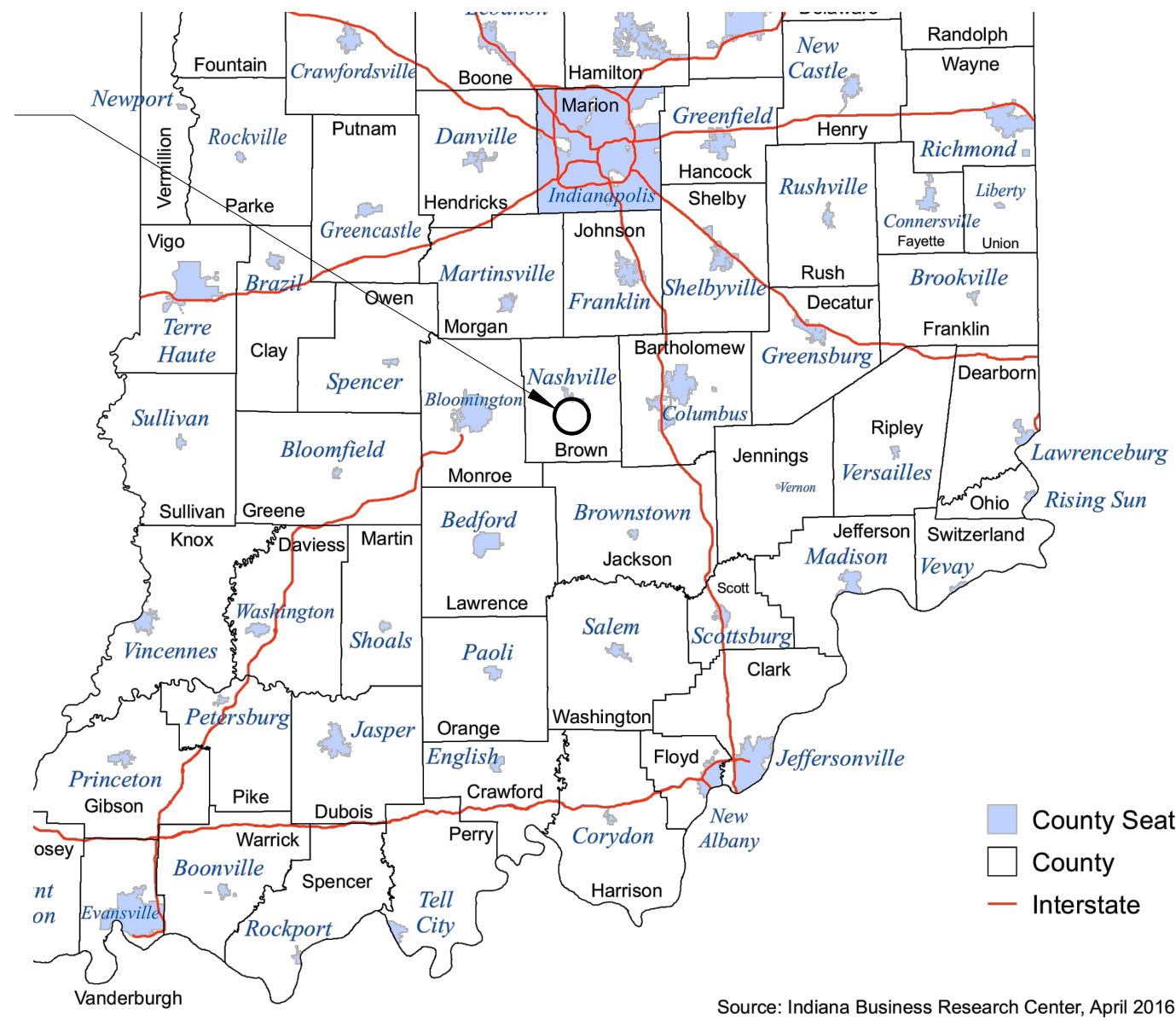


STRAHL LAKE DAM REHABILITATION

SEC. 08 - T8N - R3E, BROWN COUNTY, VAN BUREN TOWNSHIP, NASHVILLE, INDIANA

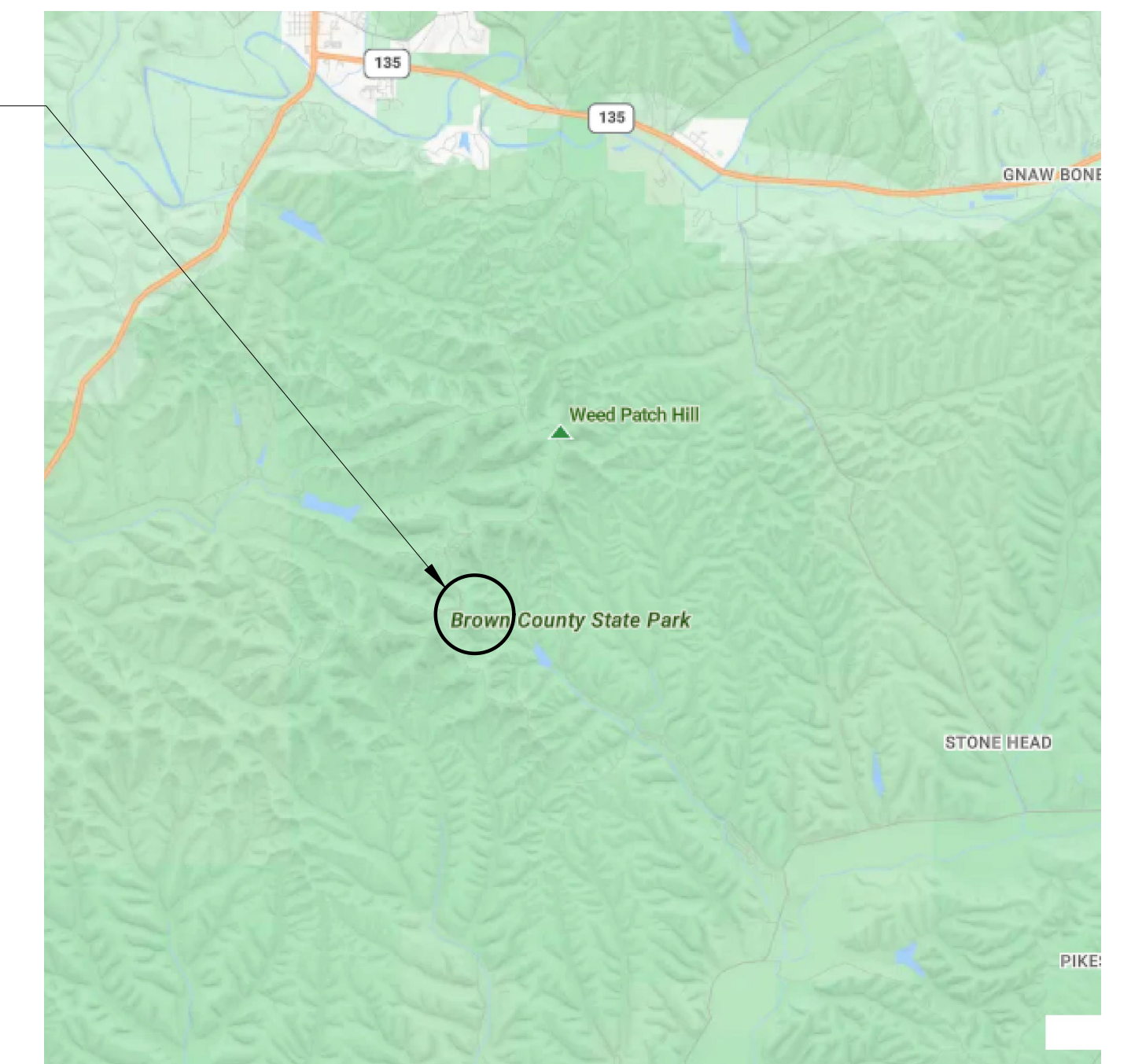
PLANS PREPARED FOR:
 INDIANA DEPARTMENT OF ADMINISTRATION
 402 W. WASHINGTON ST., ROOM W467, IGCS
 INDIANAPOLIS, INDIANA 46204
 PHONE: 317-232-4160
 FAX: 317-233-4613
 OWNER PROJECT NUMBER: 300DM-07012-34-C1

PROJECT LOCATION

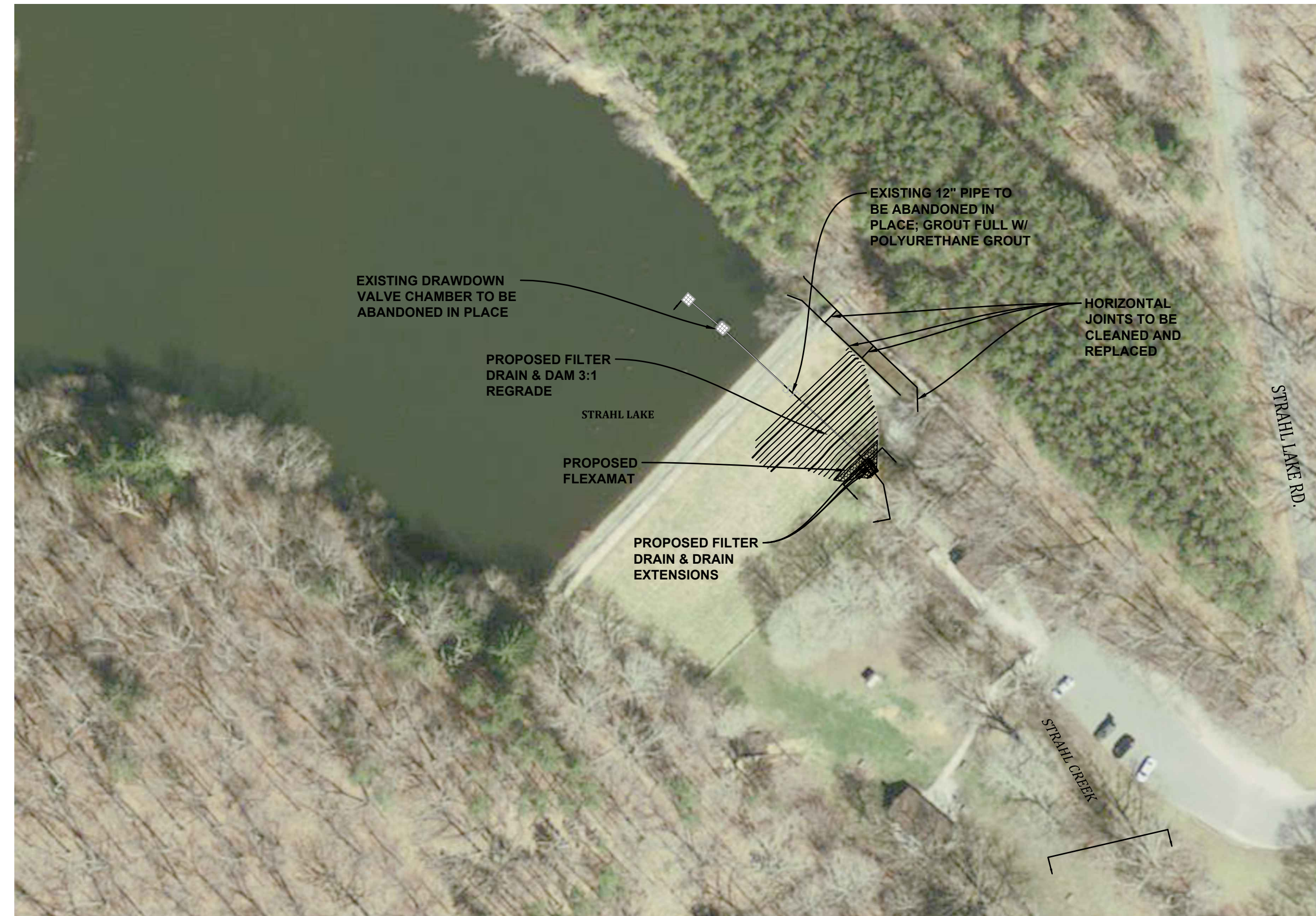


VICINITY MAP
NO SCALE

PROJECT LOCATION



LOCATION MAP
NO SCALE



SITE MAP

SCALE: 1" = 60'

