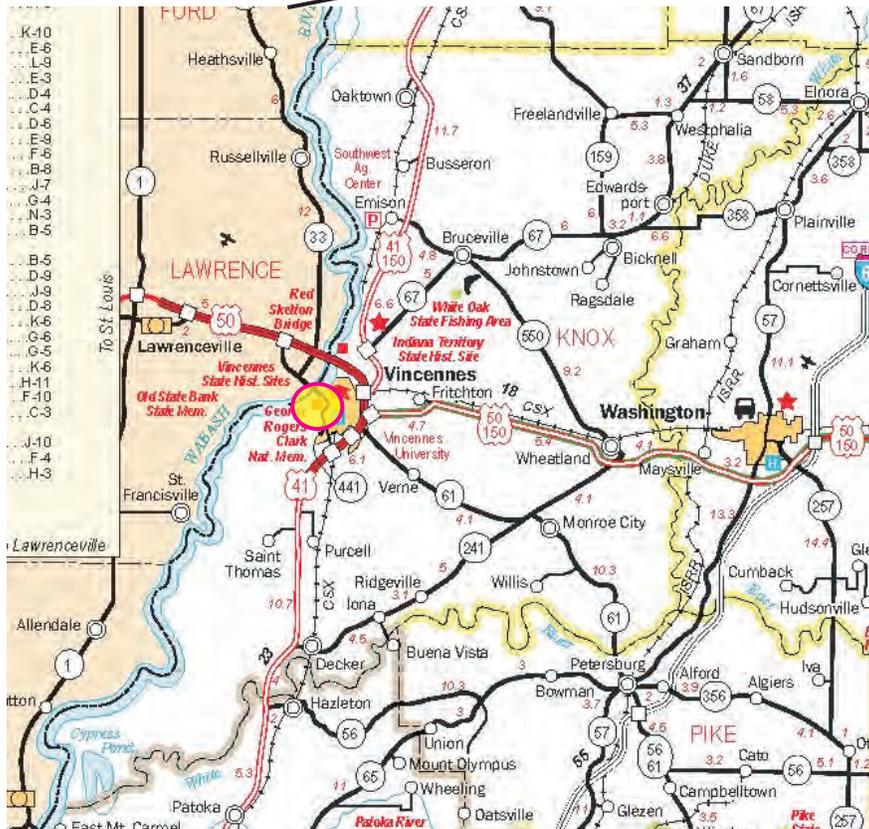


Appendix A

Project Location Maps & Preliminary Plans

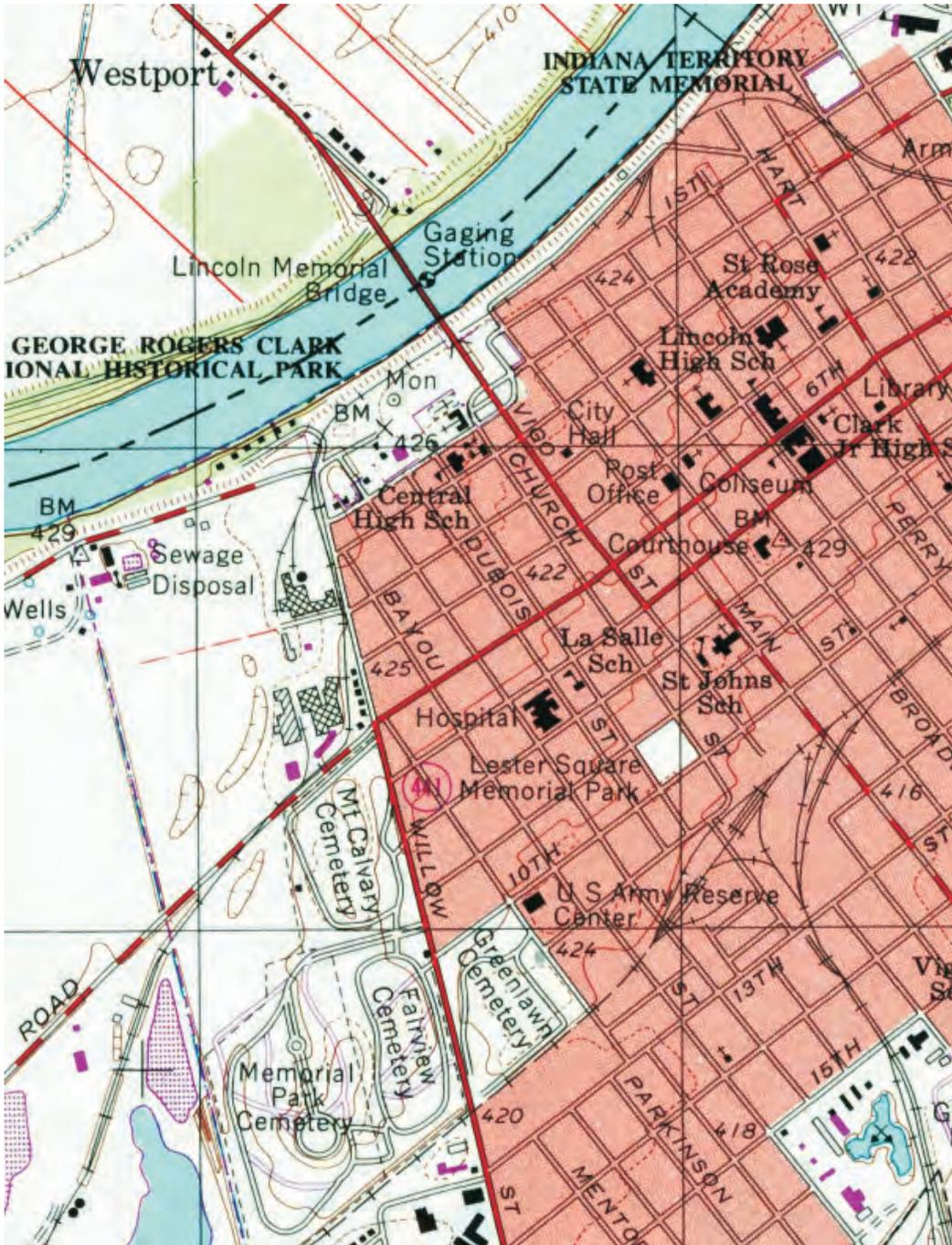


 Project Location

Source of Maps: INDOT website, www.IN.gov



State-County Project Location Map
Vincennes Levee Modification & Wastewater Infrastructure Project
George Rogers Clark National Historical Park
City of Vincennes, Indiana



Map Source: USGS; 7.5 minute, 1998 Vincennes Quad

Produced by the United States Geological Survey
 Topography compiled by photogrammetric methods from imagery dated 1958 and 1962 and planimetric surveys 1961 and 1965. Planimetry derived from imagery taken 1987 and other sources. Photoinspected using imagery dated 1998; no major culture or drainage changes observed. PLS and survey control current as of 1965. Boundaries, other than corporate, revised 1999.
 North American Datum of 1927 (NAD 27)
 Projection: Illinois coordinate system, east zone (Lambert conformal conic)
 10 000-foot ticks: Illinois coordinate system, east zone and Indiana coordinate system, west zone
 1000-meter Universal Transverse Mercator grid, zone 16
 North American Datum of 1983 (NAD 83) is shown by dashed corner ticks. The values of the shift between NAD 27 and NAD 83 for 7.5-minute intersections are obtainable from National Geodetic Survey NADCON software
 There may be private inholdings within the boundaries of the National or State reservations shown on this map.
 Information shown in purple may not meet USGS content standards and may conflict with previously mapped contours.



**USGS Topographic Map
 Vincennes Levee Modification & Wastewater Infrastructure Project
 George Rogers Clark National Historical Park
 City of Vincennes, Indiana**



Map Source: Indiana Geological Survey, www.maps.indiana.edu

- - - - - Brevoort Levee
- Willow Street temporary closure location
- - - - - Vincennes Levee
- Main Street temporary closure location
- - - - - Wastewater Infrastructure Alignment
- George Rogers Clark National Historical Park boundaries
- M George Rogers Clark Memorial Building
- C Old Cathedral "French and Indian" Cemetery
- - - - - B&O Railroad corridor alignment

Aerial Map of Key Sites & Structures Vincennes Levee Modification & Wastewater Infrastructure Project George Rogers Clark National Historical Park City of Vincennes, Indiana

WILLOW STREET CLOSURE PROJECT

PROJECT LOCATION



VICINITY MAP
NO SCALE

PLANS PREPARED FOR:
VINCENNES WATER UTILITIES
403 BUSSEY ST
VINCENNES, IN 47591
PH 812-882-5326
FX 812-882-9206
CONTACT KIRK BOUCHIE

PROJECT LOCATION



LOCATION MAP
NO SCALE



SITE MAP
NO SCALE

OPERATING AUTHORITIES

| | | |
|---|---|--|
| GAS VECTREN 609 BUSSEY STREET VINCENNES, IN 47591 GREG HOKE: 812-885-1568 | ELECTRIC DUKE ENERGY 800 OLD WHEATLAND ROAD VINCENNES, IN 47591 ROGER SWAIN: 812-866-3257 | WATER VINCENNES WATER UTILITIES 403 BUSSEY STREET VINCENNES, IN 47591 TOM BEZY: 812-882-7877 |
| ELECTRIC WIN ENERGY 3981 S. US HIGHWAY 41 VINCENNES, IN 47591 812-882-5140 | STORM VINCENNES WATER UTILITIES 403 BUSSEY STREET VINCENNES, IN 47591 STAN ECK: 812-882-7877 | TELEPHONE AT&T 1225 PRARIE STREET VINCENNES, IN 47591 TOD MOORE: 812-334-4718 |
| SANITARY VINCENNES SEWER DEPARTMENT 403 BUSSEY STREET VINCENNES, IN 47591 KIRK BOUCHIE: 812-882-7877 | CABLE TELEVISION CHARTER COMMUNICATIONS 2603 HART STREET VINCENNES, IN 47591 812-886-4973 | STREET VINCENNES STREET DEPARTMENT 1600 BAYOU STREET VINCENNES, IN 47591 BRYCE ANDERSON: 812-885-2520 |
| RAILROAD CSX TRANSPORTATION STEVE LITTLE: 812-887-2615 | | |

PLANS PREPARED BY:



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

CONTACT: KEVIN STEELY, PE

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.



CERTIFIED BY: _____

| SHEET INDEX | |
|-------------|--------------------------------------|
| SHEET NO | DESCRIPTION |
| C100 | TITLE SHEET |
| C110 | GRADING PLAN & PROFILE |
| C111 | CROSS SECTIONS & OWNERSHIP |
| C120 | LANDSCAPE PLANTING PLAN |
| C400 | EROSION & SEDIMENT CONTROL |
| C401 | STORMWATER POLLUTION PREVENTION PLAN |
| C500 | CONSTRUCTION DETAILS & NOTES |
| C501 | CONSTRUCTION DETAILS |

| REVISIONS | | |
|-----------|------------------------------------|----------|
| NUMBER | DESCRIPTION | DATE |
| | GRC - IRRIGATION SYSTEM PROTECTION | 08-05-13 |
| | LANDSCAPE MODIFICATIONS | 02-28-14 |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

Date: 04-16-13

Project No: 10006L

Sheet No:

C100



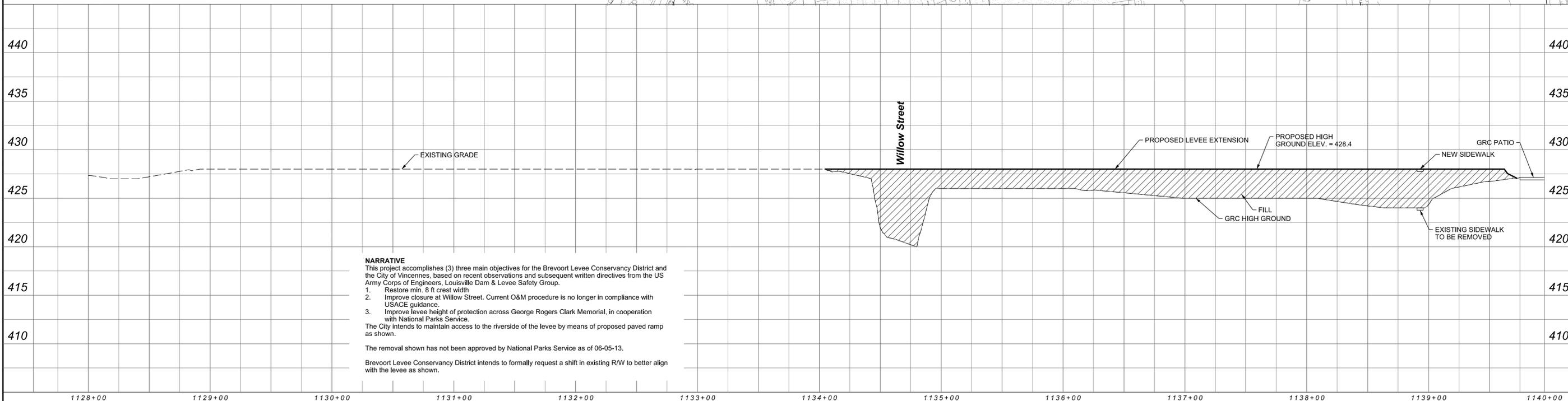
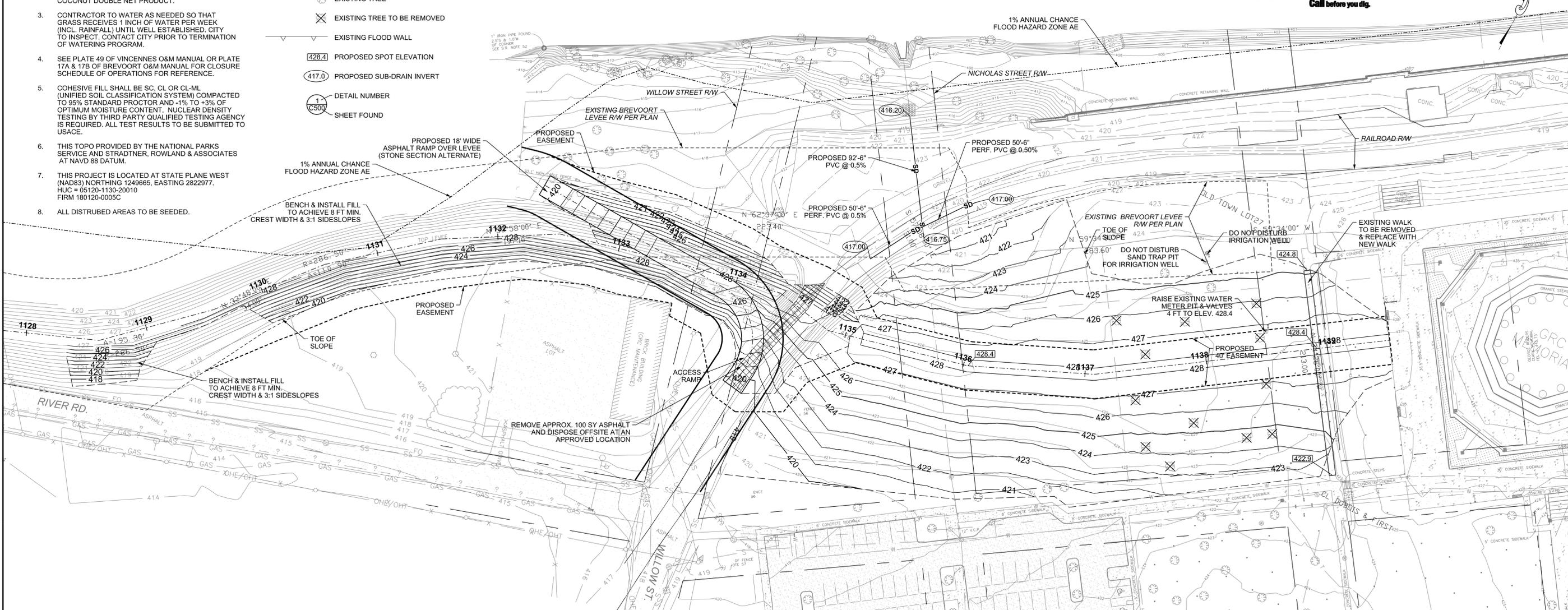
NOTES:

