

WATER PERMIT NO. 2606-2

Name of Applicant: David Steffen

Address: 34110 294th St, Burke SD 57523

Phone: 605 775-9112

Amount of Water Claimed: 59 AF

Total Acres: NA

Source of Water Supply: runoff

Water to be used for: fish & wildlife and livestock watering

County: Gregory

Type of Waste Disposal System:

Location: 3 miles southwest of Burke

PRIORITY Date Received: 10-6-06

Application/License Fee: \$200

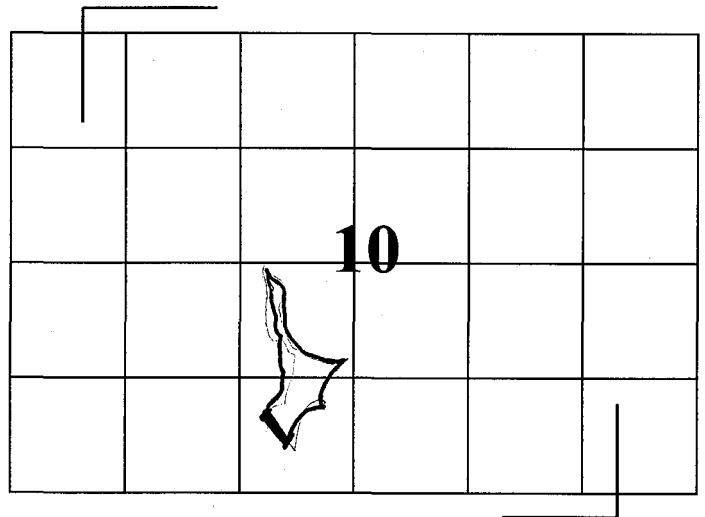
Corrected Application Received: 11-27-06

Period of Annual Use: January 1 – December 31

Remarks:

Diversion Point: SE ¼ SW ¼ Sec 10-T96N-R72W

Water Impounded: E ½ SW ¼ Sec 10-T96N-R72W



Depth of Well: NA

Well Driller:

Remarks:

Type of Map: topo

Prepared by: Steven Spawn, USFWS

Reviewed and the Number Assigned on: 11-28-06

By: Karen Schlaak

Notice of Hearing - date to intervene: _____

Mail to:
Water Rights Program
Joe Foss Building
523 E. Capitol
Pierre, SD 57501-3181
(605) 773-3352

(office use only)
No. 2606-2 Hydrologic Unit 10150001
Basin Niobrara Tributary
Newspaper Burke Gazette
Burke

RECEIVED
OCT - 6 2006
WATER RIGHTS
PROGRAM

Application For Permit To Appropriate Water Within The State Of South Dakota

Check use(s) of water:

☐ Municipal	☐ Suburban Housing	☐ Recreational	☐ Institutional
☐ Rural Water System	☐ Commercial	☒ Fish & Wildlife	☐ Geothermal Heat
☐ Domestic (over 18 gpm)	☐ Industrial	☒ Other <u>Livestock</u>	

Type of Application: (check one)

☒ New ☐ Vested Right (Use predates Mar 2, 1955) ☐ Future Use Reservation
☐ Place to Beneficial Use Water Reserved by Future Use Permit No. _____
☐ Amendment/Correction to Permit No. _____

Description of amendment/correction: (i.e. change diversion point(s), add diversion point(s), change use, etc.)

- Name of Applicant David Steffen Phone 775-9112
(check one) ☒ Owner ☐ Tenant/lessee
Mailing Address 34110 294th St. Burke State SD 57523
(Street, RR, or Box and City) (Zip Code)
- Amount of water claimed _____ *CFS or _____ **GPM 59.00 ***AF
(*Cubic Feet per Second) (**Gallons per Minute) (**Acre Feet - storage capacity of dam/dugout or annual use if applicable)
- Source of water supply Surface Runoff
- Location of point of diversion (example - 3 wells in SW1/4 NE1/4 section 12-T104N-R53W) County Gregory
E 1/2 SW 1/4 Section 10-T96N-R72W WATER Impounded: E 1/2 SW 1/4 SEC 10
SE 1/4 T96N R72W
- County or counties where water will be used Gregory
- Annual period during which water is to be used March-November Jan. 1 - Dec 31
- Give a description of the project. When available include any preliminary engineering report or other reports or information that will help explain the project. (Attach sheet if more space is needed)

See attached design and construction specifications completed by Konechne Engineering, Pierre, SD.

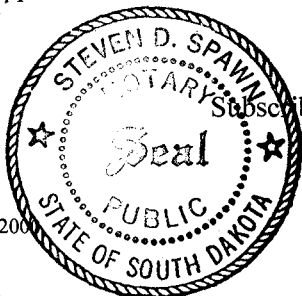
STATE OF SOUTH DAKOTA)

County of Gregory

SS

Attachments: Attach Form 2A if diversion is from a well or dugout, or if storage of water is proposed. Attach map and any other technical information. (see instructions)

I, David Steffen, the applicant, certify that I have read this application, have examined the attached map and that the matters stated are true and that I intend, and am able to complete the necessary construction.



Applicant's signature David Steffen

Subscribed and sworn to before me this 22nd day of September 20 06

My Commission Expires: July 30, 2007

Date

Steven D. Spawns
Notary Public signature

**SOUTH DAKOTA
WATER PERMIT NO. 2606-2**

Date of first receipt of application October 6, 2006.

Date of return to applicant for corrections, amendments or changes October 6, 2006.

Date of receipt of corrected application November 27, 2006.

The Chief Engineer, on behalf of the Water Management Board, issues Water Permit No. 2606-2 to David Steffen, 34110 294th St, Burke SD 57523 authorizing the construction of the dam and the placing of water to beneficial use subject to the following limitations, conditions and qualifications:

1. Water Permit No. 2606-2 authorizes impoundment of 59 acre-feet of water from runoff by constructing a dam located in the SE ¼ SW ¼ Section 10 with water impounded in the E ½ SW ¼ Section 10; all in T96N-R72W.
2. The water appropriated shall be used for fish and wildlife propagation and livestock water purposes and may not exceed the amount of water needed for beneficial use.
3. The water is to be used during the following described annual period: January 1 – December 31.
4. The date of approval of Permit No. 2606-2 is January 22, 2007.
5. The date from which applicant may claim right is October 6, 2006.
6. One-fifth of the construction is to be completed on or before July 22, 2009.
7. All construction is to be completed on or before January 22, 2012.
8. Water is to be put to beneficial use on or before January 22, 2016.
9. Water rights obtained in compliance with the laws of the State of South Dakota may not be unlawfully impaired by this appropriation.

QUALIFICATIONS

1. Water Permit No. 2606-2 authorizes a dam with a storage capacity of 59.0 acre feet of water and sufficient water annually to maintain the water level to the outlet elevation.
2. Low flows as needed for downstream domestic use, including livestock water and prior water rights must be by-passed.

WATER MANAGEMENT BOARD

By: Garland Erbele

Garland Erbele, Chief Engineer
Water Rights Program
Department of Environment and Natural Resources

MAR 14 2007

date



(type or print in ink)

1. Well Information - Proposed Construction

- a) Drill Hole Diameter _____ Depth _____
- b) Casing Type _____ Diameter _____ Thickness _____
- c) Screen Type _____ Diameter _____ Thickness _____
- d) Gravel Pack _____ Length of Gravel Pack _____
- e) Depth to Top of Water Bearing Material _____
- f) Depth to Water (ground surface to water level) _____
- g) Distance to nearest existing domestic well:
On applicants property _____ On property owned by others _____

2. Wastewater Disposal System Information

- a) Type of System (i.e. septic tank, drain field) _____
- b) System Capacity (gallons) _____ Year Constructed _____
- c) Connected to the City of _____ Sanitary System

3. Dugout Information

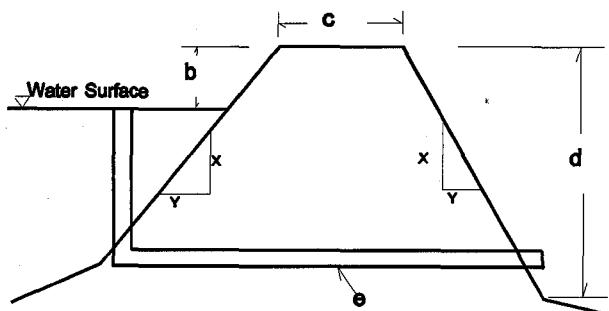
- a) Surface Dimensions _____ Depth _____
- b) Depth to water (ground surface to water level) _____

4. Water Storage Dams

If the proposed water use system contains one or more storage dams, please furnish the information requested below for each dam. The locations of the dams need to be shown on the map submitted with the application.

- a) If a private engineering firm or government agency was involved in the design of this dam, please give their name and address:

Konechne Engineering (Dave Konechne, P.E.)
Pierre, SD 57501



- b) Freeboard _____ 3.5
- c) Crest Width _____ 12
Crest Length _____ 450
- d) Height _____ 24
- e) Primary Outlet Capacity _____ 38.4 cfs
If pipe, diameter _____ 18"
- f) Secondary Spillway Capacity _____ 486.8 cfs
Spillway Width _____ 50'
- g) X & Y Slope _____ 3:1
Upstream _____ 3:1
Downstream _____ 3:1
- h) Surface Area of Impoundment _____ 8.77 A.
- i) Storage _____ 59.0 Acre Feet
- j) Drainage Area Above Dam _____ 393.0 Acres



An aerial photograph showing a patchwork of agricultural fields in various shades of brown, tan, and green. A blue line outlines a specific area in the lower-left quadrant, which contains a small, dark, irregularly shaped feature. The text "Sec. 10-96-72" is printed in black above this outlined area.

Sec. 10-96-72

Steven D. Spawn
~~Steven D. Spawn~~
Biologist, USFWS
10-18-2006

RECEIPT

WATER RIGHTS PROGRAM

South Dakota Department of Environment and Natural Resources

Date November 27, 2006RECEIVED OF US Dept of Interior, Fish & Wildlife Service, 38672 291st Street, Lake Andes

The following amount in fees for services rendered as provided for by law:

SD 57356

Fee for Application for Permit No. _____ to Appropriate Water, to construct and to put water to beneficial use	150	00
Fee for Application for Permit No. _____ to Appropriate Water for Future use		
Fee to retain Future Use Permit No. _____ after period of seven years.		
Fee for Inspecting Constructed Works, confirming beneficial use and issuing Water License No. _____	50	00
Fee for Filing Transfer Form _____		
Fee for _____		
Fee for Issuing New Well Driller's License No. _____ for C.Y. _____		
Fee for Renewal of Well Driller's License No. _____ for C.Y. _____		
Fee for Issuing Well Pump Installer's License No. _____ for C.Y. _____		
Fee for Renewal of Well Pump Installer's License No. _____ for C.Y. _____		
<i>Payment made by electronic transfer</i>		
(Any Other Work Provided by Law)		
TOTAL	200.00	

No.

02653

By

David Darland Ebel

Chief Engineer

gm

Client : Dave Steffen
 County : Gregory
 Practice: Pond

State: SD

By: DFK
 Checked: _____

Date: _____
 Date: _____

Drainage Area : 393 Acres
 Curve Number : 82
 Watershed Length : 6970 Feet
 Watershed Slope : 1.3 Percent
 Time of Concentration: 2.06 Hours
 Rainfall Type : II

Storm Number	1	2	3	4	5	6	7
Frequency (yrs)	1	2	5	10	25	50	100
24-Hr Rainfall (in)	1.9	2.4	3.2	3.7	4.4	4.9	5.5
Ia/P Ratio	0.23	0.18	0.14	0.12	0.10	0.09	0.08
Used	0.23	0.18	0.14	0.12	0.10	0.10	0.10
Runoff (in)	0.58	0.93	1.54	1.95	2.55	2.99	3.53
Unit Peak Discharge (cfs/acre/in)	0.304	0.319	0.333	0.339	0.344	0.344	0.344
Peak Discharge (cfs)	70	116	201	259	345	405	478

$$\frac{.58 \times 393}{12} = 19 \text{ Ac Ft}$$

Shaded Slope
 1.3% Slope NW
 38572 29.5 ft
 Lake Anderson 57360

1*****
 SITES XEQ 08/11/2006 WATER RESOURCE SITE ANALYSIS COMPUTER PROGRAM
 VER 2000 (USER MANUAL - DATED MAY 2001)
 TIME 14:37:38

***** 80-80 LIST OF INPUT DATA *****

SITES 05/01/2000 Dave Steffen 0.6140625 H5
 SAVMOV 0 101
 SAVMOV 101 1 1
 STRUCTURE steffen
 71 0
 76 .6
 80 2.3
 86 5.5
 92 10.4
 96 14.8
 ENDTABLE
 WSDATA 5A1 AC 82 393 6970 1.3
 PDIRECT 1.9 .00 4.40
 POOLDATA ELEV 90.0 90.0 71 71 SC
 PSINLET 1 9.42
 PSDATA 1 108 18 .009 72
 ASDATA 41 200 200 2 .1 2
 ASINSURF 41 .035
 ASINLET 41 0.0 0.0 100 0.0 3
 200 8
 ENDTABLE
 ASEXSURF 41 .035
 .65 0
 3
 2 0
 .02
 ENDTABLE
 ASEXIT 41 N 100
 BTMWIDITH FEET 50
 GRAPHICS 1
 GO,DESIGN HL TYPE2 24 TYPE2378 24
 SAVMOV 2 101 1
 ENDJOB

**** MESSAGE - ALTERNATE STRUCTURE ID (S 1) BEING USED
 SINCE USER DID NOT INPUT AN ID.

**** MESSAGE - ALTERNATE SUBWATERSHED ID (A) BEING USED SINCE
 USER DID NOT INPUT AN ID.

**** MESSAGE - DRAINAGE AREA FROM WSDATA CONTROL BEING CONVERTED FROM
 ACRES TO SQUARE MILES FOR COMPUTATION PURPOSES.

1SITES _____
 XEQ 08/11/2006 Dave Steffen WSID=

VER 2000 steffen SUBW= A
TIME 14:37:38 SITE = S 1 PASS= 1 PART= 1

***** BASIC DATA *****
CLIMATE AREA - NOT DEFINED DESIGN CLASS A1 = LT 3000.

STORM DISTRIBUTION-PSH 24 HOUR TYPE II RAINFALL DISTRIBUTION

STORM DISTRIBUTION AUX. -24 HOUR TYPE II RAINFALL DISTRIBUTION

PRECIP. - P-PS,1-DAY P-PS,10-DAY P-SD P-FB
 1.90 0.00 0.00 4.40

WSDATA - CN DA-SM TC/L -/H QRF
 82.00 0.61 6970.00 1.30 0.00

SITEDATA- PERM POOL CREST PS FP SED VALLEY FL 378?
 90.00 90.00 0.00 71.00 YES

BASEFLOW INITIAL EL EXTRA VOL SITE TYPE
 0.00 0.00 0.00 DESIGN

PSDATA - NO. COND COND L DIA/W -/H
 1.00 108.00 18.00 0.00

 PS N KE WEIR L TW EL
 0.009 1.00 9.42 72.00

 2ND STG ORF H ORF L START AUX.
 0.00 0.00 0.00 0.00

ASCRESTS - AUX.1 AUX.2 AUX.3 AUX.4 AUX.5
 0.00 0.00 0.00 0.00 0.00

AUX.DATA - REF.NO. RETARD. Ci TIE STATION INLET LENGTH
 41 0.00 200.00 200

AUX.DATA - INLET N SIDE SLOPE EXIT N EXIT SLOPE ACTUAL AUX?
 0.035 2.00 0.035 0.100 NO

BTM WIDTH - BW1 BW2 BW3 BW4 BW5
 ft 50.00 0.00 0.00 0.00 0.00

AUXILIARY SPILLWAY RATING DEVELOPED USING WSPVRT.

1SITES _____
XEQ 08/11/2006 Dave Steffen WSID=
VER 2000 steffen SUBW= A
TIME 14:37:38 SITE = S 1 PASS= 1 PART= 2

PERM POOL 90.00 FT 59.2 ACFT 8.77 AC 0.0 CFS

CREST PS 90.00 FT 59.2 ACFT 8.77 AC 0.0 CFS
 SED ACCUM 90.00 FT 59.2 ACFT 8.77 AC 0.0 CFS
 START ELEV 90.00 FT 59.2 ACFT 8.77 AC 0.0 CFS

>>>> MINIMUM DEPTH (1.00 FT) USED FOR NHCP378 RUN - CREST PS TO CREST AUX.

NRCS-PSH D= 24.00 HR P= 1.90 IN Q= 0.58 IN DA= 0.61 SM
 TC= 2.06 HR CN= 82.00 VOL= 19.1 ACFT

PEAK = 67.0 CFS, AT 13.3 HRS.

ROUTED RESULT - HYD TYPE EMAX VOL-MAX AMAX QMAX
 NRCS-PSH 91.00 FT 68.4 ACFT 9.58 AC 29.4 CFS

PS STORAGE 9.2 ACFT, BETWEEN AUX. CREST AND SED. ACCUM ELEVATIONS.

DRAWDOWN (DDT) TEST 90.00 FT 59.2 ACFT 0.00 CFS
 CONTROL IS 0.000 DETENTION STORAGE

TIME = 2.11 DAYS, TO 0.0 CFS (LIMIT = 10.00 DAYS)

RATING TABLE DEVELOPED, SITE = S 1:
 BY PROGRAM FOR PS AND AUX. SPILLWAYS
 AUX. RATING USED WSPVRT METHOD.

RATING TABLE NUMBER 1

	ELEV. FEET	Q-TOTAL CFS	Q-PS CFS	Q-AUX. CFS	VOLUME AC-FT	AREA ACRE
1	90.00	0.00	0.00	0.00	59.23	8.77
2	90.29	4.52	4.52	0.00	61.79	9.00
3	90.58	12.78	12.78	0.00	64.42	9.24
4	90.86	23.48	23.48	0.00	67.12	9.47
FULL CONDUIT FLOW, ELEV = 91.15 FT						
5	91.15	36.15	36.15	0.00	69.88	9.71
6	91.76	36.73	36.73	0.00	75.92	10.20
7	92.36	37.29	37.29	0.00	82.27	10.80
8	92.97	37.84	37.84	0.00	89.01	11.47
9	93.58	38.38	38.38	0.00	96.16	12.13
10	94.18	38.91	38.91	0.00	103.72	12.80
11	94.79	39.44	39.44	0.00	111.67	13.47
12	95.39	39.96	39.96	0.00	120.03	14.13
13	96.00	40.48	40.48	0.00	128.80	14.80

1SITES

XEQ 08/11/2006	Dave Steffen	WSID=
VER 2000	steffen	SUBW= A
TIME 14:37:38	SITE = S 1	PASS= 1 PART= 3

AUX. CREST 91.00 FT 68.4 ACFT 9.58 AC 29.4 CFS

PS STORAGE 9.2 ACFT, BETWEEN AUX. CREST AND SED. ACCUM ELEVATIONS.

START ELEV 90.00 FT 59.3 ACFT 8.77 AC 0.0 CFS

EFFECTIVE HEIGHT(H)= 20.0 FEET, PRODUCT= 1368. (H * STORAGE AT CREST AUX.).

INPUT DESIGN CLASS = A1 = LT 3000. PRODUCT.

NRCS-FBH D= 24.00 HR P= 4.40 IN Q= 2.55 IN DA= 0.61 SM
TC= 2.06 HR CN= 82.00 VOL= 83.5 ACFT

PEAK = 321.2 CFS, AT 13.0 HRS.

RATING TABLE DEVELOPED, SITE = S 1:
BY PROGRAM FOR PS AND AUX. SPILLWAYS
AUX. RATING USED WSPVRT METHOD.

RATING TABLE NUMBER 2

	ELEV. FEET	Q-TOTAL CFS	Q-PS CFS	Q-AUX. CFS	VOLUME AC-FT	AREA ACRE
1	90.00	0.00	0.00	0.00	59.23	8.77
2	90.11	1.08	1.08	0.00	60.21	8.86
3	90.22	3.06	3.06	0.00	61.20	8.95
4	90.33	5.62	5.62	0.00	62.20	9.04
5	90.44	8.65	8.65	0.00	63.21	9.13
6	90.56	12.09	12.09	0.00	64.23	9.22
7	90.67	15.90	15.90	0.00	65.26	9.31
8	90.78	20.03	20.03	0.00	66.30	9.40
9	90.89	24.47	24.47	0.00	67.35	9.49
10	91.00	29.20	29.20	0.00	68.41	9.58
11	91.05	32.90	31.47	1.43	68.90	9.63
12	91.10	36.64	33.78	2.86	69.39	9.67
FULL CONDUIT FLOW, ELEV = 91.15 FT						
13	91.15	40.44	36.16	4.29	69.88	9.71
14	91.40	49.42	36.39	13.03	72.26	9.91
15	91.64	71.16	36.61	34.55	74.69	10.10
16	92.07	130.80	37.02	93.78	79.17	10.48
17	92.61	241.25	37.51	203.74	84.92	11.07
18	93.58	531.89	38.38	493.51	96.16	12.13
19	94.79	1010.45	39.44	971.01	111.67	13.47
20	96.00	1626.52	40.48	1586.04	128.80	14.80

SUMMARY OF AUXILIARY SPILLWAY SURFACE CONDITIONS USED IN COMPUTATIONS BY REACH

REACH FROM	TO	SLOPE	RETARDANCE	VEGETAL	MAINT.	ROOTING	REACH
STA	STA	CURVE	COVER	CODE	DEPTH	LOCATION	
(ft)	(ft)	(%)	INDEX@	FACTOR	(ft)	*	

1	0.	100.	-8.0	0.035	**	**	**	INLET
2	100.	200.	0.0	0.035	**	**	**	CREST
3	200.	300.	10.0	0.035	0.65	3	2.0	EXIT !