OPERATING AUTHORITIES

COMMUNICATIONS
 AT&T
 240 N. Meridian St., Room 1791
 Indianapolis, IN, 46204
 317-265-3050

ELECTRIC
 South Central Indiana R.E.M.C.
 300 Morton Ave.
 Martinsville, IN 46151
 765-352-4751
 Howard McCormick

ELECTRIC
 Duke Energy
 100 S. Mill Creek Rd.
 Noblesville, IN 46062
 317-776-5320
 Don McDuffy

WATER
 Town of Nashville
 200 Commercial St.
 Nashville, IN 47448
 812-988-5526
 Phyllis Carr

SANITARY SEWER
 Town of Nashville
 200 Commercial St.
 Nashville, IN 47448
 812-988-5526
 Phyllis Carr

FIRE DEPARTMENT
 Southern Brown Volunteer Fire Dept.
 4040 IN-135
 Nashville, IN 47448
 812-606-8665

SCHOOL DISTRICT
 Brown County Schools
 357 East Main St.
 P.O. Box 38
 Nashville, IN 47448
 812-988-6601

SHEET INDEX

SHEET NO	DESCRIPTION
C100	TITLE SHEET
C101	EXISTING TOPOGRAPHY PLAN
C102	OVERALL PLAN
C103	CROSS SECTIONS
C104	TEMPORARY CREEK CROSSING
C400	EROSION CONTROL PLAN
C401	STORM WATER POLLUTION PREVENTION PLAN
C500	EROSION CONTROL DETAILS
C501	MISCELLANEOUS DETAILS

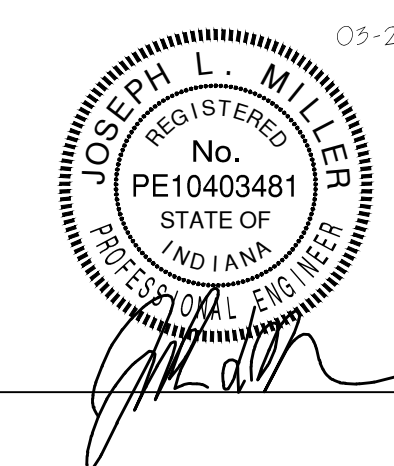
REVISIONS

NUMBER	DESCRIPTION	DATE

CONSTRUCTION DOCUMENTS

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.

03-28-24



CERTIFIED BY: _____

Date: 03-28-24
 Project No: 22066
 Sheet No:

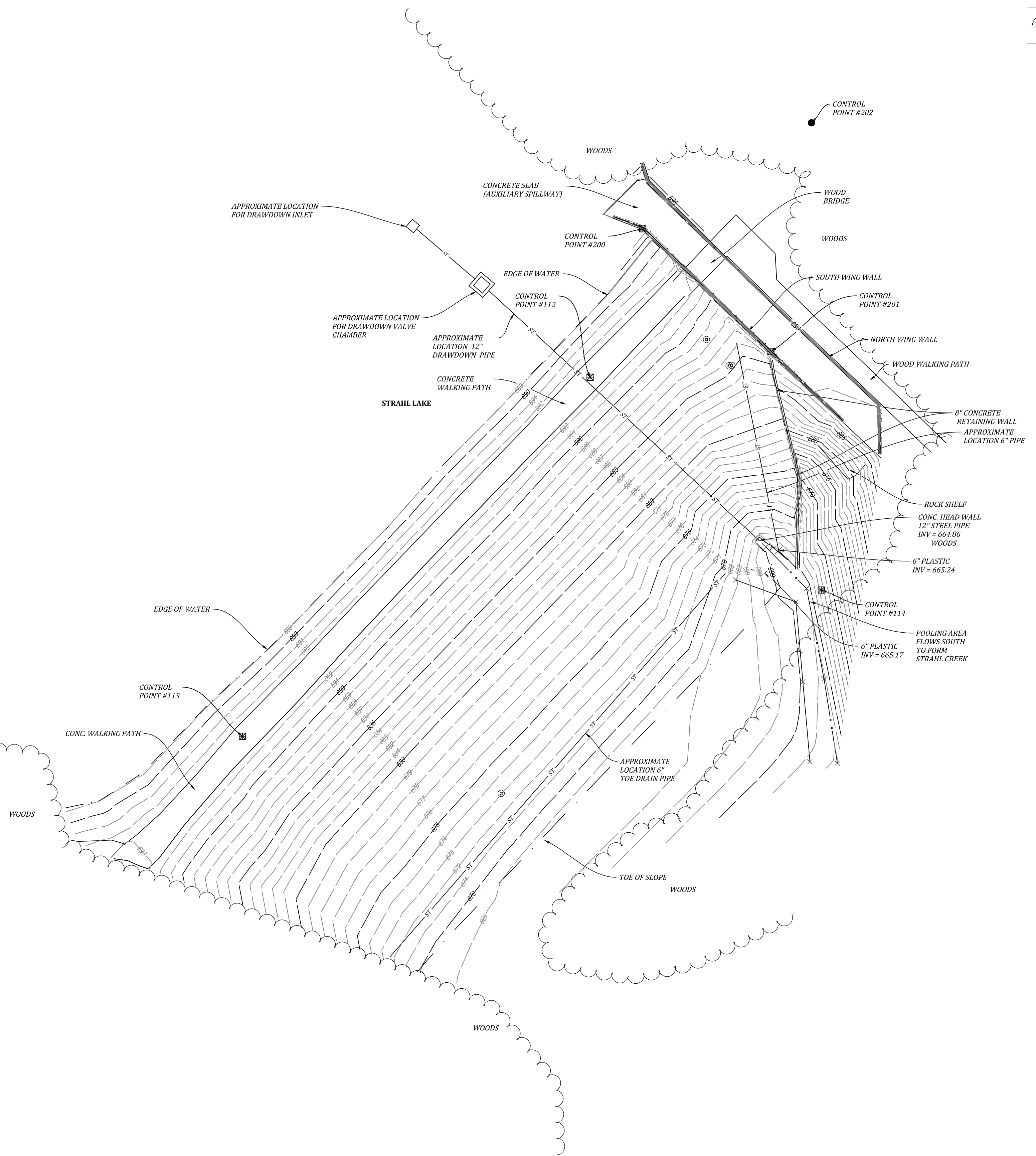
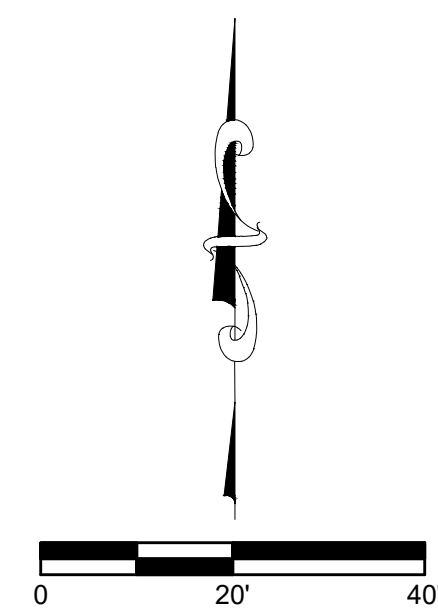
C100



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LEGEND

- | | | |
|--------------------|--------------------|------------------------|
| —ST— STORM SEWER | ⊕ STORM MANHOLE | ⊠ HANDHOLE |
| —S— SANITARY SEWER | ⊕⊕ STORM INLETS | ⊠ UTILITY POLES |
| —W— WATER LINE | ⊠ CURB INLET | ● GUY ANCHOR |
| —X— FENCE LINE | ⊕ SANITARY MANHOLE | ⊠ ELECTRIC METER |
| ~ TREELINE | ⊕ CLEAN OUT | ⊠ ELECTRIC TRANSFORMER |
| —·— FLOWLINE | ⊠ WATER VALVE | ○ POST |
| ○ GAS LINE MARKER | ⊕ WATER METER | ⊠ SIGN |
| ⊠ GAS METER | ⊠ WELL | ⊕ TREE |
| ⊠ GAS VALVE | ⊕ FIREHYDRANT | ○ SHRUB |
| | ⊕ WATER METER | |



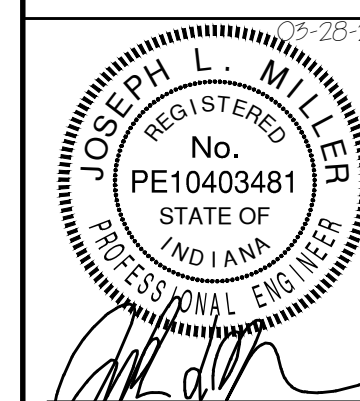
POINT #	NORTHING	EASTING	ELEV. (NAVD88)	DESCRIPTION	SHIFT	ELEV. (NGVD29)
112	1419513.128	171882.325	692.489	MAG NAIL SET IN CONC.	0.384	692.873
113	1419401.159	171773.919	692.623	MAG NAIL SET IN CONC.	0.384	693.007
114	1419446.785	171954.474	664.964	CUT "X" IN SANDSTONE ROCK	0.384	665.348
200	1419559.438	171898.784	691.445	MAG NAIL SET IN CONC.	0.384	691.829
201	1419521.172	171938.744	690.908	MAG NAIL SET IN CONC.	0.384	691.292
202	1419592.458	171951.366	704.593	5/8" REBAR FOUND	0.384	704.977

ORIGINATING BENCHMARK- THE ORIGINATING BENCHMARK WAS BASED ON VRS (VIRTUAL REFERENCE STATION) CONTROL NETWORK (A REAL-TIME KINEMATIC (RTK) CORRECTION SERVICE OVER THE INTERNET ESTABLISHED BY SEILER COMPANY ON POINT NUMBER 112.
 POINT NUMBER 112: 692.489' (NAVD 88) + 0.384' = 692.873' (NGVD 29)

ALL ELEVATIONS FOR THE PURPOSE OF THIS SURVEY WERE CONVERTED FROM NAVD88 TO NGVD29 UTILIZING VERTCON (AN NGS.NOAA.GOV WEBSITE USED FOR CONVERSIONS BETWEEN SPECIFIC VERTICAL DATUMS). THE DATUM SHIFT FOR POINT NUMBER 112 WAS 0.384 FEET. THIS SHIFT WAS APPLIED TO ALL POINTS LOCATED DURING THE COURSE OF THIS SURVEY. ALL VERTICAL ELEVATIONS SHOWN ON THIS SURVEY ARE IN THE NGVD29 DATUM AS REQUESTED BY THE CLIENT.

