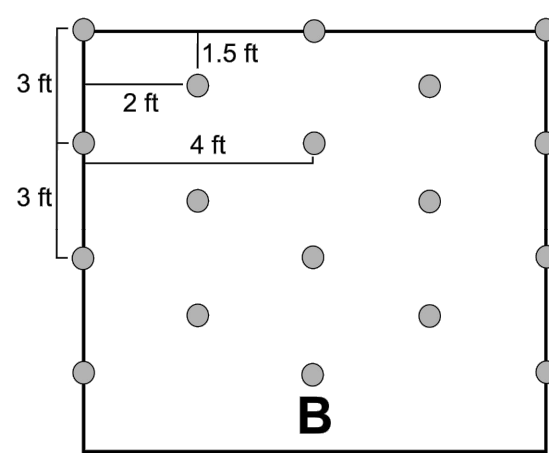
Proud Participant in NTPEP and Proud Member of



Curlex® NetFree™ Staple Pattern Guide

Application	Slope		Channel
	≤ 4H:1V	≤ 3H:1V	≤ 1.0 lb/ft ² (48 Pa) Shear Stress ≤ 3.0 ft/sec (0.9 m/sec) Velocity
Staple Pattern	A	B	C

● = Staple Placement

0.9 Staples/yd²1.9 Staples/yd²

Notes:

1. Recommended staples are a minimum of 18 inches long, made of a biodegradable E-Staple[®], as provided by American Excelsior Company, for cohesive soils and 6 in for non-cohesive soils.
2. Staples shall be placed on a stitch line and the staple heads are parallel to the flow direction.
3. Adjust staple pattern so staples are placed at points (e.g. slope interface, channel bottom, etc.)

Critical channel points are circled.

The diagram shows a trapezoidal channel cross-section. The top boundary is a horizontal line. The bottom boundary consists of two sloped lines meeting at a central point. Three points are circled: the left shoulder point, the bottom center point, and the right shoulder point. These represent the critical channel points for the flow.

STAPLE PATTERN GUIDE

NO SCALE



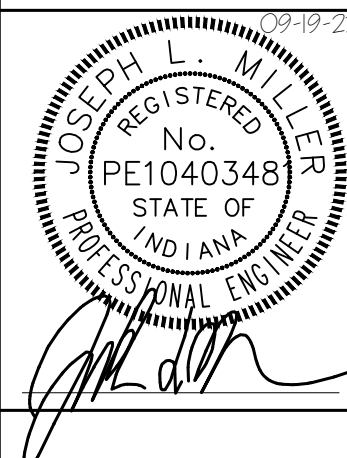
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Project No: 22067

Sheet No:

C500

EROSION CONTROL DETAILS



BANNING
ENGINEERING

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AquaBlok – 2080FW

General Description

AquaBlok® is a patented, composite-aggregate technology resembling small stones that is typically comprised of a dense aggregate core. In this application of the technology, a powdered high-swell sodium bentonite coating is utilized (Figure 1) with varying percentages of an additive (bentonite) layer by percent of total weight.

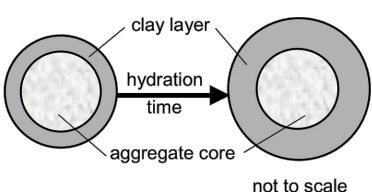


Figure 1. Configuration of AquaBlok-coated particle.

AquaBlok 2080FW is a freshwater formulation, which is approximately 20% Bentonite by weight based on the total quantity of material used in production. This product will provide a low-permeability seal in the water without mechanical compaction.



Product Specifications

- Aggregate: Nominal AASHTO #8 or custom-sized to meet project-specific needs
- Limestone or non-calcareous substitute, as deemed project-appropriate
- Bentonite:
- Powdered – Approximate 200 Mesh
 - Bentonite Clay; High-Swell Wyoming Sodium Natural Mineral (Montmorillonite)
 - Light Grey Powder; Odorless
 - Formulation Range from 15 – 25% by weight (average)
- Manufacturers – Product Designation
- Bentonite Performance Minerals – Barakade Standard
 - Others that are deemed to meet the manufacturer specification
- Binder: Cellulosic polymer



For more information, contact AquaBlok, Ltd.

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Last Revised: March 2018

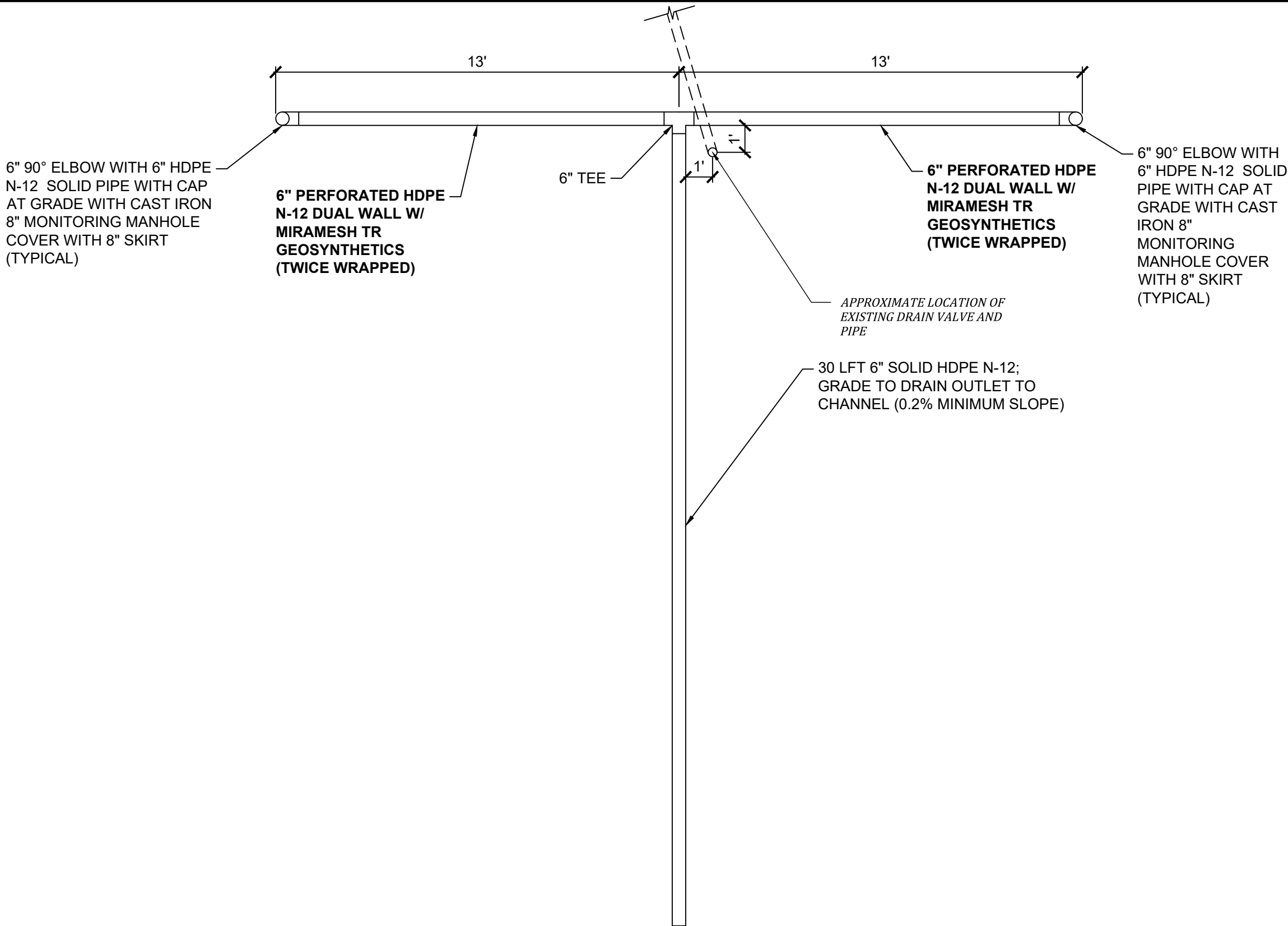
Laboratory Test Results for AquaBlok 2080FW Product on Back

