

# STORM SEWER REMEDIATION

## 1517 AQUARIUS WAY

### BOWLING GREEN, KY 42101

FOR



**WARREN COUNTY FISCAL COURT**

**JUDGE EXECUTIVE  
MICHAEL BUCHANON**

**DEPUTY JUDGE EXECUTIVE  
MARIE SMITH**

**FISCAL COURT MAGISTRATES  
DOUG GORMAN  
TOM LAWRENCE  
TONY PAYNE  
REX MCWHORTER  
MARK YOUNG  
RON CUMMINGS**

**FISCAL COURT CLERK  
BRENDA HALE**

**DEPARTMENT OF PUBLIC WORKS  
DIRECTOR  
JOSH MOORE**

**DEPARTMENT OF PUBLIC WORKS  
ASSISTANT DIRECTOR AND  
STORM WATER PROGRAM MANAGER  
NIKKI KOLLER**

## WARREN COUNTY PUBLIC WORKS

**1141 STATE STREET  
BOWLING GREEN, KY 42101**

**12/10/2019**

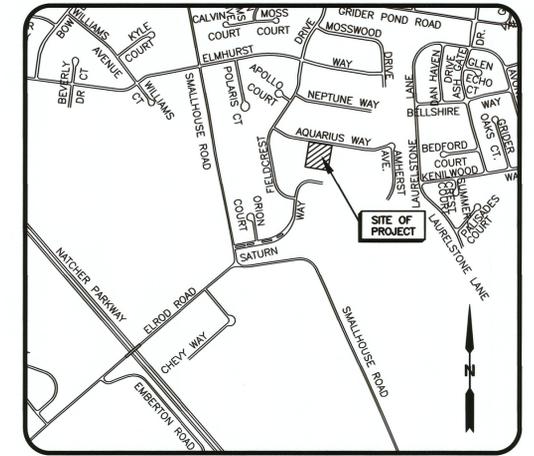
**PREPARED BY**



**DDS ENGINEERING, PLLC**  
LAND SURVEYING, CIVIL AND GEOTECHNICAL ENGINEERING,  
CONSTRUCTION MATERIALS TESTING,  
AND SPECIAL INSPECTION

**148 CHESTER COURT  
BOWLING GREEN, KY 42103**

**270-843-2247  
WWW.DDSENGINEERING.COM**



**VICINITY MAP**  
N.T.S.



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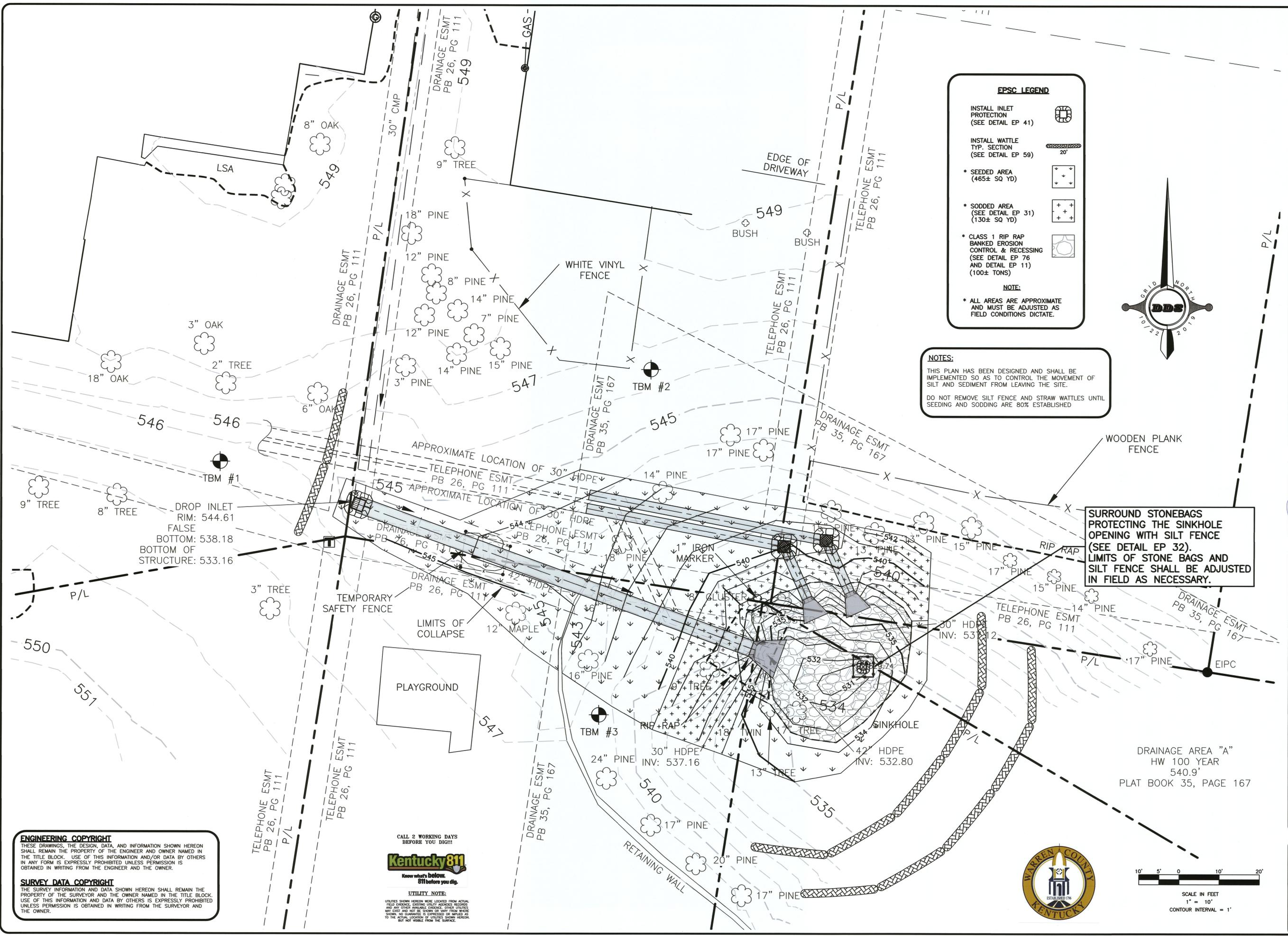
COVER SHEET	C00.00
TOPOGRAPHIC SURVEY	C01.01
SITE GRADING AND DRAINAGE	C04.01
SITE EPSC	C06.01
SITE DETAILS	C11.01 - C11.02
SITE NOTES & SPECIFICATIONS	C11.03





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1:1 DANIEL DOUGLAS Tuesday, December 10, 2019



**EPSC LEGEND**

- INSTALL INLET PROTECTION (SEE DETAIL EP 41)
- INSTALL WATTLE TYP. SECTION (SEE DETAIL EP 59)
- \* SEEDED AREA (465± SQ YD)
- \* SODDED AREA (SEE DETAIL EP 31) (130± SQ YD)
- \* CLASS 1 RIP RAP BANKED EROSION CONTROL & RECESSING (SEE DETAIL EP 76 AND DETAIL EP 11) (100± TONS)

**NOTE:**  
\* ALL AREAS ARE APPROXIMATE AND MUST BE ADJUSTED AS FIELD CONDITIONS DICTATE.

**NOTES:**  
THIS PLAN HAS BEEN DESIGNED AND SHALL BE IMPLEMENTED SO AS TO CONTROL THE MOVEMENT OF SILT AND SEDIMENT FROM LEAVING THE SITE.  
DO NOT REMOVE SILT FENCE AND STRAW WATTLES UNTIL SEEDING AND SODDING ARE 80% ESTABLISHED



**SURROUND STONEBAGS PROTECTING THE SINKHOLE OPENING WITH SILT FENCE (SEE DETAIL EP 32). LIMITS OF STONE BAGS AND SILT FENCE SHALL BE ADJUSTED IN FIELD AS NECESSARY.**

DRAINAGE AREA "A"  
HW 100 YEAR  
540.9'  
PLAT BOOK 35, PAGE 167



SCALE IN FEET  
1" = 10'  
CONTOUR INTERVAL = 1'

**ENGINEERING COPYRIGHT**  
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CALL 2 WORKING DAYS BEFORE YOU DIG!!

Know what's below. 811 before you dig.

