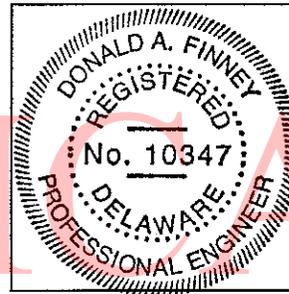


State of Delaware Department of Transportation
Maintenance and Operations – Canal District
Plans and Specifications for Contract Number T2012-034-02
Sinkhole Repair – Open End
FY 2012 through FY 2014



Recommended:

10/13/11

Canal District Maintenance Engineer

Date

Recommended:

10/11/11

Canal District Contracts Engineer

Date



Approved:

10/17/11

Canal District Engineer

Date

STATE OF DELAWARE DEPARTMENT OF TRANSPORTATION

Contract No. T2012-034-02

FY12 through FY14

Sinkhole Repair – Canal District – Open End

Page 2 of 16

Contract Description

The purpose of this contract is to repair storm drain systems for transportation infrastructure in the Canal District. Work includes the repair of deterioration, damage and/or failures in the storm water drainage system. The work shall be performed on pipe systems, drainage inlets, curbs, manhole and drainage structures and affected pavements as directed by the Engineer. The work includes internal pipe video, flushing and repair as well as external repair work.

The specific work sites are not listed herein, but will be assigned as available by the District Maintenance office via work orders.

This is a working day contract that will end three years (1,095 calendar days) from date of Notice To Proceed.

UNOFFICIAL

WEBSITE

COPY

STATE OF DELAWARE DEPARTMENT OF TRANSPORTATION

Contract No. T2012-034-02

FY12 through FY14

Sinkhole Repair – Canal District – Open End

Page 3 of 16

Project Notes

1. Construction of this contract shall conform to Delaware Department of Transportation Standard Specifications dated August 2001, as amended by the Supplemental Specifications, the Special Provisions and these Plans.
2. N/A
3. The Contractor and all others shall perform all work in a manner that shall ensure the least practical obstruction to the traveling public and shall conform to the requirements of the latest version of the Manual entitled “Delaware Manual on Uniform Traffic Control Devices For Streets And Highways (DE MUTCD)”, in effect at the time of advertisement for bids.
4. No utility relocation involvement is anticipated. Should any conflicts be encountered during construction requiring adjustment and/or relocation of the agencies’ existing facilities, the necessary relocation work shall be accomplished by the respective agencies’ forces, as directed by the District Engineer. Any adjustments and/or relocations on municipally owned facilities shall be done by the State’s contractor in accordance with the respective agencies’ standard specifications as directed by the District Engineer.
5. No environmental permits are required for this work provided no jurisdictional wetlands or waters are impacted. If there is a question as to whether or not a water or wetland is jurisdictional, contact the DeIDOT Environmental Section at 302-760-2264.
6. It is anticipated that all work will occur within DeIDOT’s existing right of way or easement areas. Should the need occur to trespass onto private property; it will be the responsibility of the project manager to secure such trespass needs.
7. It is anticipated that all work will occur within DeIDOT’s right of way. Should the need occur to trespass onto railroad property, including the highway-rail crossing; it will be the responsibility of the project manager to contact the railroad chief engineer and obtain written authorization before entering.
8. The Contractor shall not trespass on private property unless the department has acquired a “Temporary Trespass Agreement” from the property owner. If the work is within a permanent easement, the work shall not begin until the adjacent property owners have been notified. Prior to starting work on private property, the Contractor shall notify affected property owners of proposed work dates.
9. The Project Manager shall be responsible for coordinating with the Traffic Section relating to any impacts to Traffic Section facilities (including but not limited to traffic

STATE OF DELAWARE DEPARTMENT OF TRANSPORTATION

Contract No. T2012-034-02

FY12 through FY14

Sinkhole Repair – Canal District – Open End

Page 4 of 16

loops, junction wells, etc.) at least four weeks in advance of the start of the construction activity. Prior to initiating any work on this contract (or sites), the Project Manager shall be responsible for preparing and submitting for approval of the Safety Section, a Maintenance of Traffic Plan. Sufficient time shall be provided for the review and approval of the plan. The Maintenance of Traffic Plan shall include proposed time restrictions on the closure of travel lanes subject to the approval of the Safety Section. Typically, the work shall be done using Typical Application 11A of the Delaware Manual on Uniform Traffic Control Devices For Streets And Highways (DE MUTCD). Restricted working hours will be included on the work orders and will be in effect on state numbered roads as dictated by traffic volumes. For locations requiring a flagging operation, the flagger will be paid the fixed hourly rate per Item 743050.

If a road closure is required, the Contractor shall be required to submit the proposed detour route to the Traffic Engineer for approval. The Contractor shall coordinate the closure with the Engineer. The detour route must be approved by the Engineer prior to closure. All Traffic Control Devices shall be compliant as per NCHRP Report 350. The Contractor shall be responsible for furnishing and maintaining the Maintenance of Traffic apparatus at the closure (i.e. Type III Barricade, Road Closed signs, etc) and all advance warning signs. The Contractor shall be responsible for placement of detour trailblazers. If necessary, the Engineer will assign the detour route.