- TBM DESCRIPTIONS-**
- POINT NUMBER 112- A MAG NAIL SET IN A CONCRETE SQUARE IN THE WALKING PATH ALONG THE TOP OF DAM OF STRAHL LAKE.
ELEV: 692.489' (NAVD88) 692.873' (NGVD29)
 - POINT NUMBER 113- A MAG NAIL SET IN A CONCRETE SQUARE IN THE WALKING PATH ALONG THE TOP OF DAM OF STRAHL LAKE.
ELEV: 692.623' (NAVD88) 693.007' (NGVD29)
 - POINT NUMBER 114- A CUT "X" IN LARGE SANDSTONE ROCK IN BOTTOM OF CATCH BASIN FROM THE AUXILIARY OVERFLOW SPILLWAY
ELEV: 664.964' (NAVD88) 665.348' (NGVD29)
 - POINT NUMBER 200- A MAG NAIL SET IN THE WESTERLY TOP OF THE SOUTH CONCRETE WING WALL OF THE AUXILIARY OVERFLOW SPILLWAY FOR STRAHL LAKE.
ELEV: 691.445' (NAVD88) 691.829' (NGVD29)
 - POINT NUMBER 201- A MAG NAIL SET IN THE CENTER TOP OF THE SOUTH CONCRETE WING WALL OF THE AUXILIARY OVERFLOW SPILLWAY FOR STRAHL LAKE.
ELEV: 690.908' (NAVD88) 691.292' (NGVD29)
 - POINT NUMBER 202- A 5/8" REBAR WITH NO CAP FOUND ON THE WEST SIDE OF A DIRT WALKING PATH APPROXIMATELY 50 FEET NORTHEAST OF THE WOODEN BRIDGE OVER AUXILIARY OVERFLOW SPILLWAY.
ELEV: 704.593' (NAVD88) 704.977' (NGVD29)

EXISTING TOPOGRAPHY PLAN
STRAHL LAKE DAM REHABILITATION
INDIANA DEPARTMENT OF NATURAL RESOURCES
VAN BUREN TOWNSHIP, NASHVILLE, INDIANA

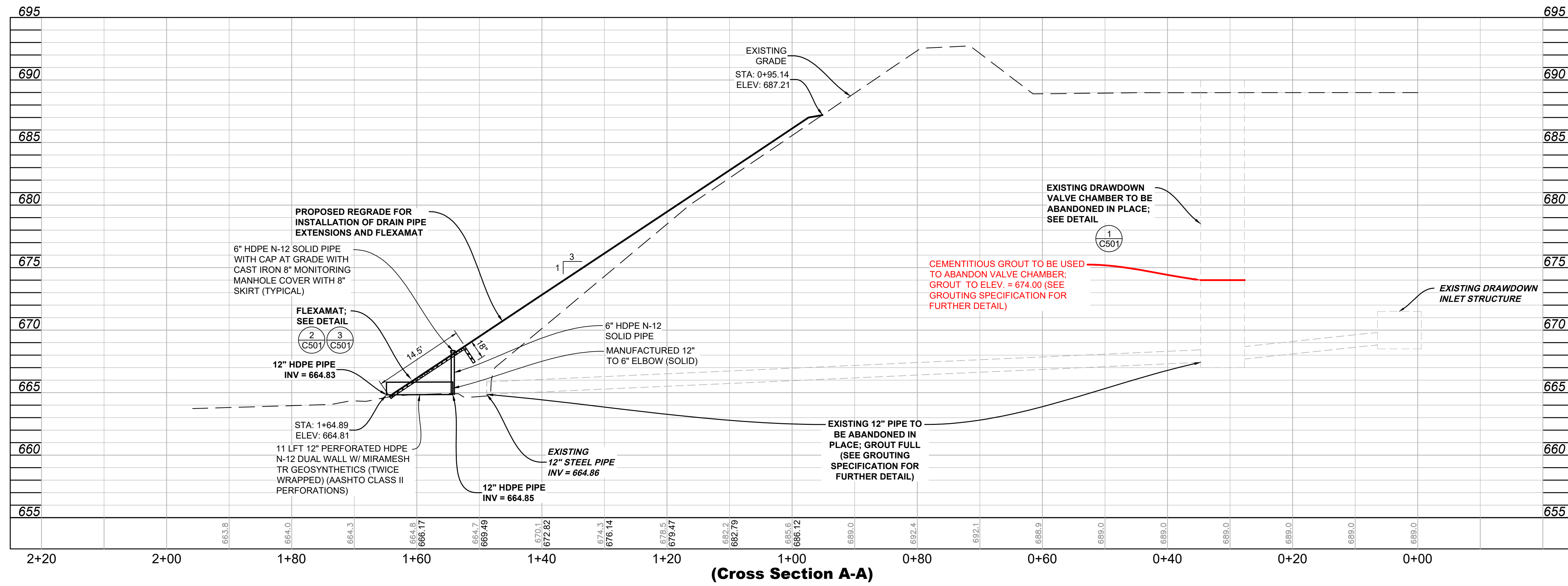


BANNING ENGINEERING
 853 COLUMBIA ROAD, SUITE #101
 PLAINFIELD, IN 46168
 BUS: (317) 707-3700, FAX: (317) 707-3800
 E-MAIL: Banning@BanningEngineering.com
 WEB: www.BanningEngineering.com

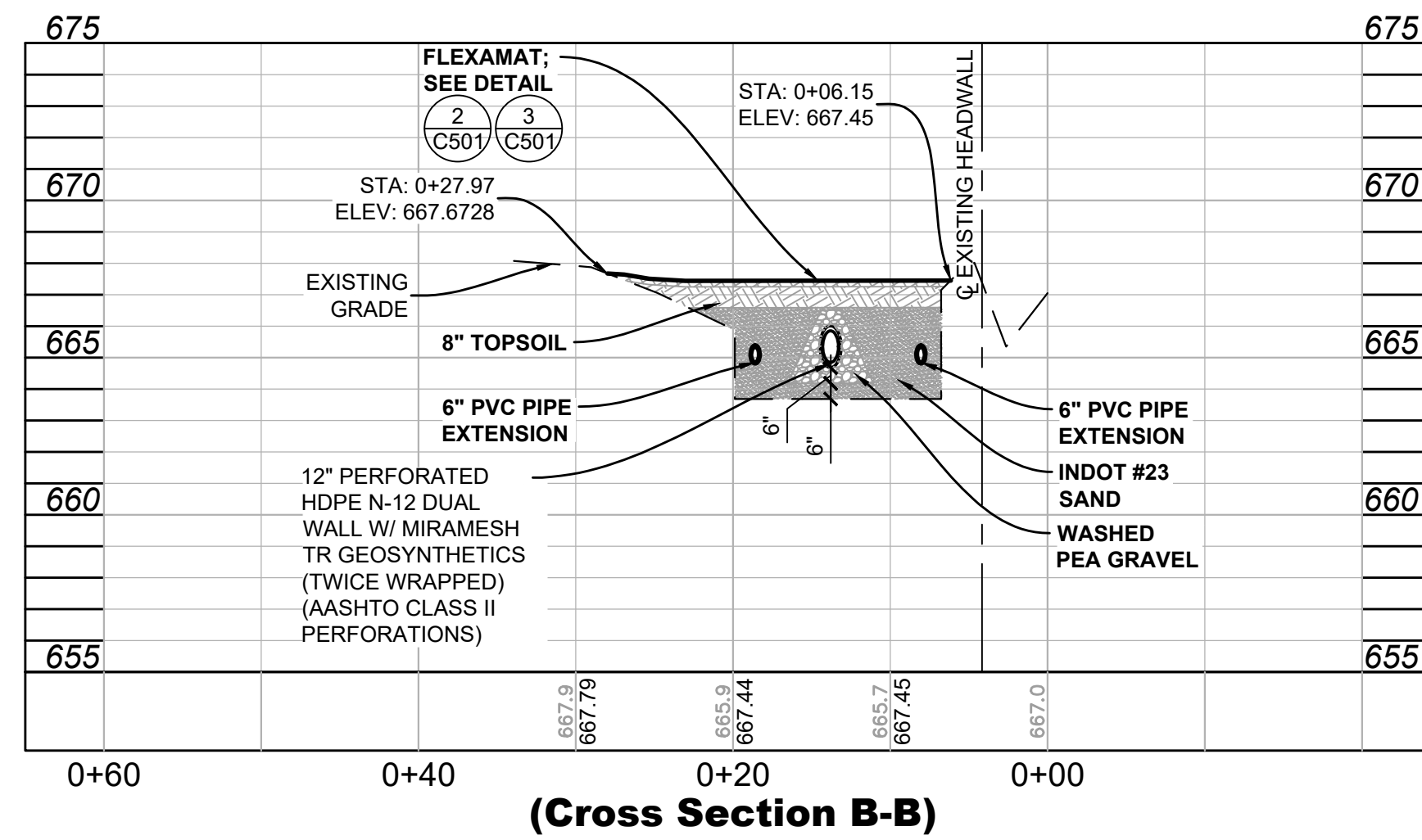


Project No: 22066
 Sheet No: **C101**

PROFILE VIEW SCALE:
1"=5' VERT.
1"=10' HOR.

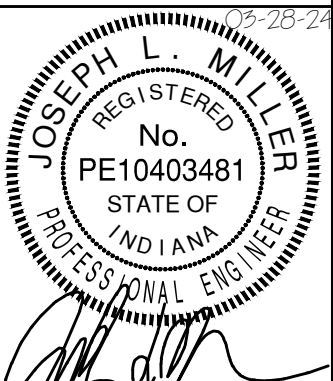


(Cross Section A-A)



(Cross Section B-B)

CROSS SECTIONS
STRAHL LAKE DAM REHABILITATION
INDIANA DEPARTMENT OF NATURAL RESOURCES
VAN BUREN TOWNSHIP, NASHVILLE, INDIANA

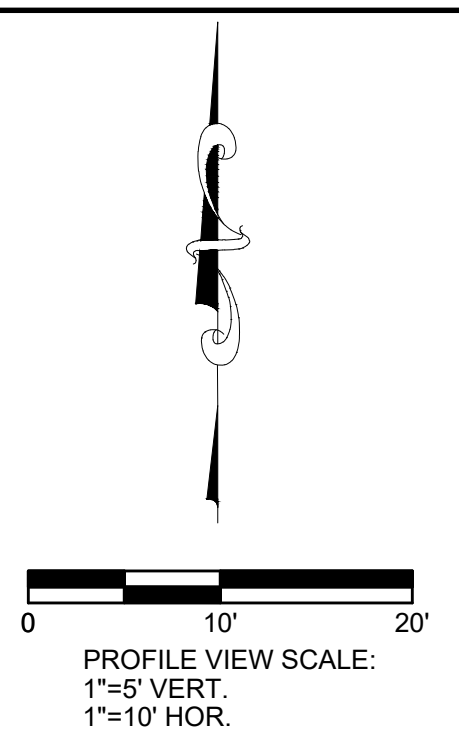
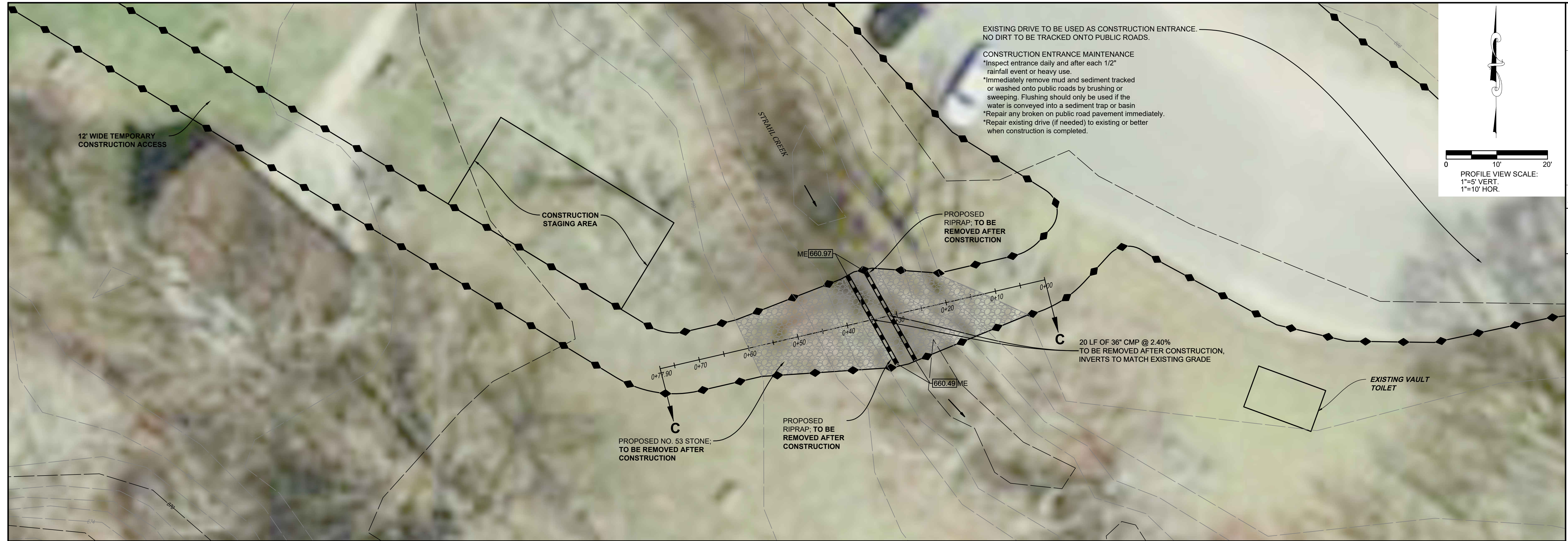