**UTILITY NOTE:**  
UTILITIES SHOWN HEREON WERE LOCATED FROM ACTUAL FIELD EVIDENCE, EXISTING UTILITY AGENCIES RECORDS AND ANY OTHER AVAILABLE EVIDENCE. OTHER UTILITIES MAY EXIST AND ARE NOT BE SHOWN OR MAY BE SHOWN. NO GUARANTEE IS EXPRESSED OR IMPLIED AS TO THE ACTUAL LOCATION OF UTILITIES SHOWN HEREON, BUT NOT VISIBLE FROM THE SURFACE.

SYMBOL	DESCRIPTION	DATE	APPROVED

DATE: 12/10/2019  
SCALE: 1"=10'  
JOB NO: 19-5305  
DRA: DDB

**DDS ENGINEERING, PLLC**  
LAND SURVEYING, CIVIL AND GEOTECHNICAL ENGINEERING,  
CONSULTING AND SPECIAL INSPECTION

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BOWLING GREEN, KY 42103

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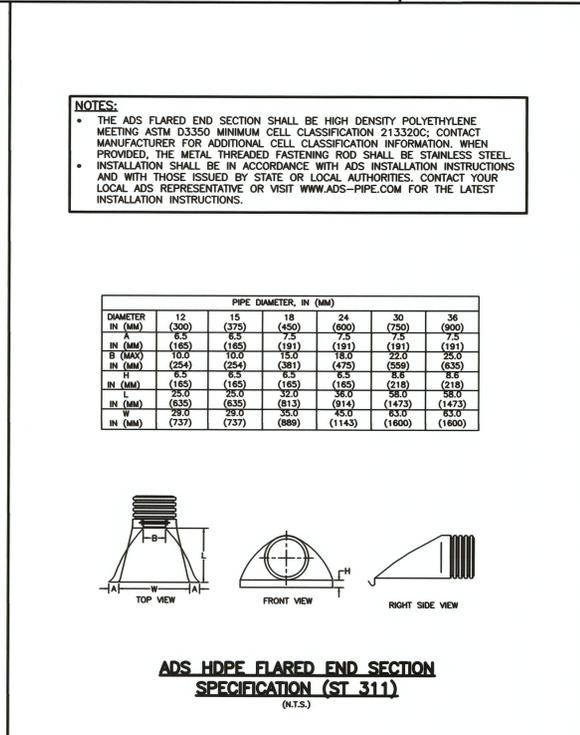
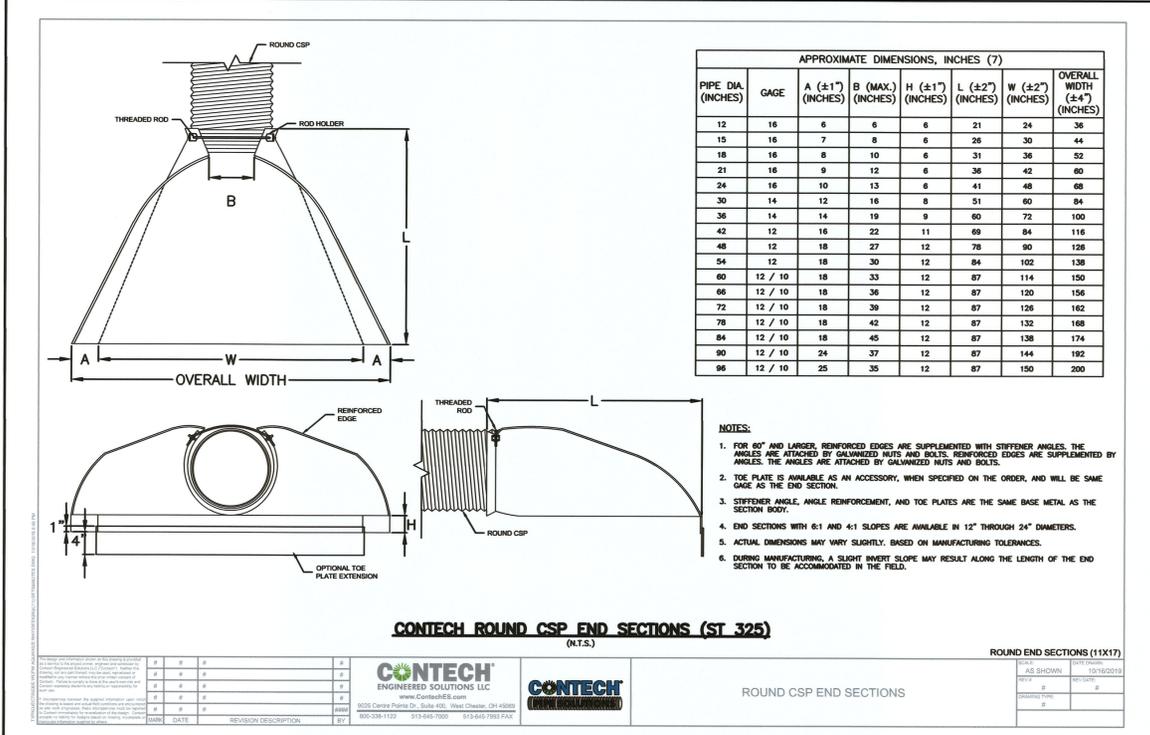
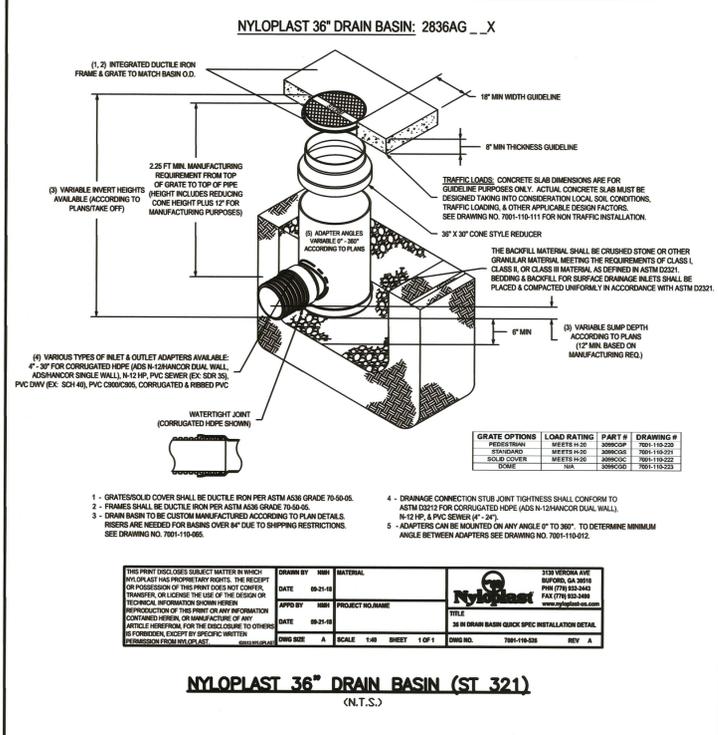
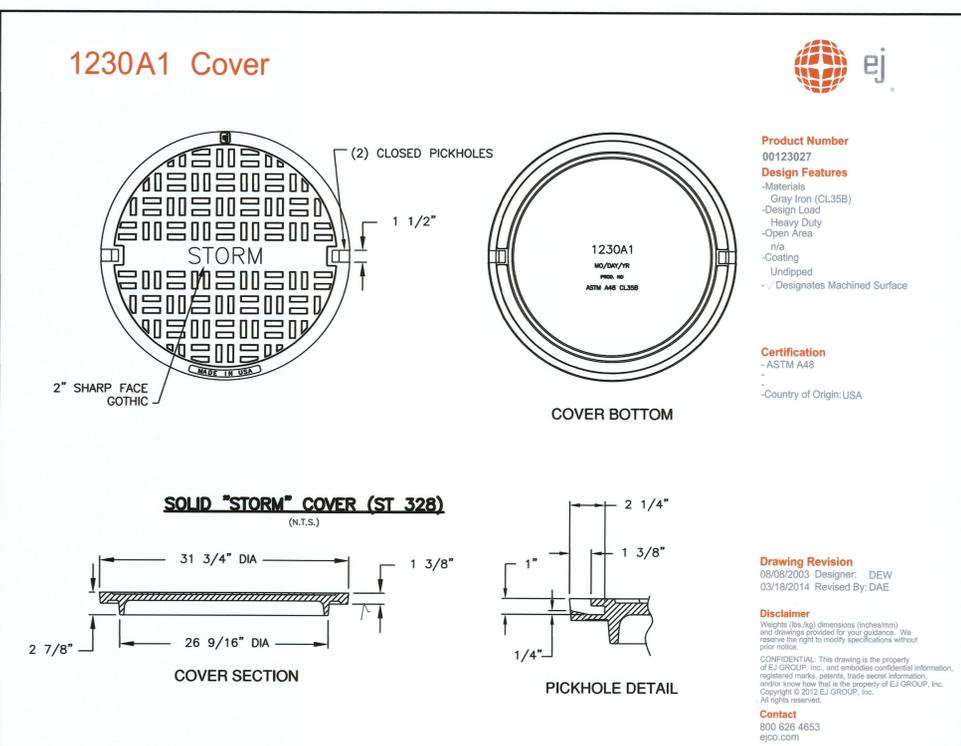
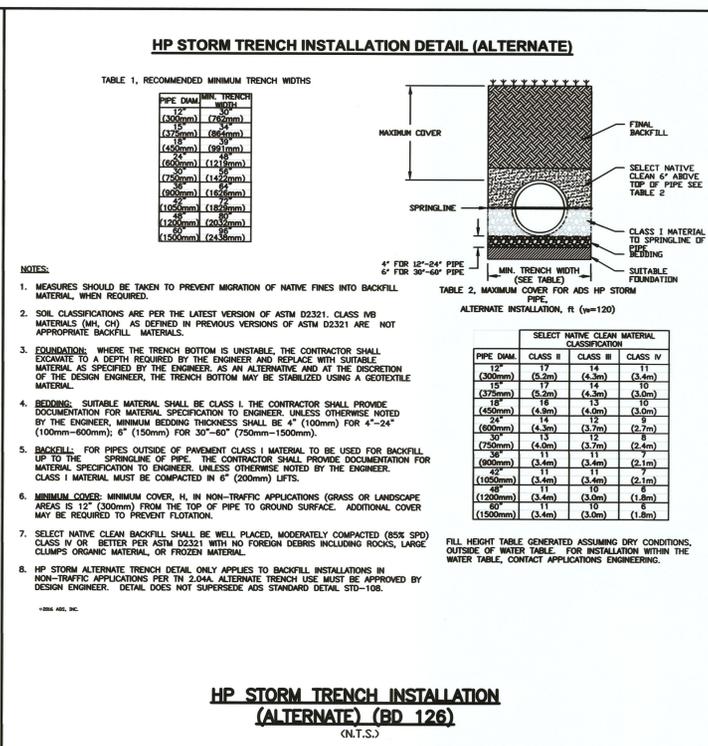
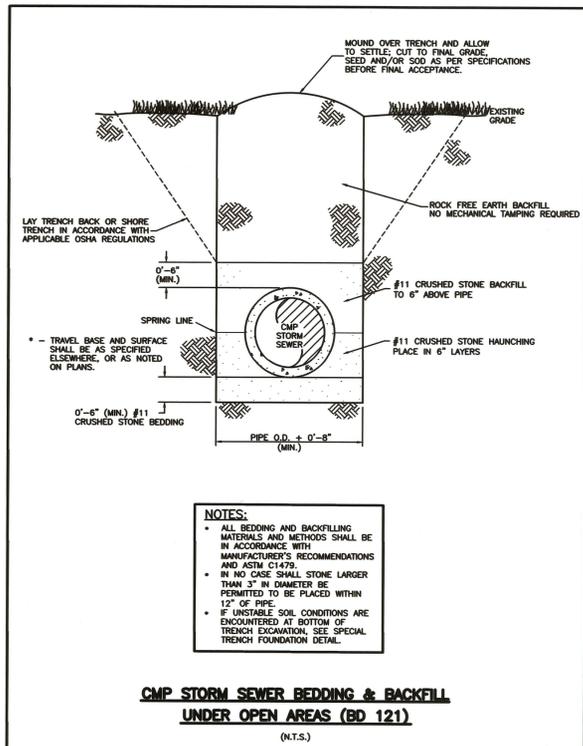