- FLOOD PROTECTION LEVEL IS 428.0 (NGVD 29) WHICH EQUATES TO 427.6 (NAVD 88) AT THIS LOCATION.
- EROSION BLANKET SHALL BE NORTH AMERICAN GREEN SC150 OR APPROVED EQUAL. THIS IS A STRAW COCONUT DOUBLE NET PRODUCT.
- CONTRACTOR TO WATER AS NEEDED SO THAT GRASS RECEIVES 1 INCH OF WATER PER WEEK (INCL. RAINFALL) UNTIL WELL ESTABLISHED. CITY TO INSPECT. CONTACT CITY PRIOR TO TERMINATION OF WATERING PROGRAM.
- SEE PLATE 49 OF VINCENNES O&M MANUAL OR PLATE 17A & 17B OF BREVOORT O&M MANUAL FOR CLOSURE SCHEDULE OF OPERATIONS FOR REFERENCE.
- COHESIVE FILL SHALL BE SC, CL OR CL-ML (UNIFIED SOIL CLASSIFICATION SYSTEM) COMPACTED TO 95% STANDARD PROCTOR AND -1% TO +3% OF OPTIMUM MOISTURE CONTENT. NUCLEAR DENSITY TESTING BY THIRD PARTY QUALIFIED TESTING AGENCY IS REQUIRED. ALL TEST RESULTS TO BE SUBMITTED TO USAGE.
- THIS TOPO PROVIDED BY THE NATIONAL PARKS SERVICE AND STRADTNER, ROWLAND & ASSOCIATES AT NAVD 88 DATUM.
- THIS PROJECT IS LOCATED AT STATE PLANE WEST (NAD83) NORTHING 1249665, EASTING 2622977. HUC = 051201130-20010 FIRM 180120-0005C
- ALL DISTURBED AREAS TO BE SEEDDED.

LEGEND

- EXISTING CONTOURS
- PROPOSED CONTOURS
- ⊗ EXISTING TREE
- ⊗ EXISTING TREE TO BE REMOVED
- ▽ EXISTING FLOOD WALL
- 428.4 PROPOSED SPOT ELEVATION
- 417.0 PROPOSED SUB-DRAIN INVERT
- 1 DETAIL NUMBER
- 6500 SHEET FOUND

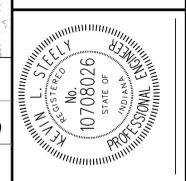
Wabash River



NARRATIVE
 This project accomplishes (3) three main objectives for the Brevoort Levee Conservancy District and the City of Vincennes, based on recent observations and subsequent written directives from the US Army Corps of Engineers, Louisville Dam & Levee Safety Group.
 1. Restore min. 8 ft crest width.
 2. Improve closure at Willow Street. Current O&M procedure is no longer in compliance with USACE guidance.
 3. Improve levee height of protection across George Rogers Clark Memorial, in cooperation with National Parks Service.
 The City intends to maintain access to the riverside of the levee by means of proposed paved ramp as shown.
 The removal shown has not been approved by National Parks Service as of 06-05-13.
 Brevoort Levee Conservancy District intends to formally request a shift in existing R/W to better align with the levee as shown.

| | |
|------------|----------|
| Date | 08-05-13 |
| Revisions | 02-28-14 |
| SYm. | |
| Designated | KS |
| Drawn | SH |
| Checked | |
| Scale | 1"=40' |
| Date | 06-19-13 |

GRADING PLAN AND PROFILE
WILLOW STREET CLOSURE
VINCENNES WATER UTILITIES
403 BUSSERON STREET, 47591



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 E-MAIL: Banning@BanningEngineering.com
 WEB: www.BanningEngineering.com

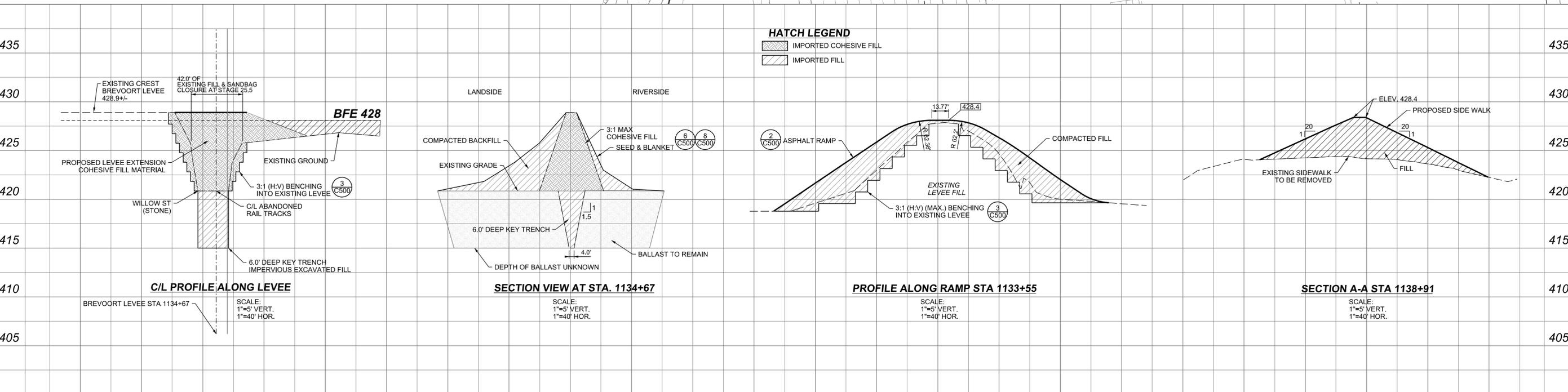
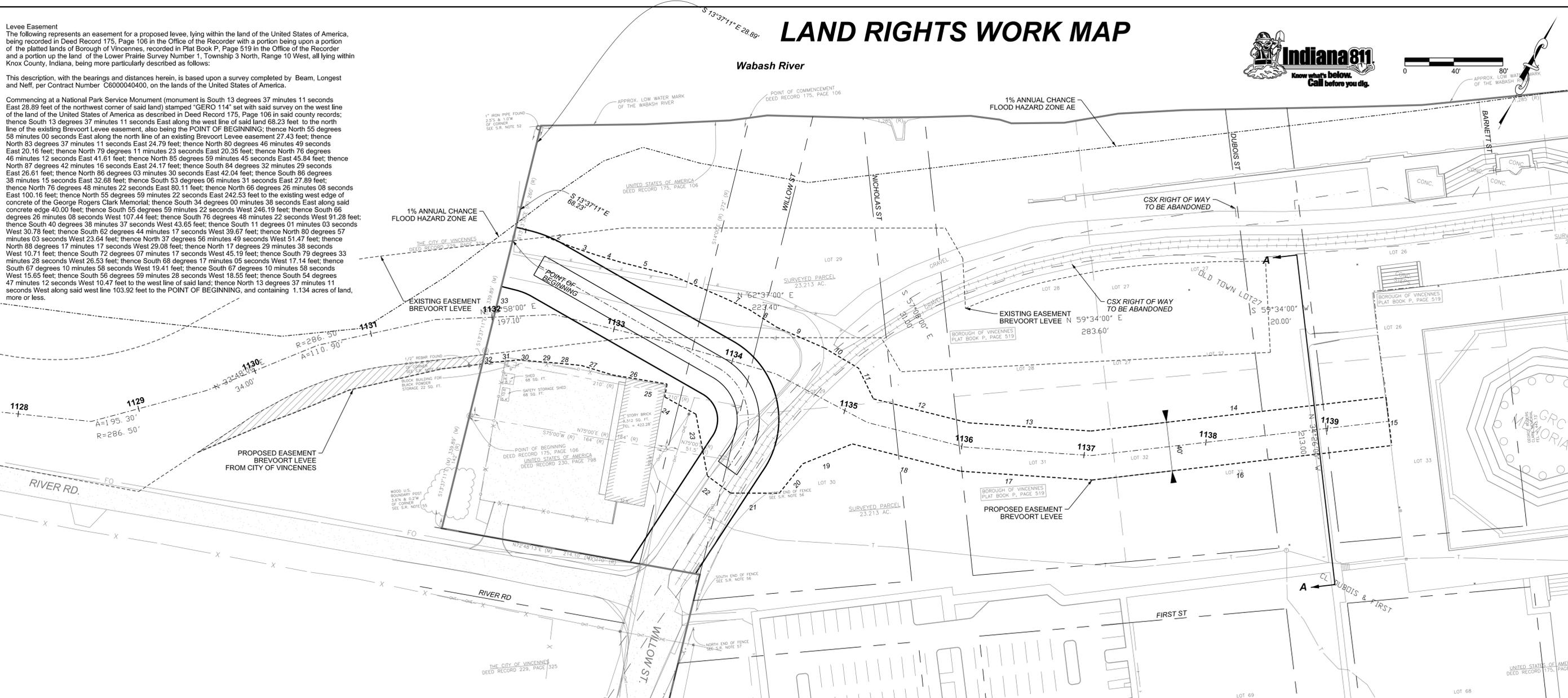
| | |
|-------------|--------|
| Project No: | 10006L |
| Sheet No: | |

Levee Easement
 The following represents an easement for a proposed levee, lying within the land of the United States of America, being recorded in Deed Record 175, Page 106 in the Office of the Recorder with a portion being upon a portion of the platted lands of Borough of Vincennes, recorded in Plat Book P, Page 519 in the Office of the Recorder and a portion upon the land of the Lower Prairie Survey Number 1, Township 3 North, Range 10 West, all lying within Knox County, Indiana, being more particularly described as follows:

This description, with the bearings and distances herein, is based upon a survey completed by Beam, Longest and Neff, per Contract Number C6000040400, on the lands of the United States of America.

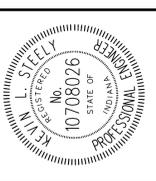
Commencing at a National Park Service Monument (monument is South 13 degrees 37 minutes 11 seconds East 28.89 feet of the northwest corner of said land) stamped "GERO 114" set with said survey on the west line of the land of the United States of America as described in Deed Record 175, Page 106 in said county records; thence South 13 degrees 37 minutes 11 seconds East along the west line of said land 68.23 feet to the north line of the existing Brevoort Levee easement, also being the POINT OF BEGINNING; thence North 55 degrees 58 minutes 00 seconds East along the north line of an existing Brevoort Levee easement 27.43 feet; thence North 83 degrees 37 minutes 11 seconds East 24.79 feet; thence North 60 degrees 46 minutes 49 seconds East 20.16 feet; thence North 79 degrees 11 minutes 23 seconds East 20.35 feet; thence North 76 degrees 46 minutes 12 seconds East 41.61 feet; thence North 85 degrees 59 minutes 45 seconds East 45.84 feet; thence North 87 degrees 42 minutes 16 seconds East 24.17 feet; thence South 84 degrees 32 minutes 29 seconds East 26.61 feet; thence North 86 degrees 03 minutes 30 seconds East 42.04 feet; thence South 86 degrees 38 minutes 15 seconds East 32.68 feet; thence South 53 degrees 06 minutes 31 seconds East 27.89 feet; thence North 76 degrees 48 minutes 22 seconds East 80.11 feet; thence North 66 degrees 26 minutes 08 seconds East 100.16 feet; thence North 55 degrees 59 minutes 22 seconds East 242.53 feet to the existing west edge of concrete of the George Rogers Clark Memorial; thence South 34 degrees 00 minutes 38 seconds East along said concrete edge 40.00 feet; thence South 55 degrees 59 minutes 22 seconds West 246.19 feet; thence South 66 degrees 26 minutes 08 seconds West 107.44 feet; thence South 76 degrees 48 minutes 22 seconds West 91.28 feet; thence South 40 degrees 38 minutes 37 seconds West 43.55 feet; thence South 11 degrees 01 minutes 03 seconds West 30.78 feet; thence South 62 degrees 44 minutes 17 seconds West 39.67 feet; thence North 80 degrees 57 minutes 03 seconds West 23.64 feet; thence North 37 degrees 56 minutes 49 seconds West 51.47 feet; thence North 88 degrees 17 minutes 17 seconds West 29.08 feet; thence North 17 degrees 29 minutes 38 seconds West 10.71 feet; thence South 72 degrees 07 minutes 17 seconds West 45.19 feet; thence South 79 degrees 33 minutes 28 seconds West 26.53 feet; thence South 68 degrees 17 minutes 05 seconds West 17.14 feet; thence South 67 degrees 10 minutes 58 seconds West 19.41 feet; thence South 67 degrees 10 minutes 58 seconds West 15.65 feet; thence South 56 degrees 59 minutes 28 seconds West 18.55 feet; thence South 54 degrees 47 minutes 12 seconds West 10.47 feet to the west line of said land; thence North 13 degrees 37 minutes 11 seconds West along said west line 103.92 feet to the POINT OF BEGINNING, and containing 1.134 acres of land, more or less.