Laboratory Test Results for AquaBlok 2080FW Product

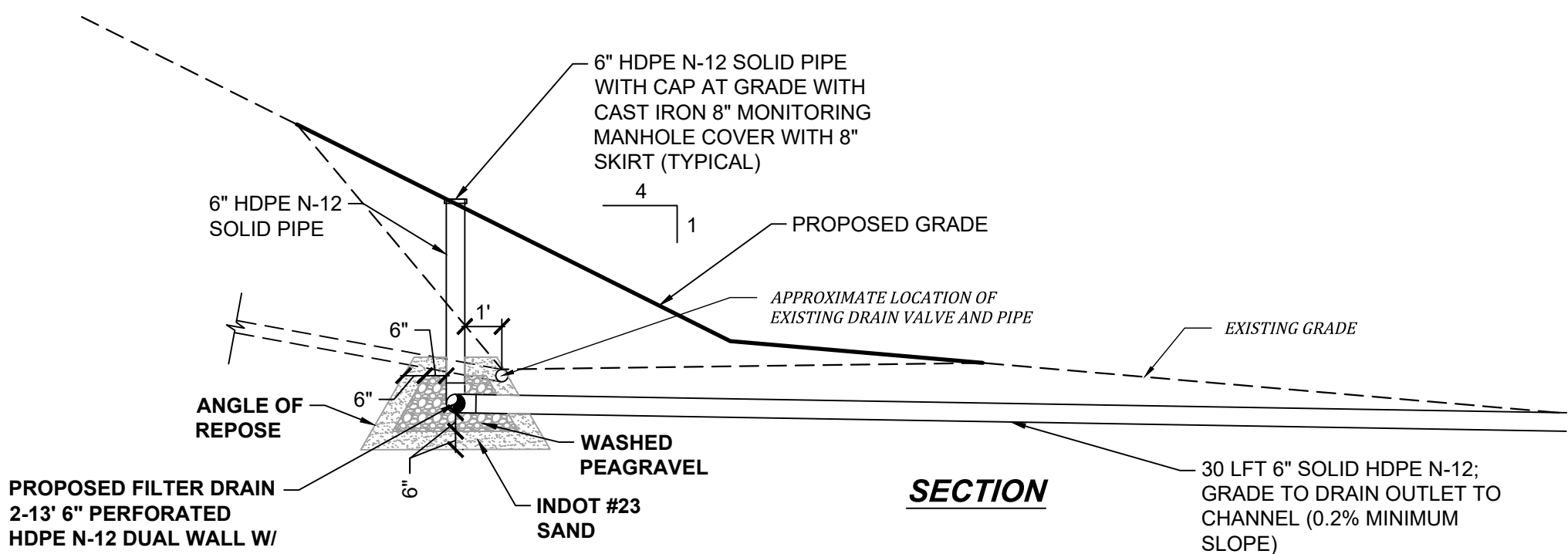
Note: The test results provided in this table were performed on 2080FW manufactured on a #8 crushed limestone. While additional testing and certification may not be necessary for small-scale projects (especially if the typical reported material characteristics significantly outperform the design requirements), large-scale projects may warrant additional testing to verify results, specifically with respect to incorporation of locally available materials in product manufacturing. Manufacturing tolerances will vary based on source materials and required performance designs.

Tests ¹	Method ²	2080 FW ³
Visual Classification - Practice for Description and Identification of Soils	ASTM D2488	Gray poorly graded gravel with bentonite coating (GP)
Moisture Content ⁴ 6	ASTM D2216, AASHTO T265	10-20%*
Dry Bulk Density	ASTM C29	75-85 pcf*
Specific Gravity ⁷	ASTM D854, AASHTO T100	2.63*
Atterberg Limits - Liquid Limit	ASTM D4318, AASHTO T89	55%
Permeability - Flexible Wall Permeameter ⁸ 13	ASTM D5084	1x10 ⁻⁷ to 1x10 ⁻⁹ cm/s*
Consolidation - Incremental Loading	ASTM D2435, AASHTO T216	C _c = 0.35, e _c = 0.85 ¹⁴ Coefficient of Consolidation = 0.03-0.48 in ² /min*
Consolidation - Swell Pressure	ASTM D4546, AASHTO T258	310-360 psf ¹⁵ *
Shear Strength - Direct Shear	ASTM D3080, AASHTO T236	139 psf, 31.4°
Shear Strength - Unconfined Compression ¹⁷	ASTM D2166, AASHTO T208	70°-220 psf
Shear Strength - Triaxial Unconsolidated-Undrained (Q or UU)	ASTM D2850, AASHTO T296	520 psf, 0° ¹⁸
Shear Strength - Triaxial Consolidated-Undrained (R or CU)	ASTM D4767, AASHTO T297	180 psf, 11.7° (total) 140 psf, 25.8° (effective)
Compaction - Standard Proctor	ASTM D698, AASHTO T99	Optimum Moisture Content 16.9% Maximum Dry Density 107.5 pcf
Compaction - Modified Proctor	ASTM D1557, AASHTO T180	Optimum Moisture Content 10.1% Maximum Dry Density 123.3 pcf
Compaction - 15-Blow	US Army Corps of Engineers	Optimum Moisture Content 21.3% Maximum Dry Density 98.8 pcf
Free Swell	ASTM D5890	500 ml/40g*

- Results are based on laboratory tests for specific blends. Variability may be experienced due to manufacturing tolerances, screening, distribution of grain sizes, quality control, etc.
- Tests were completed according to AASHTO standards when determined to be equivalent to those set by the U.S. Army Corps of Engineers.
- Core material is typically nominal AASHTO #8 aggregate. Some variability may be expected with the use of different aggregate sizes.
- Moisture content values are for dry material.
- Calculated using a weighted average of the specific gravities for the material that was retained and that passed the #4 sieve. Material retained was assumed to be nominal AASHTO #8 aggregate and have a specific gravity of 2.62. Material passed was tested according to ASTM D854 to determine its specific gravity.
- Moisture content values are for freshwater scenarios. Results will vary with other permeants, and the use of other material blends may be appropriate to maintain the desired permeability.
- Swell pressure determined based on pressure required to prevent free swell during the hydration of the material prior to consolidation testing.
- Test is commonly performed on fine-grained homogenous material, so it may not be representative of the AquaBlok product's actual strength since the product is a mixture of fine-grained material and aggregate. It is suggested that results from the UU triaxial test may provide a more reliable undrained shear strength value and is recommended for most preliminary stability analyses.
- Triaxial unconsolidated-undrained test was performed according to ASTM D4767, saturated.