**PROJECT:** AQUARIUS WAY STORM SEWER REMEDIATION  
1517 AQUARIUS WAY  
BOWLING GREEN, KY 42101

**CLIENT:** WARREN COUNTY PUBLIC WORKS  
1141 STATE STREET  
BOWLING GREEN, KY 42101

SCALE: 1"=10'  
DESIGNED BY: DDB  
DRAWN BY: DDB  
CHECKED BY: DDB  
JOB NUMBER: 19-5305  
DRAWING NUMBER: 14,794  
DATE: 12/10/2019

**SITE EPSC**  
**C06.01**



REVISIONS

SYMBOL	DESCRIPTION	DATE	APPROVED

DATE: 12/10/2019

SCALE: 1"=N.T.S.

JOB NO.: 19-5305

DWG NO.: 14,795

**DDS ENGINEERING, PLLC**

LAND SURVEYING, CIVIL AND GEOTECHNICAL ENGINEERING, CONSULTING AND SPECIAL INSPECTION

148 CHESTER COURT  
BOWLING GREEN, KY 42103

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40 YEARS OF EXCELLENCE



**AQUARIUS WAY STORM SEWER REMEDIATION**

1517 AQUARIUS WAY  
BOWLING GREEN, KY 42101

**WARREN COUNTY PUBLIC WORKS**

1141 STATE STREET  
BOWLING GREEN, KY 42101

270-842-1933

SCALE: 1"=N.T.S.

