SCD Clear River Date 3-8-78

Work Unit Rayville

Farmer-Group W. F. Jones

Location 3 miles West of Beltsville

Engineering Layout, Notes, Staking and Calculations

Job Farm Pond

Design Sur. Const. Layout

Const. Check Other

Dist. Agr. No. 784 Field No. 3

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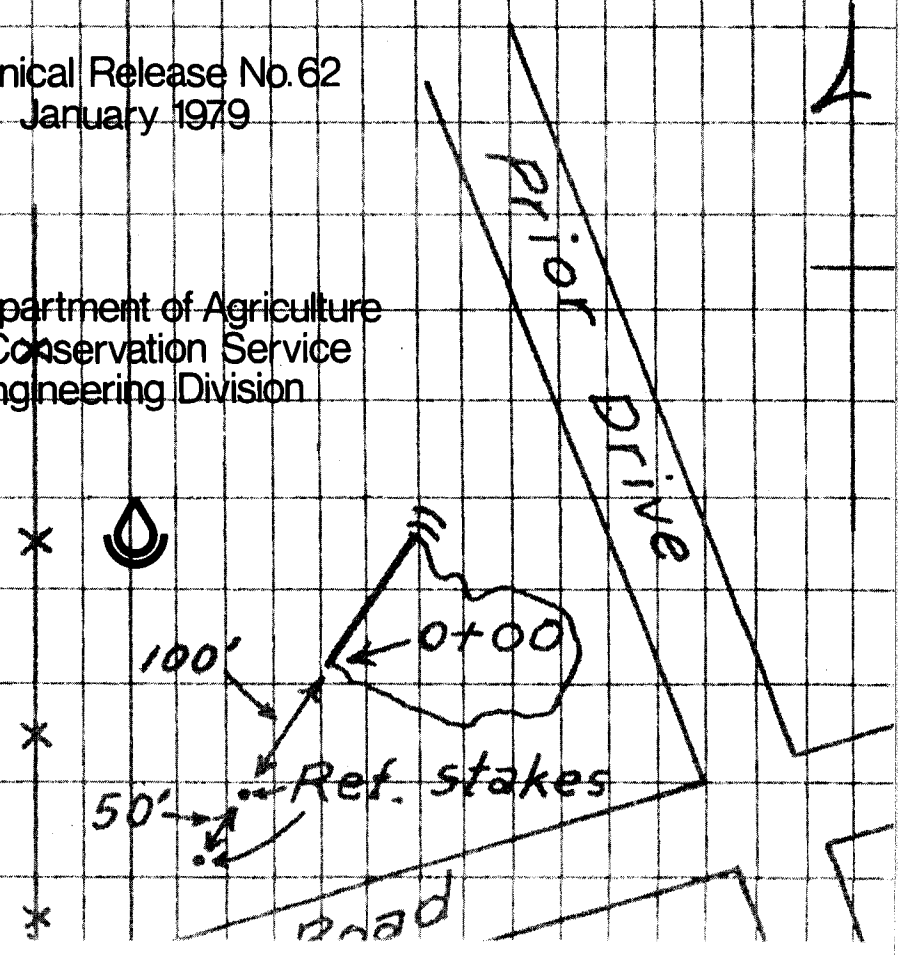

Technical Release

Number 62

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PREFACE

This technical release contains the format for engineering field notes and related field staking in SCS. The instructions and sample notes represent the best practicable blending of the many existing note formats to fit the needs of the Soil Conservation Service.

Engineering surveys, staking, notekeeping, calculations and note interpretation are part of the daily activities of many Soil Conservation Service personnel, as well as contractors, consultants, district employees and others.

It is important, therefore, that we perform these operations with the greatest possible efficiency and in a manner that will result in maximum usefulness of the information obtained. This calls for uniformity in methods and procedures between states and between work locations within states.

GENERAL

Field Notebooks and Special Forms

Bound field notebooks and looseleaf field notebooks are both satisfactory for most SCS engineering surveys. However, the looseleaf notebooks should not be used for project or other contract work where the notes might be used as evidence or supporting data in court actions. Looseleaf notes are not generally acceptable to the courts.

The use of special forms is recommended for recording engineering notes and design data for such practices as terraces, diversions, waterways, small pond dams, and similar work. It is extremely important, however, that (1) the method be uniform and (2) the forms provide for at least the minimum construction check information shown in the sample notes.

Numbering, Identifying, Indexing, and Filing

Numbering Bound Notebooks

Number bound field notebooks consecutively for each broad activity. Use one series of numbers for Public Law 46 activities (including cost share programs) in each field office. The numbering may run consecutively from year to year or may start with number 1 at the beginning of each year. In the latter case, the year should precede the number such as 1977-1, 1977-2, etc.

Design and construction notebooks for project installation will be numbered in a separate series for each structure. Place the name of the project and the name (if there is one) and number of the structure site on each notebook. All notebooks used to record notes during the project planning stage may be numbered in one continuous series for the project area. A separate series of numbers will be used for each group project. Books containing notes of surveys made for other agencies should be numbered and identified as outlined for group or project type work. In all cases the identifying name should be lettered with India ink or its equivalent.

Identifying Notebooks

Identify all field notebooks, both bound and looseleaf, so that they can be returned to proper headquarters if lost. Place this identification on the inside on the front cover or on the flyleaf of bound notebooks. For most looseleaf notebook binders it will be necessary to paste a white tab to the inside front cover.

The following identification should be used:

U.S. GOVERNMENT PROPERTY

Finder please return to

SOIL CONSERVATION SERVICE

_____
(Street or P.O. Box No.)

_____
(City) (State) (Zip Code)

Indexing Bound Notebooks
The first 5 to 10 pages of each bound notebook should be reserved for indexing.