@ The program interprets retardance curve index entries of less than 1 as Manning's n values.

* Upper case indicates a reach of constructed spillway channel.

** The program does not use vegetal cover factor, maintenance code, and rooting depth for inlet and crest reaches in computations.

! Reach 3 used in computing exit channel velocities.

DRAWDOWN USING FREEBOARD STORM FOLLOWS, STARTING AT ELEVATION 91.00 FT.

DRAWDOWN (DDT) TEST 90.00 FT 59.2 ACFT 0.00 CFS
CONTROL IS 0.000 DETENTION STORAGE

TIME = 2.29 DAYS, TO 0.0 CFS (LIMIT = 10.00 DAYS)

ROUTED RESULTS	BTM WIDTH FT	MAX ELEV FT	VOL-MAX ACFT	AREA-MAX AC	AUX.-HP FT	VOL-AUX. ACFT
NRCS-FBH	50.0	92.55	84.3	11.0	1.55	15.9

PEAK - CFS DISCHARGE =	Q-PS 37.5	Q-AUX. 192.5	Q-TOT. 230.0
---------------------------	--------------	-----------------	-----------------

	CRITICAL DEPTH FT	CRITICAL VELOCITY FT/SEC	CRITICAL SLOPE-Sc FT/FT	25% OF Q Sc FT/FT
AUXILIARY SPILLWAY	0.76	4.89	0.020	0.027

EFFECTIVE STRESS FOR STABILITY ANALYSIS OF AUX. EXIT CHANNEL
(Refer to Ag. Handbook 667, Chapt. 3, for allowable stresses.)
Aux. Discharge = 193. cfs; Bottom Width = 50. ft

REACH NO.	FROM STA	TO STA	SLOPE %	MANNING'S n	VELOCITY ft/s	STRESS lb/ft^2
3	200.	300.	10.00	0.035	8.01	1.791

AUXILIARY SPILLWAY DURATION FLOW = 9.4 HOURS
ATTACK, OE/B = 0.8 ACFT/FT

***** MESSAGE - NHCP378 CRITERIA USED BUT AUXILIARY SPILLWAY RATING NOT BASED ON ASFILE RATINGS.

EXIT CHANNEL FLOW SUPERCRITICAL: MAX VELOCITY= 8.0 FT/SEC
EXIT SLOPE = 0.100 FT/FT
FLOW DEPTH = 0.5 FT

>>>> NHCP378 RUN - MINIMUM DEPTH, CREST AUX. TO TOP OF DAM IS 2.00 FT.

NEW TOP OF DAM ELEVATION = 93.00.

ROUTED	BTM	WIDTH	MAX ELEV	VOL-MAX	AREA-MAX	AUX.HP	VOL-AUX.
RESULTS	FT	FT	ACFT	AC	FT	ACFT	
MINIMUM AUX.	50.0	93.00	89.5	11.5	2.01	21.1	

PEAK - CFS	Q-PS	Q-AUX.	Q-TOT.
DISCHARGES =	37.9	321.2	359.1

	CRITICAL	CRITICAL	CRITICAL	25% OF Q
	DEPTH	VELOCITY	SLOPE-Sc	Sc
AUXILIARY	FT	FT/SEC	FT/FT	FT/FT
SPILLWAY —	1.07	5.75	0.018	0.024

>>>>> NHCP378 RUN - MINIMUM DEPTH, DESIGN FLOW TO TOP OF DAM; 1.00 FT REQUIRED
FOR THIS PASS. NEW TOP OF DAM ELEVATION = 93.55.

ROUTED	BTM	WIDTH	MAX ELEV	VOL-MAX	AREA-MAX	AUX.HP	VOL-AUX.
RESULTS	FT	FT	ACFT	AC	FT	ACFT	
MINIMUM AUX.	50.0	93.55	95.9	12.1	2.56	27.5	

PEAK - CFS	Q-PS	Q-AUX.	Q-TOT.
DISCHARGES =	38.4	486.8	525.2

	CRITICAL	CRITICAL	CRITICAL	25% OF Q
	DEPTH	VELOCITY	SLOPE-Sc	Sc
AUXILIARY	FT	FT/SEC	FT/FT	FT/FT
SPILLWAY —	1.41	6.56	0.016	0.022

INFLOW HYD 1 PSH-PEAK = 23.65 CFS AT 15.16 HRS, LOCATION POINT

INFLOW HYD 1 FBH-PEAK = 229.99 CFS AT 13.95 HRS, LOCATION POINT
HYDOUT 1

1SITES.....JOB NO. 1 COMPLETE.

Dave Steffen

0 SUBWATERSHED(S) ANALYZED.

1 STRUCTURE(S) ANALYZED.

2 HYDROGRAPHS ROUTED AT LOWEST SITE.

0 TRIALS TO OBTAIN BOTTOM WIDTH FOR SPECIFIED STRESS OR VELOCITY.

SITES.....COMPUTATIONS COMPLETE

>>> SITE SUBWS SUBWS DA CURVE TC TOTAL DA TYPE STRUC <<<									
ID	ID	(SQ MI)	NO.	(HRS)	(SQ MI)	DESIGN	CLASS		
S	1	A	0.61	82.	2.06	0.61	378CR	A1	

PASS DIA./ AUX.CREST BTM. MAX. MAX. EMB. INTEGR.* EXIT* TYPE									
NO.	WIDTH	ELEV	WIDTH	HP	ELEV	VOL.	DIST.	VEL.	HYD
(IN/FT)	(FT)	(FT)	(FT)	(FT)	(CY)	(FT)	(FT/SEC)		
1	18.0	91.0	50.0	2.5	93.6	0.	0.	8.0	MIN. AUX.

* INTEGRITY DIST. AND EXIT VEL. ARE BASED ON THE ROUTED HYDROGRAPH AND WILL NOT RELATE TO THE MAX. ELEV. (TOP OF DAM), WHICH IS SET BY MINIMUM DESIGN CRITERIA.

SITES.....SUMMARY TABLE 1 COMPLETED.

NRCS SITES VERSION 2000 ,05/01/2000
FILES

INPUT
C:\data\Engineering\sites\steffen\36-18.D2C

OUTPUT - DATED 08/11/2006 14:37:38
C:\data\Engineering\sites\steffen\36-18.OUT

GRAPHICS FILES GENERATED

OPTION "L" DATED 08/11/2006 14:37:38
C:\data\Engineering\sites\steffen\36-18.DRG

OPTION "P" DATED 08/11/2006 14:37:38
C:\data\Engineering\sites\steffen\36-18.DHY

OPTION "E" DATED 08/11/2006 14:37:38
C:\data\Engineering\sites\steffen\36-18.DEM

CONSTRUCTION SPECIFICATIONS

DAVE STEFFEN DAM

**SECTION 10, T96N, R72W
GREGORY COUNTY, SOUTH DAKOTA**

**KONECHNE ENGINEERING
PIERRE, SOUTH DAKOTA**

CONSTRUCTION SPECIFICATION

SD - 2 CLEARING AND GRUBBING

2.1 SCOPE

The work shall consist of the clearing and grubbing of the area within the stake limits by removal and disposal of trees, snags, logs, stumps, shrubs, and rubbish.

2.2 REMOVAL

Unless otherwise specified all material to be cleared and grubbed shall be removed to a depth of 1 foot below the embankment foundation after stripping and 2 feet below a concrete subgrade.

2.3 DISPOSAL

Where brush piles for wildlife are not specified, cleared and grubbed materials shall be disposed of by burning or burying at locations selected by the contractor and approved by the landowner or engineer. Materials to be buried shall be placed at least 2 feet below the surrounding ground line and have a minimum of 2 feet of cover with the finished surface graded to drain. Any burning operations shall be subject to all public laws governing such operations, and any required permits to be obtained by the contractor.

2.4 PAYMENT

Payment for this item shall be included in the cost of earth fill and is subsidiary to Construction Specification SD-7S, Earth Fill - Class S.

CONSTRUCTION SPECIFICATION

SD – 7S EARTH FILL – CLASS S

7S-1 SCOPE

The work shall consist of the construction of compacted earth fills where the amount of compaction is to be controlled by a method type of specification.

7S-2 MATERIALS

All fill materials shall be obtained from required excavations and designated borrow areas. The selection, blending, routing and disposition of materials shall be subject to approval by the engineer.

Fill materials shall not contain frozen material, sod, brush, roots, or other perishable materials, or rocks larger than 8 inches in diameter. Fill shall not be placed on frozen surface.

7S-3 FOUNDATION PREPARATION

After stripping, the foundation shall be scarified or plowed to a minimum depth of 4 inches. The entire foundation area shall then be compacted by the process used on the fill.

7S-4 PLACEMENT

All foundation excavations and/or preparation shall be completed before placing fill. The fill shall be placed such that the distribution of materials is essentially uniform throughout the entire fill and is free from lenses, pockets, streaks, or layers of materials differing substantially from surrounding material.

Fill, adjacent to structures, shall be placed in a manner that will prevent damage to the structure and allow the structures to assume the backfill loads gradually and uniformly. Equipment weighing more than 400 pounds shall not be operated within 2 feet of any structure.

Fill shall be placed in approximately equal horizontal layers. Fill layer thicknesses shall not exceed 9 inches for machine or 4 inches for hand compaction (including hand directed power tampers adjacent to structures).

7S-5 MOISTURE CONTENT

The fill material shall have a moisture content that when kneaded in the hand will form a ball which does not easily crumble when struck sharply with a pencil or which does not crumble when pressed between the hands.

If the soil is too wet, it will yield free water when kneaded in the hand. The fill may have to be wetted or dried to achieve proper moisture control.

7S.6 COMPACTION (CLASS S)

The fill shall be compacted by one of the following methods.

- a. By routing the hauling and spreading equipment such that all points of the fill is traversed by at least one tread track of the loaded equipment, parallel to the centerline of the fill.

- b. By at least two passes of a tamping (sheepfoot) roller weighing at least 100 pounds per square inch bearing area.

Fill adjacent to structures shall be compacted to a density equivalent to that of the surrounding fill by means of hand tamping or manually directed power tampers or plate vibrators. Heavy equipment shall not be operated within 2 feet of any structure.

Compaction of fill adjacent to concrete structures shall not be started until the following time limits have elapsed after placement of the concrete.

<u>Structure</u>	<u>Time Interval</u>
Walls and counterforts	14 days
Conduits and Spillway Risers (cast in place)	14 days
Conduits, precast, cradled	2 days
Conduits, precast, bedded	1 day
Anti-seep Collars and Cantilever Pipe props	3 days

7S-7 PAYMENT

Earth Fill is a bid item and payment for earth fill shall be by the cubic yard and computed to the specified neat lines on the drawings for excavation and the specified neat lines of the completed earthfill.

Items subsidiary to earth fill are, Construction Specifications SD-2, and SD-5.

CONSTRUCTION SPECIFICATION

SD – 9 DRAIN FILL AND FILTER

9.1 SCOPE

The work shall consist of furnishing and placing drain fill and filter sands or gravels.

9.2 MATERIALS

a. Quality

Aggregates shall be sand, gravel, or crushed stone, composed of clean, hard, durable mineral particles free from organic matter, clay balls, soft particles or other substances that would interfere with their free draining properties.

b. Gradation

The aggregates shall meet the following gradation requirements unless otherwise specified in the plans.

<u>Size</u>	<u>% Finer</u>
3"	100%
1"	90-100%
#4	50-85%
#50	10-40%
#200	0-5%

9.3 BASE PREPARATION

Surfaces on which drain fill will be placed shall be as undisturbed as possible (do not scarify), and will be free of standing water during placement of the fill. Care shall be taken to prevent trench walls from sliding.

9.4 PLACEMENT

Material shall be placed in uniform, approximately 6-inch thick layers. Extreme care shall be taken to assure uniformity of the drain fill, and to prevent segregation or contamination of the drain fill with foreign matter. When collector pipes are included in drains, the fill materials shall be placed in a manner to avoid displacing the pipe.

9.5 PAYMENT

Drain fill is a bid item and payment will be by the cubic yard basis as shown on the plans and computed to the neat lines of the drawings.

CONSTRUCTION SPECIFICATION

SD-12B CONCRETE FOR MINOR STRUCTURES (FOR STRUCTURES UP TO 10 C.Y.)

12B.1 SCOPE

The work shall consist of proportioning, forming, placing, finishing, and curing Portland cement concrete.

12B.2 MATERIALS

Portland Cement shall be Type II or Type IIA Portland Cement. Cement that is partially hydrated or otherwise damaged shall not be used.

Fine Aggregate is defined as all material which will pass a ¼ inch screen. Fine aggregate shall compose between 35 and 45 percent of the total aggregate and shall not contain more than 1 percent clay lumps or more than 4 percent finer than a No. 200 sieve. Coal in fine aggregate shall not exceed ½ of 1 percent.

Coarse Aggregate is defined as all material larger than ¼ inch. Maximum size aggregate shall not exceed:

- 1 inch – Concrete thickness of 4 inches or less
- 1½ inch – Concrete thickness of 4 inches or more

Coarse aggregate shall compose between 55 and 65 percent of total aggregate and shall not contain more than ¼ of 1 percent of clay lumps or more than 1 percent of material finer than No. 200 sieve. Coal shall not exceed 1 percent.

Mixed fine and coarse aggregate or pit-run aggregate may be used provided the requirements stated above are met.

Water shall be clean and free of harmful chemicals (suitable for drinking).

12B.3 DESIGN OF CONCRETE MIX

The contractor or person in charge of construction shall be responsible for designing a high quality concrete mix conforming to this specification.

The mix shall contain less than 6 gallons of water per bag of cement, and at least 6 bags of cement per cubic yard of concrete. The air-entrainment shall be between 4 and 7 percent by volume, and the slump after mixture shall be between 2 and 4 inches.

The following table is recommended as a guide for developing a satisfactory mix to give 3000 psi compressive strength for air-entrained concrete.

Max Size Aggregate	Gal. Water per sack Of cement	% of Fine Aggregate	Sacks Cement per cu. yd.	Pounds Fine Aggregate per sack cement	Pounds Coarse Aggregate per sack cement
1"	6.0	40	6.0	190-200	300-310
1½"	6.0	35	6.0	180-190	330-340

Ready Mixed concrete may be used provided it meets the requirements of these specifications. Upon request the vendor shall provide the owner with a signed delivery ticket giving the quantities of concrete, cement, fine aggregate, coarse aggregate and water contained in the batch.

Measurements of materials shall be by weight where suitable scales are available. Where suitable scales are not available, volume measurement may be used provided volume-weight relationships are carefully determined. Calcium chloride or other accelerators or anti-freeze compounds shall not be used.

Measurements (by weight) of materials in the mix shall be made available to the engineer.

12B.4 FORMS FOR CONCRETE

Forms shall be made of wood, plywood, steel or other approved material. The type, size, shape, quality and strength of forms will be subject to approval by the engineer.

All forms shall be true to line and grade, mortar tight, and rigid enough to prevent bulging or displacement. Tolerances will be close enough to assure that the structure appears and performs well.

All forms shall be removed from the concrete. Forming shall not be embedded in the concrete.

12B.5 PLACING CONCRETE

Concrete shall be placed in final position within one and one-half hours after mixing with cement. Concrete shall be consolidated by hand spading and tamping or by mechanical vibration.

All concrete placed on earth shall be placed on clean damp surface, free of frost, ice, or running water. Concrete shall not be dropped more than 5 feet vertically unless suitable equipment is used to prevent segregation.

Uniformed surfaces (excluding slip form concrete) exposed in the completed work shall have a wood float finish. Exposed concrete edges shall be chamfered or finished with molding tools. Concrete shall be placed at air temperatures between 40 degrees F and 80 degrees F unless special measures are taken to protect the concrete. Concrete shall be protected from freezing for 7 days after placement.

12B.6 CURING CONCRETE

All concrete shall be cured by keeping all exposed surfaces wet for 7 days or by applying a spray type curing compound to exposed concrete surfaces immediately after the free water has disappeared after pouring.

12B.7 DEFECTIVE CONCRETE

Honey combed areas and other voids in concrete will be promptly repaired with mortar patching immediately upon discovery.

Concrete subjected to damage and/or other violations of this specification will be rejected.

12B.8 PAYMENT

Concrete is a bid item and payment will be by the cubic yard basis and will be calculated to the neat lines on the drawings,

CONSTRUCTION SPECIFICATION

SD-16 TIMBER FABRICATION AND INSTALLATION

16.1 SCOPE

This specification covers the quality and installation of plywood and pressure treated structural timber poles, posts and lumber structure and timber and lumber portions of composite structure.

16.2 MATERIAL

a. Plywood

Plywood shall be new, exterior grades, and shall meet Product Standard PS 1-66
Plywood for use underground shall be pressure treated in accordance with the American Wood Preservers Bureau AWPB-FDN Standard (stamped on plywood).

b. Structural Timber and Lumber

Structural timber and lumber shall be structural grade or better. Structural timber poles, posts, and lumber shall be new, sound, decay free, straight, not warped or cracked. Unless otherwise specified on the drawings, all lumber and timber except re wood and red cedar shall be treated by any of the following preservatives:

Commercial Coal Tar Creosote
Hot and Cold Bath Creosote
Pentachlorophenol – Commercial Treatment
Pentachlorophenol – Cold soaking Method
AWPB-FDN Standard Preserving Salts

c. Hardware

Bolts, rods, nuts, washers, and other hardware shall be an appropriate grade of steel, and if to be placed underground, shall be galvanized or otherwise corrosion protected.

16.3 INSTALLATION

The material shall be of the dimensions, and installed at the location, as shown on the drawings. All lumber to be treated shall be cut to size, insofar as practical, prior to treatment. Raw ends of lumber which has been cut after treatment shall be immersed in the preservative solution, or painted with four (4) heavy coats of the solution. Each application should be allowed to dry. For home treatment, the preservative manufacturer's directions shall be carefully followed.

16.4 PAYMENT

This item shall consist of furnishing and installing the Timber Pipe Support as shown on the plans. Payment for this item is on the lump sum basis.

CONSTRUCTION SPECIFICATION

SD - 19 PVC DRAIN FOR SAND SEEP COLLAR

1. SCOPE

The work shall consist of furnishing and installing polyvinyl chloride (PVC) plastic pipe, fittings and appurtenances as shown on the drawings. The specification covers drains for sand seep collars.

2. MATERIAL

Pipe shall have a minimum 160 psi pressure rating, shall meet ASTM D1785 or D2241, and shall be defect free. Pipe compound shall meet ASTM D1784, Class 12454-B.

Fittings and appurtenances shall be made of the same material as the pipe, and be designed for use with the pipe at a minimum pressure rating of 160 psi, except as noted otherwise.

Solvent cement for the pipe joints shall meet ASTM D25634.

Rubber gasket joints shall conform to ASTM D3129.

3. PIPE PLACEMENT

Pipe must be installed to specified lines and grades without blocking, distortion or damage. The pipe must be uniformly supported on firm stable soil (or other specified bedding) over its entire length.

4. BACKFILL

All backfill recommendations of the pipe manufacture shall be met. Vehicles or construction equipment shall not cross the pipe until earth cover over the pipe exceeds two feet.

Initial backfill to six inches above the top of the pipe is required. Except as otherwise specified, earth haunching and initial backfill shall consist of soil that is free of rocks, hard clods or other objects more than one inch in diameter. Earth fill shall be worked and compacted under the haunches of the pipe to provide continuous support in layers not more than six inches thick. Care shall be taken to insure the pipe is not deformed, damaged, or displaced.

Final backfill shall consist of remaining backfill from top of initial backfill to ground surface, including mounding for settlement. Final backfill shall be free of debris, rocks or other objects three inches nominal diameter or larger. Final backfill shall be approximately uniform, void free, compacted layers.

5. MEASUREMENT AND PAYMENT

This item consists of furnishing and installing the PVC drain pipe used in the sand seep collar. The quantity will be measured to the nearest foot by measurement as indicated by the neat lines on the drawings. Such payment will constitute full compensation for furnishing, transporting, and installing the pipe complete in place.

CONSTRUCTION SPECIFICATION

SD-17 METAL FABRICATION AND INSTALLATION

17.1 SCOPE

The work shall consist of furnishing, fabricating, and installing metalwork including metal parts of composite structures.

17.2 MATERIALS

A. Steel

Except as noted below, steel shall be carbon steel of a malleable, weldable quality.

High strength, weather resistant steel shall conform to the requirements of ASTM A-242, A-588, or A-514.

Bolts, nuts, washers, rods, rivets, etc. shall be of a material equal to the steel being fastened.

B. Aluminum

Aluminum alloy products shall be Alloy 60610T6.

17.3 PROTECTIVE COATINGS

A. Galvanizing

If specified on the drawings, steel shall be galvanized. Galvanizing shall conform to ASTM A-386, A-153, A-164 Type RS, or A-165 Type TS.

B. Painting

Unless shown otherwise on the plans, non galvanized metal shall be cleaned and painted using the following procedure.

- (1) Cleaning – Remove all dirt, oil, and grease by means of a mineral spirit cleaning. Next, thoroughly wet the metal with a dilute (about 5 percent strength) phosphoric acid solution. Allow the acid to dry and then thoroughly rinse the surfaces with clear water and again allow to dry.
- (2) Paint – Apply two coats of one of the following paints:
 - a. Zinc Dust – Zinc Oxide Primer conforming to Federal Specification TT-P-641, Type III.
 - b. Zinc Dust Chlorinated Rubber conforming to Federal Specification TT-P-1046a.
 - c. Zinc Dust Paint conforming to Military Specification MIL-P-21035.

d. Epoxy-Polyamide Paint conforming to Defense Specification DOD-P-15145B.