BANNING
ENGINEERING
8553 COLUMBIA ROAD, SUITE #101
PLAINFIELD, IN 46168
BUS: (317) 707-3700, FAX: (317) 707-3800
E-MAIL: Banning@BanningEngineering.com
WEB: www.BanningEngineering.com

Project No: 22066
Sheet No:

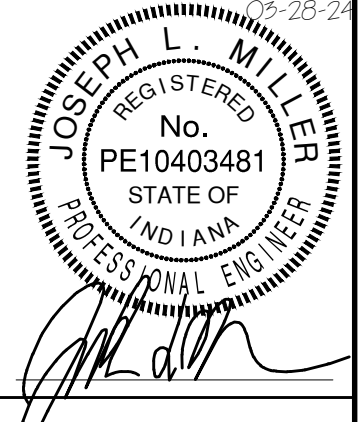


C103



Designated	Drawn	Checked	Scale	Date
JLM	TMF	JLM	1" = 10'	05/26/24

TEMPORARY CREEK CROSSING
 STRAHL LAKE DAM REHABILITATION
 INDIANA DEPARTMENT OF NATURAL RESOURCES
 VAN BUREN TOWNSHIP, NASHVILLE, INDIANA

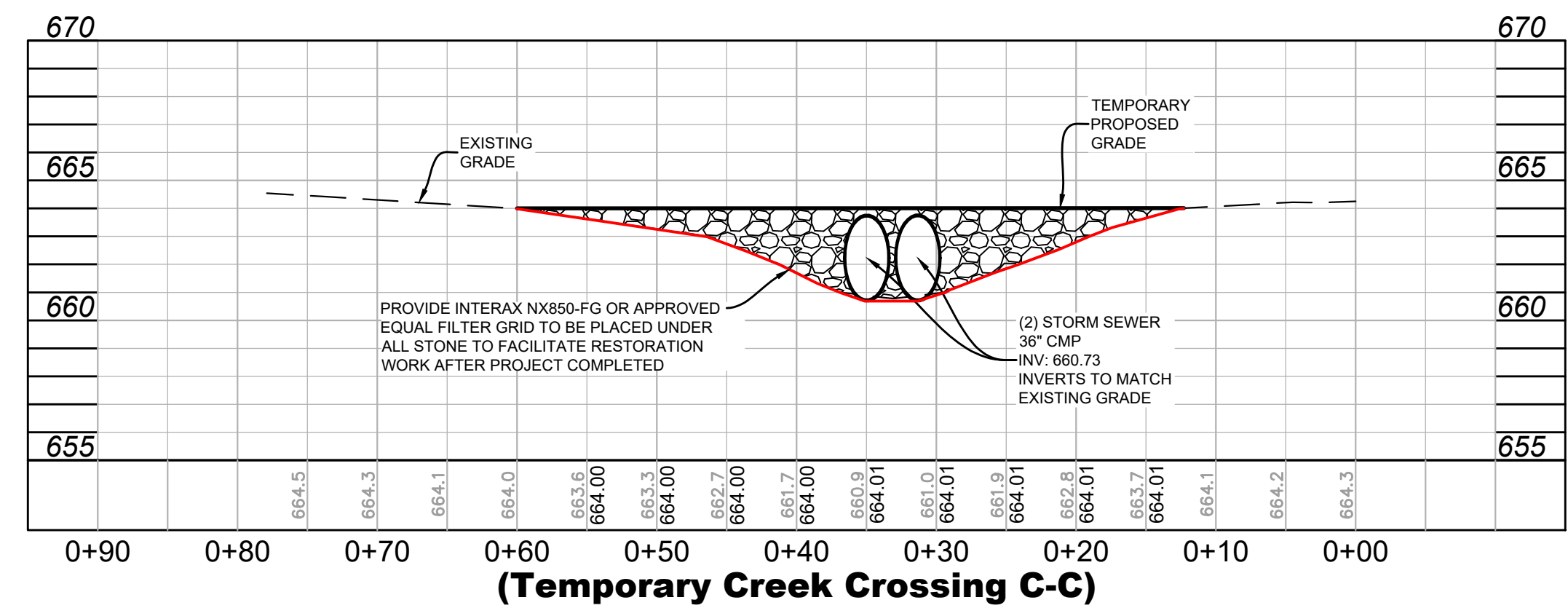


BANNING
 ENGINEERING
 853 COLUMBIA ROAD, SUITE #101
 PLAINFIELD, IN 46168
 BUS: (317) 707-3700, FAX: (317) 707-3800
 E-MAIL: Banning@BanningEngineering.com
 WEB: www.BanningEngineering.com

Project No: 22066
 Sheet No:
C104

LEGEND

- | | | | | | |
|-------|----------------------|---|----------------------------|---|---------------------|
| —ST— | STORM SEWER | ⊙ | STORM MANHOLE | ⊠ | MAILBOX |
| —S— | SANITARY SEWER | ⊕ | STORM INLETS | ⊠ | HANDHOLE |
| —W— | WATER LINE | ⊠ | CURB INLET | ■ | UTILITY POLES |
| —X— | FENCE LINE | ⊙ | SANITARY MANHOLE | ● | GUY ANCHOR |
| —OHU— | OVERHEAD UTILITIES | ⊙ | LIGHT POLE MASTERARM | ⊠ | ELECTRIC METER |
| —E— | ELECTRIC UNDERGROUND | ⊙ | SANITARY CLEANOUT | ⊠ | ELECTRIC STRUCTURE |
| —T— | TELEPHONE LINE | ⊙ | FIRE DEPARTMENT CONNECTION | ⊠ | HVAC UNIT |
| —G— | GAS LINE | ⊙ | WATER VALVE | ⊠ | TELEPHONE STRUCTURE |
| —UFO— | FIBER OPTICS | ⊙ | WATER METER | ○ | POST |
| — | FLOWLINE | ⊙ | WELL | ⊙ | SIGN |
| ○ | GAS LINE MARKER | ⊙ | FIREHYDRANT | ⊙ | TREE |
| ⊠ | GAS METER | ⊙ | WATER METER | ⊙ | SHRUB |
| ⊠ | GAS VALVE | ⊙ | WATER SPIGOT | ⊙ | LIGHT POLE |
-
- | | | | |
|--------|----------------|----|---------------|
| — | STORM SEWER | HP | HIGH POINT |
| 653.00 | SPOT GRADE | ← | DRAINAGE FLOW |
| ME | MATCH EXISTING | | |



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EROSION CONTROL SEQUENCING

- 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.
- 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 1/2" rain event.
- Existing access drive to be used as construction entrance. Install construction staging area on site as delineated on this sheet.
- Establish concrete washout as delineated on this sheet.
- Install erosion control as delineated on this sheet.
- Begin earth work for dam rehabilitation. Strip topsoil and vegetation from work area. This area is to be filled when project complete.
- Begin grouting existing drawdown valve structure and existing 12" drawdown pipe.
- Begin installing pipe extensions and regrade as delineated on plans.
- Install Flexmat and repair spillway concrete chute as delineated on plans.
- Finish grade site and replace topsoil as appropriate.
- Install permanent seeding, and other erosion control measures as delineated on this sheet.
- Re-grade, repair existing access drive to existing or better when construction is completed
- Temporarily seed and mulch all areas scheduled or likely to remain inactive for 15 days or more.
- After construction is completed, vegetation established and permission received from Indiana Department of Administration representative, remove temporary erosion control measures.

EROSION CONTROL PLAN LEGEND

- EROSION CONTROL BLANKET ADD PERMANENT SEEDING (CURLEX I BIODEGRADABLE NETFREE) SEE DETAIL ON SHEET C500
- FLEXMAT WITH CURLEX II UNDERLAYMENT BIODEGRADABLE ADD PERMANENT SEEDING SEE DETAIL ON SHEET C500 & C502
- PERMANENT SEEDING & MULCHING SEE DETAIL ON SHEET C500
- TEMPORARY SEEDING SEE DETAIL ON SHEET C500
- CONSTRUCTION LIMITS
- SOCK; 8" SITE PERIMETER FILTER/MULCH (INSTALL PER MANUFACTURERS GUIDELINES)
- CHANNEL SIDE SLOPES WILL BE SEEDED TWICE. THE FIRST SEEDING WILL OCCUR AT THE END OF EACH DAY'S CONSTRUCTION, WHILE THE GROUND IS STILL MOIST. FERTILIZER WILL BE APPLIED. APPLY THE SECOND SEEDING JUST PRIOR TO FINAL INSPECTION. ONLY THOSE AREAS WHERE THE GRASS HAS NOT GERMINATED WILL BE SEEDED THE SECOND TIME. THE SEED AND FERTILIZER WILL BE APPLIED WITH A BROADCAST TYPE SEEDER.

LATITUDE: 39°08'37.1" N
 LONGITUDE: 86°12'58.1" W
 HUC: 05120208070020

EROSION CONTROL BLANKET W/PERMANENT SEEDING AS NEEDED (CURLEX NETFREE)

QUANTITIES
 Tall Fescue (low or endophyte free) 35 lbs/acre
 Annual Rye Grass 20 lbs/acre
 12-12-12 Fertilizer 1000 lbs/acre
 SUBSTITUTE THE FOLLOWING FOR RYE GRASS
 Oats-----March 15 through May 1
 Wheat-----October 1 through November 1

EROSION CONTROL GENERAL NOTES

- Only those areas within the designated construction limits are to be disturbed during construction.
- Contractor to provide temporary surface stabilization of any area scheduled or likely to remain inactive for a period of 15 days or more.
- Contractor to provide temporary signage near the entrance of the project identifying the responsible parties and other information about the project.
- 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.
- All erosion control measures shall meet the Phase 2 IDEM Rule 327 IAC 15-5 requirements.
- Refer to the "Indiana Storm Water Quality Manual", "The Urban Development Planning Guide", and Manufacturers Recommendations for Installation for all required measures.
- Inspection and repair of erosion control measures shall be done weekly and after each 1/2" rainfall event.
- Contractor to provide a 1 year warranty on all seeding to ensure adequate and established cover. Refer to contract documents.