PLAN VIEW



FILTER DRAIN PIPE

NO SCALE

1
C501

AQUA BLOK DETAIL

NO SCALE

3
C501

WATERSTOP-RX®
EXPANDING CONCRETE JOINT WATERSTOP

DESCRIPTION

WATERSTOP-RX is a hydrophilic strip waterstop designed to stop water infiltration through cast-in-place concrete construction joints by expanding upon contact with water to form a positive seal against the concrete. The key to WATERSTOP-RX's effectiveness is its superior expansion to seal and fill voids and cracks in the concrete. WATERSTOP-RX is an active bentonite/butyl-rubber based waterstop that is designed to replace passive PVC/Rubber dumbbell waterstops, thereby eliminating the requirement of special pieces, split-forming and seam welding. WATERSTOP-RX has been successfully tested by independent testing agencies over 60 meters (200 feet) of hydrostatic water pressure, under both continuous immersion and wet/dry cycling.

WATERSTOP-RX is available in three sizes and shapes (see Product Table). WATERSTOP-RX 101 is produced in a rectangular shape measuring 25 x 20 mm (1" x 3/4"). WATERSTOP-RX 101T is produced in a trapezoidal shape measuring 31 x 12 mm (1-1/4" x 1/2") with a reinforcing plastic scrim embedded in the top surface for high tensile strength. The patented trapezoidal shape distributes the expansive force over a greater area and allows the concrete to flow more readily over the product during placement. WATERSTOP-RX 102 is produced in a half-circle (Crescent) shape measuring 19 x 9 mm (3/4" x 3/8").

Though WATERSTOP-RX possesses good resistance to many chemicals, the waterstop is not intended to be used as the primary joint sealant for chemical containment vessels. Consult manufacturer for guidance regarding chemical compatibility for secondary chemical containment applications. Additionally, WATERSTOP-RX is not an expansion joint sealant; contact CETCO for expansion joint applications.

APPLICATIONS

Applications include both vertical and horizontal non-moving concrete construction

joints, new to existing concrete construction, irregular surfaces, and around through-wall penetrations, such as plumbing and utility pipes. Additionally WATERSTOP-RX can seal around concrete pilings and steel H-piles passing through the slab. WATERSTOP-RX works in both continuous hydrostatic and intermittent hydrostatic conditions.

WATERSTOP-RX products are designed for reinforced structural concrete with a minimum of 20N/mm² (3,000 psi) compressive strength. RX-101 and RX-101T are designed for concrete 200 mm (8") thick or greater with two rows of reinforcing steel. RX-102 is designed for vertical concrete 150 mm (6") thick or greater; and horizontal concrete no less than 100 mm (4") thick. RX-102 should be used in concrete with one row of steel reinforcement, concrete curbs, planter walls, fountains, and lightweight structural

At structural and pipe penetrations, cut into strips to fit around the penetration. Apply to adhesive and abut coil ends together. On irregular surfaces such as stone or rough concrete, make sure WATERSTOP-RX remains in direct contact with the substrate along the entire installation. There should not be any air gap between the WATERSTOP-RX and the substrate.

INSTALLATION
Surface preparation: Surfaces should be clean and dry. Remove all dirt, rocks, rust or other construction debris. Do not install WATERSTOP-RX in standing water or on an load substrate.

Adhesive: Apply a continuous bead of CET-SEAL along the substrate where WATERSTOP-RX will be installed. Assure proper 75 mm (3") concrete coverage will be maintained. Keep the nozzle tip pressed against the concrete at a 45° angle during application.

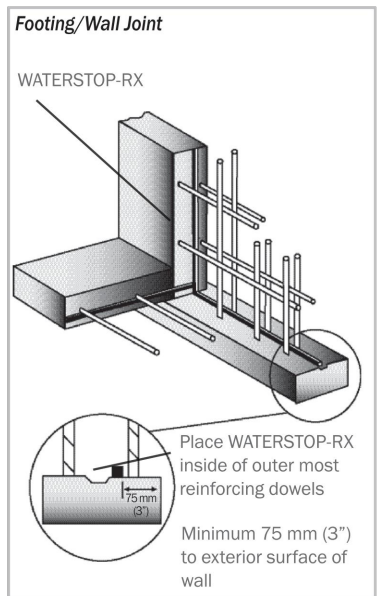
Installation: After applying a continuous bead of CETSEAL, remove release paper, then firmly press the entire length of WATERSTOP-RX onto the adhesive. For vertical and overhead applications, firmly press a minimum of 15 seconds to assure adhesion. For best results apply WATERSTOP-RX within 15 minutes of adhesive installation. WATERSTOP-RX must be placed into adhesive prior to CETSEAL

skinning over and curing. CETSEAL may be applied to damp surfaces, but not in standing water.

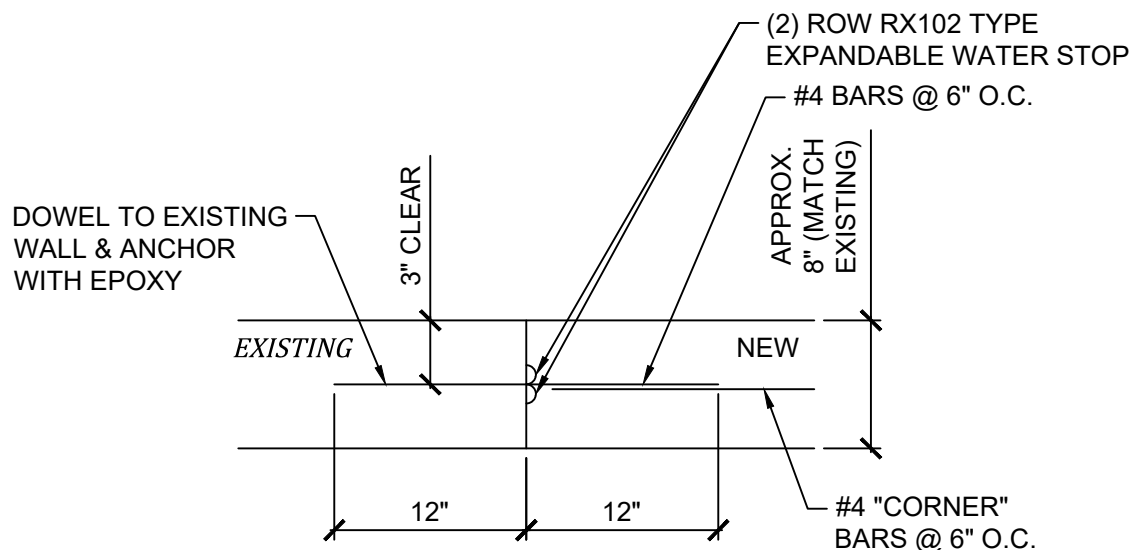
Tightly butt coil ends together to form a continuous waterstop - do not overlap coil ends. Place in maximum practical lengths to minimize coil end joints. Where required, cut coils with a sharp knife or utility blade to fit coil ends together. Make horizontal to vertical transitions by abutting product coil sections together, no special accessory pieces are required.

