

Arlington County Department of
Environmental Services
DES

**Construction Standards and
Specifications
2020**

**Update #1
February 2023**



The following Specifications are modified or added to the 2020 DES Construction Standards and Specifications:

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SECTION 01500 – TEMPORARY EROSION AND SEDIMENT CONTROL

PART 3 - EXECUTION

PARAGRAPH 3.1 Installation and Maintenance of Erosion and Sediment Controls is amended as follows:

Delete

3.1.E The Contractor shall conduct dewatering operations in a manner to prevent sediment or other pollutants from discharging to the County’s storm drain system, which includes the curb and gutter, or any surface water. Dewatering operations shall not create any erosion or flooding. Dewatering discharges that contain chemicals, hydrocarbons, or sewage shall not be discharged to the storm drain system. Any discharge from dewatering operations shall be properly filtered prior to being discharged. A dewatering plan with sufficient detail to ensure the proposed dewatering shall comply with applicable regulations must be included as part of the erosion and sediment control plan.

Add

3.1.E The Contractor shall conduct dewatering operations in a manner to prevent sediment or other pollutants from discharging to the County’s storm drain system, which includes the curb and gutter, or any surface water. Dewatering operations shall not create any erosion or flooding. Dewatering discharges that contain chemicals, hydrocarbons, or sewage shall not be discharged to the storm drain system. Any discharge from dewatering operations shall be properly filtered prior to being discharged. A dewatering plan with sufficient detail to ensure the proposed dewatering shall comply with applicable regulations *shall be prepared by the Contractor.*

SECTION 02200 – EARTHWORK

PART 3 - EXECUTION

PARAGRAPH 3.5 Dewatering is amended as follows:

Delete

3.5.C The Contractor shall conduct dewatering operations in a manner to prevent sediment or other pollutants from discharging to the County’s storm drain system, which includes the curb and gutter, or any surface water. Dewatering operations shall not create any erosion or flooding. Dewatering discharges that contain chemicals, hydrocarbons, or sewage shall not be discharged to the storm drain system. A dewatering plan with sufficient detail to ensure the proposed dewatering shall comply with applicable regulations must be included as part of the erosion and sediment control plan.

Add

3.5.C The Contractor shall conduct dewatering operations in a manner to prevent sediment or other pollutants from discharging to the County’s storm drain system, which includes the curb and gutter, or any surface water. Dewatering operations shall not create any erosion or flooding. Dewatering discharges that contain chemicals, hydrocarbons, or sewage shall not be discharged to the storm drain system. Any discharge from dewatering

operations shall be properly filtered prior to being discharged. A dewatering plan with sufficient detail to ensure the proposed dewatering shall comply with applicable regulations shall be prepared by the Contractor.

SECTION 02500 – GRAVITY SEWERS AND APPURTENANCES

PART 1 – GENERAL

PARAGRAPH 1.3 **Applicable Standards** is amended as follows:

Delete

1.3.H Virginia Department of Health (VDH) and State Water Control Board Sewerage Regulations (VR 355-17-000) [Section 62.1-44.19(8) of the Virginia Code].

Add

1.3.H Virginia Administrative Code 9VAC25-790 Part III. Manual Practice for Sewerage Systems and Treatments Works.

PART 4 – MEASUREMENT AND PAYMENT

PARAGRAPH 4.1 **Sewer** is amended as follows:

Delete

4.1.A Sewer pipe for the various materials, classes, and sizes shown on the plans shall be measured in linear feet along the center line of the pipe and shall be measured from inside wall of structure to inside wall of structures. Payment shall include the furnishing of all pipe and fittings, all necessary tests, excavation, removal and disposal of existing pipes, removal and disposal of unsuitable or surplus material, placement of bedding and backfill as shown in Standard M-3.0, restoration of roadways as shown in Standard M-6.1, all other restoration, and all other work required to providing a complete sewer installation in compliance with the Construction Documents.