DESIGNED BY: N/A

DRAWN BY: DND

CHECKED BY: DOS

JOB NUMBER: 19-5305

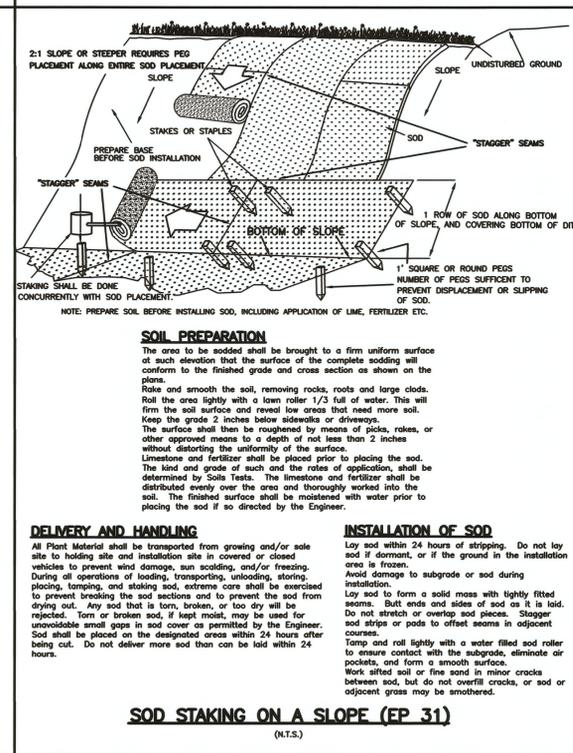
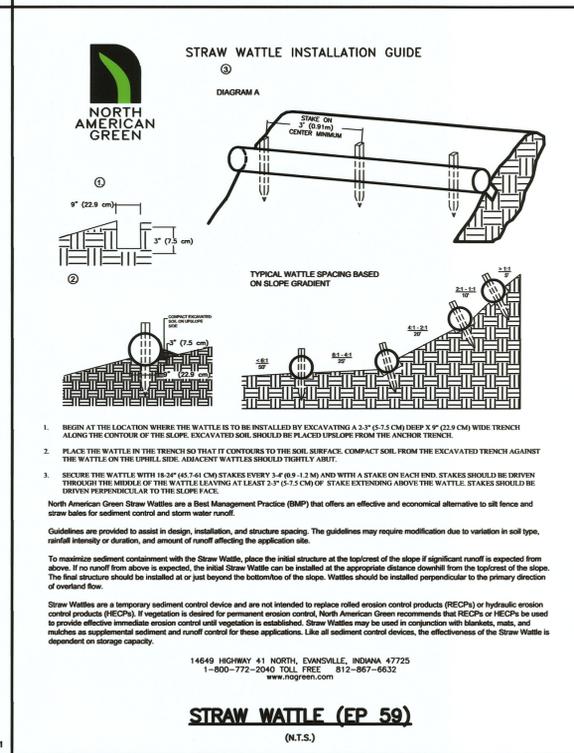
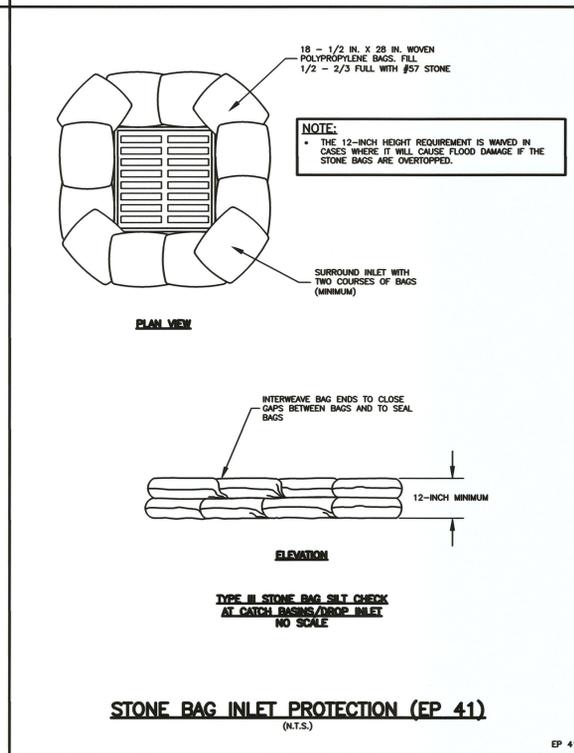
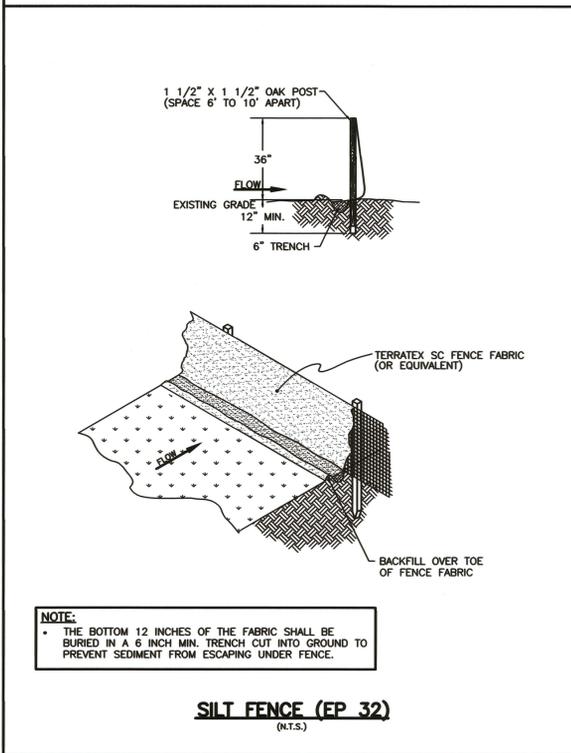
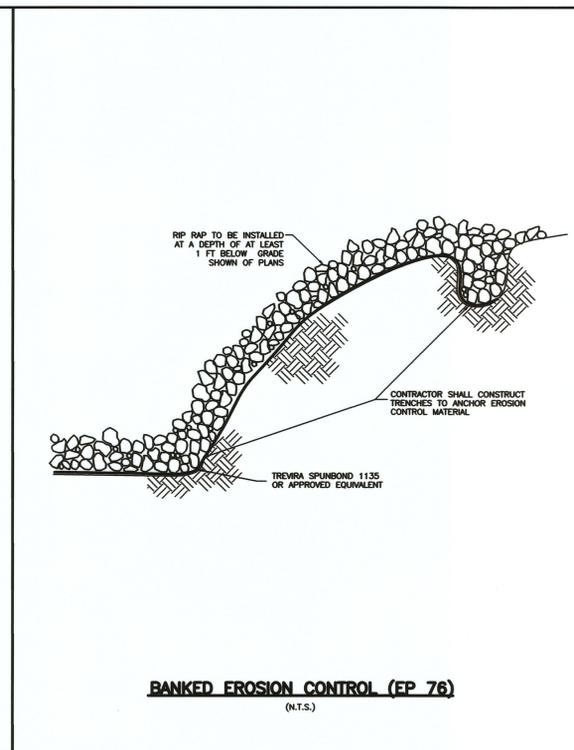
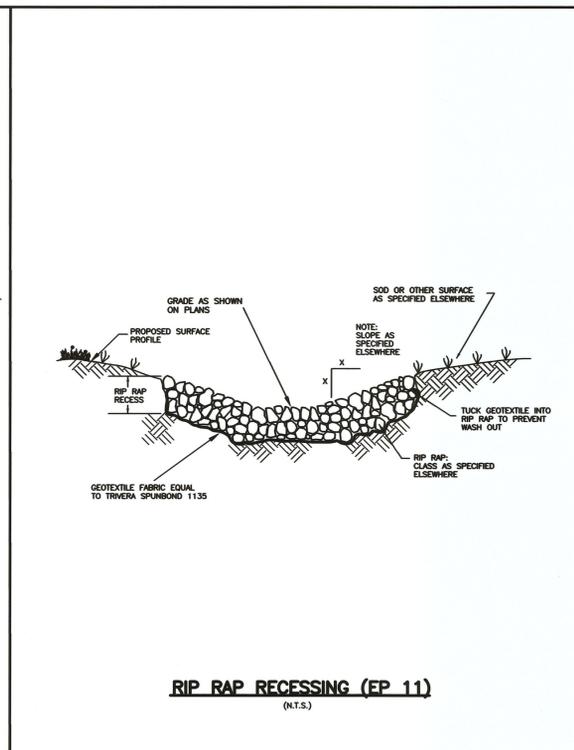
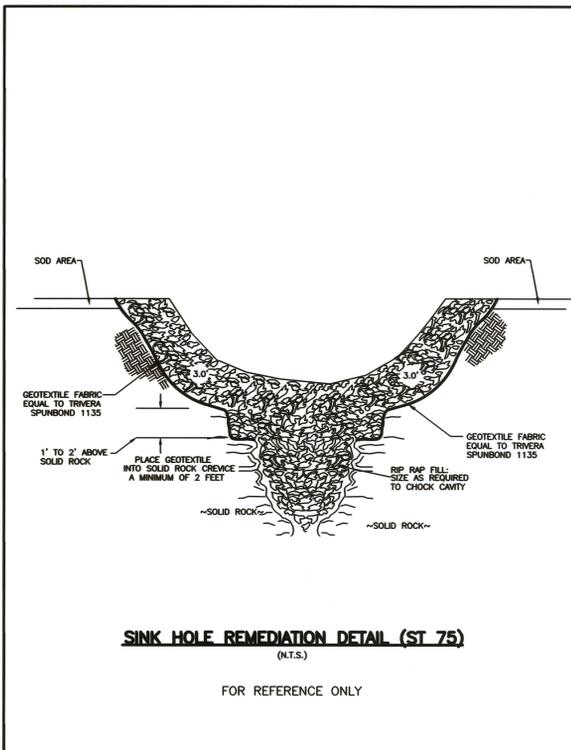
DRAWING NUMBER: 14,795

DATE: 12/10/2019

STORM DETAILS

**C11.01**





SYMBOL	DESCRIPTION	DATE	APPROVED

DATE	BY	NO.	REVISIONS
12/10/2019	DD	14,798	1"=N.T.S.
19-5305	DD	14,798	1"=N.T.S.

