

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION (SP)

TEMPORARY WATER DIVERSION

Project # - PCN

DESCRIPTION

Diversions are used to temporarily reroute surface water or restrict flows to allow for the construction activities to take place.

This work consists of constructing and maintaining a temporary diversion to allow for the installation of [Insert Construction] at Station [XX+XX].

This work is in conjunction with the requirements of SP 03(14) "Temporary Erosion and Sediment Best Management Practices," and the Construction General Permits.

MATERIALS

Item	Section
Geosynthetic Type R1	858

Where R1 material is specified according to the design, alternative materials may be used if the alternative material has a lower permittivity and higher strength than Geosynthetic Type R1.

CONSTRUCTION REQUIREMENTS

A. General.

Obtain and modify all appropriate permits before work commences on the diversions.

Design, construct, operate, and remove temporary diversions to prevent soil/water interaction.

Strip and stockpile topsoil from areas where the temporary diversion will be constructed and installed. Do not place stockpiles between the diversion and the work area. Stabilize stockpiles placed within 200 feet of the diversion and work area within 24 hours of construction of the stockpile

Isolate work area using dikes or other methods even when no water is present. Construct the diversion before beginning work on the structure.

1. Plan Submittal.

Submit a design for the diversion that includes work drawings and include the submittals with the Storm Water Pollution Prevention Plan (SWPPP).

2. Design.

Design the temporary diversion to withstand the 2 year event shown in Appendix A and meet the following:

- If flow occurs while the diversion is in place, a portion of the flow must be passed as water accumulates in order to maintain flows downstream;
- Maintain downstream water quality equal to the upstream water quality; and
- Include provisions that will prevent the accumulation of job site sediment in the diversion.

B. Diversion Components.

Construction of the diversion may entail using the components listed below or other methods approved by the Engineer.

Install diversion measures before beginning work on the structure.

1. Dike.

Construct upstream and downstream dikes to isolate the work area. Construct dikes using one or more of the following materials:

- Sandbags;
- Sheet piles;
- Soil wrapped with Geosynthetic Type R1;
- Water filled bladder;
- Impermeable containers; or
- Prefabricated dams.

2. Work Area Dewatering.

Operate the dewatering system within the work area to prevent any change in water quality of the water body. Before beginning dewatering of the work area, provide an inlet control system that limits sediment from entering the system and provide a stabilized discharge from the dewatering system.

Inlet control systems may include:

- Surface skimmers;
- Aggregate filled perforated containers; or
- Inlet filter sock.

Stabilized discharges may include:

- Dewatering basin;
- Sediment bag; or
- Filtering through vegetation.

Design and operate the discharge so that there is no visible sediment plume present in the water body and the discharge causes no additional erosion or sediment.

Do not discharge water directly to the water body or the diversion.

3. Culvert Installation.

Provide positive drainage from the upstream to downstream ends of the culvert and install energy dissipation measures at culvert outlets.

a. Culvert Through Existing Structure.

Install pipes through the existing structure.

Construction may include using the following steps:

- (1) Install a temporary culvert through the structure.
- (2) Anchor and seal the installed pipes at the upstream impervious dike.
- (3) Extend the installed pipes through the downstream impervious dike.

b. Culvert Diversion.

Install a temporary pipe crossing under the roadway near the existing culvert.

4. Channels.

Construct channels with side slopes that are 2:1 or flatter with a channel bottom of sufficient width. Cover disturbed slopes and channel bottom with Geosynthetic Material, Type R1.

Overlap splices and joints placed at least 36 inches.

Secure the liner using methods that will ensure that the liner will not be disturbed by the design flows shown in Appendix A. Potential methods of securing the liner may include:

- Staples;
- Pins;
- Sandbags; or
- Riprap.

Patch damaged areas of channel liner. Place a patch that overlaps the damaged area by 36 inches on all sides. Secure the patch with pins or staples.

Install fiber rolls or silt fence along the top of the channel to prevent any sediment or debris from entering the channel.

Connect the downstream end of the channel before connecting the upstream end of the channel to the existing water body.

5. Diversion Pumping.

Place an inlet control system at pump inlets. An inlet control systems may include:

- Surface skimmers;
- Aggregate filled perforated containers; or
- Inlet filter sock.

Route the discharge hose through the structure or work area.

Design and operate the discharge so that no visible sediment plume is present in the water body and so the discharge causes no additional erosion of the water body.

C. Diversion Removal.

Do not begin removal of the temporary diversion until the construction activities relating to the structure are complete and all permanent erosion and sediment control devices are in place. Remove the diversion in a manner that prevents soil/water interaction.

Remove all materials used to construct the diversion.

Restore the area affected by the temporary diversion to the same condition that existed before construction.

1. Downstream Dike.

Remove the downstream dike first. Stabilize the areas above the waterline where the downstream dike was located.

2. Upstream Dike.

Remove the upstream dike to restore normal flow through the structure before removal of any devices used to create the diversion.

Stabilize the areas above the waterline where the upstream dike was located.

a. Suspended Pipe.

Remove the suspended pipe at the same time as removing the upstream dike.

b. Channel and Pipe Diversion.

Remove the upstream dike and construct a dike to prevent water from entering the channel or pipe diversion.

3. Pipe.

Remove pipe after the stream has been restored to normal flow.

4. Channel.

Backfill temporary channels outside of the roadway embankment as specified in Section 203.04 E.3, "Compaction Control, Type B". When backfilling roadway embankment areas, benching of slopes will be required as specified in Section 203.04 E.1, "General".

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Pay Item	Pay Unit
Temporary Stream Diversion	Each

The Engineer will pay for the stream diversion according to the Table 1.

Work Completed	Percent of Contract Unit Price
Stream Diversion Installed	75
Restoration of the Diversion	25

Include the cost for installation, maintenance, and removal of erosion control devices used in conjunction with the stream diversion in the contract unit price for "Temporary Stream Diversion". Section 4, "Basis of Payment" in SP 03(14) does not apply to erosion control devices used in conjunction with stream diversions.

Such payment is full compensation for designing, furnishing all equipment, material, labor, and other incidentals to complete the work as specified.

Appendix A

2 Year 24 Hour Flow		
Structure Number	Existing Structure Type	Min Discharge (cfs)

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