

TEMPORARY STREAM DIVERSION

(ft.)
CODE 976



(Source: Auckland Regional Council – Stream Facts)

DEFINITION

A temporary channel or pipe used to convey stream flow around a construction site.

PURPOSE

The purpose of this practice is to maintain stream flows and water quality while providing a dry work area.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to construction sites where:

1. Work within a stream, or part of a stream is required; and
2. Flows are low enough and/or the watershed is small enough to be handled in a diversion channel, pipe, or by a pump.

CRITERIA

The construction of any temporary stream diversion shall not cause a significant water level difference upstream or downstream of the project site (not to exceed 0.1 feet, or less if local ordinances are more restrictive). The velocity of the stream flow offsite shall be maintained.

Erosion and sediment control devices shall be in place prior to starting construction to prevent sediment from entering the diversion or the main stream and shall include temporary stabilization of the inlet and outlet of the temporary stream diversion. The inlet and outlet of the temporary stream diversion shall be stabilized using proper erosion control techniques, such as riprap over geotextile.

Discharges from dewatering of construction areas where streams are being diverted shall not alter the water quality or cause erosion or sedimentation in the stream or the temporary stream diversion. See practice standard **DEWATERING 813**.

Types of Temporary Stream Diversions:
The temporary stream diversion shall be accomplished with a channel, pipe, or pumped diversion. The type of diversion shall be selected based on the site specific conditions, the amount of time the practice will be in use, and the anticipated flow rates.

Capacity –The design capacity of the temporary stream diversion shall take into account the length of time the practice will be in use. Where flood hazard exists, the capacity shall be increased according to the potential damage. See Table 1 for required channel design capacity. The

temporary pipe shall be sized to safely convey the 2-year storm, at a minimum. The pump size shall be based on the anticipated flow. The pump operation shall be monitored and augmented, as needed.

Timing – The construction shall be planned to minimize the time needed for the temporary stream diversion. The temporary stream diversion shall be properly stabilized prior to accepting flows. The temporary stream diversion shall be removed as soon as practicable and only after the worksite on the existing stream has been stabilized.

Cross section - The temporary stream diversion channel shall be trapezoidal. The side slopes shall be no steeper than 2:1 horizontal to vertical. The depth and grade of the diversion channel is variable and shall be dependent upon site conditions.

Channel Lining – The temporary stream diversion channel shall be lined to prevent erosion of the channel and sedimentation in the stream. The process of excavation and stabilization shall be continuous.

The channel lining shall be selected based on the expected velocity in the temporary stream diversion channel for the design storm. See Table 1. The lining shall meet the requirements of the applicable practice standard or material specification – see material specifications **592 GEOTEXTILE**, **523 ROCK FOR RIPRAP**, and **805 EROSION BLANKET: TURF REINFORCEMENT MAT (TRM)**, and/or practice standards **EROSION BLANKET 830** and **EROSION BLANKET: TURF REINFORCEMENT MAT (TRM) 831**.

Pipe Material – The temporary pipe shall be constructed of durable material able to withstand the anticipated site conditions. Check local ordinances for acceptable materials.

Pumped Diversion – When a pumped diversion is used, the water shall be pumped from upstream of the construction area to the existing downstream channel. The intake of the water pipe must be screened with openings $<3/32$ inch to prevent entrainment of fish in the coffered area; and fish trapped within the coffered area shall be salvaged and returned to the downstream channel. The pump outlet location shall be properly stabilized to prevent erosion.

Removal of Water – The water within the construction area shall be removed in accordance with practice standard **DEWATERING 813**. Dewatering from the construction area shall not be discharged directly to the stream.

Removal – Once the work is complete and the existing stream channel has been stabilized, the dams shall be removed starting at the downstream end. Then the temporary stream diversion shall be removed. The temporary channel, if used, shall be properly filled and stabilized using appropriate erosion control practices.

CONSIDERATIONS

Any work within a stream is subject to local, county, state and federal rules and regulations. Failure to procure, and comply with, the appropriate permit(s) may result in significant fines.

Crossings of the temporary stream diversion may be required and, if needed, should be included with the design of the temporary stream diversion. See practice standard **TEMPORARY STREAM CROSSING 975**.

When deciding on the location of temporary stockpiles, floodplain limits, wetlands, proximity to other bodies of water and the length of time the stockpile will exist need to be considered. Additionally, all stockpiles should be located outside the drip-line of

trees and away from sensitive ecosystems. For additional information, see practice standards **TREE PROTECTION 990**, **TREE PROTECTION – AUGERING 991**, and **TREE AND FOREST ECOSYSTEM PRESERVATION 984**.