LAND RIGHTS WORK MAP



| Date | 08-05-13 |
|-------------|------------------------------------|
| Revisions | GRG - IRRIGATION SYSTEM PROTECTION |
| Sym. | LANDSCAPE MODIFICATIONS |
| Designated: | KS |
| Drawn: | SH |
| Checked: | |
| Scale: | 1"=40' |
| Date: | 08-19-13 |

CROSS SECTIONS & OWNERSHIP
WILLOW STREET CLOSURE
VINCENNES WATER UTILITIES
403 BUSSERON STREET, 47591

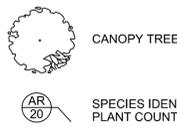


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 WEB: www.BanningEngineering.com

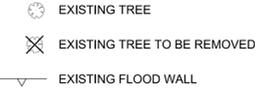
Project No: 10006L
 Sheet No:

09/27/2014
 SCALE: 40,0000' / in.
 Project Number:
 Folder: willow closure at brevoort RD - 111.dgn
 File: 10006L_RDC - 111.dgn

LANDSCAPE SYMBOLOLOGY



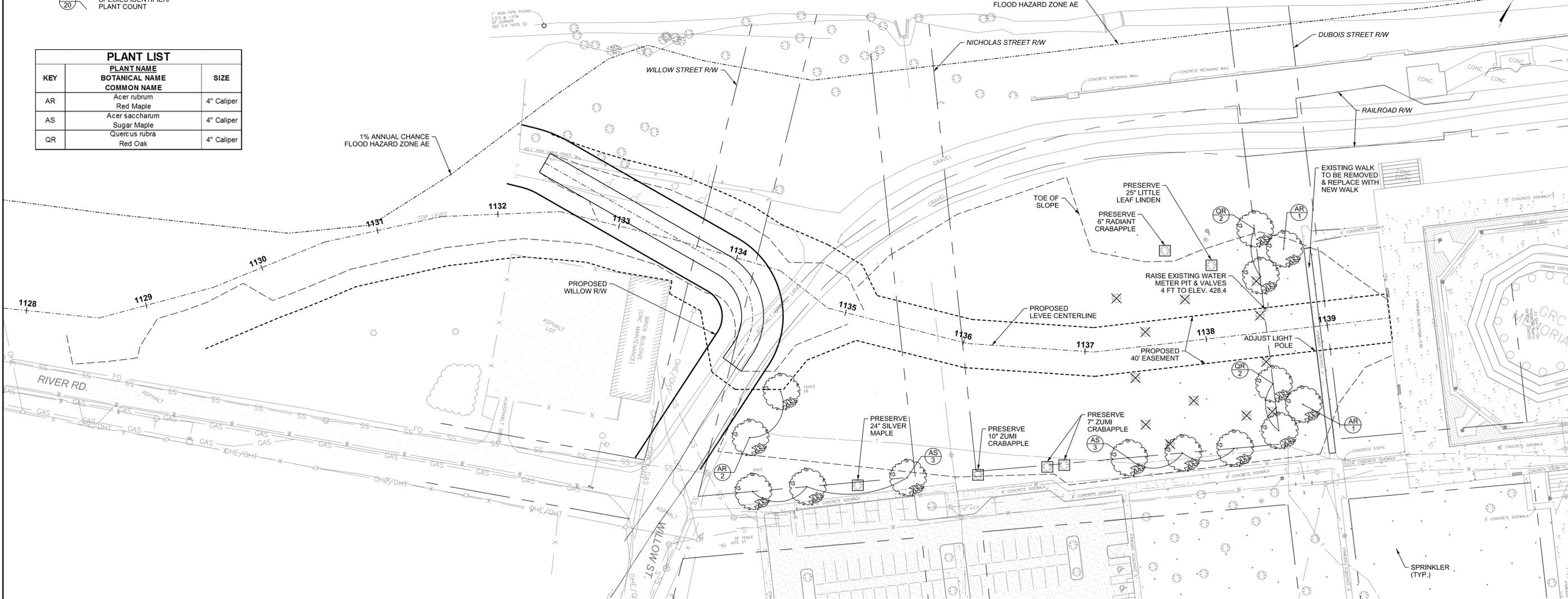
LEGEND



| KEY | PLANT NAME BOTANICAL NAME COMMON NAME | SIZE |
|-----|---|------------|
| AR | Acer rubrum Red Maple | 4" Caliper |
| AS | Acer saccharum Sugar Maple | 4" Caliper |
| QR | Quercus rubra Red Oak | 4" Caliper |

1% ANNUAL CHANCE FLOOD HAZARD ZONE AE

Wabash River



LANDSCAPE PLANTING PLAN
WILLOW STREET CLOSURE
VINCENNES WATER UTILITIES
403 BUSSERON STREET, 47591

| | |
|-------------|---|
| Date | 08-15-13 |
| Revisions | 02-28-14 |
| SYm. | GRG - IRRIGATION SYSTEM PROTECTION LANDSCAPE MODIFICATIONS |
| Designated: | KS |
| Drawn: | SH |
| Checked: | |
| Scale: | 1"=40' |
| Date: | 08-19-13 |

LANDSCAPE SPECIFICATIONS

These specifications cover the furnishing of labor, plants, equipment, and materials to perform landscape operations in connection with this construction project at the locations shown on the landscape drawing.

LANDSCAPE MATERIALS: FERTILIZER:
Granular non-burning product composed of not less than 50% organic slow acting, guaranteed analysis professional fertilizer; 20% nitrogen, 10% phosphoric acid, and 5% potash by weight or similarly approved composition.

PLANTING BACKFILL SOIL:
Backfill plant pits with the following topsoil mixture: 1 part on-site topsoil, 1 part imported topsoil, 1 part compost and 1/2 pound plant specified fertilizer per cubic yard.

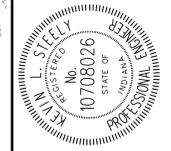
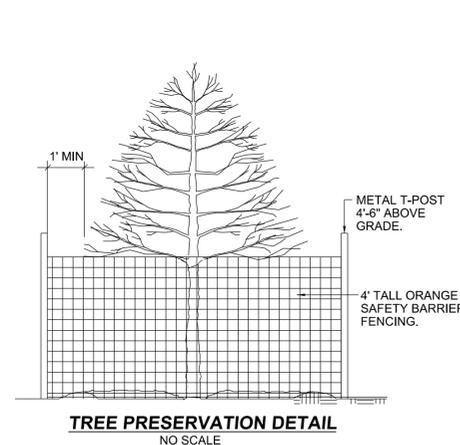
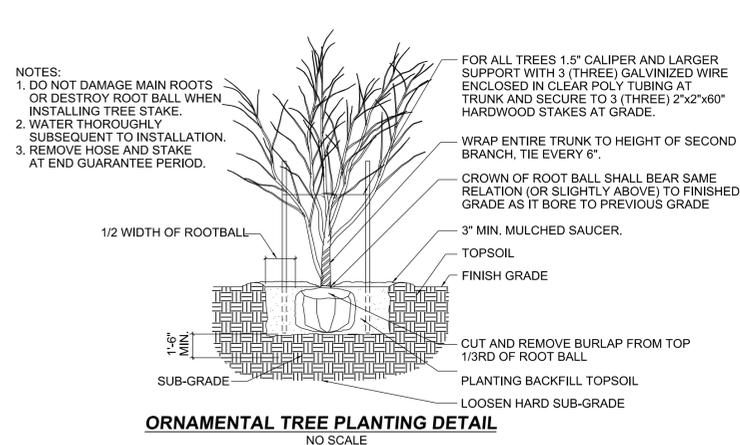
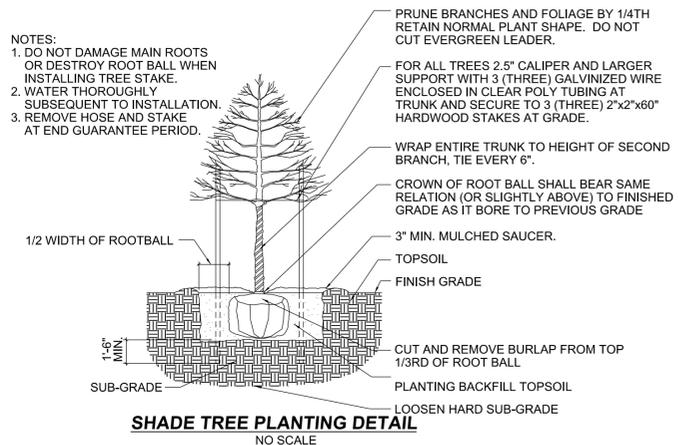
PLANT MATERIALS:
Provide trees and shrubs as indicated. Comply with sizing and grading standards of "American Standard for Nursery Stock". Provide only sound, healthy vigorous plants free from defects, disfiguring knots, sunscald injuries, frost cracks, plant diseases, insects or any other form of disease or infestation. All plants shall have fully developed form without voids or open spaces.

PROJECT EXECUTION: SUBSURFACE UTILITIES:
Contractor shall determine utility line locations prior to commencing work. Any conflicts between utility locations, excavation and/or landscape operations shall be brought to Owner's attention prior to commencing excavation and/or grading work. Contractor assumes responsibility for any utility damage resulting from landscape operations. CONTRACTOR SHALL NOTIFY UTILITY LOCATE SERVICE (1.800.382.5544) A MINIMUM OF TWO WORKING DAYS PRIOR TO EXCAVATION.

PLANTING EXCAVATION:
When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage or obstructions, notify owner before planting. See planting details for planting, pruning and staking requirements.

SEEDED LAWN:
Complete all other landscape plantings, mulching, fine grading and staking prior to seeding lawn areas. Provide seeded lawn for all lawn areas utilizing KY 31 Tall Fescue Blend Seed. Apply Seed at a rate of 5 pounds per 1000 square feet. Apply fertilizer at a rate of 4 pounds of actual nitrogen per 1,000 square feet. Spread topsoil over lawn areas to a depth of two inches and cultivate soil to a depth of three inches prior to seeding. Seed bed shall be in a firm but uncompacted condition with a relatively fine texture at time of seeding. Contractor shall maintain seeding lawn for a period of 60 days beyond final acceptance by mowing and watering as required to maintain vigorous growth during establishment period. Lawn areas shall not have voids larger than 6"x6". If voids are larger than acceptable size an overseeding shall be completed by the contractor during the next available growing season.
Fall growing season August 15th - September 20th. Spring growing season March 20th - April 20th.

PROJECT WARRANTY:
Contractor shall warrant trees, shrubs, and plants for a period of two years after date of substantial completion against defects including death and unsatisfactory growth, except for defects resulting from neglect by the Owner, abuse or damage by others, or unusual phenomena or incidents which are beyond installer's control. Remove and replace trees, shrubs or other plants found to be dead or in unhealthy condition during warranty period. Replace trees and shrubs which are in doubtful condition at end of warranty period.

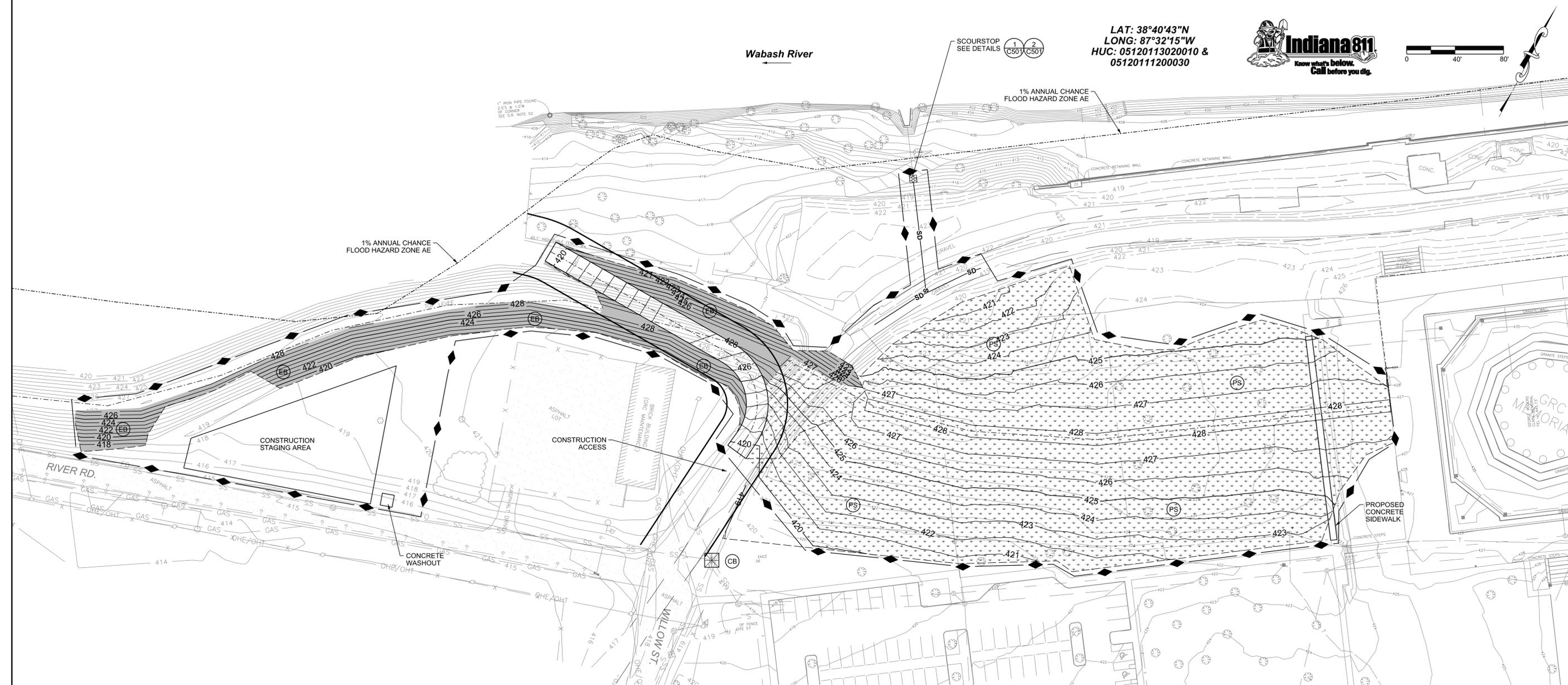
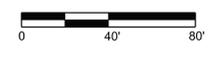


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 E-MAIL: Banning@BanningEngineering.com
 WEB: www.BanningEngineering.com

Project No: 10006L
Sheet No:

Wabash River

LAT: 38°40'43"N
LONG: 87°32'15"W
HUC: 05120113020010 &
05120111200030



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 areas 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 is responsible for obtaining any necessary sign permits for this.
- 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.

