

Considered: _____

WATER PERMIT NO. 1506-1

Phone: 773-3381

Name of Applicant: Dept. of Game, Fish and Parks

Post Office Address: 523 E. Capitol Ave, Pierre, SD 57501

Amount of Water Claimed: 294.2 acre-feet Total Acres: _____

Source of Water Supply: unnamed tributary to Brushy Creek

Water to be used for: Wildlife habitat County: Perkins

About 10 miles west and 25 miles south of Bison

PROOF OF PUBLICATION: Received _____ Not Received _____

APPLICATION: Approved _____ Subject to _____

F.F.& C/.L. Adopted _____ Not Approved _____ Deferred _____

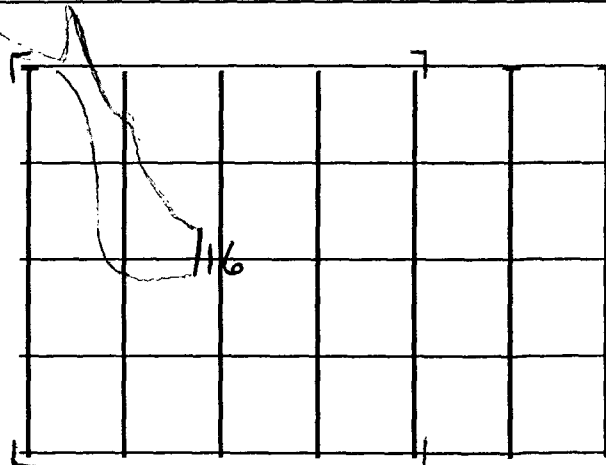
PRIORITY Date Received: 1/15/91 Fee: N/A Remarks _____

Corrected Application Received _____ Period of Annual Use _____

WATER QUALITY APPROVAL RECEIVED _____ APPROVED/CONDITIONAL (Circle one)

WI-1 Description same as Application YES _____ NO _____ REMARKS _____

Dam Site: SE1/4 NW1/4, NE1/4 SW1/4 Section 16
T14N, R12E. Impounded area NW1/4, N1/2 SW1/4
Sect. 16, SE1/4 SE1/4 Sect. 8 and SW1/4 SW1/4
Section 9; all in T14N, R12E



Well Log: Driller: _____ Licensed YES _____ NO _____

Depth of Well: _____ REMARKS _____

Type of Map: Plans PREPARED BY: Roger Smith Reviewed and the Number

Assigned on 1/16/91 By Eric Gronlund

SOUTH DAKOTA
WATER PERMIT No. 1506-1

Date of first receipt of application January 15, 1991.

The Water Management Board approved Water Permit Application No. 1506-1 on December 4, 1991 for the South Dakota Department of Game, Fish and Parks, 523 E Capitol, Pierre SD authorizing the construction of the water use system and the placing of water to beneficial use subject to the following limitations, conditions and qualifications:

1. Water Permit No. 1506-1 authorizes impoundment of 294.2 acre-feet of water by reconstruction of a breached dam (commonly known as Beck Lake) on an unnamed tributary to Brushy Creek. The dam site is located in the SE 1/4 NW 1/4, NE 1/4 SW 1/4 Section 16, T14N, R12E. The area to be impounded is primarily located in the NW 1/4 Section 16 and portions of the lake may also be located in the N 1/2 SW 1/4 Section 16, SE 1/4 Section 8 and SW 1/4 Section 9; all in T14N, R12E. Water is to be stored annually to an approximate elevation of 2548.0 feet mean sea level.
2. The water appropriated shall be used for the purpose of supplying water for wildlife habitat and stock watering 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 from which applicant may claim right is January 15, 1991.
5. One-fifth of the construction is to be completed on or before June 4, 1994.
6. All construction is to be completed on or before December 4, 1996.
7. Water is to be put to beneficial use on or before December 4, 2000.
8. Water rights obtained in compliance with the laws of the State of South Dakota may not be unlawfully impaired by this appropriation.

QUALIFICATIONS


1. Permit No. 1506-1 does not authorize storage of water unless sufficient water for downstream domestic use, including livestock watering is by-passed and until prior Water Right Nos. 88-1B and 351-1 have been satisfied.
2. Approval of Permit No. 1506-1 is subject to installation of permanent low level by-pass facilities when the dam is constructed.

(continued)

Water Permit No. 1506-1
Page 2

3. Approval of Permit No. 1506-1 authorizes storage of up to 294.2 acre-feet of water annually.

WATER MANAGEMENT BOARD

By: 
Chief Engineer, Water Rights Division
Department of Water and Natural Resources

FEB 20 1992
(date)

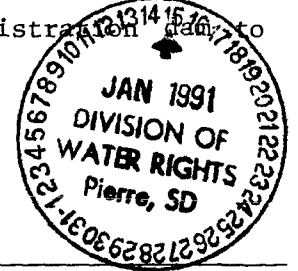
No. 1506-1 Hydrologic Unit 10130305
Map No. _____ Basin Moreau River
Newspaper Lemmon Leader, Box 180 57636

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

Check use of water: Industrial Commercial Municipal Other Common Distribution System
Rural Water System Suburban Housing Geothermal Heat Institutional Recreational
Domestic (above 18gpm) Other Reconstruction of Works Project Administration dam to provide wildlife habitat.

Type of Application: Check one or more of the following

New Vested Right Future Use Change Use
 Amend Permit No. _____ with old priority date retained
Change diversion point(s) Add diversion point(s) Other _____
 Application to: Change diversion point(s) Add diversion point(s) on Permit No. _____
 Construction to use water reserved by Future Use Permit No. _____



- Name of Applicant South Dakota Department of Game Fish & Parks Phone No. 605-773-3381
Post Office Address 523 E Capitol Pierre State South Dakota 57501
(Street, RR or Box) (City) Zip Code
- Amount of water claimed (c.f.s) Storage to 2548.0 MSL (FSL)
- Source of water supply Unnamed tributary to Brushy Creek which enters the Moreau River
- Location of point of diversion 41.0 surface acres at Full Service Level (FSL) located in section 16 TWP. 14 N. RGE. 12^E, Perkins County, South Dakota (dam - SE 1/4 NW 1/4, NE 1/4 SW 1/4 Sec 16) (impoundment - NW 1/4, N 1/2 SW 1/4 Sec 16, SE 1/4 Sec 8, SW 1/4 Sec 9, T14N, R12E)
- Counties where water will be used Perkins
- Annual period during which water is to be used year round Jan 1 - Dec 31
- Give a brief description of proposed 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)
Reconstruction of a breached Works Project Administration dam which would provide needed habitat for waterfowl, big game, fish, furbearers and also a stock watering source. Design Report is attached.

Attachments: Attach Form 2A if diversion from a well or dugout, or if storage of water, is proposed. Attach map (see instruction)

STATE OF SOUTH DAKOTA)
County of Hughes)^{SS}

I, Timothy J. Olson for Department of Game Fish & Parks 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.

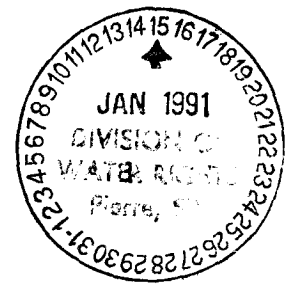
Signed Timothy J. Olson

Subscribed and sworn to before me this 16th day of January 1991

Sandra K. Sumner
Notary Public

Supplemental Information

(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 Thickness _____ 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. Dugout Information Estimates

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

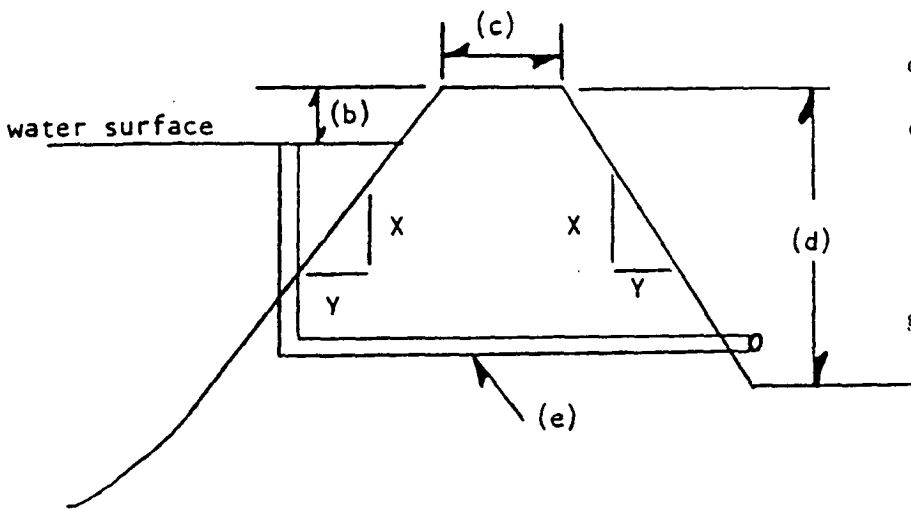
3. Water Storage Dams

If the proposed water use system contains one or more storage dams, please furnish the information requested below. The locations of each dam should 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

Ducks Unlimited Inc.
6115 East Main, Bismarck, ND 58501

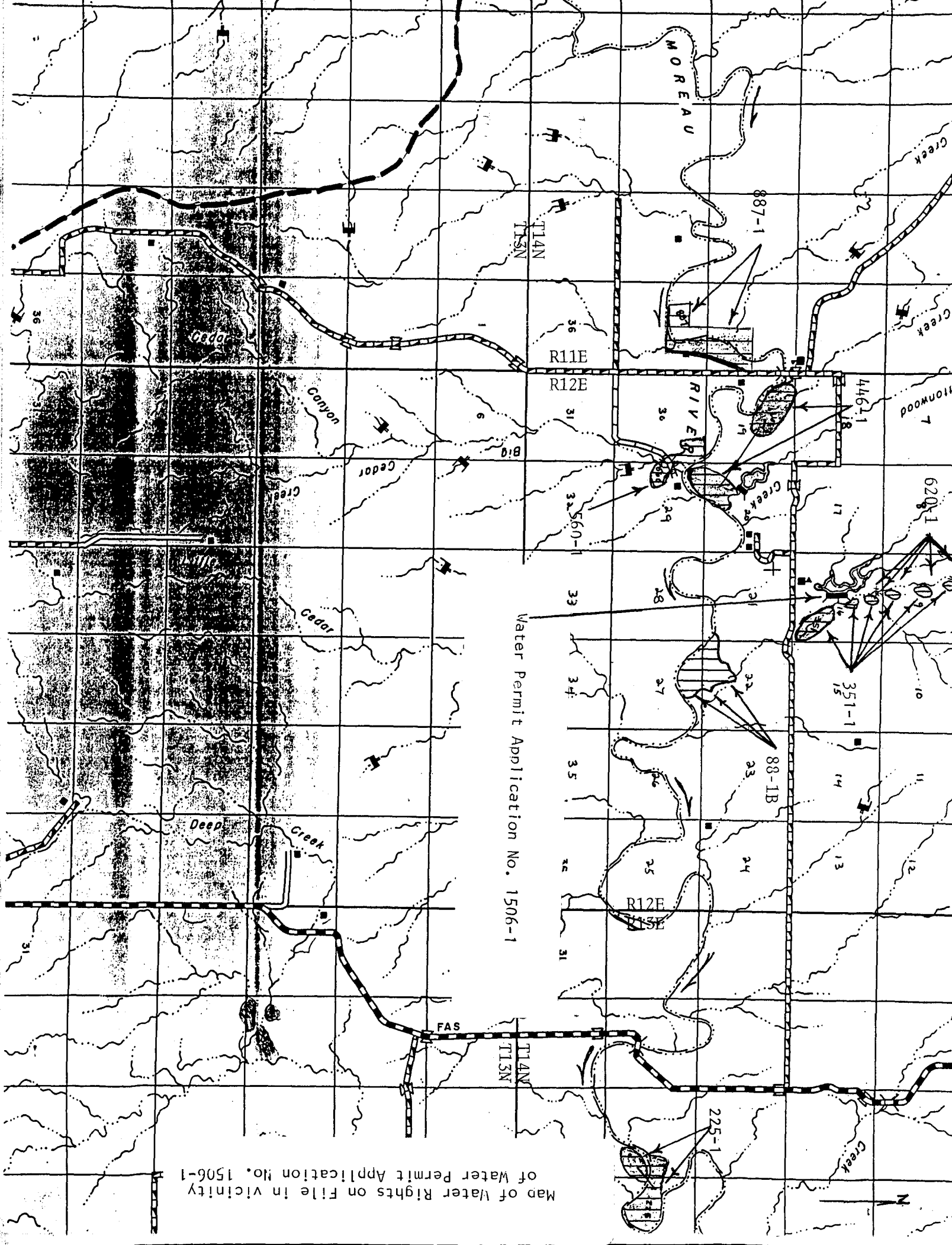
- b) Freeboard 6'
- c) Crest Width 12'
Crest Length 1250'
- d) Height 28' 2554.25 MSL
- e) Primary Outlet Capacity 228 CFS at 2550.71 MSL
If Pipe, diameter 48"
218 CFS at _____ MSL
- f) Secondary Spillway Capacity 2553.02 MSL
Spillway width 80'
- g) X & Y Slope
Upstream 2:1
Downstream 3:1



Surface Area of Impoundment 41.0 acres
 Storage 294.2 acre feet
 Drainage area above dam 4.76 sq. mi.

Timothy J. Olson
 Signature of Applicant

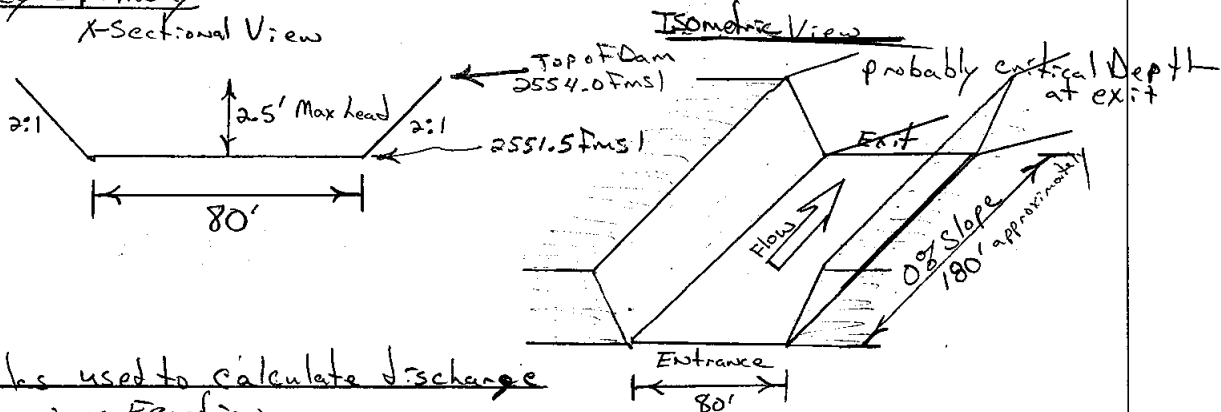
Map of Water Rights on File in Vicinity
of Water Permit Application No. 1506-1



Water Permit Application No. 1506-1

Hydraulic Analysis

Emergency Spillway



Formulas used to calculate discharge

lowest possible value unrealistic

1) Mannings Equation

- used Computer program FLOWMASTER, Haestad Method's supplier of program
 - assumed Mannings N = 0.035 and channel slope = 0.0001 ft/ft
 $Q_{\text{Emergency Spillway}} = 159 \text{ cfs}$ see printout

2) Broad Crested Weir EQ.

$$Q = C L H^{3/2}$$

$$Q = (2.6)(85)(2.5)^{3/2}$$

$$Q = 874 \text{ cfs}$$

where C = Coefficient of Discharge = 2.6 (assumed)
 L = weir length = average width = 85 ft
 H = available head = 2.5 ft

* assume head = 1.52

$$Q = (2.6)(85)(1.52)^{3/2}$$

$$Q = 414 \text{ cfs} \leftarrow \text{check of DU analysis (DU Flow} = 458 \text{ cfs)}$$

3) Backwater Analysis, HEC2 (COE computer program)

Input Data - Taken from DU Topo map of Project, see attached map
 Start at Left Bank move to Right Bank, Assume Mannings N = 0.035

x-section Number	Station Number	Elevation (FMSL)	x-section Number	Station Number	Elevation (FMSL)
0.00	0	2554.0	0.69	0	2554.0
	16	2553.0		17	2553.0
	32	2552.0		34	2552.0
	53	2551.0		51	2551.0
	134	2550.2		98	2550.5
	176	2551.0		126	2551.0
	206	2550.0		130	2552.0
	265	2553.0		190	2553.0
	265	2554.0		190	2554.0

David Brown
DWRAP, London Rights

HEC2 Data Continued

X-Section Number	Station Number	Elevation (FMSL)	X-Section Number	Station Number	Elevation (FMSL)
1.40	0	2554.0	1.68	0	2554.0
	17	2553.0		5	2553.0
	19	2552.0		8	2552.0
	22	2551.0		19	2551.0
	64	2550.7		52	2550.8
	109	2551.0		90	2551.0
	120	2552.0		96	2552.0
	122	2553.0		97	2553.0
	127	2554.0		98	2554.0

X-Section Number	Station Number	Elevation (FMSL)	X-Section Number	Station Number	Elevation (FMSL)
2.02	0	2554.0	2.14	0	2554.0
	1	2553.0		1	2553.0
	3	2552.0		3	2552.0
	48	2551.0		4	2551.5
	78	2550.0		84	2551.5
	88	2553.0		85	2552.0
	91	2554.0		89	2553.0
				92	2554.0

X-Section Number	Station Number	Elevation (FMSL)	X-Section Number	Station Number	Elevation (FMSL)
2.48	0	2554.0	2.58	0	2554.0
	13	2553.0		11	2553.0
	23	2552.0		23	2552.0
	24	2551.5		24	2551.5
	109	2551.5		121	2551.5
	110	2550.0		122	2552.0
	117	2553.0		132	2552.0
	124	2554.0		141	2554.0

X-Section Number	Station Number	Elevation (FMSL)
2.76	0	2554.0
	10	2553.0
	21	2552.0
	36	2551.0
	90	2550.8
	97	2551.0
	151	2552.0
	164	2553.0
	172	2554.0

Summary of HEC2 Analysis

Q_{max} Through Emergency Spillway
 = 800 cfs @ 2554.0 Fmsl (2.5 Feet of head)

42-381 50 SHEETS 5 SQUARE
 42-382 100 SHEETS 5 SQUARE
 42-383 150 SHEETS 5 SQUARE
 42-384 200 SHEETS 5 SQUARE
 MADE IN U.S.A.



Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Davis Brown
DWR, Water Rights Division
Pierre, SD
1/16/91

Worksheet Name: DUTTON

Comment:

Solve For Discharge

Given Input Data:

Bottom Width....	80.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.035
Channel Slope....	<u>0.0001 ft/ft</u> * <u>assumed</u>
Depth.....	2.50 ft

Computed Results:

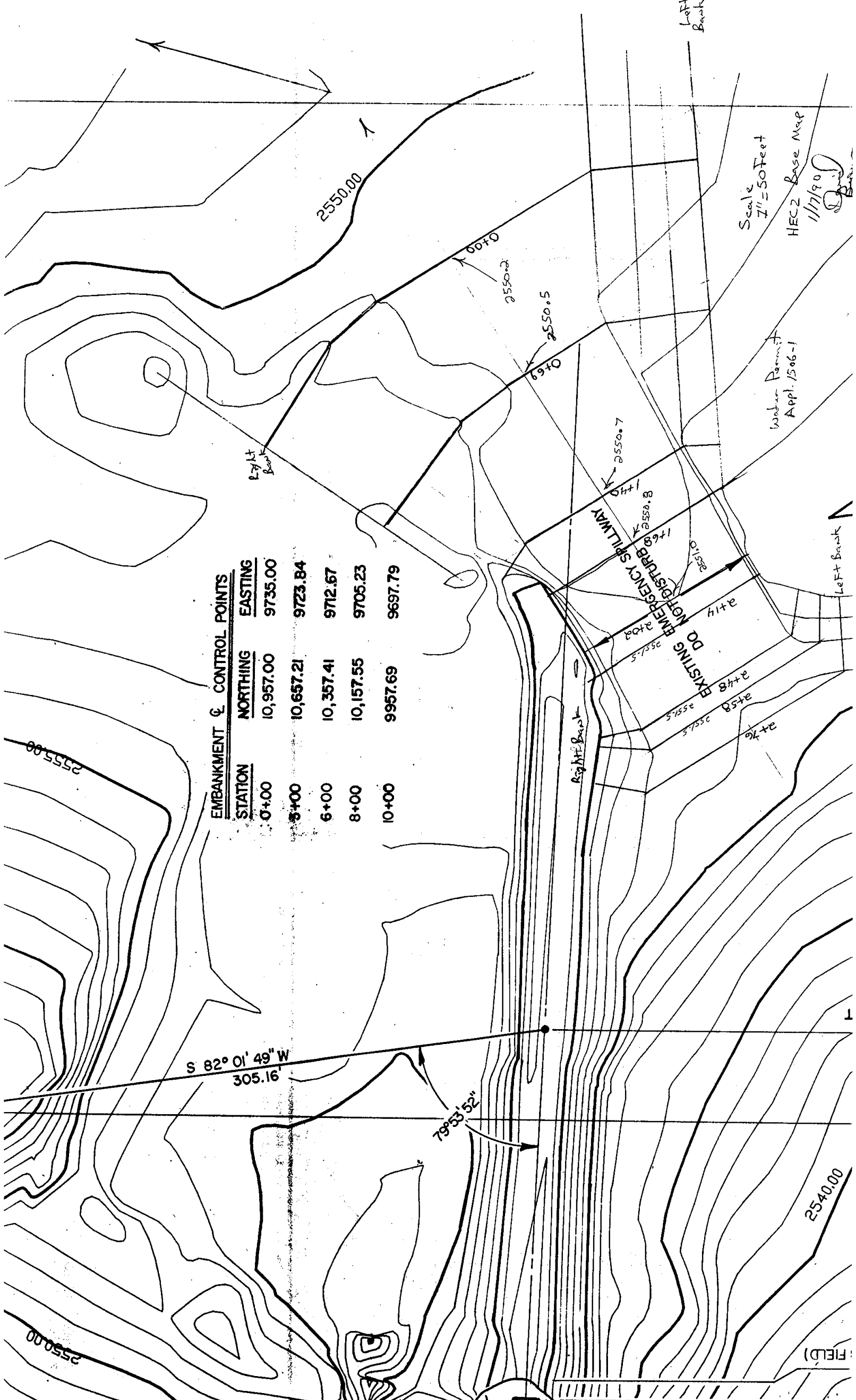
Discharge.....	<u>158.59 cfs</u>
Velocity.....	0.75 fps
Flow Area.....	212.50 sf
Flow Top Width...	90.00 ft
Wetted Perimeter.	91.18 ft
Critical Depth...	0.49 ft
Critical Slope...	0.0228 ft/ft
Froude Number....	0.09 (flow is Subcritical)

EMBANKMENT & CONTROL POINTS

STATION	NORTHING	EASTING
0+00	10,957.00	9735.00
5+00	10,657.21	9723.84
6+00	10,357.41	9712.57
8+00	10,157.55	9705.23
10+00	9957.69	9697.79

S 82° 01' 49" W
305.16'

79° 33' 52"



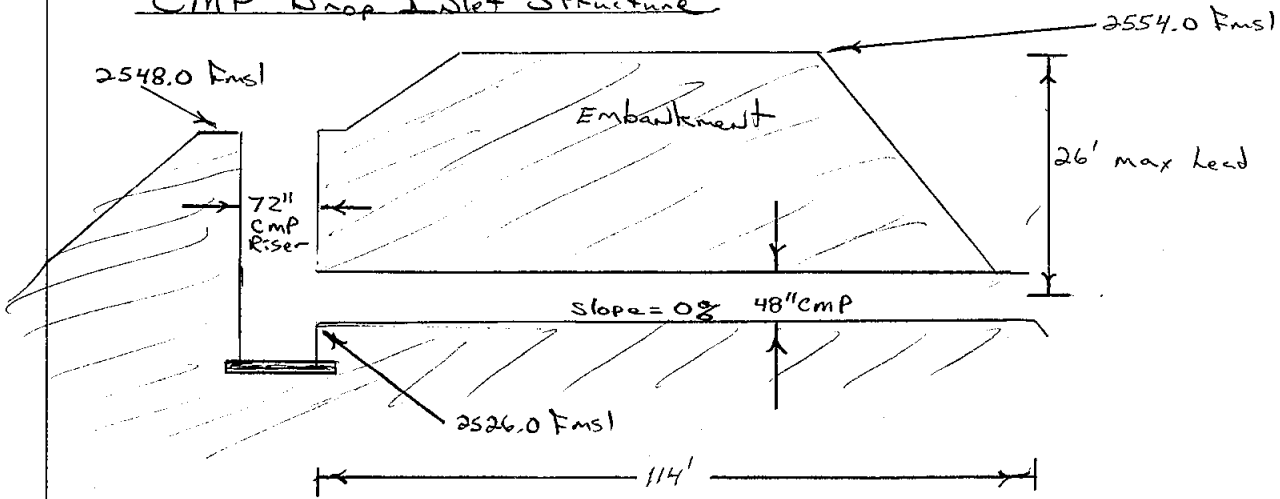
Scale 1" = 50 Feet
HEC2 Base Map
1/17/90
D. Baird

Water Permit
Appl. 1506-1

FIELD

Hydraulic Analysis continued

CMP Drop Inlet Structure



Determine max Q

Method - SCS: South Dakota Engineering Field Manual, USDA, SCS, Chapter 3, p. 3-24 → 3.25.