Add

4.1.A Sewer pipe for the various materials, classes, and sizes shown on the plans shall be measured in linear feet along the center line of the pipe and shall be measured from inside wall of structure to inside wall of structures. Payment shall include the furnishing of all pipe and fittings, all necessary tests, excavation, abandonment and/or removal and disposal of existing pipes, removal and disposal of unsuitable or surplus material, placement of bedding and backfill as shown in Standard M-3.0, restoration of roadways as shown in Standard M-6.1, all other restoration, and all other work required to providing a complete sewer installation in compliance with the Construction Documents.

SECTION 02510 – SANITARY SEWERS AND APPURTENANCES

PART 1 – GENERAL

PARAGRAPH 1.3 Applicable Standards is amended as follows:

Delete

1.3.I Virginia Department of Health (VDH) and State Water Control Board Sewerage Regulations (VR 355-17-000) [Section 62.1-44.19(8) of the Virginia Code].

Add

1.3.I Virginia Administrative Code 9VAC25-790 Part III. Manual Practice for Sewerage Systems and Treatments Works.

PART 3 – EXECUTION

PARAGRAPH 3.2 Sanitary Sewer Design Criteria is amended as follows:

Delete

3.2.A.2 Sanitary sewer mains shall be a minimum 8-inches in diameter and shall be installed in straight alignment and grade between manholes. Minimum sewer slopes should be 0.5%. Minimum slopes for terminal sewer segments and sewers serving less than 10 households or their equivalent should be 1.0%. Slopes less than those mentioned above shall only be considered for approval by DES in extreme cases with justification provided by the Licensed Professional Engineer. Absolute minimum allowable slopes for various sized pipes shall conform to Virginia Department of Health Sewerage Regulation VR 335-17-106.05(c) for non-settled sewage. Maximum slopes shall be 15%. Slopes shall be determined between centers of manholes.

Add

3.2.A.2 Sanitary sewer mains shall be a minimum 8-inches in diameter and shall be installed in straight alignment and grade between manholes. Minimum sewer slopes should be 0.5%. Minimum slopes for terminal sewer segments and sewers serving less than 10 households or their equivalent should be 1.0%. Slopes less than those mentioned above shall only be considered for approval by DES in extreme cases with justification provided by the Licensed Professional Engineer. Absolute minimum allowable slopes for various sized pipes shall conform to Virginia Administrative Code 9VAC25-790-320. Design details for non-settled sewage. Maximum slopes shall be 15%. Slopes shall be determined between centers of manholes.

Delete

3.2.A.14 Ventilation of gravity sewer systems shall be provided where continuous watertight sections (including manholes with watertight covers) greater than 1,000 feet in length are incurred [conforms to Virginia Department of Health Sewerage Regulation VR 355-17106.04(G)].

Add

3.2.A.14 Ventilation of gravity sewer systems shall be provided where continuous watertight sections (including manholes with watertight covers) greater than 1,000 feet in length are incurred [conforms to Virginia Administrative Code 9VAC25-790-350 Manholes (c7)].

SECTION 02555 - DETECTABLE MARKING TAPE AND TRACER WIRE is inserted as follows:

PART 1 - GENERAL

1.1 Description of Work

- A. Provide all labor, materials, and equipment to furnish and install Detectable Marking Tape or Tracer Wire on buried underground utilities installed as specified herein and in related specifications.*

1.2 Related Work Specified Elsewhere

- A. Section 02500 – Gravity Sewers and Appurtenances*
- B. Section 02505 – Storm Sewers and Appurtenances*
- C. Section 02510 – Sanitary Sewers and Appurtenances*
- D. Section 02550 – Water Mains and Appurtenances*

1.3 Applicable Standards and Specifications

- A. American Public Works Association (APWA) Uniform Color Code for Underground Utility Lines*
- B. American Society for Testing and Materials (ASTM)*
- C. Insulation Cable Engineers Association (ICEA)*
- D. National Electrical Manufacturers Association (NEMA)*
- E. Underwriters Laboratories UL 83 Standard for Thermoplastic-Insulated Wires and Cables*