EROSION CONTROL PLAN LEGEND

- EROSION CONTROL BLANKET W/PERMANENT SEEDING (NORTH AMERICAN GREEN SC-150) SEE DETAIL
- PERMANENT SEEDING & MULCHING SEE DETAIL
- CURB INLET PROTECTION, SEE DETAIL
- CONSTRUCTION LIMITS
- SILTY FENCE

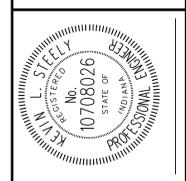
EROSION CONTROL SEQUENCING

- Setup a pre-construction meeting (at least 72 hours prior to construction) with Contractor, Vincennes Water Utilities, Engineer, and City of Vincennes representative to discuss scheduling and sequencing of project.
- 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.
- Post the approved clean water permit issued by the City of Vincennes. Notify IDEM at (317-233-1684) and the Town of Plainfield within forty-eight hours of the beginning of construction activities.
- Install construction entrance drive and construction staging area on site as delineated on this sheet.
- Establish concrete washout as delineated on this plan and associated details.
- Remove trees and rubbish only as needed for construction.

| Date | Revisions |
|----------|------------------------------------|
| 08-15-13 | GRC - IRRIGATION SYSTEM PROTECTION |
| 02-28-14 | LANDSCAPE MODIFICATIONS |

| | |
|-------------|----------|
| Designated: | KS |
| Drawn: | SH |
| Checked: | |
| Scale: | 1"=40' |
| Date: | 08-19-13 |

EROSION & SEDIMENT CONTROL
WILLOW STREET CLOSURE
VINCENNES WATER UTILITIES
403 BUSSERON STREET, 47591



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WEB: www.BanningEngineering.com

Project No: 10006L
Sheet No:

C400

09/27/2014
SCALE: 40,0000' / in.
Project Number:
Folder: willow closure at brevoortfile Name: 10006L_RDC_400.dgn

| ASSESSMENT OF CONSTRUCTION PLAN ELEMENTS (SECTION A) | |
|--|---|
| A1 | Index showing locations of required Plan Elements: See This Sheet |
| A2 | 11 x 17 Plat denoting building lot numbers, boundaries, road layout / names: Provide separately with substantial package |
| A3 | Narrative describing the nature and purpose of the project: The project installs compacted fill on the earth levee to achieve minimum 8 ft crest width and 3:1 sideslopes per USACE guidance; it permanently closes the Willow Street closure which formerly serviced the B&O railroad; it provides maintenance access up and over the levee to and from the river/levee; it raises the low area immediately south of the GRC Memorial to reduce the need for temporary closure across National Park Service lands. |
| A4 | Vicinity map showing Project Location: See Plan Set : Title Sheet |
| A5 | Legal Description of the Project Site: See Plan Set : C111 Project Latitude : 38°20'42.8" N Project Longitude : 87°32'15.1" W |
| A6 | Location of all lots and proposed site improvements: See Plan Set : C110 |
| A7 | Hydrologic unit code 14 digit -05120-11320010 |
| A8 | State or Federal Water Quality Permits Required: 401 Water quality Certification (IDEM) : None Required Section 404 Permit (USACE) : None Required Construction in a Floodway (InDNR) : Required |
| A9 | Specific Points where Stormwater discharge will leave the site: Runoff on the riverside will drain toward the river; runoff on the land side will drain toward existing municipal storm sewerage, which ultimately discharges to the Wabash River. |
| A10 | Location and names of all wetlands, lakes and water courses on and adjacent to the site: See Plan Set : C110 Wabash River |
| A11 | Identification of receiving waters: Wabash River |
| A12 | Identification of potential discharges to ground water: None known (abandoned wells sinkholes etc) |
| A13 | 100 Year floodplains, floodways and flood fringes: See Plan Set : C110 |
| A14 | Pre-construction & Post construction estimates of Peak Discharges: 10 year Pre-Construction Peak Discharge = 3.5 CFS 10 year Post Construction Peak Discharge = 3.5 CFS |
| A15 | Adjacent land use, including upstream watershed: See Plan Set : C110 North : Open Space South : Open Space East : Residential West : River (agricultural beyond) |
| A16 | Locations and approximate boundaries of all disturbed areas: See Plan Set : C111 (Construction Limits) |
| A17 | Identification of existing vegetative cover: See Plan Set : C111 This is George Rogers Clark National Historic Park |
| A18 | Soils map including soil descriptions and limitations: See Plan Set : C111 |
| A19 | Location, size and dimensions of proposed stormwater systems: See Plan Set : C110 |
| A20 | Plans for any off-site construction activities: See Plan Set : none |
| A21 | Location of Proposed soil Stockpiles and/or Borrow areas: See Plan Set : C111 |
| A22 | Existing site Topography : See Plan Set : C110 |
| A23 | Proposed final topography: See Plan Set : C110 |

| ASSESSMENT OF STORMWATER POLLUTION PREVENTION PLAN (SECTION B) | |
|--|---|
| B1 | Description of potential pollutants sources associated with the construction activities: 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 | Sequence of stormwater quality implementation relative to land disturbance activities: See noted sequences on C111 |
| B3 | Stable construction entrance location(s) and specifications: For Locations see C111 For detail See Plan Set : C500 |
| B4 | Sediment control measures for sheet flow areas: Silt fence will be installed on the perimeter of the proposed grading area. For Locations see Plan Set : C111 For details See Plan Set : C500 |
| B5 | Sediment control measures for concentrated flow areas: Erosion control Blankets and scour stop will be installed to reduce and collect sediment from concentrated flow. For Locations see Plan Set : C111 For details See Plan Set : C500 & C501 |
| B6 | Storm sewer inlet protection measures, locations and specifications: Baskets will be installed in the inlets to provide curb inlet protection. For Locations see Plan Set : C111 For details See Plan Set : C500 |
| B7 | Runoff control measures: The perimeter of the site is either existing asphalt pavement (east) or grass. The grass acts as a buffer strip to reduce sediment load and allow infiltration. For Locations see Plan Set : C111 |
| B8 | Stormwater outlet protection specifications: Scour Stop will be installed at the sub drain outlet to prevent erosion. Pavement will be installed on the ramp to prevent rutting from traffic over the levee. For Locations see Plan Set : C111 For details See Plan Set : C501 |
| B9 | Grade stabilization structures and specifications: None required |
| B10 | Location, dimensions, specifications and construction details of each stormwater quality measure: For Locations see Plan Set : C111 For details See Plan Set : C500 & C501 |
| B11 | Temporary surface stabilization methods appropriate for each season: Temporary seeding is required for any area left for 15 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. For Locations see Plan Set : C111 For details See Plan Set : C501 |
| B12 | Permanent surface stabilization specifications: Permanent seeding will be applied with the installation of the erosion control blankets on the embankments with the completion of onsite storm drainage system, and after replacement of topsoil. For Locations see Plan Set : C111 For details See Plan Set : C501 |

| B13 Material handling and spill prevention plan: 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 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 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: Wabash River 2. Drainage System: All storm drainage leaves the site by municipal storm sewer. 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 investigate 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: - 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 c. Notify the Vincennes Fire Department Phone: 9-1-1 d. Notify the Vincennes Police department Phone: 9-1-1 e. Notify waste recovery contractor, maintenance personnel or other contractors 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 pumpers 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. 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. 5. 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. |
| | Place a stockpile of spill cleanup materials where it 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 and 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, 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 washes: 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. 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. - 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 berm 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. |

| ADDITIONAL STORMWATER POLLUTION PREVENTION MEASURES (CONTINUED): | |
|--|---|
| | 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 hose 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. Littering on the project site should be prohibited. To prevent clogging of the storm drainage system, litter and debris removal from drainage grates, trash racks, and ditch lines should be a priority. Trash receptacles should be provided in the contractor's yard, field trailer areas, and at locations where workers congregate for lunch and break periods. Litter from work areas within the construction limits of the project site should be collected and placed in watertight dumpsters at least weekly, regardless of whether the litter was generated by the contractor, the public, or others. Collected litter and debris should not be placed in or next to drain inlets, stormwater drainage systems, or watercourses. Dumpsters of sufficient size and number should be provided to contain the solid waste generated by the project. Full dumpsters should be removed from the project site and the contents should be disposed of by the trash hauling contractor. Construction debris and waste should be removed from the site biweekly or more frequently as needed. Construction material visible to the public should be stored or stacked in an orderly manner. Stormwater runoff should be prevented from contacting stored solid waste through the use of berms, dikes, or other temporary diversion structures or through the use of measure to elevate waste from site surfaces. Solid waste storage areas should be located at least 50 ft. from drainage facilities and watercourses and should not be located in area prone to flooding or ponding. Inspection and Maintenance Inspect construction waste area weekly. Arrange for regular waste collection. |

| ADDITIONAL STORMWATER POLLUTION PREVENTION MEASURES (CONTINUED): | |
|---|--|
| B14 Monitoring and 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 : C111 |
| B15 Erosion & sediment control specifications for individual building lots: | For details See Plan Set : (not applicable) |
| STORMWATER POLLUTION PREVENTION PLAN POST CONSTRUCTION (SECTION C) | |
| C1 Description of pollutants and their sources associated with the proposed land use: | Leaves, mulch, vehicular sources such as leaking fuel or oil, brake fluid, brake dust, grease, antifreeze, metals, rubber fragments, road grit, salts and sands, trash and debris, fertilizers, cleaning agents, chemicals, paint, animal waste, elevated storm runoff temperatures, pesticides and pathogens. |
| C2 Sequence describing stormwater quality measure implementation: | Reference Erosion Control Sequencing See Plan Set : C111 |
| C3 Description of proposed post construction stormwater quality measures: | The restored and completed levee section will be vegetated with similar grasses and maintained by City and federal mowing crews. No impervious area is being added, except for the ramp, which shall be maintained by the City. Therefore, the graded lawn and levee areas are the only post construction BMP. |
| C4 Location, dimensions, specifications and construction details of stormwater quality measures: | For Locations see Plan Set : C111 For details See Plan Set : C501 |
| C5 Description of maintenance guidelines for post construction stormwater quality measures: | Mow grass not less than 6 inches and allow it to grow no longer than 14 inches. |

| ADDITIONAL STORMWATER POLLUTION PREVENTION MEASURES (CONTINUED): | |
|--|--|
| 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 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. |

| ADDITIONAL STORMWATER POLLUTION PREVENTION MEASURES (CONTINUED): | |
|--|---|
| | 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 hose 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. Littering on the project site should be prohibited. To prevent clogging of the storm drainage system, litter and debris removal from drainage grates, trash racks, and ditch lines should be a priority. Trash receptacles should be provided in the contractor's yard, field trailer areas, and at locations where workers congregate for lunch and break periods. Litter from work areas within the construction limits of the project site should be collected and placed in watertight dumpsters at least weekly, regardless of whether the litter was generated by the contractor, the public, or others. Collected litter and debris should not be placed in or next to drain inlets, stormwater drainage systems, or watercourses. Dumpsters of sufficient size and number should be provided to contain the solid waste generated by the project. Full dumpsters should be removed from the project site and the contents should be disposed of by the trash hauling contractor. Construction debris and waste should be removed from the site biweekly or more frequently as needed. Construction material visible to the public should be stored or stacked in an orderly manner. Stormwater runoff should be prevented from contacting stored solid waste through the use of berms, dikes, or other temporary diversion structures or through the use of measure to elevate waste from site surfaces. Solid waste storage areas should be located at least 50 ft. from drainage facilities and watercourses and should not be located in area prone to flooding or ponding. Inspection and Maintenance Inspect construction waste area weekly. Arrange for regular waste collection. |

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| C5 Description of maintenance guidelines for post construction stormwater quality measures: | Mow grass not less than 6 inches and allow it to grow no longer than 14 inches. |

| EXAMPLE EVALUATION LOG SHEET | | | | |
|---|--|-----|----|-----|
| EVALUATION FOR CONSTRUCTION PROJECTS A trained individual shall perform a written evaluation of the project site. a. By the end of the next business day following each rainfall that exceeds 0.5". b. A minimum of one (1) time per week. | | | | |
| Project Name: _____ Date of Inspection: _____ Name of Trained Individual: _____ Is Evaluation following a rainfall? 0=yes 0=no If yes, date the rain stopped: _____ inches: _____ | | | | |
| No. | PROBLEM OR CONCERN | YES | NO | N/A |
| 1. | Are all site information posted at the entrance? | | | |
| 2. | Are all necessary permits obtained and special provisions being implemented? | | | |
| 3. | Is a construction entrance installed? Is it effective? Is it enough? | | | |
| 4. | Are public and private streets clean? | | | |
| 5. | Are appropriate practices installed where stormwater leaves the site? | | | |
| 6. | Is silt fence entrenched into the ground? | | | |
| 7. | Is silt fence upright? Do fabric and stakes meet specifications? Is fabric is not too torn? Is silt fence terminated to higher ground? Is it properly joined at ends? | | | |
| 8. | Are sediment basins and traps installed according to the plan? | | | |
| 9. | Are the pipes or rock siltway still functional? | | | |
| 10. | Are the earthwork for erosion and sediment control practices properly graded, seeded and/or mulched? | | | |
| 11. | Are diversion, swales, and/or waterways installed to plan and protected? | | | |
| 12. | Do perimeter practices have adequate capacity and do not need to be cleaned out? | | | |
| 13. | Is inlet protection installed on all functional inlets? (not filter fabric under grate) | | | |
| 14. | Are inlet protection measures installed on water does not flow under it? | | | |
| 15. | Are the frame, cross-bracing and/or stakes adequate and meet specifications? | | | |
| 16. | Is the fabric, straw, mulch and/or stone intact without holes or tears? | | | |
| 17. | Are catch basin inlet protection installed where required? | | | |
| 18. | Has sediment been removed from the catch basin inlet protection? | | | |
| 19. | Has swales and ditches been stabilized or protected? | | | |
| 20. | Are stormwater outlets adequately stabilized? | | | |
| 21. | Has temporary stabilization of disturbed ground been addressed? | | | |
| 22. | Has all disturbed areas that will be dormant for 15 days protected? | | | |
| 23. | Has all protected dormant areas met a minimum 70% coverage? | | | |
| 24. | Does growing vegetation have sufficient water and/or nutrients to grow? | | | |
| 25. | Is soil erosion stabilization of disturbed ground progressing through the project? | | | |
| 26. | Is final grading and stabilization progressing on completed areas? | | | |
| 27. | Has the soil been properly prepared for seeding? | | | |
| 28. | Has hard or soft armoring been installed where natural vegetation will erode? | | | |
| 29. | Does water pumping operations have a protected outlet and is discharge water clear? | | | |
| 30. | Is a designated washout been established for concrete trucks? | | | |
| 31. | Are onsite fuel tanks and other toxic materials safely stored and protected? | | | |
| 32. | Are smaller construction sites not required to file a separate NOI complying with the overall plan? | | | |
| ALL PROBLEMS OR CONCERNS NEED TO BE ADDRESSED WITH A CORRECTIVE ACTION Identify the problem by number and/or provide additional explanation as needed. | | | | |
| Developer Rep. contacted, name and date: _____ Date: _____ | | | | |
| Contractor Rep. contacted, name and date: _____ Date: _____ | | | | |
| Report submitted by: _____ Date: _____ | | | | |