(Eq. 3-12)

$$Q = a \sqrt{\frac{2gH}{1 + k_m + k_p L}}$$

where Q = discharge (cfs)
 a = pipe area (ft²)
 g = acceleration of gravity (ft/sec²)
 H = elevation head difference (ft)
 k_m = coefficient of minor losses
 k_p = pipe friction coefficient
 L = pipe length (ft)

Area = a = πr² = π(2.0)² = 12.57 ft²

Manning's N = 0.002 (CMP, EIT review Manual)

g = 32.2 ft/sec²

H = 26 ft

k_m = 1 (assumed)

k_p = .0141 (Exhibit 3-4)

L = 114 ft

$$Q = (12.57) \sqrt{\frac{2(32.2)(26)}{1 + 1 + (.0141)(114)}}$$

Q = 271 cfs

V = Q/A = (271)/(12.57) = 21.6 ft/s

Notes: very high velocity, further Q study needed

Method - SCS: South Dakota Engineering Field Manual, Chapter 6, pp. 6-32 → 6-43.

Pipe Capacity For large CMP in Figure 6-25 (70" riser & 48" barrel), Head = 26', L = 114'
 extrapolate table - N = 0.025, k_e & k_b = 1.0
Q = 271

42-381 100 SHEETS 5 SQUARE
 42-382 100 SHEETS 5 SQUARE
 42-383 200 SHEETS 5 SQUARE
 NATIONAL MANUFACTURING U.S.A.

Dutton Impoundment

Fig. 6-25 (P. 6-41) Full Flow assumed, Barrel Controlled

$H_{res} = 26 \rightarrow$ use 25, Diameter = 48", use length = 110'

From chart $H = 26$, Diam = 48", $Q \approx 270$ (note $L = 70'$) ← extrapolated value

Correction Factor for pipe length ≈ 0.93 ($L = 110'$)

Corrected Flow value = $(270 \text{ cfs}) \times (0.93) = \underline{\underline{251 \text{ cfs}}}$ ← extrapolated value

Check velocity

$$Q = VA \quad v = Q/A = (251) / (\pi (24)^2) = \underline{\underline{20.0 \text{ ft/sec}}}$$

Diameter of Riser Barrel should be at least 1 1/4 times the Diameter of Barrel (6-42 (a) SD)

Diameter Riser = 72"

Diameter Barrel = 48"

ratio

$$72"/48" = 1.50 \text{ (ratio ok)}$$

Summary of Velocity Analysis

* Velocities in CMP will meet or exceed 20 ft/sec with a head of 26 ft

Conclusions

- 1) Inflow design Flood has a peak inflow value of approx. 1000 cfs - 50 year Flood
- 2) Emergency Spillway Capacity @ top of Dam = 800 cfs
- 3) Primary Spillway (CMP Drop Inlet structure) capacity @ Top of Dam = 250 cfs, with velocities approaching 20 ft/sec
- 4) Combined ~~max~~ spillway capacities of Primary and emergency spillways = 250 cfs + 800 cfs = 1050 cfs (excluding attenuation due to storage)
- 5) Spillway design meets standards as set for in Safety of Dams Rules
74:08:08.07



DESIGN REPORT

PROJECT: DUTTON DAM
SD-119-01

LOCATION: SECTION 16 TWP.14N. RGE.12.
Perkins County, South Dakota

MARSH DATA: Full Service Level (FSL) @ 2548.0
41.0 Surface Acres @ FSL
294.2 Acre-Feet Capacity @ FSL

CLASSIFICATION OF PROPOSED DAM:

Based on the classification criteria outlined in Chapter 74:02:08 "Safety of Dams," it is recommended that the proposed dam be classified as a small, Category 3 dam. No loss of life and minimal economic loss potential is expected should failure occur. The product of the maximum storage capacity times the effective height is 12,112.

HISTORY

According to the landowner Harold Dutton the original dam was constructed in 1936 by the Works Project Administration. The embankment breached in 1951 possibly due to muskrats. Between the years 1936 and 1952 the emergency spillway was used twice. The primary spillway consists of a 36" cmp which has rust through out.

PRELIMINARY RISK ASSESSMENT

Dutton Dam is located on an unnamed tributary to Brushy Creek which enters the Moreau River. A structure exists on Brushy Creek in an unpaved road approximately 7000 feet downstream of Dutton Dam. No other structures exist between Dutton Dam and the Moreau River based upon an inspection of the U.S.G.S. quad maps. Flood damage potential to the structure is reduced by restoring Dutton Dam.

It is unknown to what frequency the roadway structure was designed. If the structure can pass the 1% chance event prior to failure then in the event that Dutton Dam fails the roadway structure is at increased risk. If the roadway structure will fail prior to the 1% chance event then Dutton Dam does not pose any increased risks.

DESIGN:

The watershed consists of approximately 4.76 square miles. The primary spillway consist of a 72" riser and a 48" barrel constructed of corrugated metal pipe. The plunge pool is lined with rock riprap. The existing emergency spillway is a 80 ft. wide having a level crest of approximately 180 ft long. The maximum velocity on the level crest during the 100 year event is 4.26 fps. The top of the finished grade of the embankment is such that a minimum of 1 ft. of freeboard is available during the 100 year (1% chance) event. The existing emergency spillway will begin to carry water at elevation 2551.5. No construction is planned in the existing emergency spillway.

The Soil Conservation Service (SCS) TR-20 Hydrology program was used to determine the discharge at various reservoir stages with respect to time. The program uses accepted procedures to develop inflow and outflow hydrographs. An antecedent moisture condition (AMC II) was used in the computations resulting in a conservative estimate of runoff and peak flows. The primary spillway capacity was calculated by comparing discharges developed by the weir flow formula and formulas for calculating head loss through corrugated metal pipe. The emergency spillway capacity was calculated using Technical Release No. 39 Hydraulics of Broad-Crested Spillways developed by the SCS.

The following is a relationship between peak inflows, corresponding outflows, and reservoir elevations:

<u>EVENT</u> <u>YR</u>	<u>PEAK</u> <u>IN</u> <u>CFS</u>	<u>RUNOFF</u> <u>VOLUME</u> <u>AC-FT</u>	<u>MAX WATER</u> <u>ELEVATION</u> <u>MSL</u>	<u>PEAK</u> <u>OUT</u> <u>CFS</u>	<u>AVAILABLE</u> <u>FREEBOARD</u> <u>FT</u>	<u>FLOW</u> <u>IN E.S.</u> <u>CFS</u>
10	656	347	2550.71	228	3.54	0
25	983	469	2552.03	276	2.22	48
100	1385	646	2553.02	458	1.23	218

Dated: January 9, 1991

Submitted By:



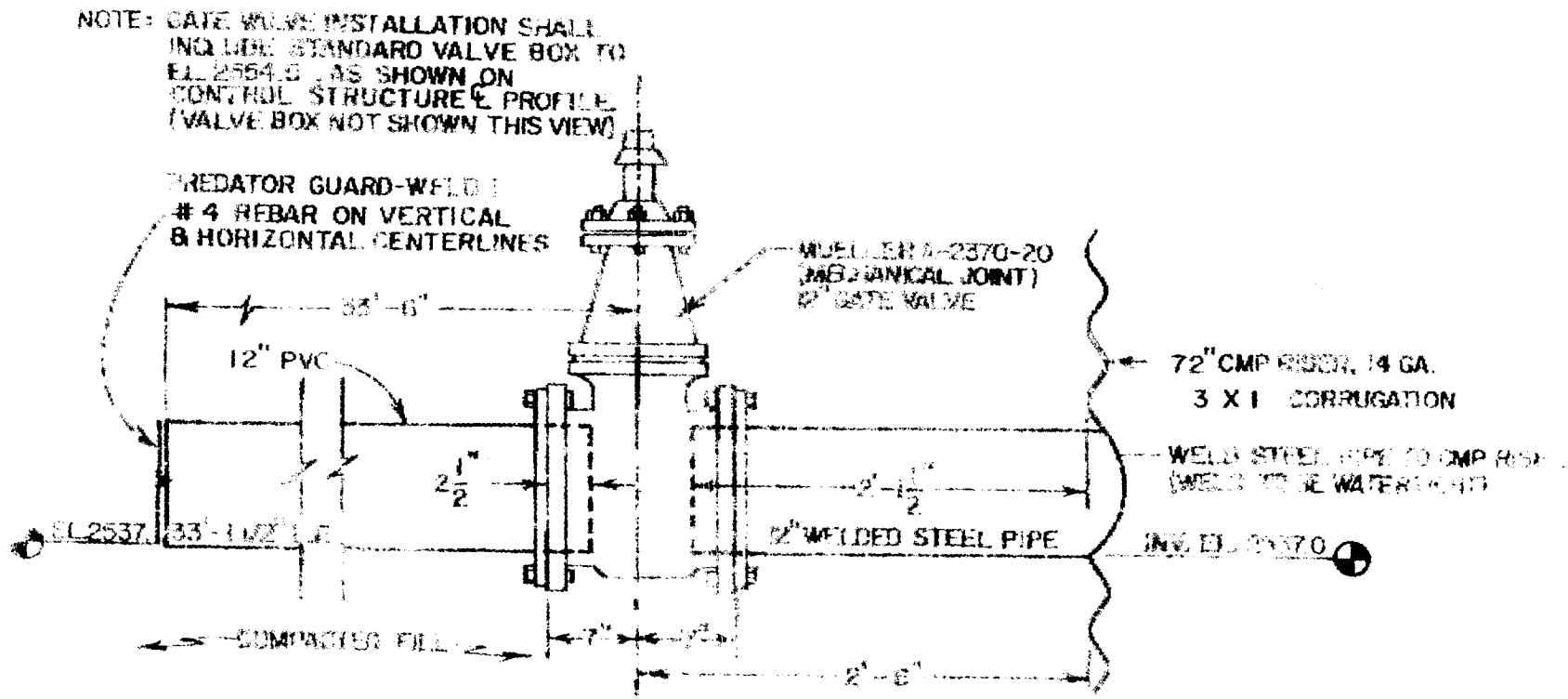
Roger Smith, P.E
PE-4325



605 773 6035;# 2

7012588364

1:1:45PM



GATE VALVE-RISER CONNECTION DETAIL

NOT TO SCALE

WILDLIFE MANAGEMENT AGREEMENT AND EASEMENT

This Agreement, dated July 24 1989, is between HAROLD DUTTON of HCR 71 Box 58 FAITH S.D 57626, hereinafter called the Wildlife Cooperator(s), and the South Dakota Department of Game, Fish and Parks, Anderson Building 445 E. Capitol Pierre, South Dakota 57501, hereinafter called GFP.

Wildlife Cooperator and GFP, for adequate and mutual consideration, hereby agree as follows:

Wildlife Cooperator hereby grants, bargains and conveys unto GFP an Easement to and certain wildlife management rights, all of which are described herein, on lands owned by them in PERKINS, County, South Dakota, described as follows:

T 14 ¹² R 12 ¹⁴ SECTIONS NW 1/4 9 & SW 1/4 16 THOSE
PARTS OF THESE SECTIONS INCLUDE THE DAM STRUCTURE, & THOSE UPLAND
AREAS WHICH ARE COOPERATIVELY AGREED UPON.
(DUTTON LAKE Wildlife MANAGEMENT AREA (see attachment).

The Wildlife Cooperator, in signing this Agreement and Easement, join as participants in a wildlife management program and grant to GFP, its agents, or assignees the authority and Easement necessary to construct, complete and maintain the wildlife habitat developments described in the attached Special Provisions (see Exhibit A) upon and over the above described property. In addition, the Wildlife Cooperator grants and conveys to GFP, its agents, or assignees an Easement to travel, transgress and go upon land described as DUTTON LAKE Wildlife Mgmt Area to effectuate the Wildlife Management Program.

The terms of this Agreement and Easement will be for 30 years beginning JANUARY 1, 1990, and ending DECEMBER 31, 2020.

This Agreement and Easement may only be modified by the written consent of both parties. It may also be terminated in writing by HAROLD DUTTON, and if so terminated, HAROLD DUTTON will reimburse the GFP for the cost of all wildlife habitat developments placed thereon. If this Agreement is terminated in writing by the GFP, then the GFP may, at its option, remove any wildlife developments placed on the land.

At the end of the term of this Agreement, the wildlife habitat development will become the property of the Wildlife Cooperator(s).

The Wildlife Cooperator(s) are responsible for noxious weed control in accordance with South Dakota Law.

The GFP does not assume jurisdiction over the premises by this Agreement. The Wildlife Cooperator(s) retain all rights to control trespass and retain all responsibility for taxes, assessments, and damage claims. The GFP, its agents, or assignees reserve the right to enter the above described land at reasonable times for wildlife habitat development and management purposes and to inspect completed work.

The GFP will have the right to alter the above described land (with approval of the Wildlife Cooperator(s)) in ways consistent with wildlife management. Specific work will be planned and completed as shown in Exhibit A.

A change in ownership shall not change the terms of this Agreement. The Agreement and terms shall be in effect on the described land for the period of the Agreement. The Wildlife Cooperator(s) will notify the GFP of planned or pending changes in ownership. The Wildlife Cooperator(s) agree not to allow any agricultural use of the tract, such as livestock grazing or haying, unless included as part of this or an amended Agreement.

At the end of the period of this Agreement, the Wildlife Cooperator(s) assume full and complete responsibility for all wildlife habitat developments made during this Agreement on the described land. There shall be no obligation to the Wildlife Cooperator(s), GFP, or any of its agents or assignees following the end of the period of this Agreement.

The Wildlife Cooperator(s) shall be responsible for and assist GF&P in securing any necessary permits. Technical advice and support will be provided by GFP and participating agencies in permit application.

The GFP is prohibited by Law from making obligations that exceed available funds and, therefore, any wildlife habitat development work described in this Agreement is contingent upon procurement of funding. GFP will notify the Wildlife Cooperator(s) in the event that no funds are available for completing the wildlife habitat work prescribed in this Agreement.

The Wildlife Cooperator(s) guarantee ownership of the above described land and warrant that there are no outstanding rights which will interfere with this Agreement.

South Dakota Department
of Game, Fish and Parks

By: Mike Schmetzer
Its PERKINS COUNTY
Wildlife Conservation Officer

Harold G. Dutton
Wildlife Cooperator

Wildlife Cooperator

Review of DU Project "Dutton Impoundment"

January 16, 1991

Section 16, T14N R12E, Perkins County

Water Permit Application No. 1506-1

SD Dept. of Game, Fish and Parks

David
Brown
DWR, Water
Rights Division

Review of Project pursuant to Safety of Dams Rules Chapter 74:02:08

74:02:08:09 Project is small Category 3 dam (74:02:08:08)

- Requires 50 year Flood design

Dan Lemmer

- 1) Topo map? yes
- 2) profile along dam axis?
- 3) Maximum x-section of Dam? yes
- 4) Area-capacity curves? yes
- 5) Detailed drawings showing plans, etc? yes
- 6) Discharge capacity each foot of Hertz Formula used? NO total Q given
- 7) Detailed plans of spillway structures, x-section...? NO, but topo submitted
- 8) Specifications including provisions...? NA, as built plans
- 9) EPP? Not needed
- 10) Preliminary risk assessment? yes, Category 3 dam

Pertinent Data (Submitted)

One foot of Freeboard available during 100 year Flood event

Dam Height = 28' (2554.25 MSL)

Freeboard above drop inlet = 6'

Surface area = 41 acres @ 2550.71

Storage = 294.2 acre feet

2526.0 fmsl = Toe of Dam

Drainage Area above dam = 4.76 mi² ← 30% of Drainage above water permit No. 58.

Top of Dam @ = 2554.0 MSL

Secondary Spillway @ 2551.5 fmsl → 80 ft wide, 2:1 slopes, 0% grade for 180'

Primary Spillway/Drop inlet @ 2548 (FSL) → 72" riser w/ 48" barrel

Note: Submitted primary Spillway discharge calculated by weir flow and head loss through CMP. Emergency Spillway capacity calculated using TR 39 Hydraulics of Broad Crested Spillways developed by SCS

42,381 3 SHEETS 5 SQUARE
43,382 100 SHEETS 5 SQUARE
43,389 200 SHEETS 5 SQUARE



Hydrologic Evaluation of: "Dutton Impoundment" / reconstruction of Beck Lake

Hydrologic evaluation

Method: Determine drainage Basin, Soils present, Land use, & slope;
 Compute hydrograph - DOT/USGS Method
 Compare with Submitted hydrologic data

Drainage Area (mi ²)	Soils Present	Land use	Main Channel Slope (ft/mi)
"A" 3.07	?	Rangeland	?
"B" 1.60	.	Rangeland	.

See Attached Drainage Basin Map

124, 133

Total = 4.67 mi²

Techniques for Estimating Flood Peaks, Volumes and Hydrographs on Small Streams in South Dakota

22-381 50 SHEETS 5 SQUARE
 42-381 100 SHEETS 5 SQUARE
 42-382 200 SHEETS 5 SQUARE
 NATIONAL
 MADE IN U.S.A.

Drainage	Total Channel Length (miles) (TCL)		FMSI Elevation	
	TCL	TCL	at 85% TCL	at 10% TCL
"A"	4.8	4.1	2,677	2,530
"B"	5.0	4.3	2,698	2,530

Drainage	Main Channel Length (miles)	Δ Elevation (Feet)	Main Channel Slope (ft/mi)
"A"	4.8 x 0.75 = 3.6	2,677 - 2,530 = 147	S = 147 ft / 3.6 mi = <u>41 ft/mi</u>
"B"	5.0 x 0.75 = 3.8	2,698 - 2,530 = 168	S = 168 ft / 3.8 mi = <u>44 ft/mi</u>

Soil Infiltration Index (SI), in inches
 = 2.50 (Figure 13)

Summary of DOT runoff Model Method

Combining both Hydrographs (Drainage "A" & "B") yields a Peak inflow event as follows:

50 year Flood \cong 1,000 cfs Design Flood

Conversation or File Documentation

NAME OF PERSON OR FILE: Dept. of Game, Fish & Parks

ADDRESS: _____ COUNTY PK

DATE: 1/16/91 TELEPHONE 773-6208

RE: Tim Olson

COMMENTS:

Tim Olson came up to the office to answer questions on the impounded area of the proposed reconstruction of Beck Lake.

Impounded area: Portions of

NW¹/₄ Section 16, T14N, R12E

N¹/₂SW¹/₄ Section 16 "

SE¹/₄ Section 8 "

SW¹/₄ Section 9 "

File in Permit or other file as necessary. Use to document conversations and what the other party was told; why action or decision was made.

NAME: Eric Thibault



DUCKS
UNLIMITED
INC.

DUCKS UNLIMITED, INC.
GREAT PLAINS REGIONAL OFFICE

6115 East Main Avenue
Bismarck, North Dakota, 58501
(701) 258-5599

January 31, 1991

Dan Limmer
SD Dept. Game, Fish & Parks
Sigurd Anderson Building
445 East Capitol
Pierre, SD 57501

RE: Dutton Dam

Dan:

With this letter I am sending the revised preliminary plans for the Dutton Dam project to you and the Water Rights Division. I have incorporated the information from the soils investigation into these revised plans.

Sincerely,

Roger Smith, P.E.
Regional Engineer

cc: Ron Duvall
Water Rights Division

Water Rights Division - DWNR
Conversation or File Documentation

File No. 1506-1

NAME OF PERSON OR FILE: G, F & P

ADDRESS: _____ COUNTY _____

DATE: 2/22/91 TELEPHONE _____

RE: WP Appl. No. 1506-1

COMMENTS:
Sent a copy of report, recommendation, and report
on WP Appl. No. 1506-1 to:

<u>Ed Blair Blair</u>	<u>Rich Blair</u>
<u>RR 3, Box 23</u>	<u>626 Weber Drive</u>
<u>Vale, SD 57788</u>	<u>Sturgis, SD</u>
	<u>347-4626</u>

Herman Kaubisch
Box 625
Sturgis, SD 57785

File in Permit or other file as necessary. Use to document conversations and what the other party was told; why action or decision was made.

NAME: Eric Krenlund



DEPARTMENT OF WATER & NATURAL RESOURCES

Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

February 22, 1991

Herman Kaubisch
Box 625
Sturgis, SD 57785

RE: 1506-1 - South Dakota Department of Game, Fish & Parks

Dear Mr. Kaubisch:

Enclosed please find the Notice of Hearing, Report, and Recommendation in regard to the above-referenced matter.