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CONSULTING, AND SPECIAL INSPECTION

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**AQUARIUS WAY STORM SEWER REMEDIATION**  
1517 AQUARIUS WAY  
BOWLING GREEN, KY 42101

**WARREN COUNTY PUBLIC WORKS**  
1141 STATE STREET  
BOWLING GREEN, KY 42101

270-842-1953

SCALE	1"=N.T.S.
DESIGNED BY	N/A
DRAWN BY	DAD
CHECKED BY	DOS
JOB NUMBER	19-5305
DRAWING NUMBER	14,798
DATE	12/10/2019
EPSC DETAILS	
<b>C11.02</b>	



T:\PROJECTS\5305 WCPW AQUARIUS WAY Design\C11.02 DDS\Notes.dwg 1:1 DANIEL DOUGLAS Tuesday, December 10, 2019

**A. GRADING AND DRAINAGE NOTES**

- Before beginning construction, the Contractor shall check each and every note, detail, invert elevation, percent grade, etc., and confirm that they are correct and that there are no conflicts with existing utilities, structures or other obstructions and that the pipe line has adequate cover, etc., for intended installation location and use. Failure of the Contractor to bring any such errors to the attention of the Engineer prior to beginning construction shall result in no consideration being given for any request for extra compensation. Decisions of the Engineer shall be final.
- Any and all permits that may be required for any work activities upon the public right-of-way shall be obtained by the Contractor performing such activities. This includes, but is not limited to, the City of Bowling Green, Commonwealth of Kentucky, Department of Highways Permits and any others that may be required.
- Every Contractor shall visit the site and ascertain for himself all conditions that may affect his work. The submission of a Proposal shall be evidence that the Contractor has made such a visit. Requests for extra compensation after construction has commenced shall be denied for items that would have been made evident had a jobsite visit been made.
- Each Contractor shall coordinate all his work activities with every other Contractor on the Project and plan his work operations for enough ahead to foresee potential problems before they arise and delay the Project. The Engineer shall be notified of any and all conflicts as they are discovered.
- The exact location and elevation of all public and private utilities must be determined by the Contractor. It shall be the duty of the Contractor to ascertain whether any additional facilities, other than those shown on the plans, may be present. The cost of relocating any utilities that conflict with any new construction in any manner, shall be incidental to the cost of the Project and shall be borne fully by the Contractor at no additional cost to the Owner.
- All excavation and backfill for roads, streets, sidewalks, parking areas, retention areas and berms, etc., shall be in strict accordance with the applicable sections of Commonwealth of Kentucky, Department of Highways Standard Specifications of Road and Bridge Construction, latest edition and as shown on the plans. All cut and fill areas shall be stripped of top soil and other organic matter before beginning structural excavation operations. All fill for areas to be seeded shall be filled and compacted in accordance with the aforesaid specifications. The topsoil shall be replaced in rough grade for the replacement of top soil. As a minimum, all fill areas shall be compacted to 98% of the Standard Proctor maximum dry density (ASTM Method D 698). All fill shall be placed in maximum eight-inch thick loose lifts and the fill soils maintained within two percent (2%) of the optimum moisture content as determined from the Proctor density test.
- Shot rock may be used within fill areas with the prior approval of the Engineer. However, no stones larger than 12" in the greatest dimension shall be permitted in the top two feet (2') of the subgrade of any fill section. Additionally, no stones larger than 24" in the greatest dimension shall be permitted within the top ten feet (10') of the subgrade of any fill section. Further, the Contractor shall coordinate the placement of the shot rock with other contractors to prevent the placement of shot rock in areas that will be excavated for utilities and other underground installations.
- Any quantities listed on the plans are for reference only and are not to be construed by the Contractor as exact quantities for bidding or construction purposes. The Contractor shall make his own estimate as to the actual quantities required from the completion of the Project.
- Erosion Control, Seeding and/or Sodding:
  - The Contractor shall completely protect all existing drainage structures, sinkholes, etc., from siltation and related damage that may occur as a result of his construction operations. This shall include, but not be limited to, the placement of acceptable silt checks, diversion silt checks or the erection of silt fences as shown on the plans or as may be required or directed by the Engineer.
  - All areas to be seeded or to receive sod (in earth or rock) shall be undercut a minimum of six inches (6") in earth and a minimum of twelve inches (12") in rock in order to place an adequate top soil base for the sod. In undercutting, allow for sod thickness in order that the top of the sod will be flush with inverts of pipes, flowlines of paved ditches, concrete pads around inlets, etc. Top soil base shall be accurately placed to line and grade before any sod is placed.
  - All areas to receive seeding and/or sodding shall have a minimum of 6" of top soil in earth areas and a minimum of 12" of top soil in rock areas. Topsoil shall be free of rocks, sticks and other deleterious matter and shall be prepared and seeded as follows:
 

C.1. All areas to be permanently seeded (in earth or rock) shall be undercut a minimum of six inches (6") in earth and a minimum of twelve inches (12") in rock in order to place an adequate top soil base for the seed. All areas to be seeded shall receive an application of Agricultural Ground Limestone, in accordance with an approved soil test, and 12-12-12 Granulated Commercial Fertilizer, the later being applied at the minimum rate of 20 pounds per one thousand (1,000) square feet of area and drilled or raked into a depth of one inch (1"). The following seed mixture shall be used at the rate of one hundred (100) pounds per one (1) acre:

40% Kentucky Tall Fescue  
20% Sericea Lespedeza  
15% Creeping Red Fescue  
15% Partridge Pea  
10% Little Bluestem

If applying seed between June and August, add ten (10) pounds of German Foaal Millet. If applying between September and May, add fifty-six (56) pounds of Cereal Rye.

Immediately after seeding, straw mulch with netting pinned in place shall be placed on the entire seeded area.

C.2. All areas to be temporarily seeded shall be prepared in the same manner as noted above for permanent seeding.

If applying between March and May, Annual Rye is to be used at a minimum rate of one hundred (100) pounds per one (1) acre.

If applying between June and August, one hundred (100) pounds of Annual Rye with ten (10) pounds of German Foaal Millet added is to be used at a minimum rate of one hundred (100) pounds per one (1) acre.

If applying between September and February, Winter Wheat or Rye Grain is to be used at a minimum of one hundred (100) pounds per one (1) acre.

**A. GRADING AND DRAINAGE NOTES (CONT.)**

- Maintenance of Storm Water Retention Areas:
  - Owners of lots or sites encompassing storm water retention areas are responsible for the maintenance of that portion of the retention area that is on their property. Maintenance shall include the following:
    - Grass shall be maintained so as to not exceed five inches (5") in height.
    - The Basin area shall be maintained free and clear of all debris and foreign objects.
    - No permanent structures of any type shall be placed in these areas without the written permission of the Bowling Green-Warren County Planning Commission and/or the City of Bowling Green Department of Public Works, City Engineer's Office.
- The Contractor shall arrange for and bear all costs for earthwork density testing and concrete compression testing as may be required. All fill under paved areas, buildings and/or concrete pads shall be compacted to a minimum of 95% Modified Proctor maximum dry density (ASTM Method D 1557). Density testing shall be performed in every 2,500 square feet for each one foot thick layer of compacted fill material. All fill placement and compaction operations shall be observed and documented by a representative of the geotechnical engineering Firm, if one is retained by the Owner. Soil and/or crushed stone or DGA backfill for footing excavations shall be included in the testing and monitoring program.
- The Contractor shall proof-roll all subgrade areas within the building pad area and under the pavement areas to delineate any unstable soil or fill materials. The proof-rolling should be done after a period of dry weather to avoid damaging the subgrade. The proof-rolling should be accomplished with a dual axle dump truck, loaded to 16 to 20 tons, or similar equipment judged acceptable by the geotechnical engineer. The proof-rolling equipment should make several passes over each section of the subgrade. The contractor shall proof-rolling, those areas shall be undercut and replaced with properly compacted materials.
- The Contractor shall control all silt from leaving site by the use of silt fences, silt checks or traps, fiber logs, or other means as required and approved by the Engineer. If required, the Contractor shall construct temporary siltation basins in addition to those controls listed above. The cost of all silt control shall be incidental to the cost of the Project.
- All materials and workmanship under this section of the contract shall be guaranteed for a period of 12 months after final acceptance by the Owner and the Engineer.
- The Contractor shall prepare as built drawings, as necessary, to indicate any and all changes made during the course of the Project construction. These drawings shall be turned over to the Engineer upon completion of the Project and approval of Contractors' request for final Project payment shall be contingent upon the receipt of these drawings.
- The Contractor shall fully comply with all rules, regulations, and other requirements of the current Federal Clean Water Act and its Storm Water permitting requirements.
- It is clearly understood that since the Engineer has no control of the Contractor's actual day to day operation of the Project, the Contractor shall in no way be held responsible for safety, adequacy and efficiency of the Contractor's plant, equipment and methods and procedures. The Contractor and his employees shall follow any and all rules and regulations of OSHA or other authority having jurisdiction over his Project.
- The Contractor shall be responsible for assuring that all required EPA Notices of Intent and any other related applications, permits, etc., have been made and are in proper order on behalf of the Owner.
- The Contractor shall furnish to the Owner and the Engineer, Certificates of Insurance naming the Owner and the Engineer as additionally insured for the duration of the Project. Any notice of cancellation of insurance shall be made available to the Owner and Engineer a minimum of thirty (30) days prior to the cancellation date.