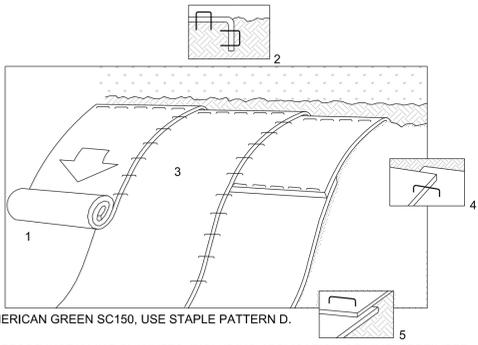
Storm Water Pollution Prevention Plan
WILLOW STREET CLOSURE
VINCENNES WATER UTILITIES
403 BUSSERON STREET, 47591

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: 1006L
Sheet No: C401

Specifications for Construction on a Levee
Taken from UFGS-35 41 00 (January 2008)

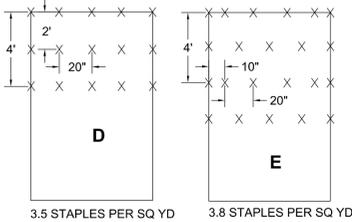
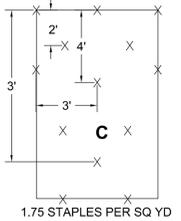
1. PART 1 General
- 1.2 References
 - ASTM D 698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort
 - ASTM D 2487 Soils for Engineering Purposes (Unified Soil Classification System)
 - ASTM D 4253 Maximum Index Density and Unit Weight of Soils Using a Vibratory Table
 - ASTM C 1107 Standard Specification for Packaged Dry, Hydraulic-cement Grout (Non-shrink)
2. PART 2 PRODUCTS
 - 2.2.2 Impervious Fill - This material shall consist of satisfactory impervious material classified as lean clay (CL), fat clay (CH), low plasticity silt (ML), and sand containing more than 30 percent of clay (CL), and borderline clay and silt (CL-ML) in accordance with ASTM 2487.
- 2.4 Grout shall be non-shrinkage compensating to meet the requirements of ASTM C-1107 or CRD-C 621, such as EDOCO 621 Grout, SikaGrout 212 or approved equal.
3. PART 3 EXECUTION
- 3.1 CONSTRUCTION
 - 3.1.1 Lines and Grades The embankment and backfill shall be constructed to the lines, grades, and cross sections indicated on the drawings, unless otherwise directed by the Engineer. The Owner reserves the right to increase or decrease the foundation widths and embankment slopes or to make such other changes in the embankment or backfill sections as may be deemed necessary to produce a safe structure. Changes in quantities resulting from revisions will not constitute justification for change in contract unit prices. Increases in the height of section, made to compensate for settlement or consolidation of the embankment material subsequent to the completion of the embankment, will not exceed 10 percent of the height above the foundation at the levee centerline indicated. The end slopes and side slopes of partial fill sections shall not be steeper than 1 vertical on 3 horizontal, unless otherwise shown on the drawings.
 - 3.1.2 Conduct of Work Maintain and protect the embankment and backfill in a satisfactory condition at all times until final completion and acceptance of all work under the contract. If, in the opinion of the Engineer, the hauling equipment causes horizontal shear planes or slicken sides, rutting, quaking, heaving, cracking, or excessive deformation of the embankment or backfill, the Engineer may limit the type load or travel speed of the hauling equipment on the embankment or backfill. The contractor may be required to remove, at no additional payment, any embankment material placed outside the prescribed slope lines. Any approved embankment or backfill material which is lost in transit or rendered unsuitable after being placed in the embankment or backfill and before final acceptance of the work shall be replaced in a satisfactory manner, and no additional payment will be made therefor. Excavate and remove from the embankment or backfill any material which is unsatisfactory, dispose of such material, and refill the excavated area as directed, all at no cost to the Owner.
- 3.4 STRIPPING
 - The entire area within the limits of existing ground to receive embankment and structures, together with strips 5 feet wide, beyond and contiguous thereto, existing levees to be degraded, ponding areas, and ditches shall be stripped to remove crops, weeds, grass, and other vegetative materials to the ground surface and topsoil to a depth of 12 inches.
- 3.8 DEWATERING AND DIVERSION
 - Surface and groundwater control shall be accomplished in coordination with the required excavation and embankment construction. Surface and/or groundwater control may necessitate the use of temporary diversion ditches, cofferdams, and/or dewatering 3' below excavation by the use of pumping. Methods for care of surface water and for controlling the surface and groundwater levels shall be subject to approval of the Engineer.
- 3.9 EXCAVATION
 - Excavation shall consist of removal of material in preparing the foundations to the lines and grades shown on the drawings, removal of material from ditches and channels to the lines and grades shown on the drawings, removal of objectionable materials and obtaining required fill materials from the borrow areas. Backfilling shall be permitted. Over excavation shall be backfilled to grade with similar over excavated material or satisfactory material and compacted to a density at least that of the surrounding material.
 - 3.9.1.1 Over Excavation
 - Over excavation outside the limits of the foundations of levees or structures shall be backfilled to grade with similar over excavated material or satisfactory material and compacted to a density at least that of the surrounding material.
 - 3.9.1.2 Over excavation within the limits of the foundations of levees or structures shall be backfilled to grade in accordance with paragraph PREPARATION OF FOUNDATION, PARTIAL FILL SURFACES AND ABUTMENTS.
 - 3.9.1.11 Utilities - Excavations for pipe beds shall be shaped to fit the contour of the pipe over a width of not less than 0.6 of the pipe diameter, or as shown on the drawings.
 - 3.9.1.13 Riprap and bedding - Excavations for riprap and bedding shall be performed at the locations and to the lines and grades shown.
- 3.15 MAINTENANCE OF WORK
 - 3.15.1 Debris Removal - Maintain all ditch and channel excavations free from leaves, brush, sticks, trash, and other debris until final acceptance of all work under the contract at no additional cost to the Owner.
 - 3.15.2 Sediment Removal - Prior to final acceptance of all work under this contract, the removal of sediments from ditch or channel excavations shall be required to restore design grade and section at no additional cost to the Owner.
- 3.17 PREPARATION OF FOUNDATION, PARTIAL FILL SURFACES AND ABUTMENTS
 - 3.17.1 Earth - After excavation or stripping of the embankment foundation to the extent indicated or otherwise required, the sides of stump holes, test pits, and other similar cavities or depressions shall be broken down so as to flatten out the slopes, and the sides of the cut or hole shall be scarified to provide bond between the foundation material and the fill. Unless otherwise directed, each depression shall be filled with the same material type that is to be placed immediately above the foundation. The fill shall be placed in layers, moistened, and compacted in accordance with the applicable provisions of paragraphs PLACEMENT, MOISTURE CONTROL, AND COMPACTION for the specific material type. Materials which cannot be compacted by roller equipment because of inadequate clearances shall be compacted with power tampers in accordance with the paragraph COMPACTION for the specific material type. After filling of depressions and immediately prior to placement of compacted fill in any section of the embankment, the foundation of such section shall be loosened thoroughly by scarifying, plowing, disking or harrowing to a minimum depth of 6 inches, and the moisture content shall be adjusted to the amount specified in paragraph MOISTURE CONTROL for the appropriate type of material. Immediately prior to placement of compacted fill on or against the surfaces of any partial fill section, all soft or loose material, material containing cracks or gullies, and all material that does not conform with the specified zoning of the embankment shall be removed. The remaining surface of the partial fill shall be loosened by scarifying, plowing, disking or harrowing to a minimum depth of 6 inches, and the moisture content shall be adjusted as stated above.
 - 3.17.3 BENCHING
 - Benching into existing levee embankment and abutments is required in order to place and compact the material in horizontal layers. The vertical face cut into the existing embankment or abutment resulting from the benching operation shall be 3 feet horizontal for every 1 foot vertical; minimum height shall be 1 foot.
- 3.19 PLACEMENT AND SPREADING
 - 3.19.1 Gradation and distribution
 - The gradation and distribution of materials throughout each zone of the levee shall be such that the embankment will be free from lenses, pockets, streaks, and layers of material differing substantially in texture or gradation from surrounding material of the same class. If lenses, pockets, or layers of materials differing substantially in texture or gradation from surrounding material occur in the spread material, the layer shall be mixed by harrowing or any other approved method to blend the materials. During the placing and spreading process, maintain at all times a force of workers adequate to remove all roots, debris, and oversize stone from all embankment materials. All stones and rock fragments larger than 1.5 inches in any dimension shall be removed from the fill. No fill shall be placed upon a frozen surface, nor shall snow, ice, or frozen earth be incorporated in the embankment.
 - 3.19.1.2 Foundations and Partial Embankment Fills - The foundations and all partial embankment receiving fills shall be kept thoroughly drained. Placing operations will be such as to avoid mixing of materials from adjacent sections as much as practicable.
 - 3.19.1.3 Equipment Traffic - Equipment traffic on any embankment zone shall be routed to distribute the compactive effort as much as practicable. Ruts formed in the surface of any layer of spread material will be filled before that material compacted. If, in the opinion of the Engineer, the compacted surface of any layer of material is too smooth to bond properly with the succeeding layer, the surface shall be loosened by scarifying or other approved methods before material from the succeeding layer is placed.
 - 3.19.1.4 Placement of Embankment and Backfill Against Structures - No embankment or backfill shall be placed on or against concrete less than 7 days after placement or achieving 70 percent of the design strength, without prior approval of the Engineer. Crawler-type tractors, vibratory equipment and other similar compaction equipment shall not be used within 4 feet of any completed or partially completed structure. Compaction within 4 feet of completed or partially completed structures shall be accomplished by the use of mechanical hand tampers, vibrating plates, or other approved methods and equipment. Ensure that compaction operations do not damage any existing utilities. Any damage caused by the contractor's operation shall be repaired at the contractor's expense.
 - 3.19.1.7 Impervious Fill - The impervious fill material shall be placed and spread in layers not more than 8 inches in uncompacted thickness, except that within 4 feet of structures, the uncompacted layer thickness shall be reduced to 4 inches. Layers should be started full out to the slope stakes and shall be carried substantially horizontal and parallel to the levee centerline with sufficient crown or slope to provide satisfactory drainage during construction.
- 3.20 MOISTURE CONTROL
 - 3.20.1 General - The materials in each layer of the fill shall contain the amount of moisture, within the limits specified below or as directed by the Engineer, necessary to achieve the required compaction. Material that is not within the specified moisture content limits after compaction shall be reworked to obtain the specified moisture content, regardless of density.
 - 3.20.3 Impervious Fill - The moisture content after compaction shall be within the limits of 3 percentage points above optimum and 1 percentage points below optimum content as determined by ASTM D 698.
- 3.21 COMPACTION
 - 3.21.1 Compaction Equipment - Self-propelled rollers may be used. The tamping feet shall be 7 to 9 inches in clear projection from the cylindrical surface of the roller. For self-propelled rollers, in which steering is accomplished through use of rubber-tired wheels, the tire pressure shall not exceed 40 psi. Self-propelled rollers shall be operated at a speed not to exceed 3.5 miles per hour.
 - 3.21.4 Compaction of Impervious Fill - After a layer of material has been dumped and spread, it shall be harrowed to break up and blend the fill materials and to obtain uniform moisture distribution. Harrowing shall be performed with a heavy disk plow, or other approved harrow, to the full depth of the layer. If one pass of the harrow does not accomplish the breaking up and blending of the materials, additional passes of the harrow shall be required, but in no case will more than 3 passes of the harrow on any one layer be required for this purpose. When the moisture content and the condition of the layer are satisfactory, the lift shall be compacted with an approved tamping roller traveling in a direction parallel to the axis of the levee. If the desired compaction to a minimum of 95 percent dry density is not achieved, additional rolling will be required. Dumping, spreading, sprinkling, and compacting may be performed at the same time at different points along a section when there is sufficient area to permit these operations to proceed simultaneously. Compaction equipment shall be operated such that the strip being traversed by the roller shall overlap the rolled adjacent strip by not less than 3 feet.
- 3.22 TESTING
 - 3.22.1 Owner shall contract Qualified testing firm to perform required density test.



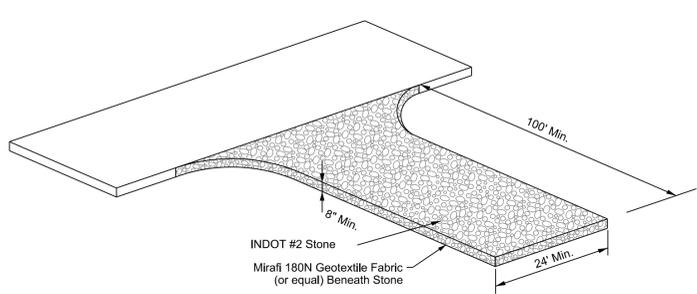
NOTE: FOR NORTH AMERICAN GREEN SC150, USE STAPLE PATTERN D.