NOTE:

- ALL DISTURBED AREAS TO BE SEEDED.
- AFTER CONSTRUCTION COMPLETE. ALL DISTURBED AREAS TO BE RETURNED TO EXISTING OR BETTER CONDITIONS.

CONCRETE WASHOUT
 CONTRACTOR TO USE TRASH DUMPSTER

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

EXISTING DRIVE TO BE USED AS CONSTRUCTION ENTRANCE.
 NO DIRT TO BE TRACKED ONTO PUBLIC ROADS.

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.

SOILS DESCRIPTIONS

BEANBLOSSOM SERIES
 Be Beanblossom channery silt loam
 Beanblossom Series - The Beanblossom series consists of deep, well drained soils that formed in 0 to 24 inches of medium-textured alluvium and the underlying loamy-skeletal alluvium. These soils are on flood plains and alluvial fans. Slope ranges from 1 to 3 percent.

TREVILAC & BERKS SERIES
 BgF Berks-Trevlac-Wellston complex (20-70% slopes)
 Trevlac Series - The Trevlac series consists of moderately deep, well drained soils formed in residuum weathered from interbedded siltstone, sandstone and shale bedrock. Permeability is moderate. Slopes range from 6 to 70 percent.
 Berks Series - The Berks series consists of moderately deep, well drained soils formed in residuum weathered from shale, siltstone and fine grained sandstone on rounded and dissected uplands. Slope ranges from 0 to 80 percent.



SOILS MAP
 NO SCALE

Designed: JLM	Drawn: TMF	Checked: JLM	Scale: 1" = 20'	Date: 05/26/24
<p>EROSION CONTROL PLAN STRAHL LAKE DAM REHABILITATION INDIANA DEPARTMENT OF NATURAL RESOURCES VAN BUREN TOWNSHIP, NASHVILLE, INDIANA</p>				
<p>BANNING ENGINEERING 853 COLUMBIA ROAD, SUITE #101 PLAINFIELD, IN 46168 BUS: (317) 707-3700, FAX: (317) 707-3800 E-MAIL: Banning@BanningEngineering.com WEB: www.BanningEngineering.com</p>				
Project No:	22066			
Sheet 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 CSCP and where they occur in the plan. Plan preparers often have their plan index mirror items on the standard plan review checklist. An MSW 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 abandoning existing drawdown pipe and constructing new filter drains and grading around filter drains for State of Indiana. The project is located in Van Buren Township, Brown County.

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

Latitude: 39°08'37.1" N
Longitude: 86°12'58.1" 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:

Provided as attachment to this narrative.

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 1801300140E Dated December 08, 2016. See this Sheet.

A8 - Land use of all adjacent properties:

See Plan Set: Existing Topography Plan, C101

North: Wooded
South: Wooded
East: Wooded
West: Wooded

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

None

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

Strahl 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): RGP Section 404 Permit (USACE): NWP

Construction in a Floodway (IDNR): 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:

1.427 Acres +/-

A23 - Total expected land disturbance expressed in acres:

0.485 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: Overall Plan, C102

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

See Plan Set: N/A

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: Overall Plan, C102 and Erosion Control Plan, C400

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 final grading and final placement. 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 - C501

B4 - Sediment control measures for concentrated flow areas:

N/A

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 entrance and the concrete washout area, in that they either reduce the velocity, such as silt fence.

For Locations See Plan Set: Erosion Control Plan, C400

For Details See Plan Set: Erosion Control Details, C500

B7 - Stormwater outlet protection location and specifications:

N/A

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 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 devices are presented below and provide options to achieve sediment removal. The size of particles present in the sediment and silt traps is a key consideration for selecting sediment treatment option(s). In some cases, the use of multiple devices may be appropriate.

B10 - Measures utilized for work within waterbodies:

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:

See Plan Set: Erosion Control Details, C500

MATERIAL HANDLING:

1. 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.

2. 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.

3. 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.

4. 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.

5. 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.

6. 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 material.

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 normally dry 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:

1. Nearest Navigable Water: Strahl Creek

2. Drainage System: All storm drainage leaves the site by open ditches and closed storm systems to Strahl Creek a tributary of Middle Fork Salt Creek.

3. 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.

4. 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:

1. Any personnel observing a spill will immediately instigate the following procedure:

a. Dialing "911" from any telephone.

b. Notify the appropriate emergency personnel.

2. The Emergency Coordinator will then take the following actions:

a. Barricade the area allowing no vehicles to enter or leave the spill zone.

b. Notify the Indiana Department of Environmental Management, Office of Emergency Response by calling the appropriate telephone number:

Office 317-233-7745

Toll Free 800-233-7745

Also the National Response Center at 800-424-8802 and provide the following information:

i. Time of observation of the spill

ii. Location of the spill

iii. Identity of material spilled

iv. Probable source of the spill

v. Probable time of the spill

vi. Volume of the spill and duration

vii. Present and anticipated movement of the spill

viii. Weather conditions

ix. Personnel at the scene

x. Action initiated by personnel

c. Notify the Town of Nashville Fire Department Phone: 9-1-1

d. Notify the Town of Nashville Police department Phone: 9-1-1

e. Notify waste recovery contractor, maintenance personnel or other contractual personnel as necessary for cleanup.

f. Coordinate and monitor cleanup until the situation has been stabilize and all spills have been eliminated.

g. Cooperate with the IDEM-OER on procedures and reports involved with the event.

Cleanup Parameters:

1. The Developer shall be continually kept informed, maintain lists of qualified contractors and available Vac-trucks, tank pumps and other equipment for clean-up operations. In addition, a continually updated list of available absorbent materials and clean-up supplies should be kept on site.

2. 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 alterations to this plan.

3. 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 fire departments.

4. 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 and 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.

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 spill response. Performing this work offsite can also be accomplished 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.

D14 - Material handling and spill prevention and spill response plan meeting the requirements in 327 IAC 2-6.1-6:

D15 - Material handling and storage procedures associated with construction activity:

1. 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.

2. 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.

3. 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.

4. 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.

5. 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

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.

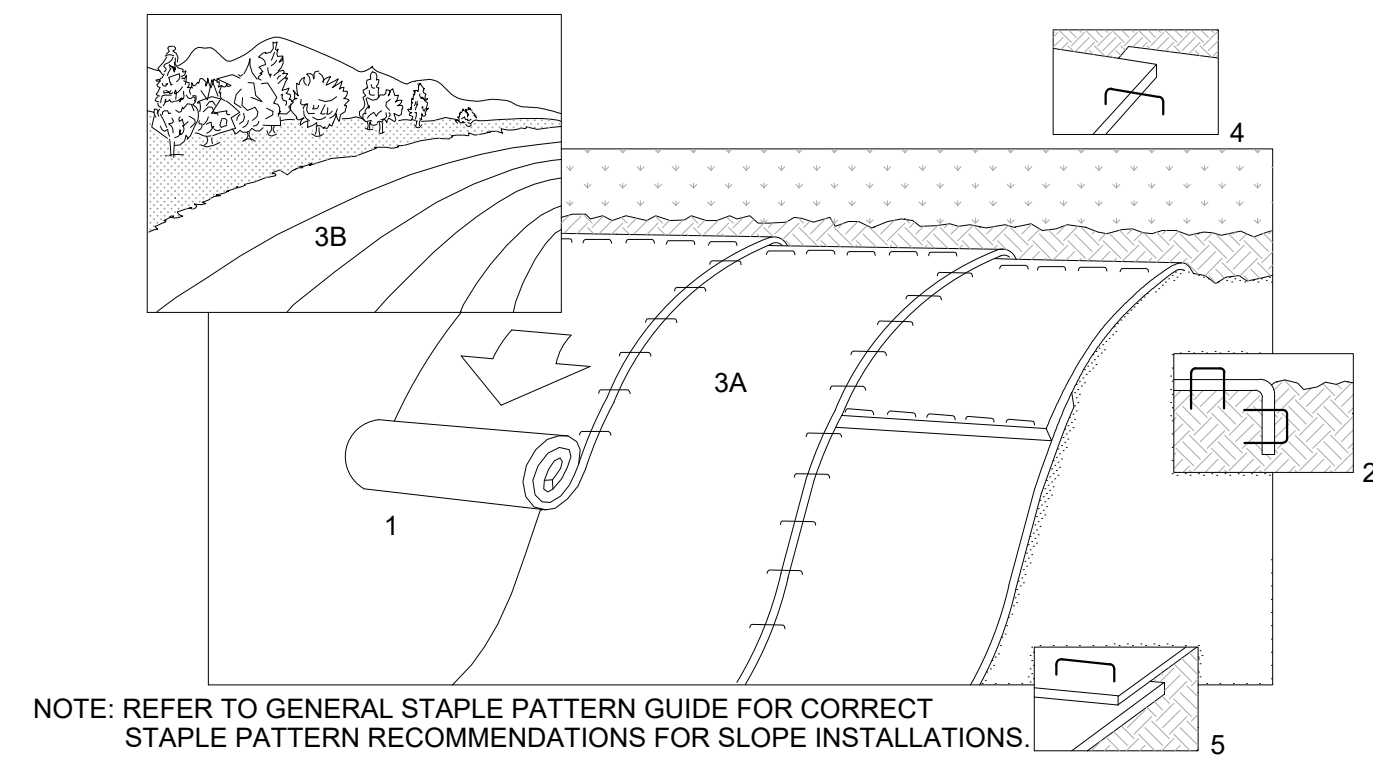
-Do not wash sweepings from exposed aggregate concrete into the street or storm drain. Collect and return sweepings to appropriate base stockpile or dispose in the trash.

SOLID WASTE MANAGEMENT

Description and Purpose: Solid waste management procedures and practices are designed to prevent or reduce the discharge of pollutants to stormwater from solid or construction waste by providing designated waste collection areas and containers, arranging for regular disposal, and training employees and subcontractors.