**B. EROSION CONTROL NOTES**

- Any and all permits that may be required for any work activities upon the public right-of-way shall be obtained by the Contractor performing such activities. This includes, but is not limited to, Local Permits, Commonwealth of Kentucky, Department of Transportation Permits and any others that may be required.
- The Contractor shall minimize the amount of silt leaving site by the use of silt fences, silt checks or traps, fiber mats or other means as required and approved by the Engineer. If required, the Contractor shall construct temporary siltation basins in addition to those controls listed above. The cost of all silt control shall be incidental to the cost of the Project. Use of straw bales is not an approved means or method.
- Every Contractor shall visit the site and ascertain for himself all conditions that may affect his work. The submission of a Proposal shall be evidence that the Contractor has made such a visit. Requests for extra compensation after construction has commenced shall be denied for items that would have been made evident had a jobsite visit been made.
- The Contractor shall fully comply with all rules, regulations, and other requirements of the current Federal Clean Water Act and its Storm Water permitting requirements. Contractor shall ascertain that all the required permits have been obtained prior to beginning construction on the Project.
- All cut and fill areas shall be stripped of top soil and other organic matter before beginning structural excavation operations. Protection against erosion of all exposed areas shall be maintained throughout the duration of the Project construction using methods specified herein.
- Any erosion prevention quantities listed on the plans are for reference only and are not to be construed by the Contractor as exact quantities for bidding or construction purposes. The Contractor shall make his own estimate as to the actual quantities required from the completion of the Project in order to adequately prevent erosion and silt from leaving the site.
- The Contractor shall completely protect all existing drainage structures, sinkholes, etc., from siltation and related damage that may occur as a result of his construction operations. This shall include, but not be limited to, the placement of fiber mats silt checks, diversion silt checks or the erection of silt fences as shown on the plans or as may be required or directed by the Engineer.
- All silt fence and fiber mats or other means of erosion protection shall be installed as shown on the plans. However, in no case shall the details override the manufacturer's recommendations for the specific erosion prevention methods associated with the specific product or method.
- All graded areas that will be subject to possible erosion before final grading is completed and the final seeding is in place, shall be temporarily seeded in accordance with the Seeding Specifications. Cost of this temporary seeding shall be incidental to the cost of the Project. This seeding requirement applies to topsoil stockpiles as well.
- Contractor shall completely restore, in like kind, any and all areas disturbed by his construction operations.
- In addition to areas specifically noted on the plans to be sodded, all ditches, unless specifically noted otherwise, shall be sodded from top of bank to top of bank.
- All materials and workmanship under this section of the contract shall be guaranteed for a period of 12 months after final acceptance by the Owner and the Engineer.
- It is clearly understood that since the Engineer has no control of the Contractor's actual day to day operation of the Project, the Engineer shall in no way be held responsible for safety, adequacy and efficiency of the Contractor's plant, equipment and methods and procedures. The Contractor and his employees shall follow any and all rules and regulations of OSHA or other authority having jurisdiction over his Project.
- The Contractor shall be responsible for assuring that all required EPA Notices of Intent and any other related applications, permits, etc., have been made and are in proper order on behalf of the Owner.
- The Contractor shall furnish to the Owner and the Engineer, Certificates of Insurance naming the Owner and the Engineer as additionally insured for the duration of the Project. Any notice of cancellation of insurance shall be made available to the Owner and Engineer a minimum of thirty (30) days prior to the cancellation date.

**C. SEEDING AND SODDING NOTES**

- All excavation and backfill for roads, streets, sidewalks, parking areas, utilities, retention areas and berms, etc., shall be in strict accordance with the applicable sections of Commonwealth of Kentucky, Department of Transportation Standard Specifications of Road and Bridge Construction, latest edition and as shown on the plans. All fill for areas to be seeded shall be filled and compacted in accordance with the aforesaid specifications, with allowances made in rough grade for the replacement of top soil for seeded.
- Any quantities listed on the plans are for reference only and are not to be construed by the Contractor as exact quantities for bidding or construction purposes. The Contractor shall make his own estimate as to the actual quantities required from the completion of the Project.
- Erosion Prevention, Seeding and/or Sodding:
  - The Contractor shall completely protect all existing drainage structures, sinkholes, etc., from siltation and related damage that may occur as a result of his construction operations. This shall include, but not be limited to, the placement of fiber mat, rock silt checks, diversion silt checks or the erection of silt fences as shown on the plans, as may be required or as directed by the Engineer.
  - All areas to receive seeding and/or sodding shall have a minimum of 6" of top soil in earth areas and a minimum of 12" of top soil in rock areas. Topsoil shall be free of rocks, sticks and other deleterious matter and shall be prepared and seeded as follows:
    - All areas to be permanently seeded (in earth or rock) shall be undercut a minimum of six inches (6") in earth and a minimum of twelve inches (12") in rock in order to place an adequate top soil base for the seed. All areas to be seeded shall receive an application of Agricultural Ground Limestone, in accordance with an approved soil test, and 12-12-12 Granulated Commercial Fertilizer, the later being applied at the minimum rate of 20 pounds per one thousand (1,000) square feet of area and drilled or raked into a depth of one inch (1"). The following seed mixture shall be used at the rate of one hundred (100) pounds per one (1) acre:
 

40% Kentucky Tall Fescue  
20% Sericea Lespedeza  
15% Creeping Red Fescue  
15% Partridge Pea  
10% Little Bluestem

If applying seed between June and August, add ten (10) pounds of German Foaal Millet. If applying between September and May, add fifty-six (56) pounds of Cereal Rye.

