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**INFILTRATION TRENCHES**

These specifications compliment the infiltration trench design portion of the Iowa Stormwater Management Manual in Chapter 2, Section 2E-2.

Sections of the following documents, as referenced within these specifications, are hereby made a part of these specifications:

- Iowa DOT Standard Specifications for Highway and Bridge Construction: The Iowa Department of Transportation Standard Specifications for Highway and Bridge Construction and the General Supplemental Specifications effective at the date of publication of the Notice to Bidders unless a different effective date is identified in the contract documents.
- American Society for Testing and Materials (ASTM) standards.
- American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Transportation Materials and Methods of Sampling and Testing.

**PART 1 - GENERAL****1.01 SECTION INCLUDES**

Infiltration Trench

**1.02 DESCRIPTION OF WORK**

Construct infiltration trenches for storage and treatment of stormwater runoff.

**1.03 SUBMITTALS**

Comply with the requirements of the contract documents

**1.04 SUBSTITUTIONS**

Comply with the requirements of the contract documents

**1.05 DELIVERY, STORAGE, AND HANDLING**

Comply with the requirements of the contract documents

**1.06 SCHEDULING AND CONFLICTS**

Comply with the requirements of the contract documents

**1.07 SPECIAL REQUIREMENTS**

None

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**1.08 MEASUREMENT AND PAYMENT**

**A. Class 10, Class 12, or Class 13 Excavation:** Refer to SUDAS Section 2010, 1.08, E for measurement and payment information for Class 10, Class 12, or Class 13 Excavation.

**B. Observation Well:**

1. **Measurement:** Each observation well will be counted.
2. **Payment:** Payment will be made at the unit price for each observation well.
3. **Includes:** Unit price includes, but is not limited to, concrete pad, supplying and installing pipe, couplings, and fittings.

**C. Filter Sand:**

1. **Measurement:** Measurement will be in tons based upon scale tickets for the material delivered and incorporated into the project.
2. **Payment:** Payment will be made at the unit price per ton of filter sand furnished and placed.
3. **Includes:** Unit price includes, but is not limited to, furnishing, hauling, and placing filter sand material.

**D. Storage Aggregate:**

1. **Measurement:** Measurement will be in tons based upon scale tickets for the material delivered and incorporated into the project.
2. **Payment:** Payment will be made at the unit price per ton of storage aggregate furnished and placed.
3. **Includes:** Unit price includes, but is not limited to, furnishing, hauling, and placing storage aggregate material.

**E. Engineering Fabric:**

1. **Measurement:** Measurement will be in square yards for the surface area covered with engineering fabric. Both horizontal and vertical areas covered with engineering fabric will be measured.
2. **Payment:** Payment will be made at the unit price per square yard.
3. **Includes:** Unit price includes, but is not limited to, placing and securing filter fabric and any overlapped areas.

**1.08 MEASUREMENT AND PAYMENT (Continued)****F. Filter Aggregate:**

- 1. Measurement:** Each type of filter aggregate will be measured in tons based upon scale tickets for the material delivered and incorporated into the project.
- 2. Payment:** Payment will be made at the unit price per ton for each type of filter aggregate furnished and placed.
- 3. Includes:** Unit price includes, but is not limited to, furnishing, hauling, and placing filter aggregate material.

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**PART 2 - PRODUCTS****2.01 OBSERVATION WELL**

**A. Pipe:** Perforated or slotted 6 inch diameter pipe complying with one of the following.

1. Solid wall PVC pipe complying with ASTM D 1785, Schedule 40.
2. Solid wall PVC pipe complying with ASTM D 3034, SDR 35.
3. Corrugated PVC pipe complying with ASTM F 949, with a minimum pipe stiffness of 46 psi.

**B. Cap:** Provide PVC cleanout fitting with removable threaded plug.

**C. Concrete Pad:** Provide a 12 inch by 12 inch precast concrete patio block to support the observation well.

**2.02 FILTER SAND**

Provide sand complying with Iowa DOT Section 4110, Gradation No. 1.

**2.03 STORAGE AGGREGATE**

Washed river gravel/river rock with 100% passing the 2 1/2 inch sieve and 100% retained on the 1 1/2 inch sieve.

**2.04 ENGINEERING FABRIC**

Comply with Iowa DOT Section 4196, requirements for subsurface drainage.

**2.05 FILTER AGGREGATE**

**A. Type 1:** Provide aggregate complying with Iowa DOT Section 4115, Gradation No. 3, Class 2 durability gravel or crushed stone (AASHTO M 43/ASTM D 448, Size 57).

**B. Type 2:** Provide aggregate complying with one of the following:

1. 1/2 inch aggregate complying with Iowa DOT Section 4125, Gradation No. 20 (AASHTO M 43/ASTM D 448, Size 7).
2. 3/8 inch aggregate complying with Iowa DOT Section 4125, Gradation No. 21 (AASHTO M 43/ASTM D 448, Size 8).

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**PART 3 - EXECUTION****3.01 PRE-INSTALLATION PROTECTION**

- A. Complete grading, utility installation, and other earth disturbing operations prior to excavating the infiltration trench.
- B. Prior to installing the infiltration trench, install sediment control practices upstream to protect the infiltration trench from sediment in stormwater runoff from disturbed soil.

**3.02 INFILTRATION TRENCH INSTALLATION**

- A. Excavate infiltration trench to the length, width, and depth specified in the contract documents. Do not compact the bottom of the trench and do not operate heavy machinery on the bottom of the trench.
- B. If an observation well is specified, install according to 3.03 below.
- C. Place a 6 inch layer of filter sand over the bottom of the trench and lightly tamp.
- D. Place the storage aggregate in 8 inch lifts to an elevation 1 foot below the finished elevation specified in the contract documents. Compact each lift to 50% Relative Density. Do not over-compact.
- E. Install engineering fabric over the top of the storage aggregate layer. Overlap adjacent strips of fabric a minimum of 6 inches.
- F. Place filter aggregate on top of the engineering fabric, up to finished elevation. Do not compact filter aggregate.
- G. Upon completion of infiltration trench, immediately install sediment control practices around infiltration trench as required to protect the trench from sediment in stormwater runoff from disturbed soil.
- H. Do not place soil, mulch, sand, aggregate, or stockpile other materials on or near the surface of the infiltration trench.

**3.03 OBSERVATION WELL INSTALLATION**

- A. Cut perforated PVC pipe 6 inches longer than the specified depth of the infiltration trench.
- B. Install cleanout fitting and threaded plug in top end of the pipe. Leave the bottom end of pipe open; do not install plug or cap on bottom end of pipe.
- C. After excavating for the infiltration trench, set concrete pad on subgrade and place observation well on the pad at location specified in the contract documents.
- D. Temporarily brace observation well pipe in a vertical position and maintain during placement of the filter sand, storage aggregate, and filter aggregate.
- E. Do not wrap pipe with engineering fabric.