- (3) Application – Paints shall be thoroughly mixed at the time of application. The first coat of paint shall be applied by brushing. All other coats may be applied by brush or spray. Each coat shall be applied in such a manner as to produce a continuous paint film of uniform thickness.

Paint shall not be applied when the temperature of the item to be painted or of the surrounding air is less than 50 degrees F. Painting shall be done only when the humidity and temperature of the surrounding air and temperature of the metal surfaces are such that evaporation rather than condensation will result during the application and drying time.

The finished surface of each coat shall be free from runs, drops, ridges, laps, or excessive brush marks and shall present no variation in color, texture, and finish. Surfaces shall be thoroughly dry before application of each coat of paint. The surface of each dried coat shall be cleaned as necessary before application of the next coat. After installation of the metalwork, all damage to painted surfaces shall be repaired.

17.4 FABRICATION

Metal items shall be fabricated to close fit, closely conforming to the drawings. Joints to be welded, shall be welded all around, in a manner developing as much strength as possible.

17.5 ERECTION

The metal shall be erected true and plumb, closely conforming to the drawings.

Riveting and welding shall not be done until as much of the structure as will be stiffened thereby has been properly aligned.

17.6 PAYMENT

This item shall consist of furnishing and installing the metal Anti-Vortex device as shown on the plans. Payment for this item will be on the lump sum basis.

MATERIAL SPECIFICATION

SD-55A CORRUGATED POLYETHYLENE (PE) PIPE

1. SCOPE

This specification covers the quality of corrugated polyethylene (PE) tubing and fittings.

2. PIPE AND TUBING

Corrugated polyethylene tubing shall conform to the following requirements for the specified tubing types, sizes, and fittings.

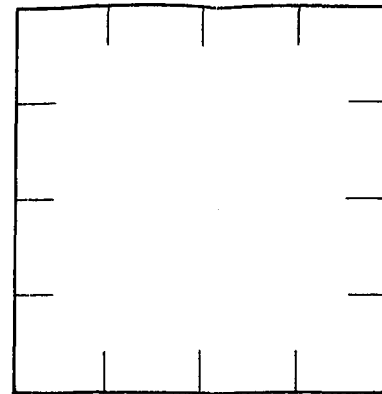
ASTM F667	Standard Specification for Corrugated Polyethylene Tubing
ASTM F667	Standard Specification for Corrugated Polyethylene Pipe
ASTM F894	Standard Specification for Polyethylene large Diameter Profile Wall Sewer and Drain Pipe.

AASHTO M252	Standard Specification for Polyethylene Corrugated Drainage Pipe
AASHTO M294	Standard Specification for Corrugated Polyethylene Pipe, 12 inches to 36 inches diameter.

RECEIVED
MAR - 5 2007
WATER RIGHTS
PROGRAM

STRUCTURE DATA

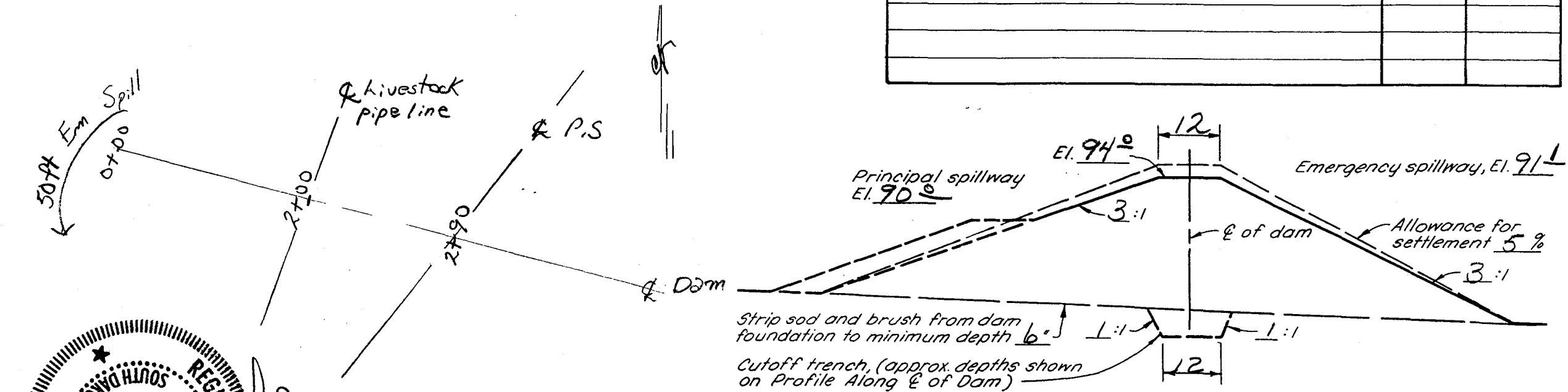
DRAINAGE AREA	ANNUAL YIELD	PEAK RUNOFF	EMERG. SPLWY. CAPACITY	WATER DEPTH	SURFACE AREA	SEDIMENT STORAGE	TOTAL STORAGE
ACRES	AC. FT.	25-YR.	C. F. S.	FEET	ACRES	AC. FT.	AC. FT.
393	19	321	486	19	8.8	—	59



Sec. 10 T. 96 N R. 72 W
Gregory County

LOCATION

TABLE OF QUANTITIES

[illegible]

TYPICAL CROSS SECTION OF DAM

S.D. CONSTRUCTION AND MATERIAL SPECIFICATIONS:

SD-2 Clearing & Grubbing
SD-7s Earth Fill
SD-9 Drain Fill
SD-12B Concrete
SD-16 Timber Fabrication
SD-17 Metal Fabrication
SD-55 PVC pipe
SD-15 CMP pipe

EARTH DAM

OPERATOR: Dave Steffen
CONSERVATION DISTRICT: Gregory
- Class "A" Hazard

Designed <u>Konechne</u>	Date	Approved by
		Title
Drawn		Title
Traced		Sheet <u> </u> Drawing No. <u> </u>

SKETCH PLAN OF DAM AND RESERVOIR AREA

Approximate scale 1" = _____

Elev

71.0

80.0

86.0

92.0

96.0

Surface Area (Acres)

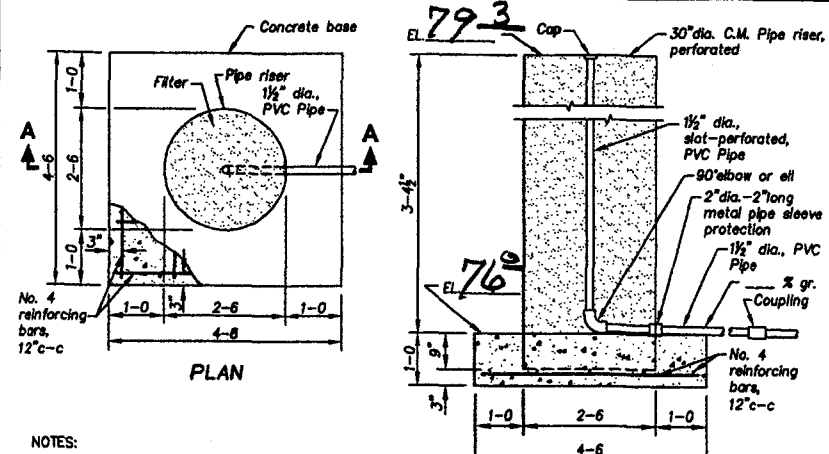
0

2.3

5.5

10.4

14.8



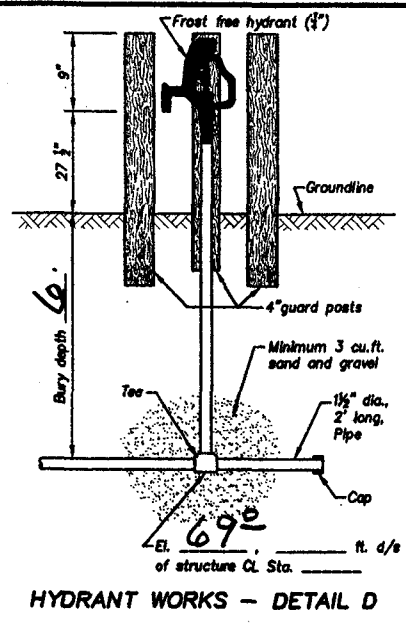
- NOTES:**
1. For the 30" dia. C.M. Pipe, 1/2" dia. perforations @ 2" c-c in the corrugation valleys.
 2. For the 1 1/2" dia. PVC Pipe in filter, field slot perforate with handsaw, 3/8" dia. in depth @ 1" c-c rotated around pipe.
 3. Pipe may be installed in through the concrete from the bottom of the riser.
 4. Top of riser shall be installed 4 ft. (min.) below permanent pool elevation.

INLET WORKS - DETAIL A

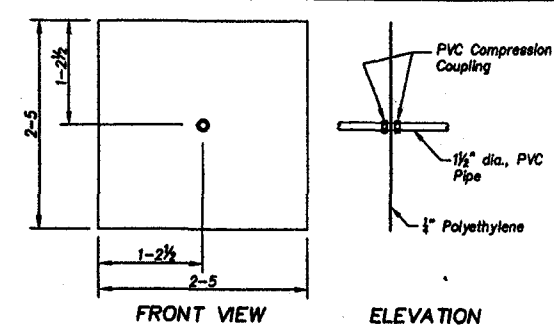
FILTER GRADATION

U.S. STANDARD SIEVE SIZE	PERCENT PASSING OR PERCENT FINER THAN
1"	95-100
1/2"	85-98
3/8"	74-85
#4	48-74
#10	6-38
#20	0-12
#40	0-4

Note: NE D.O.R. Class "A" Road Gravel meets gradation requirements.



HYDRANT WORKS - DETAIL D



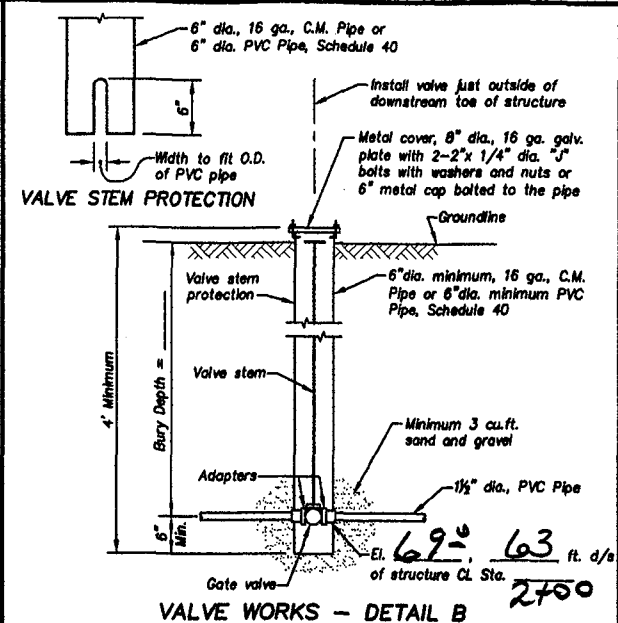
POLYETHYLENE SHEET ANTI-SEEP COLLAR**

** Collar shall be of quality equal to or exceeding the collars manufactured by Schels Drainage Products, Oregon, MO 64473

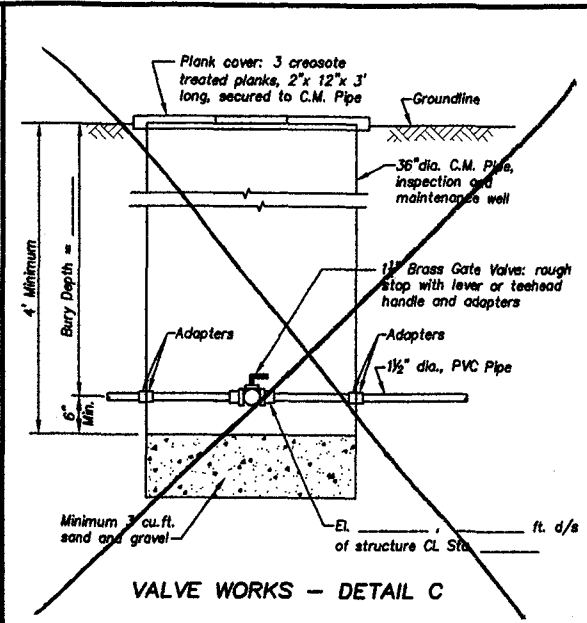
FABRICATION NOTES:

1. Pipe to be clean and dry before attaching anti-seep collar.
2. Care must be exercised when backfilling and tamping so that the anti-seep collar is not damaged.
3. Place anti-seep collars 10 ft. u/s of CL and 10 ft. d/s of CL.

DETAIL E



VALVE WORKS - DETAIL B

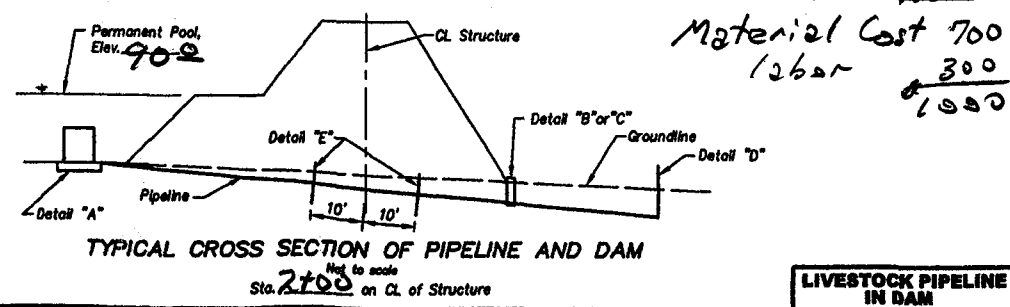


VALVE WORKS - DETAIL C

TABLE OF QUANTITIES

☒ X in box indicates detail which applies to structure

ITEM	UNIT	QUANTITY
INLET WORKS DETAIL A ☐	CONCRETE CLASS 3000	CU.YD. 0.8
	REINFORCING STEEL (NO. 4 BARS - 40 LIN.FT.)	LB. 27
	CORRUGATED METAL PIPE RISER, 30" DIA., 16 GA., PERFORATED, FULL CIRCULAR CROSS SECTION, FABRICATED WITH: ☐ ANNULAR CORRUGATIONS, CLOSE RIVETED OR ☒ HELICAL CORRUGATIONS CORRUGATION NOMINAL SIZE 2 2/3" x 1/2", ZINC COATED STEEL	LIN.FT. 4
	FILTER (SAND AND GRAVEL)	CU.YD. 0.6
VALVE WORKS DETAIL B ☒	6" DIA. 16 GA. C.M. PIPE INCLUDING GATE VALVE, VALVE STEM, METAL COVER AND ADAPTERS, 3 CU.FT. SAND AND GRAVEL	LIN.FT. 8
VALVE WORKS DETAIL C ☒	INSPECTION AND MAINTENANCE WELL, ZINC COATED C.M. PIPE, 36" DIA., 14 GA., INCLUDING GATE VALVE, PLANK COVER, ADAPTERS, 3 CU.FT. SAND AND GRAVEL PIPE CORRUGATIONS: ☐ ANNULAR CORRUGATIONS, CLOSE RIVETED OR ☐ HELICAL CORRUGATIONS	LIN.FT. 200
HYDRANT WORKS DETAIL D ☒	FROST FREE HYDRANT, INCLUDING 3-4" x 6" POSTS, TEE AND 3 CU.FT. SAND AND GRAVEL	EACH 1
DETAIL E ☐	POLYETHYLENE SHEET ANTI-SEEP COLLAR, COMPRESSION COUPLING	EACH 2
	1 1/2" DIA. PVC PIPE, SCHEDULE 40, INCLUDING ALL APPURTENANCES	LIN.FT. 200



TYPICAL CROSS SECTION OF PIPELINE AND DAM

LIVESTOCK PIPELINE IN DAM

Date _____

Designed _____

Drawn _____

Checked _____

Approved _____

Dave Steffen

NRCS
Natural Resources Conservation Service

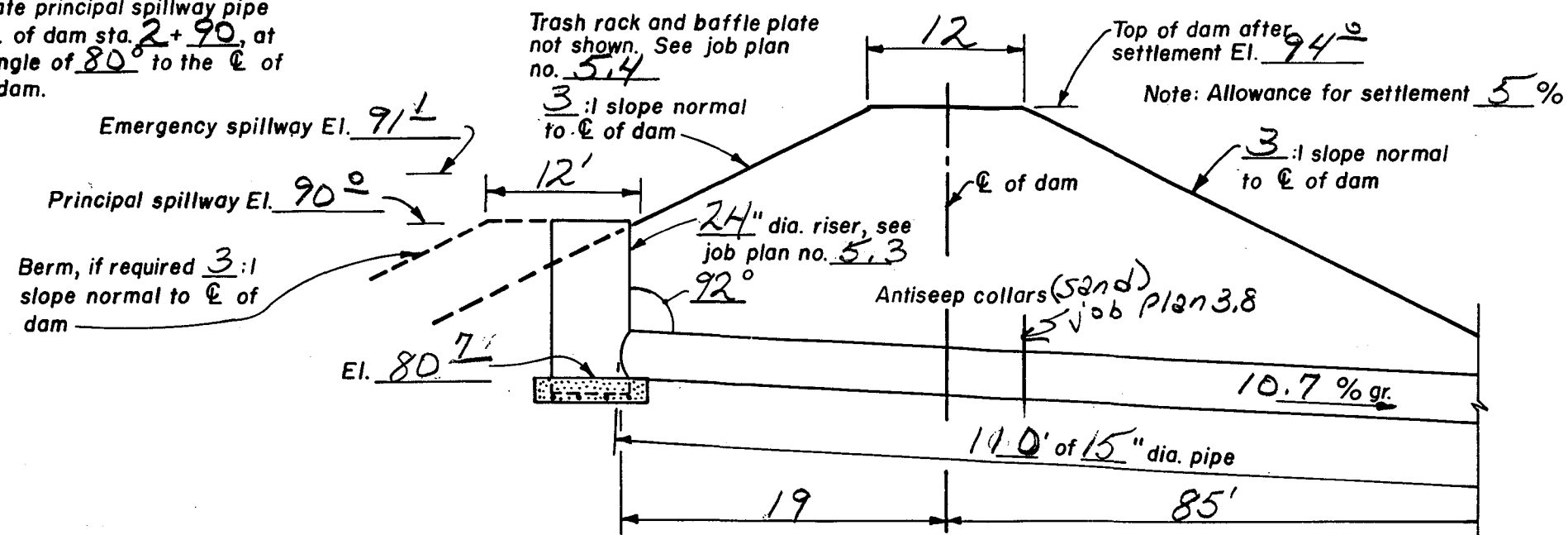
CAD file: NE200-10-003.dwg

Drawing No. _____

Sheet _____ of _____

Natural Resources Conservation Service
NE200-10-003 Revised 12/03 Replaces NE0-71

Locate principal spillway pipe at $\mathcal{C}$ of dam sta. 2+90, at an angle of 80° to the $\mathcal{C}$ of the dam.