Immediately after seeding, straw mulch with netting pinned in place shall be placed on the entire seeded area.
    - All areas to be temporarily seeded shall be prepared in the same manner as noted above for permanent seeding.
- All areas to be sodded shall be prepared as follows: All areas to be sodded shall receive an application of Agricultural Ground Limestone, in accordance with an approved soil test, and 12-12-12 Granulated Commercial Fertilizer, the later being applied at the minimum rate of 20 pounds per one thousand (1,000) square feet of area and to be drilled or raked into a depth of one inch (1"). The Contractor shall provide water, watering tools and equipment as required to adequately supply water for the sodded areas for the length of time required for the sod to develop a stable growth.
- All slopes 1 1/2 : 1 or greater, and all other areas subject to erosion, shall be sodded as follows:
  - All areas to be sodded shall be prepared as follows:
    - Where Circular Reinforced Concrete Pipe (RCP) is specified, it shall be in accordance with the ASTM C 76, Classes as specified elsewhere.
    - Where Elliptical Reinforced Concrete Pipe (ERCP) is specified, it shall be in accordance with the ASTM C 507, Classes as specified elsewhere.
    - Precast Concrete Manhole sections shall be in accordance with the ASTM C 478.
    - All Reinforced Concrete Pipe (RCP), where specified to be installed inside a building, or in other locations as noted, shall be in accordance with ASTM C 76 and shall have joints in accordance with ASTM C 443.
    - All Reinforced Concrete Pipe (RCP), where specified to be installed inside a building shall be tested in accordance with ASTM C 924 and in accordance with the appropriate instructions of the Plumber Inspector having jurisdiction.
  - Steel Pipe
    - Where any steel piping is specified for use within the storm sewer system for this Project, it shall be in accordance with ASTM A 760 for Galvanized corrugated steel and Aluminum corrugated steel pipe. Bituminous coated corrugated steel pipe shall be in accordance with ASTM A 849.
    - Gaskets and Sealants for steel piping shall be in accordance with ASTM D 1056.
    - The installation of steel piping for use within the storm sewer system for this Project, shall be in accordance with ASTM A 798.
  - Thermoplastic Pipe
    - Where Polyvinyl Chloride (PVC) piping is specified for use within the storm sewer system for this Project, it shall be in accordance with ASTM D 2241.
    - PVC solvent cement shall be in accordance with ASTM D 2564 and the joints shall be made in accordance with ASTM D 2855.
    - PVC fittings shall be in accordance with ASTM A 2729.
    - Joints utilizing flexible elastomeric seals shall be in accordance with ASTM D 3212.
    - The installation of PVC piping for use within the storm sewer system for this Project, shall be in accordance with ASTM A 2321.
  - High Density Polyethylene Pipe (HDPE)
    - Where High Density Polyethylene Pipe (HDPE) is specified for use within the storm sewer system for this Project, it shall be in accordance with AASHTO M294.
    - HDPE fittings shall be in accordance with AASHTO M294.
    - Joint gaskets shall be in accordance with ASTM F 477.
    - The installation of HDPE piping for use within the storm sewer system for this Project, shall be in accordance with ASTM A 2321.
- All Storm Sewer Pipes must have a minimum cover of 2 feet unless otherwise specifically approved by the Engineer or shown otherwise on these drawings. Bedding, haunching and backfill shall be as specified above and/or as detailed on the drawings.
- All pipe lengths shown on these plans are approximate only and shall be field verified by the Contractor.
- In areas that receive fill, the Contractor shall fill the areas to a minimum of 2 feet above the level of the Storm Sewer, before beginning the installation of the Storm Sewer. It shall be the Contractor's responsibility to see that the fill has been brought up to the proper elevation before commencing his work.
- All Storm Sewer System Pipe lines that have a grade in excess of ten percent (10%) shall be anchored by concrete collar type anchors at each joint for the lines entire length. See plans for Collar Detail, if applicable.
- All Storm Sewer inverts are given to the outlet of the structure, unless otherwise noted. See Storm Sewer Inlet Detail for further information, if applicable.
- All storm sewer piping shall be water tight and shall be capable of passing a smoke test if so directed by the Engineer. Any observable leaks in the system shall be corrected and/or replaced as directed by the Engineer or his representative.
- Any storm sewer piping installed within the building shall be installed in complete accordance with the Kentucky State Plumbing Code and Law. See paragraph 11A-5 above.
- The Contractor shall fully comply with all rules, regulations, and other requirements of the current Federal Clean Water Act and its Storm Water permitting requirements.

**D. STORM SEWER SPECIFICATIONS**

- All circular gravity storm sewer piping shall be reinforced concrete pipe conforming to the latest edition of ASTM C 76 and shall be of the class as specified on the plans. All elliptical gravity storm sewer piping shall be reinforced concrete pipe conforming to the latest edition of ASTM C 507 and shall be of the class as specified on the plans. All factory testing of the reinforced concrete pipe shall be in accordance with ASTM C 497. The Contractor shall furnish documentation that all reinforced concrete pipe for this Project has met the requirements of the aforesaid ASTM specifications.
- The pipe shall be manufactured by a reputable reinforced concrete pipe manufacturing firm that has the facilities and physical plant capable of producing the reinforced concrete pipe as specified above. The reinforced concrete pipe shall be delivered to the jobsite on the manufacturer's truck or other approved means. The Engineer shall retain the right to accept or reject any reinforced concrete pipe that may have been damaged in transit.
- The workmanship, pipe dimensions and tolerances, outside diameters, wall thickness, eccentricity, size and quantity of reinforcement, quality and types of raw materials, markings, etc., shall meet the requirements of the aforementioned Standards.
- All reinforced concrete storm sewer pipe shall be furnished in 8 foot laying lengths. The pipe shall have a bell on one end and all joints shall be as specified hereinafter.
- All reinforced concrete pipe storm sewer joints shall be of such design and the ends of the concrete pipe sections so formed that the pipe can be laid together to make a continuous line of pipe compatible with the permissible variations given in Section 12 of ASTM C 76 and ASTM 507. Where the pipe line is specified to be jet tested or the reinforced concrete pipe is shown to be installed under any structure, the reinforced concrete pipe joints shall be in accordance with ASTM C 443.
- All site rough grading work shall be completed and accepted by the respective authorities before any storm sewers are installed.
- All site testing shall be the complete responsibility of the Contractor, including but not limited to, pressure testing, (by water or air) pump startup and operation, etc. He shall furnish all necessary equipment, personnel, etc., as required for said testing. All reinforced concrete pipe testing methods and procedures shall be in accordance with ASTM C 924.
- Where it is specified or shown on the drawings for the reinforced concrete pipe to connect to any existing storm sewer structure, the Contractor shall meet all the requirements of the appropriate authority over said structure.
- It shall be the Contractor's responsibility to apply for and obtain any and all necessary permits, etc., as required for this Project.
- The Contractor shall furnish the Engineer with a minimum of six (6) copies of shop drawings, submittal data and related information for approval prior to commencing with any work on the Project. The review and/or approval of any submittals shall not relieve the Contractor of design capacity guarantees, correctly figured dimensions, space requirements or deviations from the Contract Documents. Any deviation from the Contract Documents shall be requested in writing to the Engineer, outlining the proposed deviation(s) and requesting that the work must be approved by the Engineer's endorsement on said written request.
- All piping materials shall be as specified on these drawings. Substitutions shall be made only with the prior approval of the Engineer. Request for such approval shall be in writing to the Engineer through the Project Manager, if applicable. Request for such substitutions shall include all reasons for, added costs or credits, etc.. Approval of any substitutions shall not relieve the Contractor from the responsibility of a complete, workable and approved system. Storm sewer piping materials shall, in general, be as follows:
  - Concrete Pipe
    - Where Circular Reinforced Concrete Pipe (RCP) is specified, it shall be in accordance with the ASTM C 76, Classes as specified elsewhere.
    - Where Elliptical Reinforced Concrete Pipe (ERCP) is specified, it shall be in accordance with the ASTM C 507, Classes as specified elsewhere.
    - Precast Concrete Manhole sections shall be in accordance with the ASTM C 478.
    - All Reinforced Concrete Pipe (RCP), where specified to be installed inside a building, or in other locations as noted, shall be in accordance with ASTM C 76 and shall have joints in accordance with ASTM C 443.
    - All Reinforced Concrete Pipe (RCP), where specified to be installed inside a building shall be tested in accordance with ASTM C 924 and in accordance with the appropriate instructions of the Plumber Inspector having jurisdiction.
  - Steel Pipe
    - Where any steel piping is specified for use within the storm sewer system for this Project, it shall be in accordance with ASTM A 760 for Galvanized corrugated steel and Aluminum corrugated steel pipe. Bituminous coated corrugated steel pipe shall be in accordance with ASTM A 849.
    - Gaskets and Sealants for steel piping shall be in accordance with ASTM D 1056.
    - The installation of steel piping for use within the storm sewer system for this Project, shall be in accordance with ASTM A 798.
  - Thermoplastic Pipe
    - Where Polyvinyl Chloride (PVC) piping is specified for use within the storm sewer system for this Project, it shall be in accordance with ASTM D 2241.
    - PVC solvent cement shall be in accordance with ASTM D 2564 and the joints shall be made in accordance with ASTM D 2855.
    - PVC fittings shall be in accordance with ASTM A 2729.
    - Joints utilizing flexible elastomeric seals shall be in accordance with ASTM D 3212.
    - The installation of PVC piping for use within the storm sewer system for this Project, shall be in accordance with ASTM A 2321.
  - High Density Polyethylene Pipe (HDPE)
    - Where High Density Polyethylene Pipe (HDPE) is specified for use within the storm sewer system for this Project, it shall be in accordance with AASHTO M294.
    - HDPE fittings shall be in accordance with AASHTO M294.
    - Joint gaskets shall be in accordance with ASTM F 477.
    - The installation of HDPE piping for use within the storm sewer system for this Project, shall be in accordance with ASTM A 2321.
- All Storm Sewer Pipes must have a minimum cover of 2 feet unless otherwise specifically approved by the Engineer or shown otherwise on these drawings. Bedding, haunching and backfill shall be as specified above and/or as detailed on the drawings.
- All pipe lengths shown on these plans are approximate only and shall be field verified by the Contractor.
- In areas that receive fill, the Contractor shall fill the areas to a minimum of 2 feet above the level of the Storm Sewer, before beginning the installation of the Storm Sewer. It shall be the Contractor's responsibility to see that the fill has been brought up to the proper elevation before commencing his work.
- All Storm Sewer System Pipe lines that have a grade in excess of ten percent (10%) shall be anchored by concrete collar type anchors at each joint for the lines entire length. See plans for Collar Detail, if applicable.
- All Storm Sewer inverts are given to the outlet of the structure, unless otherwise noted. See Storm Sewer Inlet Detail for further information, if applicable.
- All storm sewer piping shall be water tight and shall be capable of passing a smoke test if so directed by the Engineer. Any observable leaks in the system shall be corrected and/or replaced as directed by the Engineer or his representative.
- Any storm sewer piping installed within the building shall be installed in complete accordance with the Kentucky State Plumbing Code and Law. See paragraph 11A-5 above.
- The Contractor shall fully comply with all rules, regulations, and other requirements of the current Federal Clean Water Act and its Storm Water permitting requirements.

