

## DOCUMENTATION REQUIREMENTS Access Road - 560

### I. Reference Materials

The following is a partial listing of reference materials to be used in Access Road design and construction.

- a. Soil Survey Report
- b. North Dakota Construction and Material Specifications or Conservation Practices
- c. Section IV Technical Guide, Practice Standard 560, Access Road (ft.)
- d. Engineering Field Manual - Chapter 1
- e. Technical Release #62
- f. Section 19, National Engineering Handbook
- g. National Operation & Maintenance Manual
- h. Hydraulics and Hydrology reference materials as might be needed for water control and conveyance.
- i. Suitable Computer Software:
  - Design (e.g. Ohio Program, XSEC)
  - Watershed Hydrology (e.g. EFM2, EFH2, TR55)
  - Excel Spreadsheet Hydrology (e.g. ND-ENG-12e)
  - Excel Spreadsheet Yardage (e.g. ND-ENG-1e)
  - ND-DOT Hydrain Series (e.g. HYCHL, HY8)

### II. Site Investigation/Data Collection

The following is a list of items to be checked in the field:

- a. Determine affects access road will have on drainage patterns, watershed drainage area, average watershed slope, and weighted cover complex number for areas needing water control.
- b. Does proposed access have adequate, stable outlets for intercepted overland flows?
- c. Log soils and review soil survey data. Is there a spring or base flow condition? Will ditches be required? Linings or drop structures?
- d. Is the proposed route the most practical and acceptable?
- e. Check for buried utilities, North Dakota ONE-CALL.
- f. Determine engineering job class.

### III. Design Surveys

- a. Survey notes shall be kept in loose-leaf or bound field notebooks. The notes will be kept in a format similar to that shown in Technical Release 62 and Chapter I, Engineering Field Manual. Electronic survey notes will be documented in a format that allows complete checking by others.
- b. The surveyor will use sound professional judgement in gathering information for the design and construction of the grassed waterway. Information will be used to determine access road grades and estimated quantities.

#### IV. Design Plans and Specifications

The design of the access road will be in accordance with Standard 560 Access Road, Section IV, Technical Guide.

The steps in design are as follows:

- a. Plot access road centerline profile, soils logs, and representative cross sections on appropriately sized sheets, either hand drafted or CADD developed.
- b. Determine the required 2-10-25 year, 24 hour, minimum peak discharge for each reach, based on use. Chapter 5 of the Hydrology Manual for North Dakota, Chapter 2 of the Supplement to the Engineering Field Manual, or appropriate software will be used for determining peak "Q's". Form ND-ENG-31e, or computer printout showing all input and output, is required.
- c. Determine allowable dimensions, velocities, depths, and design values for access roads based on Standard 568 Criteria, Section IV, Technical Guide, or other more restrictive Local, State, or Federal requirements.
- d. Determine earth work, seeding, and other material quantities. The volume of work in cubic yards will be determined by the method of average cross sectional end area. Computations will be shown, or computer printout of all input and output.
- e. Check job approval based on components (NRCS personnel).

#### V. Material and Construction Requirements

The cooperator, contractor, and the NRCS cooperator's file will be provided a set of plans and specifications for the waterway construction. The plans can be shown on applicable forms and appropriately sized grid or plan/profile sheets.

The plans will contain, as a minimum, the following:

- a. Overall Plan View. This may be superimposed on the location map. Show stationing and identify reaches.
- b. Profile - Centerline of access road. Show original ground superimposed on road centerline and proposed road grade Centerline profiles are required.
- c. Cross Sections - Show typical cross sections for each reach. Cross sections are required at all significant changes in original cross section shapes and grades to calculate quantities.
- d. Construction Notes - Add notes to clarify or furnish direction for construction.
- e. Quantities - Estimates based on cross sections.

Construction specifications are to be provided with each set of plans. The North Dakota Construction and Material Specification for Conservation Practices shall be used for each item of work and material, as applicable or available.

Additional specifications may need to be written to provide full material and installation instructions. A cover sheet and list of specifications is to be provided with the specifications.

## VI. Layout and Installation Procedures

Layout surveys will be recorded in loose-leaf or bound survey books. Set necessary stakes for at alignment, depth, width, and side slopes. Set grade stakes as needed. Survey notes will be kept in the format as shown in Chapter I - Engineering Field Manual and/or Technical Release 62. Electronic survey notes will be documented in a format to allow complete checking by others.

## VII. Checkout

### a. Compliance checking - record in field notes.

- (1) Record a minimum of one cross section per reach not to exceed 400 feet between cross sections. Cross sections are required at all significant changes in original cross section shapes and grades for yardage computations. Check centerline profile, verify width and depth.
- (2) Measure lengths, areas seeded, check all quantities.
- (3) Take sufficient cross sections to ascertain compliance with design. Check lengths of culverts and where appropriate, number of end sections.
- (4) Statement of compliance on "as-built" plans - that construction is complete according to plans and specifications, and adequacy or status of vegetation and topsoil placement. Date and sign by individual making determination.
- (5) The key items to inspect on access roads are:
  - (a) Embankment compaction
  - (b) Road top width, grade compliance, and side slopes
  - (c) Seeding
  - (d) Pipe installations

### b. "As-Built" Plans

As-built plans are a record of constructed facilities. Changes from design are to be superimposed in a different color on the official file copy of the plans. On the as-builts show:

- (1) Significant design changes
- (2) Final Quantities
- (3) Identify "as-built" on plans