1. 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.
 2. 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.
 3. ROLL THE BLANKETS DOWN.
 4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2" OVERLAP.
 5. WHEN BLANKETS MUST BE SPLICED 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 beyond 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 (9) C500
NO SCALE

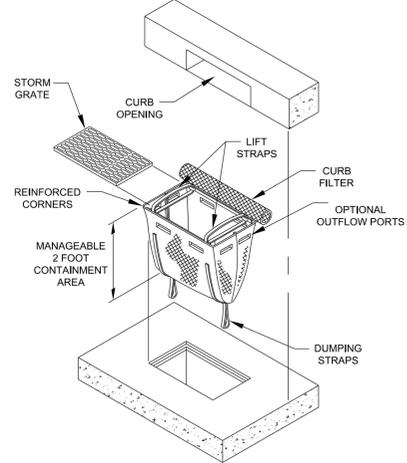


STAPLE PATTERN GUIDE (10) C500
NO SCALE



- MAINTENANCE
*Inspect entrance pad and sediment disposal area weekly and after each 1/2" rainfall event or heavy use.
*Reshape pad as needed for drainage and runoff control.
*Topdress with clean stone as needed.
*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 road pavement immediately.

TEMPORARY STONE CONSTRUCTION ENTRANCE/EXIST (11) C500
NO SCALE

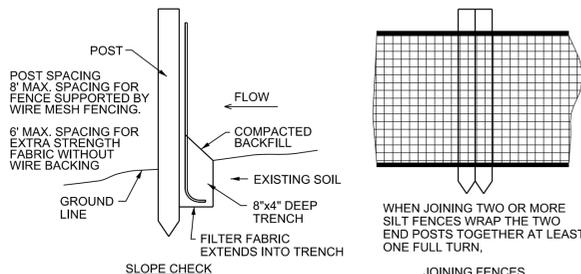


- MAINTENANCE
1. Remove all accumulated sediment and debris weekly or after each 1/2" rainfall event.
2. Remove sediment from bag after bag is 1/3 full.
3. If bag is damaged, remove bag and replace with new.

CURB SACK INLET PROTECTION (5) C500
NO SCALE

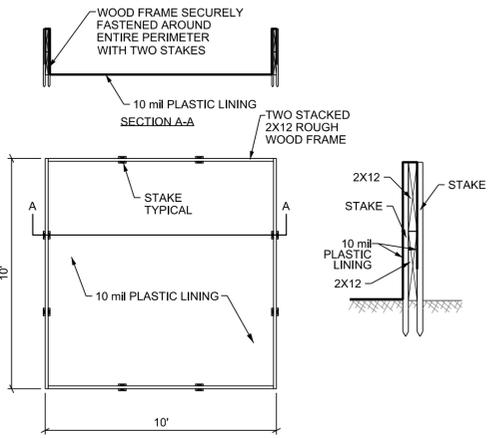
SEED MIX
ON SLOPES 3:1 (H:V) OR STEEPER
TALL FESCUE, 35 LB/AC, SUITABLE pH 5.5-8.3
ON AREAS FLATTER THAN 3:1
PERENNIAL RYE, 20 LB/AC, SUITABLE pH 5.0-9.0
TURF FESCUE, 20 LB/AC, SUITABLE pH 5.0-9.0
FERTILIZE 12-12-12 (N-P-K) OR EQUIVALENT
MULCH WITH 1 1/2 TONS/AC STRAW OR HYDRA CX2
EROSION BLANKET FOR SLOPES 3:1 (H:V) OR STEEPER.

SEED MIX (8) C500



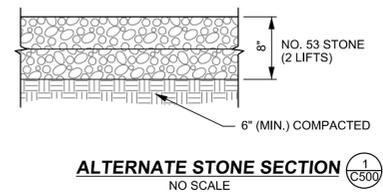
- MAINTENANCE
*Inspect the silt fence weekly and after each 1/2" rainfall event.
*If fence fabric tears, starts to decompose, or in any way becomes ineffective, replace the affected portion immediately.
*Remove deposited sediment when it reaches half the height of the fence at its lowest point or is causing the fabric to bulge.
*Take care to avoid undermining the fence during clean out.
*After the contributing drainage area has been stabilized, remove the fence and sediment deposits, bring the disturbed area to grade, stabilize, & seed.

SILT FENCE DETAIL (7) C500
NO SCALE

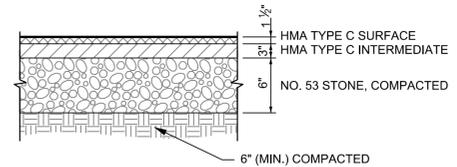


1. Concrete washout area shall be installed prior to any concrete placement on site.
2. Signs shall be placed at the construction entrance, at the washout area, and elsewhere as necessary to clearly indicate the location of the concrete washout area to all operators of concrete trucks.
3. The concrete washout area shall be repaired, enlarged, or cleaned out as necessary to maintain capacity for washed concrete.
4. Upon the completion of construction, all wasted concrete shall be removed from the site and disposed of at an approved waste site.
5. When the concrete washout area is removed, the area shall be seeded and mulched or otherwise stabilized in a manner approved by the inspector.

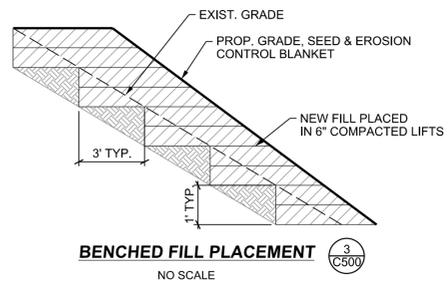
CONCRETE WASHOUT DETAIL (8) C500
NO SCALE



ALTERNATE STONE SECTION (1) C500
NO SCALE



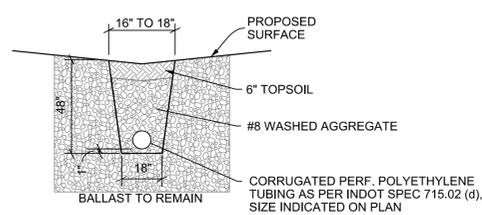
LIGHT DUTY PAVEMENT (2) C500
NO SCALE



BENCHED FILL PLACEMENT (3) C500
NO SCALE

CONSTRUCTION NOTES

- USE TYPE C SOILS FOR OSHA COMPLIANCE. MIN. SLOPE FOR CUT BACK ON TRENCH IS 1 1/2: 1
- TRENCH BOX OR SHORING IS RECOMMENDED.
- CONTRACTOR SHALL LIMIT OPEN EXCAVATION TO NO MORE THAN 1.5 TIMES THE PIPE LENGTH. THE SOFT SOILS AND KNOWN SEEPAGE RATE COULD COLLAPSE A LARGER TRENCH AND CAUSE SLOUGHING OF THE EMBANKMENT.



TOE DRAIN DETAIL (4) C500
NO SCALE

Appendix A-13

CONSTRUCTION DETAIL & NOTES
WILLOW STREET CLOSURE
VINCENNES WATER UTILITIES
403 BUSSERON STREET, 47591

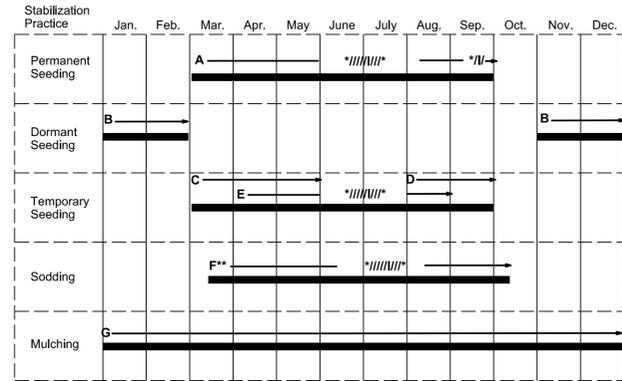


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Project No: 10006L

Sheet No:

C500



- A = Perennial Ryegrass 55 lbs/acre 2 tons straw mulch/acre
- B = Perennial Ryegrass 55 lbs/acre 2 tons straw mulch/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.
- *"I/I" 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.)

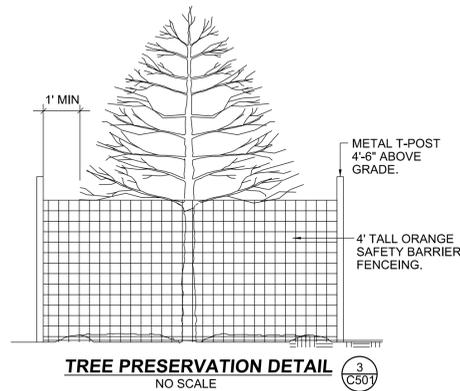
Plan to add fertilizer the following growing season according to soil test recommendations.
Repair damaged, bare, or sparse areas by filling any gullies, re-fertilizing, over- or re-seeding, and mulching.
If plant cover is sparse or patchy, review the plant materials chosen, soil fertility, moisture 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.)

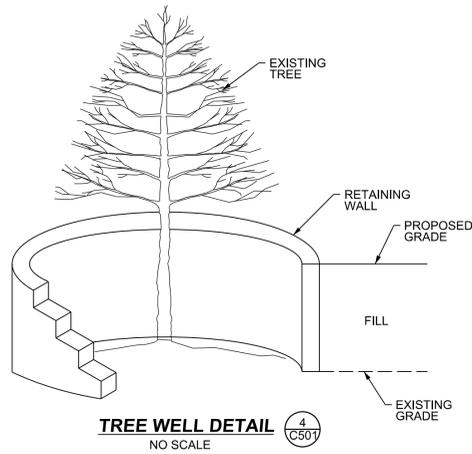
If additional fertilization is needed to get a satisfactory stand, do so according to the soil test recommendations.

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.

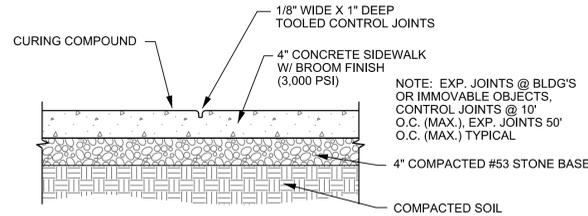
SEEDING CHART (6) C501
NO SCALE



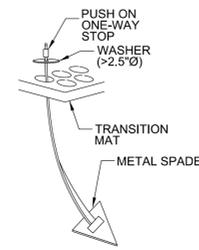
TREE PRESERVATION DETAIL (3) C501
NO SCALE



TREE WELL DETAIL (4) C501
NO SCALE

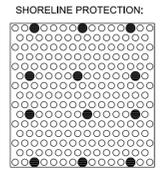


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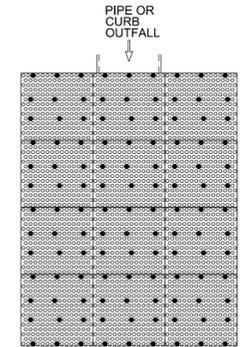
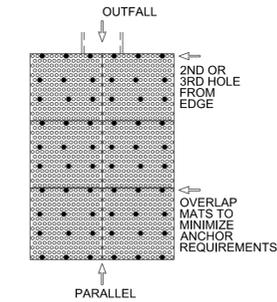
NON-COHESIVE SOILS SCOURSTOP TRANSITION MAT INSTALLATION DETAILS

| PIPE DIAMETER | DISCHARGE (CFS) | SCOURSTOP WIDTHxLENGTH |
|---------------|-----------------|------------------------|
| 12" | 8 | 4' x 4' |
| 24" | 30 | 4' x 8' |
| 36" | 75 | 8' x 12' |
| 48" | 100 | 12' x 16' |
| 60" | 150 | 12' x 20' |
| 72"+ | | SEE DETAILS |

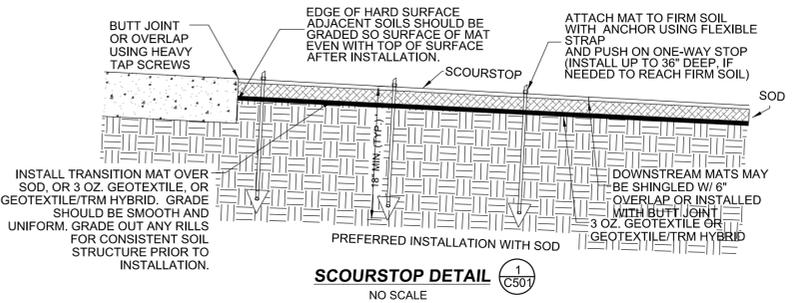


ANCHOR CONFIGURATION FOR SLOPES STEEPER THAN 5:1; TRANSITION MATS OVER A MIN. 8 OZ. GEOTEXTILE

ADD EXTRA ANCHORS IF NECESSARY TO ENSURE CONSISTENT CONTACT WITH SOIL OR IMPROVE SOIL SURFACE SMOOTHNESS.



ANCHOR REQUIREMENTS - MINIMUM OF 12 ANCHORS INCLUDING OVERLAP ROW
*TO ACHIEVE CONSISTENT CONTACT WITH THE SOIL, EXCEED THE MINIMUM ANCHOR REQUIREMENT AT INSTALLATION.



SCOURSTOP DETAIL (1) C501
NO SCALE

SCOURSTOP TRANSITION MAT APPLICATIONS

- INTENDED AS AN BIOTECHNICAL REPLACEMENT FOR HARD ARMOR LIKE ROCK RIP RAP.
- THIS IS AN ENGINEERED SYSTEM. NON-COHESIVE SOILS REQUIRE A SOIL COVER PRACTICE THAT BOTH HOLDS THE SOIL PARTICLES IN PLACE AND RESTRICTS SOIL PARTICLE MOVEMENT. THE SEMI-RIGID TRANSITION MAT COMBINED WITH THE ANCHORING SYSTEM IS CRITICAL FOR SECURING THE GEOTEXTILE SOIL COVER AGAINST THE SOIL.
- CAN BE PLACED ON DOWNSTREAM OUTLET SIDE OF CURB CUTS, OVERFLOW STRUCTURES, ENDS OF CONCRETE FLUMES OR PIPE FIXTURES; AS STREAM BANK AND SHORELINE PROTECTION.
- SCOURSTOP STANDARD SIZE IS 4 FT X 4 FT X 1/2 INCHES, CONSTRUCTED TO ALLOW VEGETATION WITHIN MULTIPLE VOIDS THROUGHOUT THE MAT PROVIDING SOIL PROTECTION FOR A) THE SCOUR AREA DIRECTLY BELOW OUTFALLS B) ANY HIGHLY EROSION AREA C) SHORELINE AND STREAM BANKS.
- PRIMARY BENEFITS OVER ROCK RIP RAP: UTILIZATION OF VEGETATION, LOWER INSTALLATION COSTS, EASE OF INSTALLATION, LONG-TERM EFFECTIVENESS, AESTHETICS, SAFETY.

