§KS593.00 Design Criteria

Design in accordance with the criteria listed in the Kansas Standard and Specification for Spring Development - 574; Chapter 12, Engineering Field Manual (EFM); and Chapter 5, Section 18 of the National Engineering Handbook (NEH).

§KS593.01 Surveys and Investigations

The extent of surveys and investigations required will vary depending on the location and type of spring being developed. Usually the procedure will conform to the following:

(a) Use a standard loose-leaf or bound field notebook. Using standard engineering notes, run a ground surface profile along the centerline of the proposed collection system line(s) to their juncture with the spring box or riser. Continue the profile from this point on the centerline of the pipe to the stock tank and extend to the proposed exit end of the overflow drain pipe from the tank. Elevation shots should be taken at 50-foot intervals and all significant highs and lows (±0.5 foot) between. Also, take elevation shots at the spring box or riser location, stock tank, and the exit end of the overflow pipe from the tank.

(b) For fracture or tubular springs with a single opening and no collection system required, the survey should begin at the water source.

(c) Set reference hubs or TBM's as needed. Record at least one permanent bench mark.

(d) Locate and identify any special conditions which may affect the design or the installation of the system.

(e) On springs requiring a collection system, it will probably be necessary to do some soil probing to determine the extent and location of the water bearing strata. The log of these test holes and their location should be shown on the plans (either the reverse side of Form KS-ENG-10 or the larger plan sheet if it is used).

(f) All pipelines should be installed on a uniform continuous grade, without highs or lows, to prevent possible air lock.

§KS593.02 Design and Plans

(a) Develop the design in accordance with the criteria listed in §593.00.

(b) Fill out Form KS-ENG-10. This field sheet may be used as the construction plans on smaller systems. The ground profile along the collection pipe, riser or spring box, tank, and overflow drain from the tank should be plotted on the reverse side of the form. The larger and more complex systems will require a supplemental plan sheet (refer to §593.10). This plan should be attached to the field sheet. In either case, the front side of the field sheet should be filled out.

§KS593.02

(c) The final plans should include:

(1) Data filled in on the front side of Form KS-ENG-10.

(2) A ground profile survey as outlined in §593.01 - Identify and show pertinent elevations at the outlet, tank location, spring box or riser, and impervious cutoff as located along the proposed development.

(3) Indicate size and type of pipe (collector, riser, supply pipe, etc.).

(4) Any special instructions or design notes.

(5) Signature of person(s) doing the design, design check, design approval and the date(s) completed (Form KS-ENG-10).

§KS593.03 Layout

Generally, sufficient stations, alignment, and grade stakes will be set when the design survey is made to establish the location of the component parts of the system.

In most cases, SCS personnel will be present during the excavation of the ditch(es), pipe installation, and backfill of the collector lines and also during the installation of the spring box or riser, stock tank and supply lines, valves, etc. The plans shall be corrected to show any adjustments or changes made in the location or elevation of any part(s) of the system during layout or constructi

§KS593.04 Checkout

(a) Complete Form KS-ENG-10 by recording:

(1) Installed materials in the Table of Quantities.

(2) Any significant changes in pipe depths, grades, or elevations on the reverse side of the form. (Record on supplemental plan sheet, if used.)

(3) Any significant changes in spring box or riser, stock tank elevations, or location.

(4) Signature of person(s) doing layout and checkout.

(b) Field notes showing:

(1) Spring box or riser inlet, outlet, and bottom elevations.

(2) Stock tank inlet, outlet, and bottom elevations.

(3) Flowline of overflow drain pipe from tank.

§KS593.05 Safety

Safety procedures according to Part 503 of the National Engineering Manual (NEM) should be adhered to.

§KS593.06 Title sheet and sample field notes for spring development.

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SCD Geary County Date 10-6-84

Field Office Junction City, Ks.

Name John Jones

Individual Group Unit of Govt.
(circle one)

Job Spring Development

Design Sur. ✓ Const. Layout ✓

Const. Check ✓ Other

Ident. No. 0049 Field No. 4

N

(See Sketch on Field Sheet)

Scale

1" =

Legal Description

SW¼ SW¼ Sec 21 T 125 R 7E

or

Location:

SCS-ENG-28 REV. 5-75

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§KS593.07 Sample field notes for spring development

John Jones
Spring Development
Design Survey

T K. Brown
R C. Carr
10-6-84

Top of Steel Pin @ Base of Corner Post
Start Collector Line
End Collector Line - Start Impervious Cutoff
End Impervious Cutoff
Spring Box Location
Stock Tank Location
Tentative Exit For Tank Over Flow Pipe