At structural and pipe penetrations, cut into strips to fit around the penetration. Apply to adhesive and abut coil ends together. On irregular surfaces such as stone or rough concrete, make sure WATERSTOP-RX remains in direct contact with the substrate along the entire installation. There should not be any air gap between the WATERSTOP-RX and the substrate.

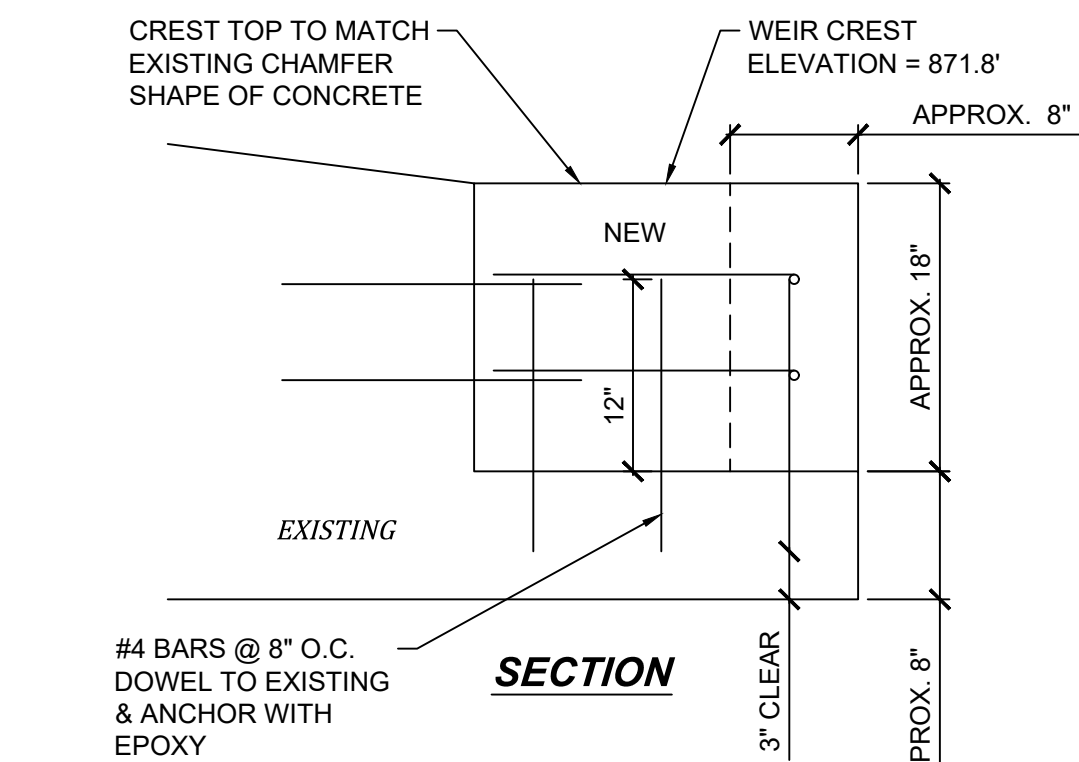
FOOTING/WALL JOINT



EXISTING STRUCTURE PHOTO



TOP VIEW



SECTION

CONCRETE SPILLWAY INLET
REPAIR DETAIL

NO SCALE

5
C501

AQUA BLOK
INSTALLATION DETAIL

NO SCALE

2
C501

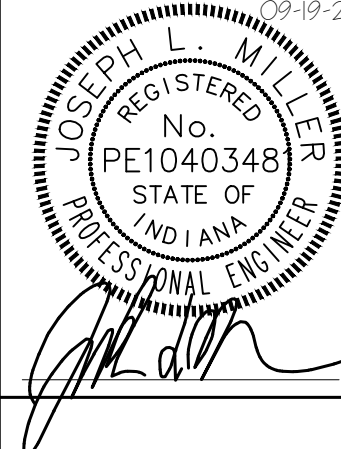
WATERSTOP-RX PRODUCT TABLE					
PRODUCT	SIZE	ROLL LENGTH	CROSS-SECTION SHAPE	UNIT QTY/CARTON	MIN CONCRETE COVERAGE
RX-101	25 x 20 mm (1" X 3/4")	5 m (16' 8")	Rectangle	30 m (100 LF)	75 mm (3")
RX-101T	31 x 12 mm (1-1/4" X 1/2")	6 m (20')	Trapezoid with Poly Scrim Reinforcement	36 m (120 LF)	75 mm (3")
RX-102	19 x 9 mm (3/4" x 3/8")	10 m (33' 4")	Half Circle	60 m (200 LF)	50 mm (2")