Drums with florescent sheeting will be required in work areas where completion time will extend beyond one daylight operation. For roadways with a posted speed limit of 25 MPH or less, a minimum of three drums with florescent sheeting will be required and warning lights will not be required. For roadways with a posted speed limit greater than 25 MPH, Type 'A' or 'B' warning lights will be required as outlined in the Delaware Manual on Uniform Traffic Control Devices For Streets And Highways (DE MUTCD) and additional drums with florescent sheeting may be required as directed by the Engineer or representative.

All open excavations shall be secured with plastic drums with florescent sheeting and orange, plastic snow fence. If the construction activity results in a vertical difference or drop-off along, adjacent to or across a travel way, the Contractor shall eliminate or remedy this hazard by the methods detailed in Section 6G.20 of the Delaware Manual on Uniform Traffic Control Devices For Streets And Highways (DE MUTCD) as directed by the Engineer. The snow fence, tie wire, etc shall be incidental to the work it protects.

10. The Project Manager is responsible for ensuring any required documents and analysis as part of the adopted Work Zone Safety and Mobility Procedures and Guidelines has been completed prior to any work starting on this contract.
11. Work located in Municipalities requires Town Agreements. Work in these locations cannot commence before obtaining them. To obtain a Town Agreement, the contractor must work with Hugo Dreibelbis of DeIDOT's TEAM Support at (302) 760-2251.
12. The work will be scheduled via work orders from the department. Work sites will vary in complexity. Typically, the work will involve repairing and/or replacing drainage inlets in

STATE OF DELAWARE DEPARTMENT OF TRANSPORTATION

Contract No. T2012-034-02

FY12 through FY14

Sinkhole Repair – Canal District – Open End

Page 5 of 16

or off the roadway, repairing and/or replacing drainage pipes in or off the roadway, removing and replacing curb and/or sidewalk and restoration. The sites will be in Area 9 and Area 10 (Canal District) in New Castle County, Delaware (reference pages 13 and 14). The work orders will indicate the work to be performed at each site. Any questions pertaining to any locations, during construction, shall be referred to the Engineer or his representative.

13. Pipe failures will be repaired in one of two ways at the discretion of the Engineer or representative. The minimum repair will be to plug lift holes or seams as directed and wrap the pipe with an approved geo-textile material fastened securely around the pipe with epoxy-coated tie wire. For pipes in roadways, or in cases of severe joint or pipe dislocation, a concrete collar shall be placed after the wrapping the pipe with geo-textile as stated above. The collar (reference page 15) shall consist of a wrap of 4 x 4 inch welded wire fabric offset from the pipe wall with cement brick as required, and a concrete collar. The collar shall surround the length of the pipe that has failed (top, bottom and sides). Any geo-textile, welded wire fabric, mortar for plugging lift holes or seams using non-shrink grout, lumber for form work or miscellaneous hardware or material required for pipe repairs, labor and equipment shall be incidental to Items 208000 and 602002. No concrete shall be released or placed until the depth of the excavation and the character of the foundation material, the adequacy of the forms and false-work, and the placing of reinforcement have been inspected and approved by the Engineer or representative.
14. An approved concrete sealant shall be used to seal the exterior and interior of the drainage inlet and shall be incidental to Item 710001.
15. Clearing and grubbing of trees and shrubs less than 6 inches in diameter shall be incidental to the applicable repair or replacement item. Other clearing and grubbing will be negotiated or performed by Force Account procedures.
16. All topsoil (Item 732000) shall be of the pre-sifted variety to remove any sticks, rocks or other contaminants.
17. All replacement pipes shall be the same size and material as the pipe that was removed or as directed by the Engineer or representative. Removal and disposal of existing pipe to an approved location is incidental to Item 208000.
18. The Contractor shall protect all driveways from damage due to Contractor's equipment and shall be responsible for all such damage done by Contractor's equipment.
19. Underground utilities may be present at all locations. Therefore, all standard practices and procedures regarding utilities shall be followed. Contractor is required to contact Miss Utility at least one week prior to starting each work order.
20. 6.0 inch PCC Sidewalk will be required at all driveways as per PCC Sidewalk standard detail and as directed by the Engineer or representative.