Extreme care should be taken to minimize the impact on the existing ecosystem. The design and implementation of the temporary stream diversion should consider the environmental impacts. Clearing of the streambed and banks should be kept to a minimum.

In order to reduce the impact on fish populations and other aquatic organisms including vegetation, consider installing riffle structures, bank habitats and other practices that mimic and protect the existing stream environment. Also, the lining selected for the temporary stream diversion should take into account the existing conditions and wildlife. When appropriate, fish exclusion or fish capture/handling measures should be used.

The temporary stream diversion can also be used to divert flow from a drainage ditch or other drainage channel. The appropriate type of temporary stream diversion should be selected based on the specific site conditions and anticipated flow amounts.

PLANS AND SPECIFICATIONS

Plans and specifications for installing a temporary stream diversion shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. At a minimum include the following items, as appropriate:

1. Channel location and alignment
2. Grade, depth and width
3. Channel lining material
4. Conduit type and diameter
5. Pump size and location

6. Outlet stabilization
7. Dam material/design
8. Sediment and erosion control practices and locations
9. Location of excavated material stockpiles
10. Installation, removal and stabilization construction sequences

All plans shall include the installation, inspection, and maintenance schedules with the responsible party identified.

The temporary stream diversion shall be constructed to meet the requirements of construction specification **760 TEMPORARY STREAM DIVERSION**. Standard drawing IL-xxx may be used as the plan sheet.

OPERATION AND MAINTENANCE

The temporary stream diversion and diversion dams shall be checked at the end of each day, at a minimum. Any necessary repairs shall be made immediately. Remove all significant sediment accumulations to maintain the designed carrying capacity. Pumping operations shall be observed in accordance with practice standard **DEWATERING 813**. Contingency measures shall be available for significant storms or unexpected events.

REFERENCES

Tennessee Department of Environment and Conservation, Division of Water Pollution Control. Stream Diversion Channel – SDC. Tennessee Erosion and Sediment Control Handbook, Second Edition, March 2002.

Croft, David. 2004. Fords, Embankments and Underpasses – Guide for Designers and Managers. Neath, UK.

Georgia Soil and Water Conservation Commission (GASWCC). Manual for Erosion and Sediment Control in

Georgia – Stream Diversion Channel.
Athens, GA. 2000.

Portland Bureau of Environmental
Services. Concept Designs and
Technical Guidance – Surface Flow
Diversion Guidelines. April 2007.

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DRAFT - NOT APPROVED FOR USE

TABLE 1
TEMPORARY STREAM DIVERSION CHANNEL LININGS

Lining Material	Acceptable Velocity Range	Upstream Tributary Area	Design Capacity Storm
Erosion Blanket ¹	up to 1½ ft./sec.	up to 1 sq. mi.	2-year, 24-hour
Turf Reinforcement Mat ² Non-vegetated	up to 8 ft./sec.	up to 1 sq. mi.	2-year, 24-hour
Geotextile ³	up to 11 ft./sec.	up to 1 sq. mi.	2-year, 24-hour
Rip-Rap and Geotextile ⁴ Avg. 4" (3" - 6") Avg. 8" (4" - 12") Avg. 14" (5" - 18")	up to 4 ft./sec. up to 6 ft./sec. up to 13 ft./sec.	up to 5 sq. mi.	10-year, 24-hour

1. Erosion blanket shall only be used with intermittent, low flows – per manufacturer's recommendations. Vegetation shall be established when using erosion blanket as a channel lining. Erosion blanket shall be installed in accordance with practice standard **EROSION BLANKET 830**.
2. Turf reinforcement mat (TRM) shall be installed per manufacturer's recommendations. TRM with temporary seeding may be used when sufficient time is available for the temporary stream diversion channel to vegetate. The acceptable velocity for vegetated TRM shall be per the manufacturer's recommendations, but not greater than 16 ft/sec. TRM shall be installed in accordance with practice standard **EROSION BLANKET: TURF REINFORCEMENT MAT (TRM) 831**.
3. Selection of Geotextile fabric shall be based on material specification **592 GEOTEXTILE**, Table 2, Class I. All geotextiles shall be installed in accordance with construction specification **95 GEOTEXTILE** and/or per the manufacturer's recommendations.
4. Rip-Rap thickness shall be 1.5 – 2.0 times D₅₀. Selection of Rip-Rap should be based on guidelines from construction specification **61 ROCK RIPRAP** and material specification **523 ROCK FOR RIP-RAP**.