CROSS SECTION OF DAM ALONG $\mathcal{C}$ OF PRINCIPAL SPILLWAY
(Not to scale)

SPECIFICATION NOTES

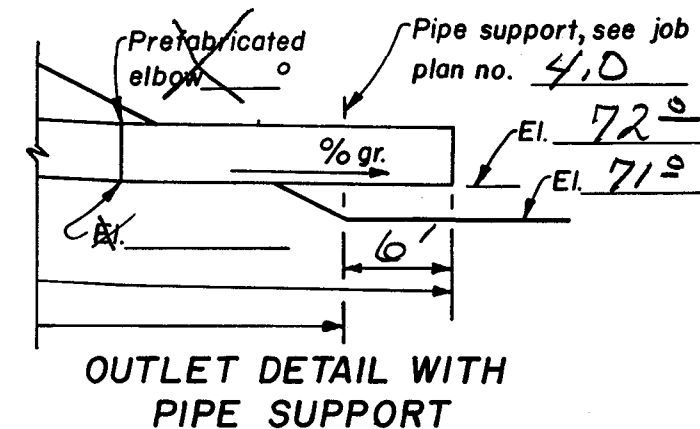
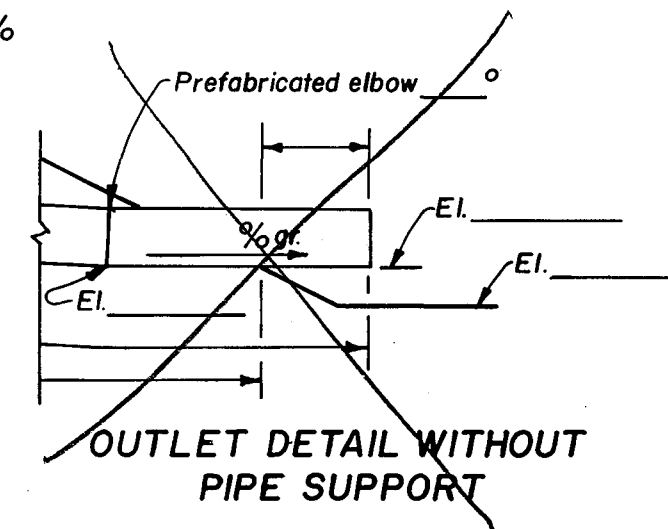
1. ELBOW, IF REQUIRED, MAY BE FABRICATED BY CONTINUOUS WELDING SEPERATE PIPE SECTIONS OR BY FABRICATING A CONTINUOUS WELDED JOINT ON THE UPSTREAM END OF LAST SECTION OF PIPE.
2. PIPE WALL THICKNESS SHALL BE 1/16 GAGE OR 0.064 INCHES.

pipe to be spiral and vinyl coated

TABLE OF QUANTITIES

ITEM	UNIT	QUANTITY

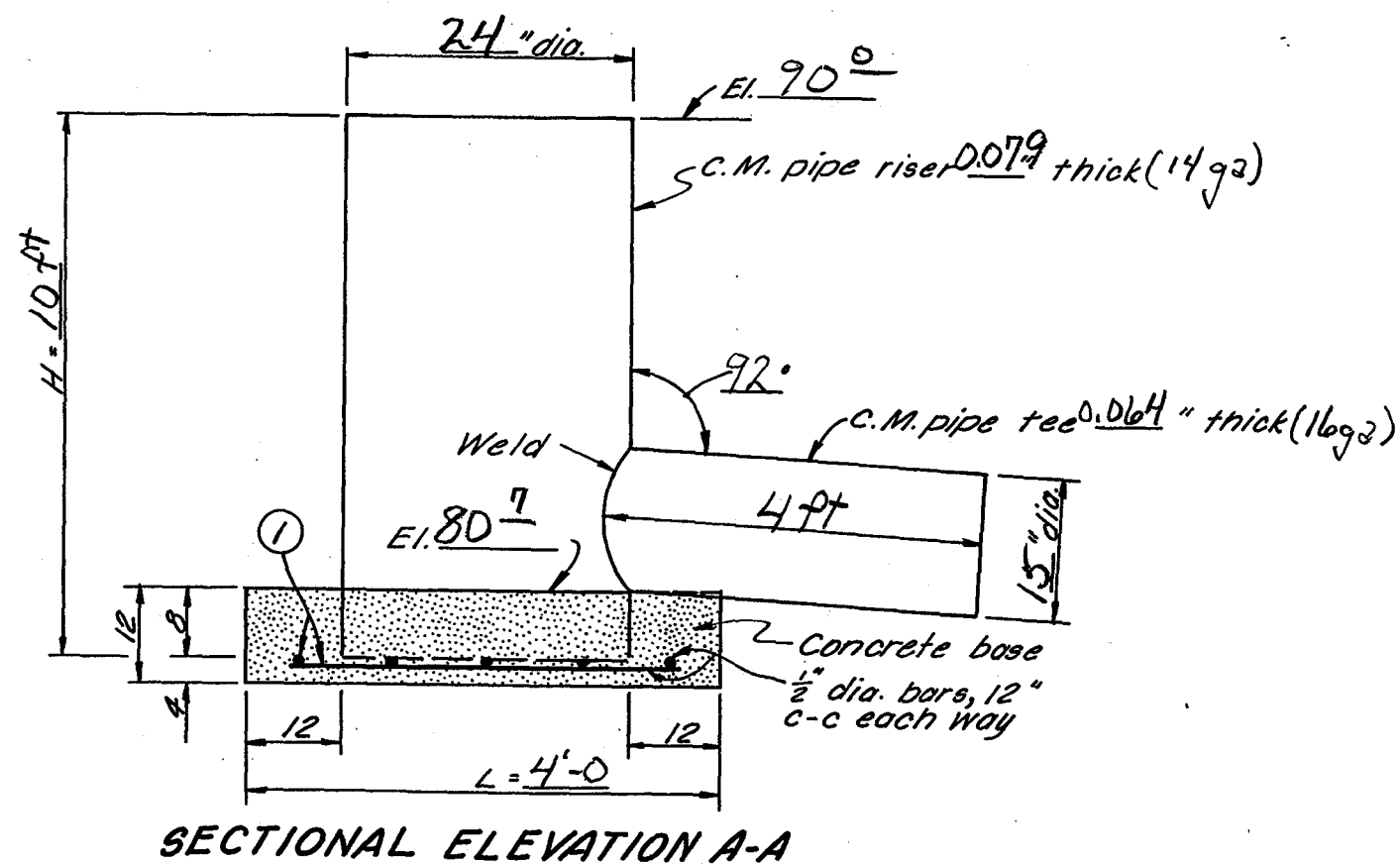
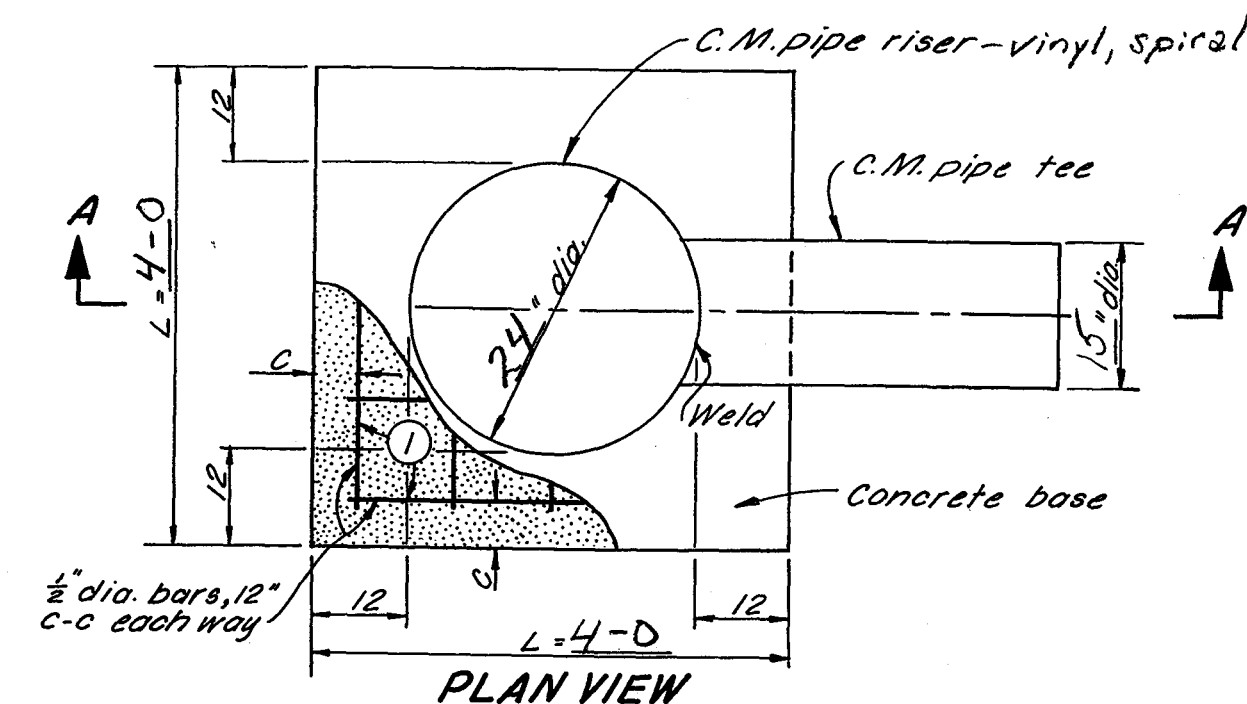
APPLICABLE STANDARD S.C.S. SPECIFICATIONS



Sec. 10, T. 96 N, R. 72 W
Gregory County
LOCATION

CORRUGATED METAL PIPE
DROP INLET PRINCIPAL SPILLWAY

OPERATOR <u>Dave Stetten</u>
CONSERVATION DISTRICT _____
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE
Designed _____ Date _____ Approved by _____ Title _____



STEEL SCHEDULE

RISER DIA. IN.	BAR SIZE	MARK	TYPE	NO. REQ'D.	LENGTH FT.-IN.	TOTAL LENGTH FT.-IN.	TOTAL WT. LB.	C IN.	L FT.-IN.
24	4	1	STR.	10	3-6	35-0	24	3	4-6

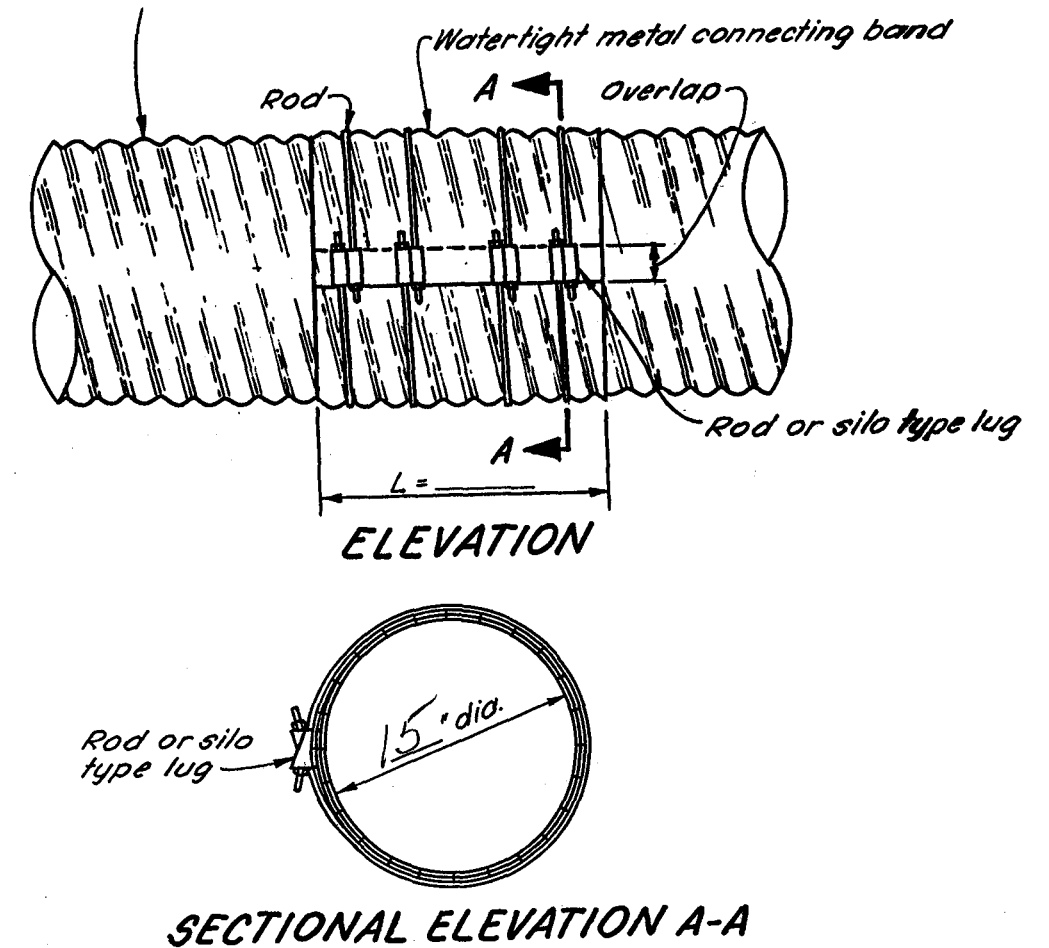
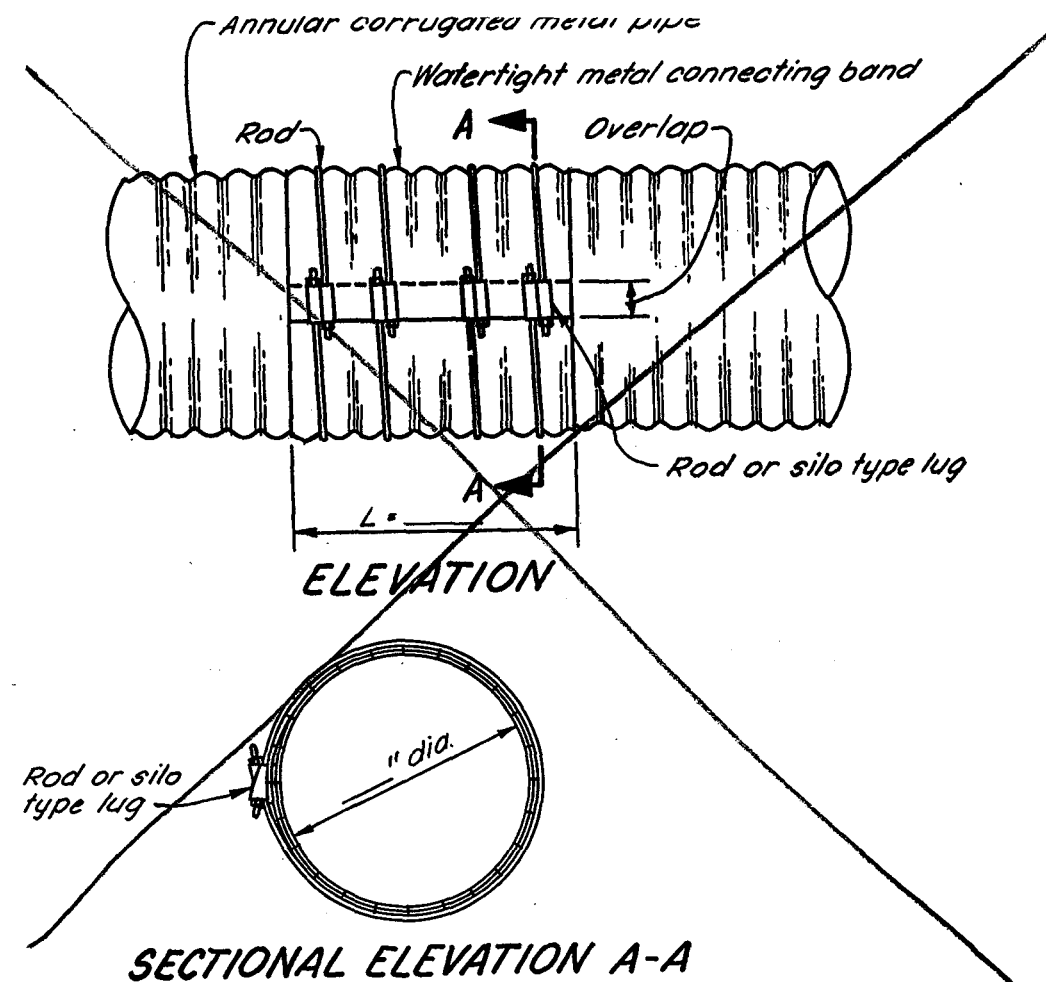
TABLE OF QUANTITIES

ITEM	UNIT	QUANTITY
CONCRETE	CU. YD.	0.6
REINFORCING STEEL	LB.	24

NOTE: All cmp pipe to be spiral and vinyl coated.

C.M. PIPE RISER WITH FABRICATED TEE

OPERATOR: <u>Dave Stetten</u>	
CONSERVATION DISTRICT: _____	
Designed _____	Date _____
Approved by _____	
Title _____	



DIMENSIONS AND QUANTITIES

PIPE DIA. INCHES	MINIMUM "L" INCHES	APPROX. OVERLAP INCHES	NUMBER OF RODS & LUGS	MINIMUM ROD DIA. IN.	NEOPRENE GASKET WIDTH INCHES	ASPHALT MASTIC GAL.
6-18	12	2	2	1/2	12	1/2
21-30	24	3	4	1/2	12	1 1/2
30-48	24	6	11	1/2	12	2

NOTES:

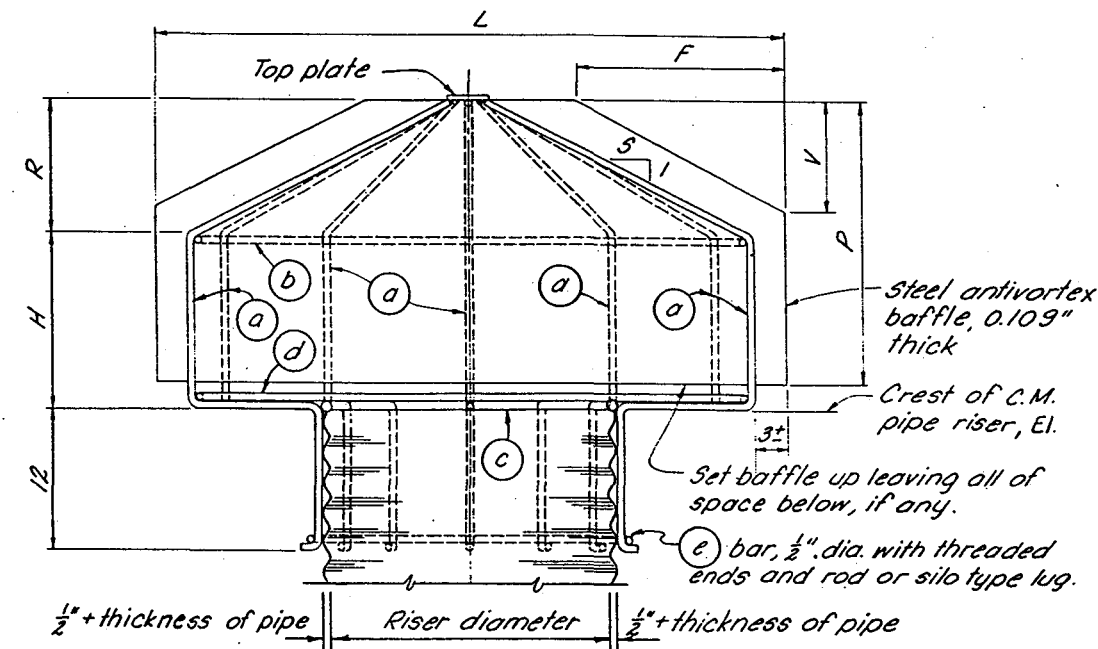
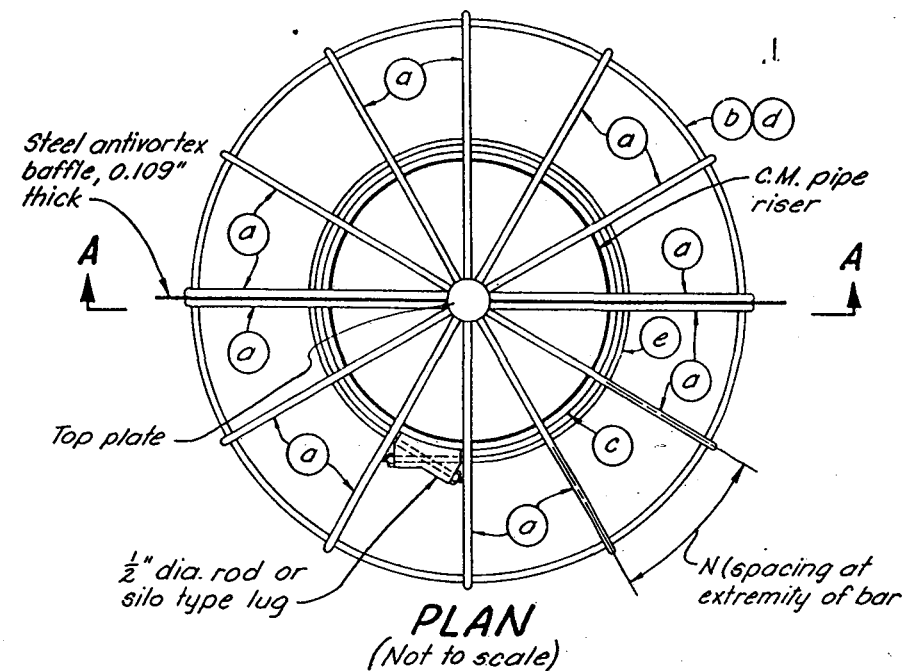
1. WATERTIGHTNESS WILL BE OBTAINED BY USE OF (1) 3/8" THICK NEOPRENE GASKET (WIDTH AS SHOWN) OR (2) ASPHALT MASTIC SEALING MATERIAL TO COVER FULL WIDTH OF BAND.
2. CROSS OUT BAND AND QUANTITIES NOT APPLICABLE.