Sincerely,

Jaci R. Konop

Jaci R. Konop
Secretary
Division of Water Rights



DEPARTMENT OF WATER & NATURAL RESOURCES

Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

February 22, 1991

Rich Blair
RR 3 Box 23
Vale, SD 57788

RE: 1506-1 - South Dakota Department of Game, Fish & Parks

Dear Mr. Blair:

Enclosed please find the Notice of Hearing, Report, and Recommendation in regard to the above-referenced matter.

Sincerely,

A handwritten signature in cursive script that reads "Jaci R. Konop".

Jaci R. Konop
Secretary
Division of Water Rights


RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT APPLICATION
NO. 1506-1, South Dakota Department of Game, Fish & Parks.

Pursuant to SDCL 46-2A-2, the following is the recommendation of the Chief Engineer, Water Rights Division, Department of Water and Natural Resources concerning Water Permit Application No. 1506-1, South Dakota Department of Game, Fish & Parks, 523 E Capitol, Pierre, SD.

The Chief Engineer is recommending APPROVAL of Application No. 1506-1 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) in the public interest with the following qualifications:

1. Permit No. 1506-1 does not authorize storage of water unless sufficient water for downstream domestic use, including livestock watering is by-passed and until prior Water Rights Nos. 88-1B and 351-1 have been satisfied.
2. Approval of Permit No. 1506-1 is subject to installation of permanent low level by-pass facilities when the dam is constructed.
3. Approval of Permit No. 1506-1 authorizes storage of up to 294.2 acre-feet of water annually.

See report on application for additional information.



JOHN HATCH, Chief Engineer
February 20, 1991

Report on Water Permit Application No. 1506-1
South Dakota Department of Game, Fish and Parks
523 E. Capitol Ave.
Pierre, SD 57501

January 18, 1991

Introduction

Water Permit Application No. 1506-1 proposes to appropriate 294.2 acre feet annually from a dry draw (unnamed tributary to Brushy Creek which enters the Moreau River) by reconstructing a dam in Perkins County that failed in 1951. The original dam (Beck Dam/Imogene Lake/Dutton Dam) was constructed by the Works Progress Administration (WPA) in 1936. This permit application is requesting to store water to the elevation of 2548.0 fmsl.

The dam embankment is located in the N1/2 SW1/4 and S1/2 NW1/4 of Section 16, T14N R12E, Perkins County. The appropriated water is to be used year round to provide needed habitat for waterfowl, big game, fish, furbearers and also is to be used for stock watering.

Safety of Dams Review

The proposed dam has a normal and maximum height of 22 and 28 feet respectively. The normal and maximum storage for the dam are 294 and 644 acre feet respectively. Safety of Dams Rules Chapter 74:02:08 require that the proposed dam have a spillway capacity capable of passing/storing a 50 year 24 hour storm. The Ducks Unlimited design report (Ducks Unlimited, 1991) submitted with the application and the Division's independent review of the project, indicates that the proposed dam discharge facilities exceed minimum design requirements.

The proposed dam discharge facilities include a drop inlet corrugated metal pipe (CMP) (72 inch riser and 48 inch barrel, 114 feet long) with a maximum entrance head of 26 feet. It is believed that velocities in the CMP during maximum head conditions could reach 20 feet per second. The applicant should be aware that these high velocities within the CMP may cause erosion problems.

In summary, all Safety of Dams Rules, Chapter 74:02:08 have been met by the applicant.

Review of Existing Water Rights

Water permits/rights (surface water) in the vicinity of the proposed project are listed below (Division files, 1991).

Table 1

Water Right/ Permit No.	Owner	Priority Date	Diver- sion rate (cfs)	No. acres irri- gated	Water Source
88-1B	Herman Kaubisch	9/6/11	1.83	124.6	local watershed
225-1	Fairview Ranch	2/26/51	1.8	131.1	Moreau River
351-1	Harold Dutton	6/57	0.47	33	surface runoff
620-1	Harold Dutton	10/16/61	1.28	89.6	surface runoff
939-1	Game, Fish and Parks, Vested Right Claimed, subject to cancellation due to forfeiture from nonuse, Imogene Lake/Beck Dam, breached in 1951				
		1935	120 ac-ft annually		surface runoff
1434-1	Wayne C. Kennedy Trust	9/12/73 & 3/15/88	1.31	85	Moreau River

Discussion

Currently, two junior Water Rights (Nos. 351-1 and 620-1, 368 acre-feet annually, small dams and water spreading systems) are upstream of senior Water Right No. 88-1B (small dam and water spreading system). Three junior water rights would be upstream of Water Right No. 88-1B if this permit application is approved.

Water Right No. 88-1B is approximately one mile downstream of the proposed project and is located on the same ephemeral drainage. **Approximately 30 percent** of the drainage basin above Water Right No. 88-1B will be impounded by this project.

Historically, the vast majority of yearly runoff is from snow melt (Kaubish, 1991). Unfortunately, it is difficult to estimate the return frequency of yearly snow melt runoff volumes. Variations in initial soil moisture conditions, snow depth/water content, frozen vs unfrozen soil, and rapidity of melting are all factors that influence the amount of runoff generated. Hence, no attempt was made to estimate yearly runoff volumes from snow melt.

The Division has made some rainfall runoff estimates for the drainages in question. Estimates of the magnitude and frequency of future flood volumes were determined using the method described in the U.S. Geological Survey publication, **TECHNIQUES FOR ESTIMATING FLOOD PEAKS, VOLUMES, AND HYDROGRAPHS ON SMALL STREAMS IN SOUTH DAKOTA**, Water Resources Investigations 80-80, September, 1980.

The results of the rainfall runoff estimates are as follows:

<u>Return Frequency (years)</u>	<u>Annual Runoff Volume (acre feet)</u>
2	245
5	441
10	621
25	927
50	1,203
100	1,539

The proposed dam has a storage capacity of 294 acre feet with a surface area of 41 acres. Once filled, average annual evaporation losses from the dam would be approximately 133 acre feet (Spuhler, 1971; 39 inches) while average direct precipitation would add approximately 55 acre feet (NOAA, 1989; 16 inches). Assuming no seepage losses, approximately 78 acre feet (133 - 55) would be needed on an average annual basis to fill the proposed dam.

Under this permit application, low flows would have to be by-passed as needed for downstream domestic use including livestock watering, and prior water rights (Nos. 88-1B and 351-1). Currently, the proposed dam is not designed with a low level drawdown facility that would pass low flows downstream.

As indicated earlier, the above runoff estimates do not take into consideration snow melt runoff. A characteristic of Perkins County is that watershed runoff (snow and rainfall) does not even exist in many years.

In summary, there is a reasonable probability that water is available for the applicants proposed use. This conclusion is based upon the fact that the applicant must by-pass low flows, an average of approximately 78 acre feet will be needed annually to "fill" the proposed dam and the proposed dam would impound approximately 30 percent of the drainage area above downstream water right holders.

Moreau River Water Rights

Approximately one and one-half miles downstream of the project is the confluence of Brushy Creek and the Moreau River. A United States Geological Survey (USGS) gauging station is located (NW1/4 NW1/4 Section 10, T14N R16E) on the Moreau River approximately 65 river miles downstream of the proposed project.

A summary of the USGS gauging information (MOREAU RIVER BASIN, MOREAU RIVER NEAR FAITH, SD) is attached. The USGS gauging station documents that the average yearly discharge during the 46 years of record was 135 cfs while the average yearly discharge volume was 97,810 acre-feet. The median of yearly mean discharges was 94 cfs while the median yearly mean discharge volume was 68,100 acre-feet.

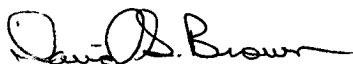
No flow conditions have occurred sometime during the year in 31 out of the 46 years of record (67 percent chance of occurrence).

Based upon the USGS gauging information, there is unappropriated water available for the applicants proposed use and the diversion can be developed without unlawful impairment of **existing Moreau River Water Rights**.

Use of water for wildlife propagation has been recognized by the Water Management Board as a beneficial use that is in the public interest.

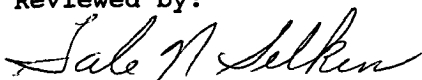
Conclusions

1. Water Permit Application No. 1506-1 proposes to appropriate 294.2 acre-feet of waters (unnamed tributary to brushy Creek which enters the Moreau River) for the purpose of providing needed habitat for waterfowl, big game, fish, furbearers and also for livestock watering.
2. There is a reasonable probability that there is unappropriated water available for the applicant's proposed use.
3. The proposed diversion can be developed without unlawful impairment of existing rights.
4. Use of water for wildlife propagation has been recognized by the Water Management Board as a beneficial use that is in the public interest.
5. All Safety of Dams Rules (74:02:08) requirements have been met.
6. A qualification to this permit should be that: Low flows as needed for downstream domestic use, including livestock watering, and prior water rights must be by-passed.



David S. Brown
Natural Resources Engineer III
DWNR, Water Rights Division

Reviewed by:



Gale N. Selken, P.E.
Natural Resources Engineer IV
DWNR, Water Rights Division

Bibliography

Division files, 1991, Water Right and Permit Files, DWNR, Joe Foss Bldg., Pierre, SD.

Ducks Unlimited, 1991, DESIGN REPORT, DUTTON DAM, SD-19-01,
submitted by Roger Smith, P. E., PE-4325 with Water Permit
Application No. 5106-1.

Kaubisch, Herman, 1991, January 22, Personal Communication,
telephone conversation, Box 625, Sturgis, SD 57785, 347-6258.

NOAA, 1989, Climatological Data Annual Summary, South Dakota, Volume
94, Number 13, p. 3.

Spuhler, W., et al, 1971, Climate of South Dakota, Bulletin 582,
November, 1971, Agricultural Experiment Station, South Dakota
State University, Brookings, SD 57007.

U.S. Geological Survey. 1989. Water Resources Data, South Dakota
Water Year 1989. U.S. Geological Survey Water-Data Report
SD-89-1.

MOREAU RIVER BASIN

06359500 MOREAU RIVER NEAR FAITH, SD

LOCATION.--Lat 45°11'52", long 102°09'22", in NW¼NW¼ sec.10, T.14 N., R.16 E., Perkins County, Hydrologic Unit 10130306, on left bank 10 ft downstream from bridge on State Highway 73, 3.1 mi downstream from Rabbit Creek, and 13.5 mi northwest of Faith.

DRAINAGE AREA.--2,660 mi², approximately.

PERIOD OF RECORD.--March 1943 to current year.

REVISED RECORDS.--WSP 1176: 1944. WSP 1279: 1946(M).

GAGE.--Water-stage recorder. Datum of gage is 2,238.68 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 5, 1949, nonrecording gage 0.3 mi upstream and Oct. 5, 1949, to July 16, 1959, nonrecording gage and crest-stage gage at present site; both at datum 1.0 ft higher. July 17, 1959, to Sept. 1, 1971, recording gage at site 500 ft downstream at present datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--46 years, 135 ft³/s, 97,810 acre-ft/yr; median of yearly mean discharges, 94 ft³/s, 68,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,000 ft³/s, Apr. 9, 1944, gage height, 20.9 ft, from floodmarks, site and datum then in use, from rating curve extended above 12,000 ft³/s on basis of slope-area measurement of peak flow; no flow at times in 1944, 1946, 1948-51, 1955-66, 1968-71, 1974-75, 1978-81, 1985, 1988-89.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 30	1100	3,500	8.78	May 3	1530	*4,130	*9.46

No flow Aug. 23, 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.0	6.1	e8.4	e5.5	e1.0	e1.6	883	2380	21	6.2	7.3	56
2	3.8	6.9	e8.8	e5.0	e.60	e1.4	463	3250	21	5.9	5.8	35
3	3.9	7.2	e8.2	e4.5	e.40	e1.4	239	3910	19	5.3	5.5	24
4	3.7	7.5	e7.8	e4.8	e.50	e1.4	157	2750	18	3.7	4.4	18
5	3.7	7.3	e8.2	e5.0	e.60	e1.2	117	1300	17	3.4	3.4	15
6	3.8	6.7	e7.8	e4.8	e.80	e1.0	99	732	15	2.9	2.8	12
7	5.1	7.3	e7.0	e4.3	e1.0	e.76	83	474	13	2.3	1.9	9.1
8	5.2	7.1	e6.5	e4.0	e.80	e1.1	72	323	12	1.7	1.9	7.6
9	5.0	7.3	e6.0	e3.7	e1.0	e1.8	60	222	10	1.5	1.7	6.7
10	5.0	7.5	e6.4	e3.5	e1.2	e2.5	52	158	9.5	1.3	1.7	6.3
11	4.5	7.6	e6.8	e3.5	e1.6	e3.0	46	122	8.5	1.81	1.6	6.1
12	4.4	7.4	e7.0	e3.6	e1.6	e2.9	41	99	8.2	85	1.3	5.6
13	4.4	7.5	e7.0	e3.7	e1.4	e2.8	37	87	8.3	46	1.3	4.9
14	4.2	7.6	e6.5	e3.7	e1.2	e2.7	35	77	8.6	107	1.2	4.3
15	4.3	e7.8	e5.8	e3.6	e1.0	e2.6	32	67	8.0	175	1.1	3.3
16	4.3	e7.0	e6.0	e3.7	e.80	e2.6	31	58	7.7	113	.62	2.6
17	4.4	e7.0	e6.0	e3.7	e.80	e2.6	28	53	11	238	.42	1.7
18	4.5	e7.2	e6.4	e3.8	e.80	e2.8	27	47	13	437	.32	1.4
19	4.1	e7.2	e6.2	e3.8	e1.0	e2.8	25	41	18	249	.32	1.4
20	4.6	e7.4	e6.0	e3.7	e1.2	e3.0	23	38	13	140	.22	40
21	3.8	e7.8	e6.0	e3.8	e1.6	e5.0	21	39	13	91	.02	67
22	4.3	e7.8	e6.0	e3.7	e1.4	e9.0	19	37	14	65	.00	34
23	4.0	e8.0	e5.8	e3.4	e1.8	e15	18	35	12	47	.00	46
24	4.4	e7.8	e5.6	e3.0	e2.0	e28	17	32	12	36	.11	62
25	4.9	e7.6	e5.4	e2.7	e2.0	e45	17	28	14	28	355	38
26	4.9	e7.6	e5.6	e2.5	e2.0	e80	30	26	13	22	310	25
27	6.2	e7.0	e5.8	e2.7	e1.8	e140	257	22	11	18	212	18
28	5.4	e7.2	e5.2	e2.5	e1.8	e250	423	22	10	15	387	14
29	6.0	e7.6	e5.5	e2.2	---	e480	1960	21	9.8	13	98	14
30	5.9	e8.0	e5.8	e1.9	---	890	3340	21	7.9	12	65	11
31	6.2	---	e6.0	e1.4	---	926	---	22	---	9.4	77	---
TOTAL	142.9	221.0	201.5	111.7	33.70	2909.96	8652	16493	376.5	2161.6	1548.93	590.0
MEAN	4.61	7.37	6.50	3.60	1.20	93.9	288	532	12.5	69.7	50.0	19.7
MAX	6.2	8.0	8.8	5.5	2.0	926	3340	3910	21	437	387	67
MIN	3.7	6.1	5.2	1.4	.40	.76	17	21	7.7	1.3	.00	1.4
AC-FT	283	438	400	222	67	5770	17160	32710	747	4290	3070	1170

CAL YR 1988 TOTAL 16121.45 MEAN 44.0 MAX 3490 MIN .00 AC-FT 31980
WTR YR 1989 TOTAL 33442.79 MEAN 91.6 MAX 3910 MIN .00 AC-FT 66330

e Estimated



DEPARTMENT OF WATER & NATURAL RESOURCES

Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

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

February 22, 1991

Timothy J. Olson
Department of Game, Fish & Parks
523 E Capitol
Pierre, SD 57501

Dear Mr. Olson:

Water Permit Application No.1506-1 for wildlife habitat and stock watering use has been examined and found to comply with the South Dakota Water Laws and applicable rules. A notice of hearing has been sent to the Publisher of the Lemmon Leader printed at Lemmon, SD. 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 of Hearing and to arrange for payment. Early contact with the paper can eliminate delays. The publisher has been instructed to publish your notice once each week for two consecutive weeks with the last publication to occur twenty days before the board meeting. The newspaper has 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.



DEPARTMENT OF WATER & NATURAL RESOURCES

Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

February 22, 1991

Lemmon Leader
Box 180
Lemmon, SD 57636

ATTENTION: Legal Department

Enclosed is a Notice of Hearing on Application No. 1506-1 to be published twice. Please publish the first notice on February 28, 1991, with the second publication 7 days later.

The APPLICANT MUST VERIFY TO YOU THAT THE NOTICE IS TO BE PUBLISHED, before you make the first publication. Please BILL the APPLICANT for the cost of publication. The APPLICANT is South Dakota Department of Game, Fish & Parks, 523 E. Capitol, Pierre, SD 57501.

A copy of BOTH publications must be SENT to the WATER RIGHTS DIVISION. IMMEDIATELY return the FIRST publication with the FIRST Transmittal form on the bottom of this page. The first copy is needed to check the publication for errors so any corrections can be made in the second publication. Publication errors can invalidate the public notice and cause the applicant costly delays.

Please be sure the SECOND publication is returned IMMEDIATELY with the enclosed Proof of Publication form. DO NOT WAIT until the end of the month or the billing cycle. No action may be taken on the permit application until proof of publication has been received.

Sincerely,

Eric Gronlund
Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures

CUT HERE

FIRST TRANSMITTAL NOTICE

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

No. _____

Date _____

We are in receipt of your letter of _____ enclosing Notice of Hearing to Appropriate Water by Application No. _____ which was first published in our issue of _____. ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.

Name _____

Newspaper _____

South Dakota



GREAT FACES. GREAT PLACES.

**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE SOUTH DAKOTA 57501-3181

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

June 20, 1991

Department of Game, Fish and Parks
523 E. Capitol Ave.
Pierre, SD 57501

Dear Sirs:

Water Permit Application No. 1506-1 for wildlife habitat and stock watering use has been examined and found to comply with the South Dakota Water Laws and applicable rules. A notice of hearing has been sent to the Publisher of the Lemmon Leader printed at Lemmon, SD.

Be sure to contact the above newspaper to authorize publication of your Notice of Hearing and to arrange for payment. Early contact with the paper can eliminate delays. The publisher has been instructed to publish your notice once each week for two consecutive weeks with the last publication to occur twenty days before the board meeting. The newspaper has 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

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 June 27, 1991 with the second publication 7 days later. The applicant is responsible for payment.

NOTICE OF HEARING on Application No. 1506-1 to Appropriate Water

Notice is given that the South Dakota Department of Game, Fish & Parks, 523 E. Capitol, Pierre, SD 57501 has filed an application for a water permit to impound 294.2 acre-feet of water in a reservoir behind a proposed dam (commonly known as Back Lake) on an unnamed stream in the NW1/4 Section 16, T14N, R12E. The area to be impounded is primarily located in the NW1/4 Section 16 and portions of the lake may also be located in the N1/2 SW1/4 Section 16, SW1/4 Section 8 and SW1/4 Section 9; all in T14N, R12E. Water is to be stored annually to an approximate elevation of 2548.0 feet mean sea level and is to be used to provide wildlife habitat and stock watering.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 1506-1 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. Unless a petition is filed opposing the application or the applicant files a petition contesting the chief engineer's recommendation, the Water Management Board will NOT CONDUCT a HEARING to consider this application and the chief engineer will issue the permit as recommended. Petitions filed in support of the application will NOT require the Board to hear the application.

Any person interested in opposing or supporting this application must file a written petition with BOTH the applicant and Chief Engineer. The applicant must also file a petition if opposed to the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Division, 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 July 15, 1991. 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.

For purposes of publishing 1) the notice of hearing on Application No. 1506-1 and 2) the chief engineer's recommendation, a Board meeting is scheduled for July 24, 1991, at 10:00 am in Kneip Room, Governors Inn, 700 W. Sioux Ave., Pierre SD. If this application is opposed or the recommendation is contested, the July 24, 1991 hearing date may be rescheduled for another Board meeting. If the hearing is rescheduled, notice of the time and place will be given by First Class Mail to the applicant and persons filing petitions. Anyone not filing a petition, but interested in attending the hearing, may contact the Division of Water Rights to confirm a hearing date and location. The July 24, 1991 hearing date will be automatically delayed for at least 20 days upon written request to the Chief Engineer from the applicant or any interested person opposing the application. The request for an automatic delay must be filed by July 15, 1991.

If a hearing is held, the Chief Engineer's recommendation is not final or binding upon the Board. The Board is authorized to 1) approve, 2) approve with qualifications, 3) defer, or 4) deny this application based on the facts presented at the public hearing. Any hearing will be an adversary proceeding. Any person filing a petition and/or the applicant have the right to be represented by a lawyer and may present evidence or cross-examine witnesses according to SDCL 1-26. These and other due process rights will be forfeited if not exercised. Decisions of the Board may be appealed to the Circuit Court and State Supreme Court as provided by law. Contact the Water Rights Division to request copies of information pertaining to this application or to assure access to the hearing by the handicapped.

This application is made pursuant to SDCL 46-1-1 thru 46-1-9, 46-1-12 thru 46-1-16; 46-2-3.1, 46-2-9, 46-2-11, 46-2-13, 46-2-17; 46-2A-1 thru 46-2A-10, 46-2A-12, 46-2A-14, 46-2A-15; 46-5-1 thru 46-5-11, 46-5-13 thru 46-5-15, 46-5-24, 46-5-25, 46-5-30.2, 46-5-30.4, 46-5-31; and Board Rules ARSD 74:02:01:01 thru 74:02:01:15.

Affidavit of Publication

STATE OF SOUTH DAKOTA
COUNTY OF PERKINS

ss:



I, Ann Williams
being the first duly sworn under oath say: The Lemmon Leader is a legal weekly newspaper of general circulation as required by South Dakota Code of Nineteen Hundred Thirty-Nine, and any acts amendatory thereto, published by the Leader Publishing Co., Inc. in Lemmon, in said county and state, and has been such legal newspaper during the time hereinafter mentioned; that during all of said time as an employee or officer of said newspaper I have had personal knowledge of the facts stated in this affidavit; that the advertisement headed:

Notice of Hearing

a printed copy of which is hereto attached, was printed and published in said newspaper for two successive weeks upon the following dates, to-wit:

June 27, July 4, 1991

that the full amount of the fees charged for publishing the same to-wit: the sum of 50.60 inures solely to the benefit of the publishers of said newspaper; that no agreement or understanding for any division of this sum has been made with any other person; and that no part of said sum has been agreed to be paid to any person whomsoever.

Margaret Ann Wellman

Subscribed and sworn to before me this 25th day of July, 19 91

Alice A. Gustaf

Notary Public, South Dakota

(Seal)

My Commission Expires
February 7, 1997

NOTICE OF HEARING on Application No. 1506-1 to Appropriate Water

Notice is given that the South Dakota Department of Game, Fish and Parks, 523 E. Capitol, Pierre, SD 57501 has filed an application for a water permit to impound 294.2 acre-feet of water by reconstruction of a breached dam (commonly known as Beck Lake) on an unnamed tributary to Brushy Creek. The dam site is located in the SE1/4 NW1/4, NE1/4 SW1/4 Section 16, T14N, R12E. The area to be impounded is primarily located in the NW1/4 Section 16 and portion of the lake may also be located in the N1/2 SW1/4 Section 16, SE1/4 Section 8 and SW1/4 Section 9, all in T14N, R12E. Water is to be stored annually to an approximate elevation of 2548.0 feet mean sea level and is to be used to provide wildlife habitat and stock watering.