STATE OF DELAWARE DEPARTMENT OF TRANSPORTATION

Contract No. T2012-034-02

FY12 through FY14

Sinkhole Repair – Canal District – Open End

Page 6 of 16

- 21. Payment for wheel chair ramps will be per Item 705001 or Item 705002.
- 22. Excavation, removal and disposal of existing drainage inlets, sidewalk, curb and gutter, pipe, etc, payment shall be incidental to the price bid or negotiated for the applicable replacement item. Excavation for repair and placement of drainage inlets and placement of sidewalk, curb and gutter, and GABC, shall be incidental to the price bid for those items. Excavated material not needed on the project shall be removed from the site at the Contractor's expense.
- 23. The Contractor will be advised of work to be performed or deleted by letter with work orders. The work order will indicate the location, an estimate of the items and quantities, property owner notification requirements, and the allowable time to perform the work. Time to perform the work assigned per work order shall be developed by the following method and Items:

Internal Pipe Repairs

Legend:

- 2 Days = Startup time, from date of issue, of each new work order location
- 1 Day = Time to video inspect 400 ft of a drainage system (pipes, inlets & manholes)
- 1 Day = Time to repair 12 pipe joints
- 1/2 Day = Restoration for associated sinkhole (Topsoil, grass seed, straw mulch, and/or site cleanup)

Example: A work order with the following repair items issued to the Contractor on Friday, May 1, 2009

- A = 300 ft of drainage system (video inspection only)
- B = 18 pipe joints repairs
- C = Restoration (Topsoil, grass seed, straw mulch and site cleanup)

Formula:

$$\begin{aligned} \text{Time To Complete} &= 2 \text{ days startup} + A(1 \text{ day}/400 \text{ ft video inspect}) + B(1 \text{ day}/12 \text{ pipe joint repairs}) + 1/2 \text{ day restoration} \\ &= 2 \text{ days startup} + (300 \text{ ft of video inspect})(1 \text{ day}/400 \text{ ft of video inspect}) \\ &\quad + (18 \text{ pipe joint repairs})(1 \text{ day}/12 \text{ pipe joint repairs}) + 1/2 \text{ day restoration} \\ &= 2 + 0.75 + 1.5 + 0.5 \end{aligned}$$

$$\begin{aligned} \text{Time To Complete} &= 4.75 = \mathbf{5.0 \text{ Days}} \end{aligned}$$

STATE OF DELAWARE DEPARTMENT OF TRANSPORTATION

Contract No. T2012-034-02

FY12 through FY14

Sinkhole Repair – Canal District – Open End

Page 7 of 16

The first day charged for the work order in this example is Monday, May 4th. Completion of all construction activities is required before the end of Wednesday, May 13th. Liquidated damages are assessed starting Thursday, May 14th, and remain in effect until all work is completed and accepted by the department.

Sinkhole Repairs

Legend:

4 Days = Startup time, from date of issue, of each new work order location. This includes contacting Miss Utility.

1 Day = Time to repair one drainage inlet or manhole.

3 Days = Time to remove and replace one drainage inlet.

1 Day = Time to remove and replace one drainage inlet hood.

1 Day = Time to repair 27 ft of pipe (each joint wrap and/or collar counted as 14 ft).

1 Day = Time to remove and replace 55 ft of pipe.

1 Day = Time to remove and replace 150 ft² of 4 inch or 6 inch sidewalk.

1 Day = Time to remove and replace 70 ft of curb and or curb and gutter.

2 Days = Restoration (Topsoil, grass seed, straw mulch, and/or hot mix patch placement, site cleanup.).

1 Day = Time to remove and replace 538 ft² of hot mix patching, for hot mix quantities greater than 108 ft². Hot mix patching quantities less than 108 ft² are considered incidental to the work, and shall offer no additional time for completion.

Example: A work order with the following repair items issued to the Contractor on Friday, June 1, 2007

A = 1 drainage inlets repairs

B = 1 drainage inlet, remove and replace

C = 1 drainage inlet hood, remove and replace

D = 92 ft of pipe repair

E = 92 ft of pipe removal and replacement

F = 40 ft² of 6 inch sidewalk removal and replacement

G = 10 ft of curb replacement

H = 86 ft² of hot mix patching.

Formula:

$$\text{Time To Complete} = 4 \text{ days startup} + A(1 \text{ day/CB repair}) + B(3 \text{ days/CB replacement}) + C(1 \text{ day/Hood}) + D/(27 \text{ ft/day}) + E/(55 \text{ ft/day}) + F/(150 \text{ ft}^2/\text{day}) + G/(70 \text{ ft/day}) + H/(538 \text{ ft}^2/\text{day}) + 2 \text{ restoration}$$

$$= 3 \text{ days startup} + (1 \text{ CB})(1 \text{ day/CB repair}) + (1 \text{ CB})(3 \text{ days/CB replacement}) + (1 \text{ Hood})(1 \text{ day/hood}) + (91 \text{ ft Pipe Repair})/(27 \text{ ft/day})$$

STATE OF DELAWARE DEPARTMENT OF TRANSPORTATION

Contract No. T2012-034-02

FY12 through FY14

Sinkhole Repair – Canal District – Open End

Page 8 of 16

$$+ (91 \text{ ft Pipe Replacement})/(55 \text{ ft/day}) + (40 \text{ ft}^2)/(150 \text{ ft}^2/\text{day}) + (10 \text{ ft curb})/(70 \text{ ft/day}) + (86 \text{ ft}^2 \text{ patching})/(538 \text{ ft}^2/\text{day}) 0 + 2 \text{ restoration}$$

$$= 3 + 1 + 3 + 1 + 3.33 + 1.67 + 0.26 + 0.14 + 0 + 2$$

Time To Complete = 14.4 = **15.0 Days**

The first day charged for the work order in this example is Monday, June 4th. Completion of all construction activities is required before the end of Friday, June 22nd. Liquidated damages are assessed starting Monday, June 25th, and remain in effect until all work is completed and accepted by the department.