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

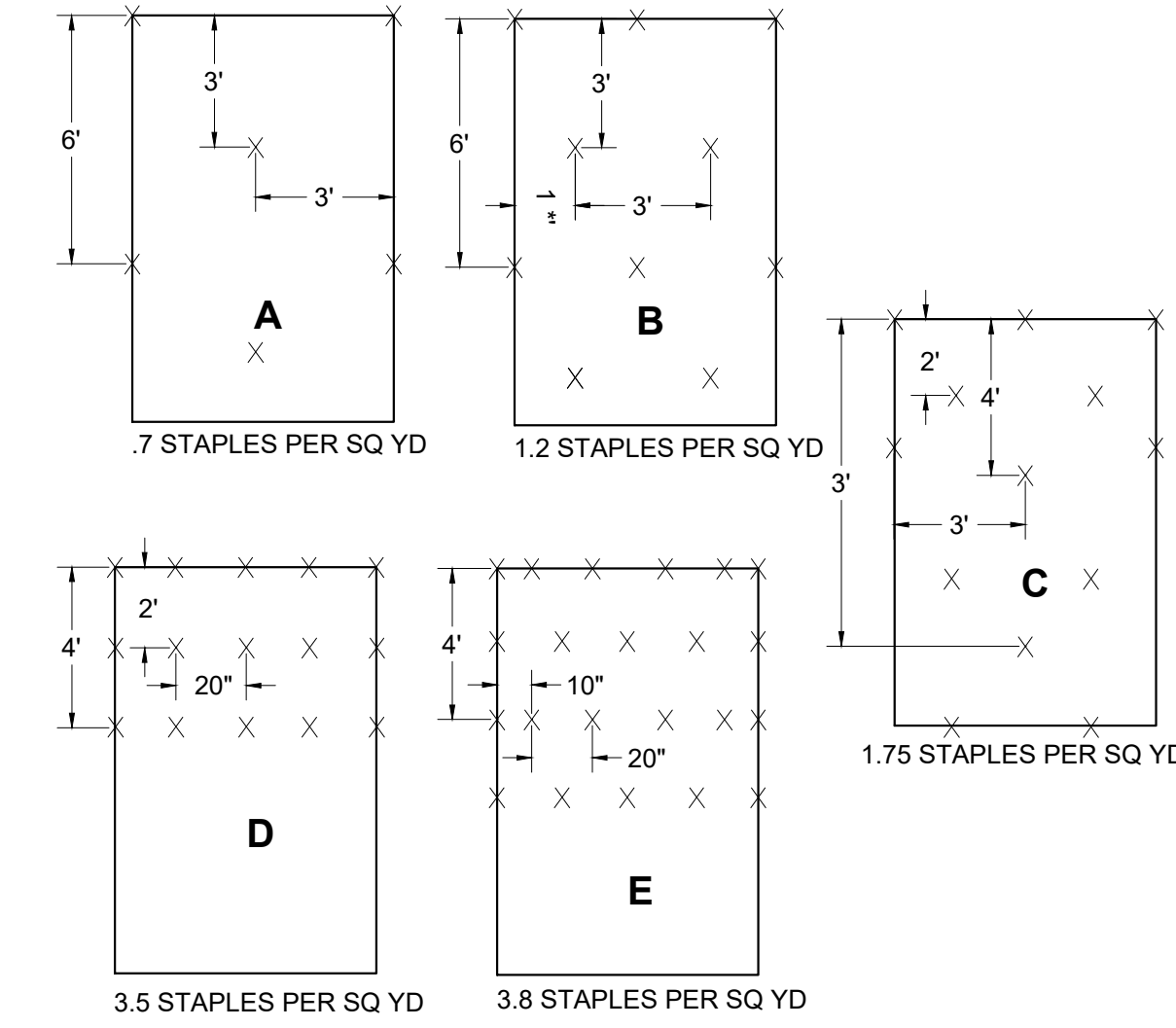
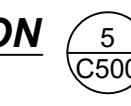


NOTE: REFER TO GENERAL STAPLE PATTERN GUIDE FOR CORRECT STAPLE PATTERN RECOMMENDATIONS FOR SLOPE INSTALLATIONS.

- PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
- BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
- ROLL THE BLANKETS (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE.
- THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2" OVERLAP.
- WHEN BLANKETS MUST BE SPICED DOWN THE SLOPE, PLACE BLANKETS END OVER END (SHINGLE STYLE) WITH APPROXIMATELY 4" OVERLAP. STAPLE THROUGH OVERLAPPED AREA APPROXIMATELY 12" APART.

MAINTENANCE
 *During vegetative establishment, inspect weekly & after each 1/2" rainfall event for any erosion below the blanket.
 *If any area shows erosion, pull back that portion of the blanket covering it, add soil, re-seed the area, and re-lay and staple the blanket.
 *After vegetative establishment, check the treated area periodically.

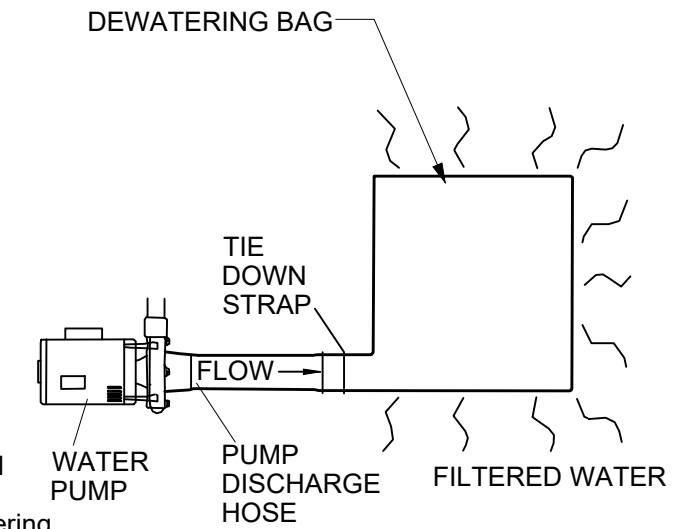
SLOPE INSTALLATION
NO SCALE



STAPLE PATTERN GUIDE
NO SCALE



- INSTALLATION**
- Lifting straps should be placed under the dewatering bag to facilitate removal after use.
 - Place the dewatering bag on a level stabilized area over dense vegetation / straw or gravel (if increased drainage surface area is needed). Insert discharge hose from pump into dewatering bag a minimum of six inches (6") and tightly secure with attached strap to prevent water from flowing out of the unit without being filtered.
 - Replace the unit when one half (1/2) full of sediment or when sediment has reduced the flow rate of the pump discharge to an impractical rate.



MAINTENANCE

- Remove the unit and sediment from environmentally sensitive areas and waterways. At the approved disposal site, open or slit the unit, remove sediment and grade smoothly into existing topography. Dispose of the dewatering bag, no longer in use at an appropriate recycling or solid waste facility.

GENERAL NOTE

- Use as needed for construction of temporary crossing.

DEWATERING FILTER BAG
NO SCALE



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 methodically 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/ft²)

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

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 trampled 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 trampled at the start of the channel and anchored using a staggered staple pattern at end of roll overlaps and end of roll terminations.

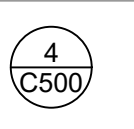
Disclaimer: Curlex NetFree is a system for erosion control and revegetation on slopes and channels. American Excelsior Company (AEC) believes that the information contained herein to be reliable and accurate for use in erosion control and revegetation applications. However, since physical conditions 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) 352-9562 or visit our website at www.curlex.com

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

Form#289/122116E

CURLEX BIODEGRADABLE NETFREE EROSION CONTROL BLANKET DETAIL
NO SCALE



Stabilization Practice	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	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 = 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.

MAINTENANCE
 Inspect weekly and after each 1/2" rainfall event, until the stand is successfully established. (Characteristics of a successful stand include: vigorous dark green or bluish-green seedlings; uniform density with nurse plants, legumes, and grasses well inter-mixed; green leaves; and the perennials remaining green throughout the summer, at least at the plant base.)

Plan to add fertilizer the following growing season according to soil test recommendations.

Repair damaged, bare, or sparse areas by filling any gullies, re-fertilizing, over- or re-seeding, and mulching.

If plant cover is sparse or patchy, review the plant materials chosen, soil fertility, moisture condition, and mulching; then repair the affected area either by over-seeding or by re-seeding and mulching after re-preparing the seedbed.

If vegetation fails to grow, consider soil testing to determine acidity or nutrient deficiency problems. (Contact your SWCD or Cooperative Extension office for assistance.)

If additional fertilization is needed to get a satisfactory stand, do so according to the soil test recommendations.

All swales shall be seeded with 2 lbs. Adelpi 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

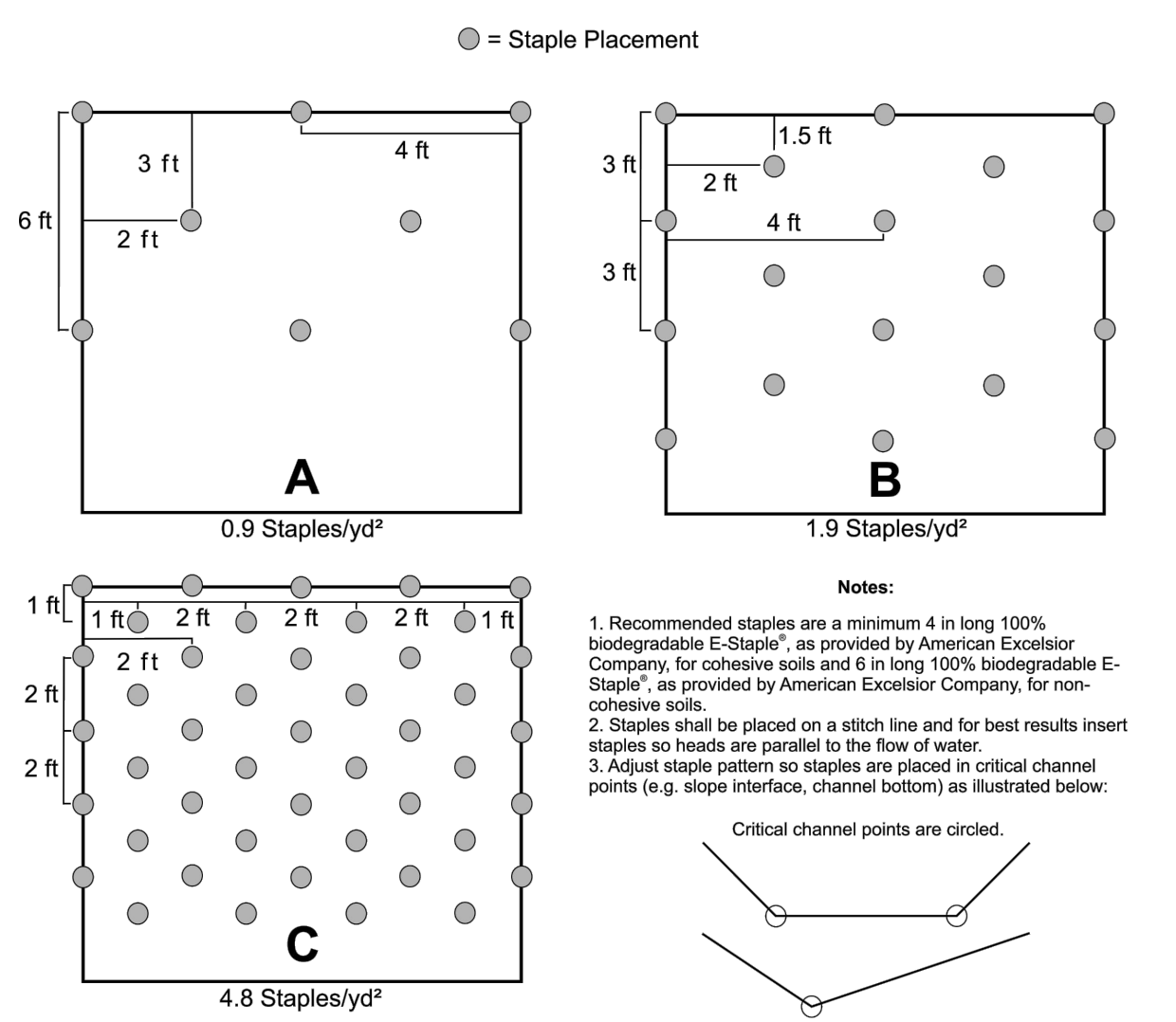


American Excelsior Company®
Earth Science Division

Proud Participant in NTPP and Proud Member of:

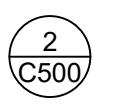
Curlex® NetFree™ Staple Pattern Guide

Application	Slope		Channel
	≤ 4H:1V	≤ 3H:1V	≤ 1.0 lb/ft² (48 Pa) Shear Stress ≤ 3.0 ft/sec (0.9 m/sec) Velocity
Staple Pattern	A	B	C



Notes:
 1. Recommended staples are a minimum 4 in long 100% biodegradable E-5-Staple™ as provided by American Excelsior Company, for cohesive soils and 6 in long 100% biodegradable E-Staple™ as provided by American Excelsior Company, for non-cohesive soils.
 2. Staples shall be placed on a stitch line and for best results insert staples so heads are parallel to the flow of water.
 3. Adjust staple pattern so staples are placed in critical channel points (e.g. slope interface, channel bottom) as illustrated below.