Note Identification
Each set of notes should have a title page. Printed title pages are available for use in looseleaf notebook binders (See Figure 1-1). Rubber stamps may be obtained for stamping the title page in bound notebooks.

Bound Notebooks
A single title page will suffice for all the surveys related to the same job if the notes are recorded on consecutive pages or clearly cross referenced by notations such as "continued on page _____," and "continued from page ____." If this is not feasible, use a separate title page for each set of notes.

Show the following information on the first page of notes following the title page:

Page number

Names of party members and assignments

Purpose of survey (design, construction layout, construction check, etc.)

Date

Show only the page number on subsequent pages unless there is a change in purpose of survey, party members, or date. Stamps may be used for recurring titles and other information.

Looseleaf Notebooks
Use a separate title page for each set of looseleaf notes (See Figure 1-1). The sample notes in Chapter 2 illustrate use of the title page.

Show the following information on the right-hand face of the first page of notes following the title page:

Page number

Individual, group or project name (may be abbreviated)

Practice or construction item (abbreviated if feasible)

Purpose of survey (design, construction layout, etc.)

Party members and their assignments

Date

Show the same information on the succeeding pages, except for party members and date which need not be listed unless they change.

Filing Notes

File all field notes in the office responsible for followup on the job. Fasten each set of looseleaf notes together and file in the plan folder or appropriate job file or folder. A large envelope stapled inside the folder makes a good repository.

Recording Survey Data

Record all numbers, figures, and explanatory notes clearly and legibly. Use pencils of a hardness equal to or exceeding No. 2-H. Do not erase numbers. If an error is made in recording a number, a line should be drawn through it and the correct number written above.

The recorded data should give a true picture of the precision of the survey. The decimal point should never be omitted when recording decimals. If measurements are made to the nearest 0.01 foot, 2 digits should always be recorded to the right of the decimal point even though the last one, or last two, may be zeros, for example 2.10 or 4.00.

Precision

The sample notes illustrate the precision required for ordinary SCS engineering surveys. A higher degree of precision may be required for project type work or special or unique jobs. The work outline for surveys should specify the degree of precision required. The Engineering Field Manual, Chapter 1, discusses survey precision and accuracy.

Sketches

Sketches are an important part of survey notes and should be made for all types of surveys. Sketches are of two general types: (1) those used on the title page

for general location of the job and (2) those used in the body of the notes to show data that cannot be readily shown in other ways. Normally, sketches are not drawn to scale but are proportioned by eye. The sample notes illustrate use of sketches. In sectioned country, the full legal description might replace the general location sketch.

Stationing

Normally the starting station for survey of streams, waterways, canals, ditches, and gullies is located at the upstream end and proceeds in the direction of flow. Stationing should be compatible with computer use. In some cases, however, the survey can be accomplished with less time and effort, and be related better with subsequent sections of the job, by locating the starting point at the downstream end. This is especially true of drainage surveys.

Negative stationing must not be used in surveys if water surface profiles are to be machine computed and positive stationing is always preferable. Negative stationing tends to be confusing and to cause errors. When the extent of the survey is not known at the beginning, a station value sufficiently greater than 0 + 00 should be assigned the starting station to insure all stationing will be positive.

Left and Right Designations

Banks of natural streams are conventionally designated left and right facing downstream. However, cross sections, slope stakes and notes should always be directed left and right as viewed in the direction of increasing stations.

Grade Rod

The notes for construction layout and check surveys illustrate the use of the grade rod. The grade rod is a timesaver and has wide application in SCS work. It eliminates the need for converting rod readings to elevations and facilitates computations since they may be made directly from the field notes. This eliminates copying time, reduces the time for checking and the chance for errors.

The grade rod is obtained by subtracting the planned elevation at each station from the height of instrument (Grade Rod = H.I. - Planned Elev.). When the height of instrument is above planned elevation, the grade rod has a plus value and is so marked in the notes, such as +5.2. If the height of instrument is below planned elevation, the grade rod has a minus values and is so marked, such as -8.3.

To find the cut or fill in construction layout surveys, subtract the actual rod reading from the grade rod. If the result has minus value, a fill is indicated. If the result has a plus value, it indicates a cut.

Example A

H.I. = 249.3
Planned Elev. = 243.0
Grade Rod = 249.3 - 243.0 = +6.3
Foresight = 9.8
+6.3 - 9.8 = -3.5 a fill

Example B

H.I. = 127.4
Planned Elev. = 132.6
Grade Rod = 127.4 - 132.6 = -5.2
Foresight = 4.2
-5.2 - 4.2 = -9.4 a fill

Example C

H.I. = 134.6
Planned Elev. = 128.4
Grade Rod = 134.6 - 128.4 = +6.2
Foresight = 2.9
+6.2 - 2.9 = +3.3 a cut

In construction check surveys, the grade rod for each station is computed as explained above. The foresight at each station is mentally compared with the grade rod for that station. Thus, the work can be checked rapidly without the necessity of converting rod readings to elevations.

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SCD | Date
Field Office
Name
Individual Group Unit of Govt.
(circle one)
Job
Design Sur. | Const. Layout
Const. Check | Other
Ident. No. | Field No.

N

Scale
1" = ____

Legal Description
Sec ____ T ____ R ____
or
Location:

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U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SCD | Date
Field Office
Name
Individual Group Unit of Govt.
(circle one)
Job
Design Sur. | Const. Layout
Const. Check | Other
Ident. No. | Field No.
Location

N

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Figure 1-1 Title Pages