Pursuant to SDCL 45-2A-2, the Chief Engineer recommends APPROVAL of Application No. 1506-1 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. Unless a petition is filed opposing the application or the applicant files a petition contesting the chief engineer's recommendation, the Water Management Board will NOT CONDUCT a HEARING to consider this application and the chief engineer will issue the permit as recommended. Petitions filed in support of the application will NOT require the Board to hear the application.

Any person interested in opposing or supporting this application must file a written petition with BOTH the applicant and Chief Engineer. The applicant must also file a petition if opposed to the Chief

Engineer's recommendation. The Chief Engineer's address is "Water Rights Division, 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 July 15, 1991. 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.

For purposes of publishing 1) the notice of hearing on Application No. 1506-1 and 2) the chief engineer's recommendation, a Board meeting is scheduled for July 24, 1991, at 10:00 a.m. in Kneip Room, Governors Inn, 700 W. Sioux Ave., Pierre, SD. If this application is opposed or the recommendation is contested, the July 24, 1991 hearing date may be rescheduled for another Board meeting. If the hearing is rescheduled, notice of the time and place will be given by First Class Mail to the applicant and persons filing petitions. Anyone not filing a petition, but interested in attending the hearing, may contact the Division of Water Rights to confirm a hearing date and location. The July 24, 1991 hearing date will be automatically delayed for at least 20 days upon written request to the Chief Engineer from the applicant or any interested person opposing the application. The request for an automatic delay must be filed by July 15, 1991.

If a hearing is held, the Chief Engineer's recommendation is not final or binding upon the Board. The Board is authorized to 1) approve, 2) approve with qualifications, 3) defer, or 4) deny this application based on the facts presented at the public hearing. Any hearing will be an adversary proceeding. Any person filing a petition and/or the applicant have the right to be represented by a lawyer and may present evidence or cross-examine witnesses according to SDCL 1-26. These and other due process rights will be forfeited if not exercised. Decisions of the Board may be appealed to the Circuit Court and State Supreme Court as provided by law. Contact the Water Rights Division to request copies of information pertaining to this application or to assure access to the hearing by the handicapped.

This application is made pursuant to SDCL 46-1-1 thru 46-1-9, 46-1-12 thru 46-1-16, 46-2-3.1, 46-2-9, 46-2-11, 46-2-13, 46-2-17, 46-2A-1 thru 46-2A-10, 46-2A-12, 46-2A-14, 46-2A-15, 46-5-1 thru 46-5-11, 46-5-13 thru 46-5-15, 46-5-24, 46-5-25, 46-5-30.2, 46-5-30.4, 46-5-31, and Board Rules ARSD 74:02:01:01 thru 74:02:01:15.

(Pub. June 27, July 4, 1991)

PARTIES OF RECORD

WATER PERMIT APPLICATION NO. 1506-1, Department of Game, Fish & Parks

Applicant

Opposition

Tim Olson
Dept. of Game, Fish & Parks
523 E. Capitol Ave.
Pierre, SD 57501

Blair Brothers
Richard Blair, ptrn.
1001 Lazelle St.
Sturgis, SD 57785

South Dakota



GREAT FACES. GREAT PLACES.

DEPARTMENT OF WATER & NATURAL RESOURCES

Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

March 14, 1991

Rich Blair
626 Weber Drive
Sturgis, SD 57785

Dear Mr. Blair:

Enclosed is a copy of the plans for the dam proposed by Water Permit Application No. 1506-1 that you requested. If there is any additional information that I may provide, please let me know.

Sincerely,

Eric Gronlund

Eric Gronlund
Water Rights Division
605 773-3352

enclosure



DUCKS
UNLIMITED
INC.



DUCKS UNLIMITED, INC.
GREAT PLAINS REGIONAL OFFICE

6115 East Main Avenue
Bismarck, North Dakota, 58501
(701) 258-5599

March 22, 1991

Ron Duvall
SD State Water Commission
Water Rights Division
523 E. Capitol
Pierre, SD 57501

RE: **Ward Dam** (SD-091-01) \ **Dutton Dam** (SD-119-01)

Ron:

Endeavoring to satisfy the intent of the condition pertaining to the structure's ability to "by-pass" flows I propose the following:

Ward Dam - Install a 6" gated conduit at elevation 2956.0. This elevation was chosen with future sediment storage considered.

Dutton Dam - Make no modifications to the structure. The SD GF&P is willing to agree to siphon or pump in the unlikely event that downstream recharge is necessary.

I am submitting the revised preliminary plans for the **Ward Dam** Project. This revision addresses the addition of a drawdown structure as required by the conditions to the Water Right Permit.

Please respond to the proposal for each project in regards to the effectiveness of the proposed drawdown plan in meeting the intent of the condition.

Please contact me if you have questions.

Sincerely,

Roger C. Smith, P.E.
Regional Engineer

cc. Mike Erk, U.S. Forest Service
Dan Limmer, SD GF&P

South Dakota

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**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE SOUTH DAKOTA 57501-3181

June 20, 1991

Roger Smith, P.E.
Regional Engineer
Ducks Unlimited, Inc.
6115 East Main Avenue
Bismarck, North Dakota 58501

Dear Mr. Smith:

We have reviewed the plans and specifications for Dutton Impoundment Project in Perkins County, South Dakota. The review included your amendment addressing the 12 inch gated conduit with an invert elevation at 2537 which will serve as the structure's low level outlet. The plans and specifications as submitted 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 the Mr. Harold Dutton as owner of Dutton Dam from the responsibility for operating and maintaining the dam in good repair to assure the safety of the dam.

The installation of the outlet at elevation 2537 does not release the Department of Game, Fish and Parks from the responsibility for releasing inflows for downstream domestic use purposes and prior Water Rights if the reservoir is below this elevation.

If you have any questions, please let us know.

Sincerely,

Gale N. Selken

Gale N. Selken, P.E.
Natural Resources Engineer IV
for John Hatch, Chief Engineer
605 773-3352

cc: Dan Limmer, SD Dept. of Game, Fish and Parks
Tim Olson, SD Dept. of Game, Fish and Parks

South Dakota

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**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE SOUTH DAKOTA 57501-3181

June 20, 1991

COPY

Ed Blair
RR 3, Box 23
Vale, SD 57788

RE: Water Permit Application - South Dakota Department of Game, Fish
& Parks

Dear Mr. Blair:

Enclosed please find the Notice of Hearing regarding Water Permit
Application No. 1506-1. The report and recommendation for this
application had been sent to you last February.

Sincerely,

Eric Gronlund
Eric Gronlund
Water Rights Division
605 773-3352

enclosure

South Dakota

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**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE SOUTH DAKOTA 57501-3181

June 20, 1991

COPY

Herman Kaubisch
Box 625
Sturgis, SD 57785

RE: Water Permit Application - South Dakota Department of Game, Fish
& Parks

Dear Mr. Kaubisch:

Enclosed please find the Notice of Hearing regarding Water Permit
Application No. 1506-1. The report and recommendation for this
application had been sent to you last February.

Sincerely,

Eric Gronlund
Eric Gronlund
Water Rights Division
605 773-3352

enclosure

South Dakota

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**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE SOUTH DAKOTA 57501-3181

June 20, 1991

COPY

Rich Blair
626 Weber Drive
Sturgis, SD 57785

RE: Water Permit Application - South Dakota Department of Game, Fish
& Parks

Dear Mr. Blair:

Enclosed please find the Notice of Hearing regarding Water Permit
Application No. 1506-1. The report and recommendation for this
application had been sent to you last February.

Sincerely,

Eric Gronlund
Eric Gronlund
Water Rights Division
605 773-3352

enclosure

South Dakota



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**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE SOUTH DAKOTA 57501-3181

July 10, 1991

NOTICE

TO: Timothy J. Olson
Department of Game, Fish & Parks
523 E. Capitol Ave.
Pierre, SD 57501
and Parties of Record (see attached list)

FROM: *for* John Hatch, Chief Engineer
Water Rights Division
605 773-3352

SUBJECT: Automatic Delay of Hearing on Water Permit Application No.
1506-1

A petition opposing Water Permit Application No. 1506-1 has been filed by the Blair Brothers. The petition also requests postponement of the hearing. Therefore, the hearing on Application No. 1506-1 is automatically delayed pursuant to SDCL 46-2A-4 and 46-2A-5 and will not be held on July 24, 1991. A copy of this petition is enclosed.

The Water Management Board will now consider Application No. 1506-1 on October 2, 1991. Future notice will be provided as to the time and place of this hearing.

cc: John Guhin, Deputy Attorney General
Diane Best, Assistant Attorney General

enclosure

July 10, 1991



Chief Engineer
Water Rights Division
Foss Building 523 E. Capitol
Pierre, SD 57501

Dear Sirs:

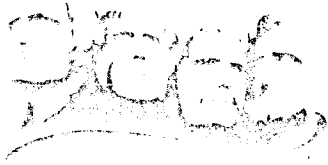
I am writing this petition opposing approval of application No. 1506-1 which would reconstruct Beck Lake in Perkins County. I recently purchased (May 1990) the property formerly owned by Herman Kaubisch which included the transfer to me of water right No. 881B, which is the senior water right. A major consideration of mine when buying the land was the ability to flood irrigate 125 acres of hayland. This greatly increases the value of the property, as hay is hard to find in that part of Perkins Co. I believe impounding 30 percent of the drainage basin will adversely affect my ability to irrigate. In the two spring seasons I have owned the property (1990-1991) there has been insufficient water to irrigate, but a small portion of the acreage. I disagree with the chief engineers conclusion that unappropriated water is available. In opposing this application No. 1506-1 I also request to the chief engineer that the July 24, 1991 hearing be delayed.

Thank you,

Richard Blair
Blair Bros.

Richard Blair ptrn.
1001 Lazelle St.
Sturgis, SD 57785

South Dakota



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**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE SOUTH DAKOTA 57501-3181

August 27, 1991

NOTICE

TO: Timothy J. Olson
Department of Game, Fish & Parks
523 E. Capitol Ave.
Pierre, SD 57501
and Parties of Record (see attached list)

FROM: John Hatch, Chief Engineer 
Water Rights Division
605 773-3352

SUBJECT: Continuance of Hearing on Water Permit Application No.
1506-1

The Water Management Board will not consider Application No. 1506-1 at their October 1 & 2, 1991 meeting. The October 1 & 2, 1991 Board meeting is to be held in Sioux Falls and due to the travel distance for all parties, this application will remain in continued status until the December 4 & 5, 1991 Board meeting in Pierre SD.

Notice of the rescheduled date, time and location of the hearing on this application will be given to all parties a month prior to the December Board meeting.

cc: Diane Best, Assistant Attorney General



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE SOUTH DAKOTA 57501-3181

October 22, 1991

NOTICE

TO: Tim Olson
Department of Game, Fish & Parks
523 E. Capitol Ave.
Pierre, SD 57501
and Parties of Record (see attached list)

FROM: John Hatch, Chief Engineer
Water Rights Division
605 773-3352

SUBJECT: Rescheduling of Hearing on Water Permit Application No.
1506-1, Dutton Impoundment Project in Perkins County

The Water Management Board will consider Water Permit Application No. 1506-1 on December 4, 1991 at 11:15 am in the Kneip Room, Governor's Inn, 700 West Sioux Ave., Pierre SD. The agenda time is an estimate and may be delayed due to prior agenda items. This application was continued from the October 1, 1991 Board meeting.

Applicable provisions of the notice of hearing published June 27, 1991 and July 4, 1991 in the Lemmon Leader will still apply at this hearing.

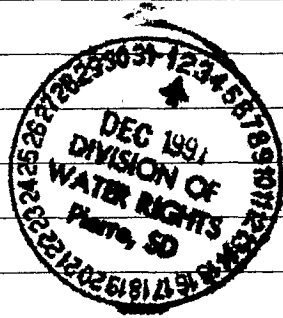
If you have any questions regarding the location of the Board meeting or the water permit application, please contact Eric Gronlund at 773-3352.

cc: Diane Best, Assistant Attorney General
Roger Smith, Ducks Unlimited, 6115 East Main Ave., Bismarck, ND
Harold Dutton, HCR 71, Box 58, Faith, SD 57626

11-29-91

Dear Sirs,

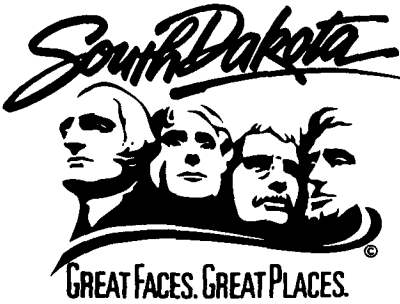
I would like to withdraw
our opposition to water permit
application No. 1506-1. Many of
the concerns that I had in regards
to the large dam on the Dutton
ranch have been addressed.



Thank You

Richard Blair

Blair Bros.



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE SOUTH DAKOTA 57501-3181

FEB 20 1992

Timothy J Olson
SD Dept of Game, Fish and Parks
523 E Capitol
Pierre, SD 57501

Dear Mr. Olson:

Enclosed is Water Permit No. 1506-1 authorizing construction of your water diversion system and beneficial use of the water, not exceeding the limits as specified in the Water Permit.

Also enclosed is Form 10, Notice of Completion of Works and Application of Water to Beneficial Use, which you are to complete and submit to the Chief Engineer when you have completed the system and/or have put the water to beneficial use. An inspection can then be scheduled so that the Water License may be issued, thus completing your acquisition of a Water Right.

Very truly yours,

A handwritten signature in black ink, appearing to read "John Hatch", is written over a faint, larger version of the signature.

JOHN HATCH, Chief Engineer
Water Rights Division
605 773-3352

enclosures

PLEASE NOTE: Certain changes can be made in your permit within the five year construction period, usually without affecting the priority date provided an application to amend your permit is made within the five year period - i.e. changes in location or number of diversion points (wells) or location of land to be irrigated. Well locations for wells into the same aquifer can be moved up to 660 feet without application.

Applications to amend a permit after the five year construction period will be assigned a new priority date. Applications to change water sources, to add lands or increase original diversion rates, if approved will usually receive the date of the new application as a priority date regardless of the five year construction period.



**NOTICE OF COMPLETION OF WORKS AND
APPLICATION OF WATER TO BENEFICIAL USE**

Date February 8, 1993

TO: Water Rights Division, DWRN
Joe Foss Building
Pierre SD 57501-3181

FROM: South Dakota Department
of Game, Fish and Parks 523 E Capitol Pierre SD 57501
name address city

I have completed the construction of the water diversion system and I have put the water to beneficial use to the maximum extent it is going to be used. I have not exceeded the amounts specified in Water Permit No. 1506-1 . Beck Lake (Dutton Dam)

Water Permit No. 1506-1 states that the diversion system is to be constructed by December 4, 1996 , and that the water it put to beneficial use by December 4, 2000 .

The diversion system was completed on April 28, 1992 .
Applying the water to beneficial use was completed on See note below

You may schedule an inspection so that the Water License may be issued.

Timothy J. Olson 2/9/93
signature GF&P Water Permits Coordinator

NOTE: Due to lack of adequate runoff, the dam has not yet filled. Wildlife production and stockwatering beneficial uses will accrue as the dam fills.

Permit No. 1506-1
Moreau River - Water District

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

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

I have this day made a thorough examination of the water use system constructed by South Dakota Department of Game Fish and Parks of Pierre, SD holder of Permit No. 1506-1, bearing the priority of January 15, 1991 authorizing the storage of 294.2 acre-feet of the waters of surface water for wildlife habitat and stock watering purposes, in Perkins County.

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

A. Works used to divert the water:

28 foot dam capable of impounding 294 ac-ft

The system is in the following condition good. The point of diversion is located in the SE1/4 NW1/4 and NE1/4 SW1/4 of Section 16 T14N-R12E. The works are capable of storing 294.2 acre-feet of water which is to be used for wildlife habitat and stock watering. The license should be issued for 294.2 acre-feet of storage.

Applicable permit qualifications have been complied with: Yes No

Exceptions to compliance are: none Date: 6/25/1993



Mark D. Rath
Natural Resources Engineer
DENR, Water Rights Division

REPORT ON INSPECTION OF PERMIT NO. 1506-1

DATE: 6/25/1993

DIVERSION POINT LEGAL LOCATION: SE1/4 NW1/4 and NE1/4 SW1/4 of Section 16 T14N-R12E

DAM INFORMATION:

- 1) Height to crest 28 feet
- 2) Height to primary spillway 24 feet
- 3) Height to secondary spillway 27 ft
- 4) Crest width 12 feet
- 5) Crest length 1250 feet
- 6) Spillway length 300 feet
- 7) Spillway width 80 feet
- 8) Approx. storage 294 ac-ft
- 11) Outlet tubes:
 - a) diameter 48 inches
 - b) type cmp
 - c) valved Y
 - d) valve type stop log
 - e) location on structure
south of center
- 12) Category of Dam III
- 13) Inspection Sheet Completed N

PERMIT QUALIFICATIONS AND REGULATIONS:

- 1) Special qualifications to permit being abided by Y
- 2) All structures, wells and lands on map Y



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE SOUTH DAKOTA 57501-3181

SEP 20 1993

1506-1

Timothy J. Olson
SD Dept of Game, Fish and Parks
523 E. Capitol
Pierre, SD 57501

Dear Mr. Olson:

Enclosed is Water License No. 1506-1. Water License No. 1506-1 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.

Very truly yours,

A handwritten signature in cursive script, appearing to read "John Hatch".

JOHN HATCH, Chief Engineer
Water Rights Division
(605) 773-3352

gm
enclosures

STATE OF SOUTH DAKOTA

WATER LICENSE NO. 1506-1

(1) The South Dakota Department of Game, Fish & Parks, of 523 E Capitol, Pierre, SD 57501 made Application No. 1506-1, January 15, 1991 for a water permit to impound 294.2 acre feet of water annually by reconstruction of a breached dam (commonly known as Beck Lake) on an unnamed tributary to Brushy Creek, Perkins County, South Dakota for wildlife habitat and domestic (stockwatering) purposes. Permit No. 1506-1, with a priority date of January 15, 1991 was approved December 4, 1991 and issued to the Department for diversion of water with construction of the described water supply system to be completed on or before December 4, 1996 and for the application to beneficial use of said water on or before December 4, 2000. A "Notice of Completion of Works and Application of Water To Beneficial Use" was received on February 9, 1993. The "Notice" stated the diversion system was completed on April 28, 1992.

(2) It is certified that the applicant has complied with the provisions of South Dakota State Law relating to completion of the construction of the dam and is entitled to store enough water annually to fill the dam to an elevation of 2548.0 feet mean sea level. The location of the dam is in the SE¼NW¼ and NE¼SW¼ Section 16, T14N, R12E (the capacity of the dam is 294.2 acre feet).

(3) The applicant has complied with the provisions of South Dakota State Law relating to the application of water to beneficial use.

(4) Pursuant to South Dakota Water Law 46-5-30.1 the Department of Game, Fish & Parks of 523 E Capitol, Pierre, SD 57501 the holder(s) and/or owner(s) of Water Permit No. 1506-1 is issued a license to appropriate water, the right to store enough water annually in Beck Lake to an elevation of 2548.0 feet mean sea level from a tributary of Brushy Creek with a priority date of January 15, 1991 from the location specified in (2) of this license. The impounded water will be for wildlife habitat and stockwatering purposes. This license is subject to any limitations or qualifications listed in Water Permit No. 1506-1 and subject to South Dakota State Law.