STAPLE PATTERN GUIDE
NO SCALE



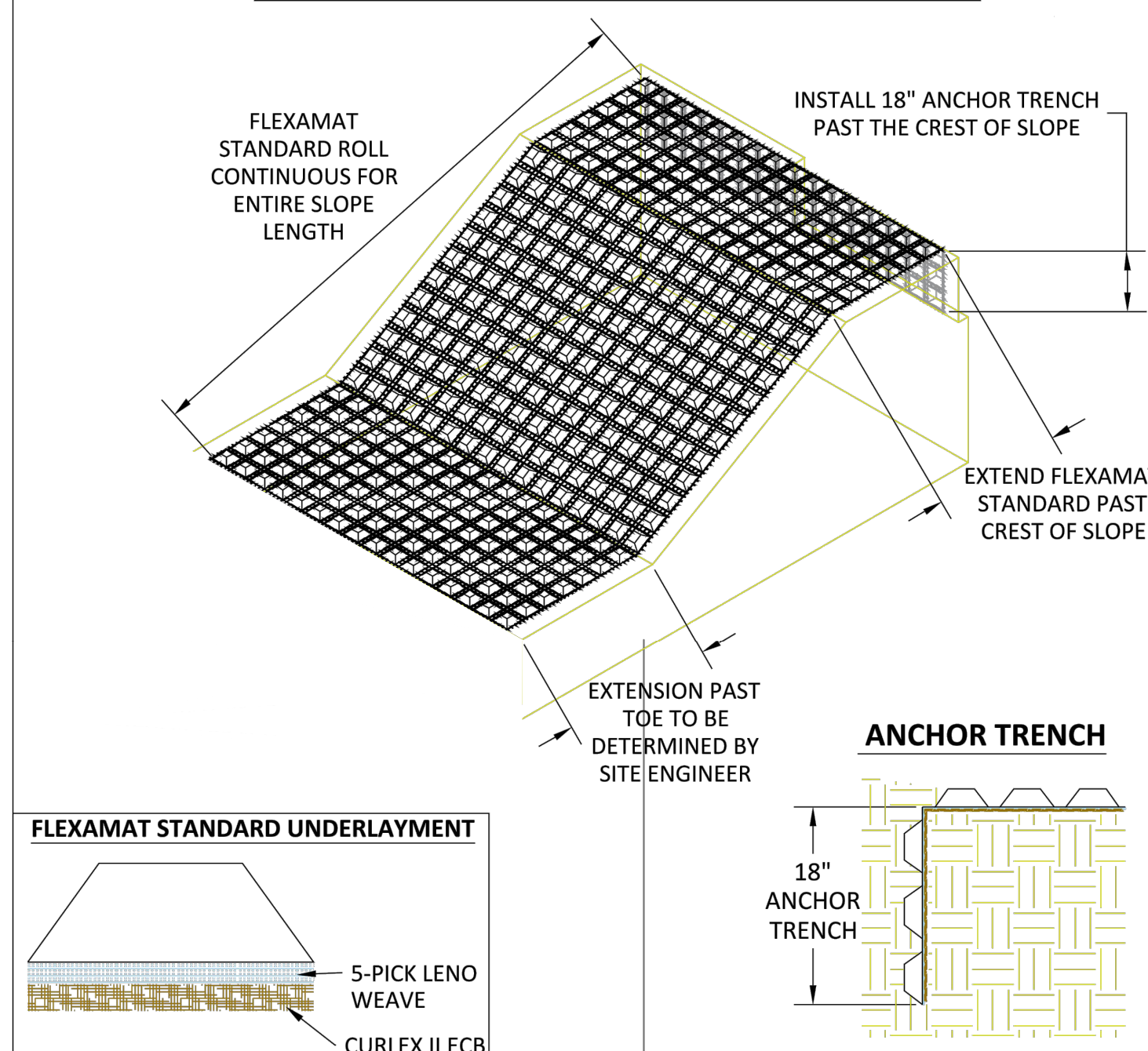
Project No: 22066
 Sheet No: C500

BANNING ENGINEERING
 853 COLUMBIA ROAD, SUITE #101
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 BUS: (317) 707-3700, FAX: (317) 707-3800
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 WEB: www.BanningEngineering.com

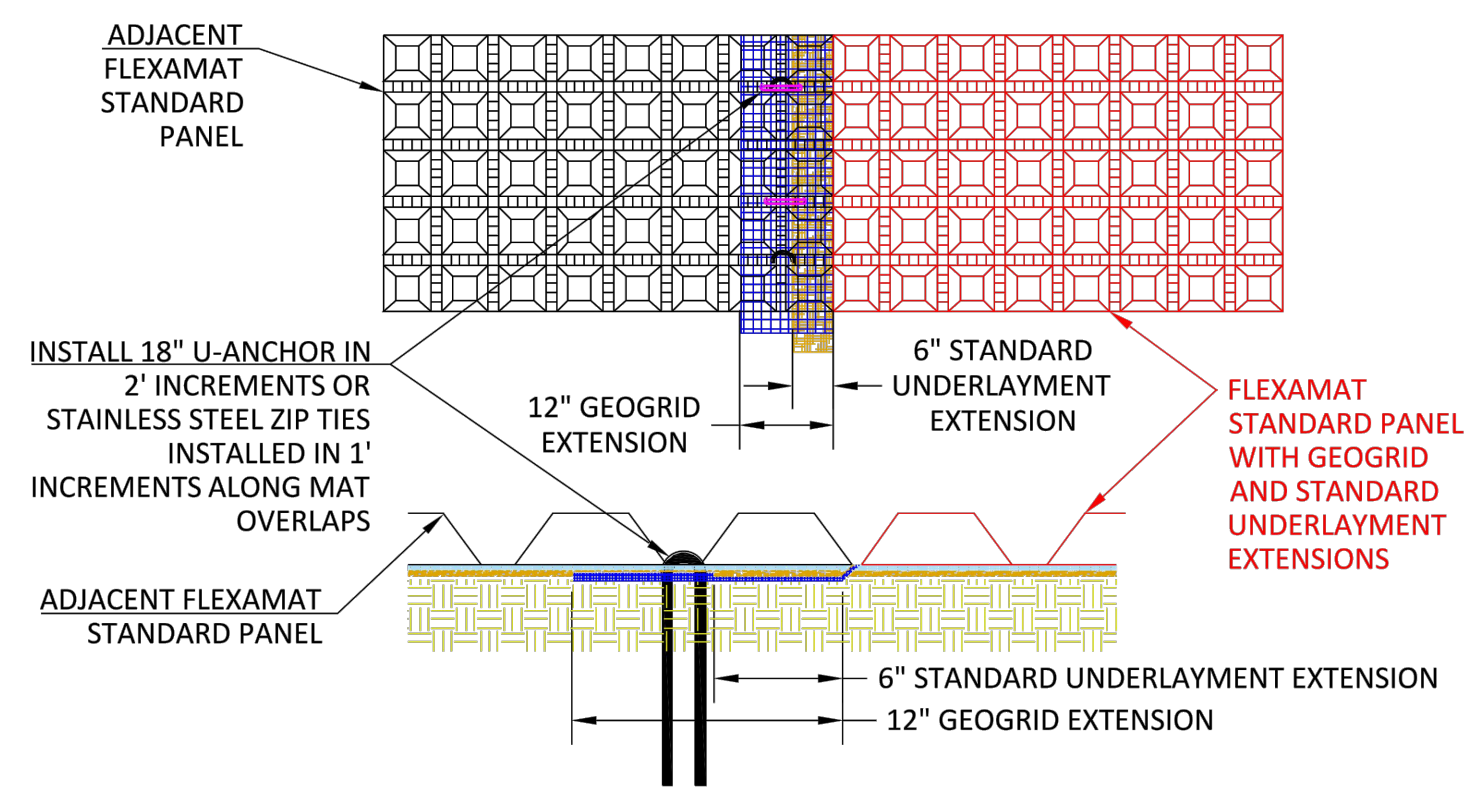
EROSION CONTROL DETAILS
 STRAHL LAKE DAM REHABILITATION
 INDIANA DEPARTMENT OF NATURAL RESOURCES
 VAN BUREN TOWNSHIP, NASHVILLE, INDIANA

Professional Engineer Seal: JOSEPH L. MILLER, No. PE1040348, STATE OF INDIANA

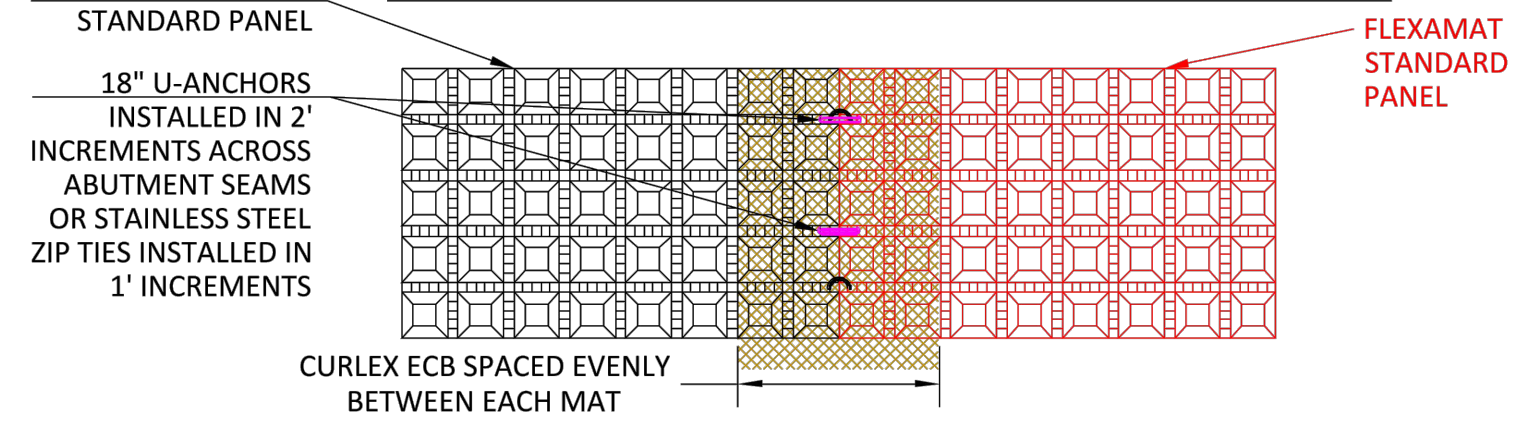
ISOMETRIC VIEW OF SLOPE AND ANCHOR TRENCHES



ABUTMENT METHOD FOR SEAMS WITH EXTENSIONS



ABUTMENT METHOD FOR SEAMS WITHOUT EXTENSIONS



FLEXAMAT STANDARD - SLOPE ARMORING

CONSTRUCTION NOTES:

1. AN ENGINEER OR MANUFACTURERS REPRESENTATIVE SHALL BE ONSITE FOR THE START OF THE INSTALLATION.
2. ALL SUBGRADE SURFACES PREPARED FOR PLACEMENT OF MATS SHALL BE SMOOTH AND FREE OF ALL ROCKS, STICKS, ROOTS, OTHER PROTRUSIONS, OR DEBRIS OF ANY KIND.
3. PRIOR TO FLEXAMAT STANDARD INSTALLATION SEED AND FERTILIZE SUBGRADE WITH SITE SPECIFIC SEED MIX IN ACCORDANCE WITH THE PROJECT PLANS AND SPECIFICATIONS.
4. INSTALL FLEXAMAT STANDARD ROLLS THAT ARE CONTINUOUS FOR ENTIRE SLOPE LENGTH. FOR SLOPES LONGER THAN 16', USE MATS WITH EXTENSIONS CUT TO THE LENGTH OF THE SLOPE. INSTALL MATS TO THAT THE MATTING EXTENDS PAST THE CREST OF SLOPE AND INTO AN 18" ANCHOR TRENCH.
 - 4.1. FOR ARMORED SLOPE LENGTHS 16' OR LESS, INSTALL CURLEX ECB EQUALLY UNDER ADJACENT MATS. SECURE SEAM WITH #3 REBAR 18" U-ANCHORS IN 2' INCREMENTS THE LENGTH OF THE ABUTMENT.
 - 4.2. ARMORED SLOPE LENGTHS LONGER THAN 16', INSTALL NEXT MAT OVER EXTENSIONS.
5. INSTALL SUBSEQUENT MATS OVER THE GEOGRID EXTENSION AND STANDARD UNDERLAYMENT EXTENSION OF THE PREVIOUSLY INSTALLED MAT. ENSURE THE GEOGRID AND STANDARD UNDERLAYMENT EXTENSIONS ARE LAYING FLAT ON THE SUBGRADE BEFORE INSTALLING ADJACENT MAT OVER THE EXTENSIONS.
6. INSTALL #3 REBAR 18" U-ANCHORS IN 2' INCREMENTS ACROSS THE GEOGRID AND STANDARD EXTENSION ABUTMENT. INSTALL ANCHORS PERPENDICULAR TO THE SLOPE DIRECTLY BEHIND FIRST ROW OF BLOCKS ON THE ADJACENT MAT.
7. AT THE END OF THE ARMORED SLOPE, IF HEAD-CUT IS ANTICIPATED, EMBED THE MAT 18" IN A TERMINATION TRENCH. FILL AND COMPACT TERMINATION TRENCH WITH SUITABLE FILL.

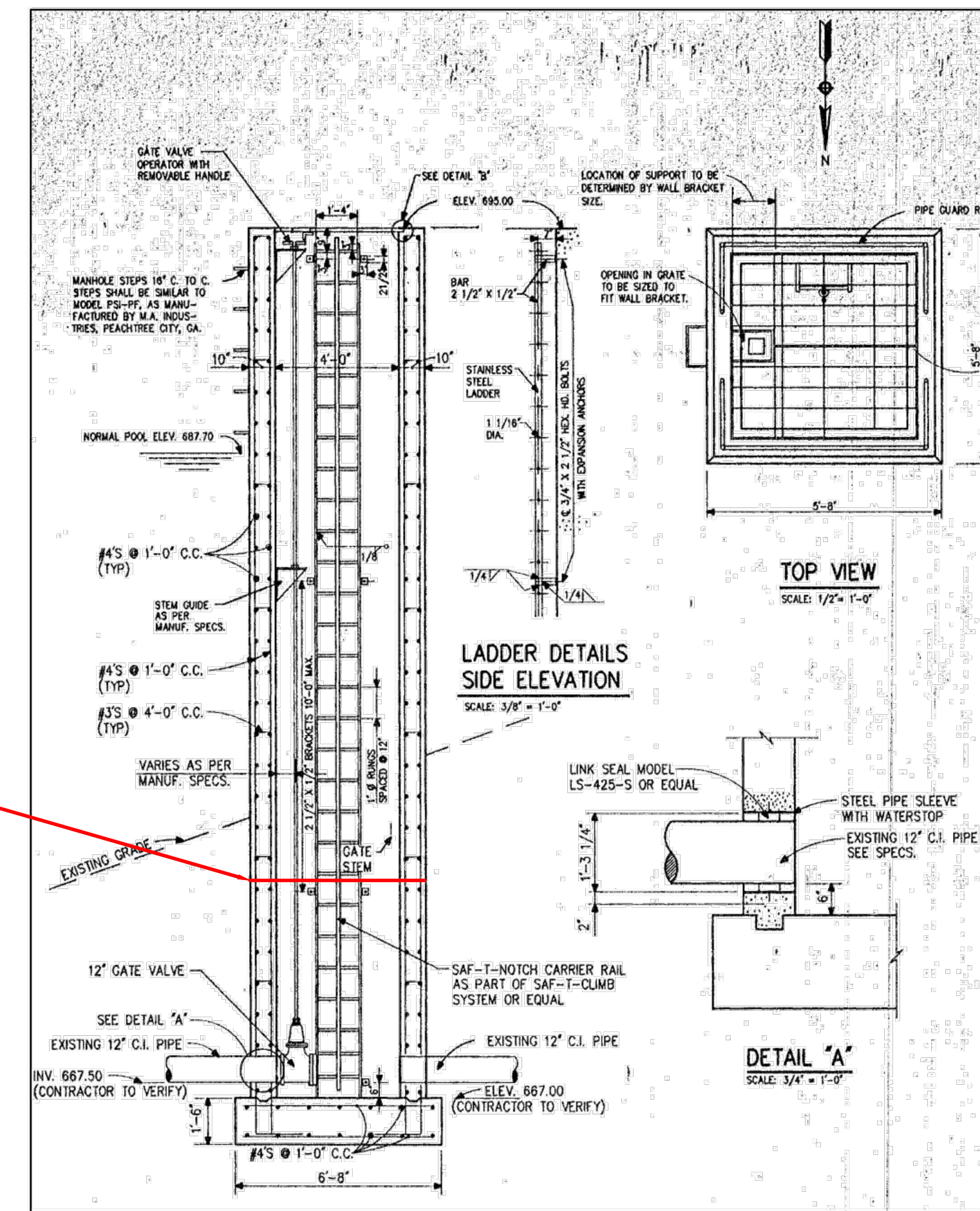
MOTZ ENTERPRISES, INC.

Flexamat
(513)772-6689
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Flexamat.com

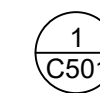


* HEADCUT NOT ANTICIPATED

FLEXAMAT INSTALLATION
NO SCALE



EXISTING DRAWDOWN VALVE CHAMBER
NO SCALE



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



Composition of Materials - Flexamat Standard

Blocks	5000 PSI, Wet-cast Portland Cement		
Interlocking Biaxial Geogrid	Formal 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.		
Property	Unit	Test	Requirement
	Mass/Unit Area	oz/yd ²	ASTM D5261
Aperture Size	English units	Measured	1.4x 1.4 inch
	Ultimate Wide Width Tensile Strength (MD x CMD)	lb/ft	ASTM D6637
Elongation at Ultimate Tensile Strength (MD x CMD)	%	ASTM D6637	6%
	Wide Width Tensile Strength @ 2% (MD x CMD)	lb/ft	ASTM D6637
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
Tensile Modulus @ 5% (MD x CMD)	lb/ft	ASTM D6637	32,800 lb/ft
	Flexamat Standard Underlayment	A three-layered system includes, in order from top to bottom: 1) Concrete block mat 2) 5-Pick Leno Weave and 3) Curlex® II. The underlayment materials shall be packaged within the roll of the Flexamat Standard.	



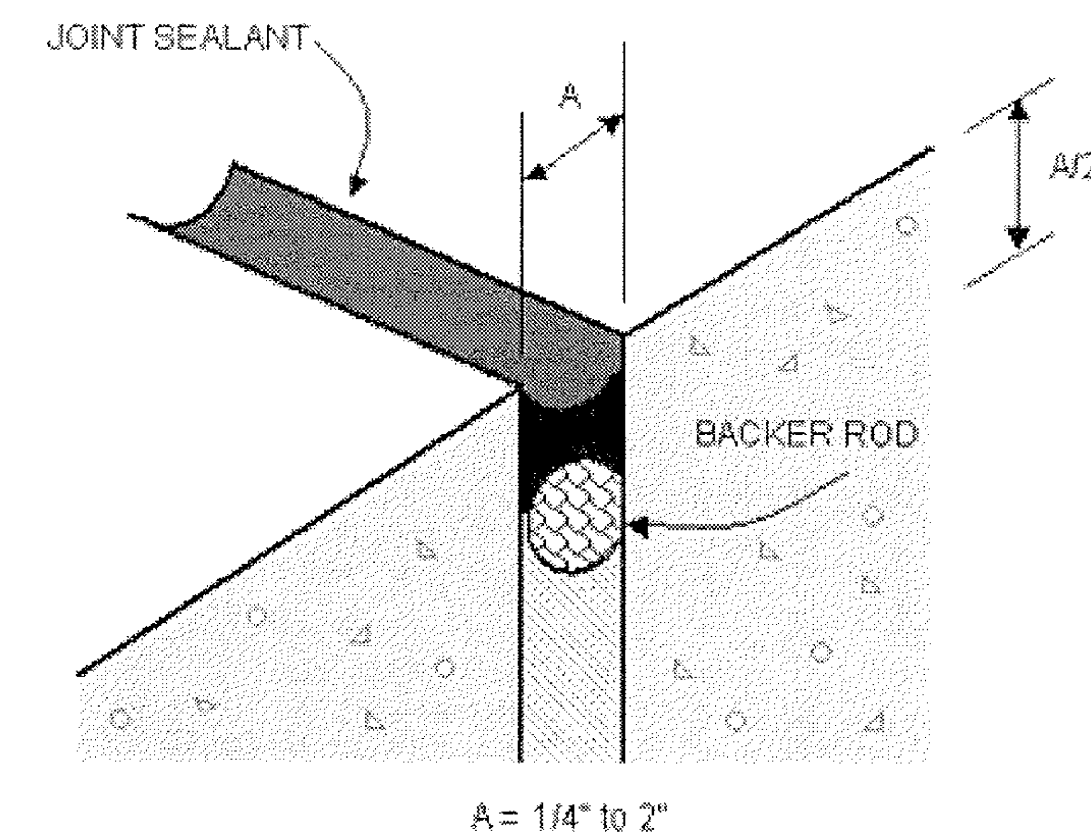
Manufacturing Values

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

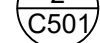
Test	Tested Value	Bed Slope	Soil Classification	Limiting Value
ASTM 6460	Shear Stress	30%	Sandy Loam (USDA)	24 PSF
ASTM 6460	Velocity	20%	Loam (USDA)	30 ft./sec

FLEXAMAT
NO SCALE



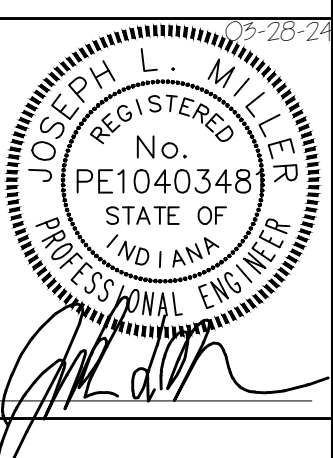
NOTES:
USE TYPE M, GRADE NS, CLASS 25, USE I (IMMERSED)
PER ASTM C920 OR ENGINEER APPROVED EQUIVALENT.

TYPICAL SEALANT JOINT DETAIL
NO SCALE



Date	Revisions	Sym.	Designed:	Drawn:	Checked:	Scale:	Date:
			JLM	TMF	JLM	NONE	05/26/24

MISCELLANEOUS DETAILS
STRAHL LAKE DAM REHABILITATION
INDIANA DEPARTMENT OF NATURAL RESOURCES
VAN BUREN TOWNSHIP, NASHVILLE, INDIANA



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