24. Prosecution and progress of work:

The Contractor shall commence work indicated on the work order no later than the third day after issuance unless required materials are not available. Non-availability of materials shall be verified by at least three (3) different sources. Verification shall be formal and supplied by the Contractor in writing.

Issuance of each work order constitutes the notice to proceed with the work described on the work order.

If there is a verified non-availability of materials, time charges shall commence on the first (1st) working day following the delivery date of said materials.

The Contractor shall have up to eighteen (18) active work orders at any one time until all assigned work has been completed. The Contractor shall be required to have simultaneous operations up to the limit of eighteen (18) active work orders. The District will attempt to issue the work orders grouped together by location. The Contractor shall be required to work in multiple areas concurrently to engage in the limit of eighteen (18) work orders simultaneously. The Contractor is required to have a minimum of three viable working crews readily available to work on this contract unless otherwise directed by the Engineer or representative. Each crew is required to have a qualified superintendent as outlined in Section 105.07 of the Standard Specifications and at least two (2) qualified equipment operators.

Failure to complete assigned work orders in the calculated time constitutes "Failure to Pursue the Work" and subjects the Contractor to liquidated damages as outlined in Subsection 108.09 of the Standard Specifications. If work on a specific work order is not completed within the allotted time, liquidated damages will be assessed in accordance with Subsection 108.09 and based on the total value of that work order.

A final inspection will be performed in accordance with Subsection 105.20 on each work order and if the work is satisfactorily completed it will be accepted by the department. When seeding is required on the work order, a full stand of grass will be required. The

STATE OF DELAWARE DEPARTMENT OF TRANSPORTATION

Contract No. T2012-034-02

FY12 through FY14

Sinkhole Repair – Canal District – Open End

Page 9 of 16

stand shall be established for a minimum of seven days prior to final inspection.

25. Each work order shall be considered a single unit of work. Upon completion of each single unit of work and acceptance by the department, one itemized invoice will be prepared by the department for that unit. A summary of the work orders will also be provided. The Contractor shall review and approve the invoices and summary. Payment will be monthly for the completed invoices as outlined in Section 109.07.
26. The following changes to the Standard Specifications are applicable to this contract:
 - (a) Delete subsection 108.02.
 - (b) Delete the second sentence of subsection 104.05 and subsections A through E.
27. Replacement of all drainage inlets or pipes will be subject to Section 710.10 of Standard Specifications.
28. Paragraph three of Section 406.05 of the standard specifications shall be deleted. When patching is required, the removal of pavement material (hot mix, graded aggregate base course, etc) shall be paid for under Section 406, hot-mix patching. For patches needed to work on pipe crossings, material removed below the pavement box will be paid for by Section 208. For patches needed to work on structures, removal of material below the pavement box will be incidental to Section 708 or 710.
29. The Contractor shall submit pipe video media files to the Department in MPEG format via a DVD or CD data storage disk. The file naming convention for the MPEGs shall indicate both work order number and location (for example, "37037 Theodora Court.mpg"). Each work order shall have a separate folder directory with the following naming convention: "DVD Drive:/37037 Theodora Court".
30. Depending on fund availability, the department reserves the right to increase or decrease quantities of items specified in this contract. Such additions or subtractions shall not be cause for an increase or decrease in contract unit bid prices. When total alterations involve an increase or decrease of more than 50 percent in the quantity of any contract item, either party to the contract shall be entitled to demand a Supplemental Agreement on that portion of the work.
31. Item 302007, Graded Aggregate Base Course, Type B, shall be used as base material under all curb, sidewalk and pavement (reference page 16).
32. Payment for Item 602002, Portland Cement Concrete Masonry Class B, will be made based on the actual measured quantity placed. Epoxy coated reinforcing, bonding agent, ties, inserts, etc as required by the Engineer or representative shall be incidental to the concrete work.