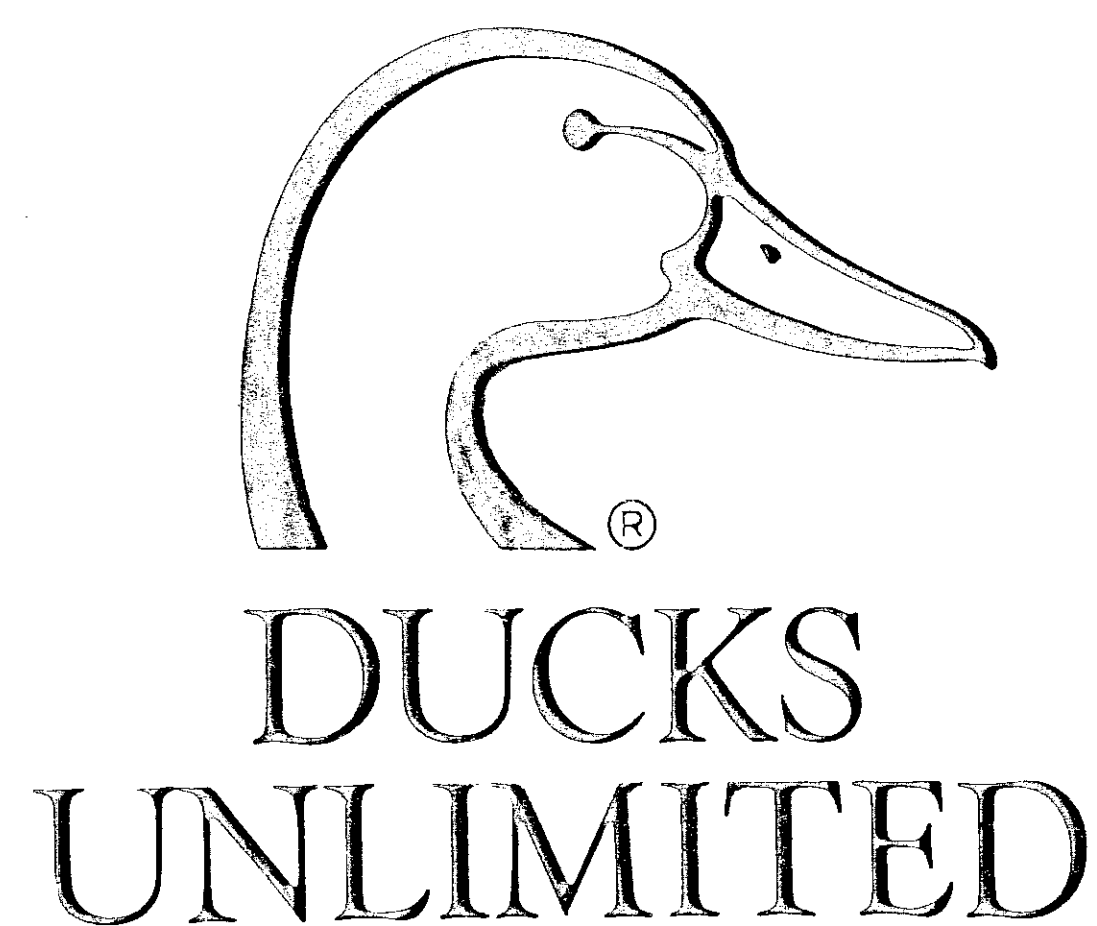


SEP 20 1993

JOHN HATCH, Chief Engineer
Water Rights Division
Department of Environment and Natural Resources



1506-1



DUCKS UNLIMITED

PROJECT

DUTTON IMPOUNDMENT

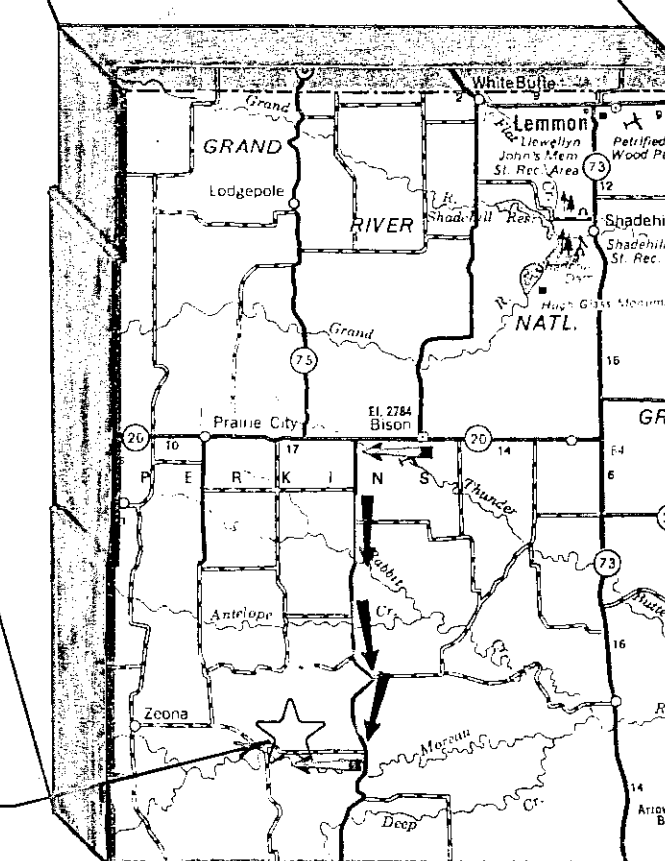
SECTION 16, TOWNSHIP 14 NORTH, RANGE 12 EAST,
PERKINS COUNTY, SOUTH DAKOTA

IN COOPERATION WITH

SOUTH DAKOTA DEPT. OF GAME, FISH & PARKS



SOUTH DAKOTA



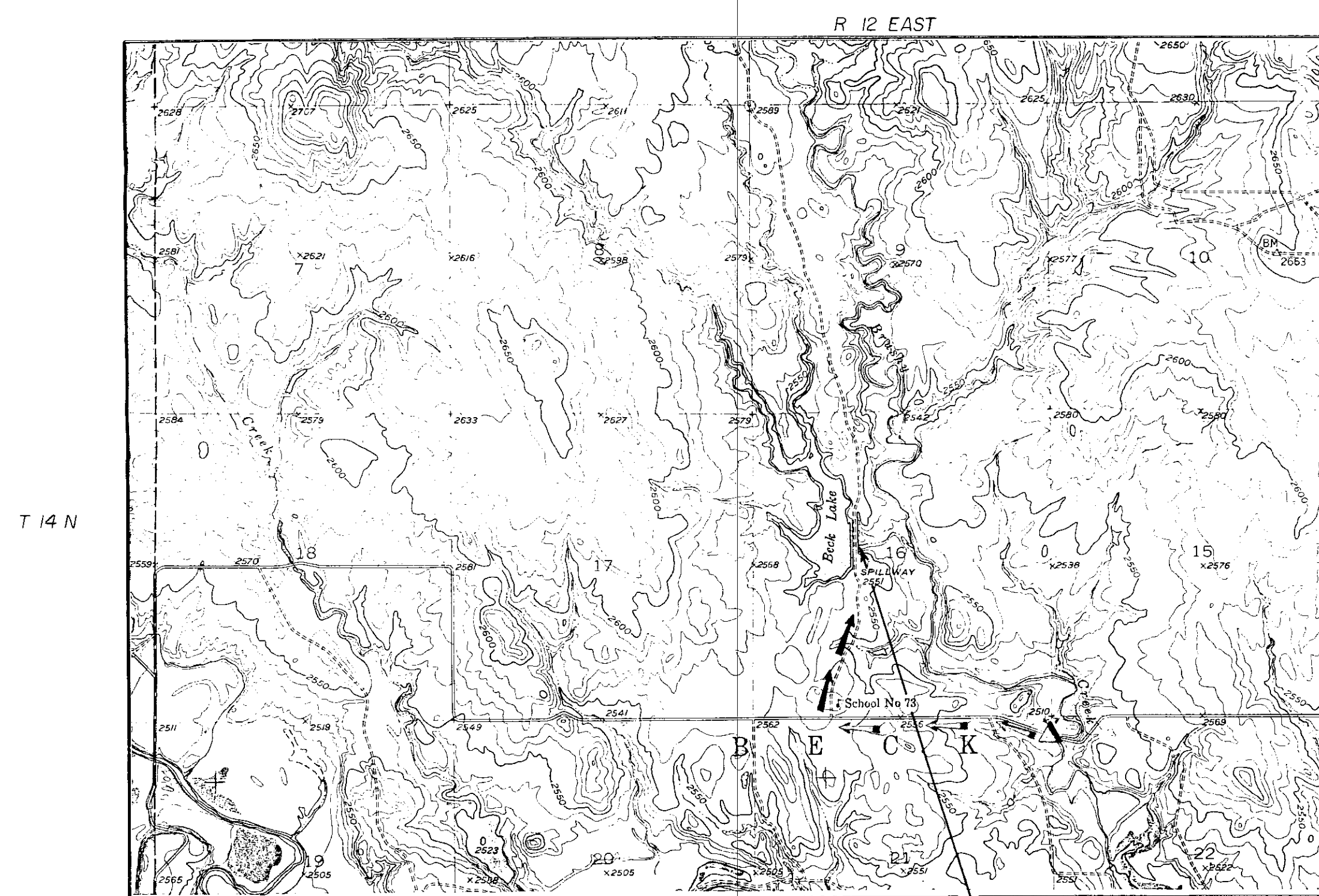
PERKINS COUNTY

SPECIFICATIONS

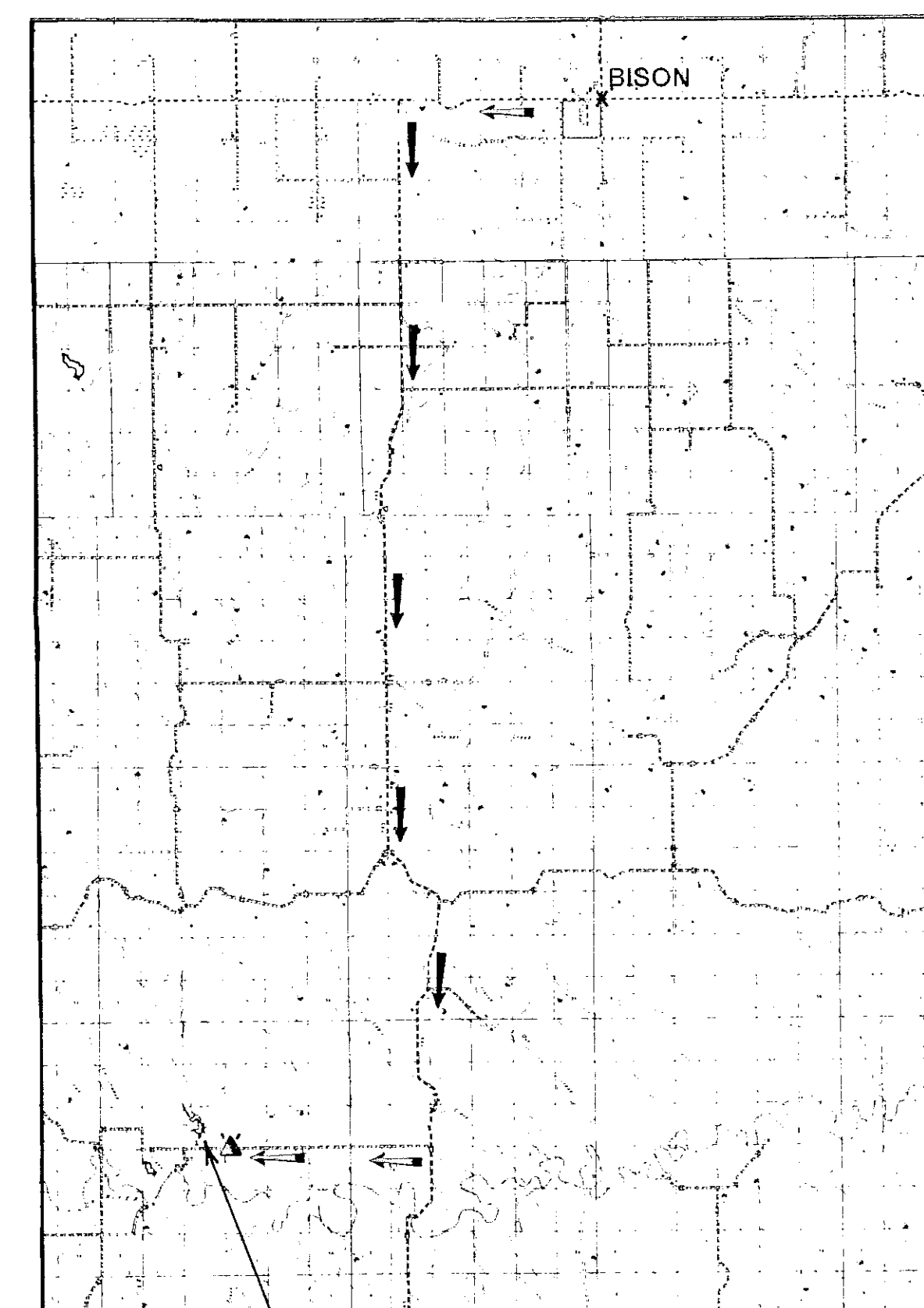
GENERAL CONDITIONS	101
MOBILIZATION	201
SITE PREPARATION	202
EXCAVATION	203
EMBANKMENT CONSTRUCTION	204
WATER	205
WATER CONTROL	
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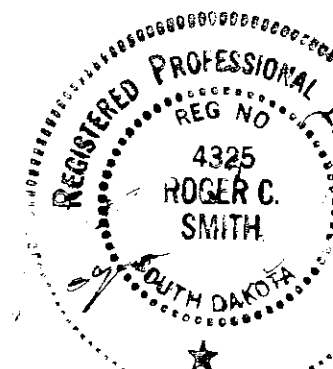
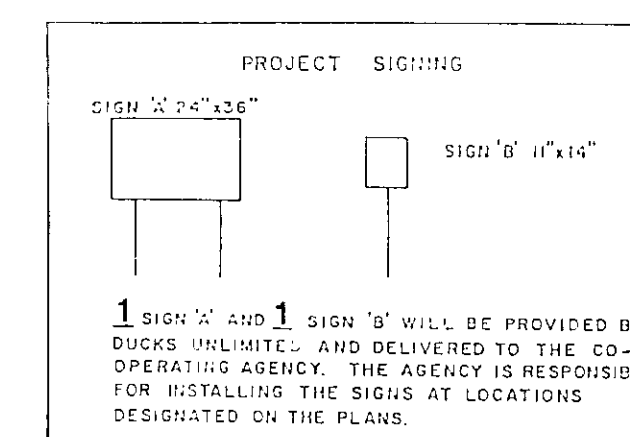


VICINITY MAP
SCALE: 1" = 2000'



PROJECT AREA
FROM 'X' IN BISON GO 5 MI. W., 25 MI. S. AND 5 MI. W. TO ▲

PROJECT LOCATION



	PROJECT NO. DU-1-SD-119-01	DESIGNED BY: R.C.S.
	DUTTON IMPOUNDMENT	DRAWN BY: RB
GREAT PLAINS REGIONAL OFFICE	VICINITY MAP	SURVEYED BY:
DATE: 1-8-91	SHEET NO: 1 OF 5	APPROVED BY: [Signature] P.E.



1506-1



DUCKS UNLIMITED

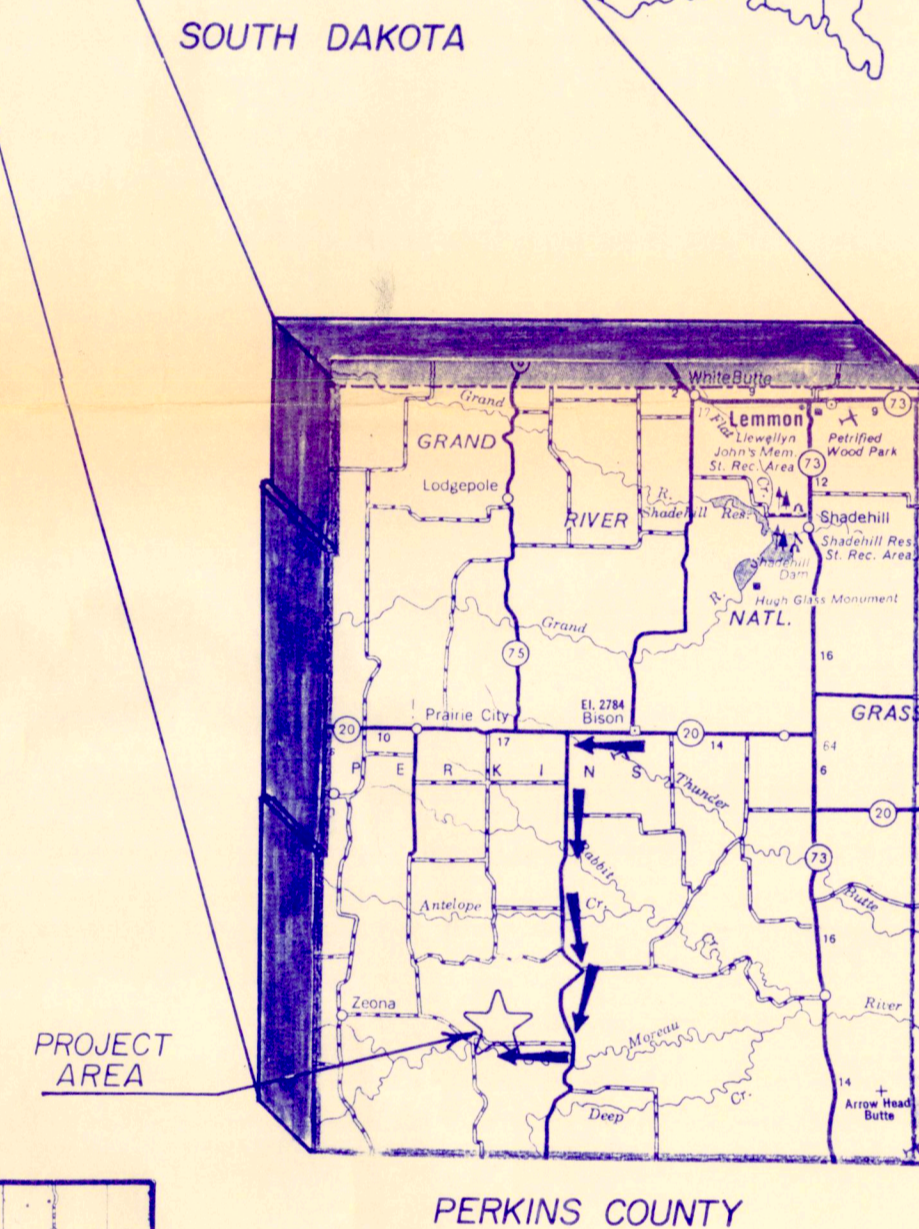
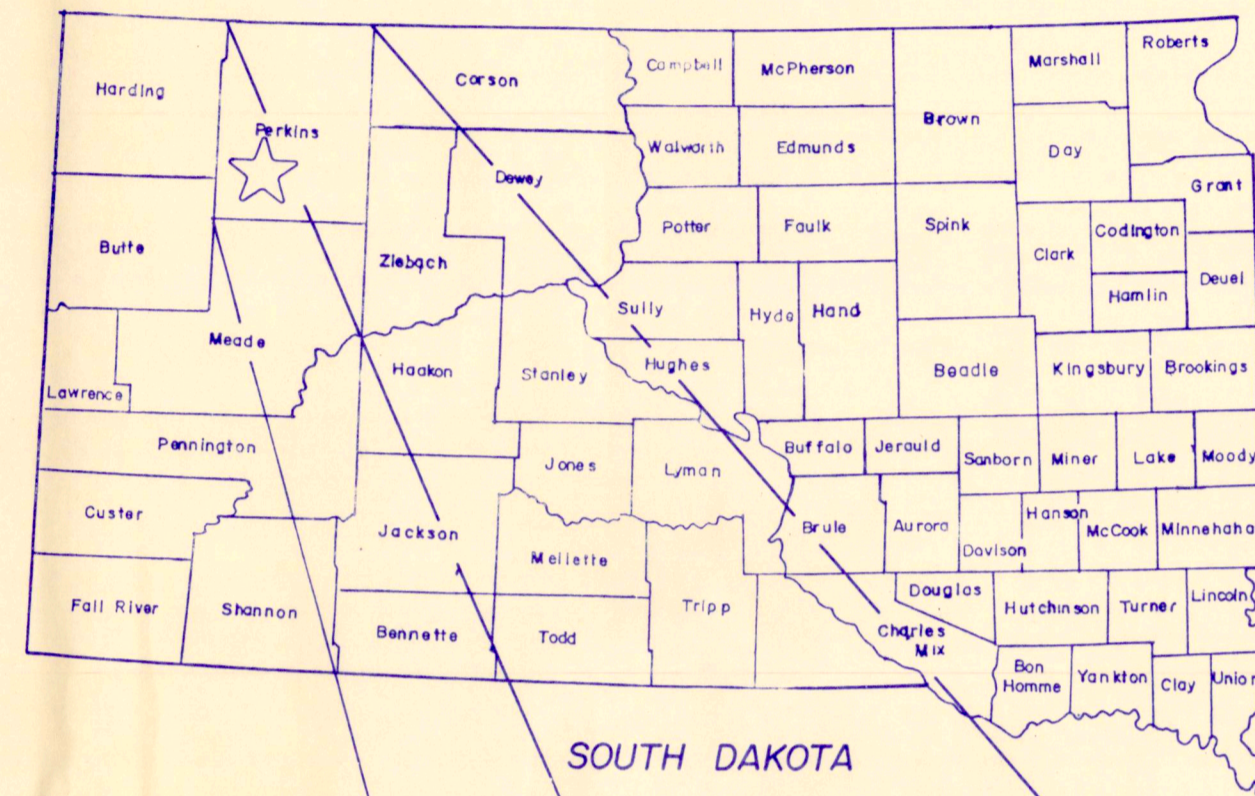
PROJECT