WATERSTOP DETAIL
NO SCALE

5
C501

MISCELLANEOUS DETAILS

CHERRY LAKE DAM REHABILITATION
INDIANA DEPARTMENT OF ADMINISTRATION
BENTON NORTH TOWNSHIP, MARTINSVILLE, INDIANA



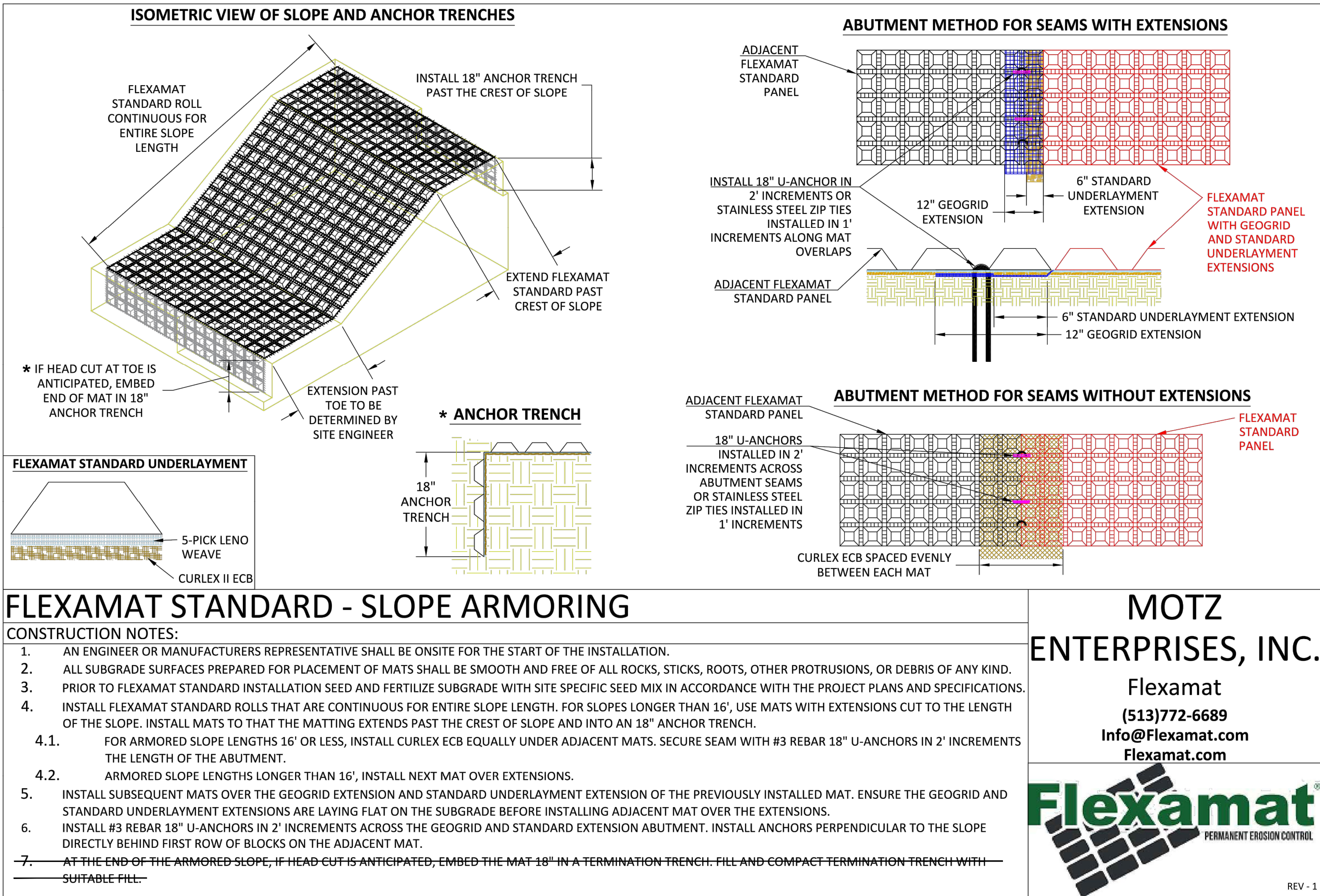
BANNING ENGINEERING
8553 COLUMBIA ROAD, SUITE #101
PLAINFIELD, IN 46168
BUS: (317) 707-3700, FAX: (317) 707-3800
E-MAIL: Banning@BanningEngineering.com
WEB: www.BanningEngineering.com

Project No: 22067

Sheet No:

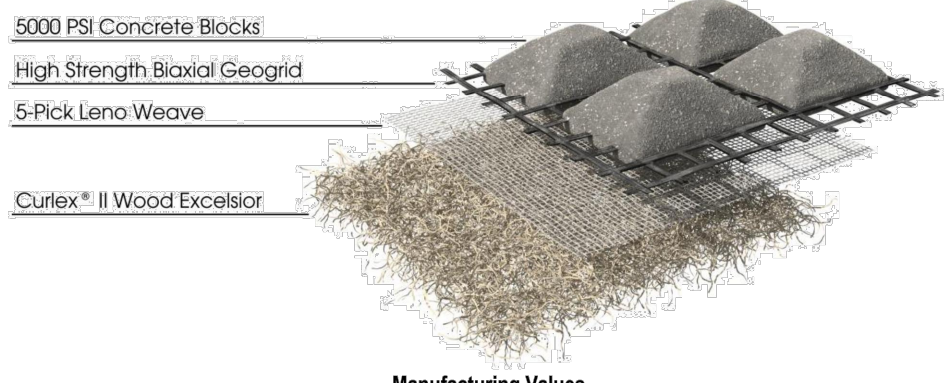
C501

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Motz Enterprises, Inc.
Office: 513-772-6689
www.Flexamat.com

Composition of Materials - Flexamat Standard				
Blocks	5000 PSI, Wet-cast Portland Cement			
Interlocking	Formit 30/30 - Polypropylene Geogrid with 2,055 lb/ft biaxial strength. Carbon black UV inhibitor shall be blended into the extruded yarns at a rate no less than 0.8% by weight.			
Biaxial Geogrid				
Property	Unit	Test	Requirement	
Mass/Unit Area	oz/yd ²	ASTM D5261	6.5 oz/yd ²	
Aperture Size	English units	Measured	1.4x 1.4 inch	
Ultimate Wide Width Tensile Strength (MD x CMD)	lb/ft	ASTM D6637	2,055 lb/ft	
Elongation at Ultimate Tensile Strength (MD x CMD)	%	ASTM D6637	6%	
Wide Width Tensile Strength @ 2% (MD x CMD)	lb/ft	ASTM D6637	822 lb/ft	
Wide Width Tensile Strength @ 5% (MD x CMD)	lb/ft	ASTM D6637	1,640 lb/ft	
Tensile Modulus @ 2% (MD x CMD)	lb/ft	ASTM D6637	41,100 lb/ft	
Tensile Modulus @ 5% (MD x CMD)	lb/ft	ASTM D6637	32,800 lb/ft	



Flexamat Properties	Values
Roll Width	4', 5.5', 8', 10', 12', 15.5', & 16'
Roll Length	30', 40', 50' / custom
Material Weight	10 lbs./sf
Block Size	6.5" x 6.5" x 2.25"
Percentage Open Area (POA)	30% min.

Performance				
Test	Tested Value	Bed Slope	Soil Classification	Limiting Value
ASTM 6460	Shear Stress	30%	Sandy Loam (USDA)	24 PSF
ASTM 6460	Velocity	20%	Loam (USDA)	30 ft./sec

FLEXAMAT

NO SCALE

1 C502

4.2 Micro-Grid Geotextile

General Requirement. The material used shall be Miramesh® TR by Tencate Geosynthetics or approved equivalent.