PART 2 - PRODUCTS

2.1 General

- A. Detectable marking tape shall be used for detecting, locating, identifying, and protecting buried utility lines.*
- B. Tracer wire shall be utilized with pipe installed using trenchless methods, or as otherwise required by the Contract Documents or Project Officer.*

2.2 Detectable Marking Tape

- A. Detectable Marking Tape shall be a minimum of overall thickness of five (5) mil and shall be six inches (6") wide.
- B. Tape shall have an aluminum core that can be detected/located using inductive locating techniques.
- C. Properties of Detectable Marking Tape will meet or exceed the standards of ASTM D2103 for Polyethylene Films and Sheeting.
- D. Properties of Detectable Marking Tape will meet or exceed the standards of and ASTM D882 Method A for Tensile Properties and Elongation of Thin Plastic Sheeting.
- E. Coloring and Lettering of Detectable Marking Tape shall be as follows unless otherwise stated in the Contract Documents or approved by the Project Officer.
 - 1. Tape installed with water piping shall have APWA blue background and include "WATER" in black letters.
 - 2. Tape installed with sanitary sewer piping shall have APWA green background and include "SEWER" in black letters.
 - 3. Tape installed with storm sewer piping shall have APWA green background and include "STORM" in black letters.

2.3 Non-Detectable Marking Tape

- A. Non-Detectable Marking Tape shall be a minimum of overall thickness of four (4) mil and shall be six inches (6") wide.
- B. Properties of Non-Detectable Marking Tape will meet or exceed the standards of ASTM D2103 for Polyethylene Films and Sheeting.
- C. Properties of Non-Detectable Marking Tape will meet or exceed the standards of and ASTM D882 Method A for Tensile Properties and Elongation of Thin Plastic Sheeting.
- D. Coloring and Lettering of Non-Detectable Marking Tape shall be as follows unless otherwise stated in the Contract Documents or approved by the Project Officer.
 - 1. Tape installed with water piping shall have APWA blue background and include "WATER" in black letters.
 - 2. Tape installed with sanitary sewer piping shall have APWA green background and include "SEWER" in black letters.
 - 3. Tape installed with storm sewer piping shall have APWA green background and include "STORM" in black letters.

2.4 Tracer Wire

- A. Open Trench - Tracer Wire shall be #12 AWG solid copper with polyethylene insulation of minimum thickness 45 mils.

- B. Directional Drilling / Boring – Tracer wire shall be #10 AWG solid copper, with polyethylene insulation of minimum thickness 45 mils.
- C. Pipe Bursting / Slip Lining – Tracer Wire shall be 7x7 stranded copper, with polyethylene insulation of minimum thickness 45 mils.
- D. Color of Tracer Wire insulation shall be per the APWA Uniform Color Code unless otherwise stated in the Contract Documents or approved by the Project Officer.
- E. Properties of Tracer Wire shall meet or exceed the standards of ASTM B-1, B-3, B08 for Copper conductors.
- F. Properties of Tracer Wire insulation shall meet or exceed the standards of ASTM D-1248 for Polyethylene.
- G. Properties of Tracer Wire shall meet or exceed the standards of ICEA S-70-547, ICEA S-61-402/NEMA WC5 and ICEA S-95-658/NEMA WC70 for cable construction.

PART 3 - EXECUTION

3.1 Detectable Marking Tape

- A. Detectable Marking Tape is required with all new County owned and maintained underground utilities.
- B. Detectable Marking Tape is required with newly installed or relocated water service lines.
- C. Detectable Marking Tape is required with newly installed or relocated sanitary service laterals.
- D. Tape shall be installed above and parallel to the axis of the utility with no breaks in continuity.
- E. Tape shall be continuous from valve box to valve box or structure to structure and shall terminate a maximum of six (6) inches away from valve box or manhole.
- F. Burial depth of Detectable Marking Tape shall not exceed 36 inches below final grade nor be at an elevation less than 12 inches above the utility line. Recommended burial depth is 9 to 18 inches below final grade.