WATERTIGHT CONNECTING BAND FOR ANNULAR AND HELICAL CORRUGATED METAL PIPE

OPERATOR: <u>Dave Steffen</u>	
CONSERVATION DISTRICT: _____	
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	
Date _____	Approved By _____
Designed _____	Title _____
Drawn _____	Title _____
Traced _____	Sheet _____
Checked _____	No _____
	of _____
	Drawing No. _____

JOB PLAN NO. 3.0

5 N-29.073.30



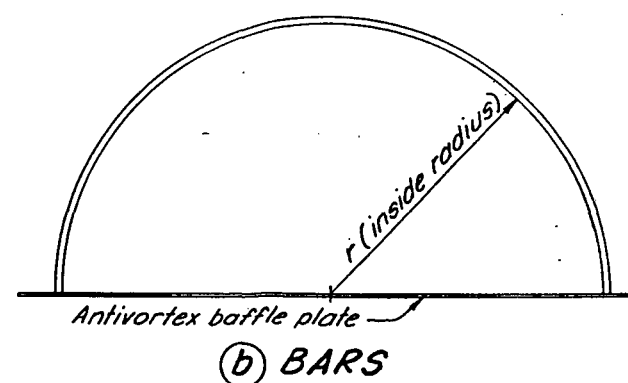
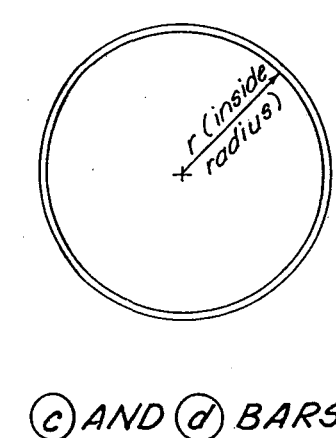
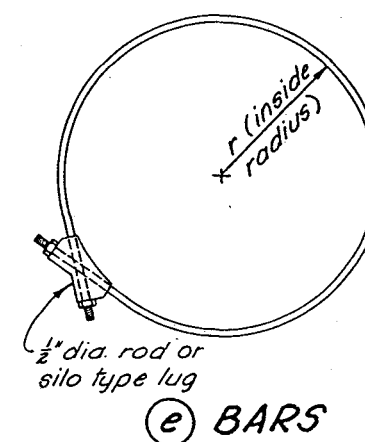
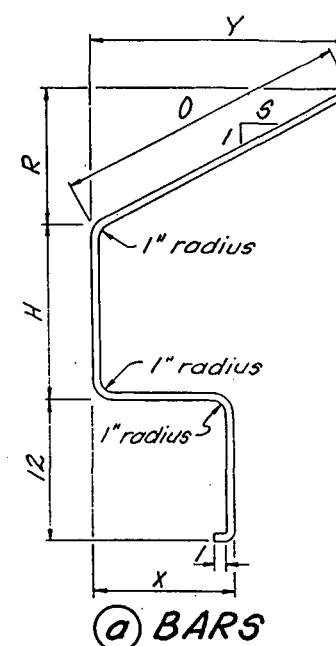
SECTIONAL ELEVATION A-A
(Not to scale)

NOTES:

1. WELD 4 (a) BARS TO BAFFLE PLATE AND TO TOP PLATE. WELD (c) AND (d) BARS TO 4 (a) BARS. WELD (b) BAR TO (a) BARS AND BAFFLE PLATE. WELD REMAINING (a) BARS TO (b), (c), AND (d) BARS AND TOP PLATE.
2. THE TRASH RACK AND ANTIVORTEX BAFFLE MAY BE FABRICATED AS A UNIT, OR TRASH RACK MAY BE FABRICATED IN IDENTICAL HALVES AND ATTACHED TO BAFFLE PLATE WITH 1/2" DIA. U BOLTS SPACED APPROXIMATELY 12" C-C ALONG THE VERTICAL AND INCLINED SECTIONS OF THE (a) BARS NEXT TO THE PLATE.
3. ALL BARS ARE SMOOTH ROUND BARS

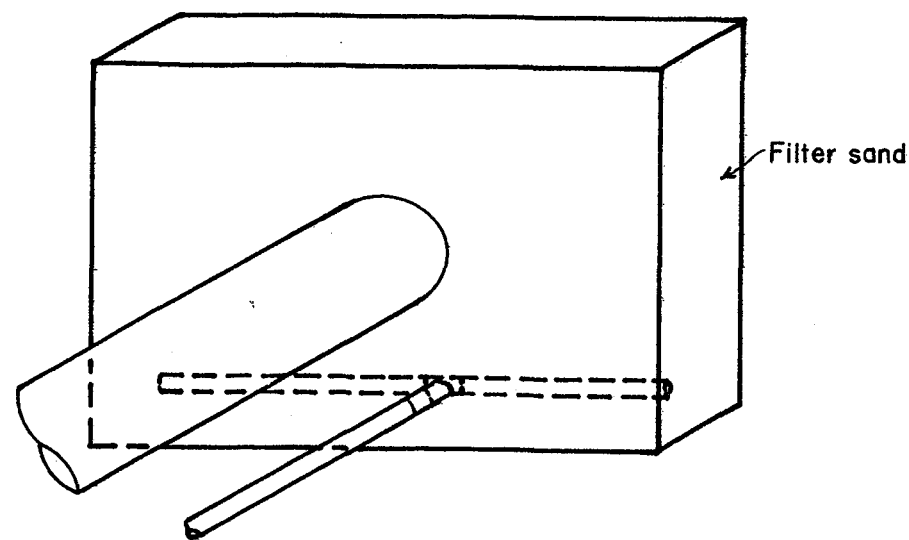
TABLE OF DIMENSIONS AND QUANTITIES

(a) BARS 5/8" DIA.									BAFFLE PLATE				(b) BARS 5/8" DIA.			(c) BARS 5/8" DIA.			(d) BARS 5/8" DIA.			(e) BARS 1/2" DIA.			TOP PLATE 1/4" THICK	NO. OF LUGS REQ'D.	TRASH RACK WEIGHT LB.
H IN.	R IN.	X IN.	Y IN.	S IN.	O IN.	TOTAL LENGTH	NO. REQ'D.	N IN.	L FT.	P IN.	F IN.	V IN.	NO. REQ'D.	r IN.	LENGTH IN.	NO. REQ'D.	r IN.	LENGTH IN.	NO. REQ'D.	r IN.	LENGTH IN.	NO. REQ'D.	r IN.	LENGTH IN.	DIA. IN.		
22 1/2" DIA. G. M. PIPE RISER																											
9	11 1/8	6	11 1/8	1	15 5/8	3-7 5/8	10	9 1/8	2-6	18	5	5	2	11 5/16	36 1/2	1	6	39 3/4	1	11 5/16	73	1	7 3/16	53	3	1	74
15 1/2" DIA. G. M. PIPE RISER																											
9	12 5/8	6	12 5/8	1	17 3/4	3-9 3/4	10	10 1/4	2-9	18	6	6	2	12 13/16	41 1/4	1	7 1/2	49	1	12 13/16	82 1/2	1	8 11/16	63	3	1	80
10 1/2" DIA. G. M. PIPE RISER																											
9	14 1/8	6	14 1/8	1	20	4-0	10	11 7/16	3-0	21	8	8	2	14 5/16	46	1	9	58 1/2	1	14 5/16	92	1	10 1/4	73	3	1	89
7 1/2" DIA. G. M. PIPE RISER																											
10 1/2" DIA. G. M. PIPE RISER																											
24 1/2" DIA. G. M. PIPE RISER																											
15	11 3/8	12	22 3/4	2	25 3/8	5-5 3/8	12	14 13/16	4-6	24	18	9	2	23 5/16	74	1	12	77 1/2	1	23 5/16	148	1	13 1/4	91 1/2	3 1/2	1	142
10 1/2" DIA. G. M. PIPE RISER																											
18	9 1/2	15	28 1/2	3	30	6-4	14	15 13/16	6-0	24	21	7	2	29 5/16	93	1	15	96	1	29 5/16	186	1	16 1/4	111	4	1	182
36 1/2" DIA. G. M. PIPE RISER																											
21	12 1/2	21	37 5/8	3	39 1/2	7-10 1/2	16	17 5/16	7-6	30	30	10	2	38 3/8	121 1/2	1	18	115	1	38 3/8	243	1	19 1/4	129	4	1	267

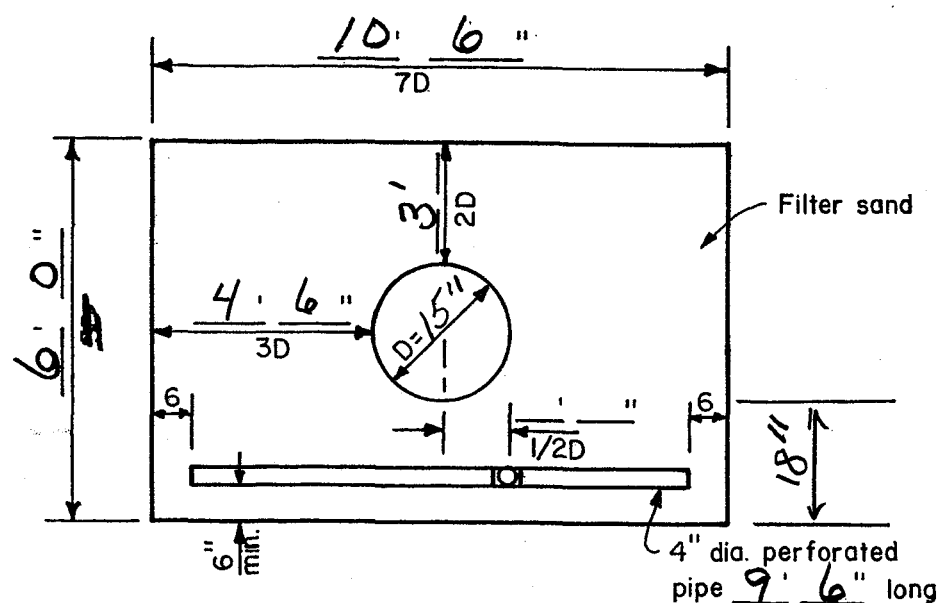


12" TO 36" DIA. CONICAL TRASH RACK AND BAFFLE PLATE

SOUTH DAKOTA GUIDE PLAN NO. 6.0	
<i>Dave Stetten</i>	
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	
Designed <i>D.H. D.T.</i>	Date <i>7-70</i> Approved by _____ Title _____



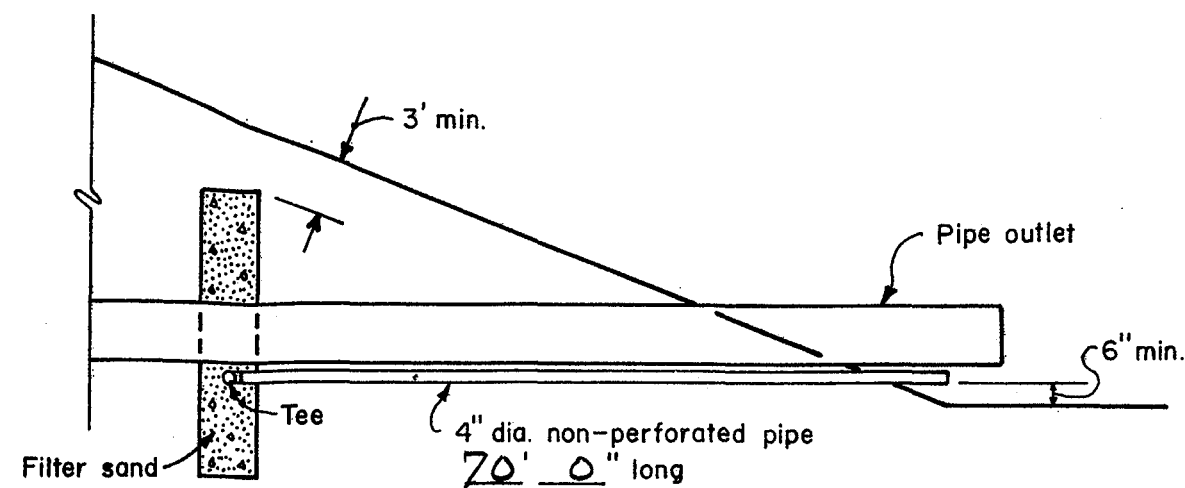
ISOMETRIC VIEW



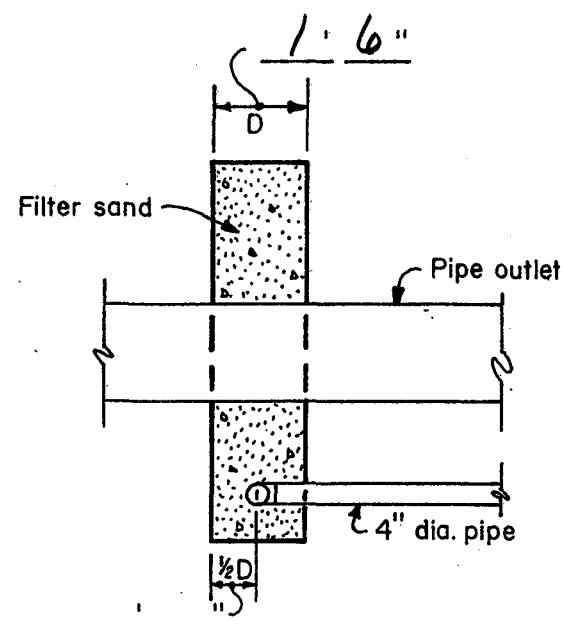
UPSTREAM VIEW

NOTE:

1. THE 4" DIA. PIPE SHALL BE ASTM DI785, SCHEDULE 40, PVC.
2. PROVIDE AN ANIMAL GUARD ON DRAIN OUTLET PIPE. DRILL 2, 1/2" DIA. HOLES, ON $\frac{1}{2}$ 6" FROM END OF PIPE AND PLACE A 3/8" DIA., 5 1/2" LONG GALVANIZED STEEL BOLT THRU THEM AND SECURE WITH A NUT (PLACE BOLT HORIZONTAL).



OUTLET DETAIL



SIDE VIEW

FILTER GRADATION

SIEVE SIZE	PERCENT PASSING
3/8"	100
4	95-100
8	80-100
16	50-85
30	25-60
50	10-30
100	2-10

See Const Spec SD-9

3.5 cy

Sec. _____, T. _____, R. _____

County

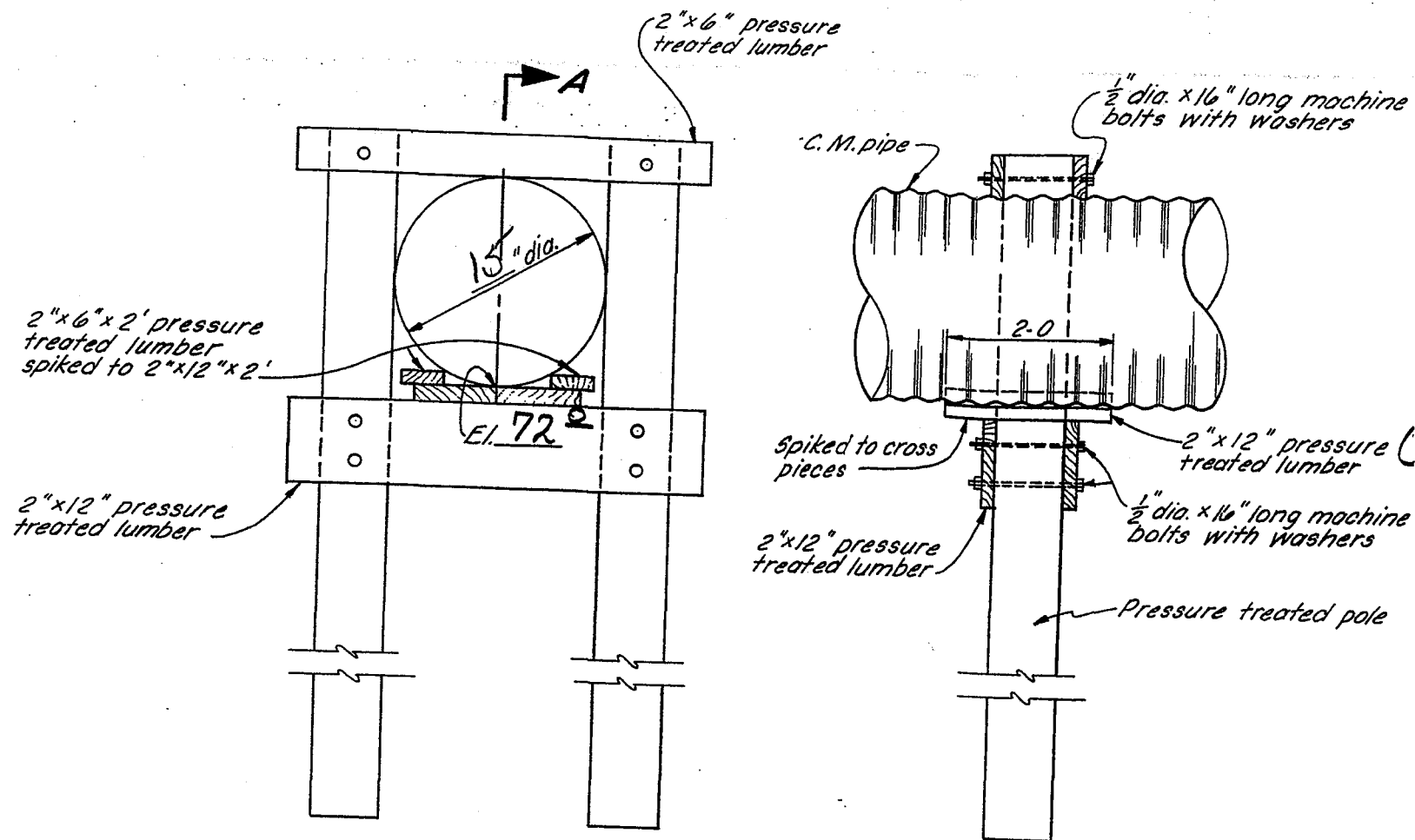
LOCATION

SAND ANTISEEP COLLAR

OPERATOR Dave Steffen

CONSERVATION DISTRICT _____

Date _____
 Designed _____
 Drawn _____
 Traced _____
 Checked _____
 Approved by _____
 Title _____
 Title _____
 Sheet _____
 No _____
 Drawing No. _____



ELEVATION SECTIONAL ELEVATION A-A

TABLE OF QUANTITIES

ITEM	LENGTH FOR 15" DIA. C.M. PIPE	UNIT	QUANTITY
PRESSURE TREATED POLE 15" DIA.	8'	EACH	2
2" X 12" PRESSURE TREATED LUMBER	12'	EACH	2
2" X 6" PRESSURE TREATED LUMBER	4'	EACH	2
2" X 12" PRESSURE TREATED LUMBER	4'	EACH	2
2" X 6" PRESSURE TREATED LUMBER	2'	EACH	2
1/2" DIA. MACHINE BOLTS WITH NUTS	1-4"	EACH	10
1/2" DIA. WASHERS		EACH	20

REFERENCE: GUIDE PLAN NO. 4.0

JOB PLAN NO. 4.0

(use 12ft long and extend 5 ft beyond Pipe Support)

NOTES:

- HAND OR MACHINE TAMP BACKFILL THOROUGHLY AROUND FOOTINGS AND COLUMNS.

TIMBER PIPE SUPPORT

OPERATOR: Dave Steffen

CONSERVATION DISTRICT:

Designed by _____ Approved by _____
 Drawn by _____ Title _____
 Traced by _____ Title _____
 Checked by _____ No _____ Drawing No. _____
 of _____



United States Department of the Interior

FISH AND WILDLIFE SERVICE
LAKE ANDES NATIONAL WILDLIFE REFUGE COMPLEX
38672 291st Street
LAKE ANDES, SOUTH DAKOTA 57356-6838
605-487-7603



RECEIVED

OCT - 6 2006

WATER RIGHTS
PROGRAM

October 5, 2006

Water Rights Program
Attn: Karen
Joe Foss Bldg., 523 E. Capitol
Pierre, SD 57501-3181

Karen:

Enclosed are 8 Location Notices and 1 Application for Water Permit. Also enclosed is a purchase order for payment of all pertinent fees. Jean Kabella from our office will process the electronic funds transfer when she receives an invoice from you. The purchase order is for such an amount to allow us to use it for other fees throughout the upcoming year.

Please give me a call at (605) 487-7603 if you have any questions. Thank-you.

Sincerely,

Steve Spawn
Private Lands Biologist
USFWS, Lake Andes NWR
(605) 487-7603 - office
481-1333 - cell

Schlaak, Karen

From: Verhelst, Sandy
Sent: Monday, November 27, 2006 2:53 PM
To: Schlaak, Karen
Cc: Marks, Glenda; Verhelst, Sandy
Subject: Wire

FWS TREAS 312 MISC PAY 112006 466000364141600 RMT*IV*20411-101006 ** 280.00

11/27/2006

Water Permit Application No 2606-2
David Steffen

Top of Dam Elev. - 94 }
 2nd Spillway Elev. - 91 }
 P. Spillway Elev. - 90 } Ht. = 24 ft
 Dis EmS Toe Elev. - 70 } Cont. 3-low Hazard Dam

Normal Storage Capacity - 59 Ac.-Ft.
 Int. Storage Capacity - 68
 Max Storage Capacity - 103

Int. Capacity x Eff. Ht. = $68 \times 21 = 1428 < 3000 \therefore 25 \text{ yr}$
Minimum Spillway Design

From USGS WRI 98-4055 "Tech for Est. Peak Flows ... in SD"
 Region C $CA = 393 \text{ Ac} = 0.614 \text{ mi}^2$

$$Q_{25} = 207 CA^{.573}$$

$$= 207 (.614)^{.573}$$

$$= 207 (.7562)$$

$$= \underline{160 \text{ cfs}}$$

$$Q_{100} = 379 CA^{.566}$$

$$= 379 (.614)^{.566}$$

$$= 379 (.7588)$$

$$= \underline{290 \text{ cfs}}$$

Secondary Spillway Flow

$$Q = CLH^{3/2}$$

$$C = 2.6$$

$$L = 50$$

$$H = 3 \text{ ft}$$

$$= 2.6(50)(3)^{1.5}$$

$$= \underline{675 \text{ cfs}}$$

Section 74:02:08:09

1. Topo Map - OK
2. Dam Axis Profile - OK
3. Dam Max X-Sec. - OK
4. Area-Capacity - OK
5. Outlet Details - OK
6. Spillway Rating - OK
7. Spillway Details - OK
8. Spres St. NRCS - OK
9. EPP - NIA Cat3 - OK

NRCS Annual Yield

DA = 393 Ac ISO = 2 1/2 CN = 82

$$80\% \text{ chance} = 0.44$$

$$0.44 \times 393^{1/2} = \underline{14 \text{ Ac.-Ft}}$$

$$50\% \text{ chance} = 1.0$$

$$1.0 \times 393^{1/2} = \underline{33 \text{ Ac.-Ft}}$$

$$10\% \text{ chance} = 3.5$$

$$3.5 \times 393^{1/2} = \underline{115 \text{ Ac.-Ft}}$$



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

December 21, 2006

David Steffen
34110 294th St.
Burke, SD 57523

Dear Mr. Steffen:

We have reviewed the plans and specifications for your dam project located in the SW ¼ of Sec. 10-T96N-R72W, in Gregory County. The plans and specifications for the construction of your dam are approved. Approval of the plans and specifications does not authorize construction of the dam. The construction of the dam may not begin until Water Permit No. 2606-2 is approved.

Our review was to determine compliance with the requirements of the Water Management Board Safety of Dams Rules, Chapter 74:02:08. Approval of these plans and specifications does not release you, as owner of the dam, from the responsibility for operating and maintaining the dam in good repair to ensure the safety of the dam.