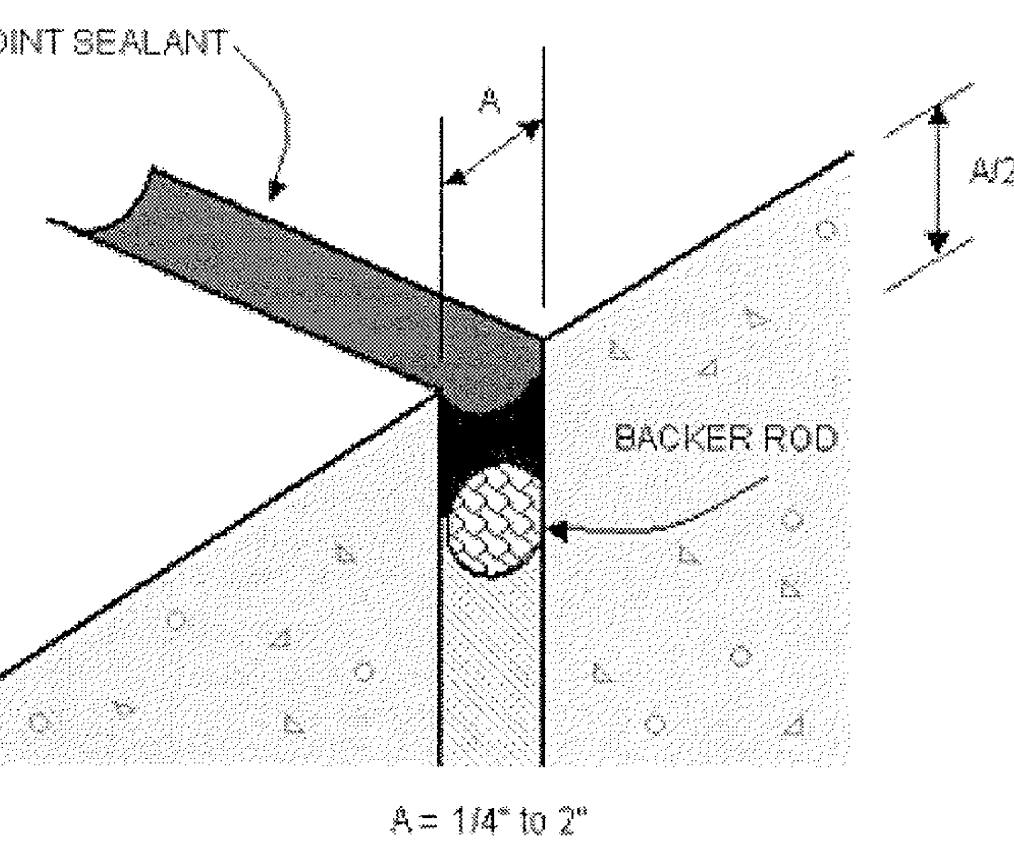
The micro-grid geotextile will be double wrapped over the 6" diameter N-12 drainpipe and will be secured during backfilling of pea gravel.

TABLE 2 GEOTEXTILE MATERIAL PROPERTIES (MIRAMESH® TR OR EQUIVALENT)		
TEST	METHOD	REQUIREMENTS*
Tensile Strength	ASTM D 4595	2100 lbs./ft. (30.6 kN/m)
Creep Reduce Strength	ASTM D 5262	686 lbs./ft. (10.0 kN/m)
Allowable Design Strength	GRI GT-7	594 lbs./ft. (8.7 kN/m)
Ultraviolet Resistance at (500 hours)	ASTM D 4355	90% strength retained
Apparent Opening Size (AOS)		2 mm x 3 mm

GEOMESH WRAP

NO SCALE

2 C502



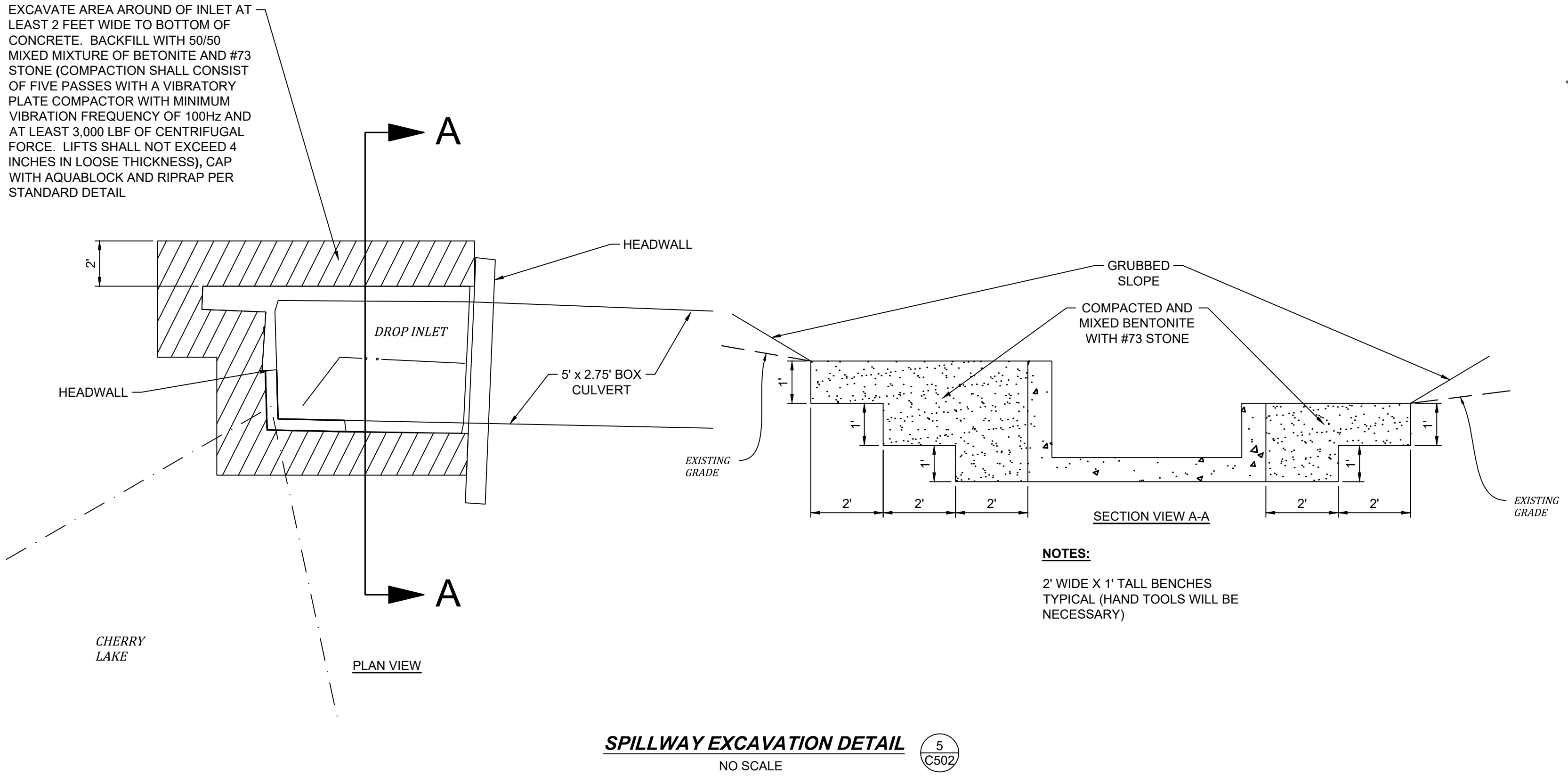
NOTES:

USE TYPE M, GRADE NS, CLASS 25, USE I (IMMERSED) PER ASTM C920 OR ENGINEER APPROVED EQUIVALENT.