Station	B.S.	H.I.	F.S. or grade rod	Elev. or planned elev.	
B.M.1	4.9	104.9		100.0	
0+00			0.9	104.0	
0+60			2.6	102.3	
0+65			2.8	102.1	
1+20			4.4	100.5	
1+72			11.4	93.5	
2+30			14.9	90.0	
2+40			15.1	89.8	

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(KS210-KNKDM, June 1984)

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KS593.08 Sample field notes for spring development

John Jones
Spring Development
Layout & Const. Check

π K. Brown
φ C. Carr
10-7-84

Station	B.S.	H.I.	F.S. or grade rod	Elev. or planned elev.	
B.M.1	5.4	105.4		100.0	
0+00			4.8	100.6	Bottom of Trench-Start 4" Dia. Perfor. PVC
0+60			6.0	99.4	Start Impervious Cutoff-End Collector Pipe
0+65					End Impervious Cutoff
1+20	Spring Box		4.4	101.0	Top
			8.9	96.5	Inlet
			9.4	96.0	Outlet
			10.4	95.0	Bottom
1+72			10.2	95.2	Water Inlet (Surface) Pipe
			12.4	93.0	Bottom of Tank
2+30			15.4	90.0	Flowline of Overflow Pipe Drain

SCS-ENG-29
(2-80)

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§KS593.09 Sample field notes for spring development

J. Jones
Spring Development
Const Check

π K Brown
φ C Carr
10-14-84

Ground Line Over System

Station	B.S.	H.I.	F.S. or grade rod	Elev. or planned elev.
B.M.1	4.4	104.4		100.0
0+00			0.2	104.2
0+60			1.9	102.5
1+20			3.9	100.5
1+72			10.9	93.5
2+30			14.4	90.0

SCS-ENG-29
(2-80)

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§KS593.10 Sample of Form KS-ENG-10

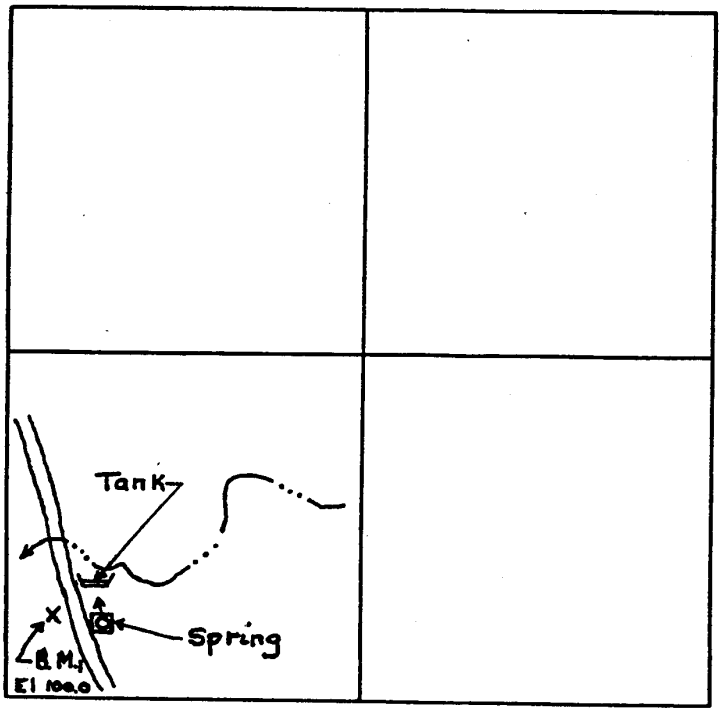
FIELD SHEET Spring Development
(Practice)

Owner John Jones Ident. No. _____

Legal Desc. SW¼ SW¼ Sec. 21 T 12S R 7E County Geary

TABLE OF QUANTITIES

Item	Unit	Design Quan.	Install Quan.
Collector pipe, 4" dia. PVC, Perforated	Lin. Ft	60	Same
Collector pipe, 4" dia. PVC, Solid	Lin Ft	60	"
Road Gravel, washed - Collector backfill	Cu Yds	6	"
Pipe, 18" dia., 16 ga., C.M. - spring box	Lin Ft	6	"
Concrete, Type I, Class 3,000	Cu Ft	0.6	"
Pipe, 2" dia., PVC, 1120, SDR 26	Lin Ft	60	"
Pipe, 2" dia., PVC, 1120, SDR 26	Lin Ft	53	"
Stockwater Tank, - precast concrete	Ea	1	"
Coarse gravel - Fill around tank	Cu Yds	3	"
Pipe fixtures - tees, elbows, etc.	—	As Required	