DUTTON IMPOUNDMENT

SECTION 16, TOWNSHIP 14 NORTH, RANGE 12 EAST,
PERKINS COUNTY, SOUTH DAKOTA

IN COOPERATION WITH

SOUTH DAKOTA DEPT. OF GAME, FISH & PARKS

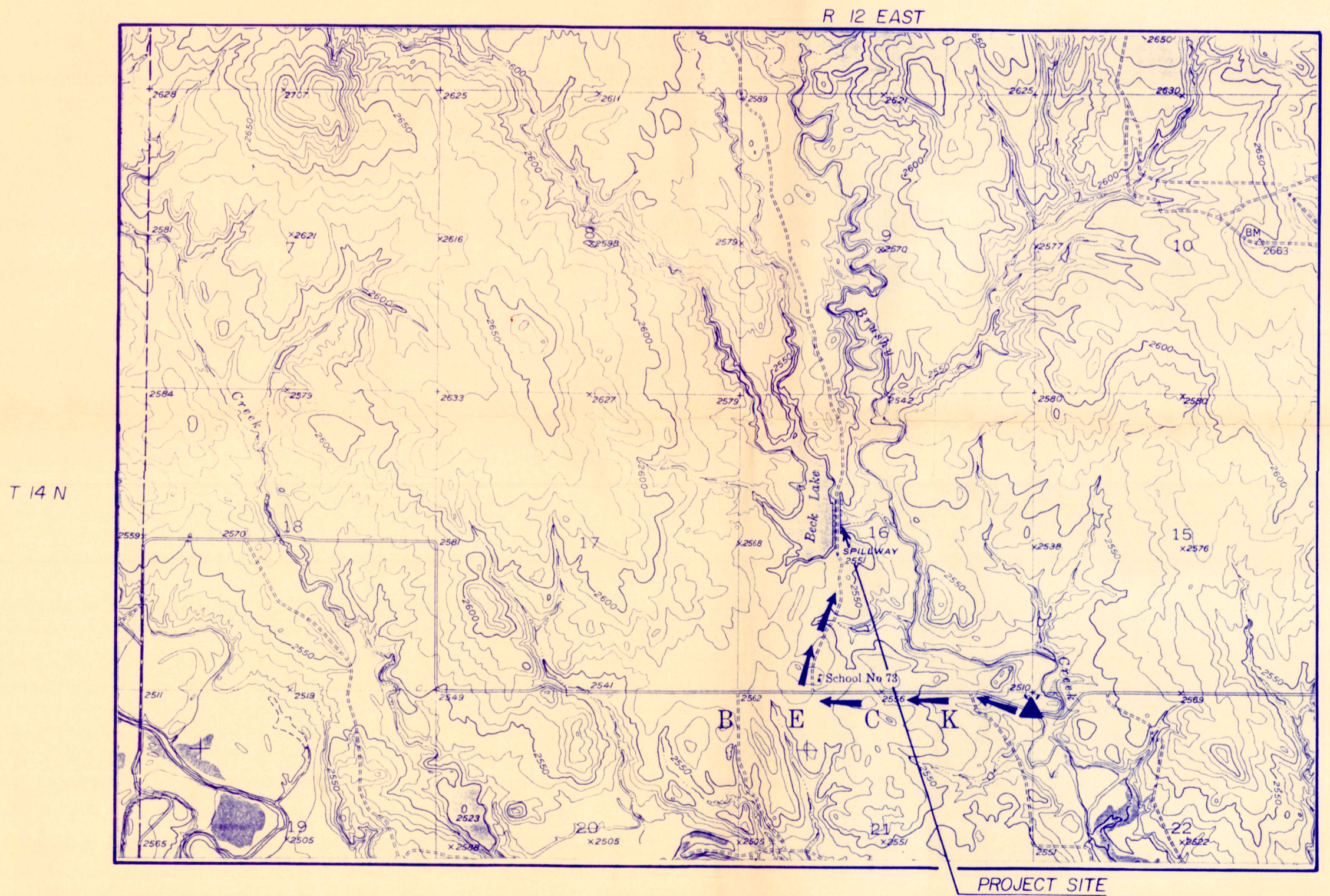


SPECIFICATIONS

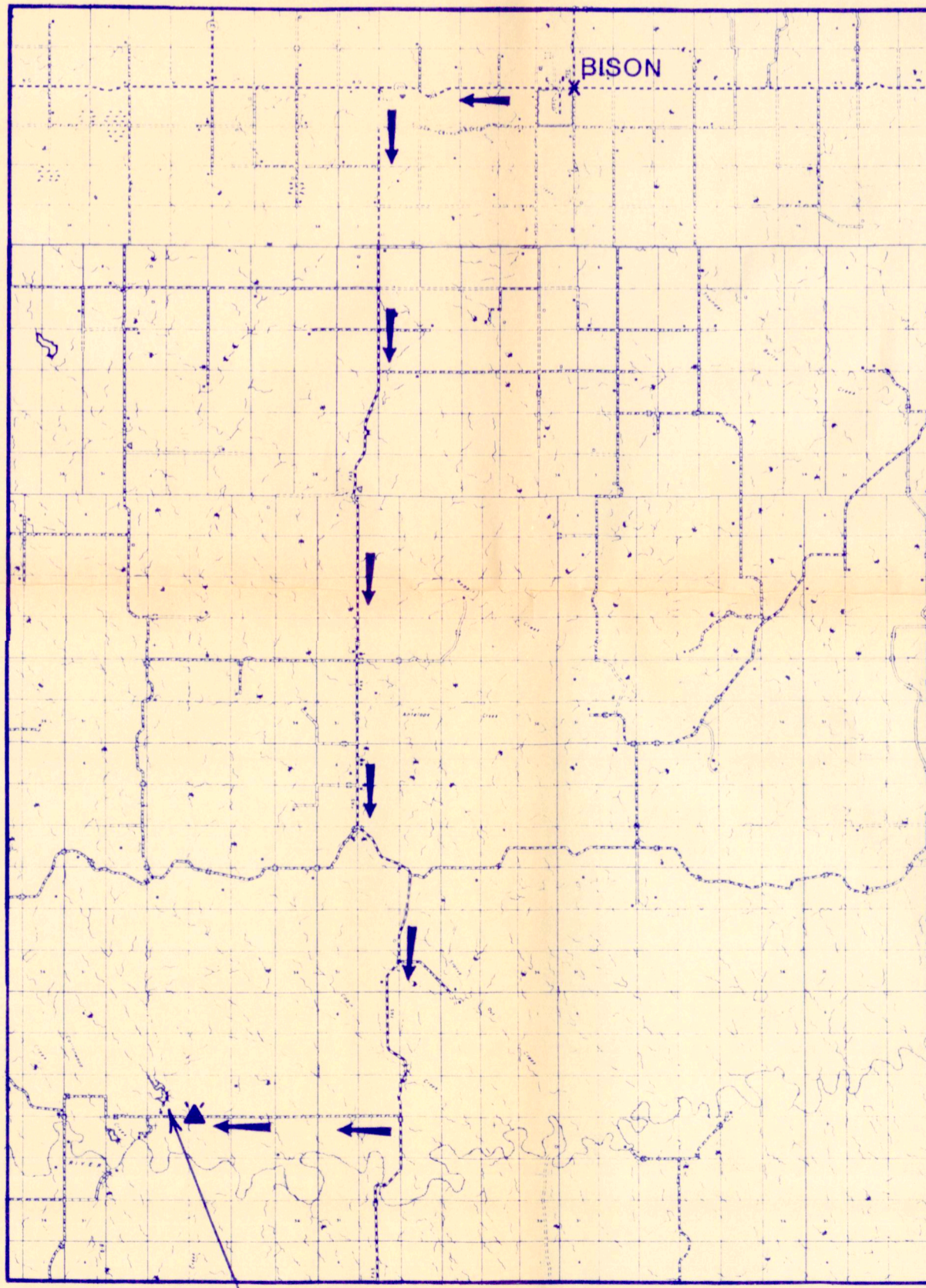
GENERAL CONDITIONS	101
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SITE PREPARATION	202
EXCAVATION	203
EMBANKMENT CONSTRUCTION	204
WATER	205
WATER CONTROL	
STRUCTURE INSTALLATION	206
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& CULVERT APPURTENANCES	206A
CULVERT INSTALLATION	207
CAST-IN-PLACE	
REINFORCED CONCRETE	208
RIPRAP PLACEMENT	209

PLAN INDEX

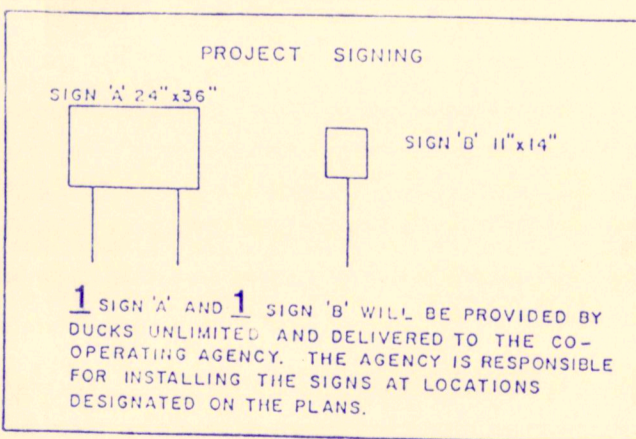
VICINITY MAP	1
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PLAN & PROFILE	4
RISER PLAN & PROFILE,	
DETAILS, & SOIL BORINGS	5



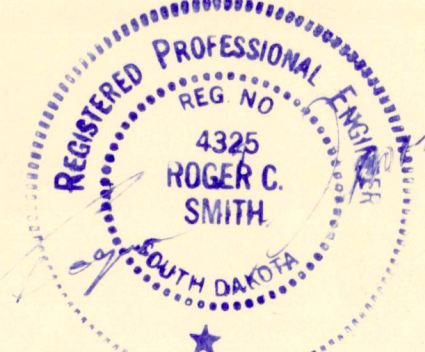
VICINITY MAP
SCALE: 1" = 2000'



PROJECT LOCATION
FROM 'X' IN BISON GO 5 MI. W., 25 MI. S. AND 5 MI. W. TO ▲

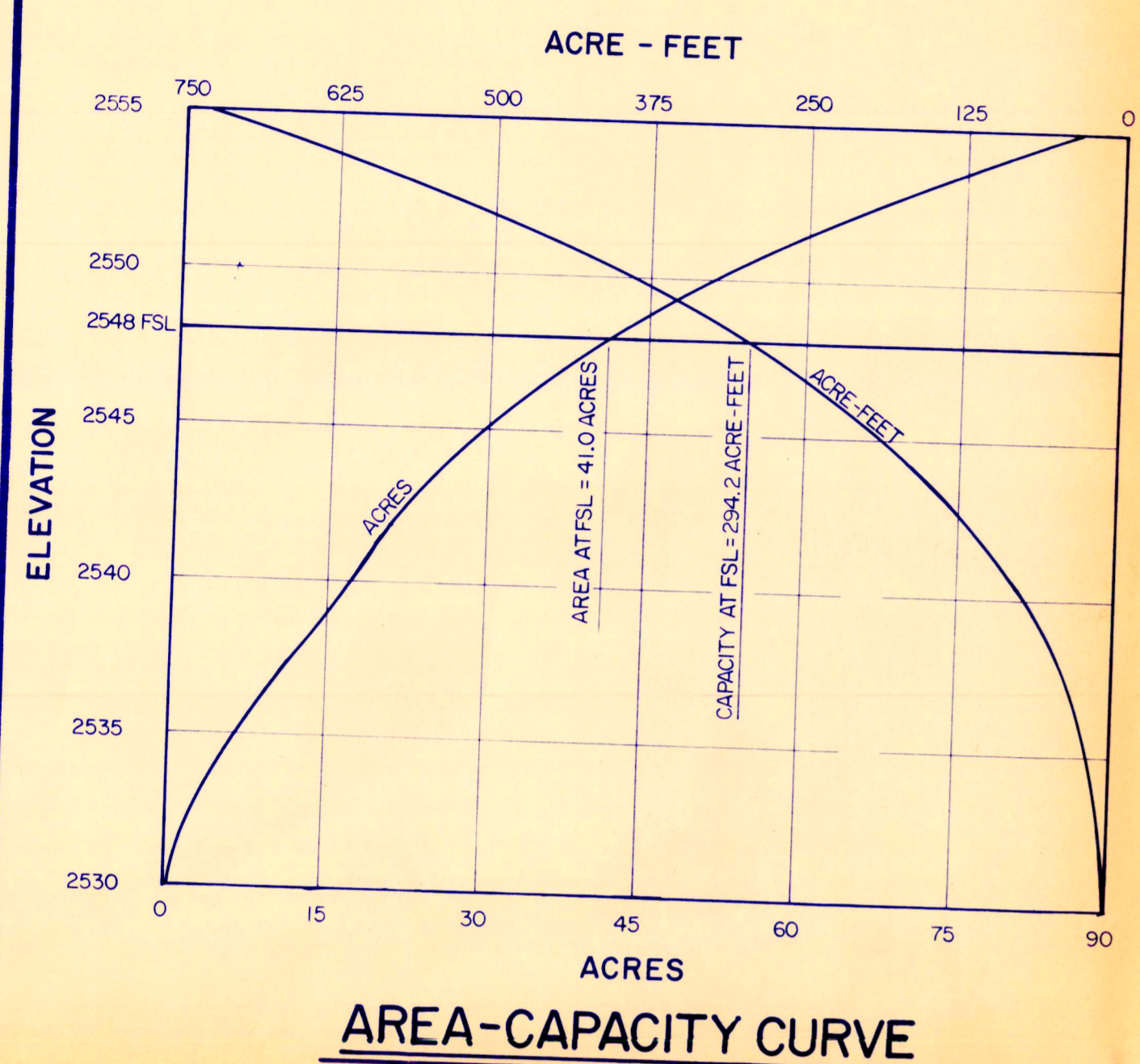


1 SIGN 'A' AND 1 SIGN 'B' WILL BE PROVIDED BY DUCKS UNLIMITED AND DELIVERED TO THE COOPERATIVE AGENCY. THE AGENCY IS RESPONSIBLE FOR INSTALLING THE SIGNS AT LOCATIONS DESIGNATED ON THE PLANS.

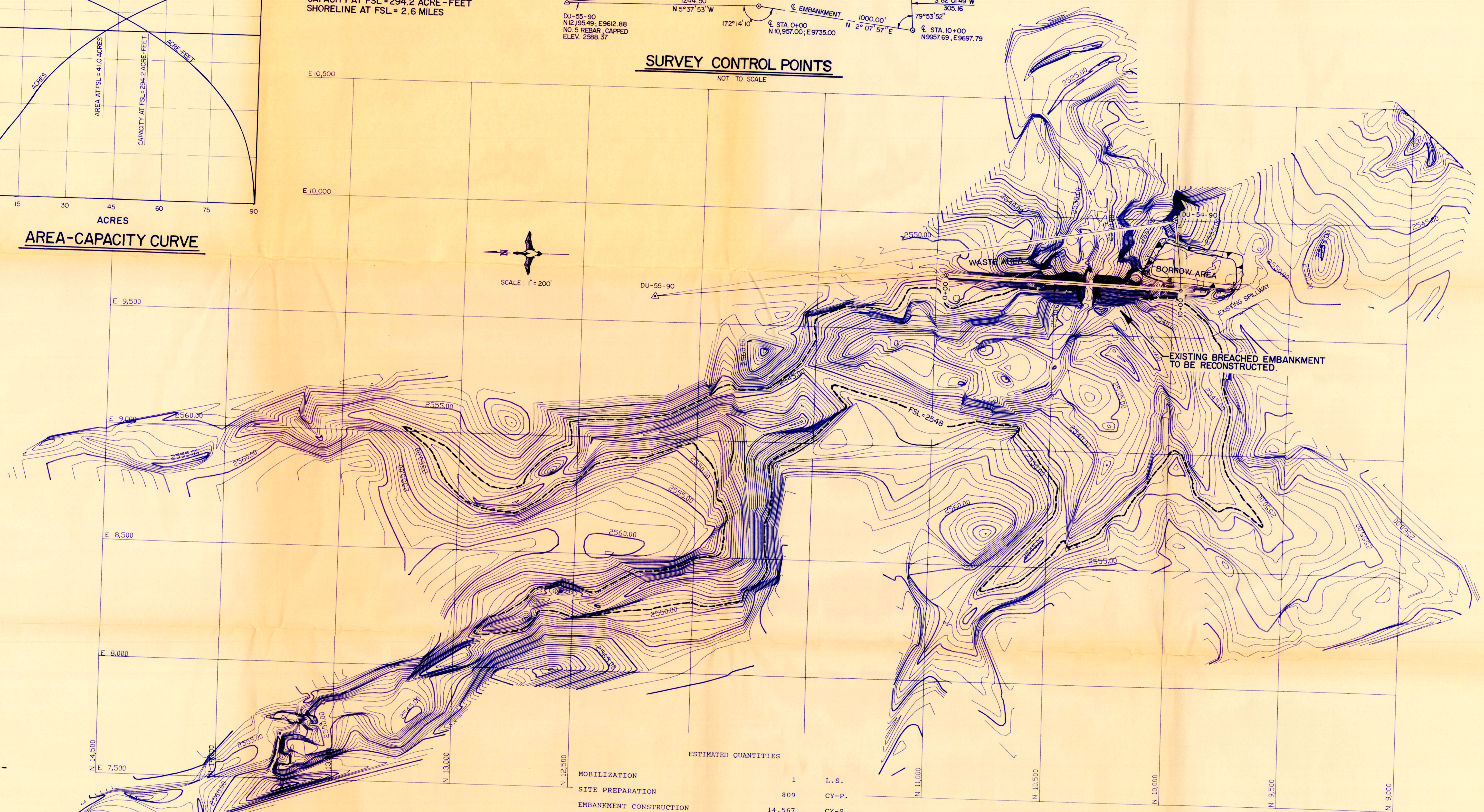
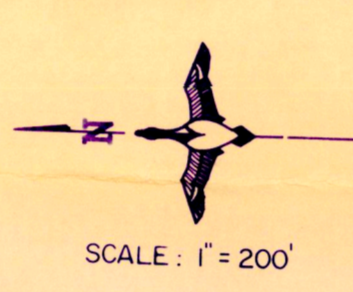
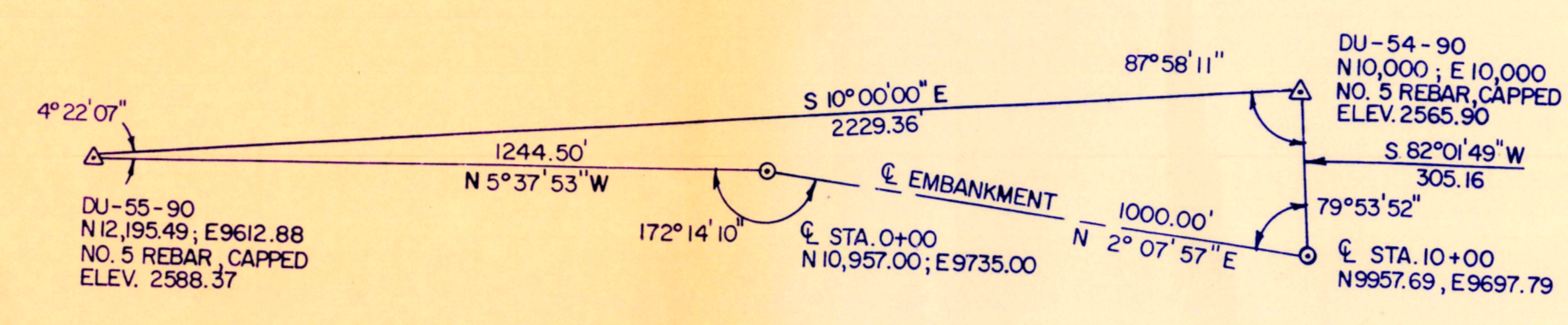


DUCKS UNLIMITED INC. GREAT PLAINS REGIONAL OFFICE		PROJECT NO. DU-1-SD-119-01	DESIGNED BY: R.C.S.
VICINITY MAP		DUTTON IMPOUNDMENT	DRAWN BY: J.B.
DATE: 1-8-91		SHEET NO: 1 OF 5	SURVEYED BY:
APPROVED BY: [Signature]		CHECKED BY: [Signature]	

1506-1



MARSH DATA
 FULL SERVICE LEVEL (FSL) = 2548
 AREA AT FSL = 41.0 ACRES
 CAPACITY AT FSL = 294.2 ACRE - FEET
 SHORELINE AT FSL = 2.6 MILES

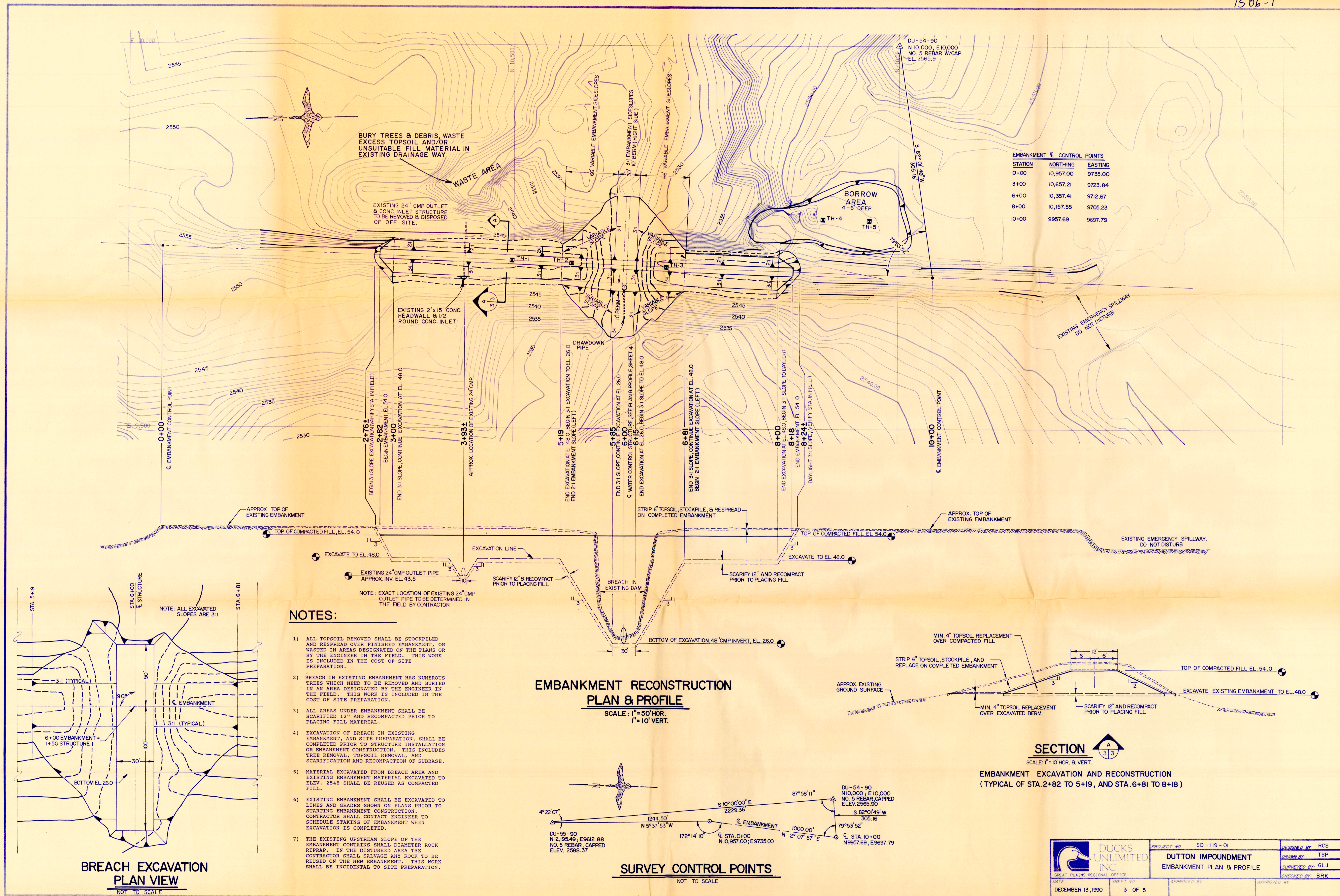


ESTIMATED QUANTITIES

MOBILIZATION	1	L.S.
SITE PREPARATION	809	CY-P.
EMBANKMENT CONSTRUCTION	14,567	CY-S.
WATER	XXXX	M-GAL.
WATER CONTROL STRUCTURE INSTALLATION	1	L.S.
WATER CONTROL STRUCTURE AND CULVERT APPURTENANCES		INCIDENTAL
CULVERT INSTALLATION		
48" CMP, 14 GA.	114	L.F.
12" PVC - SDR-35	32	L.F.
RIPRAP PLACEMENT	16	CY-P.
EXCAVATION OF EXISTING EMBANKMENT (NOT INCLUDING 6" TOPSOIL STRIPPING)	7837	C.Y. (NOT A PAY ITEM)

NOTE: 14567 C.Y. EMBANKMENT CONSTRUCTION INCLUDES 7837 C.Y. OF EXCAVATION FROM EXISTING EMBANKMENT. A BALANCE OF 6730 C.Y. OF BORROW WILL BE REQUIRED.