PREFERRED INSTALLATION SPECIFICATIONS

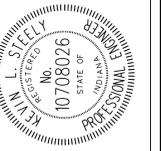
- READ AND UNDERSTAND INSTALLATION GUIDE.
- FOR EACH INSTALLATION, COMPLETE INSTALLER'S CHECKLIST AND PROVIDE TO GENERAL CONTRACTOR FOR PAYMENT.
- FOR A PIPE OUTLET WITH NO APRON, TRANSITION MAT (TM) INSTALL DIRECTLY ABUTTING THE END OF THE PIPE.
- PROJECT DESIGNER SHOULD NOTE ON CONSTRUCTION DRAWINGS THAT PIPE OUTLET FOOTINGS SHOULD NOT EXTEND PAST THE END OF THE PIPE.
- WHERE EXCESS CONCRETE FROM THE END SECTION FOOTINGS EXTENDS BEYOND THE END SECTION, INSERT A FILLER MATERIAL (LIKE A HIGH-PERFORMANCE TRM OR HEAVY GEOTEXTILE) BETWEEN THE TRANSITION MAT AND THE EXCESS CONCRETE SURFACE TO FILL THE AREA TOO SHALLOW (<4 INCHES) TO SUPPORT SOIL AND VEGETATION GROWTH.
- SCOURSTOP SHALL NOT BE INSTALLED OVER BARE SOIL. OPTIONAL SOIL COVERS UNDER THE TRANSITION MATS ARE SOD, SOME TURF REINFORCEMENT MATS (TRMS), AND GEOTEXTILES.
- PER NPDES PHASE II, THE DOWNSTREAM CHANNEL (D.C.) MUST BE PROTECTED (STABLE) FOR ITS ENTIRE LENGTH. THE DOWNSTREAM CHANNEL IS PART OF THE TRANSITION MAT ENGINEERED SYSTEM. USE SOD TO PROTECT THE D.C. WHEN POSSIBLE. ON SLOPES STEEPER THAN 10%, INSTALL A 3 OZ. GEOTEXTILE UNDER THE SOD TO BETTER PROTECT SOIL PARTICLES. TRMS ARE ACCEPTABLE. HOWEVER, A GEOTEXTILE IS REQUIRED UNDER THE MAT. WHERE VEGETATION IS UNLIKELY, USE A MINIMUM 10 OZ. GEOTEXTILE.
- CAN BE INSTALLED AS A BUTT JOINT, OR PERMANENTLY ATTACHED TO THE HARD SURFACE.
- PRIOR TO INSTALLATION, SOIL SHALL BE GRADED AS LEVEL AND SMOOTH AS POSSIBLE FOR CONSISTENT TRANSITION MAT CONTACT WITH THE SOIL.
- REMOVE AND REPLACE SATURATED SOILS FOR A SOLID BASE. TRICKLE FLOWS SHOULD BE CAPTURED WITH A SUB-SURFACE DRAIN.
- AVOID EROSION IMPACT CONDITIONS AT SCOUR AREA.
- ENSURE LOCATION HAS ADEQUATE SUNLIGHT FOR HEALTHY VEGETATION, ADDING GOOD SOIL IF NEEDED; OTHERWISE, UTILIZE THE HIGH-PERFORMANCE INSTALLATION DETAILED BELOW.
- USE FLEXIBLE STRAPPING WITH DEADMAN ANCHOR, FLAT WASHERS (>2.5 INCHES) AND ONE-WAY STOPS TO ATTACH TRANSITION MATS TO THE SOIL. A MINIMUM OF 24 INCHES FIRMLY PULL STRAP TO SNIUG THE TRANSITION MAT DOWN AGAINST THE SOIL WITH THE WASHER AND ONE-WAY STOP. A 3-3-3 ANCHOR CONFIGURATION SHOULD BE ADEQUATE IN MOST CASES. PROPER ANCHORING IS CRITICAL TO PERFORMANCE.
- RECOMMEND TRANSITION MAT COVERAGE OF SCOUR AREA WIDTH MINIMUM 3 TIMES THE PIPE DIAMETER. DISCHARGE AREA WIDTH SHOULD BE AS LEVEL AS POSSIBLE TO AVOID WATER CONCENTRATION AND RILLING. MATS MAY NOT BE INSTALLED IN PARTIAL LENGTHS; MAY BE SHINGLED TO MINIMIZE ANCHORS.

SCOUR STOP SPECIFICATIONS (2) C501
Appendix A-14

| Date | Revisions |
|----------|------------------------------------|
| 08-15-13 | GRG - IRRIGATION SYSTEM PROTECTION |
| 02-28-14 | LANDSCAPE MODIFICATIONS |

| Designated | Drawn | Checked | Scale | Date |
|------------|-------|---------|-------|----------|
| KS | SH | | NONE | 08-19-13 |

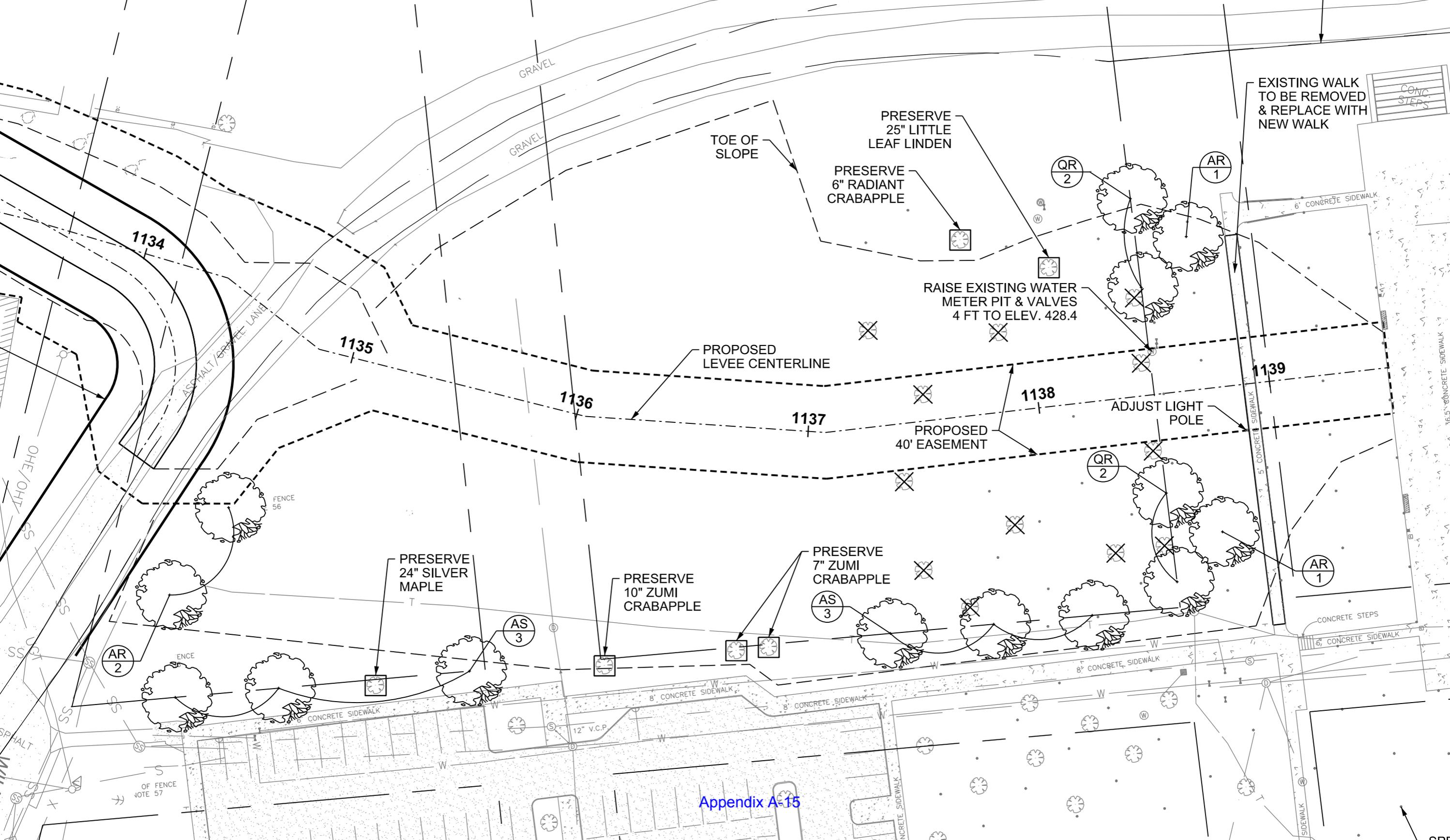
CONSTRUCTION DETAILS
WILLOW STREET CLOSURE
VINCENNES WATER UTILITIES
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| Project No: | 10006L |
| Sheet No: | |

C501



EXISTING WALK
TO BE REMOVED
& REPLACE
WITH NEW WALK

CONC.
STEPS

PRESERVE
25" LITTLE
LEAF LINDEN

PRESERVE
6" RADIANT
CRABAPPLE

RAISE EXISTING WATER
METER PIT & VALVES
4 FT TO ELEV. 428.4

TOE OF
SLOPE

PROPOSED
LEVEE CENTERLINE

PROPOSED
40' EASEMENT

ADJUST LIGHT
POLE

1134

1135

1136

1137

1138

1139

ASPHALT/GRAVEL LANE

FENCE
56

ENCE

CONCRETE SIDEWALK

8' CONCRETE SIDEWALK

8' CONCRETE SIDEWALK

8' CONCRETE SIDEWALK

6' CONCRETE SIDEWALK

CONCRETE STEPS

36.5' CONCRETE SIDEWALK

PRESERVE
24" SILVER
MAPLE

PRESERVE
10" ZUMI
CRABAPPLE

PRESERVE
7" ZUMI
CRABAPPLE

AR 2

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AS 3

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OF FENCE
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CONCRETE CONSTRUCTION

1. SCOPE

This specification covers concrete construction for reinforced structures, plain non-reinforced concrete and other slabs.

2. PREPARATION OF FORMS AND SUBGRADE

Concrete shall not be placed until the forms and steel reinforcement have been inspected and approved by the Engineer or the designated representative. The Engineer shall be notified far enough in advance to provide time for the inspection.

Prior to placement of concrete, the forms and surface of opening shall be free of chips, sawdust, debris, standing water, ice, snow, extraneous oil, mortar or other harmful substances or coatings.

Surfaces against which concrete is to be placed shall be firm and saturated surface dry.

3. FORMS

Forms shall be of wood, plywood, steel or other approved material and shall be mortar tight. The forms and associated falsework shall be substantial and unyielding and shall be constructed so that the finished concrete will conform to the specified dimensions and contours.

Items to be embedded in the concrete shall be positioned accurately and anchored firmly.

Tolerance on formed concrete is + 10 millimeters (3/8 inch). Tolerance on concrete formed in earth is -25 millimeters to + 152 millimeters (-1 inch to +6 inches).

4. CONCRETE MIX

Portland cement shall be Type I, IA, II or IIA (Type I with an added air entrainment admixture is preferred). If Type IA or IIA cement is used, additional air entrainment admixture shall be the same type that was used in the cement. Cement that is partially hydrated (hardened), or otherwise damaged, shall not be used. Air entrainment shall be 4 to 7 percent.

Aggregates shall consist of clean, hard, strong and durable particles that are free of silt, clay or any other material that may affect bonding of the cement paste.

Fine aggregate shall meet the requirements of INDOT fine aggregate number 23. Maximum coarse aggregate size shall be 3/4 inch.

Water shall be clean and free of injurious amounts of oil, salt, acid, alkali, organic matter or other deleterious substances.

Concrete shall have a minimum 28-day compressive strength of 30 MPa (4,000 psi). In lieu of strength tests, a mix containing an acceptable aggregate, 564 pounds of cement per cubic yard and no more than 0.40 water to cement ratio (including moisture in the aggregate) may be accepted.

The slump of the concrete shall be 75 to 125 millimeters (3 to 5 inches).

5. MIXING AND PLACING CONCRETE

Concrete shall be uniform and thoroughly mixed when delivered to the job sites.

Concrete shall be discharged into the forms, vibrated and spaded within 90 minutes after the cement has been introduced into the aggregates. When air temperatures are above 29°C (85°F), this time must be reduced to 45 minutes.

The Engineer may allow a longer time if an approved set retarding admixture is used.

Concrete shall be deposited as close as possible in its final position.

If concrete must be dropped more than 1.5 meters (5 feet), hoppers and tremie chutes, "elephant trunks", etc., shall be used to prevent segregation.

Immediately after placement, concrete shall be consolidated by spading and vibrating, or spading and hand tamping. It shall be worked into corners and angles of the forms and around all reinforcement and embedded items in a manner which prevents segregation or the formation of "honeycomb". Excessive vibration which results in segregation of materials will not be allowed. The vibrator head shall be kept vertical when inserted into the concrete and shall penetrate at least 6" into the previously placed layer.

Walls should be placed in essentially horizontal layers not more than 0.6 meters (24 inches) high. Successive layers shall be placed and consolidated fast enough to ensure a good bond between layers and to prevent "cold joints".

If freshly mixed concrete is to be placed against hardened concrete, the hardened concrete must be clean, sound, fairly level and roughened with some coarse aggregate particles exposed. Any dirt, form oil, wood chips or other foreign material shall be removed.

Concrete surfaces shall be smooth and even. Careful screeding (striking-off) and/or wood or magnesium float finishing are required.

The addition of dry cement or water to the surface of screeded concrete to expedite finishing will not be allowed.

6. REINFORCING STEEL

Reinforcing steel shall be deformed bars manufactured specifically for concrete reinforcement and shall be Grade 60 or higher (more details can be found in ASTM-A-61 5, A-61 6 or A-617)

Reinforcing steel shall be free from loose rust, concrete, oil, grease, paint or other deleterious coatings.