LOCATION MAP
Scale 1" = 660'

N

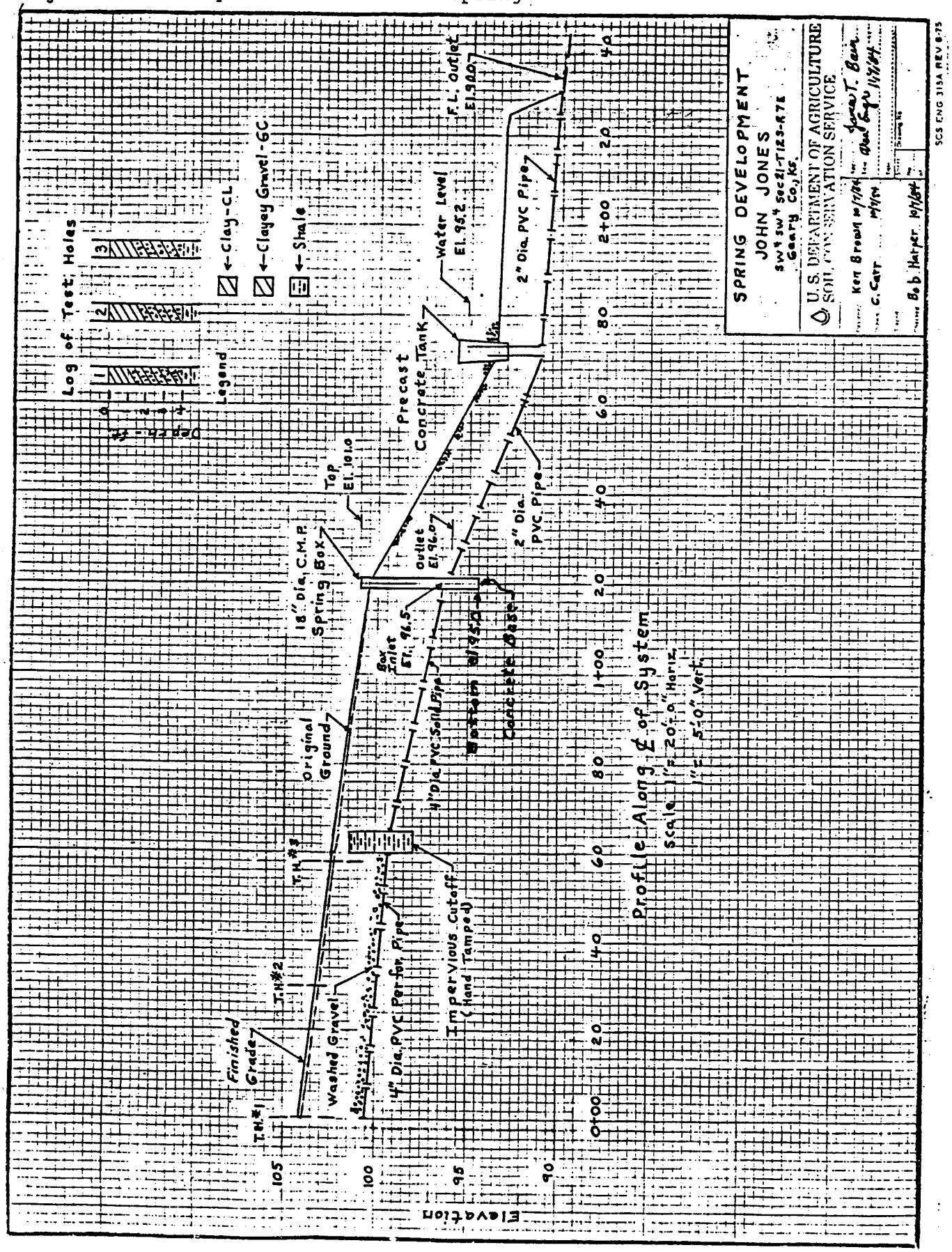
Remarks See attached plan sheet for system design and layout

Ken R. Brown — Design By — 10/7/84 Date

Bob J. Harper — Design Checked By — 10/7/84 Date

James T. Bain — Design Approved By — 10/7/84 Date

Ken R Brown — Layout By — 10/7/84 Date

Ken R Brown — Checkout By — 10/14/84 Date

§KS593.11 Sample Plan Sheet for Spring