STATE OF DELAWARE DEPARTMENT OF TRANSPORTATION

Contract No. T2012-034-02

FY12 through FY14

Sinkhole Repair – Canal District – Open End

Page 10 of 16

33. All additional work shall be performed by contract unit prices. In the case where contract prices are not available, prices are to be negotiated or performed by Force Account procedures.
34. At the discretion of the Engineer or representative, there may be periodic winter shutdowns due to inclement weather and/or low temperatures. During winter shutdowns, the Contractor shall not be charged time for issued work orders.
35. The Contractor and their heirs, successors, assigns and agents guarantee the specific locations listed in this contract against the failure of the pipe repair for three (3) years from the date of acceptance by the department. This is a good faith guarantee which shall not be cause for the department to retain the completion security, but failure to comply will affect future work with the department.
36. All flaggers utilized by the Contractor for this project shall be ATSSA certified. All flaggers shall have certification cards with them while working. Absence of a certification card will be justification for flagger dismissal from the site and corresponding suspension of work. All construction and Contractor vehicles and self-propelled equipment shall be equipped with an operating roof mounted amber flashing light.
37. ½ inch cork expansion material shall be placed on each end of replaced curb, sidewalk and drainage inlets as well as intermittently as required in the standard specifications. Payment for Item 762002, Saw Cutting Concrete, Full-Depth shall be full compensation for furnishing and placing the ½ inch cork expansion material.

COPY

STATE OF DELAWARE DEPARTMENT OF TRANSPORTATION

Contract No. T2012-034-02

FY12 through FY14

Sinkhole Repair – Canal District – Open End

Page 11 of 16

Quantity Summary

Item #	Item Description	Unit	Quantity
202000	Excavation and Embankment	C.Y.	1,500
208000	Excavation and Backfill for Pipe Trenches	C.Y.	3,000
210000	Type C Borrow, Trench and Structure Backfill	C.Y.	210
302007	GABC, Type B	C.Y.	1,000
302008	GABC, Type B, Patching	C.Y.	15
401665	Superpave, Type C Hot-Mix, 160 Gyration, Patching	T	450
401666	Superpave, Type B Hot-Mix, 160 Gyration, Patching	T	450
406001	Hot-Mix Patching	S.Y.- IN.	3,000
602002	Portland Cement Concrete Masonry, Class B	C.Y.	600
605573	Steel Plates, 4' x 6' x 3/4"	EA	60
612002	RCP 15" Diameter	L.F.	350
612003	RCP 18" Diameter	L.F.	150
612005	RCP 24" Diameter	L.F.	150
612520	Corrugated Polyethylene Pipe, Type S, 15"	L.F.	500
612529	Pipe Video Inspection	L.F.	10,000
612535	Cleaning Drain Pipe, 15" - 24" Diameter	L.F.	10,000
612536	Cleaning Drain Pipe, Greater than 24" - 30" Diameter	L.F.	3,000
612537	Heavy Cleaning of Drainage Pipe	HOUR	300
612539	Pressure Grouting Pipe Joints, 15" - 24" Diameter	EACH	450
612540	Pressure Grouting Pipe Joints, Greater than 24" - 30" Diameter	EACH	450
701010	PCC Curb, Type 1	L.F.	300
701020	Integral PCC Curb and Gutter, Type 1	L.F.	300
701021	Integral PCC Curb and Gutter, Type 2	L.F.	1,250
705001	PCC Sidewalk, 4"	S.F.	3,000
705002	PCC Sidewalk, 6"	S.F.	1,000
705007	Sidewalk Surface Detectable Warning System	S.F.	30
708050	Drainage Inlet, 34" X 18"	EACH	20
708051	Drainage Inlet, 34" X 24"	EACH	30
708060	Replace Catch Basin Grates	EACH	150
708061	Replace Catch Basin Frames	EACH	60
710001	Adjust and Repair Existing Catch Basin	EACH	800
712005	Riprap, R-4	S.Y.	200
713003	Geotextiles, Riprap	S.Y.	200

STATE OF DELAWARE DEPARTMENT OF TRANSPORTATION

Contract No. T2012-034-02

FY12 through FY14

Sinkhole Repair – Canal District – Open End

Page 12 of 16

714003	Ditching	L.F.	1,500
743006	Plastic Drums	EA-DAY	5,000
732000	Topsoil (4" Depth)	S.Y.	12,000
734016	Permanent Seeding, Subdivision	S.Y.	12,000
743050	Flagger, New Castle County, State	HOOR	1,500
743009	Furnish and Maintain Truck Mounted Attenuator, Type 1	EA-DAY	30
743010	Furnish and Maintain Truck Mounted Attenuator, Type 2	EA-DAY	30
743525	Temporary Warning Signs	EA-DAY	1,000
762001	Saw Cutting, Hot-Mix	L.F.	5,000
762002	Saw Cutting, Concrete, Full Depth	L.F.	1,450
763000	Initial Expense	LS	1