3.2 Non-Detectable Marking Tape

- A. Pipe that is installed with a depth of crown greater than 6 feet shall be installed with Marking Tape placed 12 to 24 inches above the crown of pipe as a visual marker.
- B. Tape shall be installed above and parallel to the axis of the utility with no breaks in continuity.
- C. Tape shall be continuous from valve box to valve box or structure to structure and shall terminate a maximum of six (6) inches away from valve box or manhole.

- D. In all situations in which Non-Detectable Marking Tape is required, Detectable Marking Tape shall also be installed for surface locating.

3.3 Tracer Wire

- A. Tracer Wire installation shall be performed in such a manner that allows proper access for connection of line tracing equipment, proper locating of wire without loss or deterioration of low frequency signal.
- B. Tracer Wire must be installed on County owned and maintained non-metallic pipe.
- C. For gravity sewers, Tracer Wire is not required with mainline of structure to structure construction with no deflections or bends.
- D. Tracer Wire is required on all new non-metallic service laterals from the main line to a ground access point.
- E. Tracer wire shall be attached to the outside of polyethylene encasement on the pipe or joints.
- F. Tracer Wire shall be secured to the carrier pipe at 5 foot intervals and at all joints. Approval for an alternate method of spacing and securing tracer wire to carrier pipe must be obtained from the Project Officer prior to the installation of the carrier pipe.
- G. Tracer Wire shall be installed as a single continuous wire, except where using approved connectors. No looping or coiling of wire is allowed. Connections shall be made per manufacturer's specifications.
- H. Tracer Wire must be grounded via method approved by the Project Officer.
- I. All Tracer Wire termination points must be installed per manufacturer's specifications and approved by the Project Officer.
- J. Trenchless Installation
 - 1. Tracer Wire must be installed on non-metallic pipe and metallic pipe installed using trenchless technology.

PART 4 - MEASUREMENT AND PAYMENT

- 4.1 Installation of Detectable Marking Tape is considered incidental to pipe installation and no separate payment shall be made.
- 4.2 Installation of Tracer Wire is considered incidental to pipe installation and no separate payment shall be made.

END OF SECTION 02555

SECTION 02600 - BITUMINOUS ROADWAY PAVEMENTS

PART 4 – MEASUREMENT AND PAYMENT is amended as follows:

Delete

4.2 Subbase shall be measured to the width and depths shown on the approved plans as verified in the field by the Project Officer or his designee. Payment shall be in cubic yards of material.

Add

4.2 Subbase shall be measured to the width and depths shown on the approved plans as verified in the field by the Project Officer or his designee. Payment shall be in cubic yards of material *and shall include demolition, excavation, and the necessary preparation of the sub grade surface.*

SECTION 02760 - TACTILE WARNING SURFACES is inserted as follows:

PART 1 - GENERAL

1.1 Description of Work

- A. Provide all labor, materials, equipment and services necessary to install Americans with Disabilities Act (ADA) compliant replaceable Tactile Warning Surfaces specified herein.*

1.2 Related Work Specified Elsewhere

- A. Section 02200 – Earthwork*
- B. Section 02611 - Concrete Walks & Concrete Driveway Entrance*
- C. Section 02612 - Interlocking Concrete and Brick Pavers*
- D. Section 03100 - Concrete, Formwork, Reinforcement and Materials*

1.3 Applicable Standards and Specifications

- A. Americans with Disabilities Act (ADA)
 - 1. Title 49 CFR Transportation, Part 37.9 Standards for Accessible Transportation Facilities, Appendix A, Section 4.29.2 Detectable Warnings on Walking Surfaces.**
- B. American Society for Testing and Materials (ASTM)*
- C. Virginia Department of Transportation, Road and Bridge Specifications (VDOT)*

1.4 Submittals

- A. Product Data- Submit literature describing
 - 1. Product specifications*
 - 2. Installation processes and procedures*
 - 3. Maintenance instructions requirements**
- B. Sample for Verification Purposes
 - 1. 8" x 8" Tactile Warning Surface Sample*
 - 2. Labeled with
 - a. Manufacturer's Name*
 - b. Catalog Number*
 - c. Name of Project*
 - d. Submitting Contractor*
 - e. Date of Submittal***
- C. Material Test Report*

