

MINNESOTA ENGINEERING PROCEDURE

SIDE INLET PIPE STRUCTURES TO OPEN DITCHES

This procedure covers pipe drop inlets, hood inlets, and plain culverts through the spoilbank of open ditches to provide safe entrance of surface water from a typical drainage type watershed.

A. Job Investigation

1. Type of structure needed.
2. Determine watershed size and characteristics.
3. Determine depth of ditch, height of spoilbank, and field slope draining to site with hand level.
4. Record soil information from soil borings or other satisfactory soil profile information.
5. Combine several sub-watersheds to outlet through one structure, if practical.
6. Determine need and location of emergency spillway.
7. Operation and maintenance requirements.
8. Existence and location of utilities (use MN-ENG-098).

B. Design Survey

1. Establish a benchmark.
2. Run profiles downstream and upstream from structure site to determine proper elevations of structure.
3. Make survey along centerline of proposed fill including shots to show average field elevations, and shots to record elevation of the ground surface at soil borings.
4. Record typical cross section of main channel.
5. Take necessary scattered elevations in field to identify low spots and determine proper elevation of pipe inlet.

C. Design

Design will be in accordance with Minnesota Practice Standard Grade Stabilization Structure (410).

D. Preparation of Plans

Appropriate plans will be prepared and approved for all jobs prior to construction.

E. Disposition of Plans

The cooperators will be furnished a copy of the plan, which the cooperators should make available to the contractor during construction.

Construction**A. Construction Layout**

1. Field layout will be in accordance with the plan.
2. Slope staking is only required where the fill is extensive. Set a centerline stake on each end of the fill with an offset reference hub.
3. Set offset reference hubs and centerline stakes for pipe.
4. Stake the location of the emergency spillway.

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- B. NRCS personnel will supervise construction as necessary to insure a high quality installation. Training should be provided and contractors should be encouraged to layout and perform construction checks.

After Construction

- A. Record as-built dimensions' and certify check out notes.
- B. Correct original plan if necessary to show any changes made during construction and label "As-built".

Minimum Supporting Data

As a minimum, the following supporting data must be documented in the case file. The data may be included on the as-built plans, survey notes, design sheets, or other appropriate forms, and should be sufficient to show that the installation meets standards and specifications.

1. Location of the structure.
2. Soil information from borings or other investigation.
3. Hydrology data.
4. Hydraulic data (capacities, velocities).
5. Survey data, including benchmark, profiles, cross sections, elevations and measurements of completed structure.
6. Type, quality and manufacturer of materials.
7. Name of contractor and date installed.
8. Adequacy of vegetation.
9. Engineering job class and approvals of design and installation.