UNOFFICIAL

WEBSITE

COPY

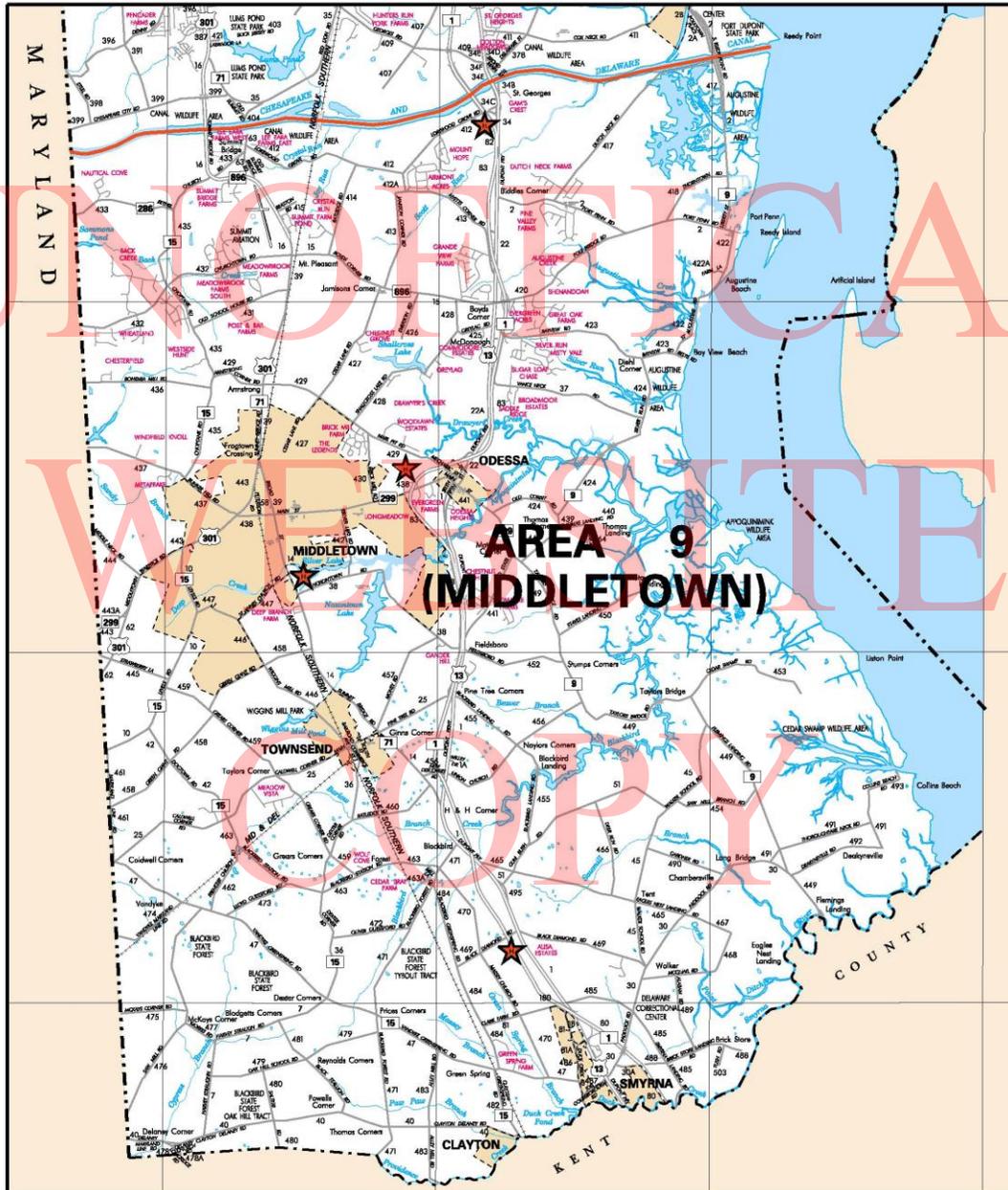
STATE OF DELAWARE DEPARTMENT OF TRANSPORTATION

Contract No. T2012-034-02

FY12 through FY14

Sinkhole Repair – Canal District – Open End

Page 13 of 16



AREA 9

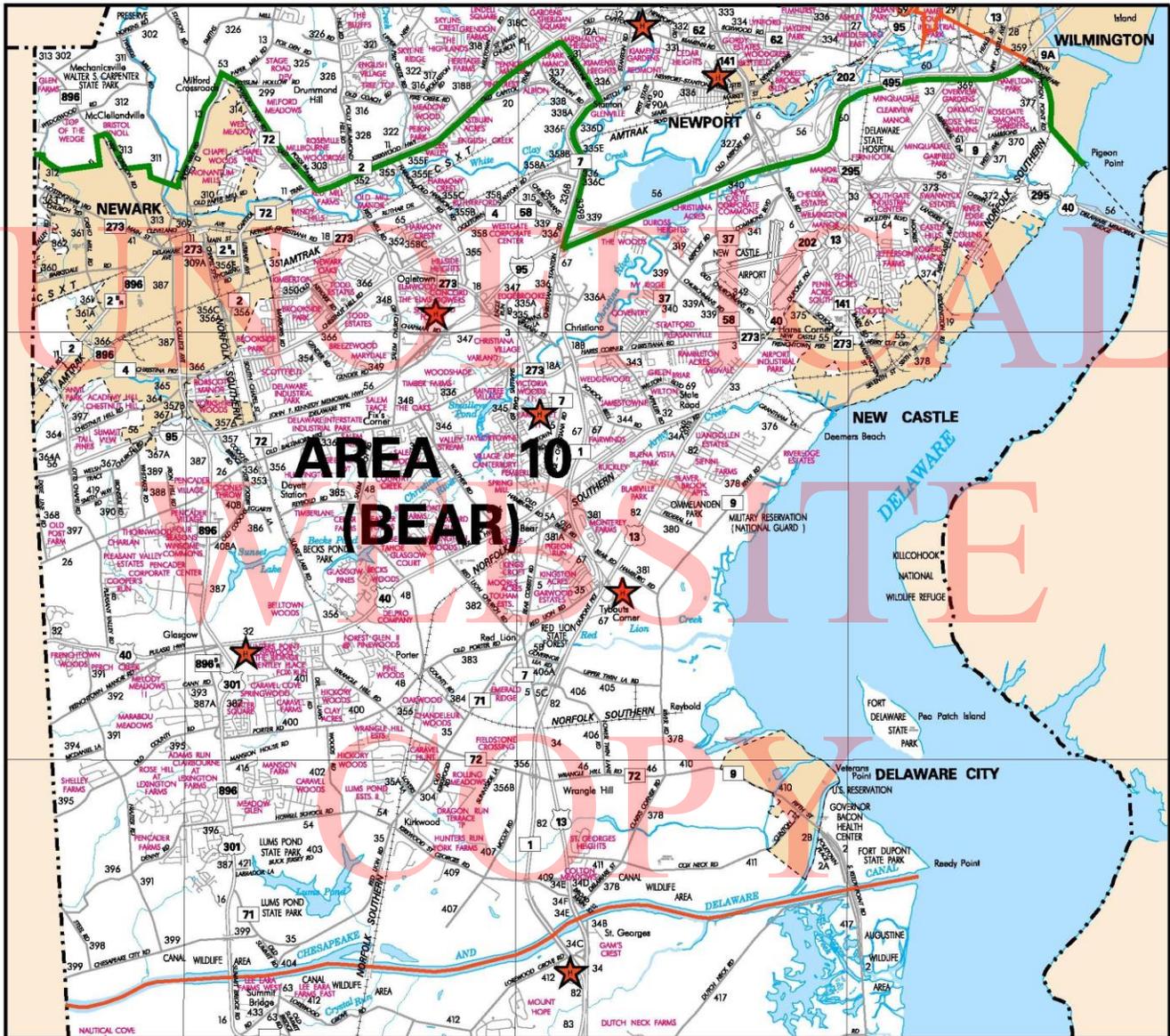
STATE OF DELAWARE DEPARTMENT OF TRANSPORTATION