<p>DUCKS UNLIMITED INC. GREAT PLAINS REGIONAL OFFICE</p>	PROJECT NO. SD-119-01 DUTTON IMPOUNDMENT SITE TOPOGRAPHY, MARSH DATA	DESIGNED BY: RCS DRAWN BY: TSP, KB SURVEYED BY: GLJ CHECKED BY: BRK
	DATE: DECEMBER 13, 1990 SHEET NO.: 2 OF 5 APPROVED BY:	APPROVED BY:



EMBANKMENT & CONTROL POINTS

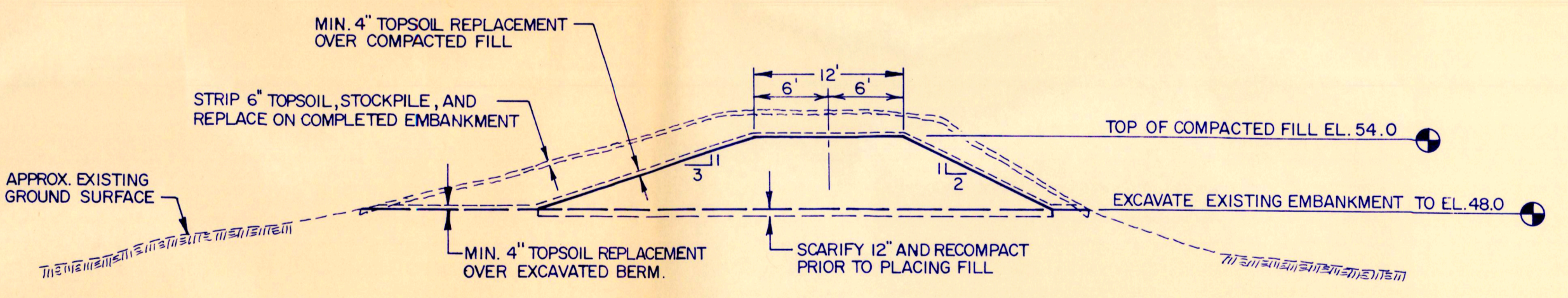
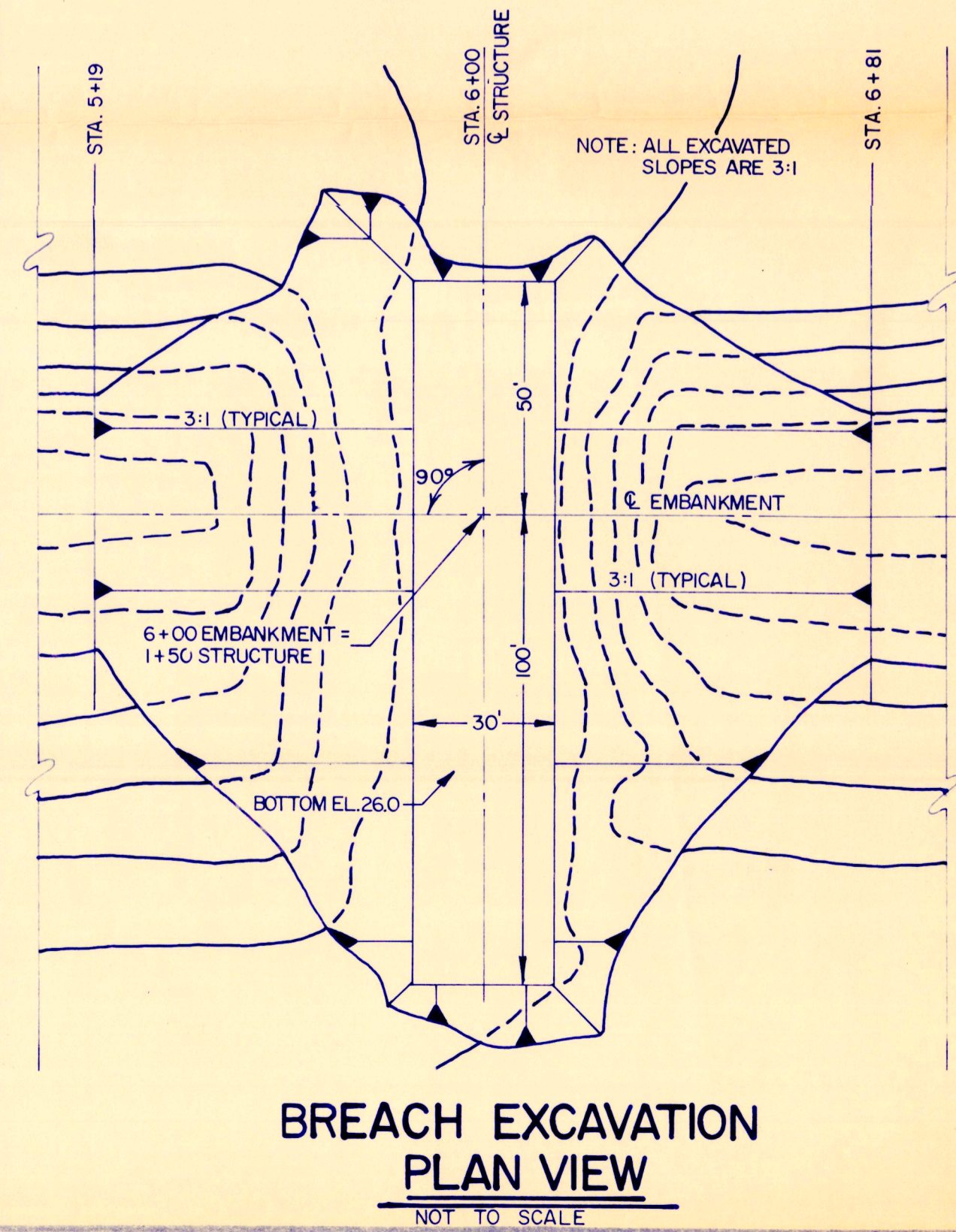
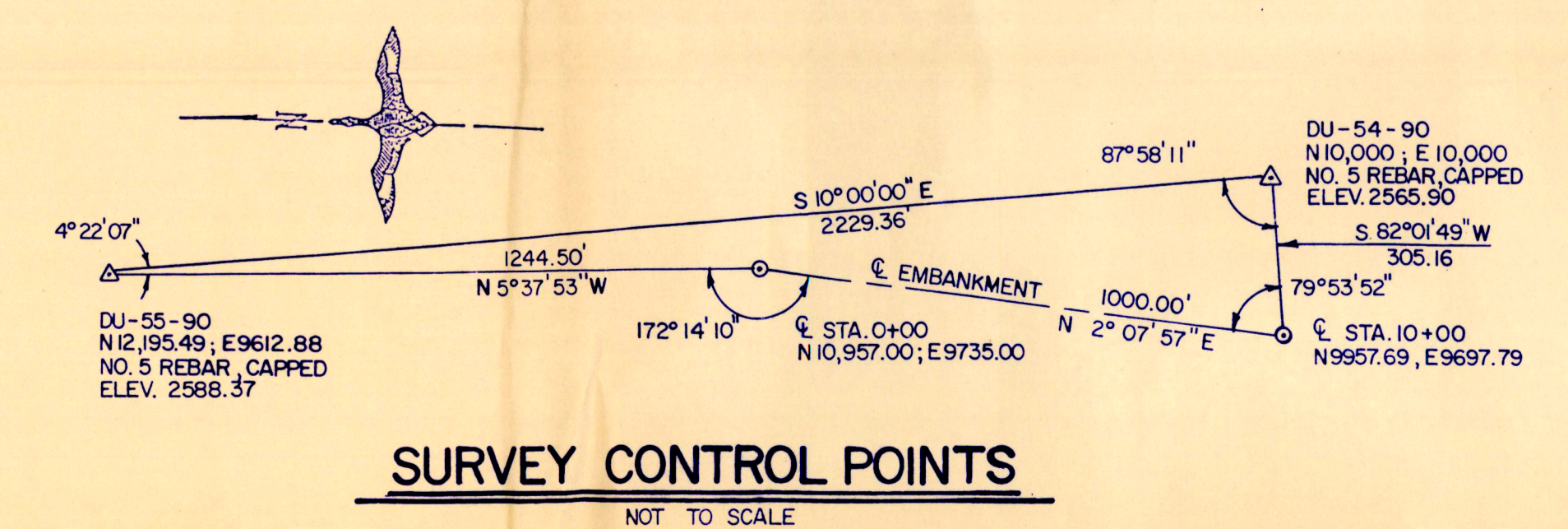
STATION	NORTHING	EASTING
0+00	10,957.00	9735.00
3+00	10,657.21	9723.84
6+00	10,357.41	9712.67
8+00	10,157.55	9705.23
10+00	9957.69	9697.79

NOTES:

- 1) ALL TOPSOIL REMOVED SHALL BE STOCKPILED AND RESPREAD OVER FINISHED EMBANKMENT, OR WASTED IN AREAS DESIGNATED ON THE PLANS OR BY THE ENGINEER IN THE FIELD. THIS WORK IS INCLUDED IN THE COST OF SITE PREPARATION.
- 2) BREACH IN EXISTING EMBANKMENT HAS NUMEROUS TREES WHICH NEED TO BE REMOVED AND BURIED IN AN AREA DESIGNATED BY THE ENGINEER IN THE FIELD. THIS WORK IS INCLUDED IN THE COST OF SITE PREPARATION.
- 3) ALL AREAS UNDER EMBANKMENT SHALL BE SCARIFIED 12" AND RECOMPACT PRIOR TO PLACING FILL MATERIAL.
- 4) EXCAVATION OF BREACH IN EXISTING EMBANKMENT, AND SITE PREPARATION, SHALL BE COMPLETED PRIOR TO STRUCTURE INSTALLATION OR EMBANKMENT CONSTRUCTION. THIS INCLUDES TREE REMOVAL, TOPSOIL REMOVAL, AND SCARIFICATION AND RECOMPACT OF SUBBASE.
- 5) MATERIAL EXCAVATED FROM BREACH AREA AND EXISTING EMBANKMENT MATERIAL EXCAVATED TO ELEV. 2548 SHALL BE REUSED AS COMPACTED FILL.
- 6) EXISTING EMBANKMENT SHALL BE EXCAVATED TO LINES AND GRADES SHOWN ON PLANS PRIOR TO STARTING EMBANKMENT CONSTRUCTION. CONTRACTOR SHALL CONTACT ENGINEER TO SCHEDULE STAKING OF EMBANKMENT WHEN EXCAVATION IS COMPLETED.
- 7) THE EXISTING UPSTREAM SLOPE OF THE EMBANKMENT CONTAINS SMALL DIAMETER ROCK RIPRAP. IN THE DISTURBED AREA THE CONTRACTOR SHALL SALVAGE ANY ROCK TO BE REUSED ON THE NEW EMBANKMENT. THIS WORK SHALL BE INCIDENTAL TO SITE PREPARATION.

EMBANKMENT RECONSTRUCTION PLAN & PROFILE

SCALE: 1" = 50' HOR.
1" = 10' VERT.



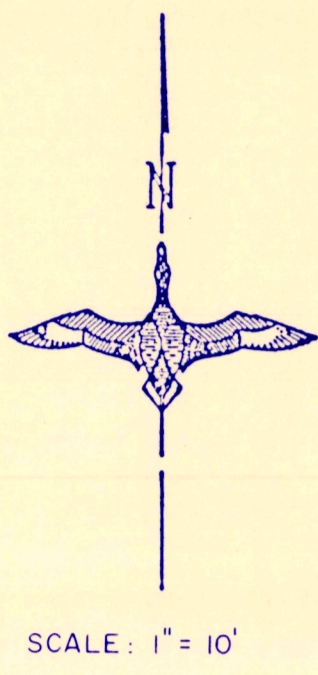
SECTION

SCALE: 1" = 10' HOR. & VERT.
EMBANKMENT EXCAVATION AND RECONSTRUCTION
(TYPICAL OF STA. 2+82 TO 5+19, AND STA. 6+81 TO 8+18)

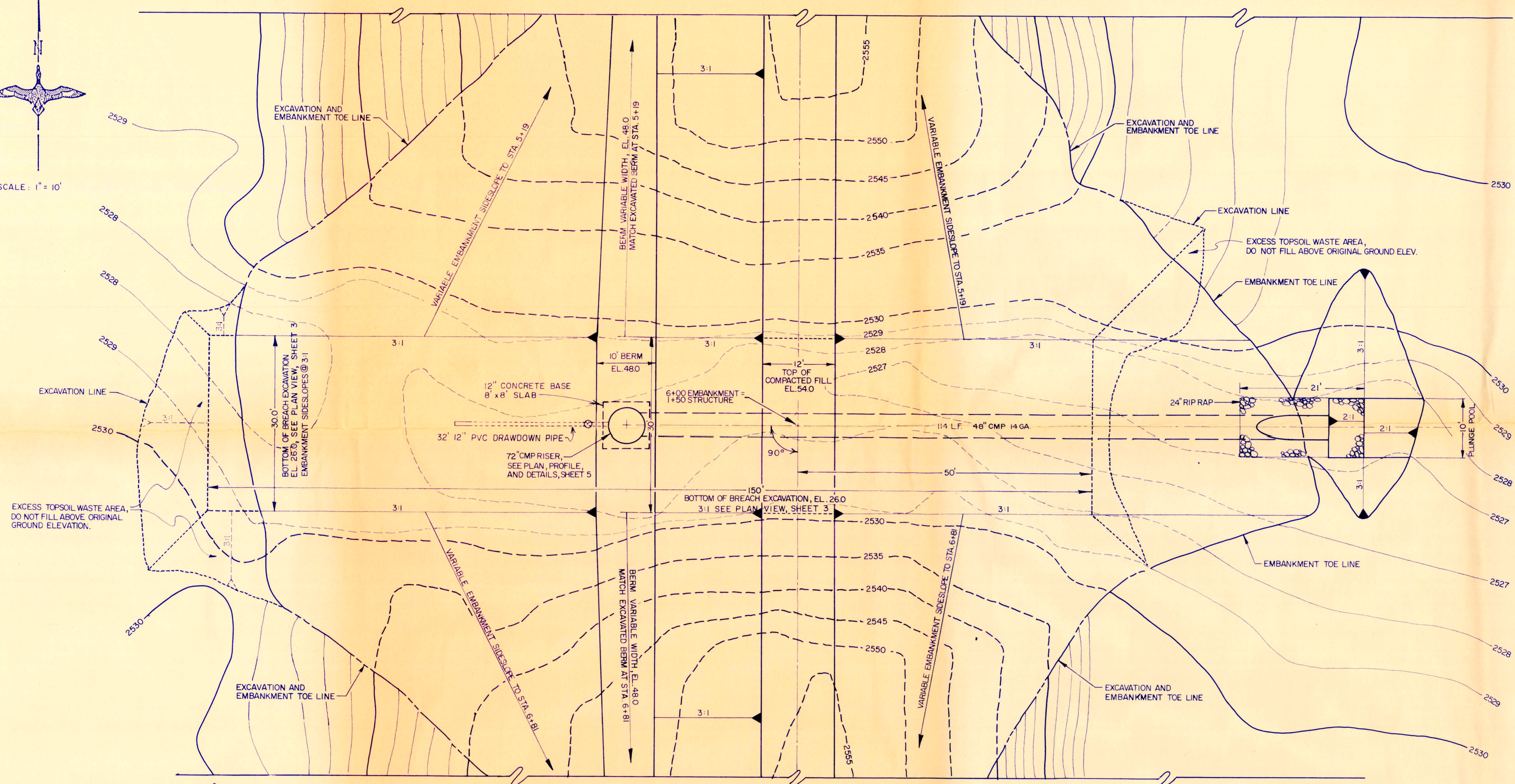
<p>DUCKS UNLIMITED INC. GREAT PLAINS REGIONAL OFFICE</p>	PROJECT NO. SD-119-01	DESIGNED BY RCS
	<p>DUTTON IMPOUNDMENT EMBANKMENT PLAN & PROFILE</p>	DRAWN BY TSP
DATE: DECEMBER 13, 1990	SHEET NO. 3 OF 5	CHECKED BY BRK

BREACH EXCAVATION PLAN VIEW
NOT TO SCALE

SURVEY CONTROL POINTS
NOT TO SCALE



SCALE: 1" = 10'



NOTE:

- 1) ALL TOPSOIL REMOVED SHALL BE STOCKPILED AND RESPREAD OVER FINISHED EMBANKMENT, OR WASTED IN AREAS DESIGNATED ON THE PLANS OR BY THE ENGINEER IN THE FIELD. THIS WORK IS INCLUDED IN THE COST OF SITE PREPARATION.
- 2) BREACH IN EXISTING EMBANKMENT HAS NUMEROUS TREES WHICH NEED TO BE REMOVED AND BURIED IN AN AREA DESIGNATED BY THE ENGINEER IN THE FIELD. THIS WORK IS INCLUDED IN THE COST OF SITE PREPARATION.
- 3) ALL AREAS UNDER EMBANKMENT SHALL BE SCARIFIED 12" AND RECOMPACTED PRIOR TO PLACING FILL MATERIAL.
- 4) EXCAVATION OF BREACH IN EXISTING EMBANKMENT, AND SITE PREPARATION, SHALL BE COMPLETED PRIOR TO STRUCTURE INSTALLATION OR EMBANKMENT CONSTRUCTION. THIS INCLUDES TREE REMOVAL, TOPSOIL REMOVAL, AND SCARIFICATION AND RECOMPACTMENT OF SUBBASE.
- 5) MATERIAL EXCAVATED FROM BREACH AREA AND EXISTING EMBANKMENT MATERIAL EXCAVATED TO ELEV. 2548 SHALL BE REUSED AS COMPACTED FILL.
- 6) EXISTING EMBANKMENT SHALL BE EXCAVATED TO LINES AND GRADES SHOWN ON PLANS PRIOR TO STARTING EMBANKMENT CONSTRUCTION. CONTRACTOR SHALL CONTACT ENGINEER TO SCHEDULE STAKING OF EMBANKMENT WHEN EXCAVATION IS COMPLETED.
- 7) THE EXISTING UPSTREAM SLOPE OF THE EMBANKMENT CONTAINS SMALL DIAMETER ROCK RIPRAP. IN THE DISTURBED AREA THE CONTRACTOR SHALL SALVAGE ANY ROCK TO BE REUSED ON THE NEW EMBANKMENT. THIS WORK SHALL BE INCIDENTAL TO SITE PREPARATION.

0+40 ± BEGIN BREACH EXCAVATION 3:1 SLOPE (VERIFY STA. IN FIELD)

0+50 END 3:1 SLOPE, CONT. EXCAVATION AT EL. 26.0. BEGIN 3:1 EMBANKMENT SIDESLOPE AFTER BREACH EXCAVATION AND SITE PREPARATION HAVE BEEN COMPLETED.

1+21 ± BERM & 72" CMP RISER SEE RISER PLAN, PROFILE, & DETAILS, SHEETS 5

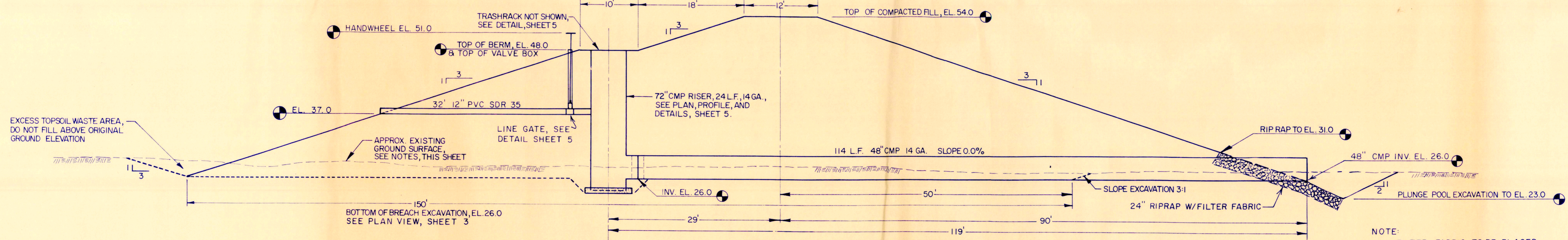
1+50 ± EMBANKMENT

2+00 ± END BREACH EXCAVATION AT EL. 26.0. BEGIN 3:1 SLOPE TO DAYLIGHT

2+40 ± END 48" CMP RISER, SEE EL. 26.0 BEGIN 2:1 PLUNGE POOL EXCAVATION

2+46 ± BOTTOM OF PL. EL. 23.0 BEGIN 2:1 SLOPE TO DAYLIGHT

2+55 ± DAYLIGHT PLUNGE POOL EXCAVATION (VERIFY STA. IN FIELD)



EXCAVATION REQUIRED FOR WATER CONTROL STRUCTURE INSTALLATION, CULVERT INSTALLATION, AND PVC INSTALLATION, SHALL BE INCIDENTAL TO THE RESPECTIVE PAY ITEMS. SEE APPLICABLE CONSTRUCTION SPECIFICATIONS.

NOTE: FILTER FABRIC TO BE PLACED UNDER ALL RIP RAP AS PER SPEC. 209

**WATER CONTROL STRUCTURE
PLAN & PROFILE**

SCALE: 1" = 10' HOR. & VERT.

<p>DUCKS UNLIMITED INC. GREAT PLAINS REGIONAL OFFICE</p>	PROJECT NO. SD-119-01	DESIGNED BY: RCS
	DUTTON IMPOUNDMENT WATER CONTROL STRUCTURE, PLAN & PROFILE	DRAWN BY: TSP
	DATE: DECEMBER 12, 1990	CHECKED BY: BRK
SHEET NO. 4 OF 5	APPROVED BY:	APPROVED BY:

MIDWEST TESTING LABORATORY

JOB NO. B2121 LOG OR TEST BORING NO. 1 VERTICAL SCALE 1"=2'

PROJECT Dutton Impoundment, Perkins County, South Dakota

DEPTH (FT)	SOIL DESCRIPTION	SAMPLE NO.	LABORATORY TESTS
1	FILL-CLAYEY SAND-brown, fine, dense to rather firm; clay inclusions, frost to 1' (SC)	1 SB 21*	
2	*N value influenced by frost	2 SB 11	
3	FILL-SANDY LEAN CLAY-brown, rather stiff (CL)	3 SB 11	
4	END OF BORING		

WATER LEVEL DATA: DATE 11-26-90 TIME 11:35 CASE IN DEPTH 11.50 WATER LEVEL 11.50 HSA 11

BORING DATA: STARTED 11-26-90 COMPLETED 11-26-90 8:11

METHOD USED 3 1/4" HSA 0-41

DATE CHEF M. Roberts

MIDWEST TESTING LABORATORY

JOB NO. B2121 LOG OR TEST BORING NO. 2 VERTICAL SCALE 1"=2'

PROJECT Dutton Impoundment, Perkins County, South Dakota

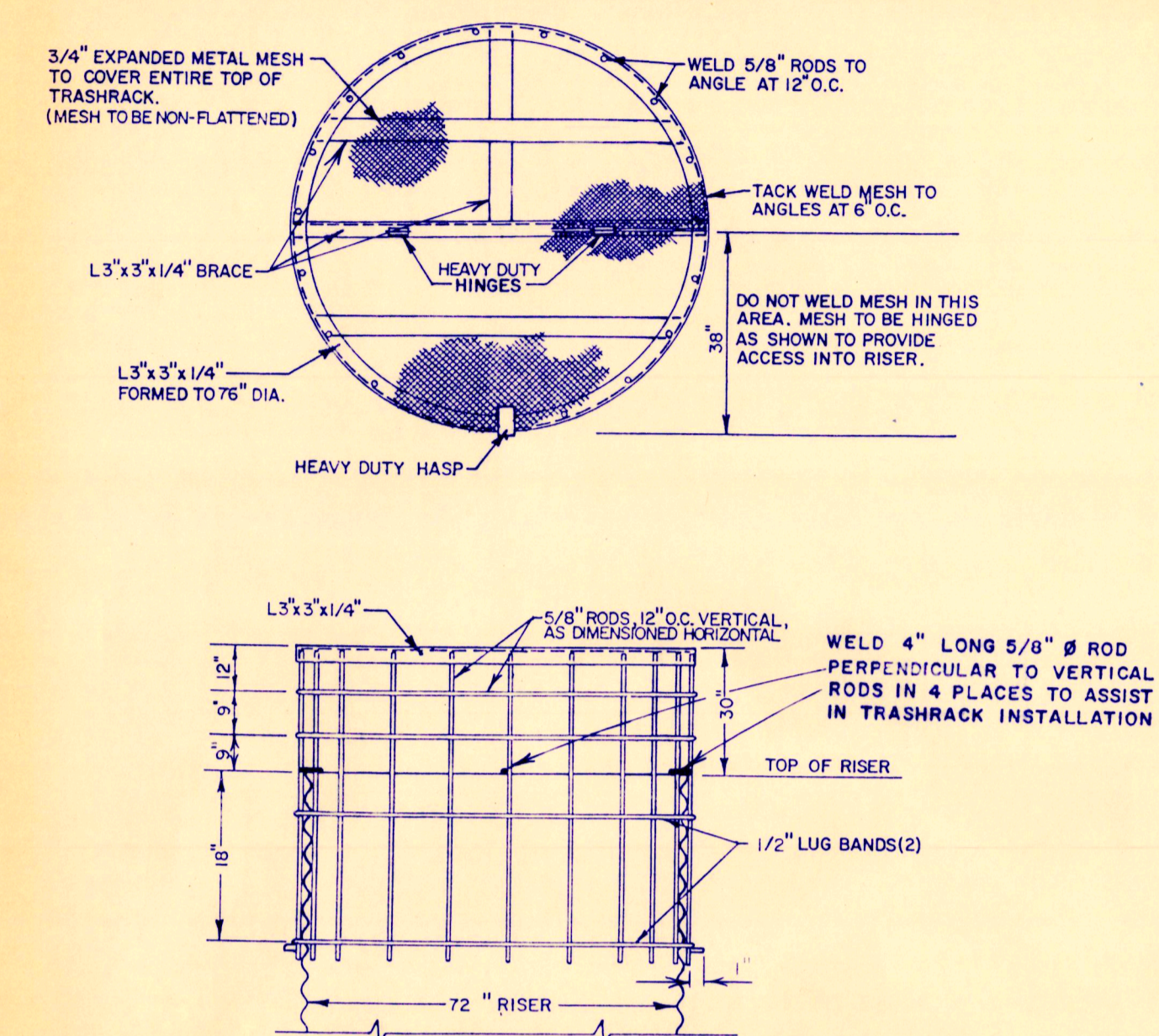
DEPTH (FT)	SOIL DESCRIPTION	SAMPLE NO.	LABORATORY TESTS
1	FILL-CLAYEY SAND-brown, fine, dense to hard to medium dense, clay inclusions, frost to 1' (SC)	1 SB 21*	
2	*N value influenced by frost	2 SB 8	
3		3 SB 11	
4	END OF BORING		