TYPICAL SEALANT JOINT DETAIL

NO SCALE

4 C502



MISCELLANEOUS DETAILS

CHERRY LAKE DAM REHABILITATION

INDIANA DEPARTMENT OF ADMINISTRATION

BENTON NORTH TOWNSHIP; MARTINSVILLE, INDIANA

Project No: 22067

Sheet No:

C502

BANNING ENGINEERING

8553 COLUMBIA ROAD, SUITE #101
PLAINFIELD, IN 46168
BUS: (317) 707-3700, FAX: (317) 707-3800
E-MAIL: Banning@BanningEngineering.com
WEB: www.BanningEngineering.com

REGISTERED PROFESSIONAL ENGINEER
No. PE1040348
STATE OF INDIANA

PROJECT: Cherry Lake Dam			CLIENT: Banning Engineering Plainfield, Indiana			Page 1 of 1		
SITE: Morgan Monroe National Forest Marsville, Indiana								
LOCATION: See <u>Exploration Plan</u> Latitude: 39.323° Longitude: -86.4237°								
Approximate Surface Elev.: 681 (F1) +/-								
DEPTH ELEVATION (F1)								
SILT (ML) trace gravel, trace sand, brown, very stiff to hard, (possible fill)								
4.0 877 +/-								
5.0 876 +/-								
WEATHERED SILTSTONE brown, soft								
14.0 867 +/-								
Boring Terminated at 14 Feet								
Stratification lines are approximate. In-situ, the transition may be gradual.			Hammer Type: Automatic					
Graphic Log			DEPTH (F1) WATER LEVEL OBSERVATIONS SAMPLE TYPE RECOVERY (%) FIELD TEST RESULTS LABORATORY TEST TYPE STRENGTH STRAIN (%) WATER CONTENT (%) ATTERBERG LIMITS LL-PL-PI PERCENT FINES					
12 4-6-5-8 N=11								
17 9-10-9-10 N=19								
20 3-3-14-26 N=17								
21 8-20-40-50/3" N=60								
10 17-50/3" 2.0								
15 25-50/4" 2.0								
4 50/4" 2.0								
Notes:			See <u>Exploration and Testing Procedures</u> for a description of field and laboratory procedures for use and additional data (if any). See <u>Supporting Information</u> for explanation of symbols and abbreviations.					
Measurement Method: 3/1" HSA			Notes:					
Abandonment Method: Backfilled with sealer cuttings and a bentonite chip plug near the surface.			Water Level Observations No water observed until drilling No water observed at completion of drilling					
Water Level Observations No water observed until drilling No water observed at completion of drilling			Terracon 1710 W New York St Indianapolis, IN					
Boring Started: 02-14-2023 Drill Rig: D-50 Track Project No.: C1225291			Boring Completed: 02-14-2023 Driller: J.S.					
Cased in at 9 ft								

BORING LOG NO. CB-2

Page 2 of 2

PROJECT: Cherry Lake Dam

CLIENT: Banning Engineering
Plainfield, Indiana

SITE: Morgan Monroe National Forest
Martinsville, Indiana

GRAPHIC LOG	LOCATION: See <u>Exploration Plan</u> Latitude: 39.3232° Longitude: -86.4232°		DEPTH (Ft.)	LABORATORY OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	FIELD TEST RESULTS	LABORATORY TEST RESULTS	STRENGTH TEST		ATTERBERG LIMITS		PERCENT FINES
	DEPTH	ELEVATION (Ft.)							UNCONSOLIDATED COMPRESSION (lb/sq)	SWELL (%)	FLUID UNIT WEIGHT (pcf)	LL-PL (%)	
		Approximate Surface Elev. = 876 (Ft.) +/-											
		SILT (ML) , trace gravel, trace sand, gray and brown, stiff to very stiff, with clay seam near 22 to 24 ft, (fill) (continued)					2-3-5-6 N=8	1.5 2.0		20.5			
							3-4-5-4 N=9	2.0 2.5		23.6		31-21-10	88
			25				3-8-6-8 N=14	2.0 3.5	UC 3.18	9.2	21.2	108	
									2.19	4.4	22.5	103	32-23-9
									1.41	2.5	21.3	105	30-21-9
	30.0	WEATHERED SILTSTONE , brown, 30.0 to 30.8 cfs	30										
		Boring Terminated at 30.8 Feet					16-50-5"	4.0 4.0			21.3		

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic


Measurement Method:
3" C HSA

See Exploration and Testing Procedures for a description of field and laboratory procedures used and associated data (if any).
See Supporting Information for explanation of symbols and abbreviations.

Notes:
Rock at 31 ft

Abandonment Method:
Backfilled with super cuttings and a bentonite chip plug near the surface.

WATER LEVEL OBSERVATIONS
No water observed while drilling
No water observed at completion of drilling



770 W New York St
Indianapolis, IN

Boring Started: 02-15-2023
Drill Rig: D-50 Track
Project No.: C2252391

Boring Completed: 02-15-2023
Driller: J.S.