Contract No. T2012-034-02

FY12 through FY14

Sinkhole Repair – Canal District – Open End

Page 14 of 16



AREA 10

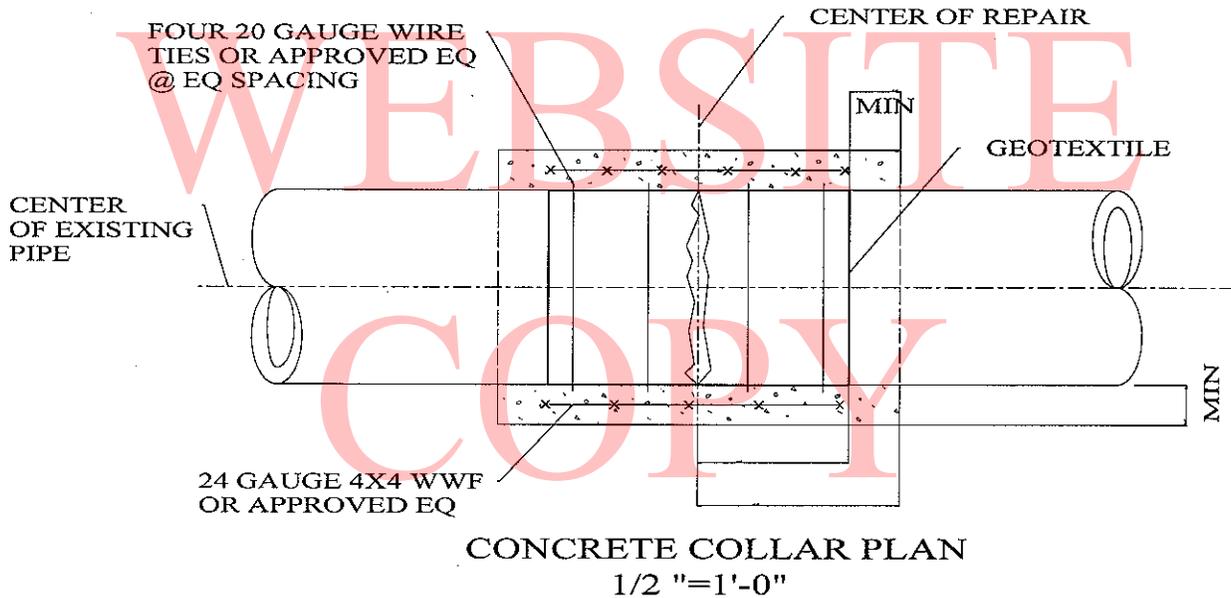
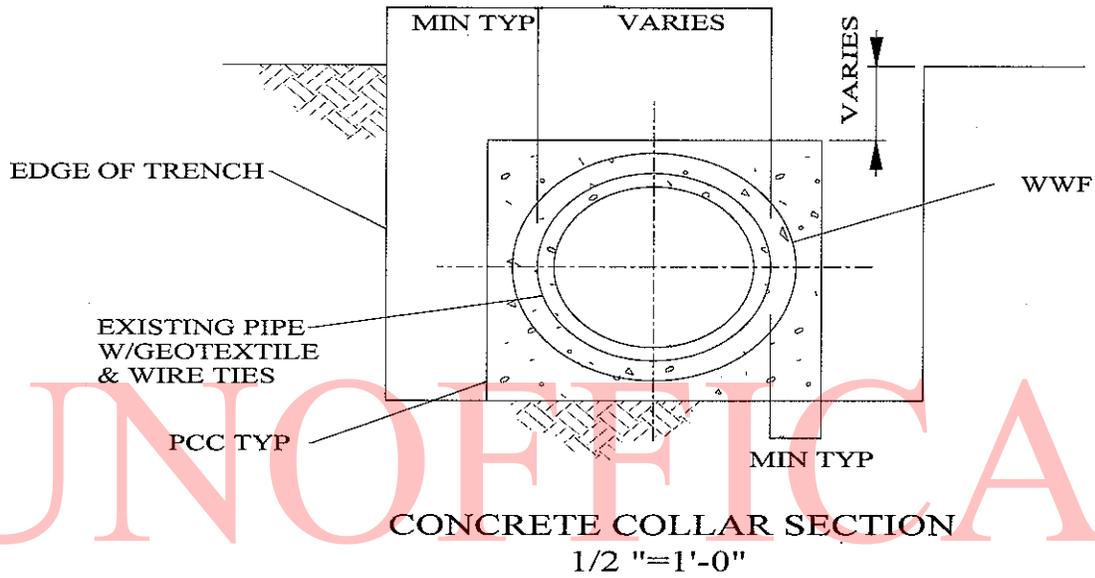
STATE OF DELAWARE DEPARTMENT OF TRANSPORTATION

Contract No. T2012-034-02

FY12 through FY14

Sinkhole Repair – Canal District – Open End

