SECTION 269 TURBIDITY CURTAIN

269.01 Description. This work consists of furnishing, constructing, installing, maintaining, and ultimately removing a turbidity curtain from a body of water to minimize the drift of suspended sediment in the water body during construction of the Project. Construction of the turbidity curtains shall be as shown on Standard Construction Detail, Turbidity Curtain, at the locations shown on the Plans, and as directed by the manufacturer and the Engineer.

269.02 General. Prior to the installation of the turbidity curtain and its accessories, the Contractor shall submit the manufacturer's drawings and technical specifications to the Engineer for approval.

MATERIALS.

269.03 Curtain. The curtain shall be a synthetic material coated with suitable elastomeric or polymeric compound and have a high resistance to weathering, hydrocarbons, fresh and salt water, and temperature extremes. The material shall have a tensile strength of not less than 200 lb (890 N) when measured lengthwise or crosswise. Seams, if required, shall be either vulcanized welded or sewn and shall develop the full strength of the material.

269.04 Flotation Units. Flotation units shall be flexible, buoyant units contained in a flotation sleeve or collar attached to the turbidity curtain. Buoyancy provided by the flotation units shall be sufficient to support the required width of the turbidity curtain and maintain a freeboard of at least 3" (75 mm) above the water surface level.

269.05 Load Lines. Load lines shall be fabricated into the top and bottom of the turbidity curtain. The top load line shall consist of woven webbing or vinyl sheathed steel cable and shall have a minimum breaking strength of 10,000 lb (44.6 kN). The bottom loadline shall consist of a **3**" (6 mm) galvanized steel chain incorporated into the bottom hem of the turbidity curtain to act as ballast. The load lines shall have suitable devices which develop the full breaking strength for connecting to load lines in adjacent sections.

269.06 Stakes. Stakes shall be constructed of oak timber or steel. Posts shall be a minimum of 6.5N (2 m) long and at least 18" (450 mm) longer that the height of the turbidity curtain.

a. *Oak Timber Posts.* Oak timber posts shall be straight and have a minimum nominal cross-section of 2 by 4" (50 by 100 mm).
b. *Steel Posts.* Steel posts shall be 2**2**" (65 mm) diameter Schedule 40 pipe or be standardsteel "T" or "U" section of 1.30 lb/ft (1.98 kg/m) minimum

269.07 Fasteners. Fasteners shall be either 5/8" (16 mm) long brass or copper staples, or 17 gage (1.37 mm) galvanized or aluminized steel tie wires long enough to securely attach the fabric to the posts.

269.08 Anchors. Anchors shall be standard marine type boat anchors. The Contractor shall use Danforth type anchors for sandy bottoms, or kedge or mushroom type anchors for mud bottoms. The size, weight, and overall number of the anchors shall be sufficient to hold the turbidity curtain in its intended location. Alternate anchoring methods such as heavy concrete weights or driven pilings may be used if approved, prior to use, by the Engineer.

269.09 Rope. Rope shall be polypropelene, 5/8" (16 mm) diameter, with a minimum breaking strength of 800 lb (3.6 kN).

CONSTRUCTION METHODS.

269.10 General. When assembling and installing a turbidity curtain, the Contractor shall follow all the directions of the turbidity curtain manufacturer.

The turbidity curtain shall not be installed perpendicular to the direction of streamflow, such as across a river. The turbidity curtain shall be installed parallel to the flow of water only, such as along a river bank. All construction activities which generate any sediment or turbidity into the waterway shall be contained within the turbidity curtain.

Unless otherwise directed by the Engineer, the Contractor shall begin installation at high tide from a shoreline anchorage and work along with the current in a downstream direction.

The turbidity curtain shall form a continuous vertical and horizontal barrier to suspended sediment. The bottom of the turbidity curtain shall rest in contact with the bottom of the waterway for the entire length of the turbidity curtain. The top of the turbidity curtain shall extend above the water surface with at least a 3" (75 mm) freeboard for all stages of water levels.

269.11 Installation of Floating Turbidity Curtain. The turbidity curtain shall be floated into position, attached to the anchor lines, and then unfurled. The Contractor shall securely attach curtain panel ends together using rope lashings. The top lashing shall be securely tied to the anchor line. The Contractor shall place the anchors such that the turbidity curtain remains in the Plan location and none of the flotation devices are pulled under the water surface. If directed by the Engineer, the Contractor shall supply and place additional anchorage.

269.12 Installation of Staked Turbidity Curtain. Stakes shall be installed along the turbidity curtain alignment as shown on the Plans. The stakes shall be driven into the ground to the depth and spacing as shown on Standard Construction Detail, Turbidity Curtain.

The curtain shall be securely fastened to the side of the stakes facing the work area generating the sediment and turbidity. At curtain panel ends, the two panels shall be overlapped a minimum of 6" (150 mm) and rolled and fastened together around a common stake to ensure a sediment-tight seam.

269.13 Maintenance of Turbidity Curtain. Throughout the Project construction period, the Contractor shall maintain the turbidity curtain so that no sediment caused by the Project enters the waterway beyond the turbidity curtain.

All turbidity curtain damaged prior to installation, during installation, or during the life of the Contract shall be repaired or replaced to the satisfaction of the Engineer.

269.14 Removal of Turbidity Curtain. The turbidity curtain shall remain in place until the Project is complete and the turbidity has settled to no more than what existed prior to the start of construction. When directed by the Engineer, the turbidity curtain shall be furled in place, then released from its anchors and towed out of the water. The turbidity curtain and all materials incidental to the construction of the turbidity curtain shall be removed in such a manner as to minimize turbidity to adjacent waters. The turbidity curtain and related components shall become the property of the Contractor and shall be removed from the Project.

269.15 Method of Measurement. The quantity of floating and staked turbidity curtain will be measured, from edge to edge of the turbidity curtain along the support cable, as the actual number of linear feet (linear meters) of turbidity curtain placed and accepted.

269.16 Basis of Payment. The quantity of floating turbidity curtain and staked turbidity curtain will be paid for at the Contract unit price per linear foot (linear meter) for each type of curtain. Price and payment will constitute full compensation for furnishing, assembling, installing, maintaining, and removing the turbidity

curtain and all materials incidental to the construction and installation of the turbidity curtain, and for all labor, tools, equipment, and incidentals required to complete the work.

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