The Steffen Dam will be classified as a small size Category 3, Low Hazard dam with a dam height of 24 ft. and a normal storage capacity of 59 acre-feet and a maximum storage capacity of 103 acre-feet.

If you have any questions, please feel free to contact us.

Sincerely,

Timothy G. Schaal, P.E.
Natural Resources Engineering Specialist
for Garland Erbele, Chief Engineer
Water Rights Program
(605) 773-3352

c: Dave Konechne, Pierre
Steve Spawn, USFWS

Gronlund, Eric

To: Tim.Schaal@state.sd.us

Subject: Dave Steffen application near Burke

The public notice was sent out for this dam. Mr. Steffen called with question about the low flow condition. I told him that it was a standard condition that does not require the release of stored water but that if a downstream domestic user (such as livestock) was not getting water but there is inflow into the dam a bypass of water may be required depending on the circumstances.

He then asked about the size of the bypass tube. I said there were not specific sizing requirements. His plan was already to put a 1" line in place with a downstream hydrant to provide livestock needs of his own. That is because the dam will be fenced to keep livestock out. I told him that sounded reasonable but that I would check with you and if you think something differently, we'll need to get back to him. He said that he contacted Dave Konechne about it he was not familiar with how we condition water rights but that he had designed bypass mechanisms.

Let me know if we need to get back to Mr. Steffen.

12/27/2006



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

March 9, 2007

David Steffen
34110 294th St.
Burke, SD 57523

Dear Mr. Steffen:

We have reviewed the modified plans and specifications for your dam project located in the SW $\frac{1}{4}$ of Sec. 10-T96N-R72W, in Gregory County. The modified plans basically indicate a change in type of pipe used for the primary spillway structure, going from HDPE pipe to a vinyl clad CMP pipe. The modified plans and specifications for the construction of your dam are approved.

Our review was to determine compliance with the requirements of the Water Management Board Safety of Dams Rules, Chapter 74:02:08. Approval of these plans and specifications does not release you, as owner of the dam, from the responsibility for operating and maintaining the dam in good repair to ensure the safety of the dam.

The Steffen Dam will be classified as a small size Category 3, Low Hazard dam with a dam height of 24 ft. and a normal storage capacity of 59 acre-feet and a maximum storage capacity of 103 acre-feet.

If you have any questions, please feel free to contact us.

Sincerely,

Timothy G. Schaal, P.E.
Natural Resources Engineering Specialist
for Garland Erbele, Chief Engineer
Water Rights Program
(605) 773-3352

c: Dave Konechne, Pierre
Steve Spawn, USFWS



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

* INVOICE *

Invoice No. 20411-101006

United States Department of Interior
Fish & Wildlife Service
38672 291st Street
Lake Andes SD 57356-6838

8 Location Notice @ \$10.00 each	\$ 80.00
1 Water Permit application/license fee	\$200.00

PLEASE PAY THIS AMOUNT:

\$280.00


Garland Erbele
Chief Engineer
Water Rights Program
(605) 773-3352

ORDER FOR SUPPLIES OR SERVICES

OB 11-12-06

PAGE OF PAGES

1 7

IMPORTANT: Mark all packages and papers with contract and/or order numbers.

1. DATE OF ORDER 10/02/2006		2. CONTRACT NO. (If any)		6. SHIP TO: Lake Andes Nat'l Wildlife Refuge	
3. ORDER NO. 645417M403		4. REQUISITION/REFERENCE NO. RW073502SD		a. NAME OF CONSIGNEE US Fish and Wildlife Service, MS 64550	
5. ISSUING OFFICE (Address correspondence to) US Fish and Wildlife Service, MS 64540 29746 Bird Road Martin SD 57551-6006				b. STREET ADDRESS 38672 - 291st Street	
				c. CITY Lake Andes	d. STATE SD
				e. ZIP CODE 57356-6838	
7. TO:				f. SHIP VIA	
a. NAME OF CONTRACTOR				8. TYPE OF ORDER	
b. COMPANY NAME Environment and Natural Resour				☒ a. PURCHASE REFERENCE YOUR: Please furnish the following on the terms and conditions specified on both sides of this order and on the attached sheet, if any, including delivery as indicated.	
c. STREET ADDRESS 523 E Capitol Avenue				☐ b. DELIVERY - Except for billing instructions on the reverse, this delivery order is subject to instructions contained on this side only of this form and is issued subject to the terms and conditions of the above-numbered contract.	
d. CITY Pierre	e. STATE SD	f. ZIP CODE 57501-3181			
9. ACCOUNTING AND APPROPRIATION DATA 2006 - - -64550 - -261A - - - -112106TA - -W2 - - -				10. REQUISITIONING OFFICE US Fish and Wildlife Service, MS 64550	

11. BUSINESS CLASSIFICATION (Check appropriate box(es)) ☐ a. SMALL ☒ b. OTHER THAN SMALL ☐ c. DISADVANTAGED ☐ d. WOMEN-OWNED							
12. F.O.B. POINT Destination		14. GOVERNMENT B/L NO.		15. DELIVER TO F.O.B. POINT ON OR BEFORE (Date) 10/01/2006		16. DISCOUNT TERMS 10 days % 20 days % 30 days % days %	
13. PLACE OF							
a. INSPECTION LAKE ANDES NWR	b. ACCEPTANCE LAKE ANDES NWR						

17. SCHEDULE (See reverse for Rejections)

ITEM NO. (a)	SUPPLIES OR SERVICES (b)	QUANTITY ORDERED (c)	UNIT (d)	UNIT PRICE (e)	AMOUNT (f)	QUANTITY ACCEPTED (g)
	SEE LINE ITEM DETAIL					
SEE BILLING INSTRUCTIONS ON REVERSE	18. SHIPPING POINT	19. GROSS SHIPPING WEIGHT	20. INVOICE NO.			
	21. MAIL INVOICE TO: Lake Andes Nat'l Wildlife Refuge					17(h) TOT. (Cont. pages)
	a. NAME US Fish and Wildlife Service, MS 64550					
	b. STREET ADDRESS (or P.O. Box) 38672 - 291st Street					
	c. CITY Lake Andes	d. STATE SD	e. ZIP CODE 57356-6838		\$500.00	17(i) GRAND TOTAL

22. UNITED STATES OF
AMERICA BY (Signature)

Ann K. Harris FWS 69051

23. NAME (Typed)

Ann K. Harris

TITLE: CONTRACTING/ORDERING OFFICER

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE

Page
1 of 4

2. AMENDMENT/MODIFICATION NO. 0001	3. EFFECTIVE DATE 10/13/2006	4. REQUISITION/PURCHASE REQ. NO. See Lines	5. PROJECT NO. (If applicable)
6. ISSUED BY US Fish and Wildlife Service, MS 64540 29746 Bird Road Martin, SD 57551-6006		CODE 00006	7. ADMINISTERED BY (If other than Item 6) CODE

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and Zip Code) Environment and Natural Resour 523 E Capitol Avenue Pierre, SD 57501-3181 CODE *	9A. AMENDMENT OF SOLICITATION NO.
	9B. DATED (SEE ITEM 11)
	(X) 10A. MODIFICATION OF CONTRACT/ORDER NO. / 645417M403
	(X) 10B. DATED (SEE ITEM 13) 10/02/2006
FACILITY CODE	

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

☐ The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers ☐ is extended, ☐ is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:

(a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

2007 - - - 64550 - - 261A - - - - 112106TA - - W2 - - - - \$200.00

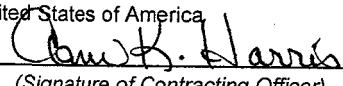
13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS.
IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

CHECK ONE	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
☒	
☐	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
☐	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
☐	D. OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor ☒ is not, ☐ is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)
Reduce line 001 to \$300 at \$10 for 30 Fees and add line 002 for 1 Water Permit Fee for \$200. No increase or decrease in Purchase Order amount of \$500.00 and no change in codes.

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print)		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Ann K. Harris	
15B. CONTRACTOR/OFFEROR (Signature of person authorized to sign)	15C. DATE SIGNED	16B. United States of America BY  (Signature of Contracting Officer)	16C. DATE SIGNED 10/13/2006

**Line Item
Summary**

Document Number

645417M403/0001

Title

Enviornment and Natur

Page

2 of 4

Total Funding: \$500.00

FYs	Fund	Budget Org	Sub	Object Class	Sub	Program	Cost Org	Sub	Proj/Job No.	Sub	Reporting Category
-----	------	------------	-----	--------------	-----	---------	----------	-----	--------------	-----	--------------------

Division	Closed FYs	Cancelled Fund
----------	------------	----------------

Line Item

Number

Description

Delivery Date

(Start date to End date)

Quantity

Unit of

Issue

Unit Price

Total Cost

DUNS 809587686

NAICS - 921110

SIC - 9111

PSC - B525

0001	Location Notice Filling Fees	10/01/2006	-20.00	ea	\$0.00	(\$200.00)
------	------------------------------	------------	--------	----	--------	------------

Change in Quantity

(10/01/2006 to 09/30/2007)

Ref Req No: RW073502SD

0002	Water Permit Application/license Fee		1.00	ea	\$200.00	\$200.00
------	--------------------------------------	--	------	----	----------	----------

(10/01/2006 to 09/30/2007)

This is a New Line

Previous Total: \$500.00

Modification Total: \$0.00

Grand Total: \$500.00
(Includes Discounts)

Contract Level Funding Summary	Document Number 645417M403/0001	Title Enviornment and Natur	Page 3 of 4
---	---	---------------------------------------	-----------------------

Funding Strip Code

2007 - - - 64550 - - 261A - - - - 112106TA - - W2 - - - -

Change in Funded Amount

\$200.00

Address Detail

Title

Enviornment and Natur

Document Number

645417M403/0001

Page

4 of 4

Shipping Addresses

Code	Detail
0001	Org: US Fish and Wildlife Service, MS 64550 Addr: 38672 - 291st Street Lake Andes SD 57356-6838 Attn: Lake Andes Nat'l Wildlife Refuge Phone: () - ext. Fax: () - ext.

Invoice Addresses

Code	Detail
0001	Org: US Fish and Wildlife Service, MS 64550 Addr: 38672 - 291st Street Lake Andes SD 57356-6838 Attn: Lake Andes Nat'l Wildlife Refuge Phone: () - ext. Fax: () - ext.

Requisitioning Office Addresses

Code	Detail
0001	Org: US Fish and Wildlife Service, MS 64550 Addr: 38672 - 291st Street Lake Andes SD 57356-6838 Attn: Lake Andes Nat'l Wildlife Refuge Phone: () - ext. Fax: () - ext.

RECEIVED
MAR - 5 2007
WATER RIGHTS
PROGRAM

CONSTRUCTION SPECIFICATIONS

DAVE STEFFEN DAM

SECTION 10, T96N, R72W
GREGORY COUNTY, SOUTH DAKOTA

KONECHNE ENGINEERING
PIERRE, SOUTH DAKOTA

CONSTRUCTION SPECIFICATION

SD - 2 CLEARING AND GRUBBING

2.1 SCOPE

The work shall consist of the clearing and grubbing of the area within the stake limits by removal and disposal of trees, snags, logs, stumps, shrubs, and rubbish.

2.2 REMOVAL

Unless otherwise specified all material to be cleared and grubbed shall be removed to a depth of 1 foot below the embankment foundation after stripping and 2 feet below a concrete subgrade.

2.3 DISPOSAL

Where brush piles for wildlife are not specified, cleared and grubbed materials shall be disposed of by burning or burying at locations selected by the contractor and approved by the landowner or engineer. Materials to be buried shall be placed at least 2 feet below the surrounding ground line and have a minimum of 2 feet of cover with the finished surface graded to drain. Any burning operations shall be subject to all public laws governing such operations, and any required permits to be obtained by the contractor.

2.4 PAYMENT

Payment for this item shall be included in the cost of earth fill and is subsidiary to Construction Specification SD-7S, Earth Fill - Class S.

CONSTRUCTION SPECIFICATION

SD - 7S EARTH FILL - CLASS S

7S-1 SCOPE

The work shall consist of the construction of compacted earth fills where the amount of compaction is to be controlled by a method type of specification.

7S-2 MATERIALS

All fill materials shall be obtained from required excavations and designated borrow areas. The selection, blending, routing and disposition of materials shall be subject to approval by the engineer.

Fill materials shall not contain frozen material, sod, brush, roots, or other perishable materials, or rocks larger than 8 inches in diameter. Fill shall not be placed on frozen surface.

7S-3 FOUNDATION PREPARATION

After stripping, the foundation shall be scarified or plowed to a minimum depth of 4 inches. The entire foundation area shall then be compacted by the process used on the fill.

7S-4 PLACEMENT

All foundation excavations and/or preparation shall be completed before placing fill. The fill shall be placed such that the distribution of materials is essentially uniform throughout the entire fill and is free from lenses, pockets, streaks, or layers of materials differing substantially from surrounding material.

Fill, adjacent to structures, shall be placed in a manner that will prevent damage to the structure and allow the structures to assume the backfill loads gradually and uniformly. Equipment weighing more than 400 pounds shall not be operated within 2 feet of any structure.

Fill shall be placed in approximately equal horizontal layers. Fill layer thicknesses shall not exceed 9 inches for machine or 4 inches for hand compaction (including hand directed power tampers adjacent to structures).

7S-5 MOISTURE CONTENT

The fill material shall have a moisture content that when kneaded in the hand will form a ball which does not easily crumble when struck sharply with a pencil or which does not crumble when pressed between the hands.

If the soil is too wet, it will yield free water when kneaded in the hand. The fill may have to be wetted or dried to achieve proper moisture control.

7S.6 COMPACTION (CLASS S)

The fill shall be compacted by one of the following methods.

- a. By routing the hauling and spreading equipment such that all points of the fill is traversed by at least one tread track of the loaded equipment, parallel to the centerline of the fill.

-
- b. By at least two passes of a tamping (sheepfoot) roller weighing at least 100 pounds per square inch bearing area.

Fill adjacent to structures shall be compacted to a density equivalent to that of the surrounding fill by means of hand tamping or manually directed power tampers or plate vibrators. Heavy equipment shall not be operated within 2 feet of any structure.

Compaction of fill adjacent to concrete structures shall not be started until the following time limits have elapsed after placement of the concrete.

<u>Structure</u>	<u>Time Interval</u>
Walls and counterforts	14 days
Conduits and Spillway Risers (cast in place)	14 days
Conduits, precast, cradled	2 days
Conduits, precast, bedded	1 day
Anti-seep Collars and Cantilever	3 days
Pipe props	

7S-7 PAYMENT

Earth Fill is a bid item and payment for earth fill shall be by the cubic yard and computed to the specified neat lines on the drawings for excavation and the specified neat lines of the completed earthfill.

Items subsidiary to earth fill are, Construction Specifications SD-2, and SD-5.

CONSTRUCTION SPECIFICATION

SD - 9 DRAIN FILL AND FILTER

9.1 SCOPE

The work shall consist of furnishing and placing drain fill and filter sands or gravels.

9.2 MATERIALS

a. Quality

Aggregates shall be sand, gravel, or crushed stone, composed of clean, hard, durable mineral particles free from organic matter, clay balls, soft particles or other substances that would interfere with their free draining properties.

b. Gradation

The aggregates shall meet the following gradation requirements unless otherwise specified in the plans.

<u>Size</u>	<u>% Finer</u>
3"	100%
1"	90-100%
#4	50-85%
#50	10-40%
#200	0-5%

9.3 BASE PREPARATION

Surfaces on which drain fill will be placed shall be as undisturbed as possible (do not scarify), and will be free of standing water during placement of the fill. Care shall be taken to prevent trench walls from sliding.

9.4 PLACEMENT

Material shall be placed in uniform, approximately 6-inch thick layers. Extreme care shall be taken to assure uniformity of the drain fill, and to prevent segregation or contamination of the drain fill with foreign matter. When collector pipes are included in drains, the fill materials shall be placed in a manner to avoid displacing the pipe.

9.5 PAYMENT

Drain fill is a bid item and payment will be by the cubic yard basis as shown on the plans and computed to the neat lines of the drawings.

CONSTRUCTION SPECIFICATION

SD-12B CONCRETE FOR MINOR STRUCTURES (FOR STRUCTURES UP TO 10 C.Y.)

12B.1 SCOPE

The work shall consist of proportioning, forming, placing, finishing, and curing Portland cement concrete.

12B.2 MATERIALS

Portland Cement shall be Type II or Type IIA Portland Cement. Cement that is partially hydrated or otherwise damaged shall not be used.

Fine Aggregate is defined as all material which will pass a ¼ inch screen. Fine aggregate shall compose between 35 and 45 percent of the total aggregate and shall not contain more than 1 percent clay lumps or more than 4 percent finer than a No. 200 sieve. Coal in fine aggregate shall not exceed ½ of 1 percent.

Coarse Aggregate is defined as all material larger than ¼ inch. Maximum size aggregate shall not exceed:

1 inch – Concrete thickness of 4 inches or less

1 1/2 inch – Concrete thickness of 4 inches or more

Coarse aggregate shall compose between 55 and 65 percent of total aggregate and shall not contain more than ¼ of 1 percent of clay lumps or more than 1 percent of material finer than No. 200 sieve. Coal shall not exceed 1 percent.

Mixed fine and coarse aggregate or pit-run aggregate may be used provided the requirements stated above are met.

Water shall be clean and free of harmful chemicals (suitable for drinking).

12B.3 DESIGN OF CONCRETE MIX

The contractor or person in charge of construction shall be responsible for designing a high quality concrete mix conforming to this specification.

The mix shall contain less than 6 gallons of water per bag of cement, and at least 6 bags of cement per cubic yard of concrete. The air-entrainment shall be between 4 and 7 percent by volume, and the slump after mixture shall be between 2 and 4 inches.

The following table is recommended as a guide for developing a satisfactory mix to give 3000 psi compressive strength for air-entrained concrete.

Max Size Aggregate	Gal. Water per sack Of cement	% of Fine Aggregate	Sacks Cement per cu. yd.	Pounds Fine Aggregate per sack cement	Pounds Coarse Aggregate per sack cement
1"	6.0	40	6.0	190-200	300-310
1 1/2"	6.0	35	6.0	180-190	330-340

Ready Mixed concrete may be used provided it meets the requirements of these specifications. Upon request the vendor shall provide the owner with a signed delivery ticket giving the quantities of concrete, cement, fine aggregate, coarse aggregate and water contained in the batch.

Measurements of materials shall be by weight where suitable scales are available. Where suitable scales are not available, volume measurement may be used provided volume-weight relationships are carefully determined. Calcium chloride or other accelerators or anti-freeze compounds shall not be used.

Measurements (by weight) of materials in the mix shall be made available to the engineer.

12B.4 FORMS FOR CONCRETE

Forms shall be made of wood, plywood, steel or other approved material. The type, size, shape, quality and strength of forms will be subject to approval by the engineer.

All forms shall be true to line and grade, mortar tight, and rigid enough to prevent bulging or displacement. Tolerances will be close enough to assure that the structure appears and performs well.

All forms shall be removed from the concrete. Forming shall not be embedded in the concrete.

12B.5 PLACING CONCRETE

Concrete shall be placed in final position within one and one-half hours after mixing with cement. Concrete shall be consolidated by hand spading and tamping or by mechanical vibration.

All concrete placed on earth shall be placed on clean damp surface, free of frost, ice, or running water. Concrete shall not be dropped more than 5 feet vertically unless suitable equipment is used to prevent segregation.

Uniformed surfaces (excluding slip form concrete) exposed in the completed work shall have a wood float finish. Exposed concrete edges shall be chamfered or finished with molding tools. Concrete shall be placed at air temperatures between 40 degrees F and 80 degrees F unless special measures are taken to protect the concrete. Concrete shall be protected from freezing for 7 days after placement.

12B.6 CURING CONCRETE

All concrete shall be cured by keeping all exposed surfaces wet for 7 days or by applying a spray type curing compound to exposed concrete surfaces immediately after the free water has disappeared after pouring.

12B.7 DEFECTIVE CONCRETE

Honey combed areas and other voids in concrete will be promptly repaired with mortar patching immediately upon discovery.

Concrete subjected to damage and/or other violations of this specification will be rejected.

12B.8 PAYMENT

Concrete is a bid item and payment will be by the cubic yard basis and will be calculated to the neat lines on the drawings,

CONSTRUCTION SPECIFICATION

SD-15 CORRUGATED METAL PIPE CONDUITS

15.1 SCOPE

The work shall consist of furnishing and placing circular, arched, or eclipitcal corrugated metal pipe and the necessary fittings as shown on the plans.

15.2 MATERIALS

Pipe and fittings shall conform to the requirements of Material Specification SD-50 or Material Specification SD-51, whichever is specified. When specified, caulked seam corrugated metal pipe shall conform to the following additional requirements:

- (1) Caulked seam corrugated metal pipe shall have all circumferential and horizontal seams caulked with an asphalt compound before riveting. This shall be accomplished by applying a uniform bead ($\frac{1}{4}$ inch minimum diameter) of the asphalt compound to the inner lap surface before riveting such that when the rivets are in place all voids are filled and a coating of asphalt is between the lap surfaces.
- (2) The asphalt compound shall consist of an asphalt base combined with asbestos fiber and other inert filler material to form a heavy-bodied compound that will not sag or run out of the seam. The compound should contain 63 to 68 percent solids by weight. It shall be similar in type and equal in quality to Trumbull 5X Asphalt Mastic, knife grade, as manufactured by the Trumbull Asphalt Company of Delaware.

15.3 HANDLING THE PIPE

The Contractor shall furnish such equipment as is necessary to place the pipe without damaging the pipe or coatings. The pipe shall be transported and handled in such a manner as to prevent bruising, scaling, or breaking of the zinc, bituminous or plastic coating.