1. Current test report from accredited independent testing Laboratory in accordance with ASTM guidelines

D. Manufacturer Shop Drawings

E. Maintenance Instructions

1.5 Quality Assurance

A. Provide replaceable Cast In Place Tactile Warning Surface Panels (CIP) and accessories as produced by a single manufacturer with a minimum of five years experience in manufacturing Cast In Place Composite Shell Tactile Warning Surface Tiles.

B. Cast In Place Tactile Warning Surface Panels (CIP) must be compliant with ADAAG, and PROWAG

C. Cast In Place Tactile Warning Surface Panels (CIP) shall meet or exceed the following test criteria using the most current test methods:

1. Compressive Strength: 28,900 psi minimum, when tested in accordance with ASTM D695.
2. Flexural Strength: 29,300 psi minimum, when tested in accordance with ASTM D790.
3. Water Absorption: Not to exceed 0.10%, when tested in accordance with ASTM D570.
4. Slip Resistance: 1.05 minimum wet and 1.18 dry static coefficient of friction when tested in accordance with ASTM C1028.
5. Flame Spread: 25 maximum, when tested in accordance with ASTM E84.
6. Salt and Spray Performance of Tactile Warning Surface: No deterioration or other defects after 200 hours of exposure, when tested in accordance with ASTM-B117.
7. Chemical Stain Resistance: No reaction to 1% hydrochloric acid, motor oil, calcium chloride, gum, soap solution, bleach, and antifreeze, when tested in accordance with ASTM D543.
8. Abrasion Resistance: 500 minimum, when tested in accordance with ASTM C501.
9. Accelerated Weathering of Tactile Warning Surface when tested by ASTM-G155 or ASTM G151 shall exhibit the following result: $\Delta E < 5.0$ at 2,000 hours minimum exposure.
10. Tensile Strength: 11,600 psi minimum, when tested in accordance with ASTM D638.
11. AASHTO-H20 Load Bearing Test: No Damage at 16,000# loading.
12. Freeze/Thaw/Heat: No deterioration when tested in accordance with ASTM C 1026.

1.6 Guarantee

A. CIP Panels shall be guaranteed in writing for a period of five (5) years from date of Contract's final completion. The guarantee includes manufacturing defects, breakage, deformation and all criteria referenced in Quality Assurance.

PART 2 - PRODUCTS

2.1 Materials

- A. Composition: CIP Panels shall be manufactured using a matte finish exterior grade homogeneous (uniform color throughout thickness of product) glass and carbon reinforced polyester-based Sheet Molding Compound (SMC) composite material.
- B. Domes:
 - 1. Square grid pattern of raised truncated domes of 0.2" nominal height,
 - 2. Base diameter of 0.9" and top diameter of 0.45".
 - 3. Truncated dome spacing range of 1.6"-2.4."
 - 4. Domes must contain fiberglass reinforcement within the truncated dome. A matte finish will be required on the Tactile Warning Surface.
- C. Use of Tactile Warning Surface Products employing coatings, aesthetic patterns, or featuring layers of material with differing composition, performance, or color properties is prohibited.
- D. Color: Color shall be homogeneous throughout CIP panel.
 - 1. Safety Yellow is the VDOT standard color for detectable warning panels and shall be the default color for all Tactile Warning Surfaces set in concrete unless otherwise specified in the Contract Documents or approved by the Project Officer.
- E. The panel shall have a non-slip textured surface with a minimum static coefficient of friction of 0.80, wet and dry.
- F. Minimum panel thickness shall be 0.25" with a perimeter structural flange minimum 0.70" in depth with gaps to prevent air entrapment.
- G. Panel Size: Precast modules shall be a minimum size of 24"x48" or 24"x60" for a full tile. Full tiles may be cut to a size of 24"x24" to fit field requirements.
- H. Panels shall be delivered pre-assembled with an anchoring system designed for insertion and embedment into wet concrete. Anchor locations must be covered with structural water-tight caps. Anchor locations shall not be at truncated dome locations
- I. Panels shall be replaceable.