PROJECT: Cherry Lake Dam			CLIENT: Banning Engineering Plainfield, Indiana			Page 1 of 1											
SITE: Morgan Monroe National Forest Marionville, Indiana																	
LOCATION: See <i>Exploration Plan</i> Latitude: 39.3234° Longitude: -86.4234°																	
Approximate Surface Elev.: 876 (Ft.) +/-																	
DEPTH (Ft.)			WATER LEVEL OBSERVATIONS			FIELD TEST RESULTS			STRENGTH TEST			ATTERBERG LIMITS					
DEPTH			SAMPLE TYPE RECOVERY (%)			LABORATORY TEST TYPE TEST STRENGTH (psi)			WATER CONTENT (%)			DRY UNIT WEIGHT (pcf)					
ELEVATION (Ft.)												LL-PL-P					
												PERCENT FINES					
FILL - LEAN CLAY (CL) track gravel, trace sand, brown, very stiff			15			3-3-3-3 N=6			2.5 2.0			21.4			33-22-11		
FILL - SILT (ML) track gravel, trace sand, brown and gray, stiff to very stiff with possible organic matter near 6 ft, with residual below 15 ft			16									20.3 21.2			102 104		
FILL - SILT (ML) track gravel, trace sand, brown and gray, stiff to very stiff with possible organic matter near 6 ft, with residual below 15 ft			18									19.5 19.7			100 100		
FILL - LEAN CLAY (CL) track gravel, trace sand, brown and gray, stiff to very stiff with possible organic matter near 6 ft, with residual below 15 ft			8			4-5-7-10 N=12			1.5 3.0			21.1					
FILL - LEAN CLAY (CL) track gravel, trace sand, brown and gray, stiff to very stiff with possible organic matter near 6 ft, with residual below 15 ft			24			6-7-11-14 N=18			2.5 2.5			18.4					
FILL - LEAN CLAY (CL) track gravel, trace sand, brown and gray, stiff to very stiff with possible organic matter near 6 ft, with residual below 15 ft			23			4-8-13-15 N=21			2.5 3.5			17.3					
FILL - LEAN CLAY (CL) track gravel, trace sand, brown and gray, stiff to very stiff with possible organic matter near 6 ft, with residual below 15 ft			24			7-11-13-14 N=24			4.0 3.0			15.6					
FILL - LEAN CLAY (CL) track gravel, trace sand, brown and gray, stiff to very stiff with possible organic matter near 6 ft, with residual below 15 ft			9			14-50/3"			4.0 3.5			17.3 19.0					
WEATHERED SILTSTONE, brown, 14.8 soft																	
Boring Terminated at 14.8 Feet																	
Stratification lines are approximate. In-situ, the transition may be gradual.																	
Hammer Type: Automatic																	
Assessment Method: 31C HSA			See <i>Inspection and Testing Procedures</i> for a description of field and laboratory procedures used and additional data (if any).			Notes:											
Assessment Method: Backfilled with water cuttings and a bentonite chip plug No water observed at completion of drilling			See <i>Supporting Information</i> for explanation of symbols and abbreviations.														
WATER LEVEL OBSERVATIONS																	
No water observed while drilling																	
No water observed at completion of drilling																	
Terracon			Boring Started: 02-14-2023			Boring Completed: 02-14-2023											
4770 W New York St Indianapolis, IN			Drill Rig: D-50 Track			Driller: J.S.											
Project No.: C225281																	

PROJECT: Cherry Lake Dam			CLIENT: Banning Engineering Plainfield, Indiana			Page 1 of 1	
SITE: Morgan Monroe National Forest Martinsville, Indiana							
LOCATION: See Exploration Plan Latitude: 39.3233° Longitude: -86.4233° Approximate Surface Elev: 871 (Ft) +/-							
GRAPHIC LOG	DEPTH (Ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE RECOVERED (in)	FIELD TEST RESULTS	STRENGTH TEST		ATTERBERG LIMITS
	DEPTH ELEVATION (Ft)				LABORATORY TEST TYPE	COMPRESSION STRENGTH (psi)	WATER CONTENT (%)
	0.0		14	1-1-2-2 N=3	1.0 1.5		25.5 33.1
	3.0	868 +/-	16	4-6-6-11 N=12	2.5 1.0		27.3 22.4
	5.0	867 +/-	22	9-15-17-18 N=32	2.5 1.5		17.6
	8.0		15	12-14-50/3"	3.0 2.0		17.2
	9.0	867 +/-	28	11	27-50/6"		
Boring Terminated at 10 Feet			10				
Stratification lines are approximate. In-situ, the transition may be gradual.			Hammer Type: Automatic				
Announcement Method: 3 1/2" HSA Announcement Method: Borelized with water cuttings and a bentonite chip plug near the surface. Water Level Observations No water observed while drilling. No water observed on completion of drilling.			See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (if any). See Supporting Information for explanation of symbols and abbreviations.			Notes: Boring Started: 02-14-2023 Drill Rig: D-50 Track Project No.: C-225291	
			Boring Started: 02-14-2023 Drill Rig: D-50 Track Project No.: C-225291			Boring Completed: 02-14-2023 Driller: J.S.	

PROJECT: Cherry Lake Dam

CLIENT: Banning Engineering
Plainfield, Indiana

Page 1 of 1

SITE: Morgan Monroe National Forest
Martinsville, Indiana

GRAPHIC LOG

LOCATION See Exposition Plan

Latitude: 39.3230° Longitude: -86.4230°

Approximate Surface Elev.: 876 (Ft.) +/-

DEPTH WEATHERED SILTSTONE brown, soil

4.8

Boring Terminated at 4.8 Feet

DEPTH (Ft.)

WATER LEVEL
OBSERVATIONS

SAMPLE TYPE

RECOVERY (in)

FIELD TEST
RESULTS

LABORATORY
TEST TYPE

STRENGTH TEST
TEST TYPE
DETERMINING
REASON

WATER
CONTENT (%)

ATTERBERG
LIMITS
LI, PL, PI

PERCENT
FINES

PROJECT: Cherry Lake Dam

CLIENT: Banning Engineering
Plainfield, Indiana

Page 1 of 2

SITE: Morgan Monroe Forest
Martinsville, Indiana

LOCATION See Deposition Plan

Approximate Surface Elev.: 876 (Ft.) +/-

GRAPHIC LOG

Latitude: 39.3232° Longitude: -86.4232°

DEPTH (Ft.)

WATER LEVEL
OBSERVATIONS

SAMPLE TYPE

RECOVERY (%)

FIELD TEST
RESULTS

LABORATORY

TEST TYPE
CORRELATION
INDEX (%)

STRAIN (%)

WATER CONTENT (%)

ATTERBERG
LIMITS

LL-PL-PI

PERCENT FINES

DEPTH (Ft.)

ELEVATION (Ft.)

5

10

15

20

10

17

15

20

19

2-2-3-5
N=5

5-6-5-7
N=11

2-2-4-5
N=6

2-3-4-6
N=7

3-5-6
N=5

1-2-3-6
N=5

3-3-5-6
N=8

2-3-6
N=6

3.0
1.5

4.0
3.5

1.0
2.5

2.0
2.5

3.5
1.5

2.0
1.5

2.0
2.0

1.0
1.0

22.2

21.5

23.5

21.1

27.3

19.6

23.2

22.4

22.0

21.0

23.5

26.9

20.8

23.2

21.5

22.4

102

105

29-24-5

31-23-8

32-26-6

107

33-24-9

95

Stratification lines are approximate. In-situ, the transition may be gradual.

Harmer Type: Automatic

Assessment Method:
31" HSA

See [Boring and Testing Procedures](#) for a description of field and laboratory procedures used and additional details if any.

See [Supporting information](#) for explanation of symbols and abbreviations.

Notes:

Assessment Method:
Backfilled with water cuttings and a bentonite chip plug near the surface.

WATER LEVEL OBSERVATIONS

No water observed while drilling.
No water observed at completion of drilling

Terracon

7770 W New York St
Indianapolis, IN

Boring Started: 02-15-2023
Drill Rig: D-60 Track
Project No.: CJ225291

Boring Completed: 02-15-2023
Driller: J.S.