Whenever the coating of zinc coated pipe is damaged in any individual area larger than 12 square inches, or if more than 0.2 percent of the total surface area of the pipe is damaged, the section will be rejected.

Whenever the coating on bituminous or plastic coated pipe is damaged in any individual area that exceeds 36 square inches or when the total area of breaks exceeds 0.5 percent of the total surface area of the pipe, the section will be rejected.

15.4 REPAIR OF DAMAGED COATINGS

Breaks, scuffs, or other damage to the various coatings shall be repaired as follows:

- (1) Zinc Coating - by thoroughly wire brushing and cleaning the damaged area with solvent, and then painting two coats of one of the following paints:
 - a. Zinc Dust - Zinc Oxide Primer conforming to Federal Specification TT-P-641, Type III.
 - b. Zinc Dust Chlorinated Rubber conforming to Federal Specification TT-P-1046a.
 - c. Zinc Dust Paint conforming to Military Specification MIL-P-21035.
 - d. Epoxy-Polyamide Paint conforming to Defense Specification DOD-P-15145B.
- (2) Bituminous Coating - by the application of two coats of hot asphaltic paint or a coating of cold-applied bituminous mastic. The repair coating shall be at least 0.05 inches thick after hardening and shall bond securely and permanently to the pipe. The material shall meet the physical requirements of the original coating.
- (3) Plastic or Vinyl Coating - by using a plastic coating similar and equal to Scotch-Clad Protective Coating 1706, manufactured by 3M Co., 3M Center, St. Paul, Minnesota. Surfaces to be coated must be clean and dry. A 10 mil coating thickness is required. If the repair coating thickness is not measured, four coats shall be applied allowing 30 minutes drying time between coats.

15.5 LAYING AND BEDDING THE PIPE

Unless otherwise specified, the pipe shall be installed in accordance with the manufacturer's recommendations. The pipe shall be laid with the outside laps of circumferential joints pointing upstream and with longitudinal laps at the sides at about the vertical midheight of the pipe. Field welding on corrugated galvanized iron or steel pipe will not be permitted. Unless otherwise specified, the pipe sections shall be joined with water-tight coupling bands, with a minimum width of 12 inches, or flanges for a flange-type connection. The area between pipe and coupling band shall be coated with either an asphalt cement to insure a water-tight joint or a rubber neoprene gasket $\frac{3}{8}$ inch thick and as wide as the connecting band $\pm$ 1 inch.

~~The trench or foundation width in or on which the pipe will be laid~~
should be at least: (a) 2 times the pipe diameter, or (b) the pipe diameter plus 2 feet, whichever is the greater.

Pipe should be laid on a moist, compacted foundation (not wet nor hard and dry). Just before the pipe is laid, spread a 2-to 3-inch layer of moist loose soil for the pipe to be placed on. The pipe should make uniform contact with the soil along its entire length.

Perforated pipe shall be laid with perforation down and oriented symmetrically about a vertical centerline. Perforations shall be clear of any obstructions at the time the pipe is laid.

15.6 BACKFILLING

The pipe shall be loaded sufficiently during backfilling around the side to prevent its being lifted from the bedding.

Backfill around the pipe shall be placed in layers not more than 4 inches thick before compaction. Each layer of backfill shall be compacted with power tampers or hand tamping to the same density requirements as specified for the adjacent embankment. Backfill over and around the pipe shall be brought up uniformly on all sides and shall extend a minimum of 2 feet over the pipe before earth embankment with earth moving equipment over the pipe is started. Special care shall be taken not to disturb the grade and alignment during backfill operations.

CONSTRUCTION SPECIFICATION

SD-16 TIMBER FABRICATION AND INSTALLATION

16.1 SCOPE

This specification covers the quality and installation of plywood and pressure treated structural timber poles, posts and lumber structure and timber and lumber portions of composite structure.

16.2 MATERIAL

a. Plywood

Plywood shall be new, exterior grades, and shall meet Product Standard PS 1-66
Plywood for use underground shall be pressure treated in accordance with the American Wood Preservers Bureau AWPB-FDN Standard (stamped on plywood).

b. Structural Timber and Lumber

Structural timber and lumber shall be structural grade or better. Structural timber poles, posts, and lumber shall be new, sound, decay free, straight, not warped or cracked. Unless otherwise specified on the drawings, all lumber and timber except re wood and red cedar shall be treated by any of the following preservatives:

Commercial Coal Tar Creosote
Hot and Cold Bath Creosote
Pentachlorophenol – Commercial Treatment
Pentachlorophenol – Cold soaking Method
AWPB-FDN Standard Preserving Salts

c. Hardware

Bolts, rods, nuts, washers, and other hardware shall be an appropriate grade of steel, and if to be placed underground, shall be galvanized or otherwise corrosion protected.

16.3 INSTALLATION

The material shall be of the dimensions, and installed at the location, as shown on the drawings. All lumber to be treated shall be cut to size, insofar as practical, prior to treatment. Raw ends of lumber which has been cut after treatment shall be immersed in the preservative solution, or painted with four (4) heavy coats of the solution. Each application should be allowed to dry. For home treatment, the preservative manufacturer's directions shall be carefully followed.

16.4 PAYMENT

This item shall consist of furnishing and installing the Timber Pipe Support as shown on the plans. Payment for this item is on the lump sum basis.

CONSTRUCTION SPECIFICATION

SD – 19 PVC DRAIN FOR SAND SEEP COLLAR

1. **SCOPE**

The work shall consist of furnishing and installing polyvinyl chloride (PVC) plastic pipe, fittings and appurtenances as shown on the drawings. The specification covers drains for sand seep collars.

2. **MATERIAL**

Pipe shall have a minimum 160 psi pressure rating, shall meet ASTM D1785 or D2241, and shall be defect free. Pipe compound shall meet ASTM D1784, Class 12454-B.

Fittings and appurtenances shall be made of the same material as the pipe, and be designed for use with the pipe at a minimum pressure rating of 160 psi, except as noted otherwise.

Solvent cement for the pipe joints shall meet ASTM D25634.

Rubber gasket joints shall conform to ASTM D3129.

3. **PIPE PLACEMENT**

Pipe must be installed to specified lines and grades without blocking, distortion or damage. The pipe must be uniformly supported on firm stable soil (or other specified bedding) over its entire length.

4. **BACKFILL**

All backfill recommendations of the pipe manufacture shall be met. Vehicles or construction equipment shall not cross the pipe until earth cover over the pipe exceeds two feet.

Initial backfill to six inches above the top of the pipe is required. Except as otherwise specified, earth haunching and initial backfill shall consist of soil that is free of rocks, hard clods or other objects more than one inch in diameter. Earth fill shall be worked and compacted under the haunches of the pipe to provide continuous support in layers not more than six inches thick. Care shall be taken to insure the pipe is not deformed, damaged, or displaced.

Final backfill shall consist of remaining backfill from top of initial backfill to ground surface, including mounding for settlement. Final backfill shall be free of debris, rocks or other objects three inches nominal diameter or larger. Final backfill shall be approximately uniform, void free, compacted layers.

5. **MEASUREMENT AND PAYMENT**

This item consists of furnishing and installing the PVC drain pipe used in the sand seep collar. The quantity will be measured to the nearest foot by measurement as indicated by the neat lines on the drawings. Such payment will constitute full compensation for furnishing, transporting, and installing the pipe complete in place.

CONSTRUCTION SPECIFICATION

SD-17 METAL FABRICATION AND INSTALLATION

17.1 SCOPE

The work shall consist of furnishing, fabricating, and installing metalwork including metal parts of composite structures.

17.2 MATERIALS

A. Steel

Except as noted below, steel shall be carbon steel of a malleable, weldable quality.

High strength, weather resistant steel shall conform to the requirements of ASTM A-242, A-588, or A-514.

Bolts, nuts, washers, rods, rivets, etc. shall be of a material equal to the steel being fastened.

B. Aluminum

Aluminum alloy products shall be Alloy 60610T6.

17.3 PROTECTIVE COATINGS

A. Galvanizing

If specified on the drawings, steel shall be galvanized. Galvanizing shall conform to ASTM A-386, A-153, A-164 Type RS, or A-165 Type TS.

B. Painting

Unless shown otherwise on the plans, non galvanized metal shall be cleaned and painted using the following procedure.

(1) Cleaning – Remove all dirt, oil, and grease by means of a mineral spirit cleaning. Next, thoroughly wet the metal with a dilute (about 5 percent strength) phosphoric acid solution. Allow the acid to dry and then thoroughly rinse the surfaces with clear water and again allow to dry.

(2) Paint – Apply two coats of one of the following paints:

- a. Zinc Dust – Zinc Oxide Primer conforming to Federal Specification TT-P-641, Type III.
- b. Zinc Dust Chlorinated Rubber conforming to Federal Specification TT-P-1046a.
- c. Zinc Dust Paint conforming to Military Specification MIL-P-21035.

d. Epoxy-Polyamide Paint conforming to Defense Specification
DOD-P-15145B.

- (3) Application – Paints shall be thoroughly mixed at the time of application. The first coat of paint shall be applied by brushing. All other coats may be applied by brush or spray. Each coat shall be applied in such a manner as to produce a continuous paint film of uniform thickness.

Paint shall not be applied when the temperature of the item to be painted or of the surrounding air is less than 50 degrees F. Painting shall be done only when the humidity and temperature of the surrounding air and temperature of the metal surfaces are such that evaporation rather than condensation will result during the application and drying time.

The finished surface of each coat shall be free from runs, drops, ridges, laps, or excessive brush marks and shall present no variation in color, texture, and finish. Surfaces shall be thoroughly dry before application of each coat of paint. The surface of each dried coat shall be cleaned as necessary before application of the next coat. After installation of the metalwork, all damage to painted surfaces shall be repaired.

17.4 FABRICATION

Metal items shall be fabricated to close fit, closely conforming to the drawings. Joints to be welded, shall be welded all around, in a manner developing as much strength as possible.

17.5 ERECTION

The metal shall be erected true and plumb, closely conforming to the drawings.

Riveting and welding shall not be done until as much of the structure as will be stiffened thereby has been properly aligned.

17.6 PAYMENT

This item shall consist of furnishing and installing the metal Anti-Vortex device as shown on the plans. Payment for this item will be on the lump sum basis.

RECEIVED
MAR - 5 2007
WATER RIGHTS
PROGRAM

Date: March 2, 2007

[illegible]

Computations by: *Steffen*
Site No: *Steffen*

$$Q = (W)(1.83 S + 0.00 H / D)(a / A)(H / D)$$

Friction Slope (With HW at the E.S. Crest): 0.13692
Pipe Slope: 0.09545

 1 SITES XEQ 03/01/2007 WATER RESOURCE SITE ANALYSIS COMPUTER PROGRAM
 VER 2000 (USER MANUAL - DATED MAY 2001)
 TIME 15:42:46

***** 80-80 LIST OF INPUT DATA *****

SITES 05/01/2000 Dave Steffen 0.6140625 H5
 SAVMOV 0 101
 SAVMOV 101 1 1
 STRUCTURE steffen

71 0
 76 .6
 80 2.3
 86 5.5
 92 10.4
 96 14.8

ENDTABLE

WSDATA 5A1 AC 82 393 6970 1.3
 PDIRECT 1.9 .00 4.40
 POOLDATA ELEV 90.0 90.0 71 71 SC
 PSINLET 1 6.28
 PSDATA 1 110 15 .025 72
 ASDATA 41 200 200 2 .1 2
 ASINSURF 41 .035
 ASINLET 41 0.0 0.0 100 0.0 3
 200 8

ENDTABLE

ASEXSURF 41 .035
 .65 0
 3
 2 0
 .02

ENDTABLE

ASEXIT 41 N 100
 BTMWIDTH FEET 50
 GRAPHICS I
 GO,DESIGN HL TYPE2 24 TYPE2378 24
 SAVMOV 2 101 1
 ENDJOB

***** MESSAGE - ALTERNATE STRUCTURE ID (S 1) BEING USED
 SINCE USER DID NOT INPUT AN ID.

***** MESSAGE - ALTERNATE SUBWATERSHED ID (A) BEING USED SINCE
 USER DID NOT INPUT AN ID.

***** MESSAGE - DRAINAGE AREA FROM WSDATA CONTROL BEING CONVERTED FROM
 ACRES TO SQUARE MILES FOR COMPUTATION PURPOSES.

1SITES

XEQ 03/01/2007 Dave Steffen WSID=
 VER 2000 steffen SUBW= A
 TIME 15:42:46 SITE = S 1 PASS= 1 PART= 1

RECEIVED
 MAR - 5 2007
 WATER RIGHTS
 PROGRAM

***** BASIC DATA *****
 CLIMATE AREA - NOT DEFINED DESIGN CLASS A1 = LT 3000.

STORM DISTRIBUTION-PSH 24 HOUR TYPE II RAINFALL DISTRIBUTION

STORM DISTRIBUTION AUX. -24 HOUR TYPE II RAINFALL DISTRIBUTION

PRECIP. - P-PS,1-DAY P-PS,10-DAY P-SD P-FB
 1.90 0.00 0.00 4.40

WSDATA - CN DA-SM TC/L -/H QRF
 82.00 0.61 6970.00 1.30 0.00

SITEDATA- PERM POOL CREST PS FP SED VALLEY FL 378?
 90.00 90.00 0.00 71.00 YES

BASEFLOW INITIAL EL EXTRA VOL SITE TYPE
 0.00 0.00 0.00 DESIGN

PSDATA - NO. COND COND L DIA/W -/H
 1.00 110.00 15.00 0.00

PS N KE WEIR L TW EL
 0.025 1.00 6.28 72.00

2ND STG ORF H ORF L START AUX.
 0.00 0.00 0.00 0.00

ASCRESTS - AUX.1 AUX.2 AUX.3 AUX.4 AUX.5
 0.00 0.00 0.00 0.00 0.00

AUX.DATA - REF.NO. RETARD. Ci TIE STATION INLET LENGTH
 41 0.00 200.00 200

AUX.DATA - INLET N SIDE SLOPE EXIT N EXIT SLOPE ACTUAL AUX?
 0.035 2.00 0.035 0.100 NO

BTM WIDTH - BW1 BW2 BW3 BW4 BW5
 ft 50.00 0.00 0.00 0.00 0.00

AUXILIARY SPILLWAY RATING DEVELOPED USING WSPVRT.

1SITES -----
 XEQ 03/01/2007 Dave Steffen WSID=
 VER 2000 steffen SUBW= A
 TIME 15:42:46 SITE = S 1 PASS= 1 PART= 2

PERM POOL 90.00 FT 59.2 ACFT 8.77 AC 0.0 CFS

CREST PS 90.00 FT 59.2 ACFT 8.77 AC 0.0 CFS

SED ACCUM 90.00 FT 59.2 ACFT 8.77 AC 0.0 CFS

START ELEV 90.00 FT 59.2 ACFT 8.77 AC 0.0 CFS

NRCS-PSH D= 24.00 HR P= 1.90 IN Q= 0.58 IN DA= 0.61 SM
TC= 2.06 HR CN= 82.00 VOL= 19.1 ACFT

PEAK = 67.0 CFS, AT 13.3 HRS.

ROUTED RESULT - HYD TYPE EMAX VOL-MAX AMAX QMAX
NRCS-PSH 91.08 FT 69.2 ACFT 9.65 AC 12.7 CFS

PS STORAGE 9.9 ACFT, BETWEEN AUX. CREST AND SED. ACCUM ELEVATIONS.

DRAWDOWN (DDT) TEST 90.00 FT 59.2 ACFT 0.00 CFS
CONTROL IS 0.000 DETENTION STORAGE

TIME = 2.80 DAYS, TO 0.0 CFS (LIMIT = 10.00 DAYS)

RATING TABLE DEVELOPED, SITE = S 1:
BY PROGRAM FOR PS AND AUX. SPILLWAYS
AUX. RATING USED WSPVRT METHOD.

RATING TABLE NUMBER 1

	ELEV. FEET	Q-TOTAL CFS	Q-PS CFS	Q-AUX. CFS	VOLUME AC-FT	AREA ACRE
1	90.00	0.00	0.00	0.00	59.23	8.77
2	90.19	1.57	1.57	0.00	60.89	8.92
3	90.37	4.45	4.45	0.00	62.57	9.07
4	90.56	8.18	8.18	0.00	64.28	9.22
FULL CONDUIT FLOW, ELEV = 90.75 FT						
5	90.75	12.59	12.59	0.00	66.02	9.38
6	91.40	12.82	12.82	0.00	72.35	9.91
7	92.06	13.03	13.03	0.00	79.04	10.47
8	92.72	13.24	13.24	0.00	86.15	11.19
9	93.37	13.45	13.45	0.00	93.73	11.91
10	94.03	13.66	13.66	0.00	101.78	12.63
11	94.69	13.86	13.86	0.00	110.32	13.36
12	95.34	14.06	14.06	0.00	119.32	14.08
13	96.00	14.25	14.25	0.00	128.80	14.80

1SITES

XEQ 03/01/2007 Dave Steffen WSID=
VER 2000 steffen SUBW= A
TIME 15:42:46 SITE = S 1 PASS= 1 PART= 3

AUX. CREST 91.08 FT 69.2 ACFT 9.65 AC 12.7 CFS

PS STORAGE 9.9 ACFT, BETWEEN AUX. CREST AND SED. ACCUM ELEVATIONS.

START ELEV 90.00 FT 59.3 ACFT 8.77 AC 0.0 CFS

EFFECTIVE HEIGHT(H)= 20.1 FEET, PRODUCT= 1388. (H * STORAGE AT CREST AUX.).

INPUT DESIGN CLASS = A1 = LT 3000. PRODUCT.

NRCS-FBH D= 24.00 HR P= 4.40 IN Q= 2.55 IN DA= 0.61 SM
TC= 2.06 HR CN= 82.00 VOL= 83.5 ACFT

PEAK = 321.2 CFS, AT 13.0 HRS.

RATING TABLE DEVELOPED, SITE = S 1:
BY PROGRAM FOR PS AND AUX. SPILLWAYS
AUX. RATING USED WSPVRT METHOD.

RATING TABLE NUMBER 2

	ELEV. FEET	Q-TOTAL CFS	Q-PS CFS	Q-AUX. CFS	VOLUME AC-FT	AREA ACRE
1	90.00	0.00	0.00	0.00	59.23	8.77
2	90.19	1.57	1.57	0.00	60.89	8.92
3	90.37	4.45	4.45	0.00	62.57	9.07
4	90.56	8.18	8.18	0.00	64.28	9.22
FULL CONDUIT FLOW, ELEV = 90.75 FT						
5	90.75	12.59	12.59	0.00	66.02	9.38
6	90.79	12.61	12.61	0.00	66.41	9.41
7	90.83	12.62	12.62	0.00	66.79	9.44
8	90.87	12.64	12.64	0.00	67.18	9.48
9	90.91	12.65	12.65	0.00	67.57	9.51
10	90.95	12.67	12.67	0.00	67.97	9.55
11	90.99	12.68	12.68	0.00	68.36	9.58
12	91.04	12.69	12.69	0.00	68.75	9.61
13	91.08	12.71	12.71	0.00	69.15	9.65
14	91.32	19.70	12.79	6.91	71.55	9.85
15	91.57	32.22	12.87	19.35	74.00	10.05
16	92.01	84.91	13.02	71.89	78.53	10.41
17	92.55	185.07	13.19	171.88	84.33	11.01
18	93.54	467.29	13.50	453.79	95.70	12.09
19	94.77	943.91	13.88	930.03	111.42	13.45
20	96.00	1556.74	14.25	1542.49	128.80	14.80

SUMMARY OF AUXILIARY SPILLWAY SURFACE CONDITIONS USED IN COMPUTATIONS BY REACH

REACH	FROM STA (ft)	TO STA (ft)	SLOPE CURVE INDEX@	RETARDANCE COVER FACTOR	VEGETAL CODE	MAINT. DEPTH (ft)	ROOTING * *	REACH LOCATION
1	0.	100.	-8.0	0.035	**	**	**	INLET
2	100.	200.	0.0	0.035	**	**	**	CREST
3	200.	300.	10.0	0.035	0.65	3	2.0	EXIT !

@ The program interprets retardance curve index entries of less than 1 as Manning's n values.

* Upper case indicates a reach of constructed spillway channel.

** The program does not use vegetal cover factor, maintenance code, and rooting depth for inlet and crest reaches in computations.

! Reach 3 used in computing exit channel velocities.

DRAWDOWN USING FREEBOARD STORM FOLLOWS, STARTING AT ELEVATION 91.08 FT.

DRAWDOWN (DDT) TEST 90.00 FT 59.2 ACFT 0.00 CFS
CONTROL IS 0.000 DETENTION STORAGE

TIME = 2.68 DAYS, TO 0.0 CFS (LIMIT = 10.00 DAYS)

ROUTED	BTM	WIDTH	MAX	ELEV	VOL-MAX	AREA-MAX	AUX.-HP	VOL-AUX.
RESULTS	FT	FT	ACFT	AC	FT	ACFT		
NRCS-FBH	50.0	92.72	86.1	11.2	1.64	17.0		

PEAK - CFS Q-PS Q-AUX. Q-TOT.
DISCHARGE = 13.2 216.8 230.1

CRITICAL CRITICAL CRITICAL 25% OF Q
DEPTH VELOCITY SLOPE-Sc Sc
AUXILIARY FT FT/SEC FT/FT FT/FT
SPILLWAY --- 0.83 5.08 0.019 0.026

EFFECTIVE STRESS FOR STABILITY ANALYSIS OF AUX. EXIT CHANNEL
(Refer to Ag. Handbook 667, Chapt. 3, for allowable stresses.)
Aux. Discharge = 217. cfs; Bottom Width = 50. ft

REACH FROM TO SLOPE MANNING'S VELOCITY STRESS
NO. STA STA % n ft/s lb/ft^2
3 200. 300. 10.00 0.035 8.39 1.923

AUXILIARY SPILLWAY DURATION FLOW = 15.2 HOURS
ATTACK, OE/B = 1.1 ACFT/FT

***** MESSAGE - NHCP378 CRITERIA USED BUT AUXILIARY SPILLWAY RATING NOT
BASED ON ASFILE RATINGS.

EXIT CHANNEL FLOW SUPERCRITICAL: MAX VELOCITY= 8.4 FT/SEC
EXIT SLOPE = 0.100 FT/FT
FLOW DEPTH = 0.5 FT

>>>>> NHCP378 RUN - MINIMUM DEPTH, CREST AUX. TO TOP OF DAM IS 2.00 FT.
NEW TOP OF DAM ELEVATION = 93.08.