PART 3 - EXECUTION

3.1 Installation

- A. Tactile Warning Surface Panels are not to be installed until all submittals have been reviewed and approved by the Project Officer.
- B. Panels must be installed per manufacturers' instructions.

- C. The concrete shall be poured and finished, true and smooth to the required dimensions and slope while maintaining a slump ratio of 4-7 inches to permit the placement of the panel in the wet cement.
- D. Tiles shall be tamped or vibrated into the fresh concrete to ensure there are no voids or air pockets, and the field level of the Tile is flush to the adjacent concrete surface to permit proper water drainage and eliminate tripping hazards between adjacent finishes. When necessary, suitable weights such as 2 concrete blocks or sandbags (25 pounds) shall be placed on each Tile.
- E. Cutting and Setting of Tiles shall be cut into size and configuration on a table saw or equivalent cutting device. Minimize cantilever effect when cutting between the anchor inserts and maintain maximum anchors for installation integrity. Panels shall be cut to no less than 2-feet in any direction.
- F. Tiles shall be oriented such that the rows of inline truncated domes are parallel with the direction of the ramp. When multiple Tiles are used, the truncated domes shall be aligned between the tactile warning surface Tiles and throughout the entire tactile warning surface installation.
- G. Tactile Warning Surface Tile shall be located relative to the curb line.
- H. During and after the Tiles installation and the concrete curing stage, there shall be no walking, leaning or external forces placed on the Tiles causing a void between the underside of the Tile and the concrete.

PART 4 - MEASUREMENT AND PAYMENT

- 4.1 Measurement shall be in square feet per the plan dimensions as verified in the field by the Project Officer or his designee.
- 4.2 Payment for Tactile Warning surfaces shall include all labor, materials, tools, equipment, transportation, supplies, preparation of sub grade, restoration of adjacent pavement, demolition, and excavation, that may be necessary for a complete installation.

END OF SECTION 02760

SECTION 02900 - PAVEMENT MARKINGS

PART 3 - EXECUTION

PARAGRAPH 3.2 Provision for Temporary Markings is amended as follows:

Add

B. All Type D pavement markings shall conform to the latest VDOT requirements.

PART 4 - MEASUREMENT AND PAYMENT

PARAGRAPH 4.4 Removal/Eradication of Existing Pavement Markings is amended as follows:

Delete

A. Payment for pavement line markings (type, class, width) removal and/or eradication shall be paid by actual work performed as listed in the contract and shall include all labor, materials, tools, equipment, transportation, supplies, and incidentals required to remove and/or eradicate the line markings as specified.

Add

A. Payment for pavement line markings (type, class, width) removal and/or eradication shall be incidental to the work and no separate payment shall be made.

Add

PARAGRAPH 4.5 Pavement Message Marking is inserted as follows:

A. Measurement of pavement message markings (type, class, size) shall be in units of each furnished and installed.

B. Payment for pavement message markings (type, class, size) shall be in units of each and shall include all labor, materials, tools, equipment, transportation, supplies, and incidentals required to furnish and install the message markings as specified.

SECTION 329100 - PLANTING PREPARATION

PART 4 - MEASUREMENT AND PAYMENT is amended as follows:

Add

4.10 The measurement of CONTINUOUS SOIL PANEL to be paid for shall be per CUBIC YARD of the amended soil in accordance with the plans, specifications and to the satisfaction of the Project Officer.

4.11 The unit price for CONTINUOUS SOIL PANEL shall include the cost of furnishing all labor, materials, equipment and incidental expenses, including but not limited to imported topsoil, vapor barrier, 4" UD-4 underdrain (per VDOT specification), bedding

material per Continuous Soil Panel and Tree Pit Drainage Details, and connection to storm sewer system.