**D. STORM SEWER SPECIFICATIONS (CONT.)**

- All materials and workmanship under this section of the contract shall be guaranteed for a period of 12 months after final acceptance by the Owner and the Engineer.
  - The Contractor shall furnish to the Owner and Engineer, Certificates of Insurance naming the Owner and Engineer as additionally insured for the duration of the Project. Any notice of cancellation of insurance shall be made available to the Owner and Engineer a minimum of thirty (30) days prior to the cancellation date.
- WARNING:**  
BEFORE EXCAVATING FOR NEW SITE UTILITIES, NOTE THE CROSSING OF ANY EXISTING UNDERGROUND PRIMARY ELECTRIC SERVICE(S), UNDERGROUND TELEPHONE SERVICE(S), UNDERGROUND GAS SERVICE(S), UNDERGROUND SANITARY OR STORM SEWER SERVICE(S) OR ANY OTHER UNDERGROUND STRUCTURE(S) THAT MAY OR MAY NOT BE SHOWN ON THE PLANS.
- SPECIAL NOTE:**  
The exact location and elevation of all public utilities must be determined by the Contractor. It shall be the duty of the Contractor to ascertain whether any additional facilities, other than those shown on the plans, may be present. The cost of relocating any utilities that conflict with any new construction, in any manner, shall be incidental to the cost of the Project and shall be borne fully by the Contractor at no additional cost to the Owner.
- F. STORM SEWER NOTES**
- Before beginning construction, the Contractor shall check each and every note, detail, invert elevation, flowing elevation, percent grade, etc., and confirm that they are correct and that there are no conflicts with existing utilities, structures or other obstructions and that the storm pipe line has adequate cover, etc., for the installation location. Failure of the Contractor to bring any such errors to the attention of the Engineer prior to beginning construction shall result in no consideration being given for any request for extra compensation. Decisions of the Engineer shall be final.
  - Every Contractor shall visit the site and ascertain for himself all conditions that may affect his work. The submission of a Proposal shall be evidence that the Contractor has made such a visit. Requests for extra compensation after construction has commenced shall be denied for items that would have been made evident had a jobsite visit been made.
  - Each Contractor shall coordinate all his work activities with every other Contractor on the project and plan his work operations for enough ahead to foresee potential problems before they arise and delay the project. The Engineer shall be notified of any and all conflicts as they are discovered. At connections to existing main(s), the existing main(s) shall be excavated at the beginning of the Project work in order to verify actual location, main sizes, depths, etc.
  - The exact location and elevation of all public utilities must be determined by the Contractor. It shall be the duty of the Contractor to ascertain whether any additional facilities, other than those shown on the plans, may be present. The cost of relocating any utilities that conflict with any new construction, in any manner, shall be incidental to the cost of the Project and shall be borne fully by the Contractor at no additional cost to the Owner. Further, before commencing any construction activities, the Contractor shall have all utilities accurately located by the respective utility agencies in order to avoid damage to any existing utilities.
  - All piping materials shall be as specified on these drawings. Substitutions shall be made only with the prior approval of the Engineer. Request for such approval shall be in writing to the Engineer through the Project Manager, if applicable. Request for such substitutions shall include all reasons for, added costs or credits, etc.. Approval of any substitutions shall not relieve the Contractor from the responsibility of a complete, workable and approved system.
  - All Storm Sewer Pipes must have a minimum cover of 2 feet unless otherwise specifically approved by the Engineer or shown otherwise on these drawings. Bedding, haunching and backfill shall be as specified above and/or as detailed on the drawings.
  - All pipe lengths shown on these plans are approximate only and shall be field verified by the Contractor.
  - In areas that receive fill, the Contractor shall fill the areas to a minimum of 2 feet above the level of the Storm Sewer, before beginning the installation of the Storm Sewer. It shall be the Contractor's responsibility to see that the fill has been brought up to the proper elevation before commencing his work.
  - All Storm Sewer System Pipe lines that have a grade in excess of ten percent (10%) shall be anchored by concrete collar type anchors at each joint for the lines entire length. See plans for Collar Detail, if applicable.
  - All Storm Sewer inverts are given to the outlet of the structure, unless otherwise noted. See Storm Sewer Inlet Detail for further information, if applicable.
  - All storm sewer piping shall be water tight and shall be capable of passing a smoke test if so directed by the Engineer. Any observable leaks in the system shall be corrected and/or replaced as directed by the Engineer or his representative.
  - Any storm sewer piping installed within the building shall be installed in complete accordance with the Kentucky State Plumbing Code and Law. Also see paragraph 11A-5 of "STORM SEWER SPECIFICATIONS".
  - The Contractor shall notify both the Owner's Representative, the Utility and the Engineer a MINIMUM OF SEVENTY-TWO (72) HOURS PRIOR TO COMMENCING ANY CONSTRUCTION ACTIVITIES.
  - The Contractor shall fully comply with all rules, regulations, and other requirements of the current Federal Clean Water Act and its Storm Water permitting requirements.
  - All materials and workmanship under this section of the contract shall be guaranteed for a period of 12 months after final acceptance by the Owner and the Engineer.
  - The Contractor shall prepare as built drawings, as necessary, to indicate any and all changes made during the course of the Project construction. These drawings shall be turned over to the Engineer upon completion of the Project and approval of Contractors' request for final Project payment shall be contingent upon the receipt of these drawings.
  - It is clearly understood that since the Engineer has no control of the Contractor's actual day to day operation of the Project, the Engineer shall in no way be held responsible for safety, adequacy and efficiency of the Contractor's plant, equipment and methods and procedures. The Contractor and his employees shall follow any and all rules and regulations of OSHA or other authority having jurisdiction over his Project.
  - The Contractor shall furnish to the Owner and Engineer, Certificates of Insurance naming the Owner and Engineer as additionally insured for the duration of the Project. Any notice of cancellation of insurance shall be made available to the Owner and Engineer a minimum of thirty (30) days prior to the cancellation date.

SYMBOL	DESCRIPTION	DATE	APPROVED

**DDS ENGINEERING, PLLC**  
LAND SURVEYING, CIVIL AND GEOTECHNICAL ENGINEERING,  
CONSULTING AND SPECIAL INSPECTION

148 CHESTER COURT  
BOWLING GREEN, KY 42103

270-843-2247  
WWW.DDSENGINEERING.COM

40 YEARS OF SERVICE



**AQUARIUS WAY STORM SEWER REMEDIATION**

1517 AQUARIUS WAY  
BOWLING GREEN, KY 42101

**WARREN COUNTY PUBLIC WORKS**

1141 STATE STREET  
BOWLING GREEN, KY 42101

270-842-1933

SCALE	1"=N.T.S.
DESIGNED BY	N/A
DRAWN BY	DD
CHECKED BY	DD
JOB NUMBER	19-5305
DRAWING NUMBER	14,797
DATE	12/10/2019

NOTES & SPECIFICATIONS

**C11.03**