Reinforcement shall be accurately placed and secured in position in a manner that will prevent its displacement during the placement of concrete. This shall be accomplished by tying reinforcing steel or special tie bars to the form "snap ties" or by other methods of tying. No welding of either stress steel or temperature and shrinkage steel will be permitted. Reinforcing steel shall not be heated to facilitate bending.

The following tolerances will be allowed in the placement of reinforcing bars.

a. Where 38 millimeters (1.5 inches) clear distance is shown between reinforcing bars and forms, allowable clear distance is 28 to 38 millimeters (1.125 to 1.5 inches).

b. Where 50 millimeters (2 inches) clear distance is shown between reinforcing bars and forms, allowable clear distance is 40 to 50 millimeters (1.625 to 2 inches).

c. Where 76 millimeters (3 inches) clear distance is shown between reinforcing bars and earth or forms, allowable clear distance is 63 to 76 millimeters (2.5 to 3 inches). Overexcavation backfilled with concrete shall not count toward clear distance.

d. Maximum variation from indicated reinforcing bar spacing: 1/12th of indicated spacing, but no reduction in amount of bars specified.

Unless otherwise indicated on the drawings, splices of reinforcing bars shall provide a lap of not less than 30 diameters of the smaller bar but not less than 300 millimeters (12 inches). Bars will not be spliced by welding. Welded wire fabric shall be lapped at least one mesh width.

The ends of all stress or temperature and shrinkage bars shall be covered with at least 50 millimeters (2 inches) of concrete.

7. CURING

Concrete shall be prevented from drying for at least 7 days after it is placed. Exposed surfaces shall be sprayed with a curing compound or covered with a 4 mil or thicker polyethylene. Forms left in place during the curing period shall be kept wet.

Concrete, except at construction joints, may be coated with a curing compound in lieu of continued application of moisture. The compound shall be sprayed on moist concrete surfaces as soon as free water has disappeared, but shall not be applied to any surface until patching, repairs and finishing of that surface are completed.

Curing compound shall be applied in a uniform layer over all surfaces requiring protection at a rate of not less than 1 liter per 3.7 square meters (1 gallon per 150 square feet) of surface or to manufacturer's recommendation, whichever is greater.

8. FORM REMOVAL AND CONCRETE REPAIR

Forms for structure walls shall not be removed until 24 hours or more after concrete placement. When forms are removed in less than 7 days, the concrete shall be sprayed with a curing compound or be kept wet continuously by methods allowed in Section 7 of this specification.

Forms shall be removed in such a way as to prevent damage to the concrete.

Where minor areas of the concrete surface is "honeycombed", damaged or otherwise defective, it shall be removed, the area wetted and then filled with a dry-pack mortar.

Dry-pack mortar shall consist of one part Portland cement and three parts sand, with just enough water to produce a workable consistency.

9. CONCRETING IN COLD WEATHER

Concrete shall not be mixed nor placed when the daily atmospheric low temperature is less than 4°C (40°F) unless facilities are provided to prevent the concrete from freezing.

Facilities for cold weather concreting shall consist of:

a. Use of warm concrete with temperatures from 130 to 18°C (55° to 65°F).

b. Adequate protection from the weather, including the use of artificial heat, to prevent the temperature of the concrete from falling below 10°C (50°F) for a period of 3 days, and the relative humidity of the air near the concrete from falling below 40 percent.

c. Accelerators such as calcium chloride may not be used to speed the hardening of concrete.

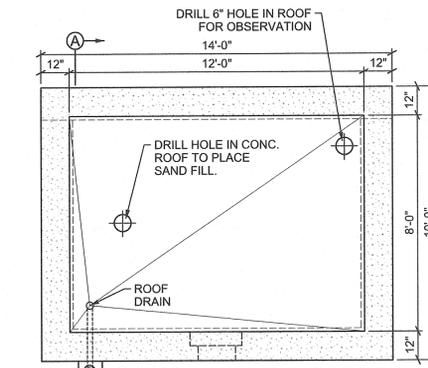
d. The contractor shall furnish to ENGINEER for approval, a written plan that shows how the contractor will meet the requirements of this specification. The plan must also show how the requirements of ACI Specification 306 will be met.

10. CONCRETING IN HOT WEATHER

Hot weather precautions should be taken when air temperatures are at or above 29°C (85°F). Concrete temperature shall be less than 32°C (90°F) during mixing, conveying and placing.

NOTES TO RETROFIT TIE BARS

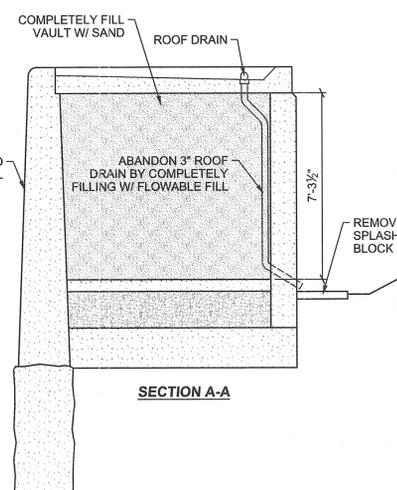
- DRILL HOLES 1/8" GREATER THAN THE NOMINAL DIAMETER OF THE BAR. THE MINIMUM DEPTH SHALL BE 8 INCHES WITH THE OPTIMUM DEPTH AT 12 INCHES. SECURE RETROFITTED TIE BARS AT RIGHT ANGLES TO THE CONCRETE WALL WITH APPROVED CHEMICAL ANCHOR SYSTEM IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION. CONTRACTOR MUST RECEIVE WRITTEN APPROVAL ON ANCHOR SYSTEM PRIOR TO INSTALLATION.
- HOLES SHALL BE CLEANED BY PRESSURIZED AIR PRIOR TO PLACEMENT OF CHEMICAL GROUT.
- INJECT CHEMICAL ANCHOR SYSTEM TO BACK OF HOLE TO ELIMINATE AIR POCKETS PRIOR TO INSERTION OF THE BAR. INJECT A SUFFICIENT QUANTITY OF MATERIAL TO DISPERSE THE MATERIAL ALONG THE ENTIRE LENGTH OF THE BAR AND COMPLETELY FILL THE ANNULAR SPACE.
- INSERT BAR FULLY USING BACK AND FORTH TWISTING MOTION, LEAVING THE PROPER LENGTH EXPOSED. IF NECESSARY, USE HAMMER TO SEAT THE BAR WHILE PROTECTING THE EXPOSED END WITH A WOOD BLOCK.
- WHEN CAPSULE TYPE CHEMICAL ANCHOR SYSTEM IS USED, THE CAPSULES SHALL BE CONDITIONED AS PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS, AND PLACED AT THE BACK OF THE HOLE. THE NUMBER OF CAPSULES SHALL BE SUFFICIENT TO DISPERSE THE MATERIAL ALONG THE ENTIRE LENGTH OF THE BAR AND COMPLETELY FILL THE ANNULAR SPACE.



ROOF PLAN

NOTES TO ABANDON VAULT

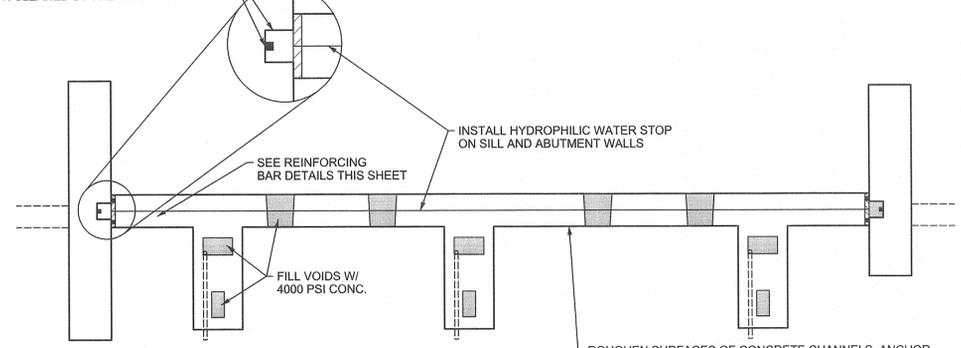
- OWNER SHALL REMOVE ALL CLOSURE EQUIPMENT PRIOR TO START OF WORK
- WELD DOOR SHUT.
- REMOVE VENT ON NE FACE. FORM AND POUR CONC. IN PLACE OF VENT.
- DRILL HOLE OF ADEQUATE SIZE IN ROOF TO PLACE SAND FILL IN VAULT.
- DRILL OBSERVATION HOLE IN OPPOSITE CORNER TO VERIFY FILL PLACEMENT.
- REPAIR FILL AND OBSERVATION PORTS WITH FLOWABLE FILL.



SECTION A-A

ROUGHEN SURFACES OF CONCRETE CHANNELS, ANCHOR RECESSES, AND RAIL SLOTS USING BUSHHAMMER OR OTHER MECHANICAL MEANS TO TO ACHIEVE 1/4 INCH SURFACE ROUGHNESS PROFILE. AFTER ROUGHENING, SURFACES SHALL BE POWER WASHED OR CLEANED BY PNEUMATIC TOOLS.

TYPICAL NORTH & SOUTH ABUTMENT



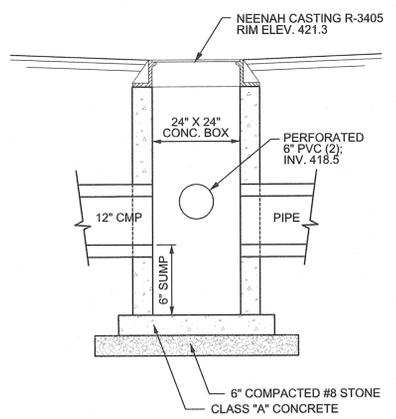
CLOSURE STRUCTURE DETAIL

NO SCALE

ROUGHEN SURFACES OF CONCRETE CHANNELS, ANCHOR RECESSES, AND RAIL SLOTS USING BUSHHAMMER OR OTHER MECHANICAL MEANS TO TO ACHIEVE 1/4 INCH SURFACE ROUGHNESS PROFILE. AFTER ROUGHENING, SURFACES SHALL BE POWER WASHED OR CLEANED BY PNEUMATIC TOOLS.

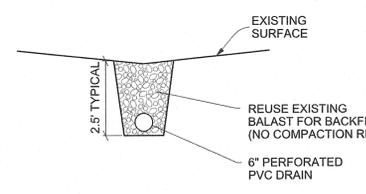
STORAGE VAULT ABANDONMENT DETAIL

NO SCALE



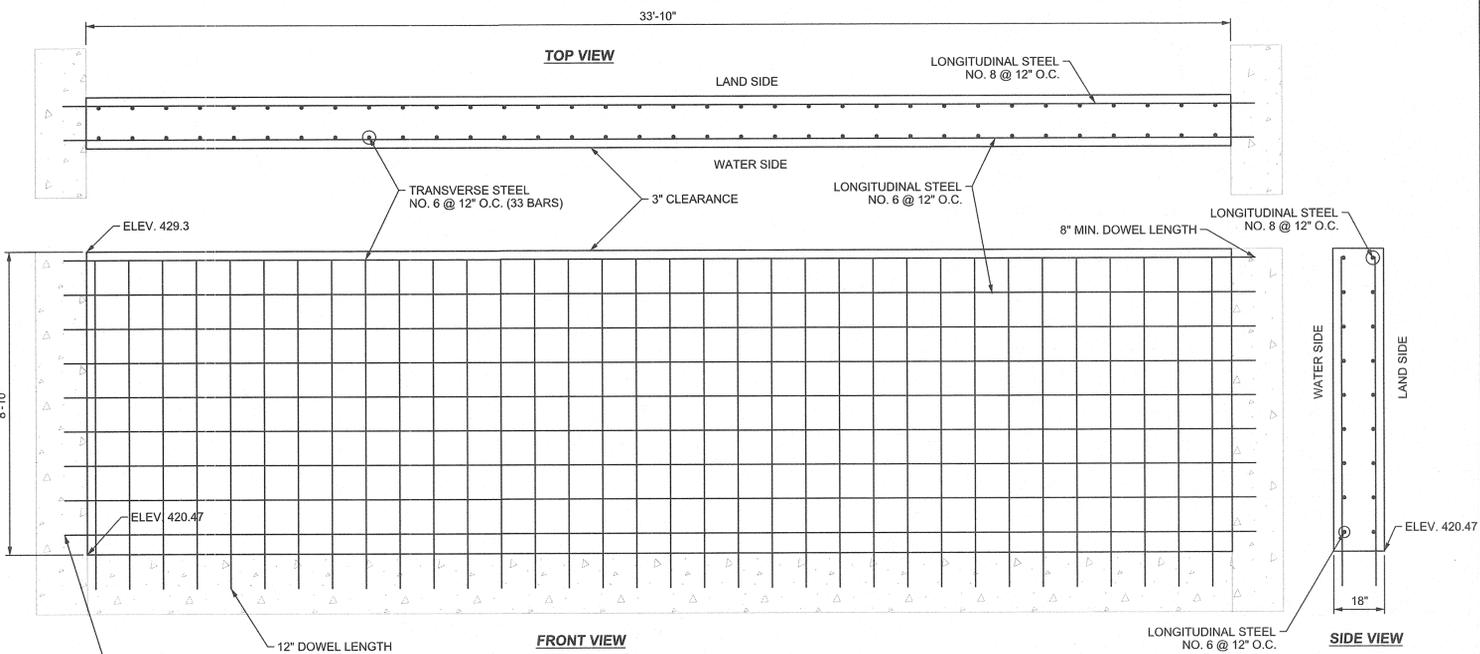
INLET DETAIL WITH 6" SUMP

NO SCALE



SUB-DRAIN DETAIL

NO SCALE



REINFORCING BAR DETAIL

NO SCALE

PLAN PREPARED FOR:
VINCENNES WATER UTILITIES
403 BUSSERON ST. VINCENNES, IN 47591

REVISED 3-29-13 PER USACE COMMENTS

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RECOMMENDED FOR APPROVAL
Tom J. Stealy 4/1/13
DESIGN ENGINEER DATE

DESIGNED: JV 03-12-13 DRAWN: GAF 09-28-12
CHECKED: KS 03-29-13 CHECKED:

INDIANA DEPARTMENT OF TRANSPORTATION
B & O CLOSURE DETAILS
LEVEE SECTION 212+94, VINCENNES LFPP

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| SCALE AS SHOWN | BRIDGE FILE |
| | DESIGNATION |
| SURVEY BOOK | SHEETS |
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