Page 15 of 16



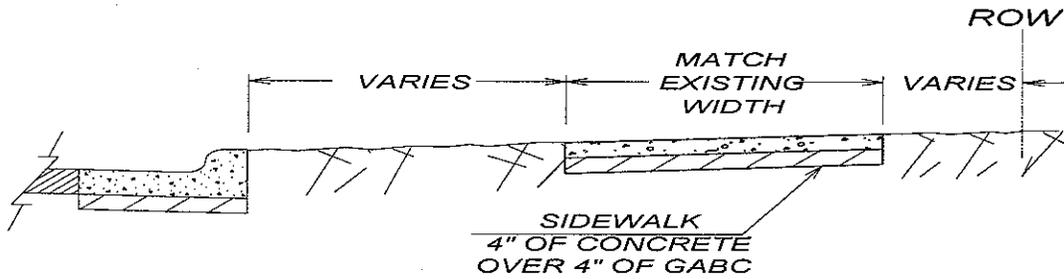
STATE OF DELAWARE DEPARTMENT OF TRANSPORTATION

Contract No. T2012-034-02

FY12 through FY14

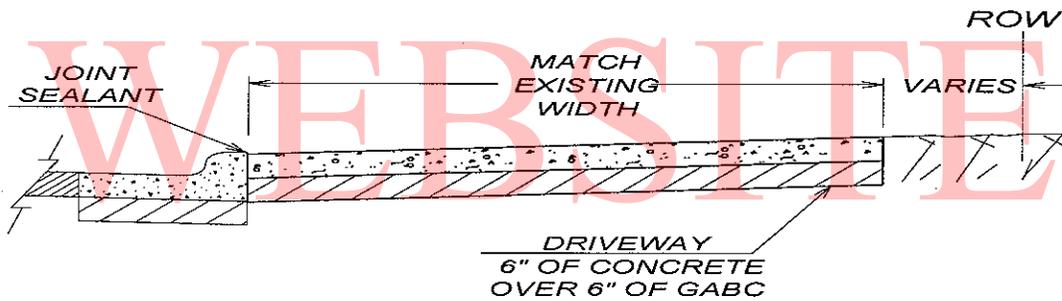
Sinkhole Repair – Canal District – Open End

Page 16 of 16



TYPICAL SIDEWALK SECTION

NOT TO SCALE



TYPICAL DRIVEWAY SECTION

NOT TO SCALE