ROUTED	BTM	WIDTH	MAX	ELEV	VOL-MAX	AREA-MAX	AUX.-HP	VOL-AUX.
RESULTS	FT	FT	ACFT	AC	FT	ACFT		
MINIMUM AUX.	50.0	93.08	90.4	11.6	2.01	21.2		

PEAK - CFS Q-PS Q-AUX. Q-TOT.
DISCHARGES = 13.4 321.7 335.0

CRITICAL CRITICAL CRITICAL 25% OF Q
DEPTH VELOCITY SLOPE-Sc Sc
AUXILIARY FT FT/SEC FT/FT FT/FT
SPILLWAY --- 1.07 5.76 0.018 0.024

>>>>> NHCP378 RUN - MINIMUM DEPTH, DESIGN FLOW TO TOP OF DAM; 1.00 FT REQUIRED
FOR THIS PASS. NEW TOP OF DAM ELEVATION = 93.72.

ROUTED RESULTS	BTM WIDTH FT	MAX ELEV FT	VOL-MAX ACFT	AREA-MAX AC	AUX.HP FT	VOL-AUX. ACFT
MINIMUM AUX.	50.0	93.72	98.0	12.3	2.65	28.8

PEAK - CFS Q-PS Q-AUX. Q-TOT.
DISCHARGES = 13.6 523.0 536.6

	CRITICAL DEPTH FT	CRITICAL VELOCITY FT/SEC	CRITICAL SLOPE-Sc FT/FT	25% OF Q Sc FT/FT
AUXILIARY	1.47	6.70	0.016	0.022
SPILLWAY ---				

INFLOW HYD 1 PSH-PEAK = 12.70 CFS AT 16.98 HRS, LOCATION POINT

INFLOW HYD 1 FBH-PEAK = 230.08 CFS AT 13.95 HRS, LOCATION POINT
HYDOUT 1

1SITES....JOB NO. 1 COMPLETE.

Dave Steffen

0 SUBWATERSHED(S) ANALYZED.

1 STRUCTURE(S) ANALYZED.

2 HYDROGRAPHS ROUTED AT LOWEST SITE.

0 TRIALS TO OBTAIN BOTTOM WIDTH FOR SPECIFIED STRESS OR VELOCITY.

SITES.....COMPUTATIONS COMPLETE

>>>	SITE ID	SUBWS ID	SUBWS (SQ MI)	DA NO.	CURVE (HRS)	TC (SQ MI)	TOTAL DA DESIGN	TYPE CLASS	STRUC	<<<
	S 1	A	0.61	82.	2.06	0.61	378CR	A1		

PASS NO.	DIA./ WIDTH (IN/FT)	AUX. CREST (FT)	BTM. MAX. (FT)	MAX. HP (FT)	EMB. ELEV (CY)	INTEGR.* VOL. (FT)	EXIT* DIST. (FT/SEC)	TYPE HYD
1	15.0	91.1	50.0	2.6	93.7	0.	0.	8.4 MIN. AUX.

* INTEGRITY DIST. AND EXIT VEL. ARE BASED ON THE ROUTED HYDROGRAPH
AND WILL NOT RELATE TO THE MAX. ELEV. (TOP OF DAM),
WHICH IS SET BY MINIMUM DESIGN CRITERIA.

SITES.....SUMMARY TABLE 1 COMPLETED.

NRCS SITES VERSION 2000 ,05/01/2000
FILES

INPUT
C:\data\Engineering\sites\steffen\24-15cmp.D2C

OUTPUT - DATED 03/01/2007 15:42:46
C:\data\Engineering\sites\steffen\24-15cmp.OUT

GRAPHICS FILES GENERATED

OPTION "L" DATED 03/01/2007 15:42:46
C:\data\Engineering\sites\steffen\24-15cmp.DRG

OPTION "P" DATED 03/01/2007 15:42:46
C:\data\Engineering\sites\steffen\24-15cmp.DHY

OPTION "E" DATED 03/01/2007 15:42:46
C:\data\Engineering\sites\steffen\24-15cmp.DEM



**DEPARTMENT of ENVIRONMENT
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**RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 2606-2, David Steffen**

Pursuant to SDCL 46-2A-2, the following is the recommendation of the Chief Engineer, Water Rights Program, Department of Environment and Natural Resources concerning Water Permit Application No. 2606-2, David Steffen, 34110 294th Street, Burke SD 57523.

The Chief Engineer is recommending APPROVAL of Application No. 2606-2 because 1) there is reasonable probability that there is unappropriated water available for the applicant's proposed use, 2) the proposed diversion can be developed without unlawful impairment of existing rights, 3) the proposed use is a beneficial use and 4) it is in the public interest with the following qualifications:

1. Water Permit No. 2606-2 authorizes a dam with a storage capacity of 59.0 acre feet of water and sufficient water annually to maintain the water level to the outlet elevation.
2. Low flows as needed for downstream domestic use, including livestock water and prior water rights must be by-passed.

See report on application for additional information.

Garland Erbele, Chief Engineer
December 20, 2006

REPORT ON
WATER PERMIT APPLICATION No. 2606-2

~~David Steffen~~
December 18, 2006

Water Permit Application No. 2606-2 has been filed by David Steffen to impound 59 acre-feet of water by constructing a dam located in the SE ¼ SW ¼ of Section 10-T96N-R72W, in Gregory County. The application also requests impoundment of sufficient water to maintain water at the outlet elevation. The water will be used for fish and wildlife production and livestock watering purposes.

Discussion:

The dam will be classified as a small size, Category 3, Low Hazard dam. Konechne Engineering has designed the dam. The plans and specifications have been reviewed and will be approved; however, construction of the dam can not begin until Water Permit Application No. 2606-2 is approved.

The dam will be 24 feet high with a normal storage capacity of 59 acre-feet with a reservoir level at the primary spillway elevation, and a maximum storage capacity of 103 acre-feet with a reservoir level at the top of dam elevation. A dam of this size and hazard classification is required to have a minimum spillway design capable of passing a 25-year frequency event.

The dam has a drainage area of 393 acres or 0.61 square miles. The dam is designed to have a 30 inch diameter concrete drop inlet structure with an 18 inch HDPE barrel as the primary spillway and a 50 foot wide earthcut secondary spillway. A 25 year frequency event produces a peak runoff of approximately 160 cfs and a 100 year frequency event produces a peak runoff of approximately 290 cfs. The 50 foot wide earthcut secondary spillway will have a capacity of approximately 675 cfs.

The annual yield for this drainage area with an 80 percent chance of occurrence, or 8 out of 10 years, is expected to be 14 acre-feet. The annual yield with a 50 percent chance of occurrence, or 1 out of 2 years, is expected to be 33 acre-feet and the annual yield with a 10 percent chance, or 1 out of 10 years, is expected to be 115 acre-feet.

The Steffen Dam will be located in the SE ¼ SW ¼ of Section 10-T96N-R72W on an unnamed tributary to Ponca Creek about 0.25 miles upstream of the confluence of the unnamed tributary and Ponca Creek. There are no existing Water Permits/Rights or Location Notices filed on the unnamed tributary between the proposed dam and Ponca Creek.

Conclusions:

1. Water Permit Application No. 2606-2 should be approved since unappropriated water is available and approval should not have any adverse effect on existing Water Permits/Rights.
2. If approved, the low flow bypass requirement for downstream domestic use should be a qualification on Water Permit Application No. 2606-2.



Timothy G. Schaal, P.E.
Natural Resources Engineering Specialist

Form 8

PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA)
) SS
County of Gregory)

I, C.J. Fahrenbacher

certify that the attached printed Notice was
taken

from the Burke Gazette

printed and published in Burke, SD

County of Gregory and

state of South Dakota. The notice was
published

in the newspaper on the following two dates:

1-3-07

1-10-07

Cost of Printing 52.08


(Signature)

publisher
(Title)

1-10-07
(Date Signed)

RECEIVED

JAN 11 2007

WATER RIGHTS
PROGRAM

NOTICE OF APPLICATION NO. 2606-2 TO APPROPRIATE WATER

Notice is given that David Steffen, 34110 294th St., Burke, SD 57523 has filed an application for a water permit to impound 59 acre-feet of water from runoff by constructing a dam located in the SE1/4 SW1/4 Section 10 with water impounded in the E1/2 SW1/4 Section 10; all in T96N-R72W. This application requests impoundment of sufficient water to maintain water to the outlet elevation. The water is for fish and wildlife propagation and livestock water purposes.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 2606-2 because 1) unappropriated water is available; 2) existing rights will not be unlawfully impaired; 3) it is a beneficial use of water; and 4) it is in the public interest. In accordance with SDCL 46-2A-23, the Chief Engineer will act on the application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider the application. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting this application or recommendation must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition if contesting the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre, SD 57501 (605) 773-3352 and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by January 22, 2007.

The petition may be informal, but must include a statement describing the petitioner's interest in the application, the petitioner's reasons for opposing or supporting the application, and the signature and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained. Contact Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to this



December 22, 2006

Burke Gazette
PO Box 359
Burke SD 57523-0359

ATTENTION: Legal Public Notice

Enclosed is a Notice on Application No. 2606-3 to Appropriate Water to be published twice. Please publish the first notice on January 3, 2007 with the second publication 7 days later. The text of the notice can be e-mailed to your paper by contacting Karen Schlaak at (605) 773-3352.

Please BILL the APPLICANT for the cost of publication. The APPLICANT is David Steffen, 34110 294th St., Burke SD (Ph # 605-775-9112).

Please send the Water Rights Program the first publication immediately. The publication is checked for accuracy so any corrections can be made in the second publication. You may use the form below or fax a copy of the first publication. Any fax should be sent to the attention of Karen Schlaak at (605) 773-4068. Publication errors can invalidate the public notice.

After the second publication, **please send us an affidavit or use the enclosed Proof of Publication form.** The applicant pays the cost of publication, but the Water Rights Program records require an affidavit or Proof of Publication. Delays in receiving the affidavit can be costly to the applicant.

Sincerely,

Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures

-----CUT HERE-----

No. 2606-2

TO: Eric Gronlund
Water Rights Program
Joe Foss Building
Pierre SD 57501-3181

Date _____

We are in receipt of your letter of December 22, 2006 enclosing Notice to Appropriate Water by Application No. 2606-2 which was first published in our issue of _____. **ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.**

Name

Newspaper



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182

www.state.sd.us/denr

NOTE: TO BE SURE OF PUBLICATION ON
THE CORRECT DATES, CONTACT
THE NEWSPAPER RIGHT AWAY.

December 22, 2006

David Steffen
34110 294th St
Burke SD 57523

Dear Mr. Steffen:

Water Permit Application No. 2606-2 for fish & wildlife and livestock watering use has been examined and found to comply with the South Dakota Water Laws and applicable rules. A notice has been sent to the Publisher of the Burke Gazette printed at Burke, SD (Ph # 605-775-2612). You will need to contact the newspaper and authorize publication of this notice. For your information, a copy of the notice, the recommendation of the Chief Engineer and a report on the application are enclosed. Please review the notice prior to publication and notify this office, if you have any corrections or questions.

Be sure to contact the above newspaper to authorize publication of your Notice and to arrange for payment. Early contact with the paper can eliminate delays. Upon receiving authorization, the publisher has been instructed to publish your notice once each week for two consecutive weeks. The newspaper has also been instructed to send us the Proof of Publication. We must receive Proof of Publication before action can be taken on the application.

Sincerely,


Eric Gronlund
Natural Resources Engineer
(605) 773-3352

enclosures

NOTE: If you plan to contest any part of the Chief Engineer's recommendation, you must file a petition pursuant to the procedures outlined in the attached notice of hearing. The Water Management Board will then consider your concerns during a hearing on the application.

~~Instruction to Newspaper - Publish first Notice on January 3, 2007 with the second publication 7 days later. The applicant is responsible for payment.~~

NOTICE OF APPLICATION NO. 2606-2 to Appropriate Water

Notice is given that David Steffen, 34110 294th St, Burke SD 57523 has filed an application for a water permit to impound 59 acre-feet of water from runoff by constructing a dam located in the SE ¼ SW ¼ Section 10 with water impounded in the E ½ SW ¼ Section 10; all in T96N-R72W. This application requests impoundment of sufficient water to maintain water to the outlet elevation. The water is for fish and wildlife propagation and livestock water purposes.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 2606-2 because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest. In accordance with SDCL 46-2A-23, the Chief Engineer will act on the application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider the application. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting this application or recommendation must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition if contesting the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by January 22, 2007.

The petition may be informal, but must include a statement describing the petitioner's interest in the application, the petitioner's reasons for opposing or supporting the application, and the signature and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained. Contact Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to this application. Steven M. Pirner, Secretary, Department of Environment and Natural Resources.



MAR 14 2007

DEPARTMENT of ENVIRONMENT
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PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

David Steffen
34110 294th St
Burke SD 57523

Dear Mr. Steffen:

Enclosed is Water Permit No. 2606-2 authorizing construction of the dam and beneficial use of the water, not exceeding the limits as specified in the Water Permit.

Form 10, *Notice of Completion of Works and Application of Water to Beneficial Use*, is enclosed. Please return this completed form after you have finished the system and have put the water to beneficial use. An investigation can then be scheduled so the water license may be issued, thus completing the acquisition of a water right.

An informational sheet *Common Water Right Questions?* is also enclosed. This sheet is intended to answer some of the questions associated with obtaining and keeping a water right.

Sincerely,

Garland Erbele, Chief Engineer
Water Rights Program
(605) 773-3352

enclosures

RECEIVED

JUL 26 2007

WATER RIGHTS
PROGRAMNOTICE OF COMPLETION OF WORKS AND
APPLICATION OF WATER TO BENEFICIAL USEDate July 24, 2007TO: Water Rights Program, DENR
523 E. Capitol
Pierre, SD 57501-3181FROM: David Steffen
(name)34110 294th St
(address)Burke SD 57523
(city, state, zip)605-775-9112
(phone)

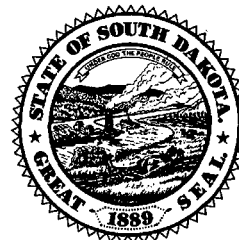
I have completed the construction of the water use system and I have put the water to beneficial use to the maximum extent it is going to be used.

Water Permit No. 2606-2 states that the water use system is to be constructed byJan 22, 2012
(date)

, and water is to be put to beneficial use by

Jan 22, 2016
~~July 24, 2007~~
(date)The water use system was completed on July 24, 2007
(date)Applying the water to beneficial use was completed on July 24, 2007
(date)

You may schedule an investigation so that the water license may be issued.

David Steffen
(signature)

Permit No. 2606-2
Niobrara Tributary - Water District

Report Of Examination Of Works And/Or Application of Water To Beneficial Use

TO: Chief Engineer, Water Rights Program, DENR, Foss Bldg., Pierre, SD 57501

I have this day, **October 8, 2008**, made a thorough examination of the water use system constructed by **David Steffen** of **34110 294th St., Burke, SD 57523** holder of Permit No. **2606-2**, bearing the priority of **October 6, 2006** authorizing the storage of **59** acre-feet of the waters of **runoff** for **fish & wildlife production and livestock watering** purposes, in **Gregory** County.

I have to report on the conditions of the same as follows:

A. Works used to divert the water:

A 24 foot high earthen dam with a normal storage capacity of 59 acre-feet

B. Works used to transport water to place of use:

N/A

C. Works used to apply water to beneficial use:

A 24 foot high earthen dam with a normal storage capacity of 59 acre-feet

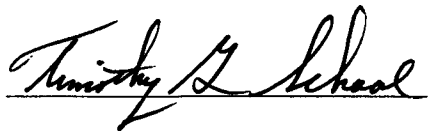
The system is in the following condition **good**. The point of diversion is located **950 ft. north & 1800 ft. east of the SW corner of Sec. 10-T96N-R72W (SE ¼ SW ¼) (Lat. 43.142597 & Long. -99.349386)**. The works are capable of storing **59** acre-feet of water which is to be used for **fish & wildlife production and livestock watering**. Water has been put to beneficial use to the maximum extent as follows:

A 24 foot high earthen dam with a normal storage capacity of 59 acre-feet

and the license should be issued for **59** acre-feet of storage.

Applicable permit qualifications have been complied with: Yes **X**

Exceptions to compliance are: **none** Date Report Completed: **June 23, 2009**



Timothy G. Schaal, P.E.
Natural Resources Engineering Specialist
DENR, Water Rights Program

REPORT ON INSPECTION OF PERMIT NO. 2606-2

DATE OF INSPECTION: **October 8, 2008**

NAME & ADDRESS OF INSPECTION CONTACT/ **David Steffen, 34110 294th St., Burke, SD 57523**

RELATIONSHIP TO PERMIT HOLDER, IF APPLICABLE: **owner**

NAME & ADDRESS OF PERMIT HOLDER: **same**

DIVERSION POINT LEGAL LOCATION: **950 ft. north & 1800 ft. east of the SW corner of Sec. 10-T96N-R72W (SE ¼ SW ¼) (Lat. 43.142597 & Long. -99.349386).**

DAM INFORMATION:

- 1) Height to crest **24** feet
- 2) Height to primary spillway **20** feet
- 3) Height to secondary spillway **21** feet
- 4) Crest width **12** feet
- 5) Crest length **450** feet
- 6) Spillway length **XXX** feet
- 7) Spillway width **50** feet
- 8) Approx. storage (Normal) **59** acre-feet
- 9) Approx. storage (Maximum) **103** acre-feet
- 10) Date constructed: **2007**

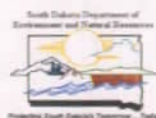
PERMIT QUALIFICATIONS AND REGULATIONS:

- 1) Soil and water permit lands agree with lands being irrigated and lands listed on permit **N/A**
- 2) Special qualifications to permit being abided by **yes**
- 3) All structures, wells and lands on map **yes**
- 4) Irrigation Questionnaires checked to determine if permit owner started irrigation by the end of construction period **N/A**

Water Permit No. 2606-2



0 0.25 0.5 1 Miles



Timothy G. Schaal

Timothy G. Schaal, P.E.
Natural Resources Engineering Specialist
SD DENR, Water Rights Program

6/23/09



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AUG 14 2009

2606-2

David Steffen
34110 294th St
Burke SD 57523

Dear Mr. Steffen:

Enclosed is Water License No. 2606-2 and a map prepared by the staff engineer who conducted the field investigation. Water License No. 2606-2 is the final document which completes the process of obtaining a water right.

As long as you use the water beneficially, as stated in the Water License, State Water Laws provide that you have a continuing right to use the water.

Sincerely,

Garland Erbele, Chief Engineer
Water Rights Program
(605) 773-3352

enclosures

STATE OF SOUTH DAKOTA

WATER LICENSE NO. 2606-2

(1) David Steffen, 34110 294th St, Burke SD 57523 made Application No. 2606-2, October 6, 2006 for a water permit to impound 59 acre feet of runoff water by constructing a dam located in Gregory County, South Dakota for fish & wildlife propagation and livestock watering purposes. Permit No. 2606-2, with a priority date of October 6, 2006 was approved January 22, 2007 and issued to the applicant for impoundment of water with construction of the storage dam to be completed on or before January 22, 2012 and for the application to beneficial use of said water on or before January 22, 2016.

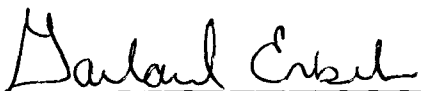
The Permit holder submitted a "*Notice of Completion of Works and Application of Water to Beneficial Use*" on July 26, 2007. The "*Notice*" stated the storage dam was completed and water placed to beneficial use on July 24, 2007.

(2) It is certified that the permit holder has complied with the provisions of South Dakota State Law relating to completion of the storage dam and the application of water to beneficial use and is entitled to impound 59 acre feet of water for beneficial use with sufficient water annually to maintain the water level to the outlet elevation. The location of the storage dam (spillway) is 950 feet north and 1,800 feet east of the SW corner of Section 10, T96N, R72W (SE ¼ SW ¼) with water impounded in the E ½ SW ¼ Section 10, T96N, R72W.

(3) Pursuant to South Dakota Water Law 46-5-30.1 David Steffen, 34110 294th St, Burke SD 57523 the holder and/or owner of Water Right No. 2606-2 is issued a license to appropriate water, the right to impound 59 acre feet of runoff water with a priority date of October 6, 2006 from the location specified in (2) of this license for fish & wildlife propagation and livestock watering purposes.

This license is subject to South Dakota Water Law, any limitations or conditions listed in Water Right No. 2606-2 and subject to the following qualifications:

- Water Right No. 2606-2 authorizes a dam with a storage capacity of 59 acre feet of water and sufficient water annually to maintain the water level to the outlet elevation.
- Low flows as needed for downstream domestic use including livestock water and prior water rights must be bypassed.


Garland Erbele, Chief Engineer
Water Rights Program
Department of Environment and Natural Resources

AUG 14 2009

date