WATER LEVEL DATA: DATE 11-26-90 TIME 11:35 CASE IN DEPTH 11.50 WATER LEVEL 11.50 HSA 11

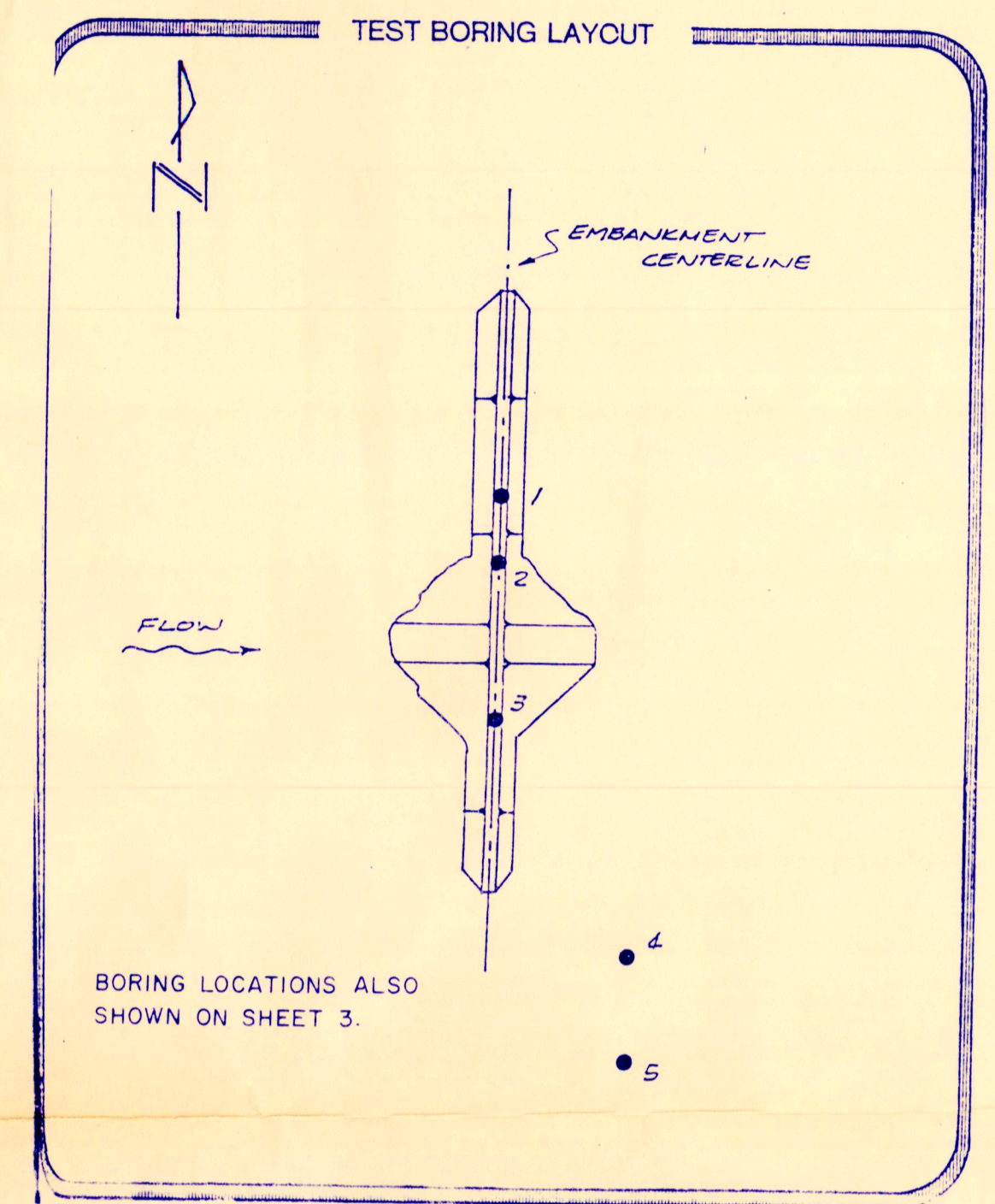
BORING DATA: STARTED 11-26-90 COMPLETED 11-26-90 8:11

METHOD USED 3 1/4" HSA 0-41

DATE CHEF M. Roberts



TRASHRACK DETAIL
NOT TO SCALE



MIDWEST TESTING LABORATORY

JOB NO. B2121 LOG OR TEST BORING NO. 3 VERTICAL SCALE 1"=2'

PROJECT Dutton Impoundment, Perkins County, South Dakota

DEPTH (FT)	SOIL DESCRIPTION	SAMPLE NO.	LABORATORY TESTS
1	FILL-SANDY LEAN CLAY-brown, stiff to rather stiff, trace of gravel (CL)	1 SB 23	
2		2 SB 21	
3		3 SB 14	
4	FILL-FAT CLAY WITH SAND-brown, stiff, sand inclusions (CI)	4 SB 18	
5		5 SB 19	
6		6 SB 20	117.4, 5412
7		7 SB 28	
8		8 SB 29	
9		9 SB 32	
10		10 SB 17	
11	END OF BORING		

WATER LEVEL DATA: DATE 11-26-90 TIME 11:35 CASE IN DEPTH 11.50 WATER LEVEL 11.50 HSA 11

BORING DATA: STARTED 11-26-90 COMPLETED 11-26-90 8:11

METHOD USED 3 1/4" HSA 0-29

DATE CHEF M. Roberts

MIDWEST TESTING LABORATORY

JOB NO. B2121 LOG OR TEST BORING NO. 4 VERTICAL SCALE 1"=2'

PROJECT Dutton Impoundment, Perkins County, South Dakota

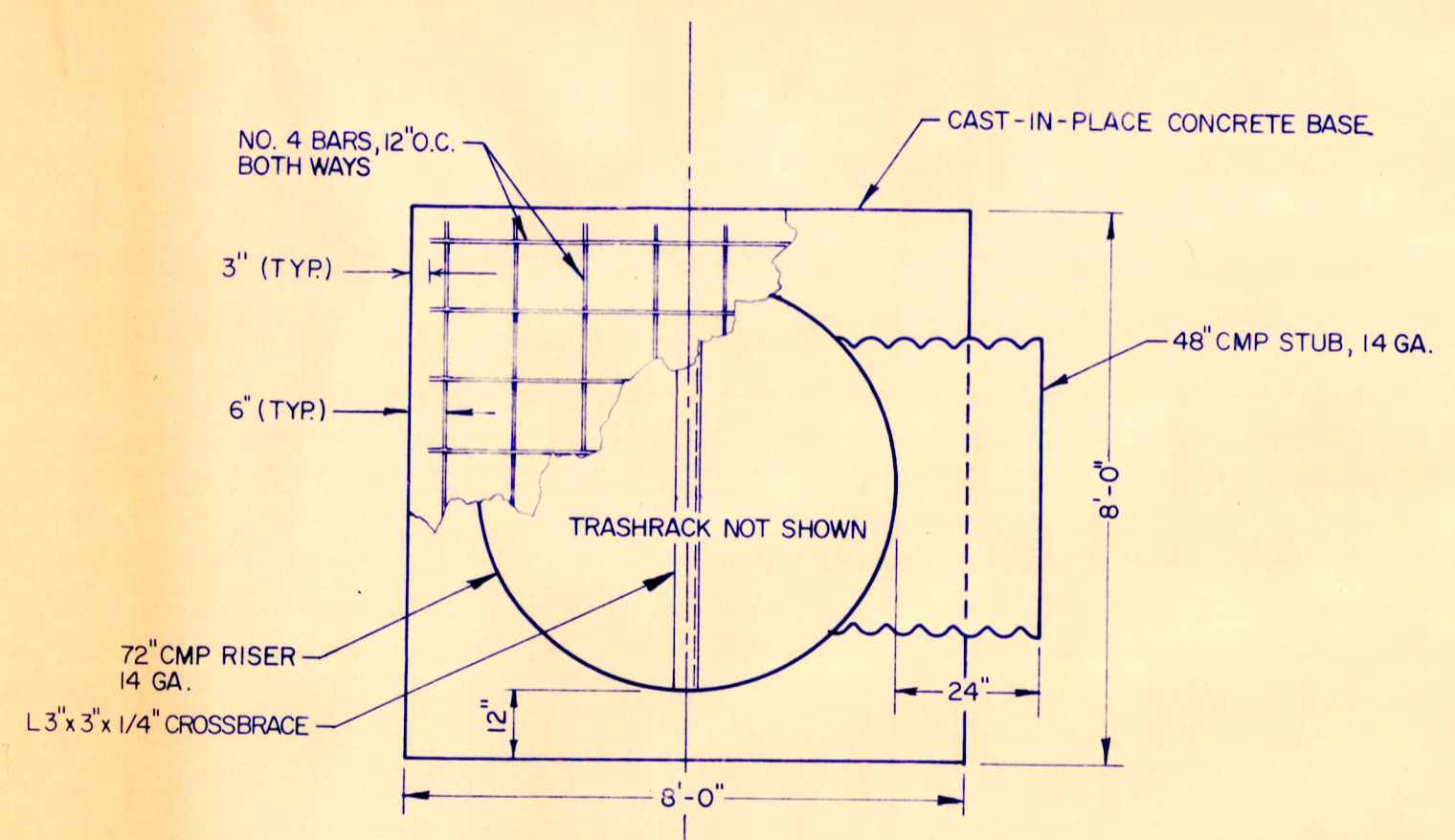
DEPTH (FT)	SOIL DESCRIPTION	SAMPLE NO.	LABORATORY TESTS
1	FILL-SANDY LEAN CLAY-brown, stiff to rather stiff, trace of gravel (CL)	1 SB 23	
2		2 SB 21	
3		3 SB 14	
4	FILL-FAT CLAY WITH SAND-brown, stiff, sand inclusions (CI)	4 SB 18	
5		5 SB 19	
6		6 SB 20	117.4, 5412
7		7 SB 28	
8		8 SB 29	
9		9 SB 32	
10		10 SB 17	
11	END OF BORING		

WATER LEVEL DATA: DATE 11-26-90 TIME 11:35 CASE IN DEPTH 11.50 WATER LEVEL 11.50 HSA 11

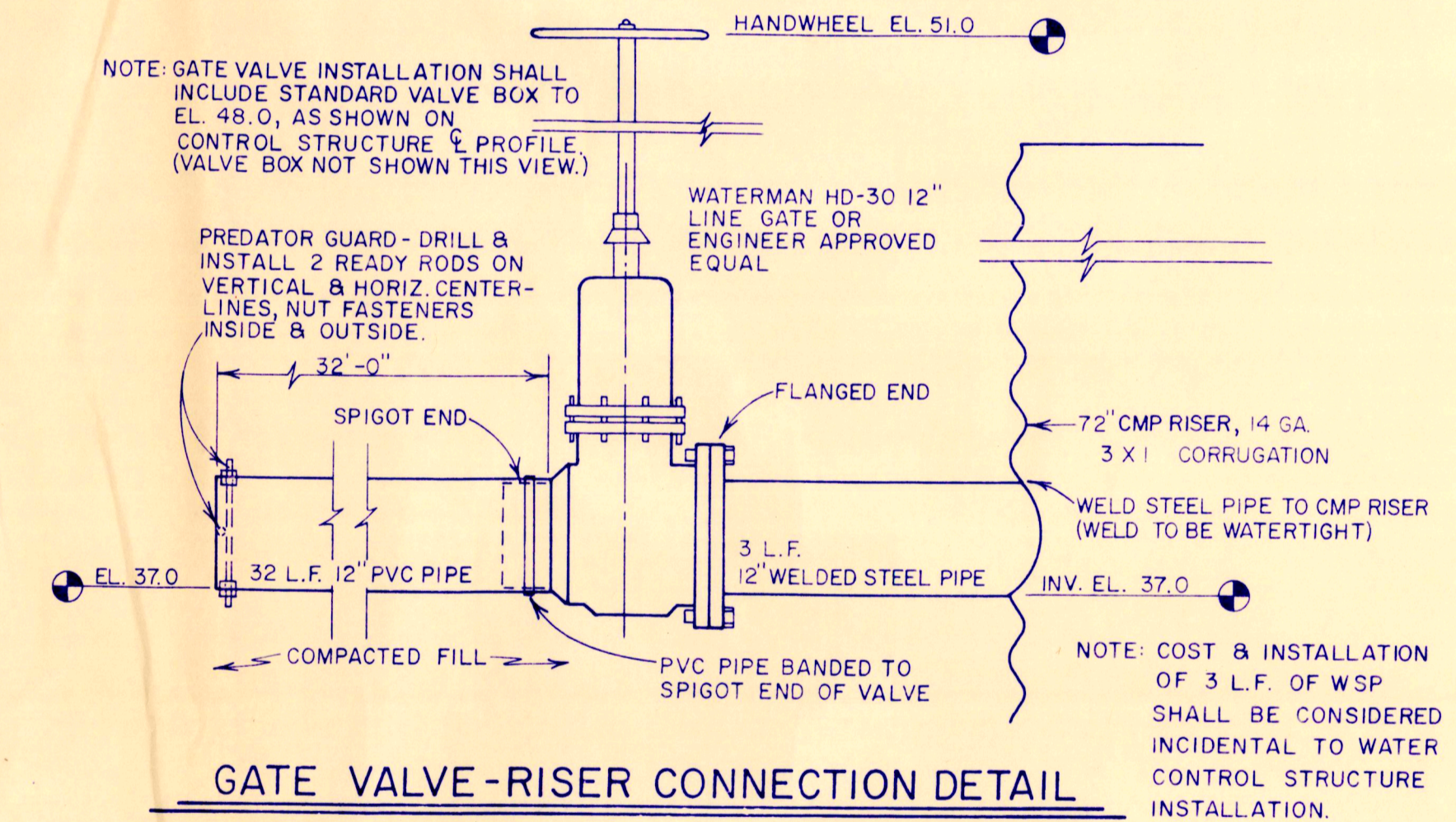
BORING DATA: STARTED 11-26-90 COMPLETED 11-26-90 8:11

METHOD USED 3 1/4" HSA 0-29

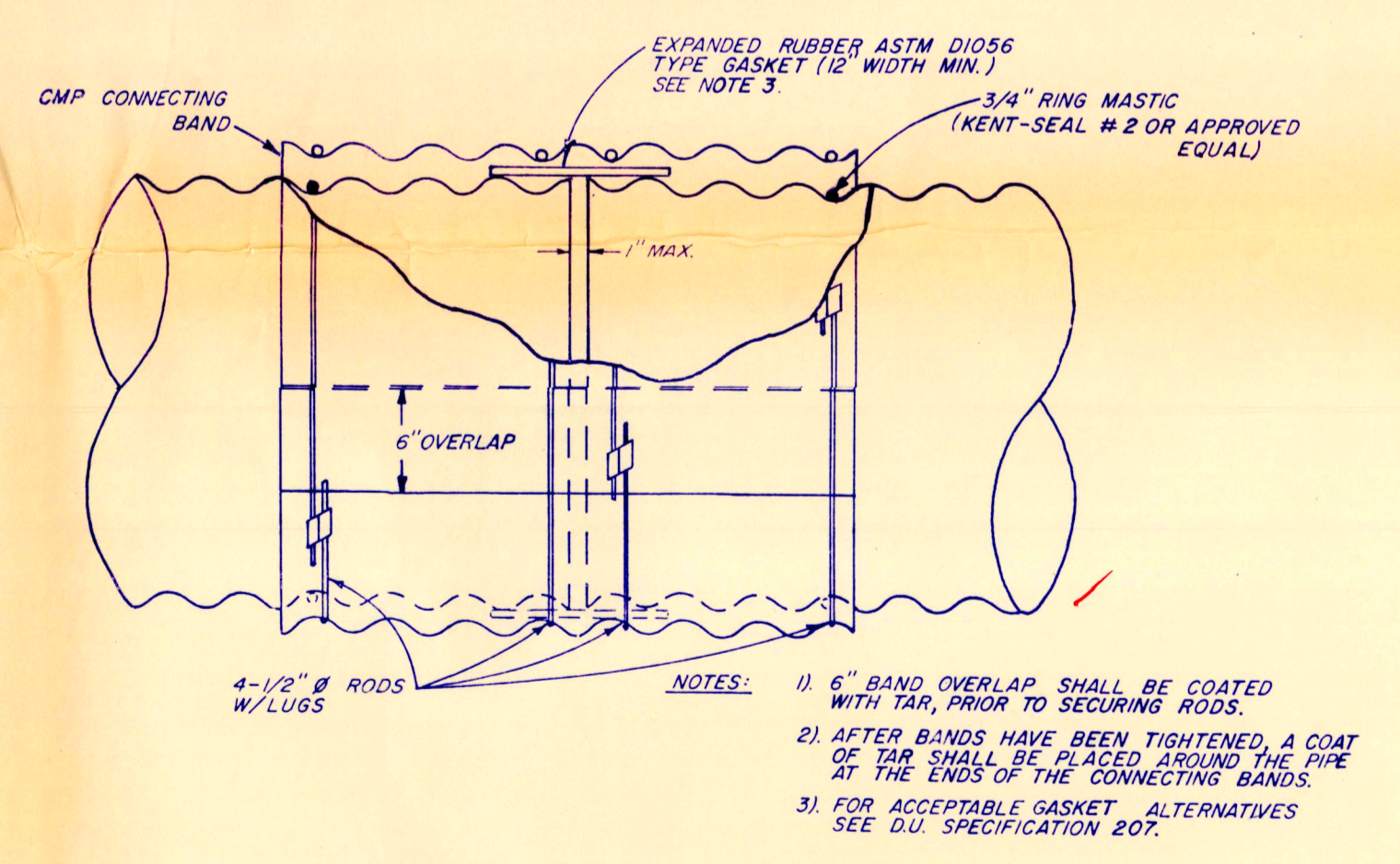
DATE CHEF M. Roberts



RISER - PLAN & PROFILE
NTS



GATE VALVE-RISER CONNECTION DETAIL



CONNECTING BAND DETAIL
NTS

MIDWEST TESTING LABORATORY

JOB NO. B2121 LOG OR TEST BORING NO. 5 VERTICAL SCALE 1"=2'

PROJECT Dutton Impoundment, Perkins County, South Dakota

DEPTH (FT)	SOIL DESCRIPTION	SAMPLE NO.	LABORATORY TESTS
1	FAT CLAY WITH SAND-grayish brown, very stiff, white mineral inclusions, surface vegetation to upper 4", frost to 1' (CR)	1 SB 44*	
2	*N value influenced by frost	2 SB 42	
3	FAT CLAY-dark gray, very stiff, sand inclusions and lenses (CR)	3 SB 52	
4		4 SB 51	
5		5 SB 51	
6		6 SB 51	
7		7 SB 51	
8		8 SB 51	
9		9 SB 51	
10		10 SB 51	
11	END OF BORING		

WATER LEVEL DATA: DATE 11-26-90 TIME 11:35 CASE IN DEPTH 11.50 WATER LEVEL 11.50 HSA 11

BORING DATA: STARTED 11-26-90 COMPLETED 11-26-90 8:11

METHOD USED 3 1/4" HSA 0-41

DATE CHEF M. Roberts

MIDWEST TESTING LABORATORY

JOB NO. B2121 LOG OR TEST BORING NO. 6 VERTICAL SCALE 1"=2'

PROJECT Dutton Impoundment, Perkins County, South Dakota

DEPTH (FT)	SOIL DESCRIPTION	SAMPLE NO.	LABORATORY TESTS
1	FAT CLAY WITH SAND-grayish brown, very stiff, white mineral inclusions, surface vegetation to upper 4", frost to 1' (CR)	1 SB 52*	
2	*N value influenced by frost	2 SB 58	16.1, 100.2
3	CLAYEY SAND-slight brownish gray, fine, dense, clay inclusions (SC)	3 SB 57	
4		4 SB 51	
5		5 SB 51	
6		6 SB 51	
7		7 SB 51	
8		8 SB 51	
9		9 SB 51	
10		10 SB 51	
11	END OF BORING		

WATER LEVEL DATA: DATE 11-26-90 TIME 11:35 CASE IN DEPTH 11.50 WATER LEVEL 11.50 HSA 11

BORING DATA: STARTED 11-26-90 COMPLETED 11-26-90 8:11

METHOD USED 3 1/4" HSA 0-91

DATE CHEF M. Roberts

THE BORINGS DONE ON THIS PROJECT REPRESENT THE SOILS FOUND AT THE LOCATIONS OF THE BORINGS ONLY. SOILS MAY VARY BETWEEN LOCATIONS AND OTHER AREAS OF THE PROJECT SITE NOT DRILLED. A COMPLETE GEOTECHNICAL ENGINEERING REPORT IS AVAILABLE FOR REVIEW AT DUCKS UNLIMITED GREAT PLAINS REGIONAL OFFICE. THE CONTRACTOR WARRANTS THAT SITE CONDITIONS HAVE BEEN EXAMINED AS REQUIRED BY SECTION 101.203 EXAMINATION OF SITE CONDITIONS OF THE GENERAL CONDITIONS PRIOR TO BIDDING OR CONSTRUCTING THIS PROJECT. NO ADJUSTMENT TO THE CONTRACT WILL BE MADE DUE TO CHANGED SITE CONDITIONS.

<p>DUCKS UNLIMITED INC. GREAT PLAINS REGIONAL OFFICE</p>	<p>PROJECT NO. SD-119-01</p>	<p>DESIGNED BY: RCS</p>
	<p>DUTTON IMPOUNDMENT RISER PLAN, PROFILE, & DETAILS SOIL BORING LOGS</p>	<p>DRAWN BY: TSP</p>
<p>DATE: DECEMBER 14, 1990</p>	<p>SHEET NO: 5 OF 5</p>	<p>CHECKED BY: BRK</p>